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ACCESS TO THE COMMUNITY OF SLABTOWN

The Blue Mountains

Class Environmental Assessment Phase 1 & 2 Report

Final Report

prepared by:

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Study Overview & Objective

Slabtown Road provides the only access to the Slabtown community. In October 2007, an appraisal of the Slabtown Bridge was completed and noted that improvements are required to several bridge elements. Recommendations included replacing the bridge due to deficient width and load limit restrictions (it is currently posted with a 9 tonne load which restricts school buses, heavy trucks, garbage trucks and fire trucks). A further evaluation of the bridge structural members was completed as part of this study, which confirmed that the 9 tonne load limit is appropriate for single axle vehicles.

The objective of this Municipal Class Environmental Assessment is therefore to consider the most appropriate manner in which access to the community of Slabtown can be improved, be it improvements to the bridge or implementation of other means of access.

Alternative Solutions

A number of reasonable and feasible solutions to addressing the Problem Statement were developed, including:

- Alternative A - Do Nothing;
- Alternative B - Rehabilitate the Existing Bridge;
- Alternative C - Replace the Existing Bridge in the Same Location;
- Alternative D - Replace the Existing Bridge in a New Location;
- Alternatives E & G - Construct a New Access Road to Grey Road 40; and
- Alternatives F, H, I & J - Construct A New Access Road to Grey Road 13.

Under the Do Nothing alternative, only basic improvements and maintenance needs of the bridge are to be addressed, with no structural improvements or changes to the bridge.

Alternative B would involve rehabilitation of the existing bridge to address deficiencies with respect to the bridge's superstructure and substructure. The intent of the rehabilitation would be to improve the bridge's load capacity, thereby allowing the existing 9 tonne load limit to be removed.

Alternative C would entail the decommissioning of the existing bridge and construction of a new bridge in the same location, which would support all vehicle types with no load restrictions. The intent would be to maintain the nature and character of the existing bridge through the implementation of a sympathetic design.

Similar to Alternative C, Alternative D involves the replacement of the existing bridge albeit in a new location. The new single lane bridge would be constructed to resemble the existing conditions and character whilst providing an appropriate level of service and more cost effective solution.

In lieu of improvements to the bridge, Alternatives E through J consider the construction of a new access road connecting Slabtown Road to either Grey Road 40 to the north or Grey Road 13 to the south. It is noted that all the road options with the exception of Alternatives E and F were pre-screened and not considered further as they resulted in greater impacts as compared to Alternatives E and F.

Environment Inventory

The purpose of the environment inventories is to provide the information from which the assessment of the alternative solutions can be based. A description of the study area has been developed considering the identified improvement alternatives, existing land uses and developments, and the natural environment, physical environment, economic environment and cultural/heritage environment.

Azimuth Environmental Consulting Inc. evaluated the study area from a natural environment perspective and identified sensitive environmental features which may be affected by the implementation of the alternative solutions. Low lying areas within the wooded areas adjacent to the proposed routes for Alternative E and Alternative F were identified as potential breeding habitats for anuran amphibians (ie. frogs and toads). The Beaver River is a cold/cool water fish habitat providing a migratory corridor and spawning/nursery habitat for Rainbow Trout and Chinook Salmon. The assessment concluded that Alternatives A, B, C, D, and F would impose no significant environmental impacts to the terrestrial and aquatic natural features and functions identified in the study area. If Alternative E is considered, it will be necessary to undertake an assessment of the Butternut trees located on the proposed road alignment to determine if they are retainable. It was further noted that impacts may result from the temporary detour route required under Alternatives A, D and F (this route could follow existing farm field access roads and thus the impacts would be negated/minimized).

A heritage impact assessment was completed by Golder Associates Ltd., to compile all available information about the known and potential cultural heritage value of the Slabtown Bridge. The assessment noted that the preferred option for improving the Slabtown Bridge is rehabilitation in that it has the least impact on the cultural heritage attributes of the bridge and its surrounding. The assessment further noted however, that should this not be possible, the next preferred alternative is the replacement of the bridge in the same location.

Golder was also retained to evaluate the site area from an archaeological perspective. The archaeological potential for pre-contact Aboriginal sites and historic Euro-Canadian sites is deemed to be moderate to high. As a result of the assessment, a Stage 2 archaeological assessment will be required for all areas to be disturbed by any construction activities affecting the study area, to be completed prior to construction.

With respect to the economic environment, the associated costs to be incurred in implementing and maintaining the road improvements were considered. The costs have been considered in relation to the extent of required upgrades or improvements to the existing bridge, the construction of a new bridge and/or any new road construction required. In addition, impacts to abutting lands have also been considered as part of the economic environment given the associated costs to obtain any required lands.

Evaluation of Alternative Solutions

The restricted load limit of the bridge is the main deficiency of the physical environment for access to the Slabtown community. While the bridge load limit could be revised given the existing structure, such is not considered sufficient to ensure passage by all vehicle types under all conditions. From a structural engineering perspective, it is preferred to replace the existing bridge with a completely new bridge, thus ensuring appropriate design standards and load limits can be achieved.

Based on the natural environment review, Alternatives A, B, C, D and F would impose no significant environmental impacts to the natural environment, with the exception of those impacts related to the need for a temporary detour. The potential impacts to the existing Ash forest and Butternut trees, which are located within the proposed road alignment for Alternative E, makes this alternative unattractive. The preferred alternative, with respect to the natural environment, is that of Alternative D, which would have no impacts to the natural environment and would not require the use of a temporary detour.

In considering the potential archaeological impacts, no such impacts are expected with Alternatives A, B and C in that existing conditions remain and no new works outside of the bridge structure itself would occur (ie. no additional grounds would be disturbed).

In order to best preserve the aesthetic and traditions of the local area and minimize social impacts, the residents have suggested that improvements focus on the existing bridge or bridge location, as opposed to creating further roads leading to Slabtown which may increase through traffic and lead to longer travel times for access to/from the community.

The economic environment pertains primarily to the cost to implement and maintain the improvement solution. A life-cycle costing assessment was undertaken to consider not only the initial costs to implement each solution, but also the longer term costs over a 50-year period.

The evaluation of alternatives considered various evaluation criteria for each environment, some of which were given greater significance and weight in the overall assessment (eg. the ability to rectify the 9 tonne load limit is considered more important than impacts to utilities or pedestrian operations). The alternatives were subsequently scored based on the relative importance of the criteria, and the extent to which positive or negative impacts resulted (impacts were gauged in relation to the “do nothing” scenario). Both the weighting and scoring schemes were presented to the public, Town staff

and Town council and a number of iterations/refinements were undertaken to address comments received.

Preferred Solution

Following consideration for all comments received, the preferred solution was identified as Alternative C - Replace Bridge in Same Location. As this alternative more or less maintains the status quo (with the exception of a new bridge), it will have minimal impacts to the adjacent environments and the residents. While Alternative C is not the least costly to implement (more expensive than some of the road based options), it does not result in the same level of impact to the social, natural and cultural/heritage environments.

Next Steps

The *Access to the Community of Slabtown Class EA* was presented to Town Council and the Preferred Solution of Alternative C was subsequently endorsed. Following completion of the Class EA Schedule B process, which allows for one further point of public consultation and review, and provided there are no outstanding issues, the Town may proceed to implementation.

1 Introduction

The Town of The Blue Mountains initiated a Class Environmental Assessment (Class EA) to examine the most appropriate strategy to improve vehicular access to the community of Slabtown. Currently, Slabtown Road is the only means of vehicular access to the 15 families that reside in the community. The Slabtown Bridge, a 1930 single lane, half-through truss structure crossing the Beaver River, has a posted load limit of 9 tonnes, which limits vehicular access to cars and light trucks. Fire trucks, snow plows, school buses and heavy trucks all exceed this load limit and thus are not legally permitted to cross the bridge. In this regard, improvements are desired to ensure ready access for the residents, be it through improvements to the existing bridge or implementation of additional means of access.

C.C. Tatham and Associates Ltd. were retained by the Town to undertake a Municipal Class Environmental Assessment study, in accordance with the appropriate guidelines[1]. The objective of the Class EA is to confirm the need for improvements and consider the most appropriate manner in which such can be implemented.

1.1 Class Environmental Assessment Process

The Class Environmental Assessment process is defined in the *Municipal Class Environmental Assessment* document. Applying to all municipal road improvement projects, a number of study categories or schedules have been established recognizing the range of environmental impacts. These are briefly described below whereas the process corresponding to each is illustrated in Figure 1.

1.1.1 Class EA Schedules

Schedule A

Schedule A projects generally include normal or emergency operational and maintenance activities. As the environmental effects of these activities are usually minimal, these projects are pre-approved and may proceed directly to implementation without the need to complete the design and planning process. No reports or study documents need to be prepared.

Schedule A+

Schedule A+, which represents a new classification in the 2007 EA guidelines, includes projects that are typically limited in size and scope, and thus have minimal associated environmental impacts. While these projects are also pre-approved, they require notification to the public prior to implementation. No reports or study documents need to be prepared outside of the notification.

[1] *Municipal Class Environmental Assessment*. Municipal Engineers Association, October 2000 as amended in 2007.

Schedule B

Schedule B projects generally include improvements and minor expansions to existing facilities. As there is the potential for some adverse environmental impacts, the municipality is required to conduct a screening process whereby members of the public and review agencies are informed of the project and given the opportunity to provide comment. Documentation of the planning and design process is required under a Schedule B study. As these studies are generally straightforward and do not require detailed technical investigations to arrive at the preferred solution, a formal report is not required. Rather, a Project File shall be prepared to demonstrate that the appropriate steps have been followed. The Project File is to be submitted for review by the public and review agencies.

Schedule C

Schedule C projects generally include the construction of new facilities and major expansions to existing facilities. As they have the potential for environmental impacts, they must proceed under the full planning and documentation procedures specified by the Municipal Class EA document. Schedule C projects require an Environmental Study Report (ESR) to be prepared and appropriately filed for review by the public and review agencies.

1.1.2 Class EA Terminology

Prior to determining the appropriate Class EA schedule, an understanding of the defining terminology is required as noted below:

New Road

Means the construction of an improved surface for vehicular traffic on a new right-of-way where the right-of-way is entirely separate from any previous right-of-way. Also refers to the construction of a road on a road allowance whereby no road surface previously existed

Hydraulic Capacity

Means capacity defined in terms of the volume of water that can be conveyed under or through a water crossing structure.

Road Capacity

Means capacity defined in terms of the number of travelled lanes and does not differentiate between various lane widths to accommodate differing traffic volumes.

Same Purpose, Use, Capacity & Location

Refers to the replacement or upgrading of a structure or facility or its performance, where the objective and application remain unchanged, and the volume, size and capability do not exceed the minimum municipal standard, or the existing rated capacity, and there is no substantial change of location. Works carried out within an existing road allowance such that no land acquisition is required are considered to be in the same location. Conversely, it is thus inferred that should improvements extend beyond the existing road allowance and additional property is required, the location is considered to have changed.

Watercourse

Means flowing water, though not necessarily continuous, within a defined channel and with a bed and banks which usually discharges itself into some other watercourse or body of water.

1.1.3 Selected Schedule

As per the Class EA guidelines and in consideration of the improvement works, the following apply:

- Schedule A+ for the reconstruction of a water crossing for the same purpose, use, capacity (refers to either hydraulic capacity or road capacity) and at the same location;
- Schedule B for the reconstruction of a water crossing where the reconstructed facility will not be for the same purpose, use, capacity (refers to either hydraulic capacity or road capacity) or at the same location and provided the cost is less than $2.2M;
- Schedule B for the construction of a new water crossing provided the cost is less than $2.2M;
- Schedule B for construction of new roads with a cost of less than $2.2M; and
- Schedule C for the above noted projects which exceed $2.2M.

In consideration of the above Class EA guidelines, potential alternative solutions and the associated costs (the reconstruction of the existing bridge, construction of a new bridge or construction of a new access road can each be implemented for less than $2.2M), and to ensure appropriate public consultation throughout the study, the Schedule B Class EA process has been adopted. As illustrated in Figure 1, a Schedule B requires completion of Phases 1 and 2 of the Municipal Class EA planning and design process.

1.2 Objective of the Report

The overall objective of this report is to document the planning process undertaken during Phases 1 and 2 of the Municipal Class EA process related to the development and evaluation of alternative solutions. Specifically the report details the following:

- a description of the problem;
- the development of alternatives to address the problem;
- the detailed inventories of the affected/applicable environments (physical, natural, social, economic, and cultural);
- the impacts of the alternatives on the environments;
- mitigative measures to minimize potential environmental effects; and
- the remaining steps involved in the planning and design process to implement the recommended improvements.

The Phases 1 and 2 Report has been prepared to follow the chronological order of the Municipal Class EA process and is structured as follows:

- Chapter 2 presents the need and justification of the study and the preparation of a problem statement to guide the Municipal Class EA process;
- Chapter 3 addresses the first point of consultation - Study Commencement;
- Chapter 4 details the alternative solutions developed to address the problem statement;
- Chapter 5 identifies the affected environments and provides an inventory of such to be considered in the subsequent evaluation;
- Chapter 6 details the evaluation of the alternative solutions in context of the manner to which they satisfy the problem statement and potential impacts to the environments;
- Chapter 7 addresses the second point of consultation - Public Information Centre;
- Chapter 8 identifies the preferred solution, considering the initial evaluation and comments received from the Public Information Centre; and
- Chapter 9 outlines the remaining tasks in the Municipal Class EA process.

2 Need & Justification

The purpose of this Class EA study is to identify the most appropriate strategy to improve access to the community of Slabtown. In doing so, it is first necessary to establish and understand the existing conditions from which the needs are determined, following which the overall problem statement can be defined. These tasks have been completed in accordance with Phase 1 of the Class EA process which culminates with the creation of the problem statement.

2.1 Study Area

The community of Slabtown is located south of Grey Road 40 and both west and north of Grey Road 13 in the Town of The Blue Mountains (as illustrated in Figure 2). Slabtown Road, which provides the only access to the community, extends from Grey Road 13 (the north-south section) approximately 860 metres to the west, where it terminates at a dead-end. As such, there is only 1 means of access to/from the community.

2.2 Existing Conditions

The need for improvements results from the existing conditions, as detailed below and illustrated through site photographs presented in Figure 3 and Figure 4.

2.2.1 Slabtown Bridge

The Slabtown Bridge is located approximately 200 metres west of Grey Road 13 and crosses the Beaver River. The bridge was built in 1930 as a single lane, half-through truss (pony truss) structure and has a single span of 27.6 metres and a width of 4.9 metres (travel deck width is 4.4 metres following consideration for curb barrier).

Bridge Appraisal

An appraisal of the Slabtown Bridge was completed in October 2007, a copy of which is provided in Appendix A. The appraisal noted that improvements are required to the following bridge elements (time of improvement noted in brackets):

- coating (now);
- travel deck width (now);
- substructure (1-5 years);
- superstructure (6-10 years); and
- railings (6-10 years).

Recommendations from the bridge appraisal are as follows:

- replace bridge because of deficient width (accommodates only a single lane of travel) and load limit restrictions;
- repair west concrete abutment bearing seat below the south truss, clean and paint structural steel trusses, floor beams, stringers and steel pipe handrails and upgrade guide rail to maintain the structure in its original condition; and
- install narrow bridge signs with one lane tabs on approaches under normal bridge maintenance (which has subsequently been done).

Subsequent to the October 2007 appraisal, a further site visit was completed as part of this study. It was noted that additional patching of the west abutment should be considered, in that previous patches have since spalled off. There are also several cracks in the south-west and north-west wingwalls that have propagated further, although there does not appear to be any settlement of the abutments. Provided the bridge is not widened, there is the potential to maintain the existing abutments and therefore avoid any in-water works.

Bridge Load Limit

In 2006, a "Maximum Weight 9 Tonnes" sign was posted on Slabtown Road, immediately east of the bridge although it is uncertain as to whether this load limit was established through evaluation or by visual inspection alone. There is no load limit sign on the west side of the bridge as such is not needed given the dead-end nature of the road. Given the load limit, snow plows, fire trucks, dump trucks, garbage trucks, standard school buses and heavy equipment are not otherwise legally permitted to cross the bridge (it is understood however that fire trucks would cross the bridge in response to an emergency situation, albeit they would do so empty of water for fire fighting and refill as necessary from the Beaver River).

A further evaluation of the bridge structural members was completed as part of this study to confirm the appropriateness of the load limit posting (and hence the need for improvements). Original design drawings for the 1930 installation and the 1984 deck replacement were obtained from the Ministry of Transportation bridge office. These drawings were reviewed in conjunction with the results from a site inspection and field measurements to confirm the bridge's structural member sizes and their condition. A load posting evaluation was subsequently completed in accordance with Section 14 of the Canadian Highway Bridge Design Code (CHBDC). The existing structural members were considered to be in good condition and thus no deterioration allowance was used in the evaluation. Based on the evaluation, the 9 tonne load limit is considered appropriate for single axle vehicles. However, this can be increased to 15 tonnes for a 2 axle vehicle and 22 tonnes for a 3 axle vehicle (recognizing that the effective load is distributed over the vehicle axles). In other words, the bridge can be "triple posted".

It is noted that the evaluation assumes that vehicles travel close to the side of the bridge deck upon crossing (as required by the CHBDC) as opposed to travelling down the centre of the bridge. Under this condition, the 1930s era floor stringer is the governing member in determining the load limits.

As part of the 1984 deck replacement, additional structural members were inserted within the central area of the bridge structure, thereby reinforcing it further. If vehicles were to travel down the centre of the bridge (which would require channelization of some manner on the bridge deck to align vehicles accordingly), the bridge could be posted at 25 tonnes for all vehicles (ie. regardless of the number of axles). In this case, the governing members are the first bottom and top chord members of the truss. However, it would be difficult to restrict traffic to the centre of the deck given requirements for snow clearing. In addition, any barriers added might not be visible during winter conditions and thus could pose additional hazards to the travelling public. Furthermore, a 25 tonne load limit would not be sufficient to accommodate all vehicle types and thus improvements would still be considered necessary.

2.2.2 Vehicular Access

Slabtown Road is of sufficient width to provide 1 travel lane per direction (although such lanes are not otherwise delineated).

The Slabtown Bridge has a travel width of 4.4 metres and thus can only accommodate travel in a single direction at one time. While the width of the bridge does not comply with current design standards, given the volume of traffic served, coupled with the rural and residential nature of the community, a single lane per direction is considered appropriate. The existing traffic volumes do not otherwise warrant a widening of the bridge to accommodate 2 lanes of travel, and nor would future traffic volumes given that no significant growth in the community is expected.

2.2.3 Pedestrian & Cyclist Access

There are no defined pedestrian facilities along Slabtown Road or on the bridge, reflective of the local environment and age of the bridge. Rather, pedestrians are required to share the travel lane with crossing vehicles, which may pose safety concerns to some local residents (although the volume of traffic is limited). There is a caution sign posted on the east side of the bridge (for motorists travelling westbound) alerting motorists to the presence of children playing ahead.

Likewise, there are no dedicated facilities for cyclists on the bridge or along Slabtown Road. However, this is not uncommon in that cyclists are expected to share the travel lane with motorists on most roads.

2.2.4 Roadside Safety

The bridge structure includes concrete curb, steel handrails and steel trusses which would prevent those crossing (vehicles, cyclists and pedestrians) from travelling over the edge of the bridge. On

each corner of both approaches, there are short concrete abutment walls that extend approximately 0.6 metres above the road surface. Extending from 3 of the 4 abutment walls are short sections of steel beam guiderail (9 metre sections on the west side, 6 metre section on the east side). There is no guiderail on the south-east corner.

Given the length of guiderail sections, the absence of guiderail on one corner, and the absence of appropriate guiderail end treatments (which are intended to absorb the impact of vehicles), the existing roadside safety measures are not deemed appropriate and improvements are therefore recommended (which is consistent with the findings of the bridge appraisal noted in Section 2.2.1).

There are steep and unrecoverable embankments along Slabtown Road immediately west of the bridge which also pose hazards to motorists. It is understood that there have been occurrences of vehicles leaving the road during winter conditions through this area. In consideration of this, appropriate guiderail treatments should be considered (as an extension to the bridge system).

2.2.5 Hydrologic & Hydraulic Reviews

A hydrologic and hydraulic review of the Beaver River adjacent to the community of Slabtown was completed, to define the appropriate design flows and standards, and to assess the suitability of the existing structural capacity from a hydraulic perspective.

Hydrology Review

The *Beaver River Floodline Mapping Study Final Report*[2] was obtained from the Grey Sauble Conservation Authority (GSCA), which provided a detailed analysis of applicable design flows for hydraulic modelling analysis within the Beaver River Watershed study limits. The methods used for estimating peak flows included statistical and hydrologic modelling analysis. The statistical analyses included both single station analyses (available period of record spans 33 years at Station 02FB009 located near Clarksburg) and application of Regional Flood Frequency techniques. The hydrologic modelling analyses were undertaken using HYDRO-PAK and OTTHYMO models. The resulting design flows for areas below Heathcote, which are applicable to the Slabtown Road Bridge, as determined from the analyses are outlined in Table 1 for various design events (eg. 2 year storm, 5 year storm, etc.). For further details relating to the determination of the noted design flows, refer to the *Beaver River Floodline Mapping Study Final Report*. The corresponding drainage area was determined to be 563 km^2.

[2] *Beaver River Floodline Mapping Study Final Report.* B.M. Ross and Associates Ltd. in cooperation with the Grey Sauble Conservation Authority and the Ministry of Natural Resources, 1995.

Table 1: Design Flows for Areas below Heathcote

2 year storm event	5 year	10 year	20 year	50 year	100 year	Timmins Storm
56.8 m^3/s	70.4	78.0	84.5	92.3	97.6	204

Hydraulic Review

A site specific topographic survey of the immediate area was undertaken in August 2009 to collect information with respect to the following:

- detailed river cross sections (at locations both upstream and downstream of the bridge);
- bridge features (deck elevations, effective flow opening and bridge dimensions);
- a cross section through the Slabtown Dam; and
- various ground spot elevations (all grades were determined relative to an arbitrary benchmark elevation set at 100.0 metres).

Hydraulic modelling of the Beaver River in the vicinity of the Slabtown Bridge was completed using the HEC-RAS 4.0 software. A total of 7 cross sections were modelled in addition to the existing Slabtown Dam and Slabtown Bridge (2 sections upstream of the dam, 2 sections between the dam and the bridge, and 3 sections downstream of the bridge). The 100 year and Regulatory Storm (Timmins) flow rates of 97.6 and 204 m^3/s as noted above were applied to the HEC-RAS hydraulic model. The flow through the existing dam structure is controlled by a single concrete gate, which was modelled as an in-line structure with an effective height of approximately 1.9 metres and a width of 12.5 metres. The "normal depth" downstream boundary condition was selected using a channel slope of 0.2% as determined by the available Ontario Base Mapping. The Mannings roughness coefficients "n" of 0.045 and 0.08 were selected for the natural channel and wooded overbank areas respectively and are consistent with the parameters used in the previously mentioned *Beaver River Floodline Mapping Study Final Report*. The hydraulic model was used to determine flood elevations at the existing Slabtown Bridge in order to assess the suitability of the existing bridge capacity.

The 100 year and Regulatory flood elevations at the existing Slabtown Bridge were determined to be 100.9 and 101.9 metres respectively (the HEC RAS modelling results are included in Appendix B). The minimum surveyed top of deck elevation on the bridge is 102.4 metres and the bottom of deck elevation is estimated at 102.1 metres (the deck is approximately 0.3 metres in thickness). On this basis, it is concluded that the existing bridge is sufficiently elevated such that it will not impede river flow and will allow for safe vehicular passage during rainfall events up to and including the Regional event.

For the purposes of assessing bridge design alternatives, it is recommended at minimum, the existing bridge bottom of deck elevation of 102.1 metres be maintained. This will ensure each alternative has sufficient hydraulic capacity to convey rainfall events up to and including the Regional event while maintaining safe ingress and egress.

2.3 Problem Statement

In consideration of the existing conditions, the Problem Statement, which sets the framework for the remainder of the study, is as follows:

> *Vehicular access to the Community of Slabtown can only be achieved via Slabtown Road and crossing of the Slabtown Bridge. Given that the structure dates to the 1930s, is showing signs of deterioration and has recently been posted with a 9 tonne load limit thus restricting access to cars and light trucks, an improved and/or alternative means of vehicular access is required to ensure safe and efficient access for all residents, whilst minimizing impacts to the surrounding environments.*

3 Consultation - Study Commencement

As per the Class EA process (refer to Figure 1), there are a number of points of stakeholder contact. The first point of contact, as discussed in this chapter, is the Notice of Study Commencement, which is used to inform the general public and stakeholders of the start of the study. The remaining points of contact are discussed further in the report following the chronological order in which they occurred.

3.1 Notification

A Notice of Study Commencement, which is a discretionary point of contact, was issued to all property owners within Slabtown and those fronting Grey Road 13 or Grey Road 40 in the immediate area (as determined from Town records) on July 57, 2009. A notice was also published on the Town's website and in the local newspapers (Collingwood Enterprise Bulletin and Blue Mountain Herald) in the same period. The notice identified the study area, the study methodology and EA guidelines to be followed. In addition, it invited public input and comments early in the process such that they could be considered in the overall study design and completion. A copy of the Notice of Study Commencement is provided in Appendix C.

Notices were also submitted to the appropriate review agencies, stakeholder groups and special interest groups, a listing of which is provided in Appendix C.

3.2 Public Comments

Comments in response to the Notice of Study Commencement were received from 2 residents in the area: 1 resident of Slabtown and another who resides on County Road 40 immediately north of Slabtown. Additional information with respect to the study area and possible alternative solutions was provided to each. Concerns were noted with respect to the impacts of improvements to the rural nature of the community and the impacts of possible new access roads to private property.

3.3 Agency Comments

Comments were received from Indian and Northern Affairs Canada and the Ministry of Culture (copies of which are provided in Appendix C)

Indian & Northern Affairs Canada

Indian and Northern Affairs Canada indicated that they will not be reviewing the project. Rather, they noted that all potentially affected First Nation communities should be contacted directly (which was otherwise completed).

Ministry of Culture

The Ministry of Culture noted that the subject property of the Class EA may have archaeological potential based on the following provincial archaeological criteria:

- a known archaeological site or within 250 meters of a known site;
- within 300 meters of a primary water source (lakeshore, river, large creek);
- within 200 meters of a secondary water source (stream, spring, marsh, swamp);
- within 300 meters of a ancient water source (beach ridge, river bed);
- on elevated topography (knolls, drumlins, plateaux);
- on pockets of sandy soil in a clay or rocky area;
- on unusual land formations (mounds, caverns, waterfalls);
- extractive area (for food or scarce resources);
- non-aboriginal settlement (monuments, cemeteries);
- historic transportation (road, rail, portage);
- designated property;
- local knowledge; and
- recent disturbance (confirmed extensive and intensive = low potential).

Given the above, the Ministry concluded that an archaeological assessment by an archaeologist licensed under the Ontario Heritage Act may be required prior to any ground disturbance and/or site alterations. The assessment must be in compliance with the Ministry of Culture's *Standards and Guidelines for Consultant Archaeologists*.

4 Alternative Solutions

A number of reasonable and feasible solutions to addressing the Problem Statement were developed and are otherwise presented in this chapter.

4.1 Alternative A - Do Nothing

Under this alternative, illustrated schematically in Figure 5, only basic improvements and maintenance needs of the bridge are to be addressed, which will essentially maintain the status quo. No structural improvements or changes to the bridge would be made to solve the identified problems and as such they would remain, including the need to maintain the 9 tonne load limit with the current bridge.

Given the age of the existing bridge, replacement has been assumed in 20 years, at which time the existing bridge would be 100 years old. Otherwise, the existing bridge is expected to have reached its useful life and would not be appropriate for vehicular traffic (and thus, no access to Slabtown would be provided). The new bridge would be designed and constructed in accordance with Ministry of Transportation and Canadian Highway Bridge Design Code (CHBDC) standards. Given the existing 9 tonne load limit, the implementation of a comparable bridge was considered in keeping with the "do nothing" approach (ie. replace same with same and thus the new bridge would also have a reduced load limit). However, as per the design standards, the design must consider emergency and maintenance vehicle weights, which will dictate the appropriate load design, thus addressing the current load restriction. While a reduced load design is possible (if properly posted and for specific uses), such is not recommended in consideration of the vehicles to be served. Furthermore, a "reduced load" design would not be expected to yield significant cost savings as compared to a "full load" bridge (the difference in design and hence cost relates to the depth and/or number of supporting trusses in the substructure) and would not offer any opportunity for future load reductions in response to expected deterioration (as is the case with the current structure).

While this alternative would not satisfy the objectives of the Town to improve the safety, condition and performance of the bridge, a Do Nothing alternative is suggested for consideration within the Municipal Class EA guidelines. A decision to do nothing would typically be made when the costs of all other alternatives, either financial and/or environmental, significantly outweigh the benefits.

4.2 Alternative B - Rehabilitate the Existing Bridge

Alternative B is illustrated schematically in Figure 5 and would involve rehabilitation of the existing bridge to address deficiencies with respect to the bridge's superstructure and substructure. The intent of the rehabilitation would be to improve the bridge's load capacity, thereby allowing the existing 9 tonne load limit to be removed. Despite these improvements, given the age of the existing bridge, replacement after 20 years is otherwise assumed to address those bridge elements not otherwise

rehabilitated. The replacement bridge would be designed in accordance with current standards and thus would accommodate all vehicle types with no load restrictions applied.

The implementation of improvements under this alternative would require full closure of the bridge during the work and thus an alternative means of access would be required for the residents. This could include the provision of a temporary bridge or a temporary access road. The latter is considered the most feasible and would likely utilize the existing farm access trail from the end of Slabtown Road to Grey Road 13 to the extent possible (with some upgrades as necessary to ensure appropriate road standards).

4.3 Alternative C - Replace the Existing Bridge in the Same Location

Alternative C (refer to Figure 5), would entail the decommissioning of the existing bridge and construction of a new bridge in the same location, which would support all vehicle types with no load restrictions. The intent would be to maintain the nature and character of the existing bridge through the implementation of a sympathetic design (examples of comparable, pre-fabricated bridges are illustrated in Figure 6, whereas additional details are provided in Appendix D). This would also include provision for only one travel lane (which is considered appropriate given the traffic volumes served). Replacement in the same location would allow the existing abutment walls to be maintained (minor improvements to the abutments would be necessary), thus limiting the need for in-water works and potential impacts to the Beaver River.

As with Alternative B, an interim access road would be necessary to maintain access for Slabtown residents during the improvements.

4.4 Alternative D - Replace the Existing Bridge in a New Location

Similar to Alternative C, Alternative D involves the replacement of the existing bridge albeit in a new location, which is illustrated schematically in Figure 5. To best utilize the existing Slabtown Road infrastructure and minimize impacts, the new bridge would be located immediate adjacent to, and south of, the existing bridge (as noted in Figure 5). The new bridge would be constructed to resemble the existing conditions and character whilst providing an appropriate level of service and more cost effective solution. As with the previous alternative, a single lane bridge is appropriate in that crossing movements are relatively minor and would not be expected to increase significantly in the future. The new abutment walls would be located beyond the Beaver River, thus avoiding impacts to the river (although this would result in a slightly longer structure and hence increased costs). Given the existing topography on the south-west corner of the existing bridge, some backfill within this area would likely be required.

In order to maintain access for residents during construction, this alternative would be achieved by first constructing the new bridge in the new location, complete with road approaches. After the new bridge is completed, decommissioning of the existing bridge would occur.

4.5 Alternatives E & G - Construct a New Access Road to Grey Road 40

The dead-end nature of the Slabtown Road provides residents with only a single means of access, and given the load limit of the Slabtown Bridge, access is only legally permitted for cars and light trucks. In lieu of improvements to the bridge, which would otherwise remove the load limit, Alternatives E and G considers the construction of a new access road connecting Slabtown Road to Grey Road 40, as illustrated in Figure 7.

With Alternative E, the length of the new road would be approximately 1500 metres, 900 metres of which would be located within existing, but unopened, road allowances[3] (as designated in Figure 7). The remaining 600 metres would be located on private property and thus property acquisition would be required. For illustrative purposes, the alignment upon approach to Grey Road 40 is shown along the existing north-south property line (the exact location will be further considered through the Class EA process pending a review of the environments affected and impacts to the existing residential driveway). Alternative E would require 2 watercourse crossings of an unnamed tributary of the Beaver River, which would be required to accommodate fire trucks, school buses, snow plows and other heavy trucks. Simple box culverts are considered sufficient, as opposed to bridges, given the nature of the watercourses (which were observed as being dry during the summer investigations).

Figure 7 also illustrates a slight deviation to Alternative E, referred to as Alternative G, which would have the same start and end points as Alternative E. While the 1320 metre length of road for Alternative G would be less than that of Alternative E, it would have greater impacts to the existing residential property and its driveway, prior to continuing southeast across the property to Slabtown Road. As with Alternative E, this alternative would also require 2 small watercourse crossings.

4.6 Alternatives F, H, I & J - Construct a New Access Road to Grey Road 13

Alternative F would result in a new road that would connect the western terminus of Slabtown Road south to Grey Road 13 as illustrated in Figure 8. The length of the new road would be approximately 1500 metres, 600 metres of which would be within an unopened road allowance with the remaining 900 metres being located within private property (the exact location in reference to the north-south property line shown in Figure 8 to be determined).

Additional alignments considered to connect Slabtown Road to Grey Road 13 are also noted in Figure 8, designated as Alternatives H, I and J.

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[3] Historic property ownership records were investigated and reviewed to determine the status of the unopened road allowance. In summary, the "road" is not an original concession road but deeds dating to the time of Confederation have acknowledged that there is a public road through the concession lot and along the west side of the lot. Property plan 16R-7723 indicates a "Township Road" but notes that it is not travelled. There are no records on title to confirm that the Town owns the road allowances. It also appears that no one has made a claim to ownership in the last 40 years.

Under Alternative H, the road would be constructed along the single-lane pathway that exists between the western terminus of Slabtown Road and Grey Road 13, with the same start and end points as Alternative G. The existing track is located along property boundaries, thus sharing impact to adjacent land owners. However the 1460 metres of new road would take an indirect route with numerous 90° bends as compared to Alternative G.

To minimize construction, shorter more direct routes were considered - Alternatives I and J (910 and 970 metres respectively). Alternative I would bisect 2 properties, travelling north along the western edge of the treeline before heading northwest to the corner of the property boundary and connecting to Slabtown Road. Alternative J is also located along the western edge of the treeline, but continues north-easterly to tie into the 120 metres of unopened road allowance which is currently being used as a residential access. In both cases, where possible the new road allowance would be located along or adjacent to existing property lines.

4.7 Initial Screening of Alternative Solutions

In order to limit the list of alternatives to those that are most practical, certain alternatives were pre-screened and will not be carried forward. They have been included in this report to demonstrate that multiple approaches were considered for the various alternatives.

Alternative E achieves its purpose of connecting Slabtown Road with Grey Road 40 whilst minimizing any adverse impacts. In comparison, Alternative G is not considered a viable alternative as it requires the use of what is currently a residential driveway, has potential impacts to an existing residential development lot and has greater property impacts overall given its configuration prior to running along the property boundaries. In this regard, the negative impacts associated with Alternative G are greater than the impact of Alternative E and thus only Alternative E will be carried forward as a possible alternative for a connection to Grey Road 40.

Alternative F connects Slabtown Road with Grey Road 13 in a direct route with minimal property impacts. While the intent of Alternative H was to follow an existing trail and thus minimize impacts, the resulting alignment and need for numerous 90° bends makes this alternative somewhat impractical from a traffic operations perspective. While Alternatives I and J are more direct routes as compared to Alternative G, they bisect 2 and 3 land parcels respectively. As some of these lands are for agricultural use, a route which bisects them may require reorganization of crops to suit the new property boundaries, possibly resulting in portions of unusable land for farming. Some farm operations may need to cross the new road to gain access to their plot of land. Alternatives I and J also have potential negative impacts to the residential golf facility that has been constructed on the property fronting Grey Road 13. As such, the negative impacts associated with Alternatives H, I and J are greater than the impact of Alternative F and thus only Alternative F will be carried forward for access to Grey Road 13.

5 Environment Inventory

A description of the study area has been developed considering the identified improvement alternatives, existing land uses and developments, and the natural environment, physical environment, economic environment and cultural/heritage environment. In accordance with the Class EA framework (as per Figure 1), detailed investigations and analyses with respect to the environment inventories were not required at this point in the study. Rather, data was obtained from site visits and a review of secondary information pertaining to the study area.

The purpose of the inventories is to provide the information from which the assessment of the alternative solutions can be based. Brief descriptions of the various environments investigated are provided below.

5.1 Physical Environment

The physical environment pertains to the transportation system, utility/infrastructure systems within the area and the general land uses.

Transportation System

The transportation system as it pertains to this study includes Grey Road 40, Grey Road 13, Slabtown Road and the associated unopened right-of-ways in the area. Details with respect to the road system were previously provided in Section 2.1.

There are no dedicated or separate pedestrian or cyclist facilities within the immediate area, nor is there transit service to the community.

Utility System

There are existing overhead utilities along Slabtown Road providing service to the local residents. However, these are not expected to be impacted by the proposed improvements (if necessary, utility poles can be relocated with minimal undertaking). There are also utility services attached to the Slabtown Bridge.

Land Uses

Land use designations within the area have been determined from the *Grey County Official Plan*[4]*;* the corresponding land use map is provided in Appendix E. The following apply:

[4] *Grey County Official Plan*. Grey County Planning & Development Department, August 30, 2000.

- Slabtown is designated a "hamlet community". Hamlets are primarily residential in nature with a limited opportunity for growth.

- The area surrounding the Beaver River is designated as "hazard lands" which indicate that the area may be affected by floods, erosion, instability, poor drainage or any other condition which may pose some type of risk.

- Farmland north-west of Slabtown is designated as "agricultural" while farmland to the south-west is designated as "special agricultural". It is the desire of local residents and government that farm operations be maintained as the dominant land use in the area. Land deemed "special agricultural" is environmentally sensitive and reserved mainly for areas that "lend themselves to the growing of fruits and vegetables".

5.2 Natural Environment

Azimuth Environmental Consulting Inc. conducted a site visit in August 2009 and undertook necessary background reviews to evaluate the study area from a natural environment perspective. The limits of their investigations included the footprint of the existing Slabtown Bridge and adjacent lands within 20 metres of the existing road allowance, and the proposed road corridors pertaining to Alternative E and Alternative F. Based on their findings, sensitive environmental features which may be affected by the implementation of the alternative solutions were identified. The corresponding findings are summarized below and otherwise detailed in the report *Environmental Existing Conditions Report – Access to the Community of Slabtown* provided in Appendix F. Natural environment features within the area are otherwise illustrated in Figure 9 through Figure 11.

Terrestrial Resources

A vegetation survey was conducted on August 20, 2009 to document the vegetation communities that reside within the proposed limit of disturbance for the alternative solutions. The encountered vegetation communities are not considered to be provincially rare and none of the observed species are considered to be provincially endangered, threatened or of special concern. Similarly, there are no known recent (ie. within 20 years) element of occurrence records on file with the Ministry of Natural Resources' Natural Heritage Information Centre to indicate that the property potentially contains habitat of threatened or endangered vegetation species.

Wildlife Habitat

Wildlife species utilizing the study area were identified from direct observation and through interpretation of obvious signs (ie. tracks, scats, vocalizations, etc.). Mammals observed or evidence of presence on the property included white-tailed deer, raccoon, Eastern chipmunk and 13 different bird species. None of the mammals or birds observed during the site visit are of conservation concern. Within a 10km $\times$ 10km square which includes Slabtown, there were no regionally rare birds confirmed as breeding. Although white-tailed deer utilize the study area, no deer yards were identified.

Low lying areas within the wooded areas adjacent to the proposed routes for Alternative E and Alternative F were identified as potential breeding habitats for anuran amphibians (ie. frogs and toads).

Aquatic Resources

Within the study area and in proximity to the bridge, the Beaver River flows within a well defined, prominently forested valley corridor, with an average wetted channel width of 10 to 20 metres. Surface water quality and in-stream habitat in the river is classified as excellent. The river is a cold/cool water fish habitat providing a migratory corridor and spawning/nursery habitat for Rainbow Trout and Chinook Salmon. Approximately 30 fish species in total have been identified as occurring in the Beaver River, although none were ranked provincially or federally as "Species at Risk".

A small unnamed tributary of the Beaver River flows within the area of the Alternative E (new road to Grey Road 40). At the time of the site investigation (August 20, 2009), the unnamed tributary was dry. Channel definition was difficult to find in most areas, and the small unnamed tributary should be classified as an intermittent system that provides seasonal indirect fish habitat, with its main function as conveying seasonal (snow melt/agricultural drainage/heavy precipitation) surface drainage to the Beaver River.

Evaluated Natural Heritage Features

There are no provincially significant wetlands (PSW) or areas of natural or scientific interest (ANSI) within 120 metres of the study area. No significant woodlands or valley lands have been identified on or adjacent to the study area.

5.3 Social Environment

A review of the social environment focused on existing residential dwellings and/or commercial properties that could be impacted by the proposed alternative solutions. In addition, potential impacts to public institutions and service facilities were also considered.

As previously noted, there are 15 families residing in the Slabtown community. However, no direct impacts to the existing dwellings are expected as they are sufficiently setback from the existing road and/or bridge and proposed footprints for new works. In addition to the emergency service limitations, the existing load limit also restricts the ability of the residents to undertake significant improvements/modifications to their properties in that construction equipment cannot pass over the bridge.

There are 2 small commercial properties (welding and woodworking) in Slabtown which are not expected to be impacted by the works.

There are no municipal buildings, schools, libraries, community centres, fire stations or other public institutions within the study area.

5.4 Cultural/Heritage Environment

This environment encompasses built heritage sites, archaeological and First Nations interest.

Built Heritage

Golder Associates Ltd. evaluated the site area from a heritage perspective, findings of which are summarized herein and detailed in the report *Heritage Impact Assessment - Slabtown Community Access Bridge* provided in Appendix G. The objective of the heritage impact assessment was to compile all available information about the known and potential cultural heritage value of the Slabtown Bridge. In addition, the assessment was to provide specific direction for the protection, management and/or mitigation of those attributes of the bridge that were deemed to have value. To complement the research for the study, a site visit and review was conducted on August 14, 2009.

The Slabtown Bridge is an example of a design once common in Ontario, but which is now becoming rare due to replacement. The name of both the bridge and the community are associated with the area's history of saw milling at the river crossing. The following site characteristics or attributes represent the heritage significance of the bridge:

- steel Warren pony-truss of standard shapes and riveted into girders;
- the narrow 4.4 metre width of the bridge;
- the curved road alignment necessary to compensate for the Beaver River channel; and
- the relationship of the bridge to the mill dam.

In addition, flower baskets hanging from the trusses of the bridge suggest that there is local interest in the aesthetic value of the bridge.

Archaeological

Golder was also retained to evaluate the site area from an archaeological perspective in compliance with the provincial regulations and standards set out in the *Archaeological Assessment Technical Guidelines* and in accordance to the *Ontario Heritage Act.* The resulting Stage 1 archaeological assessment of the study area is provided in Appendix H. In order to determine the potential for locating anything of cultural significance, background research was conducted on various aspects of the property including geology, topography, drainage, soils and vegetation. Archaeological and historic background research was also completed. To complement the research for the study, a site visit and review was conducted on August 14 and October 1, 2009.

Previous surveys conducted in Grey County have demonstrated that the area was intensively utilized and inhabited by pre-contact Aboriginal peoples. Within two kilometres of the study area, there are 12 registered archaeological sites. The archaeological potential for pre-contact Aboriginal sites is

deemed to be moderate to high. This assessment is due to the presence of nearby water sources, suitable soils for pre-contact Aboriginal agricultural practices, and the presence of a known archaeological resource.

The location of the current bridge at the site is known to be the site of a previous historic bridge, associated with a saw mill on Lot 26 in Concession 11. It spans a historic water route, the Beaver River. The area has also been occupied since the early to mid-19th century and is in close proximity to the historic communities of Thornbury and Clarksburg. The route followed by Highway 26 (to the east of the study area) also represents one of the earliest overland transportation routes into the region, having been first cleared as a dirt path in the mid-19th century. Due to these factors, the archaeological potential for historic Euro-Canadian sites is also deemed to be moderate to high.

As a result of the assessment, a Stage 2 archaeological assessment will be required for all areas to be disturbed by any construction activities affecting the study area, to be completed prior to construction.[5]

Upon submission of the Stage 1 report to the Ministry of Culture, the Ministry has indicated their acceptance of the report's findings and recommendations, including the need for a Stage 2 assessment of affected areas. A copy of the Ministry acceptance letter is also provided in Appendix H.

First Nations

There are no known First Nations lands or interests within the study area that would otherwise be impacted. Nonetheless, First Nations parties were notified of the study commencement and will be notified of further findings to confirm any such interest.

5.5 Economic Environment

With respect to the economic environment, this considers the associated costs to be incurred in implementing and maintaining the road improvements. The costs have been considered in relation to the extent of required upgrades or improvements to the existing bridge, the construction of a new bridge and/or any new road construction required.

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[5] A Stage 2 assessment involves a field assessment. The Ministry of Culture (MOC) Technical Guidelines (1993) require that lands that cannot be ploughed are to be shovel tested at 5 to 10 metre intervals, where possible and depending upon the archaeological potential and access to water. With shovel testing, test pits are excavated to subsoil and the soil is screened through to search for artefacts.

If significant archaeological resources are located during Stage 2, a Stage 3 assessment of the site found will be required by MOC if the development is to continue. In Stage 3, the boundaries of the site are defined and a report prepared for submission to MOC recommending either further work (Stage 4, complete excavation of the site) or clearance of the archaeological/heritage condition. If archaeological resources are found in Stage 2 and delineated in Stage 3 are considered to be insignificant clearance would be the recommendation made to MOC.

Stage 4 could involve mitigation of the entire site or portions thereof should the proposed works continue. Alternatively, a redesign of the lot boundaries or road alignment, to protect any sites by avoidance, could be considered.

In addition, impacts to abutting lands have also been considered as part of the economic environment given the associated costs to obtain any required lands.

There are no existing businesses or commercial establishments within the study area that would be impacted from an economic perspective.

6 Evaluation of Alternative Solutions

This section will discuss the evaluation of the alternative solutions as previously described, the results of which are considered preliminary given the need to solicit agency and public input. The evaluation is descriptive or qualitative in nature allowing for a comparative evaluation of the pros and cons associated with each alternative solution.

6.1 Evaluation Criteria

In completing the evaluation, a number of criteria were considered as they relate to the project environments - Physical Environment, Natural Environment, Social Environment, Cultural/Heritage Environment and Economic Environment. These criteria are noted below.

Physical Environment

- vehicular operations
- pedestrian operations
- load limits
- utility impacts
- maintenance and snow removal

Social Environment

- property impacts
- community impacts
- vehicular & pedestrian safety
- construction impacts

Natural Environment

- fisheries/aquatic impacts
- wildlife/terrestrial impacts
- vegetation impacts

Cultural/Heritage Environment

- archaeological impacts
- heritage impacts
- First Nations impacts

Economic Environment

- initial construction costs
- long-term costs
- land acquisition costs

6.2 Environmental Impacts

It is noted that for Alternative E (access road to Grey Road 40) and Alternative F (access road to Grey Road 13), the provision of the access road would ensure a means of year-round access for all vehicle types and sizes. In this regard, it is not considered imperative to maintain bridge access as well (although this would in essence provide 2 points of access, which is desired from an emergency access perspective). To fully consider these alternatives, the following options have been considered:

- Alternative E1 / F1 - access road with no bridge (the existing bridge would be removed following construction of the new access road);

- Alternative E2 / F2 - access road with the existing bridge maintained for the duration of its useful life (assumed to be 20 years) to serve light vehicles, following which it would be removed; and

- Alternative E3 / F3 - access road with the existing bridge maintained for the duration of its useful life, (assumed to be 20 years) to serve light vehicles, following which it would be replaced with a new, "full load" bridge at the same location.

For the first 2 options, a full municipal road has been assumed (gravel road with a 9 metre platform), recognizing that it will serve as the only means of access to the community following the removal of the bridge (either after year 1 or year 20). For the third option, a reduced road standard has been assumed (gravel road with a 6 metre platform) given that the Slabtown Bridge is expected to remain as the primary access (and thus the use of the road would likely be limited).

The potential impacts associated with each environment for each alternative solution are summarized in Table 2 through Table 4 with further discussions following. For purposes of the assessment, future bridge replacements are assumed are to be in the same location, with the exception of Alternative D.

6.2.1 Physical Environment

The restricted load limit of the bridge is the main deficiency of the physical environment for access to the Slabtown community. While the bridge load rating could be revised given the existing structure (9 tonnes for single axle vehicle, 15 tonnes for 2-axle vehicle and 22 tonnes for 3-axle vehicle), such is not considered sufficient to ensure passage by all vehicle types under all conditions. Without any repairs to the bridge, conditions would continue to deteriorate and the ability to accommodate incoming and outgoing traffic would decrease over time. Rather, the structural capacity of the bridge should be increased to ensure appropriate vehicles can be accommodated. From a structural engineering perspective, it is preferred to replace the existing bridge with a completely new bridge, thus ensuring appropriate design standards and load limits can be achieved. While rehabilitation of the existing bridge can be done to address the load limit issue, it is only considered a stop-gap measure given the condition of other bridge elements. Replacement of the entire bridge structure would still be necessary, most likely within the next 20 years (at the end of which, the bridge would be 100 years old).

From a traffic operations perspective, the volume of traffic on Slabtown Road and hence Slabtown Bridge is not considered significant. The single lane bridge is considered suitable and any replacement should reflect the same.

Table 2: Environmental Impacts of Alternative Solutions - Alternatives A, B, C & D

Evaluation Criteria	Alternative A Do Nothing	Alternative B Rehabilitate Bridge	Alternative C Replace Bridge in Same Location	Alternative D Replace Bridge in New Location
Physical Environment	× structural condition of bridge would continue to deteriorate × only cars and light trucks could use bridge to access Slabtown as the 9 tonne load limit would remain (until replacement bridge needed) × ability to safely accommodate traffic would decrease with time × additional snow removal efforts required on bridge due to load restrictions × replacement of bridge likely needed in +/- 20 years	× significant repairs required to bridge girders & trusses to address load limits × state of remaining bridge elements would continue to deteriorate × replacement of bridge likely needed in +/- 20 years ✓ load capacity increased to allow for heavy vehicles ✓ standard snow removal and garbage access could be provided × access road required for residents during construction	✓ load capacity of new bridge will support heavy vehicles ✓ greatest potential for improving structural condition of bridge ✓ single lane of travel to be maintained ✓ standard snow removal and garbage access could be provided × access road required for residents during construction	✓ load capacity of new bridge will support heavy vehicles ✓ greatest potential for improving structural condition of bridge ✓ single lane of travel to be maintained ✓ standard snow removal and garbage access could be provided ✓ no need for detour route as existing bridge would remain during construction for local access × minor realignment of Slabtown Road needed to match new bridge
Natural Environment	✓ no new impacts to natural environment areas ✓ status quo maintained	✓ no significant impacts expected - impacts of repair work can be mitigated × potential impacts from detour route albeit minor given use of existing field trails	✓ no significant impacts expected ✓ use of existing abutments will negate need for in-water works × potential impacts from detour route albeit minor given use of existing field trails	× minor impacts to vegetation community along new road/bridge alignment (although areas are disturbed) ✓ new structure abutment walls to be located outside of Beaver River to avoid impacts
Social Environment	✓ no impacts to existing development ✓ rural and unique character of area maintained × restricts ability of residents to undertake major home improvement projects given load limit × replacement of bridge will ultimately be required	✓ rural and unique character of area maintained ✓ improved vehicle access (no load limits) × minor, short-term impacts to existing development from construction × replacement of bridge will ultimately be required	✓ rural and unique character area maintained ✓ improved vehicle access (no load limits) × minor, short-term impacts to existing development from construction	✓ rural and unique character of area maintained ✓ improved vehicle access (no load limits) × minor, short-term impacts to existing development from construction
Cultural/Heritage Environment	✓ no new construction and hence no impacts ✓ nature and character of existing bridge remains ✓ no known First Nations impacts	✓ no new construction outside of existing bridge footprint and hence no impacts ✓ nature and character of existing bridge remains ✓ no known First Nations impacts	✓ no new construction outside of existing bridge footprint and hence no impacts × nature and character of existing bridge will be lost (new bridge to have sympathetic design) ✓ no known First Nations impacts	× potential impacts along new road/bridge alignment (Stage 2 archaeological assessment to be completed) × nature and character of existing structure will be lost (new structure to have sympathetic design) ✓ no known First Nations impacts
Economic Environment	✓ no significant initial construction costs × significant maintenance costs required to maintain status quo of bridge (as only means of access) × significant long-term costs as replacement of bridge will likely be required in +/- 20 years ✓ 3rd lowest total lifecycle costs ✓ no land costs	✓ lowest initial improvement costs next to Do Nothing × significant long-term costs as replacement of bridge will likely be required in +/- 20 years × high lifecycle costs given need to repair existing bridge and replace in +/- 20 years × throw-away cost of detour ✓ no land costs	× high initial construction cost (new bridge) × throw-away cost of detour ✓ lower longer-term costs ✓ no land acquisition costs	× highest initial construction costs (new bridge in new location) × 3rd highest lifecycle cost ✓ lower longer-term costs × land costs associated new road/bridge alignment
	✓ positive impact × negative impact			

Table 3: Environmental Impacts of Alternative Solutions - Alternatives E1, E2 & E3

Evaluation Criteria	Alternative E1 Access Road to Grey Road 40 No Bridge	Alternative E2 Access Road to Grey Road 40 Maintain Existing Bridge for 20 Years	Alternative E3 Access Road to Grey Road 40 Maintain Existing Bridge for 20 Years New Bridge after 20 Years
Physical Environment	✓ load capacity of new road will support heavy vehicles × road alignment is located within a low-lying meadow area, likely subject to flooding × turn around required for snow plows at bridge × existing bridge to be removed and thus only single means of access to be provided, which is somewhat more circuitous	✓ load capacity of new road will support heavy vehicles × road alignment is located within a low-lying meadow area, likely subject to flooding × turn around required for snow plows at bridge ✓ existing bridge would remain to serve car and light truck traffic for remainder of useful life (assumed 20 years), following which bridge to be removed ✓ 2nd means of access to improve community access, emergency and maintenance accessibility (as long as existing bridge remains)	✓ load capacity of new road will support heavy vehicles × road alignment is located within a low-lying meadow area, likely subject to flooding × turn around required for snow plows at bridge prior to new bridge ✓ existing bridge would remain to serve car and light truck traffic for remainder of useful life, following which it would be replaced with full load bridge ✓ 2nd means of access to improve community access, emergency and maintenance accessibility
Natural Environment	✓ no construction will occur at Beaver River × proposed new road in line with 2 identified Butternut trees (endangered) × minor impacts to existing forested areas along route × 2 crossings of Beaver River tributary streams required	✓ no construction will occur at Beaver River × proposed new road in line with 2 identified Butternut trees (endangered) × minor impacts to existing forested areas along route × 2 crossings of Beaver River tributary streams required	✓ no construction will occur at Beaver River × proposed new road in line with 2 identified Butternut trees (endangered) × minor impacts to existing forested areas along route × 2 crossings of Beaver River tributary streams required
Social Environment	✓ improved vehicle access via road (no load limits) × property impacts along length of new route × ownership of unopened road allowance uncertain × lack of bridge results in more circuitous routing to access the community	✓ improved vehicle access via road (no load limits) × property impacts along length of new route × ownership of unopened road allowance uncertain ✓ new road provides 2nd access for community should bridge become impassable (until which time bridge is removed) × provision of a through road may lead to increased traffic in Slabtown during non-winter periods (not favoured by residents) × no winter maintenance of bridge and thus more circuitous routings would result in the winter period × lack of bridge after 20 years results in more circuitous routing to access the community	✓ improved vehicle access via road (no load limits) × property impacts along length of new route × ownership of unopened road allowance uncertain ✓ new road provides 2nd access for community should bridge become impassable × provision of a through road may lead to increased traffic in Slabtown during non-winter periods (not favoured by residents) × no winter maintenance of existing bridge and thus more circuitous routings would result in the winter period (until bridge is replaced)
Cultural/Heritage Environment	× nature and character of existing bridge is lost upon removal × potential impacts along new road alignment (Stage 2 archaeological assessment to be completed) ✓ no known First Nations impacts	× nature and character of existing bridge is lost upon removal × potential impacts along new road alignment (Stage 2 archaeological assessment to be completed) ✓ no known First Nations impacts	✓ nature and character of existing bridge remains × potential impacts along new road alignment (Stage 2 archaeological assessment to be completed) ✓ no known First Nations impacts
Economic Environment	× higher initial costs due to full Town standard road ✓ no long-term costs associated with bridge as it would be removed in Year 1 ✓ 2nd lowest lifecycle cost × results in land acquisition costs (2.1 ha of land required), albeit slightly less than Alternative F	× higher initial costs due to full Town standard road × additional costs related to maintaining existing bridge for future use × higher lifecycle costs given both road and bridge costs × results in land acquisition costs (2.1 ha of land required), albeit slightly less than Alternative F	✓ lowest initial construction costs due to reduced road standards × additional costs related to maintaining existing bridge for future use and subsequent bridge replacement result in highest long-term costs × highest overall lifecycle costs × results in land acquisition costs (2.1 ha of land required), albeit slightly less than Alternative F
	✓ positive impact × negative impact		

Table 4: Environmental Impacts of Alternative Solutions - Alternatives F1, F2 & F3

Evaluation Criteria	Alternative F1 Access Road to Grey Road 13 No Bridge	Alternative F2 Access Road to Grey Road 13 Maintain Existing Bridge for 20 Years	Alternative F3 Access Road to Grey Road 13 Maintain Existing Bridge for 20 Years New Bridge after 20 Years
Physical Environment	✓ load capacity of new road will support heavy vehicles × existing bridge to be removed and thus only single means of access to be provided, which is somewhat more circuitous × turn around required for snow plows at bridge	✓ load capacity of new road will support heavy vehicles ✓ existing bridge would remain to serve car and light truck traffic for remainder of useful life (assumed 20 years), following which bridge to be removed ✓ 2nd means of access to improve community access, emergency and maintenance accessibility (as long as existing bridge remains) × turn around required for snow plows at bridge	✓ load capacity of new road will support heavy vehicles ✓ existing bridge would remain to serve car and light truck traffic for remainder of useful life, following which it would be replaced with full load bridge ✓ 2nd means of access to improve community access, emergency and maintenance accessibility × turn around required for snow plows at bridge prior to new bridge
Natural Environment	✓ no construction will occur at Beaver River × minor impacts to existing agricultural areas and hedgerows along new route	✓ no construction will occur at Beaver River × minor impacts to existing agricultural areas and hedgerows along new route	✓ no construction will occur at Beaver River × minor impacts to existing agricultural areas and hedgerows along new route
Social Environment	✓ improved vehicle access via road (no load limits) × property impacts along length of new route × ownership of unopened road allowance uncertain × lack of bridge results in more circuitous routing to access the community	✓ improved vehicle access via road (no load limits) × property impacts along length of new route × ownership of unopened road allowance uncertain ✓ new road provides 2nd access for community should bridge become impassable (until which time bridge is removed) × provision of a through road may lead to increased traffic in Slabtown during non-winter periods (not favoured by residents) × no winter maintenance of bridge and thus more circuitous routings would result in the winter period × lack of bridge after 20 years results in more circuitous routing to access the community	✓ improved vehicle access via road (no load limits) × property impacts along length of new route × ownership of unopened road allowance uncertain ✓ new road provides 2nd access for community should bridge become impassable × provision of a through road may lead to increased traffic in Slabtown during non-winter periods (not favoured by residents) × no winter maintenance of existing bridge and thus more circuitous routings would result in the winter period (until bridge is replaced)
Cultural/Heritage Environment	× nature and character of existing bridge is lost upon removal × potential impacts along new road alignment (Stage 2 archaeological assessment to be completed) ✓ no known First Nations impacts	× nature and character of existing bridge is lost upon removal × potential impacts along new road alignment (Stage 2 archaeological assessment to be completed) ✓ no known First Nations impacts	✓ nature and character of existing bridge remains × potential impacts along new road alignment (Stage 2 archaeological assessment to be completed) ✓ no known First Nations impacts
Economic Environment	× higher initial costs due to full Town standard road ✓ no long-term costs associated with bridge as it would be removed in Year 1 ✓ lowest lifecycle cost × results in land acquisition costs (2.4ha of land required)	× higher initial costs due to full Town standard road × additional costs related to maintaining existing bridge for future use × higher lifecycle costs given both road and bridge costs × results in land acquisition costs (2.4ha of land required)	✓ lowest initial construction costs due to reduced road standards × additional costs related to maintaining existing bridge for future use and subsequent bridge replacement result in highest long-term costs × 2nd highest overall lifecycle costs × results in land acquisition costs (2.4ha of land required)
	✓ positive impact × negative impact		

While there is only a single means of access to the Slabtown Community, such is also considered appropriate. While it is preferred that multiple points of access be provided from an emergency services perspective, the likelihood of a situation whereby the community is inaccessible is remote and thus the provision of a second access is not considered essential. Similarly, while a second access road may be preferred for maintenance and snow removal operations (thus negating the need for vehicles to turn around provided they can cross the bridge), such is not considered essential. With Alternatives E and F, load restrictions would remain on the bridge and thus a turn-around facility would be required in close proximity to the bridge (which would be difficult to provide given existing development and proximity of the road to the river).

From a hydraulics perspective, the existing bridge design is considered sufficient and thus all future works should maintain (or exceed) the existing bridge bottom of deck elevation of 102.1 metres. This will ensure sufficient hydraulic capacity is provided to convey rainfall events up to and including the Regional event while maintaining safe ingress and egress.

As previously noted, if the bridge is to be repaired or replaced, an access road will be required for residents during construction, albeit on a temporary basis and likely constructed to minimal standards.

6.2.2 Natural Environment

Alternative A is not expected to have any potential environmental impacts given its "do nothing" approach.

Alternative B (rehabilitate existing bridge) is expected to have a low impact on the natural environment. Due to the nature of the repairs and the limitations of the current bridge (ie. one lane), a detour would be required during the repair works. This has potential impacts, albeit minimal provided the route follows the existing trail system to Grey Road 13 (which is understood to have been used in the past on a temporary nature). Any rehabilitation activities (eg. sandblasting) that may result in deleterious substances entering the Beaver River should be avoided or mitigated with a detailed construction plan that would attempt to eliminate the potential for any foreign substances to enter the watercourse.

Alternative C (replace bridge in same location) has no potential environmental impacts on the terrestrial natural features identified in that no new works outside of the bridge superstructure are proposed. The potential environmental impacts on the aquatic natural are expected to be low, provided the existing abutment walls are maintained or new walls located outside of the Beaver River. A temporary detour would also be required, which would have potential impacts depending upon the route, albeit temporary in nature.

Under Alternative D (replace bridge in new location), a new bridge would be constructed immediately south of the existing bridge requiring minor realignments of the road approaches. Vegetation in the area surrounding the bridge is composed mostly of heavily disturbed communities including hedgerows, ditches and lawns, and thus while some impacts would result, they are not considered

significant. The design of a new span bridge would not impact the in-stream aquatic habitat (ie. no abutment/structure footprint in-water). However mitigation measures would be required to ensure that the existing aquatic habitat would be protected at all times.

The implementation of Alternative E (access road to Grey Road 40), would require crossings of the unnamed tributary of the Beaver River in two locations and runs adjacent to the intermittent stream bed for half of the north/south leg of the proposed road. The road alignment as proposed runs directly through an Ash forest and is directly in line with two identified Butternut trees (which are considered nationally endangered species and regulated accordingly). Alternative E also crosses an area of cultural meadow that appears to be seasonally flooded during spring runoff in the southern portion of the north/south leg. As a result of the above, the potential natural environmental impacts associated with Alternative E are expected to be moderate to high. It is recognized however that the alignment noted is conceptual only, and could be modified as necessary to minimize impacts to the forest area and Butternut trees (although impacts to the natural environment would remain).

The access road for Alternative F (access road to Grey Road 13) crosses mostly agricultural lands and hedgerows with a small section to the south crossing through cultural meadow on an old gravel path. The potential environmental impacts of this alternative are expected to be low.

Based on the natural environment review, Alternatives A, B, C, D and F would impose no significant environmental impacts to the natural environment, with the exception of those impacts related to the need for a temporary detour. The potential impacts to the existing Ash forest and Butternut trees, which are located within the proposed road alignment for Alternative E, makes this alternative unattractive. The preferred alternative, with respect to the natural environment, is that of Alternative D, which would have no impacts to the natural environment and would not require the use of a temporary detour. It is expected however, that the implementation of a temporary detour would follow existing trails and/or the alignment of Alternative F and thus minimal associated impacts would result (ie. if Alternative F could be implemented without significant natural environment impacts, so to could a temporary detour along the same route).

6.2.3 Social Environment

In consideration of the alternative solutions, no long-term impacts to existing buildings or residences are expected if the bridge is to be repaired or replaced. Some short-term impacts relating to the use of the detour and construction are expected, albeit on a temporary nature (a construction period of 4 to 6 weeks is anticipated).

Alternatives E and F, which would provide a new connection to the County road system, will have potential impacts to existing properties in order to accommodate the road (a 20 metre road allowance is assumed, centred on the property lines. Alternatives E1 and F1 (access roads only, no bridge), and Alternatives E2 and F2 (access roads and maintain existing bridge for 20 years) would result in the removal of the Slabtown Bridge in years 1 and 20 respectively, which would have obvious impacts to

the residents with respect to means and ease of access (recognizing that access via the Slabtown Bridge is more direct). Under Alternatives E3 and F3, for which both road and bridge access is provided, a new through road would result (ie. Slabtown Road would no longer be dead-ended), and thus there is the potential for increased traffic volumes (this would also be the case with Alternatives E2 and F2 until such time the bridge is removed). However, given the alignment of the external road system and ease of travel on such, significant increases are not expected.

In September 2009, representatives from the Town and Consultant meet with the majority of the Slabtown residents to review the alternatives and seek input with respect to potential impacts, mitigation and preferences. Key comments provided at the meeting are summarized below.

- A single lane bridge and single means of access to Slabtown is preferred (there are no concerns relating to the provision of the 2nd means of access from an emergency access perspective).
- A new access road is not desired in that it will impact the character of the area and lead to increased traffic volumes.
- The existing embankment on the south/east side of the road approaching the bridge from the west is of concern and should be remedied (a vehicle has left the road at this location).
- Garbage pick-up on the east side of the bridge is acceptable to those in attendance although it was noted that other non-Slabtown residents make use of the garbage facilities.
- The manner in which the road is currently maintained is acceptable.
- Snow clearing via current means (tractor) is acceptable. Should full size snowplows be used, there would be concern with respect to where they could turn around.
- Improvements are required to allow heavy vehicles to access the Slabtown community such that residents can undertake major construction projects (ie. home renovations).

In summary, although the need to improve access to the Slabtown Community has been established and accepted by the residents, such should not be pursued without consideration for the isolation and quaintness associated with the area. The residents have noted that the limited access to the community adds to the character of their community and was a factor in their relocation to Slabtown. In order to best preserve the aesthetic and traditions of the local area, the residents have suggested that alterations be made to the existing bridge, as opposed to creating further roads leading to Slabtown which may increase through traffic.

6.2.4 Cultural/Heritage Environment

With respect to the built heritage review, to preserve the bridge would mean protecting the nature and character of a structure once common in Ontario, which is becoming increasingly rare due to replacement. In this regard, the preferred solution from the built heritage perspective is that which has no impacts to the existing bridge. Alternative A (do nothing) satisfies this criterion in that no significant changes to the bridge would result (until such time at which the bridge is to be replaced due to poor conditions). With Alternatives E2 and F2 (access road and maintain existing bridge for 20 years) and Alternatives E3 and F3 (access road and maintain existing bridge for 20 years followed by bridge replacement), this criterion would also be satisfied for the remaining life of the existing bridge.

For those alternatives requiring improvements to the bridge, the extent of changes/modifications to the physical condition and appearance of the bridge dictate order of preference. Alternative B (rehabilitate existing bridge) is preferred over Alternative C (replace bridge in same location) which in turn is preferred over Alternative D (replace bridge in new location). For Alternatives C and D, a bridge design sympathetic to the existing design and nature is recommended (examples of which are provided in Figure 6). A new modern, concrete and steel bridge should not be considered.

In considering the potential archaeological impacts, no such impacts are expected with Alternatives A, B and C in that existing conditions remain and no new works outside of the bridge structure itself would occur (ie. no additional grounds would be disturbed). As the extent of new construction is greatest with Alternatives E and G, as compared to Alternative D (area of new road construction versus area of new bridge abutment walls and road approaches), the extent of impacts are also expected to be greater. In this case, Alternatives A, B and C are preferred.

6.2.5 Economic Environment

The economics pertain primarily to the cost to implement and maintain the improvement solution.

A number of cost elements have been considered for Alternatives A through D (those involving the bridge structure), as itemized below (additional details as to their time of need and associated costs are provided in Appendix I):

- sandblast and paint steel;
- rehabilitate/patch abutment walls;
- replace bearings, abutments, seals and joints;
- patch deck waterproof and pave;
- improve guide rails;
- remove existing bridge; and
- replace with new bridge.

It is noted that under Alternative A (do nothing) basic improvements are required to essentially maintain the status quo given the age and condition of the bridge - no structural improvements to increase the load limit have otherwise been considered. Given the age, replacement has been assumed in 20 years (at which time the existing bridge would be 100 years old). Otherwise, the existing bridge is expected to have reached its useful life and would not be appropriate for vehicular traffic (and thus, no access to Slabtown would be provided). During the replacement, a temporary access road would be required - a basic 6.0 metre gravel road has been assumed to follow the alignment of the existing field trails leading to Grey Road 13 (which have been used in the past as

temporary routes). Replacement is expected to occur in the summer months, and thus the construction of the temporary road is assumed to include grading/clearing of the route as needed, followed by placement of 150 mm of gravel (ie. reduced standards can be applied given limited use and environmental conditions expected in the dry, summer months). Given the load limits that would remain on the existing Slabtown Bridge, conventional snow clearing equipment cannot be used. Rather, the Town has historically contracted these services out, at an additional premium of $3500 per year which has been considered in the cost assessment for the initial 19 years (following which the replacement bridge, to be implemented in year 20, would be suitable to accommodate heavier loads associated with snow removal equipment).

Costs associated with Alternative B (rehabilitate existing bridge) include the initial costs necessary to increase the load bearing capacity of the bridge (ie. no load restrictions) and future costs to maintain it and ensure the bridge structure complies with appropriate standards (eg. implementation of new guide rail). As such, the costs are similar to those of Alternative A (do nothing) with exception of the initial costs. Again, replacement in 20 years has been assumed. During the initial construction and again during the future bridge replacement, a temporary access road would be required and thus associated costs have been considered.

Costs associated with Alternative C (replace bridge in same location) and Alternative D (replace bridge in new location) include the initial costs to remove and replace the bridge (new bridge to be provided in accordance with current standards and guidelines), followed by those costs required to maintain it. Again, an allowance for a detour route has been considered with Alternative C (the existing bridge will serve as the access road/detour during implementation of Alternative D).

For Alternative E (new road to Grey Road 40) and Alternative F (new road to Grey Road 13), the costs correspond to the initial construction of the new access roads, both of which are approximately 1500 metres in length, in addition to the costs of annual maintenance. Road standards assumed in the costing are as follows:

- 9.0 metre road platform width (ie. driving lane + shoulders) for Alternatives E1, E2, F1 and F2 (given that following removal of the bridge, road access will be the only means of access);
- 6.0 metre road platform width (ie. driving lane + shoulders) for Alternatives E3 and F3 (reduced road standard assumed as primary access will remain via Slabtown Bridge);
- gravel surface with 150mm Granular A and 300mm Granular B;
- rural road section (ie. open ditches);
- 2 concrete box culvert crossings on Alternative E; and
- annual maintenance cost of $2000 per kilometre for a gravel road (which includes roadside, gravel and winter maintenance).

In addition to the road costs, there would be additional costs incurred associated with the bridge as follows (as otherwise detailed under Alternative A):

- bridge removal costs (Alternatives E1 and F1);
- bridge maintenance costs for 20 years + bridge removal costs (Alternatives E2 and F2); and
- bridge maintenance costs for 20 years + bridge removal costs at year 20 + bridge replacement cost at year 20 + bridge maintenance costs from year 20 to year 50 (Alternatives E3 and F3).

As road access would otherwise be provided under Alternatives E and F, no winter maintenance of the Slabtown Bridge is assumed and thus no snow clearing premiums have been considered. As snow plows would not be permitted to cross the existing bridge, a suitable turnaround facility would be required immediately west of the bridge, which has been considered in the cost estimates (allowance of $25,000).

A life-cycle costing assessment was undertaken following the Ministry of Transportation guidelines. Present day costs were assumed for all future expenditures over a lifespan of 50 years, discounted at a rate of 2% to reflect net present day values. The residual values of the bridge and/or road after 50 years were also considered, assuming 50 year life spans for both the bridge and road and straight line depreciation. For example, a bridge implemented in year 1 would have no residual value after 50 years, whereas a bridge implemented in year 20, would have 20 years remaining after year 50 and thus would maintain 40% of its initial value as residual. Similarly, a road implemented in year 1 would have 0 years remaining at year 50 and hence no residual value. A summary of the initial costs, maintenance and total cost expenditures over 50 years, residual value and the net present values (total of all future costs over the next 50 years expressed in 2009 $) is provided in Table 5 whereas additional details are provided in Appendix I with respect to the cost items and time of need relating to each alternative.

As evident, Alternative A (do nothing) has the lowest initial costs whereas Alternative D (replace in new location) has the highest initial cost. However, in considering the costs over the 50-year period, the least costly options are those of Alternatives E1 (new road to Grey Road 40 with no bridge) and Alternative F1 (new road to Grey Road 13 with no bridge) - constructing a new road is less costly than maintaining bridge access (under of these options, the bridge is removed).

Should permanent bridge access be desired with no load limits, the most economical alternative over the 50 year period is Alternative C (replace bridge in same location) with a total overall cost of $1.4M. Alternative B (rehabilitate existing bridge) has a total cost of $2.0M, which is slightly more than Alternative D (replacing bridge in new location) at $1.9M. Repairing the bridge would require it to be replaced in 20 years, whereas replacement in the same or new location would ensure that the bridge would last 50 years before replacement.

Table 5: Life-Cycle Cost Assessment

	Alternative	Initial Cost (Year 0)	Accumulated Costs (Years 1 to 50)	Total Costs (Years 0 to 50)	Residual Value (Year 50)	Net Present Value
A	Do Nothing	$0 lowest	$1,505,500	$1,505,500	-$352,000	$1,111,000
B	Rehabilitate Bridge	$650,000	$1,360,000	$2,010,000	-$352,000	$1,659,000
C	Replace Bridge in Same Location	$1,060,000	$339,000	$1,399,000	$0	$1,252,000
D	Replace Bridge in New Location	$1,500,000 highest	$429,000	$1,929,000	$0	$1,783,000
E1	Access Road to Grey Road 40 No Bridge	$904,000	$230,000 lowest	$1,134,000	$0	$1,076,000
E2	Access Road to Grey Road 40 Maintain Existing Bridge to Year 20	$904,000	$477,000	$1,381,000	$0	$1,282,000
E3	Access Road to Grey Road 40 Maintain Existing Bridge to Year 20 New Bridge after Year 20	$773,000	$1,589,000 highest	$2,362,000 highest	-$352,000	$1,923,000 highest
F1	Access Road to Grey Road 13 No Bridge	$830,000	$230,000 lowest	$1,060,000 lowest	$0	$1,002,000 lowest
F2	Access Road to Grey Road 13 Maintain Existing Bridge to Year 20	$830,000	$477,000	$1,307,000	$0	$1,208,000
F3	Access Road to Grey Road 13 Maintain Existing Bridge to Year 20 New Bridge after Year 20	$698,000	$1,589,000 highest	$2,287,000	-$352,000	$1,848,000

all costs expressed in 2009 dollars and rounded to the nearest $1000

6.3 Assessment of Alternative Solutions

6.3.1 Score

Scores have been established for each criteria under each alternative to reflect the associated degree of impact in relation to Alternative A (do nothing). A score of -2 denotes a negative impact, 0 denotes no impact and +2 denotes a positive impact. In determining the scores, appropriate quantifiable measures were employed where possible (ie. number of residents affected, length of road to be constructed, total area of impact, etc.). Where this was not possible, the score was based on a qualitative assessment of the various alternatives.

In determining the score for each economic criterion, the actual cost figures determined (ie. cost savings or additional costs as compared to Alternative A) were squared (ie. $cost^2$) in order to allow for greater cost sensitivities towards higher costs. While one alternative may be twice as costly as another, it may be more than twice as difficult to acquire the necessary funds and justify the expenditure.

As Alternative A (do nothing) is intended to maintain the status quo, it has been assigned a score of 0 - all other scores should be read relative to that of Alternative A.

6.3.2 Weight

It is recognized that some of the noted criteria within each environment are more important than others in the overall assessment. Likewise, some of the environments are of greater importance than others. In this regard, further to the scores which reflect the effects and impacts, a weighted scoring system has been employed. Weights have been assigned to the evaluation criteria in conjunction with Town staff with input from the Infrastructure and Recreation Committee, to reflect their relative importance within their associated environment, and also in consideration of the individual environments considered. The total environment weights are noted below:

- Physical Environment - total weight of 20;
- Natural Environment - 10;
- Social Environment - 10;
- Cultural Heritage Environment - 10;
- Economic Environment - 100; and
- Total Weight - 150 points.

The economic environment (which relates to the initial and long-term costs for each alternative) is considered paramount and thus has been assigned a higher weight than the remaining environments. Within this environment, the initial cost to implement each alternative has a greater weight as compared to the long term costs in consideration of the immediate financial impacts (economic environment has a total weight of 100 - 60 for initial costs and 40 for long-term costs).

The associated criteria and environment weights are indicated in Table 6.

6.3.3 Weighted Score

The range of possible weighted scores (individual weight x score) associated with each environment are as follows (and are indicative of the significance placed with each):

- Physical Environment: -40 to +40 points;
- Natural Environment: -20 to +20 points;
- Social Environment: -20 to +20 points;
- Cultural Heritage Environment: -20 to +20 points;
- Economic Environment: -200 t + 200 points; and
- Total: -300 to +300 points.

Based on the total weighted score for each alternative, an overall ranking was determined. The resulting weighted scoring system and ranking is presented in Table 6 whereas additional details are provided in Appendix J.

Table 6: Weighted Scoring Assessment

Evaluation Criteria			Alt A Do Nothing	Alt B Rehabilitate Bridge	Alt C Replace in Same Location	Alt D Replace in New Location	Alt E1 Access via GR40 No Bridge	Alt E2 Access via GR40 Maintain Existing Bridge	Alt E3 Access via GR40 Maintain Bridge & Replace in Year 20	Alt F1 Access via GR40 No Bridge	Alt F2 Access via GR40 Maintain Existing Bridge	Alt F3 Access via GR40 Maintain Bridge & Replace in Year 20
Environment & Criteria		Weight	Weighted Score	Weighted Score	Weighted Score	Weighted Score	Weighted Score	Weighted Score	Weighted Score	Weighted Score	Weighted Score	Weighted Score
Physical Environment	vehicle operations, access & load restrictions	10	0	10	10	10	10	15	20	10	15	20
	pedestrian operations	2	0	0	2	2	-4	-2	1	-4	-2	1
	access to farm fields	2	0	0	0	-1	-1	-1	0	-1	-1	0
	utility impacts	3	0	0	0	0	6	6	6	6	6	6
	maintenance and snow removal	3	0	3	3	3	3	3	6	3	3	6
	Sub-total (max score of 40)	20	0	13	15	14	14	21	33	14	21	33
Natural Environment	fisheries/aquatic impacts	4	0	0	0	0	-4	-4	-4	0	0	0
	wildlife/terrestrial impacts	4	0	0	0	0	-4	-4	-4	-2	-2	-2
	vegetation impacts	2	0	0	0	-1	-2	-2	-2	-1	-1	-1
	Sub-total (max score of 20)	10	0	0	0	-1	-10	-10	-10	-3	-3	-3
Social Environment	property impacts	2	0	0	0	-1	-4	-4	-4	-4	-4	-4
	garbage service	1	0	1.5	1.5	1.5	1	1	2	1	1	2
	emergency service	2	0	3	3	3	2	3	4	2	3	4
	community impacts	4	0	0	0	0	-8	-6	-4	-8	-6	-4
	construction impacts	1	0	-1	-1	-0.5	-0.5	-0.5	-0.5	-0.5	-0.5	-0.5
	Sub-total (max score of 20)	10	0	3.5	3.5	3	-9.5	-6.5	-2.5	-9.5	-6.5	-2.5
Cultural Heritage Environment	archaeological impacts	3	0	0	0	0	0	0	0	0	0	0
	heritage impacts	4	0	0	-2	-2	-8	-6	-4	-8	-6	-4
	First Nations impacts	3	0	0	0	0	0	0	0	0	0	0
	Sub-total (max score of 20)	10	0	0	-2	-2	-8	-6	-4	-8	-6	-4
Economic Environment	initial implementation costs	60	0	-23	-60	-120	-44	-44	-32	-37	-37	-26
	long-term costs	40	0	18	80	77	80	76	-6	80	76	-6
	Sub-total (max score of 200)	100	0	-5	20	-43	36	32	-38	43	39	-32
TOTAL SCORE (max score of 300)			0	12	36	-29	23	30	-21	37	44	-9
OVERALL RANKING			7	6	3	10	5	4	9	2	1	8

weighted score = score (range of -2 to 2) × weight; total weight of 100 results in possible range of total score between -200 to 200

6.3.4 Alternative Evaluation

Alternative A (do nothing) is not considered appropriate in that it does not address the problem statement - the need to improve access to the community of Slabtown. While the existing bridge will suit the residents, it does not safely allow passage of heavy vehicles (eg. construction equipment, loaded fire trucks, snow plows and school buses) despite the conclusion that the posted load limit could be modified to allow for a triple posting (ie. greater load limits for vehicles with 2 and 3 axles). Repairs would be required to the existing bridge to maintain the status quo, including likely replacement within the next 20 years (at which time the bridge would be 100 years old).

While Alternative B (rehabilitate existing bridge), Alternative C (replace bridge in same location) and Alternative D (replace bridge in new location) will address the load limits with minimal environmental impacts, they are not preferred given their economic impacts. With Alternative B, only the load bearing elements are repaired and thus the remaining bridge elements will continue to deteriorate, thus reducing the effective life of the improvements. A replacement structure is otherwise considered necessary in 20 years. With Alternatives C and D, the initial costs to implement the improvements (ie. new bridge structure) are higher than the remaining alternatives.

Alternatives E1 and F1 result in the immediate loss of the bridge access to the Slabtown residents and thus result in greater social impacts resulting from longer travel distances to/from the community.

Alternatives E3 and F3, which include the provision of a new road access and maintaining the existing bridge access, result in the largest long-term costs. While the use of the bridge would remain limited to cars and light traffic, with the passage of time, the condition of it would continue to deteriorate and its ability to accommodate vehicle loadings jeopardized. To maintain appropriate access under Alternatives E3 and F3, additional repairs would also be necessary (similar to what is proposed under Alternative A). In addition, these options are not preferred by the local residents as they feel that a secondary access point to the community would increase traffic and although the bridge would remain, the uniqueness and character of their small hamlet community would not be preserved.

Alternative E2, similar to E3 with the exception that the bridge would be removed after 20 years, has similar social impacts associated with the new road, and further impacts once the bridge is removed.

6.4 Recommended Solution

Based on the initial evaluation of alternate solutions, the recommended solution for access to the community of Slabtown is Alternative F2 (access road to Grey Road 13 and maintain existing bridge to year 20). While this alternative will result in impacts to the residents, resulting from the introduction of a new road and the removal of the bridge after 20 years, it is considered a cost effective solution and thus scores highest in the overall assessment. It is noted that the recommended solution is not presented as a decision at this point in the study, but rather a preliminary recommendation based on a rational evaluation of the available information.

7 Consultation - Public Information Centre

Under a Schedule B Environmental Assessment, there are two points of mandatory stakeholder contact (as previously indicated, the Notice of Commencement is considered discretionary). As noted in Figure 1, the first point occurs towards the end of Phase 2 when a notice is issued inviting stakeholder comment and input via a Public Information Centre. The second point of contact is upon completion of the planning process at which time a Notice of Completion is provided. In keeping with the chronological order in documenting events in the order that they occurred, the first point of contact is discussed in this chapter whereas the second point of contact is discussed in Section 9.2, after the identification of the preferred solution and completion of the Schedule B Class EA requirements.

7.1 Notification

In accordance with the EA guidelines, a notification of the Public Information Centre was issued inviting stakeholder comment and input (copy of the notice is provided in Appendix K). Stakeholders include review agencies, the public and other municipalities and thus notices were directed to each, in the same manner in which the Notice of Commencement was disseminated (distribution lists are provided in Appendix K). Notices were also mailed to the area residents on January 13, 2010, published in the local newspaper on two separate occasions preceding the public information centres, and posted on the Town's website.

7.2 Public Information Centre

The purpose of the Public Information Centre was to provide information to the public and agencies and seek their input with respect to the following:

- identification of the problem;
- development and evaluation of alternative solutions to the problem;
- general inventory of the affected environments in order to determine the possible impacts; and
- the recommended alternative.

The Public Information Centre was held on Saturday, January 30, 2010 from 09:00 to 12:00 at the Marsh Street Centre in Clarksburg. No formal presentation was made but rather people were welcome to drop in during the above hours to review the materials and ask questions. Representatives from the Town of The Blue Mountains and C.C. Tatham & Associates were in attendance to answer any questions and provide assistance as necessary.

Various display boards were prepared for viewing by the public (as provided in Appendix K), which addressed the following:

- study purpose and introduction which described the reasoning behind the undertaking;
- the Municipal Class EA process and those tasks relevant to this study;
- a review of the existing conditions;
- problem identification as it relates to the existing bridge and vehicular access;
- alternative solutions for improving access to the Slabtown community;
- an inventory of the appropriate environments;
- preliminary assessment and identification of the recommended solution;
- the remaining steps to completion; and
- who to contact for additional information.

Approximately 25 people attended the Public Information Centre, which included several of the Slabtown residents.

7.3 Public Comments

Comments were received from the public and agencies in response to the Notice of Public Information Centre and at or following the PIC. A summary of the key comments are provided in Table 7 whereas the related correspondence is included in Appendix K.

The general consensus from the public is that too great of an emphasis was placed on cost, and not enough consideration was given to the societal impacts that will result to the Slabtown residents.

Further to the comments received, the residents of Slabtown also made a deputation to the Town's Infrastructure and Recreation Committee, a copy of which is also provided in Appendix K. The deputation reiterated that the residents of Slabtown would prefer that the existing bridge be replaced (Alternative C), as opposed to constructing a new road. The delegation also noted that additional costs which would be incurred by the residents should Alterative F2 be implemented, should also be considered, and that these would out-weigh any cost benefits associated with Alternative F2. Such resident costs relate to additional fuel and time costs associated with longer travel routes to/from the community (as opposed to the existing means of access via Slabtown Road).

Table 7: Public Comments from PIC

	Resident Address/Location	Comments / Concerns	Preference
1	Slabtown Road	▪ The residents of Slabtown do not want a through road. We like to keep the dead end. ▪ Preference - maintain the bridge for 20 years as is. ▪ 1st choice - maintain the existing bridge; 2nd choice - replace bridge in sympathetic form; 3rd choice - Road to Grey Road 13 and close bridge to vehicle traffic but maintain for bikes and pedestrians. ▪ Route J (Slide 12) is preferred to Route F or H.	Alternative B
2	Slabtown Road	▪ I would prefer to see the bridge replaced to accommodate the standard heavy load. ▪ No road access added out to Grey Road 13.	Alternative C
3	Slabtown Road	▪ Alternative C - replace with similar bridge as it will have the least amount of disturbance and temporary road for a season. ▪ Please contact me when Engineering Department will be presenting to Council	Alternative C
4	Slabtown Road	▪ Ultimately, we need the bridge replaced in order to maintain the charm and intrinsic value of Slabtown. ▪ We also would like to see a new sign which increases the load limits for the existing bridge. ▪ Does this mean that garbage pick-up will resume?	not stated
5	Slabtown Road	▪ Open Road to Grey Road 13 ▪ Repair Bridge	Alternative F
6	Slabtown Road	▪ This EA has a significant effect on my property values and property enjoyment so I am concerned about the outcome. I purchased my property because I appreciate the ambiance and quaint atmosphere of the Slabtown community. ▪ I am opposed to both “alternatives E and F” 1. They will increase the traffic on the road and result in a “scenic drive through”. We already have significant “tourist traffic”. I have even seen tour buses visit Slabtown. It is my feeling that the increased traffic will disrupt the wildlife, cougar, deer, and fishers, name a few. The quiet secluded nature of the area provides invaluable habitat to them. As cougars are rare and I would guess endangered it is very very important not to disrupt them. 2. These options will impact the cost of my home insurance as they will dramatically increase the distance of my home to the fire hall. ▪ My preference is to replace the bridge in its present location. This would protect the pristine environment of Slabtown and protect the wildlife, atmosphere and property values in the area.	Alternative C
7	Slabtown Road	▪ Almost to the person everyone was surprised that the concept of a new road came out on top of the list. What we know now is that there are other players external to our Slabtown community who have also been pushing their agendas as well. A new road plays into the hand of landowners who do not live here but wish to develop their land. We can't oppose this but wonder how this works with the land use planning of the Town of the Blue Mountains? ▪ When do all the issues affecting this decision get presented? ▪ If there are proposals for housing developments around a golf course at what point do we get to officially know about that? ▪ If that is going to happen is there a way to work a compromise situation where we get to protect the special flavour of Slabtown from the encroachment of a Lora Bay style development?	
8	Grey Road 40	▪ I would like a copy of the report and any further reports. ▪ I support the rehab or replacement of the bridge. ▪ I prefer not to have any new permanent road built. ▪ Please inform me of any meetings on this project that occur in the future.	Alternative B or C
9	Grey Road 40	▪ Would like to see the existing bridge replaced. ▪ Alternatives that provide for road access and leave the existing bridge do not address the state of the bridge and the fact that it is a bit of an eye sore as it deteriorates. ▪ Replacing existing bridge has the least impacts on residents in the area and on the environment.	Alternative C

10	Grey Road 13	▪ Having listened to Michael Cullip regarding the bridge replacement and discussing it with other people at the meeting, it seems that the majority of affected landowners prefer the reconstruction of a new bridge. ▪ A new bridge is the logical way to proceed since it is the least disruptive environmentally. The perceived cost is more than the alternative route of a road to Grey Rd. 13, but one would think that a 90' span bridge would be much easier to maintain, and contain costs than a 1.5 km. road. ▪ The road would increase traffic to the area and would encourage hunters and snowmobilers to frequent the area with the easy access that the road would allow. The area is now used by many cross country skiers and hikers, and as we all know, hunting and skiers don't mix very well from a safety standpoint. ▪ The environment impact on the area is also something that should be taken into consideration. The area in question is very marshy and contains a water course that runs for most of the year. Wildlife would also be affected due to the increase in traffic since it would no longer be a dead end road. ▪ I would hope these points would be taken into consideration when the council is making the decision on which way to proceed.	Alternative C
11	Unknown	▪ Roadway standard does not need to be overbuilt (minimum standard). ▪ If road goes out back, please leave fence row of trees or it will be a desert.	not stated
12	Unknown	▪ Alternative C replace bridge in same location. ▪ Pros: no work in the river, no road maintenance and no traffic to Grey Road 13.	Alternative C
13	Slabtown Road	▪ 1) We require a long term safe and QUICK access route into the Slabtown hamlet at the lowest cost to current tax payers which will accommodate emergency vehicles, fuel delivery trucks and snow removal equipment. This route should also be able to be maintained at the lowest possible cost to current and future tax payers. ▪ 2) This access route should result in minimal changes now or in the future to the current character of the Slabtown hamlet ie. no change to the winding river road, preservation of the community here composed mostly of a FEW low to middle income families living in small to midsize, affordable, rural type houses, surrounded by apple orchards, wooded areas and open or cropped fields. ▪ 3) The access route should in no way lead to any significant, year to year, jumps in tax rates to existing Slabtown owners. ▪ In short the bridge solution should in the long term be low cost, discourage increased residential expansion and increased auto traffic, and preserve the small hamlet character and beauty of Slabtown as it is. Thus restoring the bridge to meet the above requirements would be the best way to go at this time. Further research may be required as to the most efficient and effective and least expensive way to do this.	Alternative B
14	Slabtown Road	▪ My property is about ½ way up the hill and thus it may be difficult to exit my driveway during winter conditions with the preferred road option. It is ▪ My understanding that the slope of the hill has not been taken into consideration and nor is it possible to change the slope so this will be a nightmare for us! ▪ The 2nd concern is more particular to my property and that is that the drive itself was designed to come and go via the bridge so it is at an awkward angle for turning left.	
15	Slabtown Road	▪ The provision of a turnaround just west of the bridge will have impacts to my property. ▪ Spring flooding would create flooding of the proposed turnaround. Neighbours and families that use the area for swimming, canoeing and picnicking would be affected. The fish ladder would be affected too. A dangerous situation would be created for children because of increased traffic, trucks and snow plows. ▪ There will be a disruption to the peace and tranquility the neighbourhood has enjoyed over the years. ▪ The value of our property will be reduced. ▪ We are not interested in selling or providing property to the Town to construct a turnaround.	

7.4 Agency Comments

Comments pertaining to the PIC were received from Grey Sauble Conservation Authority and the Chippewas of Rama (copies provided in Appendix K).

Grey Sauble Conservation Authority

The Conservation Authority noted that depending upon the final alternative, approvals through the Conservation office would be required under Ontario Regulation 151/06 and potentially from Fisheries and Oceans Canada also. Further consultation and coordination with the Conservation Authority will occur as part of the design tasks related to the implementation of the preferred solution.

Chippewas of Rama

The Chippewas of Rama acknowledged receipt of the PIC notice and noted that it had been forwarded to the band's solicitor for review. No further actions/comments arose.

8 Identification of Preferred Solution

Following the Public Information Centre, the preliminary assessment was revisited to consider comments and input received from the various stakeholders, most notably the residents of Slabtown.

8.1 Environmental Impacts

Various environmental impacts were revisited in response to additional information and/or comments received.

8.1.1 Natural Environment

Several residents indicated that cougars (also referred to as pumas or mountain lions) have been spotted in the Slabtown area. These mammals are considered a "species at risk" by the Ministry of Natural Resources. However, these sightings have not been confirmed and no evidence of permanent habitat within the area was identified during the natural environment review. While cougars may exist in the area, the alternatives considered are not expected to have any negative impacts to them and thus no changes to the natural environment assessment resulted.

8.1.2 Economic Environment

Initial & Long-Term Costs

The cost estimates for each alternative improvement were revisited and a number of minor changes were made as follows:

- increased costs for snow clearing of the existing bridge recognizing that such cannot be done with standard equipment given the load restrictions (increased from $3500 to $5000 per year);
- increased property acquisition costs (increased from $27,200 per ha/$11,000 per acre to 49,400 per ha/$20,000 per acre); and
- increased cost to implement a turnaround just west of the bridge (increased from $25,000 to $50,000).

The first change was made in response to additional information provided by the Town, whereas the latter two changes were made in response to comments received from the local residents and landowners regarding potential property acquisition.

The resulting cost values are summarized in Table 8 whereas additional details are provided in Appendix L. The following changes resulted:

- Alternative A (do nothing) increased by $24,000;

- Alternatives E1 and E2 increased by $72,000, E3 increased by $71,000; and
- Alternatives F1 and F2 increased by $78,000, F3 increased by $79,000.

It is noted that with these changes, Alternative F2, which was previously identified as the preferred alternative, becomes more costly overall as compared to Alternative C (replace bridge in same location) as supported by the residents.

Local Community Costs & Local Economic Benefits

In addition to the initial and long-term costs, 2 additional factors were introduced to the economic environment:

1. local community costs, which reflect the additional travel costs that would be incurred by the Slabtown residents should a new road be implemented and the bridge otherwise removed from service; and

2. local economic benefits, which reflect the extent to which the improvement costs would remain within the local economy.

With respect to the resident travel costs, these consider the additional travel time due to the more circuitous routings of Alternatives E and F, the associated value of time and additional fuel consumed (all in relation to costs that would otherwise be incurred should the use of Slabtown Road and Slabtown bridge remain). Recall with Alternatives E1 and F1, the bridge would be removed in year 1; with Alternatives E2 and F2, it would remain until year 20 whereas with Alternatives E3 and F3, bridge access would be maintained. Regardless, with the provision of a road, no winter maintenance of the existing bridge has been assumed and thus all winter travel would have to use the new access road (and hence result in additional costs). A summary of the costs is provided in Table 9 whereas additional details are provided in Appendix M. As noted, depending on the alternative, the additional costs could range from just over $100,000 to almost $840,000.

The local economic benefits reflect the likelihood that the road based alternatives could be implemented by local contractors, and hence the costs incurred would remain within the local economy. With the bridge based alternatives, an out-of-town contractor is most likely and thus the local benefits would be diminished. For purpose of the assessment, 10% of the bridge improvement costs were assumed to remain local, whereas 90% of the road improvement costs were assumed local. The corresponding local economic benefits are summarized in Table 10.

Table 8: Life-Cycle Cost Assessment - Revised

	Alternative	Initial Cost (Year 0)	Accumulated Costs (Years 1 to 50)	Total Costs (Years 0 to 50)	Residual Value (Year 50)	Net Present Value
A	Do Nothing	$0 lowest	$1,534,000	$1,534,000	-$352,000	$1,135,000
B	Rehabilitate Bridge	$650,000	$1,360,000	$2,010,000	-$352,000	$1,659,000
C	Replace Bridge in Same Location	$1,060,000	$339,000	$1,399,000	$0	$1,252,000
D	Replace Bridge in New Location	$1,500,000 highest	$429,000	$1,929,000	$0	$1,783,000
E1	Access Road to Grey Road 40 No Bridge	$976,000	$230,000 lowest	$1,206,000 lowest	$0	$1,148,000
E2	Access Road to Grey Road 40 Maintain Existing Bridge to Year 20	$976,000	$477,000	$1,453,000	$0	$1,354,000
E3	Access Road to Grey Road 40 Maintain Existing Bridge to Year 20 New Bridge after Year 20	$844,000	$1,589,000 highest	$2,433,000 highest	-$352,000	$1,994,000 highest
F1	Access Road to Grey Road 13 No Bridge	$908,000	$230,000	$1,138,000	$0	$1,080,000 lowest
F2	Access Road to Grey Road 13 Maintain Existing Bridge to Year 20	$908,000	$477,000	$1,385,000	$0	$1,286,000
F3	Access Road to Grey Road 13 Maintain Existing Bridge to Year 20 New Bridge after Year 20	$777,000	$1,589,000 highest	$2,366,000	-$352,000	$1,927,000

all costs expressed in 2009 dollars and rounded to the nearest $1000

Table 9: Local Community Costs

Alternative	Additional Fuel Costs	Additional Time Costs	Total Additional Costs
Alternative E1 access to GR 40 no bridge	$89,848	$336,932	$426,780
Alternative E2 access to GR 40 20 yr bridge	$62,894	$235,852	$298,746
Alternative E3 access to GR 40 with bridge	$22,462	$84,233	$106,695
Alternative F1 access to GR 13 no bridge	$176,470	$661,763	$838,233
Alternative F2 access to GR 13 20 yr bridge	$123,529	$463,234	$586,763
Alternative F3 access to GR 13 with bridge	$44,118	$165,441	$209,558

Table 10: Local Economic Benefits

Alternative	Local Bridge Benefits[1]	Local Road Benefits[2]	Total Local Benefits
Alternative A Do Nothing	$153,400	$0	$153,400
Alternative B Rehabilitate Bridge	$201,000	$0	$201,000
Alternative C Replace Bridge in Same Location	$139,900	$0	$139,900
Alternative D Replace Bridge in New Location	$192,900	$0	$192,900
Alternative E1 access to GR 40 no bridge	$8,000	$1,013,400	$1,021,400
Alternative E2 access to GR 40 20 yr bridge	$32,700	$1,013,400	$1,046,100
Alternative E3 access to GR 40 with bridge	$143,900	$894,600	$1,038,500
Alternative F1 access to GR 13 no bridge	$8,000	$952,200	$960,200
Alternative F2 access to GR 13 20 yr bridge	$32,700	$952,200	$984,900
Alternative F3 access to GR 13 with bridge	$143,900	$834,300	$978,200

[1] assumes that 10% of the bridge improvement value will remain within the local economy
[2] assumes that 90% of the road improvement value will remain within the local economy

8.2 Assessment of Alternative Solutions

8.2.1 Score

For the criterion which addresses access to farm fields, the Alternative C (replace bridge in same location) score of 0 was increased to 0.5 for in consideration of the benefits that the new bridge would provide for farmers wishing to use the bridge to access their area fields.

All other scores remained unchanged.

New scores to reflect the local resident costs and local economic benefits were determined based on the extent to which the alternative resulted in additional costs or cost savings as compared to Alternative A (do nothing), based on a simple straight-line correlation.

8.2.2 Weight

The most significant modifications to the assessment of the alternatives, which addressed public comments, related to the weighting factors employed, particularly for the economic environment. The initial and long-term cost weights, which were 60 and 40 respectively, were reduced to 15 and 10. For the new economic criteria, the local community costs were assigned a weight of 1, whereas the local economic benefit was assigned a weight of 5 (all of which were determined in conjunction with Town staff, the Infrastructure and Recreation Committee and subsequently adopted by Town Council). The total economic environment weight was therefore reduced from 100 to 31.

The weights for emergency services and community impacts were also increased, to reflect a greater emphasis on societal impacts (increased from 2 to 4, and from 4 to 7 respectively). As a result, the total Social Environment weight increased from 20 to 30.

8.2.3 Weighted Scoring

The revised weighted scoring system and ranking is presented in Table 11 whereas additional details are provided in Appendix N.

8.3 Preferred Solution

Based on the re-evaluation, the preferred solution is Alternative C (replace bridge in same location). As this alternative more or less maintains the status quo (with the exception of a new bridge), it will have minimal impacts to the adjacent environments and the residents. While a temporary detour road will be necessary during construction, this will be limited to a short period.

While Alternative C is not the least costly to implement (more expensive that Alternatives E1 and F1 - road only options), it does not result in the same level of impact to the social, natural and cultural/heritage environments.

Table 11: Weighted Scoring Assessment - Revised

Evaluation Criteria			Alt A Do Nothing	Alt B Rehabilitate Bridge	Alt C Replace in Same Location	Alt D Replace in New Location	Alt E1 Access via GR40 No Bridge	Alt E2 Access via GR40 Maintain Existing Bridge	Alt E3 Access via GR40 Maintain Bridge & Replace in Year 20	Alt F1 Access via GR40 No Bridge	Alt F2 Access via GR40 Maintain Existing Bridge	Alt F3 Access via GR40 Maintain Bridge & Replace in Year 20
Environment & Criteria		Weight	Weighted Score	Weighted Score	Weighted Score	Weighted Score	Weighted Score	Weighted Score	Weighted Score	Weighted Score	Weighted Score	Weighted Score
Physical Environment	operations, access & load restrictions	10	0	10	10	10	10	15	20	10	15	20
	pedestrian operations	2	0	0	2	2	-4	-2	1	-4	-2	1
	access to farm fields	2	0	0	0	-1	-1	-1	0	-1	-1	0
	utility impacts	3	0	0	1.5	0	6	6	6	6	6	6
	maintenance and snow removal	3	0	3	3	3	3	3	6	3	3	6
	Sub-total (max score of 40)	20	0	13	16.5	14	14	21	33	14	21	33
Natural Environment	fisheries/aquatic impacts	4	0	0	0	0	-4	-4	-4	0	0	0
	wildlife/terrestrial impacts	4	0	0	0	0	-4	-4	-4	-2	-2	-2
	vegetation impacts	2	0	0	0	-1	-2	-2	-2	-1	-1	-1
	Sub-total (max score of 20)	10	0	0	0	-1	-10	-10	-10	-3	-3	-3
Social Environment	property impacts	2	0	0	0	-1	-4	-4	-4	-4	-4	-4
	garbage service	1	0	1.5	1.5	1.5	1	1	2	1	1	2
	emergency service	4	0	6	6	6	4	6	8	4	6	8
	community impacts	7	0	0	0	0	-14	-10.5	-7	-14	-10.5	-7
	construction impacts	1	0	-1	-1	-0.5	-0.5	-0.5	-0.5	-0.5	-0.5	-0.5
	Sub-total (max score of 30)	15	0	6.5	6.5	6	-13.5	-8	-1.5	-13.5	-8	-1.5
Cultural Heritage Environment	archaeological impacts	3	0	0	0	0	0	0	0	0	0	0
	heritage impacts	4	0	0	-2	-2	-8	-6	-4	-8	-6	-4
	First Nations impacts	3	0	0	0	0	0	0	0	0	0	0
	Sub-total (max score of 20)	10	0	0	-2	-2	-8	-6	-4	-8	-6	-4
Economic Environment	initial implementation costs	15	0	-6	-15	-29	-12	-12	-9	-11	-11	-8
	long-term costs	10	0	4	19	19	20	18	-1	20	18	-1
	local community costs	1	0	0	0	0	-1	-1	0	-2	-1	-1
	local economic benefits	5	0	1	0	0	10	10	10	9	9	9
	Sub-total (max score of 200)	31	0	-1	5	-10	16	15	-1	16	16	-1
TOTAL SCORE (max score of 300)		86	0	19	26	7	-1	12	16	6	20	24
OVERALL RANKING			10th	4th	1st	7th	10th	6th	5th	8th	3rd	2nd

Overall, Alternative C is the recommended solution for the following reasons:

- addresses load limit restriction, allowing for heavy trucks to access the community;
- preserves the location and structure of the bridge, in keeping with the hamlet designation of Slabtown;
- minimizes impacts to the adjacent environments and the residents; and
- is considered a cost effective solution to address the Problem Statement

In consideration of the area character, a sympathetic bridge design is recommended, as opposed to a modern steel/concrete bridge. Examples of comparable, pre-fabricated bridges were previously illustrated in Figure 6, whereas additional details are provided in Appendix D.

8.4 Confirmation of EA Schedule

As previously noted, the Schedule B guidelines apply to road and/or structure construction or reconstruction provided the cost to implement is less than $2.2M, not including land acquisition or engineering costs. Based on the extent of works anticipated, this cost threshold will not be surpassed and hence the Schedule B guidelines are appropriate.

9 Next Steps

This chapter details the steps remaining to complete the Schedule B Class Environmental process and to proceed to Phase 5: Implementation, which entails completion of the engineering drawings and construction.

9.1 Submission to Town of The Blue Mountains

The *Access to the Community of Slabtown Class EA* was presented to Town Council on June 14, 2010 and the Preferred Solution of Alternative C (replace bridge in same location) was subsequently endorsed.

9.2 Consultation - Study Completion

This represents the second mandatory point of stakeholder consultation in the Schedule B EA process. The purpose of such is to identify the conclusion of the study and provide an opportunity for additional review of the study findings and recommendations within a 30-day review period.

In accordance with the EA guidelines, a Notice of Completion was prepared to identify the preferred improvement solution and the opportunity for further review (a copy of the notice is provided in Appendix O). Notices were distributed on August 13, 2010 as follows:

- mailed to each of the review agencies, municipality agencies and other stakeholder groups as previously contacted;
- mailed to the area residents and those in attendance at the Public Information;
- posted on the Town's website; and
- advertised in the local newspapers on two separate occasions, in accordance with the Class EA guidelines.

9.3 30-Day Review Period

The Phase 1 & 2 report will be placed on public record for a period of 30 days following the Notice of Completion. As per the notice, the public and review agencies will be encouraged to further review the report and provide written comments to the County.

If concerns arise regarding this study, which cannot be resolved in discussion with the Town or the Project Team, the public can request that the Minister of the Environment make an order for the project to comply with Part II of the Environmental Assessment Act (referred to as a Part II Order), which addresses individual environmental assessments. Requests are to be submitted to the Minister, and copied to the County before the end of the 30-day review period.

If there is no request for a Part II Order, the project may proceed based on the identified preferred improvements.

9.4 Phase 5: Implementation

It is the intent of the Town to undertake the improvement works commencing in 2011. As such, a preliminary design study will commence immediately following the 30-day review period. The preliminary design study will include a preliminary design (30% drawings) of the preferred solution, a corresponding design report and preliminary cost estimate.

The need for mitigation measures to address impacts to the area environments will also be provided. Mitigation will include undertaking modifications/improvements during a period when impacts associated with the temporary detour and potential impacts resulting from the replacement of the structure would be lessened. Drawings will be submitted to the Town, Grey Sauble Conservation Authority and utility companies as required, to obtain the necessary approvals prior to construction.

There are no further requirements with respect to public consultation during Phase 5.

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