Ontario

HIGHWAY 417 BRONSON AVENUE INTERCHANGE OPERATIONAL IMPROVEMENTS, DETAIL DESIGN

W.P. 4089-07-01

City of Ottawa

CLASS ENVIRONMENTAL ASSESSMENT FOR PROVINCIAL TRANSPORTATION FACILITIES (2000) GROUP 'B' PROJECT

MINISTRY OF TRANSPORTATION EASTERN REGION

DESIGN AND CONSTRUCTION REPORT

October 2020

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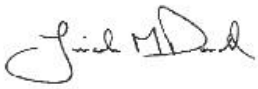

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Project Manager
WSP

THE PUBLIC RECORD

An electronic version of this document is available for review on the project website at https://queenswayexpansioneast.com/highway-417-bronson-avenue-interchange-operational-improvements.

In order to keep the economy running, and to ensure the safety of the public, MTO will be posting all Transportation Environmental Study Reports (TESR) and Design Construction Reports (DCRs) online only for public review during this time. Normally we identify locations where hard copies are made available for public review, but given the current situation we will not be directing the public to such locations.

Information will be collected in accordance with the *Freedom of Information and Protection of Privacy Act* (FOIPPA). With the exception of personal information, all comments will be part of the public record. If you have accessibility requirements in order to participate in this project, please contact one of the Project Team members listed on page 6 of this document.

Ce document hautement spécialisé n'est disponible qu'en anglais en vertu du règlement 671/92, qui en exempte l'application de la Loi sur les services en français. Pour de l'aide en français, veuillez composer le 416-585-6310.

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GLOSSARY

ANSI	AREA OF NATURAL OR SCIENTIFIC INTEREST
ATMS	ADVANCED TRAFFIC MANAGEMENT SYSTEMS
CA	CONTRACT ADMINISTRATOR
MTO CLASS EA	MINISTRY OF TRANSPORTATION'S CLASS ENVIRONMENTAL ASSESSMENT OR PROVINCIAL TRANSPORTATION FACILITIES (1999, AS AMENDED 2000)
DCR	DESIGN AND CONSTRUCTION REPORT
EA	ENVIRONMENTAL ASSESSMENT
ERD	ENVIRONMENTAL REFERENCE FOR HIGHWAY DESIGN
GWP	GROUP WORK PROJECT
MTO	ONTARIO MINISTRY OF TRANSPORTATION
NSP	NON-STANDARD SPECIAL PROVISION
OPP	ONTARIO PROVINCIAL POLICE
OPSS	ONTARIO PROVINCIAL STANDARD SPECIFICATIONS
PIC	PUBLIC INFORMATION CENTRE

ROW	RIGHT-OF-WAY
SP	STANDARD PROVISION
TESR	TRANSPORTATION ENVIRONMENTAL STUDY REPORT
TLI	TEMPORARY LIMITED INTEREST
WP	WORK PROJECT

Note:

N/S-W Ramp:	Highway 417 westbound on-ramp
N/S-E Ramp:	Highway 417 eastbound on-ramp
E-N/S Ramp:	Highway 417 westbound off-ramp
W-N/S Ramp:	Highway 417 eastbound off-ramp

1 OVERVIEW OF THE UNDERTAKING

1.1 PROJECT SUMMARY

1.1.1 INTRODUCTION

The Ministry of Transportation (MTO) has retained WSP (previously MMM Group) to complete the detail design for the operational improvements to the Highway 417 Bronson Avenue Interchange (WP 4089-07-01). The project limits are illustrated in **Figure 1-1** and extend along Highway 417 from Rochester Street to Percy Street.

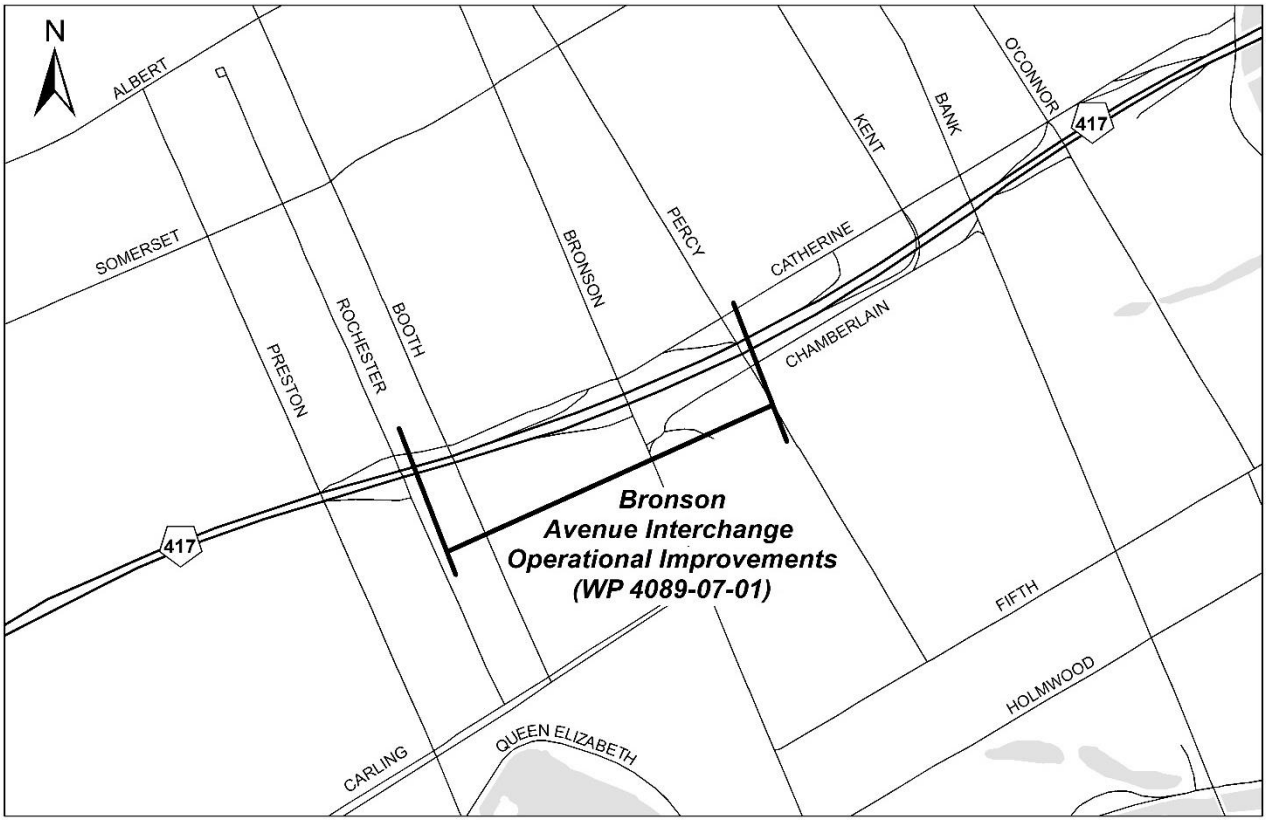

Figure 1-1: Project Limits

The improvements will be constructed and coordinated as part of the works for the Highway 417 Bridge Replacements and Operational Improvements Detail Design and Environmental Assessment Study (GWP 4173-15-00) (Highway 417 Midtown Bridges Project). The construction of the Highway 417 Midtown Bridges Project is anticipated to begin in spring 2021.

This Design and Construction Report (DCR) presents the results of the transportation engineering and environmental assessment study, in accordance with the approved environmental planning process for Group 'B' undertakings under the MTO's *Class Environmental Assessment* (Class EA) *for Provincial Transportation Facilities* (2000), with opportunity for public input throughout the project.

The purpose of this DCR is to document the existing conditions, study process, feedback received through consultation activities, the detail design, potential environmental impacts and proposed mitigation strategy for the Highway 417 Bronson Avenue Interchange Operational Improvements.

1.1.2 BACKGROUND – PRELIMINARY DESIGN STUDY

Highway 417 is the major east-west provincial transportation corridor in the Ottawa area for inter-city and local travel. Construction of Highway 417 started in the 1950s to provide a controlled-access highway to replace Highway 17. Over the years, Highway 417 has been expanded to serve growing travel demand and traffic volumes. In response to growing traffic volumes in the City of Ottawa, MTO initiated a comprehensive operational review of Highway 417 (Ottawa Queensway) from west of Highway 416 easterly to Anderson Road in 2002 (GWP 663-93-00). This study evaluated opportunities to optimize the use of the existing facility, while providing for the efficient movement of people and goods and reducing traffic congestion. It examined existing and future problems and opportunities and provided a Recommended Plan to guide the evolution of the Queensway over the next 20 years. The study examined the mainline, as well as all interchanges and crossing roadways within the study limits. This Preliminary Design and Environmental Assessment Study was carried out in accordance with the approved environmental planning process for Group 'B' projects under the MTO Class EA. The preliminary design was documented in a Transportation Environmental Study Report (TESR) which received environmental clearance in August 2008.

This study identified various concerns within the study area, including:

- Insufficient capacity to accommodate existing and projected travel demands for the study corridor;
- Locations on Highway 417 with higher than expected collision frequency (typically associated with recurring congestion);
- The standards used for the original construction and subsequent modifications to Highway 417 through the study area have resulted in a number of features that are considered atypical in the context of current design practice (including mainline horizontal and vertical alignment elements, ramp geometry and lane/shoulder widths); and
- The majority of the existing highway infrastructure is in need of significant rehabilitation and/or replacement over the planning horizon (the next 20 years) in order to maintain its functionality.

A Recommended Plan was developed to address these concerns, which included:

- Widening Highway 417 from three to four mainline lanes in each direction from Highway 416 to Carling Avenue and from Metcalfe Street to Ottawa-Road (OR) 174;
- Retaining the existing number of mainline lanes from Carling Avenue to Metcalfe Street;
- Widening Highway 417 from two to three lanes in each direction from OR 174 to east of Walkley Road;
- Retaining the basic horizontal and vertical highway geometry throughout;
- Modifying the interchanges at Richmond Road, Greenbank Road, Woodroffe Avenue, Carling Avenue, Parkdale Avenue, Bronson Avenue, Lyon Street, Nicholas Street and St. Laurent Boulevard to improve safety and traffic operations;
- Revising/enhancing the drainage system to accommodate the proposed widening;
- Rehabilitating pavement, bridges and the illumination system as required;
- Upgrading the existing Advance Traffic Management System including additional pavement loop detectors, cameras, changeable message signs and queue end warning devices;
- Upgrading the noise walls to current standards; and
- Replacing/enhancing landscaping.

1.1.3 PRELIMINARY DESIGN ALTERNATIVES FOR THE HIGHWAY 417 BRONSON INTERCHANGE IMPROVEMENTS

During preliminary design, various alternatives were considered to address the queuing of existing traffic onto the Highway 417 eastbound mainline lanes during peak periods at the Bronson Avenue off-ramp. The queuing is exacerbated by the existing jog located at the ramp terminal intersection for traffic exiting Highway 417 at Bronson Avenue and continuing easterly along Chamberlain Avenue via the Imperial Avenue / Chamberlain Avenue intersection.

Alternatives that were considered during preliminary design included:

- Lengthening the deceleration lane of the Bronson Avenue eastbound off-ramp:
- Widening the ramp to three lanes in the vicinity of the ramp terminal intersection and realigning Chamberlain Avenue to intersect Bronson Avenue at the ramp terminal intersection;
- Signalization of the eastbound off-ramp terminal and Chamberlain Avenue intersection;
- Prohibiting left turns onto Chamberlain Avenue and introducing turn restrictions at adjacent intersections, including Bronson Avenue and Powell Avenue; and
- Closing the Metcalfe Street eastbound on-ramp and relocating it to Bank Street.

The preferred alternative approved through the preliminary design and EA study that was carried forward for implementation through this detail design study includes the extension of the Bronson Avenue eastbound off-ramp deceleration lane on Highway 417 and realignment of Chamberlain Avenue approximately 70 m north to intersect with Bronson Avenue in order to eliminate the existing jog.

1.1.4 DETAIL DESIGN STUDY PURPOSE & GENERAL DESCRIPTION OF THE UNDERTAKING

This detail design study was undertaken to prepare the approved preliminary design alternative for implementation, including preparation of contract drawings and tender documents for the Highway 417 Bronson Avenue Interchange.

This project involves the following components:

- Modifications to the Highway 417 eastbound off-ramp at Bronson Avenue to lengthen the ramp and provide additional vehicle storage, including widening of the Booth Street and Rochester Street Highway 417 overpass structures (as explained further in Section 1.1.5, the widening of these bridges will be implemented through rapid replacement of the structures as recommended through the Highway 417 Midtown Bridges Project);
- Modifications to the eastbound off-ramp where it intersects with Bronson Avenue;
- Local realignment of Chamberlain Avenue to the north, to align with the Bronson Avenue eastbound off-ramp terminal;
- Construction of related works including: retaining walls, roadside protection, utility relocations, noise barrier, illumination and traffic signal modifications; and
- Coordination of the construction with the Highway 417 Midtown Bridges Project.

During construction it is anticipated that the following temporary impacts to traffic will be required:

- Continuous, long-term lane reductions on Highway 417 eastbound for the duration of construction;
- Short-term lane reductions on Bronson Avenue and Chamberlain Avenue to tie in the new construction; and
- Full closure of the Highway 417 eastbound off-ramp for a full construction season.

A more comprehensive description of the Recommended Plan is provided in Chapter 3.0 of this report.

1.1.5 COORDINATION WITH HIGHWAY 417 MIDTOWN BRIDGES PROJECT

Preliminary Design

In 2016, MTO completed a Preliminary Design and EA study for the rehabilitation or replacement of the Highway 417 Midtown Bridges (GWP 4075-11-00) (Ottawa Queensway Midtown Bridges Study), to define a bridge management plan for 23 bridges (12 sites) along the Ottawa Queensway from Holland Avenue to O'Connor Street.

The Ottawa Queensway Midtown Bridges Study developed recommendations for immediate, short-term and long-term planning horizons, including immediate bridge work required, and subsequent rehabilitation plans or replacement strategies for each bridge site.

The Preliminary Design and Environmental Assessment Study was carried out in accordance with the approved environmental planning process for Group 'B' projects under the MTO Class EA and was documented in a TESR which received environmental clearance in 2016 (BTE and Morrison Hershfield, 2016). Both the Booth Street and Rochester Street overpasses were recommended for replacement. As such, MTO decided to coordinate the Highway 417 Bronson Avenue Interchange Operational Improvements project with the Highway 417 Midtown Bridges Project for the completion of detail design and construction, in order to minimize impacts to the traveling public and ensure coordination of the works.

Detail Design

In 2017, the MTO initiated the Highway 417 Midtown Bridges Project Detail Design study to develop the Recommended Plan based on the approved Preliminary Design of 2008 and 2016 for the replacement of 10 bridges (five sites) on Highway 417 between Preston Street and Percy Street, as well as operational improvements on Highway 417 from west of Island Park Drive to the Kent Street Overpass.

The Highway 417 Midtown Bridges Project is being undertaken in accordance with the approved environmental planning process for Group 'B' undertakings under the MTO's *Class EA for Provincial Transportation Facilities* (2000) and will be documented in a separate DCR upon completion of the study. The DCR will be available for public review on the project website (www.highway417-midtownbridgesandimprovements.com) in late Fall 2020.

The scope of work for the Highway 417 Midtown Bridges project includes:

- Replacement of the Preston Street Overpass, Rochester Street Overpass, Booth Street Overpass, Bronson Avenue Overpass and Percy Street Overpass structures using rapid replacement construction techniques;
- Preparation of temporary enclosed construction staging areas for the bridge replacement activities, including, construction of the new bridge structures;
- Construction operations on City streets to provide the rapid replacement equipment with access from the construction staging areas to the bridge sites;
- Demolition of 458 Catherine Street (former A1 Mini Storage facility) and construction of an earth embankment across the limits of the existing retaining wall at this site;
- Replacement of existing noise barriers on Highway 417 at the following locations:
  - On the north side, from Island Park Drive to east of Parkdale Avenue;

  - On the north side, from the Rochester westbound on-ramp, east to Bronson Avenue;
  - On the south side, from Island Park Drive to west of the CPR/O-Train Overpass;
- Implementation of Queensway Context Sensitive Design recommendations related to structural design elements, noise barrier design, fencing, and landscaping, where applicable;
- Construction of related works including: tall wall median concrete barrier and drainage improvements from the CPR/O-Train Overpass to the Kent Street Overpass; retaining walls; illumination; overhead and ground-mounted signage; utility relocations; and roadside protection, as required;
- Coordination of construction activities with WP 4089-07-01 Highway 417 Bronson Avenue Interchange Operational Improvements (this project) and GWP 4057-12-00 New Noise Barrier Retrofits; and
- Traffic management for construction staging and the rapid replacement operations is being coordinated with the City of Ottawa.

More information on the Highway 417 Midtown Bridges Project is available at the project website at: www.highway417-midtownbridgesandimprovements.com**.**

1.1.6 CONSULTATION

Throughout the duration of the study, local elected representatives, Indigenous communities, external agencies, interest groups, and members of the general public were encouraged to participate through a proactive consultation plan that included notification letters, newspaper notices, a Public Information Centre (PIC), and a project website.

Comments provided throughout the study were taken into consideration during the refinement of the Recommended Plan. Specific concerns included screening of the highway through landscaping and noise barriers, pedestrian safety and facilities along Bronson Avenue and Chamberlain Avenue, the speed and volume of traffic along Chamberlain Avenue, and the configuration of the turning lanes at the Bronson / Chamberlain and Chamberlain / Imperial intersections. A more comprehensive discussion of comments received is described in Chapter 2.0 of this report.

1.1.7 ENVIRONMENTAL ASSESSMENT PROCESS

The Ministry of Transportation's *Class Environmental Assessment* (MTO Class EA) *for Provincial Transportation Facilities* was approved under the *Ontario Environmental Assessment Act* (OEAA) in fall 1999 and was amended in 2000. This planning document defines groups of projects and activities and the environmental assessment process that MTO has committed to follow for these undertakings. Provided that this process is followed, projects and activities included under the MTO Class EA do not require formal review or approval under the OEAA. There is an opportunity at any time during the MTO Class EA process for interested persons to provide comments and review outstanding issues.

The MTO Class EA process is principle-based. Where appropriate, this DCR references the principles applied and how they were achieved during the environmental assessment process.

The following principles underlie the MTO Class EA process:

- Transportation engineering principles;
- Environmental protection principles;
- External consultation principles;
- Evaluation principles that are intended to achieve the best overall balance of these principles;
- Documentation principles;

- 'Bump-up' principles; and
- Environmental clearance principles to proceed.

As part of the Preliminary Design and Environmental Assessment Study, a Transportation Environmental Study Report (TESR) entitled *Highway 417 (Ottawa Queensway) from Highway 416 Easterly to Anderson Road Preliminary Design Study and Environmental Assessment (GWP 663-93-00)* was prepared and filed for review. The TESR described the recommended improvements on Highway 417, anticipated environmental effects and proposed mitigation measures, and was filed for a 30-day public review period to provide interested stakeholders with an opportunity to review and comment on the report. During the 30-day public review of the TESR, 9 'bump-up' requests (i.e. Part II Order requests) were made for this project. MTO undertook additional consultation with bump-up requestors in order to address outstanding concerns; however, agreements with requestors were not achieved. The Minister of the Environment denied the bump-up requests through correspondence issued to each requestor on August 1, 2008. In response to a bump-up request which raised specific concerns pertaining to the recommended modifications to the eastbound off-ramp at Bronson Avenue, the Minister and the MTO committed to the implementation of additional design measures to address these concerns, to be carried out in the detail design phase. The design commitments made in response to the bump-up request are discussed in further detail in **Section 3.1** of this report.

This detail design study is being carried out in accordance with the approved planning process for Group 'B' projects (**Figure 1-2**). Following the 30-day public review of this DCR, the project will have met the requirements of the MTO Class EA and can proceed to construction.

1.1.8 PURPOSE OF THE DESIGN AND CONSTRUCTION REPORT

This DCR has been prepared in accordance with the requirements of the approved environmental planning process for Group 'B' undertakings under the MTO Class EA. The DCR is intended to document the following:

- Transportation engineering and environmental issues and their impact on the EA process;
- Changes in existing environmental conditions from those documented in preliminary design;
- Environmental concerns and commitments;
- Anticipated environmental impacts and commitments to mitigation measures to be included in the contract documents;
- Description of the detail design consultation program;
- Identification of all project approvals, licenses and permits that have been or must be obtained prior to construction;
- Implementation of the commitments to further work contained in the TESR (2008), including any environmental effects monitoring that is required; and
- Construction documentation, as required.

As outlined above, approval of the DCR marks the final task in the detail design portion of the EA process. The "Notice of Submission" has been published concurrent with the filing of this DCR for a 30-day public review period, and identified the start and end dates for the DCR review period are on the project website.

The Project Team is available to discuss information provided within this report. Project-related inquiries can be directed to the Project Team as follows:

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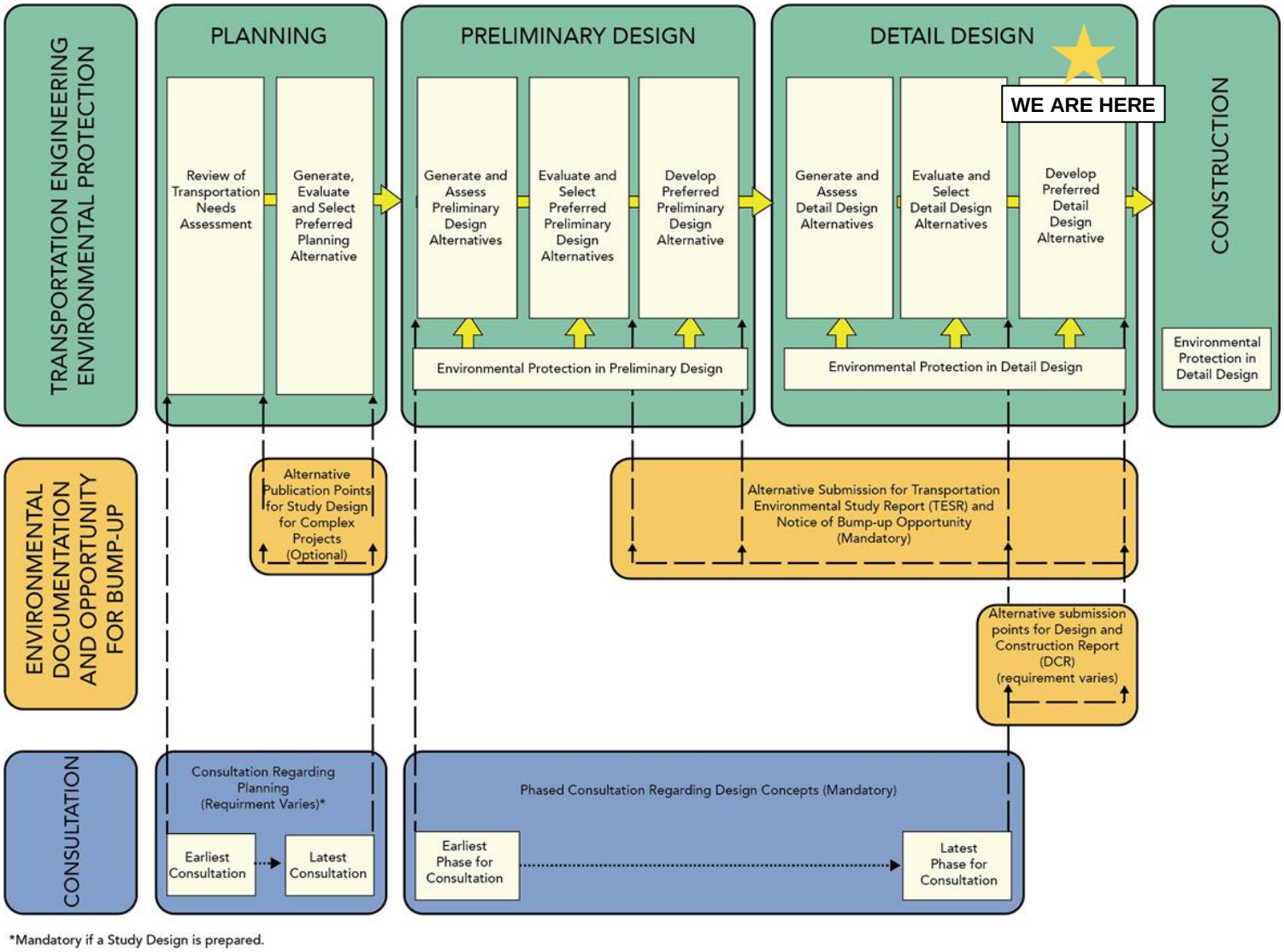

Figure 1-2: Overview of Class EA Process for Group 'B' Projects
(Excerpt from the *Class Environmental Assessment for Provincial Transportation Facilities* [2000])

2 CONSULTATION PROCESS

Consistent with the requirements for Group 'B' projects under the MTO Class EA, consultation with federal, provincial and municipal agencies, Indigenous communities, local elected representatives, interest groups, and members of the public was on-going throughout all stages of the project.

2.1 CONSULTATION DURING PRELIMINARY DESIGN

Consultation during the Preliminary Design and Environmental Assessment Study phase (2002-2008) consisted of the following:

- Ontario Government Notices advertising study commencement and three rounds of Public Information Centres (PICs);
- Direct letter mailings;
- Preparation of a Study Design Report outlining how the study would be carried out;
- On-going maintenance of the external agency and public mailing list developed during Preliminary Design;
- Meetings with Municipal Technical Advisory and Public Advisory Committees (MTAC and PAC, respectively) to facilitate identification of concerns and evaluation of alternatives;
- Presentations to the City of Ottawa Transportation Committee;
- Three PICs as follows:
    - Public Information Centre #1, held on January 21, 22, 23, and 30, 2003, to review preliminary drawings, present preliminary background inventory work, the proposed evaluation techniques, and to seek input on the Study Design Report and the overall perceived needs within the study area;
    - Public Information Centre #2, held on Jun 21, 22 and 23, 2004, to present and seek public comments on the alternatives and the technically preferred alternatives as identified by the study team;
    - Public Information Centre #3, held on June 20, 21 and 22, 2005, to present and seek public comments on the Recommended Plan as presented at a preliminary design level of detail;
- A notice announcing submission of the Transportation Environmental Study Report (TESR) for public review and comment.

Throughout the duration of the study, members of the public, interest groups, and external agencies were encouraged to participate. This proactive approach provided an opportunity for all interested stakeholders to comment both on the process and the study findings.

2.2 EXTERNAL AGENCY CONSULTATION DURING DETAIL DESIGN

A comprehensive Consultation Plan was developed at the start of the detail design study in August 2012, which placed emphasis on consultation with the stakeholders and members of the public that have the potential to be most directly affected by the project. The Consultation Plan was designed to involve stakeholders and the public early and throughout the study, identify public concerns and assist in the refinement of the Recommended Plan.

Stakeholders and the public were kept informed of the study and were asked for input using conventional, effective consultation methods including:

- Ontario Government Notices published in local newspapers;

- Notification letters/emails to local elected representatives, Indigenous communities, external agency representatives, interest groups, and members of the public;
- Correspondence and meetings with a Technical Advisory Committee and other stakeholders, including Community Associations;
- A PIC;
- Project website updates; and
- Filing of this DCR for a 30-day public review period.

An Indigenous Consultation Plan was also developed for detail design. All consultation with Indigenous communities was carried out in conformance with the Provincial Environmental Planning Office Info-bulletin: *Consultation with Aboriginal Peoples, Interim Direction* (December 2009).

2.2.1 CONSULTATION WITH LOCAL ELECTED REPRESENTATIVES

On January 11, 2013, letters were sent to local elected representatives to announce the commencement of the detail design for the Highway 417 Bronson Avenue Interchange Operational Improvements project. These letters included summaries of the project components and the study process. A copy of the Study Commencement letter sent to local elected representatives is provided in **Appendix A**.

On March 19, 2013, letters were sent to local elected representatives inviting them to attend the PIC held on April 3, 2013 (see **Appendix B**) (see **Section 2.3.4** for more details on the PIC).

On October 26, 2020, letters were sent to local elected representatives announcing the submission of the DCR for a 30-day public review period, and identified the start and end dates for the DCR review period on the project website. A copy of the Notice of Submission letter sent to local elected representatives is provided in **Appendix A**.

The following local elected representatives were contacted through these letters:

- City of Ottawa Chair of Transportation Committee of Council
- City of Ottawa Mayor
- City of Ottawa Councillor – Somerset (Ward 14)
- City of Ottawa Councillor – Kitchissippi (Ward 15)
- City of Ottawa Councillor – Capital (Ward 17)
- MP – Ottawa Centre
- MPP – Ottawa Centre

2.2.2 CONSULTATION WITH INDIGENOUS COMMUNITIES

On January 11, 2013, letters were sent to Indigenous communities announcing the commencement of detail design. These letters included summaries of the project components, the study process, and information regarding potential cultural and environmental impacts. A copy of the Study Commencement letter sent to Indigenous communities is provided in **Appendix A**.

On March 19, 2013, letters were sent to Indigenous communities inviting them to attend the PIC, which was held on April 3, 2013 (see **Appendix B**).

On October 26, 2020, letters were sent to Indigenous communities announcing the submission of the DCR for a 30-day public review period, and identified the start and end dates for the DCR review period on the

project website. A copy of the Notice of Submission letter sent to Indigenous communities is provided in **Appendix A**.

The following Indigenous Communities were contacted:

- Algonquins Consultation Office
- Algonquins of Pikwakanagan
- Métis Nation of Ontario Consultation Unit

2.2.3 CONSULTATION WITH EXTERNAL AGENCIES

On January 18, 2013 letters were also sent to external agency representatives from provincial ministries, federal agencies, the City of Ottawa, utilities, and interest groups to announce the commencement of the detail design for the Highway 417 Bronson Avenue Interchange Operational Improvements project. An Agency Comment Form was enclosed to give external agencies the opportunity to express any concerns or interests regarding the project and submit any additional comments including any required permits or approvals. Copies of the Study Commencement letter and Agency Comment Form sent to external agencies are provided in **Appendix A**.

On March 21, 2013, letters were sent to external agency representatives inviting them to attend the PIC, which was held on April 3, 2013 (see **Appendix B**).

On October 26, 2020, letters were sent to external agency representatives to announce the submission of the DCR for a 30-day public review period, and identified the start and end dates for the DCR review period on the project website. A copy of the Notice of Submission letter sent to external agency representatives is provided in **Appendix A**.

The following external agencies were contacted:

<u>Federal Agencies</u>

- Indigenous Affairs and Northern Development Canada
- National Capital Commission

<u>Provincial Ministries/Agencies</u>

- Ministry of Indigenous Affairs
- Ministry of Community and Social Services
- Ministry of Economic Development and Trade
- Ministry of the Environment and Climate Change
- Ministry of Health and Long-Term Care
- Ministry of Natural Resources and Forestry
- Ministry of Heritage, Sport, Tourism and Culture Industries
- Rideau Valley Conservation Authority
- Ontario East Economic Development Commission

<u>Municipalities and Local Agencies</u>

- City of Ottawa – Distribution
- City of Ottawa – Environmental Engineering
- City of Ottawa – Infrastructure Assessment – Water Resources Assets

- City of Ottawa – Infrastructure Projects
- City of Ottawa – Licensing, Permits & Markets
- City of Ottawa – Right of Way Information and Approvals
- City of Ottawa – Road Renewal
- City of Ottawa – Signal Design and Installation
- City of Ottawa – Sustainable Transportation
- City of Ottawa – Traffic Assessment
- City of Ottawa – Traffic Engineering
- City of Ottawa – Traffic Management
- City of Ottawa – Traffic Operations
- City of Ottawa – Traffic Safety & Mobility
- City of Ottawa – Transportation Planning
- City of Ottawa – Water Distribution
- City of Ottawa – Watermain Renewal

Emergency Services

- Ottawa Central Ambulance Communications Centre
- Ottawa Fire Services
- Ottawa Hospital – Civic Campus
- Ottawa Police

Utilities

- Allstream
- Bell Canada
- Cogeco Inc.
- Enbridge Gas Distribution
- Hydro Ottawa Limited
- Rogers
- Sprint Canada
- Telus Corporation

School Boards

- Ottawa-Carleton District School Board

2.2.4 TECHNICAL ADVISORY COMMITTEE

A Technical Advisory Committee (TAC) was formed to identify and resolve technical issues throughout the detail design process. To facilitate this coordination, a TAC contact list was developed and included representatives from the City of Ottawa and the National Capital Commission. TAC members were kept informed through study notification letters and formal TAC meetings. Four TAC meetings were held for this project. The first TAC meeting was held on September 12, 2012 and the last meeting was held on January 23, 2014.

In general, technical aspects of the Queensway Expansion projects from Parkdale Avenue to Ottawa Road 174 were discussed during the TAC meetings, including: potential utility conflicts (including the need for protection and/or relocation of utilities within the corridor); construction, traffic and pedestrian staging during

the projects; temporary/permanent signage; illumination requirements; and the need for coordination with other projects on-going within the study area.

A TAC was also formed as part of the Highway 417 Midtown Bridges Project in 2017. Five TAC meetings have been held over the course of the project as of the writing of this report. The first TAC meeting was held on May 26, 2017 and the fifth meeting was held on December 19, 2019. Discussions during these meetings regarding the Highway 417 Bronson Avenue Interchange Operational Improvements project included summarizing the scope of work to be completed, including how the interchange operational improvements will be included in the construction contract for the Highway 417 Midtown Bridges Project. Discussions were also held around coordinating City planned work on Bronson Avenue.

2.2.5 CITY OF OTTAWA

A meeting was held on May 16, 2013 between the MTO, City of Ottawa staff and the Consultant project team to review the recommended plan presented at the PIC and discuss community concerns, including those presented at a meeting on April 17, 2013 between Councillor David Chernushenko, City of Ottawa staff, members of the Glebe Community Association and Glebe Annex Community Association. Specific concerns were addressed through refinements to the detail design, as described in more detail in **Section 3.2** of this report.

Ongoing discussions were held with the City of Ottawa since 2013, including participating in the City of Ottawa's Core Team for their Chamberlain Avenue, Catherine Street and Isabella Street Functional Design Study. Core Team meetings included discussions on how to improve the environment for all road uses including pedestrians, cyclist and transit users while maintaining acceptable vehicular traffic operations in the busy corridor. The recommendations from the Functional Design Study were integrated into the final design of Chamberlain Avenue, where appropriate, to help improve pedestrian and cycle movement along the roadway. It should be noted that one of the key recommendations from the Functional Design Study is the addition of a multi-use pathway (MUP) on the south side of Chamberlain Avenue. While this MUP has not been incorporated as part of the design of the Highway 417 Bronson Avenue Interchange Operational Improvements, the realignment of Chamberlain Avenue does not preclude the addition of the MUP, should the City decide to pursue this in the future.

2.2.6 COMMENTS RECEIVED FROM EXTERNAL AGENCIES

Table 2-1 provides a summary of comments received from external agencies in response to study notifications. Comments received from external agencies are provided in **Appendix C.**

Table 2-1: Summary of External Agency Comments

NO.	DATE / FORM	AGENCY	COMMENTSRECEIVED	HOW IT WAS ADDRESSED / RESPONSE SENT
STUDY COMMENCEMENT				
1	Jan. 17, 2014 / Email	City of Ottawa, Program Manager – Right of Way Info & Approvals	• Requested a list of TAC members from the City of Ottawa and inquired regarding a proposed schedule for when the work will be taking place.	• A response was sent by email on Jan. 21, 2013 and noted that the Highway 417 Bronson Ave. interchange contract is a continuation of the Highway 417 Expansion (Nicholas to OR174) project, and membership on the TAC remains unchanged. A list of TAC members was provided and it was indicated that MTO would be providing timing for the remaining projects along Highway 417.
2	Jan. 18, 2013 / Email	National Capital Commission	• Requested to remain involved with this project and expressed a continued interest in the implementation of the Highway 417 Context Sensitive Design Concept. • Provided updated contact information. • Noted urban design and public art programs on Bronson Avenue led by the City of Ottawa and encouraged contacting the responsible teams to ensure MTO work is integrated with City initiatives.	• A response was sent by email on March 11, 2013 and included the following: o Please be advised that the project design team is aware of the Highway 417 Context Sensitive Design Concept and report, and are committed to its continued implementation in the Bronson Avenue interchange project. o As per your email, we have also added Jason Hutchison to the project contact list to receive all future project notices. As a member of the TAC, Julie Mulligan was circulated the Notice of Study Commencement and will also receive all future project notices. o In addition, thank you for your suggestion that we contact the Bronson Avenue Renewal project team to coordinate the planned interchange operational improvements with City initiatives. The Notice of Study Commencement will be circulated to Bruce Kenny (Senior Engineer, Infrastructure Projects) and Melissa Black (Project Coordinator, Public Art Program), who are the City contacts listed on the project websites you provided. o A Public Information Centre (PIC) will be held in Spring 2013, at which time further details regarding the Bronson Avenue interchange project's recommended plan, construction staging, potential impacts and proposed mitigation will be presented. A letter will be sent to you by email in advance of the PIC to inform you of its date and location.
3	Jan. 18, 2013 / Email	Ottawa Fire Service	• Expressed concerns regarding firefighting access to Highway 417.	• A response was sent by email on March 11, 2013 and included the following: o Please be advised that the Highway 417 westbound on-ramp (at Bronson Avenue) and eastbound on-ramp (at Metcalfe Street) closest to

NO.	DATE / FORM	AGENCY	COMMENTSRECEIVED	HOW IT WAS ADDRESSED / RESPONSE SENT
				the Bronson Avenue interchange will not be affected during construction of the Bronson Avenue interchange improvements. ○ During temporary closures of the Bronson Avenue eastbound off-ramp, alternate access routes will be identified. Emergency vehicles will be required to exit Highway 417 at Rochester Street to access Bronson Avenue during nightly closures of the ramp. Advance signage will be provided prior to the closure. ○ This issue will be further discussed at a future meeting with the City's Traffic Incident Management Group. A Traffic Management Plan will be developed during detail design in consultation with the City of Ottawa and Emergency Services. ○ A Public Information Centre (PIC) will be held in Spring 2013, at which time further details regarding the recommended plan, construction staging, potential impacts and proposed mitigation will be presented. A letter will be sent to you in advance of the PIC to inform you of its date and location.
4	Jan. 18, 2013 / Phone	Atria	• Atria Networks have been acquired by Rogers Communication. There is no need to include Atria in contact lists for future projects.	• The contact was removed from the project contact list.
5	Jan. 22, 2013 / Email	Rogers Communication	• Rogers has minimal plant within the limitations but some coordination will be needed to perform any relocations needed.	• The comment was addressed through utilities circulation.
6	Jan. 28, 2013 / Email	City of Ottawa, Senior Project Manager – Sustainable Transportation	• Confirmed interest in participating in the TAC.	• A confirmation email was sent on Feb. 11, 2013.

NO.	DATE / FORM	AGENCY	COMMENTSRECEIVED	HOW IT WAS ADDRESSED / RESPONSE SENT
7	Dec. 12, 2012 / Letter	Ministry of Indigenous Affairs	• Contact information update provided for general contact and mark-ups.	• The contact was updated in the project contact list and a confirmation email was sent on Feb. 11, 2013.
8	Jan. 29, 2013 / Email	Ministry of Heritage, Sport, Tourism and Culture Industries	• Requested information on the archaeology and heritage work completed as part of the Preliminary Design and advise on any future reviews/investigations planned as part of Detail Design.	• See response for Comment No. 10.
9	Jan. 30, 2013 / Email	Ministry of Heritage, Sport, Tourism and Culture Industries	• MTCS has an interest in the conservation of cultural heritage resources, including archaeological resources, built heritage resources, and cultural heritage landscapes. • Requested to remain on the contact list and be kept informed of the project as it proceeds through the EA process.	• The contact was update in the project contact list and sent a confirmation email on Feb. 11, 2013.
10	Feb. 11, 2013 / Email	Ministry of Heritage, Sport, Tourism and Culture Industries	• Reiterated the request for information on the archaeology and heritage work completed as part of the Preliminary	• A response was sent by email on March 11, 2013 and included the following: ○ As part of the Preliminary Design and Environmental Assessment (EA) Study for the Highway 417 Expansion from Highway 416 easterly to Anderson Road, Stage I & II Archaeological Assessments were completed by C.R. Murphy Archaeological Consulting in August 2002 and October 2004, respectively. The Stage I archaeological assessment

NO.	DATE / FORM	AGENCY	COMMENTSRECEIVED	HOW IT WAS ADDRESSED / RESPONSE SENT
			Design and inquired about any future reviews/investigations planned as part of Detail Design.	found that the Highway 417 right-of-way corridor lies within a zone of medium to high potential for discovery of significant prehistoric or historic archaeological sites, based on proximity to several provincially significant prehistoric and historic sites that have been recorded in the Ottawa Valley. Based on this general proximity, the Stage II archaeological assessment examined the existing Highway 417 right-of-way over the project limits. These investigations found no evidence of archaeological resources within the existing right-of-way, which has been significantly disturbed. ○ As part of the current Detail Design study, a Cultural Heritage Evaluation Report (CHER) was completed in October 2012 by Unterman McPhail Associates for the Booth Street Overpass, completed in 1962. The overpass is a one-span concrete rigid frame structure that will be widened as part of the Bronson Avenue interchange improvements. The overpass structure is not included in the Ontario Heritage Bridge List and has not been identified as a Candidate Class A, B, or C structure in the Heritage Bridges Identification and Assessment Guide 1945-1965, Ontario. The City of Ottawa has not identified the overpass structure as having cultural heritage value. ○ The cultural heritage evaluation of the Booth Street Overpass comprised a summary of the heritage attributes of the bridge and resulted in a cultural heritage value score of 32, based on the evaluation criteria of the Ontario Heritage Bridge Guidelines (January 2008). Therefore, the overpass structure does not meet the threshold of 60 points to be considered provincially important and worthy of inclusion on the Ontario Heritage Bridge List. The CHER found that the proposed widening should not adversely affect cultural heritage resources. ○ No impact on archaeological or built heritage resources is anticipated and no further assessments or investigations are planned. A Public Information Centre (PIC) will be held in Spring 2013, at which time further details regarding the Bronson Avenue interchange project's recommended plan, construction staging, potential impacts and proposed mitigation will be presented. A letter will be sent to you by email in advance of the PIC to inform you of its date and location.
11	Mar. 11, 2013 / Email	Ministry of Heritage, Sport, Tourism	• Requested a copy of the Cultural Heritage Evaluation Report	• The CHER was sent to MTCS for their record on Jan. 31, 2014.

NO.	DATE / FORM	AGENCY	COMMENTSRECEIVED	HOW IT WAS ADDRESSED / RESPONSE SENT
		and Culture Industries	(CHER) completed for the Booth Street Overpass.	
12	Mar. 22, 2013 / Email	City of Ottawa – Public Art Officer	• Managing the Public Art Project as part of the Bronson Avenue Reconstruction and does not think there would be a requirement to be involved in the MTO EA process.	• A response was not required.
PUBLIC INFORMATION CENTRE (PIC)				
13	Apr. 16, 2013 / Email	Councillor – Somerset Ward	• Concurred with the Dalhousie Community Association's comments regarding the need for attractive treed landscaping adjacent to the Queensway when any work is undertaken.	• A response was sent by email on Jan. 24, 2014 and including the following: o Please be advised that a landscape plan has been prepared for this project and includes enhanced landscaping on the north side of the eastbound off-ramp to Bronson Avenue, and along the north and south sides of the Chamberlain Avenue extension between Bronson Avenue and Percy Street, including expanded green space north of Glebe Memorial Park. o In addition, any landscaping that is disturbed during construction related to the widening of the Booth Street overpass structure will be reinstated along the slope south of the highway, approximately between Booth Street and Lebreton Street South. o As shown on the enclosed Landscape drawings, the planting plan in these areas includes a mixture of ground cover, shrub plantings, deciduous and coniferous trees, as appropriate.
14	Apr. 10, 2013 / Email	City of Ottawa, Manager of Transportation Planning, Planning & Infrastructure	• Forwarded comments from a member of the public with concerns regarding cycling and pedestrian facilities around Bronson Avenue, Chamberlain Avenue and Percy Street.	• A response was sent by email on Jan. 24, 2014 and included the following: o The MTO is aware of community concerns regarding pedestrian and cyclist safety at the Bronson Avenue interchange and along Chamberlain Avenue. In response to concerns received at the Public Information Centre (PIC) on Wednesday, April 3, 2013, the Ministry is recommending the following interchange improvements (as shown on the enclosed drawings): o The extension of Chamberlain Avenue (directly in line with the eastbound off-ramp) will be reduced to 2 lanes from the 3-lane design originally presented as part of the

NO.	DATE / FORM	AGENCY	COMMENTSRECEIVED	HOW IT WAS ADDRESSED / RESPONSE SENT
				Recommended Plan at the PIC. This will reduce the crossing distance at Percy Street. ○ The realigned portion of Chamberlain at the intersection with Imperial Avenue adjacent to Drummond's gas station will meet the 2-lane Chamberlain extension at a tighter radius and require motorists to yield and merge onto Chamberlain to proceed east. This will improve overall safety for motorists, pedestrians and cyclists. ○ Along the Chamberlain extension, oversized speed signs, enhanced landscaping, and a new sidewalk along the north side separated from the road by a 1 m wide boulevard will be implemented to reinforce a more residential character along the arterial road. ○ On the south side of the Chamberlain / Imperial intersection, improvements for pedestrians include a new sidewalk that will be reconfigured to tie into the existing sidewalk, and will be offset from Chamberlain by a distance varying from 0-25 metres. The buffer created by this realignment will be developed with enhanced landscaping. Fencing will be installed adjacent to the road on the south side, from the Chamberlain / Imperial intersection to west of Percy Street. ○ Please be aware that <<*name redacted*>> will receive a direct response to the specific concerns he submitted for MTO consideration at the PIC.
15	Apr. 18, 2013 / Email	City of Ottawa – Manager of Traffic Services	• Met with Councillor and residents to discuss proposed configuration of the Bronson Avenue off-ramp and new connection with Chamberlain. • Major issues included: ○ The continued need to allow traffic to turn right from Bronson to	• A meeting was held with MTO, City staff and MMM Group on May 16, 2013 to review the design and discuss community concerns.

NO.	DATE / FORM	AGENCY	COMMENTSRECEIVED	HOW IT WAS ADDRESSED / RESPONSE SENT
			Chamberlain at existing location – they would like to see the right turn happen at the new intersection at the off-ramp ○ To design the connection from the existing Chamberlain to the new Chamberlain so that it is not free flow. They would prefer to see a more right angle type connection ○ To reduce Chamberlain to 2 lanes from three that are currently proposed east of where the 2 roads meet (old chamberlain and extension of 417 ramp) • Noted to the community that the City will need to work with MTO on the review of the design and consideration of these issues and to undertake a traffic analysis.	

NO.	DATE / FORM	AGENCY	COMMENTSRECEIVED	HOW IT WAS ADDRESSED / RESPONSE SENT
16	July 24, 2013 / Email & Phone	City of Ottawa – Senior Project Manager, Bronson Avenue Reconstruction, Infrastructure Services Dept.	• Inquired as to the status of the Highway 417 / Bronson Avenue detail design, construction dates, and contact information.	• A response was provided by phone on July 24, 2013. The response included the following: o Following the PIC, MTO has participated in meetings with the City of Ottawa and community associations in the vicinity of Bronson Avenue. The detail design is still in progress. Changes to the recommended plan presented at the PIC include the reduction of the EB off-ramp extension / Chamberlain from 3 lanes to 2 lanes, with traffic from Chamberlain/Imperial yielding into the 2 lanes. o The detail design will be completed in Fall 2013, and provincial funding has not yet been allocated. As such, construction dates for the project have not been determined. • Contact information was provided for MMM Group Project Manager for further information on the detail design.

2.3 PUBLIC INVOLVEMENT DURING DETAIL DESIGN

2.3.1 PROJECT WEBSITE

A project website was created to provide project information, updates and documents to interested stakeholders. The project website is available at **www.queenswayexpansioneast.com/highway-417-bronson-avenue-interchange-operational-improvements**.

The website includes information on the project background, study area, study process, public involvement, and the project schedule.

The newspaper notices announcing Study Commencement and the PIC are provided on the website, as well the PIC display boards. The newspaper notice announcing submission of the DCR for a 30-day review period has also been provided on the website.

2.3.2 LETTER NOTIFICATIONS

A project contact list was developed based on a review of members of the public, including local community associations and interest groups, who previously expressed an interest in the project during preliminary design and who live/work in the general vicinity of the project. The following interest groups were included in the contact list:

- Dalhousie Community Association
- Glebe Community Association

On January 18, 2013 letters/emails were sent to members of the public to announce the commencement of the detail design project. These letters included a summary of the project components as well as a summary of the study process. A copy of the Study Commencement letter sent to members of the public is provided in **Appendix A**.

On March 21, 2013, letters/emails were sent to members of the public inviting them to attend the Public Information Centre (PIC), which was held on April 3, 2013. These letters included information on the date, location and timing of the PIC. A copy of the PIC invitation letters to members of the public is provided in **Appendix B**.

On October 26, 2020, letters were sent to members of the public to announce the submission of the DCR for a 30-day public review period, and identified the start and end dates for the DCR review period on the project website. A copy of the Notice of Submission letter sent to external agency representatives is provided in **Appendix A**.

2.3.3 NEWSPAPER NOTIFICATIONS

In order to ensure public awareness of project, a notice of Study Commencement was published in the following local newspapers:

- Ottawa Citizen (English version) January 18, 2013
- Ottawa Le Droit (French version) January 18, 2013

In order to ensure general public awareness and invite anyone with an interest in the project to attend the PIC held on Wednesday, April 3, 2013, a notice was published in the following local newspapers:

- Ottawa Citizen (English version) March 21, 2013
- Ottawa Le Droit (French version) March 21, 2013

In order to ensure general public awareness and inform anyone with an interest in the project where the DCR may be reviewed, a notice of Submission of the DCR was published in the following local newspapers:

- Ottawa Citizen (English version) October 29, 2020
- Ottawa Le Droit (French version) October 29, 2020

Copies of the French and English notices advertising Study Commencement, the PIC, and filing of the DCR for a 30-day public review period are provided in **Appendix A and B**.

2.3.4 PUBLIC INFORMATION CENTRE

A PIC was held on April 3, 2013 to provide external agencies, interest groups, business representatives and members of the general public with an opportunity to review and comment on the project's proposed design, potential impacts and proposed mitigation plan. Members of the Project Team, including bilingual members, were available at the PIC to discuss the project and answer any questions.

Eighty attendees signed the PIC register at the PIC and were encouraged to complete comment sheets. Sixteen comment sheets were received at the PIC. An additional twenty-four comments were received through email, the project website, by letter, or by phone following the PIC. Comments received pertained to screening of the highway through landscaping and noise barriers, pedestrian safety and facilities along Bronson Avenue and Chamberlain Avenue, the speed and volume of traffic along Chamberlain Avenue, and the configuration of the turning lanes at the Bronson Avenue / Chamberlain Avenue and Chamberlain Avenue / Imperial Avenue intersections.

A copy of the PIC Summary Report, including copies of notification letters, PIC display materials, and comments received, is provided in **Appendix B**.

2.3.5 COMMENTS RECEIVED FROM MEMBERS OF THE PUBLIC

Fifty-two comments were received from members of the public throughout the study.

Comments received were generally related to landscape plans along Chamberlain Avenue, traffic calming measures on Bronson Avenue and Chamberlain Avenue, traffic issues, including collisions at the Bronson Avenue, Imperial Avenue, and Chamberlain Avenue intersections. A number of commenters also raised concerns with the initially proposed expansion of Chamberlain Avenue to three lanes and potential for increased speeds and safety risks.

All comments requiring a response were responded to with a letter, email or by phone, as applicable. A summary of comments received and how they were addressed are included in **Appendix C.**

3 DETAILED DESCRIPTION OF THE RECOMMENDED PLAN

3.1 PRELIMINARY DESIGN BUMP-UP REQUEST – DETAIL DESIGN COMMITMENTS

One bump-up request was received during the 30-day public review period of the TESR (2008) which raised specific concerns that the recommended modifications to the eastbound off-ramp at Bronson Avenue had not been fully developed in partnership with the City of Ottawa and in consideration of the Glebe Traffic Plan. The concerns suggested that the recommended changes will result in safety impacts, excessive speeds and higher traffic volumes on Chamberlain Avenue. The bump-up request expressed concerns that the City had not made a commitment to take measures to address the issues in the areas which fall under the City's jurisdiction.

MTO reviewed the concerns expressed in the bump-up request and advised the Minister that the changes to the eastbound off-ramp at Bronson Avenue and modifications to the intersection are recommended to address problems identified during the Preliminary Design and Environmental Assessment Study with respect to safety and traffic operations. MTO was aware of the community's concerns related to safety. In response to the bump-up request, MTO committed to implementing additional speed control measures, such as oversized speed signs and enhanced landscaping on the eastbound off-ramp at Bronson Avenue and along the realigned section of Chamberlain Avenue. A new sidewalk will be added on the north side of Chamberlain Avenue. These design commitments have been carried out and further developed in consultation with the City and local residents during the detail design process and are included in the description of the recommended plan in **Section 3.2** of this report.

3.2 MAJOR FEATURES OF THE PROPOSED WORK

The Recommended Plan for the Highway 417 Bronson Avenue interchange improvements involves the following components:

- Modifications to the Highway 417 eastbound off-ramp at Bronson Avenue to lengthen the ramp and provide additional vehicle storage, including widening of the Booth Street and Rochester Street Highway 417 overpass structures;
- Modifications to the eastbound off-ramp where it intersects with Bronson Avenue;
- Local realignment of Chamberlain Avenue to the north, to align with the Bronson Avenue eastbound off-ramp terminal;
- Construction of related works including: retaining walls, roadside protection, utility relocations, noise barrier, illumination and traffic signal modifications; and
- Coordination of the construction with the Highway 417 Midtown Bridges Project.

3.2.1 DESIGN REFINEMENTS SINCE THE PUBLIC INFORMATION CENTRE

The Recommended Plan presented at the PIC featured three lanes along Chamberlain Avenue from Chamberlain Avenue / Imperial Avenue intersection to Percy Street, and a free-flow right turning lane from Bronson Avenue onto Imperial Avenue to proceed eastbound on Chamberlain Avenue.

Following the review of comments received at and following the PIC and after additional coordination with the City of Ottawa, the following refinements were made to the Recommended Plan and are described in greater detail in the following sections:

- The realigned Chamberlain Avenue (directly in line opposite the eastbound off-ramp) has been reduced from three lanes to two lanes from Bronson Avenue to Percy Street.
- The intersection of Chamberlain Avenue and Imperial Avenue has been changed from a free-flow condition to a yield to meet the two-lane Chamberlain Avenue at a tighter radius and merge onto Chamberlain Avenue to proceed eastbound.
- The following design features will be implemented at the realigned Chamberlain Avenue: oversized speed signs; enhanced landscaping; and new sidewalks will be constructed along the north and south sides of the realigned road. The sidewalks will be separated from the road by a 1 m wide boulevard, and the north sidewalk and boulevard will continue on the north side up to the Percy Street intersection. These design features will reinforce a more residential character along the arterial road.
- A new sidewalk will be reconfigured on the south side of the Chamberlain Avenue / Imperial Avenue intersection. The reconfigured sidewalk will to tie into the existing sidewalk and will be offset from Chamberlain Avenue by a distance varying from 0-25 m.

3.2.2 EASTBOUND OFF-RAMP IMPROVEMENTS

The Highway 417 eastbound off-ramp at Bronson Avenue will be lengthened by approximately 300 m to provide increased vehicle storage on the ramp and prevent traffic from backing up onto the highway mainline, as illustrated in **Figure 3-1**. Due to spatial constraints imposed by a 1220 mm watermain, and Orangeville Street to the south, the width of the ramp shoulder is unable to be increased beyond existing conditions.

The ramp terminal intersection at Bronson Avenue will be modified to suit the changes in geometry resulting from the realignment of Chamberlain Avenue. The ramp terminal will consist of three lanes at the ramp terminal intersection. This will result in the creation of a combined left-turn / through lane, a middle through lane, and a dedicated right-turn lane at the ramp terminal intersection at Bronson Avenue.

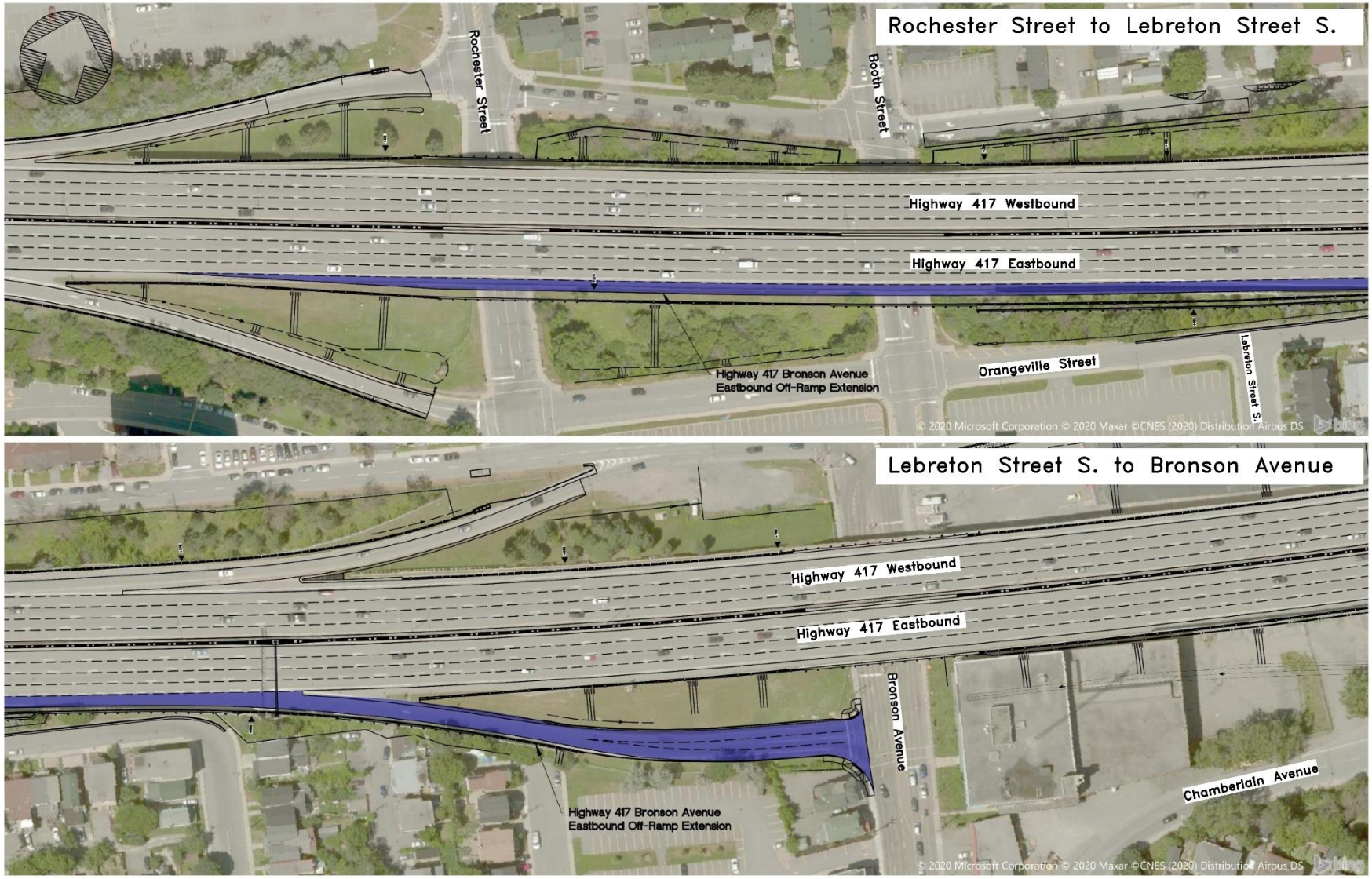

Figure 3-1: Highway 417 Eastbound Off-Ramp at Bronson Avenue

3.2.3 BOOTH STREET AND ROCHESTER STREET OVERPASSES WIDENING

The lengthening of the eastbound off-ramp at Bronson Avenue by approximately 300 m to allow for increased vehicle storage will necessitate a widening of both the Booth Street and Rochester Street overpasses by approximately 3.5 m on the south side of the structures as shown in **Figure 3-2** and **Figure 3-3**, respectively. A 1.5 m high transparent acrylic snow guard will be installed within the limits of the wingwalls and overpass structures.

While widening of these overpasses was considered at the time of the Notice of Study Commencement and PIC for this project, as noted in Section 1.1.5, the Booth Street and Rochester Street overpasses are now proposed to be replaced using rapid replacement techniques as part of the Highway 417 Midtown Bridges Project. The replacement structures will accommodate the required widening for the off-ramp.

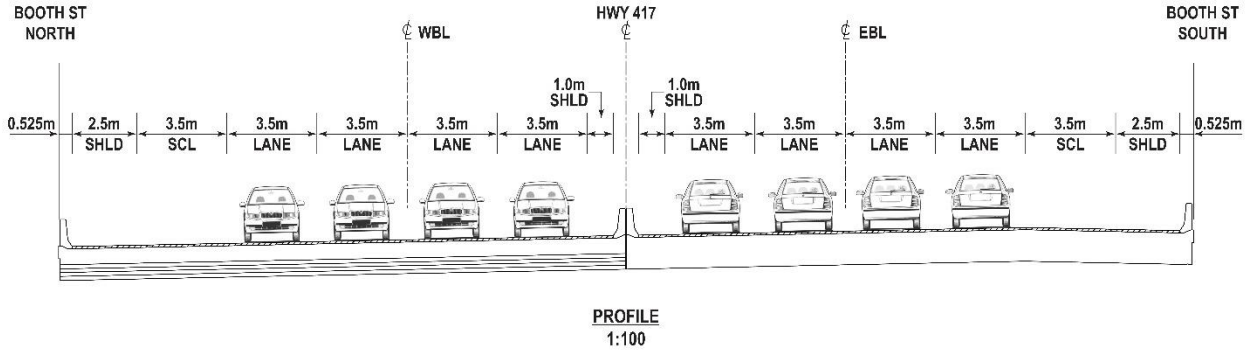

Figure 3-2: Proposed Booth Street Overpass Cross-Section

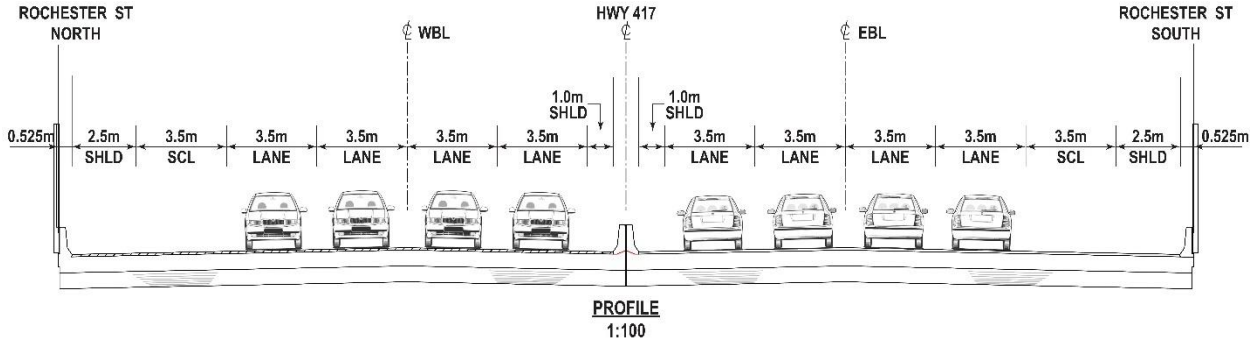

Figure 3-3: Proposed Rochester Street Overpass Cross-Section

3.2.4 CHAMBERLAIN AVENUE REALIGNMENT

Chamberlain Avenue will be realigned approximately 70 m north to align with the existing eastbound off-ramp terminal intersection at Bronson Avenue. The realignment, illustrated in **Figure 3-5**, will eliminate the existing jog which requires vehicles exiting Highway 417 to turn right and then almost immediately turn left onto Imperial Avenue to proceed eastbound along Chamberlain Avenue. A typical cross-section of Chamberlain Avenue is illustrated in **Figure 3-4**.

In response to comments received at and following the PIC regarding concerns that the Recommended Plan may result in safety issues and exacerbated speeds along Chamberlain Avenue, the realigned Chamberlain Avenue has been modified to two lanes from Bronson Avenue to Percy Street, as opposed to the three lanes originally proposed. In addition, the connecting segment of roadway from Imperial Avenue will be adjusted to meet the realigned Chamberlain Avenue at a tighter radius. This will require motorists to slow down, yield and merge onto Chamberlain Avenue, as opposed to operating as a free-flow condition as originally proposed.

On Bronson Avenue southbound, left turns onto the realigned Chamberlain Avenue at the ramp terminal intersection will be prohibited to avoid traffic wishing to turn left onto Chamberlain Avenue from queuing to the Catherine Street intersection just north of Highway 417. Motorists wishing to proceed eastbound along Chamberlain will be required to proceed southbound along Bronson Avenue, through the ramp terminal intersection, and then turn left onto Imperial Avenue to merge onto the realigned Chamberlain Avenue via the readjusted connecting segment of roadway.

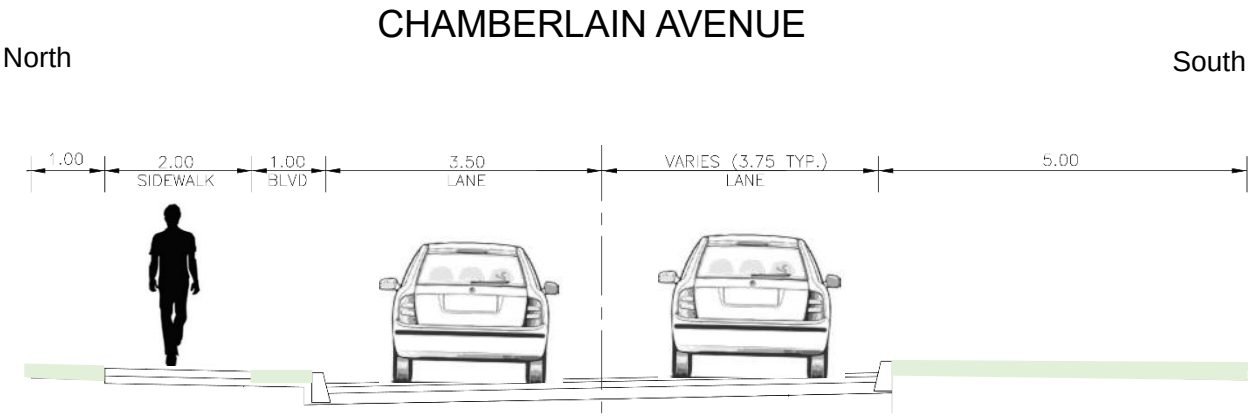

Figure 3-4: Typical Cross-Section of Chamberlain Avenue

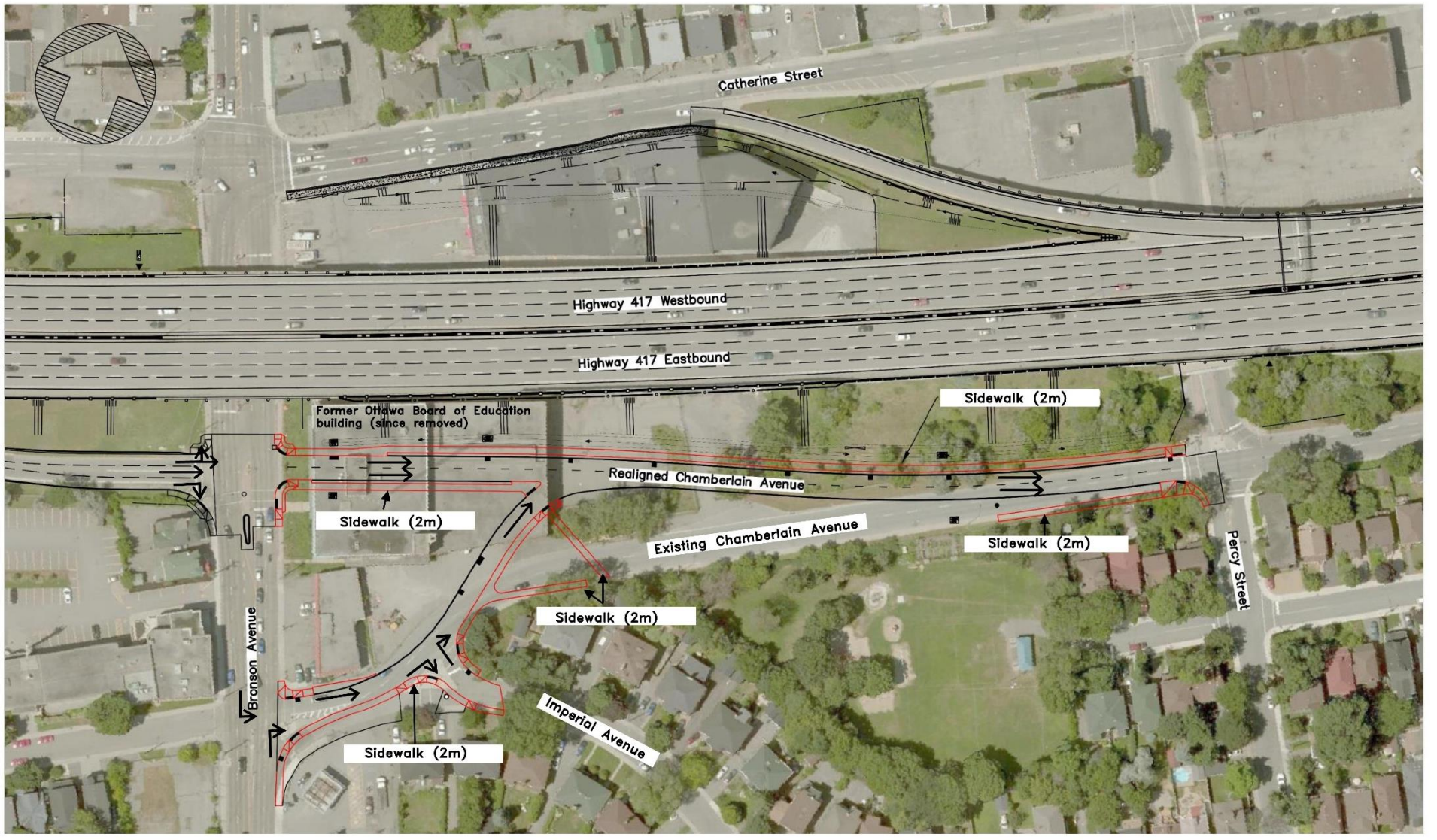

Figure 3-5: Proposed Chamberlain Avenue Realignment

3.2.5 TRAFFIC SIGNAL MODIFICATIONS

The existing traffic signal system on Bronson Avenue at the eastbound off-ramp terminal intersection will be replaced to suit changes to the geometry of the intersection and recommended roadway improvements.

3.2.6 NOISE WALLS

The existing noise barrier wall on the Bronson Avenue eastbound off-ramp shoulder, from east of the Booth Street overpass to west of the ramp terminal intersection, will be removed due to the lengthening of the ramp. A new 5 m high noise barrier wall will be constructed from east of the Booth Street overpass to west of the ramp terminal intersection.

A new 5 m high noise barrier wall will also be installed east of the Bronson Avenue overpass and will extend easterly to match the noise wall installation further to the east which is being replaced as part of the Highway 417 Midtown Bridges Project. This new noise barrier wall will be installed to provide noise attenuation for the adjacent residential area from Highway 417 noise, as a result of the demolition of the former Ottawa Board of Education building.

3.2.7 RETAINING WALLS

New retaining walls on the south side of the Booth Street and Rochester Street overpasses will be required due to the structure widenings. Due to the proximity of Orangeville Avenue, a new retaining wall will also be required between the Booth Street and Bell Street South to accommodate the widened highway embankment for the ramp extension.

The existing retaining walls along the south edge of the existing ramp at Bell Street South and Arthur Lane South will be replaced with new retaining walls and a portion of the existing retaining wall west of Bronson Avenue will be cut-off and buried in a new embankment slope.

3.2.8 DRAINAGE

The existing storm sewer system on Highway 417 consists of a median storm sewer with catchbasins on the outside connecting to the median storm sewer. A new storm sewer line and new catchbasins will be required to provide adequate drainage on the new extended off-ramp due to the additional pavement surface.

A portion of the drainage system (along the lengthened ramp) will be connected to an existing storm sewer outlet at Booth Street, while the remaining portion of the ramp drainage will be connected to the recently upgraded combined sewer on Bronson Avenue. The City of Ottawa recently completed the reconstruction of Bronson Avenue from Arlington Avenue to Imperial Avenue under City Contract CP000105.

A new drainage system will be required along the realigned Chamberlain Avenue and will connect to the existing City storm sewer systems at Bronson Avenue and Percy Street. Ditching will be provided, where necessary, to supplement the storm sewer network and provide adequate drainage.

3.2.9 UTILITIES

There are various public- and privately-owned utilities within the project area that may be impacted by construction activities, including:

- Bell Canada;
- City of Ottawa (1220 mm watermain, storm / sanitary sewers, and street lighting);
- Hydro Ottawa;
- Rogers Communications; and
- MTO Advanced Traffic Management Systems (ATMS) ducts.

ATMS ducts that are embedded in the concrete barrier of the Booth Street and Rochester Street overpasses, as well as those buried underground or surface mounted, will be relocated as part of the highway works.

3.2.10 ILLUMINATION

New illumination will be provided on the reconfigured eastbound off-ramp as required. Existing illumination at the eastbound off-ramp terminal intersection will be replaced with new conventional illumination to suit the changes in geometry and recommended roadway improvements. Municipal lighting will be provided along the realigned portion of Chamberlain Avenue and Imperial Avenue.

3.2.11 SIGNAGE

The existing overhead sign and support at Bronson Avenue will be replaced. Existing ground-mounted signs will be removed and replaced where required to situate them in front of the new noise barrier walls, with new signs appropriate for the lengthened eastbound off-ramp. Signage will be added on the approach to the ramp terminal to clearly identify lane designations on the off-ramp, turning permissibility, and any additional signage requirements that arises from the intersection improvements and realignment of Chamberlain Avenue.

In response to concerns received at and following the PIC and as per commitments made in the Minister of the Environment's response from August 1, 2008 to a bump-up request received as part of the Preliminary Design and Class EA Study, oversized speed signs will be provided along the realigned Chamberlain Avenue to deter motorists from speeding along the realigned roadway. A new yield sign will be provided at the intersection of the connecting segment between Imperial Avenue and the realigned Chamberlain Avenue, which will require motorists from Imperial Avenue to yield to traffic on Chamberlain Avenue.

3.2.12 SIDEWALKS

A new 2 m wide sidewalk will be provided on the north side of the realigned Chamberlain Avenue from Bronson Avenue to Percy Street, and will be separated from the roadway by a 1 m wide boulevard.

A new 2 m wide sidewalk, separated from the roadway by a 1 m wide boulevard, will be provided on the south side of the realigned Chamberlain Avenue from Bronson Avenue to the connecting segment of Imperial Avenue.

On the south side of the intersection of Imperial Avenue and the connecting segment to Chamberlain Avenue, a new sidewalk will be reconfigured to tie into the existing sidewalk, which will be offset from Chamberlain Avenue by a distance varying from 0 to 25 m.

Sidewalks located on Bronson Avenue that are impacted by construction will be reinstated to current City standards.

3.2.13 FENCING

Existing fencing will be removed and reinstated where required, to construct the new eastbound off-ramp terminal and the realignment of Chamberlain Avenue.

3.2.14 COMMERCIAL ENTRANCES

All commercial entrances in the vicinity of the proposed works will be maintained during construction. Drummond's gas station is located on the corner of Bronson Avenue and Imperial Avenue. The main access to the gas station is off Bronson Avenue and a loading entrance is off Imperial Avenue. The entrance from Imperial Avenue will be adjusted to match the revised curb configuration at this location.

3.2.15 LANDSCAPE PLAN

A Landscape Plan will be implemented following construction to reinstate vegetated areas disturbed by the construction works (**Figure 3-5**). The landscape design includes low maintenance, native species which have high durability (i.e. salt/wind tolerant, regional hardiness) and provide seasonal interest through colour, form, and texture. Proposed plant selections for the following areas include ground cover, shrub plantings, deciduous and coniferous trees, as appropriate:

- On the north side of the realigned Chamberlain Avenue from Bronson Avenue to Percy Street to act as a landscape buffer for the Highway 417 eastbound lanes and to assist in traffic calming and reinforce a more residential character along the arterial road;
- On the south side of the realigned Chamberlain Avenue provide a grassed buffer between the sidewalk and the roadway; and
- On the north side of Orangeville Street along the slope south of Highway 417, approximately between Booth Street and Lebreton Street South, to reinstate any landscaping that is disturbed during construction related to the replacement of the Booth Street and Rochester Street overpasses and Bronson eastbound off-ramp extension.

The following highlights key elements of the landscape strategy for the Highway 417 Bronson Avenue Interchange Operational Improvements project:

- Salt tolerant, hardy trees and shrubs will be used throughout;
- Plant composition has been selected to reflect the residential character south of Highway 417;
- Seasonal interest will be provided by drought tolerant trees and vegetation, where and as appropriate. Restrained use of Fall and Spring plants with red attributes (flowers, budding, stalk colouration, and fruit) will be used. Areas absent of existing landscaping will be enhanced where feasible;
- Appropriate MTO standard seed mixes and plantings will be utilized along roadside conditions;
- Specialized MTO standard seed mixes will be used to stabilize slopes greater than 2H:1V; and
- Plant and tree placement will be respectful of highway light and pole locations to maximize evening lighting effectiveness.

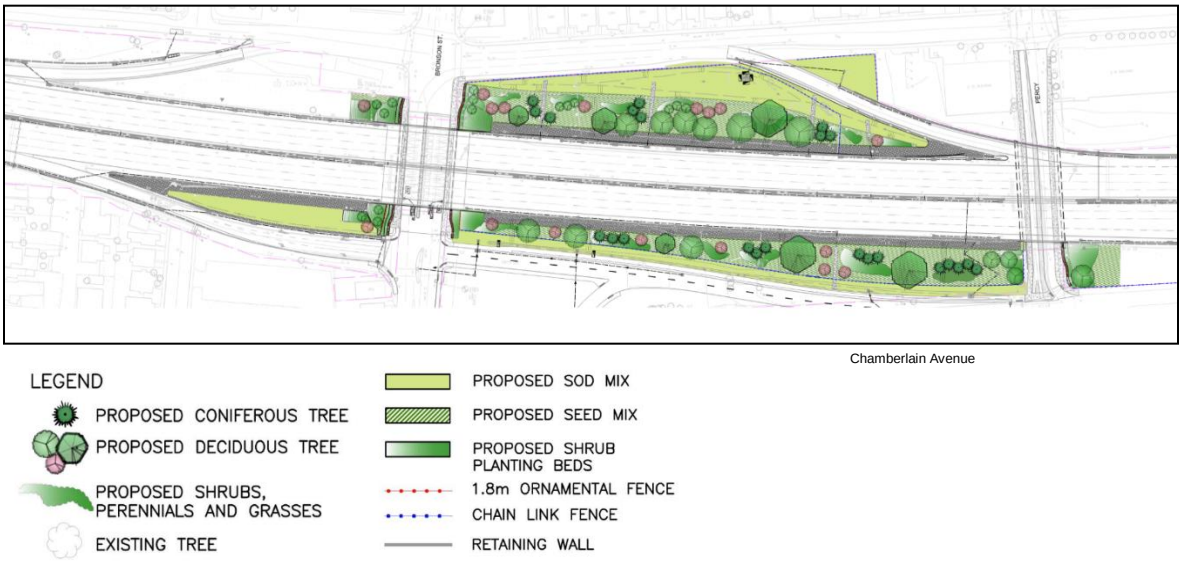

Figure 3-6: Landscape Plan

3.2.16 CONTEXT SENSITIVE DESIGN

Proposed improvements at the Bronson Avenue interchange will incorporate the recommendations developed through the Context Sensitive Design (CSD) concepts to ensure that the overall planned expansion and rehabilitation of Highway 417 reflects a holistically-planned aesthetic and vision for the Ottawa Queensway corridor. As a Capital Arrival Route, guiding principles of the CSD concepts for Highway 417 include: clean, concise, discernible features that articulate the highway as an arrival route into / through Ottawa's core as the Nation's Capital; simple design features that are easily perceived without distraction to motor vehicle operators; the use of durable, low maintenance materials; aesthetic design coordinated between the varying CSD elements; and constructible design solutions (MTO & Stantec, 2011).

As part of the Highway 417 Bronson Avenue Interchange Operational Improvements, the major opportunities to incorporate CSD recommendations include the construction of new noise barrier walls and retaining walls. A black vinyl chain link fence will also be will also be installed along the highway, as per CSD recommendations.

The new noise barrier walls will be constructed of a pre-cast concrete panel system. The concept, as used in the construction of the new noise wall at Lees Avenue as part of the widening of Highway 417 from Nicholas Street to OR 174 includes the use of panels of different colour and texture. Facing the highway, the panels will be installed in the same pattern as used in the new noise barriers as recently installed at Maitland Avenue, the Highway 417 westbound Parkdale Avenue off-ramp and Lees Avenue for walls greater than two panels in height (1 m), so that both the colour and texture of the wall provide visual interest along the corridor. On the back side of the noise barriers (facing City streets), the noise barrier will be a uniform grey treatment. Transparent acrylite panels will be installed across the Booth Street overpass, Rochester Street overpass and Bronson Avenue overpass structures. Translucent acrylite noise barrier will be installed on the concrete retaining walls at Bell Street and Arthur Lane.

Enhanced landscaping in the areas detailed in **Section 3.2.15** will utilize a palette of primarily native plants with a strong visual identity, a bold and colourful design, and four seasons of interest (MTO & Stantec, 2011).

3.3 TRAFFIC/CONSTRUCTION STAGING

Construction of the Bronson Avenue Interchange Operational Improvements project will be completed in conjunction with construction for the Highway 417 Midtown Bridges Project. As such, some of the staging operations and durations for the work cannot be attributed solely to the Bronson Avenue Interchange Operational Improvements project. The timing of construction will be coordinated with the Highway 417 Midtown Bridges Project construction and is dependent on the Contractor's schedule. The Highway 417 Midtown Bridges Project is anticipated to require approximately five construction seasons.

The key construction activities associated with the Bronson Avenue Interchange Operational Improvements project are as detailed in **Table 3-1**. See **Section 4.2.4** for a summary of required lane/ramp closures and mitigation.

Detailed information regarding the traffic and construction staging for the Booth Street and Rochester Street overpass rapid replacements will be available in the Highway 417 Midtown Bridges Project DCR.

Table 3-1: Traffic / Construction Staging

CONSTRUCTION ACTIVITIES	TIMING	TRAFFIC IMPACTS
• All work associated with the ramp lengthening, including widening of the Booth Street and Rochester Street overpasses, retaining wall construction, and associated noise walls for the Bronson W-N/S ramp.	*Year 1*	**Impacts to Highway 417:** • Construction will occur during the full closure of the Bronson Avenue W-N/S ramp as part of the Highway 417 Midtown Bridges Project (28 weeks[1]). • Construction vehicle access at night will be from the closed highway and ramp lanes, or closed portions of City streets. **Impacts to City roadways:** • Orangeville Street between Rochester Street to Booth Street and Booth Street to Lebreton Street (excluding the Booth Street / Orangeville Street intersection) will be fully closed during construction. This full closure will be for an estimated five years and will allow the Contractor to access retaining walls and noise walls from street level, as well as complete other works associated with the Highway 417 Midtown Bridges Project during this time.
• Modifications to the Bronson W-N/S terminal intersection to reconfigure the traffic	*Year 5*	**Impacts to City roadways:** • The existing lane configuration (one right turn lane and one left turn lane) at the exit ramp terminal will be maintained during the staging of construction.

CONSTRUCTION ACTIVITIES	TIMING	TRAFFIC IMPACTS
signals, illumination and median islands.		• Some construction operations will require off-peak lane closures and/or traffic control using Ottawa Police Services. • One northbound lane of traffic on Bronson Avenue will maintained during this construction. **Estimated duration:** 6 months (to be completed in conjunction with the construction of the realigned Chamberlain Avenue)
• Construction of the realigned Chamberlain Avenue from Bronson Avenue to Percy Street.	*Year 5*	**Impacts to City roadways:** • One lane of traffic will be maintained on Chamberlain Avenue during construction. Short duration lane closures may be required and will be restricted to off-peak or overnight hours only. • The realigned Chamberlain Avenue will be constructed in Stage 1. The majority of the work can be completed from within the construction staging area being used by the Highway 417 Midtown Bridges Project. Access and egress for construction traffic will be from the existing Chamberlain Avenue (on the north side). • In Stage 2, traffic will utilize the realigned Chamberlain Avenue; access and egress for construction traffic will be on the south side of the realigned Chamberlain Avenue. **Estimated duration**: 6 months

[1]Note that this estimated duration does not include the number of weeks that the ramp may need to remain closed over the winter months if some construction operations cannot proceed due to weather conditions. The work is scheduled by the Contractor and the start date of the ramp closure is dependent upon the coordination of the construction operations associated with the Highway 417 Midtown Bridges Project.

4 ENVIRONMENTAL ISSUES AND COMMITMENTS

This section focuses on the direct and indirect environmental impacts associated with the proposed works. Specifically, this section describes the mitigation measures developed to minimize the impacts for each identified environmental issue. Mitigation measures include planning decisions, design features, construction requirements and constraints.

The key to ensuring effective environmental quality control and risk management during the project is the development and proactive implementation of an approach that:

- Identifies environmental sensitivities;
- Presents environmental protection measures in a way that can be translated into contractual requirements and for which compliance can be verified; and
- Includes a monitoring program, as required, that verifies that environmental protection measures are being implemented and are effective.

It is important to ensure that the Contract Administrator and Contractor are made aware of, and are prepared to deal with, all environmental issues that may arise during construction.

Environmental contract specifications, including standard and non-standard special provisions (SP), Ontario Provincial Standard Specifications (OPSS) and MTO General Conditions of Contract, will be included in the contract documents to address specific environmental and operational concerns.

The key environmental concerns and commitments identified in the TESR for the entire preliminary design study area (Highway 417 from west of Highway 416 easterly to Anderson Road) are summarized in **Table 4-1**. This table has been provided as a reference and forms the foundation upon which the impact assessment of the detail design was developed.

Table 4-1: Summary of Environmental Concerns and Commitments – Preliminary Design (TESR, MTO, 2007) and Detail Design (2020)

Issues / Concerns Potential Effects	Concerned Agencies	Preliminary Design Mitigation / Protection / Monitoring	Detail Design Mitigation / Protection / Monitoring
Fisheries and Aquatic Ecosystems • Impact on fish habitat at culvert extension/pier extension locations identified as fish habitat. • Impact of fish habitat due to sediment and debris entry into watercourses	Department of Fisheries and Oceans (DFO)	• Habitat improvements to be determined at the detail design phase. Typical measures to be considered include: embedment of culverts, use of natural stream substrate or other suitable river stone material in culvert bottom, placement of riparian plantings at disturbed areas at culvert ends and placement of 3000 mm thickness of riverstone around pier extensions.	No fish habitat is present within the Bronson Avenue interchange study area.
		• Restrict timing of in-stream work	
		• Prepare fisheries compensation plan during Detailed Design and submit to DFO for approval; secure Federal Fisheries Act authorization during Detailed Design.	
		• Monitor construction activities. Monitor environmental protection measures and implementation of the fisheries compensation place	
		• Restrict activities adjacent to watercourse i.e. storage of materials, refueling.	
Terrestrial Ecosystems • Impact on wildlife habitats due to removal of vegetation at the edge of forested areas.	MNRF	• Minimize vegetation removal; provide protection for those trees to remain.	• Vegetation removal will be minimized to only what is required for the proposed works.
		• Replace vegetation where feasible (refer to landscape concept plan)	• A Landscape Plan has been developed and will be followed to revegetate disturbed areas using native trees, shrubs, and seed mixes, as appropriate for the site conditions and in keeping with CSD recommendations.

Issues / Concerns Potential Effects	Concerned Agencies	Preliminary Design Mitigation / Protection / Monitoring	Detail Design Mitigation / Protection / Monitoring
Surface Water / Stormwater Management • Increased runoff resulting from increased pavement platform.	City of Ottawa MTO	• Reduce runoff to pre-construction rates by using underground detention.	• A new storm sewer line and new catchbasins will be required to provide adequate drainage on the new eastbound off-ramp. • A new drainage system will be required on the realigned Chamberlain Avenue and will connect to the existing City storm sewer systems at Bronson Avenue and Percy Street. Ditching will be provided where necessary to supplement the storm sewer network and provide adequate drainage as well as water quality improvements prior to discharge into the storm sewer system. The new drainage system will maximize the ability to separate the MTO drainage from the City of Ottawa drainage.
Land Use • Traffic delays / access restrictions during construction. • Impact on emergency service routes/access. • Restricted pedestrian/ cyclist passage at the Queensway.	City of Ottawa MTO	• Prepare Traffic Management Plan during Detailed Design.	• The Contractor will be required to develop a Traffic Control Plan, a Communications Plan and an Incident Management Plan, which include the actions to mitigate impacts to traffic during construction.
		• Maintain existing number of lanes on Queensway at most times during construction except for minor reductions during off-peak travel times. Preclude lane restrictions during peak travel times.	**Highway 417** • One Highway 417 eastbound and westbound lane will be closed during construction (3 lanes will be maintained during peak periods) • The Bronson Avenue off-ramp will be closed for an extended period of time (signed detours will be in effect); • Additional off-peak closures will be required and shall not be allowed/completed during the following hours unless identified otherwise elsewhere in the Contract:

Issues / Concerns Potential Effects	Concerned Agencies	Preliminary Design Mitigation / Protection / Monitoring	Detail Design Mitigation / Protection / Monitoring
			Monday to Friday: 07:00 to 19:00h; Saturday and Sunday: 10:00 – 18:00h **City Streets** • A single lane of traffic in each direction will be maintained on Bronson Avenue during peak periods; flagging with short-term lane closures not permitted within peak periods. Peak period on City Streets are defined as follows: Monday to Friday: 07:00 to 19:00h; Saturday and Sunday: 10:00 – 18:00h • Short term lane closures and installation of any long-term lane closures shall not be allowed/completed during the following times, unless identified otherwise elsewhere in the Contract: Monday to Thursday: 06:00 to 10:00, 14:30 to 21:00h; Friday: 06:00 to 10:00, 14:00 to 22:00h; Saturday 10:00 to 22:00 h and Sunday: 10:00 to 21:00 h
		• Implement elements of an Advance Traffic Management System including changeable message signs and incident detection.	• Advance Traffic Management System will be implemented including changeable message signs and incident detection.
		• Ensure ongoing communication with emergency services during construction.	• The Contractor shall provide updated notification to Emergency Services Agencies at least 2 weeks in advance of any ramp, road and/or lane closures.
		• Free flow channelization at ramp terminals removed, where possible, to better accommodate pedestrian/cyclists.	• Not applicable.
		• Accommodate the needs of pedestrians and cyclists during construction. Do not close adjacent crossings at the same	• A Construction Site Pedestrian Control Plan will be developed to include temporary pedestrian signing; directional signing; use

Issues / Concerns Potential Effects	Concerned Agencies	Preliminary Design Mitigation / Protection / Monitoring	Detail Design Mitigation / Protection / Monitoring
		time during construction. Provide alternative route and advance warning during temporary closures.	of Traffic Control Persons; maintenance of sidewalk; relocation, maintenance, and removal of pedestrian barriers; and all necessary delineation or any other measures to provide a safe environment for pedestrians. The work shall be staged in a manner consistent with the staging of the Contract and in accordance with the implementation of the traffic control measures as stipulated in the Contractor's Traffic Control Plan.
Aesthetic / Landscape Composition • Loss of vegetation to accommodate Recommended Design. • Effect on visual landscape and scenic resources available to motorists. • Effect on adjacent dwellers sensitive to views of facility.	NCC City of Ottawa MTO	• Replace vegetation where feasible. • Enhance aesthetic design of bridges and retaining walls, where appropriate, to minimize visual intrusion. • Provide visual screening and aesthetic enhancement through landscape design. • Develop final landscape plan during Detailed Design in consultation with the City and NCC, and present to the public at that time.	• A Landscape Plan has been developed and will be followed to revegetate disturbed areas using native trees, shrubs, and seed mixes, as appropriate for the site conditions and in accordance to CSD recommendations.
Archaeological and Heritage Resources • Stage 1 and Stage 2 assessments did not indicate any concerns for	MHTSCI	• Include contract provisions that require that MHTSCI be notified immediately if deeply buried archaeological remains are encountered during construction.	• In the event that deeply buried archaeological deposits are discovered in the course of construction, the Ministry of Heritage, Tourism, Sport and Cultural Industries (MHTSCI) (416-314-1177) should be notified immediately. Should previously undocumented archaeological resources be

Issues / Concerns Potential Effects	Concerned Agencies	Preliminary Design Mitigation / Protection / Monitoring	Detail Design Mitigation / Protection / Monitoring
significant pre-contact or historic archaeological sites.			discovered, they may be new archaeological sites and therefore subject to Section 48 (1) of the Ontario Heritage Act. The proponent or person discovering the archaeological resources must cease alteration of the site immediately and engage a licensed consultant archaeologist to carry out a determination of their nature and significance.
Contaminants and Waste • Encroachment onto potentially contaminated areas.	MECP MTO	• Undertake Environmental Site Assessment for properties to be acquired during Detailed Design.	• MTO has completed property acquisition and completed any due diligence assessments required.
Noise • Increase noise levels adjacent for highway as a result of proposed highway modifications. • Noise from construction equipment and vehicles during construction.	City of Ottawa MTO	• Require contractor to maintain equipment in an operating condition that prevents unnecessary noise, including but not limited to non-defective muffler systems, properly secured components and the lubrication of moving parts.	• Equipment shall be maintained in an operating condition that prevents unnecessary noise, including but not limited to non-defective muffler systems, properly secured components and lubrication of moving parts.
		• Restrict idling of equipment to the minimum necessary to perform specified work.	• Idling equipment should be restricted to the minimum necessary to perform specific work.
Air Quality • Potential detrimental impact on air quality	MECP EC Health Canada	• No further action required. Mitigation not required since concentration levels of contaminants predicted to be below applicable government guidelines for the Recommended Design. Furthermore, results of regional air quality assessment concluded that the	• No further action required.

Issues / Concerns Potential Effects	Concerned Agencies	Preliminary Design Mitigation / Protection / Monitoring	Detail Design Mitigation / Protection / Monitoring
(increased smog / pollutants)		proposed modifications to Highway 417 would have an unnoticeable and insignificant impact on smog pollutants.	

Applicable commitments from the Preliminary Design and Environmental Assessment Study and additional commitments developed during detail design are summarized in the following sections.

4.1 NATURAL ENVIRONMENT

During preliminary design, terrestrial ecosystem sensitivities were identified and evaluated within the study area from Highway 416 easterly to Anderson Road. A reconnaissance terrestrial field survey was conducted on April 25 and 26, 2002 to determine the nature and extent to botanical and wildlife habitats within the study area, with follow-up detailed assessment surveys conducted from June 17 to 20, 2002.

The results of these surveys and a preliminary assessment of potential impacts were documented in the Botanical and Wildlife Survey Report (January 2003). During detail design, these reports were reviewed to obtain background information on the terrestrial environment within the study corridor. As there are no watercourses within the Bronson Avenue interchange improvements project limits, background information on fish and fish habitat collected during preliminary design was not reviewed.

Records for Provincially Rare species and Species at Risk were also obtained from the Ministry of Natural Resources and Forestry's (MNRF) Natural Heritage Information Centre (NHIC) database (2012) during detail design, to update the previous data from the MNRF's Vulnerable, Threatened, Endangered and Extirpated List (VTEE) (1996). Correspondence with the Kemptville District MNRF provided background data on existing Species at Risk and significant natural heritage features (i.e. Provincially Significant Wetlands (PSWs), Areas of Natural and Scientific Interest (ANSIs) etc.) in the study area.

While consultation with the MNRF identified a number of potential Species at Risk (SAR) that could occur in the study area, the habitat requirements of these species were reviewed, and it was found that suitable habitat for these species is not present within the highly urbanized study area. No SAR or SAR habitat were observed during site reconnaissance completed during detail design.

A detailed description of existing environmental conditions is documented in the TESR, while updated information on existing conditions, sensitivities, potential impacts and proposed mitigation are documented in the *Summary of Existing Environmental Conditions Report, Detail Design Update, Highway 417 Bronson Avenue Interchange Operational Improvements (WP 4089-07-01)* (November 2013).

In addition, a Terrestrial Ecosystem Existing Conditions and Impact Assessment Report (WSP, 2020) and Tree Inventory (WSP, 2017) were prepared as part of the Highway 417 Midtown Bridges Project and include information within the study area limits. Terrestrial field investigations were completed between November 12 and November 18, 2016. Investigations included vegetation and wildlife surveys within a study area that generally encompassed accessible lands 30 m north and south of Highway 417 between the project limits. Tree inventory field investigations were completed on October 12, 2016 and October 3 and 4, 2017. The inventory included a review of 802 trees and catalogued location, size and overall condition throughout the Highway 417 Midtown Bridges Project study area. Updated information was also obtained from the MNRF NHIC database and through correspondence with the MNRF Kemptville District. All relevant natural environment existing conditions within the study area documented as part of the Highway 417 Midtown Bridges Project have been included in this DCR.

The following sections describe potential impacts to the natural environment associated with the proposed works and summarize mitigation measures that have been included in the contract documents.

4.1.1 FISH AND FISH HABITAT

There are no watercourses in or within 30 m of the project limits. Impacts to fish and fish habitat are not anticipated.

4.1.2 VEGETATION

Potential Impacts

Vegetation within the Highway 417 Bronson Avenue interchange is limited to landscaped/cultural vegetation (**Figure 4-1**). Discontinuous grass, landscape trees and plantings are predominant along the Highway 417 right-of-way and adjacent to the eastbound off-ramp. Other vegetation in close proximity to the interchange occurs on private residential and commercial properties or at Glebe Memorial Park. Existing vegetation is considered to be of low ecological significance and does not form part of open space linkages or connect to any major green corridor that is bisected by the Highway 417 right-of-way. As such, vegetation removal as part of the proposed works is anticipated to have negligible impacts.

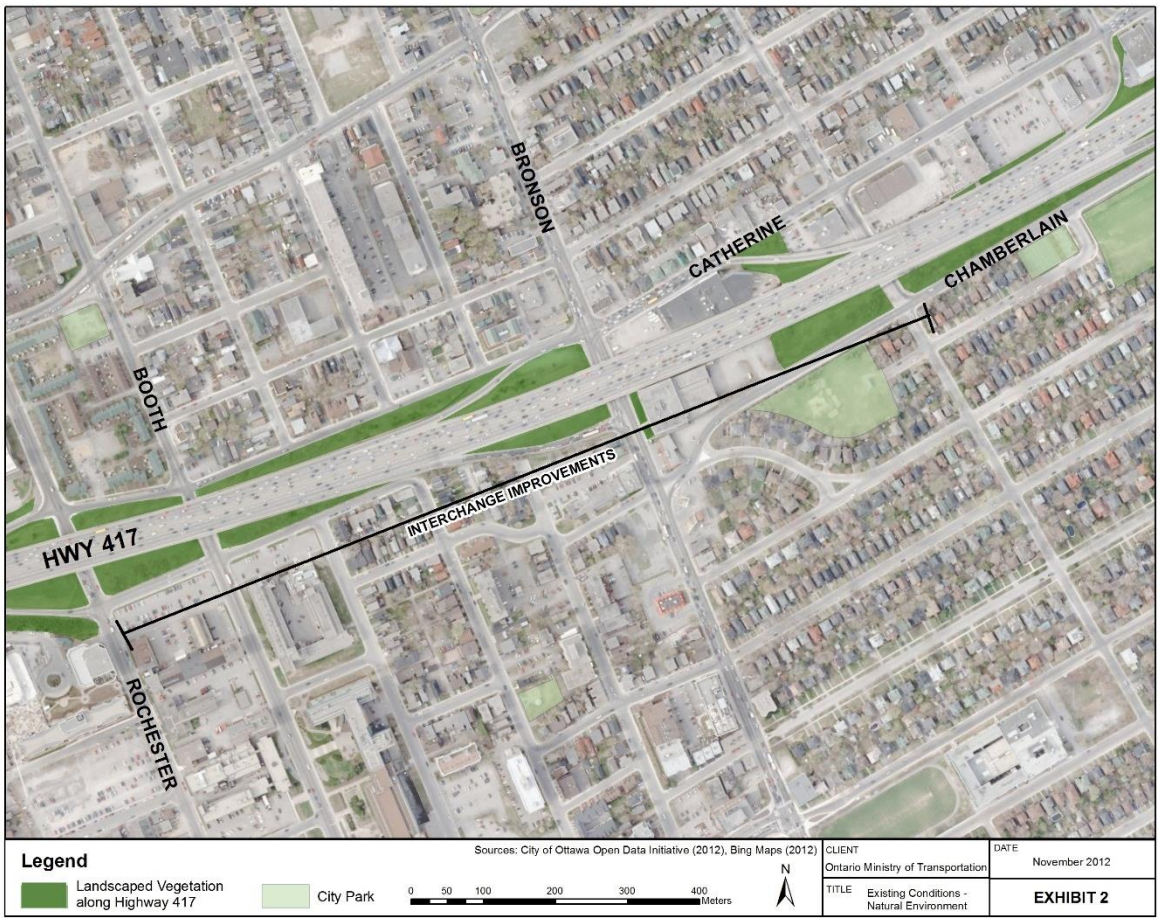

Figure 4-1: Existing vegetation within the study area

According to the Botanical and Wildlife Survey Report (2003), there were no records of regionally or provincially rare species of plants or animals within the study area based on a review of the previous VTEE (MNRF, 1996). In addition, there are no designated natural areas or features within the study area.

A review of the NHIC database identified provincially significant plant species, outlined in **Table 4-2**, as having historical records within the study area.

Table 4-2: Provincially Significant Plant Species

Plant Species	Habitat
Cattail Sedge	Moist woods along or near watercourses.
Houghton's Flatsedge	Dry, open, sandy sites.
Ram's-head Lady's-slipper	Sand woodlands, slightly shaded areas in open limestone barrens, and in mossy coniferous swamps.
American Waterwort	Shallow water, river edges, and shores of ponds, lakes, pools and ditches.
Limestone Oak Fern	Ledges and slopes in limestone or dolomite rock, and in moist humus in forests on calcareous rock.
Greene's Rush	Open sandy ground.
Southern Twayblade	Bogs, openings in Sphagnum peatlands with Black Spruce and Tamarack.
Pitch Pine	Shallow soil of dry rock outcrops and ridges.
Horn-leaved Riverweed	Fast-flowing rivers and streams.
Woodland Pinedrops	Mixed woods.

Suitable habitat for these species is not present within the study area.

Tree Inventory

One hundred and eighty-six trees were inventoried by WSP as part of the Highway 417 Midtown Bridges Project from Rochester Street to Glendale Avenue within the Bronson Avenue interchange operational improvements study area (**Figure 4-2** to **Figure 4-6**).

Figure 4-2: Tree Inventory - Percy Street and Glendale Avenue

Figure 4-3: Tree Inventory - Chamberlain Avenue between Bronson Avenue and Percy Street

Figure 4-4: Tree Inventory - Embankment at Bronson Avenue Eastbound Off-ramp

Figure 4-5: Tree Inventory - Orangeville Street between Booth and Bell Street

Figure 4-6: Tree Inventory - Orangeville Street between Rochester and Booth Street

The trees were reviewed through an on-site visual inspection of the trunk and branch condition, structure, foliage condition, and evidence of abiotic (environmental, mechanical and physical damage) and biotic (insects and disease) stressors. The assessment of the trees is recorded in **Table 4-3** and includes:

- Tree diameter at breast height (**DBH**) - +/- 130cm above ground;
- Number of Trees (**No**.) – approximate number of trees present;
- Trunk Integrity (**TI**): An assessment of the trunk for any defects or weaknesses;
- Canopy Structure (**CS**): An assessment of the scaffold branches, unions and the canopy of the tree;
- Canopy Vigor (**CV**): An assessment of the health of the tree and the amount of deadwood and live growth in the crown as compared to a 100% healthy tree. The size, colour and amount of foliage are also considered in this category, and;
- Additional remarks.

The tree condition assessment is based on the following scale of poor-fair-good:

- Good Tree Condition (**G**): Tree displays less than 15% deficiency/defect within the given tree assessment criteria;
- Fair Tree Condition (**F**): Tree displays 15%-40% deficiency/defect within the given tree assessment criteria;
- Poor Tree Condition (**P**): Tree displays greater than 40% deficiency/defect within the given tree assessment criteria.

Table 4-3: Tree Inventory Assessment

TREE #	BOTANICAL NAME	COMMENT NAME	NO.	DBH (cm)	HEIGHT (m)	CONDITION			REMARKS
						TI	CS	CV	
192	*Acer negundo*	Manitoba Maple	1	15-22	-	P	F	F	Multiple stems (3), weak unions
193	*Acer negundo*	Manitoba Maple	1	15-22	-	P	P	P	Multiple stems
194	*Elaeagnus angustifolia*	Russian Olive	1	20-25	-	F	F	F	Multiple stems suppressed canopy growth
192	*Acer negundo*	Manitoba Maple	1	15-22	-	P	F	F	Multiple stems (3), weak unions

TREE #	BOTANICAL NAME	COMMENT NAME	NO.	DBH (cm)	HEIGHT (m)	CONDITION			REMARKS
						TI	CS	CV	
193	*Acer negundo*	Manitoba Maple	1	15-22	-	P	P	P	Multiple stems
194	*Elaeagnus angustifolia*	Russian Olive	1	20-25	-	F	F	F	Multiple stems suppressed canopy growth
195	*Ulmus pumila*	Siberian Elm	1	25-30	-	F	F	F	Multiple stems (2), suppressed canopy growth (60% CV), 10% deadwood
G196	*Acer negundo*	Manitoba Maple	8	15-25	-	F	F	F	Vine in canopy, suppressed canopy growth (reduced CV)
G196	*Acer platanoides*	Norway Maple	11	15-20	-	F	F	F	Vine in canopy, suppressed canopy growth (reduced CV)
G196	*Elaeagnus angustifolia*	Russian Olive	5	15-20	-	F	F	F	Vine in canopy, suppressed canopy growth (reduced CV)
G196	*Prunus sp.*	Cherry sp.	3	10-15	-	F	F	F	Vine in canopy, suppressed canopy growth (reduced CV)
G196	*Picea pungens*	Blue Spruce	3	15-25	-	F	F	F	Vine in canopy, suppressed canopy growth (reduced CV)
G196	*Ulmus pumila*	Siberian Elm	5	20-30	-	F	F	F	Vine in canopy, suppressed canopy growth (reduced CV)
G197	*Ulmus pumila*	Siberian Elm	7	15-25	-	F	F	F	-
G197	*Acer negundo*	Manitoba Maple	10	10-25	-	F	F	F	-
G197	*Acer platanoides*	Norway Maple	2	15-25	-	F	F	F	-
G197	*Elaeagnus angustifolia*	Russian Olive	5	10-20	-	F	F	F	-
192	*Acer negundo*	Manitoba Maple	1	15-22	-	P	F	F	Multiple stems (3), weak unions
193	*Acer negundo*	Manitoba Maple	1	15-22	-	P	P	P	Multiple stems
G197	*Ulmus americana*	American Elm	3	45-50	-	F	F	F	-
G197	*Picea pungens*	Blue Spruce	5	15-20	-	F	F	F	-
90	*Ulmus americana*	American Elm	1	25-35	-	F	F	F	Multi-stem (3). 8% deadwood.

TREE #	BOTANICAL NAME	COMMENT NAME	NO.	DBH (cm)	HEIGHT (m)	CONDITION			REMARKS
						TI	CS	CV	
91	*Ulmus americana*	American Elm	1	25-35	-	F	F	F	Mulit-stem (4). Suppressed canopy growth. Leaf insect damage.
92	*Ulmus americana*	American Elm	1	25-35	-	G	F	F	5 degree lean. 5% deadwood.
93	*Ulmus americana*	American Elm	1	25-35	-	P	P	F	Weak union. Suppressed canopy growth. 5% deadwood.
94	*Ulmus americana*	American Elm	1	25-35	-	P	P	F	Granular fill at base.
95	*Ulmus americana*	American Elm	1	45-50	-	G	F	G	-
G201	*Acer negundo*	Manitoba Maple	11	15-20	-	F	F	F	Growing adjacent existing noise wall
G202	*Acer negundo*	Manitoba Maple	2	15-25	-	-	F	G	-
G1	*Acer negundo*	Manitoba Maple	~35	10-30	-	-	-	-	-
G1	*Ulmus americana*	American Elm	2	10-30	-	-	-	-	-
G1	*Elaeagnus angustifolia*	Russian Olive	~11	10-30	-	-	-	-	-
G1	*Acer platanoides*	Norway Maple	~6	10-30	-	-	-	-	-
G1	*Pinus resinosa*	Red Pine	~8	10-30	-	-	-	-	-
G1	*Celtis occidentalis*	Hackberry	~4	10-30	-	-	-	-	-
88	*Celtis occidentalis*	Hackberry	1	15	-	P	P	P	-
89	*Celtis occidentalis*	Hackberry	1	15	-	P	P	P	-
72	*Acer negundo*	Manitoba Maple	4	15-25	10	F	F	F	Grouping of multi-stems.
73	*Ulmus americana*	American Elm	1	10-15	8	F	F	F	Multi-stem.
74	*Ulmus americana*	American Elm	1	20-35	8	F	F	F	Multi-stem. Suppressed canopy growth.
75	*Ulmus americana*	American Elm	1	25-30	15	F	F	G	5% deadwood. Multi-stem.
76	*Ulmus americana*	American Elm	1	20-25	10	F	F	G	Multi-stem.
77	*Ulmus americana*	American Elm	1	10-15	5	P	P	P	Multi-stem. Adjacent highway. Suppressed growth.

TREE #	BOTANICAL NAME	COMMENT NAME	NO.	DBH (cm)	HEIGHT (m)	CONDITION			REMARKS
						TI	CS	CV	
78	*Ulmus americana*	American Elm	1	15-20	12	F	F	G	Multi-stem.
79	*Acer negundo*	Manitoba Maple	1	15	5	P	P	P	Growing on fence line.
80	*Acer negundo*	Manitoba Maple	1	15-20	10	F	F	F	Suppressed growth. 15% deadwood.
81	*Acer negundo*	Manitoba Maple	1	20-25	10	F	F	F	Multi-stem.
82	*Celtis occidentalis*	Hackberry	1	15-20	8	F	F	F	Multi-stem.
83	*Acer negundo*	Manitoba Maple	8	10-25	8	F	F	F	Grouping.
84	*Acer negundo*	Manitoba Maple	1	15-25	8	F	F	F	-
85	*Prunus sp.*	Cherry sp.	1	12	6	F	F	G	Multi-stem.
86	*Acer platanoides*	Norway Maple	1	20	-	F	P	F	Multi-stem. Grouping on fence. Suckering.
87	*Acer negundo*	Manitoba Maple	1	12	-	P	P	P	Multi-stem. Suppressed canopy. Suckering.

Approximately 5 trees with a DBH of 10 cm or greater will be removed and 1742 m^2 of vegetation will be cleared as part of construction.

Mitigation

The following design and site-specific mitigation measures will be included in the contract documents to mitigate impacts to vegetation:

- The Glebe Community Association will be notified in advance of construction start regarding the removal of existing plantings along the north side of Chamberlain Avenue, based on a commitment made at the PIC;
- Vegetation removal will be minimized to only what is required for the proposed works;
- Tree protection measures will be applied in accordance with OPSS 801 (Construction Specification for the Protection of Trees);
- Required vegetation removal and protection measures will be conducted in accordance with OPSS 201 (Tree Clearing);
- All construction-related debris will be cleared / disposed of following construction; and
- A Landscape Plan has been developed and will be followed to revegetate disturbed areas using native trees, shrubs, and seed mixes, as appropriate for the site conditions.

4.1.3 WILDLIFE AND SPECIES AT RISK

Potential Impacts

As the study area is highly urbanized, wildlife habitat is limited. A small amount of landscape vegetation along the highway may provide limited wildlife habitat for urban tolerant wildlife.

No significant wildlife features, significant wildlife habitat, or significant wildlife species, including area sensitive birds and other provincially rare species were identified within the study area.

According to the NHIC database, there are records of Eastern Pipistrelle (Provincially Rare) and Lake Sturgeon (threatened) within the study area. Eastern Pipistrelle prefer partly open country with large trees and woodland edges, and typically hibernate in caves or mines with high humidity. Therefore, they are not likely to be found within the study area. As there are no watercourses within the project limits, habitat for Lake Sturgeon is not present.

Consultation with MNRF confirmed that possible SAR that may be found within or adjacent to the Bronson Avenue interchange include Barn Swallow (Threatened), Chimney Swift (Threatened), and Butternut (Threatened).

Barn swallows typically build their cup-shaped nests on structures such as open barns, under bridges, and in culverts, and often re-use their nests from year to year. No historic records of nesting on the Highway 417 Bronson Avenue, Booth Street and Rochester Street overpass structures exist. No Barn swallow nests were observed on the structures or within the study area during the Highway 417 Midtown Bridges Project field investigations in 2016.

Chimney swifts are most likely to be found nesting or roosting in chimneys and other manmade structures and prefer to stay close to water for insect food sources. The project works will not affect any suitable habitat for this species that may be present within the study area.

Butternuts usually occur alone or in small groups in deciduous forests, are often found along streams with moist, well-drained soil, and are also found on well-drained gravel sites. They are rarely found growing in dry rocky soil. No butternuts were observed in the study area.

Migratory birds, as well as common resident species, may use the Bronson Avenue and Booth Street overpass structures for nesting, although no historic records of nesting on the structures exist and no nests were observed during the Highway 417 Midtown Bridges Project field investigations in 2016. An American Robin (*Turdus migratorius*), nest was found on a light fixture on the Rochester Street overpass during the Highway 417 Midtown Bridges Project field investigations.

Mitigation

The following mitigation measures will be included in the contract documents to protect wildlife (including SAR) during construction:

- Any wildlife incidentally encountered during construction will not be knowingly harmed;

- The Contractor shall not destroy the active nests (nests with eggs or young birds), or wound or kill birds, of species protected under the *Migratory Birds Convention Act*, 1994 and/or regulations under that Act. If active nests are encountered, the Ministry's Contract Administrator must be contacted;
- The Contractor shall refrain from clearing trees between April 5 and August 31 to protect nesting migratory birds. In the event that tree removal must occur within the above-noted window, the Contractor must retain a Qualified Biologist to conduct a nesting survey prior to clearing; and
- The Contractor shall take all necessary measures to seal all structural work plant, forms, and enclosures against entry of birds protected under the provision of the *Migratory Birds Convention Act* to prevent their nesting within the work area.
- If bridge works occur during the period when most birds in the area breed (April 5th to August 31st) they shall be preceded by bird nesting prevention measures such as:
    - Removing the light fixtures prior to the nesting period;
    - Installing bird spikes on the top of the light fixture to prevent bird nesting;
    - Covering the light fixtures with a firm surface (metal screen) that is sloped to prevent nesting.

4.1.4 DESIGNATED NATURAL AREAS

No designated natural areas including Provincially Significant Wetlands (PSWs), Areas of Natural and Scientific Interest (ANSIs), or Environmentally Sensitive Areas (ESAs) have been identified in the vicinity of the Bronson Avenue interchange. Therefore, mitigation is not required.

4.1.5 HYDROLOGY / SURFACE WATER

Potential Impacts

There is a negligible overall increase in impervious area due to construction of this project in the context of the total watershed areas.

Mitigation

Drainage for the eastbound off-ramp will be achieved through a new storm sewer line and new catchbasins on the ramp which will connect to an existing storm sewer outlet located on Booth Street and to the new combined sewer on Bronson Avenue.

Drainage for the realigned Chamberlain Avenue will be achieved through a new drainage system which will connect to the new combined sewer system at Bronson Avenue and existing City storm sewer system at Percy Street. Ditching will be provided where necessary to supplement the storm sewer network and provide adequate drainage.

No additional mitigation for stormwater management is required.

4.1.6 EROSION AND SEDIMENT CONTROL

Potential Impacts

Uncontrolled erosion and sedimentation occurring during construction can result in a loss of topsoil, disruption of nearby watercourses, drainage systems and degradation of downstream water quality.

Mitigation

Erosion and sediment control measures will be implemented during construction to prevent the migration of soils from the site. The Contractor will be required to prepare an Erosion and Sediment Control Plan including (but not limited to) the following measures:

- All vegetated cover not specified for removal should be preserved to minimize erosion and sedimentation.
- All erosion and sediment control measures should be integrated with a construction operation and the schedule as determined by the Contractor. Operations should not commence until temporary erosion and sediment control measures have been installed. Erosion control measures should include, but not be limited to, silt fence barrier, straw bale flow checks, tarps, etc.
- Erosion and sediment control measures should accommodate other aspects of the work including, but not restricted to the following:
    - Work area requirements, including equipment access, operation and storage, and material supply, utilization and storage;
    - Surface drainage from outside, through or around the work;
    - Areas of disturbed soil and soil stockpiles;
    - Means of access to erosion and sediment control measures requiring maintenance;
    - Constraints that may be specified elsewhere in the Contract; and
    - Protection of completed portions of the work.
- The Contractor should monitor the erosion and sediment control measures and if the measures are found to be ineffective, the Contractor should immediately make changes in order to control erosion and sediment.
- Temporary erosion and sediment control measures shall be applied on or around temporary stockpiles of soil or other construction related materials, in order to prevent the off-site movement of sediment. These may include but not limited to: vegetation, rolled erosion control products, perimeter silt fence, fibre roll barriers, or other perimeter sediment barriers.
- Temporary erosion and sediment controls shall be placed around work staging areas as necessary to prevent off-site movement of dust, dirt, and sediment, and this shall include measures to prevent off-site tracking of dirt onto area roads, sidewalks, or private properties.
- Storm and combined sewers within and immediately adjacent to work areas, at risk of receiving sediment from work areas, shall be protected with catch basin inlet sediment controls, throughout times of active construction.
- Area roadways and sidewalks shall be regularly cleaned of dirt and dust, and appropriate dust control measures utilized to minimize airborne dust. Should dirt or dust accumulate on private properties, such shall be cleaned up promptly, with permission from and as directed by the property owner.
- Work sites shall be kept in a reasonably tidy condition, and a litter control strategy implemented throughout the work program to keep work areas and adjacent areas free of litter.
- Temporary erosion and sediment control measures should be maintained and kept in place until 100% of all work has been completed and stabilized. Temporary control measures should be removed at the completion of the work but not until permanent erosion control measures, as specified in the Contract Documents, have been established.

4.1.7 WASTE AND CONTAMINATION / MANAGEMENT OF EXCESS MATERIALS

Potential Impacts

If not managed properly, excess waste and emissions have the potential to contaminate the surrounding environment.

Mitigation

The following mitigation measures will be included in the contract to manage excess waste and emissions:

- Excess materials generated during construction will be managed in accordance with OPSS 180 (General Specification for the Management of Excess Material);
- All wood waste will be managed as per OPSS 180;
- The Contractor shall have a spill prevention and response contingency plan, which includes the requirement for an emergency spill kit; and
- In the event of a spill during construction activities, the Ontario Ministry of the Environment's Spills Action Centre and the City of Ottawa must be notified under Ontario *Environmental Protection Act*.

4.2 SOCIAL / ECONOMIC ENVIRONMENT

During detail design, a review of existing planning documents, current land use, and the social environment (i.e. neighbourhood structures within the study area) was completed to identify any potential impacts associated with the Bronson Avenue Interchange Operational Improvements project.

In addition, property requirements were identified during preliminary design and an air quality assessment was also completed. A noise assessment was completed during detail design and is documented in the report entitled *Environmental Noise Assessment, Bronson Avenue Interchange Improvements, Ottawa, Ontario* (November 2013).

The following sections describe potential impacts to the socio-economic environment associated with the proposed works and provide a summary of mitigation included in the contract documents.

4.2.1 GREENWAYS AND OPEN SPACE LINKAGES

No impacts to greenways or open space linkages are anticipated and therefore mitigation is not required.

4.2.2 LAND USE

No impacts to current land uses are anticipated and therefore mitigation is not required.

The City of Ottawa requested MTO review the potential for a developable parcel of land at Chamberlain Avenue and Bronson Avenue intersection, as a result of the realignment of Chamberlain Avenue. At the present time the MTO has no intention to sell the property.

4.2.3 AESTHETICS AND LANDSCAPE

Potential Impacts

The lengthening and minor widening of the eastbound off-ramp at the ramp terminal, the widening of the Booth Street and Rochester Street overpasses structures, and the realignment of Chamberlain Avenue to be opposite of the eastbound off-ramp will result in minor disturbance to the existing landscape and vegetation within the project limits.

Mitigation

A Landscape Plan (presented in **Section 3.2.15** and **Figure 3-5**) has been developed and will be followed to revegetate disturbed areas with native trees, shrubs, and seed mixes, as appropriate for the site conditions and in accordance with CSD recommendations. The following areas are included in the Landscape Plan:

- On the north side of the realigned Chamberlain Avenue from Bronson Avenue to Percy Street to act as a landscape buffer for the Highway 417 eastbound lanes and to assist in traffic calming and reinforce a more residential character along the arterial road;
- On the south side of the realigned Chamberlain Avenue provide a grassed buffer between the sidewalk and the roadway; and
- On the north side of Orangeville Street along the slope south of Highway 417, approximately between Rochester Street and Lebreton Street South, to reinstate any landscaping that is disturbed during construction related to the replacement of the Booth and Rochester Street overpass structures.

As per the Landscape Plan, vegetated areas disturbed during construction will be reinstated. The landscape design includes native species which have high durability (i.e. salt/wind tolerant, regional hardiness) and provide seasonal interest through colour, form and texture while conforming to the principles of Crime Prevention Through Environmental Design (CPTED).

4.2.4 TRAFFIC OPERATIONS

Potential Impacts

While the construction staging presented in **Section 3.3** was developed with the goal of minimizing lane and ramp closures to the extent possible, some closures are required to accommodate the proposed construction activities, as identified in **Table 4-4**, including the coordination with the Highway 417 Midtown Bridges Projects (where applicable) and potential impacts to traffic.

Table 4-4: Summary of Lane, Ramp and Road Closures

CONSTRUCTION ACTIVITIES	TIMING	TRAFFIC IMPACTS
• All work associated with the ramp lengthening, including widening of the Booth Street and Rochester Street overpasses, retaining wall construction, and associated noise walls for the Bronson W-N/S ramp.	*Year 1*	**Impacts to Highway 417:** • Construction will occur during the full closure of the Bronson Avenue W-N/S ramp as part of the Highway 417 Midtown Bridges Project (28 weeks[1]). • Construction vehicle access at night will be from the closed highway and ramp lanes, or closed portions of City streets. **Impacts to City roadways:** • Orangeville Street between Rochester Street to Booth Street and Booth Street to Lebreton Street (excluding the Booth Street / Orangeville Street intersection) will be fully closed during construction. This full closure will be for an estimated five years and will allow the Contractor to access retaining walls and noise walls from street level, as well as complete other works associated with the Highway 417 Midtown Bridges Project during this time.
• Modifications to the Bronson W-N/S terminal intersection to reconfigure the traffic signals, illumination and median islands.	*Year 5*	**Impacts to City roadways:** • The existing lane configuration (one right turn lane and one left turn lane) at the exit ramp terminal will be maintained during the staging of construction. • Some construction operations will require off-peak lane closures and/or traffic control using Ottawa Police Services. • One northbound lane of traffic on Bronson Avenue will maintained during this construction. **Estimated duration:** 6 months (to be completed in conjunction with the construction of the realigned Chamberlain Avenue)
• Construction of the realigned Chamberlain Avenue from Bronson Avenue to Percy Street.	*Year 5*	**Impacts to City roadways:** • One lane of traffic will be maintained on Chamberlain Avenue during construction. Short duration lane closures may be required and will be restricted to off-peak or overnight hours only. • The realigned Chamberlain Avenue will be constructed in Stage 1. The majority of the work can be completed from within the construction staging area being used by the Highway 417 Midtown Bridges Project. Access and egress for

CONSTRUCTION ACTIVITIES	TIMING	TRAFFIC IMPACTS
		construction traffic will be from the existing Chamberlain Avenue (on the north side). • In Stage 2, traffic will utilize the realigned Chamberlain Avenue; access and egress for construction traffic will be on the south side of the realigned Chamberlain Avenue. **Estimated duration**: 6 months

Mitigation

A Traffic and Incident Management Plan (TIMP) has been prepared as part of detail design and will be presented to the City of Ottawa Traffic Incident Management Group.

As specified in the Contract Documents, the Contractor will be required to develop a Communication Plan for Traffic Management and Incident Management Plan, which is to include the following actions to mitigate impacts to traffic during construction:

- Maintain on-going communication with the City of Ottawa, OC Transpo, and Emergency Services through the formation of an Incident Management Team within 2 weeks of the contract award date;
- A public information campaign to start in advance of the work which includes bilingual media releases and public notices through local media (including newspaper notices, mail-outs, and the MTO telephone hotline and website); and
- Motorist information will be delivered through bilingual advance signage along Highway 417 and City of Ottawa local streets.

To mitigate potential impacts to Emergency Services, the Contractor shall notify all emergency service providers at least two weeks in advance of construction start regarding the construction schedule, and if any changes to traffic flow are anticipated.

4.2.5 PEDESTRIAN ACCESS

Potential Impacts

Impacts to pedestrian access on City streets are expected during construction as follows.

Bronson Avenue

Pedestrians will be directed to the opposite sidewalk when work is occurring on Bronson Avenue southbound and northbound.

Commercial entrances along Bronson Avenue will be maintained during construction. Main access to the gas station on the corner of Imperial Avenue and Bronson Avenue is from Bronson Avenue. Adjustments are required to the loading type entrance on Imperial Avenue to match the revised curb configuration at this location.

Chamberlain Avenue

Pedestrian access will be maintained during construction on the south side of Chamberlain Avenue.

Mitigation

The Contractor will be responsible for vehicular and pedestrian traffic control on or adjacent to City streets and will be required to develop a Traffic Control Plan and a Construction Site Pedestrian Control Plan, as specified in the contract documents. As part of the plan, pedestrian and cyclist access on Bronson Avenue will be maintained at all times. However, temporary sidewalk closures will be required to accommodate construction activities. During temporary closures, advance signage will be put in place to direct pedestrians to safe routes through the construction work zone for safety purposes. Specific closures will be dependent on the Contractor's timing and sequence of construction activities during each stage of construction. Where pedestrians must be detoured, the Contractor should install bilingual signage at the intersection preceding the detour.

4.2.6 PROPERTY REQUIREMENTS

Potential Impacts

To permit the realignment to Chamberlain Avenue to the north, to line up opposite with the Bronson Avenue off-ramp, MTO acquired an Ottawa Board of Education property on the east side of Bronson Avenue. MTO also acquired property on the south side of the E-N/S ramp terminal as the intersection adjustment at the E-N/S ramp terminal and Bronson Avenue made it impossible to maintain a property's driveway access on Bronson Avenue.

In addition, Temporary Limited Interests (TLIs) are required to facilitate construction of the ramp lengthening and provide construction access and egress and to permit construction of the noise barriers and retaining walls.

Mitigation

MTO will secure TLIs prior to construction. As the proposed work is being coordinated with the Highway 417 Midtown Bridges Project and the anticipated construction duration for that project is five years, all affected properties will receive a minimum of 60 days advance notice prior to the start of construction that requires use of the TLI lands.

4.2.7 AIR QUALITY

During preliminary design, it was identified that the contribution of the Highway 417 Bronson Avenue Interchange Operational Improvements project is projected to be below applicable government guidelines for

air quality and would have an unnoticeable and insignificant impact on smog pollutants. Therefore, mitigation is not required.

Dust emission may result from construction activities.

Mitigation

Dust control shall be completed using water, not chemical suppressants, and in accordance with MTO's General Conditions of Contract.

4.2.8 NOISE

Highway Noise

Potential Impacts

As the study area contains a number of residential land uses, numerous noise sensitive receptors are present. Noise barrier walls within the study area are located on the south side of Highway 417 between Booth Street and Cambridge Street and between Bronson Avenue and Lyon Street, as well as on the north side of the highway between Preston Street and Bronson Avenue.

The noise assessment conducted during detail design (November 2013) evaluated potential noise impacts on approximately 50 residential properties south of Highway 417 and adjacent to the study area, which represent Noise Sensitive Areas. Existing noise levels at receptor locations that are directly south of the highway between Lebreton Street South and Percy Street range from approximately 50 to 66 dBA. Noise levels at 14 of 17 receptor locations exceed the criteria limit of 60 dBA set forth by the City of Ottawa Environmental Noise Control Guidelines.

Mitigation

As described in **Section 3.2.6**, the existing noise barrier wall on the Bronson Avenue eastbound off-ramp shoulder, from east of the Booth Street overpass to west of the ramp terminal intersection, will be removed due to the lengthening of the ramp. A new 5 m high noise barrier wall will be constructed from east of the Booth Street overpass to west of the ramp terminal intersection.

A new 5 m high noise barrier wall will also be installed east of the Bronson Avenue overpass and will extend easterly to match the noise wall installation further to the east which is being replaced as part of the Highway 417 Midtown Bridges Project. This new noise barrier wall will be installed to provide noise attenuation for the adjacent residential area from Highway 417 noise, as a result of the demolition of the former Ottawa Board of Education building.

Construction Noise

Potential Impacts

The study area is governed by the City of Ottawa Noise By-Law (By-Law no. 2017-255). While not required to comply with municipal noise bylaws, MTO will make all reasonable attempts to work within it and when that

is not feasible, will communicate with the municipality. It is anticipated that there will be an increase in noise levels during construction. Night-time work will be required to minimize traffic closure impacts on Highway 417 and City streets.

Night construction activities may include sawcutting, roadway excavation, paving, and placement of granular materials and concrete.

Mitigation

Equipment shall be maintained in an operating condition that prevents unnecessary noise, including but not limited to non-defective muffler systems, properly secured components, and the lubrication of moving parts. Idling of equipment shall be restricted to the minimum necessary to perform the specified work.

4.2.9 UTILITIES

Potential Impacts

There are various public- and privately-owned utilities within the project area that may be impacted by construction activities, including:

- Bell Canada;
- City of Ottawa (1220 mm watermain, storm / sanitary sewers, and street lighting);
- Hydro Ottawa;
- Rogers Communications; and
- MTO ATMS ducts.

Potential Impacts

Bell Canada and Rogers Communications underground ducts along Chamberlain Avenue may be exposed during construction of the new Imperial Avenue connection to the realigned Chamberlain Avenue.

A Rogers Communications utility pedestal is in conflict with the excavation required for the retaining wall replacement along the south edge of the existing ramp.

Existing ATMS infrastructure conflicts with the embankment excavation and new retaining wall construction.

A large 1220 mm diameter City of Ottawa watermain and associated valve chambers lie very close to the existing retaining wall at the edge of the existing eastbound off-ramp along Orangeville Street. The 1220 mm watermain also runs under the existing alignment of Chamberlain Avenue.

Mitigation

Rogers Communications and Bell Canada infrastructure require localized relocations in advance of construction start.

ATMS ducts that are embedded in the concrete barrier of the Booth Street and Rochester overpasses, as well as those buried underground or surface mounted, will be relocated as part of the highway works.

The City of Ottawa 1220 mm watermain will be protected and will be monitored for the duration of construction. Where space is limited, a minimum of 1 m from the edge of the watermain to the edge of the protection system or noise wall caissons will be maintained.

4.3 CULTURAL ENVIRONMENT

Cultural Heritage

The potential cultural heritage value of the Booth Street and Rochester Street overpasses was assessed during Preliminary Design for the Highway 417 Midtown Bridges. There were no unique or significant features identified. The bridges were found not to warrant further assessment for heritage value or interest.

No cultural heritage resources are located within the study area.

Archaeology

During preliminary design, Stage 1 and Stage 2 Archaeological Assessments were completed for the larger Highway 417 Expansion Project and are documented in the following reports, which were reviewed during detail design for information on archaeological potential within the study area:

- Stage I Archaeological Assessment of Highway 417 from Highway 416 Easterly to Anderson Road (2002); and
- Stage II Archaeological Assessment of Highway 417 (Queensway) from Highway 416 Easterly to Anderson Road (2004).

4.3.1 ARCHAEOLOGY

Potential Impacts

No evidence of archaeological resources was identified within the existing Highway 417 right-of-way during the Stage I and Stage II Archaeological Assessments undertaken during preliminary design. As the existing right-of-way has been significantly disturbed, there are no present archaeological concerns.

Mitigation

In the event that deeply buried archaeological deposits are discovered in the course of construction, the Ministry of Heritage, Sport, Tourism and Culture Industries (416-314-1177) should be notified immediately. Should previously undocumented archaeological resources be discovered, they may be new archaeological sites and therefore subject to Section 48 (1) of the *Ontario Heritage Act*. The proponent or person discovering the archaeological resources must cease alteration of the site immediately and engage a licensed consultant archaeologist to carry out a determination of their nature and significance.

In the event that human remains are encountered during construction, the Cemeteries Regulation Unit of the Ministry of Consumer Service (1-800-889-9768) should be notified. In situations where human remains are associated with archaeological resources, the Ministry of Heritage, Sport, Tourism and Culture Industries should also be contacted to ensure that the site is not subject to unlicensed alterations which would be a contravention of the *Ontario Heritage Act*.

4.4 SUMMARY OF ENVIRONMENTAL EFFECTS, PROPOSED MITIGATION, COMMITMENTS TO FURTHER WORK

Table 4-5 summarizes the identified key environmental concerns and proposed mitigating measures.

Table 4-5: Summary of Environmental Concerns and Commitments

I.D #	Issues/Concerns Potential Effects	Concerned Agencies	I.D. #	Mitigation/Protection/Monitoring
NATURAL ENVIRONMENT				
1.0 Fisheries and Aquatic Ecosystems (Section 4.1.1)				
1.1	No watercourses were identified within the project limits or the immediate surrounding area.	MTO MNRF MECP	1.1.1	N/A
2.0 Vegetation (Section 4.1.2)				
2.1	Approximately 5 trees (10 cm or greater DBH) will be removed and 1742 m^2 of vegetation will be cleared as part of construction.	MTO MNRF MECP Glebe Community Association	2.1.1	The Glebe Community Association will be notified in advance of construction start so that they may remove existing plantings along the north side of Chamberlain Avenue, based on a commitment made at the PIC. **Operational Constraint – Notification of Affected Agencies**
			2.1.2	Vegetation removal and grading will be minimized to only what is required for the proposed works. Required vegetation removal and protection measures will be conducted in accordance with OPSS 201 (Tree Clearing). **Contract Drawings** **OPSS 201 – Clearing, Close Cut Clearing, Grubbing, and Removal of Surface & Piled Boulders** **OPSS 804 – Seed and Cover**
			2.1.3	Tree protection measures will be applied in accordance with OPSS 801 (Protection of Trees). **Contract Drawings** **OPSS 801 – Protection of Trees**
			2.1.4	Construction access routes and staging areas will be delineated using temporary fencing. **Contract Drawings**
			2.1.5	All construction-related debris will be cleared / disposed of following construction.

				OPSS 180 – Management of Excess Materials
			2.1.6	A Landscape Plan has been developed and will be followed to revegetate disturbed areas using native trees, shrubs, and seed mixes, as appropriate for the site conditions. **Contract Drawings** **Non-Standard Special Provision - Requirements for Planting**
3.0 Wildlife and Species at Risk (Section 4.1.3)				
3.1	Potential impacts to wildlife during construction.	MTO MNRF MECP	3.1.1	Any wildlife incidentally encountered during construction will not be knowingly harmed. **Operational Constraint (Environmental) – Prevention of Wildlife Harassment**
3.2	Potential impacts to migratory birds during construction.	MTO MNRF MECP	3.2.1	The Contractor shall not destroy the active nests (nests with eggs or young birds), or wound or kill birds, of species protected under the Migratory Birds Convention Act, 1994 and/or Regulations under that Act. When active nests are encountered, the Ministry's Contract Administrator must be contacted. **Operational Constraint (Environmental) – Migratory Bird Protection – General**
			3.2.2	The Contractor shall refrain from clearing trees between April 5 and August 31 to protect nesting migratory birds. In the event that tree removal must occur within the above noted window, the Contractor must retain a Qualified Avian Biologist to conduct a nesting survey prior to clearing. **Operational Constraint (Environmental) – Migratory Bird Protection – General**
4.0 Designated Natural Areas (Section 4.1.4)				
4.1	No designated natural areas were identified.	MTO MNRF MECP	4.1.1	N/A
5.0 Hydrology / Surface Water (Section 4.1.5)				
5.1	There is a negligible overall increase in impervious area due to construction of this project in the context of the total watershed areas.	MTO MNR MOE	5.1.1	Drainage for the eastbound off-ramp will be achieved through a new storm sewer line and new catchbasins on the ramp which will connect to: an existing storm sewer outlet located on Booth Street; and, to the new combined sewer on Bronson Avenue. Drainage for the realigned Chamberlain Avenue will be achieved through a new drainage system which will connect to the new combined sewer system at

				Bronson Avenue and existing City storm sewer system at Percy Street. Ditching will be provided where necessary to supplement the storm sewer network and provide adequate drainage. **Operational Constraint – Management of Water and Drainage** **Operational Constraint (Environmental) – Erosion and Sedimentation Control** **Contract Drawings**
6.0 Erosion and Sediment Control (Section 4.1.6)				
6.1	Uncontrolled erosion and sedimentation occurring during construction can result in a loss of topsoil, disruption of nearby watercourses, and degradation of downstream water quality.	MTO MNR MOE	6.1.1 6.1.2 6.1.3	• All vegetated cover not specified for removal should be preserved to minimize erosion and sedimentation. • All erosion and sediment control measures should be integrated with a construction operation and the schedule as determined by the Contractor. Operations should not commence until temporary erosion and sediment control measures have been installed. Erosion control measures should include, but not be limited to, silt fence barrier, straw bale flow checks, tarps, etc. • Erosion and sediment control measures should accommodate other aspects of the work including, but not restricted to the following: o Work area requirements, including equipment access, operation and storage, and material supply, utilization and storage; o Surface drainage from outside, through or around the work; o Areas of disturbed soil and soil stockpiles; o Means of access to erosion and sediment control measures requiring maintenance; o Constraints that may be specified elsewhere in the Contract; and o Protection of completed portions of the work. • The Contractor should monitor the erosion and sediment control measures and if the measures are found to be ineffective, the Contractor should immediately make changes in order to control erosion and sediment. • Temporary erosion and sediment control measures shall be applied on or around temporary stockpiles of soil or other construction related materials, in order to prevent the off-site movement of sediment. These may include but not limited to: vegetation, rolled erosion control products, perimeter silt fence, fibre roll barriers, or other perimeter sediment barriers. • Temporary erosion and sediment controls shall be placed around work staging areas as necessary to prevent off-site movement of dust, dirt, and sediment, and this shall include measures to prevent off-site tracking of dirt onto area roads, sidewalks, or private properties.

				• Storm and combined sewers within and immediately adjacent to work areas, at risk of receiving sediment from work areas, shall be protected with catch basin inlet sediment controls, throughout times of active construction. • Area roadways and sidewalks shall be regularly cleaned of dirt and dust, and appropriate dust control measures utilized to minimize airborne dust. Should dirt or dust accumulate on private properties, such shall be cleaned up promptly, with permission from and as directed by the property owner. • Work sites shall be kept in a reasonably tidy condition, and a litter control strategy implemented throughout the work program to keep work areas and adjacent areas free of litter. • Temporary erosion and sediment control measures should be maintained and kept in place until 100% of all work has been completed and stabilized. Temporary control measures should be removed at the completion of the work but not until permanent erosion control measures, as specified in the Contract Documents, have been established. **Operational Constraint – Management of Water and Drainage** **Operational Constraint (Environmental) – Erosion and Sedimentation Control** **Non-Standard Special Provision – Requirement for Temporary Erosion Control Measures** **Operational Constraint (Environmental) – Erosion and Sedimentation Control** **OPSS 201 – Clearing, Close Cut Clearing, Grubbing, and Removal of Surface & Piled Boulders** **Contract Drawings**
7.0 Waste and Contamination / Management of Excess Materials (Section 4.1.7)				
7.1	If not managed properly, excess waste and emissions have the potential to contaminate the surrounding environment.	MTO MNRF MECP	7.1.1	Excess materials generated during construction will be managed in accordance with OPSS 180 (General Specification for the Management of Excess Material). **OPSS 180 - Management of Excess Material** **Operational Constraint (Environmental) – Management of Excess Earth with Salt Impacts** **Operational Constraint (Environmental) – Management of Effluent from Concrete Cutting / Grinding**
			7.1.2	All wood waste will be managed as per OPSS 180. **OPSS 180 - Management of Excess Material**
			7.1.3	The Contractor shall have a spill prevention and response contingency plan, which includes the requirement for an emergency spill kit.

				Operational Constraint (Environmental) – Equipment Refueling, Maintenance and Washing
			7.1.4.	In the event of a spill during construction activities, the Ontario Ministry of the Environment's Spills Action Centre and the City of Ottawa must be notified under Ontario Environmental Protection Act. **Operational Constraint (Environmental) – General Environmental Protection Requirement** **MTO General Conditions of Contract**
SOCIAL-ECONOMIC ENVIRONMENT				
8.0 Greenways and Open Space Linkages (Section 4.2.1)				
8.1	No impacts to greenways or open space linkages are anticipated.	MTO MNRF MECP NCC	8.1.1	N/A
9.0 Land Use (Section 4.2.2)				
9.1	No impacts to current land uses are anticipated.	MTO City of Ottawa	9.1.1	N/A
10.0 Aesthetics and Landscape (Section 4.2.3)				
10.1	The lengthening of the eastbound off-ramp and the ramp terminal adjustments; the widening of the Booth Street and Rochester Street overpass structures; and the realignment of Chamberlain Avenue will result in minor disturbance to the existing landscape and vegetation within the project limits.	MTO MNRF MECP NCC City of Ottawa	10.1.1	A Landscape Plan has been developed will be followed to revegetate disturbed areas with native trees, shrubs, and seed mixes, as appropriate for the site conditions and in accordance with CSD recommendations. A per the Landscape Plan, vegetated areas disturbed during construction will be reinstated. The landscape design includes native species which have high durability (i.e. salt/wind tolerant, regional hardiness) and provide seasonal interest through colour, form and texture while conforming to the principles of Crime Prevention through Environmental Design (CPTED). **Non-Standard Special Provision - Requirements for Planting** **Contract Drawings**
11.0 Traffic Operations (Section 4.2.4)				
11.1	Lane and ramp closures are required on Highway 417 and local roads and	MTO City of Ottawa	11.1.1	The Contractor will be required to develop a Communication Plan for Traffic Management, Traffic Control Plan and Incident Management Plan, which include the following actions to mitigate impacts to traffic during construction:

	will potentially result in traffic delays and queues.			• Maintain on-going communication with the City of Ottawa, OC Transpo, and Emergency Services through the formation of an Incident Management team within 2 weeks of the Contract award date; • A public information campaign to start in advance of the work which includes bilingual media releases and public notices through local media (including newspaper notices, mail-outs, and the MTO telephone hotline and website); and • Motorist information will be delivered through bilingual portable variable message signs and advance signage along Highway 417 and City of Ottawa local streets. **Contract Drawings** **Non-Standard Special Provision – Communication Plan for Traffic Management** **Non-Standard Special Provision - Incident Management Plan** **Non-Standard Special Provision - Traffic Control Plan – City Streets; Non-Standard Special Provision – Control of Vehicular and Pedestrian Traffic – City Streets** **SP 199F01 – Temporary Roadway Closures** **Operational Constraint – Notification of Affected Agencies** **Operational Constraint – Highway 417 Ramp and City Street Closures**
10.2	Potential impacts to the operation of Emergency Services.	MTO City of Ottawa (including Emergency Services)	10.2.1	The Contractor shall notify all emergency service provides at least two weeks in advance of construction start regarding the construction schedule, and if any changes to traffic flow are anticipated. **Operational Constraint – Notification of Affected Agencies** **Non-Standard Special Provision – Communication Plan for Traffic Management** **Non-Standard Special Provision - Incident Management Plan**
12.0 Pedestrian Access (Section 4.2.5)				
12.1	Disruptions to pedestrian access are expected on Bronson Avenue. Pedestrian and cyclist access will be maintained at all times; however, temporary sidewalk closures will be required to accommodate construction activities.	MTO City of Ottawa	12.1.1	The Contractor will be responsible for vehicular and pedestrian traffic control on or adjacent to City streets and will be required to develop a Traffic Control Plan and a Construction Site Pedestrian Control Plan, as specified in the Contract documents. During temporary closures, advance signage will be put in place to direct pedestrians to cross to the other side of the sidewalk, in order to limit pedestrian access through the work zone for safety purposes. **Contract Drawings**

	Specific closures will be dependent on the Contractor's timing and sequence of construction activities during each stage of construction.			**Non-Standard Special Provision - Traffic Control Plan – City Streets** **Non-Standard Special Provision – Control of Vehicular and Pedestrian Traffic – City Streets** **Non-Standard Special Provision – Construction Site Pedestrian Control Plan**
13.0 Property Requirements (Section 4.2.6)				
13.1	To complete the works, MTO acquired an Ottawa Board of Education Building and surrounding lands on the east side of Bronson Avenue. In addition, a Temporary Limited Interest (TLI) is required at this location to facilitate construction of the intersection. MTO also acquired property in the south-west quadrant to accommodate improvements to the E-N/S ramp. TLI is also required to provide access and egress and to permit construction of noise barriers and retaining walls at various locations throughout the project.	MTO Private Landowners	13.1.1	Remaining TLIs required for construction will be obtained through the MTO property process.
14.0 Air Quality (Section 4.2.7)				
14.1	The contribution of the overall Highway 417 Expansion Project is projected to be below applicable government guidelines for air quality and would have an unnoticeable and	MTO MECP	14.1.1	Dust control shall be completed using water, not chemical suppressants, and in accordance with MTO's General Conditions of Contract.

	insignificant impact on smog pollutants. Therefore mitigation is not proposed. Dust emission may result from construction activities.			
15.0 Noise (Section 4.2.8)				
15.1	As the study area is largely occupied by residences and contains religious institutions, numerous noise sensitive receptors are present. Existing noise levels at receptor locations that are directly south of the highway between Lebreton Street South and Percy Street range from approximately 50 to 66 dBA. Noise levels at 14 of 17 receptor locations exceed the criteria limit of 60 dBA set forth by the City of Ottawa Environmental Noise Control Guidelines.	MTO MECP City of Ottawa	15.1.1	The existing noise barrier wall on the Bronson Avenue eastbound off-ramp shoulder, from east of the Booth Street overpass to west of the ramp terminal intersection, will be removed due to the lengthening of the ramp. A new 5 m high noise barrier wall will be constructed from east of the Booth Street overpass to west of the ramp terminal intersection. **Contract Drawings**
			15.1.2	A new 5 m high noise barrier wall will also be installed east of the Bronson Avenue overpass and will extend easterly to match the noise wall installation further to the east which is being replaced as part of the Highway 417 Midtown Bridges Project. **Contract Drawings**
15.2	It is anticipated that there will be an increase in noise levels during construction. Night-time work will be required in order to minimize traffic closure impacts on the highway.	MTO MECP City of Ottawa	15.2.1	Equipment shall be maintained in an operating condition that prevents unnecessary noise, including but not limited to non-defective muffler systems, properly secured components, and the lubrication of moving parts. **SP 199F33: Construction Noise Constraints**
			15.2.2	Idling of equipment shall be restricted to the minimum necessary to perform the specified work.

				SP 199F33: Construction Noise Constraints
16.0 Utilities (Section 4.2.9)				
16.1	A large 1220 mm diameter City of Ottawa watermain and associated valve chambers lie very close to the existing retaining wall at the edge of the existing eastbound off-ramp. The 1220 mm watermain also runs under the existing alignment of Chamberlain Avenue.	MTO Hydro Ottawa	16.1.1	The Contractor shall protect and monitor the existing 1220 mm watermain as specified in the Contract Documents. Protection and monitoring of the existing 1220 mm watermain is required during all stages of construction and for the full duration of all the work to be performed / constructed in the vicinity of the existing 1220 mm watermain. **Contract Drawings** **Operational Constraint – Large Diameter Watermains over 300mm** **Non-Standard Special Provision – Vibration Monitoring**
CULTURAL ENVIRONMENT				
17.0 Built Heritage and Cultural Landscapes (Section 4.3)				
17.1	The potential cultural heritage value of the Booth Street and Rochester Street overpasses was assessed during Preliminary Design for the Highway 417 Midtown Bridges. There were no unique or significant features identified and the bridges were found not to warrant further assessment for heritage value or interest. No cultural heritage resources are located within the study area.	MTO MTCS	17.1.1	**N/A**

18.0 Archaeology (Section 4.3.1)				
18.1	No archaeological resources were found during Archaeological Assessments, however there is potential for impact to archaeological resources.	MTO MTCS	18.1.1	In the event that deeply buried archaeological deposits are discovered in the course of construction, the Ministry of Heritage, Sport, Tourism and Culture Industries (416-314-1177) should be notified immediately. Should previously undocumented archaeological resources be discovered, they may be new archaeological sites and therefore subject to Section 48 (1) of the *Ontario Heritage Act*. The proponent or person discovering the archaeological resources must cease alteration of the site immediately and engage a licensed consultant archaeologist to carry out a determination of their nature and significance. **MTO General Conditions of Contract**
			18.1.2	In the event that human remains are encountered during construction, the Cemeteries Regulation Unit of the Ministry of Consumer Service (1-800-889-9768) should be notified. In situations where human remains are associated with archaeological resources, the Ministry of Heritage, Sport, Tourism and Culture Industries should also be contacted to ensure that the site is not subject to unlicensed alterations which would be a contravention of the *Ontario Heritage Act*. **MTO General Conditions of Contract**

5 MONITORING

The Ministry of Transportation has an internal process to identify and address updates to the Ontario Provincial Standard Specifications (OPSS) and MTO Special Provisions. This includes on-going review of unanticipated events that occur during other construction contracts and incorporation of required updates into future contract provisions. This helps to assess the effectiveness of the contract provisions to ensure that they are providing the expected control and/or protection.

An independent on-site Contract Administrator (CA Consultant) is retained by MTO to ensure that construction proceeds as per the contract documentation, including environmental protection.

During construction, the on-site CA Consultant ensures that implementation of mitigating measures and key design features are consistent with the contract requirements. In addition, the effectiveness of the environmental impact mitigation measures is assessed to ensure that:

- Individual mitigation measures are providing the expected control and/or protection;
- Composite control and/or protection provided by the mitigation measures is adequate; and
- Additional mitigation measures are provided, as required, for any unanticipated environmental problems that may develop during construction.

In the event that problems develop, the CA Consultant is there to ensure that MTO and appropriate agencies are contacted.