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City of Guelph

Ward to Downtown Bridges Class Environmental Assessment Project File (Schedule B)

GMBP File: 116046-2

July 6, 2017



EXECUTIVE SUMMARY

In response to the predicted future growth and in conformance with the Downtown Secondary Plan, the City of Guelph (City) is evaluating alternatives for two new pedestrian bridges that cross the Speed River linking St. Patrick's Ward to the Downtown. This area has been previously associated with the 5 Arthur Street Development (Fusion Metal Works) site.

St. Patrick's Ward can generally be described as the area of the City of Guelph bounded by the Guelph Junction Railway (GJR) tracks to the north, Victoria Road to the east, Eramosa River to the South and Speed River to the west.

The Study Area can be described as the area bounded by the GJR tracks and bridge, Arthur Street South, Neeve Street, Wellington Street East and Macdonell Street. The Study Area is characterized by the Speed River as well as groups of mature trees along its banks. On the property west of the Speed River, the Downtown Trail provides a pathway for pedestrians and cyclists to travel between Macdonell Street and Neeve Street.

The City has initiated a Schedule B Municipal Class Environmental Assessment (EA) study with the following key objectives:

- Consider a reasonable range of appropriately planned potential solutions;
- Consider impacts to all aspects of the environment (social, cultural, natural environment, technical and economic);
- Select a preferred solution through a transparent decision-making process; and,
- Encourage public participation throughout the process.

Problem/Opportunity Statement

The following needs have been identified with the respect to pedestrian traffic in the area:

- A portion of current pedestrian traffic trespasses on the existing Guelph Junction Railway bridge to cross the Speed River from Arthur Street South to Wellington Street East / Macdonell Street causing a public safety hazard;
- With the predicted increase in the number of residents in the St. Patrick's Ward area due to new intensification developments, pedestrian traffic trespassing on the Guelph Junction Railway bridge is anticipated to increase, worsening the exposure of this safety hazard to the public;
- A safe and direct link for pedestrian and cyclist traffic using the proposed trail through St. Patrick's Ward along the Guelph Junction Railway tracks between Macdonell Street and Huron Street currently does not exist; and
- The current and future development of the developments in the St. Patrick's Ward will significantly increase the pedestrian and cyclist traffic flowing between St. Patrick's Ward and the Guelph Central Station / downtown area.

The City of Guelph wishes to explore the preferred locations of the two pedestrian and cyclist crossings within the Study Area to improve public safety and plan for the anticipated increase in pedestrian travel demands while balancing heritage, social, economic and natural environment responsibilities.

Consultation

The City engaged in a thorough and comprehensive public consultation process involving federal, provincial, municipal and community group organizations as well as the public and First Nations and Métis groups. There were five formal points of contact with these groups:

- Notice of Study Commencement
- Cyclist and Pedestrian Intercept Survey
- Public Information Centre (PIC) #1
- Public Information Centre (PIC) #2
- Notice of Study Completion

In addition to physical mail outs, notifications were sent via email and posted on the City of Guelph's website. Notices were also published in the Guelph Mercury.

Throughout the process, all groups were invited to attend the PICs to provide comments as well as contact members of the project team directly to provide comments or to ask questions.

Impact and Evaluation of Alternatives

The alternative solutions considered are:

- Alternative 1: Bridge Immediately south of GJR Bridge (± 40 m south of Macdonell Street)
- Alternative 2: Bridge ± 200 m north of Neeve Street
- Alternative 3: Bridge ± 140 m north of Neeve Street
- Alternative 4: Bridge ± 90 m north of Neeve Street
- Alternative 5: Bridge ± 50 m north of Neeve Street
- Alternative 6: Do Nothing

Based on recommendations of the Downtown Guelph Secondary Plan, two bridge sites are being evaluated as part of this process. Therefore, two of the alternatives listed above will be preferred.

Alternative 5 is strongly opposed based on the above and input from the City, various stakeholder groups and the public. Therefore, this alternative has been screened out and removed from further consideration for the comparative assessment and evaluation.

The alternatives were evaluated against criteria developed for the Socio-Economic, Cultural, Natural and Technical Environments. The evaluation of the alternatives revealed:

- Alternative 1 is preferred as it addresses the safety concerns of pedestrians using the existing GJR bridge to cross the Speed River, takes the place of a previous pedestrian bridge in this location during the mid-1900s, has minimal impact to the natural environment and will promote connectivity from the Ward to the Downtown Trails, the downtown core and Guelph Central Station.
- Alternative 2 is preferred as it provides an alternative connection from the Ward to the Downtown Trails, has minimal impacts to the natural environment, is visible from Arthur Street South and promotes connectivity from the Ward to the downtown core.
- Alternative 3 was not preferred as it would require long ramps along the Speed River to access the east end of the bridge, would interfere with the construction of bioswales and the Riverwalk on the east side of the Speed River, is not directly accessible and visible from Arthur Street South and would require more substantial impacts to the natural environment.
- Alternative 4 was not preferred as it would require long ramps along the Speed River to access the east end of the bridge, would interfere with the construction of bioswales and the Riverwalk on the east side of the Speed River, is not directly accessible and visible from Arthur Street, may be more complex to construct due to existing infrastructure in the area, would require additional archaeological investigations and would need to be constructed below the Regional flood elevation.
- Alternative 6 (do nothing) was not preferred as it does not address the current safety issue of pedestrians using the existing GJR bridge to cross the Speed River and does not promote connectivity between the Ward and the downtown core.

Recommended Alternatives

Alternative 1 offers the City the best alternative to reduce risk exposure from pedestrians crossing the existing GJR bridge. This alternative would also replace a pedestrian bridge that was once located in this location during the mid-1900s. A bridge in this location would also link the existing Downtown Trail with the proposed trail along the GJR track from Huron Street towards downtown.

Alternative 2 offers the City a crossing to accommodate the increased pedestrian and cyclist traffic in the Ward, the lowest cost alternative, and provides a crossing location that is visible from Arthur Street South.

The bridge structures should be designed as pedestrian crossings, considering pedestrian and maintenance vehicle loading as per CSA S6-14 (the Canadian Highway Bridge Design Code).

Impacts and mitigation measures for each of the recommended alternatives have been provided for the Socio-Economic, Cultural, Natural and Technical Environments.

Additional recommendations of the Class EA study are:

- The City may wish to consider conducting additional investigations for ways to improve safety and traffic movements, both vehicular and active, at the Macdonell Street and Wellington Street East intersection.
- Alternative 1 be constructed in the near future; however, construction of Alternative 2 could be postponed to a later date.
- The City may wish to consider improving the side walk along Wellington Street East to a multi-use trail to provide sufficient room for both pedestrian and cyclist use in a safe manner.
- The construction of a crosswalk on Wellington Street East between Macdonell Street and Neeve Street should be considered.
- During the design phase for Alternative 2, moving the west abutment of the bridge south to line up with the proposed crosswalk on Wellington Street should be reviewed.
- A geotechnical investigation should be completed to determine the foundation type and location for the proposed structures.

Next Steps

The following steps are recommended following completion of the Class EA study:

- Decisions on the appearance of the Recommended Alternatives will need to be made, possibly through additional studies and consultation by the City.
- Implementation details including detailed design, agency approvals and tendering of the project for construction.
- Coordination with utilities to locate services as well as develop and implement mitigation measures (i.e., protection of existing utilities, temporary utilities during construction, etc.).
- Construction.

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CITY OF GUELPH

WARD TO DOWNTOWN BRIDGES CLASS ENVIRONMENTAL ASSESSMENT
PROJECT FILE (SCHEDULE B)

GMBP FILE: 116046-2

JULY 6, 2017

1. INTRODUCTION

The City of Guelph, with a current population of 132,000, is part of one of the fastest growing regions in Ontario. To help respond to this rapid growth, the City developed a Local Growth Management Strategy that manages the future residential and employment growth attributed to the City by The Provincial Growth Plan for the Greater Golden Horseshoe. The City's Official Plan, including Official Plan Amendment 43 (Downtown Secondary Plan), which is currently implementing the objectives and recommendations from the Local Growth Management Strategy, plans to achieve a population of 169,000 (175,000 with the undercoverage) and 92,000 jobs by the year 2031. This future growth is expected to be accommodated throughout the entire City, however, a minimum of 40 percent of new residential development is planned to occur within the built-up area of the City. These infill and intensification projects within the City's built-up area will add additional strain to the City's infrastructure, in particular, increased traffic on the existing bridges and the need for additional bridge connections.

In response to the predicted future growth and in conformance with the Downtown Secondary Plan, the City is evaluating alternatives for two new pedestrian bridges that cross the Speed River linking St. Patrick's Ward to the Downtown. This area has been previously associated with the 5 Arthur Street Development (Fusion Metal Works) site. Refer to **Figure 1** for a location plan of the Study Area.



Figure 1: Study Area

St. Patrick's Ward can generally be described as the area of the City of Guelph bounded by the Guelph Junction Railway (GJR) tracks to the north, Victoria Road to the east, Eramosa River to the South and Speed River to the west.

The Study Area can be described as the area bounded by the GJR tracks and bridge (or Wellington Street bridge) to the north, the property known as 5 Arthur Street to the east, Wellington Street East to the west and Neeve Street to the south. The Study Area is characterized by the Speed River as well as groups of mature trees along its banks. On the property west of the Speed River, the Downtown Trail provides a pathway for pedestrians and cyclists to travel between Macdonell Street and Neeve Street.

Located east of the Study Area are two historically significant buildings that have been designated as heritage sites. The site and these buildings are representative of the economic and cultural history of St. Patrick's Ward and the early development of the City of Guelph. The buildings that stand on the 5 Arthur Street South site are relics of a thriving and innovative distillery owned by William Allan, which operated from 1835 to 1877. The site changed appearances and ownership over the course of the next century, including ownership by the Taylor-Forbes Company Ltd., and eventually became the main facility of the W.C. Wood Company in 1955. W.C. Wood modified and utilized the site until 2010. Currently, the site is undergoing redevelopment and will ultimately provide space for multi-storey residential building units. [Historical information from: Cultural Heritage Conservation Plan – Stage 1, 5 Arthur Street South by: ERA Architects Inc. Issued: May 28, 2014 and ASI CHRA Report].

Located west of the north end of the Study Area are parkland and the remains of the former Allan's Mill. The wood mill was established on the site in 1830 by The Canada Company. Mr. William Allan purchased the property in 1831 and constructed a five-storey stone mill structure after 1832.

The Wellington Street Rail Bridge, located at the north end of the Study Area, was constructed in 1880 and is associated with the development of the City of Guelph and the Guelph Junction Railway.

The City has initiated a Schedule B Municipal Class Environmental Assessment (EA) study with the following key objectives:

- Consider a reasonable range of appropriately planned potential solutions;
- Consider impacts to all aspects of the environment (social, cultural, natural environment, technical and economic);
- Select a preferred solution through a transparent decision-making process; and,
- Encourage public participation throughout the process.

The Purpose of this report (Project File) is to document the Schedule B Class EA process, including public consultation, the evaluation and assessment of alternatives against social, cultural, natural environment, technical and economic criteria, as well as the selection of the preferred solution.

2. MUNICIPAL CLASS ENVIRONMENTAL ASSESSMENT PROCESS

Municipal infrastructure projects are subject to the Ontario Environmental Assessment Act (EA Act). The Class Environmental Assessment is an approved self-assessment process under the EA Act for a specific group or "class" of projects. Projects are considered approved subject to compliance with an approved Class EA process. The Municipal Class EA (Municipal Engineers Association October 2000, as amended in 2007, 2011 & 2015) applies to municipal infrastructure projects including roads, water and wastewater.

The Municipal Class EA outlines a comprehensive planning process (illustrated in **Figure 2**) that provides a rational approach to consider the environmental and technical advantages and disadvantages of alternatives and their trade-offs in order to determine a preferred alternative for addressing the problem (or opportunity), as well as consultation with agencies, directly affected stakeholders and the public throughout the process. The key principles of successful environmental assessment planning include:

- Consultation;
- Consideration of a reasonable range of alternatives;
- Consideration of effects on natural, social, cultural, and economic environments and technical components;
- Systematic evaluation;
- Clear documentation; and
- Traceable decision making.

The classification of projects and activities under the Municipal Class EA is as follows:

Schedule A – Includes normal or emergency operational and maintenance activities, which are limited in scale and have minimal adverse environmental effects. These undertakings are pre-approved and the proponent can proceed without further assessment and approval.

Schedule A+ – Introduced in 2007, these minor projects are pre-approved. The public is to be advised prior to the implementation of the project.

Schedule B – Includes projects which have the potential for adverse environmental effects. This includes improvements to, and minor expansions of existing facilities. These projects are approved subject to a screening process which includes consulting with stakeholders who may be directly affected and relevant review agencies.

Schedule C – Includes the construction of new facilities and major expansions to existing facilities. These undertakings have the potential for significant environmental effects and must proceed under the planning and documentation procedures outlined in the Municipal Class EA document.

This study is proceeding as a Schedule 'B' process, in accordance with the requirements of the Municipal Class EA process, which includes Phases 1 and 2, depicted on **Figure 2**:

- Phase 1 consists of identifying the problem or opportunity.
- Phase 2 involves identifying reasonable alternatives to the problem or opportunity, compiling an inventory on the natural, social and economic environment, evaluating each alternative and recommending a preferred alternative that will address the problem, and provide any measures necessary to mitigate potential environmental impacts. Public and agency consultation is required at this stage before the preferred solution is selected to ensure all possible impacts are identified, and assessed as part of the evaluation process.

Once the Preferred Solution is selected and confirmed by Council, the final Project File is made available for public review during a 30-calendar day period. A Notice of Completion is submitted to review agencies and the public at this time.

If concerns are raised during the 30 calendar-day review period that cannot be resolved through discussions with the Municipality, then members of the public, interested groups or technical agencies may request the Minister of the Environment and Climate Change (MOECC) to issue a Part II Order (i.e. bump-up) for the project, thereby requiring an elevated scope of study. A Part II Order request requires submission of a written request to the Minister, prior to the end of the 30-calendar day review period, outlining the unresolved issue and requesting the Minister to review the matter.

Part II Order requests are submitted to:

Ministry/Minister of the Environment and Climate Change
77 Wellesley St. West, 11th Floor
Toronto, Ontario M7A 2T5
Fax: 416-314-8452

Copies of the request must also be sent to the Director of the Environmental Approvals Branch at the MOECC at the address below:



Attn: Ms. Agatha Garcia-Wright
Director, Environmental Approvals Branch
Ministry of the Environment and Climate Change
Floor 12A, 2 St. Clair Avenue W
Toronto, ON M4V 1L5
EAASIBgen@ontario.ca

For further information regarding Part II Order requests and process, please go to:

<https://www.ontario.ca/environment-and-energy/class-environmental-assessments-part-ii-order>

The decision whether a Part II Order (i.e. bump-up) is appropriate or necessary rests with the Minister. If no Part II Order requests are outstanding by the end of the 30-calendar day review period, the project is considered to have met the requirements of the Class EA, and the proponent may proceed to design and construct the project subject to resolving any commitments documented in the Project File during the subsequent design phases and obtaining any other outstanding environmental approvals.

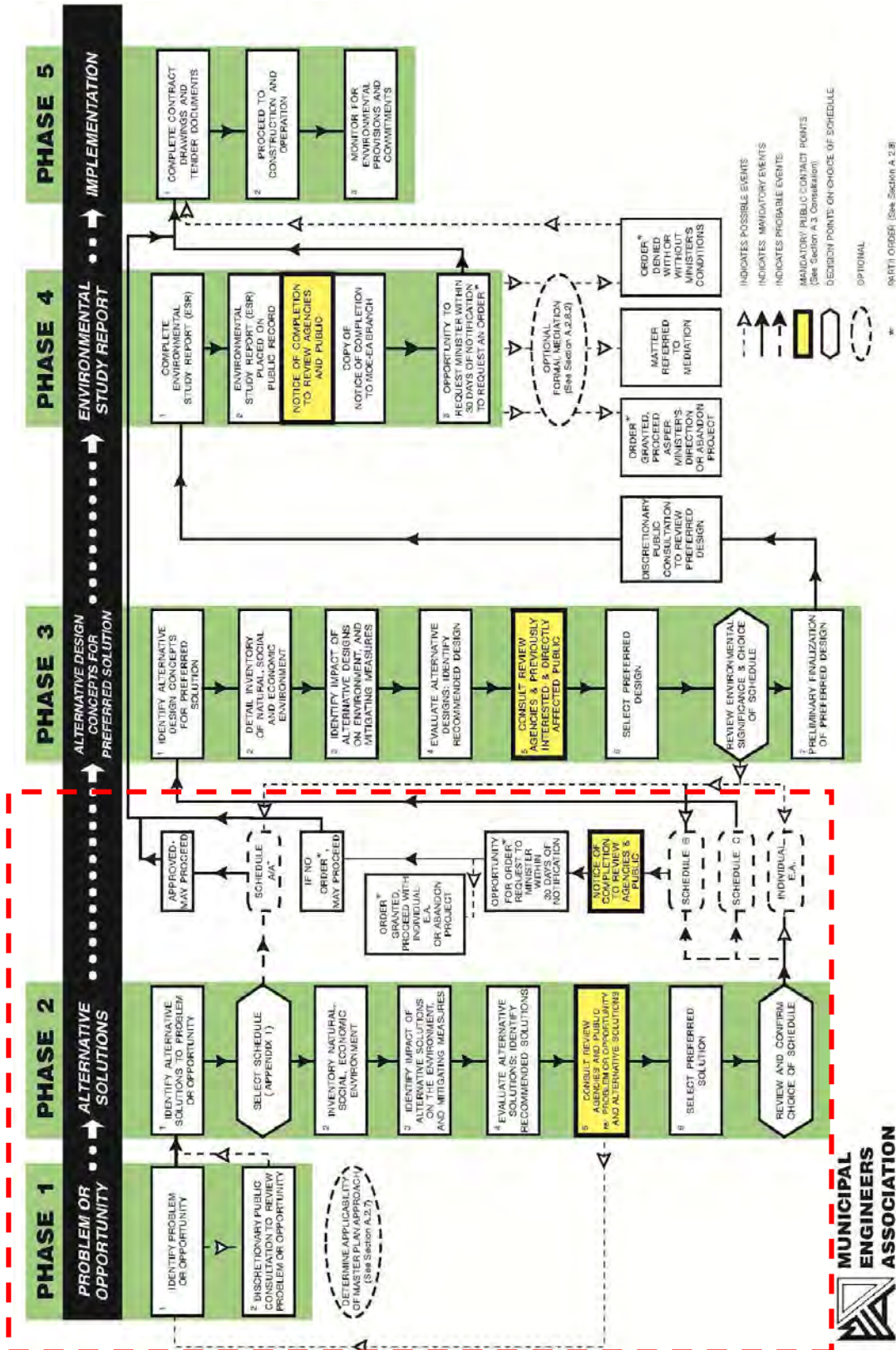


Figure 2: Municipal Class Environmental Assessment Process

3. PROBLEM / OPPORTUNITY STATEMENT

The City has adopted a Downtown Secondary Plan (City's Official Plan Amendment 43) for residential and employment growth up to the year 2031 which includes portions of St. Patrick's Ward. As a part of this strategy, infill and intensification within this area is estimated at 6,000 residents and 2,000 jobs from 2006 to 2031. To accommodate this increase in population with respect to the new residential developments in St. Patrick's Ward (including the Fusion Metal Works condominium development on Arthur Street South) and their connection from Arthur Street to Wellington Street, the Downtown Secondary Plan identifies two new river crossings linking St. Patrick's Ward to the downtown area.



The following needs have been identified with the respect to pedestrian traffic in the area:

- A portion of current pedestrian traffic trespasses on the existing Guelph Junction Railway bridge to cross the Speed River from Arthur Street South to Wellington Street East / Macdonell Street causing a public safety hazard;
- With the predicted increase in the number of residents in the St. Patrick's Ward area due to the new developments, pedestrian traffic trespassing on the Guelph Junction Railway bridge is anticipated to increase, worsening the exposure of this safety hazard to the public;
- A safe and direct link for pedestrian and cyclist traffic using the trail through St. Patrick's Ward along the Guelph Junction Railway tracks between Macdonell Street and Huron Street currently does not exist; and
- The current and future development of the Fusion Metal Works condominium development and other lands will significantly increase the pedestrian and cyclist traffic flowing between St. Patrick's Ward and the Guelph Central Station / downtown area.

The City of Guelph wishes to explore the preferred locations of the two pedestrian and cyclist crossings within the Study Area to improve public safety and plan for the anticipated increase in pedestrian travel demands while balancing heritage, social, economic and natural environment responsibilities.

Guelph's Downtown Secondary Plan (DSP) describes two pedestrian bridges crossing the Speed River between Neeve and Macdonell streets. The DSP is a council approved document that was vetted through community consultation with specific requests from the community for two bridges in this location. For efficiency in planning and due to the overlapping Study Areas for each bridge, the City elected to conduct one Environmental Assessment for both structures. It is the City's intention to stage the construction of two crossings, with one to occur in the next 1-5 years to address current needs. The second crossing would be constructed in the next 7-10 years, or at such time that the need for a second crossing is realized and City Council approves funding.

4. EXISTING CONDITIONS

4.1 Socio-Economic Environment

4.1.1 Land Use

The Study Area is set within an urban landscape on the edge of the City of Guelph's downtown core. Adjacent landscapes include parkland, multi-use trails, the Speed River, two active rail corridors, industrial buildings (active and vacant), historic buildings, high-rise residential buildings and active roadways.

The Speed River is a prominent watercourse through the City of Guelph and within the Grand River Conservation Authority's (GRCA) Watershed. The watercourse at the Study Area is channelized by large concrete retaining walls on either bank of the river. Upstream of the site is Allan's dam, Allan's dam bridge (now closed to the public), the Metrolinx railway viaduct and the Guelph Junction Railway bridge. Downstream of the site is a concrete weir (presumably a sanitary sewer crossing) and the Neeve Street bridge. The Speed River is subject to a cool-water timing window for in-water works (works not permitted from March 15 to June 30), and its narrow floodplain is characterized by wooded vegetation within urban parkland upstream and downstream of the subject area.

On either side of the Speed River within the Study Area are historic buildings and building remains of the once prominent industrial area of downtown Guelph. The W.C. Woods building, which is a heritage building, is located on the east banks of the Speed River, while the remains of an old mill are located on the west banks.

4.1.2 Official Plans and Policies

The City of Guelph Official Plan is used to guide land use and activities by establishing goals, objectives and policies while considering the greater Guelph community. This includes the social, economic and natural environments. The following summarizes a review of the Guelph's Official Plan (Amendment 43):

- Principle 5 outlines the significance of the Speed River to the greater community of the downtown area. It includes objectives which require that the Speed River is a significant feature of the downtown area, and should be a development consideration for factors such as tourism, culture and recreation.
- New linear connections should be established between the downtown and St. Patrick's Ward.
- Walking, as a mode of transportation, is important to the implementation of The Downtown Secondary Plan. Targets include increasing the number of people using public transit, cycling or pedestrian options for travel.
- New infrastructure designs should integrate with the established landscapes.
- The potential for St. Patrick's Ward to be considered a Heritage Conservation District exists and should be explored.
- Special policies applicable to St. Patrick's Ward area of the downtown core include:
 - The character of "the Ward" should be maintained as new development is implemented.
 - The City will improve connections through the neighbourhood to the downtown core and along the riverfront for pedestrians and cyclists.
 - A satisfactory Urban Design Master Plan is required for rezoning or site plan approval, and will be reviewed by the Ward community.
 - In addition to the Urban Design Master Plan required for the 5 Arthur St site, the following must be provided:
 - Well-connected open space generally along the river that promotes safety, comfort and encourages use (included in the continuous multi-use trail).
 - Creation a pedestrian bridge alongside the GJR bridge and "another bridge across the river, generally aligned with a crossing of Wellington Street and connected to Arthur Street".
 - New development and infrastructure should fit into the heritage landscape of the area.
 - New development and infrastructure should maintain public views and explore the creation of new views.

4.1.3 5 Arthur Street South Document Review

The Site Plan for Fusion Metal Works Phase 1 (5 Arthur Street South) by Kirkor Architects and Planners dated May 27, 2015 was reviewed with the following noted:

- A pedestrian crossing of the Speed River immediately south of the GJR bridge is loosely detailed.
- A pedestrian crossing approximately 80 m south of the GJR bridge is loosely detailed.

The 5 Arthur Street South Urban Design Master Plan by Kirkor Architects and Planners dated January 2014 was reviewed with the following noted:

- The title page of the document shows two pedestrian bridge crossings between the GJR bridge and Neeve Street.
- The vision of the site is to reconnect pedestrians with the Speed River through pedestrian access to the river and a pedestrian-friendly design.
- Pedestrian bridges are proposed to connect the “Riverwalk” (as outlined on the Master Plan) to the existing Downtown Trail along the Speed River.
 - The City of Guelph will locate, design and schedule construction of the pedestrian bridges.
 - The bridges are subject to regulations set out by the GRCA and may need to be constructed above the Regulatory Flood Elevation of 315.10 m.
 - The pedestrian bridge located adjacent to the GJR will be constructed on the south side of the rail bridge to facilitate connection to the Riverwalk.
- The creation of public views should be a consideration when planning the location of the pedestrian bridges. Locations that should be specifically visible include:
 - Nearby Heritage Buildings
 - The Neeve Street bridge
 - The Metrolinx overhead rail bridge (viaduct)

4.1.4 Source Water Protection

The Grand River Source Protection Plan (SPP) was reviewed for the City of Guelph and in consultation with online mapping information provided by the GRCA. The Study Area is located within a Wellhead Protection Area B, with a vulnerability of 10. The study area is not located within 100 m of a municipal well. Refer to **Figure 3** below.

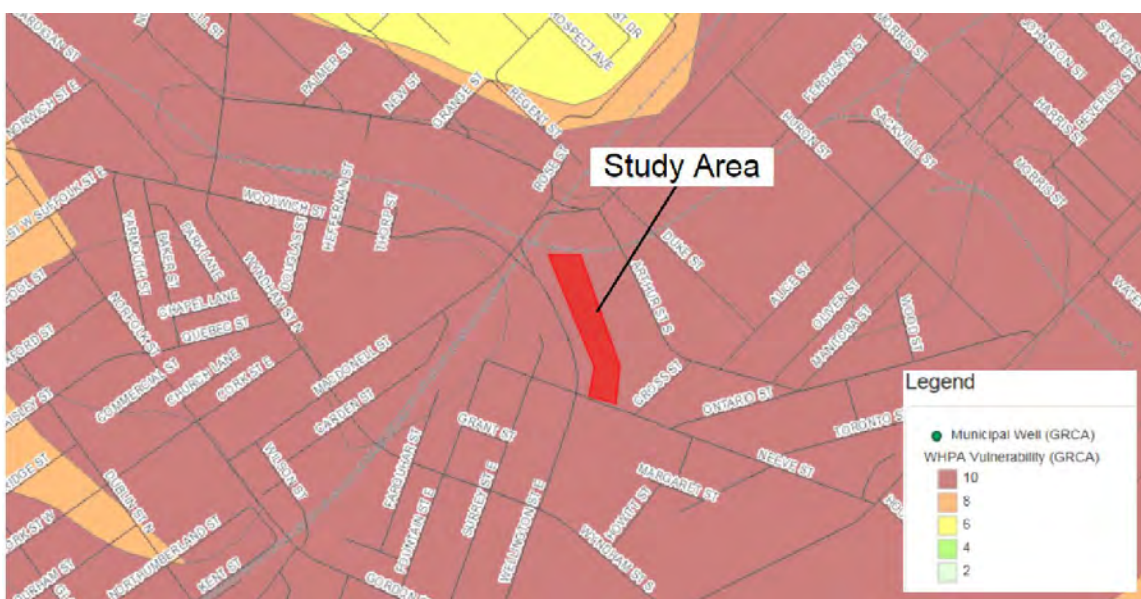


Figure 3: Source Water Protection, Wellhead Protection Area Vulnerability in Study Area (Source: GRCA)

4.2 Cultural Environment

4.2.1 Cultural Heritage Resource Assessment

A Cultural Heritage Resource Assessment (CHRA) was completed by Archaeological Services Inc. (ASI) to present an inventory of cultural heritage resources (both heritage landscapes and built heritage), and identify existing conditions of the Study Area. The complete report is provided in **Appendix A**. The assessment identified three cultural heritage resources (CHRs) within the Study Area as follows:

- CHR1 – Wellington Street Rail bridge, a functional double girder bridge built in 1880 to carry Guelph Junction Railway traffic across the Speed River, is located on the north end of the Study Area just south of Macdonell Street.
- CHR2 – Wellington Street and the Speed River, these “ruins” are located in what is now parkland on the west bank of the Speed River, and consist of a relict building with ruined foundation and reconstructed architectural elements including corbels, arch voussoirs in the Scotch Baronial style, as well as a flywheel and turbine.
- CHR3 – 43 Arthur Street (Formerly a part of 5 Arthur Street South), a property on the east banks of the Speed River containing an 1847 neo-classical stone and brick building, an 1835 neo-classic multi-storey building, a factory built in 1900. The property was originally developed by Horace Parry in 1830, sold to William Allen soon after, sold to Taylor Forbes Company Ltd. in 1902, and sold to the W.C. Wood Company in 1955.

4.2.2 Heritage Impact Assessments

Following the CHRA, Heritage Impact Assessment Reports (HIA) were completed by ASI to identify impacts to cultural heritage resources noted in the CHRA and propose appropriate mitigation measures to offset any impacts. The complete reports are provided in **Appendix A**. These reports generally identified the following:

4.2.3 Wellington Street Rail Bridge

The Wellington Street Bridge, built in 1888, is the oldest deck plate girder bridge in the Grand River Watershed. The character-defining elements of associated with this bridge include:

- Steel deck plate girder;
- Riveted steel construction;
- Stone abutments; and
- Views to the property from the south.

Crossing Alternative Analyses

- Alternatives 1 and 2 obstruct the views of this bridge when looking north from south of proposed bridges.
- Minimal obstruction of significant views of bridge when looking north from south of proposed bridges.
- No identified loss of views for Alternatives 4 through 6.

Alternatives 4 to 6 are the preferred alternatives as there would be no obstruction of views of the Wellington Street Rail Bridge. However, Alternative 1 would generally reflect the alignment of the former pedestrian bridge at the site and would allow for the inclusion of interpretive plaques, and thus should also be considered as a development option.

4.2.4 43 Arthur Street (Formerly a part of 5 Arthur Street South)

Comprised of five buildings, built between 1835 and the 1860s, on the former W.C. Wood property have been identified by the City of Guelph as being of heritage interest. Character defining elements include:

- Building 1:
 - Two-storey, limestone construction;
 - Stone sills;
 - Flush lintels and quins to openings; and
 - Wood floors.

- Buildings 2-5
 - Mixed stone and brick construction;
 - Flush stone lintels;
 - 6-over-6 sash windows; and
 - Multipane, arched window.
- Landscape:
 - Views to the property from the west bank of the Speed River.

Crossing Alternative Analyses

- None of the proposed bridge alternatives are anticipated to have a direct impact on the architectural features.
- The proposed alternatives will have varying impacts on the contextual value of the property.
- No identified loss of views into the property from the west bank of the Speed River for Alternative 1.
- Alternative 2 will obstruct views in to the property looking north from the south.
- Alternative 3 will minimally obstruct views in to the property looking north from the south.
- No identified loss of views for Alternatives 4 through 6.

As Alternatives 4 through 6 result in no identified impact to identified heritage attributes, these are the preferred alternatives; however, it is understood that a former pedestrian bridge once generally followed the alignment of Alternative 1. Therefore, if it is demonstrated that no impacts will occur to Building 1, Alternative 1 should also be considered a preferred alternative.

4.2.5 Allan's Mills Ruins

The Allan's Mill property is located on the west bank of the Speed River between the Wellington Street Bridge to the north and Neeve Street to the south. This property changed owners numerous times between 1878 and the 1960's. The original building suffered severe fire damage in the 1960's where it remained vacant until the City of Guelph bought the property 1976 when the remaining buildings were demolished. Now known as Heritage Park, the property was designed to commemorate the form Allan's Mill site through the retention of stone foundations, arch, millstone, cairn and a metal mill wheel. Several plaques on the site document the history of the site. The character defining elements include:

- Stone foundations;
- Stone abutment of former pedestrian bridge;
- Stone arch and remnant wall; and
- Landscaped park providing views to the W.C. Wood property, the Speed River, the Wellington Street Rail Bridge, Allan's Dam, the Macdonell Street Bridge, and the Macdonell Street Rail Viaduct.

Crossing Alternative Analyses

- Alternative 1 obstructs the views to the Wellington Street Rail bridge from the Allan's Mill ruins.
- Alternative 2 will obstruct views out of the property looking north from the south.
- Alternative 3 will minimally obstruct significant views
- No identified loss of views for Alternatives 4 through 6.

As Alternatives 4 through 6 result in no identified impact to identified heritage attributes, these are the preferred alternatives; however, it is understood that a former pedestrian bridge once generally followed the alignment of Alternative 1. Therefore, Alternative 1 should also be considered a preferred alternative.

4.2.6 Archaeology

Following the Standards and Guidelines for Consultant Archaeologists, administered by the Ministry of Tourism, Culvert and Sport (MTCS), a Stage 1 Archeological Assessment was completed by ASI. This assessment included background research into the Study Area and was used to determine the archaeological site potential. The complete report is provided in **Appendix B**. The assessment generally identified the following:

- Parts of the Study Area have been subjected to deep soil disturbance events from the construction of the existing right-of-ways, commemorative heritage display, and river bank stabilization and flow control and do not possess archaeological potential. These areas do not require further assessment.
- Some lands within the Study Area adjacent to the river are sloped in excess of 20 degrees, and do not possess archaeological potential. These areas do not require further assessment.
- The former Allan’s Mill in Heritage Park retains potential for deeply buried archaeological resources associated with the use of the mill since 1830. If the Allan’s Mill complex cannot be avoided, this area will require Stage 2 trenching at a maximum of 10 metre intervals prior to any development. Refer to the orange shaded area at northwest end of the Study Area as shown in in **Figure 4** below.
- The remainder of the Study Area retains archaeological potential. These areas will require Stage 2 archaeological assessment. Refer to the green shaded area at southwest end of the Study Area as shown in **Figure 4** below.

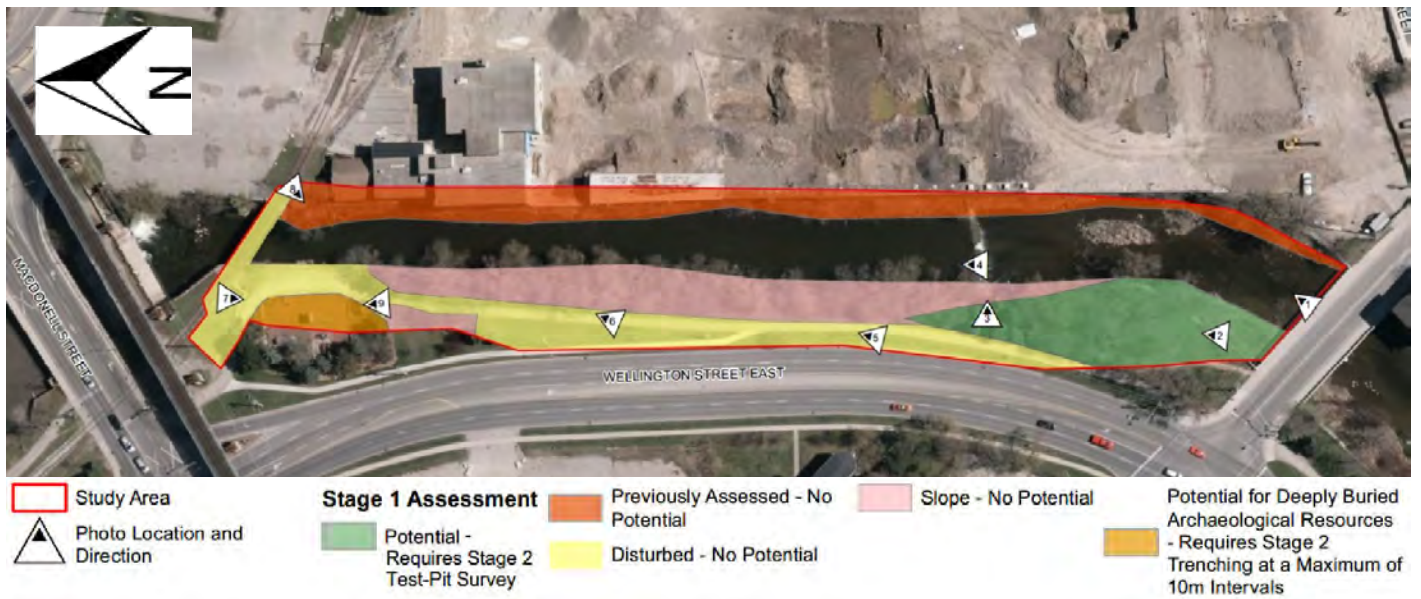


Figure 4 Results of Property Inspection
 (Source: ASI Stage 1 Archaeological Assessment Report – Figure 8)

Recommendations from the Stage 1 Archaeological Assessment report included that if Heritage Park or the area at the southwest end of the Study Area would be impacted by the selected preferred alternative(s), a Stage 2 assessment would be required. Alternative 1 is not anticipated to impact Heritage Park; however Alternatives 4 and 5 would impact the area requiring assessment at the southwest end of the Study Area. If Alternatives 4 or 5 are selected as the preferred alternatives, a Stage 2 Archaeological Assessment would be required.

4.3 Natural Environment

About & Associates Inc. (About) completed a review of the natural heritage of the Study Area as part of a scoped Environmental Impact Study (EIS). The full study is provided in **Appendix C**, and is summarized as follows.

4.3.1 Background Review

The following is a summary of the background review completed as part of the EIS report:

- No Species at Risk (SAR) were observed during the field studies, and habitat for SAR was not identified through a habitat assessment of the site.
- Investigation of the Natural Heritage Information Centre (NHIC) database identified two provincial Species at Risk (SAR) protected under the Endangered Species Act, 2007 (ESA) and three other species identified as

rare within the 1 km square that contains the Study Area. Habitat was not identified for any of these species in the study area.

- No SAR occurrence records were provided by the MNRF for this site based on a request for information response dated July 7, 2016.
- A review of the Ontario Breeding Bird Atlas identified 114 species known to occur within a 10 km x 10 km square area containing the Study Area, including 10 SAR under the ESA. No habitat for SAR birds was present in the Study Area through a review of the habitat present on site. 46 species are considered locally significant in the City of Guelph.
- A review of the Ontario Reptile and Amphibian Atlas identified 28 species that are known to occur within a 10 km x 10 km square area containing the Study Area, including four SAR under the ESA. Nesting or overwintering habitat was not identified in the Study Area; however, overwintering habitat may be present in the watercourse for Common Snapping Turtle. Twelve reptile/amphibian species considered Locally Significant by the City of Guelph were also noted for the Study Area.
- A review of the Atlas of the Mammals of Ontario (1994) identified twenty-nine species that are known to occur within the 10 km square area containing the Study Area, including one SAR. Two mammal species are considered Locally Significant by the City of Guelph.

4.3.2 Trees and Vegetation

The following is a summary of the trees and vegetation review completed as part of the EIS:

- Three ecological communities were identified within the Study Area including Fresh Manitoba Maple Deciduous Forest (FODM4-5) along the open areas within the floodplain and adjacent to the river, Parkland (CGL_2) within the park and trails on the west side of the river and Shallow Aquatic (SA) within the river.
- None of the ecological communities are listed as provincially rare communities.
- A botanical field inventory was completed, during which 69 species were identified (33 native and 36 exotic species).
- One native species inventoried was rated as Imperiled (S2) in Ontario (Honeylocust, *Gleditsia triacanthos*); however, the specimen in the Study Area is of the planted horticultural variety, which is not considered rare or protected within Ontario.
- A tree inventory was completed, listing Manitoba Maple (38%), Blue Spruce (13%) and Siberian Elm (11%) as the most abundant species within the Study Area

4.3.3 Wildlife Habitat

The following is a summary of the wildlife habitat review completed as part of the EIS:

- Of the species observed incidentally during the site review, one species was observed that is listed as Special Concern both provincially and federally: the Common Snapping Turtle. No evidence of overwintering habitat or specific, high-quality nesting habitat was observed in the study area.
- Two areas of Significant Wildlife Habitat were identified within the Speed River, but not within the Study Area: Waterfowl Stopover and Staging (Aquatic) and Turtle Wintering Area.

4.3.4 Aquatic Habitat

The following is a summary of the aquatic habitat review completed as part of the EIS:

- The Speed River within the Study area is highly modified, the watercourse has been altered and engineered and displays characteristics of a modified, urban stream.
- During the aquatic assessment, a number of small, unidentified fish were observed within the watercourse throughout the Study Area.
- The watercourse within the Study Area is of poor to moderate habitat quality for fish due to the amount of unshaded stream, the water control structure at Macdonell Street creating a full or partial barrier, little riparian or aquatic vegetation, and a relatively warm water temperature.
- The watercourse is classified as a coolwater system, meaning that in-water works are not permitted between March 15 and June 30.

Natural Environment Crossing Alternative Analyses

- Alternative 1 would presumably have a lower impact than the other bridges based on the limited number of trees within the potential impact area, the height above the regional flood line river and the lack of natural features around the bridge. Alternative 1 is a preferred alternative from a Natural Heritage perspective.
- Based on the known natural heritage features, Alternative 2 to Alternative 4 would be expected to have comparable impacts. Required tree removal for the three bridge locations would differ based on exact placement, which will be determined during detailed design.
- Alternative 5 is expected to have increased impacts to trees, since the west side is within a recreational park area, and all three trees prioritized for conservation are located within 25 m of Alternative 5; as a result, this option is least preferred.
- The **general** natural features at Alternatives 2 through 4 locations are equivalent and expected impacts from construction at any location would be similar. Therefore, between Alternatives 2 through 4, no bridge location is more preferred. However, Alternative 1 is the most preferred and Alternative 5 is the least preferred.

Natural Environment Conclusions and Recommendations

- Any bridge alternative that can accommodate a clear span bridge would be preferred over areas that require abutments or supports below the high water mark.
- Through the implementation of mitigation measures identified in the EIS, the proposed pedestrian bridges will not result in any long-term impacts to Natural Features within the study area.
- Through the implementation of the proposed restoration plan, natural features can be enhanced, resulting in long term positive effects on the natural heritage features within the study area.

4.4 Technical Environment

4.4.1 Geomorphic Assessment

Ecosystem Recovery Inc. (ERI) completed a Geomorphic Assessment for the Study Area, which is provided in **Appendix D**. This assessment spanned from the downstream side of the dam at Macdonell Street to Neeve Street.

Hydrology and Hydraulics

Flow rates provided in the HEC-RAS model are provided in **Table 1**.

**Table 1: Peak Flow Rates for Study Area
 (Ecosystem Recovery Inc. February 2017 Report – Table 3-1)**

Design Storm	Flow Rate (m ³ /s)
2 Year	81.9
5 Year	114.0
10 Year	134.0
20 Year	155.0
50 Year	181.0
100 Year	200.0
Regional – Original	512.0
Regional – GRHS	480.0

The model was updated with field-surveyed cross-sections to gain an understanding of the hydraulic conditions that occur in the study area, and to serve as the basis for further analyses pertaining to the proposed pedestrian bridge crossings. The cross-sections representing the Macdonell Street bridge, the railway viaduct, the GJR bridge and the

Neeve Street bridge were not updated in the model since field site conditions at, or in proximity to the crossings, appeared to be well represented by the model.

For the purpose of this study, it was assumed that the bankfull flow event was equivalent to 60% of the 2 Year flow. Review of the flood elevations through each of the cross-sections indicated that, through the Study Area, the 100 Year flow event is essentially contained within the concrete retaining walls lining the river. At the upstream end of the reach (HEC-RAS sections 24233.57 to 24169.23), the west bank is overtopped by the Regional event. From HEC-RAS section 24144.82 to Neeve Street, the Regional event typically spills over both banks. **Figure 5** below depicts flood elevations within the Study Area from both the original and updated HEC-RAS models.

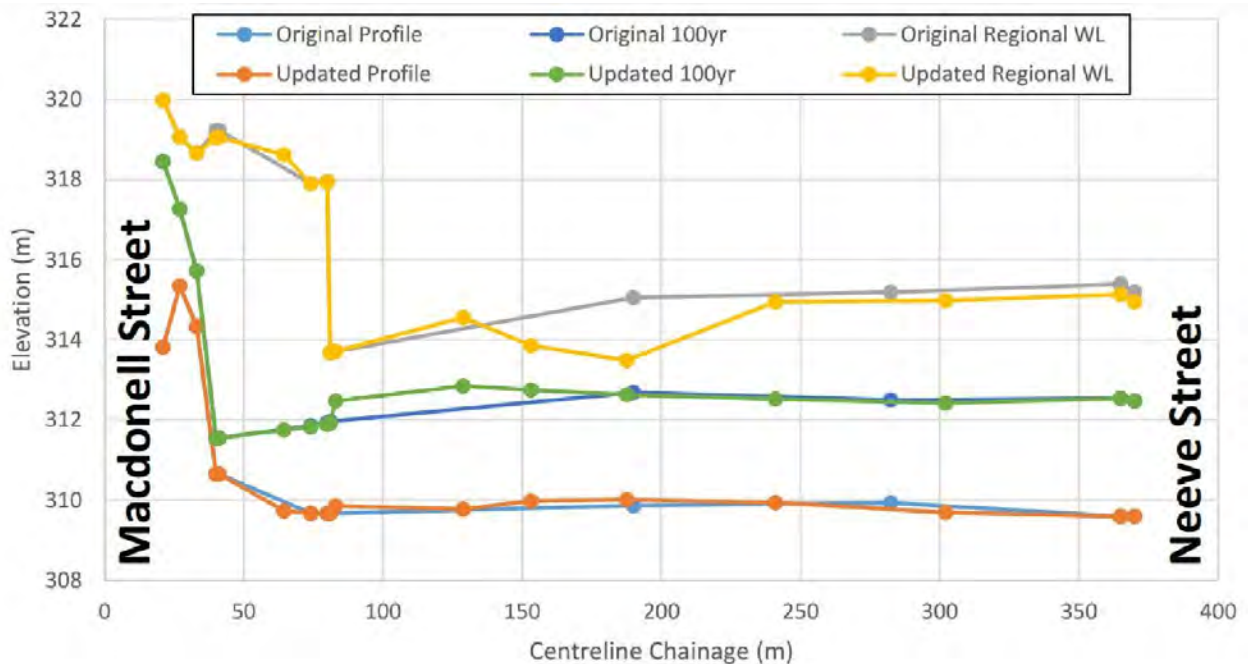


Figure 5 Water surface elevations through study area based from existing and updated HEC-RAS model (Source: Ecosystem Recovery Inc. February 2017 Report – Figure 3-4)

Geomorphic Assessment and Water Quality

The Speed River has remained in its current alignment since the 1930s, based on a review of historical aerial imagery. This alignment has been reinforced with the implementation of engineered banks consisting of concrete or masonry retaining walls throughout the study area. The presence of a portion of unprotected and naturalized bank (west side) occurs between chainage 160 m (in line with the pedestrian path between the 5 Arthur Street development and the 43 Arthur Street heritage buildings) and 270 m (midway between Phase 2 and 3 of the 5 Arthur Street Development). An existing concrete encased sanitary sewer is exposed on the channel bed near chainage 270 m; the pipe exerts an upstream backwater condition influence.

Water quality through the study area was examined during five (5) separate sample events from September 2016 to January 2017. The Safe Drinking Water Act (SDWA, 2002) reports a limit of 0 CFU/100mL of E. Coli. All water quality samples exceeded this concentration (122 to 1500 CFU/100 mL). Only two (wet weather) samples exceeded the Canadian Environmental Quality Guidelines for Fresh Water Aquatic Life (CCME, 2008; 400 CFU/100 mL). The Copper and Lead in the January 2017 (wet weather) sample exceeded the CCME (2008) levels, but not the Provincial Water Quality Objectives (PWQO). In this same sample Total Phosphorous concentrations exceeded the PWQO.

With respect to aquatic habitat water quality parameters, the CCME (2008) reports a lowest acceptable minimum concentration of Dissolved Oxygen (DO) ranging from 6.5 to 9.5 mg/L for coldwater biota and from 5.5 to 6.0 mg/L for warmwater biota. The Speed River has been defined by the GRCA as supporting coolwater fisheries in the Study Area, for which no criteria were identified. The DO levels in all five water quality samples satisfied the minimum DO limits for

warmwater biota and exceed or are within the range for coldwater biota (note: sample 1 and 2 do not meet the guideline for early life stages of coldwater biota: 9.5 mg/L).

Technical Environment Crossing Alternative Analyses

Review of the alternatives, from a hydraulic, geomorphic, and fish passage/habitat perspective was completed. The bridge deck in Alternatives 1 and 2 occurs above the regional flood elevation and result in no change to existing conditions; however, interference with regional flood processes and hydraulic conditions occur in Alternatives 3, 4 and 5.

Technical Environment Conclusions and Recommendations

Based on the review of geomorphic channel conditions within the context of the potential alternatives, it is apparent that, given the engineered channel condition, implications for geomorphic processes and fish passage potential may be limited to the regional flood event. General recommendations for consideration when implementing any alternative include the following:

Hydraulic/Water level

- Minimize interference with in-channel flows. Placement of the bridge deck above the top of banks would be preferred to reduce interference with flows
- No change in flood elevations should occur, as a result of the bridge placement, to avoid flooding of the adjacent private properties.

Geomorphology

- Avoid placing abutments in the creek, if possible, to reduce interference with flow (i.e., creation of scouring eddies, redirection of thalweg etc.) and to minimize implications to water surface elevations.
- Where possible, place abutments in areas where the channel banks are already hardened as opposed to areas of naturalized banks. This avoids removal of well-established vegetation that enhances bank integrity and stability and provides in-stream flow roughness to reduce flow velocities.
- Where possible, enhance naturalized condition of banks adjacent to proposed crossing abutments where hardened bank materials are removed. Similarly, where opportunities exist to incorporate vegetation into any abutment protection materials, this will enhance bank conditions.

Water Quality

- Opportunities to enhance water quality should be explored in conjunction with any of the potential alternatives. This could include:
 - Enhance riparian vegetation plantings to provide shade and organic inputs into the river.
 - Enhance riparian vegetation to capture sediment and associated pollutants.

4.4.2 Bridge Hydraulics

Very few guidelines are available that provide criteria for hydraulic performance of pedestrian bridges. As a reference, we have considered typical design criteria for roadway bridges and culverts as a comparison, as these structures often convey pedestrian and cyclist traffic in addition to vehicle traffic. The MTO Highway Drainage Design Standards (2008) WC-1 Design Flows (Bridges and Culverts) recommends that bridges with spans greater than 6.0 m, serving local access roads, are be designed to convey the 25 Year design flow and have consideration for the “Regional Flood Flow” for high flow conditions.

The regional flood overtops the west channel bank. A comparison between regional water levels and the likely soffit elevations for each alternative was completed. The comparison revealed that Alternatives 1 and 2 do not interfere with existing hydraulic conditions. The bridge for Alternatives 3, 4 and 5 is below the regional flood elevation and would cause interference with hydraulic conditions including an increase in water level elevation. Alternative 3 would contribute to an upstream shift in the location of a hydraulic jump which may be considered beneficial (i.e., decrease the potential for excess scour of the channel bed). **Figure 6** below describes the changes in regional floodlines with respect to Alternative 3.

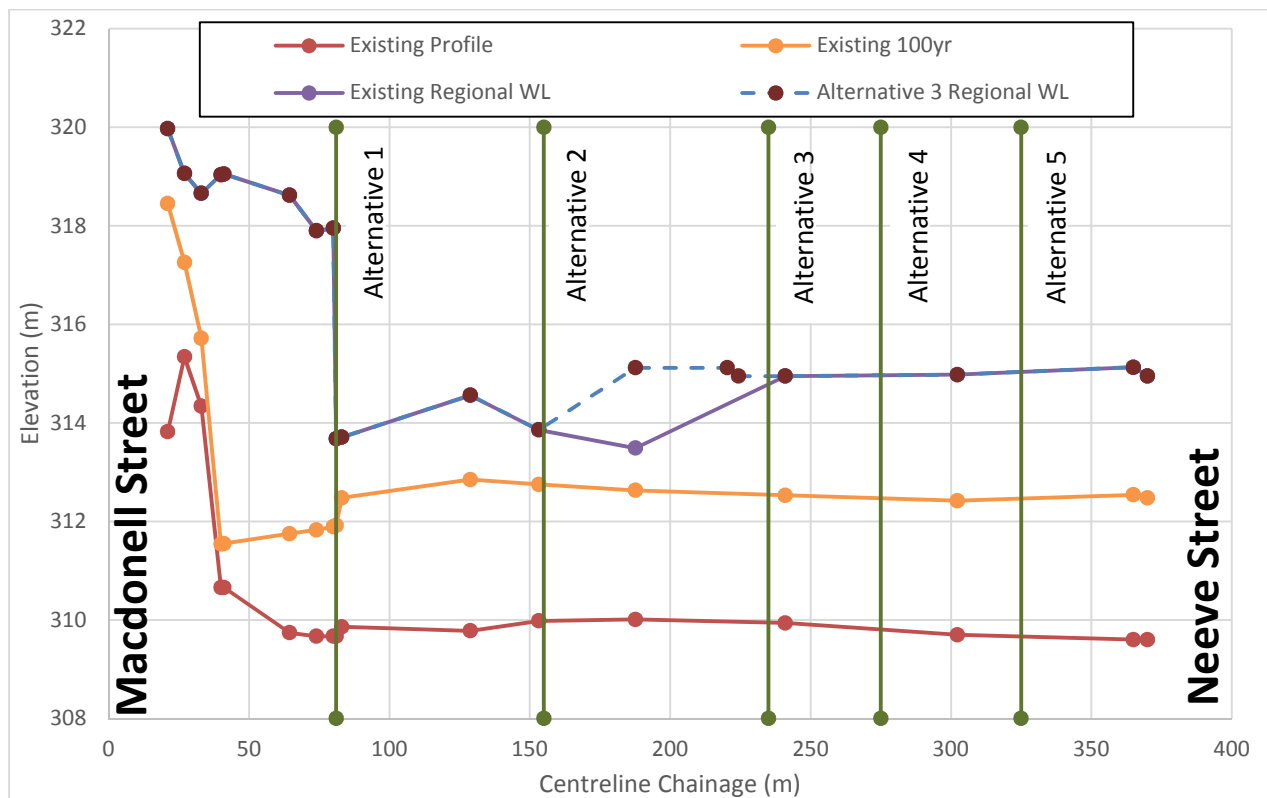


Figure 6 Comparison of Regional water level between existing condition and the proposed Alternative 3 bridge crossing
 (Source: Ecosystem Recovery Inc. February 2017 Report – Figure 4-2)

4.4.3 Transportation and Traffic

The City does not have any data on pedestrian and cyclist traffic data in this area; however, the presence of the adjacent Downtown Trail and the proposed developments at 5 Arthur Street will undoubtedly increase demand for pedestrian and cyclist infrastructure in this area.

We believe that the majority of active transportation traffic within and around the Study Area originates in the Ward neighbourhood, and that pedestrians and cyclists are travelling from the Ward to the downtown for work and recreation purposes or to access the downtown trail network. It is also our belief that, to a lesser extent, traffic does originate from the downtown to access the Ward neighbourhood for recreation and work purposes. Given the anticipated level of transportation and the proximity to the City’s downtown core, consideration should be given for a bridge width of approximately 3.0 m.

Observations by City and GMBP staff through numerous site visits and discussions with the public has revealed that several pedestrian currently cross over the Speed River using the GJR bridge at the north end of the Study Area. This bridge is not designed to safely convey pedestrian traffic, and presents a great risk to the City, GJR and those that choose to cross at this location. This would suggest that a dedicated pedestrian and cyclist crossing at this location should be heavily considered. This would link the St. Patrick’s Ward to the downtown, more specifically to Macdonnell Street and further north along Woolwich Street and would include a vital link to the north platform of the Guelph Central Station.

Other alternate locations for the pedestrian bridges will be to connect St. Patrick’s Ward to other parts of the downtown area such as to Surry Street East and include connectivity to the future south side platform of the Guelph Central Station.

Throughout the consultation process, the public, various interested community groups and City Councillors provided comments regarding pedestrian movement through and around the Wellington Street East and Macdonell Street intersection. Most of the comments relate to the difficulty of pedestrian movement across Macdonell Street connecting the Downtown Trail along the Speed River. The focus of this Environmental Assessment is to determine the preferred location of the two (2) proposed bridge crossings as detailed in the Downtown Secondary Plan. Requests have been received to increase the Study Area to incorporate the above noted intersection. While there has been some review of this intersection in the Downtown Secondary Plan, another study may be needed to determine the preferred modifications to this intersection.

5. CONSULTATION

5.1 Key Points of Contact

Consultation during the decision-making process is a key feature of the Municipal Class EA process. The Schedule B Municipal Class EA process has two mandatory points of contact: the Notice of Study Commencement and Notice of Study Completion. These points of contact are summarized in **Table 2** below:

Table 2: Summary of Points of Contact for EA Process

Point of Contact	Distribution	Purpose
Notice of Study Commencement (June 2016)	<ul style="list-style-type: none"> Sent by mail to all residents within the defined catchment area in November 2016 (completed by City staff) Published on the City of Guelph website on July 20, 2016 Published in the Guelph Mercury Tribune on June 14, 2016 	Introduce the study and problem statement to the public.
Cyclist and Pedestrian Intercept Survey (September 2016)	<ul style="list-style-type: none"> No distribution or public notice 	To obtain preliminary and informal comments from active transportation users of the Downtown Trail between Macdonell Street and Neeve Street prior to the first Public Information Centre.
MindMixer Online Survey	<ul style="list-style-type: none"> Available through the City of Guelph website from September 9th to 25th, 2016. 	Online engagement using the City of Guelph's MindMixer online survey tool to obtain preliminary input and comments.
Public Information Centre #1 (September 2016)	<ul style="list-style-type: none"> Sent by mail to all residents within the defined catchment area and those who requested to be on the mailing list in September 2016 (completed by City staff) Published on the City of Guelph website on September 8, 2016 Published in the Guelph Mercury Tribune on September 8th and 15th, 2016 	Invite the public to provide input on the problem statement, alternative solutions being considered and evaluation criteria for the alternative solutions. The City elected to host this open house for the general public; notices were not sent to agency contacts.

Point of Contact	Distribution	Purpose
Public Information Centre #2 (March 2017)	<ul style="list-style-type: none"> Sent by mail to all residents within the defined catchment area and those who requested to be on the mailing list on March 9, 2017 Published on the City of Guelph website on March 9, 2017 Published in the Guelph Mercury Tribune on March 9th and 16th, 2017 	Invite the public and agencies to review the alternative solutions considered and the preferred solutions.
Notice of Study Completion (July 2017)	<ul style="list-style-type: none"> Sent by mail to all residents within the defined catchment area and those who requested to be on the mailing list on July 6, 2017 Published on the City of Guelph website on July 6, 2017 Published in the Guelph Mercury on July 6 and 13, 2017 	Advise on the completion of the planning process and commencement of the 30-calendar day public review period of the Project File.

5.2 Cyclist and Pedestrian Intercept Survey

In order to fully appreciate the need for the new pedestrian bridges that link St. Patrick’s Ward to Downtown Guelph, project staff surveyed existing active transportation users of the Downtown Trail, as well as other pedestrians and cyclists utilizing infrastructure adjacent to the Study Area. Project staff identified two key locations along the trail and adjacent sidewalks at which they posed a short list of open-ended questions to pedestrians and cyclists on September 15, 2016. Additionally, staff provided an information handout designed to summarize the study and identify contact information. Refer to **Appendix E** for a copy of the handout and questions asked to active transportation users.

The purpose of this survey was to:

- Identify what routes residents regularly use to bike or walk between the Ward and Downtown Guelph;
- Gauge the need for new cycling and pedestrian infrastructure and improvements connecting the Ward to Downtown Guelph; and
- Identify the potential locations of pedestrian and cycling bridges crossing the Speed River, including their possible benefits and limitations.

The survey was not intended to be statistically valid. Rather, it was designed to elicit input from those who are regular users of Guelph’s active transportation system. This was also beneficial as it allowed the City to acquire a better sense of the need to improve mobility and accessibility for existing and future cyclists and pedestrians in the downtown area.

5.3 Public Information Centre #1

The first Public Information Centre (PIC) was held on September 21, 2016 at Guelph City Hall from 2:00-4:00 p.m. and 7:00-9:00 p.m. The PIC was a drop-in, open house format with members of the Project Team available to review information with attendees and answer any questions. The purpose of the PIC was to:

- Introduce the study to the public and review the problem/opportunity;
- Provide an overview of the background information available to date;
- Introduce the evaluation criteria that will be used to evaluate the alternative solutions; and,
- Identify the next steps in the process.

This PIC was held jointly with the first PIC for another Municipal Class EA assessment within the City (the Norwich Street Bridge Schedule B EA). In total, approximately 70 people attended the PIC for the Ward to Downtown assessment or both assessments. We note that attendees that did not indicate the PIC they were attending on the sign in sheet are assumed to have attended both PICs. There may also have been attendees that attended a PIC they did not indicate on the sign in sheet. The level of attendance and feedback was considered to be a success by the Project Team.

Display boards and comments received during the first PIC have been included in **Appendix E**. In general, the comments received supported the approach by the City and the criteria to be used for the evaluation of alternatives. There was a majority support for the inclusion of a bridge adjacent to the GJR tracks for safety and connectivity; however, there was wavering support for a second pedestrian bridge being constructed. Concerns were raised with a pedestrian bridge between the GJR tracks and Neeve Street that did not have a dedicated pedestrian crossing on Wellington Street to accommodate the increased pedestrian and cyclist traffic. Some comments identified that the aesthetics of the new bridge(s) would be important.

5.4 Public Information Centre #2

The second PIC was held on March 21, 2017 at Guelph City Hall from 2:00-4:00 p.m. and 6:00-8:00 p.m. The PIC was a drop-in, open house format with members of the Project Team available to review information with attendees and answer any questions. The purpose of the PIC was to:

- Introduce the alternatives considered;
- Outline our evaluation of the alternatives;
- Introduce our recommended alternatives,
- Identify the next steps in the process.

In total, approximately 26 people attended this PIC. The level of attendance and feedback was considered to be a success by the Project Team.

Display boards and comments received during the second PIC have been included in **Appendix E**. In general, the comments received supported the selection of Alternative 1 one of the preferred alternatives. There was mixed support regarding Alternative 2, and there appeared to be little to no support for Alternatives 3, 4 and 6.

5.5 Agency Consultation

The following agencies were notified of the Notice of Study Commencement and requested to provide feedback or information that may be relevant to the study:

- Guelph Junction Railway (GJR)
- Aboriginal Affairs and Northern Development Canada – Consultation and Accommodation Unit (CAU)
- Ministry of Aboriginal Affairs
- Department of Fisheries and Oceans Canada (DFO)
- Environment Canada
- Ministry of the Environment and Climate Change (MOECC)
- Ministry of Natural Resources and Forestry (MNRF)
- Ministry of Tourism, Culture and Sport (MTCS)
- Grand River Conservation Authority (GRCA)
- Hydro One
- Bell Canada
- Guelph Hydro
- Rogers
- Telus
- Union Gas

As well, the following municipal bodies were notified of the Study Commencement and requested to provide feedback or information that may be relevant to the study:

- Guelph Fire Department
- Guelph Police Services
- Guelph-Wellington EMS

Relevant agency feedback that was received is summarized below. A full list of agency contacts and full summary of correspondence is provided in **Appendix F**.

5.5.1 Utilities

- Union gas stated that they do not have any infrastructure within the study area.
- There are existing sanitary sewers, overhead utilities (Guelph Hydro, Rogers), and buried Bell infrastructure within the area.
- Design locations should be completed during the detailed design phase, and field locates should be completed prior to construction to confirm the presence and location of utilities.

5.5.2 MOECC

- A list of First Nation and Métis contacts was provided by the MOECC.
- If the project is located within a source water protection vulnerable area, determine whether any project activity is a prescribed drinking water threat.

5.5.3 GJR

- Any construction adjacent to GJR tracks must maintain a clearance of 3.0 m from the track rails.
- GJR had no additional comments.

5.5.4 GRCA

- Any proposed works would be subject to O. Reg. 150/06 requiring permission from the GRCA to undertake the works.
- The City should consider a broader area for the location of the pedestrian crossings to help assess the movement of pedestrians
- If the project proceeds after completion of the Class EA, the following plans will be required:
 - Detailed erosion and sediment control plan
 - Dewatering and diversion plan, if applicable
 - Construction staging and sequencing plan
 - Site restoration and rehabilitation plan
- Potential impacts to the flow or hydraulic capacity should be addressed with the EIS or as an independent impact study.
- The GRCA would like to be circulated on concept plans of the bridge structure to allow for technical comment.
- A bird survey should be completed to identify if birds are using the existing bridge structure.
- The GRCA suggests that a spring botanical inventory survey be completed to supplement the current 1-season summer inventory.
- The Tree Preservation Plan should encompass the entire 30 m area around the bridge as final bridge works and staging areas have not been identified.

5.6 Stakeholder Consultation

Property owners within a defined catchment area were mailed the Notice of Study Commencement, notices of PIC 1 and PIC 2 and Notice of Study Completion by the City. Refer to **Figure 7** below for the approximate catchment area.

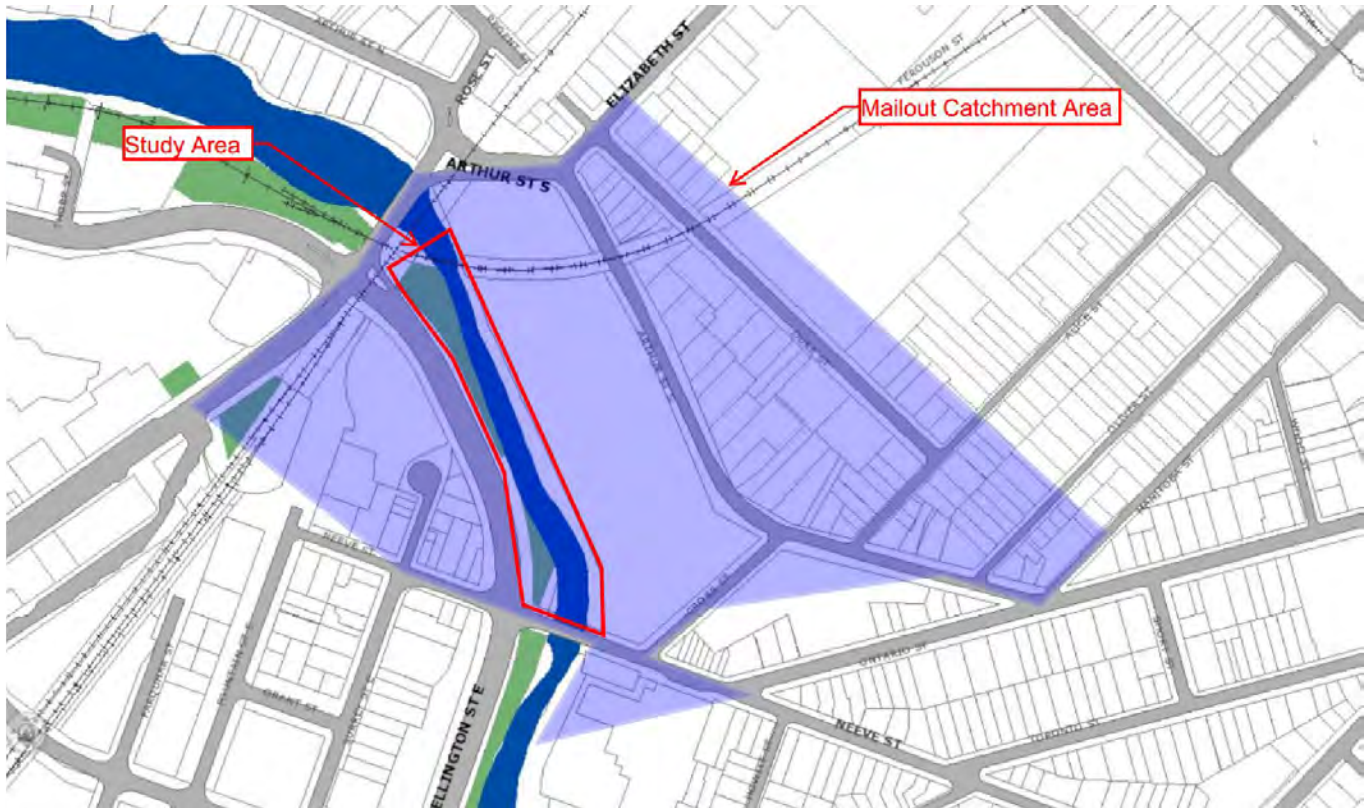


Figure 7: Maitout Catchment Area (Source: City of Guelph online GIS)

Along with comments received during the PICs, several comments were received by the Project Team via email. These comments, along with responses, have been summarized in **Appendix G**.

In general, comments were generally supportive of a new pedestrian bridge adjacent to the existing GJR bridge. There was mixed support over a second crossing related to how it would be financed and how it would connect to the trails on the west side of the Speed River and how users of the bridge going west would be able to cross Wellington Street.

5.7 First Nations and Métis Communities Consultation

After consultation with the MOECC regarding First Nation and Métis consultation, the following organizations were contacted at the onset of the project with the Notice of Study Commencement, notice of PIC #2 and the Notice of Study Completion:

- Six Nations of the Grand River Territory
- Haudenosaunee Confederacy Chiefs Council
- Mississaugas of the New Credit
- Métis Nation of Ontario, Métis Consultation Unit

To date, representatives from these organizations have not contacted the Project Team. The City will welcome discussions with these organizations should they indicate an interest in the Class EA study, or in the future implementation of the Recommended Alternatives.

6. IMPACT AND EVALUATION OF ALTERNATIVES

6.1 Alternative Solutions

The alternative solutions represent different approaches or strategies to address the needs of the project, taking into consideration the all aspects of the environment. Under the provisions of the Municipal Class EA process, all reasonable alternative solutions require consideration to ensure that there is adequate justification to proceed with the improvements and that the need for the project is clearly demonstrated. The alternative solutions are assessed against their ability to reasonably address the identified problems and opportunities.

The alternative solutions being considered are:

- Alternative 1: Bridge Immediately south of GJR Bridge (± 40 m south of Macdonell Street)
- Alternative 2: Bridge ± 200 m north of Neeve Street
- Alternative 3: Bridge ± 140 m north of Neeve Street
- Alternative 4: Bridge ± 90 m north of Neeve Street
- Alternative 5: Bridge ± 50 m north of Neeve Street
- Alternative 6: Do Nothing

Refer to **Figure 8** below for an approximation of the four locations being considered as alternatives.

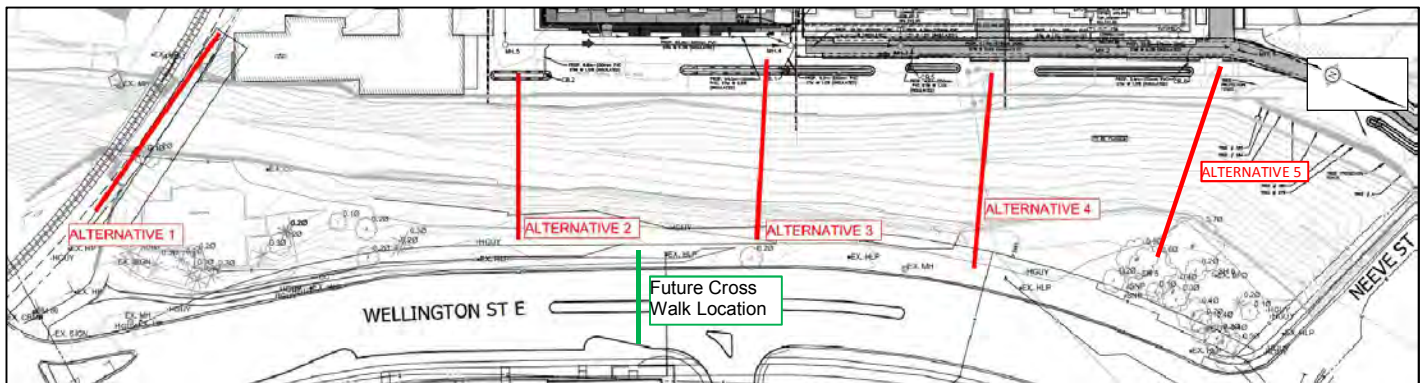


Figure 8: Bridge Location Alternatives

Based on recommendations of the Downtown Guelph Secondary Plan, two bridge sites are being evaluated as part of this process. Therefore, two of the alternatives listed above will be preferred.

A topographical survey was completed during this EA to support the assessment of the bridge locations and supply more accurate geometrics including bridge span lengths, location and grade changes.

Based on input from various stakeholders, including the City of Guelph, all bridge cross-sections should include for a clear travelled width of 3.0 m (10 ft), exclusive of barriers. Including an allowance for barriers the entire structure width would be approximately 3.7m (12 ft).

There are also three (3) access points to the Riverwalk from Arthur Street South. The first is between 43 Arthur Street Heritage Buildings and Phase 1 of the 5 Arthur Street Development which lines up with Alternative 2. The second is located between Phases 3 and 4 of the 5 Arthur Street development that lines up with Alternative 5 and the third is directly from Neeve Street.

Based on the Downtown Secondary Plan a cross walk on Wellington Street East would be located just north of Surrey Street East. This location is ideal as it is located approximately midway between Macdonell Street and Neeve Street and also is no located on a horizontal curve alignment of the road. Alternatives 2 and 3 would have reasonable access to this crosswalk.

This section reviews the alternatives considered, discusses preliminary considerations for structure configurations, provides preliminary costs for the alternatives and summarizes the general advantages and disadvantages associated with each alternative.

6.1.1 Alternative 1: Bridge Immediately south of GJR Bridge (Approximate Chainage 0+080)

This alternative would provide a pedestrian and cyclist bridge crossing the Speed River immediately south of the existing GJR steel bridge, approximately 280 m north of Neeve Street, 40 m south of Macdonell Street. There is evidence that a metal arch pedestrian bridge once existed in the location. Discussions with stakeholders have provided beliefs that this pedestrian bridge was active in the 1940s and 1950s; however, it is believed to have been removed due to safety concerns in the 1960s. There is little information known about this bridge and it is not known if this bridge was owned by the City of Guelph or was privately owned. The City does not have any records of a bridge in this location. Refer to **Figure 9** for a picture of the previous pedestrian bridge in this location (photo source: Wellington County Museum and Archives).

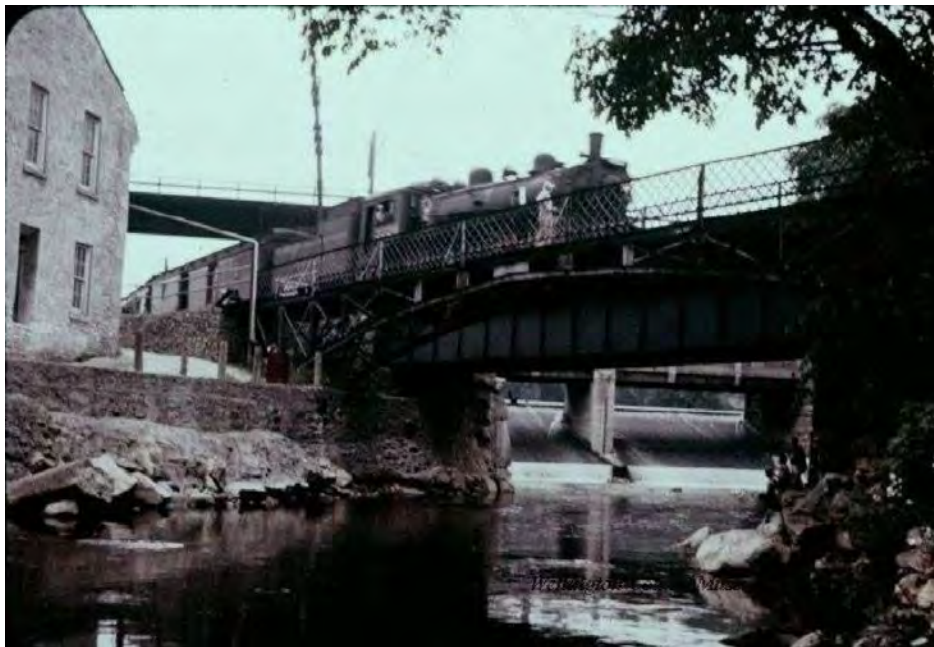


Figure 9: 1956 photo of previous footbridge south of the GJR bridge. CHR2 can be seen at the left of the picture, and Allan's Dam, the Metrolinx viaduct and GJR bridge can be seen in the background.
(Source: Wellington County Museum and Archives)

A bridge in this location would need to accommodate the necessary 3 m (10') setback from the closest rail of the active GJR tracks, as required by GJR staff for clearance and safety. This would be measured from the south face of the nearest track rail to the north face of the pedestrian bridge, as shown below in **Figure 10**.

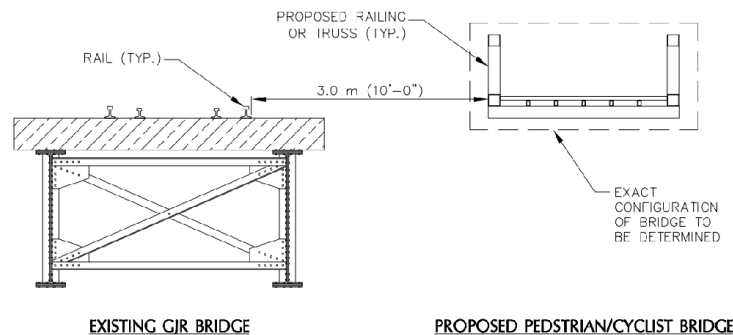


Figure 10: Horizontal spacing requirements for Alternative 1 from existing GJR bridge.

It is estimated that a pedestrian/cyclist bridge at this location may need to have a minimum span over the river of approximately 35 m (115 ft) to match the bridge shown in **Figure 9** and be accompanied with an additional approach span of approximately 11 m (115 ft) to the west in order to maintain the 3.0 m safety offset from the railway tracks. The approach span would span over the existing retaining walls and be supported at a point satisfying both offset from the railway tracks and distance from the existing retaining wall. However, to maintain the required 3.0 m offset from the rail tracks and the 3.7 m wide bridge structure, the new structure would need to be shifted to the south in comparison to the older structure. A single span option would require an approximately 50 m (165 ft) span to maintain the 3.0 m safety offset from the railway tracks. We estimate that the cost savings from shorter spans would be approximately counteracted by the construction of additional foundations.

This location would also provide a view of the existing Metrolinx overhead train bridge along with safe elevated views of the adjacent historical buildings.

A pedestrian/cyclist bridge in this location would align with the City's planned multi-use pathway along the GJR tracks through the Ward and increase the safety of pedestrian and cyclist movement through this area by providing a safer alternative to the GJR bridge. Challenges with a structure at this location would include coordination with GJR during construction, conflicts with overhead and buried utilities and work in close proximity to the adjacent heritage resources.

Considerations when determining geometric location, overall span, type of bridge and alignment for this location alternative are:

- Proximity of the bridge and proposed foundations to the heritage buildings on the east side of the Speed River
- Potential impacts to existing retaining walls (east and west)
- Proximity to the GJR bridge and tracks

6.1.2 Alternative 2: Bridge ±200 m north of Neeve Street (Approximate Chainage 0+155)

This alternative would provide a pedestrian and cyclist crossing at the south edge of the existing heritage building on the 43 Arthur Street property. It is estimated that a pedestrian/cyclist bridge in this location would need to have a minimum span of approximately 28 m (92 ft).

The main benefits of this location are its alignment with one of three public access points to the Riverwalk from Arthur Street South (would be visible from Arthur Street South), close proximity to the multi-use pathway through the Ward connecting through to Huron Street, its proximity to a destination point based on the redevelopment of the existing heritage buildings, and is the shortest spanning bridge.

However, this location would conflict with currently proposed bioswales on the east side of the river, would require detailed coordination between the plans for the 43 Arthur Street South heritage buildings.

Challenges with constructing a structure at this location would include conflicts with overhead and buried utilities and work adjacent to heritage resources.

6.1.3 Alternative 3: Bridge ± 140 m north of Neeve Street (Approximate Chainage 0+235)

This alternative would provide a pedestrian and cyclist crossing at equitable distance between the existing Macdonell Street and Neeve Street pedestrian/vehicle bridges. It is estimated that a pedestrian/cyclist bridge in this location may need to have a minimum span of approximately 35 m (115 ft).

The main benefits of this location are the larger buffer between construction activities and the existing heritage resources and the more central location between bordering vehicular roads. However, this location does not align with any of the access points from Arthur Street and based on elevation differences, would require an approximate 20 m approach ramp along the Riverwalk on the east side of the river in order to satisfy accessibility requirements and is in conflict with currently proposed bioswales on the east side of the river.

This alternative would line up with the south side of the Surrey Street East and Wellington Street East intersection, while the pedestrian crosswalk would be located on the north side of the intersection.

Challenges with construction this structure at this location would include conflicts with overhead and buried utilities, and the amount of vegetation clearing required for construction.

6.1.4 Alternative 4: Bridge ± 90 m north of Neeve Street (Approximate Chainage 0+275)

This alternative would provide a pedestrian and cyclist crossing closer to Neeve Street. It is estimated that a pedestrian/cyclist bridge in this location may need to have a minimum span of approximately 38 m (125 ft).

The main benefits of this location would be a larger buffer between construction activities and the existing heritage resources and disturbing an area already disturbed by the existing sanitary pipe crossing of the Speed River.

However, this location does not align with any of the access points from Arthur Street, would have significant impacts to the Regional flood elevation and may require the complete removal of the sanitary crossing of the Speed River.

Construction challenges with a structure at this location would include conflicts with overhead and buried utilities and the amount of vegetation clearing required for construction.

6.1.5 Alternative 5: Bridge ± 50 m north of Neeve Street (Approximate Chainage 0+325)

This alternative would provide a pedestrian and cyclist crossing in close proximity to Neeve Street. It is estimated that a pedestrian/cyclist bridge in this location may need to have a minimum span of approximately 33 m (108').

The main benefit of this location is its alignment with one of three public access points to the Riverwalk from Arthur Street South (would be visible from Arthur Street South).

However, this location may interfere with the proposed viewing area of the river in front of Phase 4 of the 5 Arthur Street Development and is also in close proximity to the existing Neeve Street Bridge. Also, the west landing of this bridge would cause the most removals of existing vegetation and would have significant impacts to the Regional flood elevation.

Challenges with a structure at this location would include conflicts with overhead and buried utilities, reduced staging area allowances on the west side of the river, and the amount of vegetation clearing required for construction.

6.1.6 Alternative 6: Do Nothing

This alternative would be to forego construction of a bridge at any of the locations or only construct a bridge at one location. Initially, this would represent a zero-cost option to the City as conditions would remain as they currently exist; however, future considerations would need to be made to deal with the pedestrian and cyclist capacity issues that are within the Study Area.

The City is aware, and it has been observed by the City and GMBP on site, that pedestrians currently use the GJR bridge to cross the Speed River at this location. This is a serious health and safety concern for the City, which would

need to be addressed through other means if the “do nothing” alternative is selected and at least one bridge is not built to service this need.

With the anticipated increase in pedestrian and cyclist traffic to the downtown core from the 5 Arthur Street development and other future developments closer to Huron Street in St. Patrick’s Ward, the existing pedestrian infrastructure may become inadequate to service the demand. Therefore, capital costs in the future to expand on existing infrastructure at Macdonell and Neeve Streets would be required.

Current Official Plans and policies depict two pedestrian and cyclist crossings within the Study Area. Selection of the “do nothing” alternative would result in the need to revisit and amend these documents, which would inherently have costs associated for the City to plan and implement these amendments. Due to the difficulty in establishing the level of effort required to complete this work, a nominal cost of \$100,000 has been provided for this item as an associated cost to the “do nothing” alternative”.

6.2 Considerations for Structure Type and Configuration

The focus of this EA study is to determine the preferred location for pedestrian crossings within the Study Area; however, some consideration needs to be given to the type of structure that will be selected. There are several types of pedestrian bridge structures that could be constructed, each with their own defining characteristics, advantages, disadvantages and aesthetics.

Within the Study Area, there are a number of existing retaining walls that could potentially be impacted by not only the structure location but the structure type selected. For example, constructing a bridge in the location described in Alternative 1 would be difficult without making alterations to the existing retaining walls on the west side of the Speed River at the abutment location for the GJR bridge. The retaining walls likely predate, or are at least as old as, the previous footbridge in this location. Selection of a structure with a longer span that maximizes the clearance between existing landscapes and structures to the underside of the structure may be beneficial to preserving these features.

For this study we have grouped the structure types based on the clearance requirements and discuss the advantages and disadvantages of each group along with examples of each bridge type.

6.2.1 Superstructure at or above Deck Elevation

Bridges where the main supporting structure, commonly referred to as the superstructure, is at or above the deck elevation typically require users of the structure to travel between supporting structural members rather than on top.

Advantages:

- Minimizes vertical alignment changes from existing grade while minimizing or avoiding impacts to existing walls and features in the Study Area.
- Can accommodate longer spans as the depth of the structural members are not limited to below the structure.
- Generally more cost efficient for longer spans.
- Railings can be incorporated into the structural elements and mask the look of the structure.

Disadvantages:

- Structural members can obstruct vistas and views.
- Steel structures are more susceptible to corrosion due to deicing salts.
- Non-redundant load path structures, i.e., only two beams or trusses support the structure. Width of structures can be limited.

Prefabricated Steel Truss Bridges

These structures are likely the most prominent pedestrian bridge structure throughout southern Ontario. They are often fabricated and shipped to site in a near install-ready condition, significantly reducing construction durations. Often times, these structures are installed with the use of an overhead crane. They are one of the most economical structure types for spans greater than approximately 10 m, and have the advantage of placing the structural members at or above the deck level of the bridge. For longer span structures, bridges can be fabricated in multiple sections and bolted together on site. As there can only be two main structural members (trusses), the width of these structures can be

limited. Typical widths range from 1.8 m (6') to 3.0 m (10'). Refer to **Figure 11** below for a typical prefabricated steel truss pedestrian bridge.



Figure 11: Typical prefabricated steel truss pedestrian/cyclist bridge (weathering steel shown).

Through Deck Steel Girder Bridge

These structures are much less common than steel truss pedestrian bridges. This structure type is made up of two steel girders on the outside of the structure with the bridge deck resting on the bottom flange of the girders. The height of the girder above deck level depends on the span of the bridge, where longer spans require taller girders. As an example, refer to **Figure 12** below for a deck through steel girder railway bridge.



Figure 12: Through deck steel girder bridge (railway bridge repurposed for pedestrian use).

Timber Bridges

While conventional timber pedestrian bridges often represent the least costly alternative, they can be difficult to effectively construct for spans greater than 10 m without the use of intermediate piers. While timber structures are often less costly to construct, they often require more maintenance and have a reduced design life.

One option that could be considered would be a covered timber bridge, similar to the covered bridge constructed over the Speed River upstream of its confluence with the Eramosa River in Guelph. Refer to **Figure 13** for a photo of the covered bridge in Guelph, which conveys pedestrian traffic. This three-span structure has a total length of

approximately 65 m (215'), and a maximum span of approximately 37 m (120'). It was constructed in 1992 by volunteer efforts.



Figure 13: Covered bridge over Speed River.

6.2.2 Superstructure below Deck Elevation

Structures where the superstructure is below the deck are typically constructed with the travelled decks on top of the main structure members such as girders or beams and are out of view of the user traveling over the structure.

Advantages:

- Structural members do not obstruct vistas or views.
- Structures can be load path redundant (3+ beams or girders) and can accommodate any width of structure.
- Many different material types available.

Disadvantages:

- Requires increased clearance below the deck.
- Longer spans (30+ m) are less efficient and often require intermediate piers.

Concrete Slab on Girder / Box Beam Bridges

These pedestrian structures typically utilize one or more main structural members to support a concrete slab of sufficient width for pedestrian and cyclist traffic. The main load carrying members can be either steel or concrete. The width of these bridges can vary, as the number of main load carrying members can be easily increased to support a wider structure. Often times, the main elements of these structures are installed with the use of an overhead crane. The concrete slabs are typically cast-in-place concrete; however, precast slabs are also an option to reduce construction durations but would increase capital costs. As such, the duration of construction for concrete slab on girder / box beam bridges is longer than that for a prefabricated truss option. Additionally, the load carrying members of these bridges are below the feet of the user, requiring increased clearance from underside of bridge to any conflicting structures or water bodies. Refer to **Figure 14** below for a typical concrete slab on concrete box beam pedestrian/cyclist bridge.



Figure 14: Typical concrete slab on concrete box girder pedestrian/cyclist bridge.

Steel Girders below Bridge Deck

Timber/concrete decks on steel girder pedestrian bridges are seen through Ontario. These bridges are most commonly historic railway bridges that are repurposed for pedestrian and cyclist use as the demand on the structural elements are greatly reduced compared to railway loading. While these structures are often used in their original location, as the railway corridor has been converted to a multi-use trail, they have been moved and installed in new locations. It is anticipated that this option will not likely be feasible for within the Study Area due to the spans required, costs for transportation and unknown availability. Refer to **Figure 15** for an example of a railway bridge re-purposed for pedestrian use.



Figure 15: Typical steel girder bridge repurposed for pedestrian/cyclist use.

Other Unique Pedestrian Bridge Structures

There are a number of unique structural designs that could be implemented for pedestrian bridge crossings that enhance the aesthetics of the crossing. These structures often serve as a gateway or focal point to a community; however, often are quite cost-prohibitive and are used for larger spans (greater than 50 m). An example of this type of structure is provided in **Figure 16**.



Figure 16: Humber River bicycle-pedestrian bridge (Source: Toronto and Region Conservation Authority).

6.3 Summary of Alternatives

A summary of the advantages and disadvantages of the alternatives solutions is provided in **Table 3**.

Table 3: Summary of Advantages and Disadvantages of Alternative Solutions

Alternative	Advantages	Disadvantages
Alternative 1 Bridge immediately south of GJR Bridge	<ul style="list-style-type: none"> • Eliminates current safety risk of pedestrians utilizing GJR bridge to cross the river • Connects future trail along GJR track from Huron Street to Macdonell Street • Opportunities for commemoration of cultural heritage resources in the area • Minimal naturalized vegetation will be removed • West abutment would be located behind existing retaining wall reducing natural heritage impacts. • No impact to flood lines, channel processes or fish movement potential 	<ul style="list-style-type: none"> • Potential impacts to views/vistas of surrounding heritage landscape • Requires a larger clear span compared to other alternatives • Significant obstruction of views to identified cultural heritage resources, particularly views to the GJR bridge from the south • No enhancement of existing aquatic habitat conditions

Alternative	Advantages	Disadvantages
Alternative 2 Bridge ±200 m north of Neeve Street	<ul style="list-style-type: none"> • In line with pedestrian promenade of 5 Arthur Street development • Can be seen from Arthur Street South • More efficient pedestrian movements getting people through the 5 Arthur Street site. • Location shown in 5 Arthur Street South, Urban Design Master Plan (January 2014) • Opportunities for commemoration of identified cultural heritage resources in the area • Provides an enhanced view from the bridge to the remaining built heritage features. • No impact to flood lines, channel processes or fish movement potential • Opportunity to restore damaged retaining wall (west side) and incorporate vegetation • West abutment would be located behind existing retaining wall reducing natural heritage impacts. • Close to multi-use pathway through the ward connecting through to Huron and would be more regional infrastructure not just for the 5 Arthur Street South development. • Close to destination/tourist point through the redevelopment of the existing heritage buildings at 43 Arthur Street South. • Just south of the approximate location of a prior conveyor/pedestrian bridge. 	<ul style="list-style-type: none"> • Requires vegetation removal on the west side of the river • Obstructed views to cultural heritage resources from the south • May interfere with existing/proposed bioswales on east side of Speed River • Requires ramp/stairs to heritage buildings on east side of Speed River
Alternative 3 Bridge ±140 m north of Neeve Street	<ul style="list-style-type: none"> • Located at midpoint between the GJR bridge and Neeve St. bridge • Aligns south of Surry Street East to provide a route to the future south platform expansion of the Guelph Central Station • Minimal impacts to identified cultural heritage properties • Reduction in length of supercritical flow during the regional flood event • No change to fish movement potential 	<ul style="list-style-type: none"> • West abutment would be located on the existing naturalized slope • Requires vegetation removal on the west side of the river affecting the naturalized slope • Need to mitigate slope impacts on west side of river • East abutment would be within the Regional flood elevation • Change in floodline due to altered flow regime (supercritical flow changes to subcritical flow) • Cannot be seen from Arthur Street South • May interfere with existing/proposed bioswales on east side of Speed River • May require long ramps (10-20 m) parallel to the Riverwalk in order to provide accessibility

Alternative	Advantages	Disadvantages
Alternative 4 Bridge ±90 m north of Neeve Street	<ul style="list-style-type: none"> • More clearance between river retaining wall and sidewalk/path on west side of the Speed River • Minimal impacts to identified cultural heritage properties • No impact to channel processes or fish movement potential • Opportunity to restore damaged retaining wall and incorporate bioengineering materials into the recently placed east side toe protection • Area has been previously disturbed due to the sanitary sewer and thus footprint of disturbance remains limited • West abutment would be located behind existing retaining wall reducing natural heritage impacts. 	<ul style="list-style-type: none"> • Requires vegetation removal on the west side of the river • May conflict with sanitary sewer infrastructure crossing the river • Bridge soffit and abutments would be within the floodplain • Anticipated increase in regional water level elevation • May interfere with existing/proposed bioswales on east side of Speed River • May require long ramps (10-20 m) parallel to the Riverwalk in order to provide accessibility
Alternative 5 Bridge ±50 m north of Neeve Street	<ul style="list-style-type: none"> • In line with pedestrian promenade between Phase 3 and 4 of the 5 Arthur Street South developments • Can be seen from Arthur Street South • Minimal impacts to identified cultural heritage properties • No impact to channel processes of fish movement potential • Opportunity to restore damaged retaining wall 	<ul style="list-style-type: none"> • Impacts the greatest number of trees, including large diameter trees • Close proximity to Neeve Street bridge • Bridge soffit and abutments would be within the Regional flood elevation • Anticipated increase in regional water level elevation • Conflicts with future plans to for a river viewing area on the east side of the Speed River • May interfere with existing/proposed bioswales on east side of Speed River • May require long ramps (10-20 m) parallel to the Riverwalk in order to provide accessibility • West abutment would be located on the existing naturalized slope
Alternative 6 Do Nothing	<ul style="list-style-type: none"> • Most economical option from a capital expenditure point of view 	<ul style="list-style-type: none"> • Fails to provide pedestrian connectivity between the Ward and Downtown • Current infrastructure may not provide sufficient pedestrian/cyclist capacity during peak usage times • 5 Arthur Street South, Urban Design Master Plan (January 2014) and Downtown Secondary Plan describe two bridge locations within the Study Area • Does not address current safety issue of pedestrians using existing GJR bridge • May require upgrades to existing adjacent bridges in the future to meet increased demand

6.4 Preliminary Costs

Preliminary cost estimates were prepared for the capital works associated with each alternative. Maintenance costs have not been included; however, maintenance costs would be assumed to be similar for each crossing location, and highly dependent on the type of bridge superstructure selected. Similarly, the expected useful life of the structures would be similar across all the alternatives, and highly dependent on the type of superstructure selected.

Preliminary capital cost estimates have been summarized in **Table 4** below. These costs also do not include other expenses (property, engineering, contingencies, utility relocation, HST, etc.). For the purposes of these cost estimates, the bridge superstructures have been assumed to be prefabricated steel truss structures.

Table 4: Preliminary Capital Cost Estimates

Alternative	Capital Cost
Alternative 1: Bridge Immediately south of GJR Bridge	\$500,000
Alternative 2: Bridge ±200 m north of Neeve Street	\$400,000
Alternative 3: Bridge ±140 m north of Neeve Street	\$425,000
Alternative 4: Bridge ±90 m north of Neeve Street	\$425,000
Alternative 5: Bridge ±50 m north of Neeve Street	\$400,000
Alternative 6: Do Nothing	\$100,000

6.5 Evaluation of Alternatives

The selection process for the Preferred Alternative Solution involves two steps: Assessment of Alternatives (Step 1) and Evaluation of Alternatives (Step 2). These steps are described below, with the results provided in **Table 5**.

Alternative 5 is strongly opposed based on the above and input from the City, various stakeholder groups and the public. Therefore, this alternative has been screened out and removed from further consideration for the comparative assessment and evaluation.

6.5.1 Assessment of Alternatives



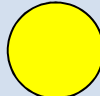


The potential benefits and impacts of each alternative are assessed against social, cultural, natural, technical and economic factors. The assessment is based on the existing environmental conditions compiled through field visits and secondary source information, as summarized in **Section 4**. The preliminary assessment was made available to stakeholders in February 2017 for review and comment. Comments received were more design related and a subsequent design review meeting was held with the stakeholders as discussed in **Section 5**.







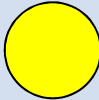
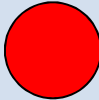


Refer to **Appendix H** for plan and elevation views of Alternatives 1 to 4, which were used during the assessment and evaluation of each alternative. Note that the superstructure type shown is that of a prefabricated steel truss bridge type for comparison and cost estimate purposes. Ultimately, the selection of the superstructure type will need to be confirmed during detailed design. This may impact the cost estimates provided in the previous sections.

6.5.2 Evaluation of Alternatives

A comparative examination of the advantages and disadvantages of the alternatives was completed based on the assessment. The evaluation was carried out using the Reasoned Argument method, comparing differences in impacts and providing a clear rationale for the selection of the preferred alternative.

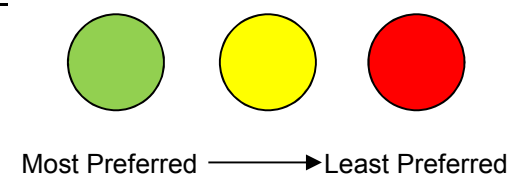
Table 5: Assessment and Evaluation of Alternative Solutions

Factor/Criteria	Alternative 1 Bridge immediately south of Guelph Junction Railway Bridge	Alternative 2 Bridge ±200 m north of Neeve Street	Alternative 3 Bridge ±140 m north of Neeve Street	Alternative 4 Bridge ±90 m north of Neeve Street	Alternative 6 Do Nothing
Socio-Economic Environment <ul style="list-style-type: none"> • Property Impacts • Impacts to Businesses and Adjacent Land Uses • Community Connectivity and Mobility including Cyclist/Pedestrian Movement • Visual Impacts • Public Safety 	<ul style="list-style-type: none"> • No property acquisitions required, but would have to adhere to setbacks to adjacent heritage buildings and GJR tracks. • Could require a short construction duration if new structure is prefabricated and craned into place. • Bridge would connect two multi-use trails on either side of the River, improving connectivity. • Improved connectivity between Ward and Downtown may benefit businesses in the area. • Visual impacts of new structure may be mitigated by the adjacent GJR bridge and Metrolinx viaduct. • Would greatly improve public safety as pedestrians currently use GJR bridge to cross the Speed River at this location. 	<ul style="list-style-type: none"> • Could require a short construction duration if new structure is prefabricated and craned into place. • Aligns with the proposed promenade on the east side of the Speed River. • This crossing location is conceptually shown on the Urban Design Master Plan for the 5 Arthur Street South developments. • Location close to proposed Wellington Street South Crosswalk leading to more direct route to the future south platform of the Guelph Central Station. • Close to destination/tourist point through the redevelopment of the existing heritage buildings. • As the 43 Arthur Street building is intended to be a destination point, view of the bridge from Arthur Street South will be beneficial for way-finding for visitors. • Improved connectivity between Ward and Downtown may benefit businesses in the area. • Does not address public safety issue of pedestrians that currently use the GJR bridge to cross the Speed River. 	<ul style="list-style-type: none"> • Could require a short construction duration if new structure is prefabricated and craned into place. • Location is midway between GJR bridge and Neeve Street. • Location close to proposed Wellington Street South Crosswalk leading to more direct route to the future south platform of the Guelph Central Station. • Bridge cannot be seen from Arthur Street South reducing way-finding for visitors. • Improved connectivity between Ward and Downtown may benefit businesses in the area. • Does not address public safety issue of pedestrians that currently use the GJR bridge to cross the Speed River. 	<ul style="list-style-type: none"> • Could require a short construction duration if new structure is prefabricated and craned into place. • Bridge cannot be seen from Arthur Street South reducing way-finding for visitors. • Improved connectivity between Ward and Downtown may benefit businesses in the area. • Does not address public safety issue of pedestrians that currently use the GJR bridge to cross the Speed River. 	<ul style="list-style-type: none"> • Does not improve connectivity between Ward and Downtown. • Urban Design Master Plan for the 5 Arthur Street South developments identifies pedestrian crossings in two locations. • Does not address public safety issue of pedestrians that currently use the GJR bridge to cross the Speed River. • Does not affect any existing views.
					

Factor/Criteria	Alternative 1 Bridge immediately south of Guelph Junction Railway Bridge	Alternative 2 Bridge ±200 m north of Neeve Street	Alternative 3 Bridge ±140 m north of Neeve Street	Alternative 4 Bridge ±90 m north of Neeve Street	Alternative 6 Do Nothing
Cultural Environment <ul style="list-style-type: none"> Built Heritage Archaeological Potential 	<ul style="list-style-type: none"> There was a pedestrian crossing in this location at one point in time. A new bridge may affect the views of existing heritage resources such as the GJR bridge and Metrolinx viaduct. Provides an enhanced view from the bridge to the remaining built heritage features. A new bridge could provide opportunities to commemorate identified heritage resources in the area. No anticipated impacts to areas with archaeological potential. 	<ul style="list-style-type: none"> A new bridge may affect the views of existing heritage resources such as the GJR bridge and Metrolinx viaduct. Provides an enhanced view from the bridge to the remaining built heritage features. Historically there was a conveyor bridge just north of this location. A new bridge could provide opportunities to commemorate identified heritage resources in the area. No anticipated impacts to areas with archaeological potential. 	<ul style="list-style-type: none"> Minimal impacts to existing heritage resources. A new bridge could provide opportunities to commemorate identified heritage resources in the area. No anticipated impacts to areas with archaeological potential. 	<ul style="list-style-type: none"> Minimal impacts to existing heritage resources. A new bridge could provide opportunities to commemorate identified heritage resources in the area. Areas with archaeological potential may be disturbed, requiring a Phase 2 Archaeological Assessment. 	<ul style="list-style-type: none"> No impacts to heritage resources. No impacts to areas with archaeological potential. Does not provide opportunities to create views of or commemorate existing heritage resources. 
Natural Environment <ul style="list-style-type: none"> Aquatic Habitat and Fish Passage Vegetation Wildlife and Habitat Species at Risk Floodplain 	<ul style="list-style-type: none"> No naturalized vegetation is anticipated to require removal. Construction would impact the fewest number of trees along the banks of the river. No impact to floodlines, channel processes or fish movement potential. No impacts to potential Species at Risk habitat. 	<ul style="list-style-type: none"> Requires naturalized vegetation removal on the west side of the Speed River. Bridge construction may affect the existing and proposed bioswales on the east side of the Speed River. No impact to floodlines, channel processes or fish movement potential. West abutment would be located behind an existing retaining wall reducing impact. No impacts to potential Species at Risk habitat. 	<ul style="list-style-type: none"> Requires naturalized vegetation removal on the west side of the Speed River. Bridge construction and long accessibility ramps will affect the existing and proposed bioswales on the east side of the Speed River. Potential for changes in flood elevations due to altered flow regime would need to be mitigated or accepted. No impact to fish movement potential. West abutment would be located on the existing naturalized slope and may impede the ability for vegetation to continue to be well-established and overhang the river. No impacts to potential Species at Risk habitat. 	<ul style="list-style-type: none"> Requires naturalized vegetation removal on the west side of the Speed River. Bridge construction and long accessibility ramps will affect the existing and proposed bioswales on the east side of the Speed River. Environmental disturbance has previously occurred in this area for construction of a sanitary sewer. Potential for changes in flood elevations due to bridge and abutments located within the floodplain. No impact to fish movement potential. West abutment would be located behind an existing retaining wall reducing impact. No impacts to potential Species at Risk habitat. 	<ul style="list-style-type: none"> No impacts to the natural environment. 

Factor/Criteria	Alternative 1 Bridge immediately south of Guelph Junction Railway Bridge	Alternative 2 Bridge ±200 m north of Neeve Street	Alternative 3 Bridge ±140 m north of Neeve Street	Alternative 4 Bridge ±90 m north of Neeve Street	Alternative 6 Do Nothing
Technical Environment <ul style="list-style-type: none"> Geometry Utilities Constructability Design Standards 	<ul style="list-style-type: none"> Requires a larger clear span compared to other alternatives, and may require an intermediate pier on one of the banks. Staging of construction would need to consider adjacent heritage resources. Significant utility coordination would be required before and during construction. A structure type that mirrors the historic arch crossing would be more expensive and difficult to construct. New structure would have an estimated 50-75 year design life. Designed as a pedestrian/cyclist bridge. 	<ul style="list-style-type: none"> Requires the shortest span and an accessibility ramp <u>not</u> parallel the east side of the Speed River. Staging of construction would need to consider adjacent heritage resources. Significant utility coordination would be required before and during construction. Construction would provide opportunities to restore the existing retaining all in this location. New structure would have an estimated 50-75 year design life. Designed as a pedestrian/cyclist bridge. 	<ul style="list-style-type: none"> Requires very long ramps (10-20 m) parallel to the Riverwalk/River for accessible access. Significant utility coordination would be required before and during construction. New structure would have an estimated 50-75 year design life. Designed as a pedestrian/cyclist bridge. 	<ul style="list-style-type: none"> Requires very long ramps (10-20 m) parallel to the Riverwalk for accessible access. Significant utility coordination would be required before and during construction. Construction may be more complex due to existing infrastructure in the area. New structure would have an estimated 50-75 year design life. Designed as a pedestrian/cyclist bridge. 	<ul style="list-style-type: none"> No impacts to the technical environment.
Economic Considerations <ul style="list-style-type: none"> Capital and Life Cycle Costs Structure Longevity 	<ul style="list-style-type: none"> Capital cost of new structure = \$ 490,000 Maintenance costs would be low initially and gradually increase over the life of the structure. Greater capital cost is largely due to span requirements. 	<ul style="list-style-type: none"> Capital cost of new structure = \$ 395,000 Maintenance costs would be low initially and gradually increase over the life of the structure. Additional maintenance would be required for stairs/ramps on east side of Speed River. 	<ul style="list-style-type: none"> Capital cost of new structure = \$ 420,000 Maintenance costs would be low initially and gradually increase over the life of the structure. Additional maintenance would be required for ramps on east side of Speed River. 	<ul style="list-style-type: none"> Capital cost of new structure = \$ 430,000 Maintenance costs would be low initially and gradually increase over the life of the structure. Additional maintenance would be required for ramps on east side of Speed River. 	<ul style="list-style-type: none"> No initial capital costs. Risk exposure from pedestrians may result in future costs to the City. Increased pedestrian and cyclist traffic may require infrastructure upgrades on Macdonell and Neeve Streets to accommodate increased traffic.
CONCLUSION					
	Alternative 1 is one of two most preferred alternatives.	Alternative 2 is one of two most preferred alternatives.			

Evaluation Legend:



7. RECOMMENDED ALTERNATIVE

7.1 Description of Recommended Alternative

Based on the Assessment and Evaluation of Alternatives presented in **Section 5**, the preferred solutions recommended for approval by Council are Alternative 1: Bridge Immediately south of GJR Bridge and Alternative 2: Bridge ±200 m north of Neeve Street.

Alternative 1 offers the City the best alternative to reduce risk exposure from pedestrians crossing the existing GJR bridge. This alternative would also replace a pedestrian bridge that was once located in this location. A bridge in this location would also link the existing Downtown Trail with the proposed trail along the GJR track from Huron Street towards downtown.

Alternative 2 offers the City a crossing to accommodate the increased pedestrian and cyclist traffic in the Ward, the lowest cost alternative, and provides a crossing location that is visible from Arthur Street South.

The bridge structures should be designed as pedestrian crossings, considering pedestrian and maintenance vehicle loading as per CSA S6-14 (the Canadian Highway Bridge Design Code).

7.2 Environment Impacts and Mitigation Measures

7.2.1 Socio-Economic Environment Impacts and Mitigation

Alternative 1 received almost unanimous support from stakeholder groups based on feedback received during consultation. Additionally, this alternative will address the ongoing safety issue of pedestrians using the existing GJR bridge to cross the Speed River.

The City owns the property on the west side of the Speed River, which can be used for staging during construction. Access through the private properties on the east side of the Speed River may be required to facilitate construction works. This should be arranged with the property owners during the design phase.

During construction, some detours and closures of the sidewalk and multi-use path on the west side of the Speed River will be required between Macdonell Street and Neeve Street.

Designs for both Recommended Alternatives should provide for enhanced views of the Speed River. Consideration for commemorative opportunities to heritage features in the area, as well as the existence of the previous pedestrian bridge at the location of Alternative 1, should be given.

Alternative 2 will need to consider the final build-out of the 43 Arthur Street property, the construction of a crosswalk on Wellington Street East and the level of demand warranting the second bridge location. At this time, the design should review whether moving the west abutment to the south would be warranted. This would skew the bridge across the Speed River to allow for the west end of the bridge to line up with a crosswalk on Wellington Street.

Based on the activities described in the “Tables of Drinking Water Threats” under the Clean Water Act (CWA, 2006), we do not foresee any activities during construction that would pose a risk to drinking water; however, this would need to be reviewed prior to construction as part of the design process. Mitigation measures to limit fuel storage and refueling should form part of the design process to be followed during construction. Once the bridge is constructed, the City should review the application of road salt on the bridge.

7.2.2 Cultural Environment Impacts and Mitigation

GJR Bridge

Neither of the Recommended Alternatives is anticipated to have a direct impact on the existing bridge, but there may be impacts to the views of this bridge from the surrounding area. Both the Recommended Alternatives could potentially obstruct existing views of the GJR bridge from the south; however, the construction of the bridges will create new views to appreciate the significance of this structure. Obstructions should be minimized through the design process. Opportunities for commemorative displays, such as interpretive plaques on the new structures, should be explored.

43 Arthur Street South

Neither of the Recommended Alternatives is anticipated to have a direct impact on the architectural features located at 43 Arthur Street South, but there may be impacts to the existing views to the property from the west bank of the Speed River for Alternative 2. Obstructions should be minimized through the design process so that Alternative 2 creates new views to appreciate the significance of the 43 Arthur Street building. Opportunities for commemorative displays, such as an interpretive plaque on the new structure, should be explored. Preservation of the industrial and commemorative theme of the existing area should be considered throughout the design stage and construction.

Ruins of Allan's Mill

Neither of the Recommended Alternatives is anticipated to have a direct impact on the ruins of Allan's Mill; however, there may be impacts to the views of these ruins from the surrounding area. Both the Recommended Alternatives would potentially obstruct views of the GJR bridge and Allan's Mill ruins from the east banks. Therefore, obstructions should be minimized through the design process. Opportunities for commemorative displays, such as interpretive plaques on the new structures, should be explored. Preservation of the industrial and commemorative theme of the existing area should be considered throughout the design stage and construction.

Archaeological Resources

Heritage Park is located within the Study Area, and has the potential for deeply buried archaeological resources. This area should be avoided during detailed design and construction.

There are no other anticipated areas of archaeological significance that could be disturbed for construction of the Recommended Alternatives.

7.2.3 Natural Environment Impacts and Mitigation

Water Processes

Based on the proposed construction activities for the Recommended Alternatives, there is very low potential for impacts to groundwater. Additionally, construction within the bankfull width of the Speed River is not anticipated. Therefore, impacts to surface water are considered minimal.

Trees

A total of 95 trees and seven tree groups were identified in the study area. Trees within 30 m of the proposed bridge locations have the potential to be injured or destroyed, as part of construction activity. During detailed design, a Tree Preservation and Compensation should be completed to provide recommendations on preservation or removal and to prescribe protection measures for retained trees. The removal of Manitoba Maple and Norway Maple from within the area of impact, and compensation with native, non-invasive trees would be considered a net benefit to the tree community. Compensation for tree removal should occur at a rate of 3:1 in accordance with City policies or as determined through consultation with City Planning staff and the GRCA.

Aquatic Habitat & Fish Passage

The Speed River in the Study Area is classified as coolwater fish habitat. Impacts to aquatic habitat could include sedimentation from construction, construction below the high water mark, impacts to fish habitat and water quality changes due to pedestrian bridge maintenance. The flow and characteristics of the watercourse will not be altered by the pedestrian bridges, as the bridges are proposed to completely span the river. The removal of invasive species and restoration of riparian habitat, where possible, along the Speed River would serve to improve fish habitat by providing

cover within this reach of the Speed River, and would be an overall benefit. The addition of a bridge above the natural deposition area located adjacent to Neeve Street may have greater impacts due to winter maintenance of trails, changes to the vegetation composition from foot traffic and introduction of non-native materials.

Vegetation

The majority of the herbaceous vegetation to be removed consists of non-native and weedy species. Removal of invasive species and restoration of riparian areas would provide an overall benefit to vegetation in the area of the pedestrian bridges.

Significant Wildlife Habitat

The Speed River is identified as a Waterfowl Overwintering area. Species that have been observed in the River, and adjacent riparian area, include Mallard and Canada Goose. Both species are considered tolerant to humans and development disturbance in the short term. Clear span bridges are unlikely to impact this habitat, and through the use of a clear spanning design above the existing retaining walls or valleyland slopes, the pedestrian bridges will occur entirely outside the habitat. The restoration of riparian areas within the valleylands may also provide additional refuge areas for waterfowl.

Species at Risk

No species at risk listed as threatened or endangered or their regulated habitat were identified in the Study Area. The addition of pedestrian bridges may convey a benefit to Barn Swallow, by providing suitable nesting habitat below the pedestrian bridges.

Wildlife & Wildlife Habitat

Potential wildlife impacts generally include the potential to harm or harass migratory birds during the migratory bird nesting season and wandering wildlife within the construction area. Recommended mitigation for these impacts include the avoidance of any clearing or grading during the general nesting season (April 1-August 31) where possible, and the clear delineation of the work space through the installation of silt and sediment and tree protection fencing to avoid potential entry by wandering wildlife. Benefits to wildlife include the addition of the bridges, which may provide nesting habitat for birds that nest on man-made structures (e.g., Barn Swallow, Northern Rough-winged Swallow).

Significant Valleylands

Valleylands occur to either side of the Speed River, where retaining walls are not present. Impacts to valleylands include the potential for increased erosion on ravine slopes adjacent to the Speed River during construction, impacts to unstable landforms and potential loss of stabilizing roots from trees to be removed. Through the installation of pedestrian bridges above existing structures (e.g., retaining walls), impacts to valleylands can be negated. The restoration of riparian areas may also provide a benefit to valleylands, through the installation of vegetation to provide greater slope stabilization.

Restoration, Compensation and Invasive Species Management Strategy

A comprehensive restoration, compensation and invasive species mitigation strategy should be developed as part of the detailed design and implementation of the first Recommended Alternative. This will inform the design process to re-establish native vegetation communities along the entire west valley slope of the Speed River within the Study Area following construction, and limit the likelihood of invasive species becoming dominant within the newly disturbed areas.

7.2.4 Technical Environment Impacts and Mitigation

The soffit elevation for Alternative 1 is not expected to have significant impacts to the in-stream hydraulic conditions of the Speed River through the Study Area. Given that this section of the Speed River is currently impacted by existing structures, it may be a beneficial location to construct the proposed pedestrian crossing. The fluvial processes are already impacted by the concrete spillway, Macdonell Street crossing and the GJR bridge crossing. Therefore, Alternative 1 should not impose further impacts through its construction. Similarly, fish passage is likely impacted by the concrete spillway upstream of Alternative 1. Thus no further implications for fish passage are expected.

Alternative 2 occurs through a portion of super-critical flow along the Speed River; however, the proposed soffit elevation is not expected to impact the existing in-stream hydraulic conditions of the Speed River. The section of the Speed River at station 0+155 contains the retaining walls on the east and west banks, meaning that fluvial processes are already impacted by existing conditions. Therefore, construction of Alternative 2 should not further impact the fluvial processes and fish passage should not be impacted given that it is not expected to modify the existing in-stream hydraulic conditions.

The span of Alternative 2 will need to be reviewed at the design stage, as it may change with movement of the west abutment to the south. How the east approach to Alternative 2 ties into the 43 Arthur Street property will also need to be reviewed.

7.3 Additional Recommendations

The following are additional recommendations to be considered by the City:

- During the Class EA study, several comments and questions were provided by the public regarding pedestrian and cyclist movements at the intersection of Macdonell Street / Wellington Street East / Woolwich Street. The developments surrounding the Study Area and Recommended Alternatives are likely to exacerbate the existing situation by conveying more pedestrian and cyclist traffic to this area. The City may wish to consider conducting additional investigations for ways to improve safety and traffic movements, both vehicular and active, at this intersection.
- Based on the comments received during the Class EA study, as well as the probable budget restrictions for these projects, we recommend that Alternative 1 be constructed now and Alternative 2 be constructed at a later date. Future growth and intensification in the area, as well as the planned construction of a south platform at Guelph Central Station, will likely dictate the timing for a second crossing. We note that this Class EA study is only valid for 10 years after acceptance by the Ministry of Tourism and Culture under the current Municipal Class Environmental Assessment Act.
- Through speaking with the public regarding pedestrian and cyclist movements along the east side of Wellington Street East during the Class EA study, the City may wish to consider improving the sidewalk to a multi-use trail to provide sufficient room for both pedestrian and cyclist use in a safe manner.
- The construction of a crosswalk on Wellington Street East between Macdonell Street and Neeve Street should be considered.
- During the design phase for Alternative 2, moving the west abutment of the bridge south to line up with the proposed crosswalk on Wellington Street should be reviewed.
- A geotechnical investigation should be completed to determine the foundation type and location for the proposed structures.

8. NEXT STEPS

The following steps are recommended following completion of the Class EA study:

- Decisions on the appearance of the Recommended Alternatives will need to be made, possibly through additional studies and consultation by the City.
- Implementation details including detailed design, agency approvals and tendering of the project for construction.
- Coordination with utilities to locate services as well as develop and implement mitigation measures (i.e., protection of existing utilities, temporary utilities during construction, etc.)
- Construction.

**APPENDIX A:
CULTURAL HERITAGE RESOURCE ASSESSMENT
& HERITAGE IMPACT ASSESSMENT**

**APPENDIX B:
STAGE 1 ARCHAEOLOGICAL ASSESSMENT**

**APPENDIX C:
SCOPED ENVIRONMENTAL IMPACT STUDY**

**APPENDIX D:
GEOMORPHIC ASSESSMENT**

**APPENDIX E:
INTERCEPT SURVEY, PIC BOARDS AND COMMENTS**

**APPENDIX F:
AGENCY CONSULTATION AND COMMENTS**

**APPENDIX G:
PUBLIC CONSULTATION AND COMMENTS**

**APPENDIX H:
DRAWINGS OF ALTERNATIVES**