BURNSIDE

Town of Caledon Bridges and Culverts Class Environmental Assessment, Schedule B Project File Report

Town of Caledon
6311 Old Church Road
Caledon ON L7C 1J6

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R.J. Burnside & Associates Limited
15 Townline
Orangeville ON L9W 3R4

April 2024
300051839.0000

Distribution List

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-	Y	Y	Town of Caledon (Town)
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Record of Revisions

Rev.	Date	Description
-	February 22, 2024	DRAFT Submission Project File Report
	April 25, 2024	Submission Project File Report

R.J. Burnside & Associates Limited

Contributors

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In Association With

ASI Heritage

Peto MacCallum Ltd.

Van Harten Surveying Inc.

Executive Summary

R.J. Burnside & Associates Limited (Burnside) was retained by the Town of Caledon (Town) to complete a Municipal Class Environmental Assessment (MCEA) to consider improvements to bridges and culverts along Patterson Side Road because of increased wear and tear on existing infrastructure through increased traffic use.

The Town initiated a Schedule B MCEA to consider options for improvements to the following three bridges.

Patterson Side Road Bridge 1 (Bridge 1) was identified as requiring improvements to the existing 2-lane, T-beam reinforced cast-in-place structure constructed in 1950. The bridge is located approximately 0.1 km west of Duffy's Lane over the Humber River.

Patterson Side Road Bridge 2 (Bridge 2) was identified as requiring improvements to the existing 2-lane, rigid frame, vertical leg reinforced cast-in-place structure constructed in 1950. The bridge is located approximately 0.03 km east of Duffy's Lane over the Humber River.

Duffy's Lane Bridge was identified as requiring a feasibility investigation to determine future management of the existing 2-lane structure. The structure is located approximately 0.03 km south of Patterson Side Road over the Humber River.

The planning of improvements was carried out in accordance with the Schedule B requirements (Phases 1 to 2) of the Municipal Engineers Association Municipal Class Environmental Assessment document (October 2000, as amended in 2007, 2011 and 2015), which is approved under the *Ontario Environmental Assessment Act*.

Alternative Solutions considered for Bridge 1 and Bridge 2 included:

1) Do nothing.

2) Rehabilitate structure.

3) Rehabilitate and widen structure.

4) Replace the structure.

Alternative Solutions considered for Duffy's Lane Bridge included:

1) Do nothing.

2) Abandon / Remove Structure and Close the Road.

3) Rehabilitate Structure.

4) Replace Structure.
    a) Vehicular Bridge – 2-Lane.
    b) Vehicular Bridge – Single-Lane, Modular.
    c) Pedestrian Bridge.

The Alternative Solutions were evaluated against the natural, social-cultural, financial, and technical environments.

Alternative Solution 4, replace the structure, was the Preferred Solution for both Patterson Side Road Bridges. The preferred solution for Bridge 1 involves replacement of the full structure with a 16.25 m span bridge. This solution includes the ability to improve alignment with the watercourse and widen the structure to meet desired road platform width. The Preferred Solution for Bridge 2 involves replacement of the full structure with a 14 m span bridge. The new structure can be constructed to the desired platform width and can allow for improved sight distance to meet 60 km/h design speed.

The evaluation determined that the preferred solution for Duffy's Lane Bridge was alternative solution 4B – replace structure-vehicular bridge (single-lane, modular). The preferred solution 4B includes a 1-lane, 2-way structure with a 4.15 m (+/-) wide driving platform as a prefabricated girder-type structure. The new structure would allow for a larger span and new bridge abutments and would allow for road profile improvements.

A key component of the study included engagement with interested Indigenous communities and consultation with stakeholders, considered broadly to include government and non-government agencies, property owners, and the general public. Consultation and engagement included a Notice of Commencement and Notice of Completion. In addition, a Public Information Centre was held to present the project and obtain input from interested stakeholders. A Notice of Completion will be published in the local newspapers and mailed to stakeholders and Indigenous communities that have interest in the project. As per the requirements of the MCEA, this Project File Report (PFR) is available for public review and comment for a period of 30 calendar days following the publication of the Notice of Completion.

The Notice of Completion will provide a link to an electronic copy of the PFR **[and the dates, times, and locations where the PFR can be reviewed]**, and names and addresses of people to whom comments can be sent.

Written comments can be provided to the project team within the 30-day comment period. If there are outstanding concerns regarding potential adverse impacts to constitutionally protected Aboriginal and treaty rights resulting from this project, a request for an order requiring a higher level of study or conditions on those matters should be addressed in writing to the Minister of the Environment, Conservation and Parks, the Director of the Environmental Assessment Branch, and the project team. Requests on other grounds will not be considered. Requests must be received by the Minister within 30 calendar days of the publication of the Notice of Completion and should include the requester's contact information and full name for the ministry.

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1.0 Introduction

R.J. Burnside & Associates Limited (Burnside) has been retained by the Town of Caledon (Town) to complete a Municipal Class Environmental Assessment (MCEA) to consider options for the improvement of the Patterson Side Road Bridge 1 (Bridge 1), Patterson Side Road Bridge 2 (Bridge 2), and Duffy's Lane Bridge. The study area map is provided as Figure 1.

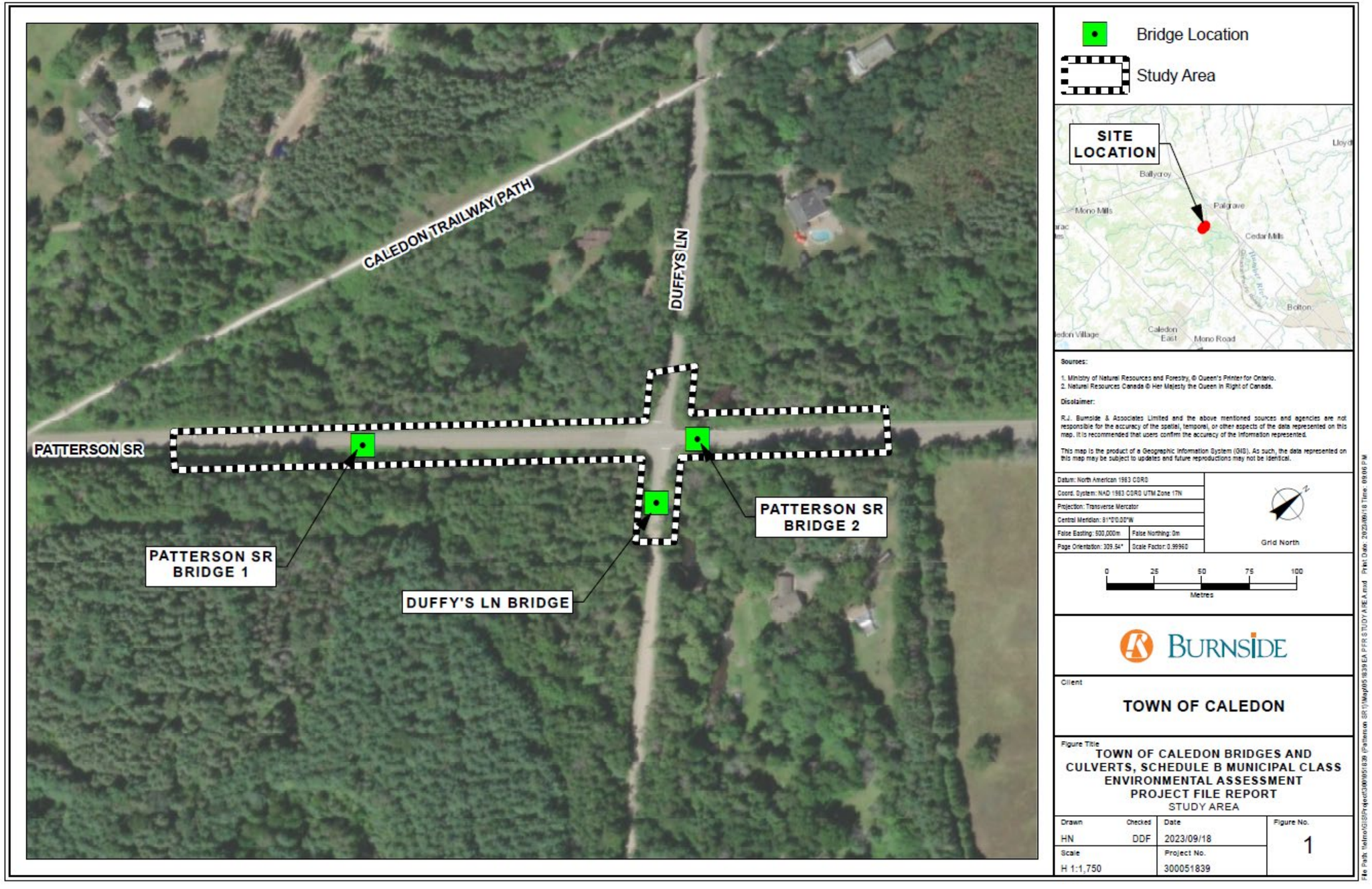
The Town of Caledon's Asset Management Strategy identified the need for improvements to the above-mentioned bridges and culverts because of increased wear and tear on existing infrastructure through increased traffic use.

The existing Bridge 1 consists of a 7.3 m span and is a T-beam reinforced cast-in-place structure. This bridge is located over the Humber River, on Patterson Side Road, approximately 0.1 km west of Duffy's Lane. The age of the structure is unknown, however is estimated to be circa 1950s.

Bridge 2 consists of a 13.7 m (+/-) span and has a cast-in-place concrete rigid frame structure. This bridge is located over the Humber River, on Patterson Side Road, approximately 20 m northeast of Duffy's Lane. Bridge 2 was constructed in 1957.

The Duffy's Lane Bridge consists of a 9.3 m (+/-) span and has a cast-in-place concrete rigid frame, arch soffit structure. The bridge is located over a tributary of the Humber River, on Duffy Lane, approximately 30 m southeast of Patterson Side Road, and was also constructed in 1957.

Figure 1: Study Area Location



2.0 Municipal Class Environmental Assessment Process

The planning of public sector projects or activities that have the potential for environmental effect is subject to an MCEA as required by *Ontario's Environmental Assessment Act*, R.S.O. 1990.

The MCEA process was developed by the Municipal Engineers Association (MEA), in consultation with the Ministry of the Environment, Conservation and Parks (previously known as MOE), as an alternative method to Individual Environmental Assessments for recurring municipal projects that were similar in nature, usually limited in scale and with a predictable range of environmental impacts, which were responsive to mitigating measures.

The MCEA solicits input from regulatory agencies, the municipality, Indigenous communities, and the public at the local level. This process leads to an evaluation of the alternatives in view of the significance of the environmental effects, including the technical, natural, social / cultural, and economic impact of a project, and the choice of effective mitigation measures.

The Town has completed a Schedule B MCEA to consider options for improvements to Bridge 1 and Bridge 2 on Patterson Side Road and Duffy's Lane Bridge.

Based on the description provided in the Municipal Engineering Association (MEA) Guide for MCEAs (2000, as amended in 2004, 2007, 2011, and 2015) for municipal road and infrastructure project activities, the Alternative Solutions being considered and the estimated cost limit for the project, it was determined that a Schedule B MCEA with a Project File Report (PFR) was appropriate for the undertaking of this investigation.

As a Schedule B project, the project planning proceeds under the planning and documentation procedures of Phases 1 and 2 of the MCEA process. Through this process, reasonable Alternative Solutions identified are evaluated with input from agencies, Indigenous communities, and stakeholders toward a recommendation for a Preferred Solution. As a minimum, public consultation is required at two stages under a Schedule B project. At the conclusion of Phase 2, the appropriate MCEA planning schedule is confirmed and, if there are no outstanding concerns, the proponent may proceed to design and implementation.

The phases of the MCEA process are illustrated in Figure 2 and summarized as follows:

- Phase 1 – Identify the problem (deficiency) or opportunity.
- Phase 2 – Identify alternative solutions to address the problem or opportunity by taking into consideration the existing environment and establish the preferred solution taking into account the public and review agency input. At this point, determine the appropriate schedule for the undertaking and document decisions in a project file for Schedule B projects.

or

Proceed through the following phases for Schedule C projects.

- Phase 3 – Examine alternative methods of implementing the preferred solution, based upon the existing environment, public and review agency input, anticipated environmental effects, and methods of minimizing negative effects and maximizing positive effects.
- Phase 4 – Document, in an Environment Study Report (ESR), a summary of the rationale and the planning, design, and consultation process of the project as established through the above phases and make such documentation available for scrutiny by review agencies and the public.
- Phase 5 – Complete contract drawings and documents, proceed to construction and operation, and monitor construction for adherence to environmental provisions and commitments. Where special conditions dictate, also monitor the operation of the completed facilities.

2.1 MCEA Updates: March 2023

In March 2023, an update to the MCEA process included revised descriptions of the class of undertakings carried out by municipalities and subject to the MCEA process. Given the timing of the update to the MCEA process and the progress of the project, the Town will complete the project under the transition provisions set out in the 2023 update that allow for a proponent to continue with the MCEA process that was started for the project prior to the 2023 update.

2.2 Class Environmental Assessment Section 16(6) Order (Formerly Part II Order)

The Ministry of the Environment, Conservation and Parks (MECP) has the authority and discretion to make an Order under Section 16 of the *Environmental Assessment Act*. Section 16 Order requests were previously known as Part II Order requests. A Section 16 Order may require that the proponent of a project going through an MCEA process:

1. Submit an application for approval of the project before they proceed. This is generally referred to as an Individual Environmental Assessment.

2. Meet further conditions in addition to the conditions in the MCEA. This could include conditions for:
    - Further study.
    - Monitoring.
    - Consultation.

The minister can also refer a matter in relation to a Section 16(6) Order request to mediation.

A Section 16(6) Order can be requested if:

- You have outstanding concerns that a project going through an MCEA process may have a potential adverse impact on constitutionally protected Aboriginal and treaty rights.
- You believe that an Order may prevent, mitigate, or remedy this impact.

In accordance with the requirements of the MCEA, this PFR is available for public review and comment for a period of 30 calendar days following the publication of the Notice of Completion.

Interested persons may provide written comments to our project team within the 30-day comment period. All comments and concerns should be sent directly to the project team at:

George Golding, P.Eng. Project Manager, Engineering Services Town of Caledon 6311 Old Church Road Caledon ON L7C 1J6 T 905-584-2272 x 4523 George.Golding@caledon.ca	**Andrew Dawson, P.Eng.** Project Engineer R.J. Burnside & Associates Limited 15 Townline Orangeville ON L9W 3R4 T 705-797-4310 Andrew.Dawson@rjburnside.com

In addition, a request may be made to the MECP for an order requiring a higher level of study (i.e., requiring an individual / comprehensive MCEA approval before being able to proceed), or that conditions be imposed (e.g., require further studies), only on the grounds that the requested order may prevent, mitigate, or remedy adverse impacts on constitutionally protected Aboriginal and treaty rights. Requests on other grounds will not be considered. Requests should include the requester contact information and full name for the MECP.

Requests should specify what kind of order is being requested (request for additional conditions or a request for an individual / comprehensive environmental assessment), how an order may prevent, mitigate, or remedy those potential adverse impacts, and any information in support of the statements in the request. This will ensure that the MECP is able to efficiently begin reviewing the request.

The request should be sent in writing or by Email to:

Minister of the Environment, Conservation and Parks
777 Bay Street, 5th Floor
Toronto ON M7A 2J3
Minister.MECP@ontario.ca

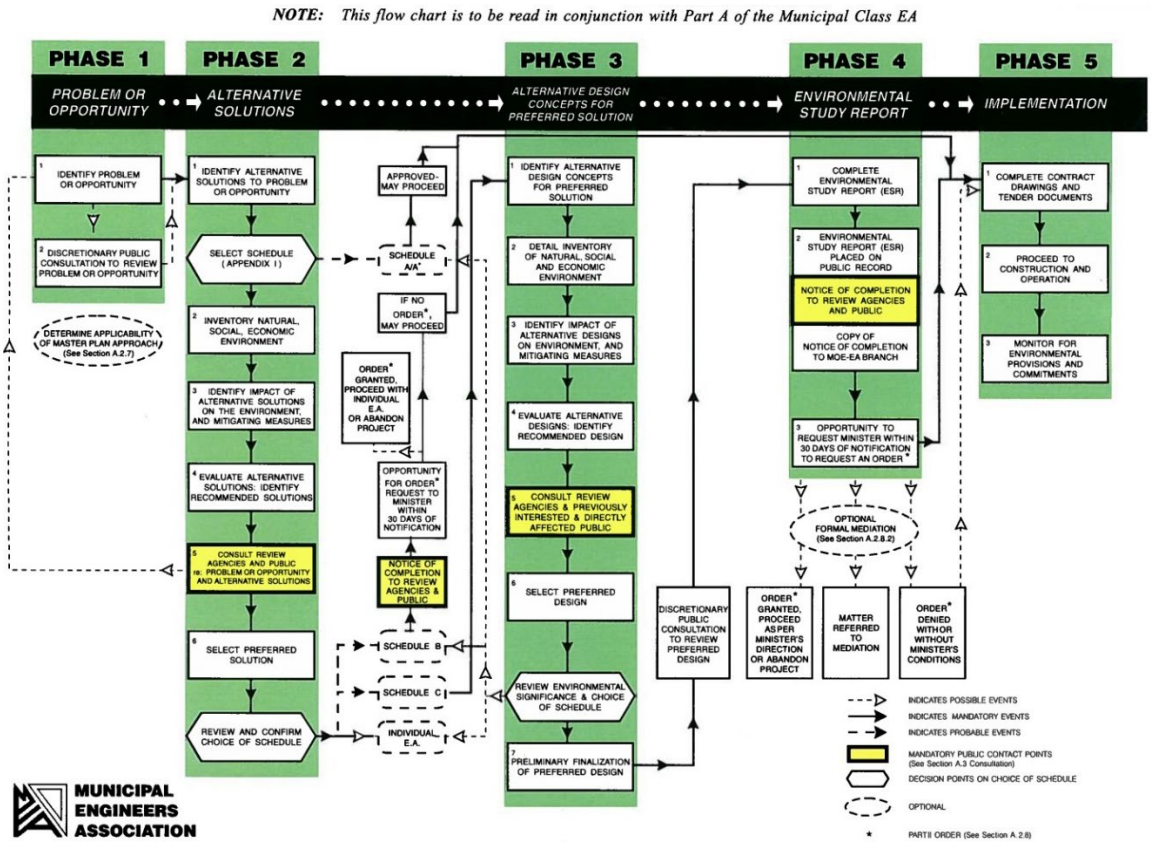
and

Director, Environmental Assessment Branch
Ministry of the Environment, Conservation and Parks
135 St. Clair Avenue West, 1st Floor
Toronto ON M4V 1P5
EABDirector@ontario.ca

Requests must also be sent to the project team.

If the Minister does not receive a request for a Section 16 Order within 30 calendar days, then the project will move forward to detailed design, approvals process, and subsequent implementation of the Preferred Design Concept.

Figure 2: MCEA Process Flow Chart (Municipal Engineers Association, October 2000, as Amended in 2007, 2011, and 2015)



3.0 Problem Identification

The Problem / Opportunity Statement has been defined as follows:

> *"As part of the Town of Caledon's Asset Management Strategy, improvements are being considered for bridge and culverts due to the wear and tear on existing infrastructure as a result of increased traffic use."*

4.0 Study Area

The study area includes Bridge 1 (B22162016) and Bridge 2 (B22164017) on Patterson Side Road, located approximately 150 m southwest and 20 m northeast of Duffy's Lane, respectively. Also included in the study area is the Duffy's Lane Bridge (B22072010), which is located on the no-exit portion of Duffy's Lane, approximately 30 m southeast of Patterson Side Road. Properties in the vicinity of the bridges are a mix of wooded areas and rural residential land use.

The study area map is provided as Figure 1.

5.0 Socio-Economic Environment

A review of existing planning and policy information was conducted to obtain secondary source information relating to the natural and social environment within the study area and to provide an overview of the existing policy framework in the study area.

5.1 Federal Planning Context

5.1.1 Fisheries Act

The federal *Fisheries Act* prohibits causing the "death of fish by means other than fishing", and the "harmful alteration, disruption, or destruction (HADD) of fish habitat". If construction activities have the potential to cause the death of fish, or HADD of fish habitat, then the project must be submitted to the Department of Fisheries and Oceans Canada (DFO) as a Request for Review. The proponent responsible for the activities is required to obtain an Authorization from DFO as per Paragraph 34.4(2) and 35(2)(b) of the *Fisheries Act*.

Fish habitat is present within the study area. Should project activities occur below the highwater mark of any identified watercourses or headwater drainage features, an assessment of potential impacts to fish and fish habitat is required. DFO has provided standardized Codes of Practice and Measures to Protect Fish and Fish Habitat to mitigate contraventions of the *Fisheries Act*.

Proponents are required to ensure that activities meet the criteria outlined on the Fish and Fish Habitat Protection Program website (http://www.dfo-mpo.gc.ca/pnw-ppe/index-eng.html) and are responsible for the implementation of best management practices (i.e., Codes of Practice) into the project design.

If it is determined that impacts of the proposed works can be avoided and a HADD is unlikely to occur, then the project does not require a review by the DFO. If HADD is anticipated because of the project, even following the application of feasible avoidance and mitigation strategies, then DFO review is recommended, and authorization may be required.

5.1.2 Migratory Birds Convention Act and Migratory Birds Regulations

The *Migratory Birds Convention Act, 1994* (MBCA) and the Migratory Bird Regulations, 2022 (MBR) are federal legislative requirements that are binding on members of the public and all levels of government, including federal and provincial governments. The legislation protects certain species, controls the harvest of others, and prohibits commercial sale of all species.

One key responsibility under the MBCA is described in Section 6 of the associated MBR:

> *"Subject to subsection 5(9), no person shall disturb, destroy or take a nest, egg, nest shelter, eider duck shelter, or duck box of a migratory bird, or have in his possession a live migratory bird, or a carcass, skin, nest, or egg of a migratory bird except under authority of a permit therefor."*

The "incidental take" of migratory bird nests or the disturbance, destruction or taking of the nest of a migratory bird are prohibited under Section 6 of the MBR under the authority of the MBCA. Nests' contents (eggs and young) are protected by virtue of the MBCA which has implications on development and construction activities that might occur during the breeding season (Canadian Wildlife Service, July 2012).

The nests of all migratory bird species are protected when they contain a live bird or a viable egg. The nests of 18 species (listed in Schedule 1 of the regulations), whose nests are reused by migratory birds, continue to have year-round nest protection, unless they have been shown to be abandoned.

The MBCA has recently updated and modernized the MBR. The new MBR came into force on July 30, 2022. Further regulatory amendments are planned.

5.2 Provincial Planning Context

5.2.1 Provincial Policy Statement

The Provincial Policy Statement (PPS) provides a vision for land use planning in Ontario that encourages the efficient use of land, resources, and public investment in infrastructure. The 2020 PPS is the complimentary policy document to the *Planning Act, 1990*, issued under Section 3 of the *Planning Act*. Provincial policies are implemented through municipal official plans and planning decisions. Land use planning decisions made by municipalities must be consistent with the PPS.

Until August 4, 2023, the Province was seeking input on a proposed PPS that would replace the existing PPS and A Place to Grow. On June 16, 2023, the Province published an updated version of the Proposed Provincial Planning Statement, 2023 (the "PPS 2023") to the Environmental Registry of Ontario which now includes natural heritage policies and related definitions. Natural Heritage policies have been transposed to Section 4.1 of the PPS 2023. No changes were made to the natural heritage policies of the PPS 2020. However, several modifications to the definitions associated with the natural heritage policies were made as part of the update. Should the government adopt the proposed PPS, the government would consequentially revoke the PPS 2020 and A Place to Grow, as well as amend regulations.

This report will address Section 1.6 (Infrastructure and Public Service Facilities which includes transportation systems and infrastructure corridors), Section 1.8 (Energy Conservation, Air Quality, and Climate Change) and Section 2.1 (Natural Heritage) of the 2020 PPS.

Section 1.6 – Infrastructure and Public Service Facilities are to be provided in an efficient manner that prepares for the impacts of a changing climate while accommodating projected needs. Subsection 1.6.3 states that the use of existing infrastructure and public service facilities should be optimized; and opportunities for adaptive reuse should be considered, wherever feasible.

Section 1.8 – Energy Conservation, Air Quality, and Climate Change identifies opportunities for planning authorities to develop plans to prepare for and reduce the impacts of climate change. Subsection 1.8.1 states that planning authorities shall support energy conservation and efficiency, improved air quality, reduced greenhouse gas emissions, and preparing for the impacts of a changing climate through land use and development patterns.

These include land use and development patterns which promote design and orientation that maximizes energy efficiency and conservation, considers the mitigating effects of vegetation and green infrastructure, and maximizes vegetation within settlement areas, where feasible.

Eight types of natural heritage features are identified in Sections 2.1.4 and 2.1.5 of the PPS, where development and site alteration are not permitted unless it has been demonstrated that there will be no negative impacts on the natural features or their ecological functions:

1. Significant Wetlands in Ecoregions 5E, 6E, and 7E.
2. Significant Coastal Wetlands.
3. Significant Wetlands in the Canadian Shield, north of Ecoregions 5E, 6E, and 7E.
4. Significant Woodlands in Ecoregions 6E and 7E (excluding islands in Lake Huron and the St. Marys River).
5. Significant Valleylands in Ecoregions 6E and 7E (excluding islands in Lake Huron and St. Marys River).
6. Significant Wildlife Habitat (SWH).
7. Significant Areas of Natural and Scientific Interest (ANSIs).
8. Coastal wetlands in Ecoregions 5E, 6E, and 7E that are not subject to Policy 2.1.4(b).

Sections 2.1.6, 2.1.7, and 2.1.8 identify three additional development and site alteration prohibitions and exemptions, as follows:

- Fish habitat, except in accordance with provincial and federal requirements.
- Habitat of Endangered and Threatened species, except in accordance with provincial and federal requirements.
- On adjacent lands to the natural heritage features and areas identified in Policies 2.1.4, 2.1.5, and 2.1.6, unless the ecological function of the adjacent lands has been evaluated and it has been demonstrated that there will be no negative impacts on the natural features or their ecological functions.

The PPS defines development as the creation of a new lot, a change in land use, or the construction of buildings and structures requiring approval under the *Planning Act* but does not include activities that create or maintain infrastructure authorized under an environmental assessment process. The MCEA process shall consider land use planning objectives identified in provincial plans, municipal Official Plans, and Secondary Plans when evaluating solutions. Municipal projects that demonstrate little to no impact on the natural environment and create stronger communities can be completed in accordance with municipal policies.

5.2.2 A Place to Grow: Growth Plan for the Greater Golden Horseshoe

The 2017 A Place to Grow: Growth Plan for the Greater Golden Horseshoe is a Provincial Plan that directs how regional growth in the Greater Golden Horseshoe (GGH) is to be managed up to 2041. The plan carries policies forward from the PPS, working to reduce development sprawl and providing direction in where intensification should take place. There are several provisions within the policy that are relevant to the Caledon Bridges improvements. Section 3.2.2 of the Growth Plan outlines the general provisions of Transportation for the GGH. According to this policy, the transportation system within the GGH will be planned and managed to:

a) Provide connectivity among transportation modes for moving people and moving goods.

b) Offer a balance of transportation choices that reduces reliance upon the automobile and promotes transit and active transportation.

Section 4 of the Growth Plan details the protection of natural features within the GGH. Within the Natural Heritage System (NHS):

> *iii. "…the removal of other natural features, not identified as key natural heritage features and key hydrologic features is avoided, where possible. Such features should be incorporated into the planning and design of the proposed use wherever possible."*

Climate change is also addressed in Section 4 of the Growth Plan. According to the growth plan, in planning to reduce greenhouse gas emissions and address the impacts of climate change, municipalities are encouraged to:

> *a) "…develop strategies to reduce greenhouse gas emissions and improve resilience through the identification of vulnerabilities to climate change, land use planning, planning for infrastructure including transit and energy, green infrastructure, and low impact development, and the conservation objectives in Policy 4.2.9.1."*

5.2.3 Greenbelt Plan

The Greenbelt Plan (Government of Ontario, 2017) includes agriculturally and environmentally protected lands within the Niagara Escarpment Plan (NEP) and the Oak Ridges Moraine Conservation Plan (ORMCP) as well as lands established as the Protected Countryside designation of the Greenbelt Plan, while enhancing the linkages between these areas and the surrounding major lake systems and watersheds.

Along with NEP and ORMCP lands, the Greenbelt Plan sets out three geographic specific policies that apply within the Protected Countryside designation: the Agricultural

System, the Natural System and Settlement Areas, as well as general policies that apply throughout the Protected Countryside.

The entirety of the subject lands is within the Greenbelt, subject to the ORMCP area.

5.2.4 Oak Ridges Moraine Conservation Plan

The Oak Ridges Moraine Conservation Plan (ORMCP) is set out in *Ontario Regulation (O. Reg.) 140/02* under the *Oak Ridges Moraine Conservation Act, 2001*. The Oak Ridges Moraine is an irregular ridge that runs 160 km from the Trent River to the Niagara Escarpment and is one of Ontario's most significant landforms in the west. The Oak Ridges Moraine has a unique concentration of environmental, geological, and hydrological features that make its ecosystem vital to South Central Ontario. The ORMCP provides land use and resource management planning direction to provincial ministers, ministries, and agencies, municipalities, landowners, and other stakeholders on how to protect the Moraine's ecological and hydrological features and functions.

The study area is located within the Natural Core Area land use designation of the Oak Ridges Moraine. Infrastructure use is permitted in these areas.

5.2.5 Endangered Species Act

The *Endangered Species Act, 2007* (ESA) provides protection for Species At Risk (SAR) and their habitat. The ESA is administered by the MECP and provides policies for the protection of Extirpated, Endangered, and Threatened species. Species listed as provincially rare or special concern do not receive legal protection under the provincial ESA; however, they may receive protection from some agencies, such as provincial and national parks, or other Acts, such as the *Ontario Fish and Wildlife Conservation Act*, which prohibits the killing, capturing, injuring, harassment, and trapping of specially protected species.

The ESA helps protect species (Section 9) and their habitat (Section 10).
Section 9(1)(a) of the ESA states:

> *"…no person shall kill, harm, harass, capture or take a living member of a species that is listed on the Species at Risk in Ontario List as an extirpated, endangered or threatened species".*

Section 10(1)(a) of the ESA states:

> *"…no person shall damage or destroy the habitat of a species that is listed on the Species at Risk in Ontario List as an endangered or threatened species".*

The ESA includes general habitat regulations, as well as species-specific habitat regulations. Species uplisted to Endangered or Threatened automatically receive general habitat protection under the ESA. The province is then required to prepare a species recovery strategy and establish a habitat regulation according to requirements of the ESA.

Regulatory amendments under the ESA were issued by the province in 2022 which streamlines ESA Authorizations for activities that have "predictable effects and common and routine mitigation actions with well understood requirements to minimize adverse impacts". Proponents are still required to avoid and minimize impacts on SAR and their habitats.

The use of a SAR Conservation Fund has been enabled for five designated conservation fund species when they seek permits and agreements related to these species (Eastern whip-poor-will (*Antrostomus vociferus*), Blanding's turtle (*Emydoidea blandingii*), or register for conditional exemptions (Eastern meadowlark (*Sturnella magna*), Bobolink (*Dolichonyx oryzivorus*), Butternut (*Juglans cinerea*)).

The Species at Risk in Ontario (SARO) list is updated from time to time; therefore, it is the proponent's responsibility to practice due diligence to ensure that the ESA and its regulations are not violated. It is also the proponent's responsibility to be apprised of any amendments to *The Act* that may come into force for the duration of this project.

5.2.6 Clean Water Act – Source Water Protection

As a result of the *Clean Water Act*, (O. Reg. 287/07) communities in Ontario are required to develop Source Protection Plans to protect their municipal sources of drinking water. These plans identify risks to local drinking water sources and develop strategies to reduce or eliminate these risks.

Ontario's Source Water Protection initiative is focused on protecting municipal drinking water sources. Key areas include wellhead protection areas (areas that drain down toward municipal wells), highly vulnerable aquifers (where groundwater lies close to ground surface), and significant groundwater recharge areas (areas that feed aquifers).

Three municipal well sites and associated wellhead protection areas for the Town of Caledon are illustrated on the atlas to the west of the study area. The size of a wellhead protection area is determined by how quickly water travels underground to the well, measured in years. The study area is not located within a wellhead protection area.

The study area is located outside of a significant groundwater recharge area. A recharge area is considered significant in areas where the highest volumes of groundwater infiltrate to help maintain the water level in an aquifer that supplies a drinking water system, including private wells (Toronto and Region Source Protection Area).

The study area is located within the boundary of a highly vulnerable aquifer. The vulnerability of an aquifer is dependent on the overlying geological materials. The vulnerability increases as the amount of protection provided by the overlying geological materials decreases.

The Clean Water Act defines a "prescribed threat" as "an activity or condition that adversely affects or has the potential to adversely affect the quality or quantity of any water that is or may be used as a source of drinking water and includes an activity or condition that is prescribed by source protection regulation as a drinking water threat." The province has identified 21 activities that could pose a threat if they are present in vulnerable areas, (listed in Section 1.1 of *The Clean Water Act*). Project activities are not prescribed drinking water threats and are not anticipated to pose a risk to drinking water.

5.3 Regional Planning Context

5.3.1 Region of Peel Official Plan

The Region of Peel Official Plan (OP) provides a holistic approach to planning through an overarching sustainable development framework that integrates environmental, social, economic, and cultural imperatives. It provides Regional Council with the long-term regional strategic policy framework for guiding growth and development while having regard for protecting the environment, managing the renewable and non-renewable resources, and outlining a regional structure that manages this growth in the most effective and efficient manner. The Region of Peel OP was adopted by Regional Council on April 28, 2022, through By-law 20-2022. This By-law repealed and replaced the former July 11, 1996, Region of Peel OP adopted by By-law 54-96, as amended. The Plan was subsequently approved with modifications by the Minister of Municipal Affairs and Housing, through the Minister's Notice of Decision on the Plan dated November 4, 2022.

On May 18, 2023, the province announced its intention to dissolve the Region of Peel. The Town of Caledon and Cities of Brampton and Mississauga are to become independent, single-tier municipalities on January 1, 2025. At that time, the Region of Peel OP, as it applies to Caledon, will become the Town's responsibility to implement.

5.3.2 Town of Caledon Official Plan

The Town of Caledon Official Plan Consolidated in April 2018 is a statement of principles, goals, objectives, and policies intended to guide future land use, physical development and change, and the effects on the social, economic, and natural environment within the Town of Caledon. The first major review of the Official Plan was initiated in 1989. This review resulted in Official Plan Amendment (OPA) 114, which was approved by the Ontario Municipal Board in September 1997. OPA 114 established an overall growth management framework for the Town within a 2021 planning horizon.

The Plan has undergone multiple amendments and Official Plan Reviews in the years since (1999, 2000, 2003, 2005, 2006, 2007, 2009, 2010, 2016, 2017, 2018) in response to multiple major provincial policy and legislative changes to bring the plan into conformity with the changes and address local growth issues.

As of June 29, 2023, the draft Future Caledon Official Plan was prepared to conform with the 2020 Provincial Policy Statement and 2019 Growth Plan for the Greater Golden Horseshoe, as amended. A revised plan is anticipated in late 2023 or early 2024.

Land use within the study area is identified on draft Schedule B1 Town Structure, and draft Schedule B4 Land Use Designations as part of the Natural Environment System, Natural Features and Areas. Schedule B2 Growth Management identifies the study area as agricultural and rural lands.

The study area is identified as located within the natural core area (draft Schedule B3c), and Landform Conservation Area Category 1 (draft Schedule D4) of the ORMCP. The valley and stream corridor associated with the Humber River is identified in the study area on draft Schedule D2. Other identified natural features in the study area include lands to the south of Patterson Side Road, beyond the study area, which are identified as an earth and life science ANSI and significant woodland.

Municipal roads have been divided into categories based on the function of the road. The categories are *Highways, Arterial Roads, Collector Roads, Local Roads*. Improvement standards for the roads are based on the function of the road. Patterson Side Road and Duffy's Lane are identified as Collector Roads with a 26 m wide right-of-way (ROW) as illustrated on draft Schedule C1 and draft Schedule C2.

5.3.3 TRCA Ontario Regulation 166/06 Regulated Area

The study area is located within the regulated area of the Toronto Region Conservation Authority (TRCA). Ontario Regulation 166/06, Development, Interference with Wetlands, and Alterations to Shorelines and Watercourses of the TRCA. The regulation prohibits development or alterations within the jurisdiction of the TRCA in regulated areas without the permission of the conservation authority.

5.4 Cultural Heritage

A Cultural Heritage Evaluation Report (CHER) was completed for the bridge in January 2021. The CHER identified that Bridge 1 and Bridge 2 do not have cultural heritage value as determined by the criteria outlined in O. Reg. 9/06. Duffy's Lane Bridge is considered a cultural heritage resource, eligible for designation under the *Ontario Heritage Act* based on its context and physical attributes (e.g., existing barrier). The subject bridges are not listed on the Town of Caledon's Heritage Register, designated under Part IV of the *Ontario Heritage Act,* or identified on the Ontario Heritage Bridge List.

A Stage 1 archaeological study was completed in January 2021. Stage 1 determined that parts of the study area have archaeological potential. Stage 2 archaeological assessment (test pit survey) is required prior to any construction activities if areas of archaeological potential are impacted. This should be reviewed during the detailed design stage of the project.

The CHER and Archaeological Assessment are presented in Appendix A.

6.0 Technical Environment

Below is a review and summary of the technical environment for the Patterson Side Road Bridge 1 (B22162016) and Bridge 2 (B22164017) and the Duffy's Lane Bridge (B22072010), with regards to physical condition, geometry (width and profile), hydraulic capacity, and geotechnical conditions. All supporting reports are provided in Appendix A.

6.1 Physical Condition

In the fall of 2020, a field investigation was conducted to review the physical conditions of Duffy's Lane Bridge and Bridges 1 and 2. Additionally, Burnside staff reviewed the previous 2019 OSIM inspections (completed by GHD Limited) and the Detailed Deck Condition Surveys (DDCS), completed by EXP Services Inc. (Duffy's Lane Bridge, 2015) (Bridge Check Canada (Patterson Bridges 1 and 2, 2019)). Each of these reports were considered in the analyses of the condition of the structures.

The Bridge 1 (B22162016) structure was noted to be in fair condition overall with light scaling and hairline to narrow cracking throughout, and localized moderate to severe defects on the abutments, wingwalls, and soffit. The DDCS also identified probable active corrosion of the deck top, the east and west abutment, and the wingwalls. Further details can be found in the Technical Memorandum Physical Condition – Patterson Side Road Bridges 1 and 2, found in Appendix A.

Currently, Bridge 1 is not well aligned with the watercourse which has caused scour on the northwest embankment, presumably requiring the previous installation of the additional steel sheet piles to retain the fill slope. It has also caused scouring along the east abutment, reducing the cover over the footings.

Bridge 2 (B22164017), similar to Bridge 1, was noted to be in fair condition overall, with minor surface defects throughout, and localized moderate to severe defects. There exists a medium to wide crack with efflorescence on the soffit near the centerline, indicating moisture penetration through the concrete deck. Areas of delamination and spalling were also noted on the soffit. Previous patching of the concrete was observed, but the bonding of these patches to the original concrete is failing in some locations.

The DDCS confirmed the presence of a waterproofing membrane which is generally in good condition, but also indicated probable corrosion of the deck top area. Given that there is 8.6% of the deck area with high corrosion potential (<-0.45V), and delamination planes were found in 75% of the deck cores, the removal limits are estimated to be above 10% of the deck area, and a concrete overlay would be the recommendation for deck top repairs. The DDCS also indicated probable active corrosion in most of the west abutment, the east abutment, and the wingwalls. With the extent of probable corrosion occurring, the degradation rate of the structure will likely accelerate in the future if no action is taken. The watercourse at Bridge 2 flows predominantly along the west abutment, which has caused some erosion along the toe of embankments adjacent to the intersection. Further details can be found in the Technical Memorandum Physical Condition – Patterson Side Road Bridges 1 and 2, found in Appendix A.

A review of the Duffy's Lane Bridge (B22072010) indicated that the existing abutments are generally in good condition overall, with hairline to medium cracking with efflorescence, light scaling, small spalls, and areas of localized delamination. The existing wingwalls are also generally in good condition, with areas of severe scaling noted on the west walls and localized delamination.

The 2020 site inspection identified that most of the soffit is severely delaminated and in poor condition overall and in comparison, to the 2015 study, the degree of poor areas has significantly increased. This illustrates that the corrosion of the bottom layer of steel may be accelerating, resulting in more delaminated areas.

Several efflorescence-stained medium to wide cracks also indicate moisture penetration through the deck slab which may be leading to increased rates of corrosion. Medium to wide cracking and severe scaling were also noted along the exterior soffit and fascia.

Overall, the corrosion potential survey indicates that just under half of the deck surface has a greater than 90% probability that reinforcing steel corrosion was occurring at the time of the measurements (2015). It is reasonable to assume that this number may have increased since the time of the survey.

6.2 Geometry – Width

Patterson Side Road currently carries two lanes of traffic, with a paved width of approximately 7 to 7.5 m and gravel shoulder widths ranging from 0.5 m to 1 m, with an overall driving platform width of approximately 9 m. The widths of Bridges 1 and 2 are 6.4 m and 7.67 m, respectively, indicating the roadway currently narrows at each of the bridge crossings.

It should be noted that a road reconstruction design is currently in the final stages for the portion of Patterson Side Road where Bridges 1 and 2 are located. The design, which is being completed by Morrison Hershfield, consists of a 9 m wide paved platform on the approach to the bridge, with 3 m lanes and 1.5 m paved shoulders.

The existing Duffy's Lane roadway has a paved driving platform width of approximately 7.25 m to 7.5 m up to the south limits of the structure. South of the structure, the roadway becomes a gravel roadway with a 5.75 m to 6 m travelled platform width and 1.25 m to 1.5 m shoulders. As previously mentioned, the width of the driving platform between raised curbs on the structure is approximately 7.3 m.

6.3 Geometry – Profile

Patterson Side Road is considered a rural collector road and has a posted speed limit of 60 km/h at the site. The structures are on a vertical curve portion of the roadway profile. The proposed road reconstruction (as designed by Morrison Hershfield) reduces the speed limit of the roadway to the northeast and southwest of the structure to 40 km/h; however, the posted speed limit at the bridge locations is noted to remain as 60 km/h based on Morrison Hershfield's '100% Submission' drawings, dated August 28, 2020.

As per the MTO Design Supplement for TAC – April 2020:

> *"Design speed should be greater than or equal to the legal posted speed. Generally, the desirable practice of selecting the design speed for new construction and reconstruction is 20 km/h greater than the posted legal speed, unless circumstances warrant a reduction.*
>
> *A design speed equal to the maximum posted speed is accepted where warranted by such factors as low traffic volumes, rugged terrain and economic considerations. This practice would be more appropriate for minor collector and local roads. A design speed equal to the legal posted speed is the normal practice for Secondary highways".*

In order to achieve the *desirable* 80 km/h design speed (20 km/h greater than currently posted), significant adjustments to the road profile would be required.

Therefore, it is recommended that the road profiles be designed for a 60 km/h design speed, to match the current maximum posted speed limit, as per normal practice for secondary highways.

To meet the minimum required design speed equal to the legal posted speed (60 km/h), the minimum K-factors for crest and sag curves in accordance with TAC Geometric Design Guides are 11 and 18, respectively. Given that the Patterson Side Road reconstruction profiles (completed by Morrison Hershfield) have more abrupt curvature rates than these standards, adjustments to the road profile should be considered as part of the bridge improvement works.

To rectify the profile / sight distance deficiencies at the site to meet the 60km/h design speed criteria, increases to the road profiles of approximately 0.65 m and 0.45 m would

be required for Bridges 1 and 2, respectively. To achieve these profile increases on the existing structures, significant structural overlays would be needed, which would likely require strengthening and imposing a load posting on the existing structures, and are therefore, not considered feasible for rehabilitation options. Replacement of the structures would allow for the 60 km/h design speed profiles to be achieved without load postings. Duffy's Lane current profile has grade changes comparable to a design speed of approximately 20 km/h and is considered sub-standard for the anticipated operating speed of the road.

The intersection at Patterson Side Road is anticipated to be raised as part of the profile improvement works along Patterson Side Road between the bridges east and west of the intersection. To tie into this raised profile, adjustments to the profile of Duffy's Lane Road will also be required. Based on preliminary design profiles, a 30 km/h design speed vertical curve can be obtained to tie the raised intersection into the north end of the existing Duffy's Lane bridge. If the Duffy's Lane bridge is to be replaced, road profile adjustments of 40 km/h or higher are achievable. The final road profile under the replacement scenario will depend on the geometry of the proposed replacement structure.

6.4 Hydraulic Capacity

With regards to hydraulics, the Patterson Side Road Bridge 1 and 2 pass the 50-year design storm flows with clearances greater than the minimum requirements for a collector road and are considered sufficiently sized. The existing structures provide minimum 1 m recommended clearance to the soffit during a 50-year flood event.

Bridge 1 – Tributary of Humber River at the bridge location:

- Flows from west to east and is not well-aligned with the structure.
- Depth of 0.2 m to 0.5 m.
- The natural channel is 5 m to 7 m wide.
- Classified as 'collector' road.

Bridge 2 – Humber River at the bridge location:

- The mainstem of Humber River flows from north to south.
- Depth of 0.2 m to 0.4 m.
- The natural channel is 9 m to 11 m wide and is aligned along the western abutment.
- Classified as 'collector' road.

Duffy's Lane Bridge – Tributary of Humber River at the bridge location:

- Flows west to east.
- Depth of 0.25 m to 0.35 m.

- The natural channel is 3 m to 4 m wide. Predominantly flows against the northern abutment.
- Classified as 'local' road.

As such, any increase to the spans of the bridges would be a result of site geometry / channel alignment and not a result of hydraulic requirements.

6.5 Utilities

Hydro

Provider: Hydro One Networks Inc.

There are overhead hydro lines located along the east side of Patterson Side Road, inside the ROW. The overhead hydro is noted to cross to the west side of the road at the intersection with Duffy's Lane.

Potential relocation of the utility may be required based on the potential increase in road profile and grading limits and construction approach. This will be explored further during the preliminary design options.

Communications

Provider: Bell Communication

There are buried bell lines located along the east side of the roadway inside the ROW. The lines are attached to the east side of Patterson Side Road Bridges 1 and 2; however, it's noted that the line attached to the side of Bridge 1 has come loose from its attachment and was hanging from the bridge.

Potential relocation (temporary or permanent) of the utility may be required based on the bridge works and grading limits. This will be explored further during the preliminary design options.

Gas

The proposed site is clear of Enbridge Gas Distribution-Owned Utilities.

The presence of utilities will be further confirmed during the preliminary design stage.

7.0 Natural Environment

A review of existing terrestrial conditions and secondary source information was conducted to characterize vegetation and aquatic communities and assess the potential for habitat of Species at Risk (SAR), including breeding bird, bat, and reptile habitat, and incidental wildlife observations.

A summary of findings is provided in the sections below. The Terrestrial Conditions Technical Memorandum and Aquatic Assessment Technical Memorandum are provided in Appendix A.

7.1 Physiography and Topography

A review of available mapping by the Ontario Geological Survey was undertaken to characterize the general topography, and surficial and bedrock geology of the study area.

The study area is relatively flat with an elevation of approximately 268 m to 272 m above sea level.

The study area is located within the kame moraines of the Oak Ridges Moraine physiographic region of Southern Ontario (Chapman and Putnam, 1984).

Surficial geology mapping illustrates the study area is primarily located within ice contact stratified deposits consisting of sand and gravel with minor silt, clay, and till deposits as well as modern alluvial deposits in the vicinity of the watercourse, consisting of clay, silt, sand, and gravel and possible organic remains (Ontario Geological Survey, 2003).

7.2 Climate

Local climate conditions were obtained from Canada's Environment and Climate Change Toronto Lester B. Pearson International Ontario meteorological station (ID 5097) (43.40.38.000" N, 79.37.50.000" W). The Toronto Lester B. Pearson International climate station is located approximately 145 m south of the study area.

According to the Canadian Climate Normals (calendar years 1971 to 2000) for this station, the daily average annual temperature is 7.5°C. The warmest month of the year is July with an average temperature of 20.8°C and the coldest month is January with an average temperature of -6.3°C.

The meteorological station recorded a total annual precipitation (snow and rain) of 792.7 mm, 684.6 mm of which was rain. The maximum mean monthly precipitation is 79.6 mm and occurs in August.

7.3 Terrestrial Environment

The study area includes the Humber River and its tributary along with riparian and treed vegetation communities. Adjacent lands include rural residential properties, forest, and wetland communities. The Caledon Trail known as the K-Tea Cup Single Track Bike trail is located to the west of the study area. The Albion Hills Conservation Area is to the southwest of the study area.

Vegetation communities in the study area were assessed and described according to the Ecological Land Classification (ELC) System for Southern Ontario, First Approximation (Lee et al., 1998), updated[1] to the 2008 Southern Ontario ELC Vegetation Type List, where available (Lee et al., 1998). TRCA ELC community mapping was referenced and verified in the field. The field assessment included the assessment of the potential for habitat of SAR, including breeding bird, bat, and reptile habitat, and incidental wildlife observations. Further details can be found in the Terrestrial Conditions Technical Memorandum found in Appendix A.

A total of eight vegetation communities were identified within the study area. All of the communities identified are considered to be relatively common in Ontario. Sensitive vegetation communities or provincially significant plant species were not observed within the study area during the field assessment. The vegetation communities within the study area are as follows:

- Fresh-Moist Deciduous Woodland (WODM5).
- White Cedar Hardwood Organic Mixed Swamp (SWMO1).
- Fresh Moist White Cedar Hardwood Mixed Forest (FOMM7-2).
- White Cedar Conifer Organic Coniferous Swamp (SWCM1-2).
- Dry Fresh White Cedar Poplar Mixed Forest (FOMM4-2).
- White Cedar Mineral Coniferous Swamp (SWCM1).
- Fresh-Moist White Cedar Coniferous Forest (FOCM4-1).
- Open Aquatic (OAO).

7.4 Aquatic Habitat

The historical and existing aquatic and fish habitat condition of the study area was assessed through background database review and field assessment. The Humber River flows under Patterson Side Road Bridge 2. A tributary of the Humber River flows under Patterson Side Road Bridge 1 and Duffy's Lane Bridge and discharges downstream of Bridge 2.

Upstream of Patterson Bridge 1

The watercourse flows through densely forested lands in a northwest to southeast direction. The reach is comprised primarily of runs with sections of flats present. The bank vegetation is comprised primarily of White cedars (*Thuja occidentalis*) with grasses and forbs observed as well. Moderate erosion was observed with some scalloped / undercut conditions and tree roots exposed.

[1] Lee, H.T., et al. (1998). Ecological Land Classification for Southern Ontario: First Approximation and Its Application. Ontario Ministry of Natural Resources, Southcentral Science Section, Science Development and Transfer branch. SCSS Field Guide FG-02.

Large woody debris, both in-stream and overhanging, is present and provides cover and habitat for aquatic life in the watercourse. The vegetation on the banks, as well as the woody debris, shades a significant portion of the reach upstream of Bridge 1, and through the bridge, the streambed has scoured and is slightly deeper. Further details can be found in the Technical Memorandum Aquatics Conditions – Patterson-Duffy's Lane Bridges Aquatics Memo, found in Appendix A.

Downstream of Patterson Road Bridge 1

The watercourse flows through a section of forested lands. The watercourse flows in a west to east direction in a meandering channel. The vegetation is mostly comprised of White cedars through this section, with grasses and forbs present as well. The watercourse flows primarily in a flats-type of morphology with runs present. A debris jam was observed approximately 10 m downstream of Bridge 1, representing a potential barrier to fish movement during periods of low-flow.

Sections of bank material have sloughed, and minor undercutting was observed as well. Woody debris is abundant in the reach downstream of Bridge 1. Organic materials in the form of fallen leaves were observed throughout the downstream reach as well. Veronica (*Veronica anagallis aquatica*) was observed downstream of the bridge.

Fish were not observed upstream or downstream of Bridge 1, although it is considered fish habitat under the *Fisheries Act*.

Upstream of Patterson Road Bridge 2

The watercourse flows in a wide, gentle meandering channel, from north to south, through forested lands of White cedars. Upstream, the banks are stable, with limited erosion observed. The morphology of the upstream reach is composed primarily of runs and flats.

Approximately 10 m upstream of Bridge 2, a section of higher-density of cedars are present and overhang, shading close to the entire surface area of the watercourse. Some trace boulders are present downstream of the cedars. The area where the cedars are located lacks diversity in substrate and wetted depth. Through the bridge, there is an exposed bank against the east abutment. Large boulders are present against the other abutment.

Downstream of Patterson Road Bridge 2

The watercourse flows in a gently meandering pattern from north to south. Roadside ditches enter the watercourse from both banks. The right upstream (east) bank is densely vegetated with White cedars and grasses. The left upstream bank is vegetated with cedars as well, although with more grasses and shrubs. A single riffle is present at the outlet of the bridge and downstream flows in a combination of runs and flats. The

vegetation does not overhang a significant amount of the downstream reach, and it shaded approximately 50% of the surface area of the watercourse.

Minor undercutting of the banks was observed, and they are slightly eroded. Watercress (*Nasturtium officinale*) was observed near the outlet of the watercourse that flows through Bridge 1 and Duffy's Lane Bridge.

Fish were not observed upstream or downstream of Bridge 2, although a dead Brown trout (*Salmo trutta*) was observed at the outlet of the channel from Duffy's Lane Bridge.

Upstream of Duffy's Lane Bridge

The watercourse flows from Bridge 1 to Duffy's Lane Bridge. The upstream reach flows from west to east through lands that are densely forested with cedars. There is an abundance of large woody debris overhanging and in-stream, upstream of Duffy's Lane Bridge. The vegetation on the bank's shades most of the watercourse and the overhanging and in-stream woody debris provides overhead cover for aquatic life (fish, crayfish, etc.).

The watercourse flows in a runs type of morphology upstream of the bridge. The banks are more eroded closer to Duffy's Lane Bridge than they are downstream of Bridge 1, and slightly undercut.

Within Duffy's Lane Bridge, there are broken vertical wooden supports and a trace amount of boulders in the bridge. Against the south abutment, the sediment is exposed, and the flow of the watercourse is closer to the northern abutment.

Downstream of Duffy's Lane Bridge

The watercourse flows for approximately 4.5 m prior to discharging to the Humber River that is conveyed through Bridge 2. The short length of the channel flows in a flats-type of morphology prior to discharging to the section of Humber River.

Fish were not observed upstream or downstream of Duffy's Lane Bridge.

Fish and Habitat

Fish were not observed during the October 30, 2020, site visit, although will be present in and around all structures. *The Fisheries Act* defines fish habitat as water frequented by fish and any other areas on which fish depend directly or indirectly to carry out their life processes, including spawning grounds and nursery, rearing, food supply, and migration areas. The watercourses in the vicinity of all bridges would be capable of providing habitat for species of fish to carry out these life processes. As such, HADD and the Death of Fish must be mitigated in the design and construction of any proposed design alternative.

The open watercourse features of the study area appear to provide potentially suitable habitat for Midland painted turtles (*Chrysemys picta*). Midland painted turtles generally inhabit shallow, slow-moving creek watercourses with the opportunity for basking areas associated with open areas on shorelines and in-stream boulders and rocks protruding from the water.

7.5 Species at Risk (SAR)

Several SAR were identified through background review to have the potential to be present in the study area.

Based on field observations, potential marginal habitat exists in the study area for the following provincial Special Concern species:

- Wood thrush (*Hylocichla mustelina*).
- Eastern wood-pewee (*Contopus virens*).
- Common nighthawk (*Chordeiles minor*).
- Barn swallow (*Hirundo rustica*).
- Snapping turtle (*Chelydra serpentina*).
- Monarch butterfly (*Danaus plexippus*).

Special Concern species were not observed within the study area during the field assessment completed in 2020.

Based on field observations, potential habitat exists in the study area for the following Endangered Species protected under the Provincial ESA (2007):

- Little brown myotis (*Myotis lucifugus*).
- Northern myotis (*Myotis septentrionalis*).
- Tri-colored bat (*Pipistrellus subflavus*).

Within the study area there were trees observed which may be suitable for roosting bats, including trees with >25 cm diameter at breast height (DBH) with potential for cavities / snags. Potential bat roosting habitat may also be present in the deciduous forested vegetation communities SWMO1, SWCM1, SWCM1-2, FOMM4-2 and FOMM7-2. These communities have some potential for large diameter trees with cavities / loose bark. Suitable foraging habitat for bats may be associated with the open watercourse features of Humber River as well as its tributary within the study area and an open aquatic feature located beyond the study area within the SWMO1 community north of Patterson Side Road in between Bridge 1 and Bridge 2.

Endangered or threatened species were not observed within the study area during the field assessment completed in 2020; however, species-specific surveys were not completed as part of the scope of work.

7.5.1 Wildlife Observations

Wildlife species observed during the field assessment included a foraging female Eastern downy woodpecker (*Picoides pubescens*) and Eastern grey squirrels (*Sciurus carolinensis*) in FOCM4-1. Evidence of other wildlife observed in the study area included excavated holes in trees in SWCM1-2, Canadian beaver (*Castor canadensis*) chewed tree trunks on banks of OAO south of Duffy's Lane Bridge, Raccoon (*Procyon lotor*) tracks under Bridge 2, North American porcupine (*Erethizon dorsatum*) stripped tree bark in SWMO1, Organ pipe mud dauber (*Trypoxylon politum*) nests on Bridge 2, holes from a Sapsucker (*Sphyrapicus sp*.) avian species in SWMO1.

The majority of these species are considered widespread and common in Ontario (i.e., provincial ranking of S5).

8.0 Identification of Alternative Solutions

Alternative Solutions considered for Patterson Side Road Bridge 1 and Bridge 2 include:

1) Do Nothing.

2) Rehabilitate Structure.

3) Rehabilitate and Widen Structure.

4) Replace the Structure.

Alternative Solutions considered for Duffy's Lane Bridge include:

1) Do Nothing.

2) Abandon / Remove Structure and Close the Road.

3) Rehabilitate Structure.

4) Replace Structure.
    a) Vehicular Bridge – 2-Lane.
    b) Vehicular Bridge – Single-Lane, Modular.
    c) Pedestrian Bridge.

The Alternative Solutions are discussed below.

The Alternative Solution of Do Nothing is a mandatory consideration within the MCEA process. For this option, the existing system would be left in place and no improvements to the bridge would be completed. This option allows for the structure to

live out remaining service life. For Duffy's Lane Bridge, the structure would be removed at the end of service life and the roadway would dead-end at the structure.

8.1 Alternative Solutions for Patterson Side Road Bridge 1 and Bridge 2

8.1.1 Alternative 2 – Rehabilitate Structure

The Alternative Solution to rehabilitate the structure varies for each bridge in the study area as follows:

Bridge 1 – Removal of existing curb and barrier, partial concrete depth repairs, removal of existing asphalt and replace with new asphalt and waterproofing, and removal of existing granular fill on deck and install reinforced concrete slab on existing deck.

Bridge 2 – Partial depth concrete repairs on soffit and on deck top, removal of existing barrier and installation of TL-4 parapet with railing, partial depth concrete repairs on substructure, scarify existing deck, and place concrete overlay, asphalt, and waterproofing.

8.1.2 Alternative 3 – Rehabilitate and Widen Structure

This Alternative Solution consists of rehabilitating and widening the structure for both Bridges 1 and 2. Included in this alternative are the rehabilitation efforts described in Alternative Solution 2, in addition to the widening of the deck and abutment, and the widening of the footing with steel piles on footing extensions.

8.1.3 Alternative 4 – Replace the Structure

The Alternative Solution 4 removes the existing structure and replaces it with a new full 2-lane structure, considered for both Bridge 1 and Bridge 2. The span for Bridge 1 would be 16.5 m and Bridge 2's span would be 14 m. With the replacement of Bridge 1, there will be the ability to improve the alignment with the watercourse and widen the structure to meet the desired road platform width. A new structure for Bridge 2 can be constructed to the desired platform width and can allow for improved sight distance to meet the 60 km/h design speed.

8.2 Alternative Solutions for Duffy's Lane Bridge

The purpose of the evaluation of alternatives for Duffy's Lane Bridge was to assess the feasibility of future management options for the existing 2-lane structure.

8.2.1 Alternative 2 – Abandon / Remove Structure and Close the Road

The Alternative Solution to abandon / remove the structure and close the road for Duffy's Lane Bridge in the study area would include removal of the structure before its end of service life and close the roadway at the structure.

8.2.2 Alternative 3 – Rehabilitate Structure

The Alternative Solution to rehabilitate the structure varies for each bridge in the study area. For Duffy's Lane bridge, rehabilitation includes partial depth concrete repairs on soffit, deck top, and substructure, removal and replacement of barrier system, full-depth curb removal and reconstruction of outer deck edges and wingwall tops, removal of asphalt wearing surface, installation of erosion, and scour protection.

8.2.3 4A – Replace Structure – Vehicular Bridge 2-Lane

Alternative Solution 4A consists of the replacement of the existing structure with a 2-lane vehicular bridge that has a slightly larger span and width to meet the Town standard driving platform, designed to full vehicular load requirements and road profile improvements.

8.2.4 4B – Replace Structure Vehicular Bridge – Single-Lane, Modular

Alternative Solution 4B is a 1-lane, 2-way structure that would provide a 4.2 m (+/-) wide driving platform as a prefabricated girder-type structure. The new structure would allow for a larger span and new bridge abutments and would allow for road profile improvements.

8.2.5 4C – Replace Structure Pedestrian Bridge

Alternative Solution 4C would eliminate vehicular access and limit the capacity to pedestrian and bicycle crossings only. A 2.4 m platform and 15 m long span would be considered.

9.0 Evaluation of Alternative Solutions

The evaluation of alternatives is a step-by-step process that compares alternatives that are feasible within the project environment and meet the project objectives outlined in the Problem / Opportunity Statement.

The impacts of the alternatives are evaluated relative to each other, against a set of equally weighted criteria, including possible mitigating measures. The criteria are developed based on the inventory of the natural, social / cultural, financial, and technical environment of the study area, and identification of key considerations, including:

- Potential impact to existing natural features.

- Minimizing encroachment onto private property and the potential for land acquisition.
- Maintaining property access.
- Consideration of active transportation along the corridor.
- Working within existing planning policy and regulations.
- Maintaining traffic flow and connection in the Town as well as providing capacity for future growth and traffic.
- Maintaining effective storm drainage.
- Financial costs.
- Potential impact to utilities.
- Consideration of community and agency input.

A table showing the Evaluation of Alternative Solutions for each of the criteria is presented in Appendix B. An estimate of life-cycle costs for each alternative is provided in Appendix B. The results of the evaluation are discussed in the following Sections.

9.1 Patterson Side Road Bridge 1

When compared to the other alternatives, the Do Nothing alternative is anticipated to have the most impact on the natural environment due to continued erosion and scouring around the abutment and ongoing impacts to water quality from road salt / sediment run-off from the bridge. The Do Nothing alternative will not be able to provide a road network that is efficient and accommodates a future level of service. While there are no upfront capital costs associated with the 'Do Nothing' alternative, this option will impose operating and maintenance costs for continued safety at the bridge which will increase over time as it continues to deteriorate. Additionally, the capital expenditure for replacement of the structure will still be required in approximately ten years. Although deferring the replacement results in lower net present value costs, the Do Nothing option does not address the Problem or Opportunity Statement, and therefore, is not preferred.

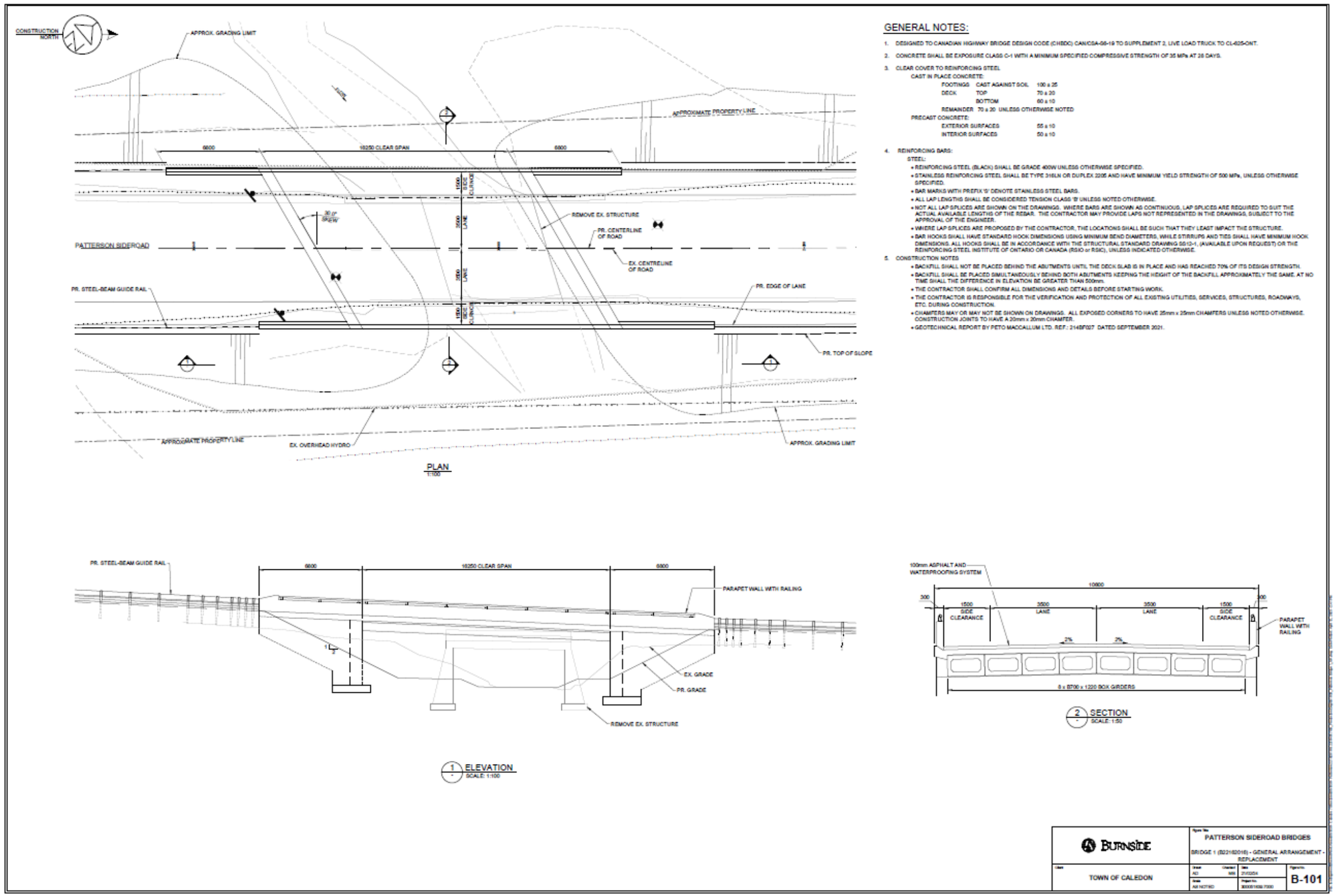
Alternative 2, Rehabilitate the Structure, is the least expensive option with a similar overall impact to the socio-cultural environment as the other Alternatives. The total upfront capital cost of this alternative is estimated to be **$385,000**. This alternative would result in some improvement to erosion protection, limited in-water work and would have a smaller footprint of construction; however, would have a similar overall impact to the natural environment as Alternatives 3 and 4 due to ongoing impacts to water quality from road run-off and vulnerability of the structure to potential flood conditions. From a technical standpoint, it will not provide improvement to the driving platform width compared to the Alternatives 3 and 4.

Alternative 3, Rehabilitate and Widen the Structure, will provide the opportunity for a widened platform width but only minor improvement to the profile and sight lines. This alternative has a similar level of impact under the natural and socio-cultural environments as Alternatives 2 and 4. The upfront capital costs associated with this

option are estimated to be **$1,200,000**. Although the immediate capital costs of this option are lower than replacement, the net present value is comparable to Alternative 4 at approximately **$2,100,00**.

Alternative 4, Replace Structure, includes a full structure replacement with a 16.25 m clear-span bridge. This option has a moderate impact on the natural environment and socio-cultural environment, comparable to Alternatives 2 and 3. This alternative has the highest upfront cost, estimated at **$1,900,000**, but comparable net present value to Alternative 3 at approximately **$2,100,000**. From a technical standpoint, Alternative 4 includes the ability to improve the alignment with the watercourse and widen structure to meet desired road platform width.

Figure 3: Patterson Bridge 1 GA Replacement



GENERAL NOTES:

1. DESIGNED TO CANADIAN HIGHWAY BRIDGE DESIGN CODE (CHBDC) CAN/CSA-S6-19 TO SUPPLEMENT 2, LIVE LOAD TRUCK TO CL-625-ONT.
2. CONCRETE SHALL BE EXPOSURE CLASS C-1 WITH A MINIMUM SPECIFIED COMPRESSIVE STRENGTH OF 35 MPa AT 28 DAYS.
3. CLEAR COVER TO REINFORCING STEEL
   CAST IN PLACE CONCRETE:
   FOOTINGS CAST AGAINST SOIL 100 ± 25
   DECK TOP 70 ± 20
   BOTTOM 60 ± 10
   REMAINDER 70 ± 20 UNLESS OTHERWISE NOTED
   PRECAST CONCRETE:
   EXTERIOR SURFACES 55 ± 10
   INTERIOR SURFACES 50 ± 10
4. REINFORCING BARS:
   STEEL:
   - REINFORCING STEEL (BLACK) SHALL BE GRADE 400W UNLESS OTHERWISE SPECIFIED.
   - STAINLESS REINFORCING STEEL SHALL BE TYPE 316LN OR DUPLEX 2205 AND HAVE MINIMUM YIELD STRENGTH OF 500 MPa, UNLESS OTHERWISE SPECIFIED.
   - BAR MARKS WITH PREFIX 'S' DENOTE STAINLESS STEEL BARS.
   - ALL LAP LENGTHS SHALL BE CONSIDERED TENSION CLASS 'B' UNLESS NOTED OTHERWISE.
   - NOT ALL LAP SPLICES ARE SHOWN ON THE DRAWINGS. WHERE BARS ARE SHOWN AS CONTINUOUS, LAP SPLICES ARE REQUIRED TO SUIT THE ACTUAL AVAILABLE LENGTHS OF THE REBAR. THE CONTRACTOR MAY PROVIDE LAPS NOT REPRESENTED IN THE DRAWINGS, SUBJECT TO THE APPROVAL OF THE ENGINEER.
   - WHERE LAP SPLICES ARE PROPOSED BY THE CONTRACTOR, THE LOCATIONS SHALL BE SUCH THAT THEY LEAST IMPACT THE STRUCTURE.
   - BAR HOOKS SHALL HAVE STANDARD HOOK DIMENSIONS USING MINIMUM BEND DIAMETERS, WHILE STIRRUPS AND TIES SHALL HAVE MINIMUM HOOK DIMENSIONS. ALL HOOKS SHALL BE IN ACCORDANCE WITH THE STRUCTURAL STANDARD DRAWING S6.10-1, (AVAILABLE UPON REQUEST) OR THE REINFORCING STEEL INSTITUTE OF ONTARIO OR CANADA (RSIO or RSIC), UNLESS INDICATED OTHERWISE.
5. CONSTRUCTION NOTES
   - BACKFILL SHALL NOT BE PLACED BEHIND THE ABUTMENTS UNTIL THE DECK SLAB IS IN PLACE AND HAS REACHED 70% OF ITS DESIGN STRENGTH.
   - BACKFILL SHALL BE PLACED SIMULTANEOUSLY BEHIND BOTH ABUTMENTS KEEPING THE HEIGHT OF THE BACKFILL APPROXIMATELY THE SAME. AT NO TIME SHALL THE DIFFERENCE IN ELEVATION BE GREATER THAN 500mm.
   - THE CONTRACTOR SHALL CONFIRM ALL DIMENSIONS AND DETAILS BEFORE STARTING WORK.
   - THE CONTRACTOR IS RESPONSIBLE FOR THE VERIFICATION AND PROTECTION OF ALL EXISTING UTILITIES, SERVICES, STRUCTURES, ROADWAYS, ETC. DURING CONSTRUCTION.
   - CHAMFERS MAY OR MAY NOT BE SHOWN ON DRAWINGS. ALL EXPOSED CORNERS TO HAVE 25mm x 25mm CHAMFERS UNLESS NOTED OTHERWISE. CONSTRUCTION JOINTS TO HAVE A 20mm x 20mm CHAMFER.
   - GEOTECHNICAL REPORT BY PETO MACCALLUM LTD. REF.: 21489027 DATED SEPTEMBER 2021.

BURNSIDE

Client: TOWN OF CALEDON

Figure Title: PATTERSON SIDEROAD BRIDGES
BRIDGE 1 (B221820105) - GENERAL ARRANGEMENT - REPLACEMENT

Drawn: AD | Checked: MW | Date: 21/02/24
Scale: AS NOTED | Project No.: 300051839.7300

Figure No.: B-101

9.2 Patterson Side Road Bridge 2

The Do Nothing alternative is anticipated to have a lesser impact on the natural environment, as compared with the other alternatives, with no anticipated impacts to terrestrial and aquatic habitat. However, ongoing impacts to water quality from road salt / sediment run-off from the bridge are possible. The Do Nothing alternative does not require any capital costs, but operating and maintenance costs will increase over time as the structure continues to deteriorate and the capital costs associated with replacement will be required in approximately ten years. Although deferring the replacement results in lower net present value costs, the Do Nothing alternative does not provide any improvement to driving platform width or profile and sight lines, and therefore, does not provide a road network that is efficient and accommodating to levels of service. The Do Nothing option does not address the Problem or Opportunity Statement, and therefore, is not preferred.

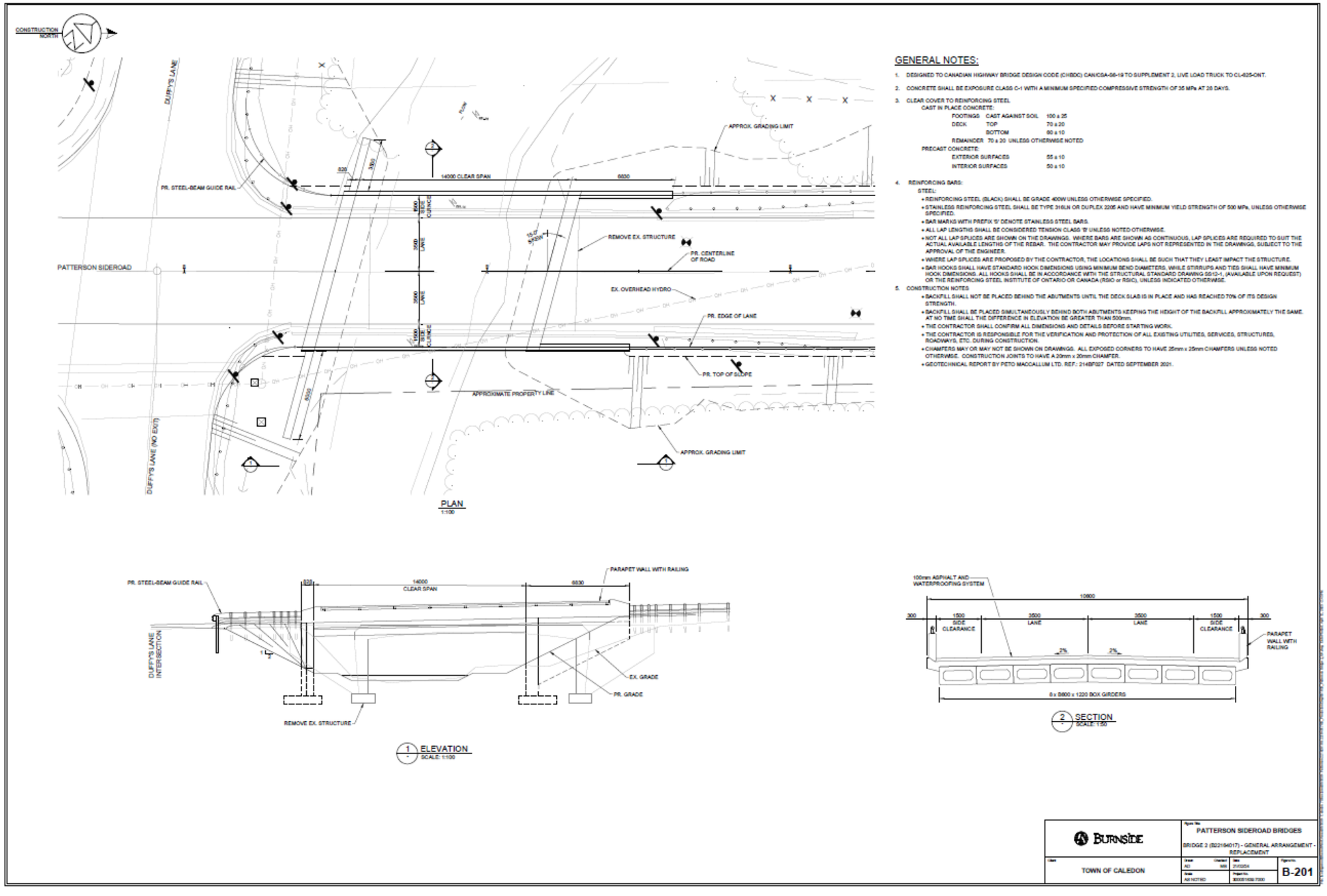
Alternative 2, Rehabilitate the Structure, is the option that limits the impacts to the aquatic, terrestrial, archaeological environments and species at risk and can be delivered at a lower upfront capital cost. However, this alternative does not provide the opportunity to meet desired driving platform widths or the Transportation Master Plan recommendations for shared on-road cycling. This alternative would require moderate upfront capital costs estimated at **$675,000** but would defer the larger capital investment for replacement to approximately 25 years from now, resulting in net present value costs of approximately **$1,850,000** over a 75-year time frame, when also considering the moderate level of maintenance required until replacement.

Alternative 3, Rehabilitate and Widen the Structure, would repair the structure in a similar manner to Alternative 2, but also include widening to allow for the desired road platform width and side clearances to be met as required to meet the shared on-road cycling routes desired. This option would result in some improvement to erosion protection, with limited in-water work anticipated; however, may result in impact to vegetation and wildlife habitat adjacent to the ROW because of construction and grading activities. As a result of the widening, this option may result in property acquisition or easement to accommodate grading, with a potential impact to archaeological resources at the limit of the ROW. Alternative 3 has higher upfront capital costs estimated at **$1,095,000** and would defer replacement of the structure by 25 years, resulting in net present value costs of approximately **$2,150,000** over the 75-year timeframe considered.

Alternative 4, Replace the Structure, includes the replacement of the full structure with a 14 m span bridge. The replacement of the existing structure with one of a larger span and increased vertical profile as outlined in Alternative 4 would allow for improved water conveyance capacity below Patterson Side Road during periods of high flow, providing resilience under changing climatic conditions. Additionally, from a technical standpoint, Alternative 4 provides the opportunity for full improvement to the road profile, sight lines

and sight distance, improving the roadway to meet a 60 km/h design speed. This option also meets the desired platform widths for shared on-road cycling as recommended in the Town's Transportation Master Plan. When compared with the other alternatives, this alternative has the highest upfront capital cost of approximately **$2,175,000** and a net present value cost of approximately **$2,450,000** over the 75-year term considered.

Figure 4: Patterson Bridge 2 GA Replacement



9.3 Duffy's Lane Bridge

The Do Nothing alternative is anticipated to have a lesser impact on the natural environment, with no near-term impact to terrestrial and aquatic habitat. The Do Nothing alternative maintains the existing vertical profile of the bridge, which is vulnerable to potential flood conditions during periods of very high flow and climate extremes. Although Do Nothing does not require any capital costs, operating and maintenance costs will increase over time and future removal costs (estimated at $100,000) or replacement costs would be required in approximately five to 10 years. Additionally, the Do Nothing alternative does not provide any improvements to platform and side clearance. Load posting would need to be considered due to corrosion of reinforcing steel.

Alternative 2, Abandon / Remove the Structure and Close the Road, is one of the less expensive options overall with moderate costs for structure removal and minimal maintenance cost. The total cost of Alternative 2 is estimated to be **$100,000.00.** This option is anticipated to have some impact to the natural environment with potential for impact to wildlife habitat associated with activities to remove the bridge, and reduced water quality impacts from road salt and sediment and improved conveyance capacity during periods of high flow. The removal of the bridge would eliminate the risks associated with structure collapse; however, the portion of Duffy's Lane beyond the structure would be cut-off from vehicular access (with exception of access through TRCA's Conservation Area, which is controlled). From a cultural standpoint, the bridge was determined to have cultural heritage value for physical and contextual reasons. The removal of the structure will be considered a substantial impact to the heritage value.

Alternative 3, Rehabilitation of the Structure, is anticipated to be relatively expensive with a total cost of approximately **$485,000.00.** This option is anticipated to have some impact on the natural environment with potential for impact to wildlife habitat associated with activities to rehabilitate the bridge. Minor impacts due to sediment mobilization during in-stream work are to be mitigated. Conveyance capacity during periods of high flow is limited by the profile of the existing bridge. This alternative would provide an opportunity to address defects and extend the service life of the bridge; however, load posting may be required. Existing sightlines and profile would be maintained. From a cultural standpoint, the bridge was determined to have cultural heritage value for physical and contextual reasons. The rehabilitation of the bridge may be considered value added for the heritage structure. Minimal impacts to potential archaeological resources are anticipated as the improvements would be made within the existing ROW.

Alternative 4, Replace the Structure. Replacement of the structure is anticipated to have limited impact on archaeological resources as the improvements would be completed within the existing ROW. This option would have a high negative impact on the bridge as a cultural heritage structure. This option is anticipated to have some impact on the

natural environment with potential for impact to wildlife habitat associated with activities to replace the bridge. Some potential for impacts due to sediment mobilization during limited in-stream work are to be mitigated. Alternative 4A, the Replacement of the Structure with a 2-lane bridge, and Alternative 4B, the Replacement of the Structure with a single-lane bridge, would provide an opportunity to improve both the profile and sight lines of the bridge. Alternative 4A could also be designed to meet the desirable 2-lane platform width. Alternatives 4A and 4B, however, are more costly compared to the other alternatives, with a total cost estimated to be **$1,400,000.00** and **$650,000.00**, respectively. Alternative 4C, Pedestrian Bridge, requires a complete bridge replacement with a pedestrian only crossing, not capable of carrying vehicular loads at an estimated cost of **$440,000**. All replacement options would have a substantial impact on the heritage value of the structure. Without a vehicular bridge, Duffy's Lane would no longer act as a local road. Alternative access to property fronting Duffy's Lane would be required.

10.0 Consultation Summary

Consultation is an important part of the MCEA process to ensure that anyone with an interest in the project has an opportunity to provide input into the Town's decision-making process before a project is implemented. Comments received throughout the MCEA process are incorporated into the evaluation of the Alternatives. Copies of correspondence are provided in Appendix C.

The Schedule B MCEA requirements include two mandatory public points of contact during the MCEA process. The mandatory points of contact for this project included a Notice of Commencement and a Notice of Completion. A Public Information Centre (PIC) and notice were completed as an additional point of contact to obtain input on the project.

Project information was made available on the Town's website at https://www.caledon.ca/en/news/public-notice-patterson-duffy-s-lane-bridge-environmental-assessment.aspx. Opportunity to provide input into the planning and design of the project included an online PIC and the opportunity to contact the project team members directly with questions or comments.

A Project Contact List was developed as a mailing list to distribute project notices. The Project Contact List consisted of technical and provincial agencies, utilities, and Indigenous communities that may have an interest in the project as well as residents within the study area. Throughout the MCEA process, the Project Contact List was used to maintain contact information for those interested in the project, as well as to summarize comments received about the project and responses from the study team. A copy of the Project Contact List is provided in Appendix C. Copies of correspondence received during the MCEA are provided in Appendix C.

Project Notices were published in the Caledon Citizen and the Caledon Enterprise and posted on the Town's website. Project Notices were emailed or mailed to those on the Project Contact List. Copies of Notices are provided in Appendix C.

The Notice of Commencement, inviting public input on the project, was published in the Caledon Citizen and the Caledon Enterprise in two issues; April 12 and April 19, 2018, and posted on the Town's website.

The Notice of the PIC, including details of the date, time, location, and purpose of the PIC were published in the Caledon Enterprise on March 16 and March 23, 2023. Notification of the PIC was also posted on the Town of Caledon website. The PIC was held online on March 29, 2023.

A Notice of Completion will be published in **[the Caledon Enterprise]** at the conclusion of the MCEA process for the project and mailed / emailed to all on the Project Contact List. The Notice of Completion will provide members of the public with the dates and location where the Project File Report can be reviewed as well as names and addresses of people to whom they can send their comments.

10.1 Indigenous Communities

A summary of comments received from Indigenous communities throughout the project is provided in the Project Contact List in Appendix C and summarized in the Table below. As a result of the government stay-at-home order in place at that time of the Notice of Commencement, due to COVID-19, most community contacts were not available to reach by phone to confirm receipt of the Notice of Commencement and interest in the project.

Community	Notices	Comments Received	Responses Provided
Haudenosaunee Confederacy	210223 Emailed Notice of Commencement 230424 Email Notice of PIC	No comments received.	
Six Nations of the Grand River	210223 Emailed Notice of Commencement 230424 Email Notice of PIC	221011_Email noting that contact has changed. 230430_Email noting SNGREC has interest in the project. Inquiring if archaeology has been completed. 230503_Email confirming interest in reviewing the Stage 1 report. 230526_Email confirmed receipt of Stage 1 report and inquired about timeframe or review. 240410_Email responded to request to review draft stage 1AA included in draft PRF report; At the time upon review SNGREC don't have comments, but looking forward to conversations in the design phase.	230503_Email from Burnside indicating a Stage 1 Archaeological assessment has been completed and inquiring if SNGREC would like to review the report. 230525_Email Burnside forwarded a copy of the Stage 1 report for review as well as a link to the PIC information on the Town's website. 230526_Email from Burnside noting request for review comments by June 14, 2023. 230616_Email from Burnside inquiring if comments on Stage 1 would be provided. 240226_phone call. Burnside spoke with Tanya Hill-Montour to confirm whether Six Nations was still interested in reviewing the Stage 1 Archaeological Assessment (AA) completed for the project. Neither Town staff nor Burnside staff received any input from Six Nations by the previously proposed review deadline of June 2023. Six Nations expressed they would still like the opportunity to review the assessment. 240228_Email. Town followed up phone call (with Tanya Hill-Montour) with email to circulate the draft PFR and PIC slides. 240312_Email. Town sent follow up email inquiring if Six Nations has had a chance to review the draft PRF, requested if Six Nations could provide input by March 20. If Six Nations would like to discuss the project, please contact Township or Burnside - contact details included. 240408_Email. Town sent a follow up email requesting the review of the Stage 1 AA that was included in the draft EA link that was provided. Original email and shared links included in email.

Community	Notices	Comments Received	Responses Provided
Nation Huron-Wendat	210223 Emailed Notice of Commencement 2100408_Email copy from Burnside with correspondence which was previously sent to M. Picard, as Burnside understands M. Gros-Louis is now the contact for this project. 230424 Email Notice of PIC.	210223_Email from M. Picard acknowledging receipt of NOC. Huron-Wendat Nation, is requesting to participate in all archaeological field work for this project as well as receiving copy of the draft reports for review and comments.	210331_Email from Burnside, with attached completed Stage 1 AA. Burnside noted a Stage 2 AA will be completed as part of the project if the preliminary preferred solution has the potential to impact identified areas of archaeological potential due to construction activities. Burnside will keep the community informed of any upcoming Stage 2 archaeological field work completed as part of the EA and to receive future notices about the EA.
Mississaugas of the Credit First Nation	210223 Emailed Notice of Commencement 230424 Email Notice of PIC.	220117_Email from F. Sault to Region. F. Sault has moved to a new role for MCFN Council and will not be checking or receiving any Emails at this address. 210401_Email from Adrian Blake, MCFN-DOCA has reviewed Stage 1 AA. At this time, MCFN had no additional comments for inclusions and is in agreement with the recommendations made within the report. 220424_Bounceback Email, no longer in role. Contact Megan DeVries for archaeology. As of October 20, 2021, Megan DeVries no longer the Archaeological Operations Supervisor. 230428_Email from A. Lee, DOCA would like to review and comment on Stage 1 AA. DOCA expects to have field involvement for Stage 2.	210202_Email from Burnside with attached signed MCFN FLR Participation Agreement and the Archaeological Review Agreement, for review and signatures, and the Stage 1 AA, for review and reference.

The Mississaugas of the Credit First Nation and Huron-Wendat Nation expressed an interest in receiving copies of Draft Archaeological Reports for review as well as participating in archaeological field work. A copy of the Stage 1 Archaeological Assessment (AA) was provided to each community for review.

The Mississaugas of the Credit reviewed Stage 1 AA and agrees with the recommendations made within the report. At this time, the Mississaugas of the Credit First Nation have no additional comments for inclusion. The Mississaugas of the Credit First Nation have requested to participate in any Stage 2 AA field work completed for the project.

Six Nations of the Grand River reviewed the Stage 1 AA included in the draft Project File Report. At the time of review, Six Nations of the Grand River had no comments but look forward to conversations in the design phase.

At the time of this report, review comments have not been received from the Huron-Wendat Nation.

The Mississaugas of the Credit First Nation and the Huron-Wendat Nation must be contacted to coordinate participation in the Stage 2 AA fieldwork prior to any field work planned for later stages of the project. Six Nations of the Grand River should also be engaged at the initiation of the design phase to confirm interest in the project.

10.2 Public Information Centre (PIC)

The PIC was hosted in a virtual environment. The virtual PIC included a presentation of information materials hosted on the Town's website for the public to attend and discuss the project with the Town. Following the virtual PIC, project information materials were posted to the Town's webpage for the project for the public to view or download anytime during the PIC comment period until May 31, 2023. Opportunity for public feedback was made available through an online digital comment form or by contacting the project team with written comments.

Presentation material described the project, the Proposed Alternative Solutions, the Preferred Alternatives, and identified next steps in the process.

The virtual PIC was attended by Town staff and one municipal councilor. No members of the public attended the PIC. No comments were received during the PIC comment period.

11.0 Preferred Solution

Based on the evaluation of the alternatives, the comments received from stakeholders, agencies, and interested parties, the Preferred Solutions identified for each of the bridges are as follows:

Patterson Side Road Bridges 1 and 2: Alternative 4 – Replace Structure received the most favourable overall ranking when compared to the other alternatives and is the preferred solution. For each of the Patterson Side Road bridges, Alternative 4 will have the most impact in terms of project costs; however, it will provide the best solution for all technical factors including sight distance and platform width, and socio-economic factors including pedestrian and cyclist access, with some impacts to the natural environment while meeting the objectives as outlined in the Problem / Opportunity Statement.

For Bridge 1, Alternative 4 consists of a full structure replacement of a 2-lane, 2-way structure with a 16.25 m span bridge. This alternative provides the ability to improve alignment with the watercourse and widen the structure to meet the desired road platform width. The replaced structure is expected to have a service life of 75 years, provided that the Town completes typical maintenance and repairs as required over the lifespan.

For Bridge 2, Alternative 4 consists of a full structure replacement of a 2-lane, 2-way structure with a 14 m span bridge. The new bridge structure can be constructed to the desired platform width and can allow for improved sight distance to meet the 60 km/h design speed. The replaced structure is expected to have a service life of 75 years, provided that the Town completes typical maintenance and repairs as required over the lifespan.

Duffy's Lane Bridge: The purpose of the evaluation of alternatives for Duffy's Lane Bridge was to assess the feasibility of future management options for the existing 2-lane structure.

Overall, Alternative 4B – Vehicular Single-Lane Bridge, received the most favourable ranking when compared to the other alternatives and is the preferred solution. Alternative 4B will have the most impact in terms of project costs, it will provide the best solution for all technical factors including sight distance and platform width, and socio-economic factors including pedestrian and cyclist access, with minimal impacts to the natural environment while meeting the objectives as outlined in the Problem / Opportunity Statement.

This alternative includes a 1-lane, 2-way structure with a 4.15 m (+/-) wide driving platform which would allow for a larger span, new bridge abutments and road profile improvements. ROW signs to notify users of the single-lane structure would be required. It is anticipated that a structure designed to meet the MTO exceptions to the Canadian

Highway Bridge Design Code for Low Volume Roads would be utilized for this alternative. The replaced structure is expected to have a service life of 75 years, provided that the Town completes typical maintenance and repairs as required over the lifespan.

A larger span (15 m +/-) prefabricated structure could be installed on cast-in-place abutments supported on deep foundations placed behind the existing abutments. This allows for the construction of the bridge to occur without impeding the watercourse, reducing the construction costs, and environmental impacts associated with waterway control. Upon installation of the new abutments, the existing abutments could be removed to or above the existing grade level and help aid in scour prevention.

12.0 Impacts

Project activities associated with the Preferred Solution for each of the bridges include the removal and replacement of the existing bridges and abutments including excavation, grading, and asphalt application, with the possibility of limited vegetation removal in select areas, located primarily within the existing ROW.

12.1 Technical Environment

From a technical perspective, the Preferred Solutions will provide a bridge that is safe and efficient and provides a high level of service.

Replacement of Bridge Structures 1 and 2 would allow for the 60 km/h design speed profiles to be achieved without load postings. Replacement of the Duffy's Lane bridge would allow for road profile adjustments of 40 km/h or higher. The final road profile under the replacement scenario will depend on the geometry of the proposed replacement structure. Potential relocation (temporary or permanent) of utilities may be required based on the bridge works and grading limits.

12.2 Natural Environment

The replacement of each of the existing structures with one of a wider span and increased vertical profile would allow for water to pass more easily during periods of high flow, providing resilience under changing climatic conditions. The consumption of energy to operate motorized construction equipment to implement the preferred solutions is anticipated to result in some greenhouse gas emissions and some minor impact to carbon storage because of vegetation removal.

The preferred solutions for the bridges do not include additional vehicle travel lanes. As such, predicted traffic growth is not anticipated to increase because of improvements, and improvements are not anticipated to significantly change air quality in the study

area. Potential air quality effects associated with the construction stage are expected to be temporary and localized to the immediate surrounding area.

The increased span of the structure is anticipated to benefit the fish habitat, watercourse morphology, and the condition of the structure. The deep sections noted beneath and downstream of the bridge should be maintained throughout the design as it provides valuable over-wintering habitat for fish and wildlife (hibernating frogs and turtles).

The watercourses in the vicinity of all bridges would be capable of providing habitat for species of fish to carry out life processes. As such, HADD and the Death of Fish must be mitigated in the design and construction of bridge replacements. If HADD is anticipated because of the project, even following the application of feasible avoidance and mitigation strategies, then DFO review is recommended, and authorization may be required. At the detailed design phase of the project, the timing window for in-water works should be confirmed with the MNRF.

Some loss of vegetation is anticipated within grading limits and natural vegetation communities located within the existing ROW in the vicinity of the bridges. All the communities identified are considered to be relatively common in Ontario.

Temporary displacement of and disturbance to migratory breeding birds, wildlife, and wildlife habitat is anticipated during the construction phase (i.e., vegetation removals, noise disturbance), including SAR.

Potential marginal habitat exists in the study area for the following provincial special concern species:

- Wood thrush (*Hylocichla mustelina*).
- Eastern wood-pewee (*Contopus virens*).
- Common nighthawk (*Chordeiles minor*).
- Barn swallow (*Hirundo rustica*).
- Snapping turtle (*Chelydra serpentina*).
- Monarch butterfly (*Danaus plexippus*).

The open watercourse features of the study area appear to provide potentially suitable habitat for the Midland painted turtle, listed as Special Concern under the federal *Species at Risk Act*.

Although species provincially listed as rare or Special Concern do not receive legal protection under the provincial *Endangered Species Act, 2007* or the federal *Species at Risk Act*, they may receive protection from some agencies, such as provincial and national parks, or other Acts, such as the *Ontario Fish and Wildlife Conservation Act*, which prohibits the killing, capturing, injuring, harassment, and trapping of specially protected species.

Potential habitat exists in the deciduous forested vegetation communities of the study area for the following endangered species protected under the Provincial ESA (2007):

- Little brown myotis (*Myotis lucifugus*).
- Northern myotis (*Myotis septentrionalis*).
- Tri-colored bat (*Pipistrellus subflavus*).

Vegetation clearing within the ROW, adjacent to the wooded area, may impact selected trees within potential roosting habitat for SAR bats. Limited vegetation removal is not expected to have a significant impact on the available overall potential habitat for these species within the greater area. Direct impact to species is expected to be avoided with appropriate timing of vegetation removal to be completed outside of the active season for bats.

The Preferred Solution is not anticipated to directly impact breeding birds, generalist mammal species, and Species at Risk wildlife with the implementation of avoidance measures, including minimizing the footprint of construction and timing of construction for the removal of vegetation.

The Species at Risk in Ontario (SARO) List is updated from time to time; therefore, it is the proponent's responsibility to practice due diligence to ensure that the ESA and its regulations are not violated. It is also the proponent's responsibility to be apprised of any amendments to *the Act* that may come into force for the duration of this project.

12.3 Socio-Economic / Cultural Environment

The construction of the preferred solution will occur within the regulated area of the TRCA. Development or alterations within the jurisdiction of the TRCA in Regulated Areas will require a Permit from TRCA under Ontario Regulation 166/06 (Toronto and Region Conservation Authority: Regulation of Development, Interference with Wetlands and Alterations to Shorelines and Watercourses).

Replacement of the structures may impact potential archaeological resources because of grading within previously undisturbed areas within the existing Patterson Side Road and Duffy's Lane ROW. Stage 2 Archaeological Assessment is required prior to any construction activities if areas of identified archaeological potential are impacted. To be confirmed during detailed design once grading limits are established.

The loss of the existing Bridge Structures 1 and 2 will not result in the loss of cultural heritage value, as identified in the CHER. The loss of the existing Duffy's Lane Bridge will result in the loss of a valued cultural heritage structure.

12.4 Financial

The preferred solutions, i.e., replacement of the bridge structures, will result in high capital cost. More accurate cost estimates are expected to be developed during the detailed design stage.

13.0 Mitigation Measures

The following mitigation measures and design approach should be implemented to mitigate negative impacts of the proposed project on the environment of the study area for the Patterson Side Road bridges and considered for future improvements to the Duffy's Lane Bridge. It is also recommended that the following mitigation and monitoring measures be included within the detailed design process and reporting, and within the Special Provisions Section of the Tender Documents, as applicable.

All Design and Construction Reports and Plans will be based on a best management approach that centers on the prevention of impacts, protection of the existing environment, and opportunities for rehabilitation and enhancement of the impacted areas.

13.1 Surface Water / Hydrology and Sedimentation

Potential Effect

1. Potential for sediments to enter the watercourse as a result of the following project activities:
   a) Stockpiling.
   b) Excavation.
   c) Construction.
2. Potential for localized water quality impacts as a result of spills.
3. Potential for invasive species to enter the environment.

Mitigation Measures

1. The footprint of disturbed areas should be minimized as much as possible, for example, vegetated buffers / setbacks should remain untouched adjacent to the watercourse, wherever possible.
   a) An Erosion and Sediment Control Plan should be developed during detailed design, prior to construction. Implementation of the erosion and sediment control measures shall conform to recognized standard specifications, such as Ontario Provincial Standards Specification (OPSS), and the requirements of the TRCA.

b) In-water operation of heavy equipment should be prevented, as well as minimizing the operation of any equipment on the banks of the watercourse. Stockpiled material should be stored and stabilized at least 30 m from the watercourse. All materials and equipment used for the purpose of site preparation and project completion should be operated and stored in a manner that prevents any deleterious substance (e.g., petroleum products, silt, etc.) from entering the water.

c) Sediment and erosion control measures (silt curtains, silt fence, rock check dams, etc.) should be installed and maintained during the work phase, until the site has been stabilized. Control measures should be inspected daily to ensure they are functioning and maintained as required. If control measures are not functioning properly, no further work should occur until the problem is resolved.

d) Temporary mitigation measures should be installed prior to the commencement of any clearing, grubbing, excavation, filling, or grading works and must be maintained on a regular basis, prior to, and after precipitation events.

e) Water quality impacts related to surface water run-off should be mitigated to avoid downstream impacts by controlling surface water run-off within the boundaries of the site.

f) All disturbed areas of the work site should be stabilized immediately, and re-vegetated as soon as conditions allow.

2. All equipment fueling and maintenance should be done at least 30 m from the watercourse to ensure that no deleterious substances enter the waterway.

   a) The contractor will be required to develop Spill Prevention and Contingency Plans for construction and operational phases of the project. Personnel will be trained in how to apply the Plans, and the Plans will be reviewed to strengthen their effectiveness and ensure continuous improvement. Spills will be immediately contained and cleaned up in accordance with provincial regulatory requirements and the contingency plan. A hydrocarbon spill response kit will be on-site at all times during the work. Spills will be reported to the Ontario Spills Action Center at 1-800-268-6060.

3. All equipment and personal protective equipment must arrive on-site clean to prevent the potential transfer of invasive species (i.e., phragmites) to the local environment.

13.2 Soil and Groundwater

Effect

1. There is potential for localized groundwater quality impacts as a result of spills.

2. Potential dewatering of the work area may be required.

3. Potential for excess soil as a result of bridge replacement.

Mitigation Measures

1. Refueling of equipment and fuel storage should be conducted in designated areas, at least 30 m away from the watercourses and any existing wells, with spill protection provided.
   a) If applicable, the work area should be dewatered as per recognized provincial standards and pumped into acceptable dewatering traps. These dewatering traps should be placed away from the watercourse to allow for infiltration prior to discharging to the watercourse. It is recommended the work be scheduled following periods of prolonged dry weather, and when the ground water table and creek flow are usually at their lowest, in order to minimize the quantity of water to be handled.
   b) Activities involving the management of excess soil should be completed in accordance with O. Reg. 406/19 and the MECP's current guidance document titled "Management of Excess Soil – A Guide for Best Management Practices" (2014). All waste generated during construction must be disposed of in accordance with ministry requirements.

13.3 Trees and Vegetation

Effect

1. Loss of vegetation.
   a) Grading impacts. Trees adjacent to the ROW may be subject to impacts within the rootzone as a result of proposed grading and other construction activities.

Mitigation

1. Minimize disturbance to existing vegetation. Adjust grading prior to construction to reduce impacts to trees by increasing the steepness of slopes in isolated locations, where feasible.
   a) Disturbed areas will be stabilized and re-vegetated upon project completion and restored to a pre-disturbed state where practical. An appropriate seed mix will be selected based on consultation with the TRCA.

2. Impacts to individual trees adjacent to the ROW should be evaluated for impacts on a case-by-case basis during detailed design. Protection measures (e.g., tree protection, erosion, and sediment control) are recommended where construction is proposed to protect trees from grading impacts and when adjacent construction is occurring to prevent access, stockpile, and storage within the adjacent sensitive watercourse communities.

3. Erosion and Sediment Control (ESC) measures must be installed prior to commencement of any grading or vegetation disturbance.

4. An environmental inspector shall be engaged during the construction phase to review ESC measures that will also act as tree protection measures for deficiencies. Deficiencies will be resolved immediately.

5. No access, storage, or stockpile of materials or equipment can occur within the area protected by the ESC measures.

6. A certified arborist should carry out or oversee the mitigation of any impacts to trees, including broken branches.

13.4 Wildlife / Habitat

Effect

1. Temporary displacement of and disturbance to wildlife and wildlife habitat during the construction phase (i.e., vegetation removals, noise disturbance), including SAR. Works associated with the bridge replacements may also temporarily limit wildlife movement and reduce useable habitat during the construction phase.

2. Vegetation clearing in the wooded area (SWM01, SWCM1-2, and SWCM1, FOMM4 2, FOMM7 2) within and adjacent to the ROW may impact selected trees within potential roosting habitat for SAR bats.

Mitigation

1. The footprint of the proposed disturbed area should be minimized as much as possible.
    a) Avoid vegetation clearing during sensitive times of the year for local wildlife, such as spring and early summer (when many animals bear their young or migrate between winter and summer habitats).
    b) To reduce the risk of potential impact to wildlife, including SAR, vegetation clearing should not be completed between April 1 to October 31 to avoid the active period for the following:
        1) Breeding birds – Broadly from April 1 to August 31 for most species (regardless of the calendar year).
        2) Reptile species – Special Concern – Generally considered to be from April to October (Environment Canada, 2014).

3) Bat species – Considered to be between April 1 to October 31, of any calendar year.

4) Monarch species – End of May through end of August. Removals of individual host plants (milkweed species) and their supporting habitat should be avoided during the active egg-laying and larval stages of monarch species.

c) Temporary silt fence barriers are recommended to exclude wildlife (i.e., amphibians and reptiles) from the earthwork and construction activities in areas adjacent to low-lying areas. Temporary exclusion fencing shall be installed to allow wildlife to leave the fenced area during vegetation clearing. Once the work area has been cleared, it can be securely fenced to prevent wildlife from returning. The excluded area shall be searched immediately following fencing installation for any wildlife (including SAR) that may have become trapped. Any wildlife shall be permitted to escape, to a suitable habitat.

d) Active nests (nests with eggs or young birds) of protected migratory birds, including SAR protected under the ESA, cannot be destroyed at any time of the year.

e) If a nesting migratory bird or SAR protected under ESA is identified within or adjacent to the construction site and the activities are such that continuing works in that area would result in a contravention of the MBCA or ESA, all activities shall stop and the contract administrator (with assistance from an avian biologist) shall discuss mitigation measures / with the County.

f) Should SAR be identified, all activities shall stop and MECP, responsible for administering SAR under the ESA, shall be contacted immediately to ensure compliance with the ESA. The contract administrator shall instruct the contractor on how to proceed based on the mitigation measures established through discussions with the County, the MECP and / or Environment Canada.

g) An environmental inspector shall be engaged during the construction phase to review ESC measures that protect adjacent natural features and prevent certain wildlife such as reptiles and amphibians from entering the work zone. The environmental inspector shall ensure that all deficiencies are resolved immediately.

h) Consideration should be given during detailed design to facilitate wildlife passage through sizing and design of bridge structures to reduce road mortality for reptiles, amphibians, and small mammals. Design details should be coordinated with MECP and TRCA during detailed design.

13.5 Fish and Fish Habitat

Effect

1. In-water works may be required, and the proposed works could potentially pose a harmful alteration, destruction, or disruption (HADD) of fish and / or fish habitat, as described in the *Fisheries Act*.

Mitigation Measures

1. The proposed works will be reviewed by a qualified professional aquatic ecologist to determine whether a HADD can be avoided or adequately mitigated. If a HADD cannot be avoided, the DFO will be consulted through a Request for Project Review to determine appropriate next steps.
   a) During detailed design, correspondence should be maintained with a qualified professional aquatic ecologist to determine appropriate mitigation measures and whether the proposal has potential to pose an unavoidable HADD. Preferred mitigation measures include work zone isolation while maintaining flow downstream and fish salvage. Efforts will be made in consultation with the DFO to mitigate, should a HADD be unavoidable.
   b) Near-water work and work below the annual high-water mark will adhere to the appropriate in-water work timing window to avoid potential impacts to resident and migratory fish species.
   c) A permit from the TRCA under the Development, Interference, with Wetlands and Alterations to Shorelines and Watercourses Regulation (Ontario Regulation 166/06) will be required prior to conducting the proposed works as work is proposed within a flood regulated area.

13.6 Noise / Vibration / Air Quality / Greenhouse Gas Emissions

Effect

1. Temporary nuisance noise during construction activities. Effects could also include increased dust in the air and carbon emissions from construction activities.

Mitigation

1. Noise control measures, such as restricted hours of operation and the use of appropriate machinery / mufflers will be implemented where required. Vehicles / machinery and equipment should be in good repair, equipped with emission controls, as applicable, and operated within regulatory requirements. If required, dust control measures may include the wetting of surfaces using a non-chloride-based compound to protect water quality.

13.7 Cultural Heritage

Effect

1. Potential impact to archaeological resources beyond the limits of the ROW. The property inspection determined that parts of the study area exhibit archaeological potential and will require Stage 2 assessment, prior to any proposed construction activities.

2. Potential impact to build cultural heritage resources beyond the limits of the ROW.

Mitigation

1. The following mitigation is excerpted from the Stage 2 Archaeological Assessment Report completed by Archaeological Services Inc. (January 2021), and provided in Appendix A.
   a) For areas within the study area that exhibit archaeological potential, these lands require Stage 2 Archaeological Assessment by test pit survey at 5 m intervals prior to any proposed impacts to the property.
   b) The remainder of the study area does not retain archaeological potential on account of deep and extensive land disturbance, watercourses, or slopes more than 20 degrees. These lands do not require further archaeological assessment.
   c) Should the proposed work extend beyond the current study area, further Stage 1 Archaeological Assessment should be conducted to determine the archaeological potential of the surrounding lands.

2. The following recommendations are excerpted from the Draft Cultural Heritage Evaluation Report (January 2021, revised March 2021).
   a) A Cultural Heritage Impact Statement / Heritage Impact Assessment should be completed for the Duffy's Lane Bridge prior to construction, as early as possible during detailed design. This assessment should be completed by a qualified person who has relevant and recent experience in the conservation of road bridges (see Section 3.0 of the Standards and Guidelines for Conservation of Provincial Heritage Properties (MHSTCI 2014) as a guide for best practice) and submitted to heritage staff at the Town of Caledon for review and approval.

14.0 Climate Change Considerations

Climate change is defined as any significant change in long-term weather patterns. The term can apply to any major variation in temperature, wind patterns or precipitation that occurs over time. Global warming describes the recent rise in the average global temperature caused by increased concentrations of greenhouse gases (GHGs) trapped in the atmosphere.

Scientists have concluded that human activity is largely responsible for recently observed changes to our climate since GHGs are mainly caused by burning fossil fuels to produce energy.

The MECP finalized a document entitled “Considering Climate Change in the Environmental Assessment Process” in 2017 that provides guidance relating to the ministry’s expectations for considering climate change during the MCEA process. It is suggested that this guide be consulted if an approved MCEA has no climate consideration method.

There are two types of climate change effects that can be considered. The first is the effect that a project can have on climate change. In this case, the degree to which the project can provide some climate change mitigation measures is to be assessed. The second is the effect climate change has on the project. In this case, the degree to which the project can demonstrate adaptation to climate change impacts is assessed. Climate change was considered during this MCEA and is discussed in this section.

14.1.1 Effects of the Project on Climate Change

There is potential for the works proposed to impact the atmosphere through the emission of GHGs on an ongoing basis.

An increase in traffic over time may result in an increase in associated GHG emissions. Bridge improvements are anticipated to reduce traffic congestion. Other carbon sources and emissions associated with this project would relate to construction vehicle emissions during the construction period. Emissions can be decreased by increasing efficiency and through regular maintenance of equipment.

Landscape changes associated with a project can also impact climate change. A carbon sink is described as a land or ocean mass that can take in carbon, in particular carbon dioxide, from the atmosphere. Vegetation can assist in removing carbon dioxide from the atmosphere.

The proposed undertaking will result in some vegetation removal during grading activities. Vegetation loss (and related carbon sink removal) is anticipated to be minimized as much as possible by reducing the footprint of grading activities where feasible.

14.1.2 Effects of Climate Change on the Project

The pavement and bridge deck infrastructure are susceptible to deterioration from freeze-thaw events. Roadside drainage and watercourse features may be impacted by increased precipitation events that are becoming more prevalent in Southern Ontario due to climate change effects which can result in potential flooding and erosion of bridge abutments.

The detailed design of the bridge improvements and associated infrastructure will consider peak flows and capacity.

15.0 Conclusions

During detailed design and construction of the project, the following commitments are required:

- Mitigation measures as detailed in Section 13.0, including updating the Draft Cultural Heritage Report for the Duffy's Lane Bridge to confirm potential impacts of the undertaking on the cultural heritage resources in the study area, as early as possible during detailed design and prior to construction.
- Evaluate options of road closure during replacement versus staged construction. Confirm staging requirements during construction.
- The Town will be required to secure all necessary Permits and / or Authorizations required for the Project, including:
    - Consultation with the TRCA with respect to working within a regulated area.
- Six Nations of the Grand River should also be engaged at the initiation of the design phase to confirm their interest in the project
- The Mississaugas of the Credit First Nation and the Huron-Wendat Nation must be contacted to coordinate participation in the Stage 2 Archaeological Assessment fieldwork prior to any field work planned for later stages of the project.

As per the requirements of the MCEA, this Project File Report is available for public review and comment for a period of 30 calendar days following the publication of the Notice of Completion.

16.0 References

Chapman, L.J. and Putnam, D.F. 2007 The Physiography of Southern Ontario; Ontario Geological Survey, Miscellaneous Release Data 228.

Conservation Ontario, Drinking Water Source Protection http://conservationontario.ca/conservation-authorities/source-water-protection/, accessed January 2019 & June 2023.

Department of Fisheries and Oceans Canada (DFO). 2022. Aquatic Species at Risk Maps. Accessed online at: Aquatic species at risk map (dfo-mpo.gc.ca) (insert date).

Endangered Species Act (ESA). 2007. Statues of Ontario, Chapter 6.

Fisheries Act. 1985. Royal Statutes of Canada, Chapter F-14.

Government of Canada Canadian Climate Normals 1971-2000 Station Data. Toronto Lester B. Pearson Int'l A. https://climate.weather.gc.ca/climate_normals/results_e.html?stnID=5097&autofwd=1.

Government of Canada. 2022. Species at Risk Public Registry. Accessed online at: Species at risk public registry - Canada.ca (June 30, 2023).

Government of Ontario. 2017. Greenbelt Plan.

Government of Ontario 2017. Oak Ridges Moraine. https://www.ontario.ca/page/oak-ridges-moraine-conservation-plan-2017.

Migratory Birds Convention Act (MBCA). 1994. Statutes of Canada, Chapter 22.

Migratory Birds Regulations (MBR). 2022. Statutes of Canada.

Ministry of Municipal Affairs and Housing (MMAH). 2020. Provincial Policy Statement (PPS) under the Planning Act.

Ministry of the Environment and Climate Change, Source Water Protection Atlas https://www.gisapplication.lrc.gov.on.ca/SourceWaterProtection/Index.html?site=SourceWaterProtection&viewer=SWPViewer&locale=en-US, accessed January, 2019 and June, 2023.

Ministry of Natural Resources and Forestry, Species at Risk in Ontario, various species http://www.ontario.ca/environment-and-energy/species-risk-ontario-list, accessed June 28, 2023.

Natural Heritage Information Centre (NHIC). 2022. Species lists obtained online at: Get natural heritage information | ontario.ca (insert date).

Ontario Breeding Bird Atlas Records and Square Summaries (OBBA) (2001-2005). Accessed online at: Ontario Breeding Bird Atlas (birdsontario.org) (insert date).

Ontario Geological Survey 2003. *Surficial Geology of Southern Ontario*. Ontario Geological Survey, open data, https://www.ontario.ca/data/surficial-geology-southern-ontario, accessed January 2018.

Ontario Regulation 166/06, Toronto and Region Conservation Authority: Regulation of Development, Interference with Wetlands and Alterations to Shorelines and Watercourses.

Ontario Reptile and Amphibian Atlas (ORAA). 2022. Accessed online at: ON Reptile & Amphibian Atlas (ontarioinsects.org) (insert date).

Species at Risk Act (SARA). 2002. Statutes of Canada, Chapter 29.

Toronto and Region Source Protection Area, Approved Updated Assessment Report, approved by MECP February 23, 2022.

The Region of Peel Official Plan, Consolidated: November 4, 2022.

The Town of Caledon Official Plan, Consolidated: April, 2018.

Toronto and Region Conservation Authority (TRCA). 2023. Planning & Permits. Accessed online at: TRCA Planning & Permits (https://trca.ca/planning-permits/) June 2023.

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