Mer Bleue Expansion Study Area

Master Transportation Study (DRAFT)

April 19, 2017

IBI

Mer Bleue Expansion Study Area

Master Transportation Study (DRAFT)

Prepared for:
Mer Bleue Expansion Area Participating Land Owners

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1. INTRODUCTION

Every five years, the City of Ottawa conducts a comprehensive review of its Official Plan (OP). This review includes growth management analyses to ensure that there is sufficient land designated for urban purposes to accommodate the projected growth to the time horizon of the OP. When the Official Plan was reviewed in 2009, City Council and the Ontario Municipal Board (OMB) approved a number of urban expansion areas to support the population projected in 2031. The Mer Bleue Expansion Study Area (MBESA) was one such area. Before the lands are developed as part of the urban area, a comprehensive study is required in the form of a Community Design Plan (CDP). The CDP implements the policies of the Official Plan in the specific area, is supported by a number of comprehensive studies, and is the result of the collective efforts of the stakeholders. The CDP process has been integrated with the Class Environmental Assessment (EA) process. EA approval is required for municipal infrastructure such as water, sanitary and storm sewers, roads and transit. The integrated process allows for the co-ordination of approvals, reviews and public consultations, and the requirements of both the Environmental Assessment Act and the Planning Act to be met.

Three concurrent and integrated Class Environmental Assessment Studies/Master Plans were initiated: a Master Transportation Study (MTS) to provide the road network; a Master Servicing Study (MSS) for water, storm drainage and sanitary; and an Environmental Management Plan (EMP) for the natural environment and to establish stormwater management criteria. These reports have been prepared in conjunction with the Community Design Plan (CDP) for lands within the Study Area of the Mer Bleue Expansion Area. Approval of the CDP and subsequent development applications under the Planning Act will be supported by these Class Environmental Assessments/Master Plans.

This report presents the methodology, findings and conclusions of the Master Transportation Study (MTS) for the MBESA.

1.1 Community Design Plan Area

The CDP area is generally bounded by the south limit of the developing community of Avalon West to the north, Mer Bleue Road to the west and Tenth Line Road to the east. The southern limit consists of two components: the western component is along Wall Road through the community of Notre Dame Des Champs and the eastern component begins east of Notre Dame Des Champs extending to Tenth Line Road at approximately the mid-way point between Wall Road and Navan Road (**Exhibit 1-1**). The Study Area for the supporting studies to the CDP may extend beyond the limits of the CDP Area to provide for a more comprehensive analysis of the influences in the CDP.

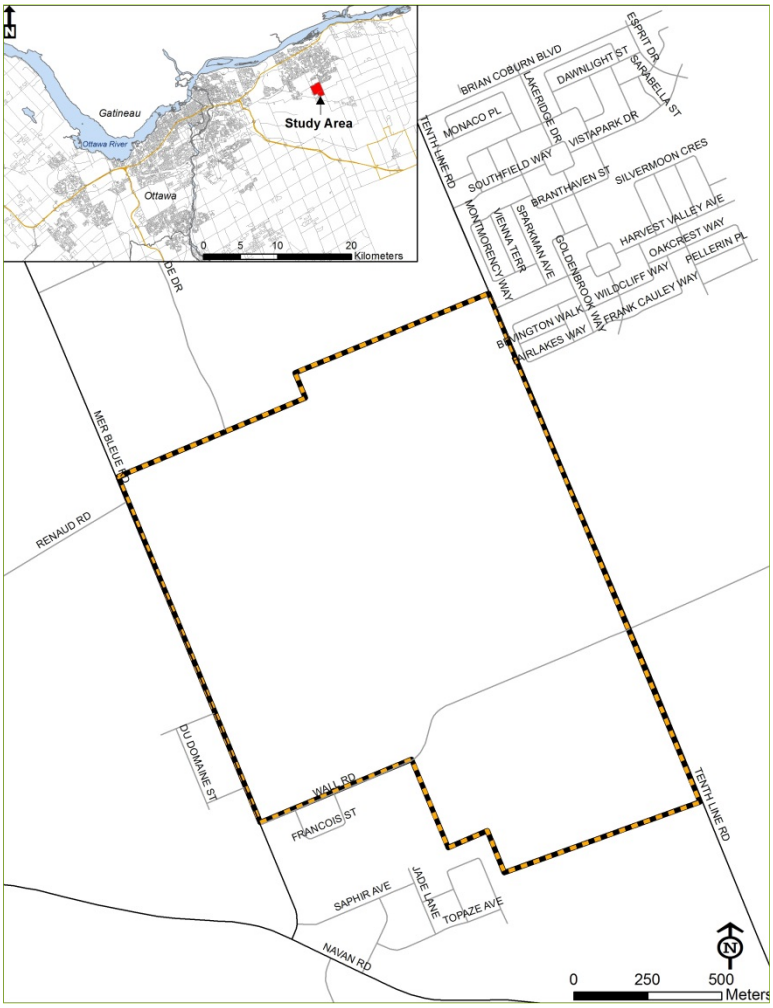

EXHIBIT 1-1: STUDY AREA

The study area encompasses the entirety of the Urban Expansion Study Area designation which currently comprises multiple land owners. A sponsoring Landowners Group has been established to assume responsibility for the comprehensive planning of the entire study area (**Table 1-1**). While the CDP is a developer-initiated and funded project, the City of Ottawa remains the key stakeholder and provides the regulatory framework within which the CDP will be completed.

TABLE 1-1: SPONSORING LANDOWNERS

Landowner	Area
Claridge Homes	103 ha (47%)
Mattamy Homes/Caivan /Bisson	72 ha (33%)
Richcraft Homes	16 ha (7%)
Other Landowners	28 ha (13%)
TOTAL	219 ha (100%)

The Mer Bleue Expansion CDP study area comprises approximately 219 gross hectares of land. The major landowners ('Sponsoring Landowners') are identified on Exhibit 1-2. Consultation with non-participating landowners within the study area has been undertaken throughout the study.

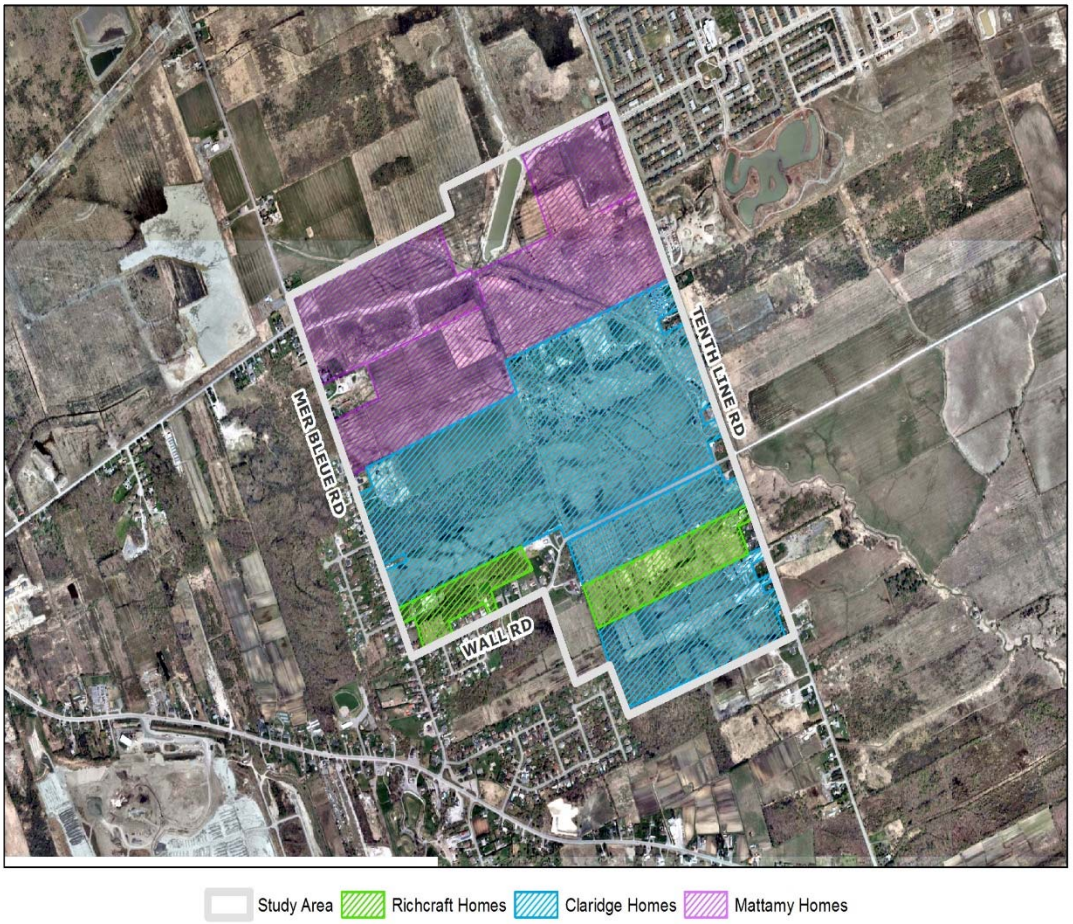

EXHIBIT 1-2: MAJOR LANDOWNERS LOCATION MAP

Successive sections of this report describe the study process; the methodology used in the development and evaluation of the preliminary concept plan options; details of the preferred concept plan; traffic analyses; and the findings and conclusions of the study. A series of appendices provide details of the background traffic information, traffic generation factors and traffic analyses.

2. STUDY PROCESS

2.1 Official Plan

The Official Plan (OP) policies (Section 3.11) respecting lands designated 'Urban Expansion Study Area' require the preparation of a Community Design Plan (CDP) or concept plan to be approved by Council prior to development proceeding. Such areas are intended to be developed primarily for residential purposes, although minor, non-residential uses to meet the needs of a neighbourhood may also be located here. **Exhibit 2-1** highlights the Mer Bleue Expansion Area as identified in the City of Ottawa OP Schedule B – Urban Policy Plan.

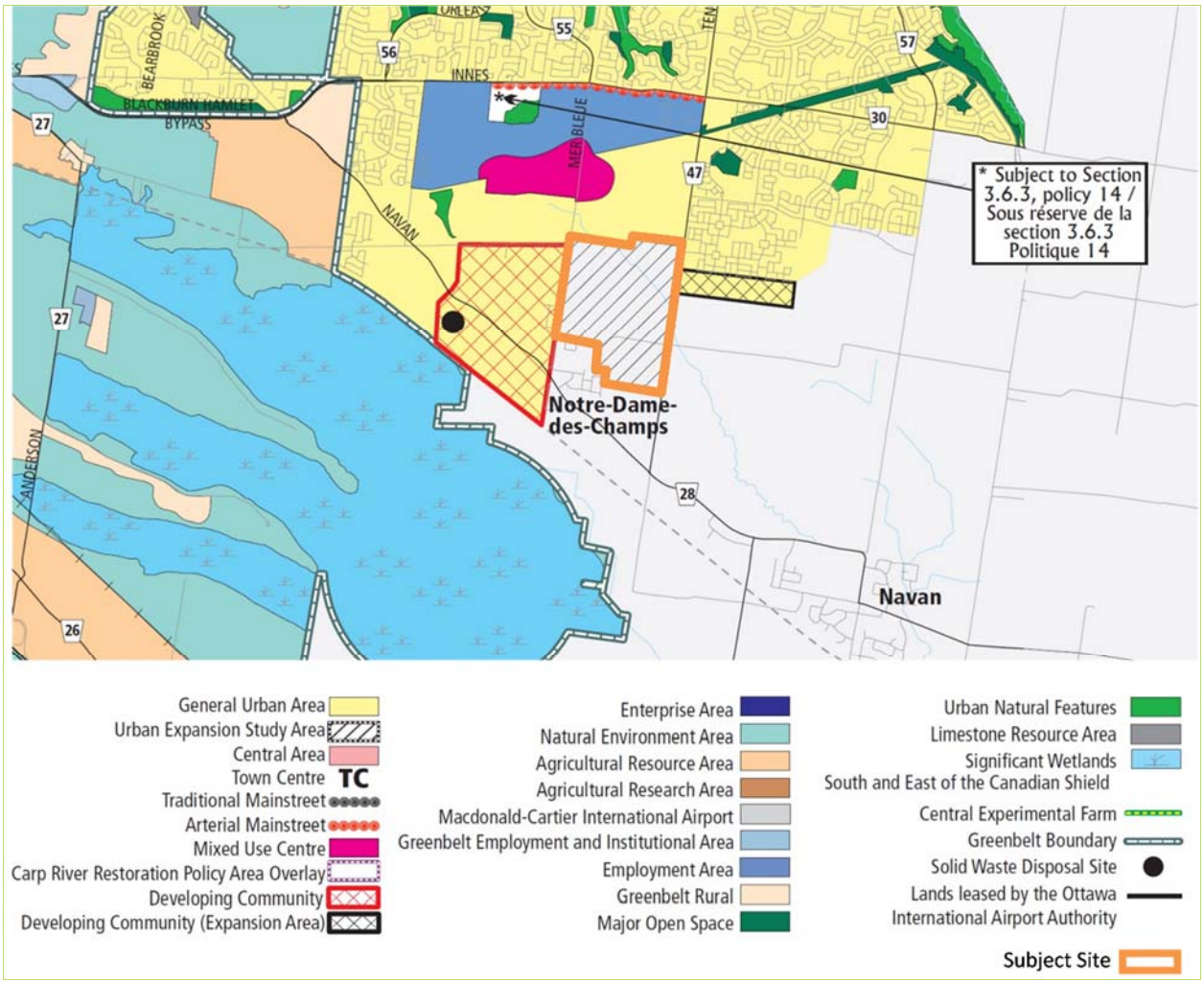

EXHIBIT 2-1: COMMUNITY DESIGN PLAN (CDP) AREA

Section 3.11 of the Official Plan also outlines the study requirements for the preparation of the CDP, which include:

- The lands will be evaluated primarily for urban residential uses;

- An Official Plan amendment will be required to designate the lands General Urban Area, and to implement infrastructure, environmental and open space provisions;
- An assessment of the need by the City of Ottawa for additional residential lands to be designated to maintain a 10 year land supply;
- A community design plan or concept plan;
- A comprehensive consultation process with the community to identify issues and potential solutions;
- A landowners' agreement addressing the location and costs of parks, stormwater ponds, and other facilities, prior to the review of development future applications;
- Studies identifying the location, timing and cost of roads and transit facilities, water and wastewater services, public utilities, stormwater management facilities, and any other on-site or off-site works required to service the CDP area;
- An Environmental Management Plan identifying the natural heritage system on the site independent of the potential developable area in accordance with Section 2.4.3 of the Official Plan;
- Identification of recreational pathways;
- Evaluation of the adequacy of community facilities—existing or planned—for the area in consultation with School Boards and other providers of community facilities;
- Establishment of the mix and location of residential dwelling types for the area which, as a minimum, will consist of the following: At least 45% single detached but not more than 55% single-detached, at least 10% apartment dwellings, and the remainder being multiple dwellings other than apartments;
- An overall minimum average density of 34 units per net hectare for residential development. Net residential density is defined as being the area of land in exclusively residential use, including lanes and parking areas internal to developments but excluding public streets, rights-of-way and all non-residential uses;
- An indication of how the plan will achieve other policies in the Official Plan including, but not limited to, affordable housing and design;
- Meet the requirements of the Environmental Assessment Act, where required; and,
- Preparation of a Financial Implementation Plan.

The CDP is intended to establish the mix, location and types of land uses within the CDP Area in accordance with good land use planning and community design principles and infrastructure requirements. The resultant community will be planned and developed in a manner to achieve a diverse, active and well-designed community wherein alternative transportation modes (such as walking, cycling and transit) are well integrated into the development. The community will also respond to adjacent existing planned communities to ensure the appropriate integration of land uses, transportation linkages and servicing networks.

The planning and coordination of the infrastructure and environmental management requirements for the CDP in consultation with the community will assist in ensuring that the objectives of the City, the community and other approval authorities are fulfilled. The CDP study process will comprise an integrated Planning and Municipal Class EA and therefore all

infrastructure studies have been prepared in accordance with the requirements of the "Class EA".

2.2 Integration of Planning Act and Municipal Class Environmental Assessment Process

The development of the transportation network within the MBESA is subject to the Environmental Assessment (EA) process, which will be completed as part of this MTS.

In completing the MTS, Phases 1 and 2 of the Municipal Engineers Association (MEA) Municipal Class EA process will be completed for 'Projects' as defined in the MEA Municipal Class EA document (October 2000, as amended in 2007 and 2011).

This study is prepared following the integration with the Planning Act provision of the MEA Class EA process (Section A.2.9 of the document). The Section recognizes the benefits of integrating approvals under the EA Act and the Planning Act. Any project which would otherwise be subject to the Municipal Class EA, that meets the intent of the Class EA (Section A.2.9) and receives approval under the Planning Act is considered to be a Schedule A project and therefore may proceed to construction.

Public contact for this study was established through a combination of meetings with regulatory agencies and individual stakeholders, a coordinated Public Open House, and the subdivision approval process.

Exhibit 2-2 illustrates the various requirements to satisfy each phase of the process. The following tasks will be addressed:

- Identify the problem or opportunity;
- Identify alternative solutions to the problem/opportunity;
- Identify impact of alternative solutions on the environment and establish mitigating measures;
- Evaluate alternative transportation solutions;
- Consult with review agencies and the public (public meeting) to present alternative transportation solutions and receive input;
- Select a preferred transportation solution;
- Review the preferred solution with the various review agencies (City of Ottawa, SNC and MOE, if required);
- Review and confirm choice of schedule; and,
- Should projects remain Schedule B, a notice of completion listing projects is to be issued, identifying review period and available appeal process.

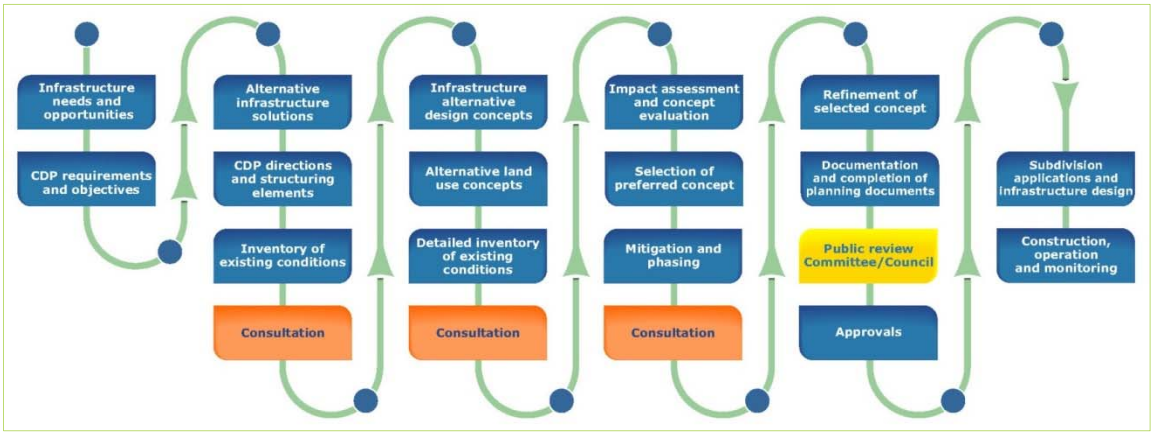

EXHIBIT 2-2: INTEGRATED ENVIRONMENTAL ASSESSMENT AND PLANNING ACT PROCESS

Following the review and approval of the MTS by the City of Ottawa, the projects identified in Section 9.1 of this study are deemed complete and can proceed to detailed design and construction without any further environmental assessment. Project implementation will take place as conditions of Draft Plan approval conducted under the Planning Act.

Alternative land use concept plans for the MBESA were developed and criteria were established to evaluate transportation requirements. A summary of this process is provided in this document.

The CDP study process comprised of an integrated planning and Municipal Class Environmental Assessment (MCEA) and therefore all infrastructure studies have been prepared in accordance with the requirements of the "Class EA".

The required Class EA environmental planning tasks generally include:

- Project need and opportunities;
- Characterization of the Existing Conditions;
- Consultation with potentially affected parties (including review agencies, public and private interest groups);
- Evaluation of alternatives;
- Identification and consideration of effects and mitigation; and
- Documentation of the planning and consultation process.

Following an integrated Planning and Class EA process enables the required approvals of municipal infrastructure to occur in conjunction with municipal planning approvals (i.e. approval of the CDP and adoption of an OP Amendment). Examples of municipal infrastructure that has been evaluated through the Class EA process include:

- Construction of new roads or other linear paved facilities;
- Construction of new sewage pumping station(s);
- Development of stormwater management systems; or
- Establish, extend or enlarge a water distribution system and all works necessary to connect the system to an existing system or water source;

- Establish, extend or enlarge a sewage collection system where the facilities are not in an existing allowance.

Class EA requirements for infrastructure have been evaluated throughout the CDP process as alternative designs were developed to ensure environmental assessment requirements, if any, were met. The ability to co-ordinate the approval requirements of the Environmental Assessment Act and the Planning Act ensures an integrated approach to the planning and development of all aspects of the community, as well as consolidation and simplification of the public review and approval processes. The key benefits of an integrated planning and environmental assessment process include:

- Improves the ability of meeting the requirements of both the Planning Act and the Class EA effectively;
- Reduces review/approval process duplication leading to faster implementation;
- Enhances opportunities to co-ordinate infrastructure with land use planning;
- Improves certainty for land use decision-making; and
- Co-ordinates appeals/objection processes.

A key component of the CDP process is also the coordination and integration of public consultation for the CDP, including the Planning Act requirements for implementing an OP Amendment and the requirements of the Class EA for related environmental and infrastructure projects. The planning and coordination of the infrastructure and environmental management requirements for the CDP in consultation with the community help to ensure that the objectives of the City, the community, other approval authorities and stakeholders have been fulfilled.

Consultation is one of the key points for integration. Accordingly, notices and information provided to the public stated that the Planning Act and Class EA processes are being integrated in accordance with Section A.2.9 of the Class EA and that any appeals will be to the Ontario Municipal Board (OMB) for both the land use planning and the infrastructure approvals. In general, the study process comprised of four phases, described as follows:

Project Need and Opportunities (Phase 1 Class EA)

A key first step in the EA process is to identify the need or opportunity for a project. The CDP study area boundaries recognize those adjacent areas that may be affected by the proposed undertaking. The spatial boundaries may vary depending on the environmental features being investigated in order to address environmental effects and operational issues; to accommodate coordination with relevant on-going studies and projects; and to identify infrastructure needs and future connections. For example, stormwater drainage or works within the watershed could have upstream and downstream impacts. Any potential off-site impacts have been constructively addressed to identify appropriate mechanisms for moving forward.

The intent of this step was to gather all existing information for the CDP study area to inform the CDP process, identify information gaps and opportunities, and to serve as a springboard to address issues affecting the community, including impacts on community facility services, (which may, in turn, affect infrastructure phasing and front-end financing).

The Guiding Principles for the CDP were developed to provide a framework for subsequent community designs and detailed land use patterns. The Guiding Principles are consistent with the City of Ottawa OP and reflect:

- The existing conditions of the Study Area;
- The preliminary opportunities and constraints produced by those existing conditions; and
- Community and landowner interests and issues.

Alternative Solutions and Existing Conditions Analysis (Phase 2 Class EA)

Identification of alternative infrastructure solutions were developed in concert with the establishment of problems, opportunities and the evaluation and selection of the alternative solutions which benefit from guiding principles input.

The Existing Conditions data was prepared by a multidisciplinary consulting team. This team of specialists collected, consolidated, reviewed and screened all available information (both from existing available data and through field research, as necessary) with a view towards identifying the existing conditions within the study area. The general methodology involved the following elements:

- The submission of requests for data, drawings, and reports to affected agencies;
- Contacting and meeting with affected parties as required;
- Consolidating, reviewing and analyzing of relevant material for each element;
- Conducting air photo interpretation and field verification as required;
- Identifying development limits;
- Identifying elements or criteria that could be considered potential evaluation criteria; and
- Preparing a draft baseline report to be reviewed by all participants to ensure thoroughness, reliance and reflectivity of agencies and public interests.

Existing document sources included (among other materials):

- City of Ottawa Official Plan, as approved by OMB (2012)
- Transportation Master Plan (2013) and any available updates thereto
- City of Ottawa Cycling Plan (2013)
- City of Ottawa Pedestrian Plan (2013)
- City of Ottawa Greenspace Master Plan (2006)
- Other CDPs
- Infrastructure Master Plan (2009) and any available updates thereto;
- National Capital Commission (NCC) Greenbelt Master Plan
- Natural Environmental Systems Strategy (NESS);
- Urban Natural Areas Environmental Evaluation Study (UNAEES)
- Stormwater Management Strategy (Master Plan);
- Pathway Network for Canada's Capital Region (Update);
- Ottawa Urban Design Guidelines for Greenfield Neighbourhoods;
- Ottawa Framework for Health and the Built Environment;

- Sports Fields Strategy;
- Ottawa Park and Pathway Development Manual; and
- Recreation Infrastructure Strategy.

Alternative Land Use Concepts and Alternative Infrastructure Designs (Phase 3 Class EA)
The Existing Conditions data formed the basis for the development of alternative land use plans (including land use, population, employment density, parks, schools, and housing statistics) and related infrastructure (servicing and road networks) for the CDP area.

Each land use concept was supported by an analysis of its advantages and disadvantages. These land use concepts have been subject to City, agency and public review.

Preferred Land Use Plan (Phase 3 Class EA)
This phase assimilates the input of the technical and public review and established a preferred land use plan which forms the basis of the CDP, Master Transportation Study and Serviceability Report. The preferred infrastructure designs have been incorporated into the Land Use plan.

Documentation - Community Design Plan and Official Plan Amendment (Phase 4 Class EA)
The Community Design Plan, Master Transportation Study and Master Servicing Study will be finalized together with the required Official Plan Amendment to implement the CDP which will be prepared and presented to Planning Committee.

This process was outlined, reviewed and accepted in the CDP Terms of Reference in consultation with the City of Ottawa and stakeholders.

2.3 Coordination and Integration

The Study Team is large and consists of municipal staff from various City departments, landowners, consultants, and approval agencies. Many meetings were held and information was reviewed and shared amongst each of the study participants. Decisions were made in an integrated and iterative process throughout the course of the studies. Through this iterative discussion and consultation many additional tasks and investigations were undertaken to ensure compatibility between the various infrastructure requirements. The following table **(Table 2-1)** highlights the concurrent activities/studies, how they were utilized and how they were integrated into the decision making process for the Study Team.

TABLE 2-1: REPORT INTEGRATION

REPORT/ACTION	FUNCTION/ROLE	UTILIZATION
Environmental Management Plan	Identification of: • Environmental constraints and opportunities in terms of natural heritage and natural hazards; • Measures to mitigate negative effects ;and • Development of recommendations for restoration and enhancement, which will shape the development limits.	CDP MSS MTS
Hydrogeology Report	Describe the site's geology and the groundwater conditions associated with that geology in terms of infiltration potentials, groundwater recharge and discharge, and the groundwater flow systems.	EMP CDP MSS
Fluvial Geomorphological Assessment	Document the existing conditions of the streams, channels and watercourses within the Study Area.	EMP MSS
Geotechnical Evaluation Report (July 2007)	To provide preliminary engineering guidelines based on preliminary sub-surface conditions, as identified by borehole and test pit investigations; identify soils conditions and develop servicing and grading plans in consideration of potential grade raise restrictions.	EMP CDP MSS
Stage 1 Archaeological Assessment	Identify areas of archaeological potential.	CDP
Land Use	Identify the existing physical land use planning conditions, policy framework and other City initiatives that would affect the development of future plans	CDP MSS MTS

The reports and planning were undertaken in an integrated fashion in a similar time frame which resulted in an iterative planning and decision making process which ensured the requirements of all the land use and infrastructure components were accommodated in an acceptable manner.

2.4 Public Consultation

Consultation is an integral part of both the Planning and Class Environmental Assessment process. Consultation and the exchange of information was undertaken throughout the assessments using a variety of methods including meetings with community associations and the general public, electronic information distribution and regular meetings with the Study Team, approval agencies, and the Ward Councilor(s).

The project proceeded under the direction of the City of Ottawa and benefitted from the direct involvement and guidance of:

- a Technical Advisory Committee (TAC) consisting of representatives from select government agencies and approval bodies;
- a Public Advisory Group (PAG) consisting of representatives from directly affected Community Associations and interested community groups; and

- Government Review Agencies (GRA) who represent government agencies and who administer specific permits and approvals.

The TAC and PAG met at key project milestones. GRA representatives were contacted as necessary for discipline specific information. Public Meetings were held to provide the general public with key project information. Details of the Consultation can be found in the Public Consultation Report.

3. PROJECT NEEDS AND OPPORTUNITIES

3.1 Project Needs

City Council approved OPA 76 which included the expansion of the urban boundary to include areas 10a, b & c within the urban fabric. These parcels make up the MBESA and were part of the approximately 850 Ha of lands identified by council to support the projected population growth for Ottawa to the year 2031.

The inclusion of the new urban lands has created the overall project need of guiding the development of these lands to meet the goal of Council to accommodate projected growth. To achieve this goal the requirements of a number of projects must be addressed. This report deals with the transportation requirements of the expansion area and the following project needs are identified to achieve the urbanization of the MBESA:

- Provision of pedestrian facilities to support growth
- Provision of cycling facilities to support growth
- Provision of transit service to support growth
- Provision of local and collector roads to support growth

3.2 Project Opportunities

The MBESA is located south of the developing Avalon West Community and north of the established Notre Dame Des Champs (NDDC) community. Its geographic location provides for opportunities to connect to the existing and planned transportation facilities in the adjacent communities which will help address the above noted project needs.

3.2.1 Pedestrian Facilities

There are currently no formal pedestrian facilities along the sections of Mer Bleue Road and Tenth Line Road directly adjacent to the CDP area. However, future plans to widen these roadways include the provision of concrete sidewalks along both sides of the widened roads.

There will be opportunities to provide connections to these facilities at each of the proposed roadway intersections along Mer Bleue Road and Tenth Line Road. Additional connection points to proposed off-road pathways within the CDP area will be considered.

Approved plans for the Avalon West Community to the north include a proposed Multi-Use Pathway (MUP) that will run east-west along the southern edge of the Avalon West development between Tenth Line Road and Mer Bleue Road. Opportunities exist to connect with the MUP from local streets or off-road pathways within the CDP area.

3.2.2 Cycling Facilities

Future plans for the widened Tenth Line Road and Mer Bleue Road include designated bicycle lanes. In the interim, there will be opportunities to connect cycling facilities within the CDP area to the existing paved shoulders on Tenth Line Road. Similarly, there is an opportunity to provide interim paved shoulders along Mer Bleue Road to connect to the

designated bicycle lanes in the widened section to the north of Renaud Road. In addition, there are opportunities to design the internal pathway network to provide connections between the different land uses within the CDP area—residential, schools, commercial, parks and natural green space areas. Connections to cycling facilities in adjacent communities, for instance the proposed MUP in Avalon West, will also be provided.

3.2.3 Transit Service

In accordance with the transit policies of the OP, the layout of new roads within the proposed CDP area will be designed to facilitate transit service through the community and to ensure reasonable walking distances to bus stops. There will be opportunities to either modify existing transit routes in the area or add new routes as required to serve the proposed development.

3.2.4 Road Network

The collector road system will be designed to provide safe and efficient travel for all modes. Connections to the adjacent arterial roads—Mer Bleue Road and Tenth Line Road—will provide the primary routes to/from the community. There is an opportunity to realign Wall Road to integrate it into the CDP area. The design of the road network will also allow for a road connection with the existing community to the north (via Gerry Lalonde Drive) and potentially to a further expansion of the urban community to the south should that occur at a future time.

4. EXISTING CONDITIONS

4.1 Transportation System

4.1.1 Roadways and Intersections

Mer Bleue Road

Mer Bleue Road is an arterial road which provides a major north-south route through the developing lands south of Innes Road. North of Innes Road, Mer Bleue Road becomes Jeanne d'Arc Boulevard which provides a connection to Ottawa Road 174. The section of Mer Bleue Road adjacent to the CDP area is a two-lane rural roadway with a posted speed limit of 60 km/h. To the north of Renaud Road, Mer Bleue Road transitions to a 4-lane, urban, divided cross-section. From Renaud Road to Navan Road, the posted speed limit is reduced to 50 km/h and heavy vehicles are prohibited.

Tenth Line Road

Tenth Line Road is an arterial road which runs from Jeanne d'Arc Boulevard North in the north to Smith Road in the south. The road has a 4-lane, urban, divided cross-section north of Brian Coburn Boulevard. The section of Tenth Line Road adjacent to the MBESA is a two-lane rural roadway with a posted speed limit of 60 km/h.

Navan Road

Navan Road is a two-lane arterial roadway which connects the community of Blackburn Hamlet with the village of Navan in the southeast. The posted speed limit within the study area is 60 km/h.

Brian Coburn Boulevard

Brian Coburn Boulevard is a two-lane urban arterial roadway which connects Mer Bleue Road to Trim Road in the east. The posted speed limit within the study area is 60 km/h.

Renaud Road

Renaud Road is a two-lane collector road connecting Mer Bleue Road to Anderson Road in the west. The posted speed limit in the vicinity of Mer Bleue Road is 50 km/h.

Wall Road

Wall Road is a two-lane rural collector road connecting Mer Bleue Road to Frank Kenny Road in the east. The posted speed limit is 50 km/h in the residential portion of the road nearest to Mer Bleue Road, but transitions to 80 km/h as it approaches Tenth Line Road. East of Tenth Line Road, Wall Road has an unpaved surface.

Study Area Intersections

The existing study area intersections, including lane configurations and controls, are shown in **Exhibit 4-1.**

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Mer Bleue Expansion
Master Transportation Study

EXHIBIT 4-1:
Existing (2013) Lane Configurations, Storage & Traffic Control

PROJECT No. 34739
DATE: April 2017
SCALE:

0m 200m 500m

Future Road Network

The City of Ottawa Transportation Master Plan (TMP), published in November 2013, identifies the following road network modifications that are part of the 2031 Affordable Network:

Phase 1 (2014-2019)

- Blackburn Hamlet Bypass Extension (1): New four-lane road between Orléans Boulevard and Navan Road
- Brian Coburn Boulevard Extension: New two-lane road (ultimately four-lane) between Navan Road and Mer Bleue Road
- Mer Bleue Road: Widen from two to four lanes between Brian Coburn Boulevard and Renaud Road

Phase 2 (2020-2025)

- Blackburn Hamlet Bypass Extension (2): New four-lane road between Blackburn Hamlet Bypass and Orléans Boulevard
- Tenth Line Road: Widen from two to four lanes between Harvest Valley Road and Wall Road

Notwithstanding the above planned implementation dates for these projects as set out in the 2013 TMP, City staff have advised that current financial constraints are impacting the ability of the City of Ottawa to achieve these implementation timelines. As such, it is anticipated that there will be a delay in the implementation of certain projects in the city-wide list of Phase 1 and Phase 2 road projects.

4.1.2 Protected Rights-of-Way

Table 4-1 indicates the right-of-way widths that are to be protected along the major roadways within the study area, as identified in the City of Ottawa Official Plan (OP) (January 2007) and subsequent Official Plan Amendment #150 (2013).

TABLE 4-1: EXISTING RIGHTS-OF-WAY

ROADWAY	SEGMENT	RIGHT-OF-WAY PROTECTION [1]
Mer Bleue Road	Innes Road to Navan Road, south section via realigned Mer Bleue Road south of Renaud Road.	37.5 m
Tenth Line Road	Vanguard Drive to Urban Area Limit	37.5 m Note: An additional 5.0 m on the rural side may be required to construct a rural cross-section.
Navan Road	Greenbelt to Urban Area Limit	37.5 m
	Urban Area Limit to Trim Rd.	34 m
Brian Coburn Boulevard	Blackburn Hamlet Bypass to Trim Rd.	40 m
Renaud Road	West of Belcourt Boulevard to future cul de sac	24 m
	Belcourt Boulevard to Mer Bleue Road	30.5 m
Wall Road	Mer Bleue Rd. to Frank Kenny Rd.	26 m

[1] Source: City of Ottawa Official Plan, 2007; Official Plan Amendment # 150, 2013

4.1.3 Bicycle and Pedestrian Facilities

According to the Ottawa Cycling Plan (2013), the following roads within the study area are designated as Spine or City-Wide cycling routes:

- Mer Bleue Road
- Navan Road
- Tenth Line Road

Sidewalks and dedicated bicycle lanes are provided along both sides of Tenth Line Road from Innes Road to just south of Brian Coburn Boulevard. The bike lanes then transition to paved shoulders which terminate just south of Southfield Way. Paved Shoulders are also provided along the section between Harvest Valley Avenue and Navan Road. Crosswalks are provided at the intersections of Tenth Line Road and Brian Coburn Boulevard and Tenth line Road and Navan Road. Ultimately, designated bike lanes and concrete sidewalks will be provided along both sides of Tenth Line Road as part of the planned widening to four lanes between Harvest Valley Avenue and Wall Road.

Bicycle lanes and concrete sidewalks will be provided along the section of Mer Bleue Road from Brian Coburn Boulevard to approximately 100 m north of Renaud Road as part of the future widening of this section of the road. It is anticipated that these facilities will be completed in 2016. South of the widened section there are currently no formal pedestrian or cycling facilities.

A bicycle pocket is provided on Brian Coburn Boulevard at the westbound approach to the intersection with Mer Bleue Road, beginning approximately 400 m east at Gerry Lalonde Drive. The remainder of the road provides sufficient width for shared-use lanes. A concrete sidewalk is provided on the north side of Brian Coburn Boulevard from Mer Bleue Road to Tenth Line Road.

There are no formal facilities for cyclists or pedestrians along the section of Navan Road within the study area, with the exception of formalized pedestrian crosswalks at the signalized intersection with Tenth Line Road and a short length of paved shoulders east of the intersection.

Details of the transportation network internal to the proposed development are discussed in further detail in Chapter 7.

4.1.4 Transit Service and Facilities

Transit service is currently provided near the CDP area via the following OC Transpo bus routes indicated in **Table 4-2** below.

TABLE 4-2: EXISTING TRANSIT SERVICE

ROUTE	DESCRIPTION	SERVICE PERIOD	PEAK HOUR FREQUENCY
30	Millennium Park and Ride to Lebreton Stn	Weekdays: 6:15 a.m.–9:00 a.m. and 3:15 p.m.–7:00 p.m. No Weekend Service. (Peak direction only)	10-minute
130	Millennium Park and Ride to Blair Station	Weekdays: 5:50 a.m.-12:00 a.m. No local service on Weekends	30-minute
35	Harvest Valley Drive to Lebreton Station	Weekdays: 5:30 a.m.–9:30 a.m. and 3:00 p.m. to 7:00 p.m. No Weekend Service. (Peak direction only)	10-minute
135	Harvest Valley Drive to Place d'Orléans	Weekdays: 6:00 a.m.–12:30 a.m. Weekends: 8:20 a.m.–12:20a.m.	30-minute
136	Tenth Line Road/Harvest Valley Drive to Place d'Orléans	Weekdays: 7:25 a.m.–9:00 a.m. and 3:00 p.m.–7:00 p.m. No Weekend Service. (Peak period service only)	30-minute
202	Cumberland to St. Laurent Station via Sarsfield/Navan	Tuesdays Only	1 Peak-Hour Trip
228	Sarsfield to Lebreton Station via Navan	Weekdays: 6am-8:30am & 3:30pm-6:30pm. No Weekend Service. (Peak direction only)	30-minute

Note: Information obtained from OC Transpo website on September 7, 2016.

Details of the existing transit routes described above are included in **Appendix A.**

The 2031 Affordable Network in the 2013 TMP indicates that Blackburn Hamlet Bypass and Brian Coburn Boulevard are designated as Transit Priority Corridors between Innes Road (west intersection) and Tenth Line Road. Continuous bus lanes are proposed during the peak period along Blackburn Hamlet Bypass between Innes Road (west intersection) and Navan Road through the reallocation of lanes. Isolated Transit Priority measures such as queue jumps and transit signal progression will be provided along Brian Coburn Boulevard between Navan Road and Tenth Line Road. A new Park-and-Ride facility is also proposed near the intersection of Brian Coburn Boulevard and Navan Road.

The Ultimate Rapid Transit and Transit Priority Network in the TMP envisions the Confederation Line Light Rail Transit (LRT) to be extended east to Trim Road. The subsequent Environmental Assessment study for the LRT Stage 2 project has included the possibility of extending LRT to Trim Road by 2023.

A secondary BRT line—Cumberland Transitway—is proposed from the Blair LRT Station, along Blackburn Hamlet Bypass and Brian Coburn Boulevard/Hydro Corridor east to Frank Kenny Drive. However, this project is not included in the City's current Affordable Network.Future stations along the Cumberland Transitway will be located at Orléans Boulevard, Belcourt Boulevard, Mer Bleue Road, Tenth Line Road, Esprit Drive, Portobello Bouevard, Provence Boulevard, Millenium Station and Frank Kenny Road.

4.1.5 Existing (2013) Traffic Volumes

Existing traffic volmes within the study area have been based on data collected from weekday traffic counts undertaken at the following intersections:

- Mer Bleue Road / Brian Coburn Boulevard (2013)
- Mer Bleue Road / Renaud Road (2013)
- Mer Bleue Road / Wall Road (2013)
- Mer Bleue Road / Navan Road (2013)
- Tenth Line Road / Brian Coburn Boulevard (2013)
- Tenth Line Road / Wall Road (2013)
- Tenth Line Road / Navan Road (2013)

Exhibit 4-2 presents details of the representative 2013 traffic volumes for the intersections indicated above, during the weekday morning and afternoon peak hours. Copies of the traffic counts have been provided in **Appendix B**.

4.1.6 Collision Records

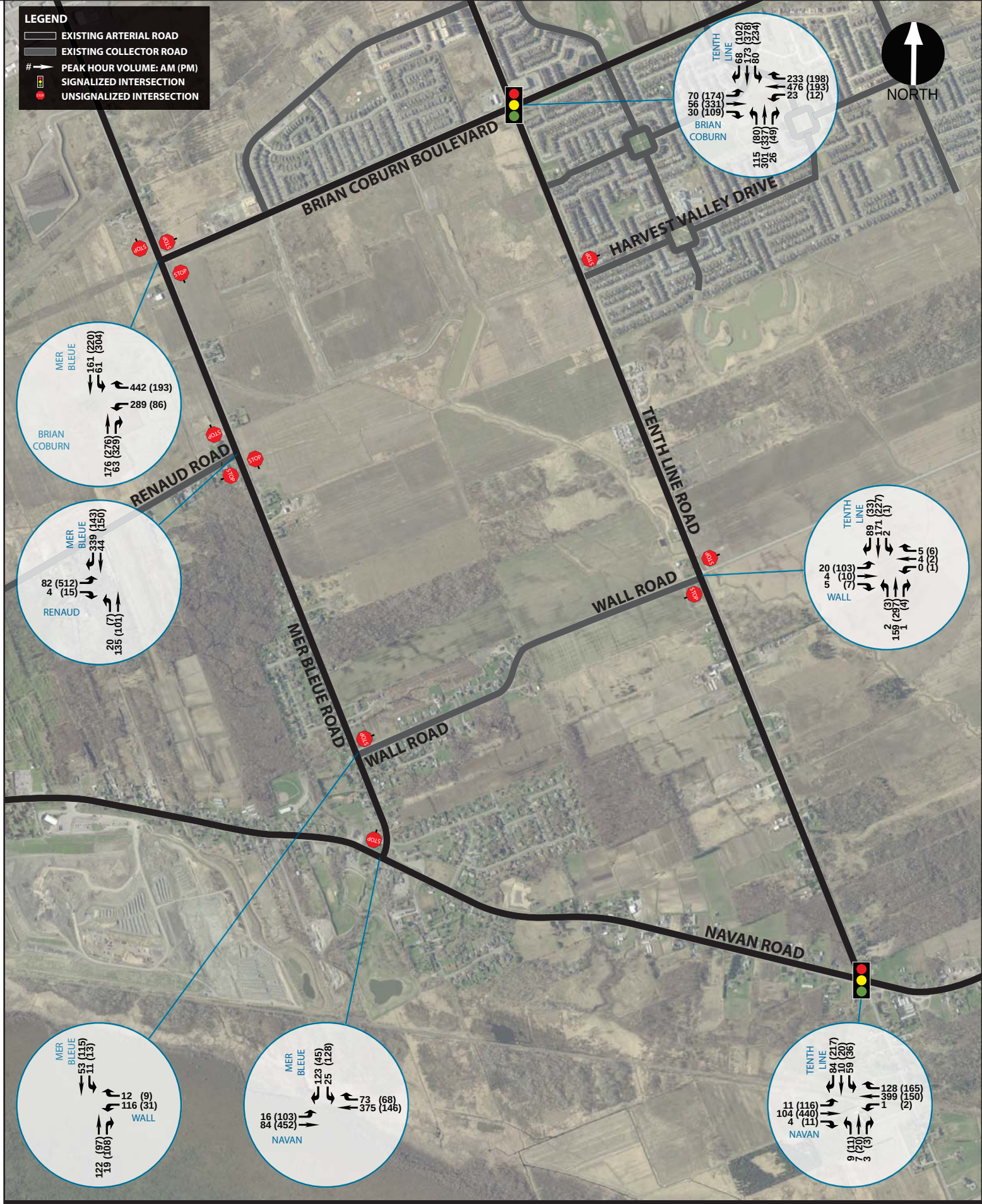
A review of collision records for the study area has been undertaken. The City of Ottawa Transportation Impact Assessment Guidelines indicate that further analysis may be warranted when there have been either 33 or more total collisions reported at a particular location, or at least 6 collisions of a particular type, over a three year period. At the request of the City, this study has analyzed a period of 5 years.

Table 4-3 presents a summary of the total collisions recorded at the locations within the study area with the highest total collisions recorded during the period between January 1, 2008 and January 1, 2013.

TABLE 4-3: SUMMARY OF REPORTED COLLISIONS WITHIN THE STUDY AREA

LOCATION	REPORTED COLLISIONS	PATTERN
Tenth Line Road (Harvest Valley to Wall)	13	Over half of the reported collisions involved southbound vehicles. Of these, five collisions involved a single vehicle leaving the roadway. There does not appear to be a pattern between time of day, weather or surface conditions that might explain this occurrence. The collisions occurred on a tangent section of roadway with relatively flat grades so roadway geometry does not appear to have been a factor.
Tenth Line & Brian Coburn Intersection	10	Most of the collisions involved southbound vehicles and/or poor surface conditions such as rain, ice or snow.
Navan Road (Mer Bleue to Tenth Line)	7	There are no apparent patterns among collision types.
Wall Road (Mer Bleue to Tenth Line)	6	There are no apparent patterns among collision types.

Copies of the detailed collision records are provided in **Appendix C**.



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Mer Bleue Expansion
Master Transportation Study

EXHIBIT 4-2:
Existing (2013) Traffic

PROJECT No. 34739
DATE: April 2017
SCALE:
0m 200m 500m

4.2 Natural Heritage

The MBESA is dominated by agricultural fields with areas of regenerating woody vegetation on former agricultural lands. The key natural heritage features as identified in a separate report entitled "Existing Conditions: Natural Environmental Features Mer Bleue Urban Expansion Area", prepared by Muncaster Environmental Planning Inc., constraints and opportunities, and potential mitigation recommendations include:

- McKinnons Creek – For the purposes of the MSS, a potential maximum setback of 15 metres from the top-of-slope has been incorporated in the analysis based on the recommendations provided within the EMP for the protection of the common aquatic habitat observed in McKinnons Creek.
- No evidence of direct fish habitat was found in any of the tributaries of McKinnons Creek. The tributaries are not recommended for retention as part of the Natural Heritage System.
- The South Deciduous Forest is recommended for retention in its current condition.
- The West Deciduous Forest is not recommended for retention as part of the Natural Heritage System.
- Two avian Species at Risk were observed in the urban expansion area - bobolink and barn swallow. Prior to individual parcel applications, detailed surveys should be completed for these species if suitable habitat remains.
- A healthy butternut was observed in the southwest portion of the study area north of Wall Road. A mitigation planting plan for two pure butternut seedlings will be submitted to the Ministry of Natural Resources prior to any site disturbances within 25 metres of the butternut.

There are a few trails through the South Deciduous forest and it is recommended that these trails be used as much as possible as part of a passive recreational interpretation trail through the retained forest. A 5-m setback without grading, excavations or other activities that could impact the critical root zones of the adjacent trees is recommended along the periphery of the South Deciduous Forest. This woodlot is identified on Schedule L1 of the City's Natural Heritage System Overlay within the City's Official Plan, identifying the requirement for an Environmental Impact Statement for development proposed in or adjacent to the woodlot. As additional engineering for each parcel is completed, it is recommended to further assess the Hedgerows and other woody vegetation to determine the possibility and benefits of retention Key natural heritage features which are illustrated in **Exhibit 4-3**.

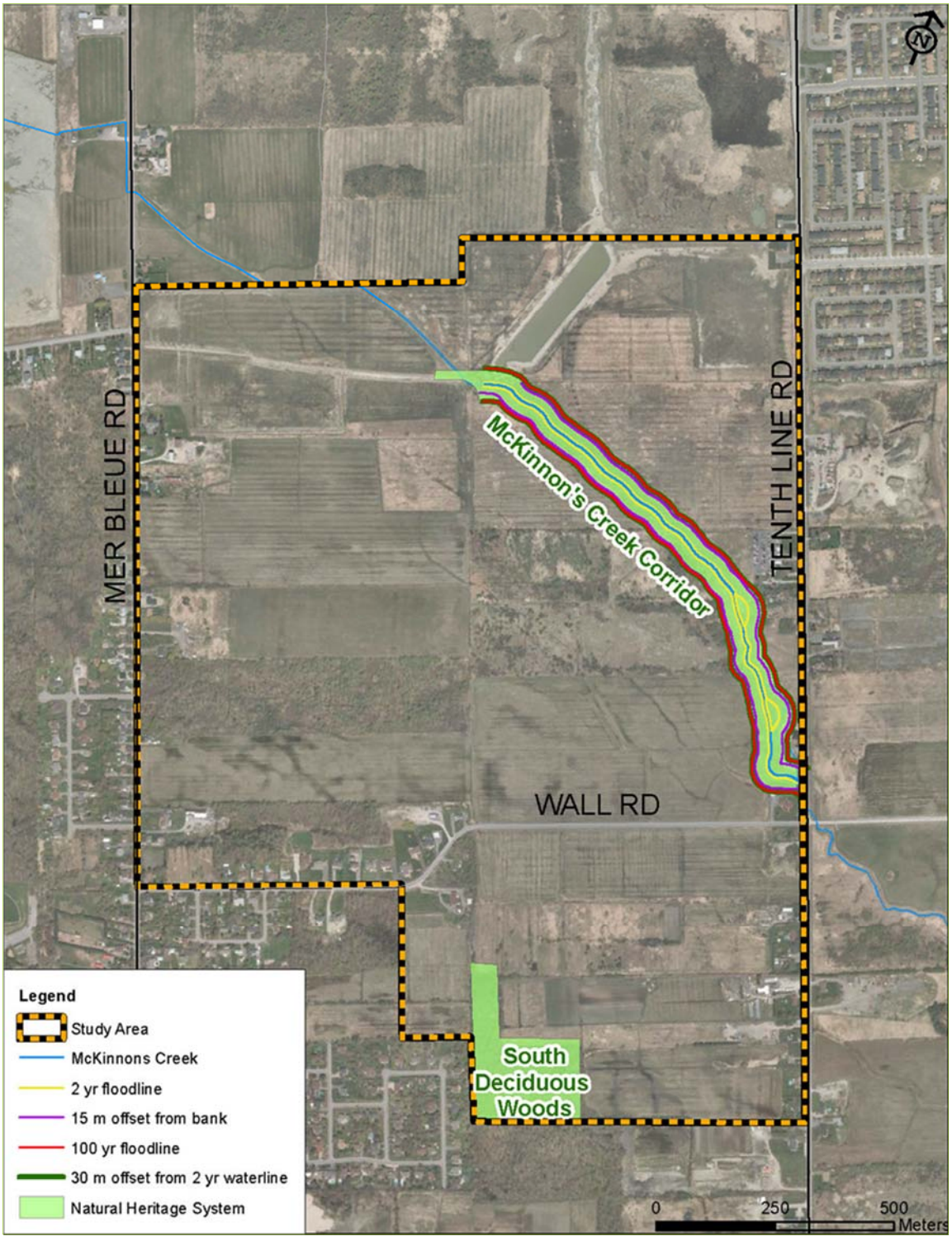


EXHIBIT 4-3: KEY NATURAL HERITAGE FEATURES

4.3 Social Environment

Area 10 a, b and c consists of a mixture of agricultural lands, brush and strip development along the two major roads, Mer Bleue Road on the western limits and Tenth Line Road on the eastern limits. Prior to OPA 76, the areas OP designation was General Rural and zoning RU Rural. The subject lands are located immediately south of the developing community of Avalon West and north of the Village of Notre Dame Des Champs. Lands west of the subject property will be urbanized and lands east are agricultural lands. The extension of the urban boundary will allow for the extension of municipal infrastructure services (water, sanitary, storm), transit service, expanded utility services such as high speed internet and natural gas. Development will include community usages also such as parks and recreational facilities. The strip development along Mer Bleue and Tenth Line Road consists of approximately 24 houses within the subject lands and 37 houses with frontage abutting the subject lands. While some homes within the subject lands will sell to developers those that do not will be able to utilize the extended services. Those houses abutting the subject lands and the surrounding area will benefit from the extension of transit and the development of new schools and municipal recreational facilities. Connection to direct infrastructure services such as water, wastewater and stormwater would require municipal approval.

5. IDENTIFICATION AND EVALUATION OF ALTERNATIVE SOLUTIONS

In order to address the transportation needs of the MBESA, the following alternative solutions have been assessed:

- Do Nothing
- Build Roads
- Provide for Transit
- Improve Cycling and Pedestrian Mobility

The alternative solutions have been evaluated in terms of their ability to meet the problem statement—their ability to support the approved level of development and their ability to meet relevant regulations and guidelines—and their expected net environmental impacts.

A summary of the evaluation of alternative solutions is provided in **Table 5-1**.

TABLE 5-1: EVALUATION OF ALTERNATIVE TRANSPORTATION SOLUTIONS

ALTERNATIVE SOLUTION	TRANSPORTATION AND LAND USE	SOCIAL ENVIRONMENT	NATURAL ENVIRONMENT	COMMENT	CARRIED FORWARD?
Do Nothing	✘	✘	✘	Does not satisfy the travel demand. Does not address the problem/opportunity. Does not meet the intent of the planning or transportation policies.	**No**
Build Roads	✓	~	~	Accommodates a substantial part of the travel demand. Addresses the problem/opportunity. Requires mitigation to lessen negative environmental impacts.	**Yes**
Provide for Transit	✓	✓	✓	Accommodates an important part of the travel demand and provides alternative means of travel. Addresses part of the problem/opportunity. Assists in reducing vehicular travel thereby improving air quality.	**Yes**
Improve Cycling and Pedestrian Mobility	~	✓	✓	Does not significantly accommodate the travel demand. Addresses part of the problem/opportunity. Meets the intent of transportation/planning policies.	**Yes**

✘ Negative Impact ✓ Positive Impact ~ Neutral/Mitigable Impact

A combination of building and modifying roads, providing routes for transit and improving cycling and pedestrian mobility has been carried forward as the preferred transportation solution to be incorporated in the alternative concept plans for the MBESA.

6. ALTERNATIVE LAND USE CONCEPTS AND INFRASTRUCTURE DESIGNS

6.1 Land Use Concepts

The Land Use Concepts for the MBESA draw upon the physical, locational, visual and contextual factors in the area that may be affected by the plan. A set of principles for design and development in key aspects of the plan have been developed.

The following design guidelines provide a framework of the design criteria for the overall identity and structure of the proposed CDP, as well as for the appearance of new buildings, streetscape, parks and open spaces within the community.

These guiding principles, prepared through a consultative process, will form the foundations of creating a vibrant, attractive, livable, healthy and sustainable community:

- Protect key natural heritage features and functions.
- Create distinct, livable neighbourhoods that are sensitive and responsive to, and integrates with, the existing Mer Bleue community.
- Provide an opportunity for a mix of residential housing types and densities that responds to the needs of residents of differing lifestyles and incomes.
- Provide for a connected network of community facilities including parks, schools, walkways and open spaces.
- Ensure timely and efficient phasing of future infrastructure.
- Provide a safe and efficient transportation system that accommodates all modes of transportation and integrates these systems with the land uses

6.1.1 Concept Plan Option 1

The key features of Option 1 include:

- East/West Collector Road connecting to Re-aligned Mer Bleue Road;
- Re-alignment of Wall Road;
- Road connection to the south;
- Preservation of McKinnons Creek and woodlot;
- Community Park, co-located with McKinnons Creek and SWM Facility;
- Neighbourhood Park abutting the existing woodlot;
- High density residential blocks; located at Mer Bleue Road and Tenth Line Road;
- Commercial blocks located at Mer Bleue Road and Tenth Line Road;
- Two separate SWM Facilities located within the Study Area;
- Three dry ponds
- Potential transit route;
- Pathways.

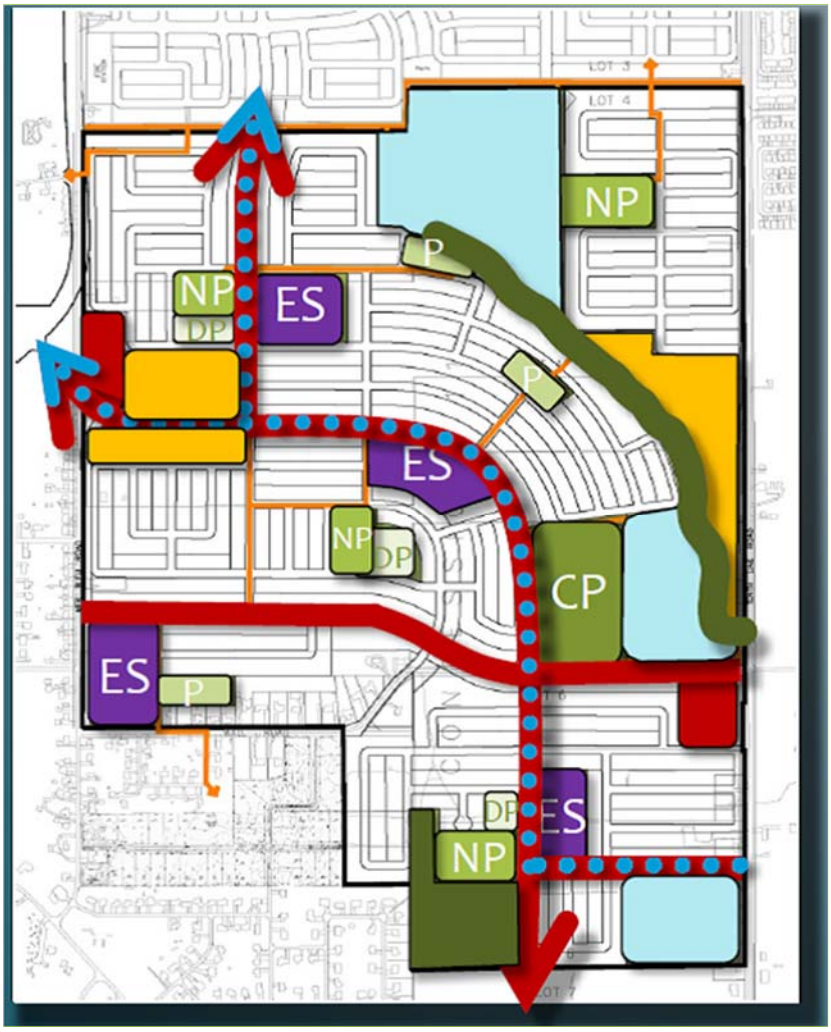


EXHIBIT 6-1: CONCEPT PLAN OPTION 1

6.1.2 Concept Plan Option 2

The key features of Option 2 include:

- Re-alignment of Wall Road connecting to Re-aligned Mer Bleue Road;
- Wall Road redesigned with Cul-De-Sac
- Preservation of McKinnons Creek and woodlot;
- Centrally located Community Park;
- Neighbourhood Park abutting the existing woodlot;
- High density residential located at Mer Bleue Road;
- Commercial block Located at Mer Bleue Road;
- One SWM Facility located outside of the Study Area;
- 'Green' Corridor along one side of two collector roads;
- Potential transit route;
- Pathways.

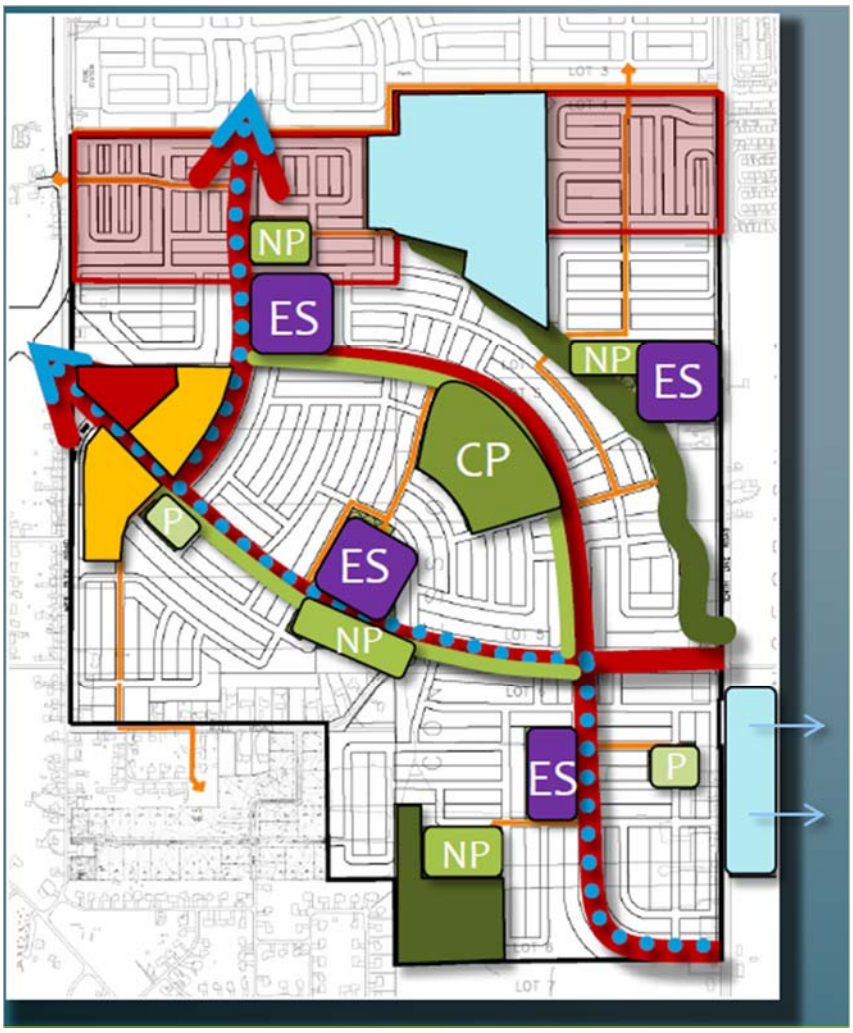


EXHIBIT 6-2: CONCEPT PLAN OPTION 2

6.1.3 Concept Plan Option 3

The key features of Option3 include:

- East/West collector road crossing McKinnons Creek and connecting to Re-aligned Mer Bleue Road
- Re-alignment of Wall Road
- Road connection to the south
- Preservation of McKinnons Creek and woodlot
- Community Park—co-located with McKinnons Creek
- High density residential located at Tenth Line Road
- No commercial
- Separate SWM Facilities located in the Study Area
- Potential transit route
- Pathways

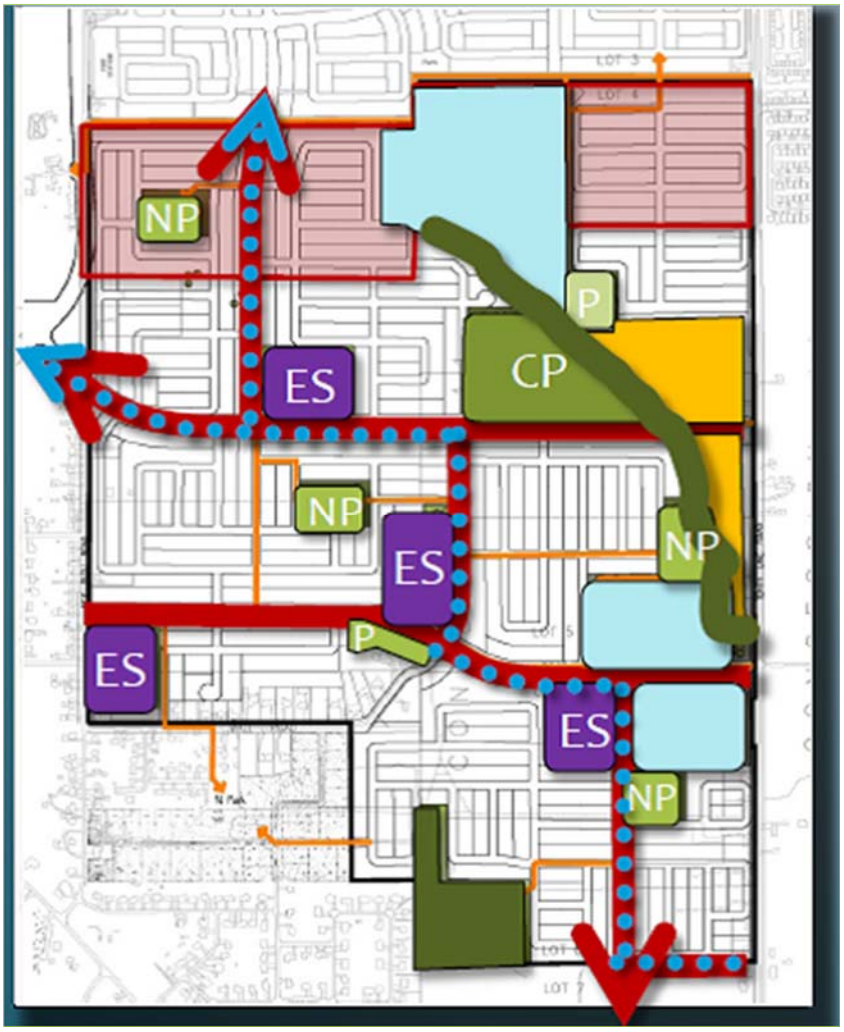


EXHIBIT 6-3: CONCEPT PLAN OPTION 3

6.2 Evaluation of Alternative Land Use Concepts and Designs

A preliminary list of criteria groups and sample criteria were presented to the TAC and PAG so that feedback could be obtained and the indicators could be refined. Evaluation criteria groups included the natural, social and physical environments; technical transportation and services; and the economic environment.

Evaluation criteria groups, criteria, and indicators have been developed for the evaluation of alternative neighbourhood concepts, alternative transportation designs, and alternative infrastructure servicing. Alternatives were comparatively evaluated based on the qualitative impact assessment technique described in **Table 6-1**.

TABLE 6-1: QUALITATIVE IMPACT ASSESSMENT TECHNIQUE

	Terms describing:		Definitions
	Negative Impacts	Positive Impacts (i.e., Benefits)	
Most Preferred	Negligible/ Low	Greatest	The impact exists, but is of a magnitude small enough that it has little effect, or is of limited benefit; or has the least impact compared to all the alternatives. Greatest compliance, contribution or benefit.
	Slight	Good	The impact exists and is of relatively low magnitude. Provides a moderate effect or contribution or benefit.
	Some	Reasonable	The impact exists and has an effect that is of a moderate magnitude. Provides a measurable contribution or benefit.
Least Preferred	Significant	Limited	The impact exists and has an effect that is relatively large, or has the most impact when compared to other alternatives. Little to no contribution or benefit

Table 6-2 below presents details of the evaluation of the transportation networks of the three land use options under the transportation criterion. Each option was evaluated against the following key transportation indicators:

- Land use compatibility/constraints
- Geometrics/serviceability
- Compatibility with existing and future transit/road options
- Cost

TABLE 6-2: EVALUATION OF LAND USE OPTIONS - TRANSPORTATION

CRITERIA	CONSIDERATION	CONCEPT 1	CONCEPT 2	CONCEPT 3
Land use Compatibility / Constraints	Length of road constructed through bedrock	Negligible	Negligible	Negligible
	Number if crossings of watercourse or disruptions of natural habitat	No crossings	No crossings	One Crossing. Significant impact due to collector road crossing of McKinnons Creek
Geometrics / Serviceability	Alignment of Arterials compatible with desired design speed	Good compatibility with desired design speed with two roundabouts that will provide traffic calming effect at major internal collector intersections	Good compatibility with desired design speed with two roundabouts that will provide traffic calming effect at major internal collector intersections	Good compatibility with desired design speed with two roundabouts that will provide traffic calming effect at major internal collector intersections
Compatibility with Existing and Future Transit/Road Operations	Sufficient integration with adjacent off-site road network while minimizing undesirable “cut through” traffic	Good integration with adjacent road network: five connections to arterial roads and six connections to collector/local roads. Roundabouts strategically located to reduce speeds and discourage cut-through traffic	Reasonable integration with adjacent road network: six connections to arterial roads but fewer (four) connections to collector/local roads. Roundabouts strategically located to reduce speeds and discourage cut-through traffic	Good integration with adjacent road network: six connections to arterial roads and seven connections to collector/local roads. Roundabouts strategically located to reduce speeds and discourage cut-through traffic
	Planned adjacent land uses compatible with arterial road proximity, and can be efficiently served by it	Good compatibility with higher density residential located near adjacent arterial roadways and the main east-west collector road for greatest exposure to transit service	Good compatibility with higher density residential located near adjacent arterial roadways and the main east-west collector road for greatest exposure to transit service.	Good compatibility with higher density residential located near adjacent arterial roadways and the main east-west collector road for greatest exposure to transit service.
	Road network capable of supporting transit with connections to existing transit service on adjacent arterial roads.	The design provides for efficient routing of transit through the development with best overall service coverage	The design provides for efficient routing of transit but with less service coverage. i.e. larger potential area outside of 400 m service radius	The design provides the least efficient routes for transit due to number of turns required but provides good service coverage
Cost	Length of arterial and collector road networks and number of traffic signals	4,700 m	4,650 m	5,025 m
	Operation and maintenance costs	Lowest cost due to shortest length of collector roadways and least number of signalized intersections	Equivalent length of collector roads as in Option 1 but with one additional signalized intersection	Highest cost due to longest length of collector roads and one additional signalized intersection
		PREFERRED CONCEPT PLAN		

7. PREFERRED DEVELOPMENT PLAN

Upon completion of the various public meetings, TAC meetings and PAC meetings, the design team reviewed the core information and feedback from stakeholders and developed the preferred development plan as illustrated in **Exhibit 7-1**. This plan was guided by but not limited to the following attributes drawn from Planning, Transportation and Servicing evaluations:

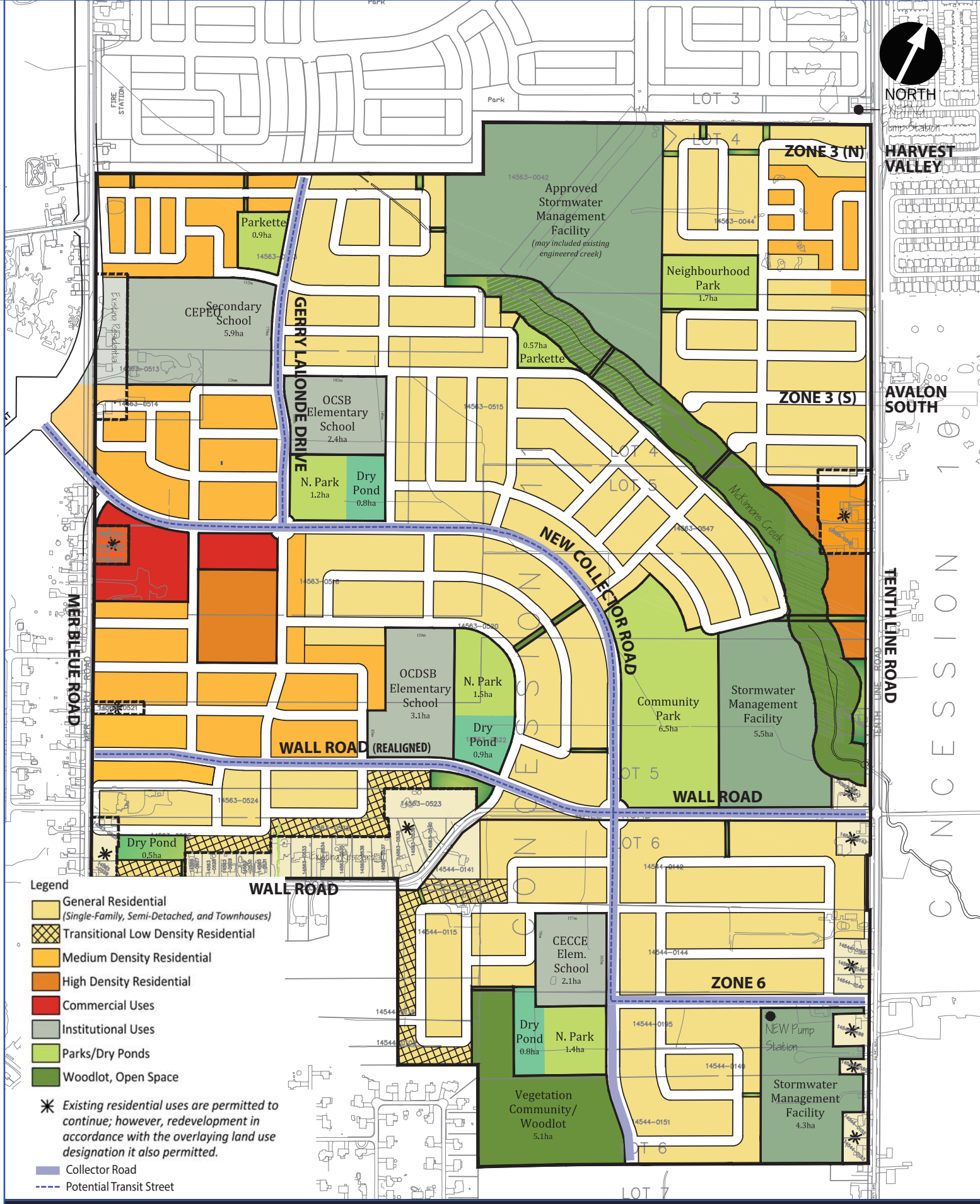
- East/West Collector Road connecting to realigned Mer Bleue Road with connections to the South, North and Tenth Line Road.
- Realignment of Wall Road
- Preservation of McKinnons Creek and woodlot
- Neighbourhood Parks abutting Elementary Schools and the existing woodlot
- Community Park co-located with McKinnons Creek and Stormwater Management Facility
- Two separate Stormwater Management Facilities located within the Study area
- Four dry ponds
- Potential transit route
- Pathways
- Commercial located along Collector Road
- High density residential blocks located south of the commercial block and along Tenth Line Road

In addition, it should be noted that Mattamy Homes received special status for their northern lands that allowed for their development to proceed in advance of the CDP and supporting studies. Stage One of their development (Northeast Quadrant) has received governmental approvals and has gone to construction. The approved road network design does not allow for a street connection between this Northeast Quadrant and the existing developed area to the north. Connections for pedestrians and cyclists will be provided between those parts of the community but vehicles must exit out to tenth Line Road to travel between the two adjacent communities. To ensure continuity between the approved plans for Mattamy and the CDP, the CDP has incorporated the approved Mattamy plans within the respective documents—CDP, MSS and MTS.

7.1 Proposed Land Use

The MBESA will consist primarily of residential dwellings of low, medium and high density. The proposed commercial area will be located along the New Collector Road at Mer Bleue Road, as indicated on Exhibit 7-1. The plan also includes three elementary schools and one secondary school. Details of the proposed uses in the CDP area are as follows:

- Residential—Low Density (Single Family): 2,014 units
- Residential—Medium Density (Townhouse): 1,194 units
- Residential—High Density (Apartment): 398 units
- Institutional—Secondary School: 175,000 ft^2 (16,000 m^2) GFA
- Commercial—Retail: 3.9 ha Parcel



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Mer Bleue Expansion
Master Transportation Study

EXHIBIT 7-1:
Proposed Concept Plan

PROJECT No. 34739
DATE: April 2017
SCALE:
0m 100m 250m

7.2 Proposed Internal Road Network

New Collector Road: The preferred concept plan provides a two-lane collector road through the CDP area, connecting Mer Bleue Road with Tenth Line Road via the existing intersection with Wall Road. Two neighbourhood-scale roundabouts within the site are proposed.

Exhibit 7-1 indicates the ultimate alignment of the New Collector Road as it approaches the future realigned Mer Bleue Road. At that time, the existing section of Mer Bleue Road to the south will be realigned to intersect with the New Collector Road. Since the realignment of Mer Bleue Road is not planned until beyond 2031, the New Collector Road will intersect with Mer Bleue Road at a temporary location in the interim period. It is anticipated that the details of this temporary intersection will be developed at the Draft Plan of Subdivision stage and may require that a portion of the Commercial Block be reserved to accommodate this temporary arrangement.

Gerry Lalonde Drive: Upon development of the Avalon West lands directly north of the Mer Bleue Expansion Area, Gerry Lalonde Drive (also classified as a collector road) will be extended from Brian Coburn Boulevard south to the proposed New Collector Road described above. It will then continue south to the Realigned Wall Road as a local road.

Wall Road Realignment: Wall Road will be realigned and a new connection to Mer Bleue Road will be introduced. This realignment will eliminate the existing sharp curvature of the road and minimize the impact of increased traffic to the existing residential land uses along the western portion of the road.

The existing intersection of Wall Road/Mer Bleue Road will remain and will provide secondary access to the proposed community.

Several other secondary roadway connections to the Mer Bleue Expansion Area will be provided along Tenth Line Road at Harvest Valley Drive, a future intersection servicing 2605 Tenth Line Road development (referred to in this study as ‘Avalon South’) and an intersection south of Wall Road.

7.3 Proposed Pedestrian and Bicycle Facilities

Cycle tracks are proposed along the New Collector Road, Wall Road and Gerry Lalonde Drive. These facilities will serve as the primary east-west route for cyclists through the community and will connect to the interim paved shoulders on Mer Bleue Road and Tenth Line Road and ultimately to dedicated bike lanes when those roadways are widened. The cycle tracks on Gerry Lalonde Drive will provide a connection to the proposed multi-use pathway (MUP) just north of the CDP area.

A MUP is also proposed along the east side of Mer Bleue Road between the New Collector Road and the existing Wall Road intersection.

Pedestrian facilities—either concrete sidewalks will be provided on both sides of all collector roads in the development. Local streets that serve as direct routes to transit service, schools, parks and commercial areas will include concrete sidewalks on at least one side.

The proposed concept plan includes many parks and public open spaces complete with recreational pathways. These pathways will also be provided along and across McKinnons Creek connecting the northeastern portion of the development with the rest of the site. There will be no automobile connections across McKinnons Creek. Some of the recreational pathways connecting the Northeast Quadrant lands with the rest of the community will be required to be both adequately lit and winter maintained. This requirement is to allow for an ability to interconnect the community and allow movement of people for all purposes, including accessing transit service on the New Collector Road, travelling to/from school, parks, etc.

Interim cycling facilities are proposed along the Tenth Line Road and Mer Bleue Road frontages before both roadways are widened to four lanes. **Table 7-1** summarizes the proposed cycling and pedestrian facilities along Mer Bleue Road and Tenth Line Road in the interim and ultimate configurations.

TABLE 7-1: PROPOSED OFF-SITE PEDESTRIAN AND CYCLING FACILITIES

ROADWAY	INTERIM FACILTIES	ULTIMATE FACILITIES
Mer Bleue Road from Wall Road to the New Collector Road	**Paved shoulders and MUP on east side**	**Paved shoulders and MUP on east side**
Mer Bleue Road from the New Collector Road to Renaud Road	**Paved shoulders**	**Bicycle lanes and sidewalks (Realigned Mer Bleue Road section)**
Tenth Line Road	**Paved shoulders**	**Bicycle lanes and sidewalks**

Exhibit 7-2 illustrates the proposed bicycle and pedestrian facilities within the MBESA.

7.4 Proposed Transit Service

The introduction of efficient and convenient transit service to the MBESA will be integral to the success of the community. During the early phases of development, the provision of transit service will be encouraged through the creation of Early Service Agreements between developers and the City of Ottawa/ OC Transpo. Modification of existing transit routes in the area and/or the introduction of new routes will be required to service the proposed development. OC Transpo has indicated that transit service will ultimately be provided along the internal collector road network as indicated on Exhibit 7-1. The layout of the collector road network will allow for flexibility in routing buses through the early phases of the development. The details of the implementation of transit service to the MBESA will be developed with OC Transpo at the Plan of Subdivision stage for each phase of the development. Transit amenities such as appropriate bus platforms, shelters and benches will be incorporated in the plan during the development application process.

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Mer Bleue Expansion
Master Transportation Study

EXHIBIT 7-2:
Proposed Bicycle & Pedestrian Facilities

PROJECT No. 34739
DATE: April 2017
SCALE:
0m 100m 250m

7.5 Proposed Rights-of-Way and Cross-Sections

The following City of Ottawa standard right-of-way widths are proposed for the new roads in the preferred development plan:

- Collector roads: 24 m
- Local streets: 18 m

The design of these roads will generally adhere to the requirements of the City of Ottawa standard cross-sections for residential roads. The standard City of Ottawa cross-sections for 24 m and 18 m wide residential roadways are included in **Appendix D**.

A variation of the standard 24 m right-of-way cross-section is proposed for the New Collector Road, Gerry Lalonde Drive and Wall Road. The modified cross-section includes two 3.5 m travel lanes, a 2.5 m parking lane along one side, 1.5 m cycle tracks and 1.8 m sidewalks. **Exhibit 7-3** indicates the proposed cross-section for the modified 24 m ROW. A 1.0 m buffer is proposed between the curb and cycle tracks to allow space for snow storage and to provide sufficient width to avoid "dooring" of cyclists from cars in the parking lane. It is proposed that the 2.5 m parking lane be designated along the north (or east) side only of the modified 24 m collector road. At westbound transit stops the parking lane will be dropped and the curb extended to accommodate a bus pad and shelter, as shown on **Exhibit 7-4.** It has been assumed that bus shelters will be provided in the morning peak direction (westbound) only. Eastbound transit stops would consist of a standard 1.8 m wide asphalt bus pad.

An alternative design with the cycle track and sidewalk abutting could be considered subject to approval by the City of Ottawa of the type of material used to show a separation between the facilities.

The details of the arrangement of servicing infrastructure, utilities, streetlighting and landscaping will be confirmed with City of Ottawa staff during the development application process. It is anticipated that parking will only be permitted along one side of collector roads that support transit service.

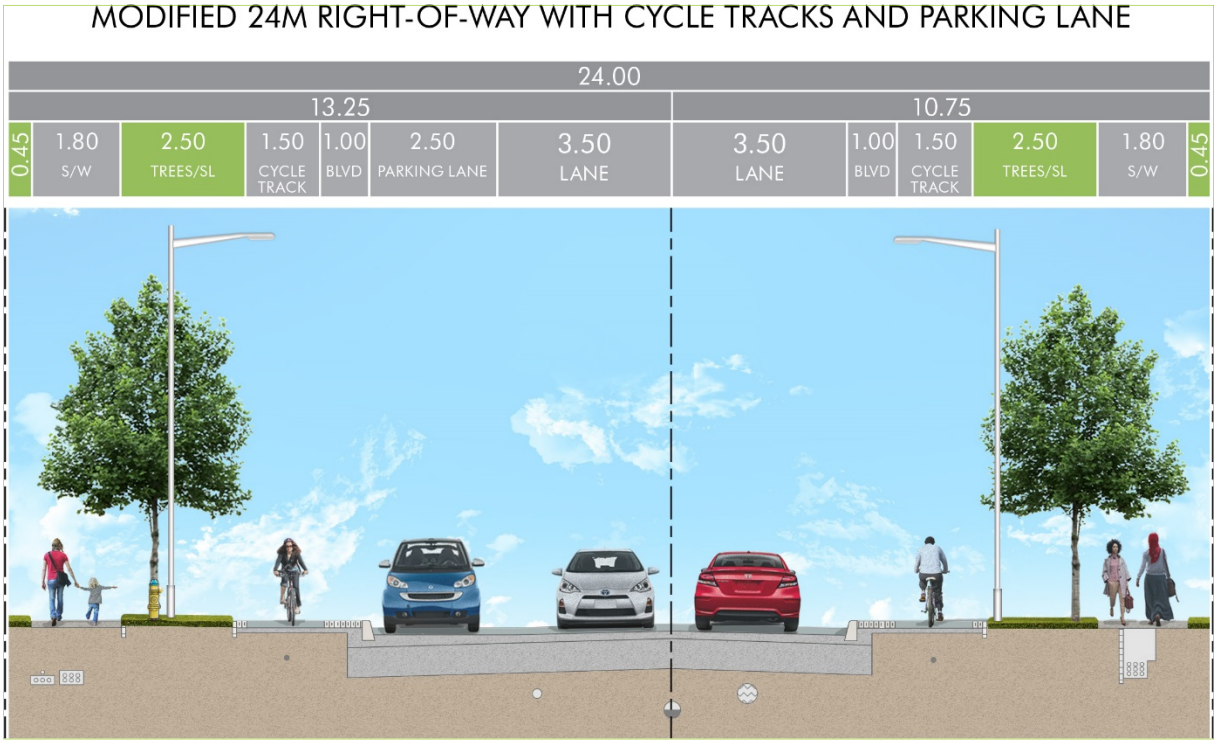


EXHIBIT 7-3: MODIFIED 24 M RIGHT OF WAY CROSS-SECTION WITH MULTI-USE PATHWAY AND DEDICATED PARKING LANE

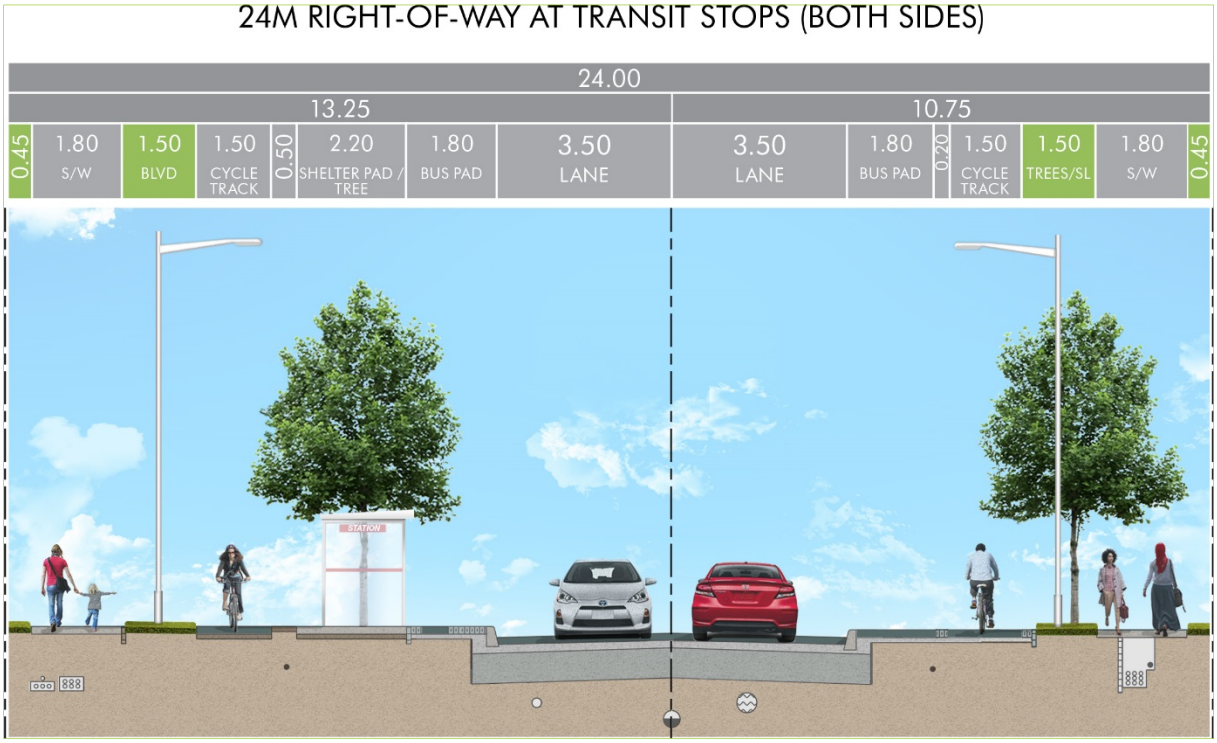


EXHIBIT 7-4: MODIFIED 24 M RIGHT-OF-WAY CROSS-SECTION AT TRANSIT STOPS

8. TRANSPORTATION IMPACT ANALYSIS

8.1 Future Background Traffic

The horizon years for this study have been established as 2025 and 2031, representing the estimated 50% build-out and full build-out years of the proposed development, respectively. Future traffic volumes have been based on existing (2013) traffic data and adjusted to account for planned changes to the future road network, additional traffic anticipated from adjacent developments and background traffic growth from outside of the study area.

8.1.1 Future Traffic Patterns

The City of Ottawa maintains an up-to-date model of future traffic projections for the 2031 weekday morning peak hour. This information is generally used to assist in planning long-term roadway infrastructure needs and is continuously updated and refined between updates to the Transportation Master Plan to account for amendments to the Official Plan, changes in demographics and changes to the timing and/or scope of major transportation infrastructure projects.

The extension of Brian Coburn Boulevard will provide an important east-west link between the southern part of Orléans and areas to the west. As this route is expected to have a significant impact on traffic patterns in the area, the City's modelling group was consulted to help quantify this impact.

To determine the direct impact of this new route, a modified 2011 traffic model which included the Brian Coburn extension was received from the City. When compared with the true 2011 traffic model, the changes to traffic patterns could be clearly identified. The most significant pattern change was that 40% of traffic on Renaud Road would shift to Brian Coburn Boulevard, as would 5% of traffic to/from the north (Innes Road) and the south (Navan Road).

The next step in developing future background traffic volumes was to redistribute existing volumes according the future traffic pattern that was identified. Subsequent steps involved the application of a nominal growth rate and addition of future development traffic, as described below.

8.1.2 Annual Background Traffic Growth Rate

An annual growth rate of 1% was applied to all arterial roads within the study area. This rate of growth is intended to account for traffic originating outside of- and passing through the study area or for potential developments within the study area that have not been accounted for.

8.1.3 Adjacent Developments

In 2007, a Community Transportation Study (CTS) was undertaken for the Eden Park community, located west of Mer Bleue Road and north of Renaud Road. This CTS provided details for each of the adjacent development sites bounded generally by Innes Road to the north, Navan Road to the southwest and Tenth Line road to the east.

Seven adjacent developments within the study, described in **Table 8-1** below and illustrated in **Exhibit 8-1**, have been included in the development of future background traffic volumes.

TABLE 8-1: ADJACENT DEVELOPMENT

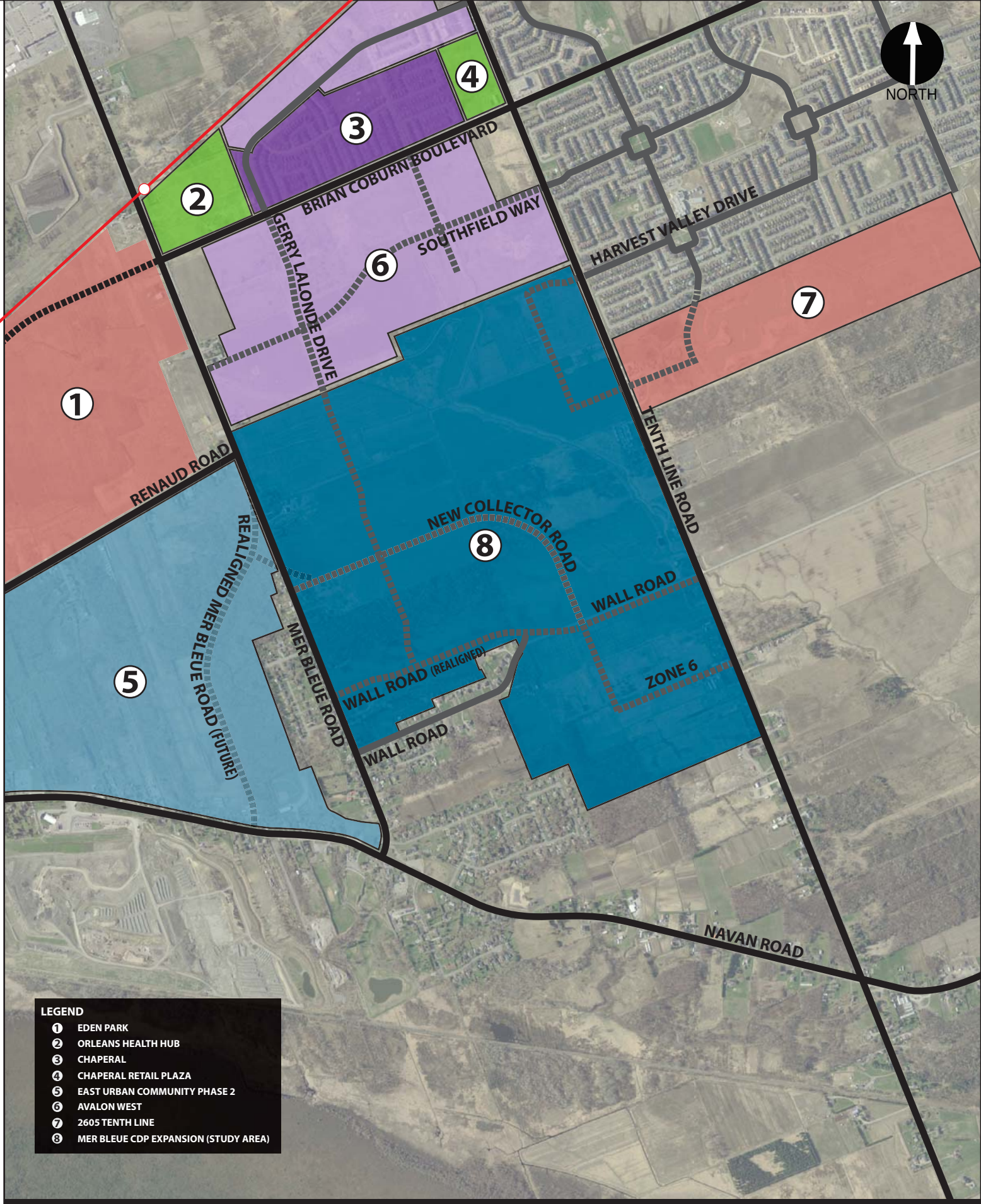
#	DEVELOPMENT	STUDY REFERENCED	LAND USE	BUILDOUT YEAR
1	Eden Park (FOTENN)	CastleGlenn CTS (July 2007)	Single Detached: 456 units Townhouse:1,287 units Apartment: 937 units Retail: 67,649 ft^2 Supermarket: 41,000 ft^2 Office: 698 jobs	2026
2	Orléans Health Hub (Montfort)	Delcan TIS (October 2010)	Medical Facility: 230,000 ft^2	2017
3	Chaperal (Minto)	CastleGlenn TB (April 2013 & July 2015)	230 Residential units remaining as of 2013	2015
4	Chaperal Retail Plaza (Taggart)	Delcan TIS (May 2014)	Residential: 1,400 units Mixed-Use: 635,000 ft^2	2015
5	East Urban Community Phase II (City of Ottawa)	Delcan CTS (August 2013)	Residential: 1,400 units Mixed-Use: 635,000 ft^2	2031
6	Avalon West (Minto)	Castleglenn TB (April 2013 & July 2015)	Residential: 2,200 units Commercial/Retail: 330,000 ft^2	2018
7	2605 Tenth Line (Minto)	Delcan CTS (March 2014)	Single Detached: 190 units Townhouse:230 units Stacked Townhomes: 192 units	2019

It is understood that several of the reports listed above are now dated, however they provide the best available information for the lands within the study area and therefore have been referenced in the development of future background traffic volumes.

By the 2025 interim analysis year, it has been assumed that all of the above developments will be built-out, with the exception of Eden Park and East Urban Community Phase II, which is estimated to be approximately 75% built at that time. By 2031, this study has assumed that all of the developments identified above will be completed, based on the timelines presented in each of their supporting transportation studies.

Notwithstanding the above, it is recognized that development of the areas listed in Table 8-1 may occur at a slower rate depending on market conditions and the development schedules of the various landowners, and it may take longer to achieve full buildout of the south Orléans area than what has been estimated in previous studies. However, for the purpose of the traffic analysis in this study and to remain consistent with previous studies, the more aggressive build-out scenario has been considered.

Background traffic volumes for the years 2025 and 2031 are presented in **Exhibit 8-2** and **Exhibit 8-3**, respectively.



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Mer Bleue Expansion
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EXHIBIT 8-1:
Adjacent Development Areas

PROJECT No. 34739
DATE: April 2017
SCALE:
0m 200m 500m

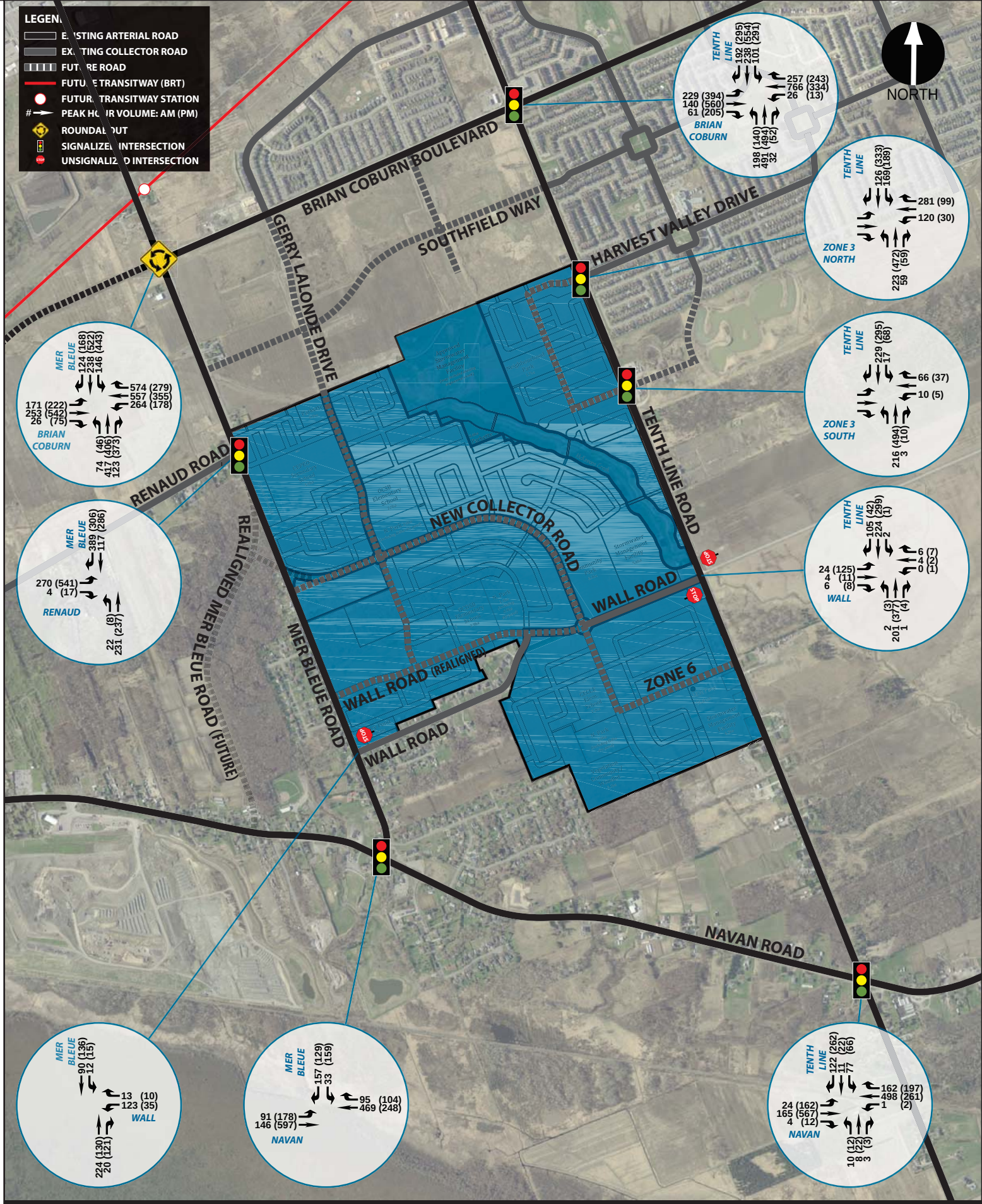

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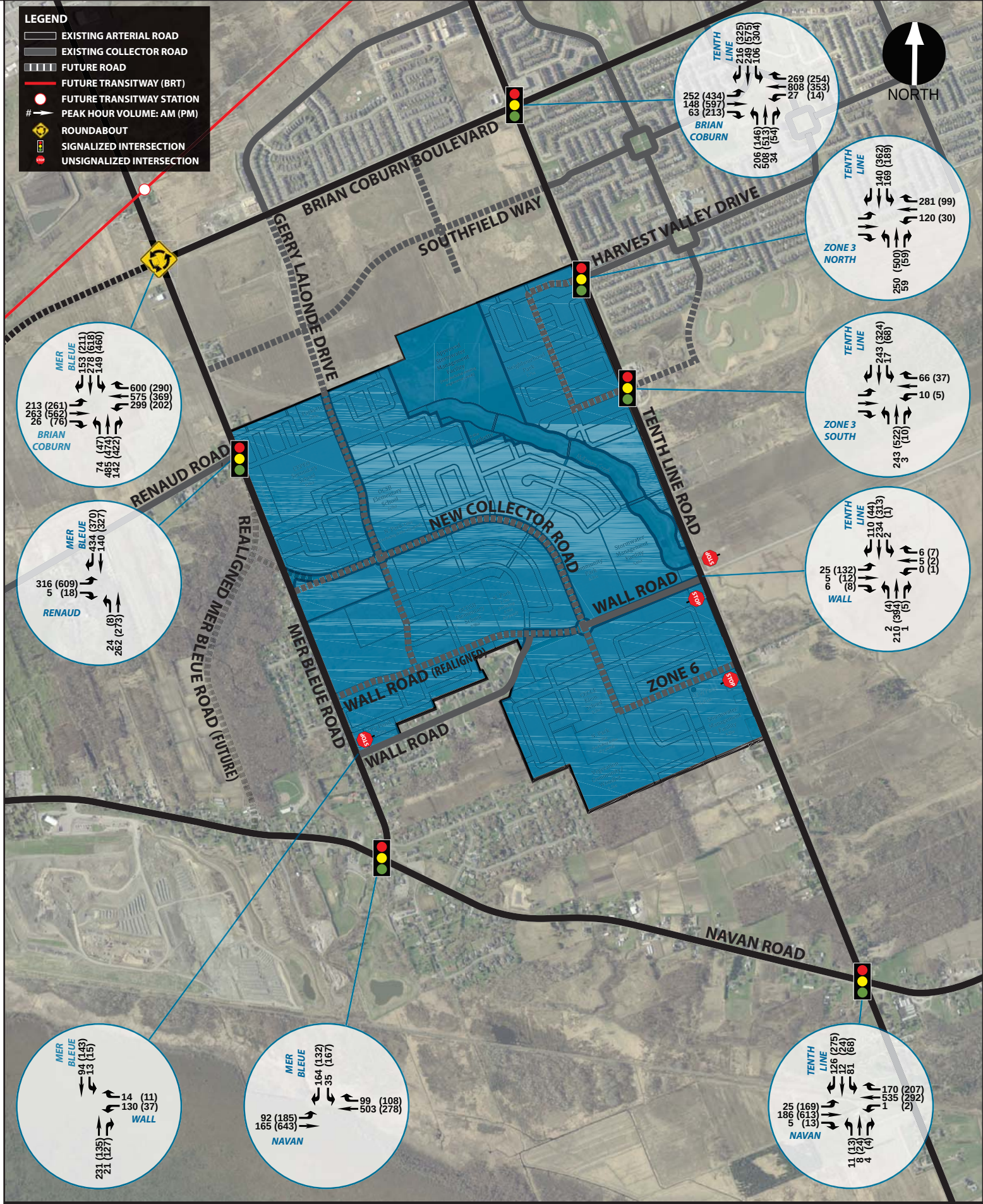
EXHIBIT 8-2:
Future (2025) Background Traffic

PROJECT No. 34739
DATE: April 2017
SCALE:
0m 200m 500m



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Mer Bleue Expansion
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EXHIBIT 8-3:
Future (2031) Background Traffic

PROJECT No. 34739
DATE: April 2017
SCALE:
0m 200m 500m

8.2 Trip Generation

Traffic generation associated with the Mer Bleue expansion area has been estimated based on data included in the publication *Trip Generation*, 9th Edition, 2012, published by the Institute of Transportation Engineers (ITE), Washington. Traffic generation for the weekday morning and afternoon peak hours has been derived for the land uses referenced above. Relevant extracts from the ITE publication are provided in **Appendix E**.

Site generated traffic has been based on the proposed land use details indicated in Section 7.1 above.

Site-generated traffic volumes have been derived for both the 2025 and 2031 analysis years. It has been assumed that by 2025, roughly 50% of the site would be built-out. Development will likely occur from east to west; however, because of the multiple land owners involved, any of the interior parcels could begin development by 2025. To simplify the analysis, each interior parcel is assumed to be half-developed by this interim year.

The concept development plan provides a range of density configurations for each residential dwelling type. For the purposes of this study, it has been assumed that each residential land use would be in its highest-density configuration such that it provides a worst-case traffic generation for the entire site (i.e. the development could include anywhere from 3,180 to 3,602 residential units in total).

8.2.1 Mode Share

The ITE Publication described above is based on data collected throughout North America over the latter portion of the 20th century for isolated suburban developments with little to no access to public transit. In recognition of this, it has become standard practice to adjust the trip generation volumes to better reflect local travel conditions. The automobile trip generation volumes derived from the ITE data are first converted to person trips using an automobile occupancy rate of 1.3 passengers per vehicle. These person trips are then divided into each travel mode according to mode share data identified in the *NCR Household Origin-Destination Survey* published by the TRANS Committee in January 2013. The modal share proportions vary from AM peak to PM peak and also between local traffic and regional traffic. To simplify this analysis, the weekday commuter peak rates were averaged for each of these traffic origins/destinations, indicated in **Table 8-2**.

TABLE 8-2: MODE SHARE

MODE	LOCAL TRIPS (to/from Orléans)	REGIONAL TRIPS (to/from Greater Ottawa)
Auto Driver	46%	59%
Auto Passenger	22%	13%
Transit	5%	22%
Other	27%	6%
Total	**100%**	**100%**

The modal share for Regional Trips, indicated above, is consistent with the values used in the transportation studies completed for the adjacent developments referenced in this report. The anticipated extension of LRT to Place d'Orléans (and possibly to Trim Road) by 2023 will allow for bus service from the MBESA to connect to a future LRT station east of Blair Station which can be expected to increase the transit modal share in the study area. However, the effect that this Stage 2 project will have on transit modal share in the study area is difficult to determine at this time. Also, given that the Cumberland Transitway—the other key transit corridor in Orleans—is not currently planned to be constructed through the study area until sometime beyond the 2031 horizon year, the City's ultimate target modal share for transit is not expected to be reached in this part of Orléans during the timeframe of this study. As such, for the purpose of the analysis carried out in this study, the existing modal share has been considered to be representative of future conditions in this area.

8.2.2 Internal Trips

Within the proposed Mer Bleue development, two major traffic generators are planned: a secondary school and a retail/commercial block. For the purpose of the analysis in this study, it was assumed that each of these internal developments would generate 50% of their traffic from within the proposed Mer Bleue expansion area. The remaining 50% of traffic generated by these blocks would originate from the five residential zones and thus was subtracted from their respective local traffic generation volumes so as to ensure these trips were not double-counted.

There are also three elementary schools planned for the community. Traffic generation associated with these schools during the morning peak hour is expected to consist mostly of student drop-offs originating from within the community on the way to another destination. Therefore, to avoid double-counting with the trips generated by the residential areas, the elementary school trips have been excluded from the analysis. As well, the afternoon peak hour of traffic for the elementary schools typically occurs outside of the peak period for the road network and therefore can be considered to have a negligible impact on the major study area intersections during the afternoon peak hour.

8.2.3 Pass-By Trips

Commercial pass-by trips are trips generated by a particular land use from vehicles who are already en-route to their ultimate destination. Based on the ITE Trip Generation Handbook, pass-by trips for the Retail/Commercial block are estimated to be 40% of the total trips.

8.2.4 Trip Generation Summary

Site-generated traffic was separated into distinct traffic zones, as illustrated in **Exhibit 8-4**. With consideration of the above, the net trip generation volumes are presented below in **Table 8-3** for each of the traffic zones.

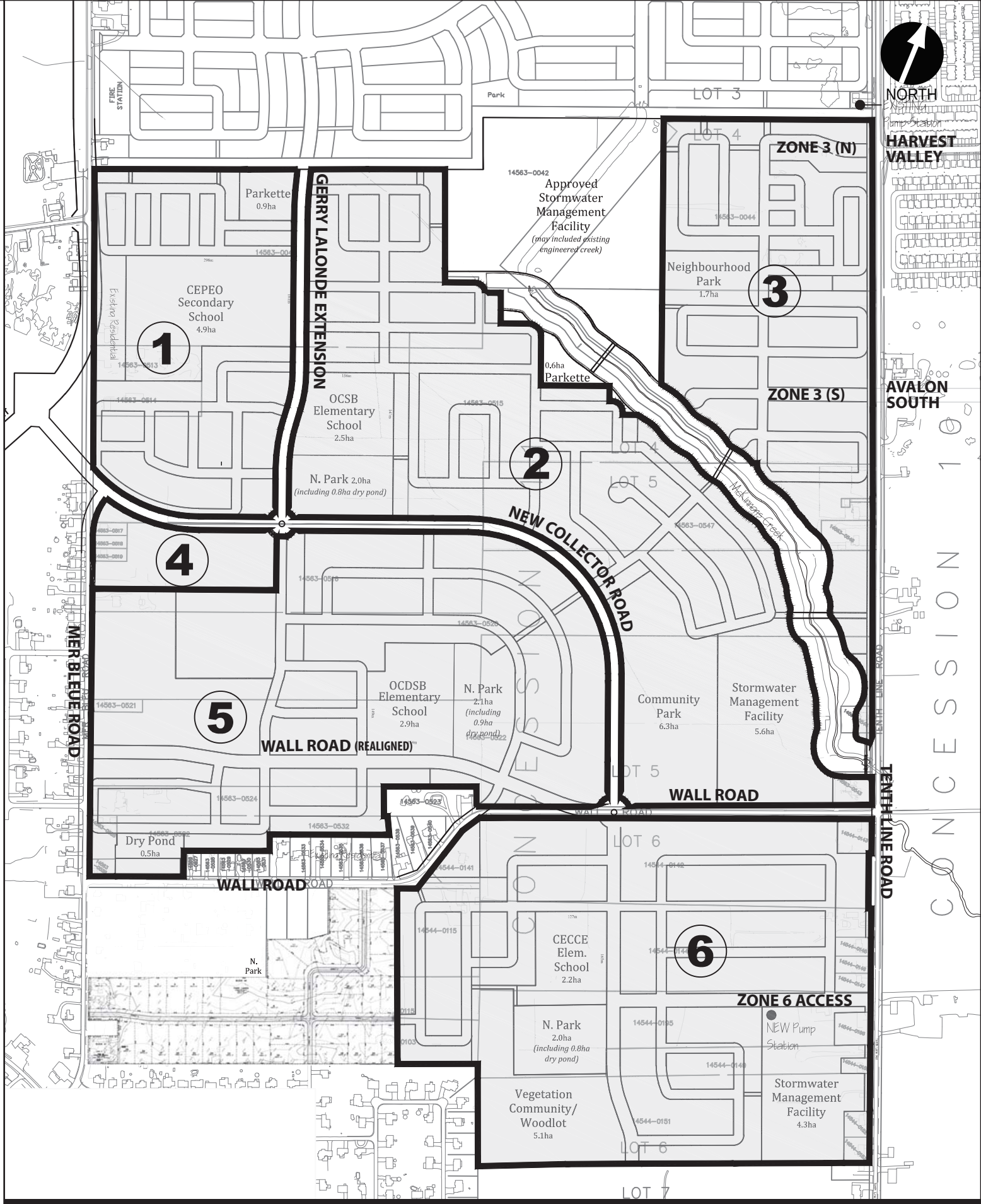

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EXHIBIT 8-4:
Traffic Zones

PROJECT No. 34739
DATE: April 2017
SCALE:
0m 100m 250m

TABLE 8-3: TRIP GENERATION SUMMARY

Traffic Zone	Land Use	AM Peak Hour			PM Peak Hour		
		In	Out	Total	In	Out	Total
1	Townhomes (504 units)	17	105	122	96	43	139
1-S	Secondary School (175,000 ft^2 GFA)	380	155	536	92	78	170
2	Single Family (580 units)	46	170	216	195	103	298
3	Single Family (319 units) Townhomes (120 units) Apartments (188 units)	37	150	188	204	107	312
4	Retail/Commercial (3.8 ha Block)	86	53	139	159	149	308
5	Single Family (479 units) Townhomes (570 units) Apartments (210 units)	62	298	360	321	158	480
6	Single Family (636 units)	48	181	229	211	111	322
TOTAL		**676**	**1,113**	**1,790**	**1,278**	**750**	**2,028**

8.3 Traffic Distribution

According to the 2011 O-D Survey, weekday peak hour traffic in Orléans is generally split between traffic that remains within Orléans (local) and traffic that is destined to the greater Ottawa area, or more specifically downtown (regional).

Route selection and weighting was completed based on a number factors including the shortest path as well as arterial road capacity/congestion and checked against the City's 2031 traffic model to ensure the assumptions made sense on a macro-level. The detailed assignment of trips to the road network was completed for each traffic zone using engineering judgement for all potential routes and weighted in favour of those considered most likely to be taken by motorists. The sum of each zone's paths and associated weighting was compared to the overall distribution assumptions. This iterative process lead to slight adjustments in routing assumptions to ensure consistency with the overall distribution. The routing exercise completed for each traffic zone resulted in detailed turning movement volumes at intersections within the study area, including the two proposed roundabouts within the development area.

8.3.1 Local Traffic

Based on data from the 2011 O-D Survey, approximately 46% of trips originating in Orléans during the weekday morning peak hour are destined to other areas in Orléans. For the purpose of this report, this traffic is considered "local" traffic. The portion of local traffic originating in the Mer Bleue expansion area whose destination is within the site boundary, such as the secondary school block (Zone 1-S) retail/commercial block (Zone 4), is considered "internal" traffic.

Local Traffic has been distributed as follows:

- 50% to/from the north on Mer Bleue Road

- 50% to/from the north on Tenth Line Road

8.3.2 Regional Traffic

The remaining 54% of trips originating in Orléans during the weekday morning peak hour are destined to areas outside of Orléans with the vast majority heading west toward central Ottawa. For the purposes of this report, these trips are considered “regional” trips.

Regional Traffic has been distributed as follows:

- 65% to/from the north on Mer Bleue Road
    - 10% to/from the north on Mer Bleue Road
    - 50% to/from the west on Brian Coburn Boulevard
    - 20% to/from the west on Renaud Road
    - 20% to/from the west on Navan Road
- 35% to/from the north on Tenth Line Road
    - 10% to/from the north on Tenth Line Road
    - 30% to/from the west on Brian Coburn Boulevard
    - 10% to/from the west on Renaud Road
    - 50% to/from the west on Navan Road

The resultant site-generated traffic volumes are presented in **Exhibit 8-5**.

8.4 Future Total Traffic

Future Total Traffic volumes have been established by adding the background traffic volumes (Exhibit 8-2 and Exhibit 8-3) to the site-generated traffic volumes presented in Exhibit 8-5. As indicated above, the proposed development is only expected to be 50% complete by the 2025 analysis year and therefore only half of the site-generated traffic is considered in the Future (2025) Total Traffic scenario.

Future (2025) Total Traffic and Future (2031) Total Traffic volumes are presented in **Exhibit 8-6** and **Exhibit 8-7**, respectively.

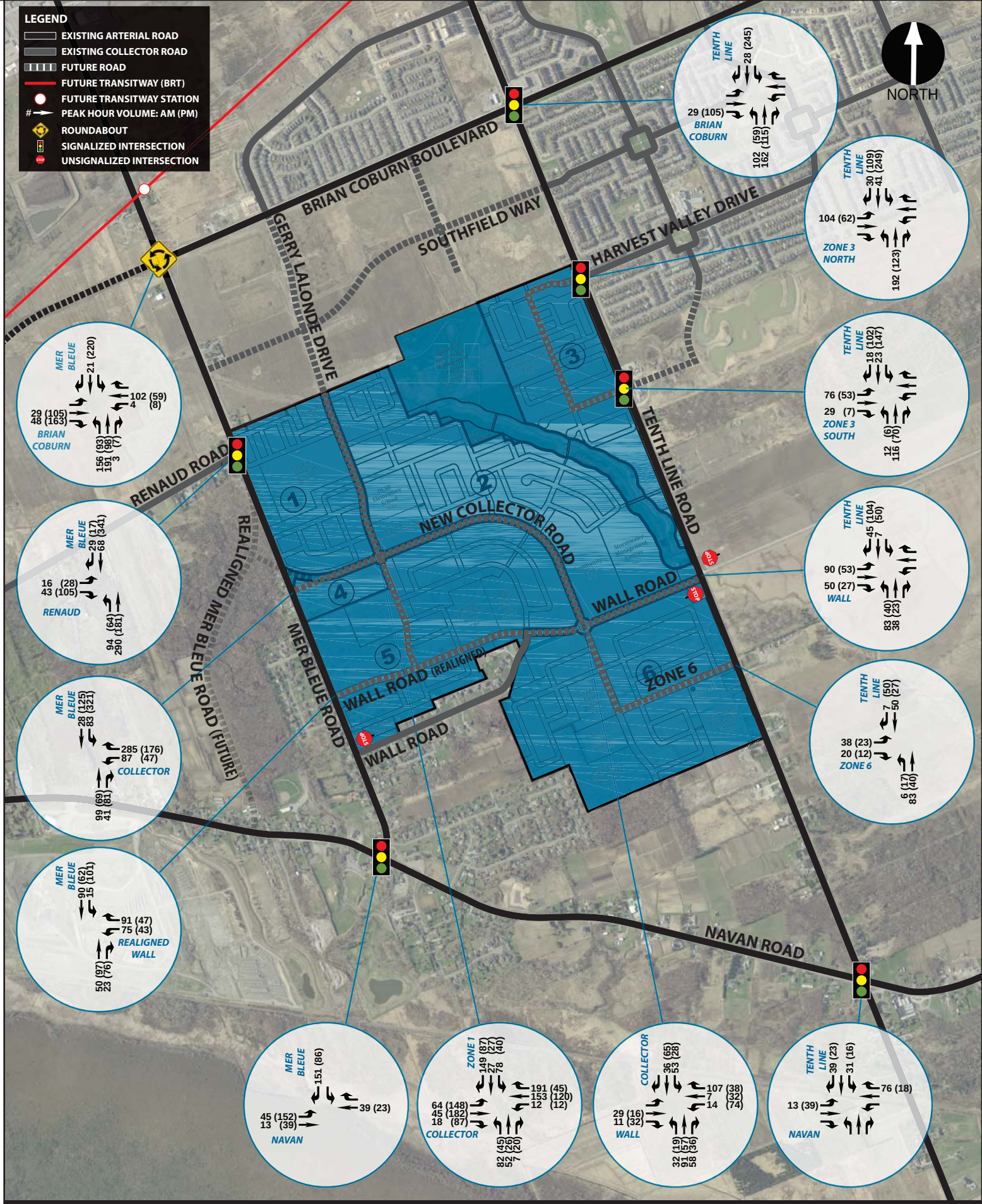

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EXHIBIT 8-5:
Site-Generated Traffic

PROJECT No. 34739
DATE: April 2017
SCALE:
0m 200m 500m

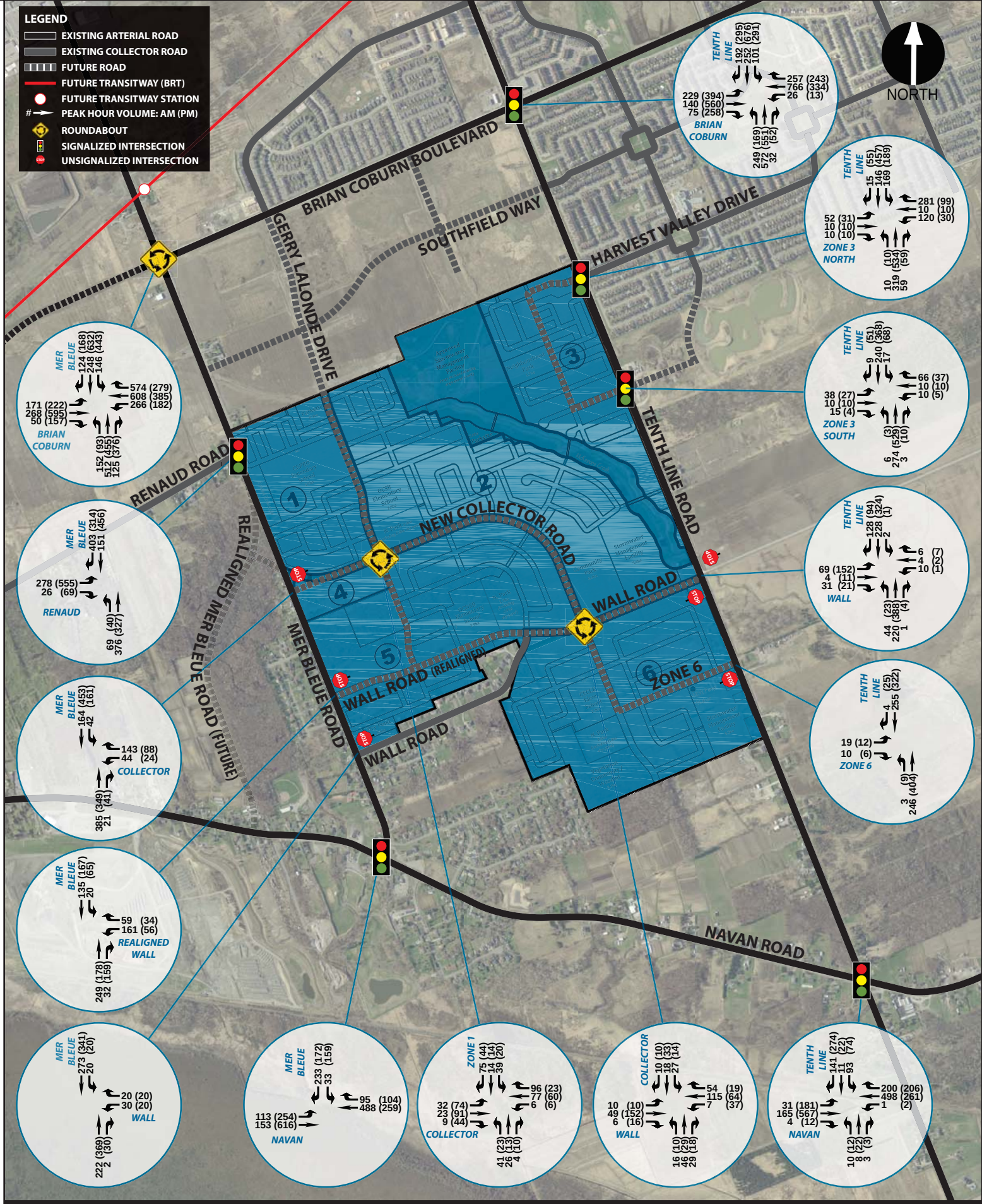

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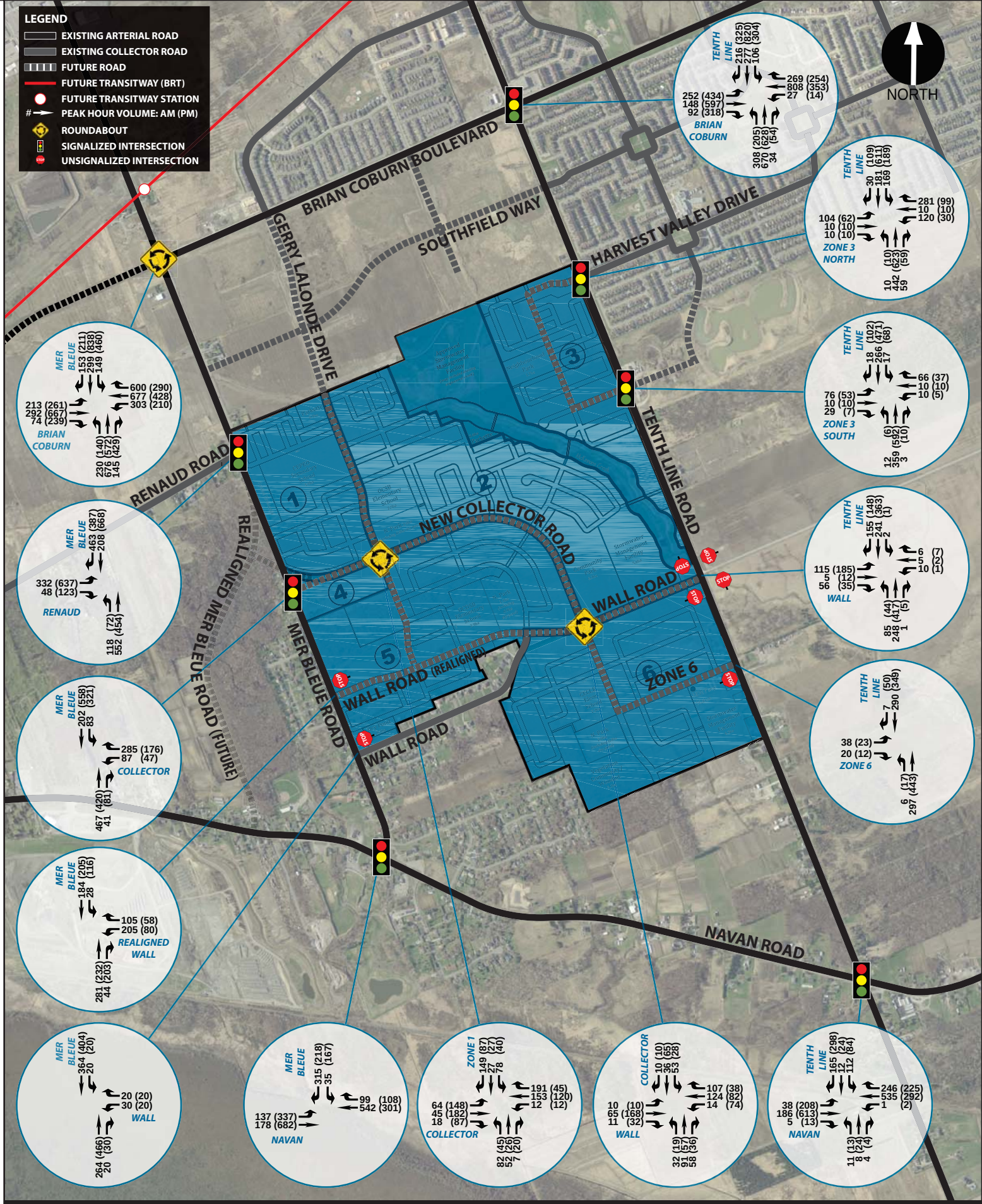
EXHIBIT 8-6:
Future (2025) Total Traffic

PROJECT No. 34739
DATE: April 2017
SCALE:
0m 200m 500m



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Mer Bleue Expansion
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EXHIBIT 8-7:
Future (2031) Total Traffic

PROJECT No. 34739
DATE: April 2017
SCALE:
0m 200m 500m

8.5 Intersection Operations Review

8.5.1 Intersection Capacity Analysis Criteria

The intersection capacity of a signalized intersection is commonly expressed by the manner in which an intersection functions in terms of the "Level of Service" (LOS) it provides.

In qualitative terms, the LOS defines operational conditions within a traffic stream and their perception by motorists. A LOS definition generally describes these conditions in terms of such factors as delay, speed and travel time, freedom to maneuver, traffic interruptions, safety, comfort and convenience. LOS can also be related to the ratio of the volume to capacity (v/c) which is simply the relationship of the traffic volume (either measured or forecast) to the capability of the intersection or road section to accommodate a given traffic volume. This capability varies depending on the factors described above. LOS are given letter designations from A to F. LOS "A" represents the best operating conditions and LOS "E" represents the level at which the intersection or an approach to the intersection is carrying the maximum traffic volume that can, practicably, be accommodated. LOS "F" indicates that the intersection is operating beyond its theoretical capacity.

The City of Ottawa has developed criteria as part of the Transportation Impact Assessment Guidelines, which directly relate the volume to capacity (v/c) ratio of a signalized intersection to a LOS designation. These criteria are as follows:

TABLE 8-4: LOS CRITERIA FOR SIGNALIZED INTERSECTIONS

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 intersection capacity analysis technique provides an indication of the LOS for each movement at the intersection under consideration and for the intersection as a whole. The overall v/c ratio for an intersection is defined as the sum of equivalent volumes for all critical movements at the intersection divided by the sum of capacities for all critical movements.

The capacity of an unsignalized intersection can also be expressed in terms of the LOS it provides. For an un-signalized intersection, such as a two-way stop-control (TWSC), all-way stop-control (AWSC) or roundabout, the Level of Service is defined in terms of the average movement delays at the intersection. This is defined as the total elapsed time from when a vehicle stops at the end of the queue until the vehicle passes the stop line; this includes the time required for a vehicle to travel from the last-in-queue position to the first-in-queue position. The average delay for any particular minor movement at the unsignalized intersection is a function of the capacity of the approach and the degree of saturation.

The Highway Capacity Manual 2010 (HCM 2010), prepared by the Transportation Research Board, includes the following Levels of Service criteria for unsignalized intersections, related to average movement delays at the intersection.

TABLE 8-5: LOS CRITERIA FOR UNSIGNALIZED INTERSECTIONS

LOS	Delay (s)
A	<10
B	>10 and <15
C	>15 and <25
D	>25 and <35
E	>35 and <50
F	>50

The unsignalized intersection capacity analysis technique included in the HCM and used in the current study provides an indication of the LOS for each movement of the intersection under consideration. By this technique, the performance of the unsignalized intersection can be compared under varying traffic conditions, using the LOS concept in a qualitative sense. One unsignalized intersection can be compared with another unsignalized intersection using this concept. LOS "E" represents the capacity of the movement under consideration and generally, in large urban areas, LOS "D" is considered to represent an acceptable operating condition (LOS "E" is considered an acceptable operating condition for planning purposes for intersections located in Ottawa's Urban Core – the downtown and its vicinity). LOS "F" indicates that the movement is operating beyond its design capacity.

8.5.2 Intersection Capacity Analysis Results

Intersection capacity analysis has been carried out for the study area intersections using Synchro (Version 9) and SIDRA INTERSECTION 6.1 software which employ the HCM 2010 methodology. The results of the analysis are summarized in **Tables 8-6** through **8-10** below.

The criteria for identifying critical intersections and movements are:

- An average control delay of 55 seconds and 35 seconds for signalized and unsignalized intersections, respectively; and
- A v/c ratio of greater than 0.90.

Detailed output from the software is provided in **Appendix F.**

Existing (2013) Traffic

Intersection capacity analysis have been undertaken for existing (2013) traffic conditions utilizing the traffic volumes presented in **Exhibit 4-2**. The results of the analysis are presented in **Table 8-6**.

TABLE 8-6: INTERSECTION CAPACITY ANALYSIS RESULTS - EXISTING (2013) TRAFFIC

INTERSECTION	INTERSECTION CONTROL	PEAK HOUR	OVERALL INTERSECTION		CRITICAL MOVEMENTS	
			LOS	V/C RATIO or DELAY	MOVEMENT	V/C RATIO or DELAY
Mer Bleue & Brian Coburn	Roundabout	AM	B	15.0s	-	-
		PM	A	8.2s	-	-
Mer Bleue & Renaud	All-Way Stop	AM	B	10.6s	-	-
		PM	D	27.6s	-	-
Mer Bleue & Wall	WB Stop	AM	B	10.6s	-	-
		PM	B	10.4s	-	-
Mer Bleue & Navan	SB Stop	AM	B	13.2s	-	-
		PM	D	27.0s	-	-
Tenth Line & Brian Coburn	Signalized	AM	A	0.54	-	-
		PM	B	0.67	-	-
Tenth Line & Wall	EB & WB Stop	AM	B	11.6s	-	-
		PM	C	16.9s	-	-
Tenth Line & Navan	Signalized	AM	A	0.33	-	-
		PM	A	0.43	-	-

The results from Table 8-6 above indicate that the study area intersections are all currently operating at acceptable levels of service during the morning and afternoon peak hours.

Future (2025) Background Traffic

Intersection capacity analyses have been undertaken for future (2025) background traffic conditions utilizing the traffic volumes presented in Exhibit 8-2. Based on the implementation schedule for the City's Affordable Road Network, the following projects have been assumed to be completed by 2025 and have been included in the traffic analysis:

- Widening of Mer Bleue Road to four lanes from north of Brian Coburn Boulevard to north of Renaud Road.
- Extension of Brian Coburn Boulevard as a two-lane road from Mer Bleue Road to Navan Road.
- Widening of Tenth Line Road to four lanes from Harvest Valley Road to Wall Road.

TABLE 8-7: INTERSECTION CAPACITY ANALYSIS RESULTS - FUTURE (2025) BACKGROUND TRAFFIC

INTERSECTION	INTERSECTION CONTROL	PEAK HOUR	OVERALL INTERSECTION		CRITICAL MOVEMENTS	
			LOS	V/C RATIO or DELAY	MOVEMENT	V/C RATIO or DELAY
Mer Bleue & Brian Coburn	Roundabout	AM	F	283.4s	WB	586.1s
		PM	F	167.6s	All Movements	47.8s to 447.6s
Mer Bleue & Brian Coburn	NEW- Roundabout[1,2]	AM	C	19.1s	-	-
		PM	D	27.3s	-	-
Mer Bleue & Renaud	All-Way Stop	AM	C	16.3s	-	-
		PM	F	54.8s	EBL SBTR	1.06 1.04
Mer Bleue & Renaud	NEW – Signalized	AM	A	0.41	-	-
		PM	A	0.48	-	-
Mer Bleue & Wall	WB Stop	AM	B	12.2s	-	-
		PM	B	10.9s	-	-
Mer Bleue	SB Stop	AM	C	18.5s	-	-

INTERSECTION	INTERSECTION CONTROL	PEAK HOUR	OVERALL INTERSECTION		CRITICAL MOVEMENTS	
			LOS	V/C RATIO or DELAY	MOVEMENT	V/C RATIO or DELAY
& Navan		PM	F	276.5s	SBL	1.47
Mer Bleue & Navan	NEW – Signalized	AM	A	0.40	-	-
		PM	A	0.58	-	-
Tenth Line & Brian Coburn	Signalized	AM	E	1.00	EBL WBT NBL	1.01 1.00 1.01
		PM	D	0.89	EBL EBT	0.95 0.96
Tenth Line & Brian Coburn	NEW – Signalized[1,3]	AM	B	0.70	-	-
		PM	B	0.69	-	-
Tenth Line & Zone 3 (N)/Harvest Valley	NEW – Signalized [4]	AM	A	0.37	-	-
		PM	A	0.33	-	-
Tenth Line & Zone 3 (S)/Avalon South	NEW – Signalized [4]	AM	A	0.10	-	-
		PM	A	0.20	-	-
Tenth Line & Wall	EB & WB Stop	AM	B	12.8s	-	-
		PM	C	24.5s	-	-
Tenth Line & Navan	Signalized	AM	A	0.42	-	-
		PM	B	0.63	-	-

Notes:

1. Widening of Brian Coburn Boulevard to four lanes through the intersections of Mer Bleue Road and Tenth Line Road.
2. Addition of auxiliary right-turn lanes at each approach to the Mer Bleue/Brian Coburn roundabout.
3. Modifications to the Tenth Line Road/Brian Coburn Boulevard intersection: double left-turn lanes on each approach; right-turn lanes on the southbound and eastbound approaches.
4. Traffic signals triggered by the planned widening of Tenth Line Road to four lanes from Harvest Valley Drive to Wall Road.

The results of the intersection capacity analysis under 2025 background traffic conditions indicate the following:

The existing Mer Bleue Road/Brian Coburn Boulevard roundabout will operate above capacity—level of service 'F'— during both the weekday morning and afternoon peak hours. This is due primarily to the projected increase in traffic volumes along Brian Coburn Boulevard from approximately 600–750 vehicles/h in the peak direction in 2013 to approximately 1150–1400 vehicles/h in 2025. Under these traffic conditions, Brian Coburn Boulevard will have reached its capacity as a two-lane road. Widening of Brian Coburn Boulevard to four lanes and modifying the roundabout to provide auxiliary right-turn lanes on each approach would improve the operating condition at the intersection to Levels of Service 'C' and 'D' in the morning and afternoon peak hours, respectively.

Similarly, by 2025 the existing Tenth Line Road/Brian Coburn Boulevard intersection is projected to operate at its theoretical capacity—level of service 'E'—during the morning peak hour with three individual movements operating above capacity. Further analysis indicates that widening of Brian Coburn Boulevard to four lanes and providing the following additional modifications to the intersection would improve the operating condition to acceptable Levels of Service:

- Double Left-Turn lanes on each approach
- Right-Turn lanes on the southbound and eastbound approaches

Under 2025 background traffic conditions, the existing Mer Bleue Road/Renaud Raod intersection is projected to reach its capacity as an all-way stop controlled intersection. Signalization of the intersection would improve the operating condition of the intersection to an acceptable level of service.

Under 2025 background traffic conditions, the intersection of Mer Bleue Road and Navan Road is projected to operate above its theoretical capacity as an unsignalized intersection during the afternoon peak hour. This is due to an increase in delay to left-turning vehicles on the southbound approach which is stop controlled. With the introduction of traffic signals at the intersection, the operating condition of the intersection would improve to acceptable levels of service.

The remaining intersections within the study area will continue to operate at acceptable levels of service under 2025 background traffic conditions. It has been assumed that the intersections of Tenth Line Road/Harvest Valley Drive and Tenth Line Road/Avalon South will be signalized when Tenth line Road is widened to four lanes.

Future (2031) Background Traffic

Intersection capacity analyses have been undertaken for future (2031) background traffic conditions utilizing the traffic volumes presented in **Exhibit 8-3**. The road network assumptions and proposed intersection modifications identified above in the analysis of 2025 background traffic conditions has been carried forward in the analysis under 2031 traffic conditions.

TABLE 8-8: INTERSECTION CAPACITY ANALYSIS RESULTS - FUTURE (2031) BACKGROUND TRAFFIC

INTERSECTION	INTERSECTION CONTROL	PEAK HOUR	OVERALL INTERSECTION		CRITICAL MOVEMENTS	
			LOS	V/C RATIO or DELAY	MOVEMENT	V/C RATIO or DELAY
Mer Bleue & Brian Coburn	Roundabout[1,2]	AM	D	27.7s	WBR	72.1s
		PM	E	45.4s	EBTL EBT	101.6s 98.8s
Mer Bleue & Renaud	Signalized	AM	A	0.45	-	-
		PM	A	0.53	-	-
Mer Bleue & Wall	WB Stop	AM	B	12.5s	-	-
		PM	B	11.1s	-	-
Mer Bleue & Navan	Signalized	AM	A	0.44	-	-
		PM	B	0.69	-	-
Tenth Line & Brian Coburn	Signalized[1,3]	AM	C	0.75	-	-
		PM	C	0.72	-	-
Tenth Line & Zone 3 (N)/Harvest Valley	Signalized[4]	AM	A	0.38	-	-
		PM	A	0.34	-	-
Tenth Line & Zone 3 (S)/Avalon South	Signalized[4]	AM	A	0.10	-	-
		PM	A	0.20	-	-
Tenth Line & Wall	EB & WB Stop	AM	B	13.2s	-	-
		PM	D	27.7s	-	-
Tenth Line & Navan	Signalized	AM	A	0.45	-	-
		PM	B	0.66	-	-

Notes:

1. Widening of Brian Coburn Boulevard to four lanes through the intersections of Mer Bleue Road and Tenth Line Road.
2. Addition of auxiliary right-turn lanes at each approach to the Mer Bleue/Brian Coburn roundabout.
3. Modifications to the Tenth Line Road/Brian Coburn Boulevard intersection: double left-turn lanes on each approach; right-turn lanes on the southbound and eastbound approaches.

4. Traffic signals triggered by the planned widening of Tenth Line Road to four lanes from Harvest Valley Drive to Wall Road.

The results of the intersection capacity analysis under 2031 background traffic conditions indicate that the modified Mer Bleue Road/Brian Coburn Boulevard roundabout will experience capacity issues on the westbound right-turn movement during the morning peak hour and eastbound approach during the afternoon peak hour.

The other intersections within the study area will continue to operate at acceptable overall levels of service with the improvements identified under 2025 background traffic conditions

Future (2025) Total Traffic

Intersection capacity analyses have been undertaken for future (2025) total traffic conditions utilizing the traffic volumes presented in Exhibit 8-6. The modifications to the road network identified above have been carried forward in the analysis. In addition, the New Collector Road that will connect Mer Bleue Road to Tenth Line Road via Wall Road is included in the analysis. Other access roads to the proposed development will be provided on Mer Bleue (Realigned Wall Road) and on Tenth Line (Zone 3 North/Harvest Valley, Zone 3 South/Avalon South and Zone 6). Two single-lane roundabouts are proposed along the New Collector Road within the development boundary.

The results of the analysis are summarized in **Table 8-9** below.

TABLE 8-9: INTERSECTION CAPACITY ANALYSIS RESULTS - FUTURE (2025) TOTAL TRAFFIC

INTERSECTION	INTERSECTION CONTROL	PEAK HOUR	OVERALL INTERSECTION		CRITICAL MOVEMENTS	
			LOS	V/C RATIO or DELAY	MOVEMENT	V/C RATIO or DELAY
Mer Bleue & Brian Coburn	Roundabout [1,2]	AM	D	29.1s	WBR	74.2s
		PM	E	41.8s	SBTL SBT EBTL EBT	36.0s 35.1s 92.6s 89.8s
Mer Bleue & Renaud	Signalized	AM	A	0.42	-	-
		PM	A	0.55	-	-
Mer Bleue & New Collector	NEW - WB Stop	AM	B	13.0s	-	-
		PM	B	14.4s	-	-
Mer Bleue & Wall (Realigned)	NEW - WB Stop	AM	C	15.0s	-	-
		PM	B	13.3s	-	-
Mer Bleue & Wall	WB Stop	AM	B	11.9s	-	-
		PM	B	13.8s	-	-
Mer Bleue & Navan	Signalized	AM	A	0.48	-	-
		PM	B	0.67	-	-
Tenth Line & Brian Coburn	Signalized [1,3]	AM	C	0.72	-	-
		PM	C	0.71	-	-
Tenth Line & Zone 3 (N)/Harvest Valley	Signalized[4]	AM	A	0.42	-	-
		PM	A	0.36	-	-
Tenth Line & Zone 3 (S)/Avalon South	Signalized[4]	AM	A	0.13	-	-
		PM	A	0.23	-	-
Tenth Line & Wall	EB & WB Stop	AM	C	16.1s	-	-
		PM	E	40.1s	EBL	40.1s
Tenth Line & Wall	All-Way Stop	AM	B	10.7s	-	-
		PM	C	15.7s	-	-
Tenth Line & Zone 6	NEW - EB Stop	AM	B	11.6s	-	-
		PM	B	13.8s	-	-
Tenth Line & Navan	Signalized	AM	A	0.43	-	-
		PM	B	0.63	-	-
New Collector & Gerry Lalonde (internal)	NEW –Roundabout	AM	A	5.0s	-	-
		PM	A	4.9s	-	-

INTERSECTION	INTERSECTION CONTROL	PEAK HOUR	OVERALL INTERSECTION		CRITICAL MOVEMENTS	
			LOS	V/C RATIO or DELAY	MOVEMENT	V/C RATIO or DELAY
New Collector & Wall (internal)	NEW –Roundabout	AM	A	4.7s	-	-
		PM	A	4.9s	-	-

Notes:

1. Widening of Brian Coburn Boulevard to four lanes through the intersections of Mer Bleue Road and Tenth Line Road.
2. Addition of auxiliary right-turn lanes at each approach to the Mer Bleue/Brian Coburn roundabout.
3. Modifications to the Tenth Line Road/Brian Coburn Boulevard intersection: double left-turn lanes on each approach; right-turn lanes on the southbound and eastbound approaches.
4. Traffic signals triggered by the planned widening of Tenth Line Road to four lanes from Harvest Valley Drive to Wall Road.

Under 2025 total traffic conditions the modified roundabout at Mer Bleue Road and Brian Coburn Boulevard would continue to operate at acceptable overall levels of service during the morning peak hour but would operate at level service 'E' during the afternoon peak hour.

With the additional traffic generated by the proposed development, the Tenth Line Road/ Wall Road intersection will operate at an acceptable level of service (LOS 'C') during the morning peak hour but will approach its capacity (LOS 'E') as a two-way stop controlled intersection during the afternoon peak hour. Conversion of the intersection to All-Way Stop Control would improve the operating condition to acceptable levels of service—LOS 'B' and 'C', respectively—during the morning and afternoon peak hours.

Future (2031) Total Traffic

Intersection capacity analyses have been undertaken for future (2031) total traffic conditions utilizing the traffic volumes presented in Exhibit 8-7. The arterial road network within the study area is not expected to change since the 2025 analysis year.

TABLE 8-10: INTERSECTION CAPACITY ANALYSIS RESULTS - FUTURE (2031) TOTAL TRAFFIC

INTERSECTION	INTERSECTION CONTROL	PEAK HOUR	OVERALL INTERSECTION		CRITICAL MOVEMENTS	
			LOS	V/C RATIO or DELAY	MOVEMENT	V/C RATIO or DELAY
Mer Bleue & Brian Coburn	Roundabout[1,2]	AM	F	73.1s	WBTL WBT WBR	126.5s 126.5s 194.0s
		PM	F	83.3s	NBTL NBTR SBTL SBTR EBTL EBTR	59.7s 57.5s 110.5s 109.3s 173.7s 171.0s
Mer Bleue & Renaud	Signalized	AM	A	0.51	-	-
		PM	B	0.69	-	-
Mer Bleue & New Collector	WB Stop	AM	D	27.7s	-	-
		PM	F	55.9s	WBR	55.9s
Mer Bleue & New Collector	Signalized	AM	A	0.53	-	-
		PM	A	0.52	-	-
Mer Bleue & Wall (Realigned)	WB Stop	AM	C	21.9s	-	-
		PM	C	19.1s	-	-
Mer Bleue & Wall	WB Stop	AM	B	13.4s	-	-
		PM	C	16.0s	-	-
Mer Bleue & Navan	Signalized	AM	A	0.59	-	-
		PM	C	0.74	-	-
Tenth Line	Signalized[1,3]	AM	C	0.78	-	-

INTERSECTION	INTERSECTION CONTROL	PEAK HOUR	OVERALL INTERSECTION		CRITICAL MOVEMENTS	
			LOS	V/C RATIO or DELAY	MOVEMENT	V/C RATIO or DELAY
& Brian Coburn		PM	C	0.77	-	-
Tenth Line & Zone 3 (N)/Harvest Valley	Signalized[4]	AM	A	0.43	-	-
		PM	A	0.39	-	-
Tenth Line & Zone 3 (S)/Avalon South	Signalized[4]	AM	A	0.17	-	-
		PM	A	0.26	-	-
Tenth Line & Wall	All-Way Stop	AM	D	13.0s	-	-
		PM	C	24.1s	-	-
Tenth Line & Zone 6	EB Stop	AM	B	12.9s	-	-
		PM	C	15.2s	-	-
Tenth Line & Navan	Signalized	AM	A	0.47	-	-
		PM	B	0.66	-	-
New Collector & Gerry Lalonde (internal)	Roundabout	AM	A	5.0s	-	-
		PM	A	5.0s	-	-
New Collector & Wall (internal)	Roundabout	AM	A	4.7s	-	-
		PM	A	4.9s	-	-

Notes:

1. Widening of Brian Coburn Boulevard to four lanes through the intersections of Mer Bleue Road and Tenth Line Road.
2. Addition of auxiliary right-turn lanes at each approach to the Mer Bleue/Brian Coburn roundabout.
3. Modifications to the Tenth Line Road/Brian Coburn Boulevard intersection: double left-turn lanes on each approach; right-turn lanes on the southbound and eastbound approaches.
4. Traffic signals triggered by the planned widening of Tenth Line Road to four lanes from Harvest Valley Drive to Wall Road.

The modified Mer Bleue Road/Brian Coburn Boulevard roundabout is projected to operate above its theoretical capacity during the morning and afternoon peak hours under 2031 total traffic conditions, resulting in average vehicular delays of approximately 73 seconds and 83 seconds, respectively. The eastbound and southbound approaches are the critical movements in the afternoon peak hour with estimated 95th percentile queue lengths of 296 m and 316 m, respectively. These queue lengths are considered to be manageable as they will not spill back to the upstream intersections on these approaches.

Under 2031 total traffic conditions, the proposed intersection of Mer Bleue and the New Collector Road will operate above capacity—level of service 'F'— during the afternoon peak hour as a stop controlled intersection. Further analysis indicates that the intersection would operate at a high level of service ('A') with traffic control signals in place.

8.5.1 Intersection Capacity Analysis Summary

Mer Bleue Road/Brian Coburn Boulevard

The existing Mer Bleue Road/Brian Coburn roundabout is projected to reach its capacity under 2025 background traffic conditions. Widening of Brian Coburn Boulevard to four lanes and the addition of auxiliary right turn lanes on all approaches to the roundabout will provide additional capacity to improve traffic operations at the intersection in the interim period until 2031 total traffic conditions are reached.

Mer Bleue Road/Renaud Road

The existing All-Way Stop Controlled intersection is projected to reach its capacity under 2025 background traffic conditions. With traffic signals in place the intersection will operate at an acceptable level of service under 2031 total traffic conditions.

Mer Bleue Road/New Collector Road

The interim intersection of Mer Bleue Road and the proposed New Collector Road can operate initially as an unsignalized T-intersection with stop control on the side street approach. As the MBESA is built-out, the intersection will need to be signalized.

Ultimately, it is expected that the intersection of the Realigned Mer Bleue Road (four lanes) and the New Collector Road will be signalized.

Mer Bleue Road/Realigned Wall Road

The new intersection of Mer Bleue Road and the Realigned Wall Road will operate at an acceptable level of service as an unsignalized intersection with stop control on the Realigned Wall Road approach.

Mer Bleue Road/Wall Road

The existing intersection of Mer Bleue Road and Wall Road will continue to operate at acceptable levels of service during the weekday peak hours at the 2031 horizon year.

Mer Bleue Road/Navan Road

The existing intersection of Mer Bleue Road and Navan Road is projected to reach capacity as an unsignalized intersection under 2025 background traffic conditions. The intersection will operate acceptably at the 2031 horizon year with traffic control signals in place.

Tenth Line Road/Brian Coburn Boulevard

The existing Tenth Line Road/Brian Coburn Boulevard intersection will operate at its theoretical capacity under 2025 background traffic conditions. Widening of Brian Coburn Boulevard to four lanes and the following additional modifications to the intersection would be required for the intersection to operate at acceptable levels of service at the 2031 study horizon year:

- Double Left-Turn lanes on each approach
- Right-Turn lanes on the southbound and eastbound approaches

Tenth Line Road/Zone 3 (N)/Harvest Valley Avenue

The Tenth Line Road/Zone 3 (N)/Harvest Valley Avenue intersection will operate at an acceptable level of service at the 2031 study horizon year. It is assumed that traffic signals will be required at the intersection when Tenth Line Road is widened to four lanes between 2020 and 2025.

Tenth Line Road/Zone 3 (S)/Avalon South

The Tenth Line Road/Zone 3 (N)/Avalon South intersection will operate at an acceptable level of service at the 2031 study horizon year. It is assumed that traffic signals will be required at the intersection when Tenth Line Road is widened to four lanes between 2020 and 2025.

Tenth Line Road/Wall Road

The Tenth line Road/Wall Road intersection can continue to operate as a two-way stop controlled intersection in the interim phases of the development, but will approach its capacity during the afternoon peak hour at the assumed 50% build-out stage in 2025. Introducing All-Way Stop Control will allow the intersection to operate at an acceptable level of service at the 2031 horizon year.

Tenth line Road/Zone 6

The intersection of Tenth Line Road and the future access to Zone 6 of the proposed development will operate at acceptable levels of service during the weekday peak hours at the 2031 horizon year. It is assumed that the intersection would be unsignalized with stop control on the side street approach.

Tenth Line Road/Navan Road

The existing intersection of Tenth line Road and Navan Road will continue to operate at acceptable levels of service at the 2031 horizon year.

Internal Intersections

The two roundabouts proposed at the collector road intersections in the development—New Collector Road/Gerry Lalonde Drive and New Collector Road/Wall Road—will operate acceptably at full build-out of the development.

8.6 Traffic Signal Warrant Analysis

Traffic control signal warrants analysis has been undertaken for several intersections within the study area using the established methodology outlined in the Ontario Traffic Manual, Book 12, Ministry of Transportation Ontario (MTO), 2012.

The existing eight-hour turning movement counts are used in the analysis. The methodology applies the following three justifications to determine whether a traffic control signal would be warranted at any intersection:

- Justification 1 – Minimum Vehicular Volume
- Justification 2 – Delay to Cross Traffic
- Justification 3 – Volume/Delay Combination

Justification 1 considers traffic signals for the purposes of mitigating the cumulative delay produced by large volumes of intersecting traffic. Justification 1A accounts for the lowest total traffic for all intersection approaches while Justification 1B accounts for the lowest volume on the minor road. The predetermined minimum volume thresholds for both Justifications 1A and

1B must be 100% fulfilled for signals to be justified. Under the event that the thresholds are not met but are at least 80% fulfilled, Justification 3 may be applied.

Justification 2 considers traffic signals where main road traffic volumes are excessive to the point that minor road vehicles suffer significant delays or hazards in entering the intersection. Similar to Justification 1, both Justification 2A and 2B minimum volume thresholds must reach 100% compliance for signals to be justified. Justification 3 may be applied if Justifications 2A and 2B both exceed 80% compliance but do not reach the 100% threshold.

Justification 3 considers traffic signals for applications where both the volumes and delays evaluated under Justifications 1 and 2 are approaching the 100% threshold but do not meet the requirements. For signals to be warranted under Justification 3, all four Justifications 1A, 1B, 2A and 2B must meet their respective minimum volume thresholds to a compliance of 80%.

The following three intersections, anticipated to require signalization based on traffic volumes, have been analyzed according to the methodology described above. The results of this analysis are summarized in **Tables 8-11 through 8-13** below. Details of the signal warrant analysis have been provided in **Appendix G**.

TABLE 8-11: TRAFFIC SIGNAL WARRANT ANALYSIS - MER BLEUE/RENAUD: FUTURE (2025) BACKGROUND TRAFFIC

JUSTIFICATION		COMPLIANCE	URBAN (RESTRICTED FLOW) SIGNAL JUSTIFIED	
			YES	NO
1. Minimum Vehicular Volume	A. Total Volume	100%	✓	
	B. Crossing Volume	100%		
2. Delay to Cross Traffic	A. Main Road	100%	✓	
	B. Crossing Road	100%		
3. Combination	Justification 1	100%	✓	
	Justification 2	100%		

The results of the signal warrants analysis indicate that the intersection of Mer Bleue Road and Renaud Road are warranted based on projected Future (2025) Background Traffic volumes.

TABLE 8-12: TRAFFIC SIGNAL WARRANT ANALYSIS - MER BLEUE/NAVAN: FUTURE (2025) BACKGROUND TRAFFIC

JUSTIFICATION		COMPLIANCE	RURAL (UNRESTRICTED FLOW) SIGNAL JUSTIFIED	
			YES	NO
1. Minimum Vehicular Volume	A. Total Volume	100%	✓	
	B. Crossing Volume	100%		
2. Delay to Cross Traffic	A. Main Road	100%		✓
	B. Crossing Road	96% < 100%		
3. Combination	Justification 1	100% > 80%	✓	
	Justification 2	96% > 80%		

The results of the analysis indicate that traffic signals are warranted at the intersection of Mer Bleue Road and Navan Road based on projected Future (2025) Background Traffic volumes.

TABLE 8-13: TRAFFIC SIGNAL WARRANT ANALYSIS - MER BLEUE ROAD/NEW COLLECTOR ROAD: FUTURE (2031) TOTAL TRAFFIC

JUSTIFICATION		COMPLIANCE	URBAN (RESTRICTED FLOW) SIGNAL JUSTIFIED	
			YES	NO
4. Minimum Vehicular Volume	C. Total Volume	100%		✓
	D. Crossing Volume	98% < 100%		
5. Delay to Cross Traffic	C. Main Road	99% < 100%		✓
	D. Crossing Road	87% < 100%		
6. Combination	Justification 1	98% > 80%	✓	
	Justification 2	87% > 80%		

The results of the analysis indicate that traffic signals are warranted at the intersection of Mer Bleue Road and the proposed New Collector Road based on projected Future (2031) Total Traffic volumes.

8.7 Auxiliary Lane Analysis

Auxiliary lane analysis has been undertaken for the proposed development intersections based on projected 2031 total traffic conditions.

8.7.1 Left-Turn Lanes – Unsignalized Intersections

Auxiliary left-turn lane analyses were completed for the left-turn movements at unsignalized intersections within the study area. The queue length analysis was based on the highest peak hour traffic volumes for the approach.

The MTO Geometric Design Standards for Ontario Highways left-turn lane warrant was checked against projected 2031 total peak hour traffic volumes at the two-way stop controlled intersections within the study area. The results are summarized in **Table 8-14** below.

TABLE 8-14: AUXILIARY LEFT-TURN LANE ANALYSIS RESULTS - UNSIGNALIZED INTERSECTIONS

INTERSECTION	MOVEMENT	POSTED SPEED (km/h)	DESIGN SPEED (km/h)	LEFT-TURN VOLUME (vph)	APPROACH VOLUME (vph)	OPPOSING VOLUME (vph)	LEFT-TURN STORAGE (m)
Mer Bleue Road & Realigned Wall Road	SBL	60	70	116 (36%)	321	436	**20m Taper Required**
Mer Bleue Road & Wall Road	SBL	60	70	20 (5%)	424	496	**No LTL Required**
Tenth Line & Zone 6	NBL	60	70	17 (4%)	460	399	**No LTL Required**

Note: Left-turn storage does not include taper.

The results of the analysis indicate that a 20m auxiliary left-turn lane is warranted on the southbound approach to the Mer Bleue Road/Realigned Wall Road intersection.

8.7.2 Left-turn Lanes – Signalized Intersections

Two methods were used to determine left-turn storage length requirements at the signalized intersections: a manual left-turn storage lane calculation, based on the requirements of the City of Ottawa Transportation Impact Assessment (TIA) Guidelines; and the estimated 95th percentile queue length from the Synchro analysis.

The storage length requirement has been calculated using the following formula:

$$Storage\ Length, S = \frac{NL}{30} \times 1.5$$

Where N = Peak hour traffic volume (veh/h)

L = Average vehicle length = 7m

30 = Number of traffic signal cycles per hour (assuming 120 s cycle length)

1.5 = Factor of safety

The results of the auxiliary left-turn lane analysis are summarized in **Table 8-15** below and are based on the projected Future (2031) Total Traffic volumes. Minimum recommended storage lengths are provided for each signalized intersection.

TABLE 8-15: AUXILIARY LEFT-TURN LANE ANALYSIS RESULTS - SIGNALIZED INTERSECTIONS

INTERSECTION	MOVEMENT	EXISTING STORAGE (m)	HIGHEST PEAK HOUR VOLUME (veh/hr)	QUEUE LENGTH (m)		MINIMUM RECOMMENDED STORAGE (m)
				SYNCHRO (95TH Percentile)	CALCULATED	
Mer Bleue Road & New Collector Road	WBL	-	87	11.9	15	15
	SBL	-	321	34.5	56	60
Mer Bleue Road & Zone 3 (N) / Harvest Valley Drive	EBL	-	104	26.3	36	40
	WBL	-	120	20.5	42	45
	NBL	-	0	1.8	0	20
	SBL	-	189	22.9	66	70
Mer Bleue Road & Zone 3 (S) / Avalon South	EBL	-	76	16.1	13	20
	WBL	-	10	3.9	2	20
	NBL	-	12	1.8	2	20
	SBL	-	68	5.6	12	20

Note: recommended storage lengths rounded up to nearest 5 m.

8.7.3 Right-Turn Lanes – Signalized Intersections

Analysis of the existing right-turn lanes at the signalized intersections within the study area has been based on the estimated 95th percentile queue lengths from Synchro. The queue length analysis was completed using the worst peak hour traffic volumes for the approach and the results are summarized in **Table 8-16**.

TABLE 8-16: AUXILIARY RIGHT-TURN LANE ANALYSIS RESULTS - SIGNALIZED INTERSECTIONS

INTERSECTION	MOVEMENT	EXISTING STORAGE	HIGHEST PEAK HOUR VOLUME (veh/hr)	MINIMUM RECOMMENDED STORAGE
Mer Bleue Road & New Collector Road	WBR	-	285	15m
	NBR	-	81	<10m*
Mer Bleue Road & Zone 3 (N) / Harvest Valley Drive	NBR	0m	59	<10m*
	SBR	-	109	<10m*
Mer Bleue Road & Zone 3 (S) / Avalon South	SBR	-	102	<10m*

Note: Queue lengths rounded up to nearest 5m
* Right-turn auxiliary turning lanes may not be required at these locations. Specific intersection geometry to be established at the Site Plan Application stage.

Details of the Auxiliary Lane Analysis have been provided in **Appendix H**.

8.8 Screenline Analysis

Screenline analysis is a comparison of forecasted demands and lane capacities for the major road network connecting the site to the area transportation network. Lane capacities are based generally on the Official Plan designation of the road classifications and other general characteristics of the roads (e.g. urban or rural cross sections).

The screenline analysis methodology, locations and capacities were obtained from the 2013 Transportation Master Plan Update – Road Network Development Report (September 2013), prepared by IBI Group on behalf of the City of Ottawa.

The following screenlines were evaluated in this analysis:

- Bilberry Creek screenline (No.45) is a north-south line that runs roughly along the Bilberry Creek alignment and Mer Bleue Road between the Ottawa River and Navan Road
- Frank Kenny Road screenline (No.46) runs roughly along Frank Kenny Road at the Ottawa River, Trim Road, Wall Road and ends just south of Navan Road at Tenth Line Road.
- Innes Road screenline (No.47) is an east-west line that runs along Innes Road from Navan Road to Trim Road.

Two scenarios representing the screenline capacity under the Network Concept plan identified in the TMP were evaluated. The 2011 (existing) network capacity represents the base scenario for existing conditions; the 2031 Network Concept includes 2031 Base Scenario plus new projects considered in the TMP.

The proposed development was incorporated in the City Network Model, which means the expected demand was represented in the TMP Screenline and Cordon Travel Volume evaluations. However, the percentage buildout and density assumed in the City Model may not have been accurately represented. Therefore, inbound AM site generated traffic volumes (from Exhibit 8-5) crossing the noted screenlines were incorporated into this analysis to ensure

the proposed development is accounted for. This process resulted in a second 2031 Network Concept scenario comparing the combined 2031 estimated network demand and inbound AM site generated traffic volumes with the 2031 Network Concept.

Table 8-17, presents the results of the screenline analysis for the weekday AM peak hour in the peak direction under existing traffic conditions and at the 2031 horizon year.

TABLE 8-17: SCREENLINE ANALYSIS

SCREENLINE SCENARIO	SCREENLINE	INBOUND (AM PEAK)		
		VEHICLES	CAPACITY	V/C RATIO
2011 BASE NETWORK [1]	SL 45: Bilberry Creek	6,179	8,000	0.77
	SL 46: Frank Kenny	2,224	7,800	0.29
	SL 47: Innes	2,277	7,600	0.30
2031 NETWORK CONCEPT [2]	SL 45: Bilberry Creek	7,681	11,600	0.66
	SL 46: Frank Kenny	3,880	9,800	0.40
	SL 47: Innes	4,278	12,200	0.35
2031 NETWORK CONCEPT (WITH DEVELOPMENT VOLUMES)	SL 45: Bilberry Creek	8,252	11,600	0.71
	SL 46: Frank Kenny	3,911	9,800	0.40
	SL 47: Innes	4,631	12,200	0.38

[1] Existing Network Capacity taken from Exhibit 3-4: Screenline and Cordon Travel Volumes (Motorized Travel Modes) – Inbound 2011 and 2031 Base (Do Nothing) Scenario

[2] Network Concept capacity taken from Exhibit 4-8: Screenline and Cordon Travel Volumes (Motorized Travel Modes) – Inbound 2031 Base Scenario and 2031 Network Concept

Based on the results summarized in Table 13 above, the screenlines are projected to be under capacity at the 2031 horizon year in both future development scenarios with the existing road network in place.

9. IMPLEMENTATION

9.1 Required Roadway Infrastructure

Table 9-1 summarizes the new roadway infrastructure required to support the preferred development plan and identifies the anticipated MCEA schedule for each project.

TABLE 9-1: REQUIRED ROADWAY INFRASTRUCTURE

ROAD INFRASTRUCTURE	DETAILS	MCEA SCHEDULE
New Collector Road	Two-lane collector road (24 m ROW)	B
Realigned Wall Road	Two-lane collector road (24 m ROW)	B
Gerry Lalonde Drive Extension	Two-lane collector road from the north limit of the MBESA to the New Collector Road	B
Zone 6 Collector Road	Two-lane collector road (24 m ROW)	B
Local Roads	Internal local road network	A
Mer Bleue Road/New Collector Road	New intersection: unsignalized initially; traffic signals by 2031.	A+
Mer Bleue Road/Realigned Wall Road	New stop-controlled intersection	A+
Tenth Line Road/Zone 6	New stop-controlled intersection	A+
Tenth Line Road/Zone 3 (N)/Harvest Valley Avenue	Add west leg—Zone 3 (N)—to existing Tenth Line Road/Harvest Valley Avenue intersection.	A+
Tenth Line Road/Zone 3 (S)/Avalon South	New intersection with Tenth Line Road/Avalon South.	A+

9.2 Modifications

The change process distinguishes between minor and major changes. A substantive design change would require approval by Planning and Environment Committee and external agencies as necessary and may necessitate the completion of an amendment to the Master Transportation Study/EA, whereas a minor change would not. Minor changes may be made at the discretion of the Director of Planning and Infrastructure Approvals and incorporated into subdivision and/or site plan approvals.

Minor Changes

Minor design changes may be defined as those which do not appreciably change the expected net impacts or outcomes associated with the project. For example, median width, pathway connections, and underground infrastructure sizes, adjustments to the distribution of low and medium density residential areas, minor changes to the location and configuration of neighbourhood parks, minor changes to the residential mix, minor adjustments to stormwater management pond block size and location would be considered minor. Slight changes in alignment or facility footprints, which have the agreement of all affected landowners, would also be considered as minor.

All affected landowners and appropriate stakeholders will be provided details of the modification. The majority of such changes could likely be dealt with during the detailed design phase and would remain the responsibility of the proponent to ensure that all relevant issues are taken into account.

Major Changes

Major changes may be defined as those which change the intent of the EAs or appreciably change the expected net impacts or outcomes associated with the project. An example of a major change would result from a proposed shift in a preferred design alignment or configuration which would warrant changes in mitigation to the number of storm ponds, the relocation of school and community park sites, or a major change to McKinnons Creek.

If the proposed modification is major, the recommendations and conclusions associated with the change would require updating. An addendum to the MTS and MSS may be required to document the change, identify the associated impacts and mitigation measures and allow related concerns to be addressed and reviewed by the appropriate stakeholders. Major changes will be subject to approval by Planning and Environment Committee and external agencies as required.

10. IMPACTS, MITIGATION AND MONITORING

10.1 Impacts and Mitigation

The values and conditions identified in the documentation of existing conditions were used as the basis for assessing the effects of the preferred alternatives on the natural, social, physical and technical environments. The impact analysis involved applying the following steps:

Step 1: Identify and analyze instances where the project may interact with existing environmental conditions.

Step 2: Acknowledge predetermined project activities that act as built-in mitigation measures.

Step 3: Identify the residual environmental effects, if any.

Step 4: Identify opportunities for further mitigation of residual effects, if possible/practical.

Step 5: Determine the significance of the residual environmental effects, after further mitigation.

10.1.1 Built-In Mitigation Measures

In this assessment, "built-in mitigation" is defined as actions and design features incorporated in the pre-construction, construction, and operational phases that have the specific objective of lessening the significance or severity of environmental effects which may be caused by the project.

The project will be designed and implemented with the benefit of contemporary planning, engineering, and environmental management practices. Regard shall be had for the legislation, policies, regulations, guidelines, and best practices of the day. Where possible, mitigation measures will be prescribed in the construction contracts and specifications. Examples of practices that should be employed, based on current standards, are described below. These measures can be considered "built into" the preferred design for the MBESA. They will be updated and refined during the pre-construction, construction, and operation phases of the project.

Erosion and Sediment Control Plan

The purpose of the Erosion and Sedimentation Control Plan is to determine the degree of erosion and sedimentation that would occur under normally anticipated weather conditions during the life of the project, and to develop and implement mitigative strategies to control any areas determined to be pre-dispositioned to the problem. This would include: the identification of planting and slope rounding specifications within the contract tender; identifying and specifying seeding and sodding locations; identifying areas requiring slope benching or retaining structures in the detailed design process; and post construction monitoring and mitigative practices.

Construction and Traffic Management Plan

A Construction and Traffic Management Plan will be developed to manage the road network transportation function for all travel modes including equipment and material deliverables at various times during the construction period. The objective of the plan will be to maintain safe and clear pedestrian routes, maintain existing traffic as close as possible to its current conditions, and outline the road signage program.

Archaeological Findings

If during the course of construction archaeological resources are discovered, the site should be protected from further disturbance until a licensed archaeologist has completed the assessment and any necessary mitigation has been completed. In the event that human remains are encountered during construction activities, local law enforcement authorities and/or the coroner will be notified immediately, followed by the Ministry of Tourism, Culture and Sport, and the Registrar of Cemeteries at the Ministry of Consumer Services (416) 326-8393.

Emergency Response Plan

The preparation of an Emergency Response Plan to be used by the Contractor will be included to allow full access to emergency services during the construction period, so that at any given time there is a method to access all adjacent land uses. Additionally, the Emergency Response Plan should include provisions for providing temporary services to end users in the event of a construction related service outage or other service disruption.

Environmental Protection Plan

It will be the responsibility of the Contractor to ensure that no contamination, waste or other substances, which may be detrimental to aquatic life or water quality, will enter a watercourse as either a direct or indirect result of construction. In this regard, any floating debris resulting from construction which accumulates on watercourse beds and watercourse banks is to be immediately cleaned up and disposed of. Any spills or contamination, waste or other substances which may be detrimental to aquatic life or water quality will also be immediately cleaned up.

Any work which will cause or be the cause of discharge to watercourses is to be prohibited. At all times, construction activities are to be controlled in a manner that will prevent entry of deleterious materials to watercourses. In particular, construction material, excess material, construction debris and empty containers are to be stored away from watercourses and the banks of watercourses.

Spills or discharges of pollutants or contaminants will be reported immediately. Clean up shall be initiated quickly to ensure protection of the environment.

Management of Contaminated Materials

The Ministry of the Environment and Climate Change and the Construction Manager are to be notified immediately upon discovery of any contaminated material encountered within the construction area. If contaminated materials or contaminated groundwater are encountered within the construction limits, these are to be removed and disposed of in accordance with all

applicable Acts and Regulations. Treatment and discharge of contaminated groundwater are also to be in accordance with applicable legislation and regulations.

10.1.2 Assessment and Evaluation Results

Determination of an environmental effect requires consideration of the interaction between the project (i.e. project activities) and the environment. Pre-construction, construction and operational activities were all assessed. Professional judgment and experience formed the basis for identifying environmental effects and mitigation measures. The analysis was based primarily on comparing the existing environment with the anticipated future environment, during and after construction. Consideration was given to:

- the magnitude, spatial extent, and duration of effects;
- the proportion of a species population or the number of people affected;
- direct or indirect effects;
- the degree to which the effect responds to mitigation; and
- the level of uncertainty about the possible effect.

In this assessment, "residual" environmental effects are defined as changes to the environment caused by the project, and vice versa, when compared to existing conditions and taking into account all mitigation measures. Potential residual environmental effects are assessed as to their significance, including spatial and temporal considerations, and are categorized according to the following definitions:

"Negligible" means an effect that may exhibit one or more of the following characteristics:

- nearly-zero or hardly discernible effect; or
- affecting a population or a specific group of individuals at a localized area and/or over a short period.

"Insignificant" means an effect that may exhibit one or more of the following characteristics:

- not widespread;
- temporary or short-term duration (i.e., only during construction phase);
- recurring effect lasting for short periods of time during or after project implementation;
- affecting a specific group of individuals in a population or community at a localized area or over a short period; or
- not permanent, so that after the stimulus (i.e., project activity) is removed, the integrity of the environmental component would be resumed.

"Significant" means an effect that may exhibit one or more of the following characteristics:

- widespread;
- permanent transcendence or contravention of legislation, standards, or environmental guidelines or objectives;
- permanent reduction in species diversity or population of a species;
- permanent alteration to groundwater flow direction or available groundwater quantity and quality;

- permanent loss of critical/productive habitat;
- permanent loss of important community archaeological/heritage resources; or
- permanent alteration to community characteristics or services, established land use patterns, which is severe and undesirable to the community as a whole.

The above definitions of significance were adopted for use in this assessment because many of the impacts cannot be quantified in absolute terms, although changes and trends can be predicted. The definitions provide guidance and are intended to minimize personal bias. A summary table describing the potential effects on the transportation network, mitigation, residual effects and their significance, and monitoring recommendations for the preferred development plan, is provided in Table **10-1**. Similar guidance on the potential effects on the natural heritage features and social environment are provided in the *MBESA Environmental Management Plan*.

10.2 Monitoring

Monitoring is important to verify the accuracy of effects predictions. Monitoring measures were recommended to determine which effects actually occurred with project implementation, and may result in the modification of mitigation measures to improve their effectiveness. Identified monitoring measures include:

Fisheries

A qualified inspector will conduct frequent visits during construction to ensure that the contractor is constructing the project in accordance with the design drawings and that the mitigation measures are being implemented and maintained as specified. Bulkhead barriers, filter cloths on open surface structures, and silt fencing may require removal of sediment and repairs. The inspector must ensure that construction vehicles and chemicals, fuels and other potentially hazardous materials remain in designated areas.

The inspections will include frequent monitoring of watercourses in the vicinity of work areas. Any water quality issues such as elevated turbidity levels are to be addressed immediately with cessation of work until sediment and erosion controls are properly functioning. Fish passage or fish removal to be monitored for all in-water work.

Species at Risk

Monitor work areas and adjacent lands and ensure protection of any identified Species at Risk. If a mitigation or compensation plan is required, monitor the success of the plan such as the health of butternut plantings or collection of butternut seeds. Monitoring reports will be submitted to the Ministry of Natural Resources.

TABLE 10-1: IMPACTS, MITIGATION AND MONITORING

CRITERIA		PROJECT ACTIVITY/IMPACT	MITIGATION MEASURE	MONITORING RECOMMENDATIONS	SIGNIFICANCE OF IMPACT
Transportation	Transit Ridership	• Sequence of construction phasing may hinder transit service. • Potential for residential areas to fall outside of the required 400 m minimum walking distance to transit.	• Ensure phasing allows for good collector road connectivity to support interim transit routes. • Layout of collector roads is designed to maximize transit service and to provide flexibility for routing.	Coordination with the City of Ottawa/OC Transpo	Insignificant
	Network/System Integration	• Construction of servicing infrastructure along Tenth Line Road will require construction phasing and will result in the disruption of traffic.	• A Traffic Management Plan will be developed during detailed design and adhered to by the Contractor, considering staging of construction efforts and maintaining access to private property. • Impacted owners to be notified of construction staging and detours prior to the start of construction. • Site access may be restricted in the construction specifications.	Construction Monitoring	Insignificant
	Level of Service	• Delay to traffic due to construction activity on roadways could impact LOS. • Construction phasing may impact LOS at arterial intersections. Higher volume of vehicles at some intersections in the interim until full roadway network is complete.	• Contractor to prepare Traffic Management Plan in accordance with City and Provincial guidelines. Police assistance at intersections when required. Peak period restrictions on construction will be required on arterial roads and at critical intersections. • Interim intersection modifications may be required.	• Construction monitoring • Transportation Impact Studies in support of Plan of Subdivision Applications to review and identify interim roadway capacity requirements.	Insignificant
	Capacity	• Delay to traffic due to construction activity on roadways could impact LOS. • Construction phasing may impact LOS at arterial intersections. Higher volume of vehicles at some intersections in the interim until full roadway network is complete. • Delay due to congestion will also impact transit on-time performance.	• Contractor to prepare Traffic Management Plan in accordance with City and Provincial guidelines. Police assistance at intersections when required. Peak period restrictions on construction will be required on arterial roads and at critical intersections. • Ensure phasing allows for good collector road/arterial road connectivity. Interim intersection modifications may be required. • Temporary detours of transit routes may be considered where appropriate.	• Construction monitoring • Transportation Impact Studies in support of Plan of Subdivision Applications to review and identify interim roadway capacity requirements. • Coordination with the City of Ottawa/OC Transpo.	Insignificant
	Operation	• The overall efficiency of the transportation network could be impacted by delays due to construction activity.	• Contractor to prepare Traffic Management Plan in accordance with City and Provincial guidelines. Police assistance at intersections when required. Peak period restrictions on construction will be required on arterial roads and at critical intersections.	• Construction monitoring • Consultation with City of Ottawa for work impacting adjacent arterial roadways or transit service.	Insignificant

11. CONCLUSIONS AND RECOMMENDATIONS

The main findings and conclusions of this Master Transportation Study report are summarized as follows:

- **A Preferred Development Plan including new collector roads, pathways and potential transit routes has been developed for the MBESA.**
- **The proposed pathway network includes sidewalks along both sides of all collector roads and sidewalks along one side of many of the local streets. The plan also proposes a network of off-road pathways to connect the many parks, public open spaces and natural features, including McKinnons Creek.**
- **Cycle tracks are proposed along both sides of the New Collector Road, Wall Road and portions of Gerry Lalonde Drive and will be the primary routes for cyclists through the community. Connections to future planned cycling facilities along Mer Bleue Road and Tenth Line Road will also be provided.**
- **Transit service will be provided along the proposed network of collector roads. This service will be implemented through the modification of existing routes or the introduction of new routes, as required. The details of the implementation of transit service to the MBESA will be dependent on the phasing of development and will be coordinated with OC Transpo at the Plan of Subdivision stage for each phase. During the early phases of development, the provision of transit service will be encouraged through the creation of Early Service Agreements between the developers and the City of Ottawa/OC Transpo.**
- **At full build-out by 2031, it is estimated that the proposed development will generate 1,790 total new auto vehicle trips during the weekday morning peak hour and 2,028 new trips during the afternoon peak hour.**
- **Screenline analysis indicates that there will be sufficient capacity at the Bilberry Creek (SL45), Frank Kenny (SL46) and Innes Road (SL47) screenlines to accommodate future background traffic growth plus the traffic generated by the MBESA during the weekday morning peak hour.**
- **Based on the analysis conducted in this study, widening of Brian Coburn Boulevard to four lanes from west of Mer Bleue Road to east of Tenth Line Road will be required by 2025 to support the projected background traffic growth in the study area. This traffic growth is generated primarily from the adjacent development areas but is also due to traffic that is expected to divert to the corridor when the extension between Mer Bleue Road and Navan Road is completed. The widening of Brian Coburn Boulevard is not included in the City's Transportation Master Plan as part of the 2031 Netowrk Concept or the 2031 Affordable Network. The TMP acknowdledges that Brian Coburn Boulevard will ultimately be a four-lane arterial roadway at a time post-2031. Given the potential capacity constraints identified in this study, it is recommended that the timing of the widening of Brian Coburn Boulevard to four lanes be further reviewed**

when the next update to the TMP is undertaken.It should be noted that the background traffic projections in this study have been based on the anticipated timing of the various developments in the surrounding area established in previous studies, which represents a very aggressive rate of development. The actual rate of development, which will be dependent on local market conditions and the individual development schedules of the various landowners, may be slower than assumed in the study.

- **In addition to the widening of Brian Coburn Boulevard, the following modifications to the adjacent road network have been identified as being required by 2025 to accommodate future background traffic:**
  - **Mer Bleue Road/Brian Coburn Boulevard Roundabout: Auxiliary right-turn lanes on each approach**
  - **Tenth Line Road/Brian Coburn Boulevard: Double left-turn lanes on each approach and auxiliary right-turn lanes on the southbound and eastbound approaches.**
  - **Mer Bleue Road/ Renaud Road: traffic signals and auxiliary turning lanes**
  - **Mer Bleue Road/Navan Road: traffic signals**
- **It has been assumed that the existing intersection of Tenth Line Road and Harvest Valley Avenue and the future intersection of Tenth Line Road and Avalon South will require signalization as part of the scheduled widening of Tenth Line Road between 2020 and 2025.**
- **New intersections and modifications to existing intersections will be required to support the MBESA. The timing of the following projects will be coordinated with the phasing of the development:**
  - **New Collector Road: two-lane collector road (24 m ROW) from Mer Bleue Road to the southern urban boundary limit**
  - **Realigned Wall Road: two-lane collector road (24 m ROW) from Tenth Line Road to Mer Bleue Road**
  - **Gerry Lalonde Drive Extension: two-lane collector road from the north limit of the MBESA to the New Collector Road**
  - **Zone 6 Collector Road: two-lane collector road (24 m ROW) between the New Collector Road and Tenth Line Road**
  - **Mer Bleue Road/New Collector Road: new intersection—unsignalized initially; traffic signals required by 2031.**
  - **Mer Bleue Road/Realigned Wall Road: new stop-controlled intersection**
  - **Tenth Line Road/Wall Road: conversion to All-Way Stop Control**
  - **Tenth Line Road/Zone 6: new stop-controlled intersection**

- **Tenth Line Road/Zone 3 (N)/Harvest Valley Avenue: Addition of the west leg—Zone 3 (N)—to existing Tenth Line Road/Harvest Valley Avenue intersection.**
- **Tenth Line Road/Zone 3 (S)/Avalon South: New intersection with Tenth Line Road/Avalon South.**

- **Further details of the requirements at the new intersections identified in this Master Transportation Study will be determined as part of future Transportation Impact Studies to be prepared at the Plan of Subdivision stage.**

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