Preliminary Design and Environmental Assessment Study for the Rehabilitation/Replacement of Ottawa Queensway Downtown Bridges from Metcalfe Street to Main Street

Group Work Project No. 4170-13-00

Public Information Centre No. 1

Tuesday, December 5, 2017

Saint Paul University

Ottawa
Welcome to the first Public Information Centre (PIC) meeting for the Preliminary Design and Environmental Assessment (EA) Study for the Rehabilitation/Replacement of Ottawa Queensway Downtown Bridges from Metcalfe Street to Main Street. Please sign in on the Attendance Sheet and obtain a Comment Sheet at the Registration Desk.

The purpose of this PIC is to present information concerning:

- Project Overview and Study Area
- EA Process and Schedule
- Draft Study Design Report
- Existing Conditions (Environmental, Traffic, Bridges)
- Planning Alternatives and Preliminary Recommendations
- Preliminary Design Alternatives
- Next Steps
- Obtain your Comments

Should you have any questions regarding the presentation materials, background reports or any other aspect of the study, please speak to MTO or Consultant Study Team members in attendance.

We encourage your input/feedback/concerns on the material being presented on the display boards. Please deposit completed Comment Sheets in the Comment Box or mail/ e-mail to the address at the bottom of the form by December 19, 2016.

There is an opportunity at any time during the EA process for interested persons to provide written input. Any comments received will be collected under the Environmental Assessment Act and Freedom of Information and Protection of Privacy Act and, with the exception of personal information, will become part of the public record.
MTO is conducting an Environmental Assessment and Preliminary Design study to establish bridge management plans for 7 bridges at 4 sites on the Ottawa Queensway at the following locations: Metcalfe Street; Elgin Street; Rideau Canal; and Main Street. The Study Area is presented below. The study is assessing both rehabilitation and replacement alternatives.

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

A draft Study Design Report has been prepared to present: the proposed problem and opportunity statement; a blueprint of the proposed Work Plan and Study Process; 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. This document elicits early input on the planning process and comments are encouraged. The draft Study Design will be finalized following this PIC.

*The draft Study Design Report is available on the Resource Table*
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 for operational and safety improvements. This previous study completed the “planning” phase of the Queensway corridor but 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 to the east adjacent to the Midtown bridges project.

The 2007 and 2016 TESR’s are available on the Resource Table
This project is being conducted in accordance with the requirements of the Ministry of Transportation (MTO) Class Environmental Assessment for Provincial Transportation Facilities (2000) for a Group B project. As part of these requirements, the following will occur:

- A Transportation Environmental Study Report (TESR) will be prepared and filed with the Regional Office of the Ministry of the Environment and Climate Change for a 30-day public review period.
- A public notice will be published in the local newspaper at the time of submission for the TESR. The public notice for the TESR will identify any additional location(s) where the document can be viewed.

You are encouraged to contact the MTO Project Team if you have questions or concerns about this study. If you feel, after consulting with MTO staff, that serious environmental concerns remain unresolved, it is your right to request that the project be subject to an Individual Environmental Assessment. The decision rests with the Minister of the Environment and Climate Change.
Overview of the MTO Class EA Process for Group B Projects

Consultation

Environmental Protection and Environmental Documentation

Transportation Engineering and Public Consultation

Schedule

PLANNING

- Review of Bridge Needs Assessment
- Generate, Evaluate and Select Preferred Planning Alternatives

Spring 2017

PRELIMINARY DESIGN

- Generate Preliminary Design Alternatives
- Evaluate and Select Preferred Preliminary Design Alternatives
- Develop Preferred Preliminary Design Alternatives

Summer 2017
Fall 2017
Winter 2017/2018
Spring 2018
Spring 2018

PIC No. 1

We Are Here

PIC No. 2

Transportation Environmental Study Report (TESR) and Notice of Completion*

End of Current Study

DETAIL DESIGN

CONSTRUCTION

Environmental Protection in Detail Design

Environmental Protection in Construction

Note: Schedule may be subject to change as the study proceeds.

*The TESR will be made available for public review and comment for a period of 30 days.
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.
Existing Conditions/Constraints

**Overall Constraints:**
- Very restricted Highway 417 right-of-way and limited staging sites
- Current land uses of potential staging sites

**Major Utilities**
- Buried hydro cable, gas mains
- Major City of Ottawa trunk watermain (1200 mm)

**Rideau Canal**
- UNESCO World Heritage Site
- Timing constraints: boating season (May to Thanksgiving weekend in October); Winterlude skating (January to March); fish spawning period (April to July)
- Maintain access under bridge for Colonel By Drive and Queen Elizabeth Drive and multi-use pathways
- Possible contaminated site due to canal and railway past activities

**Main Street**
- Former gas station
- Ottawa East Town Hall Community Centre
- Commercial building between service station and Queensway
- Ballantyne Park

**Metcalf Street /Elgin Street**
- No known constraints
Summary of Environmental Features within the Immediate Study Area

Legend
- Local Study Area
- Bridge Location
- Major Streets
- Recreational
- Education
- Parkland
- Commercial and Institutional
- Residential

Rideau Canal
- Winterfude skateway, fish spawning and boat navigation.

Metcalfe
- Queensway overpass of Metcalfe Street
- Arterial roadway northward and collector roadway southwest of Highway 417.
- Mix of residential and commercial land
- Canadian Museum of Nature to the north
- YMCA/WWCA to the northwest
- OC Transpo bus route 56

Elgin
- Queensway overpass of Elgin Street
- Major collector roadway
- Residential, commercial and park land
- Shared cycling lane
- Police Station located northwest
- Lobsters located southwest
- OC Transpo bus route 5

Main
- Queensway overpass of Main Street
- Major collector roadway
- Mostly residential land, some commercial and park land
- Immaculata High School, Riverside Montessori Pre-School and St. Nicholas Adult High School to the South
- Separate cycling route
- Ottawa East Town Hall Community Centre
- Commercial building between service station and Queensway

OC Transpo bus routes 5, 56, 101 and 103
Immediate Study Area Issues

Legend
- Major Streets
- 1200 mm Water Main

Rideau Canal Construction Timing
Restrictions
- January 5 - March 4 (Weather Permitting): NCC
  Skateway preparation and removal
- March 15 - July 1: Fish spawning period, no in-water
  construction/work
- May 22 (Victoria Day) - October 9 (Thanksgiving): Canal
  navigation period
- Mid October to January 1: Restricted construction
  period

Main
- Former gas station located at Hawthorne
  and Main St.
- Presence of immature
  Black Walnut trees

General Notes
- 5 known contamination sites in
  the "Immediate Study Area"
- Major utilities include buried
  hydro cable and gas mains
- 1200 mm major trunk watermain
- Current land use of potential and
  recommended staging sites
- Very restricted Queen's Way 417
  Highway Right-of-way and limited
  staging sites

Rideau Canal
- Marine archaeology investigation
  required
- Temporary relocation of parking
  for Bar and Grill and bicycle
  shop
- Maintain access under bridge for
  Colonel By Dr. and Queen
  Elizabeth Dr.
- Possible contaminated site due to
  Canal and railway historic
  activities
- UNESCO World Heritage Site

Elgin

Metcalfe

Main
The existing physical, biological, and socio-economic resources within the study area as well as the existing traffic and bridge conditions are being studied to assess the potential impacts of the proposed undertaking. The following studies have been conducted or are in progress as part of this project:

- Terrestrial and Aquatic
- Stage 1 Archaeological Assessment
- Land Use Planning
- Contamination Overview Study
- Context Sensitive Design
- Sourcewater Protection
- Noise

The Highway 417 (Ottawa Queensway) from Highway 416 Easterly to Anderson Road Preliminary Design Study and Environmental Assessment (G.W.P 663-93-00) Transportation Environmental Study Report (TESR) (January 2007), the Preliminary Design and Environmental Assessment for the Rehabilitation / Replacement of Ottawa Queensway Mid-town Bridges from Holland Avenue to O'Connor Street (GWP 4075-11-00) TESR (April 2016) and the accompanying background studies have also been reviewed for this project.
Aquatic Assessment

A field survey undertaken on the Rideau Canal on October 22, 2017 at the Queensway Bridges. Although the canal had been lowered several days earlier, water levels were sufficient to access the canal and obtain a representative sample of the fish community. The following species were captured, identified and released: pumpkinseed, Johnny Darter, common carp, white sucker, brown bullhead, smallmouth bass, yellow perch, rock bass and bluegill.

A Parks Canada contract in 2008 to conduct inventories along the Rideau Canal, primarily for aquatic Species at Risk – pugnose shiner (Notropis anogenus), bridle shiner (Notropis bifrenatus), river redhorse (Moxostoma carinatum) and American eel (Anguilla rostrata) – was undertaken by the Fish Ecology and Conservation Physiology Laboratory at Carleton University. During these surveys 28 fish species were identified. No priority target species were encountered.

Terrestrial Assessment

A highly urbanized environment forms the bulk of the study area and staging areas. The botanical species found on the typically manicured Kentucky bluegrass slopes beyond the elevated highway surfaces are for the most part plantings or introduced landscape species. No vegetation, fauna or avian Species at Risk were identified during field investigations.
A Stage 1 Archaeological Assessment was completed within the Study Area to determine the archaeological potential for the recovery of both pre-contact and Euro-Canadian archaeological resources. This archaeological potential has been removed through significant past disturbance associated with the development of the Project Area. The figure below illustrates the archaeological potential within the Study Area and potential staging sites (candidate construction areas to build replacement bridges off-site). The review of staging sites is presented on a subsequent exhibit.
This study will review the existing noise barriers in this area. The existing conditions for acoustics are illustrated below using the projected traffic volumes forecast for 2017. Additional information will be provided at PIC No. 2.
The approach and treatment will be similar to the adjacent Queensway Mid-town Bridges study to the west.

The context of the bridge sites will be modelled and designs will be developed to suit this context. These images show a similar approach taken for the adjacent Mid-town Bridges project.

Green space Context around Downtown Bridges for Consideration

Ballantyne Park looking east

Large landscaped embankment areas

NCC Driveways and Recreational Paths
-Cultural Landscapes
Context Sensitive Design – Other Significant CSD Features

Metcalfe Bridge looking north
Victoria Memorial Building
(Museum of Nature) beyond

Ottawa East Residential Context

Historic gas station at Main & Hawthorne
- small office adaptive reuse
- not designated under Part IV of Ontario Heritage Act but community landmark

Ottawa East
Town Hall Community Centre on Main Street
- designated under Part IV of Ontario Heritage Act

Rideau Canal Bridge: View from Pretoria Bridge
Rideau Canal National Historic Site & UNESCO World Heritage Site
The CSD design will build on previously developed Queensway CSD guidelines.

If the extent of rehabilitation at any given site supports it, CSD elements will be considered for inclusion.

MTO will design a basic landscape treatment for each bridge site.

Design elements and landscaping that exceed the MTO standard proposed as part of this study will be considered in partnership with communities, with permitting conditions established by MTO.

CSD elements/considerations may include:

- Light – natural and artificial
- Materials
- Public Art (in partnership only)
- Views
- Facades
- Noise Barriers
- Soft landscape
- Furnishings/equipment (in partnership only)

General principle is to make each bridge site safer, brighter, more open and green.
### Existing Bridge Conditions

#### Metcalfe Street Bridge Overpass

<table>
<thead>
<tr>
<th>Construction Year</th>
<th>Bridge Type</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>1962</td>
<td>Rigid Frame</td>
<td>- Leaking expansion joint</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Delaminated and cracked area with edge spalls at the top of retaining</td>
</tr>
<tr>
<td></td>
<td></td>
<td>wall / abutment interface</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Broken section of retaining wall coping</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Typical service life: 50-60 years</td>
</tr>
</tbody>
</table>

#### Elgin Street Bridge Overpass

<table>
<thead>
<tr>
<th>Construction Year</th>
<th>Bridge Type</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>1962</td>
<td>Rigid Frame</td>
<td>- Leaking longitudinal expansion joint</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Delaminated areas on deck soffit at joints</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Delaminated areas on abutments and retaining walls</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Delamination and broken sections on retaining wall coping</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Typical service life: 50-60 years</td>
</tr>
</tbody>
</table>

#### Main Street Bridge Overpass

<table>
<thead>
<tr>
<th>Construction Year</th>
<th>Bridge Type</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>1962</td>
<td>Rigid Frame</td>
<td>- Leaking longitudinal expansion joint</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Spalled area on deck soffit at the longitudinal expansion joint</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Delaminated and spalled areas at the bottom of abutments</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Delaminated areas on retaining walls</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Typical service life: 50-60 years</td>
</tr>
</tbody>
</table>

#### Rideau Canal Bridge Overpass

<table>
<thead>
<tr>
<th>Construction Year</th>
<th>Bridge Type</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>1962</td>
<td>Continuous Post-Tensioned Beam</td>
<td>- Girders have delaminations at bearing seats at multiple girders</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Exterior girders and girders along median have delamination, spalling</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Pier repairs starting to deteriorate</td>
</tr>
</tbody>
</table>
• The Queensway is a key transportation corridor that serves local, regional and long distance mobility needs
• Two way traffic volumes average approximately 170,000 vehicles/day
• During peak periods (morning and afternoon) commuter travel demands create traffic congestion
• Rehabilitation or conventional replacement of the 7 structures will require select lane and ramp closures which will affect mobility over an entire construction season (8 months)
• This assignment will examine opportunities to mitigate the traffic impacts by completing much of the construction when hourly traffic volumes are lower (at night or weekends)
• The evaluation of alternatives will include factors which consider traffic operational impacts.

2016 Daily Traffic Volumes - Nicholas to Metcalfe

- Average Annual Daily Traffic: 170,000
- Summer Average Daily Traffic: 170,000
- Summer Average Weekday Traffic: 163,000
- Winter Average Daily Traffic: 161,000
Alternatives to the Undertaking represent alternative ways or methods of addressing the Problem / Opportunity Statement specific to this study. Considering Alternatives to the Undertaking is a mandated task under the MTO Class EA. In this study, the focus is on four bridge locations. These alternatives reflect different strategies and include the “Do Nothing” approach (maintaining the status quo but not addressing the Problem / Opportunity Statement).

**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. **This alternative is NOT recommended to be carried forward.**

**Alternative 2:** In accordance with the MTO Class EA, this 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. **This alternative is recommended to be carried forward.**

- **Alternative 2b:** Replace the existing bridges with new structure(s). **This alternative is recommended to be carried forward.**

The Assessment of Alternatives to the Undertaking Report is available on the Resource Table.
EXISTING SIDEROAD CROSS SECTIONS

Cross Section on Metcalfe Street

Cross Section on Elgin Street

Cross Section on Main Street
Preliminary Design Alternatives to the Undertaking carried forward for the rigid frame bridge sites (Metcalfe Street, Elgin Street and Main Street) include rehabilitation or replacement of the bridges as bridge management strategies.

**Bridge Preliminary Design Alternatives** being considered include:

- **Alternative A-A1** – Rapid Rehabilitation
- **Alternative A-A2** – Conventional Rehabilitation
- **Alternative B-B1** – Conventional Replacement
- **Alternative B-C1** – Rapid Replacement

Staging Area Site Alternatives are being considered for Rapid Replacement. Alternatives and are presented on the following exhibits.

Traffic Management Alternatives are being considered for the conventional (construction in place) and rapid replacement (Queensway closure) alternatives are presented on the following exhibits.
For Traffic Staging Alternative A-A1: Rapid Rehabilitation, see separate exhibits for Metcalfe Street, Elgin Street and Main Street.
For Traffic Staging Alternative A-A2: Conventional Rehabilitation, see separate exhibits for Metcalfe Street, Elgin Street and Main Street.
For Traffic Staging Alternative B-B1: Conventional Replacement, see separate exhibits for Metcalfe Street, Elgin Street and Main Street.
For Traffic Staging Alternative B-C1: Rapid Replacement, see separate exhibits for Metcalfe Street, Elgin Street and Main Street.

**Preliminary Design Alternatives**

**Rigid Frame Bridge Sites – Rapid Replacement**

**RAPID REPLACEMENT**

**Scope of work:**

- Construct new rigid frame structure in a staging area.
- Install temporary support and prepare existing structure for removal.
- Install protection system, excavate and saw cut abutments above the footing to suit the connection to new structure.
- Remove existing structure.
- Prepare the remaining footings and part of abutments to receive the new structure.
- Install new structure(s) using a self-propelled modular transporter (SPMT).

**Advantages:**

- Minimal traffic disruption is anticipated.
- No traffic staging is required.
- A new structure, except for the footings, is provided.
- Existing footings are reused and excavation is minimized.

**Disadvantages:**

- The service life of the replacement structure could be affected by the remaining service life of the existing foundations.
- Staging area(s) required near the bridge site.
- Risk of late opening and full closure of Hwy 417 needs to be considered.
- The inherent cost of the Rapid Replacement Technology is additional.
# Potential Staging Sites for Rigid Frame Structures – Main Street

<table>
<thead>
<tr>
<th>Location</th>
<th>RBR Potential</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>M-1 Adjacent to Hawthorne Avenue just 10m west of Main Street</strong></td>
<td>• Good</td>
</tr>
<tr>
<td>(Ballantyne City Park / municipal park area)</td>
<td>→ Access can be direct onto Main Street with no impact on nearby residences</td>
</tr>
<tr>
<td></td>
<td>→ Work area is acceptable</td>
</tr>
<tr>
<td></td>
<td>→ Grades to site good</td>
</tr>
<tr>
<td><strong>M-2 Graham Street (Adult Education Building)</strong></td>
<td>• Poor</td>
</tr>
<tr>
<td></td>
<td>→ Does not meet area and dimension requirements</td>
</tr>
<tr>
<td></td>
<td>→ Relatively long travel route from staging area to bridge structure compared to site M-1</td>
</tr>
<tr>
<td></td>
<td>→ Overhead utility relocations required both sides of Main Street</td>
</tr>
<tr>
<td><strong>M-3 (use of Immaculata High School Parking area)</strong></td>
<td>• Poor</td>
</tr>
<tr>
<td></td>
<td>→ Does not meet area or dimension requirements</td>
</tr>
<tr>
<td></td>
<td>→ Main Street is too narrow to transport structure</td>
</tr>
<tr>
<td></td>
<td>→ To improve the profile from this site to Main Street major excavation would be required.</td>
</tr>
<tr>
<td></td>
<td>→ Impacts to overhead utilities along west/east sides of Main Street</td>
</tr>
<tr>
<td><strong>M-4 MTO lands east side of Main Street, immediately south of the Queensway</strong></td>
<td>• Poor</td>
</tr>
<tr>
<td></td>
<td>→ Does not meet minimum span dimension needs</td>
</tr>
<tr>
<td></td>
<td>→ Construction vehicles would have difficulty to access 2 structures that would have to be built back to back.</td>
</tr>
<tr>
<td><strong>M-5 MTO ROW immediately north of the Queensway, east side of Main Street</strong></td>
<td>• Poor</td>
</tr>
<tr>
<td></td>
<td>→ Size/dimensions of ROW site do not meet requirements</td>
</tr>
<tr>
<td></td>
<td>→ Impact on nearby residences</td>
</tr>
<tr>
<td></td>
<td>→ loss of on street parking</td>
</tr>
<tr>
<td><strong>M-6 Residential properties located north of Queenway west side of Main Street</strong></td>
<td>• Poor</td>
</tr>
<tr>
<td></td>
<td>→ Major residential impact (up to 6 residential buyouts)</td>
</tr>
<tr>
<td></td>
<td>→ Grade requirements satisfied</td>
</tr>
<tr>
<td><strong>M-7 Immaculata High School football field</strong></td>
<td>• Poor</td>
</tr>
<tr>
<td></td>
<td>→ Main Street has insufficient width transportation of new structures not possible.</td>
</tr>
<tr>
<td></td>
<td>→ Loss of community use of the football field / community impacts</td>
</tr>
</tbody>
</table>

The Rigid Frame Staging Sites Assessment Memo is available on the Resource Table
## Potential Staging Sites for Rigid Frame Structures – Elgin and Metcalfe Streets

<table>
<thead>
<tr>
<th>Location</th>
<th>RBR Potential</th>
</tr>
</thead>
</table>
| **E-1 Adjacent to Elgin Street, north of the Queensway just to the east of the Elgin Street Bridge site.** | **Good**  
- Site can have direct access to Elgin Street and Catherine Street  
- Work area is acceptable  
- Short travel route  
- No impact on detour route while Queensway is closed  
- Grades to site good |
| **E-1e (expanded to include Catherine Street)** | **Good**  
- Provides better access to the Canal structure for larger cranes and moving equipment |
| **E-2 Adjacent to Elgin Street west side of Elgin Street** | **Poor (for full structure)**  
- Does not meet area and dimension requirements for a full structure replacement site  
- Short travel route from staging area to bridge structure  
- Overhead utility relocations required  
- No impacts on detour route |
| **E-3 Adjacent to Metcalfe Street, immediately west of Metcalfe Street** | **Good**  
- Direct access for Metcalfe Street Structure  
- Can accommodate Elgin Street Structure if E-1 not available due to timing constraints  
- No community impacts |
| **E-4 MTO lands east side of Metcalfe Street, north of Queensway; adjacent to the Catherine Street exit ramp from the Queensway.** | **Poor**  
- Does not meet minimum span dimension needs  
- Construction vehicles would have access from the off-ramp from the Queensway introducing collision potential |

The Rigid Frame Staging Sites Assessment Memo is available on the Resource Table.
## ALTERNATIVE A-A1
### TRAFFIC STAGING FOR RAPID REHABILITATION OF QUEENSWAY ELGIN BRIDGE

<table>
<thead>
<tr>
<th>Stage</th>
<th>Lane(s)</th>
<th>Description</th>
<th>Duration</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stage 1</td>
<td>Lane 1</td>
<td>(Median Barrier)</td>
<td>6 weeks</td>
<td>Ramp, Distance</td>
</tr>
<tr>
<td>Stage 2</td>
<td>Lane 1 &amp; 2</td>
<td></td>
<td></td>
<td>Ramp, Distance</td>
</tr>
<tr>
<td>Stage 3</td>
<td>Lane 3 &amp; SCL's</td>
<td></td>
<td></td>
<td>Ramp, Distance</td>
</tr>
<tr>
<td>Stage 4</td>
<td></td>
<td></td>
<td></td>
<td>Ramp, Distance</td>
</tr>
</tbody>
</table>

**Legend:**
- Work Zone
- Roadway Lanes Open
- Shoulder Lanes Open

**Note:** Traffic mapping and temporary structures shown are illustrative and at preliminary design level of detail and may be subject to change.
ALTERNATIVE B/B1
TRAFFIC STAGING FOR
CONVENTIONAL REPLACEMENT OF QUEENSWAY ELGIN BRIDGE

Legend:
- Dark Blue: Main Lane
- Medium Blue: Median Lane
- Orange: Auxiliary Lane

Note: Traffic staging can vary by site and construction methods.

Existing Conditions

Stage 1

Stage 2

Stage 3

Stage 4

Stage 5 (Median Barrier)

Stage 6 (Cross Area and Bulwark)
OPTION 1
TEMPORARY STAGING AREAS
FOR MAIN BRIDGE REPLACEMENT
Scale 1:15
PRELIMINARY RECOMMENDATION NOT TO CARRY FORWARD TO DETAILED EVALUATION PHASE

OPTION 2
TEMPORARY STAGING AREAS
FOR MAIN BRIDGE REPLACEMENT
Scale 1:15
PRELIMINARY RECOMMENDATION TO CARRY FORWARD TO DETAILED EVALUATION PHASE
Preliminary Design Alternatives to the Undertaking carried forward for the Rideau Canal Bridge include rehabilitation or replacement of the bridge as bridge management strategies.

**Bridge Preliminary Design Alternatives** being considered include:

- **Alternative A** – Replacement – Girder Bridge at Existing Pier Location
- **Alternative B** – Replacement – Girder Bridge at Existing Pier Location
- **Alternative C** – Replacement – Extrados Concrete Bridge at New Pier Location
- **Alternative D** – Replacement – Girder Bridge at New Pier Location behind Existing Canal Walls
- **Alternative E** – Replacement – Single Span Structure
- **Alternative F** – Rehabilitation – Conventional

Construction Staging Alternatives for Bridge Replacement are presented on the following exhibits.

Traffic Management Alternatives are being considered for the conventional (construction in place) and rapid replacement (Queensway closure) alternatives and are presented on the following exhibits.
Alternatives Not Carried Forward: Alternative C and Alternative E

- Reduced flexibility for MTO
- High superstructure impacts heritage canal (reduces visual focus on canal)
- Hour-glassing Queensway median results in lower safety (curves on freeway), higher cost ($50 million), and triggers replacements of 6 adjacent bridges.

The Rideau Canal Bridge Alternatives Coarse Screening Memo is available on the Resource Table.
Alternatives Not Carried Forward: Alternative C and Alternative E

- Reduced flexibility for MTO
- High superstructure impacts heritage canal (reduces visual focus on canal)
- Hour-glassing Queensway median results in lower safety (curves on freeway), higher cost ($50 million), and triggers replacements of 6 adjacent bridges.

The Rideau Canal Bridge Alternatives Coarse Screening Memo is available on the Resource Table.
Rideau Canal Bridge Construction Alternatives

- **Canal Alternative 2A**: Conventional Construction in Strips.
- **Canal Alternative 2B**: Conventional Construction in Strips allowing wheel tracking on the joint between bridges. Recommended to be carried forward.
- **Canal Alternative 2C**: Conventional Construction in Strips. Recommended to be carried forward.
- **Canal Alternative 3A**: Rapid Replacement for complete superstructure replacement using Self Propelled Modular Transporters (SMPTs) from bridge farm sites used for Rigid Frames. Not recommended to be carried forward (substantial impacts to existing properties and traffic).
- **Canal Alternative 3B**: Rapid Replacement using three separate sections for each structure using SMPTs from bridge farm sites used for Rigid Frames. Not recommended to be carried forward (substantial impacts to existing properties and traffic).
- **Canal Alternative 3C**: Rapid Replacement using three separate sections for each structure using SMPTs from Ballantyne Park and bridge farm sites used for Rigid Frames. Not recommended to be carried forward (substantial impacts to existing properties and traffic).
- **Canal Alternative 3D**: Rapid Replacement using three separate sections for each structure using SMPTs from Ballantyne Park and bridge farm sites used for Rigid Frames. Not recommended to be carried forward (substantial impacts to existing properties and traffic).
- **Canal Alternative 4**: Demolish in place and jack and slide from sides (2 bridges replaced on same weekend).
- **Canal Alternative 5**: Sequential jack and slide removing one bridge at a time (2 bridges replaced in two separate years).
- **Canal Alternative 6**: SPMT transport to Nicholas. Innovative technique to build platform under structure to lift the SPMT and each of the 3 spans sequentially to the elevation of the Queensway. The SPMT drives the bridge sections to Nicholas and returns with new sections. Requires support piers in canal.

The Rideau Canal Construction Methodology Alternatives Coarse Screening Memo is available on the Resource Table.
The following groups of alternatives will be compared and presented at PIC No. 2:

**Rigid Frame Bridge Alternatives:**

- Rapid Rehabilitation
- Conventional Rehabilitation
- Rapid Replacement
- Conventional Replacement

**Rideau Canal Bridge Alternatives:**

- Alternative A: Replacement Girder Bridge on Existing Pier Location
- Alternative B: Replacement Girder Bridge on New Pier Location
- Alternative C: Replacement Extrados Concrete Bridge on New Pier Location
- Alternative D: Replacement Girder Bridge on New Pier Location
- Alternative E: Replacement: Single Span Structure
- Alternative F: Rehabilitation: Conventional (carried forward as baseline)

**Rideau Canal Construction Staging Alternatives:**

- Canal Alternative 1: Barge Removal
- Canal Alternative 2A: Conventional Construction in Strips
- Canal Alternative 2B: Conventional Construction in Strips
- Canal Alternative 2C: Conventional Construction in Strips
- Canal Alternative 3A: SPMT Rapid Replacement (Complete Structure)
- Canal Alternative 3B: SPMT Rapid Replacement (Separate Structures)
- Canal Alternative 3C: SPMT Rapid Replacement (Separate Structures)
- Canal Alternative 3D: SPMT Rapid Replacement (Separate Structures)
- Canal Alternative 4: Jack and Slide on One Weekend
- Canal Alternative 5: Jack and Slide in Two Separate Years
- Canal Alternative 6: SPMT Transport to Nicholas
The following evaluation criteria may be used in the evaluation of the Preliminary Design Alternatives presented on the previous exhibits.

**Transportation**
- Traffic operations (delays to the travelling public)
- Collision potential
- Out-of-way travel (transit, pedestrians, cyclists and general traffic)
- Construction duration

**Natural Environment**
- Loss of vegetation
- Aquatic disturbance

**Socio-Economic Environment**
- Emergency Services
- Temporary business impacts (loss of parking)
- Permanent business buyouts
- Noise and air quality
- Tourism/events
- Contaminated property

**Cultural Environment**
- Impact to UNESCO world heritage site of the Rideau Canal
- Heritage views and cultural landscapes
- Heritage resources
- Archaeological potential

**Property and Land Use**
- Impacted properties

**Cost**
- Capital cost
- Operation and maintenance cost
Following this meeting we will:

• Review all comments post PIC No. 1
• Evaluate alternatives
• Schedule PIC No. 2 (Spring 2018)
• Review all comments post PIC No. 2
• Finalize the Recommended Plans
• Prepare the Transportation Environmental Study Report (TESR)
• Place the Study Completion Notice in the newspaper
• 30-day public review period of the TESR
• Environmental Clearance

How can you remain involved in the Study?

• Request that your name/e-mail be added to the mailing list
• Provide a completed comment sheet
• Contact MTO or consultant representatives at any time
• Check the project website at www.queenswaydowntownbridges.com

Any of our representatives that are present can assist you with the above activities.

Thank you for your participation at tonight's Public Information Centre. Your input into this study is valued and appreciated. Please provide your completed comment sheet on or before December 19, 2017. All information is collected and used in accordance with the Environmental Assessment Act and the Freedom of Information and Protection of Privacy Act.