CITY COUNCIL AGENDA

Council Chambers, Guelph City Hall, 1 Carden Street

DATE Thursday, December 3, 2015 – 6:00 p.m.

Please turn off or place on non-audible all cell phones, PDAs, Blackberrys and pagers during the meeting.

Disclosure of Pecuniary Interest and General Nature Thereof

Niska Road Improvements – Schedule C Municipal Class Environmental Assessment

Presentation:

Don Kudo, Deputy City Engineer

Recommendation:

1. That the report from Infrastructure, Development and Enterprise dated December 3, 2015, regarding the Niska Road Improvements Schedule 'C' Class Environmental Assessment be received.

2. That staff be authorized to complete the Schedule 'C' Municipal Class Environmental Assessment process and issue a notice of completion to place the Environmental Study Report on the public record for the mandatory 30 day public review period and proceed with the implementation of the preferred alternatives as outlined in the Council Report dated December 3, 2015.

Delegations:

- Vince Hanson
- Sandy Nicholls
- Shugang Li
- Hanna Boos
- Nicole Abouhalka
- Bhaju Tamot
- Peter Lennie

ADJOURNMENT

STAFF REPORT

TO	City Council
SERVICE AREA	Infrastructure, Development and Enterprise
DATE	December 3, 2015
SUBJECT	**Niska Road Improvements - Schedule C Municipal Class Environmental Assessment**
REPORT NUMBER	

EXECUTIVE SUMMARY

PURPOSE OF REPORT

To provide an overview of the study findings and recommendations for the Niska Road Improvements Schedule 'C' Municipal Class Environmental Assessment (EA) and to seek Council approval to complete the EA process.

KEY FINDINGS

- The overall goal of the EA process is to strike a balance between public needs, public safety and natural environmental impacts
- Niska Road and bridge are part of a stable road system servicing existing neighbourhoods with established travel patterns
- Niska Road between Downey Road and the City limits, including the bridge, is designated as a two-lane collector road in both the City's Official Plan and the Transportation Master Plan (2005)
- The proposed replacement of the Niska Road bridge has been planned for a number of years and has been included in the City budget forecast since 2004
- Through the EA study process, a range of rehabilitation and replacement options for the road and bridge were evaluated using a detailed set of criteria that include factors from the social, economic, cultural, natural and technical environments to establish the preferred alternatives
- The preferred alternatives that are recommended include:
  - Reconstruct the existing two-lane collector road with a two-lane collector road urban (curb and gutter) cross section including shared bicycle lanes and sidewalk on the north side
  - Replace the existing Bailey bridge with a new two-lane Pony Truss bridge
  - Reconstruct the intersection of Downey Road and Niska Road as a fully signalized intersection
  - Implement traffic calming measures on Niska Road from Downey Road to the City limit
  - On street parking located near a potential canoe launch area is a design consideration
  - Viewscape and tree impacts are to be mitigated through minimal changes to road profile and minimizing urban road cross section
- Capacity analysis for the road confirmed that there is no need to widen the

existing two-lane collector road and therefore also no need to widen the bridge beyond two lanes to accommodate future growth in the City
- Should Council not approve the recommendation contained within this report authorizing staff to complete the EA process, the Environmental Study Report (ESR) would not be filed and additional public, stakeholder and agency consultation would be required to support an amendment to the ESR
- A delay in completing the EA process would also delay implementation of structural improvements, which are recommended to occur in 2016-2017 to ensure continued public safety.

FINANCIAL IMPLICATIONS

The cost estimate to implement the preferred alternatives is $5,280,000. In the proposed 2016 Capital Budget and Forecast a total of $2,750,000 and $200,000 is proposed for accounts RD0286 Niska Road bridge and road reconstruction and RD0316 Downey Road and Niska Road intersection improvements respectively. Additional funding requests will be included in future Capital Budgets under RD0286 and in RD0316 to implement the balance of the preferred alternatives.

ACTION REQUIRED

Authorize staff to complete the Municipal Class Environmental Assessment process for this project with the preferred alternatives as outlined in this report.

RECOMMENDATION

1. That the Council Report dated December 3, 2015, regarding the Niska Road Improvements Schedule 'C' Class Environmental Assessment be received.

2. That staff be authorized to complete the Schedule 'C' Municipal Class Environmental Assessment process and issue a notice of completion to place the Environmental Study Report on the public record for the mandatory 30 day public review period and proceed with the implementation of the preferred alternatives as outlined in the Council Report dated December 3, 2015.

BACKGROUND

Niska Road from Downey Road to the City limits is a two-lane Collector road (one-lane in each direction) that includes a one-lane Bailey bridge that crosses over the Speed River. Niska Road from Ptarmigan Drive to the Speed River and the Bailey bridge are nearing the end of their operational life. Both road and bridge require significant remediation and/or replacement in order to meet current and future traffic and safety demands of the corridor. In addition to the road and bridge concerns, improvements are also required at the intersection of Niska Road and Downey Road which yields significant delays as a 3-way stop intersection during peak periods.

The City of Guelph initiated a Class Environmental Assessment (EA) study to investigate opportunities for improvements to Niska Road from the Downey Road to the City Limits. The overall goal of the EA process was to strike a balance between

public needs, public safety and natural environmental impacts. The Niska Road EA examined options for the road, bridge and intersection within the study limits (Attachment 1). The project study scope included public, stakeholder and review agency consultation; an evaluation of alternative solutions to address the problems; alternative design concepts for the preferred solutions; an assessment of potential environmental and heritage impacts of the proposed improvements, and identification of reasonable measures to mitigate any potential adverse impacts.

REPORT

Study Process

The study has been undertaken in accordance with the process outlined in the Municipal Class Environmental Assessment Guide (October 2000, as amended in 2007 and 2011), which is approved under the *Ontario EA Act*. The study followed this comprehensive planning and pre-design process in order to recognize and accommodate the needs of City, the local residents, the travelling public and the requirements to minimize the impacts to the natural and heritage environments.

Originally this study was advertised as a Schedule B Study to examine bridge solutions and the reconstruction of Niska Road from the Bailey bridge to Ptarmigan Drive. Following posting of a Notice of Study Commencement on April 11, 2013 and a Public Community Meeting held on June 27, 2013 to address community concerns, the City of Guelph:

- expanded the study area to include Niska Road from the Bailey Bridge to its terminal point at Downey Road;
- re-advertised this study as a Schedule C (first posted October 17, 2013); and
- created a Community Working Group (CWG) to review and provide input on data collection, study results and evaluation of alternate solutions.

Schedule C projects must complete Phases 1 to 4 prior to proceeding to Phase 5, the Implementation Phase, as outlined in Attachment 2. The Niska Road Improvements EA study has proceeded through Phases 1 to 3 of the EA process. Phase 4 of the process is to complete an Environmental Study Report (ESR) and file the document for a 30 day review period and publish a notice of completion to notify review agencies and the public.

If no Part II appeals are made with respect to the ESR, the City could move forward with final design and possibly tender the first project stage in 2016 with other stages being tendered in 2017, depending on budget approvals.

Should Council not approve the staff recommendations to receive the staff report and not authorize staff to complete the Schedule 'C' Municipal Class Environmental Assessment process, the ESR would not be filed and staff would not proceed to implementation of the ESR preferred alternatives. Additional public, stakeholder and agency consultation would be required and an amendment to the ESR would be required. This action would delay implementation of structural improvements.

Due to the poor condition of the existing bridge and road, the City must be proactive and find a solution to the current conditions. The Schedule C Municipal Class Environmental Assessment study that has been completed to date is the appropriate and recommended approach to reaching a solution to address the situation.

The phases and findings for this EA are described in the following sections.

Phase 1: Needs and Justification

At the onset of the project, a problem opportunity statement was established in order to set a benchmark for the final output of the project. This statement included input from City Staff, members of the public, Community Working Group (CWG), project team members, sub-consultants and review agencies. The problem opportunity statement is summarized in Section 2.0 of Attachment 3 (ESR - Executive Summary). Throughout the EA, the Problem Opportunity Statement was revisited to ensure it was being addressed.

Phase 2: Alternative Solutions and Preliminary Preferred Solution

Based on the Problem Opportunity Statement, a range of Alternative Solutions were developed.

Alternative solutions for the **bridge** included:

- Do Nothing – Repair and maintain the existing bridge;
- Close the Bailey bridge to vehicular traffic and maintain;
- Remove Bailey bridge and do not replace;
- Replace the Bailey bridge with a new one-lane bridge and provide operational improvements to Niska Road to address existing traffic and safety issues (e.g. truck restrictions, traffic calming, bicycle/pedestrian facilities and intersection improvements);
- Replace the Bailey bridge with a new two-lane bridge and provide operational improvements to Niska Road to address existing traffic and safety issues (e.g. truck restrictions, traffic calming, bicycle/pedestrian facilities and intersection improvements).

Alternative solutions for the **road** included:

- Do Nothing;
- Resurface the road;
- Reconstruct the road.

The alternatives were evaluated using a detailed set of criteria that include factors from the social, economic, cultural, natural and technical environments. Key criteria are summarized in this report and are also described in Attachment 3 (ESR - Executive Summary.) Community input, whether from an individual or a group, was evaluated as part of these criteria. Results of the evaluations are shown in Attachment 4.

Based on the evaluations, **the preliminary preferred alternatives** were:

- Replace the bridge with a new two-lane bridge;

- Reconstruct Niska Road from Ptarmigan Drive to the bridge as two-lane road.

A preliminary preferred alternative was not developed for the intersection of Downey Road and Niska Road during the initial phases of the EA study but alternatives were presented and evaluated during the subsequent phases of alternative design concepts.

The Alternative Solutions and preliminary Preferred Alternatives for the road and bridge were presented to the public at a Public Information Centre (PIC) at the Kortright Presbyterian Church on November 27, 2014.

Phase 3: Alternative Design Concepts for Preferred Solutions
A number of design concept options for the road, bridge and intersection were developed based on the preliminary preferred alternatives.

Alternative design concepts for the bridge included:
- Covered Steel Through Truss Bridge;
- Concrete Slab on Steel Girder Bridge;
- Pony Truss Bridge.

Alternative design concepts for the roadway included:
- Urban cross-section;
- Rural cross-section;
- Semi-Urban cross-section.

Alternative design concepts for intersection improvements at Downey Road and Niska Road included:
- Signalized Intersection;
- Roundabout Intersection.

In addition to significant consultation with the local community, advisory committees and review agencies, the evaluation process included a holistic examination of many environmental considerations to effectively evaluate three separate road cross section types. Cross-section configurations were evaluated based on their impacts to:
- existing trees;
- built heritage;
- natural environmental;
- cultural heritage;
- wildlife;
- terrestrial and aquatic habitat;
- viewscape review, and;
- stormwater management.

Results of the evaluations are shown in Attachment 5. Based on this evaluation, the preferred alternatives are as follows:
- Reconstruct the existing two-lane collector road (Niska Road from Ptarmigan Drive to the bridge) with an urban two-lane collector road including shared

bicycle lanes, sidewalk on the north side, traffic calming and an on street parking area west of Pioneer Drive on the north side of Niska Road;
- Replace the existing Bailey bridge with a new two-lane Pony Truss bridge;
- Reconstruct the intersection of Downey Road and Niska Road as a fully signalized intersection;
- Implement traffic calming measures on Niska Road from Downey Road to the west city limit.

The design concepts for the preferred solutions were presented to the public at a Public Information Centre (PIC) at the Kortright Presbyterian Church on September 10, 2015.

Phase 4: Environmental Study Report (ESR)

A draft Environmental Study Report has been prepared by the project team based on the preferred solutions and design concepts. It includes a description of impacts, mitigation measures and monitoring plans that are recommended. Mitigation plans will be addressed in detail during the detailed design phase of the project. Construction activities will occur within existing road right-of-way and specified working easements. The Grand River Conservation Authority (GRCA), River Systems Advisory Committee (RSAC), Heritage Guelph Committee (HGC), Guelph Transit all impacted Utility companies and all requires City of Guelph Departments will be fully consulted during the detail design process. Regulated lands, associated with the Speed River and its floodplain, are present in the vicinity of the Niska Road Bridge. As such, GRCA approval will be required prior to any bridge works. Construction Plans will include (but are not limited to) the following:

- Erosion and Sediment Control Plan;
- Emergency Response and Communications Plan;
- Tree Protection and Management Plan;
- Stormwater Management Plan;
- Traffic Management Plan;
- Guelph Transit Alternate Route Plan;
- City of Guelph Fire & Emergency Service Plan.

The Executive Summary for the ESR is provided in Attachment 3.

Evaluation Criteria

As noted in previous sections of this report, a number of key factors and criteria were considered throughout the EA study in determining the preliminary preferred design alternatives and finally the preferred alternatives. Attachment 7 provides a detailed evaluation matrix for the alternative solutions using key criteria. In addition, the following sections summarize some, but not all, of these factors.

Transportation Planning

Niska Road is a two-lane collector road as designated in the City's Official Plan. The road classification has been confirmed in the Transportation Master Plan (2005) and subsequent transportation modelling work to support the Development Charges Background Studies (2009, 2014) and Ministry of Transportation Environmental Assessment for the Hanlon Expressway (2008). Based on the Niska Road EA study

findings, the following are facts with respect to the function of Niska Road as a two-lane collector road:

- Current and future expected traffic volumes on Niska Road are well within the range for a two-lane collector road;
- Origin destination survey indicates that Niska Road is important to the City and area as it is to local residents;
- Most trips are for work from an external destination to locations in the City outside of the immediate neighbourhood.

Niska Road and bridge are part of a stable road system servicing existing neighbourhoods with established travel patterns. The proposed replacement of the Niska Road bridge has been planned for a number of years and has been included in City budget forecast since 2004. The City is not encouraging any use of the road beyond that which is intended.

As the City grows, increases in traffic throughout the City can be expected over time. The traffic volume increase for Niska Road and bridge is similar to the expected traffic volume growth on the City's transportation network and is consistent with the City's Transportation Master Plan.

Modeling of expected increases in traffic volumes demonstrates that a two-lane collector road will continue to safely meet traffic needs. The purpose of a collector road is to move low to moderate volumes of traffic within specific areas of the city, and collect local traffic for distribution to the arterial or Provincial highway system.

Currently, the total average weekday volume on Niska Road is 4,652 vehicles per day with 2,405 vehicles per day eastbound and 2,247 vehicles per day westbound. Traffic modeling predicts that peak two-way traffic volumes will increase from approximately the current 510 vehicle per hour to 730 vehicles per hour in 2031.

Consequently, the transportation modelling work for this study has confirmed that that there is no need to widen Niska Road beyond the current two-lane collector road as the capacity analysis for the road took into account future development and growth in the City including possible development in the Niska Road area. Since there is no need to widen the existing two-lane collector road, there is also no need to widen the bridge beyond the two lanes required to connect the existing two-lane City collector road and the existing two-lane Township road on either side of the existing one-lane bridge.

A number of related transportation planning concerns or issues have also arisen during the EA study including discussion of previous road projects in the area. It is noted that the need to replace the Niska Road bridge was planned before the completion of the Ministry of Transportation Environmental Assessment (MTO EA) for the Hanlon Expressway and before the removal of the Stone Road extension and College Avenue extension from the City's Official Plan. Additional detail related to these two transportation projects is provided in Attachment 6.

Due to comments and inquiries from the CWG and local residents, staff undertook additional transportation modelling scenarios in drafting this report to provide Council with the following background information:

Traffic impacts if the Stone Road extension was implemented indicated the following:

- Decreases in traffic on Niska Road ranging from 10% to 30% for peak hour traffic based on current and future traffic volumes for a scenario with a two-lane Niska Road and bridge;
- Minimal changes in peak hour traffic volume at various locations (Downey, County Road 124, Hanlon Kortright) for a scenario with no Niska Road bridge.

Traffic impacts if Niska Road bridge was closed to vehicular traffic indicated the following:

- Minimal increases and decreases in traffic volume on Niska Road ranging from 0% to 10% changes in peak hour traffic volume at various locations (Downey, County Road 124, Hanlon Kortright);
- Increased travel time and inconvenience for community residents currently using Niska Road bridge;
- Increased congestion at signalized intersections on Hanlon Expressway can be anticipated until the highway is upgraded as recommended in MTO EA.

Structural assessment

The Ontario Structural Inspections Manual, Regulation 104/97 requires all municipal bridge structures to be inspected biannually. The most recent full bridge inspection report for the Niska Road Bridge was completed in 2013 and indicated the structure was in very poor condition. An interim structural inspection in 2015 led to emergency repairs in March and April of 2015. These repairs allowed for the continued short-term use of the bridge until the environmental assessment is completed and a permanent solution is put in place. The 2015 full bridge inspection report is currently underway and will be received by the City by the end of 2015.

The 2013 report completed for the bridge indicates that the majority of bridge elements have remaining service lives of one to five years. The most significant structural issue with the bridge is the span opening being shorter than the watercourse width and the resultant ongoing erosion and undermining of the retaining walls and abutments by the river.

It has been noted that replacement parts are available for the existing bridge and the City has in the past repaired the superstructure with structural components (transoms, sway bracing, bolts and wood decking) replaced in 2003. However, the major concern with the superstructure at this time is the ongoing corrosion and the need to replace the steel trusses and bearings. Replacement of these elements may require partial removal of the superstructure in order to access these elements. These ongoing repairs, replacement of elements and rehabilitation costs were factors in evaluating the alternatives for the bridge.

Key findings from structural inspections and reports include:

- Overall poor structural condition;
- Water encroaching against abutments;
- Progressive undermining of northwest retaining wall;
- Failure of northwest and northeast embankments;
- Severe corrosion on both embankments;
- Numerous longitudinal cracks (checks) and isolated missing bolts;
- Deck is partially loose as a result of aging, weathering and loose bolts;
- Deck replacement should be considered as soon as possible in order to avoid continuous maintenance;
- Posted 5 tonne load limit;
- Absence of pedestrian access;
- Most of the rehabilitation work needs to be completed within one to five years (2014-2018).

In summary, the existing Niska Road bridge structure is insufficient for current and future use due to increasing deterioration. Due to increased deterioration creating safety concerns, increased associated maintenance costs and inability to support current flood levels, the bridge requires remediation or replacement in order to fulfill its role within the City's road network on a two-lane collector road.

Similar to the poor condition of the existing bridge, the existing two-lane collector road on Niska Road between Ptarmigan Drive and the bridge is in poor condition with severely cracked pavement, sub-standard lane widths, and eroding ditches that are creating sedimentation in the surrounding natural environment and lacks both pedestrian and cyclist amenities.

Standards, Guidelines, Technical Requirements

The design and construction of bridges in Ontario is regulated by the Province of Ontario through *Public Transportation and Highway Improvement Act* which requires the design, evaluation, construction or rehabilitation of a bridge to conform to the Canadian Highway Bridge Design Code and the Ontario Ministry of Transportation Geometric Design Standards for Ontario Highways. To establish the bridge design criteria, some of the key considerations that pertain to the Niska Road EA study of the bridge code are as follows:

- The geometric manual states that the number and width of lanes on a bridge should be the same as the approaches;
- For bridges where traffic exceeds 400 vehicles per day, the design manual strongly recommends that a two-lane bridge is required;
- The current average weekday traffic volume on Niska Road is approximately 4,600 vehicles per day;
- The MTO structural manual urges Ontario users not to use single load path structures;
- The Niska Road bridge is a Bailey bridge, which is also considered a single load path-type truss bridge and the Ontario Bridge Code recommends against the use of single load path type bridges as this means that failure of one critical element can lead to a more global structural failure;
- According to the MTO bridge structural manual, the minimum bridge cross section should be 8.5 metres for two lanes, and 5.0 metres for one-lane. The

existing bridge deck does not meet the design standards with an existing travel width of 3.44 metres;
- Horizontal clearances from the edge of the through traveled way to the face of an abutment or pier should meet or exceed the minimum clear zone widths specified in MTO's Roadside Safety Manual. The existing bridge does not meet this current safety requirement;
- There is currently no structural barrier system in place on the existing bridge; however, the narrowing of the roadway at the one-lane bridge has created a situation that temporarily reduces vehicle speeds.

Risk and Liability

As noted above, there are a number of guidelines, standards and design recommendations governing the design and construction of bridge structures and roads in Ontario. The EA study evaluated the alternatives for the bridge and road with respect to the technical factors and the results indicated that the two-lane bridge was the preferred alternative. If the City were to choose the one-lane bridge alternative knowing that it does not meet current guidelines, standards and design recommendations and was not recommended as preferred alternative in the EA study, it would likely place the City at risk from a liability perspective should an incident arise at the bridge that is a result of the one-lane bridge design.

Traffic Calming

During the public consultation process, traffic volume and speed were identified as a major concern for residents on Niska Road. Some comments from the public also suggested that the current one-lane bridge acts as a traffic calming measure. In response to the concerns expressed, permanent traffic calming measures are proposed in the EA that have the potential to both deter and slow down traffic.

Currently, the one-lane bridge only provides intermittent traffic delays when opposing vehicles meet at the bridge and reduces vehicle speed only at the bridge location. The design concept alternatives in the EA study proposes traffic calming measures that could be implemented throughout the Niska Road corridor as follows:

- Raised intersections along Niska Road from Downey Road to the west City limit excluding the Downey Road intersection;
- Pavement markings and signage;
- The preferred alternative of an urban road cross section with a shared vehicle lane for cyclists and a sidewalk should also act as a traffic calming measure relative to the current rural road cross section.

Truck Traffic

The public consultation process also identified truck traffic as a concern for Niska Road and bridge. The existing bridge has a weight restriction due to its temporary nature and current condition. A new bridge would need to be designed to meet current standards which would include truck loadings.

Truck traffic has been considered in the EA design concepts. The proposed bridge height can be designed to prevent/reduce large truck use and consideration for the implementation of on road structures such as limit clearance arches have been

included as possible design concepts. However, consideration of the viewscape for the Niska Road corridor may be a factor in the implementation of limit clearance arches.

Niska Road is not a permissive truck route and part of Niska Road from Downey Road to Ptarmigan Drive is currently included in a truck exclusionary zone for the Kortright Hills neighbourhood.

Cultural Heritage Landscape and Viewscape

A Cultural Heritage Evaluation Report (CHER) was completed for the bridge as part of the EA study. Following input from the Community Working Group, an addendum to the CHER to assess the potential for a cultural heritage landscape (CHL) was undertaken. The findings of the CHER and the addendum were as follows:

- Using the criteria of Regulation 9/06 under the *Ontario Heritage Act*, a section of the study area was determined to contain lands and features with cultural heritage value or interest;
- The 40+ year old Bailey bridge has cultural heritage value, but it has not been designated under the *Ontario Heritage Act* and has not been listed on the City's Municipal Register of Cultural Heritage Properties as a non-designated property;
- If bridge removal is required, every effort be taken to relocate or document the bridge's significance;
- Niska Road Bridge and a portion of the roadway and abutting Grand River Conservation Area (GRCA) lands meet the criteria under the *Ontario Heritage Act* as a cultural heritage landscape;
- Designation of the cultural heritage landscape (CHL) under the *Ontario Heritage Act* was not recommended by the EA heritage consultant since the boundary for the CHL suggested in the CHER addendum is already protected through the Natural Heritage provisions of the City's Official Plan and GRCA regulations;
- The existing one-lane bridge inhibits enjoyment of the landscape by limiting access safe access for users.

In response to the CHER and the addendum report findings, public and Community Working Group consultation, the EA study recommends implementation of a number of items in the project design:

- Relocation and rehabilitation of the current bridge's superstructure at a suitable location within Guelph, Puslinch Township, or Guelph-Eramosa Township for use as a pedestrian or cycling bridge;
- Conserve the current historical stone abutments in place as a monument to past bridges and bridge construction;
- Install interpretive signage explaining the history of the Niska Road crossing and the associated cultural heritage landscape;
- Design the replacement bridge to be compatible with the cultural heritage landscape and with views from the bridge not impeded for vehicular, bicycle or pedestrian traffic;
- The preferred alternative of the Pony Truss bridge was selected as the previous permanent bridge at this location was of similar design.

Environmental

Throughout the EA process, the alternative solutions were evaluated and assessed against existing conditions. The natural environment for the study area was characterized through a review of secondary source information and databases, as well as field investigations including air photo mapping, the MNRF Natural Heritage Information Centre (NHIC), GRCA Fisheries Management Plan and online soils Canada mapping. Additional field studies completed during the course of the EA included an Aquatics Assessment, a Terrestrial Environment Survey and Wildlife Species and Habitat Field Assessment, as well as a Corridor Tree Inventory and Impact Assessment. Mitigation measures and recommendations for road and bridge reconstruction work within, and adjacent to, natural areas are included in the ESR document.

Tree Canopy

Both the road and bridge concept alternatives were developed to maintain the existing viewscape and minimize impacts to adjacent trees by not changing the existing road profile and using an urban road cross section.

The tree impact assessment noted there are 199 trees of 10 centimeter diameter at breast height (DBH) or greater on the right of way or adjacent to the right of way. Based on preliminary design concepts 34 trees are estimated to be impacted by the preferred urban road cross section design while 124 trees would be impacted by the rural road cross section.

Operations, Maintenance and Emergency Services

Response time for emergency services to respond to incidents on adjacent township locations would be more dependable with the preferred alternatives in place since the load restrictions prevent fire response vehicles from crossing the existing bridge. Winter maintenance activities for City and Township staff would also be enhanced with a new bridge structure in place. An urban road section with raised intersections and additional pavement markings and signage for traffic calming purposes would require minor adjustments to standard maintenance activities.

Cost Estimate Summary and Analysis

In evaluating the various alternatives for the bridge, base cost estimates were developed and the following table provides the cost estimates for the bridge alternatives:

Bridge Alternatives	Estimated Amount
Repair bridge and maintain (the initial capital cost only and does not include ongoing maintenance costs)	$1,300,000
Close bridge to vehicular traffic and maintain (the initial capital costs only and do not include ongoing maintenance costs)	$1,000,000
Remove bridge	$350,000
New single lane bridge	$2,000,000
New two-lane bridge	$2,500,000

The following table provides a summary of the cost estimates for the preferred alternatives:

Project Components	Estimated Amount
Construction of a Two-Lane bridge	
Steel Girder bridge	$2,072,700
Pony Truss bridge	$2,742,000
Reconstruction of Niska Road	$2,088,500
Reconstruction/Signalization of Niska Rd & Downey Rd Intersection	$450,000
Total Estimated – With Steel Girder bridge (excluding HST)	**$4,611,200**
Total Estimated – With Pony Truss bridge (excluding HST)	**$5,280,500**

Consultation
During the EA process, significant consultation was conducted with the public, City advisory committees and various agencies. The following sections describe some key points of contact and input to the study.

Public Information Centres
Two Public Information Centres (PICs) where held during the study to present study findings to the public and receive public comment. The PICs were held in the gymnasium of the Kortright Presbyterian Church, 55 Devere Drive, Guelph.

The first PIC was held on November 27, 2014 to present the problem/opportunity statement, the results of environmental studies completed to date, alternative solutions and preliminary preferred alternatives for the road, bridge and intersection at Downey. In total, 135 people signed the attendance register at the PIC.

The second PIC was held on September 10, 2015. The meeting followed the same drop-in style format as the first PIC, with information boards displayed around the room and exhibit copies of all technical and background reports completed to date available for public review. Attendance records from PIC #2 indicated that 116 people attended.

Surveys
In addition to the Public Information Centres, the City conducted an online survey that received 305 responses. Combined stakeholder and online survey results for the preliminary alternative solutions for the road were as follows:

Do Nothing	40%
Resurface the road	12%
Reconstruct the road	47%

Combined stakeholder and online survey results for the preliminary alternative solutions for the bridge were as follows:

Do Nothing	25%
Close the Bailey bridge to vehicular traffic	20%
Remove the Bailey bridge & do not replace the bridge	3%
Replace the Bailey bridge with a new 1-Lane Bridge	19%
Replace the Bailey bridge with a new 2 Lane Bridge	33%

Combined stakeholder and online survey results for the preliminary alternative solutions for the intersection at Downey Road were as follows:

Construct traffic circle / roundabout	39%
Install traffic signals	28%
Install stop signs	33%

The EA project team was also made aware of a community survey conducted by residents. The results of the survey will be included in the Environmental Study Report.

Community Working Group

A Community Working Group (CWG) was created for the EA study following initial consultation with the community and was formalized following the upgrade of the study to a Schedule C undertaking. Through a series of eight meetings, the CWG provided valuable input in the EA study that resulted in additional project studies with respect to the cultural heritage landscape and traffic to be undertaken. The CWG mandate was not to be a decision making group but a group to provide input to the study and to provide an opportunity for the 14 CWG members to gain greater insight into the project EA process.

River Systems Advisory Committee (RSAC)

The EA project team presented the preliminary preferred solutions to RSAC on February 18, 2015. Public delegations also presented to the committee at the same meeting. The committee passed resolutions indicating their conditional support of the preliminary preferred alternative.

As requested in the Committee's resolutions of February 18, 2015, the EA project team returned to RSAC on October 8, 2015 to present the preferred alternative design options and obtain further input. Public delegations again presented to the committee at the same meeting. RSAC passed resolutions indicating their conditional support of the preferred alternative design options provided the preferred options and the ESR incorporate a number of elements, minimize the overall amount of encroachment into adjacent natural heritage features, provide opportunities for edge enhancement, protect the viewscape, provide for public access to the river, and provide opportunity for RSAC to participate in the detailed design phase and incorporate a number of technical elements.

Heritage Guelph (HG)

The EA project team presented to HG on March 9, 2015. Public delegations also presented to the committee at the same meeting. Due to the need for further committee discussion, the matter was deferred to the next HG meeting on April 18,

2015. At that time, HG passed resolutions indicating their acceptance and support of the conclusions of the Cultural Heritage Evaluation Report and the Cultural Heritage Landscape Addendum along with their recommendation from a cultural heritage conservation perspective that the ideal outcome of the environmental assessment process would involve the retention and conservation of the identified heritage attributes of the Niska Road bridge *in situ* and the portion of the cultural heritage landscape identified on Niska Road (between Pioneer Trail and the bridge) within the city limits. The committee also passed resolutions indicating their conditional support of the preliminary preferred alternative.

As requested in the resolutions of April 18, 2015, the EA project team returned to HG on September 14, 2015 to present the design concepts for the preferred solution. Public delegations also presented to the committee at the same meeting. Subsequent to the September 14, 2015 meeting, a notice of motion to reconsider the HG resolutions of April 18, 2015 was approved at the HG meeting of November 9, 2015. The reconsideration motion resulted in new resolutions from HG as follows:

> *"THAT Heritage Guelph does not support the preliminary preferred alternative for the Niska Road Environmental Assessment presented to Heritage Guelph on April 13, 2015 by Engineering Staff and their consultant; and*
>
> *THAT Heritage Guelph recommends to Council that the Niska Road area bounded to the west by the Speed River, the north by the Guelph-Eramosa and Puslinch Township line, to the east at the eastern boundary of the GRCA lands, and the south at the City of Guelph boundary be designated under the Ontario Heritage Act as a cultural heritage landscape and be preserved in such a form as to continue its sightlines and its current land use patterns*
>
> *THAT the area recommended for designation include the existing Bailey bridge, stone abutments and existing road widths and graded shoulders."*

While the project team considered the revised November 9, 2015 recommendations from the Heritage Guelph Advisory Committee, the preferred options and mitigation strategies identified through the EA are consistent with the Cultural Heritage Evaluation Report (CHER) and CHER Addendum findings and recommendations and also consistent with the City Heritage Planner's recommendations.

Grand River Conservation Authority

Consultation with the Grand River Conservation Authority was conducted for the study duration. GRCA was a member of the Community Working Group for the project and will be an approval agency during the detailed design phase of the project.

Public concerns with respect to the adjacent land use on Niska Road between Ptarimgan Drive and the bridge were identified during the EA. The Grand River Conservation Authority (GRCA) owns property on either side of Niska Road along this section and the City's Official Plan designates the land in this area as Open

Space and Significant Natural Areas and Natural Areas. Consideration of allowable land uses with respect to the current land designation was included in the EA study. As well, GRCA is undertaking a master plan for their adjacent property and it is expected that the City will actively participate in their planning process.

Ontario Ministry of Environment and Climate Change (MOECC)
During the study process, members of the CWG contacted the MOECC twice with respect to their concerns on the EA process for the Niska Road project. In both cases, the MOECC responded to the concerns that the City was conducting the EA consistent with the Municipal Class Environmental process and that the consultation that was being conducted was over and above the EA process requirements.

Townships of Guelph Eramosa and Puslinch
The adjacent townships were circulated as stakeholders to the EA study. In addition, members of the EA project team met directly with Guelph Eramosa Township (GET) staff and council representative following the second Public Information Centre to provide GET representatives an overview of the EA process, study details and recommended alternatives. GET was satisfied with the information presented and had no formal comments on the EA alternatives other than to note that the final bridge design may have an operational impact in terms of winter maintenance access activities if a two-lane structure is implemented.

Members of the EA project team also presented an overview of the EA process, study details and recommended alternatives at the Township of Puslinch council meeting of October 21, 2015. A council resolution to receive the presentation was approved by Township of Puslinch council. Delegations with respect to the EA were also received by Puslinch council.

Subsequent to the council meeting, City staff sent a letter to Mayor Lever and Councillors to provide further information and clarify matters that were presented to them by delegations on October 21, 2015. At the November 4, 2015 Puslinch Council Meeting the following resolution was passed:

> *That Council receive the correspondence from the City of Guelph regarding City of Guelph Municipal Class Environmental Assessment- Niska Rd. dated October 29, 2015; and*
>
> *That Council direct staff to report back on the potential impact to Township's roads with respect to increased traffic; and*
>
> *That the Puslinch Heritage Committee be made aware of the project and that staff report back on the steps involved in the designation of a Cultural Heritage Landscape.*

CORPORATE STRATEGIC PLAN

1.2 Develop collaborative work teams and apply whole systems thinking to deliver creative solutions
2.3 Ensure accountability, transparency and engagement
3.1 Ensure a well-designed, safe, inclusive, appealing and sustainable City
3.3 Strengthen citizen and stakeholder engagement and communications

FINANCIAL IMPLICATIONS

The cost estimate to implement the preferred alternatives is $5,280,000. In the proposed 2016 Capital Budget and Forecast a total of $2,750,000 and $200,000 is proposed for accounts RD0286 Niska Road bridge and road reconstruction and RD0316 Downey Road and Niska Road intersection improvements respectively. Additional funding requests will be made through future Capital Budgets under RD0286 and in RD0316 to implement the preferred alternatives.

Based on the preferred alternatives of constructing a two-lane bridge and two-lane urban collector road, the City can use Development Charges to fund 70 per cent of the project. If another bridge alternative other than a two-lane bridge (e.g. close, remove, or replace with a one-lane bridge) is proposed to be implemented, a greater portion of the project would need to be funded using property taxes and/or capital funding sources other than Development Charges.

DEPARTMENTAL CONSULTATION

Staff from Community Engagement, Corporate Communications, Environmental Planning, Heritage Planning, Operations, Transportation Services, Transit Services, Emergency Services, Guelph Police, Parks Planning were consulted during the EA process.

COMMUNICATIONS

The following is a link to the project website that provides study details including all public consultation materials from with Community Workshop, Public Information Centres and Community Work Group meeting minutes:
http://guelph.ca/living/construction-projects/niska-road-improvements/

RECOMMENDATIONS: SUMMARY OF ALTERNATIVES

The Niska Road Improvements EA has established preferred alternatives that include reconstruction of the road with an urban cross section including shared bicycle lanes and sidewalk and replacement of the existing Bailey bridge with a new two-lane Pony Truss bridge.

Should Council not approve the recommendation authorizing staff to complete the EA and file the ESR with the preferred alternatives, then selection of an alternate solution by Council will be required. The options considered in the EA to retain the existing one-lane bridge for traffic or construct a new one-lane bridge do not meet provincial standards and criteria and, therefore, are not viable given the significant risk and liability for the City. Consequently, the remaining options would be to remove the bridge or close the bridge to vehicular traffic and maintain.

STAFF REPORT

ATTACHMENTS
ATT-1 Study Area
ATT-2 MCEA Schedule C Process Summary for Niska Road Improvements Study
ATT-3 Environmental Study Report - Executive Summary (DRAFT)
ATT-4 Evaluation of Alternatives for Road and Bridge
ATT-5 Evaluation of Alternative Design Concepts for Road, Bridge and Intersection
ATT-6 Previous Area Road Projects and Studies
ATT-7 Detailed Evaluation Matrix for Alternative Solutions

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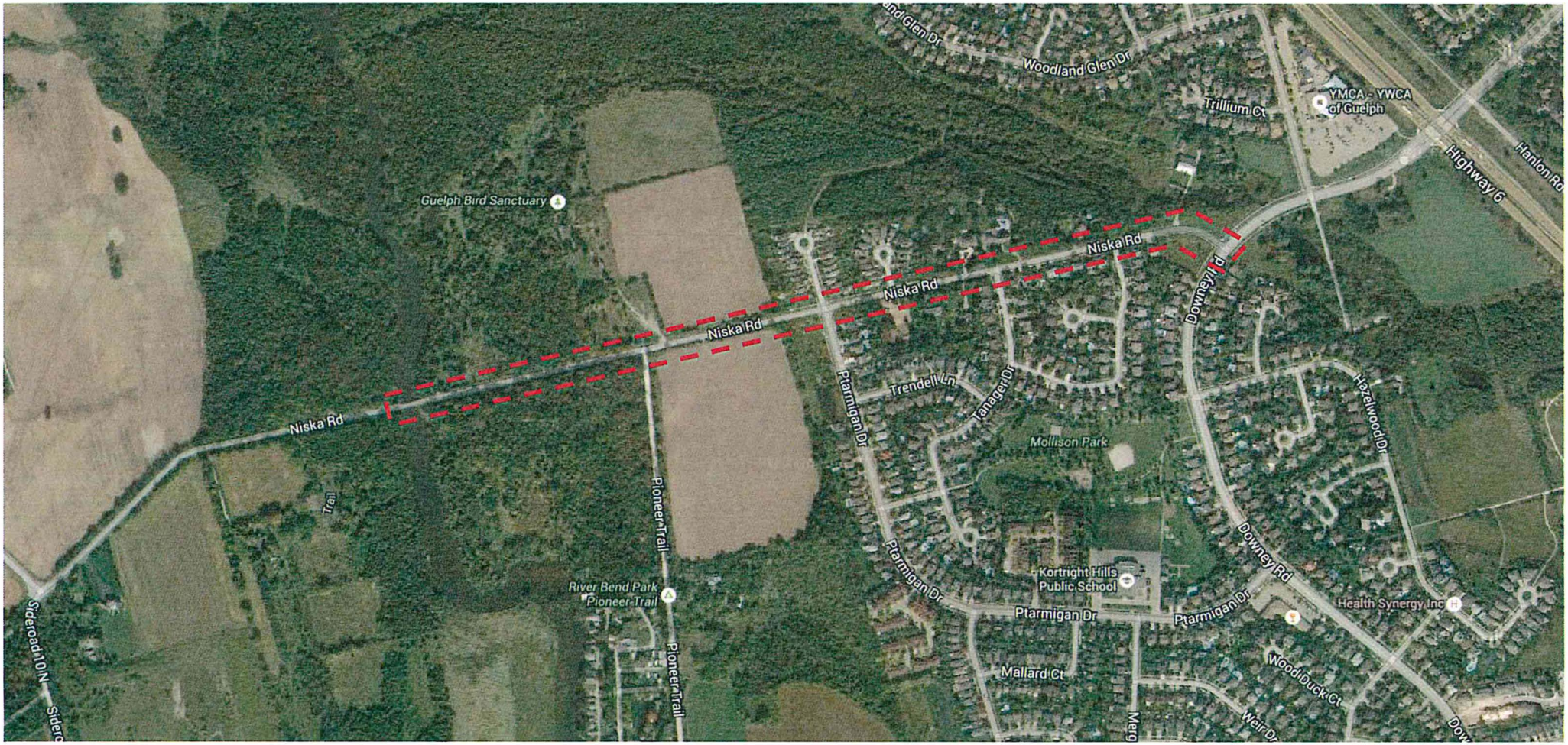
ATT-1 Niska Road Improvements – Schedule C Municipal Class Environmental Assessment

Study Area



ATT-2 Niska Road Improvements – Schedule C Municipal Class Environmental Assessment

MCEA Schedule C Process Summary for Niska Road Improvements Study

Phase 1

- Identify Problems and Opportunities
- Inventory natural, built, social/cultural and economic environments
- Notify stakeholders and public, create Community Working Group , host Public Information Centre No. 1

Phase 2

- Identify Alternative Solutions
- Identify alternative solutions for bridge (do nothing, close bridge to vehicular traffic, close bridge and remove, construct new one lane bridge, construct new two lane bridge) and for road (do nothing, resurface the road, reconstruct the road)
- Consider environmental and technical impacts on each alternative solution
- On going meetings with CWG and stakeholder input (including meetings with HG and RSAC)
- **Select preliminary preferred alternatives (construct new two lane bridge, reconstruct road)**

Phase 3

- Identify Design Concepts to Implement the Preferred Solution
- Identify alternative bridge design concepts (covered steel truss , concrete slab, pony truss), road design concepts (urban, rural, semi urban) and intersection (roundabout, signals)
- Consider environmental and technical impacts on each alternative design concept
- On going meetings with CWG and stakeholder input (including meetings with HG and RSAC)
- **Select preferred design concepts (construct two lane pony truss bridge, reconstruct road to two lane urban section, signalize Downey/Niska intersection)**
- Host Public Information Centre No. 2

Phase 4

- Prepare and File the Environmental Study Report (ESR)
- Complete an ESR detailing all of the activities undertaken to date
- **Present ESR to City Council**
- Issue the ESR for a 30-day public review period
- Address any concerns raised by the Minister of the Environment and Climate Change
- Notify the public and agencies of completion of the ESR and of the Part II Order provision in the EA Act

Current Study Status

Phase 5

- Project Implementation
- Proceed to detailed design and construction of the project
- Monitor for environmental provisions and commitments

ATT- 3 Niska Road Improvements – Schedule C Municipal Class Environmental Assessment

Executive Summary

1.0 Introduction

The City of Guelph (City) has undertaken a Schedule C Municipal Class Environmental Assessment (EA) to determine the most appropriate improvement strategies for Niska Road from Downey Road to the City limits on the west side of the Bailey bridge over the Speed River. Segments of the roadway and the bridge over the Speed River are nearing the end of their useful life and require a solution to address their deterioration, their increasing maintenance costs and improve the overall safety of this road section. During the course of this Class EA Study, a range and variety of road cross-sections, bridge solutions and intersection solutions were examined.

The main feature being examined in this project is the one-span, double truss Bailey bridge installed in 1974 after the collapse of an earlier steel pony truss bridge. It is located on Niska Road over the Speed River in the southwest part of the City of Guelph. Although the Niska Road Bridge is not municipally designated under the Ontario Heritage Act (OHA) and is not listed on the City of Guelph's *Municipal Register of cultural Heritage Properties*, the structure is referenced as the only example of a bridge or its type in the City of Guelph in the publication, *Arch, Truss & Beam: The Grand River Watershed Heritage Bridge Inventory* (March 2013). The bridge has been emotionally *'adopted'* as the key heritage feature by the local community.

1.1 Description of Study Area

Niska Road is currently classified as a collector road in the City of Guelph Official Plan. Collector roads are to provide through movement for travel to/from arterials and expressways. Traffic control on Niska Road is characterized by:

- All way stop at Ptarmigan Drive and Niska Road;
- Stop sign control at Niska Road and Downey Road; and,
- 50 km/h speed limit.

Pavement on Niska Road between the Niska Bridge and Ptarmigan Drive is approximately 6.0 to 6.5 meters wide, with a rural cross section supporting drainage ditches. The road has severely cracked pavement throughout the road corridor, eroding ditches creating sedimentation in surrounding natural environment, lacks proper gravel shoulders and lacks pedestrian and cyclist amenities. The existing 20 meter right-of-way has been completely disturbed by the existing road corridor. The existing road corridor is undulating in nature, decreasing in elevation in areas around the Speed River.

The existing bridge over the Speed River is a single lane bridge without pedestrian access which is in need of significant repair due to poor structural condition with a posted 5 tonne load and failure of abutment, foundation and embankments

Niska Road runs parallel to residential, agricultural and riverine lands. The extent of the Study Area is shown on Figure 1.1.

1.2 Project Team Organization

The Study has been carried out by a Project Team consisting of City of Guelph Staff, Consultant and Sub-consultant staff led by R.J. Burnside & Associates Ltd. (Burnside). A number of external regulatory agencies, adjacent property owners, stakeholders and a project selected Community working Group have also participated throughout the process.

1.3 Municipal Class EA Process

The study has been undertaken in accordance with the process outlined in the Municipal Class Environmental Assessment Guide (October 2000, as amended in 2007 and 2011), which is approved under the *Ontario Environmental Assessment Act.* The study has followed this comprehensive planning and pre-design process in order to recognize and accommodate the needs of City, the local residents, the travelling public and the requirements to minimize the impacts to the natural and heritage environments.

Originally this study was advertised as a Schedule B Study to examine bridge solutions and the reconstruction of Niska Road from the Bailey bridge to Ptarmigan Drive. Following our Notice of Study Commencement first posted on April 11, 2013 and a Public Community Meeting held on June 27, 2013 to address community concerns, the City of Guelph:

- expanded the study area to include Niska Road from the Bailey bridge to its terminal point at Downey Road;
- re-advertised this study as a Schedule C (first posted October 17, 2013); and
- created a Community Working Group (CWG) to review and provide input on data collection, study results and evaluation of alternate solutions.

Schedule C projects must complete Phases 1 to 4 prior to proceeding to Phase 5, the Implementation Phase. These phases are summarized in detail in Section 1.3.1 of the ESR and associated EA Process Flowchart.

Public consultation is required under a Schedule C project to assist in identifying and evaluating alternative design concepts and selecting preferred design concepts. The Class EA process ensures that an adequate EA process is followed for various types of projects. Class EAs place emphasis on project assessment and public and agency involvement.

1.4 Class EA Project Schedule Selection

The Municipal Class Environmental Assessment is a planning and decision-making process, as well as a predictive science designed to identify impacts on the environment from an enterprise, activity, plan or facility. "Traceability" of the planning process is required by the Ontario's *Environmental Assessment Act.*

As noted in Section 1.3, under the Municipal Class EA process, projects are assessed and planned to varying levels of detail, depending on their complexity. Each component of the Niska Road project was reviewed to determine its appropriate schedule. Based on schedule definitions, it was determined that:

- The road reconstruction portion of the project could fall within the scope of a Schedule 'A+' Municipal Class EA Process.
- The bridge portion of the project could fall within the scope of a Schedule 'B' Municipal Class EA Process.
- The intersection reconstruction could fall within the scope of a schedule 'A+' Municipal Class EA Process.

However, as noted above, based on feedback received from initial consultation and comments from the local community, the City decided to elevate the level of the Class EA from a Schedule B undertaking to a Schedule C undertaking. With this elevation of schedule, the Study Area was extended from the intersection at Niska Road and Downey Road to the City limits. In addition to comments from the public, key factors considered when deciding to elevate the EA included:

- The need for enhanced community input through detailed public consultation;
- Heritage considerations associated with the Bailey bridge, including the fact that the bridge will turned 40 years of age in 2014;
- GRCA Heritage Bridge Inventory indicated that the bridge "has the potential to yield information that contributes to an understanding of the community or culture;"
- Although initial cost estimates in 2012 and 2013 were below $2 million, it was considered that the cost of bridge replacement could exceed the Municipal Class EA threshold of $2.4 million, depending on the preferred solution or design option,
- Need to fully address safety concerns, including truck usage issues, speeding and traffic calming opportunities; and,
- Need for further exploration of opportunities for corridor improvements and upgrades that may include bike paths, multi-use paths, sidewalks and an overall road cross-section that meets current standard.

The Niska Road Class EA was conducted as Schedule C project in accordance with the Municipal Class Environmental Assessment and two Public Information Centres (PICs) were held during the course of the EA Study, in adherence to EA process.

1.5 Part II Order Process

If concerns arise that cannot be resolved by the Project Team, an individual or agency may request that the Minister of the Environment make an Order for the project to comply with Part II of the Environmental Assessment Act. This is known as a Part II Order Request. If an individual or agency feels that significant outstanding issues have not been addressed in a Class Environmental assessment process and could be better addressed through an Individual Environmental Assessment process, they may ask for a higher level of assessment. Detailed instructions for filing a Part II Order Request are available in the ESR.

2.0 Needs and Justification

Niska Road from Downey Road to the City limits is a two lane Collector road (one lane in each direction) which connects to a one lane Bailey bridge that crosses over the Speed River. Niska Road from Ptarmigan Drive to the Speed River and the Bailey bridge are nearing the end of their respective operational life. Both road and bridge require significant remediation and/or replacement in order to meet current and future traffic and safety demands of the corridor. In addition to the road and bridge concerns, improvements are also required at the intersection of Niska Road and Downey Road which yields significant delays as a 3-way stop intersection during peak periods.

At the onset of the project, a problem opportunity statement was established in order to set a benchmark for the final output of the project. This statement included input from City Staff, members of the public, Community Working Group (CWG), project team members, sub-consultants and review agencies. In summary:

The purpose of this study is to undertake a Schedule C Municipal Class Environmental Assessment to assess the rehabilitation and replacement options for Niska Road between the Bailey bridge and Downey Road including improvements to the Downey and Niska Road intersection.

A solution is required to address the deterioration and increasing maintenance costs to Niska Road infrastructure. In addition to reviewing a variety of road cross-sections, impacts to the natural environment and community road safety issues, a range of bridge solutions will also be examined which includes bridge closure, bridge rehabilitation and bridge replacement.

Social and economic impact, natural environmental impact, archaeological assessments and heritage assessment will all be assessed as part of the Class EA study process. Community safety and road safety will also be examined. Presently, traffic volumes exceed regulatory thresholds and guidelines for a single lane bridge.

The Local Community has identified four (4) important considerations:

1. *Consider how to maintain, preserve and protect natural environment and cultural heritage, viewscapes, historic character of existing road and rural/urban interface;*
2. *Consider the cultural and historical evaluation of the existing Bailey Bridge;*
3. *Consider health and safety of the local community; and,*
4. *Consider recreational opportunities.*

The Problem Opportunity Statement was revisited throughout the EA to ensure it was being addressed. The complete Problem Opportunity Statement can be found under Section 2.1.

3.0 Planning Overview

The Study Area is located within the City of Guelph, in the province of Ontario. As such, all development within the Study Area must adhere to the City of Guelph Official Plan (OP) as well as provincial plans and the Provincial Policy Statement. The City of Guelph OP intended to guide land use activity and change within the City. The policies within the OP are intended to

simultaneously achieve social well-being, economic vitality and environmental protection. With specific reference to Niska Road, Schedule 9A, Existing Road Network, identifies Niska Road as a Collector Road. Any improvements to the road, bridge or intersection must comply with applicable sections of the OP. Section 8.2 of the OP specifically includes the following objectives:

A. *To derive a transportation system, involving all forms of transport modes, to move people and goods in an environmentally efficient and effective manner.*
B. *To ensure that the transportation system is financially feasible and has received an acceptable level of public approval.*
C. *To implement programs to facilitate and encourage greater and safer use of the bicycle as a mode of transport.*
D. *To support measures to improve the pedestrian environment and system.*
M. *To develop a transportation system that minimizes impact on the environment and aesthetic character of the City.*

In addition, OP Section 2.4.13.4, indicates that the City will ensure that pedestrian and bicycle networks are integrated into transportation planning.

The Study Area includes natural heritage features, open space lands, floodplains and has potential to contain cultural resources. The OP also includes the City of Guelph Cycling Master Plan which acts as a guide for the development of the cycling network throughout Guelph.

Additional planning and policy guidelines also applicable to the Study Area include those reinforced by the GRCA, Guelph Transit Commission, and adjacent Townships. Regulated lands, associated with the Speed River and its floodplain, are present in the vicinity of the Niska Road bridge. The Class EA Study Team received special permission and permits to enter onto these lands adjacent to Niska Road and preform the required natural environmental assessment. Consultation with these agencies throughout the EA process was performed to ensure adherence to applicable regulations and guidelines.

4.0 2013 GRCA Heritage Bridge Inventory

In 2012, the GRCA and Heritage Resources Centre at the University of Waterloo formed a partnership to prepare the *Arch, Truss, Beam: The Grand River Watershed Heritage Bridge Inventory*. The study supported the Canadian Heritage River designation.

The Niska Road bridge over the Speed River was assessed in 2012 by GRCA and their bridge information, data, findings and details are as follows:

> *The Niska Road bridge crosses the Speed River 0.35 km west of Pioneer Trail. The one-lane Bailey bridge was built in 1974 and is the only of its type in the City of Guelph.*
>
> *The Bailey bridge is a pre-fabricated, portable, truss bridge that was developed by the British during World War II for military use. This type of bridge requires no heavy equipment or specialized tools to construct and is typically used for temporary crossings. The Niska Road bridge has a steel structure with a timber deck and masonry abutments.*

It is speculated that the bridge was chosen to be one-lane in order to discourage vehicles from using the road as a main artery. However, the bridge still carries a large amount of traffic due to the residential area to the east.

5.0 Existing Technical Environment

5.1 Existing Bridge

The bridge was originally installed in 1974 as a 'temporary bridge replacement' for the bridge previously crossing the Speed River which collapsed on September 23, 1974. Following this collapse, the municipality moved quickly to install a temporary bridge at the site in order to reopen the road as soon as possible. MTC agreed to provide the City of Guelph with a Bailey bridge subject to a number of conditions. Due to a change in policy in 1994, making bridge materials available for loan for only two years, and due to the depreciation in value of the Bailey Bridge, it was determined that the bridge held a value of zero dollars. The City was therefore able to purchase the bridge form the province for one dollar in 1994. At this point, the bridge became referred to as the Niska Road Bridge (Unterman, 2014 CHER). The (new) Bailey bridge reused the stone masonry substructure of the previous bridge.

5.1.1 Existing Bridge Condition

The existing Bailey bridge is supported on the existing stone masonry abutments with concrete rubble retaining walls which relate to a previous structure constructed by the Township of Puslinch. The abutments and retaining walls were constructed as part of earlier bridge works at the site and predate the construction of the Bailey bridge. By definition, Bailey bridges are currently classified as a type of Temporary Modular Bridge. Modular structures continue to be used in emergency situations and for detour purposes, but are also applicable for permanent installations in remote areas.

Since originally constructed, the bridge has undergone many modifications. Regardless of these modifications, the bridge still maintains its dominant form and design character. Through its limestone abutments, concrete rubble retaining walls and Bailey bridge form, the structure conveys aspects of bridge building activities at the site through the 19th and 20th century.

The existing Bailey bridge abutments and foundation have reached the end of their operational life and will eventually cause an operational safety risk. The bridge cannot remain 'as is' and 'in situ' as a safe and operating bridge structure for the City of Guelph. This type of bridge was not originally designed to be a long term structure and components of the bridge today are in very poor condition.

A Biennial Bridge Inspection Report completed on August 6, 2013, deemed the bridge insufficient in fulfilling its purpose as part Niska Road's status as a Collector Road in respect to the following:

- Poor structural condition;
- Water encroaching against abutments;
- Absence of pedestrian access;
- Progressive undermining of northwest retaining wall;
- Failure of northwest and northeast embankments;

- Severe corrosion on both embankments;
- Posted 5 tonne load limit; and
- High estimated cost of complete repairs estimated to be over $1 million based on 2012 Biennial Bridge Inspection Report.

The 2015 bi-annual bridge inspection, completed by Engineered Management Systems Inc. concluded that:

- There are numerous longitudinal cracks (checks) and isolated missing bolts. The deck is partially loose as a result of aging, weathering and loose bolts which will lead to continued damage in the immediate future. There is a single patched area less than one square metre, probably covering some damaged timber boards.
- Deck replacement should be considered as soon as possible in order to avoid continuous maintenance which requires bridge closure as there is only one available lane.
- Pending deck replacement, the top surface of the deck should be thoroughly checked and all areas which are severely damaged should be immediately repaired.
- Upon removal of the deck boards an engineer should thoroughly inspect the underlying supporting elements before new decking is put in place.

All original bridge inspection reports can be found under Appendix C.

5.1.2 Bridge Structure Load Capacity and Structure Geometry

The existing Niska Road Bridge is a steel, portable truss bridge with a timber deck and stone abutments. The bridge currently carries one lane of vehicular traffic across the Speed River in one continuous span. Currently the Niska Road bridge holds a posted capacity of 5 tonnes and a truck ban is also in place. The bridge dimensions currently do not meet geometric standards according to the Ontario Bridge Recommendations.

5.1.3 Ontario Bridge Code Guidelines

The Ontario Bridge Code refers to the Geometric Design Standards for Ontario Highways and Roadways in terms of establishing bridge cross section criteria. Upon review of the Bridge Code and current conditions on Niska Road, the existing Niska Road Bailey bridge structure is insufficient for current and future traffic volumes due to increasing deterioration. Due to increased deterioration creating safety concerns, increased associated maintenance costs and inability to support current flood levels, the bridge requires remediation or replacement in order to fulfill its role within the City of Guelph road network on a Collector Road. Considerations applicable to Niska Road include:

- In Ontario, the Bridge Code recommends against the use single load paths such as the Niska Bailey Bridge.
- Low volume roads are those in which the **traffic volumes are less than 400 vehicles per day** (vpd). However, even in this case, once you approach 400 vehicles per day it is strongly recommended that a two lane bridge is required.
- **On Niska Road the average weekday 24 hour volume eastbound is 2,405 and westbound is 2,247.**
- The Geometric manual says that the number and width of lanes on a bridge should be the same as the approaches.

- The bridge code section indicates and recognizes that widening of bridges after initial installation is a more costly exercise than to build wider from the start. The code also indicates that bridges should be designed for future reasonable road widening where practical and planned.
- As per Table D7-1 of the Geometric Manual, in the Ministry of Transportation (MTO) Structural Manual, the minimum bridge cross section should be 8.5 m for two lanes, and 5.0 m for a one lane bridge supporting a low volume road, (the current Bailey Bridge deck has a travel width of 3.44 m).
- Horizontal clearances from the edge of the through traveled way to the face of an abutment or pier should meet or exceed the minimum clear zone widths specified in the Ministry's Roadside Safety Manual, the Bailey bridge does meet today safety requirements.

5.2 Existing Road

Niska Road is a paved road with two lanes. It runs east to west from the City limits to Downey Road, and has a posted speed limit of 50 km/hr. Niska Road is an important component in the City of Guelph Road Network as it connects the City of Guelph to surrounding townships, and is integral to emergency access to local residences. It is a two lane road from Downey Road west to the City limits, narrowing to a single lane at the Niska bridge.

Traffic control on Niska Road is characterized by an all-way stop at Ptarmigan Drive and Niska Road, stop sign control at Niska Road and Downey, and a 50 km/h speed limit. The pavement on Niska Road between the Baily Bridge and Ptarmigan Drive is approximately 6.0 to 6.5 metres wide, with a failing rural cross section, and deficient gravel shoulder on both sides of the roadway.

5.2.1 Road Classification

Within the City of Guelph Official Plan, Niska Road is defined as a Collector Road. According to Section 8.2.17 of the City of Guelph Official Plan (September 2014 Consolidation):

- *Collector roads are intended to move low to moderate volumes of traffic within specific areas of the City and collect local traffic for distribution to the arterial of Provincial highway system.*

- *Collectors are moderate speed design, having capacity for 2 - 4 lanes, usually undivided.*

Niska Road has slightly lower average right-of-way width of around 20 metres, but is still considered a Collector road.

5.2.2 Existing Road Geometry

Niska Road currently does not meet the geometric guidelines for a Collector road within the City of Guelph Official Plan, though it holds designation as a Collector road as the OP recognizes that meeting these guidelines is not possible in every road corridor.

6.0 Traffic and Transportation Study – Existing Conditions

6.1 Traffic Volumes and Transportation Surveys

A traffic volume and transportation study was completed between October 17, 2013 and October 23, 2013 for inclusion in the Overview of Existing Conditions Report, provided in Appendix D. This study documented the highest weekday peak volumes (eastbound and westbound), average vehicle speeds and truck traffic for both westbound and eastbound traffic. The traffic volumes can be summarized as follows:

Section of Road	Average 24 hour eastbound traffic	Average 24 hour westbound traffic
Niska Road between Ptarmigan Drive and Pioneer Trail	2405	2247
Niska Road between Pioneer Trail and the Bridge	2431	2315

Despite bylaws in place prohibiting trucks with gross weights of 4,500 kg from using Niska Road, or 5 tonnes or greater using the Bailey bridge, the total number of heavy trucks counted in these surveys (average of 20 truck in each direction), indicated that truck traffic is significant on this bridge and this stretch of road. Mitigation measures to address this issue was considered and evaluated during the EA phase. Complete traffic volume charts are under Section 4.3.

6.2 Future Traffic Projections and Conditions

6.2.1 2031 Traffic Projections

In order to understand anticipated traffic growth and associated road intersection traffic pressures, a peak hour traffic forecast analysis was conducted in 2013. The City provided traffic volume projections from their TransCAD model for 2006 traffic conditions and 2031 traffic conditions. The PM peak hour annual growth rate is 3% for Niska Road at the Downey Road Intersection, and 2% for the bridge crossing traffic with higher growth in the westbound direction and lower growth in the eastbound direction.

The anticipated PM peak hour growth from 2013 to 2031 is 75% for Niska Road at the Downey Road intersection and 43% for the traffic across then Niska Road Bridge. These traffic projections were used to determine intersection design options that best serve the anticipated traffic volume.

6.2.2 Vehicle Speeds Study

Results from a vehicle speed study performed between October 17, 2013 and October 23, 2013 concluded that despite the posted speed limit of 50 km/hour, many vehicles are exceeding the speed limit on Niska Road. Mitigation measures to address this safety issue was evaluated during the detailed design phase of the EA and traffic Calming measures were developed.

6.2.3 'Purpose of Travel' Surveys

An origin destination travel survey was conducted on Thursday June 19, 2014 from 7:00 am to 7:00 pm on the Niska Road Bailey Bridge to determine the purpose of travel, origin and destination of trip, type of vehicles used, and valued importance of the bridge. These surveys concluded that most of the trips on the roadway were external indicating that the corridor is integral to external trips and is a significant roadway within the City of Guelph road network.

6.2.4 Traffic Safety Review – Niska Road from Downey Road to West City Limits

A safety performance of Niska Road between Downey Road and the West City limits concluded that between April 1, 2008 and April 30, 2013, there were 16 reported collisions in the area. Of the 16 collisions, 5 occurred on Niska Road between Pioneer Trail and Speed River and were directly related to motor vehicle operation at the single lane Bailey bridge. Five collisions also occurred at the Niska Road and Downey Road intersection, of which three resulted in personal injury. Most recently,

The high correlation of accidents in relation to the Bailey bridge and intersection at Niska Road and Downey Road is illustrative of some of the traffic safety issues in this area which must be addressed through the design of the road and bridge improvements along Niska Road. Further details regarding the Traffic Safety Review are found in the Overview of Existing Traffic Conditions Report in Appendix D.

6.2.5 Traffic Operations

Assessment of existing traffic operations at the intersection at Niska Road and Downey Road indicated that during the weekday mornings and afternoons, there are delays turning onto Downey Road from Niska Road. The other intersections along Niska Road were not assessed operationally given lower traffic volumes on Niska Road and the intersecting streets when compared to traffic volumes on Downey Road. Traffic volumes on Niska Road are well within the range of the capacity of a two lane roadway, and improvements at the intersection at Downey Road and Niska Road are required to accommodate future traffic volumes and improve exiting conditions.

6.2.6 Utilities / Services

The Study Area includes many private utility services within the road allowance and easements associated with servicing corridors. They include overhead hydroelectric and telecommunication services and underground natural gas distribution services. The privately owned utility service providers have been notified of this Class EA, and have been requested to provide input with respect to current location and potentially required relocation of their services

7.0 Existing Natural Environmental Conditions

The natural environment for the Study Area was characterized through a review of secondary source information and databases, as well as field investigations including air photo mapping, the MNRF Natural Heritage Information Centre (NHIC), GRCA Fisheries Management Plan and online soils Canada mapping. Various field verification and investigations took place between

2013 and 2015. Further details regarding field work completed is available in the Natural Environment Report (NER) and associated appendix materials.

7.1 Terrestrial Environment

The Ecological Land Classifications – Natural Heritage System Map within the City of Guelph's Official Plan identifies several vegetation communities in lands adjacent to the Study Area. These communities were verified and further refined through field investigations in accordance with the Ecological and Classification (ELC) of South Ontario Guide (Lee et. al, 1998 and 2007 amendments). A total of thirteen vegetative communities were identified by the Project Team within the Study Area. Detailed descriptions of these communities are available in the NER.

7.1.1 Wildlife and Wildlife Habitat

The Study Area and adjacent lands extend through various environmental features which have the potential to provide habitat for various wildlife species including avifauna, mammals, amphibians and reptiles and fish. Records of for rare species within the Study Area were compiled through background data obtained from NHIC and Ontario Breeding Bird (OBBA) databases. Habitat for these species was then assessed through a series of field visits, as summarized in the NER under Appendix E.

The City of Guelph Natural Heritage System mapping designates portions of the Study Area as Significant Wildlife Habitat due to the potential presence of:

- waterfowl overwintering areas;
- colonial nesting bird habitat;
- raptor wintering areas;
- woodland breeding bird habitat;
- woodland/specialized raptor nesting habitat, and
- confirmed deer winter congregation areas (as identified by MNRF)

Consultation with the GRCA and City planning department on March 2, 2015 concluded that a breeding bird survey was not necessary, as background studies and the City's existing mapping provide adequate detail to deem the area significant. As such, this area is presumed to provide the Significant Wildlife Habitat noted above in the City's Natural Heritage System mapping.

7.1.2 Aquatic Environment

The Speed River Provincially Significant Wetland is located within the Study Area. The wetland boundary was delineated and mapped by Burnside staff accompanied by representatives from the GRCA and City in 2015 to ensure potential encroachment was avoided and mitigated.

The Speed River crosses through the Study Area at the Bailey bridge on Niska Road. The Speed River flows beneath the Niska Road bridge from the north to south, traversing the western portion of the Study Area. This stretch of the Speed River within the Study Area is home to diverse warmwater and cool/cold fish communities (GRCA Fisheries Management Plan, 2005).

Hanlon Creek crosses lands adjacent to the Study Area approximately 200 metres east of the intersection at Downey and Niska Road. The Hanlon Creek is classified as a cold water fishery within the City of Guelph Natural Heritage System mapping and provides a source of cold water to the Speed River, upstream of the existing Niska Road Bridge.

7.1.3 Species at Risk

A review of background information (OBBA 2001-2005 and NHIC records) identified three Endangered and six Threatened species in the Study Area or lands adjacent. Endangered species included Henslow's Sparrow, Loggerhead Strike and Northern Bobwhite and threatened species included Blanding's Turtle, Barn Swallow, Bobolink, Chimney Swift, Least Bittern and Whip-Poor-Will. During the field investigations, priority was given to locating these species or their habitats; however, none were found. Additional details can be found in the NER.

7.1.4 A Review of Species of Conservation Concern

A search of the NHIC database confirmed that several species of conservation concern have been documented in the vicinity of the Study Area. A total of three vascular plant records were identified, though none of these species are protected under the *Endangered Species Act*. None of these species were observed within Study Area limits during field investigations, and it is predicted that none of these species are present within the Study Area as the highly specialized habitat requirements for these species are not present on-site.

A review of background information (OBBA 2001-2005 and NHIC records) resulted in a total of 174 records for SAR or species of conservation concern that have been recorded within the general vicinity of the Study Area. The majority of these species are species of conservation concern as they hold S-ranks of S1-S3, but do not hold provincial or federal designation. Two species of conservation concern were observed during field investigations, including Snapping Turtle and Monarch Butterfly. The presence of species and suitable habitat were confirmed during field investigations. Habitat for other species of conservation concern is not present in the Study Area or adjacent lands.

7.1.5 Natural Heritage System

The City of Guelph's Natural Heritage System includes "Significant Natural Areas" and "Natural Areas" within proximity of the Study Area (City of Guelph Natural Heritage Features Figure in Appendix A of the NER). These designations encompass the following features:

- Significant Woodlands;
- Speed River Provincially Significant Wetland (PSW);
- Significant Wildlife Habitat (Ecological linkages, deer winter congregation areas and waterfowl over wintering habitat); and,
- Significant Valleylands (Speed River Valley).

Potential impacts, mitigation measures and recommendations for road and bridge reconstruction work within, and adjacent to, natural areas are provided in the Impacts and Mitigation section (Section 10.5).

8.0 Existing Cultural Environments and Socio-Economic

Existing information was reviewed and field studies were undertaken to document the socio-economic and cultural environments within the Study Area. Included in these assessments was an Archaeological Assessment conduced in June 2013. The archaeological assessment concluded part of the eastern section of the proposed right-of-way does have some potential for both Aboriginal and Euro-Canadian archaeological resources, and that some sections of the proposed right-of-way area also located within 300 metres of a source of water and are potential undisturbed, therefore holding archaeological potential. Consultation with the Ministry of Tourism, Culture and Sport confirmed that there are currently no registered archaeological sites located either on, or immediately adjacent to the Niska Road corridor.

8.1 Cultural Heritage Resources

In order to assess potential cultural heritage, a Cultural Heritage Evaluation Report (CHER) and Cultural Heritage Landscape (CHL) Amendment were completed. Based on the findings from these reports, sections of the study area contain lands and features with cultural heritage and cultural heritage landscape value.

8.1.1 Cultural Heritage Evaluation Report

As noted in the Cultural Heritage Evaluation Report (CHAR) from Unterman & McPhail Associates, the Niska Road bridge is the only identified example of a Bailey bridge within the City of Guelph. It is a rare example of a Bailey bridge within the Grand River watershed as one of only two examples of its type, and it is one of a limited number of Bailey bridges located in Southern Ontario. The document *Arch, Truss & Beam: The Grand River Watershed Heritage Bridge Inventory* (March 2013) identifies only one other Bailey bridge in the Grand River watershed, located in the Township of Mapleton, but this bridge was considered to be a "non-heritage" feature. The Niska Road Bridge is noted as the only example of its type in the City of Guelph.

A CHER was conducted for the Niska Road Bridge in 2014 using criteria established under Ontario Regulation 9/06. This report concluded that the Niska Bridge holds characteristics assigning it with cultural heritage value. Although the potential for cultural heritage value exist, the bridge is not included on a local heritage inventory of cultural heritage resources or a municipal heritage register adopted under the *Ontario Heritage Act* (*OHA*).

According to the CHER, the Niska Bailey Bridge was determined to hold cultural heritage value based on:

1. *Design Value or Physical Value*
   a) *Rare, unique, representative or early example of a style, type, expression, material or construction method.*
2. *Historical or Associative Value*
   a) *Has a direct association with a theme, event, belief, person, activity, organization or institution that is significant to a community.*
   b) *Yields, or has the potential to yield, information that contributes to an understanding of a community or culture.*
3. *Contextual Value*

a) *Is important in defining, maintaining, or supporting the character of any area.*
b) *Is physically, functionally, visually or historically linked to its surroundings.*
c) *Is a landmark.*

8.1.2 Cultural Heritage Landscape Amendment

In response to the Community Working Groups concerns, a Cultural Heritage Landscape Assessment (CHL). An addendum to the CHER was completed. The CHL Study Area included lands in three political boundaries including the City of Guelph and townships of Guelph-Eramosa and Puslinch. It examined any features that may be deemed as culturally significant landscapes including such groups of features as townscapes and farmscapes.

The CHL concluded that the Study Area includes a significant cultural heritage landscape, but that current bridge and road conditions inhibit enjoyment of this landscape by limiting safe access for pedestrians and vehicles. In order to ensure these features are accessible to the public, the design alternatives considered will ensure the safe access of pedestrians and vehicles along the road and bridge corridor.

The Townships of Puslinch and Guelph-Eramosa were both consulted with to determine if they had any interest in the cultural heritage of the bridge and both indicated none. Townships of Puslinch Council indicated they may consider the viability of a Cultural Heritage Landscape designation, discussions will be continues with the City of Guelph.

A key feature of the Cultural Heritage Landscape is the overall topography and tree canopy. The preliminary design for road reconstruction has be matched the existing road profile. The road corridor will not be significant 'filled in' or 'cut down'. **The final grade of the newly paved road will closely match the existing grade. Also, based on the minimum number of trees that will be removed, the tree canopy (i.e. tree cover), will not be impacted, thus preserving the current look and *'feel'* of this road corridor within the community.**

8.1.3 Socio-Economic Environment

Niska Road is located in the community of Kortright Hills. The existing land use east of Ptarmigan Drive on the north and south sides of Niska Road to Downey consists primarily of single-family residences. Along Niska Road there are a number of older homes being replaced by large 4,000 square or larger foot homes. The community is an affluent area made up of a balanced blend of '*empty nesters'* and '*young families'*. There are neighbourhood commercial shopping centres on Stone Road within 2.5 kilometres from the Study Area. The University of Guelph's main campus is 3.5 kilometres away and a large YMCA facility is located just east of the Study Area. The community also contains Kortright Hills Public School and Mollson Community Park. The Study area is approximately 6 kilometres from downtown Guelph and City Hall. The area also supports Cottage/Trailer called Riverbend Park that is surrounded by GRCA's Conservation Lands (formally Kortright Hills Water Fowl Park) and the Speed River,

9.0 Phase 2 – Selection of Preferred Solution

The first overall objective of this EA was to identify a Preferred Solution that will allow for the safe and efficient movement of traffic for the travelling public and local community, at a reasonable cost, while minimizing impacts on the natural environment and heritage components

of the study area. To this end, a set of Evaluation Criteria, grouped under five key areas were established as part of the Class EA process to comparatively evaluate the Alternative Solutions. The areas included, Natural Environment, Socio-Economic / Cultural, Technical Factors, Municipal and Social Factors, Adherence to Problem Statement.

Throughout the Niska Road Environmental Assessment (EA) process, several alternative solutions were evaluated and assessed in the Study Area in a holistic manner. Field studies completed during the course of the EA included:

- Aquatics Assessment;
- Terrestrial Environment Survey and Wildlife Species and Habitat Field Assessment;
- Corridor Tree Inventory and Impact Assessment;
- Archaeological Assessment;
- Existing Traffic, Speed and Collision Study;
- Travel Destination Survey;
- Cultural Heritage Evaluation Study (CHAR); and,
- Cultural Heritage Landscape Assessment (CHL).

Significant consultation with interested stakeholders, the local community, a project focused Community Working Group, City of Guelph Committees (including Heritage Guelph Committee and River Systems Advisory Committee) and review Agencies (in particular Grand River Conservation Authority and the Ministry of Tourism, Culture and Sport), also took place.

9.1 Phase 2 - Assessment of Alternative Solutions For Bridge

Several alternative solutions were evaluated to determine a solution which best addressed the bridge's safety and structural deficiencies, while allowing it to serve the needs of those using the bridge. These alternatives included:

Alternative 1: Do Nothing but Repair and Maintain
This alternative includes rehabilitating the existing bridge structure, abutments, foundation and maintaining it in a 'good state of repair.'

Alternative 2: Close Bridge to Vehicular Traffic and Maintain
This alternative rebuilds the existing Niska Road Bridge to accommodate pedestrian and cyclist traffic only. The bridge would be closed entirely too vehicular traffic.

Alternative 3: Remove Bridge and Do Not Replace Existing Bridge
This alternative would remove the bridge, convert Niska Road from a Collector road to a local residential street and cut-off any direct access to the west across the Speed River.

Alternative 4: Replace the Existing Bailey Bridge With New One Lane Structure and Provide Operational Improvements to Niska Road
This alternative addresses the need to replace the existing Bailey bridge that has reached the end of its life. Operational improvements to address existing traffic and safety issues would be considered.

Alternative 5: Replace the Existing Bailey Bridge with a Two Lane Structure and Provide Operational Improvements to Niska Road

This alternative addresses the need to replace the existing Bailey bridge with a two-lane vehicular structure over the Speed River. Operational improvements to the Niska Road to address the existing traffic and safety issues will be considered. Based on baseline studies, consultation efforts and information collected through various studies, this option has been selected as the Preferred Alternative.

Preferred Solution – Two Lane Bridge

Based on our evaluation table as provided in Table 9.1 - Detail Evaluation of Alternative Solutions for Bridge, **the two lane bridge is the preferred solution.** A two lane bridge supports the following:

- Safe pedestrian or bicycle crossing with sidewalks and shared travel lanes.
- Significantly reduces the risk of accidents at the bridge. Fatalities have occurred at the bridge.
- Eliminates the root cause of many "near misses" at the bridge due to indecision of drivers crossing the current one lane bridge
- Current traffic volumes as the one lane bridge is not deterring traffic to the extent that community would like, therefore noise, safety and general community is a continued concern for residents.
- Safer wildlife crossing.
- Reduces sedimentation and erosion of the embankment into in river.
- Supports Niska Road's designation as a Collector Road.
- Positive impacts on the road network through increased functional use by surrounding community.
- Compatibility with long term surrounding land uses.
- Conformity with the City's OP and other Transportation Class EA's completed within the past 5 years.
- Meets address the City's decision to close Stone Road river crossing and enhance Niska Road river crossing.
- Provides an opportunity to construct safety and recreational features as part of the bridge such as, sidewalks, traffic calming features, canoe launch, on street parking, etc.
- Hanlon Parkway Class EA identified Niska Road as a fully functioning Collector road as part of the analysis and decision-making process when analyzing location of ramps and traffic routing. Analysis included the anticipation of a two lane bridge. This option meets these obligations.

9.2 Phase 2 - Assessment of Alternative Solutions For Road Improvements

Several alternative solutions were evaluated to determine which best addressed road deficiencies while allowing the road to best serve the great Guelph community.

Alternative 1: Do Nothing / Repair and Maintain
This alternative involves assessment of what would happen if no action were taken to address the study concerns. In this case, 'Do Nothing' means to maintain Niska Road in its current condition.

Alternative 2: Repave Road Surface
This alternative involves the maintenance of the existing Niska Road in a good state of repair, which entails or only repaving of the road from Ptarmigan Drive to the bridge at the Speed River.

Alternative 3: Reconstruct Road
This alternative involves the full reconstruction of Niska Road from Ptarmigan Drive to the bridge at the Speed River (i.e. gravel shoulders with roadside ditches).

Preferred Solution for the Road Rehabilitation
Based on our evaluation table as provided in Table 9.3 - Detail Evaluation of Alternative Solutions for Niska Road**, complete reconstruction of Niska Road from Ptarmigan Drive to Speed River is the preferred solution**. The preferred solution of reconstructing Niska Road is based on the following:

- The road base and surface pavement is at the end of its end of its operational life, the shoulder and storm drainage ditches are either deficient or failing and the road corridor between the bridge and Ptarmigan Drive do not support safe pedestrian access;
- Niska Road is currently classified as a Collector road in the City of Guelph Official Plan;
- Niska Road is currently averaging between 2200 and 2400 vehicles per day.
- Traffic control on Niska Road is characterized by an all way stop at Ptarmigan Drive and Niska Road with a 50 km/h speed limit. However, there is an opportunity to introduce traffic calming measures to encourage slower speeds and discourage 'short cut' traffic;
- Pavement on Niska Road between the Speed River and Ptarmigan Drive varies between 6.25 to 6.5 meters wide, with a failing rural drainage system. This section of road:
  - Has severely cracked pavement throughout the road corridor and requires pavement reconstruction;
  - Has eroding ditches creating sedimentation in surrounding natural environment;
  - Is without sidewalks or bike path;
  - Has gravel shoulders that are either almost completely eroded way or overgrown with vegetation; and
  - Has inadequate parking for access to Speed River.
- The reconstruction of Niska Road from Speed River and Ptarmigan Drive provide an opportunity to address all road safety issues and correct the list of road deficiencies noted above.

9.3 Inclusion of the Niska Road and Downey Road Intersection

In accordance with the Municipal Class EA process the signalization of an intersection less than 9.5 million is a Schedule A. As shown under Appendix 1-Project Schedules on pages 1-5 of the guidelines.

13. Installation, construction or reconstruction of traffic control devices (e.g. signing, signalization)

Given the community concerns about examining the entire corridor, City revised the projects terms of reference to include intersection design options in Phase 3 along with the road design options and the traffic calming measures. This would allow the local community, surrounding stakeholders and the general public to examine to full extent of all changes proposed for this road corridor and provide their input.

10.0 Phase 3 – Identification and Evaluation of Alternative Design Concepts for the Preferred Solution

Phase 3 of the Class EA process involves an evaluation of design concepts associated with the preferred solutions identified in Phase 2.

10.1 Alternative Design Concepts for the Bridge

Three separate bridge designs concepts were examined as part of this Class EA process. Design concepts examined included:

- Covered Steel Through Truss
    - A truss bridge is a bridge whose load-bearing superstructure is composed of a truss and a structure of connected elements forming triangular units. A truss bridge can be characterized by the location of its traffic deck.
- Concrete Slab on Steel Girder Bridge
    - A girder bridge is a bridge that utilizes girders as the means of supporting the deck. A girder bridge is one of the most commonly built and utilized bridge in the world.
- Pony Truss Bridge
    - A pony truss is a truss bridge which allows traffic through the truss, but the top of the bridge is not joined together with cross braces.

10.1.1 Heritage Screening Process

A one-span steel pony truss bridge pre-dated the current one-span Bailey bridge that was installed in 1974 after the previous bridge collapsed. It has been suggested by the City of Guelph's Senior Heritage Planner that a Warren Truss type bridge would be in keeping with historical and cultural nature of the area, as the previous bridge was a Warren type truss bridge.

The current Bailey bridge is only one of a number of bridges that has serviced this location. Retention and conservation of this identified cultural heritage landscape can be further preserved through the placement of a monument at the bridge site with an interpretive plaque detailing the history of the Niska Road Bridge.

All three bridge types being considered (i.e. Covered Steel Through Truss Bridge, Concrete Slab on Steel Girder bridge and Pony Truss bridge), will be designed to ensure the current views from the bridge (upstream and downstream) will not impeded for vehicular, bicycle or pedestrian traffic.

10.1.2 Selection of Preferred Bridge Design Option

Based on the evaluation process and with consideration of the cost, complexity of construction, and heritage factors, **the preferred bridge design option is a Pony Truss bridge by a very small margin.**

A new bridge and reconstructed road will provide an opportunity to address many of the safety and environmental issues documented to date. As previously noted, the new two lane bridge will be designed to incorporate and reflect heritage and physical design characteristics from the original structure. Retention and conservation of this identified cultural heritage landscape will be further preserved through the placement of a monument at the bridge site with an interpretive plaque detailing the history of the Niska Road Bridge.

10.2 Alternative Design Concepts for Road Reconstruction

In addition to significant consultation with the local community, City Committees and review Agencies the evaluation process included a holistically examination of many environmental considerations to effectively evaluate three separate road cross section types. Cross-section configurations were evaluated based on their impacts to:

- existing trees,
- built heritage,
- natural environmental,
- cultural heritage,
- wildlife,
- terrestrial and aquatic habitat,
- viewscape review, and
- stormwater management

The cross section of a road way is designed to match the operational purpose of the road and as such three configurations were examined:

- Urban cross-section;
- Rural cross-section; and,
- Semi-Urban cross-section.

Urban Cross-Section typically included curbs, gutters, catch basins, underground storm water services, and sidewalks. In general an urban cross-section profile can allow for a reduced road operational foot print. *Rural Cross-Section* design roads may be lacking some or all of these components supported by an urban cross-section and are more likely to include culverts and ditches for storm water management. A rural cross-section will general create a wider operational foot print, however; it also provides an opportunity to match a pre-existing rural natural environment. Niska Road is currently a rural cross-section with detreated gravel shoulders. *Semi-Urban Cross-Section* provides the opportunity to join the best side of the urban cross sections with the best operation side of the rural cross sections, taking advantage of a more naturalized stormwater system on one side of the road while having sidewalks on the other side of the road.

The road cross-section was evaluated in a two-stage evaluation approach. First by pre-screening cross-sections that would cause the greatest impacts, then second by modifying

various cross-sections designs that would provide the greatest social and environmental benefit while still minimizing the over operational footprint. City standard cross-sections were pre-screened immediately as they create the largest footprints.

10.2.1 Stage 1 - Evaluation of Modified Road Cross Section

Three modified road cross-section types were fully examined for Niska Road from Ptarmigan Drive to the west side of the Baily Bridge over the Speed River. Modified cross sections were developed based on Transportation Association of Canada (TAC) standards and best road design and safety practices. The modified designs also included traffic calming measures where appropriate, the options evaluated were:

- Modified Urban cross-section,
- Modified Rural cross-section; and,
- Modified Semi-Urban cross-section.

These various cross-sections was evaluated from Ptarmigan Drive to the west side of the Baily bridge over the Speed River, based on their impacts to the natural heritage features (forests and wetlands), permanent and temporary impacts to tree, impacts to road corridor heritage features and overall operational foot print.

An evaluation of the number of trees that would be directly impacted as a result of the design options, including removal and direct effects within the drip-line, grading and excavation for relocated ditches was conducted. It was determined that even though the existing cross-section is rural, once the road is reconstructed an urban cross-section will create a narrower footprint throughout this road corridor. A curb and gutter in conjunction with a storm sewer allows for the most narrow configuration when considering the placement of sidewalks and bike paths.
With the rural option, once the shoulder and ditches were completely reinstated there would be considerable tree loss.

Based on our findings and assessment of the three types of cross section design concepts, the urban cross section was selected as the preferred design type.

10.2.2 Stage 2 - Evaluation and Selection of Preferred Urban Cross Section

In the second stage, variations of urban cross-section designs options were evaluated and compared. Elements such as, lowering tree impacts, inclusion of a sidewalk, impacts of adding street parking, review of various lane widths for shared vehicle and bike use, reduction of boulevard widths, decrease environmental and wildlife impacts, further increase of public safety, introduction of traffic calming measures and placement of stormwater management facilities were all taken into consideration.

After careful evaluation of the various options, the preferred cross section design option is Option 1. Option 1 is comprised of an 8.0 metre wide asphalt road (shared vehicle / bike lane), curb and gutter, 3.0 metre wide boulevard on the south side and boulevard and sidewalk on the north side. All lands beyond the 3.0 metre section would be subject to minimal impacts to match proposed grades with the adjacent natural contours. Option 1 provided an appropriate balance of social and safety requirement while respecting the natural environment. During the detail process further reduction of the overall pavement width can be considered.

An important element to the local community is the viewscape. There is concerned that the reconstruction of the roadway will dramatically change the current viewscape. Therefore, very minor alterations will be implemented to the vertical alignment. The new elevation of the road closely matches the current elevation. The dimensions of Option #1 are shown on Figure 9.7 and a summary comparison is provided in Table 9.5.

10.2.3 Traffic Calming

In an effort to resolve traffic concerns raised by neighbourhood residents, a traffic calming strategy for Niska Road was developed. Traffic calming measures were utilized to address the range of issues related to excessive traffic speeds, high traffic volumes, high truck traffic volumes, poor driver behavior and reduce 'cut through' traffic

Since Niska Road is a collector road and the road grades are being maintained to preserve the viewscape, there were some limitations. Speed bumps and excessive stop sign use could not be used. However, several other corridor treatments were used. These treatments are intended to relay the message to drivers that they are travelling within a community. The plan represents a scenario that can be implemented based on a staged process, depending on the City's capital program for future years. However all measures implemented together will be most effective.

The preliminary road design includes the implementation of the following traffic calming measures:

- signage indicating entrance to community,
- raised intersection at all intersection from Speed River to Downey Road,
- oversized stop signs,
- additional stop sign at Tanager Drive, and
- pavement markings to illustrate lane narrowing (i.e. tiger teeth that are aimed at increasing conspicuity and to promote continued attention and reminder to drivers of the transition zone.).

Layout of Community Traffic Calming Measures are shown in Figure 10.1 in the ESR.

11.0 Project Consultation

11.1 Agency Correspondence

Consultation with various review agencies and organizations was initiated by the Study Team. At the onset of the project, a comprehensive Agency and Organization Contact list was established based on listings in the Municipal Class EA Guide (pages A-64-A-65) and online research for local municipality, agency and utility contacts. This list was used to mail the Notice of Project Commencement and an Agency Response form to each review agency. The Agency and Organization list was used to track all correspondence received, and as a base for creation of distribution lists at various stages in the EA. Agency correspondence received has been summarized in the Agency Correspondence Summary Table in Appendix A.

11.2 Aboriginal Correspondence

At the onset of the project the Ministry of Aboriginal Affairs and Northern Development Canada was contacted to request contact information for First Nation groups and affiliations with potential interest in lands within the Study Area or vicinity. On April 23, 2103, a response was received with a list of First Nation contacts. This list was compared to recent contacts for each group on the Chiefs of Ontario website Directory of First Nations (http://www.chiefs-of-ontario.org/directory). This contact list was used to notify potentially interested groups of project initiation and of public meetings being held. Aboriginal groups were also sent Aboriginal Response Forms to complete if they had interest in the project. To date, no other response forms have been received. Consultation with Aboriginal communities is summarized in the correspondence section in Appendix A of the ESR.

11.3 Community Working Group

Many interested stakeholders submitted comments at the onset of the project. In response to this abundance of correspondence, the City and Study Team decided to form a Community Working Group (CWG) to allow for more meaningful, concentrated and productive community consultation and engagement effort. The Community Working Group (CWG) consisted of 14 representative members of the local community was established in November 2013. The purpose of this group was to allow representatives of the community to:

- Engage in CWG meetings and participate in discussions regarding the project;
- Become informed about the road and bridge design options, Study Area limitation, community traffic flows, area traffic volumes, traffic safety options, and environmental mitigation.;
- Relay any input received to the broader community;
- Bring a community perspective to the discussion, complaints or issues raised by the public, offer opportunities and identify threats; and,
- Discuss ideas and opportunities.

Eight (8) CWG meetings were held over a 22 month period. Members were often given workshop tasks to complete or materials to review to initiate discussion at subsequent meetings. The CWG was provided information on all aspects of the EA process and the preliminary design process. Many concerns, suggestions, issues and presentations were brought forth by members and were fully discussed with the Project Team. However, many of the CWG and community

members prefer to either close the bridge or leave the current one lane bridge 'in-situ'. As stated by one of the CWG members *'…although the bridge is failing, the old Bailey Bridge has become a part of their community'*

11.4 Public Information Centre

Two separate Public Information Centres were held to educate the public about the EA process and create an opportunity to meet and discuss concerns with members of the Project Study team. Hundreds of comments, emails and notes on aerial drawings were received regarding preference of alternatives for the road and bridge improvements. Members of the Study Team including Burnside and City of Guelph representatives were available to facilitate discussion and answer project related questions. Comments received through the community surveys, comment sheets, long plan aerial comments, email and letters were be taken into consideration during the decision, selection and preliminary design process of the study, to ensure needs and concerns were respected.

12.0 Selection of the Preferred Intersection Design Alternative

The preferred design option for the intersection is to signalize the intersection. The signalized intersection can be accommodated within the existing right-of-way and only minor widening is required to the existing road platform. Pedestrian crossings would be accommodated within the traffic signal phases via pedestrian crosswalks. The median proposed on the south leg of Downey Road would restrict the driveway at 52 Downey Road to right-in right-out. Auxiliary heads on Niska Road will be required for visibility, which can be confirmed through detailed design.

The roundabout option has a greater physical impact than the traffic signal option. The effects are similar for either the single lane with a southbound by-pass lane or for the multi-lane roundabout. Additional right-of-way will be required along Downey Road. The road base is pushed closer to the existing storm pond. The median proposed on the south leg of Downey Road would restrict the driveway at 52 Downey Road to right-in right-out.

Pedestrians also must rely on gaps in traffic or for vehicles to yield for them to cross. Cyclists would have similar impacts with either the traffic signal option or the roundabout option.

The traffic signal option is preferred in this case as there are less geometric impacts. 2031 traffic operations would be at overall level of service B, which is acceptable and well within standards.

12.1 Final Preliminary Design Recommendations

Throughout the Niska Road Environmental Assessment (EA) process, many alternative solutions were evaluated and assessed in the Study Area in a holistic manner.

With the completion of many studies, field assessments and significant consultation with interested stakeholders, the local community, a project focused Community Working Group and review Agencies, the following design solution alternatives have been selected for the road, bridge and intersection components of this EA:

- **Replace the Existing One Lane bridge with a Two lane Pony Truss bridge**
- **Reconstruct the Niska Road from the Bailey bridge to Ptarmigan Drive with a 4 metre wide shared use lane with sidewalks on the north side**
- **Reconstruct the Intersection at Niska Road and Downey Road as a fully signalized intersection**

Table 11.1 in the ESR summarizes impacts, mitigation measures and monitoring plans recommended. Mitigation plans will be addressed in detail during the detailed design phase of the project. Construction activities will occur (within existing road right-of-way and specified working easements. The Grand River Conservation Authority (GRCA), River Systems Advisory Committee (RSAC), Heritage Guelph Committee (HGC), Guelph Transit all impacted Utility companies and all requires City of Guelph Departments will be fully consulted during the detail design process. Regulated lands, associated with the Speed River and its floodplain, are present in the vicinity of the Niska Road Bridge. As such, GRCA approval will be required prior to any bridge works. Construction Plans will include (but not limited to) the following:

- Erosion and Sediment Control Plan;
- Emergency Response and Communications Plan;
- Tree Protection and Management Plan
- Stormwater Management Plan;
- Traffic Management Plan.
- Guelph Transit Alternate Route Plan
- City of Guelph Fire & Emergency Service Plan;

13.0 Cost Estimate

The estimated cost of the preferred design alternative for each of the three components of this Class EA Study has been prepared based on the preliminary design plans for the Ultimate Scenario (2031). These cost estimates will need to be revisited and revised accordingly during the detailed design phase of each project once detailed design plans are established. The cost estimates for each project are provided in the tables below.

Since the type of bridge selected will have very similar environmental impacts and estimated time of construction; an estimate was provided for two bridge options.

The Pony Truss bridge is approximately 34% greater in cost that the Steel Girder bridge however the Community, the City's Heritage and Planning Department and the Guelph Heritage Committee have all expressed preference and desire to construct a 'heritage type' truss style bridge that references back to the previous bridge style (i.e. a Warren Truss bridge) and addresses the former heritage 'look' and 'feel' of the community. The final cost may be a lesser factor in the final selection of the type of bridge during detail design. The detailed cost estimate charts can be found under Appendix I.

Cost Estimate Summary Table

Project Components	Estimated Amount
Construction of a Two Lane bridge	
– Steel Girder bridge	$2,072,719
– Pony Truss bridge	$2,742,019
Reconstruction of Niska Road	$2,088,486
Reconstruction/Signalization of Niska Rd & Downey Rd Intersection	$449,995
Total Estimated – With Steel Girder bridge (Excl. HST)	**$4,611,200**
Total Estimated – With Pony Truss bridge (Excl. HST)	**$5,280,500**

14.0 In Conclusion

The overall goal was to strike a balance between public needs, public safety and natural environmental impacts. Three urban and one rural cross-section were examined. To ensure concerns of the community were incorporated, the following key elements were also included in the overall assessment process when evaluating the various design alternatives options:

- Safe Public Access (sidewalks and shared vehicle lanes).
- Traffic Calming Measures.
- Minimization of Tree Loss (focus on maintaining overall tree canopy).
- Maintaining of overall viewscape for Ptarmigan Drive to the Speed River.
- Creation of an environment which reduces speed.
- Creation an environment which discourages 'short-cut' travel.
- Creation of on-street Community Parking.
- Improved stormwater management.

These preferred solutions best address current deficiencies of the road and bridge, while supporting improvement in safety, structural integrity, adherence to applicable municipal and provincial guidelines and minimization of impacts to cultural, social and environmental features present within the Study Area and adjacent lands.

The existing Niska Road bridge structure is insufficient for current and future use due to increasing deterioration. Due to increased deterioration creating safety concerns, increased associated maintenance costs and inability to support current flood levels, the bridge requires remediation or replacement in order to fulfill its role within the City's road network on a two lane collector road. As well, the existing two lane collector road on Niska Road between Ptarmigan Drive and the bridge is in poor condition with severely cracked pavement, sub-standard lane widths, and eroding ditches that are creating sedimentation in the surrounding natural environment and lacks both pedestrian and cyclist amenities.

The preferred solutions selected respects the past and current heritage elements of this road corridor, while addressing current community safety issues and positions the City to address future long term growth of the area.

Once the ESR is filed, if no Part II Order appeals are made with respect to the ESR, the City could move forward with final design and possibly tender of this project depending on capital budget and Council approvals.

ATT-4 Niska Road Improvements – Schedule C Municipal Class Environmental Assessment
Evaluation of Alternatives for Bridge

Criteria Sections	Do Nothing/Repair and Maintain	Close Bridge to Vehicular Traffic and Maintain	Remove Bridge / Do Not Replace Bailey Bridge	Replace the Existing Bailey Bridge With a New One Lane Structure and Provide Operational Improvements to Niska Road	Replace the Existing Bridge With a New Two Lane Structure and Provide Operational Improvements to Niska Road
A: Natural Environment					
B: Social Economic/Cultural Environment					
C: Financial Factors					
D: Technical Factors					
E: Problem Statement					
Total Average					
Recommendation	Not Carried Forward	Not Carried Forward	Not Carried Forward	Not Carried Forward	**Preliminary Preferred Solution**

Understanding the Rating System:
Least Preferred to Most Preferred

ATT- 4 Niska Road Improvements – Schedule C Municipal Class Environmental Assessment

Evaluation of Alternatives for Road

Criteria Sections	Do Nothing/Repair and Maintain	Repave	Reconstruct Road
A: Natural Environment			
B: Social Economic/Cultural Environment *			
C: Financial Factors			
D: Technical Factors			
E: Problem Statement			
Total Average			
Recommendation	Not Carried Forward	Not Carried Forward	**Preliminary Preferred Solution**

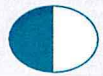
Understanding the Rating System:
Least Preferred to Most Preferred

ATT-5 Niska Road Improvements – Schedule C Municipal Class Environmental Assessment
Evaluation of Alternative Design Concepts for Bridge

Criteria Sections	Steel Through Truss Bridge	Concrete Slab on Steel Girder Bridge	Pony Truss Bridge
A: Transportation Management			
B: Natural Environment			
C: Social Economic			
D: Cultural Environment			
E: Land Use Planning			
F: Implementation			
G: Technical Consideration			
H: Economical Environment			
Recommendation	Still Being Considered	Not Carried Forward	**Preferred Alternative**

Understanding the Rating System:
Least Preferred to Most Preferred

ATT- 5 Niska Road Improvements – Schedule C Municipal Class Environmental Assessment
Evaluation of Alternative Design Concepts for Road

Criteria Sections	Urban Cross-Section	Rural Cross-Section	Semi-Urban Cross-Section
A: Transportation Management			
B: Natural Environment			
C: Social Economic			
D: Cultural Environment			
E: Land Use Planning			
F: Implementation			
G: Technical Consideration			
H: Economical Environment			
Recommendation	**Preferred Alternative**	Still Being Considered	Not Carried Forward

Understanding the Rating System:
Least Preferred to Most Preferred

ATT- 5 Niska Road Improvements – Schedule C Municipal Class Environmental Assessment

Evaluation of Alternative Design Concepts for Intersection

Criteria Sections	Signalized Intersection	Roundabout
A: Transportation Management		
B: Natural Environment		
C: Social Economic		
D: Cultural Environment		
E: Land Use Planning		
F: Implementation		
G: Technical Consideration		
H: Economical Environment		
Recommendation	**Preferred Alternative**	Still Being Considered

Understanding the Rating System:
Least Preferred to Most Preferred

Attachment 6

Previous Area Road Projects and Studies – Hanlon Expressway Environmental Assessment, Stone Road Extension, College Avenue Extension

The City's Transportation Master Plan provides the City with the basis to support and plan for a modern and efficient transportation network that is economically, socially and environmentally sustainable in accommodating all alternate modes of travel e.g. walking, cycling and automobile/truck throughout the City. The master plan was developed in direct consultation and involvement with the County of Wellington and Ministry of Transportation. Outside of the master plan, on going collaboration between the City and County on regional transportation matters continues to occur.

The need to replace the Niska Road bridge was planned before the completion of the Ministry of Transportation Environmental Assessment (MTO EA) for the Hanlon Expressway and before the removal of the Stone Road extension and College Avenue extension from the City's Official Plan. Planning for the bridge replacement in the Transportation Master Plan included the requirement to undertake an EA study. Further details on these area transportation studies follows:

- Hanlon Expressway Environmental Assessment
    - The approved Ministry of Transportation's Environmental Assessment (MTO EA) for the Hanlon Expressway from the Speed River to the south of Maltby Road recommended future modifications to the at grade intersections : full interchange at Stone Road, grade separation at College Avenue, partial interchange at Kortright and full interchange at Laird Road
    - The MTO EA study considered different interchange configurations for the Stone Road intersection both with and without the Stone Road extension, and the recommended configuration does not include the extension of Stone Road
    - In April, 2009, City Council supported the intersection modifications recommended by the MTO EA for the Hanlon Expressway, including the interchange configuration at Stone Road without the extension of Stone Road

- Stone Road Extension
    - Stone Road and Niska Road are two different travel corridors with Stone Road being the City's main east west arterial south of the Speed River with a future interchange planned at the Hanlon Parkway and Niska Road being a collector road servicing established land uses within the City
    - The removal of the Stone Road extension from the Official Plan was recommended and approved since the extension was not required to provide access to development lands to the west of the City limits and not required as a network connection after upgrades to the Hanlon Expressway are completed

- Subsequently, the Official Plan does not include the Stone Road extension to the west of the Hanlon Expressway to connect with the existing or future alignment of Wellington Road 124
- When an extension of Stone Road was considered, it was noted that an environment assessment would be required to create a new road and a new bridge across significant natural areas recognized in the City's Natural Heritage System, possibly cross environmentally sensitive areas including provincially significant wetlands and approximately half the length of the road extension would be on lands not owned by the City and outside of the City's limits. This would also create a further fragmentation of the Speed River Valley and river system.
- An estimated cost for the Stone Road extension is approximately $15,000,000 to $20,000,000.

- College Avenue extension
  - The College Avenue extension from Stone Road to Niska Road was included in Official Plan as an alternative to providing a partial interchange at Kortright Road
  - With the MTO EA recommending a partial interchange at Kortright Road, the College Avenue extension was not required and subsequently it was removed from the Official Plan
  - When an extension of College Avenue was considered, it was noted that an environmental assessment would be required to create a new road and river crossing that crosses significant natural areas that are included in the City's Natural Heritage System. This would also create a further fragmentation of the Speed River Valley and river system.
  - An estimated cost for the College Avenue extension is approximately $10,000,000 to $15,000,000.

ATT- 7 Niska Road Improvements – Schedule C Municipal Class Environmental Assessment

Detailed Evaluation Matrix for Alternative Solutions - Bridge

Criteria For Evaluating Alternatives			Existing Conditions	Do Nothing/ Repair and Maintain	Close Bridge to Vehicular Traffic and Maintain	Remove Bridge / Do Not Replace Bailey Bridge	Replace the Existing Bailey Bridge With a New One Lane Structure and Provide Operational Improvements to Niska Road	Replace the Existing Bailey Bridge With a New Two Lane Structure and Provide Operational Improvements to Niska Road
A	**Natural Environment** *Rating:*							
1	**Designated Sites (e.g. Provincially Significant Wetlands, Areas of Natural and Scientific Interest)**	Encroachment into designated features. Permitting Requirements.	The Speed River Wetland Complex and former Kortright Waterfowl Park and Wildlife Centre (GRCA owned lands) are within the study area. One federally and provincially ranked Special Concern Species, the Snapping Turtle was observed on adjacent GRCA lands. Grand River holds designation as navigable waterway.	Minimal impact during regular maintenance and repair. In general, minor bridge maintenance activities do not require permitting.	Minimal impact over existing conditions. Snow storage areas may be identified on both sides of the bridge. Emergency vehicle access gates may be installed for EMS and fire. Closing the bridge would require turnaround facilities / cul-de-sac for maintenance vehicles with potential to encroach into Designated Sites.	Temporary surface disruption will occur. Restoration plan will be required. Permitting from GRCA will be required for work in the regulated area. Removing the bridge would require turnaround facilities / cul-de-sac for maintenance vehicles with potential to encroach into Designated Sites.	Potential for encroachment into Designated Sites as a result of construction activities. Impacts will be minimized/ mitigated by using best practices. Any works within the delineated limits of the Speed River Wetland Complex (PSW) will be subject to Grand River Conservation Authority (GRCA) and Ministry of Natural Resources and Forestry (MNRF) permitting and approval requirements. Mitigation measures will be required to minimize impacts to the PSW, adjacent lands, common and Special Concern species on site and adjacent lands. Appropriate buffers will be maintained outside of the study area in accordance with GRCA and MNRF permitting requirements.	Potential for encroachment into Designated Sites as a result of construction activities. Impacts will be minimized/ mitigated by using best practices. Any works within the delineated limits of the Speed River Wetland Complex (PSW) will be subject to GRCA and MNRF permitting and approval requirements. Mitigation measures will be required to minimize impacts to the PSW, adjacent lands, common and Special Concern species on site and adjacent lands. Appropriate buffers will be maintained outside of the study area in accordance with GRCA and MNRF permitting requirements. The footprint of the abutments may be larger for a two-lane structure than a one- lane structure.

Criteria For Evaluating Alternatives			Existing Conditions	Do Nothing/ Repair and Maintain	Close Bridge to Vehicular Traffic and Maintain	Remove Bridge / Do Not Replace Bailey Bridge	Replace the Existing Bailey Bridge With a New One Lane Structure and Provide Operational Improvements to Niska Road	Replace the Existing Bailey Bridge With a New Two Lane Structure and Provide Operational Improvements to Niska Road
2	**Terrestrial Habitat and Biology (e.g. woodlands, wetlands, wildlife corridors)**	Displacement of Threatened, vulnerable or endangered species (Species at Risk). Loss of wetland habitat. Loss of trees, edge effects to significant woodland. Barrier effects on wildlife travel corridors.	Various vegetation types observed including forested, wetland and agricultural land classification. Deer and other incidental wildlife observed onsite and valued by residents and anglers. MNRF Deer Wintering and Waterfowl Overwintering Areas within adjacent GRCA lands No rare species identified within study area. One species of Federal and Provincial Special Concern was found on adjacent GRCA lands. Current vegetation surrounding river key to resisting sedimentation in river. Some perching of trees indicates periods of flooding and poor drainage. Current forested and wetland areas provide wildlife habitat and natural corridors/ecological linkages between Hanlon Creek and Speed River watersheds	Existing bridge footprint does not change the current environmental conditions as it relates to terrestrial habitat and biology. Minimal impact during regular maintenance and repair. In general, minor bridge maintenance activities do not require permitting.	Existing bridge footprint does not change the current environmental conditions as it relates to terrestrial habitat and biology. Minimal impact during regular maintenance and repair. In general, minor bridge maintenance activities do not require permitting. Closing the bridge would require turnaround facilities / cul-de-sac for maintenance vehicles with potential to impact Terrestrial Habitat and Biology.	Potential to improve wildlife corridors and habitat by removing the existing structure and removing the fill slopes from the flood plain. Potential for impact to terrestrial habitat and wetland will be taken into consideration. Impacts will be minimized/ mitigated by using best practices. Potential temporary impacts on adjacent terrestrial habitat and biology as a result of removal activities. Removing the bridge would require turnaround facilities / cul-de-sac for maintenance vehicles with potential to impact Terrestrial Habitat and Biology	Potential temporary impacts on adjacent terrestrial habitat and biology as a result of construction activities (including potential edge effects) Impacts will be minimized/ mitigated by using best practices. However, there is potential to improve wildlife corridors by increasing the span of the bridge. Potential to affect breeding birds using bridges structure as nesting habitat. May require permitting under the Migratory Bird Convention Act. Preconstruction nesting surveys will be conducted as requested by GRCA to assess habitat potential within Study Area.	Potential temporary impacts on adjacent terrestrial habitat and biology as a result of construction activities (including potential edge effects). Impacts will be minimized/ mitigated by using best practices. However, there is potential to improve wildlife corridors by increasing the span of the bridge. Potential to affect breeding birds using bridges structure as nesting habitat. May require permitting under the Migratory Bird Convention Act. Preconstruction nesting surveys will be conducted as requested by GRCA to assess habitat potential within Study Area. The footprint of the abutments may be larger for a two-lane structure that a one- lane structure.

Criteria For Evaluating Alternatives		Existing Conditions	Do Nothing/ Repair and Maintain	Close Bridge to Vehicular Traffic and Maintain	Remove Bridge / Do Not Replace Bailey Bridge	Replace the Existing Bailey Bridge With a New One Lane Structure and Provide Operational Improvements to Niska Road	Replace the Existing Bailey Bridge With a New Two Lane Structure and Provide Operational Improvements to Niska Road
		Presumed significant breeding bird habitat present within Study Area					
3	**Aquatic Habitat and Biology (e.g. fish species, fisheries or aquatic habitat)**	Displacement of Threatened, vulnerable or endangered aquatic species (Species at Risk). Loss of/effect to significant individual fish species. Barrier effects on fish. Loss of aquatic habitat.	Stretch of Speed River within Study Area characterized as a diverse warmwater fish community and considered a recreational fishery within the cool water Speed River. No Species at Risk identified within reach observed. Bridge's masonry abutments create deep pools. These pools provide refuge to resident fish. Current depth of river as well as substrate type and groundwater provide refuge and potential spawning habitat for fish.	Existing bridge footprint does not change the current environmental conditions as it relates to aquatic habitat and biology. Minimal impact during regular maintenance. In general, minor bridge maintenance activities do not require permitting. However the bridge currently requires in-situ major repairs of the abutments, as such major disruption to fish species and habitat during the abutment repair process that will occur. Pools providing refuge for resident fish will be impacted. Continued structural deterioration has potential to increase sedimentation into river.	Existing bridge footprint does not change the current environmental conditions as it relates to aquatic habitat and biology. Minimal impact during regular maintenance and repair. In general, minor bridge maintenance activities do not require permitting. Lighter loads and traffic volumes likely to decrease rate of structural deterioration lessening impact on aquatic habitat due to sedimentation. Abutment will still require repair, however the extent of the repair may be lessened. Pools would continue to provide refuge for resident fish.	Potential to improve aquatic habitat by removing the existing structure from the flood plain if existing abutments remain. In the event that the removal of existing abutments is required, temporary cofferdams will be installed to minimize the impacts to aquatic habitat. Potential for impact to aquatic habitat will be taken into consideration. Impacts will be minimized/ mitigated by using best practices. Permanent disruption to fish species and habitats during removal activities. Section of river downstream of bridge would widen and infill the deep pools currently used as refuge for resident fish if abutments were removed leading to a loss of habitat.	Temporary disruption to fish species and habitat during bridge construction. In order to minimize impacts to aquatic habitat, abutment locations beyond river embankments will be considered within the ROW allowing for the existing abutments to remain as active fish and aquatic habitat. Aquatic habitat would theoretically remain the same as pre-construction.	Temporary disruption to fish species and habitat during bridge construction. In order to minimize impacts to aquatic habitat, abutment locations beyond river embankments will be considered within the ROW allowing for the existing abutments to remain as active fish and aquatic habitat. Aquatic habitat would theoretically remain the same as pre-construction. The footprint of the abutments will be larger for a two-lane structure. Wider bridge and related abutments would alter habitat downstream of bridge. Potentially increasing refuge habitat.

Criteria For Evaluating Alternatives			Existing Conditions	Do Nothing/ Repair and Maintain	Close Bridge to Vehicular Traffic and Maintain	Remove Bridge / Do Not Replace Bailey Bridge	Replace the Existing Bailey Bridge With a New One Lane Structure and Provide Operational Improvements to Niska Road	Replace the Existing Bailey Bridge With a New Two Lane Structure and Provide Operational Improvements to Niska Road
4	**Hazard Lands (e.g. floodplain)**	Encroachment into floodplain. Erosion and sedimentation impacts within floodplain.	Floodplain areas located within Study Area lands associated with Speed River.	No impact over existing conditions.	No impact over existing conditions.	Encroachment into the floodplain can be reduced. Road embankments graded/removed from the flood plain. Temporary impact/disruption during removal activities. Affected areas would require re-vegetation with native plantings.	Potential to improve the hazard lands by constructing a new multi-span structure. Repairs that may occur within the floodplain will be subject to GRCA permitting and requirements. Temporary impact/disruption during construction/maintenance activities. Affected areas would require re-vegetation with native plantings.	Potential to improve the hazard lands by constructing a new multi-span structure. Repairs that may occur within the floodplain will be subject to GRCA permitting and requirements. Temporary impact/disruption during construction/maintenance activities. Affected areas would require re-vegetation with native plantings.
5	**Surface Water Quality and Drainage**	Erosion and sedimentation impacts to road drainage features and receiving watercourse. Increases to runoff from impermeable surface.	Current water quality in Speed River good due to slight groundwater seep. Continued deterioration of bridge may negatively impact water quality of Speed River due to sedimentation. Evidence of groundwater input to Speed River. Although river is classified as a warmwater thermal regime within the Study Area, the Speed River is classified as a cool water river. The river is a stable, permanent channel characterized as a run.	Temporary effects during maintenance activities. Continued deterioration of bridge may lead to sedimentation in river. Continued erosion of the embankment around the bridge and abutment structure. Abutments are failing. Impacts from roadside litter, bridge runoff and road salt applications would continue.	Continued structural deterioration may negatively impact water quality. Benefit to water quality through less roadside litter and road salt application.	Minimal impact during removal activities. Potential benefit to water quality through less litter and less impact to water quality through road salt applications and bridge runoff.	Temporary effects during construction/ maintenance activities. Potential for less sediment from winter sanding if new bridge wide enough to accommodate machinery to clear debris from bridge. Impacts from roadside litter, bridge runoff and road salt applications would continue however new bridges are found to instill community pride of ownership. Opportunity to improve and manage bridge runoff to river. Opportunity to potentially improve thermal conditions and water quality in area of the bridge towards a sustainable coldwater fishery.	Temporary effects during construction/ maintenance activities. Potential for less sediment from winter sanding if new bridge wide enough to accommodate machinery to clear debris from bridge. Impacts from roadside litter, bridge runoff and road salt applications would continue however new bridges are found to instill community pride of ownership. Opportunity to improve and manage bridge runoff to river. Opportunity to potentially improve thermal conditions and water quality in area of the bridge towards a sustainable coldwater fishery.

Criteria For Evaluating Alternatives		Existing Conditions	Do Nothing/ Repair and Maintain	Close Bridge to Vehicular Traffic and Maintain	Remove Bridge / Do Not Replace Bailey Bridge	Replace the Existing Bailey Bridge With a New One Lane Structure and Provide Operational Improvements to Niska Road	Replace the Existing Bailey Bridge With a New Two Lane Structure and Provide Operational Improvements to Niska Road
		Water quality impacts from roadside litter and bridge runoff including road salt impacts. The Hanlon Creek is located in lands adjacent to the Study Area.					
6 **Groundwater Quality**	Impacts to groundwater resources from dewatering activities (if necessary).	Curent groundwater quality in Speed River good due to slight groundwater seep. Continued deterioration of bridge may negatively impact water quality due to sedimentation. Groundwater quality and quantity in the area of the bridge is unknown. No monitoring wells are in the study area.	No impact over existing conditions.	No impact over existing conditions.	No impact over existing conditions provided that erosion/sediment and spill controls are in place during removal activities to safeguard water quality.	No impact over existing conditions provided that erosion/sediment and spill controls are in place during construction to safeguard water quality.	No impact over existing conditions provided that erosion/sediment and spill controls are in place during construction to safeguard water quality.
B **Socio-economic/ Cultural Environment** *Rating:*							
1 **Local Residents**	Nuisance Impacts (noise, dust, vibrations, traffic, detours) during construction and operations. Safety impacts during construction and operations. Heritage Impacts. Traffic Volumes. Public safety. Concern that a new	Community is concerned that a two lane bridge will attract more traffic. Traffic safety an issue due to speed, volume and truck traffic. Increased deterioration of bridge compromises safety of structure. Current condition of bridge is a major concern of City Road Operations. The bridge is being	Temporary nuisance impacts due to road closure/limited access during construction repairs to existing structure. Bridge and road deficiencies cannot be fully addressed through repair/rehabilitation. Therefore ongoing impacts will affect residents and traffic using the road and bridge, including limited emergency services.	No vehicle traffic will be permitted across the structure, improving traffic safety. Eliminating vehicle and truck traffic across the bridge will also serve as permanent traffic calming measure along the roadway. Longer travel times may occur for EMS vehicles. EMS vehicles could be given access to bridge. Permanent decrease of	Temporary nuisance impacts during removal activities. Removal of the structure will also serve as permanent traffic calming measure along the roadway. Residents will be impacted by the removal of the bridge as no longer access to across the Speed River at this location. EMS routing may be impacted for both the City	Temporary nuisance impacts due to road closure/detour/limited access during construction. New bridge will provide access to all emergency services and traffic calming measures will be installed to improve traffic safety. Temporary safety impacts due to construction and increased truck traffic during construction. Potential for increased safety measures of residents if	Temporary nuisance impacts due to road closure/detour/limited access during construction. New bridge will address all existing bridge and road deficiencies and will be beneficial to residents and traffic long term. Temporary safety impacts due to construction and increased truck traffic during construction. Potential for increased safety measures of residents if sidewalks and/or bike lanes

Criteria For Evaluating Alternatives		Existing Conditions	Do Nothing/ Repair and Maintain	Close Bridge to Vehicular Traffic and Maintain	Remove Bridge / Do Not Replace Bailey Bridge	Replace the Existing Bailey Bridge With a New One Lane Structure and Provide Operational Improvements to Niska Road	Replace the Existing Bailey Bridge With a New Two Lane Structure and Provide Operational Improvements to Niska Road
	bridge and new road will have a negative effect on real estate value of local properties, due to increase traffic.	monitored and was closed on three separate occasions for repairs in 2015 The local community through the Community Working Group (CWG) made it clear their preferences were to keep the one lane bridge and/or close the road. The list of key community concerns included: Road safety and traffic speeds, Volume of truck traffic and size of trucks in the community, Volume of vehicular traffic, Traffic speed on Niska Road, Heritage value of bridge. Preservation of corridor viewscapes, Protection of aquatic and terrestrial wildlife and wildlife habitat, Preservation of recreational use of lands (water use, trail use, greenspace, cycling), Implementation of traffic calming measures, Deer and other incidental wildlife observed onsite and is valued by residents and anglers; and, Future development plans for GRCA Lands.	Local residents view the existing bridge as a heritage feature of the local community. Current bridge would remain intact with this option. Local residents consider the current single bridge as a traffic calming feature. Local residents have concerns with continued truck traffic that crosses the bridge. Local resident have concerns with excessive speed of cars over the bridge and through this road corridor. In general, current safety issues such as the following would remain: No sidewalk No bike path Speeding over the bridge. Near misses Indecision of drivers crossing the bridge Bridge lighting No parking Effective traffic calming measures Deficient bridge and road grade at road.	traffic through neighbourhood, which is currently favoured by residents. A closed bridge would allow for greater cycle and pedestrian use. General community may be concerned that there is no direct access to the Townships of Guelph Eramosa and Puslinch. Potential betterment of air quality due to reduced idling at bridge and traffic use in area	and the Townships. Permanent decrease of traffic through neighbourhood, which is currently favoured by residents. Local residents view the existing bridge as a heritage character feature of the local community. This feature will be removed from the community with this option. Both local and external motorists will need to cross the Speed River at Hanlon Parkway and Wellington to the north or near Wellington County Road 32 and Wellington 124 in Puslinch to the south. Potential to increase safety as Niska Road becomes a cul-de-sac at the bridge on both sides.	sidewalks and/or bike lanes added as part of new lane bridge. With over 2200 AADT the current one lane bridge is **not** deterring traffic as much as the local community would like, therefore noise, safety and general community well-being a concern for residents.	added as part of two lane bridge. Local residents are concerned that a new two lane bridge will attract additional traffic volumes through this corridor. However traffic modelling shows a nominal volume change/increase to 2031 as significant development is not planned for the area. There is no evidence that property value will decrease with the addition of a two lane bridge. In fact it can be shown that property values in the area are healthy and a number of large executive type home are being constructed in the area today. In order to full explore the range of traffic calming measures and recreational features (i.e. cross-walks, bike paths, multi-use paths, sidewalks signage etc.) the community would be interested in implementing, 1313 drivers were interviewed in the 12 hour survey. The importance of the bridge was ranked on a scale 1 (very important) to 5 (not important) Of 1313 drivers: 1012 rated 5 (77.1%) 102 rated 4 (7.8%) 88 rated 3 (6.7%) 45 rated 2 (3.4%) 66 rated 5 (5%)

Criteria For Evaluating Alternatives		Existing Conditions	Do Nothing/ Repair and Maintain	Close Bridge to Vehicular Traffic and Maintain	Remove Bridge / Do Not Replace Bailey Bridge	Replace the Existing Bailey Bridge With a New One Lane Structure and Provide Operational Improvements to Niska Road	Replace the Existing Bailey Bridge With a New Two Lane Structure and Provide Operational Improvements to Niska Road
		The community also expressed that the one lane Bailey Bridge serves as a convenient traffic calming feature that helps discourage truck traffic and discourages bypass traffic. The community wishes to keep and maintain the 41 year Bailey Bridge which helps to preserve a heritage character and ascetics of the local community.					As such, traffic calming measures will be included as part of the preliminary design. These measures will be put in place to slow down drivers and to discourage 'short-cut traffic.
2 **Greater Community, Region and Neighbouring Townships**	Conformity to City of Guelph Official Plan and obligations as per previous EAs. Compatibility with Surrounding Land Uses. Impacts on functional needs of local community (ex. use of bridge for commute out of town, local residential property access) Impacts on functional needs of surrounding community (ex. commute into Guelph).	Niska Road is designated as a Collector road in the City of Guelph Official Plan. Collector roads are intended to move low to moderate volumes of traffic within specific areas of the City and collect local traffic for distribution to the arterial or Provincial highway system. Collectors are moderate speed design, having capacity for 2 - 4 lanes, usually undivided. Direct access to private property may be permitted, but controlled to avoid traffic hazards.	No impact over existing conditions. Potential negative impacts on the community and surrounding area as road not properly utilized as a Collector road, which negatively impacts the local traffic network. Would not support functional needs of surrounding community and current planning of road network. City Council Analysis included the anticipation of a two lane bridge. Stone Road was removed as an option and was not considered in the process when locating of the Hanlon Pkwy ramps.	Would not support Niska Road's designation as a Collector road within the City of Guelph Official Plan. Negative impacts on the local traffic network and surrounding community, increasing commute times around the site. Snow plow and removal operations for the City and neighbouring Townships will require modification and possible snow storage areas. Hanlon Parkway Class EA identified Niska Road as a fully functioning Collector road as part of the analysis and decision-making process when analyzing location of ramps and traffic	Would not support Niska Road's designation as a Collector road within the City of Guelph Official Plan. Negative impacts on the local traffic network and surrounding community, increasing commute times around the site. Snow plow and removal operations for the City and neighbouring Townships will require modification and possible snow storage areas. Both local and external motorists will need to cross the Speed River at Hanlon Parkway and Wellington to the north or near Wellington County Road 32 and Wellington 124 in Puslinch	No impact over existing conditions. Road not properly utilized as a Collector road, which negatively impacts the local traffic network. Would not support functional needs of surrounding community and current planning of road network. Provides an opportunity to construct safety and recreational features as part of the bridge. Hanlon Parkway Class EA identified Niska Road as a fully functioning collector road as part of the analysis and decision-making process when analyzing location of ramps and traffic routing. Analysis included	Supports Niska Road's designation as a Collector road. Positive impacts on the road network through increased functional use by surrounding community. Conformity to City of Guelph Official Plan and obligations as per previous EAs. Compatibility with current and long term surrounding land uses Meets current obligation of the City's OP and Class EA's completed within the past 5 years. Provides an opportunity to construct safety and recreational features as part of the bridge. Hanlon Parkway Class EA

Criteria For Evaluating Alternatives		Existing Conditions	Do Nothing/ Repair and Maintain	Close Bridge to Vehicular Traffic and Maintain	Remove Bridge / Do Not Replace Bailey Bridge	Replace the Existing Bailey Bridge With a New One Lane Structure and Provide Operational Improvements to Niska Road	Replace the Existing Bailey Bridge With a New Two Lane Structure and Provide Operational Improvements to Niska Road
		Parking may be permitted on Collector roads. Niska Road's geographic position linking Hwy 124 (Wellington) to Hwy 6 (Hanlon Pkwy) via Whitelaw Road encourages drivers who wish to travel on Hwy 6 to use Niska Road as a 'short-cut route. Niska Road is the *'hypotenuse'* link that joins Hwy 124 and Hwy 6. Adequate right-of-way exists for potential improvements. Surrounding lands are agricultural, woodlands wetlands, meadows and residential. Western extent of the Study Area borders neighbouring Townships of Guelph-Eramosa and Puslinch. Solution must be accepted by neighbouring townships.	Hanlon Parkway Class EA identified Niska Road as a fully functioning Collector road as per the OP. This was a major consideration in the This option does NOT meet these obligations of the Hanlon Pkwy Class EA.	routing. Analysis included the anticipation of a two lane bridge. This option does NOT meet these obligations.	to the south. Hanlon Parkway Class EA identified Niska Road as a fully functioning Collector road as part of the analysis and decision-making process when analyzing location of ramps and anticipated traffic routing. Analysis included the anticipation of a two lane bridge. This option does NOT meet these obligations.	the anticipation of a two lane bridge. This option does NOT meet these obligations.	identified Niska Road as a fully functioning Collector road as per the OP. This was a consideration in the Hanlon EA as part of the analysis and decision-making process when determining the location of the ramps and impacts to traffic routing. Stone Road was removed as an option by City Council. The Transportation Master Plan for the City of Guelph includes analysis for Niska Road as a functional two-lane Collector road and bridge. This option meets these obligations and commitment. <u>Township of Guelph Eramosa comments:</u> Township of Guelph Eramosa is satisfied with the information provided in the ESR as presented at the October 6, 2015 meeting attended by Township staff and council representative. In terms of the Township's position regarding the EA, process, they had no formal comments regarding the intersection improvements, proposed road cross section or bridge options. Primarily due to the fact that all components are located outside of the Township. However, they do note that the final bridge design may have an

Criteria For Evaluating Alternatives		Existing Conditions	Do Nothing/ Repair and Maintain	Close Bridge to Vehicular Traffic and Maintain	Remove Bridge / Do Not Replace Bailey Bridge	Replace the Existing Bailey Bridge With a New One Lane Structure and Provide Operational Improvements to Niska Road	Replace the Existing Bailey Bridge With a New Two Lane Structure and Provide Operational Improvements to Niska Road
							operational impact in terms of winter maintenance access activities if a two lane structure is implemented. Accordingly they will follow with interest in that regard and look forward to future discussions with City Operations as well as the Township of Puslinch with respect to winter maintenance.
3 **Heritage Resources (e.g. archaeological features, built heritage, and cultural heritage landscapes)**	Disruption and/or destruction of sites, structures, landscape units having significant archaeological value. Impacts to historical or architectural value.	Current bridge holds cultural significance due to historical value. Possibility for archaeological potential in low-laying, well-drained areas, though no features yet identified. One registered archaeological site located within 1km of study area in surrounding township. The bridge is not currently designated under the Ontario Heritage Act and is not listed in a local history inventory or a municipal heritage register adopted under the OHA. The bridge is listed in a publication from 2013 that describes heritage bridges within the Grand River Watershed. The area surrounding the bridge has been	Future anticipated structural deterioration will result in eventual loss of steel truss structure, which will negatively impact the heritage value. Repairs to steel truss structure will help to increase lifespan of existing structure. Repairs to the existing structure may also compromise existing heritage aesthetics. Repairs to the abutments will require a more extensive and intrusive approach and will require in-water repair and/or replacement works. One lane bridge and lack of safe pedestrian or cyclist access to bridge prevents observation and enjoyment of significant heritage landscape surrounding bridge.	Future anticipated structural deterioration will result in eventual loss of steel truss structure, which will negatively impact the heritage value. Repairs to steel truss structure will help to increase lifespan of existing structure. Repairs to the abutments will still be required however the extent of the initial required repair may be less than the 'Do Nothing' approach. Major repairs to the abutments will eventually be required, that will require in-water repair and/or replacement works. Potential to increase cyclist ad pedestrian access to allow observation and enjoyment of significant heritage landscape surrounding bridge.	Loss of steel truss will result in a loss in local heritage aesthetics. A monument or heritage feature can be placed in the area near that displays information on the 'former' bridge. Parts of the steel truss can be used in this feature. The stone abutments will be examined and could remain in place as a reminder of the bridge and as fish habitat. If the abutments are crumbing and are deemed a public hazard, removal of the abutments will be required. Loss of fish habitat will require involvement from GRCA and possibly DFO. Removal of bridge may discourage access for pedestrians and cyclist to surrounding area for observation and enjoyment of significant heritage landscape surrounding	Loss of steel truss will result in a loss in local heritage aesthetics. A monument or heritage feature can be placed in the area near that displays information on the 'former' bridge. Parts of the steel truss can be used in this feature. New bridge will change/alter the 'viewscape' of the bridge area. However, the area surrounding the bridge has been deemed a significant heritage landscape partially due to the crossing itself, which will be preserved. Potential to increase safe pedestrian and cyclist access by adding sidewalks and bicycling lanes to allow observation and enjoyment of significant heritage landscape surrounding bridge.	Loss of steel truss will result in a loss in local heritage aesthetics. A monument or heritage feature can be placed in the area near that displays information on the 'former' bridge. Parts of the steel truss can be used in this feature. New bridge will change/alter the 'viewscape' of the bridge area. However, the area surrounding the bridge has been deemed a significant heritage landscape as part of the EA study, partially due to the crossing itself, which will be preserved. Potential to increase safe pedestrian and cyclist access by adding sidewalks and bicycling lanes to allow observation and enjoyment of significant heritage landscape surrounding bridge.

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			deemed a significant cultural heritage landscape due to the presence of unique landscape representing early settlement, association with people who were important to the community and the character of the area.			bridge.		
4	**Pedestrian and Cyclist Accessibility and Safety**	Impacts to pedestrian and cyclist safety	Currently walking trails throughout surrounding area valued by residents. Access to bridge, and safety of crossings limited by traffic and narrow bridge. Currently no walkway/bike lane on single lane bridge. Roadway width between Niska bridge and Ptarmigan too narrow to safely support bikes/pedestrian use. Over a 7 day period in October 2013, 77 cyclists shared the section of Niska Road from Ptarmigan Drive and Downey Road with 250 vehicles during morning and evening rush hours (8:00 to 9:00 a.m. and 5:00 to 6:00 p.m.). Safety issue for children walking to school bus from Whittaker to Tanager (no sidewalks).	No impact over existing conditions. Continued risk for pedestrians and cyclists due to lack of sidewalks and/or bike lanes.	Pedestrian and cycling access is greatly improved over the bridge and safety is improved due to the vehicle traffic being removed from the bridge. Also roadway safety is improved due to roadway becoming a cul-de-sac.	Negative impacts to pedestrian and cycling access along Niska Road as there is no river crossing at this location. Cyclists will need to cross the Speed River at Hanlon Parkway and Wellington to the north or near Wellington County Road 32 and Wellington 124 in Puslinch to the south.	Potential to improve pedestrian and cyclist accessibility and safety by adding sidewalks and bicycle lanes to the road and bridge cross section. Potential for increased traffic as drivers attracted to new bridge.	Potential to improve pedestrian and cyclist accessibility and safety by adding sidewalks and bicycle lanes to the road and bridge cross section. Potential for increased traffic as drivers attracted to new bridge.

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5	**Lifestyle and Culture**	Loss of privacy/reduced use and enjoyment of property due to removal of vegetation. Loss of privacy/reduced use and enjoyment of property due to setback requirements. Reduced use and enjoyment of recreational areas during construction and operations. Effects/loss of 'country' viewscape	Speed River is considered a Recreational fishery and provides value to river through recreational value. Surrounding community and region surrounding bridge valued culturally as urban/rural interface, historical region and natural heritage landscape/ viewscape. Use for recreation (canoeing, fishing, hiking and cycling) valued culturally.	No impact over existing conditions. Continued safety issues at recreational areas due to lack of parking, unsafe crossing conditions and lack of sidewalks and bike lanes.	Increased lifestyle and culture as the natural/rural feel is maintained by reducing vehicle traffic along Niska Road. Increased safe access to recreational areas across the bridge for pedestrians and cyclists. Restricted access to recreational areas for greater community/ motorists.	Increased lifestyle and culture as the natural/rural feel is maintained by reducing vehicle traffic along Niska Road. Decreased access to recreational areas across bridge for pedestrians, cyclists and motorists. Loss of visual landscape feature of current bridge and crossing.	Potential impact on lifestyle on culture caused by the bridge improvements. Temporary loss of vegetation to widen road embankments during construction. Potential for increased safe access to recreational areas adjacent to the bridge. Potential alteration of rural 'viewscape' by removing current bridge.	Potential impact on lifestyle on culture caused by the bridge improvements. Temporary loss of vegetation to widen road embankments during construction. Potential for increased safe access to recreational areas adjacent to the bridge. Potential alteration of rural 'viewscape' by removing current bridge.
C	**Financial Factors** *Rating:*							
1	**Construction and Demolition Costs**		<u>Preliminary Cost Estimates:</u> 2 lane + bike lanes + sidewalk $2.5 million. 1 lane + bike lanes + sidewalk $2 million. Demolition cost of existing bridge $300, 000.	Rehabilitative and repair cost estimate $1,300,600. No demolition costs provided the bridge does not fail. Potential for catastrophic failure of abutments by nature of heavy loads with 5 years	Rehabilitative and repair cost estimate $1,026,000. No demolition costs provided the bridge does not fail. Potential for catastrophic failure of abutments by nature of heavy loads with 5 years. There is the potential for the abutments to shift sooner without the load and anchor of the steel bridge.	Demolition cost of existing bridge $350,000 to 500,000. The potential of in-water works and restoration will impact the fee High demolition costs and no construction costs.	1 lane + bike lanes + sidewalk $2 to $2.2 million High construction and demolition costs associated with new bridge. There are no economies of scale constructing a one lane bridge vs. a two lane bridge.	2 lane + bike lanes + sidewalk $2.5 million. High construction and demolition costs associated with new bridge. Will have considerable economies of scale constructing a two lane bridge vs. a one lane bridge.

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2 **Operation and Maintenance Costs**		Current bridge in need of costly repairs. August 6, 2013 Bridge inspection Report indicates that bridge requires $1, 026,193 in repair costs. Currently maintenance and repairs undertaken as required.	High operating and maintenance costs will significantly increase over time. Major ongoing repairs. Abutments are failing and key steel components are in constant need of maintenance. Continued snow removal issues due to size of bridge. Extensive on-going monitoring. Continued safety issue. Continued truck weight restrictions	Moderate operating and maintenance costs will still significantly increase over time due to its current condition and as bridge deteriorates. Extensive on-going monitoring.	No operating and maintenance costs.	Low initial operating and maintenance cost will moderately increase over time. Bridge life cycle will be approximately 75 to 100 years with current technology, construction methods and quality of materials. Other means of traffic control will be required at an additional cost as the traffic increases. Safe crossing of the bridge will remain a concern.	Low initial operating and maintenance cost will moderately increase over time. Bridge life cycle will be approximately 75 to 100 years with current technology, construction methods and quality of materials.
D **Technical Factors** *Rating:*							
1 **Structural – Condition and Load Capacity**		Currently a maximum weight restriction on bridge for 5 tonnes. Increased deterioration of bridge compromises safety of structure. Overall the structure is in very poor condition. The major concerns at this site are the water encroaching against abutments as a result of span opening being shorter then watercourse width (this situation may lead to unstable substructure in case of high volume water - flooding), major	Does not address all structural deficiencies, in particular load capacity. Currently a maximum weight restriction on bridge for 5 tonnes helps to deter truck traffic. Could be argued that this condition be considered a traffic calming feature. Most significant concern with the bridge is the span opening being shorter than the watercourse width and the resultant ongoing erosion and undermining of the abutments by the river.	Does not address existing structural deficiencies. Currently a maximum weight restriction on bridge for 5 tonnes will become irrelevant and the pace of deterioration may slow down due to absence of vehicular traffic.	Bridge removed, no structural deficiencies need to be addressed.	New bridge will provide a 75 to 100 year life cycle. New bridge will address all existing structural deficiencies.	New bridge will provide a 75 to 100 year life cycle. New bridge will address all existing structural deficiencies.

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		road constriction, absence of a pedestrian access, absence of traffic barrier, progressive undermining of the northwest retaining wall, severe failure of the northwest embankment, partial failure of northeast embankment, severe corrosion of the bearing plates, isolated severe corrosion of the bottom chords at the ends and west end verticals, partial poor condition and progressive deterioration of the bearing seats and progressive deterioration of the masonry retaining walls.					
2 **Geometry – Road Profile and Width**		Existing right-of-way an average of 20 metres in width.	Does not address existing geometry deficiencies, including significant elevation changes (drops on road profile) on both sides of the bridge. No changes to current geometry.	Addresses existing geometry deficiencies as the bridge will no longer support vehicular traffic.	Bridge will be removed.	Road profile and approach geometry will be improved. Bridge geometry will be improved but not brought to the minimum standard as per the MTO's Geometric Design Standards	Road profile and road geometry will be brought to the minimum standard as per current municipal and MTO standards. Opportunity to introduce pedestrian and cycle facilities (bike lane, multiuse path, sidewalks, trails etc.)
3 **Roadside Safety – Barriers and Clearances**		No structural barrier system over bridge and approach guide rail does not meet minimum length requirements or have correct end treatments. The Bridge Code refers to the Geometric Design	Does not address existing roadside safety issues. The Bridge Code manual indicates that the number and width of lanes on a bridge should be the same as the approaches. This solution does not meet this criteria	Address existing roadside safety issues as the road will be closed and outside traffic (i.e. short-cut traffic) will be reduced significantly	Bridge will be removed.	New bridge will be designed to address all roadside safety issues. The Bridge Code section 1.5.1 indicates and recognizes that widening of bridges later is a more costly exercise than to	New bridge will be designed to address all roadside safety issues. The Bridge Code manual indicates that the number and width of lanes on a bridge should be the same as the approaches.

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			Standards for Ontario Highways in terms of establishing bridge cross-section criteria. The geometric manual says that the minimum bridge cross-section be 8.5 metres for two lanes and 5.0 metres for one lane, and refers to the Exceptions to the Bridge code provided Table D7-1 of the Ministry of Transportation (MTO) Structural Manual. The exceptions to the Bridge Code set out in the Structure Manual are for low volume roads. Low volume roads are those in which the traffic volumes are less than 400 vehicles per day (vpd).	The geometric manual says that the minimum bridge cross-section should be 8.5 metres for two lanes and 5.0 metres for one lane, and refers to the Exceptions to the Bridge code provided Table D7-1 of the Ministry of Transportation (MTO) Structural Manual. This solution does not meet this criteria Niska Road is a Bailey bridge, which is also considered a single load path type truss bridge. In Ontario, the Bridge Code recommended against the use single load path structures.			build wider from the start and indicates that bridges should be designed for future reasonable road widening where practical and planned. Niska Road is a Bailey bridge, which is also considered a single load path type truss bridge. In Ontario, the Bridge Code recommended against the use single load path structures.	This solution does meet this criteria The geometric manual says that the minimum bridge cross-section should be 8.5 metres for two lanes and 5.0 metres for one lane, and refers to the Exceptions to the Bridge code provided Table D7-1 of the Ministry of Transportation (MTO) Structural Manual. This solution does meet this criteria
4	**Utility Impacts**	Movement of hydro transmission lines.	Overhead hydro lines on the south side of the road.	Will not likely impact utilities.	No impact over existing conditions.	Will not likely impact utilities.	May require temporary or permanent relocation of utilities. Opportunity to improve and upgrade bridge and corridor utilities Lighting will be placed on Bridge	May require temporary or permanent relocation of utilities. Opportunity to improve and upgrade bridge and corridor utilities. Lighting will be placed on Bridge
5	**Emergency Access**	Impacts to/loss access for emergency services.	Restrictive 5 tonne load limit prevents fire response vehicles from crossing the bridge.	No impact over existing conditions.	Emergency access prevented from crossing the river; establishment of alternative routes would be necessary; potential increase in response time	Emergency access prevented from crossing the river; establishment of alternative routes would be necessary; potential increase in response time	Improved emergency access, no load restriction on bridge, but still a one lane bridge the EMS will require to be caution when crossing, particularly during morning and evening rush hour.	Significant improvement to emergency access. No load restrictions and two lanes.

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6 **Traffic Impacts**	Impacts to surrounding road networks (e.g. traffic volumes).	Residents concerned with speed, truck use, and increase in traffic within neighbourhood. The existing bridge over the Speed River only has a single lane. Currently Niska Road Bridge exceeds the threshold of 400 vehicles per day (vpd) for a single lane bridge.	Currently one lane bridge not properly serving functional traffic needs of surrounding community. One lane serves as an unintentional traffic calming measure. Provision for snow storage and emergency access can be provided in the existing road right-of-way (ROW). Existing laws restrict heavy trucks from using bridge. This could remain intact.	Does not support Niska Road's designation as a Collector road. Traffic impacts if Niska Road bridge was closed to vehicular traffic indicated the following: • Minimal increases and decreases in traffic volume on Niska Road ranging from 0% to 10% changes in peak hour traffic volume at various locations (Downey, County Road 124, Hanlon Kortright). • Increased travel time and inconvenience for community residents currently using Niska Road Bridge. • Increased congestion at signalized intersections on Hanlon Expressway can be anticipated until the highway is upgraded as recommended in MTO EA. Would not support functional needs of Official Plan and travelling public dependent on Niska Road. Closing the bridge serves as a traffic calming measure. Provision for snow storage can be provided in the existing road right-of-way (ROW).	Does not support Niska Road's designation as a Collector road. Traffic impacts if Niska Road bridge was removed (closed) to vehicular traffic indicated the following: • Minimal increases and decreases in traffic volume on Niska Road ranging from 0% to 10% changes in peak hour traffic volume at various locations (Downey, County Road 124, Hanlon Kortright). • Increased travel time and inconvenience for community residents currently using Niska Road Bridge. • Increased congestion at signalized intersections on Hanlon Expressway can be anticipated until the highway is upgraded as recommended in MTO EA.] Would not support functional needs of Official Plan and travelling public dependent on Niska Road. Removing the bridge serves as a traffic calming measure. Provision for snow storage can be provided in the existing road right-of-way (ROW).	Load limit removed from structure. Existing laws allow for the designation of a road as 'No heavy truck.' Operational improvement can be implemented to discourage illegal truck use in Niska Corridor, such as a 'height restricting arch or bar on the bridge Two way traffic still restricted by a single lane bridge. Does not change Niska Road's designation and function as a Collector road, though does not safely support traffic volumes of a Collector, or fully service functional needs of surrounding community. Would service functional needs of surrounding community.	Traffic Impacts improved by removing load limit and providing two-way traffic. Operational improvement can be implemented to discourage illegal truck use in Niska Corridor. Supports Niska Road's designation and function as a Collector road. Would service functional needs of surrounding community. Ministry of Transportation (MTO) design guidelines recommends the construction of a 2 lane bridge (with a minimum width 7 meters), for bridges with a posted speed of 50 km/hr that service road volumes between greater than 400 vpd. O. Reg. 472/10 requires the following; **2.** (1) Where any person [i.e. Owner]undertakes or causes to be undertaken the design, evaluation, construction or rehabilitation of a bridge, the design, evaluation, construction or rehabilitation shall conform to, (a) the standards set out in the Canadian Highway Bridge Design Code; and (b) the most current accepted engineering standards, guidelines, procedures and practices. A two-lane bridge satisfies best practices

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7	**Storm water Infrastructure**	Effect on existing storm sewers, culverts. Requirements for new storm sewers, culverts.	Improved storm water management facilities required.	No impact on storm water infrastructure.	No impact on storm water infrastructure.	No impact on storm water infrastructure.	Opportunity to improve adjacent road profile and surrounding storm water infrastructure in either an urban or rural form.	Opportunity to improve adjacent road profile and surrounding storm water infrastructure in either an urban or rural form.
8	**Vehicular Safety**		Deterioration of bridge a vehicular safety concern due to potential for failure. Lack of positive traffic control for the one lane bridge.	No change to existing conditions. Continued risk for users due to road deterioration increasing potential for road failure. Continued vehicular safety concerns due to lack of positive traffic control on existing one-lane bridge. Potential to improve barriers and roadside safety measures.	Increase in local community safety. Potential for increased traffic on surrounding roads decreasing safety these roads.	Increase in community safety. Potential for increased traffic on surrounding roads decreasing safety these roads.	Still a one lane bridge. No change to existing conditions. Continued risk for users due to road deterioration increasing potential for road failure. Continued vehicular safety concerns due to lack of positive traffic control on existing one-lane bridge. Potential to improve barriers and roadside safety measures.	Significant improvement to safety by providing two full lanes with proper barriers and roadside safety measures such as sidewalks and cyclist accommodation.
E	**Problem Statement** *Rating:*							
	TOTAL EVALUATION							
	RECOMMENDATIONS			Not carried forward	Not carried forward	Not carried forward	Not carried forward	**Carried forward**

ATT- 7 Niska Road Improvements – Schedule C Municipal Class Environmental Assessment

Detailed Evaluation Matrix for Alternative Solutions - Road

CRITERIA FOR EVALUATING ALTERNATIVES			Existing Conditions	Do Nothing/ Repair and Maintain	Repave Surface	Reconstruct Road
A	**Natural Environment** *Rating:*					
1	**Designated Sites (e.g. Provincially Significant Wetlands, Areas of Natural and Scientific Interest)**	Encroachment into designated features.	The Study Area crosses the Provincially Significant Speed River Wetland Complex (PSW) and is adjacent to the former Kortright Waterfowl Park and Wildlife Centre (GRCA owned lands). Sections of the coldwater Hanlon Creek PSW cross adjacent lands to Study Area. No Species at Risk were observed during field surveys within study area. Snapping Turtle were observed on adjacent GRCA lands, which are a federally and provincially ranked Special Concern species.	No impact over existing regular maintenance and road repair operations. All maintenance works will occur within the existing right-of-way (ROW).	Potential temporary impacts on adjacent Speed River Wetland Complex (PSW) as a result of construction activities. Mitigation measures will be required to minimize impacts to the PSW, adjacent lands, common and Special Concern species on site and adjacent lands.	Works would occur mainly within existing ROW. Any works within the PSW areas will be subject to permitting and approval requirements as established by GRCA and Ministry of Natural Resources and Forestry (MNRF) based on the area and function of any impacted features. Mitigation measures to minimize the potential impacts to the PSW, adjacent lands, common and Special Concern species on site and adjacent lands. Appropriate buffers will be maintained outside of the area defined by the permit.
2	**Terrestrial Habitat and Biology (e.g. woodlands, wetlands, wildlife corridors)**	Displacement of Threatened, vulnerable or endangered species (Species at Risk). Loss of wetland habitat. Loss of trees and edge effects on significant woodland on adjacent lands Barrier effects on habitat.	As a result of severe cracking and spidering of the pavement, along with roadside erosion, washout and sedimentation in surrounding natural communities has created stress to tree health. Further road deterioration may lead to habitat deterioration. Various vegetation types observed including forested, wetland and agricultural land classification. Deer	No impact over existing conditions. All works will occur within the existing ROW. Risk of reoccurring roadside erosion, washout and sedimentation as traffic is projected to increase within existing roadway. Road kill will continue to be an issue.	Potential temporary impacts on adjacent significant woodland and wetland areas as a result of construction activities (including potential edge effects), permanent impacts unlikely Preconstruction nest surveys for breeding birds will be conducted as requested by GRCA to determine whether habitat potential present	Impact over existing conditions as works may be required outside of the existing ROW in order to complete the required improvements to Niska Road. Potential temporary and permanent impacts on adjacent significant woodland and wetland areas as a result of construction activities (including potential edge effects)

CRITERIA FOR EVALUATING ALTERNATIVES		Existing Conditions	Do Nothing/ Repair and Maintain	Repave Surface	Reconstruct Road
	Effects on ecological linkages and wildlife travel corridors.	and other incidental wildlife observed onsite and valued by residents and anglers. MNRF Deer wintering areas and waterfowl overwintering areas in adjacent GRCA lands. 2 deer crossing areas within Study Area. No rare species identified within study area. One species of Federal and Provincial Special Concern was found on adjacent GRCA lands. Current vegetation surrounding river key to prevention of sedimentation in river. Some perching of trees indicates periods of flooding and poor drainage. Sedimentation from road affecting tree health. Current forested and wetland areas in adjacent lands provide wildlife habitat and ecological linkages between the Hanlon Creek and Speed River watersheds. Road kill a problem as a result of road transversing wildlife travel corridors/ ecological linkages created by adjacent significant wetlands or woodlands. Study Area presumed to have significant breeding bird habitat, supported due to Significant woodlot and wetland areas in portions of Study Area and adjacent lands.	Increased erosion, washout and sedimentation may lead to habitat deterioration.	within Study Area, and determine appropriate mitigation measures. Road kill will continue to be an issue. Mitigation measures will be determined during detailed design. Mitigation measures will be required to ensure minimal impacts on features on adjacent lands, especially those creating habitat or ecological linkages for Species of Special Concern, or lands of local or provincial significance. Does not address flooding and poor drainage. Does not address sedimentation from road shoulders affecting tree health.	Activities may result in potential habitat loss/change/disturbance Mitigation measures will be required to ensure minimal impacts on features on adjacent lands, especially those creating habitat or ecological linkages for Special Concern species or those of local or provincial significance. Preconstruction nest surveys for breeding birds will be conducted as requested by GRCA to determine whether habitat potential present within Study Area, and determine appropriate mitigation measures. Opportunity to address flooding and poor drainage. Opportunity to address sedimentation from road affecting tree health. Road kill will continue to be an issue. Mitigation measures will be determined during detailed design.

CRITERIA FOR EVALUATING ALTERNATIVES		Existing Conditions	Do Nothing/ Repair and Maintain	Repave Surface	Reconstruct Road
3 **Aquatic Habitat and Biology (e.g. fish species, fisheries or aquatic habitat)**	Displacement of Threatened, vulnerable or endangered aquatic species (Species at Risk). Loss of/effect to significant individual fish species. Barrier effects on fish. Loss of aquatic habitat.	Stretch of Speed River examined considered a diverse warmwater fish community and considered a recreational fishery. No Species at Risk identified within reach observed. Current depth of river as well as substrate type and groundwater provide refuge and potential spawning habitat for fish. Hanlon Creek is located within close proximity of Study Area. The majority of Study Area is located within Hanlon Creek watershed and this watershed will be used in the storm water management assessment. However the Study Area does not cross Hanlon Creek.	Risk of re-occurring roadside erosion, washout and sedimentation as traffic projected to increase within existing roadway. Increased erosion, washout and sedimentation may lead to habitat deterioration/ increased sedimentation in waterway.	Construction activities may result in potential habitat loss/change/disturbance. Mitigation measures will be required to ensure minimal impacts on features on adjacent lands. Slightly increased impermeable surface, increasing amount of runoff. Aquatic habitat would theoretically remain the same as pre-construction.	Construction activities may result in potential habitat loss/change/disturbance. Mitigation measures will be required to ensure minimal impacts on features and habitats on adjacent lands. Increased runoff due to re-established drainage ditches, storm sewers, and road reconstruction activities (including excavation, granular base construction, and paving) could potentially disrupt fish species and habitat, though no long term impacts are anticipated. Potential for in-water works associated with storm water management outlets. If no in-water works required, aquatic habitat would theoretically remain the same as pre-construction. Medium to long term, aquatic habitat would theoretically remain the same as pre-construction.
4 **Hazard Lands (e.g. floodplain)**	Encroachment into floodplain. Erosion and sedimentation impacts within floodplain.	Sections of current roadway transverse floodplain areas surrounding the Speed River. The Storm Management Facility at the intersection of Niska Road and Ptarmigan Drive discharges to the roadside ditch which has increased associated erosion. This discharge volume would need to be accounted for in either a new ditch design or storm sewer.	No impact over existing conditions. Potential temporary impact/disruption during construction/maintenance activities. Affected areas would require re-vegetation with native plantings.	Repairs that may occur within the floodplain will be subject to GRCA regulations and permitting requirements. Potential temporary impact/disruption during construction/maintenance activities. Slightly increased impermeable surface, increasing amount of runoff.	Repairs that may occur within the floodplain will be subject to GRCA and City of Guelph regulations and permitting requirements. Temporary impact/disruption during construction/maintenance activities. Possible increased footprint of right of way due to additional recreation features or excavation of ditches. Several cross-section types will need to be examined.

CRITERIA FOR EVALUATING ALTERNATIVES		Existing Conditions	Do Nothing/ Repair and Maintain	Repave Surface	Reconstruct Road
		Currently, this ditch is fairly steep and is being eroded by the continuous discharge from the pond. There is clear evidence that this ditch was never meant to accept the volumes or rates being discharged from the pond. If we were to pursue a rural cross-section it would be strongly recommended that a storm sewer be used through this section to intercept discharge from the pond and convey it to the nearest outlet (that is not private property). Today, where the ditch is most unstable a considerable effort would be required to stabilize the area where the Ptarmigan Drive SWM Pond outlets to the road ditch.			Pavement may be contained using curb and gutter. Hazard Lands (floodplain) would be impacted. Affected areas would require re-vegetation with native plantings.
5 **Surface Water Quality and Drainage**	Erosion and sedimentation impacts to road drainage features and receiving watercourse. Increases to runoff from impermeable surface.	Current water quality in Speed River good due to slight groundwater seep. Continued deterioration of road may negatively impact water quality of Speed River due to sedimentation. Runoff carrying road sand and eroded ditch bank sediment has some sediment removed by existing grass-lined ditches. Limited hydrocarbon removal from capture in ditch soil. Evidence of groundwater input to Speed River, though river is classified as a warmwater thermal regime. The Speed River is a stable, permanent channel characterized as a run.	No changes to existing conditions. Continued deterioration of road may negatively impact water quality of Speed River due to sedimentation. Potential temporary effects during construction/maintenance activities. Impacts from roadside litter, road runoff and road salt applications would continue.	Potential temporary increase during resurfacing works. No permanent change to existing runoff conditions. Potential temporary impacts on soils and surface water quality will require that erosion/sediment and spill controls are in place during construction to safeguard water quality. Fresh asphalt presents a potential impact to water quality through runoff. Slightly increased impermeable surface, increasing amount of runoff. Road surface would be re-paved leading to potentially less related sedimentation	Probable increase in sediment if wider road requiring more winter sanding generates more runoff. Potential temporary impacts on soils and surface water quality will require that erosion/sediment and spill controls are in place during construction to safeguard water quality. Potential water quality improvement with full capture of road runoff in an oil / grit separator. Fresh asphalt presents a potential impact to water quality through runoff. Slightly increased impermeable surface, increasing amount of direct runoff through use of storm sewers. Road surface would be re-paved

CRITERIA FOR EVALUATING ALTERNATIVES		Existing Conditions	Do Nothing/ Repair and Maintain	Repave Surface	Reconstruct Road
		Water quality impacts from roadside litter and bridge runoff including road salt impacts.		impacts to the watercourse.	leading to potentially less related sedimentation impact to the watercourse. Opportunity to address localized flooding in areas by addressing road profiles. Cut and fill design options will include the considerations to minimize impacts to the existing viewscapes, (i.e. minimal fill and minimize tree removal).
6 **Groundwater Quality**	Impacts to groundwater resources from dewatering activities (if necessary).	Current water quality in Speed River is good due to slight groundwater seep. Continued deterioration of road may negatively impact water quality of Speed River and Hanlon Creek due to sedimentation. Groundwater quality and quantity in the area of the bridge is unknown.	No impact over existing conditions.	Temporary impact over existing conditions. Potential temporary impacts on groundwater resources due to dewatering operations. Erosion/sediment and spill controls will need to be in place during construction to safeguard water quality.	Depending on the elevation of the ground water table, potential temporary impacts on groundwater resources due to dewatering operations during installation of storm sewers. Erosion/sediment and spill controls will need to be in place during construction to safeguard water quality.
B **Socio-economic/ Cultural Environment** *Rating:*					
1 Residents	Temporary nuisance Impacts (noise, dust, vibrations, traffic, detours) during construction and operations. Safety impacts during construction and operations.	Surrounding lands are agricultural, wetland, riparian meadow, woodlands and residential. Traffic volumes exceed 2400 AADT on a regular basis, therefore noise, safety and general community well-being a concern for residents. As indicated by Guelph Police, traffic safety an issue due to a number of near misses at the bridge. Current traffic safety issues deterring	Increased traffic volumes with existing infrastructure will lead to increased wear and, posing risks to residents. Temporary nuisance impacts (noise, dust, vibrations, traffic, detours) during road maintenance. Preservation of current appearance of roadway and viewscapes.	Temporary nuisance impacts (noise, dust, vibrations, traffic, detours) during construction. Some community safety concerns can be addressed through introduction of road surface traffic calming measures. No sidewalks installed therefore any potential to increase pedestrian or cyclist	Temporary nuisance impacts (noise, dust, vibrations, traffic, detours) during construction. Community safety concerns can be fully addressed. Opportunity to fully explore the range of traffic calming measures and recreational features (i.e. cross-walks, bike paths, multi-use paths, sidewalks signage etc.).

CRITERIA FOR EVALUATING ALTERNATIVES		Existing Conditions	Do Nothing/ Repair and Maintain	Repave Surface	Reconstruct Road
		enjoyment of land and road area by residents, pedestrians and cyclists. Community concern that Niska Road is being used as a commuter short-cut	Community safety concerns are not addressed. No implementation of traffic calming measures or sidewalks. Community has expressed that regardless of the selected preferred solution, they would like a traffic calming components and elements installed along Niska Road.	recreational access or safety beside road. Community has expressed that regardless of the selected preferred solution, they would like a traffic calming components and elements installed along Niska Road.	Local residents concerned that new road will attract drivers to Niska Road and increase traffic volume on Niska Road making access in and out driveways difficult and potentially creating noise impacts. Community has expressed that regardless of the selected preferred solution, they would like a traffic calming components and elements installed along Niska Road.
2 **Community and Region**	Conformity to City of Guelph Official Plan, Transportation Master Plan, and Environmental Assessment studies and commitments as per previous EAs. Compatibility with Surrounding Land Uses. Impacts on functional needs of local community. Impacts on functional needs of surrounding community.	Niska Road Is designated as a Collector road in the City of Guelph Official Plan. Adequate right-of-way exists for potential improvements. City of Guelph Official Plan classes Niska Road as a Collector Road. Traffic Interview Study Performed in June 2014 concluded that Niska integral route for residents of greater community including commuters travelling through the area.	No impact over existing conditions. Niska Road considered a Collector road in the City of Guelph Official Plan, but currently road width does not support requirements of traditional Collector road. Current traffic volume is too high for existing structural capacity.	No impact over existing conditions. Potential to increase road safety. Road will continue to operate as a collector road as per the City of Guelph's Official Plan and commitments as per previous EAs and surrounding land uses.	Continued use as a two-lane bridge Increases usability for community and region. Improvement in Niska Road's function as a Collector road within the City of Guelph Official Plan and road network. Impact over existing conditions as works may be required outside of the existing ROW in order to complete the required improvements to Niska Road. Further land acquisition will be examined through preliminary design, however it is anticipated at this time that all road improvements can be placed within the current ROW.
3 **Heritage Resources (e.g. archaeological features, built heritage, and cultural heritage landscapes)**	Disruption and/or destruction of sites, structures, landscape units having significant archaeological	Existing 20 metre right-of-way completely disturbed by existing road corridor therefore no longer holds archaeological potential. Eastern section of proposed right-of-	No impact over existing conditions.	No impact over existing conditions. Increased potential for safe access for vehicles and pedestrians/cyclists for	No impact over existing conditions. Potential for archaeological resources will be assessed prior to construction to ensure any potential resources protected.

CRITERIA FOR EVALUATING ALTERNATIVES		Existing Conditions	Do Nothing/ Repair and Maintain	Repave Surface	Reconstruct Road
	historical or architectural value.	way well drained therefore holding potential for Aboriginal and Euro-Canadian archaeological resources due to located within 300 metres of water source and potentially undisturbed. Most areas along road corridor associated with low lying, poorly drained lands therefore holding no archeological potential. One registered archaeological site located within 1km of study area in surrounding township. Agricultural lands east of Pioneer Trail relatively undisturbed therefore holding archaeological potential. Niska Road not currently designated as a historic road. Possibility for archeological potential in low-laying, well-drained areas, though no features yet identified. Stage 1 Archaeological Assessment indicates that no evidence of late 19th century homesteads or other buildings situated along road corridor in the northwestern section of Puslinch Township. The area surrounding the bridge has been deemed a significant cultural heritage landscape due to the presence of unique landscape representing early settlement, association with people who were important to the community and the character of the area.		observation and enjoyment of significant cultural landscape surrounding bridge.	Road design options will include the considerations to minimize impacts to the existing viewscapes, (i.e. minimal fill and minimize tree removal). If the road is reconstructed as a rural cross-section, there will be a greater impact on the surrounding landscape due to the roadside ditches than an urban cross-section. However there will be increased potential for safe access for vehicles and pedestrians/cyclists for observation and enjoyment of significant cultural landscape surrounding bridge. Phase 2 archaeological assessment was recommended during the detail design process.

CRITERIA FOR EVALUATING ALTERNATIVES		Existing Conditions	Do Nothing/ Repair and Maintain	Repave Surface	Reconstruct Road
4 **Local Economy**	Nuisance Impacts (noise, vibrations, dust, traffic, detours) to businesses during construction and operations. Impacts on agricultural land due to property requirements. Local resident fear that their property value may decrease if the road is reconstructed and it results in increased traffic flow through the community. Impacts on businesses or residents relying on road corridor for transport of employees or goods to and from business.	Niska Road is located in the community of Kortright Hills. The existing land use east of Ptarmigan Drive on the north and south sides of Niska Road to Downey consists primarily of single-family residences. Within 5.0 kilometers of the Study Area there are neighbourhood commercial shopping centers on Stone Road, and the University of Guelph's main Campus. The YMCA is located at the east end of the study area, and is an important feature of the local and great Guelph community The community in close vicinity to the Study Area also contains Kortright Hills Public School and Mollison community Park. Approximately 1.5 kilometers south of Niska Road on Pioneer Trail is the Riverbend Park which contains 170 cottages During peak summer season the population can grow to 200 people.	No change in existing conditions, residential area. Potential negative impacts from on local businesses restricting traffic across bridge and along Niska Road during repair and maintenance construction (potentially more frequent as solution has less longevity than repaving or reconstructing.	No impact over existing conditions, residential area. Potential negative impacts from on local businesses restricting traffic across bridge and along Niska Road during construction. May lessen need for future repairs and maintenance causing delays for local businesses using roadway for transport of employees or goods. The road base and surface pavement is at the end of its end of its operational life, the shoulder and storm drainage ditches are either deficient or failing and the road corridor between the bridge and Ptarmigan Drive do not support safe pedestrian access. Repaving the road allow the City to increase the life of the road and repair the drainage ditches	No impact over existing conditions for residential areas. Potential positive impact on agricultural machinery access in surrounding lands due to increased road width. Potential to improve local economy by improving functional use of Niska Road to connect to commercial areas nearby. Access to future development opportunities may become important. Reconstruction may lessen need for future repairs and maintenance causing delays for local businesses using roadway for transport of employees or goods The road base and surface pavement is at the end of its end of its operational life, the shoulder and storm drainage ditches are either deficient or failing and the road corridor between the bridge and Ptarmigan Drive do not support safe pedestrian access. Niska Road is currently classified as a Collector road in the City of Guelph Official Plan. Niska Road is currently averaging between 2200 and 2400 vehicles per day and between 110 and 120 cyclists per week. Reconstructing the road allow the City to increase the life of the road

CRITERIA FOR EVALUATING ALTERNATIVES		Existing Conditions	Do Nothing/ Repair and Maintain	Repave Surface	Reconstruct Road
					and fully address the drainage problems and add pedestrian and cycle facilities
5 **Pedestrian and Cyclist Accessibility and Safety**	Impacts to pedestrian and cyclist safety	Currently walking trails throughout surrounding area valued by residents. Roadway width between Niska bridge and Ptarmigan too narrow to safely support bikes/pedestrian use. Over a 7 day period in October 2013, 77 cyclists shared the section of Niska Road between Ptarmigan Drive and Downey Road with 250 vehicles during morning and evening rush hours (8:00 to 9:00 a.m. and 5:00 to 6:00 p.m.). Safety issue for children walking to school bus from Whittaker to Tanager (no sidewalks)	No impact over existing conditions. Continued risk for pedestrians and cyclists due to roadway being too narrow for sidewalks and/or bike lane. Currently the one-lane bridge connected to a two lane roadway is creating an *'unintentional'* traffic calming condition; however, there are no sidewalks to provide safe passage for pedestrians and cyclists.	No impact over existing conditions. Continued risk for pedestrians and cyclists due to roadway being too narrow for sidewalks and/or bike lane. Currently the one-lane bridge connected to a two lane roadway is creating an *'unintentional'* traffic calming condition; however, there are no sidewalks to provide safe passage for pedestrians and cyclists.	Potential to improve pedestrian and cyclist accessibility and safety by adding sidewalks and bicycle facilities to the road. Wider road and shoulders could increase pedestrian safety with painted bike lane. Road reconstruction may increase speeding as motorists are more comfortable on the road. To ensure cyclist safety, bike lanes should have a solid white stripe leaving a 3.5m wide vehicular path, making drivers perceive a narrow lane, and slow down. A rumble strip could also be introduced as a community entry feature.
6 **Lifestyle and Culture**	Loss of privacy/reduced use and enjoyment of property due to removal of vegetation. Loss of privacy/reduced use and enjoyment of property due to setback requirements. Temporary reduction in use and enjoyment of recreational areas	Speed River is considered a recreational fishery and provides value to river through recreational use. Bridge valued culturally as urban/rural interface, historical region and natural heritage landscape/viewscape. Use for recreation (canoeing, fishing, hiking and cycling) valued culturally.	No impact over existing conditions. Allows preservation of the natural/rural feel of the corridor. Temporary disruption of use and enjoyment of recreational areas during road maintenance and repair activities. Safety issues such as the following remain: No side walk No bike path Speeding	No impact over existing conditions. Allows preservation of natural/rural feel of corridor Temporary disruption of use and enjoyment of recreational areas during construction and operations. No additional effects on cultural landscape value of lands surrounding bridge as mainly attributed to the crossing itself, not the road.	Temporary loss of privacy if trees need to be removed during construction. Temporary disruption of use and enjoyment of recreational areas during construction and operations. Potential to create a safer travel environment for the pedestrians and cyclists with addition of facilities for safe access to recreational areas. Opportunity to add and allow for on road parking areas. Opportunity to formalize canoe launch and fishing access areas from safe roadside access points.

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	during construction and operations. Potential impact to 'rural' viewscape.		Narrow driving area Street lighting No parking Need for safer /designated school drop-off areas No on road traffic calming measures		Potential alteration of 'viewscape', as such, special attention must be paid to avoid removal of ornamental vegetation, rehabilitation and restoration. However cultural landscape value of lands surrounding bridge mainly attributed to the crossing itself, not the road. Opportunity to introduce road traffic calming measures.
C Financial Factors *Rating:*					
1 Construction and Demolition Costs			<$20,000	$200,000	$500,000 - $1, 300,000
2 Operation and Maintenance Costs		Road requires rehabilitation. Currently maintenance and repairs undertaken as required. Road section is in need of repair as the pavement is nearing the end its service life. Current bridge is in need of repairs.	***Considerable ongoing repair cost*** No changes over existing conditions. Current bridge is in need of costly repairs that will continue into the future.	***Lesser on-going repairs initially, however drainage and flooding issue may not be addressed effectively.*** No changes over existing conditions.	Minimum operation cost for the next 20 years. Road will be reconstructed as per City standard. Possible minor increase in area to maintain. Can consider semi-urban design as well. Opportunity to address operational deficiencies (i.e. flooding, erosion control and storm water management.
3 Property Acquisition Costs		None.	None.	None.	None.
D Technical Factors *Rating:*					
1 Structural – Condition and Load Capacity		Spidering and cracking of pavement is causing road washout. Road repairs necessary to prevent	Continued maintenance and partial reconstruction. Overall ongoing deterioration	Probable several years without surface restoration. Possible weak subgrade	Possible minor increase in longevity over rural from curb and drainage improvements.

CRITERIA FOR EVALUATING ALTERNATIVES			Existing Conditions	Do Nothing/ Repair and Maintain	Repave Surface	Reconstruct Road
			continued deterioration creating vehicular safety issues.	of road.	issues not addressed.	Provides for 60 year life cycle.
2	**Geometry – Road Profile and Width**		Existing right-of-way an average of 20 metres in width. The existing road corridor consists of a single 3.5 metres wide lane in each direction flanked on both sides by drainage ditches.	No changes to existing conditions. Sub-standard design.	No changes to existing conditions. Sub-standard design.	Minor increase or lane width to 4 m foe a shared travelling lane. Currently the pavement ranges from 3.25 to 3.5m, therefore this is a minor profile adjustment. Meets City standards.
3	**Roadside Safety – Barriers and Clearances**		Posted speed in study area is 50 km/hr.	No changes to existing conditions.	No changes to existing conditions. Some traffic calming measures can be added throughout the road corridor.	Curbs increase pedestrian and motorist safety. Widening of existing narrow shoulder increases pedestrian and motorist safety. Traffic calming measures can be added throughout the road corridor
4	**Utility Impacts**	Movement of hydro transmission lines. Movement of lighting standards. Movement of watermains.	Minimal disruption anticipated to existing utilities as a result of improvements to Niska Road.	No changes to existing conditions.	No changes to existing conditions.	Relocation / protection of existing utilities likely required.
5	**Emergency Access**	Impacts to/loss access for emergency services.	Niska Road provides emergency access to neighbourhood within study and to surrounding residents of Puslinch and Guelph-Eramosa.	No changes to existing conditions.	No changes to existing conditions.	No changes to existing conditions.
6	**Traffic Impacts**	Impacts to surrounding road networks (e.g. traffic volumes).	Currently study area classed as residential. Niska Road is a Collector road. Residents concerned with speed, truck use, and increase in flow of traffic within neighbourhood.	No impact over existing conditions. Niska Road designated as a Collector road in the City of Guelph Official Plan, but currently road width does not support requirements of	No impact over existing conditions. Niska Road designated as a Collector road in the City of Guelph Official Plan, but currently road width does not support requirements of	Improvement in Niska Road's function as a Collector road within the City of Guelph Official Plan and road network. Residents concerned with current traffic on Niska Road and that improved road could attract more

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			traditional Collector road. Currently one lane bridge and not serving functional needs of a two lane collector road for the community.	traditional Collector road. Currently one lane bridge and not serving functional needs of a two lane collector road for the community. Residents concerned with current traffic on Niska Road and that improved road could attract more traffic.	traffic.
7 **Storm water Infrastructure**	Effect on existing storm sewers, culverts. Requirements for new storm sewers, culverts.	Improved storm water management facilities required. Runoff carrying road sand and eroded ditch bank sediment has some sediment removed by existing grass-lined ditches. Limited hydrocarbon removal from capture in ditch soil.	No changes to existing conditions.	Potential temporary increase during resurfacing works, no permanent change to existing runoff conditions.	Potential water quality improvement with full capture of road runoff in an oil / grit separator. Probable quantity increase. Potential for increase in sediment from due to more winter sanding. This will be offset by introducing an oil/grit separator, and/or a plunge and/ or other storm water quality measures.
8 **Vehicular Safety**		Deterioration of road a vehicular safety concern. Lack of positive traffic control for the one lane bridge. Concern for improved traffic control at Niska/Downey intersection.	No changes to existing conditions. Continued risk for users due to road deterioration increasing potential for road failure. Continued vehicular safety concerns due to lack of positive traffic control for the one lane bridge.	Increased stability of road decreasing potential for road failure.	Curbs increase pedestrian and motorist safety. Widening of existing narrow shoulder increases pedestrian and motorist safety. Potential to improve vehicular safety by installing proper roadside safety measures and traffic control.
E **Problem Statement** *Rating:*					
AVERAGE TOTAL/ PREFERRED SOLUTION					
RECOMMENDATIONS			Not carried forward	Not carried forward	**Carried forward**