BRIDGES 2 & 3 AND BRIDGE 13 IMPROVEMENTS
TOWN OF THE BLUE MOUNTAINS
CLASS ENVIRONMENTAL ASSESSMENT
PUBLIC INFORMATION CENTRE

July 9, 2019
WELCOME

THIS PUBLIC INFORMATION CENTRE WILL:

- establish channels of communication with public & stakeholders
- detail the study area, study purpose & objective
- present the need & justification for the study and issues to be resolved
- identify alternative solutions & potential environmental impacts
- identify a preliminary preferred solution for public review
- seek input & comments for consideration in the selection of the final preferred solution

PUBLIC AND STAKEHOLDERS SHOULD:

- sign the registry
- review the presentation material
- ask questions of the Town and/or Consultant
- submit a comment sheet & indicate whether or not you want to be kept informed of the process
BACKGROUND

BRIDGES 2 & 3 2017 OSIM Inspection identified the following concerns in both structures:

- Barriers are in poor condition and do not meet current crash test requirements;
- The soffit has large localized spalled areas with exposed corroded reinforcing;
- 50% of the girders are in poor condition with extensive delamination, spalling and exposed corroded reinforcing steel;
- The substructure is in poor condition with severe erosion, and moderate efflorescence, spalling and scaling;
- Guide rail on the approaches is deficient in length and uses a substandard connection to the bridges; and
- Load posting: 10 tonne

BRIDGE 13 2017 OSIM Inspections identified the following concerns:

- No barrier is present across the structure, which is a safety issue;
- The deck is in fair condition with poor connection to the girders;
- Debris buildup on the abutments;
- Stacked stone ballast walls allow material loss behind abutments;
- Bearings are deteriorated;
- Erosion of the embankments is allowing water behind the wingwalls; and
- Load posting: 5 tonne.
STUDY OBJECTIVE & PURPOSE

THE OBJECTIVES OF THE BRIDGES 2 & 3 STUDY ARE TO:

1. Improve safety at the bridges
2. Assess alternative solutions for the improvement of the bridges

THE PURPOSE OF THE BRIDGES 2 & 3 STUDY IS TO:

- Develop alternative solutions to improve safety at the crossing location
- Identify the location, extent and sensitivity of affected environments
- Assess the alternatives given potential environmental impacts
- Identify the preferred solutions
- Establish measures to mitigate impacts
- Satisfy the Class EA requirements

THE OBJECTIVES OF THE BRIDGE 13 STUDY ARE TO:

1. Improve safety at the bridge
2. Assess alternative solutions for the improvement or re-assignment of the bridge.

THE PURPOSE OF THE BRIDGE 13 STUDY IS TO:

- Develop alternative solutions to improve safety, maintain the structure and determine best ownership of the structure.
- Identify the location, extent and sensitivity of affected environments
- Assess the alternatives given potential environmental impacts
- Identify the preferred solutions
- Establish measures to mitigate impacts
- Satisfy the Class EA requirements
- The Class EA schedule is based on the type of work, potential impacts & $ value
- The Bridge 13 assessment is a Schedule B Process, requiring completion of Phases 1-2 & 5
- Opportunities for public review & input
  - Notice of Commencement
  - Public Information Centre
  - Notice of Completion
  - 30 day review period for Project File
- The Bridges 2 & 3 assessment is a Schedule A+ Class EA Process being completed with the Schedule B Phases for improved consultation.
  - Opportunities for public review & input
    - Notice of Commencement
    - Public Information Centre
Bridges 2 & 3 (Mitchell’s Creek Bridges) are located on 6th Sideroad
BRIDGES 2 & 3 - PROBLEM IDENTIFICATION

Existing conditions:

- designated as a rural local road
- ditches on either side of road
- bridges posted at 10 tonnes – no fire truck or snow plow access
- the right-of-way (ROW) is approximately 20 metres
- serves approximately 100 vehicles per day
- heavily deteriorated

Future needs:

- provide improved roadside safety at the structures

PROBLEM STATEMENT: “Town of The Blue Mountains Bridges 2 & 3 show signs of deterioration and have been posted with a 10 tonne load limit. The Town has identified the need to assess alternative solutions for this crossing to provide an improved crossing or alternative route that will be most safe and cost effective, while minimizing impacts to the surrounding residents and environments.”
BRIDGES 2 & 3 - ALTERNATIVE SOLUTIONS

ALTERNATIVE A: DO NOTHING
- maintain existing conditions with no improvements

ALTERNATIVE B: PERMANENTLY CLOSE AND REMOVE THE EXISTING BRIDGES
- removes safety issues at the site
- removes future costs for maintenance

ALTERNATIVE C: REPURPOSE BRIDGES TO NON-VEHICULAR TRAFFIC
- reduces concern with low load posting
- reduces maintenance costs

ALTERNATIVE D: REHABILITATE THE EXISTING BRIDGES
- does not improve load capacity
- increases safety
- resolves deterioration

PRE-SCREEN ALTERNATIVES
Can the alternatives fully address the problem statement?
✖ Alt A - no improvements and continued deterioration will lead to eventual closure
✔ Alt B - eliminates safety needs and future maintenance costs.
✔ Alt C - reduces current and future maintenance costs and reduces impact of load posting. Extends lifespan of structures.
✔ Alt D - this does not resolve load capacity, but does address safety issues.
BRIDGES 2 & 3 - ALTERNATIVE SOLUTIONS

ALTERNATIVE E1: REPLACE THE BRIDGES WITH SINGLE-LANE BRIDGES

- eliminates load posting
- improves roadside safety

ALTERNATIVE E2: REPLACE THE BRIDGES WITH TWO-LANE BRIDGES

- eliminates load posting
- improves roadside safety

PRE-SCREEN ALTERNATIVES
Can the alternatives fully address the problem statement?

✓ Alt E1 - this alternative addresses all deficiencies.
✓ Alt E2 - this alternative addresses all deficiencies.
BRIDGES 2 & 3 - NATURAL ENVIRONMENT

EXISTING CONDITIONS

- Study area is comprised of a watercourse with residential and farm land adjacent to it.

- No areas of natural and scientific interest are located within the study area limits.

- Potential habitat for species of conservation concern in the proximity is primarily located within the large swamp community located to the south of 6th Sideroad.

- Mitchell’s Creek is a coolwater community, and at this location has extensive invertebrate and trout spawning habitat within the creek bed.

POTENTIAL IMPACTS

- Work in this location will have minor impacts on the natural environment that can be mitigated with reasonable construction practices.

RECOMMENDATIONS

- Minimize bank and bed hardening.
- Minimize vegetation removal and disturbance.
- Minimize expansion of bridge footprint.
- Incorporate vertical faces into bridge design and areas adjacent to the bridge to help exclude reptiles from the road surface.
BRIDGES 2 & 3 - CULTURAL/HERITAGE & SOCIAL ENVIRONMENTS

ARCHAEOLOGICAL & CULTURAL HERITAGE CONDITIONS

- Stage 1 Archaeological Assessment identified that any areas not previously disturbed or low lying and wet are recommended to have a Stage 2 Assessment prior to commencement of work.
- A Cultural Heritage Evaluation was completed, and identified the bridges as having no cultural value or interest under Ontario Regulation 9/06.

SOCIAL ENVIRONMENT CONDITIONS

- Land use is primarily residential and farm
- Safety is of the utmost importance

POTENTIAL IMPACTS TO CULTURAL/HERITAGE ENVIRONMENT

- no heritage impact
- additional archaeological study recommended if area of disturbance includes areas previously undisturbed

POTENTIAL IMPACTS TO SOCIAL ENVIRONMENT

- potential property impacts
- potential impact to access to properties
- potential noise impacts during construction
## BRIDGES 2 & 3 - ASSESSMENT OF ALTERNATIVES

<table>
<thead>
<tr>
<th>Evaluation Criteria</th>
<th>Alternative A Do Nothing</th>
<th>Alternative B Permanently Close and Remove the Existing Bridges</th>
<th>Alternative C Repurpose the Bridges to Non-Vehicular Traffic</th>
<th>Alternative D Rehabilitate the Existing Bridges</th>
<th>Alternative E1 Replace with Single Lane Bridges</th>
<th>Alternative E2 Replace with Two Lane Bridges</th>
</tr>
</thead>
<tbody>
<tr>
<td>Physical Environment</td>
<td></td>
<td>improvement to roadside safety</td>
<td>improvement to roadside safety</td>
<td>safety of bridge can be improved</td>
<td>increased load capacity to current standard</td>
<td>increased load capacity to current standard</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>barrier protection can be upgraded</td>
<td>barrier protection upgraded</td>
<td>barrier protection upgraded</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>roadside safety can be improved with approach</td>
<td>roadside safety improved</td>
<td>roadside safety improved</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>barrier</td>
<td>site meets low volume road requirements to</td>
<td>longest extension of service life</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>protection</td>
<td>maintain a single lane structure</td>
<td>removes traffic</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>service life</td>
<td>longest extension of service life</td>
<td>construction</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Natural Environment</td>
<td></td>
<td>no impacts to environment or habitat</td>
<td>no impacts to environment or habitat</td>
<td>no significant impacts to environment or habitat</td>
<td>potential for impacts in areas adjacent to</td>
<td>greatest impacts in areas widened beyond</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>potential impacts can be mitigated with best</td>
<td>existing substructure during construction</td>
<td>existing substructure and road layout</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>practices</td>
<td></td>
<td>greatest impacts within watercourse</td>
</tr>
<tr>
<td>Social Environment</td>
<td></td>
<td>no impacts to existing abutting lands</td>
<td>no impacts to existing abutting lands</td>
<td>no impacts to existing abutting lands</td>
<td>no impacts to existing abutting lands</td>
<td>potential for impacts to abutting lands</td>
</tr>
<tr>
<td></td>
<td></td>
<td>permanent road closure</td>
<td>permanent road closure</td>
<td>shorter construction time and road closure</td>
<td>longer construction time and length of road</td>
<td>longest construction time and length of road</td>
</tr>
<tr>
<td>Cultural Heritage Environment</td>
<td></td>
<td>no archaeological or cultural/heritage impacts</td>
<td>no archaeological or cultural/heritage impacts</td>
<td>no impacts to existing abutting lands</td>
<td>no cultural heritage impact</td>
<td>No cultural heritage impact</td>
</tr>
<tr>
<td>Economic Environment</td>
<td>least overall construction cost ($0)</td>
<td>low construction cost (~$525K)</td>
<td>lower construction cost (~$300K)</td>
<td>low construction cost (~$675K)</td>
<td>greater construction cost ($1.7M)</td>
<td>greater construction cost ($2.3M)</td>
</tr>
<tr>
<td></td>
<td>greatest maintenance costs</td>
<td>eliminates future maintenance</td>
<td>less maintenance costs</td>
<td>greater maintenance costs</td>
<td>least maintenance costs</td>
<td>less maintenance costs</td>
</tr>
<tr>
<td>Climate Change</td>
<td>no effect on the environment</td>
<td>no effect on the environment</td>
<td>no effect on the environment</td>
<td>no effect on the environment</td>
<td>no long-term effect on the environment</td>
<td>no long-term effect on the environment</td>
</tr>
<tr>
<td></td>
<td>no improvements to hydraulic capacity or resistance to the effects of climate change</td>
<td>Improvement to hydraulic capacity and resistance to the effects of climate change</td>
<td>no improvements to hydraulic capacity or resistance to the effects of climate change</td>
<td>no long-term effect on the environment</td>
<td>potential to improve hydraulic capacity and resistance to the effects of climate change</td>
<td>potential to improve hydraulic capacity and resistance to the effects of climate change</td>
</tr>
</tbody>
</table>
BRIDGES 2 & 3 - PRELIMINARY EVALUATION OF ALTERNATIVES

<table>
<thead>
<tr>
<th>Assessment Criteria</th>
<th>Weight</th>
<th>Alternative A Do Nothing</th>
<th>Alternative B Permanently Close and Remove the Existing Bridges</th>
<th>Alternative C Repurpose the Bridges to Non-Vehicular Traffic</th>
<th>Alternative D Rehabilitate the Existing Bridges</th>
<th>Alternative E1 Replace with Single Lane Bridges</th>
<th>Alternative E2 Replace with Two-Lane Bridges</th>
</tr>
</thead>
<tbody>
<tr>
<td>score</td>
<td>weighted score</td>
<td>score</td>
<td>weighted score</td>
<td>score</td>
<td>weighted score</td>
<td>score</td>
<td>weighted score</td>
</tr>
<tr>
<td>Physical Environment</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>road geometry and alignment</td>
<td>4</td>
<td>0.0</td>
<td>-0.5</td>
<td>-2.0</td>
<td>-1.0</td>
<td>-4.0</td>
<td>0.0</td>
</tr>
<tr>
<td>structural stability and load restrictions</td>
<td>5</td>
<td>-2.0</td>
<td>-10.0</td>
<td>2.0</td>
<td>10.0</td>
<td>1.0</td>
<td>5.0</td>
</tr>
<tr>
<td>roadside protection</td>
<td>4</td>
<td>0.0</td>
<td>0.0</td>
<td>2.0</td>
<td>8.0</td>
<td>2.0</td>
<td>8.0</td>
</tr>
<tr>
<td>traffic operations</td>
<td>5</td>
<td>-1.0</td>
<td>-5.0</td>
<td>-1.5</td>
<td>-7.5</td>
<td>-1.0</td>
<td>-5.0</td>
</tr>
<tr>
<td>farm access</td>
<td>4</td>
<td>-1.0</td>
<td>-4.0</td>
<td>-1.5</td>
<td>-6.0</td>
<td>-1.0</td>
<td>-4.0</td>
</tr>
<tr>
<td>maintenance and snow removal</td>
<td>3</td>
<td>-2.0</td>
<td>-6.0</td>
<td>-1.5</td>
<td>-4.5</td>
<td>-1.0</td>
<td>-3.0</td>
</tr>
<tr>
<td>Sub-Total</td>
<td>25</td>
<td>-25.0</td>
<td>-2.0</td>
<td>-6.5</td>
<td>6.0</td>
<td>45.5</td>
<td>50.0</td>
</tr>
<tr>
<td>Natural Environment</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>fisheries/aquatic impacts</td>
<td>6</td>
<td>0.0</td>
<td>0.0</td>
<td>2.0</td>
<td>12.0</td>
<td>0.0</td>
<td>0.0</td>
</tr>
<tr>
<td>wildlife/terrestrial impacts</td>
<td>6</td>
<td>0.0</td>
<td>0.0</td>
<td>0.5</td>
<td>3.0</td>
<td>0.0</td>
<td>0.0</td>
</tr>
<tr>
<td>vegetation impacts</td>
<td>3</td>
<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
</tr>
<tr>
<td>Sub-Total</td>
<td>15</td>
<td>0.0</td>
<td>15.0</td>
<td>0.0</td>
<td>-4.5</td>
<td>-15.0</td>
<td>0.0</td>
</tr>
<tr>
<td>Social Environment</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>noise/construction impacts</td>
<td>1</td>
<td>0.0</td>
<td>0.0</td>
<td>-0.5</td>
<td>-0.5</td>
<td>0.0</td>
<td>0.0</td>
</tr>
<tr>
<td>ease of access for residents</td>
<td>3</td>
<td>0.0</td>
<td>0.0</td>
<td>-1.0</td>
<td>-3.0</td>
<td>0.0</td>
<td>-0.5</td>
</tr>
<tr>
<td>emergency service</td>
<td>3</td>
<td>-1.0</td>
<td>-3.0</td>
<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
</tr>
<tr>
<td>property acquisition requirements</td>
<td>3</td>
<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
</tr>
<tr>
<td>community impacts</td>
<td>5</td>
<td>-1.0</td>
<td>-5.0</td>
<td>-0.5</td>
<td>-2.5</td>
<td>-0.5</td>
<td>-2.5</td>
</tr>
<tr>
<td>Sub-Total</td>
<td>15</td>
<td>-8.0</td>
<td>-6.0</td>
<td>-4.0</td>
<td>-4.0</td>
<td>-16.0</td>
<td>1.0</td>
</tr>
<tr>
<td>Cultural Heritage Environment</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>archaeological impacts</td>
<td>4</td>
<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
</tr>
<tr>
<td>heritage impacts</td>
<td>2</td>
<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
</tr>
<tr>
<td>First Nations impacts</td>
<td>4</td>
<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
</tr>
<tr>
<td>Sub-Total</td>
<td>10</td>
<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
</tr>
<tr>
<td>Economic Environment</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>construction costs</td>
<td>15</td>
<td>2.0</td>
<td>30.0</td>
<td>-1.0</td>
<td>-15.0</td>
<td>-0.5</td>
<td>-7.5</td>
</tr>
<tr>
<td>future maintenance costs</td>
<td>10</td>
<td>-2.0</td>
<td>-20.0</td>
<td>2.0</td>
<td>20.0</td>
<td>-1.0</td>
<td>-10.0</td>
</tr>
<tr>
<td>land acquisition costs</td>
<td>5</td>
<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
</tr>
<tr>
<td>Sub-Total</td>
<td>30</td>
<td>10.0</td>
<td>5.0</td>
<td>-17.5</td>
<td>-30.0</td>
<td>-27.5</td>
<td>-42.5</td>
</tr>
<tr>
<td>Climate Change</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>impact on the environment</td>
<td>2</td>
<td>0.0</td>
<td>0.0</td>
<td>1.0</td>
<td>2.0</td>
<td>0.0</td>
<td>0.0</td>
</tr>
<tr>
<td>resiliency to climate change</td>
<td>3</td>
<td>-1.0</td>
<td>-3.0</td>
<td>2.0</td>
<td>6.0</td>
<td>-1.0</td>
<td>-3.0</td>
</tr>
<tr>
<td>Sub-Total</td>
<td>5</td>
<td>-3.0</td>
<td>8.0</td>
<td>-3.0</td>
<td>-3.0</td>
<td>-3.0</td>
<td>-3.0</td>
</tr>
<tr>
<td>TOTAL ENVIRONMENT ASSESSMENT</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>100</td>
<td></td>
<td>-26.0</td>
<td>20.0</td>
<td>-31.0</td>
<td>-30.5</td>
<td>20.0</td>
<td>-1.0</td>
</tr>
</tbody>
</table>

**OVERALL RANKING (greatest score = highest ranking)**

Weight: reflects the relative importance of each evaluation criteria within each project environment, and the relative importance of each project environment in relation to one another.

Score: reflects the effect of each alternative as it relates to the evaluation criteria in comparison to Do Nothing (status quo); -2 denotes a significant negative impact, 0 denotes no impacts and +2 denotes a significant positive impact.

Weighted Score: product of weight x score.
BRIDGES 2 & 3 - PRELIMINARY PREFERRED SOLUTION

Based on the preliminary assessment of alternatives, two alternatives were identified as equally suitable solutions to be explored further:

ALTERNATIVE B: PERMANENTLY CLOSE AND REMOVE THE EXISTING BRIDGES

- removes safety issues at the site
- removes future costs for maintenance
- ~$525K

THIS ALTERNATIVE WILL INCLUDE:
- removal of existing bridges
- addition of a turn-around at either end of the bridges
- signage for a permanent detour route
- installation of approach guide rail
- detour of 6.7 to 14.3 km, taking approximately 10 to 16 minutes

ALTERNATIVE E1: REPLACE THE BRIDGES WITH SINGLE-LANE BRIDGES

- eliminates load posting
- improves roadside safety
- ~$1.7M

THIS ALTERNATIVE WILL INCLUDE
- removal and replacement of existing bridges
- replacement alternatives include:
  - concrete rigid frame structure
  - prefabricated bridge on concrete abutments
- installation of approach guide rail

The final decision will be made following feedback received at and after the PIC.
BRIDGES 2 & 3 – DETOUR ROUTE

If Bridges 2 & 3 are permanently closed, the following detours are possible.

Detour 1 (14.3 km, 16 minutes)
Detour 2 (11.7 km, 16 minutes)
Detour 3 (6.7 km, 10 minutes)
(Seasonal Road – Unmaintained in winter)
BRIDGE 13 - STUDY AREA
Bridge 13 (Heathcote Bridge) is located on Main Street
BRIDGE 13 - PROBLEM IDENTIFICATION

Existing conditions:

- designated as a rural local road
- ditches on either side of road
- bridge posted at 5 tonnes – no emergency vehicle or snow plow access
- the right-of-way (ROW) is approximately 20 metres
- serves approximately 20 vehicles per day
- two properties are located on the east side of the watercourse with no alternate access
- one property on the west side of the watercourse extends partially to the east side of the watercourse
- the structure is identified as having cultural heritage value

Future needs:

- provide improved safety at the structure
- maintain heritage value
- maintain access to residences on the east side of the watercourse

PROBLEM STATEMENT: “Town of The Blue Mountains has identified the need to evaluate alternative solutions for the improvement of the Bridge 13 crossing in order to improve safety at the bridge. The existing bridge is considered to be deficient with respect to barrier protection, load capacity and signage.”
ALTERNATIVE A: DO NOTHING
- maintain existing conditions with no improvements

ALTERNATIVE C: REPURPOSE BRIDGE TO NON-VEHICULAR TRAFFIC
- reduces concern with low load posting
- reduces maintenance costs

ALTERNATIVE B: PERMANENTLY CLOSE AND REMOVE THE EXISTING BRIDGE
- removes safety issues at the site
- removes future costs for maintenance

ALTERNATIVE D: REHABILITATE THE EXISTING BRIDGE
- does not improve load capacity
- increases safety
- resolves deterioration

PRE-SCREEN ALTERNATIVES
Can the alternatives fully address the problem statement?
✗ Alt A - no improvements and continued deterioration will lead to eventual closure
✗ Alt B – while this eliminates safety needs, the structure is necessary for access to two properties on the east side of the watercourse.
✗ Alt C – while this reduces safety needs and maintains heritage value, the structure is necessary for access to two properties on the east side of the watercourse.
✓ Alt D – this does not resolve load capacity, but does maintain heritage value at the site.
BRIDGE 13 – ALTERNATIVE SOLUTIONS

ALTERNATIVE E1: REPLACE THE BRIDGE WITH A SINGLE-LANE BRIDGE

- eliminates load posting
- improves roadside safety
- can be done in a way that mitigates heritage impact

ALTERNATIVE E2: REPLACE THE BRIDGE WITH A TWO-LANE BRIDGE

- eliminates load posting
- improves roadside safety
- reduces heritage value

ALTERNATIVE F: REHABILITATE AND DOWNLOAD THE BRIDGE

- eliminates future maintenance costs for the Town
- maintains heritage value
- a by-law permanently transferring ownership of the structure would require the person or people affected to agree to the transference.

PRE-SCREEN ALTERNATIVES
Can the alternatives fully address the problem statement?
✓ Alt E1 – this alternative addresses all deficiencies.
✓ Alt E2 – this alternative addresses all deficiencies.
✓ Alt F – this alternative addresses all deficiencies.
BRIDGE 13 - NATURAL ENVIRONMENT

EXISTING CONDITIONS

- Study area is comprised of a watercourse with residential and farm land adjacent to it
- No areas of natural and scientific interest are located within the study area limits
- The watercourse is a coolwater community that often dries up completely in the summer
- Low potential for the bridge or adjacent areas to provide habitat for Species of Conservation Concern

POTENTIAL IMPACTS

- Work in this location will have minor impacts on the natural environment that can be mitigated with reasonable construction practices

RECOMMENDATIONS

- Minimize bank and bed hardening
- Minimize vegetation removal and disturbance
- Minimize expansion of bridge footprint
- Incorporate vertical faces into bridge design and areas adjacent to the bridge to help exclude reptiles from the road surface
BRIDGE 13 - CULTURAL/HERITAGE & SOCIAL ENVIRONMENTS

ARCHAEOLOGICAL & CULTURAL HERITAGE CONDITIONS

- Stage 1 Archaeological Assessment identified that any areas not previously disturbed or low lying and wet are recommended to have a Stage 2 Assessment prior to commencement of work.

- A Cultural Heritage Evaluation was completed, and identified Bridge 13 as having cultural heritage value or interest under Ontario Regulation 9/06.

- Sympathetic structure or modifications, or documentation and salvage are recommended mitigation measures.

SOCIAL ENVIRONMENT CONDITIONS

- Land use is primarily residential and farm.
- Safety is of the utmost importance.

POTENTIAL IMPACTS TO CULTURAL/HERITAGE ENVIRONMENT

- Heritage impact possible, with mitigation measures depending on alternative chosen.
- Additional archaeological study recommended if areas of disturbance includes areas previously undisturbed.

POTENTIAL IMPACTS TO SOCIAL ENVIRONMENT

- Potential property impacts.
- Potential impact to access to properties.
- Potential noise impacts during construction.
## BRIDGE 13 - ASSESSMENT OF ALTERNATIVES

| Evaluation Criteria | Alternative A  
| De Nothing | Alternative D  
| Rehabilitate the Existing Bridge | Alternative E1  
| Replace with Single Lane Bridge | Alternative E2  
| Replace with Two Lane Bridge | Alternative F  
| Rehabilitate and Download Bridge |

### Physical Environment
- Safety of bridge will decrease over time
- No improvement to load carrying capacity
- No improvement to roadside safety
- No improvement to barrier protection
- Safety of bridge can be improved
- Barrier protection can be upgraded to standard
- Roadside safety can be improved with approach barrier
- No improvement to load carrying capacity
- Shortest extension of service life
- Increased load capacity to current standard
- Barrier protection can be upgraded to standard
- Roadside safety can be improved with approach barrier
- The site meets low volume road requirements to maintain a single lane structure
- Longest extension of service life
- Safety of bridge can be improved
- Barrier protection can be upgraded to standard
- Roadside safety can be improved with approach barrier
- No improvement to load carrying capacity
- Shortest extension of service life
- Safety of bridge can be improved
- Barrier protection can be upgraded to standard
- Roadside safety can be improved with approach barrier
- No improvement to load carrying capacity
- Shortest extension of service life

### Natural Environment
- No impacts to environment or habitat
- Potential impacts can be mitigated with best practices
- Potential for impacts in areas adjacent to existing substructure during construction
- Increased review requirements from agencies
- Greatest impacts in areas widened beyond existing substructure and road layout
- Greatest impacts within watercourse to place new wider substructure
- No significant impacts to environment or habitat
- Potential impacts can be mitigated with best practices

### Social Environment
- No impacts to existing abutting lands
- No construction delays or road closures
- No impacts to existing abutting lands
- Shorter construction time and road closure
- No impacts to existing abutting lands
- Longer construction time and length of road closure
- Potential for impacts to abutting lands
- Longest construction time and length of road closure
- No impacts to existing abutting lands
- Shortest construction time and road closure

### Cultural Heritage Environment
- No archaeological or cultural/heritage impacts
- No archaeological impacts
- Minimal impact to cultural heritage, repairs would be sympathetic to existing aesthetics
- Some potential for archaeological impacts should works extend beyond existing ROW or previously disturbed/constructed areas
- Impacts to cultural heritage by removal of existing bridge
- Additional studies to be undertaken as necessary
- Greatest potential for archaeological impacts as works will extend beyond existing ROW or previously disturbed/constructed areas
- Greatest impacts to cultural heritage by removal of existing bridge
- Additional studies to be undertaken as necessary
- No archaeological impacts
- Minimal impact to cultural heritage, repairs would be sympathetic to existing aesthetics

### Economic Environment
- Least overall construction cost ($0)
- Greatest maintenance costs
- Lower overall construction cost (-$225K)
- Greater maintenance costs
- Greater overall construction costs (Concrete Culvert ~-575K, Sympathetic Structure ~-750K)
- Less maintenance costs (higher for sympathetic structure than culvert)
- Greatest overall construction costs(-$1M)
- Less maintenance costs
- Lower overall construction cost (-$100K)
- No future maintenance cost to Town

### Climate Change
- No effect on the environment
- No improvements to hydraulic capacity or resistance to the effects of climate change
- No long-term effect on the environment
- No improvements to hydraulic capacity or resistance to the effects of climate change
- No long-term effect on the environment
- No improvements to hydraulic capacity or resistance to the effects of climate change
- No long-term effect on the environment
- No improvements to hydraulic capacity or resistance to the effects of climate change
- No long-term effect on the environment
- No improvements to hydraulic capacity or resistance to the effects of climate change
- No long-term effect on the environment
- No improvements to hydraulic capacity or resistance to the effects of climate change
## BRIDGE 13 - PRELIMINARY EVALUATION OF ALTERNATIVES

<table>
<thead>
<tr>
<th>Assessment Criteria</th>
<th>Weight</th>
<th>Alternative A</th>
<th>Alternative D</th>
<th>Alternative E1</th>
<th>Alternative E2</th>
<th>Alternative F</th>
</tr>
</thead>
<tbody>
<tr>
<td>Do Nothing</td>
<td></td>
<td>score</td>
<td>weighted score</td>
<td>score</td>
<td>weighted score</td>
<td>score</td>
</tr>
<tr>
<td>Fishery/aquatic impacts</td>
<td>6</td>
<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
<td>-1.0</td>
</tr>
<tr>
<td>Wildlife/terrestrial impacts</td>
<td>6</td>
<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
<td>-1.0</td>
</tr>
<tr>
<td>Vegetation impacts</td>
<td>3</td>
<td>0.0</td>
<td>-0.5</td>
<td>-1.5</td>
<td>-1.0</td>
<td>-3.0</td>
</tr>
<tr>
<td>Sub-Total</td>
<td>15</td>
<td>0.0</td>
<td>-1.5</td>
<td>-3.0</td>
<td>-3.0</td>
<td>0.0</td>
</tr>
<tr>
<td>Economic Environment</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Construction costs</td>
<td>11</td>
<td>2.0</td>
<td>22.0</td>
<td>1.0</td>
<td>-11.0</td>
<td>-1.5</td>
</tr>
<tr>
<td>Future maintenance costs</td>
<td>10</td>
<td>-2.0</td>
<td>-20.0</td>
<td>-2.0</td>
<td>-20.0</td>
<td>-5.0</td>
</tr>
<tr>
<td>Land acquisition costs</td>
<td>4</td>
<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
<td>-1.0</td>
</tr>
<tr>
<td>Sub-Total</td>
<td>25</td>
<td>2.0</td>
<td>-21.5</td>
<td>-36.0</td>
<td>27.0</td>
<td>-14.5</td>
</tr>
<tr>
<td>Climate Change</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Impact on the environment</td>
<td>2</td>
<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
<td>-1.0</td>
</tr>
<tr>
<td>Resiliency to climate change</td>
<td>3</td>
<td>-1.0</td>
<td>-3.0</td>
<td>-3.0</td>
<td>1.0</td>
<td>3.0</td>
</tr>
<tr>
<td>Sub-Total</td>
<td>5</td>
<td>-3.0</td>
<td>-3.0</td>
<td>1.0</td>
<td>1.0</td>
<td>-3.0</td>
</tr>
<tr>
<td>TOTAL ENVIRONMENT ASSESSMENT</td>
<td>100</td>
<td>-23.00</td>
<td>-6.00</td>
<td>29.50</td>
<td>-2.00</td>
<td>12.00</td>
</tr>
<tr>
<td>OVERALL RANKING (greatest score = highest ranking)</td>
<td>5</td>
<td>4</td>
<td>1</td>
<td>3</td>
<td>2</td>
<td></td>
</tr>
</tbody>
</table>

**Weight**: reflects the relative importance of each evaluation criteria within each project environment, and the relative importance of each project environment in relation to one another

**Score**: reflects the effect of each alternative as it relates to the evaluation criteria in comparison to the Existing Conditions (status quo); -2 denotes a significant negative impact, 0 denotes no impacts and +2 denotes a significant positive impact

**Weighted Score**: product of weight x score
BRIDGE 13 - PRELIMINARY PREFERRED SOLUTION

Based on the preliminary assessment of alternatives, the following alternative best meets all the Study requirements:

ALTERNATIVE E1: REPLACE THE BRIDGE WITH A SINGLE-LANE BRIDGE

- eliminates load posting
- the bridge is the only access point to the properties on the far side of the watercourse
- improves roadside safety
- can be done in a way that mitigates impacts to heritage value
- cost: concrete culvert - ~$575K (low maintenance), sympathetic structure - $750K (moderate maintenance)

THIS ALTERNATIVE WILL INCLUDE:

- documentation of heritage structure and implementation of other heritage mitigation measures
- removal of existing bridge
- replacement alternatives include:
  - concrete culvert
  - steel girder bridge
  - prefabricated bridge on concrete abutments
- installation of approach guide rail
BRIDGE 13 – ACCESS

Bridge 13 is the only access point to two properties and a portion of a third property.

Source: County of Grey GIS
NEXT STEPS
Bridge Improvements:
- review/address stakeholder comments
- identify the preferred solution
- further develop the preferred solution with details for implementation & mitigation
- address natural environment/water crossing requirements & mitigation
- design & implementation

Before you leave:
- have your questions been addressed?
- have you signed the registry to be informed of the next phase of the study?
- have you completed a comment sheet?

Following the PIC:
- if you have more questions, contact the Town or Tatham Engineering.
- further comments are invited for incorporation into the planning and design of the project, and will be received until July 23, 2019.

CONTACTS

JEFFERY FLETCHER
Manager of Solid Waste & Special Projects
Town of The Blue Mountains
32 Mill Street, P.O. Box 310
Thornbury, ON N0H 2P0
t: (519) 599-3131 x 238
e: managersolidwaste@thebluemountains.ca

Project Manager, Senior Engineer
Tatham Engineering Limited
115 Sandford Fleming Drive, Suite 200
Collingwood, ON L9Y 5A6
t: (705) 444-2565 x 2101
e: ewilkinson@tathameng.com