Welcome to the Public Information Centre

- Please Sign In
- Please feel free to ask questions
- Please fill out a Comment Form before you leave
North River Bridge
Municipal Class Environmental Assessment

Welcome

Welcome to the Public Information Centre regarding the North River Bridge.

The purpose of the Public Information Centre is:

- To introduce the project and explain the Class Environmental Assessment (EA) process.
- To summarize the study area and existing conditions for this structure.
- To describe the alternative solutions assessed and the Preferred Alternative Solution for this structure.
- To provide an opportunity for the public to discuss and provide comments.

The County of Peterborough, in consultation with the Ainley Group, is working to complete the detail design in accordance with the environmental assessment process.

Project Background

Your comments are important to us. Following your review of the information, please complete one of the comment forms and place it in the box provided or send written or email comments to the address on the form prior to March 27, 2015.
NOTE: This flow chart is to be read in conjunction with Part A of the Municipal Class EA.
Methods of Communication

- **Request for Background Information**
  - Information request letters were submitted to the Ministry of Natural Resources and Crowe Valley Conservation Authority for natural heritage information.

- **Notice of Study Commencement and Public Information Centre**
  - Mailed / submitted electronically to potentially affected First Nations.
  - Mailed directly to regulatory agencies that may have potential interest in the project.
  - Mailed to Emergency Services, local school boards, and Student Transportation Services.
  - Published in local newspapers.
  - Posted on the County of Peterborough and the Township of Havelock-Belmont-Methuen website.

- **Notice of Study Completion**
  - To be published in local newspapers and on the County of Peterborough and Township of Havelock-Belmont-Methuen website at the end of the MCEA process.
The Study Purpose and Background

- **Study Purpose**
  The purpose of this Class Environmental Assessment is to identify the preferred solution to address the deteriorated condition of the North River Bridge and prepare a preliminary and detail design for the preferred solution.

- **Study Background**
  The North River Bridge is located on County Road 46, approximately 800 m west of the intersection of County Road 46 and Anderson Road, and approximately 12.1 km north of the settlement area of Havelock.
During the assessment / evaluation of alternative solutions, consideration has been given to the following factors and criteria:

**Natural Environment**
- Fish habitat and watercourse features
- Terrestrial ecosystems (vegetation, wildlife, Species at Risk)
- Stormwater / hydrology

**Socio-Economic Environment**
- Accessibility for local residents during construction
- Impacts to municipal / emergency services
- Property impacts

**Cultural Environment**
- First Nations, Heritage, and Archaeological resources

**Transportation Environment**
- Traffic staging during construction
- Roadway safety
- Traffic operations and consideration for AADT volumes.
<table>
<thead>
<tr>
<th></th>
<th><strong>North River Bridge</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Structure Design Code</strong></td>
<td>Canadian Highway Bridge Design Code (CHBDC)</td>
</tr>
<tr>
<td><strong>Road Design Standard</strong></td>
<td>Rural Arterial 1,700 AADT</td>
</tr>
<tr>
<td><strong>Drainage Basin (catchment area; hectares)</strong></td>
<td>15,900 ha</td>
</tr>
<tr>
<td><strong>Design Flow Return Period</strong></td>
<td>50 years</td>
</tr>
<tr>
<td><strong>Structure Span</strong></td>
<td>Existing – 9.14 m Proposed – 9.14 m</td>
</tr>
<tr>
<td><strong>Structure Rise</strong></td>
<td>Existing – 2.44 m Proposed – 2.44 m</td>
</tr>
<tr>
<td><strong>Structure Width</strong></td>
<td>Existing – 8.33 m Proposed – 10.7 m</td>
</tr>
<tr>
<td><strong>Soffit Clearance (Inlet, 50 year Design Flow)</strong></td>
<td>Existing – 1.28 m Proposed – 0.95 m</td>
</tr>
</tbody>
</table>
North River Bridge
Municipal Class Environmental Assessment

Existing Conditions

- North River Bridge
- Municipal Class Environmental Assessment

Barriers do not meet the crash test requirements of the Canadian Highway Bridge Design Code. Barriers display map cracking, staining, localized spalls, delaminations, and narrow vertical cracks.

Deck soffit and fascia display honeycombing, narrow to wide stained cracks with efflorescence and localized delamination and spalling, indicating active corrosion throughout the entire depth of the concrete deck.

Ground penetrating survey of abutments indicates extensive deterioration of abutment walls and wingwalls. Narrow to medium width stained and unstained cracks and light to moderate scaling were observed during visual inspection.

Steel beam guiderail system with wooden posts display local collision damage and longitudinal split in its connection with the concrete barrier wall. Buried end treatment do not meet the current standards and need to be upgraded.

Panel 9

Deck condition survey indicates that 93% of the deck area is in the state of active corrosion. It also confirms that there is no waterproofing system provided on the deck.

Narrow lane widths cause large vehicles to cross over centreline.
Problem and Opportunity Statement

North River Bridge

- **Problem Statement**
  - Narrow structure and travelled lane widths causes large vehicles to cross over the centreline, creating a potential traffic safety concern.
  - The existing bridge has deteriorated to a condition such that replacement/rehabilitation is warranted. Structure deterioration includes:
    - Cracks and potholes on the asphalt wearing surface,
    - Localized spalling, cracks, and delaminations on barriers,
    - Honeycombing, cracks, and localized spalling on deck soffit and fascia,
    - Concrete railing and post barrier system does not meet current standards,
    - Loss of strength of concrete materials,
    - Deterioration/rusting of reinforcing steel, etc.

- **Opportunity Statement**
  - Replacement / rehabilitation of the North River Bridge will provide improved safety conditions on County Road 46 for the crossing of the North River given the deteriorated condition of the structure.
North River Bridge

Municipal Class Environmental Assessment

Alternative Solutions

North River Bridge

- **Do Nothing**
  - This alternative has been included as a basis for comparison to other alternative solutions.
  - Remaining residual lifespan for the existing structure is estimated at 5-10 years.

- **Rehabilitation**
  - Rehabilitation of the structure to a functioning state in accordance with Canadian Highway Bridge Design Code (CHBDC).
  - Gross cost = $645,000 (Construction = $315,000; Temporary Structure and Roadwork = $330,000).

- **Replacement**
  - Replacement of the structure with a new bridge that complies with CHBDC and keeping with the current profile / configuration of the roadway (two-lane). Alternatives include:
    - Replacement of the bridge with a pre-cast concrete rigid frame bridge.
    - Replacement of the bridge with a Super Cor structural steel plate box bridge.
  - Gross cost = $970,000 (Construction = $895,000; Roadwork = $75,000)
Summary of Evaluation of Alternative Solutions

- **Do Nothing**
  - This alternative does not address the deteriorated condition of the structure. More than 93% of the bridge deck is in the state of active deterioration. No waterproofing system is provided on the bridge deck.
  - On average, 20% of the abutment walls and 40% of the wingwalls are in the state of active deterioration.
  - The “do nothing” alternative will lead to additional deterioration of the structure leading to increased costs for repairs / rehabilitation in the future.
  - The projected lifespan of the bridge without rehabilitation/replacement is 5-10 years.
  - The “do nothing” alternative does not address current operational safety concerns.

- **Rehabilitation**
  - Rehabilitation of the structure addresses the problem/opportunity statement by extending the expected life of the structure to approximately 25 years.
  - The expected construction duration for this alternative would be 9-11 weeks with construction costs of approximately $645,000. Elevated costs are resultant from installation of a temporary bailey bridge and associated road work to facilitate traffic detours due to narrow traffic lanes during construction. This temporary structure would be removed after rehabilitation; therefore, the associated cost (approximately $330,000) would be a “throw-away”.

- **Replacement**
  - Replacement of the structure addresses the problem / opportunity statement and would be a cost-effective long term strategy given the current deteriorated state of the structure.
  - Replacement alternatives provide a service life range from 60 to 75 years, construction duration from 10 to 12 weeks, and construction costs of approximately $970,000.
  - The net present values for replacement alternatives, to adequately compare with rehabilitation alternatives, range from $571,000 to $640,000.
  - Replacement structure would eliminate the existing width deficiency and would accommodate future rehabilitation without any need for temporary structures.
  - Temporary bailey bridge not required as a single traffic lane will be maintained during construction (staged demolition of existing bridge / staged construction of new bridge)
### Alternatives Weighted Rating Table

<table>
<thead>
<tr>
<th>Rehabilitation/Replacement Alternative</th>
<th>Gross Cost ($)</th>
<th>Net Present Value* ($)</th>
<th>$R_c$</th>
<th>Weighted $R_c$ ($R_c,f=R_c \times 50$)</th>
<th>Construction duration (days)</th>
<th>$R_t$</th>
<th>Weighted $R_t$ ($R_t,f=R_t \times 30$)</th>
<th>Environmental Impact</th>
<th>$R_e$</th>
<th>Weighted $R_e$ ($R_e,f=R_e \times 20$)</th>
<th>Total Weighted Rating ($R_f=R_c,f+R_t,f+R_e,f$)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alternative 1: Major Rehabilitation</td>
<td>$645,000</td>
<td>$645,000</td>
<td>0.09</td>
<td>4.5</td>
<td>55</td>
<td>0.13</td>
<td>3.9</td>
<td>35%</td>
<td>0.65</td>
<td>13</td>
<td>21.4</td>
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<tr>
<td>Alternative 2-1: Replacement of the bridge with Supercore structural steel plate box structure</td>
<td>$970,000</td>
<td>$640,000</td>
<td>0.10</td>
<td>5.0</td>
<td>60</td>
<td>0.14</td>
<td>4.2</td>
<td>40%</td>
<td>0.6</td>
<td>12</td>
<td>21.2</td>
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<tr>
<td>Alternative 2-2: Replacement of the bridge with Precast concrete rigid frame structure</td>
<td>$970,000</td>
<td>$571,000</td>
<td>0.19</td>
<td>9.5</td>
<td>60</td>
<td>0.14</td>
<td>4.2</td>
<td>40%</td>
<td>0.6</td>
<td>12</td>
<td>25.7</td>
</tr>
<tr>
<td>Alternative 3: Do Nothing</td>
<td>$0</td>
<td>$708,000**</td>
<td>0.0</td>
<td>0.0</td>
<td>70</td>
<td>0.0</td>
<td>0.0</td>
<td>40%</td>
<td>0.6</td>
<td>12</td>
<td>12.0</td>
</tr>
</tbody>
</table>

*Net Present Value is defined as the value in today’s dollar for construction and maintenance of the bridge to keep it in service to the end of its current theoretical service life. Net present Value = Gross Construction Cost – the actual worth of the structure at the end of its theoretical service life (the residual value).
**Based on the estimated net present value of major rehabilitation/replacement that would be necessary within 4-5 years plus the additional maintenance costs from more frequent required inspections.
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Preliminary Recommended Solution

North River Bridge – Replacement with Pre-Cast Concrete Rigid Frame Bridge

Criteria / Rationale:

- Replacement design to similar dimensions and opening of the existing bridge thereby minimizing extent of impacts during construction.
- The new bridge width will be approximately 3-4 m wider to meet the requirements of the MTO Geometric Design Manual and CHDBC. Approximate length of modified approach roads would be 125 m on either side of the structure.
- Existing roadway profile (two lane traffic configuration) to be maintained given the low to moderate average annual daily traffic (AADT) volumes on County Road 46.
- Scope of this alternative would involve replacement of the entire structure with a wider structure, allowing one lane of traffic (3.25 m wide with a 0.5 m shoulder on each side; total width 4.25 m) to be maintained throughout construction using temporary traffic signals.
- Longest structural service life (estimated to be 75 years) of structural alternatives.
- Reasonable construction duration (10-12 weeks).
- Optimum net present value considering the expected ‘service life’ and ‘construction cost’ (Net Present Value $571,000).
Preliminary General Arrangement – North River Bridge

Pre-cast Concrete Rigid Frame Bridge
Examples of Replacement Alternatives

Pre-cast Concrete Rigid Frame Bridge

Super Cor Structural Steel Plate Box Bridge
Conclusions:

- Alternative solutions reviewed for the structure include ‘Do Nothing’, ‘Rehabilitation’ and ‘Replacement’ (alternatives pre-cast concrete rigid frame bridge and Super Cor structural steel plate box bridge).
- The existing North River Bridge is substandard in design and components do not meet the current Canadian Highway Bridge Design Code (CHBDC).
- The existing North River Bridge has deteriorated beyond the point of economic viability for conducting rehabilitation.
- The existing North River Bridge has a projected remaining lifespan of 5-10 years.
- The preliminary recommended solution for this bridge is to schedule replacement of this structure with a pre-cast concrete rigid frame bridge. This option provides a reasonable construction duration, the optimum net present value and the longest service life of all alternatives.

Next Steps

Upon completion of the Public Information Centre, the following steps will be taken:

- Review comments received from the Public/Agencies for consideration in finalizing the preliminary design.
- Review the preferred alternative design concept in consideration of public / agency comments.
- Further review the preferred alternative design concept in consideration of natural, socio-economic, cultural, and transportation environments.
- Confirm the preferred alternative.

Thank you for your attendance and participation in this public meeting.

Please provide comments by March 27th, 2015.
Comments and information regarding the proposed project are being collected to assist in meeting the requirements of the Environmental Assessment Act. The collection of comments and information will be conducted in accordance with the Freedom of Information and Protection of Privacy Act. Comments will be maintained on file for use during the Study and may be included in the Study documentation. With the exception of personal information, all comments will become part of the public record.

If you wish to comment or have any questions, please fill out a comment sheet or provide written comments to the contacts below no later than March 27, 2015.

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