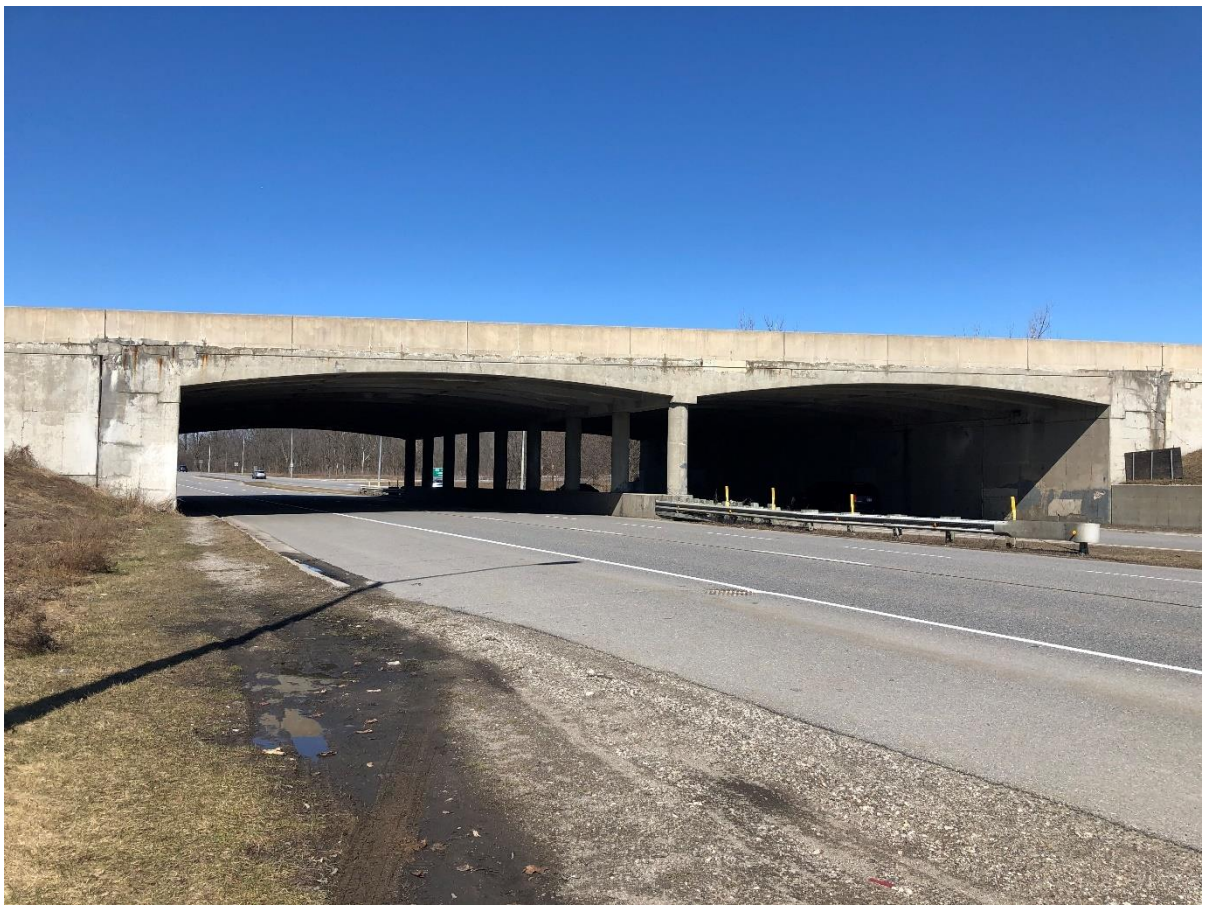
REGION OF WATERLOO

CULTURAL HERITAGE EVALUATION REPORT

REGIONAL ROAD 8 OVERPASS

MAY 28, 2020 FINAL



CULTURAL HERITAGE EVALUATION REPORT

REGIONAL ROAD 8 OVERPASS

REGION OF WATERLOO

FINAL

PROJECT NO.: 161-07859-01.
DATE: MAY 28, 2020

WSP
582 LANCASTER STREET WEST
KITCHENER, ON, CANADA N2K 1M3

T: +1 519-743-8778
WSP.COM

SIGNATURES

PREPARED BY

May 28, 2020

Joel Konrad, PhD, CAHP
Senior Cultural Heritage Specialist

Date

APPROVED BY

May 28, 2020

Douglas Yahn, MES, CAHP
National Archaeology, Heritage and Indigenous Relations Lead

Date

EXECUTIVE SUMMARY

WSP Canada Inc. was retained by the Region of Waterloo to complete a Cultural Heritage Evaluation Report as part of the Transit Project Assessment (TPA) Process for the proposed Cambridge Stage 2 ION Light Rail Transit (LRT) system to determine the cultural heritage value of the Regional Road 8 Overpass.

The subject structure is a cast-in-place reinforced T-beam rigid frame bridge carrying Highway 401 over Regional Road 8 (King Street) in the City of Kitchener, Ontario.

This report has been completed in partial fulfillment of the cultural heritage requirements of the Ministry of Heritage, Sport, Tourism and Culture Industries and the Ministry of the Environment, Conservation and Parks (MECP) under the TPA Process as defined in Ontario Regulation 231/08 (O. Reg. 231/08) Transit Projects and Metrolinx Undertakings under the *Environmental Assessment Act*. According to the TPA Process, an objection can be submitted to the MECP about a matter of provincial importance that relates to the natural environment or has Cultural Heritage Value or Interest. The MECP requires transit projects to make reasonable efforts to avoid, prevent, mitigate or protect matters of provincial importance.

The Regional Road 8 Overpass was identified in the Cultural Heritage Existing Conditions and Preliminary Impact Assessment Report: Stage 2 ION LRT from Kitchener to Cambridge (February 2020) as being a directly impacted potential cultural heritage property. The Cultural Heritage Report was completed as part of the TPA Process for Stage 2 of the proposed rapid transit system.

The purpose of this report is to evaluate the property using Ontario Regulation 9/06 (O. Reg. 9/06) to determine if the property retains cultural heritage value or interest. Based on the results of research, site investigation, and application of the criteria in O. Reg. 9/06 it was determined that Regional Road 8 Overpass does not retain cultural heritage value or interest. Accordingly, no additional heritage assessments are required at this time.

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

1 The Regional Road 8 Overpass was determined not to have cultural heritage value or interest. Therefore, no additional heritage reporting is required at this time.

PROJECT PERSONNEL

CLIENT

Client Contact	Paula Sawicki, P. Eng. Manager, RT Coordination Region of Waterloo 150 Frederick St., Kitchener, Ontario N2G 4J3

WSP

Project Manager	Joel Konrad, PhD, CAHP *Senior Cultural Heritage Specialist* *Cultural Heritage Lead – Ontario*
Cultural Heritage Specialist	Joel Konrad
Report Preparation	Joel Konrad Jacqueline Bradica, BA *Cultural Heritage Assistant*
GIS and Mapping	Andrew Turner, HBA *Cultural Heritage Geomatics Specialist*
Report Review	Douglas Yahn, MES, CAHP *National Archaeology and Heritage Lead*
Administrative Support	Lyn Pedersen *Administrative Assistant – Document Control*

TABLE OF CONTENTS

TABLES

FIGURES

APPENDICES

1 INTRODUCTION

1.1 OBJECTIVES

WSP Canada Inc. was retained by the Region of Waterloo to complete a Cultural Heritage Evaluation Report (CHER) as part of the Transit Project Assessment (TPA) Process for the proposed Cambridge Stage 2 ION Light Rail Transit (LRT) system to determine the cultural heritage value of the Regional Road 8 Overpass in the City of Kitchener (Figure 1).

This report has been completed to fulfil the cultural heritage requirements of the Ministry of Heritage, Sport, Tourism and Culture Industries (MHSTCI) and the Ministry of the Environment, Conservation and Parks (MECP) under the TPA Process as defined in Ontario Regulation 231/08 Transit Projects and Metrolinx Undertakings (O. Reg. 231/08) under the *Environmental Assessment Act* (EAA). Under the TPA Process, an objection can be submitted to the MECP about a matter of provincial importance that relates to the natural environment or has Cultural Heritage Value or Interest (CHVI). The MECP requires transit projects to make reasonable efforts to avoid, prevent, mitigate or protect matters of provincial importance.

The structure known as the Regional Road 8 Overpass was identified in the Cultural Heritage Existing Conditions and Preliminary Impact Assessment Report: Stage 2 ION LRT from Kitchener to Cambridge (Cultural Heritage Report) (WSP 2020) as being a directly impacted potential cultural heritage property. The Cultural Heritage Report was completed as part of the TPA Process for Stage 2 of the proposed rapid transit system.

The purpose of this report is to evaluate the subject bridge using Ontario Regulation 9/06 (O. Reg. 9/06) to determine if the structure retains CHVI.

1.2 PROJECT DESCRIPTION

WSP was retained by the Region of Waterloo to conduct a Cultural Heritage Existing Conditions and Preliminary Impact Assessment as part of the TPA Process for Stage 2 of the proposed Cambridge Stage 2 ION LRT system. The study area consists of the proposed preferred route for the Stage 2 ION LRT that falls within the municipal boundaries of the City of Kitchener and the City of Cambridge (Figure 1).

The Cultural Heritage Report was completed as a component of the Environmental Project Report (EPR) in support of the TPA Process, specifically addressing the cultural heritage component of the EPR. This CHER has been completed based on the recommendations of the Cultural Heritage Report and to fulfill the requirements of MHSTCI 2019 TPA Process Draft Guidance.

Stage 1 of the rapid transit project in the Region of Waterloo consisted of the completion of LRT infrastructure between Conestoga Mall in the City of Waterloo and Fairview Park Mall in the City of Kitchener (19 km), as well as bus rapid transit (BRT) between Fairview Park Mall in the City of Kitchener and Ainslie Street Terminal in the City of Cambridge (17 km). The TPA Process for Stage 1 was completed in 2012 and BRT service opened in late 2015. The LRT opened in June of 2019.

Stage 2 of the rapid transit project will consist of the replacement of the current BRT with LRT along a modified route alignment. Once finished, passengers will have the ability to travel between the Cities of Waterloo, Kitchener and Cambridge's urban centres.

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

wsp

LEGEND

Study Area

TITLE: FIGURE 1: PROJECT LOCATION	SCALE: 1:2,000	PROJECT NO: 161-07859-01	DATE: APRIL 2020
	DRAWN BY: AST	CLIENT: R.M. OF WATERLOO	
PROJECT: REGIONAL ROAD 8 OVERPASS CHER	CREDITS: LAND INFORMATION ONTARIO		

0 50 100 m

N

Document Path: C:\Users\Andrew.S.Turner\Projects\161-07859-01 Kitchener BRT\MapDocuments\Regional Road 8 Overpass\Map 1 Study Area.mxd

2 LEGISLATION AND POLICY CONTEXT

2.1 PROVINCIAL AND MUNICIPAL CONTEXT AND POLICIES

2.1.1 ENVIRONMENTAL ASSESSMENT ACT AND THE TRANSIT PROJECT ASSESSMENT PROCESS

The purpose of the EAA is “the betterment of the people of the whole or any part of Ontario by providing for the protection, conservation and wise management, in Ontario, of the environment” (EAA 2009, Part I-Section 2). The EAA defines environment broadly to include built environment and cultural environment. The EAA outlines a planning and decision-making process to ensure that potential environmental effects are considered before a project begins. The EAA applies to provincial ministries and agencies, municipalities, and other public bodies. Certain “classes” of projects can follow streamlined EA processes, such as the TPA Process, as defined in O. Reg. 231/08 under the EAA.

The TPA Process is a focused impact assessment process that includes consultation and engagement, an assessment of potential positive and negative effects, a recommendation of measures to mitigate negative effects, and documentation of the process. The proponent must complete the prescribed steps of the TPA Process within a pre-determined time limit.

Transit projects, including the construction of new stations and facilities as well as widening or expansion of linear components of the transit system, can directly or indirectly affect cultural heritage resources (CHR). The TPA Process identifies CHVI as a matter of provincial importance and ensures that steps must be taken to consider the effects to these resources. As such, part of the TPA Process is to identify and assess impacts to cultural heritage resources and provide mitigation recommendations.

2.1.2 GUIDE TO ENVIRONMENTAL ASSESSMENT REQUIREMENTS FOR TRANSIT PROJECTS

The MECP’s Guide to Environmental Assessment Requirements for Transit Projects (Transit Guide) provides direction to proponents on how to meet the requirements of O. Reg 231/08. The Transit Guide encourages proponents to obtain information and input from appropriate government agency technical representatives before starting the TPA Process to assist in meeting the timelines specified in the regulation, including the submission of a draft EPR for review and comment prior to issuing a Notice of Commencement.

Among the pre-planning activities outlined in Section 4.1 of the Transit Guide, a proponent is advised to conduct studies to:

- identify existing baseline environmental conditions;
- identify project-specific location or alignment (including construction staging, land requirements); and,
- identify expected environmental impacts and proposed measures to mitigate potential negative impacts.

2.1.3 ONTARIO HERITAGE ACT (2005)

The *Ontario Heritage Act* (OHA) gives municipalities and the provincial government powers to conserve Ontario’s cultural heritage, with a focus on protecting heritage properties and archaeological sites. The OHA grants the authority to municipalities and to the province to identify and designate properties of

CHVI, provide standards and guidelines for the preservation of heritage properties, and enhance protection of heritage conservation districts, marine heritage sites and archaeological resources.

The protection of heritage properties is achieved through designation, using Sections 33, 34 and 42 of the OHA that prohibit the owner of the property from altering, demolishing or removing a building or structure on the property unless an application to the council of the municipality is filed and written consent received to proceed with the alteration, demolition or removal. Properties can be designated individually (Part IV of the OHA) or as part of a larger group of properties, known as a Heritage Conservation District (HCD) (Part V of the OHA).

The OHA recommends municipalities maintain a Heritage Register with both designated properties and properties that have potential CHVI.

In the Region of Waterloo, Listed properties are those for which the Municipal Council has adopted a resolution for inclusion on the Register as a non-designated property. This makes Listed properties subject to Section 27 of the OHA. An owner of a Listed heritage property must provide the municipality with 60 days' notice of their intention to demolish buildings on the property.

Pursuant to the OHA, the Ontario Heritage Trust (OHT) was established as a trustee and steward of heritage resources in Ontario and has a broad, province-wide mandate to identify, protect, promote and conserve Ontario's heritage in all its forms. In this capacity, it is empowered to conserve provincially significant cultural and natural heritage, to interpret Ontario's history, to educate Ontarians of its importance in our society, and to celebrate the province's diversity.

The MHSTCI is charged under Section 2 of the OHA with the responsibility to determine policies, priorities and programs for the conservation, protection and preservation of the cultural heritage of Ontario and has published guidelines to assist in assessing cultural heritage resources as part of an environmental assessment. The following guidelines have informed the preparation of this Report:

- Guideline for Preparing the Cultural Heritage Resource Component of Environmental Assessments (1992)
- Guidelines on the Man-Made Heritage Component of Environmental Assessments (1981)
- The Ontario Heritage Toolkit (2006)
- MHSTCI Standards & Guidelines for Conservation of Provincial Heritage Properties (2010)
- Environmental Guide for Built Heritage and Cultural Heritage Landscapes (2007)

2.1.4 ONTARIO REGULATION 9/06

O. Reg 9/06 outlines the criteria for d CHVI under the OHA. This regulation was created to ensure a consistent approach to the designation of heritage properties under Ontario under the act. All designations under the OHA after 2006 must meet the minimum criteria outlined in the regulation.

A property may be designated under section 29 of the OHA if it meets one or more of the following criteria for determining whether it is of cultural heritage value or interest:

1 The property has design value or physical value because it,

i. is a rare, unique, representative or early example of a style, type, expression, material or construction method,

ii. displays a high degree of craftsmanship or artistic merit, or

iii. demonstrates a high degree of technical or scientific achievement.

2 The property has historical value or associative value because it,

i. has direct associations with a theme, event, belief, person, activity, organization or institution that is significant to a community,

ii. yields, or has the potential to yield, information that contributes to an understanding of a community or culture, or

iii. demonstrates or reflects the work or ideas of an architect, artist, builder, designer or theorist who is significant to a community.

3 The property has contextual value because it,

i. is important in defining, maintaining or supporting the character of an area,

ii. is physically, functionally, visually or historically linked to its surroundings, or

iii. is a landmark.

2.1.5 THE PLANNING ACT AND PROVINCIAL POLICY STATEMENT

Additionally, the *Planning Act* (1990) and related Provincial Policy Statement (PPS) (2020) provide guidance for the assessment and evaluation of potential cultural heritage resources. Subsection 2.6 of the PPS, Cultural Heritage and Archaeological Resources, states that:

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

2.1.6 MUNICIPAL OFFICIAL PLAN POLICIES

The Region of Waterloo's *Official Plan* (2015), as approved with modifications by the Ontario Municipal Board on June 18, 2015, contains policies that support a regional transit system in Chapter 5, including policy 5.A.6 that states, "The Regional transit system will be improved on an on-going basis through the addition of rapid transit service and the preparation and implementation of the Transit Business Plan." The Region of Waterloo's *Official Plan* also contains policies that support the retention of significant cultural heritage resources such as policy 3.G.1 that states, "The Region and Area Municipalities will ensure that cultural heritage resources are conserved using the provisions of the Heritage Act, the Planning Act, the *Environmental Assessment Act*, the Cemeteries Act and the Municipal Act."

The City of Kitchener's *Official Plan: A Complete & Healthy Kitchener* (2014) is similarly supportive of rapid transit initiatives with policies such as policy 13.C.3.4 that states, "The City will work with the Region to support the planning and implementation of rapid transit service within the City along the established rapid transit route and at planned rapid transit station stops, as well as existing and future Express Bus and Local Bus networks." Relevant cultural heritage policies include:

12.1.1. "To conserve the city's cultural heritage resources through their identification, protection, use and/or management in such a way that their heritage values, attributes and integrity are retained."

12.1.2. "To ensure that all development or redevelopment and site alteration is sensitive to and respects cultural heritage resources and that cultural heritage resources are conserved."

2.1.7 GRAND RIVER – CANADIAN HERITAGE RIVERS SYSTEM

The Grand River and its major tributaries – the Conestogo, Eramosa, Nith and Speed rivers – were designated as a Canadian Heritage River under the Canadian Heritage Rivers System in 1994. The Canadian Heritage Rivers System is Canada's national river conservation program. It provides national

recognition of outstanding Canadian rivers and encourages long term maintenance of these resources to conserve and protect their natural, cultural and recreational value. The designation itself does not impart any restrictions on use of the rivers but relies on existing by-laws, regulations and conservation authorities for conservation.

The Grand River watershed is protected by the Grand River Conservation Authority (GRCA) across 39 municipalities. The GRCA's mandate is to provide flood control, protect environmentally important areas, provide recreational opportunities and promote environmental stewardship.

2.2 METHODOLOGY

The recommendations of this CHER 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 CHER is guided by key documents such as the Municipal Engineers Association's 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), and the Guidelines for Preparing the Cultural Heritage Resource Component of Environmental Assessments (Ministry of Culture and Communications, 1992).

A CHER 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:

- A summary of the history of the immediate context informed by a review of archival sources and historical maps;
- A summary of the land-use history of the property including key transfers of land and milestones informed by Land Registry records and additional archival research into prominent owners of tenants such as tax assessments or City Directories;
- Thorough photographic documentation of the subject property and context;
- A written description of the existing conditions and immediate context;
- A discussion of consultation with local communities;
- A comparative analysis, using bridges of a similar age, style, typology, context and history to inform the evaluation of CHVI;
- An evaluation of whether the property satisfies criteria under O. Reg. 9/06;
- Discussion of the integrity of the property; and
- A draft statement of CHVI if appropriate.

For the purposes of this CHER the following documents were also consulted:

- The Ministry of Transportation Ontario's (MTO) bridge list; and,
- Arch, Truss and Beam: The Grand River Watershed Heritage Bridge Inventory.

2.3 CONSULTATION

The Region of Waterloo and the City of Kitchener were 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
Leon Bensason, Coordinator, Cultural Heritage Planning	By email on March 9, 2020	March 13, 2020	The City of Kitchener has no information on the Regional Road 8 Overpass and the structure is not identified as on the City's Heritage Register.
Bridget Coady Region of Waterloo BCoady@regionofwaterloo.ca	By email on March 9, 2020	March 19, 2020.	No information for Regional Road 8 Overpass.

2.3.1 STAGE 2 ION PUBLIC CONSULTATION CENTRES

Public Consultation Centres (PCCs) for Stage 2 ION are being held throughout the preliminary stages of the project. PCCs often consist of multiple meetings and are used to present details about the project to the public and facilitate conversation, answer inquiries, and record suggestions the public may have about the project. PCC No. 1 was undertaken in November 2015 and included more than 100 community members who took part in two events providing their input on the alternative routes for this network.

PCC No. 2 was held between February – March 2017 and consisted of more than 350 residents attending three events to provide feedback on the preliminary preferred route. Many comments were received from the public at these events, including several suggested alternative routes.

PCC No. 3 was held from November 2017 – January 2018 at which time the Region presented localized route alternatives and refinements to the preliminary preferred route and a methodology for evaluating the routes. PCC No. 4 presented the evaluation results of the new localized route alternatives and refinements and the resulting Project Team Preliminary Proposed Route.

In June 2018, Region of Waterloo Council endorsed the Project Team Preliminary Proposed Route (Preferred Route) for the Stage 2 ION project, subject to further evaluation of the portion of the route between Shantz Hill Road and Eagle Street North at William Street. The Region has further considered local route and station location options between Hamilton Street and the Eagle Street Canadian Pacific Rail crossing. The evaluated refinements were presented to the public at PCC No. 4b in March 2019 along with the evaluation results, and the Project Team Preferred Refinement based on these results.

3 HISTORICAL CONTEXT

3.1 LOCAL CONTEXT AND SETTLEMENT HISTORY

3.1.1 PHYSIOGRAPHIC CONTEXT

The study area is in the Waterloo Hill physiographic region which is located within the centre of the Grand River Watershed. It occupies approximately 192,000 acres predominantly across the Region of Waterloo and extends into both Brant and Perth counties. The surface of this region is composed primarily of sandy hills and kames. The sandy soils of these hills and kames provide areas of good drainage and consist of grey-brown podzolic sands (Chapman and Putnam, 1984). The study area contains the Grand River, Speed River and Mill Creek of the Grand River Watershed. The Grand River is one of the oldest in Ontario; the present river and its valley began with the retreat of the Wisconsinan ice approximately 12,000 before present (BP) (Heritage Resources Centre, 1989: 8). In the central basin which encompasses the study area, hummocky interlobate and recessional or retreat moraines provide evidence of the effects of ancient ice advance and retreat (Heritage Resources Centre, 1989: 8).

The study area lies in the Mixed-wood Plains Ecozone, within the Lake Simcoe-Rideau Ecoregion (Ecoregion 6E). Lake Simcoe-Ecoregion encompasses 6.4% of Ontario (6, 311, 957 ha) of Ontario. The climate is mild and moist, with a mean annual temperature range of 4.9 to 7.8 degrees Celsius. The land cover is/was predominantly cropland, pasture and abandoned fields. Forested areas include deciduous, coniferous and mixed forest types (Crins et al., 2009).

The study area is also within the Great Lakes-St. Lawrence Forest Region. The deciduous trees characterizing this region include sugar maple, beech, red maple, yellow birch, basswood, white ash, large-toothed aspen, red and burr oak, white eastern hemlock, eastern white pine, white spruce and balsam fir are among the coniferous species (Rowe, 1972).

3.1.2 INDIGENOUS CONTEXT

Paleoindian period populations were the first to occupy what is now southern Ontario, moving into the region following the retreat of the Laurentide Ice Sheet approximately 11,000 years BP. The first Paleoindian period populations to occupy southern Ontario are referred to by archaeologists as Early Paleoindians (Ellis and Deller, 1990).

Early Paleoindian period groups are identified by their distinctive projectile point morphologies, exhibiting long grooves, or 'flutes', that likely functioned as a hafting mechanism (method of attaching the point to a wooden stick). These Early Paleoindian group projectile morphologies include Gainey (ca. 10,900 BP), Barnes (ca. 10,700), and Crowfield (ca. 10,500) (Ellis and Deller, 1990). By approximately 10,400 BP, Paleoindian projectile points transitioned to various unfluted varieties such as Holcombe (ca. 10,300 BP), Hi Lo (ca. 10,100 BP), and Unstemmed and Stemmed Lanceolate (ca. 10,400 to 9,500 BP). These morphologies were utilized by Late Paleoindian period groups (Ellis and Deller, 1990). Both Early and Late Paleoindian period populations were highly mobile, participating in the hunting of large game animals. Paleoindian period sites often functioned as small campsites where stone tool production and maintenance occurred (Ellis and Deller, 1990).

Climatic warming, approximately 8,000 BP, was accompanied by the arrival of the deciduous forest in southern Ontario. With this shift in flora came new faunal resources, resulting in a change in cultural adaptations in the region. This change is reflected in new tool-kits and associated subsistence strategies referred to archaeologically as the Archaic period. The Archaic period in southern Ontario is divided into

three phases: the Early Archaic (ca. 10,000 to 8,000 BP), the Middle Archaic (ca. 8,000 to 4,500 BP), and the Late Archaic (ca. 4,500 to 2,800 BP) (Ellis et al., 1990).

The Archaic period is differentiated from earlier Paleoindian populations by a number of traits such as: 1) an increase in tool stone variation and reliance on local tool stone sources, 2) the emergence of notched and stemmed projectile point morphologies, 3) a reduction in extensively flaked tools, 4) the use of native copper, 5) the use of bone tools for hooks, gorges, and harpoons, 6) an increase in extensive trade networks, and 7) the production of ground stone tools. Also noted is an increase in the recovery of large woodworking tools such as chisels, adzes (a tool similar to an axe with an arched blade, used for cutting or shaping large pieces of wood), and axes (Ellis et al., 1990). The Archaic period is also marked by population growth. Archaeological evidence suggests that by the end of the Middle Archaic period (ca. 4,500 BP) populations were steadily increasing in size (Ellis et al., 1990). Over the course of the Archaic period, populations began to rely on more localized hunting and gathering territories. By the end of the Archaic period, populations were utilizing more encampments that are seasonal. From spring to fall, the archaeological record shows populations were shifting their settlement patterns on a regular, seasonal basis. From spring to fall, settlements would exploit lakeshore/riverine locations where a broad-based subsistence strategy could be employed, while the late fall and winter months would be spent at interior sites where deer hunting was likely a primary focus with some wild edibles likely being collected (Ellis et al. 1990:114). The steady increase in population size and adoption of a localized seasonal subsistence strategy eventually evolved into what is termed the Woodland period.

The beginning of the Woodland period is identified by archaeologists by the emergence of ceramic technology for the manufacture of pottery. Similar to the Archaic period, the Woodland period is separated into three primary timeframes: the Early Woodland (approximately 2,800 to 2,000 BP), the Middle Woodland (approximately 2,000 to 1,200 BP), and the Late Woodland (approximately 1,200 to 350 BP) (Spence et al., 1990; Fox, 1990).

The Early Woodland period is represented in southern Ontario by two different cultural complexes: the Meadowood Complex (ca. 2,900 to 2,500 BP), and the Middlesex Complex (ca. 2,500 to 2,000 BP). During this period, the life ways of Early Woodland populations differed little from that of the Late Archaic with hunting and gathering representing the primary subsistence strategies. The pottery of this period is characterized by its relatively crude construction and lack of decorations. These early ceramics exhibit cord impressions, likely resulting from the techniques used during manufacture (Spence et al., 1990).

While evidence of both complexes is present, the Meadowood complex is more prominent within Southern Ontario, and consequently within the study area. It is characterised by Meadowood cache blades, Meadowood side notched points, trapezoidal gorgets and a marked preference for Onondaga chert (Spence et al., 1990).

The Middle Woodland period is differentiated from the Early Woodland period by changes in lithic tool morphologies (e.g. projectile points, expedient tools) and the increased elaboration of ceramic vessels (Spence et al., 1990). In southern Ontario, the Middle Woodland is observed in three different cultural complexes: the Point Peninsula Complex to the north and northeast of Lake Ontario, the Couture Complex near Lake St. Clair, and the Saugeen Complex throughout the remainder of southern Ontario. These groups can be identified by their use of either dentate or pseudo scalloped ceramic decorations. It is by the end of the Middle Woodland period that archaeological evidence begins to suggest the rudimentary use of maize (corn) horticulture (Warrick, 2000).

The Saugeen Complex lies in south-central Ontario, but is best known for material culture found along the east shores of Lake Huron. Vinette 2 ceramics are characterized by their thick walls, wide necks, coil construction, poorly defined shoulders and conoidal bases. Typically, the majority of the vessel is decorated with pseudo-scallop stamps or dentate impressions, with the latter occurring more frequently at later dates (Spence et al., 1990).

Early contact with European settlers at the end of the Late Woodland period resulted in an extensive change to the traditional lifestyles of most populations inhabiting southern Ontario. Trade with the Europeans lead to dependency on European goods and incited conflict between the Indigenous

communities in southern Ontario (Warrick, 2000). Neutral Territory was situated between the Wendat (Huron) territory to the north, and the League of the Haudenosaunee (Five Nations Iroquois) to the south. Their unfortunate placement between these two territories resulted in their disbandment as a distinct nation when the Haudenosaunee began their campaign against the Wendat from 1649-1650. This disbandment was largely a product of intensification of the fur trade, resource scarcity, and European rivalries that carried out by their Indigenous trade partners.

The League of the Haudenosaunee continued their offensive northward to Anishinabek territory where they were faced with fierce opposition by the Mississauga and their allies (Six Nations of the Grand River, 2015). The Mississauga were able to drive the Haudenosaunee back south of Lake Ontario and inhabited the newly vacant territory including the Grand River area. After the American Revolutionary War, Haudenosaunee loyal to the British Crown lost their homes fighting against the newly established American republic. Land around the Grand River was granted to these loyalists through the Haldimand Treaty of 1784. In 1798 Col. Joseph Brant, acting for the Six Nations, sold 94, 012 acres known as Block No.2 to Richard Beasley, James Wilson, and Jean Baptiste Rosseaux. In 1800 Beasely began to sell land within the study area to immigrants of German descent from Pennsylvania.

Today the study area is located within the traditional territories of the Six Nations, as well as the Mississauga's of the Credit, part of the Anishinaabe peoples, and is within lands included the Crown Grant to the Six Nations. These communities are represented today by Reserve 40, belonging to Six Nations of the Grand River and Reserve 40A, belonging to the Mississaugas of the Credit, both located in Brant County.

3.2 EURO-CANADIAN CONTEXT

3.2.1 WATERLOO COUNTY

In 1788 the Province of Quebec created the first districts to serve administrative needs at the local level – Hesse, Nassau, Mecklenburg and Lunenburg. The study area was in the Nassau District that included as far south as the current Fort Erie and Thunder Bay to the north. After the creation of Upper Canada in 1791, The Nassau District was renamed the Home District. By way of an Act of Parliament in 1798 the Home and Western Districts were realigned with a portion of these districts becoming London and Niagara Districts. The study area remained part of the Home District.

At the turn of the nineteenth century, Crown Land was granted to arriving settlers on conditions, such as the requirement to clear at least 2.02 ha of their lot and the adjacent road allowance as well as to build a house and shingle it within 18 months.

In 1816 the Home District was divided and the majority of what would become Waterloo County was reorganized into the Gore District (Pope, 1877:76). The first settlers of the Gore District were almost exclusively United Empire Loyalists (Pope, 1877: 76). Initially Halton County included the Townships of Beverley, Dumfries, Esquesing, Flamboro West and Flamboro East, Nassagaweya, Nelson and Trafalgar (Pope, 1877:76) and was expanded to include the townships of Guelph, Puslinch, Nassagaweya, Esquesing, Eramosa, Erin and Garafraxa in 1822 (Cumming, 1971:2).

The District of Wellington was created in 1837/1838 and included the counties of Wellington, Waterloo, Grey and parts of Dufferin County (Archives of Ontario, 2011; Wellington County, n.d.). The United Counties of Waterloo, Wellington and Grey was formed in 1852, but only two years later Wellington County became its own entity and consisted of the Townships and Towns of Amarantha, Arthur, Eramosa, Erin, Guelph, Garafraxa, Maryborough, Nichol, Peel, Pilkington, and Puslinch (Wellington County, n.d.).

On February 1841 Wellington District became part of Canada West in the new United Province of Ontario. Only eight years later in 1849, the District system was eliminated. Wellington District was divided

into Grey, Wellington, Perth and Waterloo Counties. Waterloo County included the Townships of Waterloo, Woolwich, Wilmot, Wellesley and North Dumfries. Waterloo County was dissolved in 1973 and replaced with the Region of Waterloo.

3.2.2 TOWNSHIP OF WATERLOO

The Township of Waterloo was historically bounded on the north by the Township of Woolwich, on the east by the Townships of Guelph and Puslinch, on the south by the Township of Dumfries and on the west by the Township of Wilmot. The Township of Waterloo was part of Block 2 of the Haldimand Tract. The Haldimand Tract was land granted by Sir Frederick Haldimand on October 25, 1784, to the Six Nations in recognition of their support of the British during the American Revolution. Joseph Brant, representing the Six Nations, arranged for the sale of Block 2 of the tract to United Empire Loyalists, Richard Beasley and his partners James Wilson and Jean-Baptiste Rousseaux in 1796. When the transaction finalized in 1798 Beasley became solely responsible for the mortgage payments.

Due to the terms of the sale of the tract from the Six Nations to Beasley, the final deed was not transferred to Beasley until payment was made in full. As such, Block 2 could not be legally subdivided and sold to make payments for the initial land transfer (English and McLaughlin, 1983). Beasley did begin to sell lots, however, despite his inability to grant clear title. In 1800 Beasley sold almost 5571 ha to predominantly German Mennonites who did not realize that the mortgage prevented them from getting clear title to their lands (Bloomfield, 1995:21). This led to the almost complete halt of settlement in 1803 and 1804 (Bloomfield, 1995:21). Beasley and Brant realized the only solution was a bulk sale of the remaining portions of Block 2 to pay off the mortgage (Bloomfield, 1995: 22). Samuel Bricker who had immigrated to Block 2 in 1802 successfully convinced other German Mennonites in Pennsylvania to form the 'German Company' to purchase the remaining Block 2 lands. Lots were then drawn and distributed to families that contributed to the German Company according to the number of shares owned (Sprung 1984:12). Due to the tract being sold as a block, the area was not addressed in the typical manner by the local of administration of Upper Canada, with surveys and basic services. As such, roads were informally laid out by the new settlers and lots were often oddly shaped.

The area's reputation for fertile and cheap lands within a predominantly German speaking community attracted non-Mennonite Germans during the early nineteenth century. Additionally, large numbers of Scottish, German and other European immigrants also came to Waterloo (Bloomfield, 1995: 45-50). The earliest settlement clusters were not necessarily the areas with the best soil due to the lack of formally laid roads, rather the earliest settlement clusters were around the forks of the Grand and Speed Rivers in the south and in the north along the road connecting John Erb's mills and Abraham Erb's mills which are now the urban cores of the cities of Cambridge and Waterloo, respectively (Bloomfield, 1995:61).

By 1846, the Township of Waterloo had a population of 4,424, and included 20 sawmills and eight gristmills (Smith, 1846:205). Early residential structures tended to be one to two storey log structures. Prior to 1850 log houses and shanties were exempt from taxes if they only had one fireplace and, as such, many were built in the Township. During the second half of the nineteenth century, large, often two storey stone dwellings became popular.

The creation of the Grand Trunk Railway, the Galt & Guelph Railway and the Preston & Berlin Railways in the 1850s brought additional prosperity. Wheat and barley were the primary exports, both becoming especially lucrative when the Crimean War (1853-1856) raised British demand for Canadian Wheat (Hayes 1997:40).

3.2.3 BERLIN/CITY OF KITCHENER

Originally known as Sand Hills and later as Mount Pleasant, the area was first settled in 1807 by German Mennonites Benjamin Eby and Joseph Snider. It later became known as Berlin due to its significant German immigrant population. In 1823 the "fathers of Kitchener's furniture industry" John Hoffman and Samuel Bowers partnered together to create the first Canadian furniture business (Waterloo Region

Record, 2014). Bowers later withdrew from the partnership and Hoffman's brother purchased his interest (City of Kitchener, 1954). The Hoffman brothers later went on to introduce the steam engine to local manufacturing, commencing Kitchener's strong industrial background.

Hoffman is credited with the creation of over 50 homes in Berlin (City of Kitchener, 1954). David Miller opened the first mercantile business c.1825 and Henry B. Bowman opened the second in 1837. The 1830s brought further immigration of settlers direct from Germany, and the name was changed to Berlin.

With a population of over 1000 in late 1853, Berlin was incorporated as a village. It was also during this decade that economic growth began to flourish with the introduction of the Grand Trunk Railway in 1856. With a population of 5000 in the 1880s, Parsell described Berlin as "among the most substantial and progressive towns in Ontario" (H. Parsell & Co., 1881:7).

Furniture making continued to be a predominant source of industry. Hartman Krug and Dan Hibner received permission from Council in 1887 to erect a factory called the H. Krug Furniture Co. Ltd. Now known simply as Krug, the furniture company is one of the few surviving furniture companies in Kitchener and has garnered international recognition. Other early industrial endeavors in the area included tanning hides, shoemaking, button manufacturing and rubber manufacturing (City of Kitchener, 1954).

Berlin was proclaimed a City on June 10, 1912 with a population of 15,195. After becoming a City, Council set about to encourage further industrial businesses to settle in Berlin. The beginning of World War I (WW1) put a pause on this growth in 1914. WWI brought significant changes to a City with so many German descendants. German instruction in school was no longer allowed, and those with German sounding names often suffered discrimination. The biggest change brought about by WWI was the change in the city's name. In an effort to choose something "less Germanic" the name Kitchener was decided upon (Moyer, 1979: 53-56).

Kitchener is one of Canada's most carefully planned communities thanks to W. H. Breithaup. In 1920, Breithaup's advocacy for a planning board and a city plan paid off. In 1923, the planning board engaged noted town planner T. A. Adams and his associated H. I. Seymour. Their contract was completed in 1925, and a comprehensive plan was the result. The plan included a complete layout and recommendations for areas of growth within Kitchener, including recommendations for development controls such as zoning by-laws (Moyer, 1979: 64).

Following World War II, there was significant growth and progress. Until about 1960, taxable assessment had risen on an aggressive curve (Moyer, 1979: 83). As with most urban centres, Kitchener's downtown suffered in the 1960s through to the 1990s from in the insurgence of suburban sprawl despite ongoing renewal efforts. More recent urban revitalization efforts such as the implementation of the Streetscape Master Plan published in 2007, have been implemented with success.

3.2.4 ROADWAY AND TRANSPORTATION HISTORY IN ONTARIO

The earliest transportation routes in Ontario consisted of the many waterways and paths utilized by Canada's Indigenous populations. These same routes were utilized by early European explorers during the fur trade as they were the most effective way to traverse the tree covered land (MTO, 2016). It wasn't until the growth of Euro-Canadian settlement that the need for cleared paths suitable for wagon travel led to the development of roadways.

The earliest roadways consisted of little more than dirt pathways cleared of stumps and boulders to a width that would allow for the passage of wagons and coaches. These roads were often built to varying levels of quality by settlers and quickly became pitted and washed out.

The introduction of corduroy roads, consisting of horizontal logs laid along the roadway and covered/chinked with dirt, provided an improvement upon basic dirt roads. They allowed for the construction of roadways over marshy, wet terrain that basic dirt roads could not pass through easily. However, these roads also experienced short periods of use before decaying and becoming impassable (MTO, 2016).

In the late 1700's there were no formal road workers responsible for the construction and maintenance of roadways. Instead, the construction of roads was the responsibility of township citizens and settlers who were required to contribute time in road work every year as statutory labour and overseen by the local 'Pathmaster'.

Techniques for roadway construction improved throughout the 1800's, with the invention of the plank road (sawed planks of wood laid horizontally perpendicular to the road alignment) in the 1830's. Similar to the previous corduroy roads, plank roads were prone to decomposition and deterioration (MTO, 2016). The macadam road (using various gravel sizes) provided better drainage, compaction, slope control, and longevity, but the initial construction cost posed an issue for many roadworks. The costly repair and maintenance of these early roads meant that in the latter half of the nineteenth century many of Ontario's roadways were in disrepair.

The arrival of the automobile in Ontario during the late 1800's – early 1900's, and the advocacy work of the bicycle lobby, resulted in a push for new and improved roadways. The use of cars and bicycles on roadways resulted in the development of improved gravel and macadamized dirt roadways, and the patent of modern tarmac technology in 1901 allowed for improved road conditions and longevity (MTO, 2016). By 1916, roadways had become important enough to warrant the founding of the Department of Public Highways (what would eventually become the MTO).

The first half of the 20th century saw a number of developments on Ontario's roadways, despite the restrictions imposed by the great depression and two world wars. The 1920's saw the formalization of road systems, the passing of the provincial Highway Traffic Act, and the removal of municipal and regional road tolls. By the 1940's preliminary construction on numerous sections of 400 series highways were completed. Over the following decades numerous highway expansions were completed and older dirt roads upgraded to improved tarmac.

3.2.5 BRIDGE CONSTRUCTION HISTORY IN ONTARIO

The history of bridge construction in Ontario coincided roughly with the spread of Euro-Canadian settlers and surveyors and the expansion of Ontario's road systems (Bradford 2015, MTO 2016). These earliest bridges were rudimentary in construction, utilizing the abundance of large trees available to span waterways and covering the bridge top with a corduroy log cover and dirt flooring. With the decline of suitable large lumber came the introduction of wooden truss bridges.

Wooden truss bridges benefitted from the construction knowledge of early settlers, utilizing King and Queen trusses common in barn construction. The wooden truss bridge enjoyed a long-lived popularity in southern Ontario, being commonly used until the 1890's.

Stone arch bridge construction began during the same period as the wooden truss bridges, being used throughout the 1850's to 1880's. However, stone bridges were never as common, due largely to the expensive and time-consuming nature of quarrying, transporting, and crafting the raw material (Bradford, 2015; MTO, 2016). As such, stone bridges are more common for larger important bridge crossings and wealthier economic centres.

With the arrival of the railway came the use of iron in bridge construction. Introduced in the 1850's, early iron bridges were constructed using cast iron and were brittle. Later development of wrought iron bridges improved on the tensile strength of the material, thus improving its longevity (Bradford, 2015; MTO, 2016). However, iron's use in bridge construction was limited to the 1870's and 1880's, as the introduction of steel replaced it as the standard bridge material in the 1870s.

Numerous bridge technologies were used in the construction of wooden, iron, and steel bridges in the 1800's. These included the truss (1820's), suspension (1848), and cantilever (1883).

With the reintroduction of concrete as a building material in the twentieth century came a more efficient and effective way to build bridges. Concrete's malleability meant that the construction of slab and arch bridges could be produced relatively quickly and easily to span the many smaller waterways of Ontario.

This resulted in the decline of steel in bridge construction, with concrete soon becoming the dominant material. The introduction of steel reinforcing concrete further improved its versatility, allowing for its use in larger building projects (Bradford, 2015; MTO, 2016). The result is the increased use of concrete in major roadworks throughout the 1940's and 1950's.

The most recent innovation to the use of concrete is the development of pre-stressed concrete, which provides better resistance to cracking and failure and can be either cast in place or pre-formed off site. This versatility has resulted in pre-stressed concrete's dominance in modern bridge construction.

3.2.5.1 *RIGID FRAME BRIDGES*

Rigid frame bridges are structures where the superstructure and substructure are rigidly connected to act as a unit. Older rigid frame bridges tend to be small to medium spans with an arch shape to them. The use of rigid frame bridges began in Germany in the early twentieth century and proliferated in Ontario during the first half of that century (Lin & Yoda, 2017).

In 1920, an innovation in concrete bridge construction was developed by Arthur Hayden, the concrete rigid frame (Parsons, 2005). The first use in North America was in Westchester County, New York, in the development of a comprehensive parkway system. Between 1922 and 1930, 74 rigid frame structures were built on the Westchester County parkway system (Parsons, 2005).

This bridge type was introduced in Ontario in the 1930s and continued to be the dominant form of highway bridges into the 1950s until the introduction of pre-stressed concrete beam and post-tension cast-in-place structures in the 1960s (Benjamin et al., 2013).

3.3 HISTORY OF REGIONAL ROAD 8 OVERPASS

According to Tremaine's *Map of the County of Waterloo* (1861), the subject bridge is located on the former properties of Jacob Hagey and Joseph Erb (Figure 2), however the *Illustrated Historical Atlas of the County of Waterloo* (1881) does not indicate owners of the properties at that time (Figure 3). Both maps depict a road alignment to the northwest of the location of the subject structure, though no significant features are depicted within the bridge's current footprint.

Topographic mapping produced by the Department of Defence for the years 1929 and 1936 (Figures 4 and 5) depict the footprint of the subject structure sitiated across the existing Regional Road 8. Several houses are located to the north and south of the footprint along the right-of-way, though no significant features are located within the footprint. Arial photgraphy from 1955 (Figrue 6) indicates that additioal road development had occurred to the south of the structure footprint by that time, however only farmland and the Regional Road 8 right-of-way are depicted within the footprint.

The Regional Road 8 Overpass was constructed by the Department of Highways, Ontario (DHO, now MTO), in 1959. The subject structure was part of a larger project to alleviate congestion along Highway 2 by completing a new east-west highway that traversed Ontario (Bevers, History of King's Highway 401, 2020). Designated Highway 401, construction on this new controlled access highway was initiated in the early 1950s, with the Toronto Bypass completed in 1956. Further sections of the highway were completed in the following years with particular empahsis on connecting urban areas (Bevers, History of King's Highway 401, 2020). The subject bridge was constructed through an expansion of the route west from Milton towards Woodstock.

Arial photography produced in 1963 (Figure 7) and topographic mapping from 1968 (Figure 8) depict the completed bridge and controlled acces cloverleaf constructed for the Regional Road 8 Overpass. The subject structure is located at the centre of the cloverleaf and no additional significant landscape features are noted within the immediate vicinity.

According to the original drawings (Appendix C), the structure was designed for the DHO by T.O. Lazarides and Associates Limited, Consulting Engineers, as "Waterloo Township Bridge #10." The firm was established in 1953 as Lazarides, Lount and Partners in 1953 to specialize in structural engineering,

with its head office located in Toronto. As a result of the devestation of Hurricane Hazel, one of Canada's worst natural disasters, the firm was awarded their first bridge project from the DHO in 1954 to replace the Highway 401 Humber River Bridge (LEA, 'History', 2020). After the departure of Murray Lount, the firm was reformed as T.O. Lazarides and Associates in 1957 and was later acquired by Damas & Smith Ltd., which was subsequently acquired by N.D. Lea, a Vancouver-based engineering consultancy, in 1984. Now rebranded as LEA, the company has completed various infrastructure projects within Ontario, Canada, and globally.

According to the Detailed Condition Survey Report (Bridge Check Canada Ltd., 2017), a deck rahibilitation was undertaken on the subject structure in 1982 and consisted primarily of repaving of the bridge deck and minor structural rehabilitation of concrete spalling. Additional work was undertaken in 2000 and included replacement of existing barriers, waterproofing and repaving, drainage replacement, and some regrading.

4 EXISTING CONDITIONS

4.1 DESCRIPTION OF STRUCTURE

The following descriptions of the structure are based on a site visit conducted on March 21, 2020, by Lauren Walker, Cultural Heritage Specialist. Access to the bridge deck was not possible due to safety concerns. However, the bridge was observed and recorded from the King Street East right-of-way (Images 1-10).

The Regional Road 8 Overpass is an eight-lane, two-span rigid frame concrete T-beam bridge constructed in 1959 to carry Highway 401 across Regional Road 8 (King Street East) in the City of Kitchener. The Regional Road 8 Overpass is generally oriented east-west and consists of concrete abutments with non-projecting wing-wall, supported by grass berms rising from King Street East to the bridge approaches. The abutments extend to the King Street right-of-way, with a low concrete retaining wall located on the northwest side of the west abutment.

The deck is concrete overlaid with an asphalt wearing surface and supported by 17 concrete T-beams. The beams have a slight curve, producing an arch effect, and rest on the concrete abutments as well as nine cylindrical piers supported by a concrete median separating the northbound and southbound lanes of Regional Road 8. A concrete barrier system lines the north and south elevation of the bridge and connects to a steel and wood barrier system extending along the approaches. A concrete median divides the east and west lanes of Highway 401 traffic along the bridge.

The Detailed Condition Survey Report completed by Bridge Check Canada Ltd. (2017) recorded existing conditions, including several deficiencies. These include:

- Deck:
    - Concrete deck removal is recommended to include delaminated areas only.
- Deck Soffit:
    - The bridge deck soffit is in fair condition with clean/stained medium width cracks, clean wide width cracks, delaminations, spalls, patches, honeycombing, and wet areas.
- Girders:
    - The bridge girders are in fair-to-good condition with clean/stained medium width cracks, delaminations, spalls, patches, and wet areas.
- Diaphragms:
    - The diaphragms are in good condition with clean medium width cracks and wet areas.
- Bridge Approaches:
    - The asphalt on the approaches is in fair-to-good condition with unsealed cracks. Observation of corehole C23, located in the east approach of the EBL, confirmed the presence of a concrete approach slab beneath the asphalt.
- Concrete Barrier Walls:
    - The concrete barrier walls are in fair condition with clean/stained medium width cracks, delaminations, spalls, light scaling, and patches.
- End Posts and Guide Rails:

    - The concrete end posts are generally in fair-to-good condition with cracks, spalls, and delaminations except for the northwest end post which is in poor condition. The steel beam guiderails are in fair-to-good condition with impact damages.

- Abutment Walls:
    - The exposed surfaces of the abutment walls were inspected and sounded to check for delamination. The abutment walls are in fair condition. The field investigation of the east abutment wall revealed clean/stained medium width cracks, clean wide width cracks, delaminations, spalls, patches, honeycombing, and wet areas. The field investigation of the west abutment wall revealed clean/stained medium width cracks, clean wide width cracks, delaminations, spalls, patches, and wet areas. The cracks are vertical.
- Wingwalls:
    - A detailed visual inspection and hammer sounding of the wingwalls was carried out. The wingwalls are in fair-to-poor condition. The deteriorations included clean/stained medium width cracks, clean wide width cracks, delaminations, spalls, patches, wet areas, and movements. The wide crack was observed in the Southeast wingwall. The spalls observed in 2016, on the northwest and southeast wingwalls, have been patched and repaired in 2017.
- Retaining Walls:
    - A detailed visual inspection and hammer sounding of the retaining walls was carried out. The retaining walls are in fair-to-good condition. The deteriorations included stained medium width vertical cracks, delaminations, spalls, and light scaling.
- Piers:
    - The exposed areas of the bridge piers were inspected and hammer sounded. The concrete piers are generally in fair condition with clean medium width cracks, clean wide width cracks, delaminations, patches, honeycombing, and wet areas. The wide width cracks were observed on the concrete pier protection wall.
- Embankments:
    - The embankments are in good condition with vegetation growth.

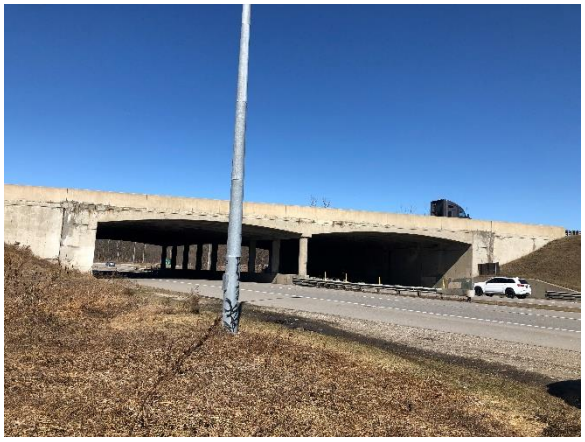


Image 1: Views northwest to the south elevation

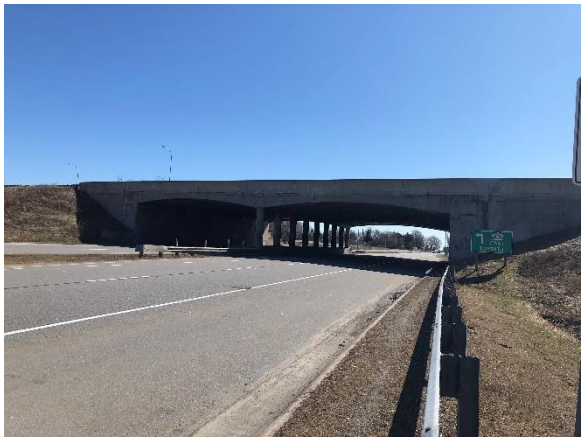


Image 2: View southeast to the north elevation

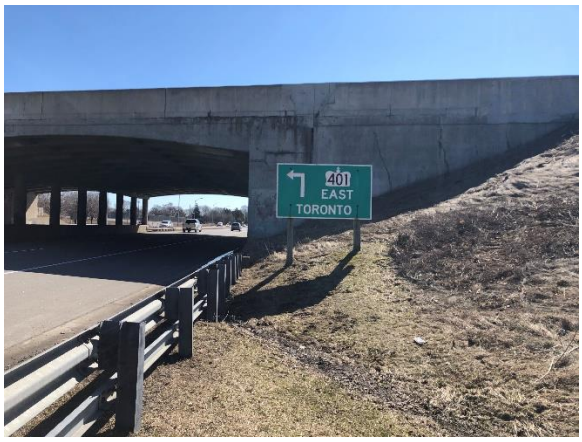


Image 3: View south of the northwest abutment

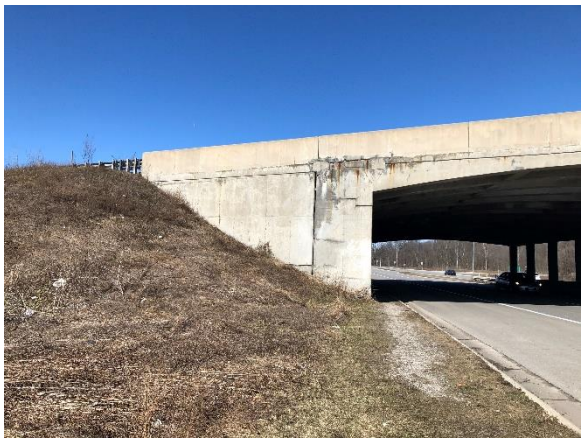


Image 4: View north of the southwest abutment

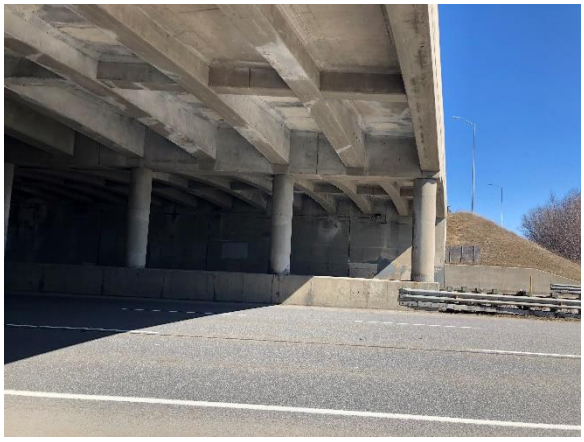


Image 5: View of the bridge soffit from the south side of the structure

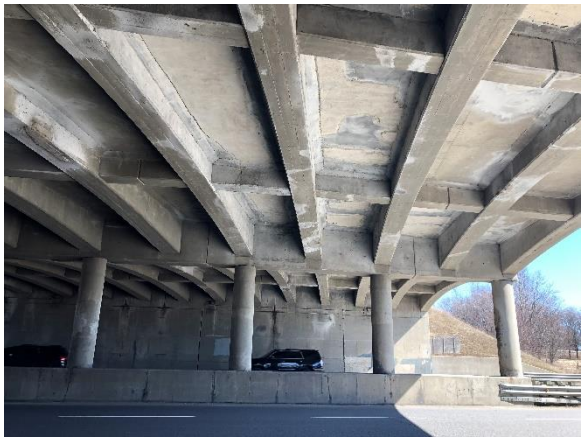


Image 6: Detail of the bridge soffit from underneath the structure

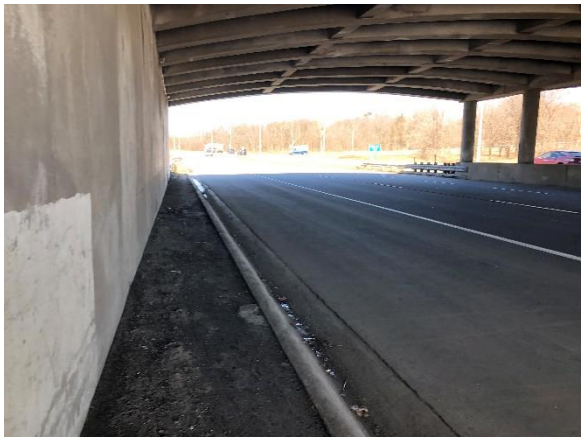


Image 7: View northwest beneath the subject bridge

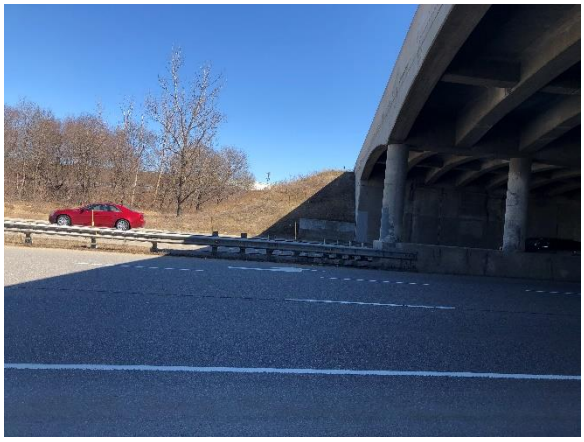


Image 8: View east along the north elevation of the structure

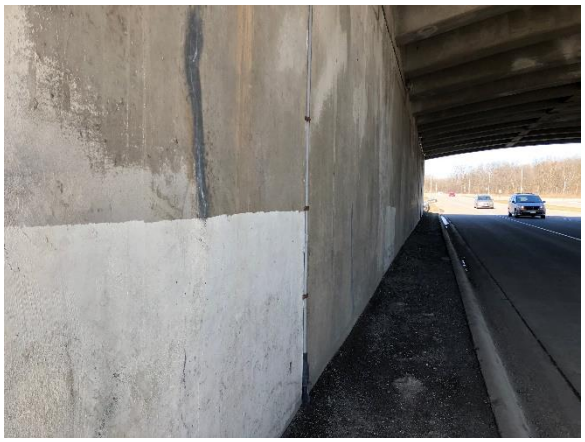


Image 9: Detail of the west abutment, looking north

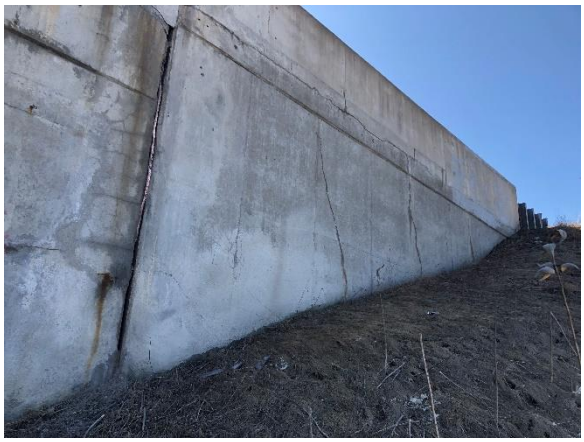


Image 10: Detail of the west abutment, looking southwest

4.1.1 DESIGN AND CONSTRUCTION

Structure Name	Regional Road 8 Overpass	**Road Name**	King Street – Regional Road 8
District	Central Region	**Road Type**	Highway
Municipality	City of Cambridge	**Owner**	MTO
Bridge or Culvert	Bridge	**Overall Structure Width (m)**	Unknown
Structure Type	Rigid Frame	**Roadway Width (m)**	19.29m x 2
Span (m)	18.03m x 2	**Total Deck Length (m)**	36.6m
Height (M)		**Total Deck Area (s.m)**	Unknown
Direction of Structure	West/East	**Heritage Description**	None
Year Built/Rehabilitated	Built 1959		
Current Load Limit	Unknown	**Designer/Construction Firm**	T.O. Lazarides and Associates
Waterway	N/A		

4.2 DESCRIPTION OF STUDY AREA AND LANDSCAPE CONTEXT

The Regional Road 8 Overpass is located in the City of Kitchener, Region of Waterloo. The study area consists of the current bridge, approaches to the bridge, and grading associated with the structure and is located just north of the boundary with the City of Cambridge. The bridge is situated within a cloverleaf design-controlled access to Highway 401 from Regional Road 8 and is generally surrounded by small woodlots and open, grassy areas (Images 11-14). Suburban subdivisions are located to the south and southeast of the highway infrastructure in the Preston area of the City of Cambridge. The Grand River is located immediately to the west, though is not visible from the subject structure.

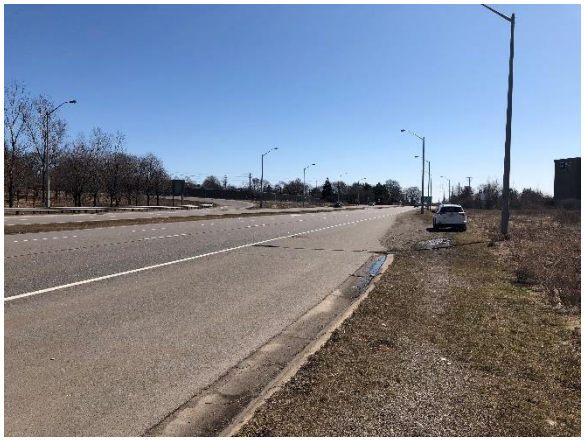


Image 11: View looking generally southeast of the subject structure

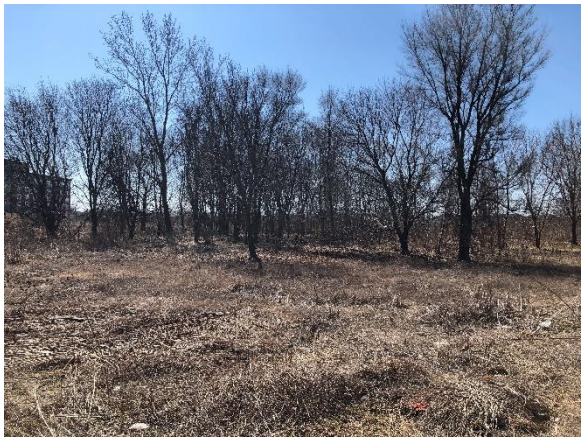


Image 12: View looking generally south of the subject structure

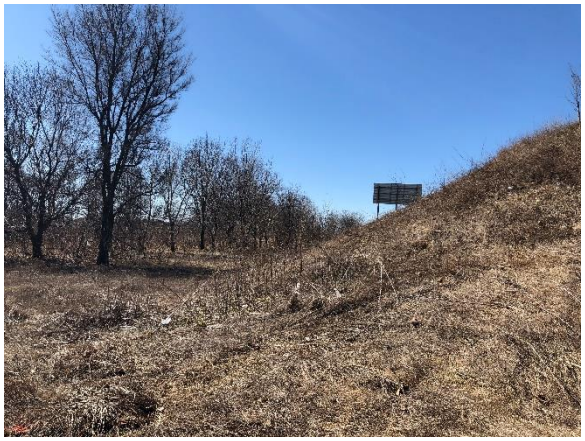


Image 13: View generally west from Regional Road 8

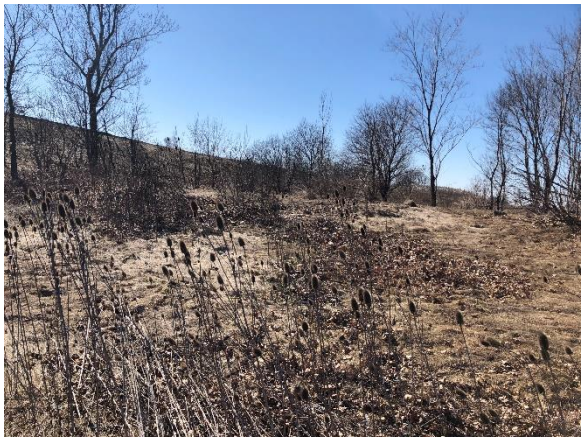


Image 14: View generally east from Regional Road 8

5 CULTURAL HERITAGE EVALUATION

5.1 COMPARATIVE ANALYSIS

A comparative analysis was undertaken to establish a baseline understanding of similar bridges in the general vicinity of the subject bridge, and to determine if the materials, bridge type, or size is uncommon within the region. As the Regional Road 8 Overpass was constructed by the DHO and is owned by the MTO, comparative examples were drawn from the MTO bridge inventory for Central Region (See Appendix B for a list of comparative examples).

5.1.1 CENTRAL MTO BRIDGE LIST

Of the structures reviewed, 54 reinforced cast-in-place concrete rigid frame bridges are identified on the Central Region bridge inventory, built between 1937 and 2003. Lengths vary between 7.8 m to 40.4 m and the number of spans vary from one to two (Appendix B).

The oldest MTO owned reinforced cast-in-place rigid frame bridges in Central Region are the Sturgeon River Bridge and the Dillon's Creek Bridge which were both constructed in 1937. As such, the Regional Road 8 Overpass is not the oldest MTO owned cast-in-place concrete rigid frame bridge in Central Region.

The longest total span of a rigid frame bridge in Central Region is 40.4 m and belongs to the Underpass at King Side Road and Highway 400. Of the 54 comparable examples, 2 have longer spans than the Regional Road 8 Overpass. Accordingly, the subject structure is not the longest spanning bridge of this type.

Of the 54 comparable examples, 51 have one span and three have two spans. As such, the Regional Road 8 Overpass has a typical number of spans for rigid frame bridges currently owned by the MTO in Central Region.

5.2 ONTARIO REGULATION 9/06 EVALUATION

As the subject structure is being evaluated under TPAP and not using the MTO's *Ontario Heritage Bridge Guidelines* (2008 – Interim), O. Reg. 9/06 was used to determine the heritage value of the bridge. If future MTO work is required subject to the *Ontario Heritage Bridge Guidelines*, additional work will be required by a cultural heritage specialist to evaluate the bridge using the approved MTO scoring system.

O. Reg. 9/06 of the OHA provides criteria for determining whether a property has cultural heritage value or interest. If a property meets one or more of the criteria in O. Reg. 9/06, a property is eligible for designation under the OHA. Table 2 presents the evaluation of the subject property using O. Reg. 9/06.

Table 2 – Ontario Regulation 9/06 Evaluation

CATEGORY	CRITERIA	Y/N	COMMENTS
Design/Physical Value	Is a rare, unique, representative or early example of a style, type, expression, material or construction method	N	The subject structure is a two-span, cast-in-place reinforced T-beam rigid frame bridge carrying eight lanes of Highway 401 traffic over Regional Road 8 in the City of Kitchener. The T-beams exhibit a slight curve, though this design feature does not indicate a distinctive style or expression. Therefore, the Regional Road 8 Overpass does not meet this criterion.
	Displays a high degree of craftsmanship or artistic merit	N	The subject structure does not have any elements that display a high degree of craftsmanship or artistic merit. Therefore, the Regional Road 8 Overpass does not meet this criterion.
	Demonstrates a high degree of technical or scientific achievement	N	The structure does not demonstrate a high degree of technical or scientific achievement. Therefore, the Regional Road 8 Overpass does not meet this criterion.
Historical/ Associative Value	Has direct associations with a theme, event, belief, person, activity, organization or institution that is significant to a community	N	The structure is associated with the construction of Highway 401, an important component of Ontario's transportation infrastructure. However, the subject structure is not a significant component of this broader infrastructure, and therefore the Regional Road 8 Overpass does not meet this criterion.
	Yields, or has the potential to yield, information that contributes to an understanding of a community or culture	N	The structure does not contribute to the understanding of a community or culture. Therefore, the Regional Road 8 Overpass does not meet this criterion.

	Demonstrates or reflects the work or ideas of an architect, artist, builder, designer or theorist who is significant to a community	N	The structure was designed by T.O Lazarides and Associates, a firm that would later be acquired by Lea. However, this structure is not a significant engineering work and did not represent an important moment in the history of the company. Therefore, the Regional Road 8 Overpass does not meet this criterion.
Contextual Value	Is important in defining, maintaining or supporting the character of an area	N	While the subject structure is one of a several similar structures along Highway 401, it is not important in defining, maintaining or supporting the character of the area. Therefore, the Regional Road 8 Overpass does not meet this criterion.
	Is physically, functionally, visually or historically linked to its surroundings	N	The subject structure is not physically, functionally, visually or historically linked to its surroundings. Therefore, the Regional Road 8 Overpass does not meet this criterion.
	Is it a landmark	N	The Regional Road 8 Overpass is not considered a landmark.

6 CONCLUSIONS

Based on the results of research, site investigation, and application of the criteria in O. Reg. 9/06, the Highway 401 Overpass does not retain CHVI. Accordingly, no Statement of Cultural Heritage Value or Interest and list of Attributes have been prepared.

7 RECOMMENDATIONS

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

1 The Regional Road 8 Overpass was determined not to have CHVI. Therefore, no additional heritage reporting is required at this time.

BIBLIOGRAPHY

References

Archaeological Research Associates Ltd. (2016), Existing Conditions Report: Cultural Heritage Resources, Stage 2 Light Rail Transit Environmental Assessment Region of Waterloo Prepared for WSP Parsons Brinckerhoff

Beers, J.H. and Co. (1883). The Cultural Implication of Drainage in the Municipality of Waterloo. Kitchener: Region of Waterloo.

Bevers, Cameron (2002-2020). The King's Highway: The History of Ontario's King's Highways. Retrieved from <https://www.thekingshighway.ca/>.

Bloomfield, E. (1995). Waterloo Township Through Two Centuries. Waterloo Historical Society.

Bothwell, Robert. (1986). A Short History of Ontario. Hurtig Publishers, Edmonton, Alberta.

Bradford, R. (2015). Keeping Ontario Moving: The History of Roads and Road Building in Ontario. Dundurn. Toronto, Ontario.

Bloomfield, E. (1995). Waterloo Township Through Two Centuries. Waterloo Historical Society.

Chapman L.J. and D.F. Putnam (1984). The Physiography of Southern Ontario. Ontario Geological Survey, Special Volume 2. Ontario, Canada.

City of Cambridge (n.d.) Local History. Retrieved from <http://www.cambridge.ca/en/learn-about/Local-History.aspx>

Cambridge Heritage Master Plan (2006). Prepared by BRAY Heritage, ERA Architects Inc., Archaeological Services Inc, Maltby and Associates Inc and the Tourism Company. Online Resource, https://www.cambridge.ca/en/learn-about/resources/Cambridge-Heritage-Master-Plan.pdf. Accessed April 16, 2018.

City of Cambridge Heritage Properties Register (2017) Online Resource, https://www.cambridge.ca/en/learn-about/resources/Heritage/Heritage-Properties-Register---September-2017.pdf. Accessed March 1, 2018.

Eby, Ezra E. (1895) A biographical history of Waterloo township and other townships of the county: being a history of the early settlers and their descendants, mostly all of Pennsylvania Dutch origin: as also much other unpublished historical information chiefly of a local character, Kitchener, Ontario

Ellis, C.J. and D.B. Deller (1990). Paleo-Indians. In The Archaeology of Southern Ontario to A.D. 1650, Ed C.J. Ellis and N. Ferris, pp. 37-74. Occasional Publication of the London Chapter, OAS No.5. London: Ontario Archaeology Society.

Ellis, C.J., I.T. Kenyon, and M.W. Spence (1990). The Archaic. In The Archaeology of Southern Ontario to A.D. 1650, Ed C.J. Ellis and N. Ferris, pp. 65-124. Occasional Publication of the London Chapter, OAS No. 5. London: Ontario Archaeology Society.

English, J. & K. McLaughlin (1983). Kitchener: An Illustrated History. Wilfred Laurier University Press.

Epp, Frank H and T. D. Regehr (1974) Mennonites in Canada: 1939-1970: a people transformed, Macmillan of Canada

Fox, W. (1990). The Middle Woodland to Late Woodland Transition. In The Archaeology of Southern Ontario to A.D. 1650, Ed C.J. Ellis and N. Ferris, pp. 171-188. Occasional Publication of the London Chapter, OAS No. 5. London: Ontario Archaeology Society.

General, P. and G. Warrick (2012) The Grand River Sturgeon Fishery. Journal of the Ontario Archaeological Society (92). 27-37.

Grand River Conservation Authority (2013) Heritage River Inventory. Online Resource, https://www.grandriver.ca/en/our-watershed/resources/Documents/Heritage-Inventory_As-of-March-13_2013.pdf. Accessed March 2, 2018.

Hayes. G. (1997). Waterloo County: An Illustrated History. Waterloo Historical Society.

Heritage Resources Centre (1989). The Grand as a Canadian Heritage River. University of Waterloo Occasional Papers Series.

Janusas, S. (1988a). An Archaeological Perspective of an Historical Overview of the Region of Waterloo. Kitchener: Region of Waterloo.

Janusas, S. (1988b). The Cultural Implication of Drainage in the Municipality of Waterloo. Kitchener: Region of Waterloo.

Lea Engineering (2020). History. Retrieved from: <https://www.lea.ca/About-LEA/History>

Lennox, P.A. and W.R. Fitzgerald (1990) The Culture History and Archaeology of the Neutral Iroquoians. In The Archaeology of Southern Ontario to A.D. 1650, Ed C.J. Ellis and N. Ferris, pp 405-456. Occasional Publication of the London Chapter, OAS No. 5. London: Ontario Archaeological Society.

Mika, Nick and Helma (1977) Places in Ontario: Their Name Origins and History. Belleville: Mika Publishing (Volumes 2 and 3 published in 1981 and 1983.)

Mills, R. (2017). February 21. Flash from the Past: Industry crowds the Grand River in Galt. *The Record.* Retrieved from < https://www.therecord.com/living-story/7142935-flash-from-the-past-industry-crowds-the-grand-river-in-galt

Moyer, B. (1979). Kitchener, Yesterday Revisited: An Illustrated History. Windsor Publications.

Schull, Joseph. (1978). Ontario Since 1867. McClelland and Stewart, Toronto, Ontario.

Smith, W.H. (1846). Smith's Canadian Gazetteer, Canada West. Toronto, Ontario.

Surtees, Robert J. (1994). Land Cessions, 1763-1830. In Aboriginal Ontario: Historical Perspectives on the First Nations, Ed Edward S. Rogers and Donald B. Smith, pp. 92-121. Dundurn Press for the Government of Ontario, Toronto, Ontario.

Warrick, G. (2000). The Precontact Iroquoian Occupation of Southern Ontario. Journal of World Prehistory 14(4):415-456.

Quantrell, J. (2010) A Part of Our Past: Essay's on Cambridge's History. City of Cambridge. Cambridge, ON. (2004) Spanning the Generations: A Study of Old Bridges in the Waterloo Region Phase 1 Inventory.

Young, J. (1880) Reminiscences of the Early History of Galt and the Settlement of Dumfries: In the Province of Ontario. Hunter, Rose & Co., Toronto, ON.

Ministry of Heritage, Sport, Tourism and Culture Industries Resources

Ministry of Culture. (2006). Ontario Heritage Tool Kit. Retrieved from www.culture.gov.on.ca/english/heritage/Toolkit/toolkit.ht

Ministry of Tourism and Culture and Sport. (2010). Standards and Guidelines for Conservation of Provincial Heritage Properties. Retrieved from http://www.mtc.gov.on.ca/en/publications/Standards_Conservation.pdf

Ministry of Tourism and Culture and Sport. (2014). Standards and Guidelines for Conservation of Provincial Heritage Properties: Heritage Identification and Evaluation. Retrieved from http://www.mtc.gov.on.ca/en/heritage/MHSTCI_Heritage_IE_Process.pdf.

Ministry of Tourism, Culture and Sport. (2007). Heritage Conservation Principle's for Land Use Planning. Retrieved from www.culture.gov.on.ca/english/heritage/info_sheets/info_sheet_landuse_planning.htm

Ministry of Tourism, Culture and Sport. (2007). Eight Guiding Principles in the Conservation of Historic Properties. Retrieved from www.culture.gov.on.ca/english/heritage/info_sheets/info_sheet_8principles.htm

Additional Provincial Standards and Resources

Environmental Assessment Act (1990). Retrieved from https://www.ontario.ca/laws/statute/90e18

Ministry of Municipal Affairs and Housing (2014). Provincial Policy Statement. Retrieved from http://www.mah.gov.on.ca/Page10679.aspx

National and International Standards and Resources

Canadian Register of Historic Places (2017). Retrieved from www.historicplaces.ca/visit-visite/rep-reg_e.aspx

Parks Canada National Historic Sites of Canada (2017). Retrieved from www.pc.gc.ca/progs/lhn-nhs/index_e.asp

APPENDIX

B MTO RIGID FRAME BRIDGES – CENTRAL REGION

APPENDIX

Table 3: Central MTO Bridge List Comparative Examples

STRUCTURE ID	STRUCTURE NAME	TYPE	MATERIAL	HIGHWAY	YEAR OF CONSTRUCTION	NUM SPANS	SPAN LENGTH TOTAL (M)
10 - 20/1	HIGHWAY 401 CROSSING AT CPR. OVERPASS	Rigid Frame, Vertical Legs	Reinforced Cast-In-Place Concrete	401	1958	1	15.2
10 - 20/2	HIGHWAY 401 CROSSING AT CPR. OVERPASS	Rigid Frame, Vertical Legs	Reinforced Cast-In-Place Concrete	401	1958	1	15.2
10 - 57/1	CNR OVEHEAD WIDENING AT HIGHWAY 401	Rigid Frame, Vertical Legs	Reinforced Cast-In-Place Concrete	401	1965	1	15
10 - 57/2	CNR OVEHEAD WIDENING AT HIGHWAY 401	Rigid Frame, Vertical Legs	Reinforced Cast-In-Place Concrete	427	1969	1	15.2
18 - 105/	LAKE STREET UNDERPASS	Rigid Frame, Vertical Legs	Reinforced Cast-In-Place Concrete	401	1996	2	40.2
18 - 166/	CNR SUBWAY MERRITON	Rigid Frame, Vertical Legs	Reinforced Cast-In-Place Concrete	401	2003	0	
21 - 158/1	Highway 401/Courtice Road Overpass, EBL	Rigid Frame, Vertical Legs	Reinforced Cast-In-Place Concrete	401	1965	1	12
21 - 158/2	Highway 401/Courtice Road Overpass, WBL	Rigid Frame, Vertical Legs	Reinforced Cast-In-Place Concrete	1	1937	1	7.8
21 - 161/1	BOWMANVILLE CR.BR. WIDENING	Rigid Frame, Vertical Legs	Reinforced Cast-In-Place Concrete	401	1985	1	10.5
21 - 161/2	BOWMANVILLE CR.BR. WIDENING	Rigid Frame, Vertical Legs	Reinforced Cast-In-Place Concrete	401	1950	1	11.3
21 - 187/1	Highway 35/CPR Overhead, NBL	Rigid Frame, Vertical Legs	Reinforced Cast-In-Place Concrete	401	1958	1	33.5

APPENDIX

STRUCTURE ID	STRUCTURE NAME	TYPE	MATERIAL	HIGHWAY	YEAR OF CONSTRUCTION	NUM SPANS	SPAN LENGTH TOTAL (M)
21 - 187/2	Highway 35/CPR Overhead, SBL	Rigid Frame, Vertical Legs	Reinforced Cast-In-Place Concrete	401	1940	2	34
21 - 188/	WILMOT CRK. BR.	Rigid Frame, Vertical Legs	Reinforced Cast-In-Place Concrete	427	1968	1	22.6
21 - 191/1	Highway 401/Wilmot Creek, EBL	Rigid Frame, Vertical Legs	Reinforced Cast-In-Place Concrete	401	1959	1	17
21 - 191/2	Highway 401/Wilmot Creek Bridge, WBL	Rigid Frame, Vertical Legs	Reinforced Cast-In-Place Concrete	401	1965	1	17.1
21 - 193/	MILL STREET UNDERPASS	Reinforced Cast-In-Place Concrete	Reinforced Cast-In-Place Concrete	35	1954	1	19.5
21 - 195/1	CLARKE TWP. BR #12 CPR. O/H	Rigid Frame, Vertical Legs	Reinforced Cast-In-Place Concrete	401	1965	1	17.1
21 - 195/2	CLARKE TWP. BR #12 CPR. O/H	Rigid Frame, Vertical Legs	Reinforced Cast-In-Place Concrete	401	1955	1	17.3
21 - 197/1	NEWTONVILLE ROAD OVERPASS	Rigid Frame, Vertical Legs	Reinforced Cast-In-Place Concrete	401	1958	1	18.2
21 - 197/2	NEWTONVILLE ROAD OVERPASS	Rigid Frame, Vertical Legs	Reinforced Cast-In-Place Concrete	401	1951	1	18.3
21 - 432/1	Reg. Rd. 4 Overpass	Rigid Frame, Vertical Legs	Reinforced Cast-In-Place Concrete	401	1952	1	18.3
21 - 432/2	Reg. Rd. 4 Overpass	Rigid Frame, Vertical Legs	Reinforced Cast-In-Place Concrete	401	1952	1	18.3
22 - 41/	Vrooman Creek Bridge	Rigid Frame, Vertical Legs	Reinforced Cast-In-Place Concrete	1	2003	1	20
22 - 150/1	Hwy 401 Lynde Creek Bridge at Whitby, EBL	Rigid Frame, Vertical Legs	Reinforced Cast-In-Place Concrete	401	1955	1	17.3

APPENDIX

STRUCTURE ID	STRUCTURE NAME	TYPE	MATERIAL	HIGHWAY	YEAR OF CONSTRUCTION	NUM SPANS	SPAN LENGTH TOTAL (M)
22 - 150/2	Hwy 401 Lynde Creek Bridge at Whitby, WBL	Rigid Frame, Vertical Legs	Reinforced Cast-In-Place Concrete	401	1958	1	18.2
22 - 183/1	FAREWELL CK - HWY 401	Rigid Frame, Vertical Legs	Reinforced Cast-In-Place Concrete	401	1950	1	15
22 - 183/2	FAREWELL CK - HWY 401	Rigid Frame, Vertical Legs	Reinforced Cast-In-Place Concrete	401	1950	1	15
22 - 367/	Hwy 401 TIS Ramp Bridge	Rigid Frame, Vertical Legs	Reinforced Cast-In-Place Concrete	401	1959	1	17
24 - 124/1	Hwy.401 O'Pass at Derry Rd. W, EBL	Rigid Frame, Vertical Legs	Reinforced Cast-In-Place Concrete	401	1950	1	15
24 - 124/2	Hwy.401 O'Pass at Derry Rd. W. WBL	Rigid Frame, Vertical Legs	Reinforced Cast-In-Place Concrete	401	1950	1	15
24 - 190/	DILLON'S CREEK BRIDGE	Rigid Frame, Vertical Legs	Reinforced Cast-In-Place Concrete	401	1965	1	12
30 - 22/	Sturgeon River Bridge	Rigid Frame, Vertical Legs	Reinforced Cast-In-Place Concrete	1	1965	1	21.4
30 - 135/1	WILLOW CREEK (NORTH BRIDGE)	Rigid Frame, Vertical Legs	Reinforced Cast-In-Place Concrete	427	1968	1	22.6
30 - 135/2	WILLOW CREEK (NORTH BRIDGE)	Rigid Frame, Vertical Legs	Reinforced Cast-In-Place Concrete	427	1968	1	22.6
30 - 137/1	HIGHWAY #93 OVERPASS	Rigid Frame, Vertical Legs	Reinforced Cast-In-Place Concrete	35	1985	1	24.9
34 - 27/	CNR OVERHEAD BRIDGE #3	Rigid Frame, Vertical Legs	Reinforced Cast-In-Place Concrete	35	1985	1	24.9
34 - 102/	MILL RACE BR-WAINFLEET #2	Rigid Frame, Vertical Legs	Reinforced Cast-In-Place Concrete	427	1968	1	22.6
37 - 93/	U'PASS AT KING SIDE RD & 400	Rigid Frame, Vertical Legs	Reinforced Cast-In-Place Concrete	401	1996	2	40.4

APPENDIX

STRUCTURE ID	STRUCTURE NAME	TYPE	MATERIAL	HIGHWAY	YEAR OF CONSTRUCTION	NUM SPANS	SPAN LENGTH TOTAL (M)
37 - 95/1	Vaughan TWP O/P NB	Rigid Frame, Vertical Legs	Reinforced Cast-In-Place Concrete	1	1965	1	21.4
37 - 186/2	C.N.R.O/H W.OF ISLINGTON 401 WB COLLECTORS	Rigid Frame, Vertical Legs	Reinforced Cast-In-Place Concrete	401	1965	1	12
37 - 186/6	C.N.R.O/H W.OF ISLINGTON 401 EW OFF-RAMP FOR 409	Rigid Frame, Vertical Legs	Reinforced Cast-In-Place Concrete	401	1976	1	12.2
37 - 195/1	CNR O/H ON HWY 401 AND WIDENING	Rigid Frame, Vertical Legs	Reinforced Cast-In-Place Concrete	401	1950	1	11.3
37 - 195/2	CNR O/H ON HWY 401 AND WIDENING	Rigid Frame, Vertical Legs	Reinforced Cast-In-Place Concrete	401	1950	1	11.3
37 - 200/3	BATHURST ST O/P	Rigid Frame, Vertical Legs	Reinforced Cast-In-Place Concrete	401	1951	1	18.3
37 - 215/3	CNR O'HEAD EB & WB CORE	Rigid Frame, Vertical Legs	Reinforced Cast-In-Place Concrete	401	1961	1	10.4
37 - 234/1	N.QUEEN ST O/P (HWY 427 NBL collectors)	Rigid Frame, Vertical Legs	Reinforced Cast-In-Place Concrete	401	1954	1	13
37 - 234/2	N.QUEEN ST O/P (HWY 427 SBL collectors)	Rigid Frame, Vertical Legs	Reinforced Cast-In-Place Concrete	401	1981	1	14
37 - 234/3	N.QUEEN ST O/P (QEW WN AND EN) Hwy 427 SBL core)	Rigid Frame, Vertical Legs	Reinforced Cast-In-Place Concrete	401	1981	1	14

APPENDIX

STRUCTURE ID	STRUCTURE NAME	TYPE	MATERIAL	HIGHWAY	YEAR OF CONSTRUCTION	NUM SPANS	SPAN LENGTH TOTAL (M)
37 - 341/3	HWY #1001 OPASS/RAMP W-N EB CORE	Rigid Frame, Vertical Legs	Reinforced Cast-In-Place Concrete	401	1958	1	15.2
37 - 341/4	HWY #1001 OPASS/RAMP W-N WB CORE	Rigid Frame, Vertical Legs	Reinforced Cast-In-Place Concrete	401	1958	1	15.2
37 - 342/	YONGE ST BR #10	Rigid Frame, Vertical Legs	Reinforced Cast-In-Place Concrete	401	1965	1	12
37 - 801/	BR. 1 HWY 427 SB OVER HWY 27 SB	Rigid Frame, Vertical Legs	Reinforced Cast-In-Place Concrete	401	1976	1	12.2
37 - 802/	BR. 2 HWY 427 NB OVER HWY 27 SB	Rigid Frame, Vertical Legs	Reinforced Cast-In-Place Concrete	427	1970	1	15.2
37 -1480/	Hwy 404/401 N-W HOV Ramp Tunnel	Rigid Frame, Vertical Legs	Reinforced Cast-In-Place Concrete	401	1950	1	19.9

APPENDIX

C ORIGINAL BRIDGE DRAWINGS