APPENDIX F

Heritage Impact Assessment Report

WELLINGTON COUNTY

HERITAGE IMPACT ASSESSMENT

CONESTOGO RIVER BRIDGE #4 (B109133)

January 28, 2022

FINAL

HERITAGE IMPACT ASSESSMENT

CONESTOGO RIVER BRIDGE #4 (B109133)

WELLINGTON COUNTY

FINAL

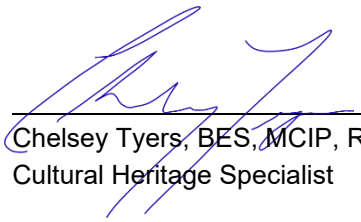
PROJECT NO.: 17M-01271-01
DATE: JANUARY 28, 2022

WSP
4 HUGHSON STREET SOUTH, SUITE 300
HAMILTON, ON, CANADA L8N 3Z1

WSP.COM

SIGNATURES

PREPARED BY



Chelsey Tyers, BES, MCIP, RPP
Cultural Heritage Specialist

January 28, 2022
Date

APPROVED BY

Joel Konrad, PhD, CAHP
Cultural Heritage Lead - Ontario

January 28, 2022
Date

EXECUTIVE SUMMARY

WSP Canada Inc. (WSP) was retained by Wellington County to complete the preliminary and detailed design of the Conestogo River Bridge #4 (B109133) replacement through a Municipal Class Environmental Assessment (MCEA) Study.

In advance of the commencement of the MCEA Study, WSP completed a Cultural Heritage Evaluation Report (CHER) for the Conestogo River Bridge #4 and submitted to the County of Wellington in January 2020. The CHER determined that the Conestogo River Bridge #4 is of cultural heritage value or interest for design and contextual reasons through application of Ontario Regulation 9/06.

The County of Wellington has also retained WSP to complete a Heritage Impact Assessment of the Conestogo River Bridge #4 in advance of the MCEA Study, to identify whether there are any impacts to the bridge's identified cultural heritage value or interest and list of heritage attributes, to demonstrate how the resource will be conserved if possible and to recommend mitigative or avoidance measures, alternative development or site alteration as appropriate. This document builds upon the CHER to address the requirements for the HIA.

The completion of this study has resulted in the following recommendations:

1. The Bridge #4 should be recorded through a Documentation and Salvage Report containing measured drawings, a thorough photographic record and written description of the bridge as well as recommendations for elements worthy of salvage prior to demolition (i.e., steel truss members, commemorative bridge plaque). Given the County of Wellington intends to replace other bridges along Wellington Road 109 (Conestogo Bridge #5, Conestogo Bridge #6 and Conestogo Bridge #10) and that these bridges have a contextual relationship to each other and Wellington Road 109, being built around the same time by the DHO, WSP recommends that the documentation of each bridge be combined into one report. This report should be shared with the County of Wellington and the County of Wellington Museum & Archives. The bridge(s) should be documented to the standard outlined according to section 6.3.1.4 of the MTO *Environmental Guide for Built Heritage and Cultural Heritage Landscapes* (2007), and according to the *Historic American Engineering Record* (HAER) guidelines.

2. Commemoration opportunities should be explored for the bridge with community input.

3. The construction of a new bridge should be designed in a manner that draws from the design inspiration and materials of the extant bridge while maintaining legibility. Design considerations should explore the incorporation of the scale, massing, rhythm and finishes of the original bridge, where possible and feasible. Specifically,

the arched concrete design, the placement and design of the concrete railings, and siting at the same location over the Conestogo River should be considered in the final design for the replacement structure.

PROJECT PERSONNEL

CLIENT

Client Contact	Joe DeKoning, P. Eng. Manager of Construction, Wellington County

WSP

Project Manager	William Van Ruyven, P. Eng.
Cultural Heritage Specialist	Chelsey Tyers, BES, RPP, MCIP Cultural Heritage Specialist
Report Preparation	Chelsey Tyers Jacqueline Bradica, BA Cultural Heritage Assistant
GIS and Mapping	Andrew Turner, MSc.
Report Review	Joel Konrad, PhD, CAHP Cultural Heritage Lead – Ontario

TABLES

FIGURES

1 INTRODUCTION

1.1 PROJECT CONTEXT

WSP Canada Inc. (WSP) was retained by Wellington County to complete a Heritage Impact Assessment (HIA) in advance of the Municipal Class Environmental Assessment (MCEA) Study for Conestogo River Bridge #4. A Cultural Heritage Evaluation Report (CHER) was completed in January 2020 and determined that the subject bridge has cultural heritage value or interest in accordance with Ontario Regulation 9/06 (O. Reg. 9/06). The CHER recommended that an HIA be conducted for the preferred alternative to assess the impact and recommend appropriate mitigation measures.

The County of Wellington is seeking to replace the Conestogo River Bridge #4 with a new bridge structure (Figure 1). As such, the purpose of this report is to build upon the conclusions of the CHER and address the requirements for the HIA. This includes an analysis of the impact of the structure removal and replacement and recommendations for mitigation measures.

wsp

LEGEND

- Connestoga Bridge 4

TITLE: FIGURE 1: PROJECT LOCATION	SCALE: 1:15,000	PROJECT NO: 17M-01271-01	DATE: NOVEMBER 2019
	DRAWN BY: AST	CLIENT: WELLINGTON COUNTY	
PROJECT: CONNESTOGA BRIDGE #4 CHER	CREDITS: LAND INFORMATION ONTARIO		

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2 LEGISLATION AND POLICY CONTEXT

2.1 PROVINCIAL AND MUNICIPAL CONTEXT AND POLICIES

2.1.1 PROVINCIAL POLICY CONTEXT

This HIA considers built heritage resources and cultural heritage landscapes in the context of a proposed bridge replacement under the *Environmental Assessment Act* (1990), the *Planning Act* (1990), and O. Reg. 160/02: Standards for Bridges (*Public Transportation and Highway Improvement Act*, R.S.O. 1990, c. P.50). This assessment addresses above-ground built heritage resources over 40 years old (MTO, 2007; Ontario Realty Corporation, 2007) as well as through the application of the Ministry of Heritage, Sport, Tourism and Culture Industries' (MHSTCI) *Criteria for Evaluating Potential for Built Heritage Resources and Cultural Heritage Landscapes* (2016), and the Municipal Engineers Association's (MEA) *Municipal Heritage Bridges, Cultural, Heritage and Archaeological Resources Assessment Checklist* (2014).

Under the *Environmental Assessment Act*, environment is defined in Subsection 1(c) to include:

- Cultural conditions that influence the life of man or a community, and;
- Any building, structure, machine, or other device or thing made by man.

The MHSTCI is charged under Section 2 of the *Ontario Heritage Act* with the responsibility to determine policies, priorities and programs for the conservation, protection and preservation of Ontario's cultural heritage resources. To that end, the MHSTCI has published the following guidelines to assist in assessing cultural heritage resources as part of an environmental assessment:

- *Guideline for Preparing the Cultural Heritage Resource Component of Environmental Assessments* (1992);
- *Guidelines on the Man-Made Heritage Component of Environmental Assessments* (1981); and
- *Ontario Heritage Toolkit, Info Sheet #5: Heritage Impact Assessments and Conservation Plans* (2006).

All guidelines have been utilized in this assessment process.

Additionally, the *Planning Act* and related *Provincial Policy Statement* (PPS) (2020) provide guidance on the identification and conservation of built heritage resources and cultural heritage landscapes. In Subsection 2.6 - Cultural Heritage and Archaeological Resources, the *PPS* states that:

2.6.1 Significant built heritage resources and significant cultural heritage landscapes shall be conserved.

2.1.2 WELLINGTON COUNTY OFFICIAL PLAN

The Wellington County Official Plan was adopted by Wellington County Council on September 24, 1998, approved by the Ministry of Municipal Affairs on April 13, 1999, came into effect on May 6, 1999 and was last updated on August 15, 2019. Policies relevant to this HIA include:

4.1.2 **Ontario Heritage Act**

Under the Ontario Heritage Act, a local Council may pass by-laws to:

a) Designate individual properties of cultural heritage value or interest, in accordance with the criteria set out in Ontario Regulation 9/06. Such a by-law shall include a description of the property and a statement of cultural heritage value or interest and description of the heritage attributes;

4.1.5 **Policy Direction**

a) significant built heritage resources and significant cultural heritage landscapes shall be conserved. Conserved means the identification, protection, use and/or management of cultural heritage and archeological resources in such a way that their heritage values, attributes and integrity are retained. This may be addressed through a conservation plan or heritage impact assessment in accordance with Section 4.6.7.

4.6.7 **Heritage Impact Assessment and Conservation Plan**

A heritage impact assessment and conservation plan may be required to determine if any significant cultural heritage resources are impacted by a development proposal. A heritage impact assessment is a study to determine if any significant cultural heritage resources are impacted by a development proposal, whether the impacts can be mitigated, and by what means. A heritage impact assessment will generally be required to contain:

a) Historical research, site analysis and evaluation

b) Identification of the significance and heritage attributes of the cultural heritage resources

c) Description of the proposed development or site alteration

d) Assessment of development or site alteration impact

e) Consideration of alternatives, mitigation and conservation methods. Methods to minimize or avoid a negative impact on a significant cultural heritage resource include, but are not limited to:

   i) alternative development approaches

   ii) isolating development and site alteration from significant built and natural features and vistas

   iii) design guidelines that harmonize mass, setback, setting, and materials

   iv) limiting height and density

v) allowing only compatible infill and additions

vi) reversible alterations

vii) buffer zones, and

viii) site plan control

f) Implementation and monitoring

g) Summary statement and conservation recommendations

2.2 METHODOLOGY

The recommendations of this HIA are based on an understanding of the physical values of the property, a documentation of its history through research, an analysis of its social and physical context, comparisons with similar properties and mapping.

This HIA is guided by key documents and policies such as the Municipal Engineers Association's (MEA) Municipal Heritage Bridges, Cultural, Heritage and Archaeological Resources Assessment Checklist (2014), the Reference Guide on Physical and Cultural Heritage Resources (Government of Canada, 1996), the Ontario Heritage Toolkit (Ministry of Culture, 2006), the Guidelines for Preparing the Cultural Heritage Resource Component of Environmental Assessments (Ministry of Culture and Communications, 1992), and the County of Wellington's HIA requirements in Section 4.6.7 of the County of Wellington Official Plan.

An HIA examines a property in its entirety, including its relationship to its surroundings, as well as its individual elements – engineering works, landscape etc. This report will include the following reproduced from the CHER:

- Thorough photographic documentation of the bridge and context;
- A written description of the existing conditions and immediate context; and,
- A draft statement of CHVI.

For the complete background including the history of the immediate context, land-use history of the bridge, comparative analysis and assessment of the bridge according to O. Reg. 9/06, please consult the CHER directly.

To address the requirements of an HIA this report will also include:

- A review of the preferred alternative and the identification of potential impacts to the subject bridge; and,
- The identification and analysis of mitigation opportunities as required.

3 EXISTING CONDITIONS

3.1 DESCRIPTION OF STRUCTURE

The Conestogo River Bridge #4 is a two-lane, single span rigid-frame structure constructed in 1931 and located along Wellington Road 109, 1.7 km east of Highway 6 (Figure 1). The bridge is not listed on a municipal heritage register or designated under the *Ontario Heritage Act.* It is also not included on the list of provincial heritage properties maintained by the MHSTCI.

The Conestogo River Bridge #4 is a reinforced cast-in-place bridge with concrete abutments, asphalt paving surface and cast-in-place concrete railing. The bridge is oriented west to east and spans 13.8 m, while the roadway width is 9.5 m, the overall width is 13.8 m and the total deck length is 16 m. Embankments on either end of the bridge consist of soil and overgrown, low lying vegetation. Approaches to the bridge on both sides are straight and flat, and both sides of the road are lined with steel barriers (Images 1-10).

As the Conestogo River Bridge #4 is a rigid-frame concrete bridge, the superstructure and substructure were cast as one single unit. The substructure consists of reinforced concrete abutments. The abutments were cast-in-place separately and are separated from the superstructure by a construction joint. The superstructure has a segmental arch with a deck depth ranging from 0.93 m (3’1”) to 0.38 m (1’3”). The bridge deck consists of paved asphalt and both sides of the bridge have a reinforced concrete railing system. A sidewalk is only located on the north side of the bridge’s deck.

Repairs to the bridge were undertaken in 1989 which included repairs to the superstructure, railings and curbs; patching, waterproofing and paving the deck; and soffit repairs. In accordance with legislation, inspections of the bridge have been conducted biennially to monitor the conditions of the bridge and identify any potential repair or replacement. The most recent Municipal Structure Inspection Form (MSIF) was completed in May 2018 by WSP. The form identifies the condition of each element and is summarized in Table 2. In total, approximately 60% of the bridge is considered to be in good condition, 28% is considered to be in fair condition and 11% is considered to be in poor condition. Overall the MSIF has attributed a Building Condition Index of 52.78 (a score out of 100) and notes the overall condition as “Poor”.

Table 1: Summary of Bridge Condition from the Municipal Structure Inspection Form

Bridge Element	Condition (square metres)			
	Excellent	Good	Fair	Poor
Deck: wearing surface	0	106.63	16	8

Decks: soffit thick slab (interior)	0	142.33	15.8	0
Decks: soffit thick slab (exterior)	0	6	8	8
Decks: drainage	0	3	1	0
Sidewalks and curbs	0	20	30	30
Barriers: concrete balustrade	0	10	20	20
Barriers: parapet wall with single railing	0	0	25	25
Barriers: railing system (steel flex beam on steel post)	0	188	0	0
Abutments: wingwalls	0	22.4	4	4
Abutments: abutment walls	0	27.75	12	12
Stream and waterway	0	1	0	0
Embankments	0	0	4	0
Approaches: wearing surfaces	0	90	16	8
Totals	0	617.11	151.8	115
	0.00%	69.82%	17.17%	13.01%

Image 1: Looking west to west approach to the bridge

Image 2: Looking east to east approach to the bridge

Image 3: Looking east towards the bridge deck

Image 4: Looking north towards south side of the bridge

Image 5: Looking southeast towards north side of the bridge

Image 6: View of the south side of the west wingwall

Image 7: View of hand rail, note construction joint between abutment and deck/superstructure

Image 8: View of sidewalk on north side of the bridge deck

Image 9: View of west abutment

Image 10: View of west abutment and bridge soffit, note the formwork outlines in the concrete used to cast the concrete

3.1.1 DESIGN AND CONSTRUCTION

Structure Name	Conestogo River Bridge #4	**Road Name**	Wellington Road 109
District	Central Region	**Road Type**	Highway
Municipality	Township of Wellington North	**Owner**	Wellington County
Bridge or Culvert	Bridge	**Overall Structure Width (m)**	11.5
Structure Type	Rigid-frame	**Roadway Width (m)**	9.5
Span (m)	13.8	**Total Deck Length (m)**	16
Height (M)	Unknown	**Total Deck Area (s.m)**	185
Direction of Structure	West/East	**Heritage Description**	None
Year Built/Rehabilitated	Built 1931		
Current Load Limit	Unknown	**Designer/Construction Firm**	Department of Highways Ontario
Waterway	Conestogo River		

A site visit to the structure was completed to record existing conditions. An inspection of the bridge and the landscape context was conducted on November 6, 2019. The weather allowed for good visibility of the landscape and structural features. Access to the bridge was gained via Wellington Road 109.

3.2 DESCRIPTION OF STUDY AREA AND LANDSCAPE CONTEXT

The Conestogo River Bridge #4 is located in the Township of Wellington North, in Wellington County. The study area consists of the current bridge, approaches to the bridge and the embankments supporting the bridge (Images 11-14). Wellington Road 109 consists of a two lane-divided road with gravel shoulders that was formerly provincial Highway 9. The approaches to the Conestogo River Bridge #4 are straight and flat, and include steel guardrails on both sides of the road on either end of the bridge.

The area surrounding the bridge includes cultivated agricultural fields lined with interspersed deciduous and coniferous trees parallel to the road. A steel and metal bridge structure is located north of the bridge on private property crossing the Conestogo River.

The Conestogo River flows underneath the bridge and the riverbank on the west side, south of the bridge, is supported by gabions. Narrow, shallow and winding, the Conestogo River crosses Wellington Road 109 multiple times within the general area.

Image 11: Looking northeast towards agricultural fields

Image 12: Looking north towards a small bridge in the agricultural field

Image 13: Looking south towards the Conestogo River surrounded by agricultural fields

Image 14: Looking east towards the bridge and the Conestogo River

3.3 ARCHAEOLOGY ASSESSMENT

As of the writing of this report, a Stage 1-2 Archaeological Assessment report is currently underway for Bridge #4 by WSP.

4 RESULTS OF CULTURAL HERITAGE ASSESSMENT

The CHER (dated October 4, 2021) found that the Conestogo River Bridge #4 has cultural heritage value or interest according to Ontario Regulation 9/06 (*Ontario Heritage Act*). Accordingly, the following Statement of Cultural Heritage Value or Interest and list of Attributes has been prepared.

4.1 STATEMENT OF CULTURAL HERITAGE VALUE OR INTEREST

4.1.1 DESCRIPTION OF RESOURCE

The Conestogo River Bridge #4 was constructed in 1931 to carry Highway 9 (now Wellington Road 109) traffic over the Conestogo River in the Township of Wellington-North, Wellington County. The rigid-frame cast-in-place concrete bridge is a single span and allows for two lanes of traffic to travel across it.

4.1.2 CULTURAL HERITAGE VALUE OR INTEREST

Built in 1931, the Conestogo River Bridge #4 is one of three rigid-frame cast-in-place concrete bridges along Wellington Road 109 built between 1931 and 1934. The Conestogo River Bridge #4 is an early and representative example of a rigid-frame cast-in-place concrete bridge in Wellington County. The bridge has had minimal repairs since it's construction and continues to display the original rigid-frame design which consists of the reinforced cast-in-place superstructure and substructure, the reinforced and cast-in-place wingwalls and the concrete hand rails.

The bridge was built by the Department of Highways, Ontario (DHO) according to their General Specifications for Concrete Highway Bridges. These specifications emphasized the importance of the aesthetic quality of bridges, particularly the hand rails and arched design. The subject bridge exhibits a simple but aesthetically pleasing design that also supports the character of the surrounding rural area.

The Conestogo River Bridge #4 also demonstrates a contextual relationship with the other two rigid frame cast-in-place bridges (Conestogo River Bridge #6 and Conestogo River Bridge #10) built by the DHO along Wellington Road 109 shortly after the DHO acquired the road and designated it Provincial Highway 9.

4.1.3 DESCRIPTION OF HERITAGE ATTRIBUTES

The heritage attributes that reflect the cultural heritage value or interest of the Conestogo River Bridge #4 include:

- One-span length;
- Reinforced, cast-in-place wingwalls;
- Reinforced, cast-in-place abutments;
- Slight arch design; and
- DHO railing system.

5 PROPOSED UNDERTAKING, IMPACTS AND MITIGATION

5.1 DESCRIPTION AND PURPOSE OF PROPOSED UNDERTAKING

The Conestogo River Bridge #4 consists of a reinforced cast-in-place bridge with concrete abutments, asphalt paving surface and cast-in-place concrete railing. The bridge is oriented west to east and spans 13.8 m, while the roadway width is 9.5 m, the overall width is 13.8 m and the total deck length is 16 m. As part of a bridge inspection conducted in 2018, the Bridge #4 was found to be in poor condition with major elements showing signs of significant deterioration. WSP has been retained by the County of Wellington to complete a Municipal Class EA Study to address these items and the County is seeking to replace the bridge with a new structure.

The following four alternatives are being considered for Bridge #4 as a result of the MCEA Study:

Option 1 – Do Nothing

This would not include any repairs to the structure but would include regular monitoring and may require that the bridge be closed and thus the road as well.

Option 2 – Remove Without Replacement

This would include removal of the bridge and closure of the road.

Option 3 – Rehabilitation

Areas of deterioration would be removed and repaired and the bridge may require widening to meet current safety standards. To facilitate the flow of traffic during the bridge rehabilitation, a temporary bailey bridge may need to be installed adjacent to the road to allow through traffic.

Option 4 – Replace

This would include complete removal of the existing structure and replacement with a new bridge. To facilitate the flow of traffic during the bridge replacement, a temporary bailey bridge may need to be installed adjacent to the road to allow through traffic.

5.2 IMPACT ASSESSMENT

This section provides an assessment of the potential adverse effects resulting from the proposed undertakings.

Built heritage resources may experience displacement or **direct impacts**, i.e., demolition or removal of heritage attributes. Direct impacts are permanent, not temporary changes to the cultural heritage environment.

Built heritage resources may also experience disruption, or **indirect impacts**, by the introduction of physical, visual, audible or atmospheric elements that are not in keeping with their character and/or setting. These indirect impacts may be temporary during construction, such as vibration impacts and dust particles, or permanent such as the introduction of new infrastructure. Other indirect impacts of a temporary or permanent nature may include, but are not limited to, changes in grading, alterations to built heritage resource setting and fabric as a result of visual, audible or atmospheric elements, etc. Indirect impacts can be permanent or temporary changes to the cultural heritage environment.

The impacts of each of the four alternatives being considered for the bridge through the MCEA Study will be rated based on the following categories identified in Table 2.

Table 2: Impact Ratings

RATING	DESCRIPTION
None	The proposed undertaking has no impact on the heritage value/attribute.
Low	The undertaking has minimal impact on the heritage value/attribute.
Medium	The undertaking affects/disturbs the heritage value/attribute. The undertaking requires mitigation.
High	The undertaking replaces/removes a heritage value/attribute. The undertaking requires mitigation.

5.3 EVALUATION OF IMPACTS

Table 3 provides an evaluation of the impacts of the four alternatives being explored in the MCEA Study.

Table 3: Evaluation of Impacts

CRITERIA	EVALUATION			
	Option 1: Do Nothing	**Option 2: Remove Without Replacement**	**Option 3: Rehabilitation**	**Option 4: Replace**
Destruction of any, or part of	Impact Rating: None	Impact Rating: High	Impact Rating: None	Impact Rating: High

any, significant heritage attributes or features.	Rationale: No heritage attributes will be impacted if the bridge remains *in situ*.	Rationale: Removal of the bridge would result in the destruction of all heritage attributes.	Rationale: No heritage attributes will be destructed.	Rationale: Replacement of the bridge would result in the destruction of all heritage attributes.
Alteration that is not sympathetic, or is incompatible, with the historic fabric and appearance.	Impact Rating: None Rationale: No heritage attributes will be impacted if the bridge remains *in situ*.	Impact Rating: None Rationale: Removal of the bridge is not considered an “alteration” and will result in the destruction of all heritage attributes.	Impact Rating: Medium Rationale: Rehabilitation of the bridge to meet current safety standards and repair deteriorated elements may result in some physical changes to the heritage attributes.	Impact Rating: None Rationale: Replacement of the bridge is not considered an “alteration” and will result in the removal of all heritage attributes.
Shadows created that alter the appearance of a heritage attribute or change the viability of a natural feature or plantings, such as a garden.	Impact Rating: None Rationale: There will be no new shadows created.	Impact Rating: None Rationale: There will be no new shadows created.	Impact Rating: None Rationale: There will be no new shadows created.	Impact Rating: None Rationale: There will be no new shadows created.
Isolation of a heritage attribute from its surrounding environment, context or a significant relationship.	Impact Rating: None Rationale: No heritage attributes will be impacted if the bridge remains *in situ*.	Impact Rating: None Rationale: Removal of the bridge will remove all the heritage attributes.	Impact Rating: None Rationale: Rehabilitation of the bridge will not result in the isolation of any heritage attributes.	Impact Rating: None Rationale: Replacement of the bridge will remove all the heritage attributes.
Direct or indirect obstruction of significant views or vistas within, from, or	Impact Rating: None Rationale: Significant views or vistas were not identified as heritage	Impact Rating: None Rationale: Significant views or vistas were not identified as heritage	Impact Rating: None Rationale: Significant views or vistas were not identified as heritage	Impact Rating: None Rationale: Significant views or vistas were not identified as heritage

to built and natural features.	attributes of the bridge.	attributes of the bridge.	attributes of the bridge.	attributes of the bridge.
A change in land use such as rezoning a battlefield from open space to residential use, allowing new development or site alteration to fill in the formerly open spaces.	Impact Rating: None Rationale: No change in land use will occur if the bridge remains *in situ*.	Impact Rating: High Rationale: The removal of the bridge will result in a change in land use resulting from the closure of an arterial road.	Impact Rating: None Rationale: There will be no change in use.	Impact Rating: None Rationale: There will be no change in use.
Land disturbances such as a change in grade that alters soils, and drainage patterns that adversely affect an archaeological resource.	Impact Rating: None Rationale: No land disturbance will occur if the bridge remains *in situ*.	Impact Rating: Low Rationale: Removal of the bridge will result in soil disturbance.	Impact Rating: None Rationale: There will be no change in grade.	Impact Rating: None Rationale: There will be no change in grade.

5.4 RESULTS OF IMPACT ASSESSMENT

The impact assessment outlined in Section 5.3**Error! Reference source not found.** has reviewed the four alternatives being explored for the Bridge #4 through the MCEA Study and determined the following:

- **Option 1 – Do Nothing** will not result in any impacts to the bridge's heritage attributes however it will also not address the deteriorating condition of the structure.
- **Option 2 – Remove Without Replacement** will result in significant impacts as it would require the complete demolition of the bridge and its heritage attributes, removal of the bridge's contextual relationship to the historic crossing of Wellington Road 109 over the Conestogo River, removal of the contextual relationship with the two other rigid frame cast-in-place bridges (Conestogo River Bridge #6 and Conestogo River Bridge #10) built by the DHO and closure of Wellington Road 109 at the river crossing.

- **Option 3 – Rehabilitation** of the bridge to meet current safety standards and to repair deteriorated elements will result in physical changes, thus impacting the integrity of the bridge's heritage attributes.
- **Option 4 – Replacement** of the bridge in its entirety will result in significant impacts through the destruction of all the structure's heritage attributes as well as removal of the bridge's contextual relationship to the historic crossing of Wellington Road 109 over the Conestogo River at this location and well as the contextual relationships to the other two rigid frame cast-in-place bridges (Conestogo River Bridge #6 and Conestogo River Bridge #10) built by the DHO along Wellington Road 109.

From a cultural heritage perspective, the alternatives that retain the concrete structure of the Bridge #4 in its current location are the most desirable (Options 1 and 3). If the bridge is to be retained and/or rehabilitated, the heritage attributes should be conserved. Option 4, which would see the current bridge removed and replaced with a new bridge, could maintain several of the bridge's design and contextual attributes through the application of mitigation measures. Option 2 represents the least desirable option as it would see the complete removal of the structure and closure of Wellington Road 109 at the river crossing.

5.5 CONSIDERED ALTERNATIVES AND MITIGATION MEASURES

When adverse impacts are expected from proposed site alteration, alternatives and mitigation measures should be considered to manage the site alteration in a way that will not adversely affect built heritage resources and cultural heritage landscapes. The preferred heritage approach for the protection of resources is retention *in situ* and the preservation of the material integrity to the maximum extent possible, as public safety allows.

In situations where the nature of site alteration is such that adverse impacts are unavoidable, it is possible to implement mitigative conservation strategies that lessen the adverse effects to the built heritage resources and cultural heritage landscapes. Conservation options are outlined in the *Ontario Heritage Bridge Guidelines* (OHBG) (MTO, 2008), regarded as current best practice for conserving heritage bridges in Ontario. While the OHBG's are intended for use in the assessment of provincially-owned structures and are not directly applicable in the municipal context, they ensure that heritage concerns and appropriate mitigation options are considered.

5.5.1 ALTERNATIVES, MITIGATION AND CONSERVATION OPTIONS ANALYSIS

Consistent with the eight conservation options of the OHBG, regarded as appropriate in managing interventions to heritage bridges, and considered in rank order according to the level or degree of intervention from minimum to maximum, WSP has presented the results of impact assessment based on the preferred option being carried forward as

part of the MCEA Study and the observed structural condition of the bridge (WSP, 2019).

Below, Table 4 presents the results of impact assessment based on the OHBG conservation options.

Table 4: OHBG Impact Assessment of Bridge #4

OHBG CONSERVATION OPTIONS	ADVANTAGE	DISADVANTAGE	COMMENTS
1) Retention of existing bridge with no major modifications undertaken	This option is consistent with the principle of minimal intervention and would retain all of the bridge's heritage attributes in the short-term. This option is also consistent with the *County of Wellington Official Plan* policy 4.1.5 that encourages the retention of significant built heritage resources and cultural heritage landscapes.	Given the bridge's current state of disrepair and functional/operational deficiencies, this option would pose a significant public safety concern in the long-term.	This option would likely result in the deterioration of the bridge's heritage attributes, and the eventual closure of the bridge, requiring traffic rerouting.
2) Retention of existing bridge and restoration of missing or deteriorated elements where physical or documentary evidence (e.g. photographs or drawings) can be used for their design	This conservation option involves little change to the original fabric of the structure, and repairs made based on the historic record. This option is also consistent with the *County of Wellington Official Plan* policy 4.1.5.	This option does not address the bridge's functional/operational deficiencies including substandard roadway width, barrier protection, and guide rail protection with several components requiring maintenance, rehabilitation and/or replacement. An evaluation of this option from a technical perspective, reveals this option only defers but does not avoid eventual structural replacement.	This option is not viable due to concerns related to the condition of the bridge that cannot be addressed through restoration of deteriorated elements. While the cost of rehabilitation is less than the cost of replacement, this option simply defers rather than replaces the eventual need to replace the structure which would prove more costly in the long-term.
3) Retention of existing bridge with sympathetic modification	This option is consistent with the principle of preservation of material to its highest integrity and would maintain some heritage attributes of the bridge. This option is also	This option would provide a short-term solution that only defers instead of avoids eventual structure replacement. If the scope of rehabilitation is expanded to address all the bridge's functional/operational	Although rehabilitation remains the preferred alternative for the Bridge #4 from a cultural heritage perspective, the extent and nature of the deterioration of the structural components of the bridge,

	consistent with the *County of Wellington Official Plan* policy 4.1.5.	deficiencies including substandard roadway width, barrier protection, and guide rail protection in addition to the structural deficiencies, the cost would become similar to a replacement option.	and the extensive repairs needed to address the functional/operational deficiencies (i.e., the substandard roadway width, barrier and guide rail protection), will result in a significant loss of historic materials and a change in the dimensions of the bridge to increase its traffic capacity. Considering these principles, sympathetic modification is not recommended.
4) Retention of existing bridge with a sympathetically designed new structure in proximity	This conservation option would retain the heritage attributes of the bridge and address the safety concerns. This option is also consistent with the *County of Wellington Official Plan* policy 4.1.5.	Bridge # 4 and the sympathetically designed new bridge would both require ongoing maintenance, and a new bridge would require additional property to be purchased to expand the road right-of-way and would result in a curve added to the road, creating geometric challenges.	This option is not viable due to the expense of maintaining the existing bridge, acquiring additional property and building a new sympathetically designed structure. It would also introduce undesirable road geometrics that would adversely impact road safety.
5) Retention of existing bridge no longer in use for vehicular purposes but adapted for a new use. For example, prohibiting vehicles or restricting truck traffic or adapting for pedestrian walkways, cycle paths, scenic viewing, etc.	This option is consistent with the principle of minimal intervention and would retain all the heritage attributes of the bridge. Pedestrian or cyclist traffic would likely require less intervention for rehabilitation. This option is also consistent with the County of Wellington's Official Plan policy 4.1.5.	This conservation option alters the use of the bridge from a vehicular bridge to a pedestrian bridge. There is minimal need for a pedestrian bridge in this remote, rural location. This option would require construction of a new road to by-pass the existing bridge, which would pose additional environmental and budgetary impacts.	Pedestrianized bridges are often more appropriate in urban areas where they are well traveled, and the public funding can be justified. This option is not viable due to its expense, engineering constraints and the loss of function as a road bridge.
6) Retention of existing bridge as a heritage monument for viewing purposes only	This conservation option retains the bridge *in situ* and retains its scale and massing. This option is also consistent with the County of Wellington's Official Plan policy 4.1.5.	The bridge will require extensive maintenance and refurbishment and this option removes the bridge as a useful structure and from its historic function as a road bridge. In addition, the County of Wellington will still require a road	The County of Wellington will require a road bridge at this location. Retaining the Bridge as a heritage monument *in situ* would require realigning the road and construction of a new bridge. Retaining the bridge *in situ* as a heritage monument is not viable due

		bridge across the river at this location.	to the considerable expense and engineering constraints.
7) Relocation of smaller, lighter single span bridges to an appropriate new site for continued use (see 4) or adaptive re-use (see 5)	This option is consistent with the principle of preservation of material to its highest integrity and would maintain all the bridge's heritage attributes.	Given the bridge's cast-in-place concrete construction, moving the bridge intact is likely not feasible. Furthermore, relocating the bridge would remove its contextual relationship with the crossing over the Conestogo River on Wellington Road 109. This option presents considerable risk of damage/destruction of the bridge through the relocation process. The bridge will still require extensive maintenance and refurbishment at considerable expense during disassembly, relocation and future maintenance.	This option is likely not viable given the concrete construction of the bridge. Relocation of bridges is rare and would require a thorough Conservation Plan to facilitate the process. Furthermore, even if possible, the expense of moving the bridge as well as the rehabilitation costs to make it appropriate for continued use would be prohibitive.
8) Bridge removal and replacement with a sympathetically designed structure: **a) Where possible, salvage elements/ members of the bridge for incorporation into a new structure or for future conservation work or displays;** **b) Undertake full recording and documentation of existing structure**	Thorough detailed investigations, the construction and contextual relationships of Bridge #4 would be better understood and become part of an example for comparative study. Documentary records could be made accessible to the public through the local library or other commemorative methods. Impacts from the introduction of a new bridge could be minimized if it retained its contextual relationship (i.e., original location) and adopted a design that draws from the materials and design inspiration of the extant bridge while maintaining legibility (new work that is	Built heritage resources are finite, meaning once gone, they are gone forever. Demolition would result in the loss of all the bridge's heritage attributes. Although once common, this bridge type is now a diminishing resource due to replacement to meet current safety requirements and traffic needs. Bridge #4 is the one of the oldest rigid-frame cast-in-place concrete bridge in the County of Wellington. .	Prior to demolition, the bridge should be recorded through a Documentation and Salvage Report that contains measured drawings, a thorough photographic recording and written description of the structure as well as a list of elements worthy of salvage. Preservation by record is the least desirable conservation option but may be appropriate in cases where structural integrity of a bridge is poor, rehabilitation is prohibitively expensive, it is technically difficult to stabilize a structure, or where public safety is a concern.

	distinguishable from the old). This approach represents a best practice in heritage conservation.		

Conservation Option 8 will result in major adverse effects to a cultural heritage resource. The OHBG requires four additional conditions be considered before this option is selected (Table 7). Only one of the following requirements must be met to justify replacing a bridge that is a cultural heritage resource.

Table 5: Detailed Conditions for Conservation Option 8

DETAILED CONDITIONS FOR CONSERVATION OPTION 8	ASSESSMENT RATIONALE
The safety of the existing structure is compromised to the extent that rehabilitation is not a practical option	The safety of the existing structure is of concern. The Structure Inspection completed by WSP in 2018 identifies several cracks in the wingwalls, as well as the abutment walls . While the bridge can be repaired, this would only delay rather than replace the eventual need to replace the bridge.
The cost of rehabilitation is prohibitive compared to replacement	The cost of rehabilitation to address the structural deficiencies as well as the bridge's functional/operational deficiencies including substandard roadway width, barrier protection, and guide rail protection would be similar in cost to the cost of replacement.
The bridge has been severely altered from its original form	Not applicable. The bridge has not been significantly altered from its original form.
Replacement is required to meet demand requirements that are not achievable through rehabilitation or upgrading the existing structure	Replacement is required to meet demand requirements that is not achievable through rehabilitation or upgrading the existing structure as the bridge exhibits several functional/operational deficiencies including substandard roadway width and substandard barrier protection and guide rail protection with several components requiring maintenance, rehabilitation and/or replacement.

5.5.2 RESULTS OF ALTERNATIVES, MITIGATION AND CONSERVATION RECOMMENDATIONS

The CHER completed in WSP in 2021 demonstrated that the Bridge #4 has design or physical, historical or associative and contextual value in accordance with O. Reg. 9/06. Given the bridge's CHVI, ideally it would be retained on its original site, rehabilitated in a sensitive manner and continued to be used for its original purpose. However, given the bridge's state of deterioration and the public safety concerns related to its functional/operational deficiencies, it is understood that retention and rehabilitation of the bridge is not feasible. Furthermore, Bridge #4 is not considered a good candidate for relocation or reuse.

Option 8 – Bridge removal and replacement with a sympathetically designed structure and salvage elements of the bridge for adaptive reuse is the recommended alternative.

Prior to demolition, a Documentation and Salvage Report should be prepared by a qualified heritage consultant to record the bridge thorough measured drawings and photographic and written descriptions. Elements worthy of salvage should also be recommended. It may be determined that the CHER and HIA provide sufficient documentation of the bridge, only requiring preparation of a Salvage Plan. Given the County of Wellington intends to replace other bridges along Wellington Road 109 (Conestogo Bridge #5, Conestogo Bridge #6 and Conestogo Bridge #10) and that these bridges have a contextual relationship to each other and Wellington Road 109, being built around the same time by the DHO, WSP recommends that the documentation of each bridge be combined into one report.

Elements to be salvaged (i.e., commemorative bridge plaque) should be collected prior to demolition. This material could be incorporated into a compatible design for the new bridge (i.e., commemorative bridge plaque) or used to construct a commemorative display or new plaque near the site of the bridge.

The design of a compatible replacement structure in a manner sympathetic to the current bridge should be explored. Efforts should be made to incorporate design qualities and/or materials of the original bridge and its setting, while maintaining legibility. This approach represents a best practice in heritage conservation. Design considerations should explore the incorporation of the scale, massing, rhythm and finishes of the original bridge, where possible and feasible. Specifically, the concrete arch, the placement and design of the concrete railings, and siting at the same location over the Conestogo River should be considered in the final design for the replacement structure.

5.6 SUMMARY OF COMMUNITY ENGAGEMENT

Wellington County was consulted as a part of this project with the intent of information gathering regarding any cultural heritage interests or concerns related to Bridge #4. This engagement was not combined with the Public Information Centres completed as part of the MCEA. Details regarding the scope and timing of this consultation are provided in Table 6.

Table 6: Consultation Record

CONTACT	CONTACT DETAILS	RESPONSE RECEIVED	RESPONSE
Michelle Innocente Senior Planner, Wellington County michellei@wellington.ca	By email on October 30, 2019; follow up on November 13, 2019.	November 13, 2019	Wellington County does not have a Heritage Register; Michelle suggested contacting the municipality's Clerk.

Karren Wallace Director of Legislative Services/Clerk, Township of Wellington-North kwallace@wellington-north.com	By email November 13, 2019	November 18, 2019	The bridges have no heritage status.

The MHSTCI was circulated this report for review on July 14, 2021. A response was received on August 3, 2021 in which the Ministry provided comments and recommendations outlining suggested revisions. Those revisions have been incorporated into this report. Given that the bridge was found to possess CHVI, the MHSTCI recommended that the CHER and HIA be publicly disclosed for any interested groups and persons for review and comment as part of the EA process.

5.7 RECOMMENDATIONS

Given the identified CHVI of Bridge #4 and the preferred option being carried forward as part of the MCEA Study involving the complete removal and replacement of subject bridge, the following mitigation measures are recommended:

1. The Bridge #4 should be recorded through a Documentation and Salvage Report containing measured drawings, a thorough photographic record and written description of the bridge as well as recommendations for elements worthy of salvage prior to demolition (i.e., steel truss members, commemorative bridge plaque). Given the County of Wellington intends to replace other bridges along Wellington Road 109 (Conestogo Bridge #5, Conestogo Bridge #6 and Conestogo Bridge #10) and that these bridges have a contextual relationship to each other and Wellington Road 109, being built around the same time by the DHO, WSP recommends that the documentation of each bridge be combined into one report. This report should be shared with the County of Wellington and the County of Wellington Museum & Archives. The bridge(s) should be documented to the standard outlined according to section 6.3.1.4 of the MTO *Environmental Guide for Built Heritage and Cultural Heritage Landscapes* (2007), and according to the *Historic American Engineering Record* (HAER) guidelines.
2. Commemoration opportunities should be explored for the bridge with community input.
3. The construction of a new bridge should be designed in a manner that draws from the design inspiration and materials of the extant bridge while maintaining legibility. Design considerations should explore the incorporation of the scale, massing, rhythm and finishes of the original bridge, where possible and feasible. Specifically, the arched concrete design, the placement and design of the concrete railings, and

siting at the same location over the Conestogo River should be considered in the final design for the replacement structure.

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WELLINGTON COUNTY

HERITAGE IMPACT ASSESSMENT

CONESTOGO RIVER BRIDGE #5 (B109123)

January 26, 2022 FINAL

HERITAGE IMPACT ASSESSMENT

CONESTOGO RIVER BRIDGE #5 (B109123)

WELLINGTON COUNTY

FINAL

PROJECT NO.: 17M-01271-01
DATE: JANUARY 26, 2022

WSP
4 HUGHSON STREET SOUTH, SUITE 300
HAMILTON, ON, CANADA L8N 3Z1

WSP.COM

WSP Canada Inc.

SIGNATURES

PREPARED BY

Chelsey Tyers, BES, MCIP, RPP
Cultural Heritage Specialist

January 26, 2022
Date

APPROVED BY

Joel Konrad, PhD., CAHP
Cultural Heritage Lead - Ontario

January 26, 2022
Date

EXECUTIVE SUMMARY

WSP Canada Inc. (WSP) was retained by Wellington County to complete the preliminary and detailed design of the Conestogo River Bridge #5 (B109123) replacement through a Municipal Class Environmental Assessment (MCEA) Study.

In advance of the commencement of the MCEA Study, WSP completed a Cultural Heritage Evaluation Report (CHER) for the Conestogo River Bridge #5 and submitted to the County of Wellington in January 2020. The CHER determined that the Conestogo River Bridge #5 is of cultural heritage value or interest for design and contextual reasons through application of Ontario Regulation 9/06.

The County of Wellington has also retained WSP to complete a Heritage Impact Assessment of the Conestogo River Bridge #5 in advance of the MCEA Study, to identify whether there are any impacts to the bridge's identified cultural heritage value or interest and list of heritage attributes, to demonstrate how the resource will be conserved if possible and to recommend mitigative or avoidance measures, alternative development or site alteration as appropriate. This document builds upon the CHER to address the requirements for the HIA.

The completion of this study has resulted in the following recommendations:

1. The Bridge #5 should be recorded through a Documentation and Salvage Report containing measured drawings, a thorough photographic record and written description of the bridge as well as recommendations for elements worthy of salvage prior to demolition (i.e., steel truss members, commemorative bridge plaque). Given the County of Wellington intends to replace other bridges along Wellington Road 109 (Conestogo Bridge #4, Conestogo Bridge #6 and Conestogo Bridge #10) and that these bridges have a contextual relationship to each other and Wellington Road 109, being built around the same time by the DHO, WSP recommends that the documentation of each bridge be combined into one report. This report should be shared with the County of Wellington and the County of Wellington Museum & Archives. The bridge(s) should be documented to the standard outlined according to section 6.3.1.4 of the MTO *Environmental Guide for Built Heritage and Cultural Heritage Landscapes* (2007), and according to the *Historic American Engineering Record* (HAER) guidelines.
2. Commemoration opportunities should be explored for the bridge with community input.
3. The construction of a new bridge should be designed in a manner that draws from the design inspiration and materials of the extant bridge while maintaining legibility. Design considerations should explore the incorporation of the scale, massing, rhythm and finishes of the original bridge, where possible and feasible. Specifically, the arched concrete design, the placement and design of the

concrete railings, and siting at the same location over the Conestogo River should be considered in the final design for the replacement structure.

PROJECT PERSONNEL

CLIENT

Client Contact	Joe DeKoning, P. Eng. Manager of Construction, Wellington County

WSP

Project Manager	William Van Ruyven, P. Eng Project Manager, Transportation – Bridge Engineering
Cultural Heritage Specialist	Chelsey Tyers, BES, MCIP, RPP Cultural Heritage Specialist
Report Preparation	Chelsey Tyers, BES, MCIP, RPP Cultural Heritage Specialist Lauren Walker, BA (Hons) Cultural Heritage Specialist
GIS and Mapping	Andrew Turner, MSc.

TABLE OF CONTENTS

TABLES

FIGURES

1 INTRODUCTION

1.1 PROJECT CONTEXT

WSP Canada Inc. (WSP) was retained by Wellington County to complete a Heritage Impact Assessment (HIA) in advance of the Municipal Class Environmental Assessment (MCEA) Study for Conestogo River Bridge #5. A Cultural Heritage Evaluation Report (CHER) was completed in January 2020 and determined that the subject bridge has cultural heritage value or interest in accordance with Ontario Regulation 9/06 (O. Reg. 9/06). The CHER recommended that a HIA be conducted for the preferred alternative to assess the impact and recommend appropriate mitigation measures.

The County of Wellington is seeking to replace the Conestogo River Bridge #5 with a new bridge structure (Figure 1). As such, the purpose of this report is to build upon the conclusions of the CHER and address the requirements for the HIA. This includes an analysis of the impact of the structure removal and replacement and recommendations for mitigation measures.

LEGEND

- Connestoga Bridge 5

TITLE: FIGURE 1: PROJECT LOCATION	SCALE: 1:5,000	PROJECT NO: 17M-01271-01	DATE: NOVEMBER 2019
	DRAWN BY: AST	CLIENT: WELLINGTON COUNTY	
PROJECT: CONNESTOGA BRIDGE #5 CHER	CREDITS: LAND INFORMATION ONTARIO		

0 130 260 m

N

Document Path: C:\Users\Andrew.S.Turner\Projects\17M-01271-01 Wellington Bridges and Culverts\MapDocuments\Bridge#5\Map 1 Project Location.mxd

2 LEGISLATION AND POLICY CONTEXT

2.1 PROVINCIAL AND MUNICIPAL CONTEXT AND POLICIES

2.1.1 PROVINCIAL POLICY CONTEXT

This HIA considers built heritage resources and cultural heritage landscapes in the context of a proposed bridge replacement under the *Environmental Assessment Act* (1990), the *Planning Act* (1990), and O. Reg. 160/02: Standards for Bridges (*Public Transportation and Highway Improvement Act*, R.S.O. 1990, c. P.50). This assessment addresses above-ground built heritage resources over 40 years old (MTO, 2007; Ontario Realty Corporation, 2007) as well as through the application of the Ministry of Heritage, Sport, Tourism and Culture Industries' (MHSTCI) *Criteria for Evaluating Potential for Built Heritage Resources and Cultural Heritage Landscapes* (2016), and the Municipal Engineers Association's (MEA) *Municipal Heritage Bridges, Cultural, Heritage and Archaeological Resources Assessment Checklist* (2014).

Under the *Environmental Assessment Act*, environment is defined in Subsection 1(c) to include:

- Cultural conditions that influence the life of man or a community, and;
- Any building, structure, machine, or other device or thing made by man.

The MHSTCI is charged under Section 2 of the *Ontario Heritage Act* with the responsibility to determine policies, priorities and programs for the conservation, protection and preservation of Ontario's cultural heritage resources. To that end, the MHSTCI has published the following guidelines to assist in assessing cultural heritage resources as part of an environmental assessment:

- Guideline for Preparing the Cultural Heritage Resource Component of Environmental Assessments (1992);
- Guidelines on the Man-Made Heritage Component of Environmental Assessments (1981); and
- Ontario Heritage Toolkit, Info Sheet #5: Heritage Impact Assessments and Conservation Plans (2006).

All guidelines have been utilized in this assessment process.

Additionally, the *Planning Act* and related *Provincial Policy Statement* (PPS) (2020) provide guidance on the identification and conservation of built heritage resources and cultural heritage landscapes. In Subsection 2.6 - Cultural Heritage and Archaeological Resources, the *PPS* states that:

2.6.1 Significant built heritage resources and significant cultural heritage landscapes shall be conserved.

2.1.2 WELLINGTON COUNTY OFFICIAL PLAN

The Wellington County Official Plan was adopted by Wellington County Council on September 24, 1998, approved by the Ministry of Municipal Affairs on April 13, 1999, came into effect on May 6, 1999 and was last updated on August 15, 2019. Policies relevant to this HIA include:

4.1.2 **Ontario Heritage Act**

Under the Ontario Heritage Act, a local Council may pass by-laws to:

a) Designate individual properties of cultural heritage value or interest, in accordance with the criteria set out in Ontario Regulation 9/06. Such a by-law shall include a description of the property and a statement of cultural heritage value or interest and description of the heritage attributes;

4.1.5 **Policy Direction**

a) significant built heritage resources and significant cultural heritage landscapes shall be conserved. Conserved means the identification, protection, use and/or management of cultural heritage and archeological resources in such a way that their heritage values, attributes and integrity are retained. This may be addressed through a conservation plan or heritage impact assessment in accordance with Section 4.6.7.

4.6.7 **Heritage Impact Assessment and Conservation Plan**

A heritage impact assessment and conservation plan may be required to determine if any significant cultural heritage resources are impacted by a development proposal. A heritage impact assessment is a study to determine if any significant cultural heritage resources are impacted by a development proposal, whether the impacts can be mitigated, and by what means. A heritage impact assessment will generally be required to contain:

a) Historical research, site analysis and evaluation

b) Identification of the significance and heritage attributes of the cultural heritage resources

c) Description of the proposed development or site alteration

d) Assessment of development or site alteration impact

e) Consideration of alternatives, mitigation and conservation methods. Methods to minimize or avoid a negative impact on a significant cultural heritage resource include, but are not limited to:

   i) alternative development approaches

   ii) isolating development and site alteration from significant built and natural features and vistas

   iii) design guidelines that harmonize mass, setback, setting, and materials

   iv) limiting height and density

v) allowing only compatible infill and additions

vi) reversible alterations

vii) buffer zones, and

viii) site plan control

f) Implementation and monitoring

g) Summary statement and conservation recommendations

2.2 METHODOLOGY

The recommendations of this HIA are based on an understanding of the physical values of the property, a documentation of its history through research, an analysis of its social and physical context, comparisons with similar properties and mapping.

This HIA is guided by key documents and policies such as the Municipal Engineers Association's (MEA) Municipal Heritage Bridges, Cultural, Heritage and Archaeological Resources Assessment Checklist (2014), the Reference Guide on Physical and Cultural Heritage Resources (Government of Canada, 1996), the Ontario Heritage Toolkit (Ministry of Culture, 2006), the Guidelines for Preparing the Cultural Heritage Resource Component of Environmental Assessments (Ministry of Culture and Communications, 1992), and the County of Wellington's HIA requirements in Section 4.6.7 of the County of Wellington Official Plan.

An HIA examines a property in its entirety, including its relationship to its surroundings, as well as its individual elements – engineering works, landscape etc. This report will include the following reproduced from the CHER:

- Thorough photographic documentation of the bridge and context;
- A written description of the existing conditions and immediate context; and,
- A draft statement of CHVI.
- For the complete background including the history of the immediate context, land-use history of the bridge, comparative analysis and evaluation of the bridge according to O. Reg. 9/06, please consult the CHER directly.
- To address the requirements of an HIA this report will also include:
- A review of the preferred alternative and the identification of potential impacts to the subject bridge; and,
- The identification and analysis of mitigation opportunities as required.

3 EXISTING CONDITIONS

3.1 DESCRIPTION OF STRUCTURE

The Conestogo River Bridge #5 is a two-lane concrete barrel arch structure on Wellington Road 109, located approximately 0.7 km from Highway 6 (Image 1, 2). It was built in 1930 and has a length of 14m and a width of 11.7m (Figure 1). Wellington County has provided drawings for the Conestogo River Bridge #5, including original drawings. Conestogo River Bridge #5 consists of a cast-in-place concrete barrel arch with concrete embankments and an asphalt paving surface. The bridge is oriented east to west.

Railings include concrete balustrade barriers, with a steel flex beam on steel post railing system, which appears to be spalling and is in a poor state of disrepair (Image 4, 7, 8). Part of the balustrade railing on the south side has collapsed (Image 3). Embankments on either end of the bridge consist of soil and overgrown, low lying vegetation (Image 2, 10). Approaches to the bridge on both sides are straight and flat, and both sides of the road are lined with steel barriers (Image 5, 6).

The superstructure and substructure were cast as one single unit. The substructure consists of reinforced concrete abutments that meet the river (Image 9, 10). The bridge deck consists of paved asphalt and both sides of the bridge have a reinforced concrete railing system.

In accordance with legislation, inspections of the bridge have been conducted biennially to monitor the conditions of the bridge and identify any potential repair or replacement. The most recent Municipal Structure Inspection Form (MSIF) was completed in October 2017 by WSP. The form identifies the condition of each element and is summarized in Table 2. In total, approximately 61% of the bridge is considered to be in good condition, 23% is considered to be in fair condition and 15% is considered to be in poor condition. Overall the MSIF has attributed a Building Condition Index of 59.39 (a score out of 100) and notes the overall condition as “Poor”.

Table 1: Summary of Bridge Condition from the Municipal Structure Inspection Report

Bridge Element	Condition (square metres)			
	Excellent	Good	Fair	Poor
Deck: wearing surface	0	68.25	50	10
Barriers: concrete balustrade	0	0	0	69.3
Barriers: railing system (steel flex beam on steel post)	0	240	25	0

Culverts: Inlet Components	0	32.63	20	20
Culverts: Outlet Components	0	32.68	20	20
Culverts: Barrels	0	132	100	25
Stream and waterway	0	0	1	0
Embankments	0	0	2	2
Approaches: wearing surfaces	0	99	10	5
Totals	0	604.56	228	151.3
	0.00%	61.45%	23.17%	15.38%

Image 1: South elevation Conestogo River Bridge #5 looking south.

Image 2: North elevation Conestogo River Bridge #5 looking south.

Image 3: Balustrade deterioration detail, looking northwest.

Image 4: Conestogo River Bridge #5, balustrade detail, looking southeast.

Image 5: Conestogo River Bridge #5, asphalt deck and concrete barrier detail, looking east.

Image 6: Conestogo River Bridge #5, asphalt deck and concrete barrier detail, looking west.

Image 7: Conestogo River Bridge #5 balustrade detail and Conestogo River, looking north.

Image 8: Conestogo River Bridge #5, solid spandrel and balustrade railing system.

Image 9: Conestogo River Bridge #5 view under arch, looking north, along Conestogo River.

Image 10: Conestogo River Bridge #5 solid wall and embankment detail, looking east.

Image 11: Conestogo River Bridge #5, substructure arched concrete with shotcrete repairs.

Image 12: Conestogo River Bridge #5, arched concrete wall with formwork detail.

3.1.1 DESIGN AND CONSTRUCTION

Structure Name	Conestogo River Bridge #5	**Road Name**	109

County	Wellington County	**Road Type**	Municipal Road
Municipality	Wellington	**Owner**	Municipal
Bridge or Culvert	Bridge	**Overall Structure Width (m)**	11.7
Structure Type	Rectangular Box	**Roadway Width (m)**	
Span (m)	14	**Total Deck Length (m)**	14
Height (M)		**Total Deck Area (s.m)**	164
Direction of Structure	EAST/WEST	**Heritage Description**	None
Year Built/Rehabilitated	Built 1930		
Current Load Limit		**Designer/Construction Firm**	Unknown
Waterway	Conestogo River		

A site visit to the structure was completed to record existing conditions. An inspection of the bridge and the landscape context was conducted on November 4, 2019. The weather allowed for good visibility of the landscape and structural features. Access to the bridge was gained via Wellington Road 109. Field notes and photographs of the property were taken during the inspection and the locations and directions were noted and all photographs were catalogued.

3.2 DESCRIPTION OF STUDY AREA AND LANDSCAPE CONTEXT

The Conestogo River Bridge #5 is located in Wellington County along Wellington Road 109 immediately east of Arthur, Ontario. The study area consists of the current bridge, a predominantly agricultural area surrounded by farmers fields, and topography generally described as hilly with river shoreline environs (Image 13,14). Highway 35 consists of a two-lane divided highway with gravel shoulders. The Conestogo River is a tributary of the Grand River that crosses Wellington Road 109 multiple times.

Wellington Road 109 consists of a two lane-divided road with gravel shoulders that was formerly the provincial Highway 9. The Conestogo River flows underneath the bridge and is a tributary of the Grand River. The Conestogo River is a narrow, shallow and winding river that crosses Wellington Road 109 multiple times. The approaches to the

Conestogo River Bridge #5 are straight and flat, and include steel guardrails on both sides of the road on either end of the bridge. The area surrounding the bridge includes cultivated agricultural fields lined with interspersed deciduous and coniferous trees parallel to the road.

Image 13:Conestogo River valley, and surrounding environs, looking northeast.

Image 14:Conestogo River valley, and surrounding environs, looking southwest.

3.3 ARCHAEOLOGY ASSESSMENT

As of the writing of this report, a Stage 1-2 Archaeological Assessment report is currently underway for Bridge #5 by WSP.

4 RESULTS OF CULTURAL HERITAGE EVALUATION

The CHER (dated October 4, 2021) found that the Conestogo River Bridge #5 has cultural heritage value or interest according to Ontario Regulation 9/06 (*Ontario Heritage Act*). Accordingly, the following Statement of Cultural Heritage Value or Interest and list of Attributes has been prepared.

4.1 STATEMENT OF CULTURAL HERITAGE VALUE OR INTEREST

4.1.1 DESCRIPTION OF PROPERTY

The Conestogo River Bridge #5 is a two-lane concrete barrel arch structure on Wellington Road 109, which crosses the Conestogo River, located approximately located 0.7 km from Highway 6, east of Arthur, Ontario. The area consists of the subject structure, located within a predominantly agricultural area surrounded by farmers fields, and topography generally described as hilly with river shoreline environs.

4.1.2 CULTURAL HERITAGE VALUE OR INTEREST

The Conestogo River Bridge #5 has design or physical value as an early example of a reinforced concrete arch bridge in Wellington County. Conestogo River Bridge #5 was built in 1930, and represents the oldest of its type in the area. The construction of concrete arch bridges peaked between 1900 and 1930. Conestogo River Bridge #5 consists of a cast-in-place concrete barrel arch with concrete embankments and an asphalt paving surface. The bridge was built by the Department of Highways, Ontario (DHO). Railings include concrete balustrade barriers, with a steel flex beam on steel post railing system.

The subject bridge exhibits a simple but aesthetically pleasing design that also supports the character of the surrounding rural area. The Conestogo River Bridge #5 also demonstrates a contextual relationship with Wellington Road 109, as it was built shortly after the DHO acquired the road and designated it Provincial Highway 9.

4.1.3 DESCRIPTION OF HERITAGE ATTRIBUTES

The heritage attributes that reflect the cultural heritage value or interest of the subject property include:

- Single span length crossing the Conestogo River;
- Reinforced concrete arch design;
- Solid arch supported vertical sidewalls;
- Concrete balustrade barriers.

5 PROPOSED UNDERTAKING AND IMPACTS

5.1 DESCRIPTION AND PURPOSE OF PROPOSED UNDERTAKING

The Conestogo River Bridge #5 is a two-lane concrete barrel arch structure on Wellington Road 109, located approximately 0.7 km from Highway 6 (Image 1, 2). It was built in 1930 and has a length of 14m and a width of 11.7m. As part of a bridge inspection conducted in 2018, the Bridge #5 was found to be in poor condition with major elements showing signs of significant deterioration. WSP has been retained by the County of Wellington to complete a Municipal Class EA Study to address these items and the County is seeking to replace the bridge with a new structure.

The following four alternatives are being considered for Bridge #5 as a result of the MCEA Study:

Option 1 – Do Nothing

This would not include any repairs to the structure but would include regular monitoring and may require that the bridge be closed and thus the road as well.

Option 2 – Remove Without Replacement

This would include removal of the bridge and closure of the road.

Option 3 – Rehabilitation

Areas of deterioration would be removed and repaired and the bridge may require widening to meet current safety standards. To facilitate the flow of traffic during the bridge rehabilitation, a temporary bailey bridge may need to be installed adjacent to the road to allow through traffic.

Option 4 – Replace

This would include complete removal of the existing structure and replacement with a new bridge. To facilitate the flow of traffic during the bridge replacement, a temporary bailey bridge may need to be installed adjacent to the road to allow through traffic.

5.2 IMPACT ASSESSMENT

This section provides an assessment of the potential adverse effects resulting from the proposed undertakings.

Built heritage resources may experience displacement or **direct impacts**, i.e., demolition or removal of heritage attributes. Direct impacts are permanent, not temporary changes to the cultural heritage environment.

Built heritage resources may also experience disruption, or **indirect impacts**, by the introduction of physical, visual, audible or atmospheric elements that are not in keeping with their character and/or setting. These indirect impacts may be temporary during construction, such as vibration impacts and dust particles, or permanent such as the introduction of new infrastructure. Other indirect impacts of a temporary or permanent nature may include, but are not limited to, changes in grading, alterations to built heritage resource setting and fabric as a result of visual, audible or atmospheric elements, etc. Indirect impacts can be permanent or temporary changes to the cultural heritage environment.

The impacts of each of the four alternatives being considered for the bridge through the MCEA Study will be rated based on the following categories identified in Table 2.

Table 2: Impact Ratings

RATING	DESCRIPTION
None	The proposed undertaking has no impact on the heritage value/attribute.
Low	The undertaking has minimal impact on the heritage value/attribute.
Medium	The undertaking affects/disturbs the heritage value/attribute. The undertaking requires mitigation.
High	The undertaking replaces/removes a heritage value/attribute. The undertaking requires mitigation.

5.3 EVALUATION OF IMPACTS

Table 3 provides an evaluation of the impacts of the four alternatives being explored in the MCEA Study.

Table 3: Evaluation of Impacts

CRITERIA	**EVALUATION**			
	Option 1: Do Nothing	**Option 2: Remove Without Replacement**	**Option 3: Rehabilitation**	**Option 4: Replace**
Destruction of any, or part of any, significant heritage	Impact Rating: None Rationale: No heritage attributes will be	Impact Rating: High Rationale: Removal of the bridge would result	Impact Rating: None Rationale:	Impact Rating: High Rationale: Replacement of the bridge would result

attributes or features.	impacted if the bridge remains *in situ*.	in the destruction of all heritage attributes.	No heritage attributes will be destructed.	in the destruction of all heritage attributes.
Alteration that is not sympathetic, or is incompatible, with the historic fabric and appearance.	Impact Rating: None Rationale: No heritage attributes will be impacted if the bridge remains *in situ*.	Impact Rating: None Rationale: Removal of the bridge is not considered an "alteration" and will result in the destruction of all heritage attributes.	Impact Rating: Medium Rationale: Rehabilitation of the bridge to meet current safety standards and repair deteriorated elements may result in some physical changes to the heritage attributes.	Impact Rating: None Rationale: Replacement of the bridge is not considered an "alteration" and will result in the removal of all heritage attributes.
Shadows created that alter the appearance of a heritage attribute or change the viability of a natural feature or plantings, such as a garden.	Impact Rating: None Rationale: There will be no new shadows created.	Impact Rating: None Rationale: There will be no new shadows created.	Impact Rating: None Rationale: There will be no new shadows created.	Impact Rating: None Rationale: There will be no new shadows created.
Isolation of a heritage attribute from its surrounding environment, context or a significant relationship.	Impact Rating: None Rationale: No heritage attributes will be impacted if the bridge remains *in situ*.	Impact Rating: None Rationale: Removal of the bridge will remove all the heritage attributes.	Impact Rating: None Rationale: Rehabilitation of the bridge will not result in the isolation of any heritage attributes.	Impact Rating: None Rationale: Replacement of the bridge will remove all the heritage attributes.
Direct or indirect obstruction of significant views or vistas within, from, or to built and	Impact Rating: None Rationale: Significant views or vistas were not identified as heritage attributes of the bridge.	Impact Rating: None Rationale: Significant views or vistas were not identified as heritage attributes of the bridge.	Impact Rating: None Rationale: Significant views or vistas were not identified as heritage attributes of the bridge.	Impact Rating: None Rationale: Significant views or vistas were not identified as heritage attributes of the bridge.

natural features.				
A change in land use such as rezoning a battlefield from open space to residential use, allowing new development or site alteration to fill in the formerly open spaces.	Impact Rating: None Rationale: No change in land use will occur if the bridge remains *in situ*.	Impact Rating: High Rationale: The removal of the bridge will result in a change in land use resulting from the closure of an arterial road.	Impact Rating: None Rationale: There will be no change in use.	Impact Rating: None Rationale: There will be no change in use.
Land disturbances such as a change in grade that alters soils, and drainage patterns that adversely affect an archaeological resource.	Impact Rating: None Rationale: No land disturbance will occur if the bridge remains *in situ*.	Impact Rating: Low Rationale: Removal of the bridge will result in soil disturbance.	Impact Rating: None Rationale: There will be no change in grade.	Impact Rating: None Rationale: There will be no change in grade.

5.4 RESULTS OF IMPACT ASSESSMENT

The impact assessment outlined in Section 5.3 has reviewed the four alternatives being explored for the Bridge #5 through the MCEA Study and determined the following:

- **Option 1 – Do Nothing** will not result in any impacts to the bridge's heritage attributes however it will also not address the deteriorating condition of the structure.
- **Option 2 – Remove Without Replacement** will result in significant impacts as it would require the complete demolition of the bridge and its heritage attributes, removal of the bridge's contextual relationship to the historic crossing of Wellington Road 109 over the Conestogo River and closure of Wellington Road 109 at the river crossing.
- **Option 3 – Rehabilitation** of the bridge to meet current safety standards and to repair deteriorated elements will result in physical changes, thus impacting the integrity of the bridge's heritage attributes.
- **Option 4 – Replacement** of the bridge in its entirety will result in significant impacts through the destruction of all the structure's heritage attributes as well as removal of the bridge's contextual relationship to the historic crossing of Wellington Road 109 over the Conestogo River at this location.

From a cultural heritage perspective, the alternatives that retain the concrete structure of the Bridge #5 in its current location are the most desirable (Options 1 and 3). If the bridge is to be retained and/or rehabilitated, the heritage attributes should be conserved. Option 4, which would see the current bridge removed and replaced with a new bridge, could maintain several of the bridge's design and contextual attributes through the application of mitigation measures. Option 2 represents the least desirable option as it would see the complete removal of the structure and closure of Wellington Road 109 at the river crossing.

5.5 CONSIDERED ALTERNATIVES AND MITIGATION MEASURES

When adverse impacts are expected from proposed site alteration, alternatives and mitigation measures should be considered to manage the site alteration in a way that will not adversely affect built heritage resources and cultural heritage landscapes. The preferred heritage approach for the protection of resources is retention in situ and the preservation of the material integrity to the maximum extent possible, as public safety allows.

In situations where the nature of site alteration is such that adverse impacts are unavoidable, it is possible to implement mitigative conservation strategies that lessen the adverse effects to the built heritage resources and cultural heritage landscapes. Conservation options are outlined in the Ontario Heritage Bridge Guidelines (OHBG) (MTO, 2008), regarded as current best practice for conserving heritage bridges in Ontario. While the OHBG's are intended for use in the assessment of provincially-owned structures and are not directly applicable in the municipal context, they ensure that heritage concerns and appropriate mitigation options are considered.

5.5.1 ALTERNATIVES, MITIGATION AND CONSERVATION OPTIONS ANALYSIS

Consistent with the eight conservation options of the OHBG, regarded as appropriate in managing interventions to heritage bridges, and considered in rank order according to the level or degree of intervention from minimum to maximum, WSP has presented the results of impact assessment based on the preferred option being carried forward as part of the MCEA Study and the observed structural condition of the bridge (WSP, 2019).

Below,

Table 4 presents the results of impact assessment based on the OHBG conservation options.

Table 4: OHBG Impact Assessment of Bridge #5

OHBG CONSERVATION OPTIONS	ADVANTAGE	DISADVANTAGE	COMMENTS
1) Retention of existing bridge with no major modifications undertaken	This option is consistent with the principle of minimal intervention and would retain all of the bridge's heritage attributes in the short-term. This option is also consistent with the *County of Wellington Official Plan* policy 4.1.5 that encourages the retention of significant built heritage resources and cultural heritage landscapes.	Given the bridge's current state of disrepair and functional/operational deficiencies, this option would pose a significant public safety concern in the long-term.	This option would likely result in the deterioration of the bridge's heritage attributes, and the eventual closure of the bridge, requiring traffic rerouting.
2) Retention of existing bridge and restoration of missing or deteriorated elements where physical or documentary evidence (e.g. photographs or drawings) can be used for their design	This conservation option involves little change to the original fabric of the structure, and repairs made based on the historic record. This option is also consistent with the *County of Wellington Official Plan* policy 4.1.5.	This option does not address the bridge's functional/operational deficiencies including substandard roadway width, barrier protection, and guide rail protection with several components requiring maintenance, rehabilitation and/or replacement. An evaluation of this option from a technical perspective, reveals this option only defers but does not avoid eventual structural replacement.	This option is not viable due to concerns related to the condition of the bridge that cannot be addressed through restoration of deteriorated elements. While the cost of rehabilitation is less than the cost of replacement, this option simply defers rather than replaces the eventual need to replace the structure which would prove more costly in the long-term.
3) Retention of existing bridge with sympathetic modification	This option is consistent with the principle of preservation of material to its highest integrity and would maintain some heritage attributes of the bridge. This option is also consistent with the *County of Wellington Official Plan* policy 4.1.5.	This option would provide a short-term solution that only defers instead of avoids eventual structure replacement. If the scope of rehabilitation is expanded to address all the bridge's functional/operational deficiencies including substandard roadway width, barrier protection, and guide rail protection in addition to the structural deficiencies,	Although rehabilitation remains the preferred alternative for the bridge from a cultural heritage perspective, the extent and nature of the deterioration of the structural components of the bridge, and the extensive repairs needed to address the functional/operational deficiencies (i.e., the substandard roadway width,

		the cost would become similar to a replacement option.	barrier and guide rail protection), will result in a significant loss of historic materials and a change in the dimensions of the bridge to increase its traffic capacity. Considering these principles, sympathetic modification is not recommended.
4) Retention of existing bridge with a sympathetically designed new structure in proximity	This conservation option would retain the heritage attributes of the bridge and address the safety concerns. This option is also consistent with the *County of Wellington Official Plan* policy 4.1.5.	Bridge # 5 and the sympathetically designed new bridge would both require ongoing maintenance, and a new bridge would require additional property to be purchased to expand the road right-of-way and would result in a curve added to the road, creating geometric challenges.	This option is not viable due to the expense of maintaining the existing bridge, acquiring additional property and building a new sympathetically designed structure. It would also introduce undesirable road geometrics that would adversely impact road safety.
5) Retention of existing bridge no longer in use for vehicular purposes but adapted for a new use. For example, prohibiting vehicles or restricting truck traffic or adapting for pedestrian walkways, cycle paths, scenic viewing, etc.	This option is consistent with the principle of minimal intervention and would retain all the heritage attributes of the bridge. Pedestrian or cyclist traffic would likely require less intervention for rehabilitation. This option is also consistent with the County of Wellington's Official Plan policy 4.1.5.	This conservation option alters the use of the bridge from a vehicular bridge to a pedestrian bridge. There is minimal need for a pedestrian bridge in this remote, rural location. This option would require construction of a new road to by-pass the existing bridge, which would pose additional environmental and budgetary impacts.	Pedestrianized bridges are often more appropriate in urban areas where they are well traveled, and the public funding can be justified. This option is not viable due to its expense, engineering constraints and the loss of function as a road bridge.
6) Retention of existing bridge as a heritage monument for viewing purposes only	This conservation option retains the bridge *in situ* and retains its scale and massing. This option is also consistent with the County of Wellington's Official Plan policy 4.1.5.	The bridge will require extensive maintenance and refurbishment and this option removes the bridge as a useful structure and from its historic function as a road bridge. In addition, the County of Wellington will still require a road bridge across the river at this location.	The County of Wellington will require a road bridge at this location. Retaining the Bridge as a heritage monument *in situ* would require realigning the road and construction of a new bridge. Retaining the bridge *in situ* as a heritage monument is not viable due to the considerable expense and engineering constraints.
7) Relocation of smaller, lighter single span	This option is consistent with the principle of	Given the bridge's cast-in-place concrete construction,	This option is likely not viable given the concrete

bridges to an appropriate new site for continued use (see 4) or adaptive re-use (see 5)	preservation of material to its highest integrity and would maintain all the bridge's heritage attributes.	moving the bridge intact is likely not feasible. Furthermore, relocating the bridge would remove its contextual relationship with the crossing over the Conestogo River on Wellington Road 109. This option presents considerable risk of damage/destruction of the bridge through the relocation process. The bridge will still require extensive maintenance and refurbishment at considerable expense during disassembly, relocation and future maintenance.	construction of the bridge. Relocation of bridges is rare and would require a thorough Conservation Plan to facilitate the process. Furthermore, even if possible, the expense of moving the bridge as well as the rehabilitation costs to make it appropriate for continued use would be prohibitive.
8) Bridge removal and replacement with a sympathetically designed structure: **a) Where possible, salvage elements/ members of the bridge for incorporation into a new structure or for future conservation work or displays;** **b) Undertake full recording and documentation of existing structure**	Thorough detailed investigations, the construction and contextual relationships of Bridge #5 would be better understood and become part of an example for comparative study. Documentary records could be made accessible to the public through the local library or other commemorative methods. Impacts from the introduction of a new bridge could be minimized if it retained its contextual relationship (i.e., original location) and adopted a design that draws from the materials and design inspiration of the extant bridge while maintaining legibility (new work that is distinguishable from the old). This approach represents a best practice in heritage conservation.	Built heritage resources are finite, meaning once gone, they are gone forever. Demolition would result in the loss of all the bridge's heritage attributes. Although once common, this bridge type is now a diminishing resource due to replacement to meet current safety requirements and traffic needs. Bridge #5 is the oldest concrete barrel arch structure in the County of Wellington .	Prior to demolition, the bridge should be recorded through a Documentation and Salvage Report that contains measured drawings, a thorough photographic recording and written description of the structure as well as a list of elements worthy of salvage. Preservation by record is the least desirable conservation option but may be appropriate in cases where structural integrity of a bridge is poor, rehabilitation is prohibitively expensive, it is technically difficult to stabilize a structure, or where public safety is a concern.

Conservation Option 8 will result in major adverse effects to a cultural heritage resource. The OHBG requires four additional conditions be considered before this option is selected (Table 7). Only one of the following requirements must be met to justify replacing a bridge that is a cultural heritage resource.

Table 5: Detailed Conditions for Conservation Option 8

DETAILED CONDITIONS FOR CONSERVATION OPTION 8	ASSESSMENT RATIONALE
The safety of the existing structure is compromised to the extent that rehabilitation is not a practical option	The safety of the existing structure is of concern. The Structure Inspection completed by WSP in 2018 identifies wide cracks on the concrete barrel. While the bridge can be repaired, this would only delay rather than replace the eventual need to replace the bridge.
The cost of rehabilitation is prohibitive compared to replacement	The cost of rehabilitation to address the structural deficiencies as well as the bridge's functional/operational deficiencies including substandard roadway width, barrier protection, and guide rail protection would be similar in cost to the cost of replacement.
The bridge has been severely altered from its original form	Not applicable. The bridge has not been significantly altered from its original form.
Replacement is required to meet demand requirements that are not achievable through rehabilitation or upgrading the existing structure	Replacement is required to meet demand requirements that is not achievable through rehabilitation or upgrading the existing structure as the bridge exhibits several functional/operational deficiencies including substandard roadway width and substandard barrier protection and guide rail protection with several components requiring maintenance, rehabilitation and/or replacement.

5.6 RESULTS OF ALTERNATIVES, MITIGATION AND CONSERVATION RECOMMENDATIONS

The CHER completed in WSP in 2021 demonstrated that the Bridge #5 has design or physical, historical or associative and contextual value in accordance with O. Reg. 9/06. Given the bridge's CHVI, ideally it would be retained on its original site, rehabilitated in a sensitive manner and continued to be used for its original purpose. However, given the bridge's state of deterioration and the public safety concerns related to its functional/operational deficiencies, it is understood that retention and rehabilitation of the bridge is not feasible. Furthermore, Bridge #5 is not considered a good candidate for relocation or reuse.

Option 8 – Bridge removal and replacement with a sympathetically designed structure and salvage elements of the bridge for adaptive reuse is the recommended alternative. Prior to demolition, a Documentation and Salvage Report should be prepared by a qualified heritage consultant to record the bridge thorough measured drawings and photographic and written descriptions. Elements worthy of salvage should also be recommended. It may be determined that the CHER and HIA provide sufficient

documentation of the bridge, only requiring preparation of a Salvage Plan. Given the County of Wellington intends to replace other bridges along Wellington Road 109 (Conestogo Bridge #4, Conestogo Bridge #6 and Conestogo Bridge #10) and that these bridges have a contextual relationship to each other and Wellington Road 109, being built around the same time by the DHO, WSP recommends that the documentation of each bridge be combined into one report.

Elements to be salvaged (i.e., commemorative bridge plaque) should be collected prior to demolition. This material could be incorporated into a compatible design for the new bridge (i.e., commemorative bridge plaque) or used to construct a commemorative display or new plaque near the site of the bridge.

The design of a compatible replacement structure in a manner sympathetic to the current bridge should be explored. Efforts should be made to incorporate design qualities and/or materials of the original bridge and its setting, while maintaining legibility. This approach represents a best practice in heritage conservation. Design considerations should explore the incorporation of the scale, massing, rhythm and finishes of the original bridge, where possible and feasible. Specifically, the concrete arch, the placement and design of the concrete railings, and siting at the same location over the Conestogo River should be considered in the final design for the replacement structure.

5.7 SUMMARY OF COMMUNITY ENGAGEMENT

Wellington County was consulted as a part of this project with the intent of information gathering regarding any cultural heritage interests or concerns related to Bridge #5. This engagement was not combined with the Public Information Centres completed as part of the MCEA. Details regarding the scope and timing of this consultation are provided in Table 6.

Table 6: Consultation Record

CONTACT	CONTACT DETAILS	RESPONSE RECEIVED	RESPONSE
Michelle Innocente Senior Planner, Wellington County michellei@wellington.ca	By email on October 30, 2019; follow up on November 13, 2019.	November 13, 2019	Wellington County does not have a Heritage Register; Michelle suggested contacting the municipality's Clerk.

Karren Wallace Director of Legislative Services/Clerk, Township of Wellington-North kwallace@wellington-north.com	By email November 13, 2019	November 18, 2019	The bridges have no heritage status.

The MHSTCI was circulated this report for review on July 14, 2021. A response was received on August 3, 2021 in which the Ministry provided comments and recommendations outlining suggested revisions. Those revisions have been incorporated into this report. Given that the bridge was found to possess CHVI, the MHSTCI recommended that the CHER and HIA be publicly disclosed for any interested groups and persons for review and comment as part of the EA process.

5.8 RECOMMENDATIONS

Given the identified CHVI of Bridge #5 and the preferred option being carried forward as part of the MCEA Study involving the complete removal and replacement of subject bridge, the following mitigation measures are recommended:

1. The Bridge #5 should be recorded through a Documentation and Salvage Report containing measured drawings, a thorough photographic record and written description of the bridge as well as recommendations for elements worthy of salvage prior to demolition (i.e., steel truss members, commemorative bridge plaque). Given the County of Wellington intends to replace other bridges along Wellington Road 109 (Conestogo Bridge #4, Conestogo Bridge #6 and Conestogo Bridge #10) and that these bridges have a contextual relationship to each other and Wellington Road 109, being built around the same time by the DHO, WSP recommends that the documentation of each bridge be combined into one report. This report should be shared with the County of Wellington and the County of Wellington Museum & Archives. The bridge(s) should be documented to the standard outlined according to section 6.3.1.4 of the MTO *Environmental Guide for Built Heritage and Cultural Heritage Landscapes* (2007), and according to the *Historic American Engineering Record* (HAER) guidelines.
2. Commemoration opportunities should be explored for the bridge with community input.
3. The construction of a new bridge should be designed in a manner that draws from the design inspiration and materials of the extant bridge while maintaining legibility. Design considerations should explore the incorporation of the scale, massing, rhythm and finishes of the original bridge, where possible and feasible. Specifically, the arched concrete design, the placement and design of the

concrete railings, and siting at the same location over the Conestogo River should be considered in the final design for the replacement structure.

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Canadian Register of Historic Places
http://www.historicplaces.ca/visit-visite/rep-reg_e.aspx

Parks Canada Standards and Guidelines for the Conservation of Historic Places in Canada
http://www.pc.gc.ca/docs/pc/guide/nldclpc-sgchpc/index_E.asp

Parks Canada National Historic Sites of Canada
http://www.pc.gc.ca/progs/lhn-nhs/index_e.asp

International Council of Monuments and Sites (ICOMOS): Appleton Charter
http://www.international.icomos.org/charters/appleton.pdf

WELLINGTON COUNTY

HERITAGE IMPACT ASSESSMENT

CONESTOGO RIVER BRIDGE #6 (B109132)

January 28, 2022 FINAL

HERITAGE IMPACT ASSESSMENT

CONESTOGO RIVER BRIDGE #6 (B109132)

WELLINGTON COUNTY

FINAL

PROJECT NO.: 17M-01271-01
DATE: JANUARY 28, 2022

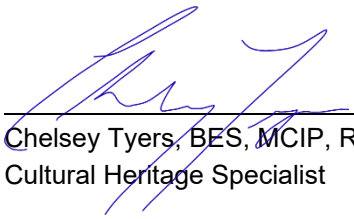
WSP
4 HUGHSON STREET SOUTH, SUITE 300
HAMILTON, ON, CANADA L8N 3Z1

WSP.COM

WSP Canada Inc.

SIGNATURES

PREPARED BY



Chelsey Tyers, BES, MCIP, RPP
Cultural Heritage Specialist

January 28, 2022
Date

APPROVED BY

Joel Konrad, PhD, CAHP
Cultural Heritage Lead - Ontario

January 28, 2022
Date

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This limitations statement is considered an integral part of this report.

EXECUTIVE SUMMARY

WSP Canada Inc. (WSP) was retained by Wellington County to complete the preliminary and detailed design of the Conestogo River Bridge #6 (B109132) replacement through a Municipal Class Environmental Assessment (MCEA) Study.

In advance of the commencement of the MCEA Study, WSP completed a Cultural Heritage Evaluation Report (CHER) for the Conestogo River Bridge #6 and submitted to the County of Wellington in January 2020. The CHER determined that the Conestogo River Bridge #6 is of cultural heritage value for design and contextual reasons through application of Ontario Regulation 9/06.

The County of Wellington has also retained WSP to complete a Heritage Impact Assessment of the Conestogo River Bridge #6 in advance of the MCEA Study, to identify whether there are any impacts to the bridge's identified cultural heritage value or interest and list of heritage attributes, to demonstrate how the resource will be conserved if possible and to recommend mitigative or avoidance measures, alternative development or site alteration as appropriate. This document builds upon the CHER to address the requirements for the HIA.

The completion of this study has resulted in the following recommendations:

1. The Bridge #6 should be recorded through a Documentation and Salvage Report containing measured drawings, a thorough photographic record and written description of the bridge as well as recommendations for elements worthy of salvage prior to demolition (i.e., steel truss members, commemorative bridge plaque). Given the County of Wellington intends to replace other bridges along Wellington Road 109 (Conestogo Bridge #4, Conestogo Bridge #5 and Conestogo Bridge #10) and that these bridges have a contextual relationship to each other and Wellington Road 109, being built around the same time by the DHO, WSP recommends that the documentation of each bridge be combined into one report. This report should be shared with the County of Wellington and the County of Wellington Museum & Archives. The bridge(s) should be documented to the standard outlined according to section 6.3.1.4 of the MTO Environmental Guide for Built Heritage and Cultural Heritage Landscapes (2007), and according to the Historic American Engineering Record (HAER) guidelines.

2. Commemoration opportunities should be explored for the bridge with community input.

3. The construction of a new bridge should be designed in a manner that draws from the design inspiration and materials of the extant bridge while maintaining legibility. Design considerations should explore the incorporation of the scale, massing,

rhythm and finishes of the original bridge, where possible and feasible. Specifically, the arched concrete design, the placement and design of the concrete railings, and siting at the same location over the Conestogo River should be considered in the final design for the replacement structure.

PROJECT PERSONNEL

CLIENT

Client Contact	Joe DeKoning, P. Eng. Manager of Construction, Wellington County

WSP

Project Manager	William Van Ruyven, P. Eng.
Cultural Heritage Specialist	Chelsey Tyers, BES, MCIP, RPP Cultural Heritage Specialist
Report Preparation	Chelsey Tyers
	Jacqueline Bradica, BA Cultural Heritage Assistant
GIS and Mapping	Andrew Turner, MSc.
Report Review	Joel Konrad, PhD, CAHP Cultural Heritage Lead – Ontario

TABLE OF CONTENTS

TABLES

FIGURES

1 INTRODUCTION

1.1 PROJECT CONTEXT

WSP Canada Inc. (WSP) was retained by Wellington County to complete a Heritage Impact Assessment (HIA) in advance of the Municipal Class Environmental Assessment (MCEA) Study for Conestogo River Bridge #6. A Cultural Heritage Evaluation Report (CHER) was completed in January 2020 and determined that the subject bridge has cultural heritage value or interest in accordance with Ontario Regulation 9/06 (O. Reg. 9/06). The CHER recommended that an HIA be conducted for the preferred alternative to assess the impact and recommend appropriate mitigation measures.

The County of Wellington is seeking to replace the Conestogo River Bridge #6 with a new bridge structure (Figure 1). As such, the purpose of this report is to build upon the conclusions of the CHER and address the requirements for the HIA. This includes an analysis of the impact of the structure removal and replacement and recommendations for mitigation measures.

LEGEND

- Connestoga Bridge 6

TITLE: FIGURE 1: PROJECT LOCATION	SCALE: 1:5,000	PROJECT NO: 17M-01271-01	DATE: NOVEMBER 2019
	DRAWN BY: AST	CLIENT: WELLINGTON COUNTY	
PROJECT: CONNESTOGA BRIDGE #6 CHER	CREDITS: LAND INFORMATION ONTARIO		

0 130 260 m N

Document Path: C:\Users\Andrew.S.Turner\Projects\17M-01271-01 Wellington Bridges and Culverts\MapDocuments\Bridge#6\Map 1 Project Location.mxd

2 LEGISLATION AND POLICY CONTEXT

2.1 PROVINCIAL AND MUNICIPAL CONTEXT AND POLICIES

2.1.2 PROVINCIAL POLICY CONTEXT

This HIA considers built heritage resources and cultural heritage landscapes in the context of a proposed bridge replacement under the *Environmental Assessment Act* (1990), the *Planning Act* (1990), and O. Reg. 160/02: Standards for Bridges (*Public Transportation and Highway Improvement Act*, R.S.O. 1990, c. P.50). This assessment addresses above-ground built heritage resources over 40 years old (MTO, 2007; Ontario Realty Corporation, 2007) as well as through the application of the Ministry of Heritage, Sport, Tourism and Culture Industries' (MHSTCI) *Criteria for Evaluating Potential for Built Heritage Resources and Cultural Heritage Landscapes* (2016), and the Municipal Engineers Association's (MEA) *Municipal Heritage Bridges, Cultural, Heritage and Archaeological Resources Assessment Checklist* (2014).

Under the *Environmental Assessment Act*, environment is defined in Subsection 1(c) to include:

- Cultural conditions that influence the life of man or a community, and;
- Any building, structure, machine, or other device or thing made by man.

The MHSTCI is charged under Section 2 of the *Ontario Heritage Act* with the responsibility to determine policies, priorities and programs for the conservation, protection and preservation of Ontario's cultural heritage resources. To that end, the MHSTCI has published the following guidelines to assist in assessing cultural heritage resources as part of an environmental assessment:

- Guideline for Preparing the Cultural Heritage Resource Component of Environmental Assessments (1992);
- Guidelines on the Man-Made Heritage Component of Environmental Assessments (1981); and
- Ontario Heritage Toolkit, Info Sheet #5: Heritage Impact Assessments and Conservation Plans (2006).

All guidelines have been utilized in this assessment process.

Additionally, the *Planning Act* and related *Provincial Policy Statement* (PPS) (2020) provide guidance on the identification and conservation of built heritage resources and cultural heritage landscapes. In Subsection 2.6 - Cultural Heritage and Archaeological Resources, the *PPS* states that:

2.6.1 Significant built heritage resources and significant cultural heritage landscapes shall be conserved.

2.1.3 WELLINGTON COUNTY OFFICIAL PLAN

The Wellington County Official Plan was adopted by Wellington County Council on September 24, 1998, approved by the Ministry of Municipal Affairs on April 13, 1999, came into effect on May 6, 1999 and was last updated on August 15, 2019. Policies relevant to this HIA include:

4.1.2 **Ontario Heritage Act**

Under the Ontario Heritage Act, a local Council may pass by-laws to:

a) Designate individual properties of cultural heritage value or interest, in accordance with the criteria set out in Ontario Regulation 9/06. Such a by-law shall include a description of the property and a statement of cultural heritage value or interest and description of the heritage attributes;

4.1.5 **Policy Direction**

a) significant built heritage resources and significant cultural heritage landscapes shall be conserved. Conserved means the identification, protection, use and/or management of cultural heritage and archeological resources in such a way that their heritage values, attributes and integrity are retained. This may be addressed through a conservation plan or heritage impact assessment in accordance with Section 4.6.7.

4.6.7 **Heritage Impact Assessment and Conservation Plan**

A heritage impact assessment and conservation plan may be required to determine if any significant cultural heritage resources are impacted by a development proposal. A heritage impact assessment is a study to determine if any significant cultural heritage resources are impacted by a development proposal, whether the impacts can be mitigated, and by what means. A heritage impact assessment will generally be required to contain:

a) Historical research, site analysis and evaluation

b) Identification of the significance and heritage attributes of the cultural heritage resources

c) Description of the proposed development or site alteration

d) Assessment of development or site alteration impact

e) Consideration of alternatives, mitigation and conservation methods. Methods to minimize or avoid a negative impact on a significant cultural heritage resource include, but are not limited to:

i) alternative development approaches

ii) isolating development and site alteration from significant built and natural features and vistas

iii) design guidelines that harmonize mass, setback, setting, and materials

iv) limiting height and density

v) allowing only compatible infill and additions

vi) reversible alterations

vii) buffer zones, and

viii) site plan control

f) Implementation and monitoring

g) Summary statement and conservation recommendations

2.2 METHODOLOGY

The recommendations of this HIA are based on an understanding of the physical values of the property, a documentation of its history through research, an analysis of its social and physical context, comparisons with similar properties and mapping.

This HIA is guided by key documents and policies such as the Municipal Engineers Association's (MEA) Municipal Heritage Bridges, Cultural, Heritage and Archaeological Resources Assessment Checklist (2014), the Reference Guide on Physical and Cultural Heritage Resources (Government of Canada, 1996), the Ontario Heritage Toolkit (Ministry of Culture, 2006), the Guidelines for Preparing the Cultural Heritage Resource Component of Environmental Assessments (Ministry of Culture and Communications, 1992), and the County of Wellington's HIA requirements in Section 4.6.7 of the County of Wellington Official Plan.

An HIA examines a property in its entirety, including its relationship to its surroundings, as well as its individual elements – engineering works, landscape etc. This report will include the following reproduced from the CHER:

- Thorough photographic documentation of the bridge and context;
- A written description of the existing conditions and immediate context; and,
- A draft statement of CHVI.
- For the complete background including the history of the immediate context, land-use history of the bridge, comparative analysis and evaluation of the bridge according to O. Reg. 9/06, please consult the CHER directly.

— To address the requirements of an HIA this report will also include:
— A review of the preferred alternative and the identification of potential impacts to the subject bridge; and,
— The identification and analysis of mitigation opportunities as required.

2.3 CONSULTATION

Wellington County was consulted as a part of this project for information regarding potential cultural heritage resources. Details regarding the scope and timing of this consultation have been provided in Table 1.

Table 1: Consultation Record

CONTACT	CONTACT DETAILS	RESPONSE RECEIVED	RESPONSE
Michelle Innocente Senior Planner, Wellington County michellei@wellington.ca	By email on October 30, 2019; follow up on November 13, 2019.	November 13, 2019	Wellington County does not have a Heritage Register; Michelle suggested contacting the municipality's Clerk.
Karren Wallace Director of Legislative Services/Clerk kwallace@wellington-north.com	By email November 13, 2019	November 18, 2019	The bridges have no heritage status.

3 EXISTING CONDITIONS

3.1 DESCRIPTION OF STRUCTURE

The Conestogo River Bridge #6 is a two-lane, single span rigid-frame structure constructed in 1931 and located along Wellington Road 109, 0.2 km east of Highway 6 (Figure 1). The bridge is not listed on a municipal heritage register or designated under the *Ontario Heritage Act.* It is also not included on the list of provincial heritage properties maintained by the MHSTCI.

The Contestogo River Bridge #6 is a reinforced cast-in-place bridge with concrete abutments, asphalt paving surface and cast-in-place concrete railing. The bridge is oriented west to east and spans 17 m, while the roadway width is 11.6 m, the overall width is 17 m and the total deck length is 18.5 m. Embankments on either end of the bridge consist of soil and overgrown, low lying vegetation. Approaches to the bridge on both sides are straight and flat, and both sides of the road are lined with steel barriers (Images 1-9).

As the Conestogo River Bridge #6 is a rigid-frame concrete bridge, the superstructure and substructure were cast as one single unit. The substructure consists of reinforced concrete abutments. The abutments were cast-in-place separately and are separated from the superstructure by a construction joint. The superstructure has a segmental arch with a depth ranging from 1.19 m (3’11”) to 0.81 m (2’8”). The bridge deck consists of paved asphalt and both sides of the bridge have a reinforced concrete railing system.

Repairs to the bridge were undertaken in 1989 and included railing and sidewalk repairs, deck repaving, soffit repairs and substructure repairs. In 2015 the bridge was inspected and deemed to require replacement.

In accordance with legislation, inspections of the bridge have been conducted biennially to monitor the conditions of the bridge and identify any potential repair or replacement. The most recent Municipal Structure Inspection Form (MSIF) as completed in October 2017 by WSP. The form identifies the condition of each element and is summarized in Table 2. In total, approximately 61% of the bridge is considered to be in good condition, 28% is considered to be in fair condition and 11% is considered to be in poor condition. Overall the MSIF has attributed a Building Condition Index of 56.37 (a score out of 100) and notes the overall condition as “Poor”.

Table 2: Summary of Bridge Condition from the Municipal Structure Inspection Report

Bridge Element	Condition (square metres)			
	Excellent	Good	Fair	Poor
Deck: wearing surface	0	91	30	15

Decks: soffit thick slab (interior)	0	135.5	50	10
Decks: soffit thick slab (exterior)	0	9.2	15	3
Decks: drainage	0	0	0	2
Barriers: concrete balustrade	0	14	25	25
Barriers: railing system (steel flex beam on steel post)	0	102	0	0
Abutments: wingwalls	0	43.3	20	8
Abutments: abutment walls	0	14	20	20
Stream and waterway	0	0	1	0
Embankments	0	0	3	1
Approaches: wearing surfaces	0	48	48	0
Totals	0	457	212	84
	0.00%	60.69%	28.15%	11.16%

Image 1: Looking east toward west approach to the bridge

Image 2: Looking east towards east approach to the bridge

Image 3: Looking east towards the bridge deck

Image 4: Looking southwest towards north side of the bridge

Image 5: Looking northwest towards south side of the bridge

Image 6: Looking southwest towards north side of west abutment and embankment

Image 7: Looking west towards the west abutment

Image 8: Looking south towards the east abutment

Image 9: Detail of the concrete railing on the south side of the bridge

3.1.1 DESIGN AND CONSTRUCTION

Structure Name	Conestogo River Bridge #6	**Road Name**	Wellington Road 109
District	Central Region	**Road Type**	Highway
Municipality	Township of Wellington North	**Owner**	Wellington County
Bridge or Culvert	Bridge	**Overall Structure Width (m)**	17
Structure Type	Rigid-frame	**Roadway Width (m)**	11.6
Span (m)	17	**Total Deck Length (m)**	18.5
Height (M)		**Total Deck Area (s.m)**	215
Direction of Structure	West/East	**Heritage Description**	None
Year Built/Rehabilitated	Built 1931		
Current Load Limit	Unknown	**Designer/Construction Firm**	Department of Highways Ontario
Waterway	Conestogo River		

A site visit to the structure was completed to record existing conditions. An inspection of the bridge and the landscape context was conducted on November 6, 2019. The weather allowed for good visibility of the landscape and structural features. Access to the bridge was gained via Wellington Road 109.

3.2 DESCRIPTION OF STUDY AREA AND LANDSCAPE CONTEXT

The Conestogo River Bridge #6 is located in the Township of Wellington North, in Wellington County. The study area consists of the current bridge, approaches to the bridge and the embankments supporting the bridge (Images 10-13). Wellington Road 109 consists of a two lane-divided road with gravel shoulders that was formerly provincial Highway 9. The Conestogo River is a narrow, shallow and winding river that crosses Wellington Road 109 multiple times. The approaches to the Conestogo River Bridge #6 are straight and flat, and include steel guardrails on both sides of the road on either end of the bridge.

The area surrounding the bridge includes a naturally vegetated area, beyond which are agricultural fields and the Village of Arthur to the west. West of the bridge, in the Village of Arthur, several single detached dwellings are located on the south side of Wellington Road 109 and a restaurant and gas station on the north side of Wellington Road 109.

The Conestogo River is narrow, shallow and winding at this point and the waterway crosses Wellington Road 109 multiple times within the general area.

Image 10: Views west of the bridge toward the restaurant and gas station

Image 11: Views west of the bridge toward the single detached dwellings

Image 12: View of the Conestogo River from the south side of the bridge

Image 13: View of the Conestogo River from the north side of the bridge

3.3 ARCHAEOLOGY ASSESSMENT

As of the writing of this report, a Stage 1-2 Archaeological Assessment report is currently underway for Bridge #6 by WSP.

4 RESULTS OF HERITAGE EVALUATION

The CHER (dated October 4, 2021) found that the Conestogo River Bridge #6 has cultural heritage value or interest according to Ontario Regulation 9/06 (*Ontario Heritage Act*). Accordingly, the following Statement of Cultural Heritage Value or Interest and list of Attributes has been prepared.

4.1 STATEMENT OF CULTURAL HERITAGE VALUE OR INTEREST

4.1.1 DESCRIPTION OF RESOURCE

The Conestogo River Bridge #6 was constructed in 1931 to carry Highway 9 (now Wellington Road 109) traffic over the Conestogo River in the Township of Wellington-North, Wellington County. The rigid-frame cast-in-place concrete bridge is a single span and allows for two lanes of traffic to travel across it.

4.1.2 CULTURAL HERITAGE VALUE OR INTEREST

Built in 1931, the Conestogo River Bridge #6 is one of three rigid-frame cast-in-place concrete bridges along Wellington Road 109 built between 1931 and 1934. The Conestogo River Bridge #6 is an early and representative example of a rigid-frame cast-in-place concrete bridge in Wellington County. The bridge has had minimal repairs since it's construction and continues to display the original rigid-frame design which consists of the reinforced cast-in-place superstructure and substructure, the reinforced and cast-in-place wingwalls and the concrete hand rails.

The bridge was built by the Department of Highways, Ontario (DHO) according to their General Specifications for Concrete Highway Bridges. These specifications emphasized the importance of the aesthetic quality of bridges, particularly the hand rails and arched design. The subject bridge exhibits a simple but aesthetically pleasing design that also supports the character of the surrounding rural area.

The Conestogo River Bridge #6 also demonstrates a contextual relationship with the other two rigid-frame cast-in-place bridges (Conestogo River Bridge #4 and Conestogo River Bridge #10) built by the DHO along Wellington Road 109 shortly after the DHO acquired the road and designated it Provincial Highway 9.

4.1.3 DESCRIPTION OF HERITAGE ATTRIBUTES

The heritage attributes that reflect the cultural heritage value or interest of the Conestogo River Bridge #6 include:

- One-span length;
- Reinforced, cast-in-place wingwalls;
- Reinforced, cast-in-place abutments;
- Slight arch design; and
- DHO railing system.

5 PROPOSED UNDERTAKING AND IMPACTS

5.1 DESCRIPTION AND PURPOSE OF PROPOSED UNDERTAKING

The Contestogo River Bridge #6 is a reinforced cast-in-place bridge with concrete abutments, asphalt paving surface and cast-in-place concrete railing. The bridge is oriented west to east and spans 17 m, while the roadway width is 11.6 m, the overall width is 17 m and the total deck length is 18.5 m. As part of a bridge inspection conducted in 2018, the Bridge #6 was found to be in poor condition with major elements showing signs of significant deterioration. WSP has been retained by the County of Wellington to complete a Municipal Class EA Study to address these items and the County is seeking to replace the bridge with a new structure.

The following four alternatives are being considered for Bridge #6 as a result of the MCEA Study:

Option 1 – Do Nothing

This would not include any repairs to the structure but would include regular monitoring and may require that the bridge be closed and thus the road as well.

Option 2 – Remove Without Replacement

This would include removal of the bridge and closure of the road.

Option 3 – Rehabilitation

Areas of deterioration would be removed and repaired and the bridge may require widening to meet current safety standards. To facilitate the flow of traffic during the bridge rehabilitation, a temporary bailey bridge may need to be installed adjacent to the road to allow through traffic.

Option 4 – Replace

This would include complete removal of the existing structure and replacement with a new bridge. To facilitate the flow of traffic during the bridge replacement, a temporary bailey bridge may need to be installed adjacent to the road to allow through traffic.

5.2 IMPACT ASSESSMENT

This section provides an assessment of the potential adverse effects resulting from the proposed undertakings.

Built heritage resources may experience displacement or **direct impacts**, i.e., demolition or removal of heritage attributes. Direct impacts are permanent, not temporary changes to the cultural heritage environment.

Built heritage resources may also experience disruption, or **indirect impacts**, by the introduction of physical, visual, audible or atmospheric elements that are not in keeping with their character and/or setting. These indirect impacts may be temporary during construction, such as vibration impacts and dust particles, or permanent such as the introduction of new infrastructure. Other indirect impacts of a temporary or permanent nature may include, but are not limited to, changes in grading, alterations to built heritage resource setting and fabric as a result of visual, audible or atmospheric elements, etc. Indirect impacts can be permanent or temporary changes to the cultural heritage environment.

The impacts of each of the four alternatives being considered for the bridge through the MCEA Study will be rated based on the following categories identified in Table 4.

Table 4: Impact Ratings

RATING	DESCRIPTION
None	The proposed undertaking has no impact on the heritage value/attribute.
Low	The undertaking has minimal impact on the heritage value/attribute.
Medium	The undertaking affects/disturbs the heritage value/attribute. The undertaking requires mitigation.
High	The undertaking replaces/removes a heritage value/attribute. The undertaking requires mitigation.

5.3 EVALUATION OF IMPACTS

Table 5 provides an evaluation of the impacts of the four alternatives being explored in the MCEA Study.

Table 5: Evaluation of Impacts

CRITERIA	EVALUATION			
	Option 1: Do Nothing	**Option 2: Remove Without Replacement**	**Option 3: Rehabilitation**	**Option 4: Replace**
Destruction of any, or part of any, significant heritage attributes or features.	Impact Rating: None Rationale: No heritage attributes will be impacted if the bridge remains *in situ*.	Impact Rating: High Rationale: Removal of the bridge would result in the destruction of all heritage attributes.	Impact Rating: None Rationale: No heritage attributes will be destructed.	Impact Rating: High Rationale: Replacement of the bridge would result in the destruction of all heritage attributes.
Alteration that is not sympathetic, or is incompatible, with the historic fabric and appearance.	Impact Rating: None Rationale: No heritage attributes will be impacted if the bridge remains *in situ*.	Impact Rating: None Rationale: Removal of the bridge is not considered an "alteration" and will result in the destruction of all heritage attributes.	Impact Rating: Medium Rationale: Rehabilitation of the bridge to meet current safety standards and repair deteriorated elements may result in some physical changes to the heritage attributes.	Impact Rating: None Rationale: Replacement of the bridge is not considered an "alteration" and will result in the removal of all heritage attributes.
Shadows created that alter the appearance of a heritage attribute or change the viability of a natural feature or plantings, such as a garden.	Impact Rating: None Rationale: There will be no new shadows created.	Impact Rating: None Rationale: There will be no new shadows created.	Impact Rating: None Rationale: There will be no new shadows created.	Impact Rating: None Rationale: There will be no new shadows created.
Isolation of a heritage attribute from its surrounding environment, context or a	Impact Rating: None Rationale: No heritage attributes will be impacted if the	Impact Rating: None Rationale: Removal of the bridge will remove all	Impact Rating: None Rationale: Rehabilitation of the bridge will not result	Impact Rating: None Rationale: Replacement of the bridge will remove all

significant relationship.	bridge remains *in situ*.	the heritage attributes.	in the isolation of any heritage attributes.	the heritage attributes.
Direct or indirect obstruction of significant views or vistas within, from, or to built and natural features.	Impact Rating: None Rationale: Significant views or vistas were not identified as heritage attributes of the bridge.	Impact Rating: None Rationale: Significant views or vistas were not identified as heritage attributes of the bridge.	Impact Rating: None Rationale: Significant views or vistas were not identified as heritage attributes of the bridge.	Impact Rating: None Rationale: Significant views or vistas were not identified as heritage attributes of the bridge.
A change in land use such as rezoning a battlefield from open space to residential use, allowing new development or site alteration to fill in the formerly open spaces.	Impact Rating: None Rationale: No change in land use will occur if the bridge remains *in situ*.	Impact Rating: High Rationale: The removal of the bridge will result in a change in land use resulting from the closure of an arterial road.	Impact Rating: None Rationale: There will be no change in use.	Impact Rating: None Rationale: There will be no change in use.
Land disturbances such as a change in grade that alters soils, and drainage patterns that adversely affect an archaeological resource.	Impact Rating: None Rationale: No land disturbance will occur if the bridge remains *in situ*.	Impact Rating: Low Rationale: Removal of the bridge will result in soil disturbance.	Impact Rating: None Rationale: There will be no change in grade.	Impact Rating: None Rationale: There will be no change in grade.

5.4 RESULTS OF IMPACT ASSESSMENT

The impact assessment outlined in Section 5.2.1 has reviewed the four alternatives being explored for the Bridge #6 through the MCEA Study and determined the following:

- **Option 1 – Do Nothing** will not result in any impacts to the bridge's heritage attributes however it will also not address the deteriorating condition of the structure.

- **Option 2 – Remove Without Replacement** will result in significant impacts as it would require the complete demolition of the bridge and its heritage attributes, removal of the bridge's contextual relationship to the historic crossing of Wellington Road 109 over the Conestogo River, removal of the contextual relationship with the two other rigid frame cast-in-place bridges (Conestogo River Bridge #4 and Conestogo River Bridge #10) built by the DHO and closure of Wellington Road 109 at the river crossing.
- **Option 3 – Rehabilitation** of the bridge to meet current safety standards and to repair deteriorated elements will result in physical changes, thus impacting the integrity of the bridge's heritage attributes.
- **Option 4 – Replacement** of the bridge in its entirety will result in significant impacts through the destruction of all the structure's heritage attributes as well as removal of the bridge's contextual relationship to the historic crossing of Wellington Road 109 over the Conestogo River at this location and well as the contextual relationships to the other two rigid frame cast-in-place bridges (Conestogo River Bridge #4 and Conestogo River Bridge #10) built by the DHO along Wellington Road 109.

From a cultural heritage perspective, the alternatives that retain the concrete structure of the Bridge #6 in its current location are the most desirable (Options 1 and 3). If the bridge is to be retained and/or rehabilitated, the heritage attributes should be conserved. Option 4, which would see the current bridge removed and replaced with a new bridge, could maintain several of the bridge's design and contextual attributes through the application of mitigation measures. Option 2 represents the least desirable option as it would see the complete removal of the structure and closure of Wellington Road 109 at the river crossing.

5.5 CONSIDERED ALTERNATIVES AND MITIGATION MEASURES

When adverse impacts are expected from proposed site alteration, alternatives and mitigation measures should be considered to manage the site alteration in a way that will not adversely affect built heritage resources and cultural heritage landscapes. The preferred heritage approach for the protection of resources is retention in situ and the preservation of the material integrity to the maximum extent possible, as public safety allows.

In situations where the nature of site alteration is such that adverse impacts are unavoidable, it is possible to implement mitigative conservation strategies that lessen the adverse effects to the built heritage resources and cultural heritage landscapes. Conservation options are outlined in the Ontario Heritage Bridge Guidelines (OHBG) (MTO, 2008), regarded as current best practice for conserving heritage bridges in Ontario. While the OHBG's are intended for use in the assessment of provincially-owned structures and are not directly applicable in the municipal context, they ensure that heritage concerns and appropriate mitigation options are considered.

5.5.1 ALTERNATIVES, MITIGATION AND CONSERVATION OPTIONS ANALYSIS

Consistent with the eight conservation options of the OHBG, regarded as appropriate in managing interventions to heritage bridges, and considered in rank order according to the level or degree of intervention from minimum to maximum, WSP has presented the results of impact assessment based on the preferred option being carried forward as part of the MCEA Study and the observed structural condition of the bridge (WSP, 2019).

Below, Table 6 presents the results of impact assessment based on the OHBG conservation options.

Table 6: OHBG Impact Assessment of Bridge #6

OHBG CONSERVATION OPTIONS	ADVANTAGE	DISADVANTAGE	COMMENTS
1) Retention of existing bridge with no major modifications undertaken	This option is consistent with the principle of minimal intervention and would retain all of the bridge's heritage attributes in the short-term. This option is also consistent with the *County of Wellington Official Plan* policy 4.1.5 that encourages the retention of significant built heritage resources and cultural heritage landscapes.	Given the bridge's current state of disrepair and functional/operational deficiencies, this option would pose a significant public safety concern in the long-term.	This option would likely result in the deterioration of the bridge's heritage attributes, and the eventual closure of the bridge, requiring traffic rerouting.
2) Retention of existing bridge and restoration of missing or deteriorated elements where physical or documentary evidence (e.g. photographs or drawings) can be used for their design	This conservation option involves little change to the original fabric of the structure, and repairs made based on the historic record. This option is also consistent with the *County of Wellington Official Plan* policy 4.1.5.	This option does not address the bridge's functional/operational deficiencies including substandard roadway width, barrier protection, and guide rail protection with several components requiring maintenance, rehabilitation and/or replacement. An evaluation of this option from a technical perspective, reveals this option only defers but does not avoid eventual structural replacement.	This option is not viable due to concerns related to the condition of the bridge that cannot be addressed through restoration of deteriorated elements. While the cost of rehabilitation is less than the cost of replacement, this option simply defers rather than replaces the eventual need to replace the structure which would prove more costly in the long-term.

3) Retention of existing bridge with sympathetic modification	This option is consistent with the principle of preservation of material to its highest integrity and would maintain some heritage attributes of the bridge. This option is also consistent with the *County of Wellington Official Plan* policy 4.1.5.	This option would provide a short-term solution that only defers instead of avoids eventual structure replacement. If the scope of rehabilitation is expanded to address all the bridge's functional/operational deficiencies including substandard roadway width, barrier protection, and guide rail protection in addition to the structural deficiencies, the cost would become similar to a replacement option.	Although rehabilitation remains the preferred alternative for the bridge from a cultural heritage perspective, the extent and nature of the deterioration of the structural components of the bridge, and the extensive repairs needed to address the functional/operational deficiencies (i.e., the substandard roadway width, barrier and guide rail protection), will result in a significant loss of historic materials and a change in the dimensions of the bridge to increase its traffic capacity. Considering these principles, sympathetic modification is not recommended.
4) Retention of existing bridge with a sympathetically designed new structure in proximity	This conservation option would retain the heritage attributes of the bridge and address the safety concerns. This option is also consistent with the *County of Wellington Official Plan* policy 4.1.5.	Bridge # 6 and the sympathetically designed new bridge would both require ongoing maintenance, and a new bridge would require additional property to be purchased to expand the road right-of-way and would result in a curve added to the road, creating geometric challenges.	This option is not viable due to the expense of maintaining the existing bridge, acquiring additional property and building a new sympathetically designed structure. It would also introduce undesirable road geometrics that would adversely impact road safety.
5) Retention of existing bridge no longer in use for vehicular purposes but adapted for a new use. For example, prohibiting vehicles or restricting truck traffic or adapting for pedestrian walkways, cycle paths, scenic viewing, etc.	This option is consistent with the principle of minimal intervention and would retain all the heritage attributes of the bridge. Pedestrian or cyclist traffic would likely require less intervention for rehabilitation. This option is also consistent with the County of Wellington's Official Plan policy 4.1.5.	This conservation option alters the use of the bridge from a vehicular bridge to a pedestrian bridge. There is minimal need for a pedestrian bridge in this remote, rural location. This option would require construction of a new road to by-pass the existing bridge, which would pose additional environmental and budgetary impacts.	Pedestrianized bridges are often more appropriate in urban areas where they are well traveled, and the public funding can be justified. This option is not viable due to its expense, engineering constraints and the loss of function as a road bridge.

6) Retention of existing bridge as a heritage monument for viewing purposes only	This conservation option retains the bridge *in situ* and retains its scale and massing. This option is also consistent with the County of Wellington's Official Plan policy 4.1.5.	The bridge will require extensive maintenance and refurbishment and this option removes the bridge as a useful structure and from its historic function as a road bridge. In addition, the County of Wellington will still require a road bridge across the river at this location.	The County of Wellington will require a road bridge at this location. Retaining the Bridge as a heritage monument *in situ* would require realigning the road and construction of a new bridge. Retaining the bridge *in situ* as a heritage monument is not viable due to the considerable expense and engineering constraints.
7) Relocation of smaller, lighter single span bridges to an appropriate new site for continued use (see 4) or adaptive re-use (see 5)	This option is consistent with the principle of preservation of material to its highest integrity and would maintain all the bridge's heritage attributes.	Given the bridge's cast-in-place concrete construction, moving the bridge intact is likely not feasible. Furthermore, relocating the bridge would remove its contextual relationship with the crossing over the Conestogo River on Wellington Road 109. This option presents considerable risk of damage/destruction of the bridge through the relocation process. The bridge will still require extensive maintenance and refurbishment at considerable expense during disassembly, relocation and future maintenance.	This option is likely not viable given the concrete construction of the bridge. Relocation of bridges is rare and would require a thorough Conservation Plan to facilitate the process. Furthermore, even if possible, the expense of moving the bridge as well as the rehabilitation costs to make it appropriate for continued use would be prohibitive.
8) Bridge removal and replacement with a sympathetically designed structure: **a) Where possible, salvage elements/ members of the bridge for incorporation into a new structure or for future conservation work or displays;** **b) Undertake full recording and documentation of**	Thorough detailed investigations, the construction and contextual relationships of Bridge #6 would be better understood and become part of an example for comparative study. Documentary records could be made accessible to the public through the local library or other commemorative methods. Impacts from the	Built heritage resources are finite, meaning once gone, they are gone forever. Demolition would result in the loss of all the bridge's heritage attributes. Although once common, this bridge type is now a diminishing resource due to replacement to meet current safety requirements and traffic needs. Bridge #6 is the one of the oldest rigid-frame cast-in-place concrete bridge in the County of Wellington.	Prior to demolition, the bridge should be recorded through a Documentation and Salvage Report that contains measured drawings, a thorough photographic recording and written description of the structure as well as a list of elements worthy of salvage. Preservation by record is the least desirable conservation option but may be appropriate in cases where structural integrity of a bridge is poor,

existing structure	introduction of a new bridge could be minimized if it retained its contextual relationship (i.e., original location) and adopted a design that draws from the materials and design inspiration of the extant bridge while maintaining legibility (new work that is distinguishable from the old). This approach represents a best practice in heritage conservation.	. .	rehabilitation is prohibitively expensive, it is technically difficult to stabilize a structure, or where public safety is a concern.

Conservation Option 8 will result in major adverse effects to a cultural heritage resource. The OHBG requires four additional conditions be considered before this option is selected (Table 7). Only one of the following requirements must be met to justify replacing a bridge that is a cultural heritage resource.

Table 7: Detailed Conditions for Conservation Option 8

DETAILED CONDITIONS FOR CONSERVATION OPTION 8	ASSESSMENT RATIONALE
The safety of the existing structure is compromised to the extent that rehabilitation is not a practical option	The safety of the existing structure is of concern. The Structure Inspection completed by WSP in 2018 identifies a longitudinal crack along the full length of the deck and spalling concrete exposing reinforcing throughout. While the bridge can be repaired, this would only delay rather than replace the eventual need to replace the bridge.
The cost of rehabilitation is prohibitive compared to replacement	The cost of rehabilitation to address the structural deficiencies as well as the bridge's functional/operational deficiencies including substandard roadway width, barrier protection, and guide rail protection would be similar in cost to the cost of replacement.
The bridge has been severely altered from its original form	Not applicable. The bridge has not been significantly altered from its original form.
Replacement is required to meet demand requirements that are not achievable through rehabilitation or upgrading the existing structure	Replacement is required to meet demand requirements that is not achievable through rehabilitation or upgrading the existing structure as the bridge exhibits several functional/operational deficiencies including substandard roadway width and substandard barrier protection and guide rail protection with several components requiring maintenance, rehabilitation and/or replacement.

5.6 RESULTS OF ALTERNATIVES, MITIGATION AND CONSERVATION RECOMMENDATIONS

The CHER completed in WSP in 2021 demonstrated that the Bridge #6 has design or physical, historical or associative and contextual value in accordance with O. Reg. 9/06. Given the bridge's CHVI, ideally it would be retained on its original site, rehabilitated in a sensitive manner and continued to be used for its original purpose. However, given the bridge's state of deterioration and the public safety concerns related to its functional/operational deficiencies, it is understood that retention and rehabilitation of the bridge is not feasible. Furthermore, Bridge #6 is not considered a good candidate for relocation or reuse.

Option 8 – Bridge removal and replacement with a sympathetically designed structure and salvage elements of the bridge for adaptive reuse is the recommended alternative. Prior to demolition, a Documentation and Salvage Report should be prepared by a qualified heritage consultant to record the bridge thorough measured drawings and photographic and written descriptions. Elements worthy of salvage should also be recommended. It may be determined that the CHER and HIA provide sufficient documentation of the bridge, only requiring preparation of a Salvage Plan. Given the County of Wellington intends to replace other bridges along Wellington Road 109 (Conestogo Bridge #4, Conestogo Bridge #5 and Conestogo Bridge #10) and that these bridges have a contextual relationship to each other and Wellington Road 109, being built around the same time by the DHO, WSP recommends that the documentation of each bridge be combined into one report.

Elements to be salvaged should be collected prior to demolition. This material could be incorporated into a compatible design for the new bridge (i.e., commemorative bridge plaque) or used to construct a commemorative display or new plaque near the site of the bridge.

The design of a compatible replacement structure in a manner sympathetic to the current bridge should be explored. Efforts should be made to incorporate design qualities and/or materials of the original bridge and its setting, while maintaining legibility. This approach represents a best practice in heritage conservation. Design considerations should explore the incorporation of the scale, massing, rhythm and finishes of the original bridge, where possible and feasible. Specifically, the concrete arch, the placement and design of the concrete railings, and siting at the same location over the Conestogo River should be considered in the final design for the replacement structure.

5.7 SUMMARY OF COMMUNITY ENGAGEMENT

Wellington County was consulted as a part of this project with the intent of information gathering regarding any cultural heritage interests or concerns related to Bridge #6. This engagement was not combined with the Public Information Centres completed as part

of the MCEA. Details regarding the scope and timing of this consultation are provided in Table 8.

CONTACT	CONTACT DETAILS	RESPONSE RECEIVED	RESPONSE
Michelle Innocente Senior Planner, Wellington County michellei@wellington.ca	By email on October 30, 2019; follow up on November 13, 2019.	November 13, 2019	Wellington County does not have a Heritage Register; Michelle suggested contacting the municipality's Clerk.
Karren Wallace Director of Legislative Services/Clerk, Township of Wellington-North kwallace@wellington-north.com	By email November 13, 2019	November 18, 2019	The bridges have no heritage status.

The MHSTCI was circulated this report for review on July 14, 2021. A response was received on August 3, 2021 in which the Ministry provided comments and recommendations outlining suggested revisions. Those revisions have been incorporated into this report. Given that the bridge was found to possess CHVI, the MHSTCI recommended that the CHER and HIA be publicly disclosed for any interested groups and persons for review and comment as part of the EA process.

5.8 RECOMMENDATIONS

Given the identified CHVI of Bridge #6 and the preferred option being carried forward as part of the MCEA Study involving the complete removal and replacement of subject bridge, the following mitigation measures are recommended:

1. The Bridge #6 should be recorded through a Documentation and Salvage Report containing measured drawings, a thorough photographic record and written description of the bridge as well as recommendations for elements worthy of salvage prior to demolition (i.e., steel truss members, commemorative bridge plaque). Given the County of Wellington intends to replace other bridges along Wellington Road 109 (Conestogo Bridge #4, Conestogo Bridge #5 and Conestogo Bridge #10) and that these bridges have a contextual relationship to each other and Wellington Road 109, being built around the same time by the DHO, WSP recommends that the documentation of each bridge be combined

into one report. This report should be shared with the County of Wellington and the County of Wellington Museum & Archives. The bridge(s) should be documented to the standard outlined according to section 6.3.1.4 of the MTO *Environmental Guide for Built Heritage and Cultural Heritage Landscapes* (2007), and according to the *Historic American Engineering Record* (HAER) guidelines.

2 Commemoration opportunities should be explored for the bridge with community input.

3 The construction of a new bridge should be designed in a manner that draws from the design inspiration and materials of the extant bridge while maintaining legibility. Design considerations should explore the incorporation of the scale, massing, rhythm and finishes of the original bridge, where possible and feasible. Specifically, the members of a Warren pony truss, the placement and design of the concrete railings, and siting at the same location over the Conestogo River should be considered in the final design for the replacement structure.

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WELLINGTON COUNTY

HERITAGE IMPACT ASSESSMENT

CONESTOGO RIVER BRIDGE #10 (B109134)

January 26, 2022 FINAL

HERITAGE IMPACT ASSESSMENT

CONESTOGO RIVER BRIDGE #10 (B109134)

WELLINGTON COUNTY

FINAL

PROJECT NO.: 17M-01271-01
DATE: JANUARY 26, 2022

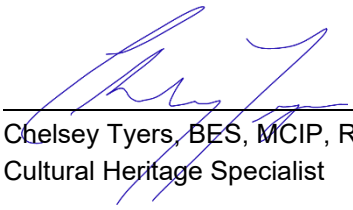
WSP
4 HUGHSON STREET SOUTH, SUITE 300
HAMILTON, ON, CANADA L8N 3Z1

WSP.COM

WSP Canada Inc.

SIGNATURES

PREPARED BY



Chelsey Tyers, BES, MCIP, RPP
Cultural Heritage Specialist

January 26, 2022
Date

APPROVED BY

Joel Konrad, PhD, CAHP
Cultural Heritage Lead - Ontario

January 26, 2022
Date

EXECUTIVE SUMMARY

WSP Canada Inc. (WSP) was retained by Wellington County to complete the preliminary and detailed design of the Conestogo River Bridge #10 (B109134) replacement through a Municipal Class Environmental Assessment (MCEA) Study.

In advance of the commencement of the MCEA Study, WSP completed a Cultural Heritage Evaluation Report (CHER) for the Conestogo River Bridge #10 and submitted to the County of Wellington in January 2020. The CHER determined that the Conestogo River Bridge #10 is of cultural heritage value or interest for design and contextual reasons through application of Ontario Regulation 9/06.

The County of Wellington has also retained WSP to complete a Heritage Impact Assessment of the Conestogo River Bridge #10 in advance of the MCEA Study, to identify whether there are any impacts to the bridge's identified cultural heritage value or interest and list of heritage attributes, to demonstrate how the resource will be conserved if possible and to recommend mitigative or avoidance measures, alternative development or site alteration as appropriate. This document builds upon the CHER to address the requirements for the HIA.

The completion of this study has resulted in the following recommendations:

1. The Bridge #10 should be recorded through a Documentation and Salvage Report containing measured drawings, a thorough photographic record and written description of the bridge as well as recommendations for elements worthy of salvage prior to demolition (i.e., steel truss members, commemorative bridge plaque). Given the County of Wellington intends to replace other bridges along Wellington Road 109 (Conestogo Bridge #5, Conestogo Bridge #5 and Conestogo Bridge #6) and that these bridges have a contextual relationship to each other and Wellington Road 109, being built around the same time by the DHO, WSP recommends that the documentation of each bridge be combined into one report. This report should be shared with the County of Wellington and the County of Wellington Museum & Archives. The bridge(s) should be documented to the standard outlined according to section 6.3.1.4 of the MTO *Environmental Guide for Built Heritage and Cultural Heritage Landscapes* (2007), and according to the *Historic American Engineering Record* (HAER) guidelines.

2. Commemoration opportunities should be explored for the bridge with community input.

3. The construction of a new bridge should be designed in a manner that draws from the design inspiration and materials of the extant bridge while maintaining legibility. Design considerations should explore the incorporation of the scale, massing,

rhythm and finishes of the original bridge, where possible and feasible Specifically, the arched concrete design, the placement and design of the concrete railings, and siting at the same location over the Conestogo River should be considered in the final design for the replacement structure.

PROJECT PERSONNEL

CLIENT

Client Contact	Joe DeKoning, P. Eng. Manager of Construction, Wellington County

WSP

Project Manager	William Van Ruyven, P. Eng.
Cultural Heritage Specialist	Chelsey Tyers, BES, MCIP, RPP Cultural Heritage Specialist
Report Preparation	Chelsey Tyers Jacqueline Bradica, BA Cultural Heritage Assistant
GIS and Mapping	Andrew Turner, MSc.
Report Review	Joel Konrad, PhD, CAHP Cultural Heritage Lead – Ontario

TABLE OF CONTENTS

TABLES

FIGURES

1 INTRODUCTION

1.1 PROJECT CONTEXT

WSP Canada Inc. (WSP) was retained by Wellington County to complete a Heritage Impact Assessment (HIA) in advance of the Municipal Class Environmental Assessment (MCEA) Study for Conestogo River Bridge #10. A Cultural Heritage Evaluation Report (CHER) was completed in January 2020 and determined that the subject bridge has cultural heritage value or interest in accordance with Ontario Regulation 9/06 (O. Reg. 9/06). The CHER recommended that a HIA be conducted for the preferred alternative to assess the impact and recommend appropriate mitigation measures.

The County of Wellington is seeking to replace the Conestogo River Bridge #10 with a new bridge structure (Figure 1). As such, the purpose of this report is to build upon the conclusions of the CHER and address the requirements for the HIA. This includes an analysis of the impact of the structure removal and replacement and recommendations for mitigation measures.

Service Layer Credit Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

wsp

LEGEND

- Connestoga Bridge 10

TITLE: FIGURE 1: PROJECT LOCATION

SCALE: 1:5,000 | PROJECT NO: 17M-01271-01 | DATE: NOVEMBER 2019

DRAWN BY: AST | CLIENT: WELLINGTON COUNTY

PROJECT: CONNESTOGA BRIDGE #10 CHER

CREDITS: LAND INFORMATION ONTARIO

0 120 240 m

N

Document Path: C:\Users\Andrew.S.Turner\Projects\17M-01271-01 Wellington Bridges and Culverts\MapDocuments\Bridge#10\Map 1 Project Location.mxd

2 LEGISLATION AND POLICY CONTEXT

2.1 PROVINCIAL AND MUNICIPAL CONTEXT AND POLICIES

2.1.1 PROVINCIAL POLICY CONTEXT

This cultural heritage assessment considers cultural heritage resources in the context of proposed highway intersection improvements under the *Environmental Assessment Act* (1990), as well as the *Planning Act* (1990). This assessment addresses above-ground cultural heritage resources over 40 years old (Ministry of Transportation 2007; Ontario Realty Corporation 2007) as well as through the application of the Ministry of Heritage, Tourism, Sport, and Culture Industries' (MHSTCI; formerly the Ministry of Tourism, Culture and Sport) Criteria for Evaluating Potential for Built Heritage Resources and Cultural Heritage Landscapes (2016).

Under the *Environmental Assessment Act* (1990), environment is defined in Subsection 1(c) to include:

- Cultural conditions that influence the life of man or a community, and;
- Any building, structure, machine, or other device or thing made by man.

The MHSTCI is charged under Section 2 of the *Ontario Heritage Act* with the responsibility to determine policies, priorities and programs for the conservation, protection and preservation of Ontario's cultural heritage resources. To that end, the MHSTCI has published the following guidelines to assist in assessing cultural heritage resources as part of an environmental assessment:

- Guideline for Preparing the Cultural Heritage Resource Component of Environmental Assessments (1992)
- Guidelines on the Man-Made Heritage Component of Environmental Assessments (1981)
- Ontario Heritage Toolkit, Info Sheet #5: Heritage Impact Assessments and Conservation Plans (2005)

All guidelines have been utilized in this assessment process.

Additionally, the *Planning Act* (1990) and related Provincial Policy Statement (PPS 2020), provide guidance on the identification and conservation of cultural heritage resources. In Subsection 2.6 - Cultural Heritage and Archaeological Resources, the PPS states:

2.6.1 Significant built heritage resources and significant cultural heritage landscapes shall be conserved.

2.1.2 WELLINGTON COUNTY OFFICIAL PLAN

The Wellington County Official Plan was adopted by Wellington County Council on September 24, 1998, approved by the Ministry of Municipal Affairs on April 13, 1999, came into effect on May 6, 1999 and was last updated on August 15, 2019. Policies relevant to this HIA include:

4.1.2 **Ontario Heritage Act**

Under the Ontario Heritage Act, a local Council may pass by-laws to:

a) Designate individual properties of cultural heritage value or interest, in accordance with the criteria set out in Ontario Regulation 9/06. Such a by-law shall include a description of the property and a statement of cultural heritage value or interest and description of the heritage attributes;

4.1.5 **Policy Direction**

a) significant built heritage resources and significant cultural heritage landscapes shall be conserved. Conserved means the identification, protection, use and/or management of cultural heritage and archeological resources in such a way that their heritage values, attributes and integrity are retained. This may be addressed through a conservation plan or heritage impact assessment in accordance with Section 4.6.7.

4.6.7 **Heritage Impact Assessment and Conservation Plan**

A heritage impact assessment and conservation plan may be required to determine if any significant cultural heritage resources are impacted by a development proposal. A heritage impact assessment is a study to determine if any significant cultural heritage resources are impacted by a development proposal, whether the impacts can be mitigated, and by what means. A heritage impact assessment will generally be required to contain:

a) Historical research, site analysis and evaluation
b) Identification of the significance and heritage attributes of the cultural heritage resources
c) Description of the proposed development or site alteration
d) Assessment of development or site alteration impact
e) Consideration of alternatives, mitigation and conservation methods. Methods to minimize or avoid a negative impact on a significant cultural heritage resource include, but are not limited to:
    i) alternative development approaches
    ii) isolating development and site alteration from significant built and natural features and vistas

iii) design guidelines that harmonize mass, setback, setting, and materials

iv) limiting height and density

v) allowing only compatible infill and additions

vi) reversible alterations

vii) buffer zones, and

viii) site plan control

f) Implementation and monitoring

g) Summary statement and conservation recommendations

2.2 METHODOLOGY

The recommendations of this HIA are based on an understanding of the physical values of the property, a documentation of its history through research, an analysis of its social and physical context, comparisons with similar properties and mapping.

This HIA is guided by key documents and policies such as the Municipal Engineers Association's (MEA) Municipal Heritage Bridges, Cultural, Heritage and Archaeological Resources Assessment Checklist (2014), the Reference Guide on Physical and Cultural Heritage Resources (Government of Canada, 1996), the Ontario Heritage Toolkit (Ministry of Culture, 2006), the Guidelines for Preparing the Cultural Heritage Resource Component of Environmental Assessments (Ministry of Culture and Communications, 1992), and the County of Wellington's HIA requirements in Section 4.6.7 of the County of Wellington Official Plan.

An HIA examines a property in its entirety, including its relationship to its surroundings, as well as its individual elements – engineering works, landscape etc. This report will include the following reproduced from the CHER:

- Thorough photographic documentation of the bridge and context;
- A written description of the existing conditions and immediate context; and,
- A draft statement of CHVI.

For the complete background including the history of the immediate context, land-use history of the bridge, comparative analysis and evaluation of the bridge according to O. Reg. 9/06, please consult the CHER directly.

To address the requirements of an HIA this report will also include:

- A review of the preferred alternative and the identification of potential impacts to the subject bridge; and,
- The identification and analysis of mitigation opportunities as required.

3 EXISTING CONDITIONS

3.1 DESCRIPTION OF STRUCTURE

The Conestogo River Bridge #10 is a two-lane, single span rigid-frame structure on Wellington Road 109 constructed in 1934 and located along Wellington Road 109, 1 km east of Wellington Road 45 (Figure 1). The bridge is not listed on a municipal heritage register or designated under the *Ontario Heritage Act.* It is also not included on the list of provincial heritage properties maintained by the MHSTCI.

The structure is a reinforced cast-in-place bridge with concrete abutments, asphalt paving surface and cast-in-place concrete railing. The bridge is oriented west to east and spans 12 m, while the roadway width is 9.5 m, the overall width is 11.4 m and the total deck length is 13.5 m. Embankments on either end of the bridge consist of soil and overgrown, low lying vegetation. Approaches to the bridge on both sides are straight and flat, and both sides of the road are lined with steel barriers (Images 1-12).

As the Conestogo River Bridge #10 is a rigid-frame concrete bridge, the superstructure and substructure were cast as one single unit. The substructure consists of reinforced concrete abutments. The wing walls were cast-in-place separately and are separated from the substructure by a construction joint. The superstructure has a segmental arch with a deck depth ranging from 0.93 m (3’1”) to 0.38 m (1’3”). The bridge deck consists of paved asphalt and both sides of the bridge have a reinforced concrete railing system.

Repairs to the bridge were undertaken in 1989 which included repairs to the railings and curbs; overlaying, waterproofing and paving the deck; and soffit repairs. Additional repairs to the west abutment were undertaken in 2007. In 2017 the bridge was inspected and deemed to require replacement.

In accordance with legislation, inspections of the bridge have been conducted biennially to monitor the conditions of the bridge and identify any potential repair or replacement. The most recent Municipal Structure Inspection Form (MSIF) was completed in October 2017 by WSP. The form identifies the condition of each element and is summarized in Table 1. In total, approximately 79.34% of the bridge components considered to be in good condition, 12% is considered to be in fair condition and 8% is considered to be in poor condition. The high percentage of bridge components considered to be in good condition is skewed by the large amount of steel flex beam on steel posts that are neither original to the bridge nor provide any structural support. Overall the MSIF has attributed a Building Condition Index of 58.85 (a score out of 100) and notes the overall condition as “Poor”.

Table 1: Summary of Bridge Condition from the Municipal Structure Inspection Report

Bridge Element	Condition (square metres)			
	Excellent	Good	Fair	Poor
Deck: wearing surface	0	106	4	4
Decks: soffit thick slab (interior)	0	104	20	20
Decks: soffit thick slab (exterior)	0	9.3	5	18
Decks: drainage	0	2	2	0
Sidewalks and curbs	0	0	28.5	0
Barriers: concrete balustrade	0	17.6	16	11.5
Barriers: railing system (steel flex beam on steel post)	0	298	0	0
Abutments: wingwalls	0	14	5	2
Abutments: abutment walls	0	36	22	12
Stream and waterway	0	0	0	1
Embankments	0	0	2	2
Approaches: wearing surfaces	0	108	3	3
Totals	0	694.9	107.5	73.5
	0.00%	79.34%	12.27%	8.39%

Image 1: Looking east towards east approach to the bridge

Image 2: Looking west towards west approach to the bridge

Image 3: Looking west towards the bridge deck

Image 4: Looking northeast towards the south side of the bridge

Image 5: Looking south towards north side of the bridge

Image 6: View of north side of west wing wall

Image 7: View of south side of west wing wall

Image 8: Looking east towards east abutment

Image 9: Looking north towards west abutment, note concrete accretion on the soffit

Image 10: View of the underside of the bridge deck, note drainage pipes

Image 11: View of concrete hand rails

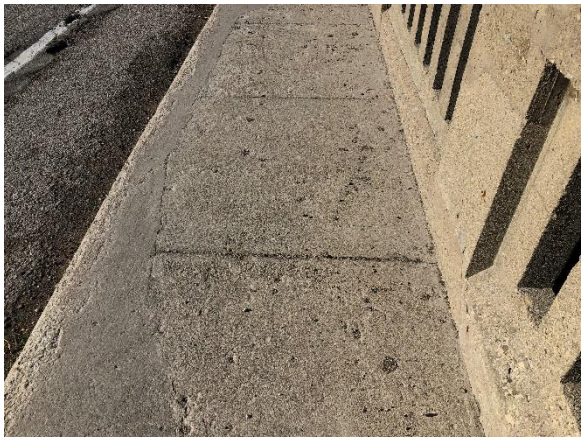


Image 12: View of sidewalk located on north side of the bridge

3.1.1 DESIGN AND CONSTRUCTION

Structure Name	Conestogo River Bridge #10	**Road Name**	Wellington Road 109
District	Central Region	**Road Type**	Highway
Municipality	Township of Wellington North	**Owner**	Wellington County
Bridge or Culvert	Bridge	**Overall Structure Width (m)**	11.4

Structure Type	Rigid-frame	**Roadway Width (m)**	9.5
Span (m)	12	**Total Deck Length (m)**	13.5
Height (M)		**Total Deck Area (s.m)**	154
Direction of Structure	West/East	**Heritage Description**	None
Year Built/Rehabilitated	Built 1934		
Current Load Limit	Unknown	**Designer/Construction Firm**	Department of Highways Ontario
Waterway	Conestogo River		

A site visit to the structure was completed to record existing conditions. An inspection of the bridge and the landscape context was conducted on November 6, 2019. The weather allowed for good visibility of the landscape and structural features. Access to the bridge was gained via Wellington Road 109.

3.2 DESCRIPTION OF STUDY AREA AND LANDSCAPE CONTEXT

The Conestogo River Bridge #10 is located in the Township of Wellington North, in Wellington County. The study area consists of the current bridge, approaches to the bridge and the embankments supporting the bridge (Images 13-17). Wellington Road 109 consists of a two lane-divided road with gravel shoulders that was formerly provincial Highway 9. The Conestogo River is a narrow, shallow and winding river that crosses Wellington Road 109 multiple times. The approaches to the Conestogo River Bridge #10 are straight and flat, and include steel guardrails on both sides of the road on either end of the bridge.

The area surrounding the bridge includes cultivated agricultural fields with several agricultural buildings such as greenhouses, barns and some single detached farm houses.

The Conestogo River flows underneath the structure and the riverbank on the west side, south of the bridge, is supported by gabions. Narrow, shallow and winding, the Conestogo River crosses Wellington Road 109 multiple times within the general area.

Image 13: View looking north towards the Conestogo River and a house

Image 14: View looking northeast towards the Conestogo River and a barn

Image 15: Looking east towards the Conestogo River

Image 16: View from the bridge looking south towards the Conestogo River

Image 17: Looking east towards farm field south of the bridge

3.3 ARCHAEOLOGY ASSESSMENT

As of the writing of this report, a Stage 1-2 Archaeological Assessment report is currently underway for Bridge #10 by WSP.

4 RESULTS OF HERITAGE EVALUATION

The CHER found that the Conestogo River Bridge #10 has significant cultural heritage value or interest. Accordingly, the following Statement of Cultural Heritage Value or Interest and list of Attributes has been prepared.

4.1 STATEMENT OF CULTURAL HERITAGE VALUE OR INTEREST

4.1.1 DESCRIPTION OF RESOURCE

The Conestogo River Bridge #10 was constructed in 1934 to carry Highway 9 (now Wellington Road 109) traffic over the Conestogo River in the Township of Wellington-North, Wellington County, 1.7 km east of Highway 6. The rigid-frame cast-in-place concrete bridge is a single span and allows for two lanes of traffic to travel across it.

4.1.2 CULTURAL HERITAGE VALUE OR INTEREST

Built in 1934, the Conestogo River Bridge #10 is one of three rigid-frame cast-in-place concrete bridges along Wellington Road 109 built between 1931 and 1934. The Conestogo River Bridge #10 is a representative example of a rigid-frame cast-in-place concrete bridge in Wellington County. The bridge has had minimal repairs since it's construction and continues to display the original rigid-frame design which consists of the reinforced cast-in-place superstructure and substructure, the reinforced and cast-in-place wingwalls and the concrete hand rails.

The bridge was built by the Department of Highways, Ontario (DHO) according to their General Specifications for Concrete Highway Bridges. The specifications had greater emphasis on the aesthetic quality of bridges than contemporary bridge design and in particular the design of the hand rails is of artistic merit.

The Conestogo River Bridge #10 also demonstrates a contextual relationship with the other two rigid-frame cast-in-place bridges (Conestogo River Bridge #4 and Conestogo River Bridge #6) built by the DHO along Wellington Road 109 shortly after the DHO acquired the road and designated it Provincial Highway 9.

4.1.3 DESCRIPTION OF HERITAGE ATTRIBUTES

The heritage attributes that reflect the cultural heritage value or interest of the Conestogo River Bridge #10 include:

- One-span length;
- Reinforced, cast-in-place wingwalls;
- Reinforced, cast-in-place abutments;
- Slight arch design; and
- DHO railing system.

5 PROPOSED UNDERTAKING AND IMPACTS

5.1 DESCRIPTION AND PURPOSE OF PROPOSED UNDERTAKING

The Conestogo River Bridge #10 is a reinforced cast-in-place bridge with concrete abutments, asphalt paving surface and cast-in-place concrete railing. The bridge is oriented west to east and spans 12 m, while the roadway width is 9.5 m, the overall width is 11.4 m and the total deck length is 13.5 m. As part of a bridge inspection conducted in 2018, the Bridge #10 was found to be in poor condition with major elements showing signs of significant deterioration. WSP has been retained by the County of Wellington to complete a Municipal Class EA Study to address these items and the County is seeking to replace the bridge with a new structure.

The following four alternatives are being considered for Bridge #10 as a result of the MCEA Study:

Option 1 – Do Nothing

This would not include any repairs to the structure but would include regular monitoring and may require that the bridge be closed and thus the road as well.

Option 2 – Remove Without Replacement

This would include removal of the bridge and closure of the road.

Option 3 – Rehabilitation

Areas of deterioration would be removed and repaired and the bridge may require widening to meet current safety standards. To facilitate the flow of traffic during the bridge rehabilitation, a temporary bailey bridge may need to be installed adjacent to the road to allow through traffic.

Option 4 – Replace

This would include complete removal of the existing structure and replacement with a new bridge. To facilitate the flow of traffic during the bridge replacement, a temporary bailey bridge may need to be installed adjacent to the road to allow through traffic.

5.2 IMPACT ASSESSMENT

This section provides an assessment of the potential adverse effects resulting from the proposed undertakings.

Built heritage resources may experience displacement or **direct impacts**, i.e., demolition or removal of heritage attributes. Direct impacts are permanent, not temporary changes to the cultural heritage environment.

Built heritage resources may also experience disruption, or **indirect impacts**, by the introduction of physical, visual, audible or atmospheric elements that are not in keeping with their character and/or setting. These indirect impacts may be temporary during construction, such as vibration impacts and dust particles, or permanent such as the introduction of new infrastructure. Other indirect impacts of a temporary or permanent nature may include, but are not limited to, changes in grading, alterations to built heritage resource setting and fabric as a result of visual, audible or atmospheric elements, etc. Indirect impacts can be permanent or temporary changes to the cultural heritage environment.

The impacts of each of the four alternatives being considered for the bridge through the MCEA Study will be rated based on the following categories identified in Table 2.

Table 2: Impact Ratings

RATING	DESCRIPTION

None	The proposed undertaking has no impact on the heritage value/attribute.
Low	The undertaking has minimal impact on the heritage value/attribute.
Medium	The undertaking affects/disturbs the heritage value/attribute. The undertaking requires mitigation.
High	The undertaking replaces/removes a heritage value/attribute. The undertaking requires mitigation.

5.3 EVALUATION OF IMPACTS

Table 3 provides an evaluation of the impacts of the four alternatives being explored in the MCEA Study.

Table 3: Evaluation of Impacts

CRITERIA	EVALUATION			
	Option 1: Do Nothing	**Option 2: Remove Without Replacement**	**Option 3: Rehabilitation**	**Option 4: Replace**
Destruction of any, or part of any, significant heritage attributes or features.	Impact Rating: None Rationale: No heritage attributes will be impacted if the bridge remains *in situ*.	Impact Rating: High Rationale: Removal of the bridge would result in the destruction of all heritage attributes.	Impact Rating: None Rationale: No heritage attributes will be destructed.	Impact Rating: High Rationale: Replacement of the bridge would result in the destruction of all heritage attributes.
Alteration that is not sympathetic, or is incompatible, with the historic fabric and appearance.	Impact Rating: None Rationale: No heritage attributes will be impacted if the bridge remains *in situ*.	Impact Rating: None Rationale: Removal of the bridge is not considered an “alteration” and will result in the destruction of all heritage attributes.	Impact Rating: Medium Rationale: Rehabilitation of the bridge to meet current safety standards and repair deteriorated elements may result	Impact Rating: None Rationale: Replacement of the bridge is not considered an “alteration” and will result in the removal of all heritage attributes.

			in some physical changes to the heritage attributes.	
Shadows created that alter the appearance of a heritage attribute or change the viability of a natural feature or plantings, such as a garden.	Impact Rating: None Rationale: There will be no new shadows created.	Impact Rating: None Rationale: There will be no new shadows created.	Impact Rating: None Rationale: There will be no new shadows created.	Impact Rating: None Rationale: There will be no new shadows created.
Isolation of a heritage attribute from its surrounding environment, context or a significant relationship.	Impact Rating: None Rationale: No heritage attributes will be impacted if the bridge remains *in situ*.	Impact Rating: None Rationale: Removal of the bridge will remove all the heritage attributes.	Impact Rating: None Rationale: Rehabilitation of the bridge will not result in the isolation of any heritage attributes.	Impact Rating: None Rationale: Replacement of the bridge will remove all the heritage attributes.
Direct or indirect obstruction of significant views or vistas within, from, or to built and natural features.	Impact Rating: None Rationale: Significant views or vistas were not identified as heritage attributes of the bridge.	Impact Rating: None Rationale: Significant views or vistas were not identified as heritage attributes of the bridge.	Impact Rating: None Rationale: Significant views or vistas were not identified as heritage attributes of the bridge.	Impact Rating: None Rationale: Significant views or vistas were not identified as heritage attributes of the bridge.
A change in land use such as rezoning a battlefield from open space to residential use, allowing new development or site alteration to fill in the formerly open spaces.	Impact Rating: None Rationale: No change in land use will occur if the bridge remains *in situ*.	Impact Rating: High Rationale: The removal of the bridge will result in a change in land use resulting from the closure of an arterial road.	Impact Rating: None Rationale: There will be no change in use.	Impact Rating: None Rationale: There will be no change in use.

Land disturbances such as a change in grade that alters soils, and drainage patterns that adversely affect an archaeological resource.	Impact Rating: None Rationale: No land disturbance will occur if the bridge remains *in situ*.	Impact Rating: Low Rationale: Removal of the bridge will result in soil disturbance.	Impact Rating: None Rationale: There will be no change in grade.	Impact Rating: None Rationale: There will be no change in grade.

5.4 RESULTS OF IMPACT ASSESSMENT

The impact assessment outlined in Section **Error! Reference source not found.** has reviewed the four alternatives being explored for the Bridge #10 through the MCEA Study and determined the following:

- **Option 1 – Do Nothing** will not result in any impacts to the bridge's heritage attributes however it will also not address the deteriorating condition of the structure.
- **Option 2 – Remove Without Replacement** will result in significant impacts as it would require the complete demolition of the bridge and its heritage attributes, removal of the bridge's contextual relationship to the historic crossing of Wellington Road 109 over the Conestogo River, removal of the contextual relationship with the two other rigid frame cast-in-place bridges (Conestogo River Bridge #4 and Conestogo River Bridge #6) built by the DHO and closure of Wellington Road 109 at the river crossing.
- **Option 3 – Rehabilitation** of the bridge to meet current safety standards and to repair deteriorated elements will result in physical changes, thus impacting the integrity of the bridge's heritage attributes.
- **Option 4 – Replacement** of the bridge in its entirety will result in significant impacts through the destruction of all the structure's heritage attributes as well as removal of the bridge's contextual relationship to the historic crossing of Wellington Road 109 over the Conestogo River at this location and well as the contextual relationships to the other two rigid frame cast-in-place bridges (Conestogo River Bridge #4 and Conestogo River Bridge #6) built by the DHO along Wellington Road 109.

From a cultural heritage perspective, the alternatives that retain the concrete structure of the Bridge #10 in its current location are the most desirable (Options 1 and 3). If the bridge is to be retained and/or rehabilitated, the heritage attributes should be

conserved. Option 4, which would see the current bridge removed and replaced with a new bridge, could maintain several of the bridge's design and contextual attributes through the application of mitigation measures. Option 2 represents the least desirable option as it would see the complete removal of the structure and closure of Wellington Road 109 at the river crossing.

5.5 CONSIDERED ALTERNATIVES AND MITIGATION MEASURES

When adverse impacts are expected from proposed site alteration, alternatives and mitigation measures should be considered to manage the site alteration in a way that will not adversely affect built heritage resources and cultural heritage landscapes. The preferred heritage approach for the protection of resources is retention *in situ* and the preservation of the material integrity to the maximum extent possible, as public safety allows.

In situations where the nature of site alteration is such that adverse impacts are unavoidable, it is possible to implement mitigative conservation strategies that lessen the adverse effects to the built heritage resources and cultural heritage landscapes. Conservation options are outlined in the *Ontario Heritage Bridge Guidelines* (OHBG) (MTO, 2008), regarded as current best practice for conserving heritage bridges in Ontario. While the OHBG's are intended for use in the assessment of provincially-owned structures and are not directly applicable in the municipal context, they ensure that heritage concerns and appropriate mitigation options are considered.

5.5.1 ALTERNATIVES, MITIGATION AND CONSERVATION OPTIONS ANALYSIS

Consistent with the eight conservation options of the OHBG, regarded as appropriate in managing interventions to heritage bridges, and considered in rank order according to the level or degree of intervention from minimum to maximum, WSP has presented the results of impact assessment based on the preferred option being carried forward as part of the MCEA Study and the observed structural condition of the bridge (WSP, 2019).

Below, Table 4 presents the results of impact assessment based on the OHBG conservation options.

Table 4: OHBG Impact Assessment of Bridge #10

OHBG CONSERVATION OPTIONS	ADVANTAGE	DISADVANTAGE	COMMENTS

1) Retention of existing bridge with no major modifications undertaken	This option is consistent with the principle of minimal intervention and would retain all of the bridge's heritage attributes in the short-term. This option is also consistent with the *County of Wellington Official Plan* policy 4.1.5 that encourages the retention of significant built heritage resources and cultural heritage landscapes.	Given the bridge's current state of disrepair and functional/operational deficiencies, this option would pose a significant public safety concern in the long-term.	This option would likely result in the deterioration of the bridge's heritage attributes, and the eventual closure of the bridge, requiring traffic rerouting.
2) Retention of existing bridge and restoration of missing or deteriorated elements where physical or documentary evidence (e.g. photographs or drawings) can be used for their design	This conservation option involves little change to the original fabric of the structure, and repairs made based on the historic record. This option is also consistent with the *County of Wellington Official Plan* policy 4.1.5.	This option does not address the bridge's functional/operational deficiencies including substandard roadway width, barrier protection, and guide rail protection with several components requiring maintenance, rehabilitation and/or replacement. An evaluation of this option from a technical perspective, reveals this option only defers but does not avoid eventual structural replacement.	This option is not viable due to concerns related to the condition of the bridge that cannot be addressed through restoration of deteriorated elements. While the cost of rehabilitation is less than the cost of replacement, this option simply defers rather than replaces the eventual need to replace the structure which would prove more costly in the long-term.
3) Retention of existing bridge with sympathetic modification	This option is consistent with the principle of preservation of material to its highest integrity and would maintain some heritage attributes of the bridge. This option is also consistent with the *County of Wellington Official Plan* policy 4.1.5.	This option would provide a short-term solution that only defers instead of avoids eventual structure replacement. If the scope of rehabilitation is expanded to address all the bridge's functional/operational deficiencies including substandard roadway width, barrier protection, and guide rail protection in addition to the structural deficiencies, the cost would become similar to a replacement option.	Although rehabilitation remains the preferred alternative for the Bridge #10 from a cultural heritage perspective, the extent and nature of the deterioration of the structural components of the bridge, and the extensive repairs needed to address the functional/operational deficiencies (i.e., the substandard roadway width, barrier and guide rail protection), will result in a significant loss of historic materials and a change in the dimensions of the

			bridge to increase its traffic capacity. Considering these principles, sympathetic modification is not recommended.
4) Retention of existing bridge with a sympathetically designed new structure in proximity	This conservation option would retain the heritage attributes of the bridge and address the safety concerns. This option is also consistent with the *County of Wellington Official Plan* policy 4.1.5.	Bridge # 10 and the sympathetically designed new bridge would both require ongoing maintenance, and a new bridge would require additional property to be purchased to expand the road right-of-way and would result in a curve added to the road, creating geometric challenges.	This option is not viable due to the expense of maintaining the existing bridge, acquiring additional property and building a new sympathetically designed structure. It would also introduce undesirable road geometrics that would adversely impact road safety.
5) Retention of existing bridge no longer in use for vehicular purposes but adapted for a new use. For example, prohibiting vehicles or restricting truck traffic or adapting for pedestrian walkways, cycle paths, scenic viewing, etc.	This option is consistent with the principle of minimal intervention and would retain all the heritage attributes of the bridge. Pedestrian or cyclist traffic would likely require less intervention for rehabilitation. This option is also consistent with the County of Wellington's Official Plan policy 4.1.5.	This conservation option alters the use of the bridge from a vehicular bridge to a pedestrian bridge. There is minimal need for a pedestrian bridge in this remote, rural location. This option would require construction of a new road to by-pass the existing bridge, which would pose additional environmental and budgetary impacts.	Pedestrianized bridges are often more appropriate in urban areas where they are well traveled, and the public funding can be justified. This option is not viable due to its expense, engineering constraints and the loss of function as a road bridge.
6) Retention of existing bridge as a heritage monument for viewing purposes only	This conservation option retains the bridge *in situ* and retains its scale and massing. This option is also consistent with the County of Wellington's Official Plan policy 4.1.5.	The bridge will require extensive maintenance and refurbishment and this option removes the bridge as a useful structure and from its historic function as a road bridge. In addition, the County of Wellington will still require a road bridge across the river at this location.	The County of Wellington will require a road bridge at this location. Retaining the Bridge as a heritage monument *in situ* would require realigning the road and construction of a new bridge. Retaining the bridge *in situ* as a heritage monument is not viable due to the considerable expense and engineering constraints.
7) Relocation of smaller, lighter single span bridges to an appropriate new site for continued use (see 4) or	This option is consistent with the principle of preservation of material to its highest integrity and would maintain all the	Given the bridge's cast-in-place concrete construction, moving the bridge intact is likely not feasible.	This option is likely not viable given the concrete construction of the bridge. Relocation of bridges is rare and would require a

adaptive re-use (see 5)	bridge's heritage attributes.	Furthermore, relocating the bridge would remove its contextual relationship with the crossing over the Conestogo River on Wellington Road 109. This option presents considerable risk of damage/destruction of the bridge through the relocation process. The bridge will still require extensive maintenance and refurbishment at considerable expense during disassembly, relocation and future maintenance.	thorough Conservation Plan to facilitate the process. Furthermore, even if possible, the expense of moving the bridge as well as the rehabilitation costs to make it appropriate for continued use would be prohibitive.
8) Bridge removal and replacement with a sympathetically designed structure: **a) Where possible, salvage elements/ members of the bridge for incorporation into a new structure or for future conservation work or displays;** **b) Undertake full recording and documentation of existing structure**	Thorough detailed investigations, the construction and contextual relationships of Bridge #10 would be better understood and become part of an example for comparative study. Documentary records could be made accessible to the public through the local library or other commemorative methods. Impacts from the introduction of a new bridge could be minimized if it retained its contextual relationship (i.e., original location) and adopted a design that draws from the materials and design inspiration of the extant bridge while maintaining legibility (new work that is distinguishable from the old). This approach represents a best practice in heritage conservation.	Built heritage resources are finite, meaning once gone, they are gone forever. Demolition would result in the loss of all the bridge's heritage attributes. Although once common, this bridge type is now a diminishing resource due to replacement to meet current safety requirements and traffic needs. Bridge #10 is the one of the oldest rigid-frame cast-in-place concrete bridge in the County of Wellington. .	Prior to demolition, the bridge should be recorded through a Documentation and Salvage Report that contains measured drawings, a thorough photographic recording and written description of the structure as well as a list of elements worthy of salvage. Preservation by record is the least desirable conservation option but may be appropriate in cases where structural integrity of a bridge is poor, rehabilitation is prohibitively expensive, it is technically difficult to stabilize a structure, or where public safety is a concern.

Conservation Option 8 will result in major adverse effects to a cultural heritage resource. The OHBG requires four additional conditions be considered before this option is selected (Table 7). Only one of the following requirements must be met to justify replacing a bridge that is a cultural heritage resource.

Table 5: Detailed Conditions for Conservation Option 8

DETAILED CONDITIONS FOR CONSERVATION OPTION 8	ASSESSMENT RATIONALE
The safety of the existing structure is compromised to the extent that rehabilitation is not a practical option	The safety of the existing structure is of concern. The Structure Inspection completed by WSP in 2018 identifies a long crack through the deck as well as spalling and exposed reinforcement. While the bridge can be repaired, this would only delay rather than replace the eventual need to replace the bridge.
The cost of rehabilitation is prohibitive compared to replacement	The cost of rehabilitation to address the structural deficiencies as well as the bridge's functional/operational deficiencies including substandard roadway width, barrier protection, and guide rail protection would be similar in cost to the cost of replacement.
The bridge has been severely altered from its original form	Not applicable. The bridge has not been significantly altered from its original form.
Replacement is required to meet demand requirements that are not achievable through rehabilitation or upgrading the existing structure	Replacement is required to meet demand requirements that is not achievable through rehabilitation or upgrading the existing structure as the bridge exhibits several functional/operational deficiencies including substandard roadway width and substandard barrier protection and guide rail protection with several components requiring maintenance, rehabilitation and/or replacement.

5.5.2 RESULTS OF ALTERNATIVES, MITIGATION AND CONSERVATION RECOMMENDATIONS

The CHER completed in WSP in 2021 demonstrated that the Bridge #10 has design or physical, historical or associative and contextual value in accordance with O. Reg. 9/06. Given the bridge's CHVI, ideally it would be retained on its original site, rehabilitated in a sensitive manner and continued to be used for its original purpose. However, given the bridge's state of deterioration and the public safety concerns related to its functional/operational deficiencies, it is understood that retention and rehabilitation of the bridge is not feasible. Furthermore, Bridge #10 is not considered a good candidate for relocation or reuse.

Option 8 – Bridge removal and replacement with a sympathetically designed structure and salvage elements of the bridge for adaptive reuse is the recommended alternative. Prior to demolition, a Documentation and Salvage Report should be prepared by a

qualified heritage consultant to record the bridge thorough measured drawings and photographic and written descriptions. Elements worthy of salvage should also be recommended. It may be determined that the CHER and HIA provide sufficient documentation of the bridge, only requiring preparation of a Salvage Plan. Given the County of Wellington intends to replace other bridges along Wellington Road 109 (Conestogo Bridge #5, Conestogo Bridge #6 and Conestogo Bridge #10) and that these bridges have a contextual relationship to each other and Wellington Road 109, being built around the same time by the DHO, WSP recommends that the documentation of each bridge be combined into one report.

Elements to be salvaged (i.e., commemorative bridge plaque) should be collected prior to demolition. This material could be incorporated into a compatible design for the new bridge (i.e., commemorative bridge plaque) or used to construct a commemorative display or new plaque near the site of the bridge.

The design of a compatible replacement structure in a manner sympathetic to the current bridge should be explored. Efforts should be made to incorporate design qualities and/or materials of the original bridge and its setting, while maintaining legibility. This approach represents a best practice in heritage conservation. Design considerations should explore the incorporation of the scale, massing, rhythm and finishes of the original bridge, where possible and feasible. Specifically, the concrete arch, the placement and design of the concrete railings, and siting at the same location over the Conestogo River should be considered in the final design for the replacement structure.

5.6 SUMMARY OF COMMUNITY ENGAGEMENT

Wellington County was consulted as a part of this project with the intent of information gathering regarding any cultural heritage interests or concerns related to Bridge #10. This engagement was not combined with the Public Information Centres completed as part of the MCEA. Details regarding the scope and timing of this consultation are provided in Table 6.

Table 6: Consultation Record

CONTACT	CONTACT DETAILS	RESPONSE RECEIVED	RESPONSE
Michelle Innocente Senior Planner, Wellington County michellei@wellington.ca	By email on October 30, 2019; follow up on November 13, 2019.	November 13, 2019	Wellington County does not have a Heritage Register; Michelle suggested contacting the municipality's Clerk.

Karren Wallace Director of Legislative Services/Clerk, Township of Wellington-North kwallace@wellington-north.com	By email November 13, 2019	November 18, 2019	The bridges have no heritage status.

The MHSTCI was circulated this report for review on July 14, 2021. A response was received on August 3, 2021 in which the Ministry provided comments and recommendations outlining suggested revisions. Those revisions have been incorporated into this report. Given that the bridge was found to possess CHVI, the MHSTCI recommended that the CHER and HIA be publicly disclosed for any interested groups and persons for review and comment as part of the EA process.

5.7 RECOMMENDATIONS

Given the identified CHVI of Bridge #10 and the preferred option being carried forward as part of the MCEA Study involving the complete removal and replacement of subject bridge, the following mitigation measures are recommended:

1. The Bridge #10 should be recorded through a Documentation and Salvage Report containing measured drawings, a thorough photographic record and written description of the bridge as well as recommendations for elements worthy of salvage prior to demolition (i.e., steel truss members, commemorative bridge plaque). Given the County of Wellington intends to replace other bridges along Wellington Road 109 (Conestogo Bridge #4, Conestogo Bridge #5 and Conestogo Bridge #6) and that these bridges have a contextual relationship to each other and Wellington Road 109, being built around the same time by the DHO, WSP recommends that the documentation of each bridge be combined into one report. This report should be shared with the County of Wellington and the County of Wellington Museum & Archives. The bridge(s) should be documented to the standard outlined according to section 6.3.1.4 of the MTO *Environmental Guide for Built Heritage and Cultural Heritage Landscapes* (2007), and according to the *Historic American Engineering Record* (HAER) guidelines.
2. Commemoration opportunities should be explored for the bridge with community input.
3. The construction of a new bridge should be designed in a manner that draws from the design inspiration and materials of the extant bridge while maintaining

legibility. Design considerations should explore the incorporation of the scale, massing, rhythm and finishes of the original bridge, where possible and feasible. Specifically, the arched concrete design, the placement and design of the concrete railings, and siting at the same location over the Conestogo River should be considered in the final design for the replacement structure.

ALTERNATIVES, MITIGATION AND CONSERVATION RECOMMENDATIONS

When adverse impacts are expected from proposed site alteration, alternatives and mitigation measures should be considered to manage the site alteration in a way that will not adversely affect cultural heritage resources. The preferred heritage approach for the protection of cultural heritage resources is retention *in situ* and the preservation of the material integrity to the maximum extent possible, as public safety allows.

In situations where the nature of site alteration is such that adverse impacts are unavoidable, it is possible to implement mitigation strategies that lessen the adverse effects to the cultural heritage resource.

As a result of the impact assessment, WSP has identified the following Five graded options for further analysis.

1. Do nothing.
2. Rehabilitate and maintain the Conestogo River Bridge #10.
3. Decommission the Conestogo River Bridge #10 and use it for pedestrian pathway.
4. Relocate and rehabilitate the Conestogo River Bridge #10 for use elsewhere such as in a park or another scenic location.
5. Prior to demolition, record the Conestogo River Bridge #10 through a documentation report that contains a thorough photographic recording and written description.

The mitigations options analysis is included in the Table 5 below.

5.8 ALTERNATIVES, MITIGATION AND CONSERVATION OPTIONS ANALYSIS

Table 7: Analysis of Alternative, Mitigation and Conservation Options

OPTION	ADVANTAGE	DISADVANTAGE	ADDITIONAL COMMENTS
1) Do Nothing.	This option is consistent with the principle of minimal intervention and would retain all the heritage attributes of the bridge in	Given the bridge's current state of disrepair this would pose a significant public safety concern.	This would likely result in eventual bridge closure and require rerouting traffic.

	the short term. This option is also consistent with the County of Wellington's Official Plan policy 4.1.5 that encourages the retention of significant cultural heritage resources.		
2) Rehabilitate and maintain the Conestogo River Bridge #10.	This option is consistent with the principle of preservation of material to its highest integrity and would maintain some heritage attributes of the bridge. This option is also consistent with the County of Wellington's Official Plan policy 4.1.5 that encourages the retention of significant cultural heritage resources.	Given the bridge's current state of disrepair and the number of heritage attributes that would require repair or replacement, it would result in very few retained heritage attributes. Furthermore, given the nature of the bridge's cast-in-place concrete barrel arch construction, replacing individual deteriorated elements would likely be impractical if not impossible.	
3) Decommission the Conestogo River Bridge #10 and use it for a pedestrian pathway.	This option is consistent with the principle of minimal intervention and would retain all the heritage attributes of the bridge. Pedestrian traffic would likely require less intervention for rehabilitation. This option is also consistent with the County of Wellington's Official Plan policy 4.1.5 that encourages the retention of significant cultural heritage resources.	There is very minimal need for a pedestrian bridge in this location given its remote rural location. This would also require construction of a new road to by-pass the existing bridge, which would have additional environmental impacts.	Pedestrianized bridges are often more popular in urban areas where they are well traveled and the public funding can be justified.
4) Relocate and rehabilitate the Conestogo River Bridge #10 for use elsewhere such as in a park or another scenic location.	This option is consistent with the principle of preservation of material to its highest integrity and would main all the heritage attributes.	Given the bridge's cast-in-place concrete barrel arch construction moving the bridge intact is likely impossible. Furthermore, it would remove its contextual relationship with Wellington	Relocation of bridges is very rare and would require a thorough conservation plan to facilitate the process.

		Road 109.	
5) Prior to demolition, record the Conestogo River Bridge #10 through a documentation report that contains a thorough photographic recording and written description.	Thorough detailed investigations, the construction and contextual relationships of the Conestogo River Bridge #10 would be better understood and become part an example for comparative study. Documentary records could be made accessible to the public through the local library or through other commemorative methods.	Built heritage resources are finite, meaning once gone, they are gone forever. Demolition would result in the loss of all the bridge's heritage attributes.	Preservation by record is usually the least desirable conservation option but may be appropriate in cases where structural integrity of a structure is poor and it is prohibitively expensive, technically difficult to stabilize or a public safety concern. It may also be an option where there is a large stock of other surviving, more representative examples.

5.9 RESULTS OF ALTERNATIVES, MITIGATION AND CONSERVATION RECOMMENDATIONS

The CHER completed in January 2020 demonstrated that the Conestogo River Bridge #10 has design and contextual value in accordance with O. Reg. 9/06. Given the bridge's cultural heritage value or interest, ideally the bridge would be retained on its original site, rehabilitated in a sensitive manner and continued to be used for its original purpose. However, given the bridge's state of deterioration and the public safety concerns it is understood that retention and rehabilitation of the bridge is not feasible.

Furthermore, the Conestogo River Bridge #10 is not considered a good candidate for relocation, reuse or salvage due to its cast-in-place construction.

To lessen the adverse impacts of the replacement of the Conestogo River Bridge #10, the following is recommended:

1. Prior to demolition, the Conestogo River Bridge #10 shall be recorded through a documentation report that contains a thorough photographic recording and written description.
2. Given the County of Wellington intends to replace other bridges along Wellington Road 109 (Conestogo Bridge #4, Conestogo Bridge #5 and Conestogo Bridge #6) and that these bridges have a contextual relationship to each other being built around the same time by the DHO and along the same highway, WSP recommends that the documentation of each bridge be combined into one report.

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