

Ottawa Queensway Downtown Bridges Preliminary Design and Environmental Assessment Study for Rehabilitation/Replacement GWP 4170-13-00

Study Design FINAL



Revision 2: January 3, 2018

Revision History

Revision	Date	Description of Major Change
1	September 11, 2017	Section 5.0 Alternatives to the Undertaking – Planning Alternatives: provided clarification Figure 3: Broader Study Area amended
2	January 3, 2018	Finalize document

Table of Contents

1.0	Introduction	1
1.1	Study Areas	1
2.0	Need and Justification.....	4
2.1	Background Queensway Studies	4
2.2	Problem and Opportunity Statement.....	4
2.3	Queensway Downtown Bridges	4
3.0	Proposed Study Approach	9
3.1	Study Web Site	9
4.0	Proposed Study Process.....	11
4.1	Proposed Public Consultation.....	11
4.2	Proposed Municipal and Agency Consultation.....	11
4.3	Proposed External Agencies and Regulatory Agencies.....	12
4.4	Proposed Community Interest Groups.....	12
4.5	Proposed Utilities.....	13
4.6	Proposed Indigenous Peoples Consultation	14
5.0	Alternatives to the Undertaking – Planning Alternatives.....	16
6.0	Alternative Preliminary Design Methods and Proposed Evaluation Process.....	18
6.1	Alternative Methods	18
6.2	Proposed Evaluation Process.....	24
7.0	Proposed Work Program.....	26
8.0	Documentation	39
9.0	Identification of Formal Environmental Approvals and Bylaw Exemptions	40
10.0	Proposed Project Schedule.....	41

List of Figures

Figure 1: Project Location	2
Figure 2: Study Area	2
Figure 3: Broader Study Area	3
Figure 4: Provincial Class Group B Planning and Design Process.....	10
Figure 5: Typical Rigid Frame Bridge Façade Context Sensitive Design Concept (with Potential Transparent Noise Barrier Option)	19

Figure 6: Rideau Canal Replacement Alternatives	23
Figure 7: Potential Staging Areas for Metcalfe Street and Elgin Street Structures	34
Figure 8: Potential Staging Areas for Main Street Structures.....	35
Figure 9: Staged Sequential Works with Temporary Lane Reductions	36
Figure 10: Concept Detour Alternatives for Full Queensway Closure (Weekend)	37
Figure 11: Concept Detour Alternatives for Metcalfe Street On-Ramp and Off-Ramp Closure.....	37

List of Photos

Photo 1: Deterioration of Beam Girders and Piers	5
Photo 2: Metcalfe Street Overpass	6
Photo 3: Elgin Street Overpass.....	6
Photo 4: Main Street Overpass	7
Photo 5: Typical deck scarifying and local deck removal from additional deteriorated areas in advance of new overlay (Reference TAC Guide for Bridge Repair and Rehabilitation Nov 2006) 18	
Photo 6: Cornwall Bridge over Highway 401	20

List of Tables

Table 1: Proposed Preliminary Study Schedule Summary	41
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Glossary of Terms

1.0 Introduction

This Study Design Report is the initial public document for the Ministry of Transportation (MTO) Class Environmental Assessment for Provincial Transportation Facilities (MTO Class EA) for the rehabilitation or replacement of 7 bridges on the Queensway from Metcalfe Street easterly to Main Street. The 7 bridges include 4 locations at Metcalfe Street, Elgin Street, Rideau Canal (including crossings of Queen Elizabeth Drive and Colonel By Drive) and Main Street. The Study Design Report presents: the proposed problem and opportunity statement; a blueprint of the proposed Work Plan and Study Process for the pending transportation project to meet the requirements of the Ontario and Canadian Environmental Assessment Acts; proposed alternatives to the undertaking; proposed alternative methods and the proposed evaluation process; proposed public, agency and indigenous peoples consultation; and proposed documentation and post study steps. The report outlines the key activities required to complete the study and the EA preliminary planning and design process.

The draft Study Design will be circulated at the initiation of the study to various agencies, and will be presented to the study's Municipal Technical Advisory Committee (MTAC), Federal Advisory Committee (FAC) and the general public by posting the document on the study's website and at the first Public Information Centre (PIC). The early distribution of this draft report is intended to solicit early input on the planning process. Following the first PIC, the draft Study Design will be finalized and posted on the study website.

This Study will be completed as a Group B project by the MTO Eastern Region under the MTO Class EA. The final documentation of the Environmental Assessment will be a Transportation Environmental Study Report (TESR).

Included in this document is a Consultation program for obtaining input from potentially interested and affected persons during the planning of this project. Consultation is used to identify interested persons, government agencies, and Indigenous Peoples groups, and establishes how they can be engaged in the project. The Consultation program is a process by which stakeholders can be identified early in the decision-making process.

1.1 Study Areas

Initiated by MTO in April 2017, this project involves an MTO EA and preliminary design for the rehabilitation/replacement of 7 structures at 4 sites on the Ottawa Queensway within the urban core of the City of Ottawa. The project location is illustrated in **Figure 1**. The Study Area and bridge sites along Highway 417 (Ottawa Queensway) extend from Metcalfe Street to Main Street and are illustrated on **Figure 2**.

The study area has been divided to allow for three levels of analysis. The "Broader Study Area" includes the geographic area of the City where temporary short term offsite detour routes are being considered for freeway closures. **Figure 3** illustrates the Broader Study Area. The

“Immediate Study Area” will include a focus on the Queensway Corridor generally within or adjacent to the MTO right-of-way that will include the bridge alternatives and staging areas for alternative construction staging sites. The “Local Study Areas” will focus on the bridges at each individual site location. **Figure 2** illustrates the Immediate Study Area as well as the Local Study Areas.

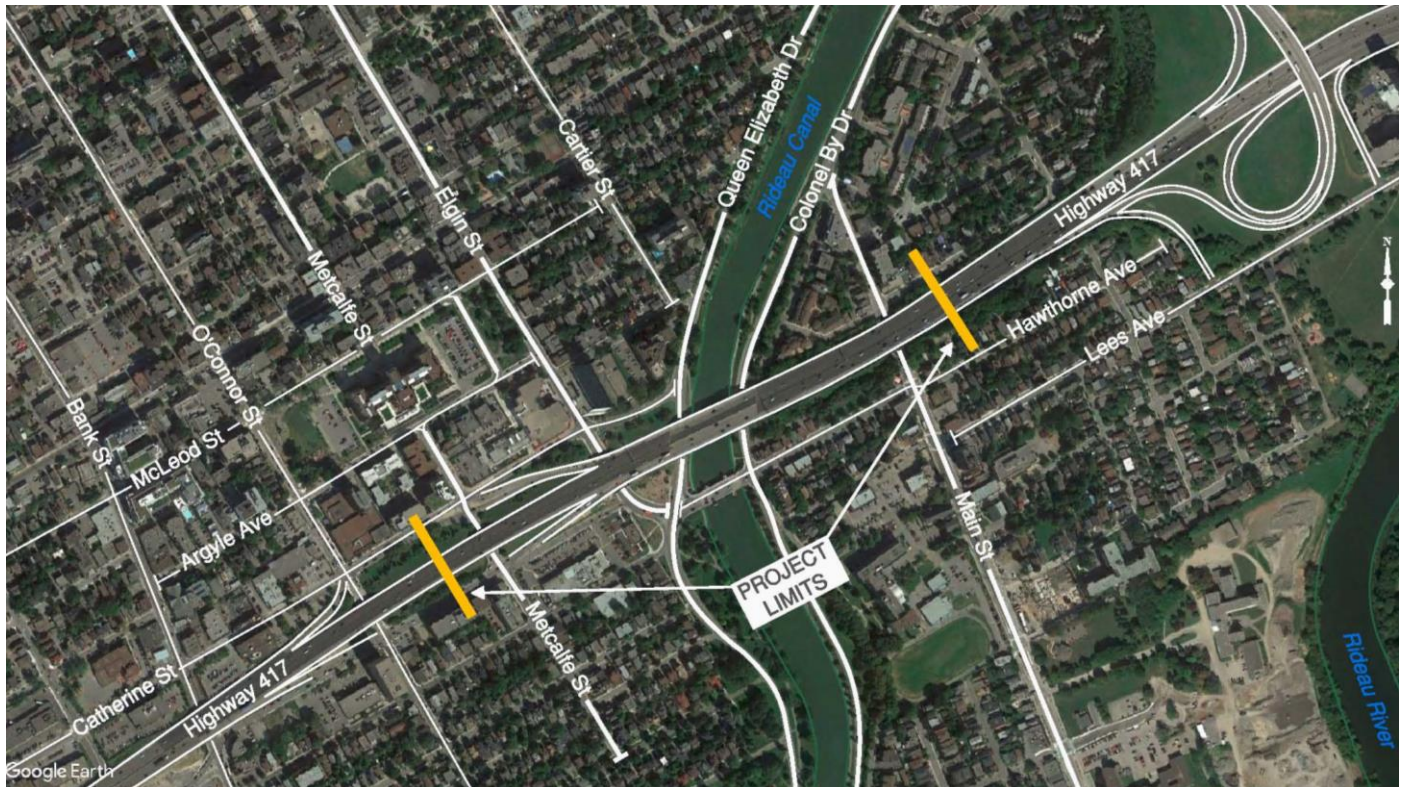


Figure 1: Project Location

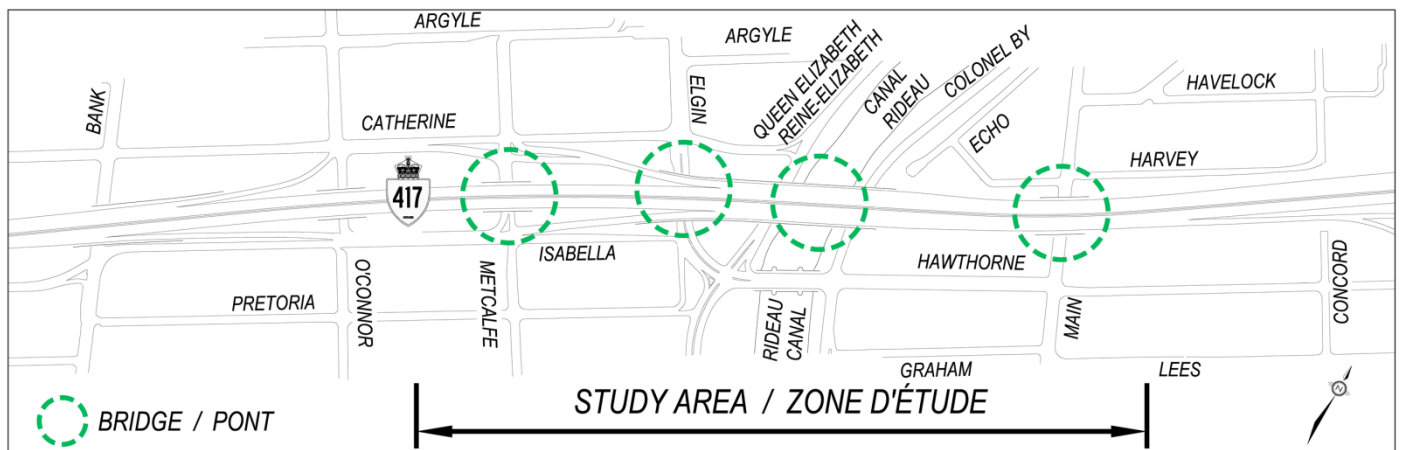


Figure 2: Study Area

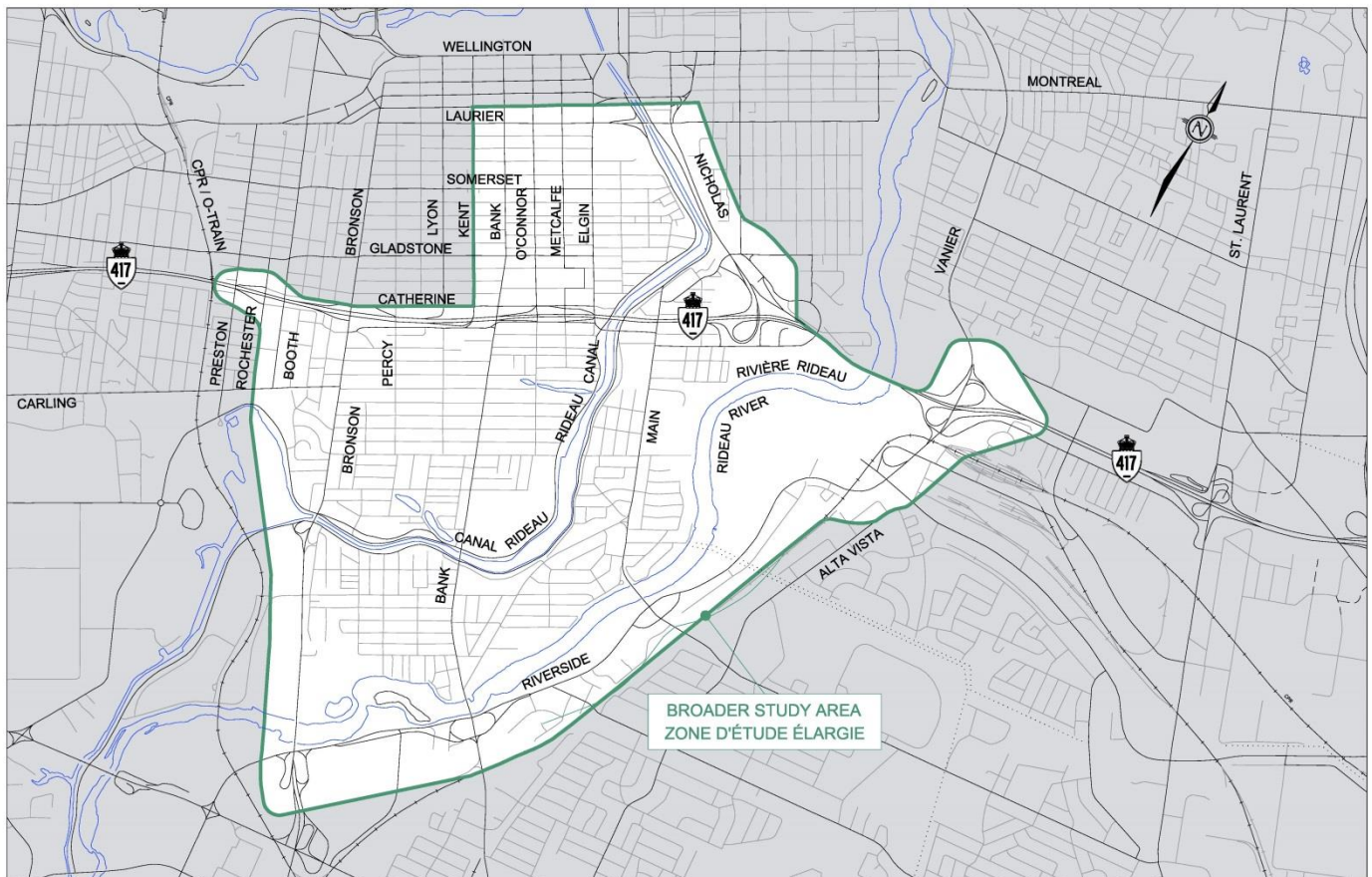


Figure 3: Broader Study Area

2.0 Need and Justification

2.1 Background Queensway Studies

Other studies that have been completed and their relevance to this study include:

- 2007: Highway 417 (Ottawa Queensway) from Highway 416 easterly to Anderson Road Environmental Assessment and Preliminary Design Study (GWP 663-930-00) – this EA defined the long term vision for the Queensway improvements including widening of the freeway for operational and safety improvements. As the “planning” phase of the Queensway corridor, this study did not discuss site-specific bridge management plans.
- 2016: Ottawa Queensway Mid-town Bridges from Holland Avenue to O’Connor Street, Environmental Assessment and Preliminary Design Study (GWP 4075-11-00) – this EA defined bridge management plans for rehabilitation and replacement projects to the west of the current study area. The current EA is now reviewing the structural bridge management plans required for the next 7 structures adjacent to the Midtown bridges project.

2.2 Problem and Opportunity Statement

Problem:

The seven (7) Ottawa Queensway Downtown bridges date from the original Queensway construction from 1959 to 1968. The Queensway Rideau Canal Bridge is nearing the end of its service life. Unlike the 23 Mid-town bridges to the west, these bridges do not have individual or coordinated bridge management plans for rehabilitation or replacement to ensure the continued safe operation of the highway for the future planning horizon.

Opportunity:

- Establish bridge management plans for the 7 Queensway bridges from Main Street to Metcalfe Street, continuing the MTO program of establishing bridge management plans from west to east along the Queensway.
- Coordinate the bridge management plans for the 7 bridges based on design, traffic staging and construction considerations.

2.3 Queensway Downtown Bridges

The Ottawa Queensway (Highway 417) plays a major role in connecting the western, central and eastern Ottawa regions. With over 163,000 vehicles passing through this section of highway per day, the bridges under consideration in the Study are key components of MTO’s traffic infrastructure. Therefore, the reliability and safety of these structures are of paramount importance to the travelling public. Over the past several years investigations conducted by the MTO have identified continued deterioration of the structures resulting in the need to identify future bridge management plans. The bridge management plans may be either rehabilitation or replacement projects for the bridges.

The Rideau Canal Bridge, which spans over Queen Elizabeth Drive, the Rideau Canal and Colonel By Drive, has been identified by the MTO Structural Section as a candidate for structure replacement. Constructed in 1963 and having undergone a rehabilitation program in 1985, the structure is approaching the end of its service life (see **Photo 1**). Inspections completed in May of 2016, using the Ontario Bridge Management System (OBMS), Ontario Structure Inspection Manual, indicated that both the Queensway eastbound and westbound Rideau Canal structures require remedial works.



Photo 1: Deterioration of Beam Girders and Piers

The Metcalfe Street overpass (**Photo 2**) was initially built in 1965 and has undergone one major and two minor rehabilitations since 1985.



Photo 2: Metcalfe Street Overpass

The Elgin Street Overpass (**Photo 3**) consists of two structures. The eastbound structure was built in 1965 and the westbound in 1963. The two structures were rehabilitated in 1985 and again in 1999. In 2017 repairs were made to the barrier walls and fascia.



Photo 3: Elgin Street Overpass

The Main Street Overpass (**Photo 4**) consists of two structures. The eastbound lane structure was built in 1963, and the westbound in 1959. Both structures were included in Contract 85-64 which completed major rehabilitation on the two structures. The aging bridges were subject to recent inspections that identified the need for replacement.



Photo 4: Main Street Overpass

Key Study Issues/Opportunities

Key issues/opportunities which the study will resolve include:

1. Traffic management of the Ottawa Queensway during any rehabilitation or replacement project to minimize travel delays.
2. The Rideau Canal is a UNESCO World Heritage Site and any project must protect the cultural heritage canal infrastructure. A context sensitive design solution may be considered subject to input from the cultural heritage assessment, bridge design alternatives and agency and public input.
3. Pedestrian and cycling travel through the corridor.
4. Accommodating active modes of transportation along the canal including pedestrians, skating and cyclists.
5. Requirements for construction lay-down areas.

6. Potential business disruptions from short term road closures and lane reductions for construction.
7. Fisheries impacts
8. Duration of construction
9. Rideau Canal bridge aesthetics
10. Lighting

The study will document the up-to-date need and justification for the bridge project(s), the structural management plan for the 7 bridges and define the implementation plan for construction including mitigation plans for all temporary works. These works may be planned as successive projects ranging from initial holding strategies to rehabilitation to ultimate replacement of the bridges; or proceeding directly to short term replacement projects where structural evaluations and condition surveys recommend this action.

3.0 Proposed Study Approach

The rehabilitation/replacement of these 7 structures will follow the Environmental Assessment process for Group 'B' projects as outlined in the MTO Class EA. This Study Design was circulated to external agencies and was posted on the study web site at the study initiation. The Study Design presents an initial description of the problem, design alternatives to be considered and the environmental work program. This approach provides early input from agencies and the public, and can allow agencies to comment on the process and technical work programs at the Study initiation. This document will continue to be described as a draft report, being updated and amended as comments are received by the public and agencies. It will be finalized after PIC No. 1 and posted as final on the study's web site.

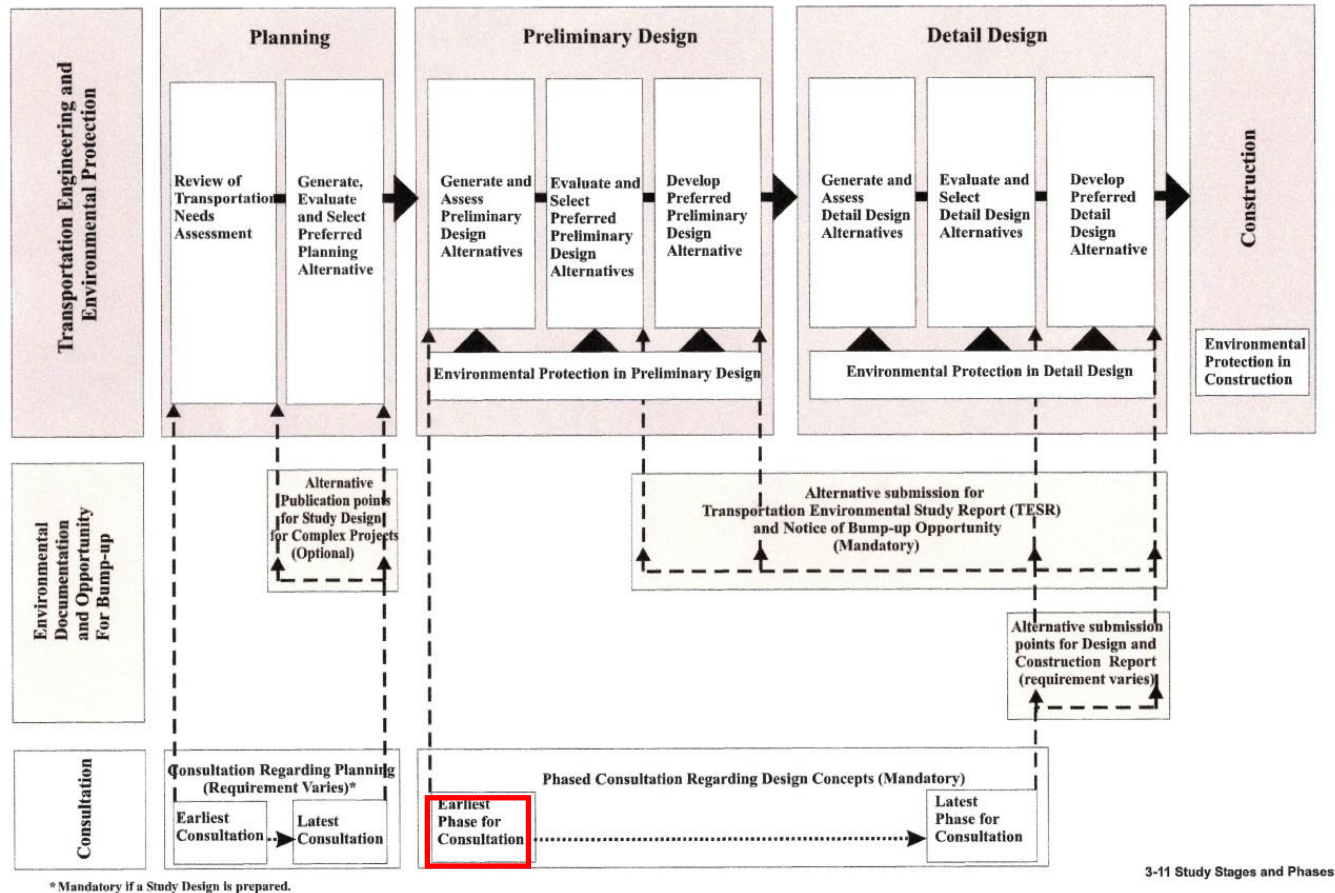
The Planning and Design Process for a Provincial Class EA Group B project is illustrated in detail in **Figure 4**.

3.1 Study Web Site

The EA study will include the use of a web site to post information and allow the public to monitor the study progress. The Web site is: **www.queenswaydowntownbridges.com**. This tool will be used to post the Draft Study Design, collect comments and post the final Study Design Report.

Figure 4: Provincial Class Group B Planning and Design Process

Overview Of Class EA Process For Group B Projects



4.0 Proposed Study Process

4.1 Proposed Public Consultation

The proposed public consultation process will allow an opportunity to involve all potential stakeholders. This will include, but is not necessarily limited to the public, private property owners, businesses and interest groups. It is essential that there be involvement and interaction with regulatory agencies.

Study commencement flyers were hand delivered to every property within the Immediate Study Area, to inform the public of the study and provide contact information. A contact list has been created to keep interested property owners informed of each subsequent stage of the study.

Formal public consultation in the form of 2 Public Information Centres (PICs) will be carried out at a local and accessible location. Bilingual staff will be present at both PICs.

The consultation program includes regular Project Web Site updates, including selected PIC materials and Frequently Asked Questions (FAQs) that will be updated as required to respond to study developments and emerging issues or concerns.

With respect to public involvement, the work program proposes the following key elements:

- Study Commencement Notice, PIC notices and TESR Submission Notice in local papers and mailed to agencies, Indigenous Peoples and Utilities
- Posting the draft Study Design online on the study website
- Maintaining and updating a study mailing list
- PIC No. 1 will present the project goals, problem and opportunity statement, draft Study Design (Work Plan), assessment of Alternative Planning Solutions, environmental inventories, traffic analysis, assessment of Alternative Planning Solutions, design criteria for roads and structure under study, preliminary coarse screening of Design Alternatives (alignment, cross section and structure types) and seek public/agency input. A session will be scheduled to present information to agencies and elected officials in advance of the public.
- PIC No. 2 will present the evaluation of alternatives and a Technically Preferred Plan for each bridge site and seek public/agency input. A session will be scheduled to present information to agencies and elected officials in advance of the public.

4.2 Proposed Municipal and Agency Consultation

Municipal and Federal consultation will be maintained during the study through a MTAC and a FAC. Meetings will be held at key milestones. Municipal participation will include as a minimum City of Ottawa departments and Ottawa Police. Federal participation will include as a minimum Parks Canada and the National Capital Commission (NCC).

4.3 Proposed External Agencies and Regulatory Agencies

The following agencies will be kept on a study mailing list, which will be updated and maintained throughout the study:

- Ministry of Aboriginal Affairs, Aboriginal Relations and Ministry Partnerships Division
- Ministry of the Environment and Climate Change (Eastern Region)
- Ministry of Environment and Climate Change (MOECC)
- Ministry of Agriculture and Food
- Ontario Ministry of Tourism, Culture and Sport, Heritage Operations Unit
- Ministry of Natural Resources and Forestry
- Ministry of Tourism, Culture and Sport
- Ministry of Economic Development and Innovation, Ottawa Office
- Ministry of Municipal Affairs – Eastern Region
- Ministry of Community and Social Services – Eastern Region
- Rideau Valley Conservation Authority
- Ontario Provincial Police (Ottawa Detachment)
- City of Ottawa
- Ottawa-Carleton District School Board and Catholic School Board
- Conseil Des Ecoles Publiques De L'Est De L'Ontario
- Conseil Des Ecoles Catholiques De Langue Francaise Du Centre Est -Consortium de transport scolaire d'Ottawa

4.4 Proposed Community Interest Groups

The following community interest groups will be kept on a study mailing list, which will be updated and maintained throughout the study:

- Ottawa Chamber of Commerce
- Ottawa Tourism
- Invest Ottawa
- Ontario Trucking Association
- CAA Ontario
- Ontario East Economic Development Commission
- Transport Action Ontario
- Ottawa Real Estate Board
- Action Sandy Hill
- Bank Street BIA

- Centretown Citizens' Community Association
- Citizens for Safe Cycling
- City Centre Coalition
- Community Activities Group of Old Ottawa East
- Dalhousie Community Association
- Dow's Lake Residents' Association
- Downtown Rideau BIA
- Ecology Ottawa
- Federation of Citizens' Associations of Ottawa-Carleton
- Glebe Annex Community Association
- Glebe BIA
- Glebe Community Association
- Glebe Report
- Lowertown Community Association
- Mainstreeter
- Old Ottawa South Community Association
- Ottawa Bicycle Club
- Ottawa Children's Garden
- Ottawa East Community Association
- Ottawa Riverkeeper
- Preston Street BIA
- Rideau River Residence Association
- Somerset Street Chinatown BIA
- Somerset Village BIA
- Sustainable Living Ottawa East
- The Centretown BUZZ
- Walk Ottawa

4.5 Proposed Utilities

- Allstream
- Atria Networks
- Bell
- Bell (360 Networks)
- Enbridge Gas Distribution

- Hydro One Distribution
- Hydro One Transmission
- Hydro Ottawa
- P2P Fibre
- Rogers
- Telus
- Videotron
- City of Ottawa, UCC Central Registry
- CP Rail
- Capital Railway (O-Train)

4.6 Proposed Indigenous Peoples Consultation

Governments (and the private sector) have a constitutional duty to consult aboriginal groups. Consultation will be initiated (through MTO staff) at the beginning of the project, and Indigenous Peoples interests will be carefully addressed as part of the consultation program. We propose this will include provision of the initial Study Design and offers to meet during the study. This study will include liaison with Ministry of Indigenous Relations and Reconciliation and Indigenous and Northern Affairs Canada in identifying the Indigenous Peoples that require notification and involvement. As starting point this study will initially consult with the following:

- Aboriginal Affairs and Northern Development Canada, Gatineau, ON
- Ministry of Aboriginal Affairs, Toronto, ON
- Algonquins of Pikwàkanagàn, Golden Lake, ON
- Algonquins of Ontario Consultation Office, Pembroke, ON
- Kinouchepinini Algonquin First Nation, Petawawa, ON
- Kijicho Manito Madaouskarin – Anishinaabe Baptiste, Maynooth, ON
- Bonnechere Algonquins First Nation, Renfrew, ON
- Algonquins of Greater Golden Lake First Nation, Killaloe, ON
- Mattawa / North Bay Algonquin First Nation, Mattawa, ON
- Ottawa, Wendover, ON
- Shabot Obaadiwan First Nation, Sharbot Lake, ON
- Snimikobi Algonquin First Nation, Eganville, ON
- Whitney and Area Algonquin Community, Whitney, ON
- Chippewas of Georgina Island, Sutton West, ON
- Mississaugas of the New Credit First Nation, Hagersville, ON
- Mississaugas of Scugog Island First Nation, Port Perry, ON

- Beausoleil First Nation, Christian Island, ON
- Alderville First Nation, Alderville, ON
- Hiawatha First Nation, Hiawatha, ON
- Curve Lake First Nation, Barrie, ON
- Moose Deer Point First Nation, Mactier, ON
- Ottawa Region Métis Council, Ottawa, ON
- Mohawk Council of Akwesasne, Cornwall, ON
- Métis Nation of Ontario, Ottawa, ON

5.0 Alternatives to the Undertaking – Planning Alternatives

Alternatives to the Undertaking represent alternative ways or methods of addressing the Problem / Opportunity Statement specific to this study. In this study, the focus is on four bridge locations. These reflect different strategies and include the “Do Nothing” approach (maintaining the status quo but not addressing the Problem / Opportunity Statement).

Following the assessment of Alternatives to the Undertaking, those alternatives judged to address the Problem / Opportunity Statement will be carried forward and will form the Recommended Planning Solution or “Transportation Undertaking”. The selected “Transportation Undertaking” will be deemed to address the Problem / Opportunity Statement required to plan for the safety of the travelling public on these bridges and provide a cost effective bridge management plan, while providing the best overall balance between the structural and transportation engineering objectives, life cycle costs, and other environmental, cultural, socio-economic, and land use planning objectives.

In developing “Preliminary Design” Alternative Planning Solutions (Alternatives to the Undertaking), a number of general principles and objectives are being considered, that take into consideration the location, type and number of bridge sites. These include:

- Satisfy existing code requirements of the bridges;
- Provide for the efficient movement of people and goods during the staging of the projects by minimizing or avoiding long term multi-lane closures on the Queensway;
- Ensure the safety of the travelling public;
- Ensure the technical feasibility of construction, operation and maintenance;
- Minimize the environmental impacts and the use of non-renewable natural resources such as aggregates;
- Minimize the number of disruptions to the travelling public by grouping of projects together in order that they occur in the same time period; and
- Consider the linkage of the communities divided by the Queensway and context sensitive design solutions that may improve the aesthetics of these bridges as viewed from the streets and avenues.

It should be noted that the assessment of broader transportation strategies, such as mass transit initiatives or other transportation modes, are more appropriately considered for larger network links in the overall provincial transportation system and were considered in the 2007 EA Study: G.W.P. Highway 417 (Ottawa Queensway) from Highway 416 to Anderson Road. This Study evaluated 10 Alternatives to the Undertaking and recommended three: do nothing; improve existing highway with strategic widening and intersection modifications; and implement transportation demand management and advanced traffic management systems for the 28 km. long Queensway corridor. They are not considered applicable for bridge management studies such as: the 2016 EA Study G.W.P. 4075-11-00 Rehabilitation/ Replacement of Ottawa Mid-town Bridges from Holland Avenue to O’Connor Street and the 23 bridges at 13 locations; and this study with 7 bridges at 4 locations.

The following feasible and cost/effective Preliminary Design Alternatives to the Undertaking were identified:

Alternative 1: The “Do Nothing” Alternative maintains the status quo of the existing bridges with no significant actions taken to manage aging infrastructure. This approach would accept further deterioration within the 20 year planning horizon.

Alternative 2: In accordance with the MTO Class EA, the Alternative would be new and / or improved (rehabilitated) Provincial Transportation Facilities. Since the bridge sites already exist, the Alternative could be simply referred to as “Management of Bridge Infrastructure”.

Alternative 2a: Rehabilitate the existing bridges to extend their service lives including structural upgrades to meet existing seismic code requirements.

Alternative 2b: Replace the existing bridges with new structure(s).

The identified opportunities for enhanced safety and aesthetics through context sensitive design are important aspects of the project that will be considered as part of the criteria used for the evaluation of the above Alternatives to the Undertaking and through the subsequent evaluation of Alternative Methods (or Preliminary Design Alternatives). Similarly the opportunity to maintain / improve personal safety and security for users of the multi-use pathway along the Rideau Canal will be considered as part of the evaluation of the above Alternative Planning Solutions and through the subsequent evaluation of Alternative Methods.

6.0 Alternative Preliminary Design Methods and Proposed Evaluation Process

A long list of alternatives methods has been developed to address the Preliminary Design Alternatives. The proposed list is described below.

6.1 Alternative Methods

Rigid Frame Rehabilitation Alternatives (Metcalfe, Elgin and Main Streets)

The rehabilitation alternative will focus on either conventional or rapid repair in areas of high deterioration as illustrated in **Photo 5**. The rehabilitation alternative can include new facades as part of the rehabilitation works as illustrated in **Figure 5**. Conventional rehab uses a staged construction approach with medium/long term lane closures while rapid rehab uses short term lane closures that may involve full lane closures.



Photo 5: Typical deck scarifying and local deck removal from additional deteriorated areas in advance of new overlay (Reference TAC Guide for Bridge Repair and Rehabilitation Nov 2006)

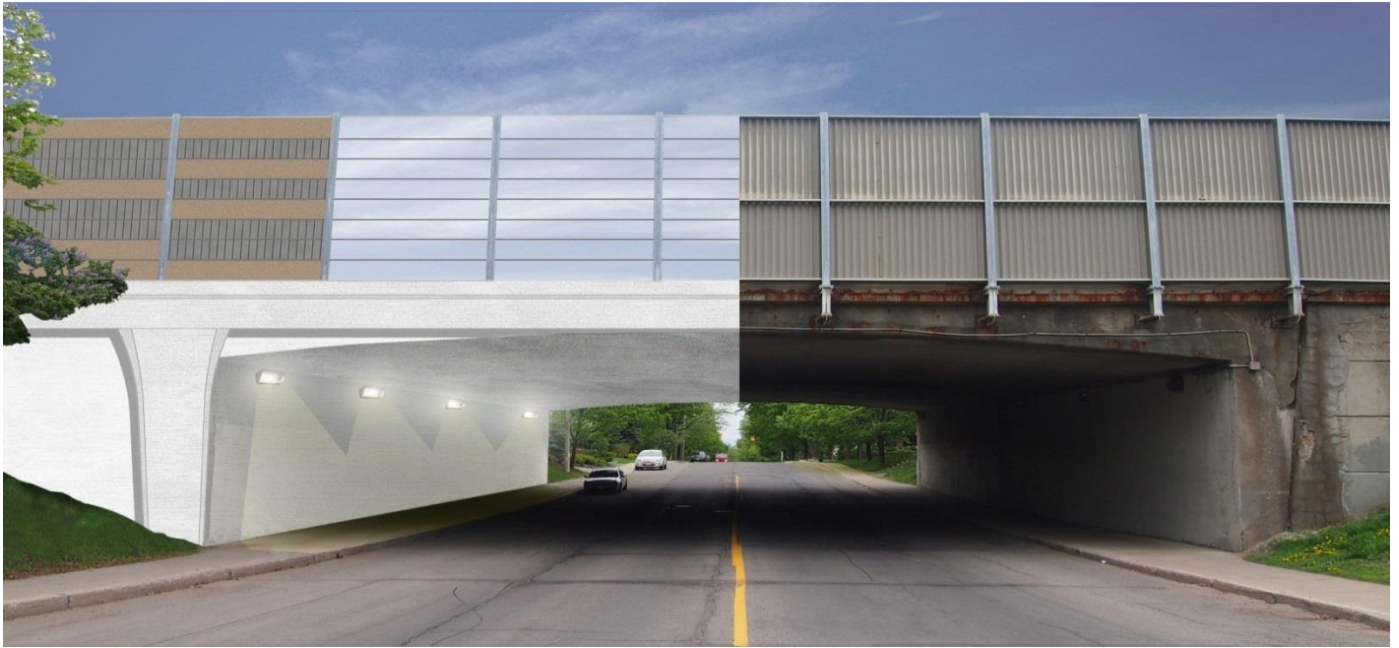


Figure 5: Typical Rigid Frame Bridge Façade Context Sensitive Design Concept (with Potential Transparent Noise Barrier Option)

Rigid Frame Replacement Alternatives

- Conventional staged replacement (constructed in place)
- Rapid replacement (new rigid frame constructed off-site and transported into place during short term highway closure)

See **Photo 6** illustrating rapid replacement transportation using Self Propelled Mobile Transporters (SPMT's) to transport the new bridge from an off-site bridge farm to the replacement location.



Photo 6: Cornwall Bridge over Highway 401

Rideau Canal Bridge Replacement Alternatives

Preliminary candidate replacement alternatives for the Rideau Canal Bridge include:

- Alternative A: Replacement Girder on Existing Piers
- Alternative B: Replacement Girder on New Piers with Re-aligned Canal Walls
- Alternative C: Extrados Concrete on New Piers with Re-aligned Canal Walls
- Alternative D: Replacement Girder Bridge on New Piers Behind Existing Concrete Canal Walls
- Alternative E: Single Span Replacement Structure

All replacement alternatives for the structures will consider reducing the negative visual intrusion of the existing structure. The possible restoration of the original Rideau Canal wall alignment (the walls were historically relocated outward to their current locations) in combination with repositioning of the piers behind the canal wall will be considered. Structure types to be considered for the three span alternative include steel box girder (haunched or prismatic), concrete girder and extrados concrete box girder. Single span alternatives, spanning the full crossing including adjacent roadways, include vertical and basketweave tied-arch structures. Additional replacement alternatives may be added during the assessment of the study as appropriate. **Figure 6 to Figure 10** illustrate the proposed structural replacement alternatives for the Rideau Canal.

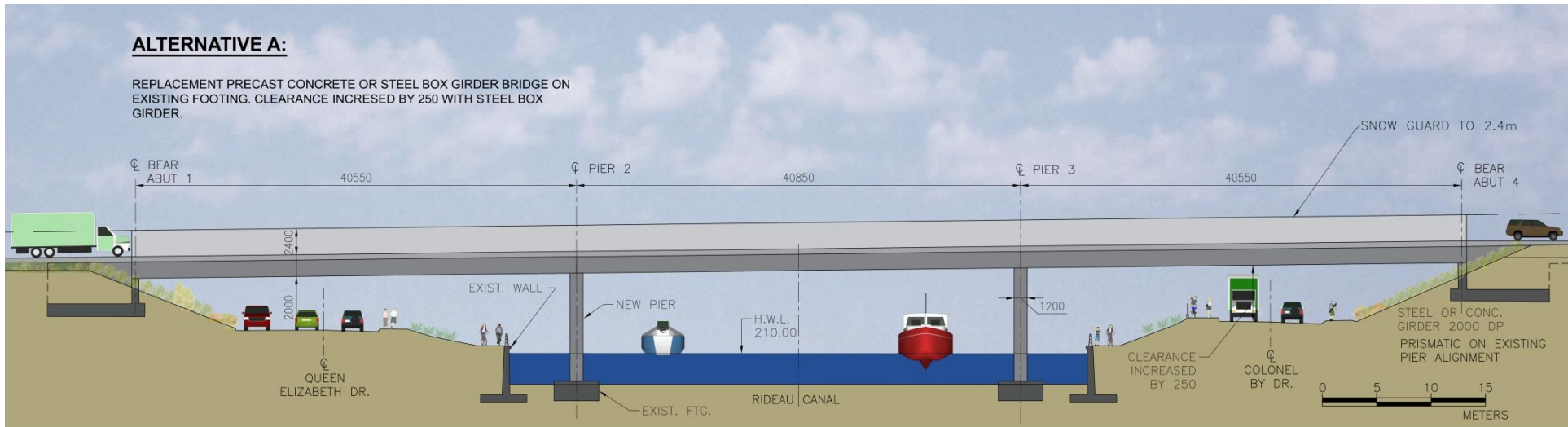


Figure 6: Rideau Canal Replacement Alternative A

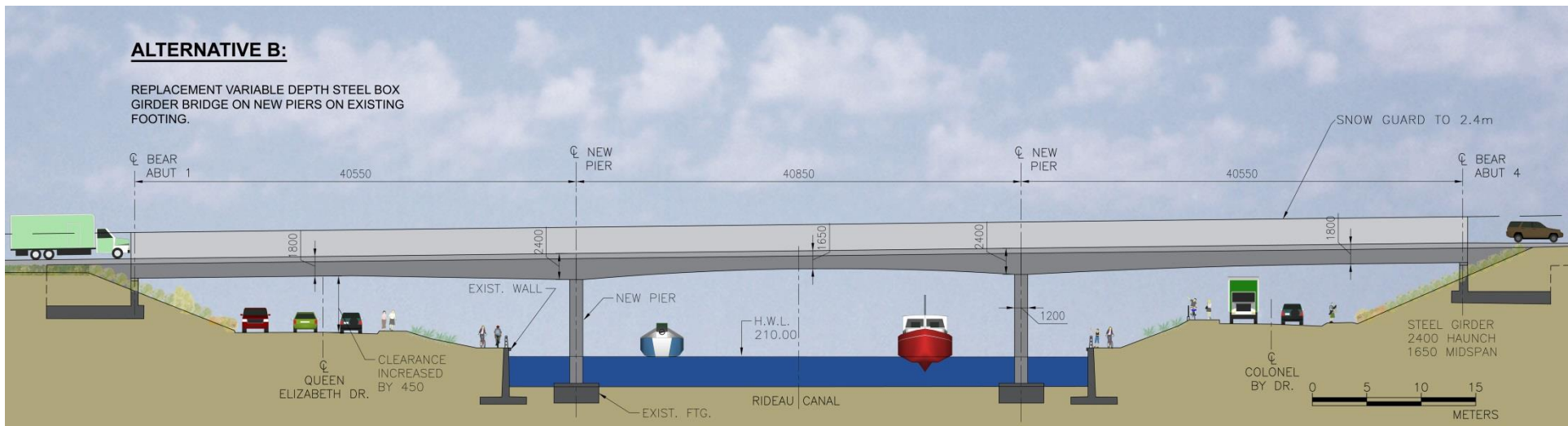


Figure 7: Rideau Canal Replacement Alternative B

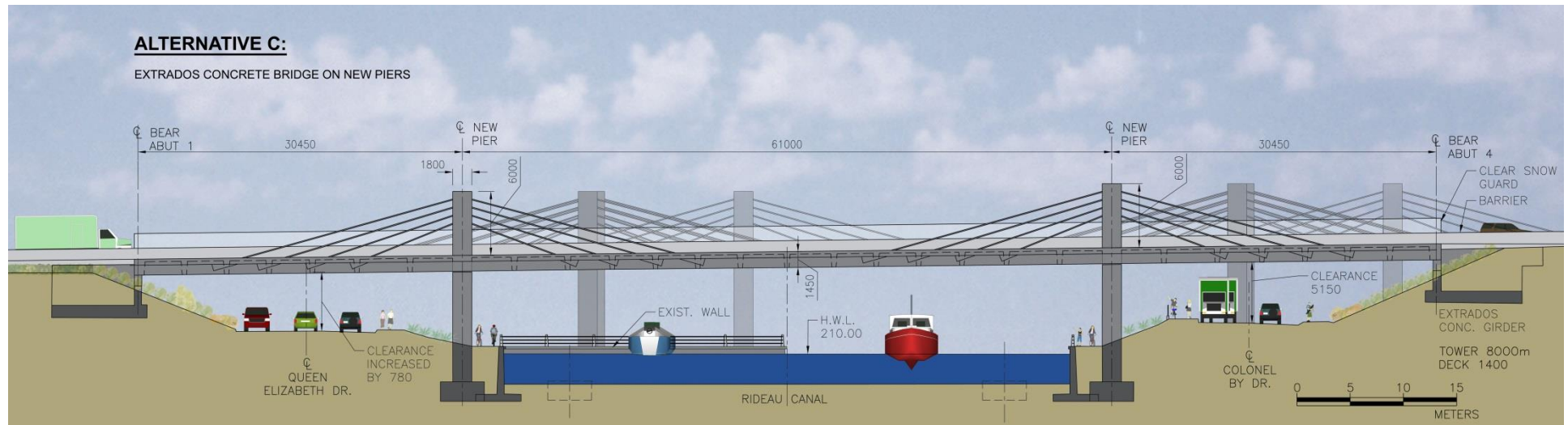


Figure 8: Rideau Canal Replacement Alternative C

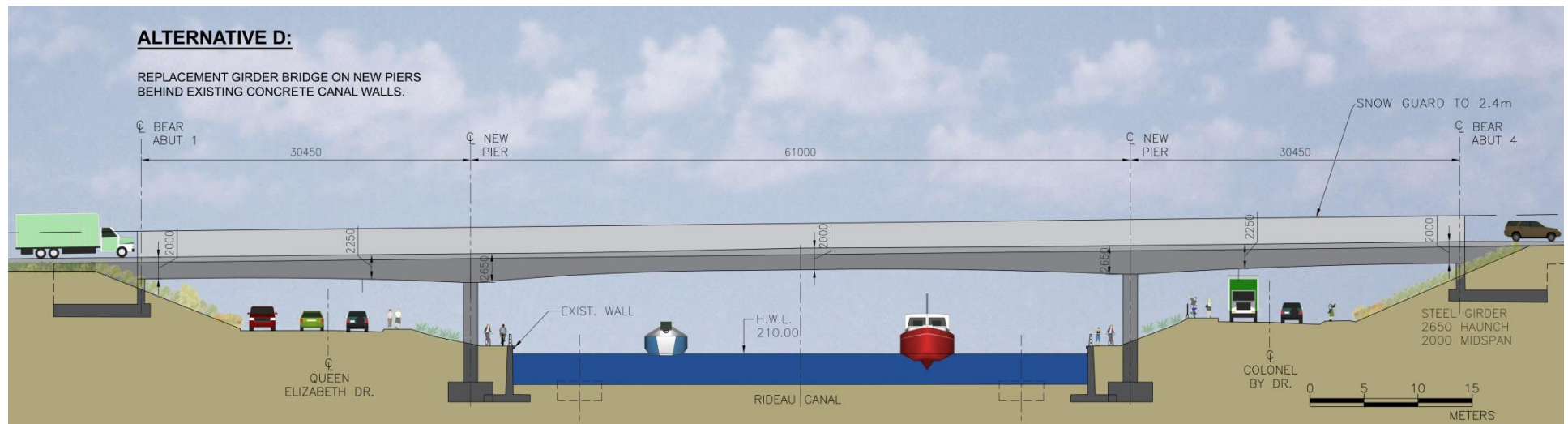


Figure 9: Rideau Canal Replacement Alternative D

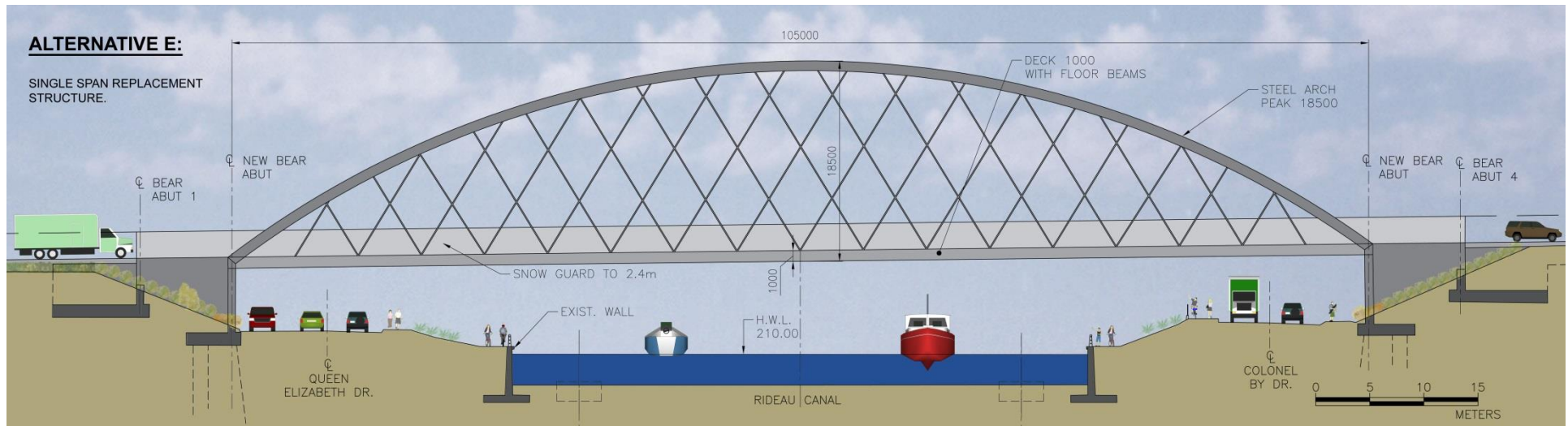


Figure 10: Rideau Canal Replacement Alternative E

6.2 Proposed Evaluation Process

For the evaluation of preliminary design alternatives, the study will utilize a formal quantitative evaluation methodology described as the Multi Attribute Trade-off System (MATS). The use of this multi-criteria decision analysis involves scoring each alternative on each criterion and then combining the scores using a system of weights to yield an overall ranking of each option.

The evaluation approach is based on the MATS methodology which focuses on the differences between the alternatives, addresses the complexity of the base data collected and provides a traceable decision-making process. In addition, the method allows sensitivity tests to be performed because of the matrix configuration of the assessment and the use of numerical scores to measure the impact of the alternatives. This approach is consistent with the MTO and MOECC practices for the complex evaluation of alternatives. Using the MATS methodology, overall scores are assigned to each alternative and the option with the highest score is selected as the technically preferred alternative. This approach allows a rigorous comparison of the trade-offs of alternatives and traceability in the decision-making process.

The steps shown below will be undertaken to arrive at an overall score for each alternative.

- Development of Evaluation Criteria (coarse screening a long list of criteria to develop a short list of criteria to carry forward for evaluation). These factors and sub-factors are used to measure the differences between the alternatives.
- Public review (PIC No. 1)
- Development of definitions and utility functions for each sub-factor carried forward. (Data must be collected for each alternative under each sub-factor. Measurements for each alternative, under each sub-factor, are conducted using topographic plans, field surveys, numerical modelling etc.)
- Weighting of Criteria (assigning weights to each Factor and Sub-factor based on their importance to each team member's discipline or area of expertise)
- Rating Alternatives (based on Average Weights)
- Selection of Technically Preferred Alternative – Highest Ranked Alternative
- Sensitivity testing
- Public review (PIC No. 2), and
- Recommendations and presentation of a Recommended Plan.

This systematic approach is consistent with MOECC practices for the evaluation of numerous and complex alternatives. It avoids many of the pitfalls associated with qualitative assessments by using an analytical approach that measures scores based on a mathematical relationship, i.e. the degree of subjectivity by the evaluation team is minimized. This traceable process allows the

evaluation team and the public an opportunity to assess trade-offs involved in the evaluation and use of this information in the decision making process. Sample evaluation criteria include:

1. Global Evaluation Factors: Traffic and Transportation; Natural Environment; Social and Cultural Environment; Economic Environment; Land Use and Property; and Cost.
2. Local Evaluation Criteria (under global evaluation factors): Maximum peak queue length on the Queensway; temporary property impacts (during construction); loss of fish habitat; noise; built heritage resource impacts; emergency response; loss of parking; and capital cost.

7.0 Proposed Work Program

The major elements of the technical work program include the following:

Task 1: Project Start-Up

Upon initiation of the project, the Study will establish membership and meeting dates, and determine the role of the MTAC and FAC.

Task 2: Draft and Final Study Design

The Study Design Report is a document that describes, at the outset of the study, the intended approach to complete the EA assignment. The Study Design Report will help establish the foundation for all of the remaining environmental planning and public consultation processes. This draft document will be posted on the Study website at the outset of the study and sent to external agencies as a draft for public review and comment. The Study Design Consultation Plan allows the early identification of the major issues and concerns, and in addition, recognizes areas of consensus or agreement. The Study Design Report will be finalized following the first PIC.

Task 3: Information Gathering and Generation of Alternatives

The third task involves the collection and organization of the data necessary for the remaining analysis, evaluation and design activities. Activities will include:

- Assembly and preliminary review of study materials;
- Collection of background reports;
- Obtain digital mapping, photographs and associated drawings;
- Undertake the existing natural/social environmental inventories and technical investigations;
- Collection of traffic data (turning movements, ATR counts and signal timing) for the freeway, municipal and federal roads in the study area;
- Detailed bridge condition surveys of the existing bridges which will include a review of existing reports and new assessments completed as part of the study;
- Structural condition evaluations; and
- Foundation investigations

Task 4: Need and Justification

The need and justification for the necessary structural remedial action plan for the bridges will rely on updated bridge condition surveys, inspections of the existing structures and structural evaluations to determine deficiencies for repair and/or structural replacement. An initial overview of the need and justification for the study is described in **Section 2.0**.

Task 5: Inventory of Natural, Social and Cultural Environments

Environmental Impact Study: Based on a review of existing background and field data collected and communications with review agencies such as Ministry of Natural Resources and Forests (MNR), the Study will document potential environmental sensitivities and issues relating to the natural sciences (fisheries, terrestrial, avian) resources of the study area (including nesting birds and species at risk), impacts to land use/community activities and events/recreation, traffic delays (on Highway 417 and crossing streets) considering all modes of travel, business impacts, construction noise, dust, erosion/sediment control, archaeology, potential site contamination, vegetation removal, etc. Following the collection of background and field data, analyses will be carried out for the study area. Specialists will verify the applicability and appropriate level of detail for factor specific analyses during the site investigation and inventory stage, determine the significance, and assess the impacts. The results of the environmental inventory/assessment work will be relevant environmental sensitivities, constraints, opportunities, and deficiencies, documented in Factor Specific reports which will be summarized in an Existing Conditions Map as part of the Summary of Existing Environmental Conditions Report.

Natural Sciences: A field investigation of existing environmental conditions will supplement secondary sources of information received from various sources including the Ministry of Natural Resources and Forestry, Kemptonville District. The study area is an urbanized location with no native areas remaining. The natural habitat review will include a reconnaissance screening of the terrestrial habitat and focus on the fisheries resources associated with the Rideau Canal. The natural science review of the study area will focus on areas of disturbance with regard to design alternatives and staging areas.

Field studies will be conducted during an appropriate season. Investigations will be consistent with the Environmental Reference for Highway Design (2009) and Environmental Standards and Practices (2006). Should terrestrial Species at Risk (SAR) be identified or encountered in the study areas, discussions will be held with the MNR District office to develop mitigation measures and to review the need for a potential Endangered Species Act (ESA) authorization. Terrestrial environment field investigations will document any potential risk of impacting SAR and/or their potential habitat. All activities (including field investigations) will comply with the *Endangered Species Act* and the environmental impacts will be assessed, avoided, or mitigated, and documented.

Fisheries investigations will be undertaken as per the current MNR/DFO/MTO Fish Protocol and will focus on the 120 m section of Rideau Canal within and immediately adjacent to the study area. A fish collection licence will be obtained from MNR. Field investigations will focus on collection of fish habitat and water quality data sufficient to determine the potential impacts of highway improvements.

Planning and Land Use Factors: An inventory of existing land uses within the Study Area will be undertaken in order to establish the opportunities and constraints that exist as a result of the built and recreational environment. This will include secondary source documentation for commercial and residential development, industrial, recreational, institutional and utility corridor land uses. The inventory will also include consideration and identification of future land uses such as development, right-of-way requirements and future transportation facilities. Candidate properties, such as those north and south of the Queensway, will be considered for use as Temporary Staging areas where rapid replacement bridges may be constructed prior to being moved into place.

City / NCC Pedestrian and Cycling Plans and routes will be reviewed considering the potential project impacts to several key pedestrian routes as well as the City cycling routes on Metcalfe and the Rideau Canal pathways. Key transit routes will be identified and reviewed with OC Transpo for potential disruptions during construction.

Site Contamination: A Contamination Overview Study (COS) will be conducted in accordance with Section 3.6.1 of the Environmental Reference for Highway Design (ERD) (MTO, October 2006) and the Environmental Guide for Contaminated Property Identification and Management (MTO, October 2006), during the bridge condition survey focusing on the 4 bridge sites. The purpose of the COS is to provide a general overview of the study area to identify properties/areas with the potential for site contamination including those being investigated for staging areas.

Hazardous Materials Investigation: Study specialists will investigate to determine the extent and location of these hazardous materials for each structure. The investigation will include sampling of asbestos, arsenic and lead paint during the structural investigation of the bridge, and generation of an inventory of potential PCB-containing electrical equipment. Samples for asbestos and lead will be analyzed by a certified laboratory. One report will be produced summarizing the extent and location of the asbestos, lead, and potential PCB-containing electrical equipment. Separate summary reports for each structure will be prepared.

Archaeology: A Stage 1 Archaeological Assessment will be completed for this project and will be restricted to areas outside the right-of-way that are anticipated to be directly impacted by construction operations (staging areas for bridge farms) and those areas impacted to provide access to the work areas. The archaeological portion of the environmental work plan will follow the 2009 Draft Standards and Guidelines for Consultant Archaeologists (MTCS) which represent “best practices” for conducting archaeological consulting in Ontario. The Stage 1 Archaeological Assessment (MCL 2009: Section 1) focuses on conducting background research on these extra areas outside the right-of-way of the project study area. The archaeological site potential of these areas will be determined by reviewing the previous Stage 1 Archaeological Assessment Ottawa Queensway Study (GWP663-93-00) and by reviewing background archaeological data developed since this Stage 1 Archaeological Assessment. A Stage 1 Archaeological Assessment report will

be prepared which will describe the results of all background research and the property inspection fieldwork conducted, and will contain all necessary photographic and cartographic documentation (MCL 2009: Section 7). The report will provide recommendations for a Stage 2 Archaeological Assessment, if necessary.

Noise: This review will assess the existing noise conditions and condition of the existing barriers and previous commitments under the MTO's retrofit program, in accordance with MTO EDR requirements, with the goal of maintaining all previous commitments for noise abatement to achieve the acoustic requirements as set out in the MTO Environmental Guide for Noise. The existing noise conditions will be presented at the first PIC with the preliminary design for any new noise barriers being presented at the second PIC. The study will be conducted according to the MTO Environmental Guide for Noise 2006, as updated in 2013.

Landscape Composition: The Landscape Composition investigation will focus on the Rideau Canal Structure and the treatments on the four corners of each bridge for all 4 sites and will be conducted in accordance with Section 3.9 of the ERD. Site visits will occur both during growing and dormant tree conditions to assess the visual characteristics of the existing corridor and its environs. A photographic record will be produced. A site assessment will be conducted in order to assess the site context, character and surrounding influences – as well as potential impacts to vegetation and opportunities for mitigation. The Project Landscape Architect will work closely with the Project Architect in assessing potential Context Sensitive Design Solutions for the work and will lead the preparation of landscape concepts and final landscape preliminary plans.

Cultural Heritage: The 7 bridges under this preliminary design assignment were constructed prior to 1965. MTO bridges built between 1945 and 1965 have been screened for heritage significance with the information documented in the Heritage Bridges Identification and Assessment Guide, Ontario 1945 – 1965. None of the 7 structures are included on the Candidate Bridge List A, B or C. No additional heritage work is required for the 7 bridges under this assignment. Therefore, the focus of the cultural heritage analysis will be to characterize the heritage Rideau Canal for inclusion in the development of alternatives for this bridge. This input is described in the following section.

Context Sensitive Design: The bridge sites will be assessed for a Context Sensitive Design (CSD) approach and features that support the municipal, provincial and federal objectives for the National Capital Region and local communities and follow the direction of the Ministry's latest Queensway Corridor CSD Concepts.

The Rideau Canal waterway extends 202 km linking the Ottawa River to Lake Ontario. Highway 417 (the Queensway) crosses it near the northern end in downtown Ottawa. The Canal is honoured with a number of distinctions: a National Historic Site, a Canadian Heritage River, and inscription as a UNESCO World Heritage Site. Through these designations, the corridor that

encompasses the Rideau Canal has been recognized as a cultural landscape of some significance. The Rideau Corridor Landscape Strategy (RCLS), Landscape Character Assessment & Planning and Management Recommendations is the guiding document when proposals for change within the landscape are assessed for the degree of landscape sensitivity, under cultural, natural and visual character categories.

This document and several others will be referenced by the CSD Team in its evaluations of the bridge site and proposed new bridge design alternatives. This evaluation will form part of the project CSD Report. Alternatives will consider a multi span bridge (trails using an end span) and a single span structure.

Source Water Protection: The environmental team will undertake this assessment in accordance with the requirements of the Ministry's EDR and relevant guidelines. The issues of recharge/discharge areas within and immediately adjacent to the right-of-way will be reviewed as they pertain to the presence of any known wells, the City of Ottawa and MTO storm water drainage systems and outlet locations, City of Ottawa potable water distribution system and the system's source at Lemieux Island in the Ottawa River, upriver from Chaudière Bridge. The results of this assessment will be documented in a factor-specific report.

Task 6: Technical Investigations

BRIDGE ENGINEERING

The general scope of work for Bridge Engineering includes:

- Review all available bridge drawings and reports. Perform all site investigations to support the design process and acquire sufficient data to facilitate selection of the preferred strategy;
- Verify by visual inspection and sounding, the condition of all exposed accessible substructure surfaces for delamination and spalling. An updated detailed condition survey of the deck will also be conducted by the project team to verify the present condition. The inspection information will be used to determine the rehabilitation / replacement strategy to ensure the desired service life;
- Determine clearance and geometries are in compliance with the Canadian Highway Bridge Design Code (CHBDC) and the Geometric Design Standards for Ontario Highways and clearance requirements at the canal crossing;
- Prepare Structural Site Investigation Reports, documenting the findings incorporating input from previously prepared condition surveys;
- Produce a technical memorandum with technical recommendations on the replacement and rehabilitation strategies for input in the Assessment of Alternatives to the Undertaking; Participate in the evaluation of alternatives using the MATS methodology producing a Structural Evaluation

Report that will form part of the Evaluation Report for the EA, assessing every major component's structural capacities;

- Complete a Seismic Evaluation for the Rideau Canal Bridge structures;
- Produce a Structural Design Report, presenting the structural design considerations, criteria, constraints, methods of evaluating alternatives, analysis the alternatives including the project scope / cost / schedule risk and the selection of the recommended rehabilitation or replacement method;
- Detail the use of accelerated bridge construction/rehabilitation methods including staging areas, primary and secondary closure periods and schedule impacts;
- Develop a holding strategy (short term emergency repairs and monitoring program) for structures that require an interim strategy until construction can be undertaken in the 6-10 year timeframe;
- Develop Context Sensitive Design for the prominent Rideau Canal structures commensurate with their location in a world heritage site, and appropriate treatment of the Metcalfe, Elgin and Main structures;
- Prepare structural rehabilitation or replacement preliminary design package, including draft General Arrangement drawings for new bridge(s) or major rehabilitation and text and costing for inclusion in the Preliminary Design Report (PDR); and
- Identify any ancillary structures and the existing utilities that will be impacted by the work.

ELECTRICAL ENGINEERING

The electrical scope of work for this project will include:

- Obtain existing available documentation from MTO for the six intersections and for all existing illumination within the study limits.
- Carry out a detailed inventory assessment of existing MTO, Municipal, Private and Utility illumination and electrical systems, power supplies, counting stations etc., and summarize findings in report. Identify ownership and condition of the equipment.
- Carry out a photometric analysis of the existing lighting system and identify conformance with current Ministry standards and policies.
- Establish preferred electrical engineering alternatives for the civil improvements and highlight specifics for high mast vs. conventional lighting.
- Recommend appropriate alternatives and identify removals, potential conflicts and constraints.
- Review traffic detours, staging and geometric improvements and identify requirements for temporary illumination. Maintain existing illumination intensity at all stages.

FOUNDATION ENGINEERING

The preliminary foundation investigations and desktop studies will consist of the following:

- A site reconnaissance and desktop study for each site, including a review of available geological and subsurface conditions, a review of the existing foundations based on design and/or as-built drawings, a review of any existing Foundation Reports to assess the type and performance of the existing foundations, and a review of any MTO maintenance records or issues for the structures.
- Preliminary foundation investigation and design for the widening/rehabilitation and/or replacement of the Rideau Canal structures.
- Desktop studies will be completed for the widening/rehabilitation or possible replacement of the Metcalfe, Elgin and Main Street Bridges.
- A review of temporary construction staging areas for potential Rapid Bridge/Deck replacement.

HIGHWAY ENGINEERING

The highway engineering activities will consist of the following activities:

- Liaison with the NCC, DFO, Transport Canada, DFO, Heritage Canada and Parks Canada for operational issues with respect to the Rideau Canal for the construction activities of the bridge replacement and navigability.
- Liaison with the City of Ottawa on future projects and operations and NCC to incorporate relevant information from other planned projects in the corridor.
- Document the existing conditions along the Queensway.
- Generate operational, safety and staging alternatives for replacement of the 7 structures considering conventional and rapid removal, and accelerated construction methods.
- Evaluate staging alternatives for the structure replacements, widening and rehabilitation works.
- Coordinate the City of Ottawa and Multi-use pathway, bike lanes, or sidewalk improvements across the Queensway (to meet new accessibility guidelines of TAC, NCC and the City of Ottawa).
- Prepare a composite utility relocation plan which is based on meetings with utility companies to ensure acceptance and costing of all proposed utility relocations.

TRAFFIC ENGINEERING

The traffic analysis will complete traffic engineering reviews of temporary traffic levels of service and delays associated with alternative staging plans for rehabilitation or replacement alternatives. The analysis will assess lane reductions, ramp closures for conventional or rapid rehabilitation or replacement, and full Queensway closures for rapid replacement bridge projects.

Task 7: Assessment of Planning Alternatives to the Undertaking

The evaluation of the bridge alternatives will be completed in a two-step process. The initial step (see **Section 5.0**) is to consider alternatives to the undertaking, which include:

- The “Do Nothing” Alternative
- Rehabilitation of the bridge
- Replacement of the bridge

A preliminary recommendation for public and agency review and comment is that the “Do Nothing” alternative is not recommended to be carried forward for this study based on the age and deterioration of the existing structures (see **Section 2.0**). Both rehabilitation and replacement alternatives are recommended to be carried forward to be investigated for each bridge site.

Task 8: Development, Analysis and Evaluation of Preliminary Design Alternatives

The rehabilitation and replacement alternatives for the bridges will be generated through discussions with MTO, the MTAC and FAC, agencies and the general public during the finalizing of the Study Design. The list will be confirmed with the public as required as part of the EA process, including the “Do Nothing” option. The preliminary design alternatives include the following separate groups of alternatives:

- 1) Rehabilitation alternatives;
- 2) Replacement alternatives;
- 3) Traffic Operations (detours); and
- 4) Staging Areas.

Rigid Frame (Metcalfe, Elgin & Main) Rehabilitation Alternatives may include:

- Lane by lane or full deck i.e. one stage overlay
- Overlay material including low shrinkage and latex modified concretes
- Waterproofing materials including Methyl Methacrylate waterproofing
- Timing of waterproofing application

Rigid Frame Replacement Alternatives may include:

- Deck only replacement with rehabilitation of the abutment walls
- Full replacement on the existing footings
- Full replacement with increased or decreased span and new foundations
- Bridge farm staging area location alternatives (see **Figure 11** and **Figure 12**).

Rideau Canal Replacement bridge type alternatives may include:

- three span concrete or steel girder type structures on existing piers
- three span steel box girder or extrados concrete bridges with repositioned piers

- Single span basketweave or vertical hanger arch

Rideau Canal Replacement Methodologies may include:

- Lateral sliding requiring temporary piers in the canal
- No long term freeway detours or disruption beyond the construction zone which is suitable for all structure types indicated
- Section by section replacement in place
- Gantry assist of the demolition and reconstruction process, suitable for all girder type replacement options requiring multi-stage traffic management which is also suitable for all structure options (see **Figure 13**)

Rideau Canal Pier Location Alternatives may include:

- Maintaining the current location with rebuilt or reinforced piers
- Placement of new piers behind the existing canal walls and paths
- Reconstructing the canal walls on their original alignment and positioning piers behind the path in the widened parkland

Traffic Management Alternatives will consider:

- Staged sequential works with temporary lane reductions on the Queensway, as illustrated in **Figure 13**
- Rapid replacement projects with full closures on the Queensway. Conceptual Queensway full closures are illustrated in **Figure 14** and **Figure 15**



Figure 11: Potential Staging Areas for Metcalfe Street and Elgin Street Structures

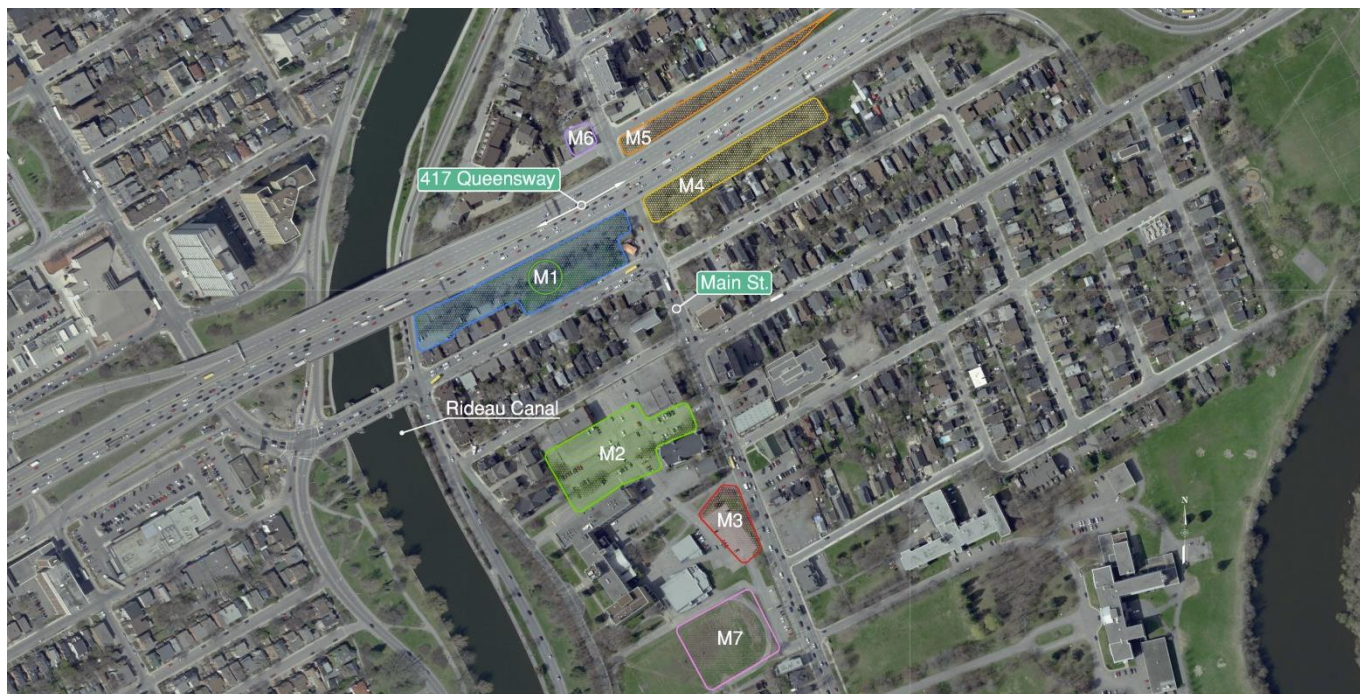


Figure 12: Potential Staging Areas for Main Street Structures

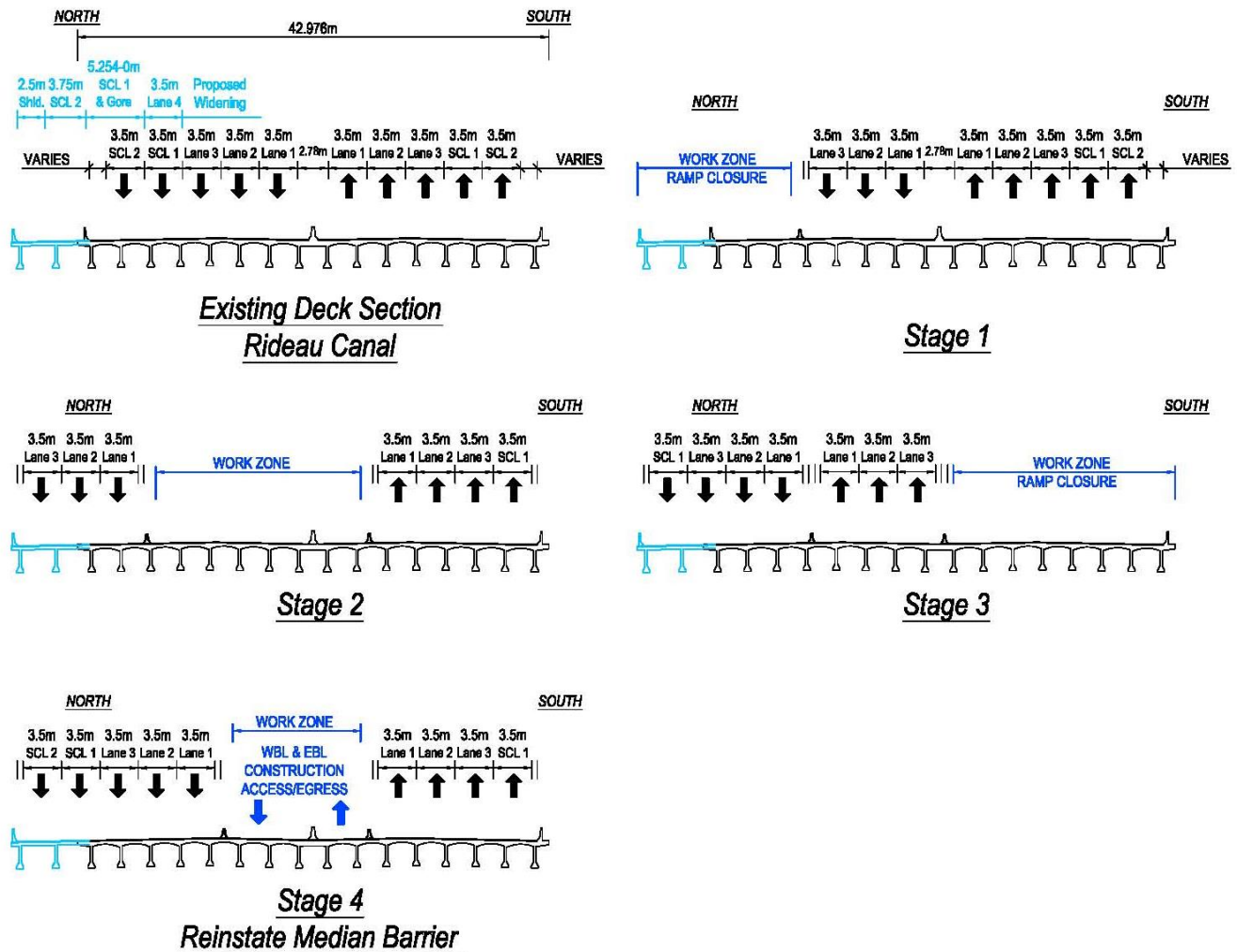


Figure 13: Staged Sequential Works with Temporary Lane Reductions

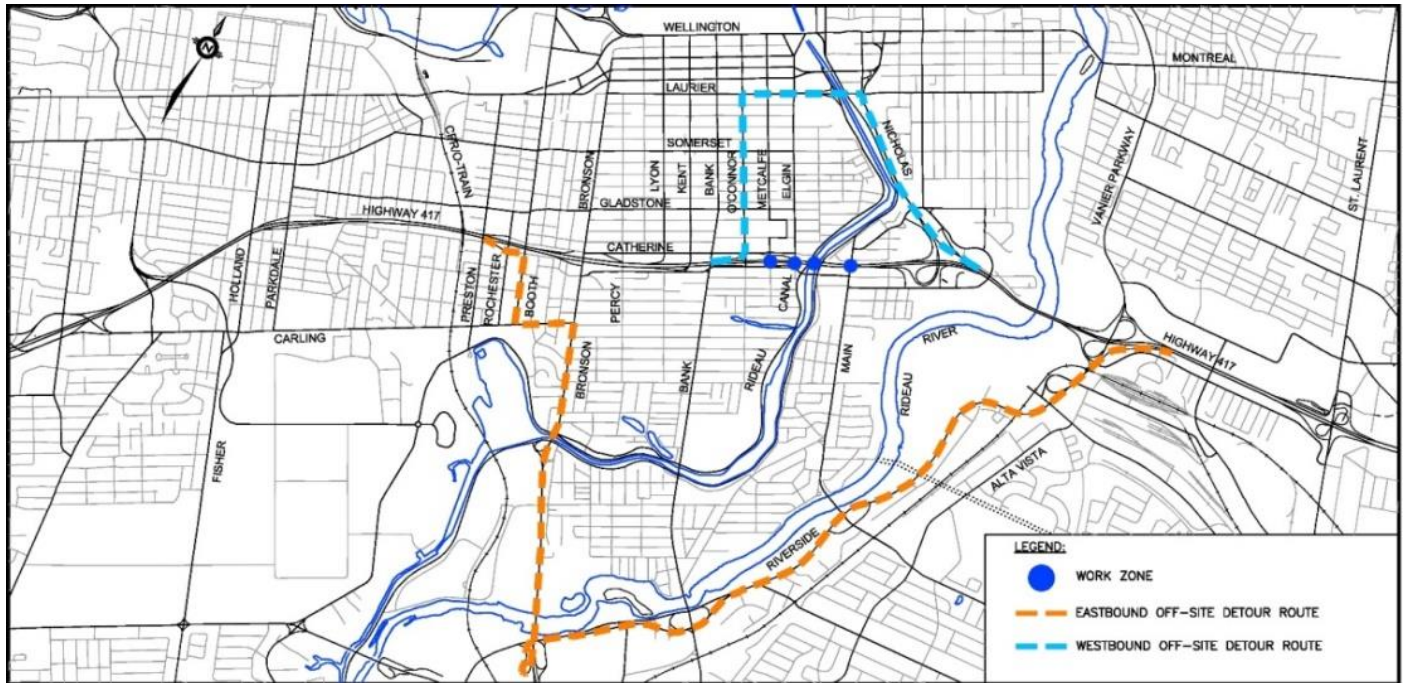


Figure 14: Concept Detour Alternatives for Full Queensway Closure (Weekend)

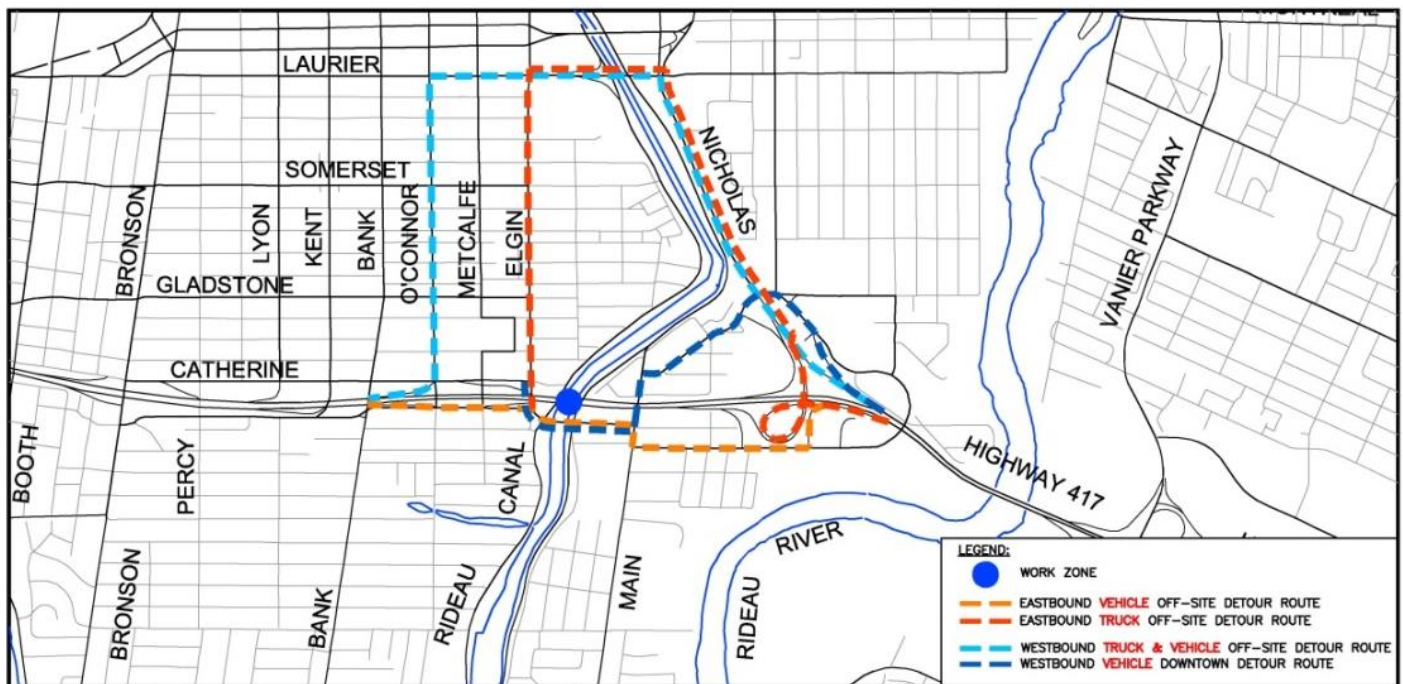


Figure 15: Concept Detour Alternatives for Metcalfe Street On-Ramp and Off-Ramp Closure

Task 9: Evaluation Process

For the evaluation of preliminary design alternatives, the systematic approach described in **Section 6.2** will be used to define a balanced Recommended Plan. This traceable process allows the evaluation team and the public an opportunity to assess trade-offs involved in the evaluation and use of this information in the decision making process.

Task 10: Public Consultation

PIC No. 1 will present:

- The draft Study Design Report;
- Need and justification;
- Seek information and comments from agencies and the public;
- Assessment of Planning alternatives;
- Environmental and engineering inventories;
- Coarse screening of alternatives;
- Coarse screening of preliminary design bridge and highway alternatives; and
- Evaluation criteria for rating and the selection of the TPA for each bridge.

PIC No. 2 will present the technical evaluation of alternatives and recommendation for a Technically Preferred Plan for each bridge site.

The use of a PIC at two stages of the study will encourage the public and agencies to comment on the process and final Recommended Plan for the study. Each PIC will include coloured graphics and text boards to describe the process and opportunities for the public to provide comment. In addition, we will hold an initial viewing and briefing of the materials for elected officials and external agencies before opening each meeting to the public.

Task 11: Preparation of the TESR

The preparation of the draft and final TESR will follow the format and content in accordance with the MTO Class Document. The TESR will document the study methodology, findings, public involvement and recommendations. Draft versions of all reports will be submitted to MTO and selected agencies based on their mandate and concerns for review prior to the preparation of the final document.

The public will be notified of the availability of the TESR for public review. Update letters/emails will be forwarded to individuals requesting direct contact through the study.

8.0 Documentation

The study will conclude with a TESR that will be presented to the public and agencies for final review. The TESR will follow the format and content in accordance with the MTO Class Document. The TESR will document the study methodology, findings, public involvement and recommendations. Draft versions of all reports will be submitted to MTO and selected agencies based on their mandate and concerns for review prior to the preparation of the final document.

9.0 Identification of Formal Environmental Approvals and Bylaw Exemptions

In consultation with the approving agencies, all necessary formal applicable environmental approvals and bylaw exemptions will be determined and (at least) agreement in principle obtained where possible. These approvals may include Federal work permits or authorizations for construction within regulated areas from Parks Canada under the *Heritage Canals Act*, Transport Canada under the *Navigable Waters Act*, Department of Fisheries and Oceans under the *Fisheries Act*, or the NCC. In addition, clearances will be required for: stormwater management/ Species at Risk from the Ministry of Natural Resources and Forestry (MNR/F); archaeological and cultural heritage from the Ministry of Tourism, Culture and Sport (MTC/S); and potentially a Permit to Take Water (PTTW) from MOECC.

The need for noise by-law exemptions may be identified by the City of Ottawa for any proposed construction activity that does not comply with existing by-laws.

The Canadian Environmental Assessment Act was repealed when the new *Canadian Environmental Assessment Act*, 2012 (CEAA 2012) came into force on July 6, 2012. Projects such as this one no longer require a CEAA Screening even if a former 'federal EA trigger' exists. However, projects will still be subject to relevant federal laws, regulations and standards as applicable and CEAA 2012 still requires that before federal authorities make any decision that would allow a project to proceed, they must determine whether a project is likely to cause significant adverse environmental effects. Therefore, the potential need for any federal approvals for the project will be determined and (at least) agreement in principle obtained during the preliminary design/EA study with the proponent initiating a self-assessment.

10.0 Proposed Project Schedule

A preliminary Project Schedule has been prepared and a summary is available for review as shown in **Table 1**. This schedule reflects the limitations of seasonal inventories beginning in summer 2017 with project start-up. The PIC meetings will be scheduled to avoid the Christmas and summer vacation periods.

Table 1: Proposed Preliminary Study Schedule Summary

Task	Date
Project Start-Up Meeting	April 2017
Study Design	April-May 2017
Information Gathering	April-July 2017
Study Commencement Notice	July 2017
Bridge Condition Survey	July 2017
Environmental Inventories: Natural Environment, Archaeology, Fisheries, Land Use, Business Impacts	June-August 2017
Technical Investigations: Traffic, Geotechnical	June-August 2017
Assessment of Alternatives to the Undertaking	August 2017
Public Information Centre (PIC) No. 1	Fall 2017
Development, Analysis and Evaluation of Design Alternatives	Winter 2017/2018
Selection of Technically Preferred Alternative	Winter 2017/2018
Public Information Centre (PIC) No. 2	Spring 2018
Refinements to Technically Preferred Alternative (if required)	Spring 2018
Draft Transportation Environmental Study Report	Summer 2018
Final TESR submission	Fall 2018
Public Review Period	Fall 2018
Preliminary Design Report	Winter 2018

Glossary of Terms

• AADT	Annual Average Daily Traffic – the average 24-hour, two-way traffic per day for the period from January 1st to December 31st.
• ACPDR	Advisory Committee on Planning, Design and Realty
• Alignment	The vertical and horizontal position of a road.
• Alternative	Well-defined and distinct course of action that fulfills a given set of requirements. The EA Act distinguishes between alternatives to the undertaking and alternative methods of carrying out the undertaking.
• Alternative Planning Solutions	Alternative ways of solving problems or meeting demand (Alternatives to the Undertaking).
• Alternative Design Concepts	Alternative ways of solving a documented transportation deficiency or taking advantage of an opportunity. (Alternative methods of carrying out the undertaking).
• Alternative Project	Alternative Planning Solution, see above.
• Alternatives to the Undertaking	Alternative ways of solving problems or meeting demand (Alternative Planning Solutions).
• ANSI	Area of Natural or Scientific Interest
• Berm	Earth landform used to screen areas.
• Bridge Farm Staging Areas	See Staging Areas definition
• BMP	Best management practice.
• Bump-Up	The act of requesting that an environmental assessment initiated as a class EA be required to follow the individual EA process. The change is a result of a decision by the proponent or by the Minister of Environment to require that an individual environmental assessment be conducted.

• Bypass	A form of realignment in which the route is intended to go around a particular feature or collection of features.
• Canadian Environmental Assessment Act (CEAA)	The CEAA applies to projects for which the federal government holds decision-making authority. It is legislation that identifies the responsibilities and procedures for the environmental assessment.
• Class Environmental Assessment Document	An individual environmental report documenting a planning process which is formally submitted under the EA Act. Once the Class EA document is approved, projects covered by the class can be implemented without having to seek further approvals under the EA Act provided the Class EA process is followed.
• Class Environmental Assessment Process	A planning process established for a group of projects in order to ensure compliance with the Environmental Assessment (EA) Act. The EA Act, in Section 13 makes provision for the establishment of Class Environmental Assessments.
• Compensation	The replacement of natural habitat lost through implementation of a project, where implementation techniques and other measures could not alleviate the effects.
• Consortium	A group of businesses or organizations allied to take on a project.
• Corridor	A band of variable width between two locations. In transportation studies a corridor is a defined area where a new or improved transportation facility might be located.
• Criterion	Explicit feature or consideration used for comparison of alternatives.
• Cumulative Effects Assessment	Cumulative Effects Assessment assesses the interaction and combination of the residual environmental effects of the project during its construction and operational phases on measures to prevent or lessen the predicted impacts with the same environmental effects from other past, present, and reasonably foreseeable future projects and activities.

• Decibel (dB)	A logarithmic unit of measure used for expressing level of sound.
• dBA	'A' weighted sound level; the human ear cannot hear the very high and the very low sound frequencies as well as the mid-frequencies of sound, and hence the predicted sound levels, measured in dBA, are a reasonable accurate approximation of sound levels heard by the human ear.
• Detail Design	The final stage in the design process in which the engineering and environmental components of preliminary design are refined and details concerning, for example, property, drainage, utility relocations and quantity estimate requirements are prepared, and contract documents and drawings are produced.
• DFO	Department of Fisheries and Oceans.
• EA	Environmental Assessment
• EA Act	Ontario Environmental Assessment Act (as amended by S.O. 1996 C.27), RSO 1980.
• Environment	<ul style="list-style-type: none"> • Air, land or water, • Plant and animal life, including human life, • The social, economic and cultural conditions that influence the life of humans or a community, • Any building structure, machine or other device or thing made by humans, • Any solid, liquid, gas, odour, heat, sound, vibration or radiation resulting directly or indirectly from human activities, or • Any part or combination of the foregoing and the interrelationships between any two or more of them, in or of Ontario. •
• Environmental Effect	A change in the existing conditions of the environment which may have either beneficial (positive) or detrimental (negative) effects.

• Environmentally Sensitive Areas (ESA's)	Those areas identified by any agency or level of government which contain natural features, ecological functions or cultural, historical or visual amenities which are susceptible to disturbance from human activities and which warrant protection.
• Equivalent Sound Level (Leq)	The level of a continuous sound having the same energy as a fluctuating sound in a given time period. In this report Leq refers to 24-hour, 16 or 18-hour averages.
• Evaluation	The outcome of a process that appraises the advantages and disadvantages of alternatives.
• Evaluation Process	The process involving the identification of criteria, rating of predicted impacts, assignment of weights to criteria, and aggregation of weights, rates and criteria to produce an ordering of alternatives.
• External Agencies	Include Federal departments and agencies, Provincial ministries and agencies, conservation authorities, municipalities, Crown corporations or other agencies other than MTO.
• General Arrangement	Structural plan of the bridge and proposed works including elevations and cross-sectional views of the bridge.
• FAC	Federal Advisory Committee
• Factor	A category of sub-factors.
• HADD	Harmful Alternation, Disturbance or Destruction of fish habitat.
• Harmonized EA Process	Harmonized planning process for this project that will meet both the Provincial and Federal EA requirements.
• Individual Environmental Assessment	An environmental Assessment requiring the submission of a document for approval by the Minister, pursuant to the EA Act and which is neither exempt from the EA Act nor covered by a Class EA approval.

• Mitigating Measure	A measure that is incorporated into a project to reduce, eliminate or ameliorate detrimental environmental effects.
• Mitigation	Taking actions that either remove or alleviate to some degree the negative impacts associated with the implementation of alternatives.
• MNRF	Ministry of Natural Resources and Forestry.
• MOECC	Ministry of the Environment and Climate Change.
• MTAC	Municipal Technical Advisory Committee.
• MTCS	Ministry of Tourism, Culture and Sport.
• MTO	Ministry of Transportation Ontario.
• MTO Class EA	Class Environmental Assessment for Provincial Transportation Facilities
• NCC	National Capital Commission
• Noise Attenuation	A mitigation measure used to lessen the intensity of the noise level (dBA) where the noise level is increased in a noise sensitive area greater than 5 dBA 10 years after completion.
• NSA	Noise Sensitive Area is a noise sensitive land use, which has an outdoor living area associated with the residential unit.
• OBMS	Ontario Bridge Management System
• OLA	Outdoor Living Area is the part of an outdoor amenity area provided for the quiet enjoyment of the outdoor environment.
• Planning Alternatives	Planning alternatives are “alternative methods” under the EA Act. Identification of significant transportation engineering opportunities while protecting significant environmental features as much as possible.

• Planning Solutions	That part of the planning and design process where alternatives to the undertaking and alternative routes are identified and assessed. Also described as “Alternative Project” under the federal EA Act.
• PIC	Public Information Centre
• Prime Agricultural Areas	Prime agricultural areas as defined in municipal official plans and other government policy sources.
• Project	A specific undertaking planned and implemented in accordance with the Class EA including all those activities necessary to solve a specific problem.
• Proponent	A person or agency that carries or proposes to carry out an undertaking, or is the owner or person having charge, management, or control of an undertaking.
• Public	Includes the general public, interest groups, associates, community groups, and individuals, including property owners.
• Realignment	Replacement or upgrading of an existing roadway on a new or revised alignment.
• Recommended Plan	That part of the planning and design process, during which various alternative solutions are examined and evaluated including consideration of environmental effects and mitigation; the recommended design solution is then developed in sufficient detail to ensure that the horizontal and vertical controls are physically compatible with the proposed site, that the requirements of lands and rights-of-way are satisfactorily identified, and that the basic design criteria or features to be contained in the design, have been fully recognized and documented in sufficient graphic detail to ensure their feasibility.
• Route Alternatives	Location alternatives within a corridor.
• SADT	Summer Average Daily Traffic – the average 24-hour, two-way traffic for the period from July 1 st to August 31 st including weekends.
• SAR	Species at Risk.

• Screening	Process of eliminating alternatives from further consideration, which do not meet minimum conditions or categorical requirements.
• Staging Areas	Locations where entire bridges and/or bridge segments are constructed in advance of being moved by the self-propelled modular transporters to replace previously removed existing bridge segments. The staging areas will also be used to demolish the existing bridges/bridge segments moved out in advance of the new replacements being moved in.
• Sub-factor	A single criterion used for the evaluation. Each sub-factor is grouped under one of the factors.
• TAC	Technical Advisory Committee.
• TESR	Transportation Environmental Study Report. The final documentation for Group B project, defining the project, consultation process, preferred solution and mitigation measures.
• TIMG	Traffic Incident Management Group
• Traceability	Characteristics of an evaluation process which enables its development and implementation to be followed with ease.
• Undertaking	In keeping with the definition of the Environmental Assessment Act, a project or activity subject to an Environmental Assessment.