



HIGHWAY 6 LITTLE CURRENT SWING BRIDGE STUDY

GWP 5268-14-00 January 2023

Northeastern Region Ministry of Transportation Ontario

Transportation Environmental Study Report

Ontario 🍞

TRANSPORTATION ENVIRONMENTAL STUDY REPORT

Highway 6 Little Current Swing Bridge Study



January 2023

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THE PUBLIC RECORD ONTARIO MINISTRY OF TRANSPORTATION HIGHWAY 6 LITTLE CURRENT SWING BRIDGE STUDY (GWP 5268-14-00) TRANSPORTATION ENVIRONMENTAL STUDY REPORT

This Transportation Environmental Study Report (TESR) is available for review from January 25, 2023, to February 24, 2023, on the study website (swingbridgestudy.ca) and at the following locations:

- Northeastern Manitoulin and the Islands Municipal Building
- Gore Bay Municipal Office
- Municipality of Central Manitoulin Municipal Office
- Township of Burpee Mills Municipal Office
- Township of Assiginack Municipal Office
- Municipality of Billings
- Wiikwemkoong Unceded Territory Administration Office
- Sheguiandah First Nation Administration Office
- M'Chigeeng First Nation Administration Office
- Aundeck Omni Kaning First Nation Administration Office
- Sheshegwaning First Nation Administration Office
- Zhiibaahaasing First Nation Administration Office
- Whitefish River First Nation Administration Office

This project is being carried out in accordance with the requirements of the 2000 *Class Environmental Assessment (EA) for Provincial Transportation Facilities*, a process that has been accepted and approved under Ontario's *Environmental Assessment Act*, as described in Section 2.0 of this report. This study is a "Group A" project under the *Class Environmental Assessment* (Class EA) *for Provincial Transportation Facilities* (2000), a process that has been accepted and approved under Ontario's *Environmental Assessment Act*, and which includes major realignments of existing provincial highways, and new provincial ferryboat connections, docks, and terminals. The Class EA process is for projects of a defined scope and magnitude, where the impact can be effectively determined and mitigated. This TESR fulfills the documentation requirements of the Class EA. In accordance with the requirements of the Class EA, this report is being submitted for a 30-day comment period from January 25 to February 24, 2023.

Interested persons are encouraged to review this TESR and provide written comments to the study team by February 24, 2023. All comments and concerns should be sent directly to either of the following study team members:

Gregg Cooke, P.Eng. Project Manager Stantec Consulting Ltd. 200 – 835 Paramount Drive Stoney Creek ON L8J 0B4 Phone: (289) 439-9630 Fax: 1-905-385-3534

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In addition, a request may be made to the Ministry of the Environment, Conservation and Parks (MECP) for an order requiring a higher level of study (i.e., requiring an individual/comprehensive environmental assessment approval before being able to proceed), or that conditions be imposed (e.g., requiring 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's contact information, full name, and specify what kind of order is being requested (request for conditions or a request for an individual/comprehensive environmental assessment), how an order may prevent, mitigate or remedy potential adverse impacts on Aboriginal and treaty rights, 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 the below MECP contacts, as well as copied to MTO:

Minister of the Environment, Conservation and Parks

Ministry of Environment, Conservation and

Parks

777 Bay Street, 5th Floor Toronto, ON M7A 2J3 Minister.mecp@ontario.ca

Director, Environment Assessment Branch

Ministry of Environment, Conservation and Parks

135 St. Clair Ave. W, 1st Floor Toronto, ON M4V 1P5 EABDirector@ontario.ca

Upon reviewing comments received from the public, the Minister of Environment, Conservation and Parks may make a Section 16 Order on their own initiative within 30 days from the end of the comment period set out in the Notice of Completion. If no concerns or issues are outstanding within 60 days from the end of the comment period set out in the Notice of Completion, the project is considered to have met the requirements of the Class EA, and MTO may proceed to design stage, subject to the commitments documented in the TESR, and obtain any outstanding environmental approvals.

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EXECUTIVE SUMMARY

GENERAL DESCRIPTION OF PROJECT

The Ontario Ministry of Transportation (MTO) retained Stantec Consulting Ltd. to undertake the Planning, Preliminary Design, and Class Environmental Assessment (Class EA) Study for the Highway 6 Little Current Swing Bridge located in the Town of Northeastern Manitoulin and the Islands in Northeastern Ontario. The bridge provides year-round highway access between the community of Little Current and Manitoulin Island and mainland areas of Northern Ontario. The existing bridge is nearing the end of its service life. The purpose of this study is to identify a Recommended Plan that addresses current and future transportation needs at the bridge crossing and Highway 6 in the study area.

This Transportation Environmental Study Report (TESR) documents the decision-making process, and includes a description of the project purpose; the existing technical, natural, social, economic, and cultural environmental factors; identification and evaluation of alternatives that were considered; consultation activities, including a record of the comments received and how they were considered; the Recommended Plan; anticipated environmental effects and proposed mitigation measures; and, commitments to future work and monitoring.

ENVIRONMENTAL ASSESSMENT PROCESS

This Class EA Study was carried out under the requirements of the 2000 MTO Class EA document. This study has been carried out following the requirements of the Class EA as a "Group 'A" undertaking, which includes projects such as major realignments of existing provincial highways, and new provincial ferryboat connections, docks and terminals.

This TESR fulfills the documentation requirements of the Class EA and is filed for a 30-day comment period. If you have any questions and/or concerns regarding this study, please contact either one of the following individuals:

Gregg Cooke, P.Eng. Project Manager Stantec Consulting Ltd. 200 – 835 Paramount Drive Stoney Creek ON L8J 0B4 Phone: (289) 439-9630 Fax: 1-905-385-3534

Email: projectteam@swingbridgestudy.ca

Melissa Delfino, P.Eng. Senior Project Engineer Project Delivery Northeast Design and Engineering Branch Ministry of Transportation 447 McKeown Avenue North Bay, ON P1B 9S9 Phone: (705) 491-7756

Email: projectteam@swingbridgestudy.ca

In addition, a request may be made to the Ministry of the Environment, Conservation and Parks (MECP) for an order requiring a higher level of study (i.e., requiring an individual/comprehensive environmental assessment approval before being able to proceed), or that conditions be imposed (e.g., requiring 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.

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The request should be sent in writing or by email to the below MECP contacts, as well as copied to MTO:

Minister of the Environment,	Director, Environment Assessment
Conservation and Parks	Branch
Ministry of Environment, Conservation and	Ministry of Environment, Conservation and
Parks	Parks
777 Bay Street, 5 th Floor	135 St. Clair Ave. W, 1st Floor
Toronto, ON M7A 2J3	Toronto, ON M4V 1P5
Minister.mecp@ontario.ca	EABDirector@ontario.ca

Upon reviewing comments received from the public, the Minister of Environment, Conservation and Parks may make a Section 16 Order on their own initiative within 30 days from the end of the comment period set out in the Notice of Completion. If no concerns or issues are outstanding within 60 days from the end of the comment period set out in the Notice of Completion, the project is considered to have met the requirements of the Class EA, and MTO may proceed to design stage, subject to the commitments documented in the TESR, and obtain any outstanding environmental approvals.

TRANSPORTATION NEEDS ASSESSMENT

The Transportation Needs Assessment process is part of the ongoing management and administration of the transportation systems by the province. Assessment of needs can result in a number of recommendations, including initiating a study, initiating major or minor improvements, initiating routine maintenance, monitoring a situation, or doing nothing. Given the range of potential outcomes, the transportation needs assessment process includes the following:

- Identifying transportation problems and opportunities
- Evaluating and selecting reasonable alternatives, including 'do nothing'
- Developing potential transportation study objectives
- Initiating the study process



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PROBLEMS AND OPPORTUNITIES

The Little Current Swing Bridge provides single-road access between the community of Little Current and Manitoulin Island and mainland areas of Northeastern Ontario and offers the only year-round access to/from the island. Currently, road access is not available for 15 minutes of each daylight hour during the summer months, to provide boat access along the North Channel. Continuous road access with traffic signals is provided at night and during the winter months when the bridge is closed to boat traffic. This Class EA was initiated to address the following problems with the existing swing bridge:

- The bridge requires significant and ongoing maintenance and repairs to maintain a safe and reliable connection between Manitoulin Island and the mainland
- Due to its age, there is a significant risk of mechanical breakdown causing major disruption to the transportation network
- The type of structure (truss) provides no redundancy in the design, which increases the risk of a bridge closure causing major disruption to the transportation network
- There is potential for disruptions to emergency access due to bridge closures and Highway 6 traffic is also disrupted for 15 minutes of each hour to accommodate boat traffic during summer daylight hours

These problems are further exasperated given that the bridge is the only permanent link to the island from the mainland.

The following opportunities were identified during the Transportation Needs Assessment phase of the study:

- Improve the reliability of the crossing
- Reduce maintenance and operating costs
- Improve access and reduce traffic delays
- Improve emergency access (shorter wait times)
- Reduce closure times
- Improve boat access (shorter wait times)

CULTURAL HERITAGE

The Little Current Swing Bridge was listed on the MTO Ontario Heritage Bridge List in 1983. A Cultural Heritage Evaluation Report (CHER) was completed in 2019, the findings of which indicated that the existing bridge met the criteria in Ontario Regulations 9/06 and 10/06 and MTO identified the bridge property as a Provincial Heritage Property of Provincial Significance (PHPPS).

A Heritage Impact Assessment (HIA) was completed to assess impacts of the project to this PHPPS, and to recommend appropriate conservation and/or mitigation measures. The HIA was also used to inform and support MTO's request for the Minister of Citizenship and Multiculturalism to provide consent for the removal or demolition of the existing bridge.

Under the Ontario Heritage Act (OHA), MTO must comply with OHA requirements and the MTO's *Ontario Heritage Bridge Guidelines* (Interim 2008) (OHBG). As such, removal or demolition will only be deemed as a last resort, after all other alternatives having been considered. The following conservation options were assessed for the existing bridge:

- 1. Retain the existing bridge with no major modifications
- 2. Restore missing or deteriorated elements where physical or documentary evidence existing for their design
- 3. Retain the existing bridge with sympathetic modifications
- 4. Retain the existing bridge with sympathetically designed new structure in proximity
- 5. Retain the existing bridge no longer in use for vehicular traffic but adapted for new use
- 6. Retain the existing bridge as heritage monument for viewing purposes only
- 7. Relocate the existing bridge to new location for continued or adaptive use

Based on the findings of the assessment, it was determined that removal and replacement of the existing Little Current Swing Bridge is the only viable option to satisfy the need to improve safety and reliability at the crossing, reduce maintenance costs, and improve access for boats and emergency services. Consent to remove the existing bridge was required from the Minister of Citizenship and Multiculturalism, prior to the completion of this Class EA.

EVALUATION OF ALTERNATIVES

The Environmental Assessment Act requires that 'reasonable alternatives' be considered in addressing identified problems and/or opportunities. This involves two levels of analysis. The Alternatives to the Undertaking considers a broad range of alternatives that could address the project needs. Once the best alternative is selected, Alternative Methods of Carrying out the Undertaking are studied in greater detail.

ALTERNATIVES TO THE UNDERTAKING

The Alternatives to the Undertaking considered as part of this assignment consisted of: Do Nothing; Replace with a Ferry; Replace with a 2-lane Tunnel; Replace with a 2-lane Movable Bridge; Replace with a 2-lane Fixed Bridge. Based on the findings of the assessment, the 'Replace with a Ferry' alternative was not carried forward as it did not realistically address all the problems and opportunities.

ALTERNATIVE METHODS OF CARRYING OUT THE UNDERTAKING

Seven corridor alternatives were developed that crossed the North Channel from Little Current to Highway 6 on the mainland. Five structure alternatives were also considered based on different highway alignments and bridge characteristics. The design alternatives carried forward for detailed evaluation included a tunnel, a fixed bridge and three movable bridge options (lift bridge, bascule bridge, and swing bridge).



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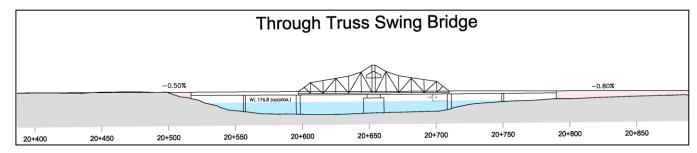
A detailed evaluation of alternatives was carried out to identify an improvement plan that is cost-effective, addresses structural needs, provides safe operations, and provides reasonable local access, while minimizing effects on the natural, social, and cultural environments.

Following the evaluation of alternatives, and consultation with the public, Indigenous communities, agencies and community stakeholders, a Recommended Plan was selected.

RECOMMENDED PLAN

The Recommended Plan includes the replacement of the existing Little Current Swing Bridge with a new through-truss swing bridge, located on a new alignment that is located approximately 80 m west of the existing bridge. A sketch depicting the elevation view of the new bridge is shown in ES-1.

The design of the replacement bridge has potential to mitigate the removal of the existing bridge by careful integration of the original bridge design or type in the design or type of the new bridge, with allowances for use of modern materials. In accordance with the OHBG guidance for sympathetic design for replacement bridges, any new structure should reflect the heritage attributes of the existing bridge. The new design will respect the design principles of the original bridge and its setting.



ES-1: Elevation View of New Through Truss Swing Bridge

The Recommended Plan is shown in ES- 2.

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ES- 2: Recommended Plan



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MINISTER OF CITIZENSHIP AND MULTICULTURALISM'S DECISION

On November 2, 2022, the Minister of Citizenship and Multiculturalism provided written consent to the MTO for the removal of the existing swing bridge, subject to the conditions outlined in Section 7.3.4 of this TESR.

PUBLIC CONSULTATION

The main objective of consultation in the Class EA process is to ensure that project information is shared in a meaningful way, and that consideration is given to all aspects of the environment from the earliest stages of planning. To achieve this, a variety of communication strategies were used to engage the public, agencies, interest groups, property owners and community members. Numerous opportunities for input were provided at key points during the study process including three Public Information Centres (PICs), two community events, an impacted property owner meeting, and a boating survey. In addition, direct contact with the Project Team via mail, email and phone was encouraged throughout the study.

A project website (swingbridgestudy.ca) was developed at the onset of the study to provide the public with access to project information. The project website was maintained throughout the study process, including project updates, notifications of public events, project team member contact information, PIC materials and links to project-specific documentation.

An outline of the public consultation activities is provided in Section 8.0.

INDIGENOUS CONSULTATION

Two rounds of Community Information Sharing Sessions (CISSs) and three separate meetings were held in 2018 and 2019 within Indigenous communities to share information about the study. Due to COVID-19 and physical distancing requirements, a virtual presentation to UCCMM Board of Directors was made in 2020, and PIC 3 was shared online in 2021 (in English and Anishnaabemowin). An outline of the Indigenous consultation activities is provided in Section 9.0.

POTENTIAL ENVIRONMENTAL EFFECTS, PROPOSED MITIGATION AND COMMITMENTS TO FUTURE WORK

A summary of environmental effects and proposed mitigation measures, as identified during the course of this study, is provided in Section 11.0, and forms a comprehensive list of commitments to be adhered to during the subsequent design phase of the project.



Overview of the Undertaking January 25, 2023

1.0 Overview of the Undertaking

1.1 Introduction

The Ontario Ministry of Transportation (MTO) retained Stantec Consulting Ltd. to undertake a Planning, Preliminary Design, and Class Environmental Assessment (Class EA) Study for the Highway 6 Little Current Swing Bridge located in the Town of Northeastern Manitoulin and the Islands in Northeastern Ontario. The bridge provides the only year-round highway access between the community of Little Current and Manitoulin Island and mainland areas of Northern Ontario. The existing bridge is nearing the end of its service life. The purpose of this study is to identify a Recommended Plan that addresses current and future transportation needs at the bridge crossing and Highway 6 in the study area.

The study area includes a portion of the North Channel, the south portion of Goat Island and the north portion of Manitoulin Island in the vicinity of Little Current, within the Town of Northeastern Manitoulin and the Islands (NEMI) in Manitoulin District. The Highway 6 study limits extend from Sim Street in the Town of Little Current, northerly to 1.1 km north of the Little Current Swing Bridge.

1.2 General Description of the Project

The purpose of this study is to identify a Recommended Plan for improvements as part of the Ministry's ongoing review of safety and operational needs for the provincial highway network.

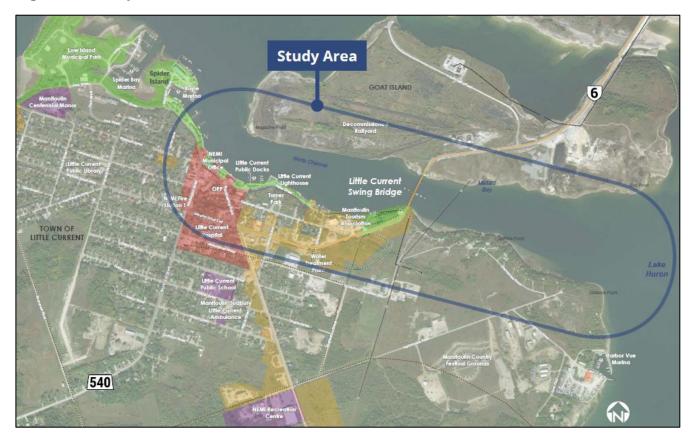
This study is a "Group A" project under the *Class Environmental Assessment* (Class EA) *for Provincial Transportation Facilities* (2000) and includes undertaking environmental and engineering field investigations and seeking input from stakeholders, external agencies, Indigenous communities, and the public. This study included a review of existing conditions and a Transportation Needs Assessment to determine the scope and extent of alignment and crossing requirements. A *Study Design Report* (SDR) was also completed and was previously made available for public review. The study also includes developing and evaluating alignment and crossing type alternatives, identifying appropriate improvements, and outlining environmental protection/mitigation measures. This includes recognition of the significant cultural heritage value of the existing swing bridge and identifying appropriate mitigation measures, in consultation with the Ministry of Citizenship and Multiculturalism (MCM). A Recommended Plan and preliminary design were completed at the conclusion of this study, in consideration of the feedback received during the course of this study.

1.2.1 Study Area

The study area is located within the Town of Northeastern Manitoulin and the Islands (NEMI) in Manitoulin District. The Little Current Swing Bridge is located on Highway 6 in the community of Little Current and offers the only year-round access between Manitoulin Island and the mainland, as shown within **Figure 1**.



Figure 1: Study Area Location Plan



1.3 Project Background

1.3.1 Little Current Swing Bridge

The Little Current Swing Bridge is located on Highway 6 at the community of Little Current, on Manitoulin Island, and crosses the North Channel of Lake Huron to connect through Goat Island to the mainland. The Little Current Swing Bridge was built in 1913 by Algoma East Rail as a rail bridge connecting Manitoulin Island to the mainland. In 1946, the bridge was modified to allow motor vehicles to cross in addition to rail traffic. Rail traffic to Manitoulin Island ended in the 1980s and ownership of the bridge was transferred from CP Rail to MTO. The railway track was subsequently removed from the bridge, and the bridge was modified to accommodate a single lane of motor vehicle traffic.

The superstructure consists of a two-span riveted steel through-truss swing section and three riveted steel deck plate fixed approach spans. The control room is located above the centre of the bridge and accessed via a metal staircase on the east side of the bridge. The substructure

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of the bridge consists of the abutments, wingwalls, piers, and machinery associated with the swing bridge. The bridge has six cast-in-place concrete piers. Two of these six piers located east and west of the bridge are the original rest piers for the swing spans when the bridge was used for railway traffic. The three southernmost piers and the east and west piers contain machinery and mechanisms associated with the bridge's swinging operation.

The piers that support the ends of the swing span when open to vehicular traffic each contain two wedges. These piers are accessible from the bridge deck via a staircase and small ladder. The wedges are monitored from the control room via closed circuit cameras. The centre pier contains the ring gear, balancing trucks, the centre pivot bearing, and four wedges. The ring gear mechanism turns on a pivot using disks and eight wheels running on steel track. The piers contain the remnants of the timber formwork that was used to construct the concrete piers. The rock filled timber cribs are situated between the centre piers and the rest piers and were the original falsework supports used to construct the superstructure.

1.3.2 Previous and Adjacent Studies

From 2002 to 2009, the MTO initiated several design studies to identify rehabilitation and replacement recommendations for the Little Current Swing Bridge.

A Detail Design Study was carried out in 2002 to identify a Recommended Plan for the rehabilitation of the Little Current Swing Bridge on Highway 6. The Recommended Plan included structural steel inspection, structural evaluation and replacement of the current centre bearing with a modern low maintenance bearing including replacement of any bearing component or housing as required, reconstruction of the concrete base under the centre bearing, and repair/replacement of corroded structural steel below the deck of the main swing spans.

A Preliminary Design Study was carried out in 2009 to identify a Recommended Plan for the deck replacement and substructure rehabilitation of the Little Current Swing Bridge on Highway 6. The Recommended Plan included deck replacement with prefabricated timber deck panels, refacing the entire surface of each pier following the removal of the outer layer of the existing concrete, refacing the north and south abutments and retaining walls.

A Detail Design Study was carried out in 2009 to further develop the recommended preliminary design alternative and investigate options for carrying out the work on the Little Current Swing Bridge on Highway 6. The Detail Design study was documented in a *Design and Construction Report* (DCR, 2009), and split the proposed deck replacement rehabilitation of the substructure into two work phases. Phase 1 included replacement of the existing timber deck and repairs to various structural steel components. Phase 2 included repair of the substructure (piers and abutments) by removing approximately 150 mm of concrete and replacing with new concrete.

Since 1988, several bridge rehabilitation activities have been undertaken to support the ongoing operation of the Little Current Swing Bridge. A summary of these activities is outlined in Figure 3.

1.4 Purpose of the Transportation Environmental Study Report

This *Transportation Environmental Study Report* (TESR) documents the decision-making process, and includes a description of the project purpose; the existing technical, natural, social, economic, and cultural environmental factors; identification and evaluation of alternatives that were considered; consultation activities, including a record of the comments received and how they were considered; the Recommended Plan; anticipated environmental effects and proposed mitigation measures; and, commitments to future work and monitoring.

The TESR fulfills the documentation requirements of the Class EA process for a "Group A" project. The TESR is filed for a 30-day comment period. If you have any questions and/or concerns regarding this study, please contact either one of the following individuals:

Gregg Cooke, P.Eng. Project Manager Stantec Consulting Ltd. 200 – 835 Paramount Drive Stoney Creek ON L8J 0B4 Phone: (289) 439-9630) Fax: 1-905-385-3534

Email: projectteam@swingbridgestudy.ca

Melissa Delfino, P.Eng.
Senior Project Engineer
Project Delivery Northeast
Design and Engineering Branch
Ministry of Transportation
447 McKeown Avenue
North Bay, ON P1B 9S9

Phone: (705) 491-7756

Email: projectteam@swingbridgestudy.ca

Interested persons may provide written comments to the study team by February 24, 2023.

In addition, a request may be made to the Ministry of the Environment, Conservation and Parks (MECP) for an order requiring a higher level of study (i.e., requiring an individual/comprehensive environmental assessment approval before being able to proceed), or that conditions be imposed (e.g., requiring 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's contact information, full name, and specify what kind of order is being requested (request for conditions or a request for an individual/comprehensive environmental assessment), how an order may prevent, mitigate, or remedy potential adverse impacts on Aboriginal and treaty rights, 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.



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The request should be sent in writing or by email to the below MECP contacts, as well as copied to MTO:

Minister of the Environment,	Director, Environment Assessment
Conservation and Parks	Branch
Ministry of Environment, Conservation and	Ministry of Environment, Conservation and
Parks	Parks
777 Bay Street, 5 th Floor	135 St. Clair Ave. W, 1st Floor
Toronto, ON M7A 2J3	Toronto, ON M4V 1P5
Minister.mecp@ontario.ca	EABDirector@ontario.ca

Upon reviewing comments received from the public, the Minister of Environment, Conservation and Parks may make a Section 16 Order on their own initiative within 30 days from the end of the comment period set out in the Notice of Completion. If no concerns or issues are outstanding within 60 days from the end of the comment period set out in the Notice of Completion, the project is considered to have met the requirements of the Class EA, and MTO may proceed to design stage, subject to the commitments documented in the TESR, and obtain any outstanding environmental approvals.

The potential exists for final design plans completed during the next stage of planning and design to identify design modifications or refinements that may result in environmental benefits or impacts that were not anticipated or identified in this TESR. Any changes that result in design modifications will be discussed with affected external agencies, interested stakeholders and property owners during the next study phase and documented in a *Design and Construction Report* (DCR) that will be made available for public review. If significant changes are made to the project following the completion of the TESR and eligibility for Environmental Clearance, a TESR Addendum may be required to document the project changes.

1.4.1 Environmental Clearance

If there are no significant concerns following the Public Review Period, or once the Minister of the Environment, Conservation and Parks has reviewed and considered any Order Requests, the project may be eligible for Environmental Clearance and continue to move forward. This will permit MTO to:

- Negotiate temporary and permanent property acquisition, consistent with the project needs (including ROW designation)
- Relocate utilities
- Initiate subsequent study stages (i.e., design and contract preparation) for the Recommended Plan

Although the timeline for implementing the results of this study is not confirmed, this planning will assist MTO, municipalities, Indigenous communities, business owners, and private landowners with future planning and development within the study area. The implementation of the identified improvements is dependent on regional and provincial priorities and available funding.



Class Environmental Assessment Process January 25, 2023

2.0 Class Environmental Assessment Process

2.1 Classification of Project

This Preliminary Design and Class EA Study was carried out under the requirements of the 2000 MTO Class EA document. Based on the nature and extent of the project, the MTO Class EA document specifies different groups under which projects may be planned, and the assessment process required for each. Provided that this process is followed, and its requirements are met for a project, the requirements of the Ontario *Environmental Assessment Act* are considered to be met. This project is being carried out following the requirements of the Class EA as a "Group 'A" undertaking, which includes projects such as major realignments of existing provincial highways, and new provincial ferryboat connections, docks and terminals.

For additional information on the MTO Class EA process, the public may contact the MTO (contact information provided in Section 1.4). In addition, the following documents are available to assist with understanding the process:

- Class Environmental Assessment for Provincial Transportation Facilities, MTO, July 2000
- Environmental Reference for Highway Design, MTO, 2006, updated in June 2013
- Code of Practice for Preparing, Reviewing, and using Class Environmental Assessments in Ontario, MOE, January 2014

These publications are available from the MTO Research Library Online Catalogue (library.mto.gov.on.ca/) and from Publications Ontario (publications.gov.on.ca).

The study process for a Group A undertaking, as applicable to this project, is illustrated in **Figure 2**.

Figure 2: Class EA Process, Group A Undertaking

	-	Ongoing Consultation
2	Transportation Needs Assessment Phase (2018) a. Develop Problem and Opportunity Statements b. Identify Alternatives to the Undertaking (i.e., "Alternatives to") c. Publish Study Design Report (SDR) Planning Phase (2019) a. Assess "Alternatives to" (How well do they address the Problem and Opportunity Statements?) b. Select "Alternatives to" to carry forward for further development c. Confirm Class EA Process	Public Information Centre 1 & Indigenous Community Information Sharing Sessions SDR 30-Day Public Review
3	d. Develop Planning Alternatives ("Alternative Methods") e. Develop Evaluation Process f. Evaluate Planning Alternatives g. Select Preferred Alternative Preliminary Design Phase (2020-2021) a. Develop Recommended Plan	Public Information Centre 2 & Indigenous Community Information Sharing Sessions
4	b. Identify Traffic Management and Staging Requirements c. Confirm Environmental Impacts and Mitigation d. Identify Property Requirements e. Refine and Finalize Recommended Plan Documentation and Environmental Clearance Phase a. Publish Transportation Environmental Study Report (TESR)	Public Information Centre 3 & Indigenous Community Information Sharing Sessions
	b. Obtain Environmental Clearance	TESR 30-Day Public review
6	Future Phases Detail Design of the Recommended Plan Property Acquisition and Utility Relocation Construction	- Additional Public Consultation



Class Environmental Assessment Process January 25, 2023

2.2 Environmental Assessment Approval Regulations

A Preliminary Design and Class EA Study of this type must be carried out in accordance with applicable environmental legislation and the current government policies and procedures. The policies and legislation that apply to this study are described below.

2.2.1 Ontario Environmental Assessment Act

The Ontario *Environmental Assessment Act* (EAA) governs the conduct of planning studies in the province of Ontario. The purpose of the EAA is to make sure that:

- A reasonable and traceable planning process is followed
- The need for the project is demonstrated
- The public has input into the process and investigations
- The study includes a review of a full range of alternatives
- The selected alternative minimizes any environmental impacts or provides mitigation strategies to minimize impacts resulting from the improvements

2.2.2 Canadian Impact Assessment Act

The Canadian Impact Assessment Act, 2019 (IAA 2019) and its regulations establish the legislative basis for the federal environmental assessment process. Under IAA 2019, an environmental assessment is only required for projects included in the list of "designated projects". These types of projects are likely to have significant adverse environmental effects and therefore may be subject to a federal EA.

A proponent is not required to complete the federal EA process if a project is not on this list. This project does not fall under the list of designated projects.

2.2.3 Ontario Heritage Act

Under Part III.1 of the Ontario Heritage Act (OHA), all Ontario government ministries, including MTO, must comply with the MCM 2010 Standards & Guidelines for Conservation of Provincial Heritage Properties (S&Gs) (*issued under section 25.2 of the OHA*) in the management of properties in their ownership or under their control. The S&Gs require all ministries and public bodies that have been prescribed by regulation to identify, protect and care for provincial heritage properties they own and manage. These S&Gs apply to provincial heritage properties that are:

- Owned by a ministry
- Owned by a prescribed public body
- Occupied by a ministry or prescribed public body if they are entitled to make alterations

The S&Gs set out the criteria and process for identifying provincial heritage properties, and the standards for their protection, maintenance, use and disposal.

Under provision F.5 of the S&Gs, MCM Minister's Consent is required prior to the removal or demolition of a building or structure on a provincial heritage property of provincial significance, subject to a heritage impact assessment and community engagement.

Under Part VI of the OHA, the Conservation of Resources of Archaeological Value, no person shall perform any activities as listed in the S&Gs unless the person applies to the Minister and is issued a license under Part VI that allows the person to carry out the activity in question.

2.2.4 Permits and Approvals

Undertaking an EA also requires consideration of other approvals and review agencies, as outlined below.

2.2.4.1 Federal Review Agencies

- Department of Fisheries and Oceans (DFO) MTO/DFO/MNRF Fisheries Protocol, Fisheries Act (FAA)
- Environment and Climate Change Canada (ECCC) Species at Risk Act (SARA), Migratory Birds Convention Act (MBCA)
- Transport Canada Canadian Navigable Waters Act

2.2.4.2 Provincial Review/Policy Requirements

- Provincial Policy Statement (2020)
- Ministry of the Environment, Conservation and Parks (MECP) EAA, Environmental Protection Act, Ontario Water Resources Act, Permits to Take Water
- Ontario Access and Privacy Office Freedom of Information and Protection of Privacy Act and Accessibility for Ontarians with Disabilities Act
- Ministry of Natural Resources and Forestry (MNRF) MTO Fisheries Protocol, Ontario Wetlands Policy, Endangered Species Act (ESA)
- Ministry of Citizenship and Multiculturalism (MCM) –OHA

2.2.4.3 Municipal Policy

While MTO is not required to obtain approvals or exemptions for municipal Official Plans, bylaw exemptions and/or or policies, municipal policies and plans are considered as part of the Class EA study process.

2.2.5 Indigenous Rights

Indigenous peoples asserting Aboriginal and Treaty rights must be consulted and accommodated prior to any decision-making, conduct or activities that may have an impact on those rights.



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3.0 Transportation Needs Assessment

The Transportation Needs Assessment process is part of the ongoing management and administration of the transportation systems by the province. Assessment of needs can result in a number of recommendations, including initiating a study, initiating major or minor improvements, initiating routine maintenance, monitoring a situation, or doing nothing. Given the range of potential outcomes, the transportation needs assessment process includes the following:

- Identifying transportation problems and opportunities
- Evaluating and selecting reasonable alternatives, including 'do nothing'
- Developing potential transportation study objectives
- Initiating the study process

This section of the report provides an overview of the transportation problem and opportunity and assessment of Alternatives to the Undertaking that led to the initiation of this study.

3.1 Provincial Responsibilities

The Ontario Ministry of Transportation (MTO) has a mandate to provide transportation services for the people of Ontario. This mandate is to:

- Preserve the safety and efficiency of Ontario's provincial highway network and the Ontario government's investment in highway infrastructure
- Provide a safe and efficient transportation system that is critical to Ontario's quality of life, a strong economy, and a clean and healthy environment

The Ministry's actions are guided by the transportation policies found under both the Transportation Systems and Transportation and Infrastructure Corridors sections of the Ontario *Provincial Policy Statement, 2020* (PPS). These policies include, but are not limited to:

- Providing transportation systems that are safe, energy efficient, facilitate the movement of people and goods, and are appropriate to address projected needs
- Making efficient use of existing and planned infrastructure
- Maintain connectivity within and among transportation systems
- Minimize the length and number of vehicle trips and support current and future use of transit and active transportation
- Planning for and protecting corridors and rights-of-way for transportation, transit, and infrastructure facilities to meet current and projected needs
- Protect major goods movement facilities and corridors

The Transportation Needs Assessment for this study was carried out within the context of the MTO responsibilities and requirements of the PPS, and to meet the requirements of the Class EA process.

3.2 Existing Bridge Condition

MTO undertakes routine bridge inspections every two years and the condition of elements is used to calculate a Bridge Condition Index (BCI). Prior to 2010, the BCI indicated that the bridge was in poor condition. Upon completion of major rehabilitation in 2009 to 2011, the BCI was improved, and the bridge was deemed to be in good condition. The 2020 inspection notes that, while the bridge is still considered to be in good condition, there are numerous elements with severe pitting and perforations due to corrosion.

Chemical analysis and strength testing was completed in 1986 on two steel samples extracted from the structure. Empirical analysis undertaken using the test results indicates that the steel could become brittle at normal temperatures.

An evaluation of the bridge's load capacity was completed in 2002, the findings of which identified a few elements of the truss that were under capacity, however it is understood that these deficiencies have since been resolved. The bridge was, therefore, shown to be capable of supporting highway loading at the time of the 2002 evaluation, although the structure has not been re-evaluated since completion of that study.

Detailed structural steel inspections, non-destructive testing, and fatigue evaluations were undertaken in 2006. While the inspections did not identify any fatigue-related concerns, the eyebars and pin components of the bridge structure were noted to be fatigue-prone with no redundancy that are susceptible to sudden failure. This is especially concerning given that the steel is expected to be brittle under normal temperatures. The report recommended that the eyebars and pins be monitored and inspected every two years.

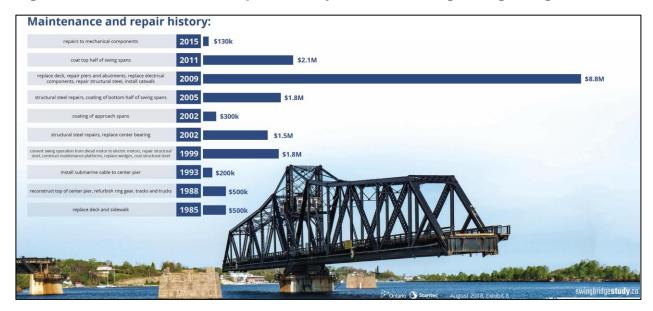
While the structure was shown to be capable of supporting highway loads in 2002, the concerns raised regarding steel corrosion, brittle steel, and non-redundant truss members pose challenges to extending its life. It should also be noted that the existing bridge provides the only direct access to Manitoulin Island and is, therefore, one of the highest priority structures in Northeast Region. Residents, emergency services, service providers, and tourists require that the crossing be in service, and any shutdowns due to structural repairs or mechanical breakdown are problematic for island residents, emergency service providers and visitors. For this reason, MTO has undertaken several rehabilitation projects in recent decades to maintain the bridge in good condition, and to minimize the risk of breakdowns, which could hinder access for vehicular and/or navigation traffic.

Figure 3 presents a summary of the recent major expenses incurred to maintain the bridge over the past 35 years. In total, expenditures for bridge rehabilitation are approximately \$17.6M (approximately \$500,000 annual average).



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Figure 3: Maintenance and Repair History for the Existing Swing Bridge



As bridge deterioration generally increases exponentially with age, a continual increase in rehabilitation costs is expected.

The existing bridge is limited to one lane of vehicular travel. Widening of the bridge would be required to accommodate an additional lane of travel, which would be expected to raise both structural (load-carrying capacity and brittle steel) and practical (space limitation between trusses) issues. Cantilevering a 2nd lane from the outside of the truss would also not be possible as the bridge would not be stable and balanced when swinging open.

At 108 years of age, the structure is beyond the end of its expected life. The costs associated with keeping it operational and in good condition will continue to increase. There are concerns with the corrosion and brittleness of the structural steel and this could lead to failure of local members and jeopardize serviceability of the truss given its lack of redundancy. These issues are likely to increase the risk of bridge breakdowns or closures for repair, which will disrupt traffic to and from the island. In addition, rehabilitation of the structure does not address traffic delays associated with the single lane available on the bridge.

3.3 Traffic Safety and Operations

A Traffic Study Report was carried out as part of this study and summarizes existing traffic conditions in the study area. Based on the findings of this study, the characteristics of Highway 6 within the vicinity of Little Current are as follows:

- There is one single lane that is used for two-way traffic across the existing bridge span
- There are signals that control traffic on both the north and south approaches of the bridge. At the south traffic light, there are three separate lanes on the approach which are each

- controlled by a separate signal head. At the north traffic light, there is one lane on the approach
- During the summer, the swing bridge opens for 15 minutes of each daylight hour to allow boats to pass through the channel
- The existing mainline traffic volumes on Highway 6 are low within the vicinity of Little Current. As the study area is located within an area that is popular with tourists, there is high seasonal variation in traffic patterns. The summer traffic volumes are notably higher than winter and annual average daily traffic volumes. The current (2018) Annual Average Daily Traffic (AADT) volume is 3,200 vehicles per day (vpd), and the Summer Average Daily Traffic (SADT) is 4,250 vpd
- The capacity analysis conducted for the Highway 6 and Highway 540 intersection indicates that the intersection currently operates well
- The findings of the capacity analysis indicates that the bridge generally operates at a poor level of service with significant delays. This is to be expected with a signalized one-lane bridge operation due to the delay that vehicles experience as they wait for their phase to be called
- The findings of the collision analysis also indicates that there is a higher collision rate than
 average within the study area. Most of the collisions occur either on the bridge itself, or on
 either approach to the bridge. After exploring a variety of factors as well as detailed
 collision records, it was concluded that a number of collisions, particularly rear-end
 collisions, may be attributed to the sudden slowing and stopping that occurs at the traffic
 signal control at either approach to the bridge

3.4 Problems and Opportunities

The Little Current Swing Bridge provides single-road access between the community of Little Current and Manitoulin Island and mainland areas of Northeastern Ontario and offers the only year-round access to/from the island. Currently, road access is not available for 15 minutes of each daylight hour during the summer months, to provide boat access along the North Channel. Continuous road access with traffic signals is provided at night and during the winter months when the bridge is closed to boat traffic. This current study has been initiated to address the following problems with the existing swing bridge:

- The bridge requires significant and ongoing maintenance and repairs to maintain a safe and reliable connection between Manitoulin Island and the mainland
- Due to its age, there is a significant risk of mechanical breakdown causing major disruption to the transportation network
- The type of structure (truss) provides no redundancy in the design, which increases the risk of a bridge closure causing major disruption to the transportation network
- There is potential for disruptions to emergency access due to bridge closures and Highway 6 traffic is also disrupted for 15 minutes of each hour to accommodate boat traffic during summer daylight hours



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These problems are further exasperated given that the bridge is the only permanent link to the island from the mainland.

The following opportunities were identified during the Transportation Needs Assessment phase of the study:

- Improve the reliability of the crossing
- Reduce maintenance and operating costs
- Improve access and reduce traffic delays
- Improve emergency access (shorter wait times)
- Reduce closure times
- Improve boat access (shorter wait times)

3.5 Cultural Heritage

3.5.1 Existing Bridge – Cultural Heritage Value or Interest (Provincial Heritage Property of Provincial Significance)

The Little Current Swing Bridge was listed on the MTO Ontario Heritage Bridge List in 1983. A Cultural Heritage Evaluation Report (CHER) was completed in 1987 by David Cuming and Associates and in 2009 by Unterman McPhail Associates. An additional CHER was completed in 2019 by Stantec Consulting Ltd. (Stantec) to meet current standards. Based on the recommendations of the 2019 CHER, the bridge met the criteria in Ontario Regulation 9/06 and 10/06 and MTO identified the bridge property as a Provincial Heritage Property of Provincial Significance (PHPPS).

3.5.2 Cultural Heritage Evaluation Report

A CHER was completed for the existing swing bridge as part of this study in 2019. Based on the findings of the CHER and associated assessment, the Little Current Swing Bridge meets the criteria of O. Reg 9/06, O. Reg 10/06 and the OHBG, and is considered to be of both local and provincial significance, given that the bridge is a rare remaining example of the movable swing bridge type and the longest known example in the province. It has historical associations with the development of railway lines in Northern Ontario and has contextual value as a character-defined landmark in the community that is physically, functionally, visually and historically linked to its surroundings. The existing bridge is the only provincially owned and operated movable swing bridge. Several other remaining swing bridges in the province no longer operate as swing structures.

A Heritage Impact Assessment (HIA) was completed to assess impacts of the project to this provincially significant heritage property and to recommend appropriate conservation and/or mitigation measures. The HIA was also used to inform and support MTO's Request for the MCM Minister's consent for the removal or demolition of the existing bridge. The Minister's decision and associated conditions is discussed in Section 7.3.4.

3.5.3 Statement of Cultural Heritage Value

Description of Property

The Little Current Swing Bridge is a five-span steel through truss movable swing bridge. The bridge is located on Highway 6 at the community of Little Current, on Manitoulin Island, and crosses the North Channel of Lake Huron to connect through Goat Island to the mainland. The southern end of the bridge is located in Lot 23, Concession 12, former Township of Howland, present-day Town of Northeastern Manitoulin and the Islands. The northern end of the bridge is located on Goat Island, part of the Mink Island Area, present-day Town of Northeastern Manitoulin and the Islands. Constructed in 1913, the bridge was originally designed to carry only railway traffic but was modified to accommodate both rail and vehicular traffic in 1945. Currently, the Little Current Swing bridge accommodates one lane of vehicular traffic and is the main structure connecting Manitoulin Island to the mainland.

The Little Current Swing Bridge was identified as a Provincial Heritage Property of Provincial Significance (PHPPS) by MTO.

Cultural Heritage Value

The Little Current Swing Bridge is associated with the development of railways in northern Ontario and was constructed as part of the Algoma Eastern Railway. Railway connection between northern and southern Ontario was seen as an important factor in the development of mining, pulp and paper, and timber industries in the north that needed access to markets in the southwest of the province. Planning for the Algoma Eastern Railway began as early as the 1880s as a way of connecting Manitoulin Island to the mainland and the erection of a swing bridge across the North Channel at Little Current would allow shipping traffic use of the channel while trains were not crossing the bridge. Passenger service was also part of the operation providing residents of the island with a permanent link to the mainland and eventually supporting tourism on Manitoulin Island that developed into a significant industry by the 1920s. While the plan was to connect Sudbury with southern Ontario, the railway never reached further south than Little Current. Passenger service ceased in 1963 with all rail service ending in the 1980s. The bridge is the only surviving remnant of the Algoma Eastern Railway line between Little Current and Espanola and serves as a visible reminder of the importance that was given to railway and resource development in the early 20th century.

The Little Current Swing Bridge is significant as a rare surviving example of a moveable swing bridge. It is the longest known example of a swing bridge in Ontario. The use of swing bridge designs was most prominent between 1890 and 1910. As these types of bridges often require complex systems for allowing their movement, they were used only in specific situations, typically where road or rail traffic needed to pass over a watercourse without inhibiting marine traffic. At the time of its construction, the Little Current Swing Bridge represented the height of engineering technology in movable swing bridge types.



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The superstructure consists of a two-span riveted steel through truss swing section and three riveted steel deck plate fixed approach spans. The control room is located above the centre of the bridge and accessed via a metal staircase on the east side of the bridge. To facilitate the passage of ships, the superstructure is built atop a central pier in the watercourse upon which the bridge pivots. The pivot motion allows the bridge to swing horizontally at 90 degrees, allowing marine traffic to pass through the open channel created on either side of the central pier. A pedestrian walkway on the west side of the bridge consists of wood decking and a steel railing that is supported from the bridge stringer.

The substructure of the bridge consists of the abutments, wingwalls, piers, and machinery associated with the swing bridge. The bridge has six cast-in-place concrete piers some of which contain machinery and mechanisms associated with the bridge's swinging operation. The two piers, located approximately 50 metres to the east and west of the bridge, support the bridge when it is swung into the open position. The centre pier contains the ring gear, balancing trucks, the centre pivot bearing, and four wedges and is protected from ice and ship collisions by protection cribs. The ring gear mechanism turns on a pivot using disks and eight wheels running on steel track. The bridge is locked into place by a system of wedges. Most swing bridge designs consist of two central wedges but the Little Current Swing Bridge employs four. The use of additional wedges is attributed to the substantial size of the structure when compared to other swing bridges.

Research suggests that the bridge was designed by the Canadian Bridge Company of Walkerville, Ontario, as well as the New York firm Boller, Hodge and Baird. The Canadian Bridge Company was noted in the early 20th century as a major manufacturing and construction firm in Ontario specializing in the design and construction of steel bridge structures in the province.

Set within a rural landscape, the Little Current Swing Bridge is a highly visible, unique and dominant structure crossing the channel. It is a prominent feature in the Little Current area and is a highly recognizable local landmark. The bridge features strongly in local identity, and its image is used on municipal entrance signage, banners, commemorative and interpretive materials, and local business advertisements. The bridge dominates views of the North Channel from the boardwalk and harbourfront and has been the only constant point of crossing at the area for over a century.

Description of Heritage Attributes

Heritage attributes that contribute to and/or support the cultural heritage value or interest of the Little Current Swing Bridge include:

Structure

- The size and massing of the overall structure:
- Movable swing bridge design characterized by:
 - Riveted steel through truss superstructure

- Cast in place concrete piers including central pivot pier
- Cast in place concrete abutments and wing walls
- Protection cribs
- Plate girder approach spans
- Mechanical elements related to 'swing' infrastructure including the ring gear and wedges (four centre wedges and two end wedges at each end of the bridge)
- Elevated control room above central pier and bridge deck (not including machinery and electronics, which are not original)
- Pedestrian walkway (former train worker walkway) on west side of bridge with wood decking and steel railing

Siting and Location

- Prominent and original location and setting on the North Channel of Lake Huron between Little Current and Goat Island;
- Functional and visual integration into the landscape making it a highly recognizable landmark; and
- Last surviving remnant of the Algoma Eastern Railway line between Little Current and Espanola.

Views

• Views to the bridge from Highway 6 and Little Current.

3.5.4 Ontario Heritage Bridge Guidelines

The existing bridge is listed on the Ontario Heritage Bridge List. Under the Ontario Heritage Act, MTO must comply with the OHA's *S&Gs* as well as the MTO's *Ontario Heritage Bridge Guidelines* (Interim 2008) (OHBG) as it relates to identification/evaluation, conservation, maintenance, use and/or disposal of the existing bridge.

The OHBG were originally established by MTO and MCM in 1983 to provide a clear process for identifying heritage road bridges during the early stages of planning and design work where a proposed undertaking may affect a road bridge. The OHBG are designed to provide direction on the conservation of provincially owned heritage road bridges by:

- Establishing a process for their identification, evaluation and listing at an early stage of the planning process
- Identifying conservation options to be considered when planning for any rehabilitation, widening or replacement that may be required
- Identifying the methods and principles for defining heritage values and assessing project alternatives in the Environmental Assessment process
- Ensuring the management of heritage bridges conforms to the provisions of the OHA, the EA Act and its regulations, as well as O.Reg. 104/97



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Where a bridge is known to be Listed, its status must be considered in the Class EA process, and consideration is to be given to the heritage attributes of the Listed bridge and its associated landscape by considering the various conservation options described in the OHBG. Given that the existing bridge is listed on the Ontario Heritage Bridge List, removal or demolition will only be deemed as a last resort, after all other alternatives having been considered.

As such, the following conservation options were considered for the existing bridge as separate but parallel assessment to the Alternatives to the Undertaking:

- 1. Retain the existing bridge with no major modifications
- 2. Restore missing or deteriorated elements where physical or documentary evidence existing for their design
- 3. Retain the existing bridge with sympathetic modifications
- 4. Retain the existing bridge with sympathetically designed new structure in proximity
- 5. Retain the existing bridge no longer in use for vehicular traffic but adapted for new use
- 6. Retain the existing bridge as heritage monument for viewing purposes only
- 7. Relocate the existing bridge to new location for continued or adaptive use
- 8. Remove the existing bridge and replace with a sympathetically designed structure



Table 3-1: Consideration of Conservation Options

OHBG Conservation Option		Analysis	Viable Option	
OHBG 1 2	Retention of existing bridge with no major modifications undertaken Restoration of missing or deteriorated elements where physical or documentary evidence exists for their design	Retention of the existing bridge as required for OHBG Conservation Options 1 and 2. Options 1 and 2 assume that the existing bridge would remain a single-lane bridge and would require on-going regular maintenance and rehabilitations. From a conservation perspective – Options 1 and 2: • Would require significant rehabilitation requiring strengthening of trusses, inclusion of redundant members and reconstruction of pivot gear with new parts • Reconstruction of the pivot gear could be costly and difficult to source. This could result in prolonged bridge closures • Extensive and ongoing maintenance would be costly. Since 1985, the Ministry has invested almost \$18 million to maintain the bridge to provide a safe and reliable link between Manitoulin Island and the mainland. This has included extensive maintenance and replacement of the bridge deck, structural steel and center bearing replacement, and pier and abutment repairs. This annual average investment of over \$500,000 per year is much	No No	
		higher than other typical bridges in the provincial highway network (typically greater than \$100,000 per year) From a transportation perspective, Options 1 and 2 do not meet the basic project objectives: Objective 1: Improving the reliability of the crossing. Objective 2: Reducing ongoing maintenance and operating costs. Objective 3: Improving boat access. Objective 4: Improving evacuation and emergency service access and		
		Objective 5: Improving traffic capacity and flow. Retaining a single-lane movable crossing would not improve or address traffic capacity or emergency service. The reliability of the pivot mechanism may remain a risk to the reliability of the crossing, even if repaired or replaced.		
3.	Retention of the existing bridge with sympathetic modification Additional assumptions: • That the existing bridge could be modified or widened to accommodate an additional traffic lane and/or pedestrian sidewalk(s)	In theory, this could address the project objectives, However, from an engineering perspective widening of the existing bridge is not a viable option. Cantilevering a second lane from the outside of the truss would also not be possible as the bridge would not be stable and balanced when swinging open. Other factors outlined under Options 1 and 2 such as on-going repairs, maintenance and cost would continue to be factors in Option 3.	No	



OHBG Conservation Option		Analysis	Viable Option
4.	Retention of existing bridge with sympathetically designed new structure in proximity Additional Assumptions: • The existing bridge could be "twinned" with a similar or complementary bridge being constructed along side the existing one	As with option 3, in theory, this could address the project Objectives, However, from an engineering perspective "twinning" is not a viable option. Due to the existing conditions at the crossing. In addition, given the structural design and movement of swing bridges, the two bridges cannot be accommodated in this location. Due to the swing function of the existing bridge an additionally structure in close proximity could inhibit opening of the bridge. The width of physical site cannot accommodate the footprint for two side-by-side structures Other factors outlined under options 1 and 2 such as on-going repairs, maintenance and cost would continue to be factors in option 3.	No
5	Retention of existing bridge no longer in use for vehicle purposes but adapted for new use Additional Assumptions: • Existing structure will be rehabilitated for active transportation access (e.g., bicycles, pedestrians) • New 2-lane structure provided for vehicles on new alignment	Retention of the existing bridge for an alternative use is not feasible because it would be required to remain in the open position to allow for ship access through the channel, and thus would not be able to serve non-vehicle uses. Although this option would meet some project objective 1 to increase reliability, as noted for option 4, this does not address project objective 2. The maintenance of two separate structures significantly increases maintenance and operating costs. This option includes unknown risks (i.e., costs) to meet current technical and safety requirements. Objective 3 will not be met, as the existing bridge will be a hazard for boat traffic if left in place adjacent to a new bridge. The presence of new piers and/or abutments in proximity to the existing piers and/or abutments is anticipated to create a navigational hazard and increases the risk for boat-bridge collisions. Objectives 4 and 5 would be met with this option.	No
6	Retention of bridge as a heritage monument for viewing purposes only Additional Assumptions: Bridge will be left in place and in open position for boat traffic New two-lane structure provided for vehicles and active transportation on a new alignment	Retention of the existing bridge in its existing location as a heritage monument is not possible. Refer to the discussion for option 5, as all conditions are the same for this option. In addition, leaving the swing bridge open and stationary negatively affects its cultural heritage value as a landmark.	No
7	Relocation of smaller lighter single span bridges to an appropriate new site for continued or adaptive use Additional Assumptions: • Swing bridge spans moved off-site for re-use • Approach bridge spans removed • New two-lane structure provided for vehicles and active transportation on a new alignment	While this conservation option is directed towards smaller and lighter span bridges, it may be possible to relocate the Little Current Swing Bridge, in whole or, more likely, in part, to an appropriate new site nearby for commemorative purposes. This option would include the construction of a new bridge that would meet all of the project objectives.	Yes



OHBG Conservation Option		Analysis	Viable Option
8	 Bridge removal and replacement with a sympathetically designed structure Additional Assumptions: New two-lane structure provided for vehicles and active transportation on a new alignment New structure is expected to be a movable swing bridge type New structure is expected to be a through-truss design New structure is expected to be located in an alignment within close proximity to the existing structure 	Replacing the existing movable swing bridge with a new sympathetically designed structure is a viable option and the Recommended Plan. The proposed replacement bridge type is a sympathetically designed movable swing bridge with through truss component that will be visually similar to the existing structure. As the existing bridge is the new one will be designed as a landmark structure in the community. Construction of a new bridge will meet all of the project objectives.	Yes
a)	Where possible, salvage elements/members of bridge for incorporation into new structure or for future conservation work or displays	A commemoration plan will be prepared during the detail design phase of the project. The plan will determine whether the existing bridge, in whole or in part will be included in an interpretive display. An evaluation of incorporation of salvaged components of the existing bridge in the new bridge design where feasible will be part of the detail design phase of the project.	Yes
b)	Undertake full recording and documentation of existing structure	The bridge and setting will be documented using digital photography, reality capture using LiDAR scanning, or photogrammetry to create a point cloud model and video recording of the bridge in motion.	Yes



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Based on the analysis of the OHBG Conservation Options it was determined that Options 1 through 6, requiring the bridge to remain in its current location, were not viable alternatives, and that removal and replacement of the existing Little Current Swing Bridge is the only viable option to satisfy the need to improve safety and reliability at the crossing, reduce maintenance costs, and improve access for boats and emergency services.

3.6 Alternatives to the Undertaking

The Environmental Assessment Act requires that 'reasonable alternatives' be considered in addressing identified problems and/or opportunities. This involves two levels of analysis. The Alternatives to the Undertaking considers a broad range of alternatives that could address the project needs. Once the best alternative is selected, the Alternative Methods of Carrying out the Undertaking are studied in greater detail. The Alternatives to the Undertaking considered as part of this assignment consisted of:

3.6.1 Do Nothing

Maintain the existing single-lane structure and provide on-going maintenance and repairs to the structure, as required.

3.6.2 Replace with a Ferry

A ferry that will carry traffic from Goat Island to Little Current; will require docking terminals on both sides of the shore and loading and queuing areas for vehicles.

3.6.3 Replace with a 2-lane Tunnel

A tunnel alternative will provide year-round vehicular access via a two-lane tunnel.

3.6.4 Replace with a 2-lane Movable Bridge

A two-lane structure with pedestrian and vehicular facilities that could be a lift bridge, a swing bridge, or a bascule bridge.

3.6.5 Replace with a 2-lane Fixed Bridge

A fixed structure with a higher vertical clearance to provide clearance for boat navigation and will require long approaches to meet safety and geometric standards.

3.6.6 Preliminary Assessment of Alternatives to the Undertaking

The Class EA process required that 'reasonable alternatives' are considered to address the identified problems. This involves two levels of analysis. Initially, the *Alternatives to the Undertaking* considers a broad range of alternatives that could address the project needs.

Once the best alternative is selected, the *Alternative Methods of Carrying out the Undertaking* can be studied.

A process has been developed to evaluate the conceptual options and select only the most reasonable alternatives for more detailed study. This process allows unreasonable alternatives or alternatives that do not meet provincial policy requirements to be eliminated from consideration in advance of the detailed developed and evaluation stage.

The preliminary assessment of the alternatives to the undertaken uses the following screening criteria:

- Does the option realistically address all the problems and opportunities?
- Does the option make a significant contribution towards realistically addressing all of the problems and opportunities?

Only those alternatives that satisfy at least one of the above criteria were carried forward.

The assessment of Alternatives to the Undertaking along with recommendations are summarized in **Table 3-2**.



Table 3-2: Screening Assessment of Alternatives to the Undertaking

Alternatives to the Undertaking	Does it address the Issues?	Carried Forward?
Do Nothing Maintain the existing single-lane structure and provide on-going maintenance and repairs to the structure, as required	 Provides year-round road access Risk of mechanical breakdown causing major disruption to the transportation system Risk of structural failure due to non-redundant structure type Requires extensive and ongoing operating and maintenance costs Maintains existing traffic operations, a single-land bridge, and does not reduce closure times Maintains 15-minute/hour boat access Maintains intermittent road access for emergency services 	Yes The "Do Nothing" alternative will be considered as part of a separate cultural heritage evaluation process.
Ferry Includes docking terminals on both sides of the shore, and loading and queuing areas for vehicles	 Does not provide a permanent fixed link The new ferry would reduce the risk of mechanical breakdown Requires extensive and ongoing operating and maintenance costs The ferry has limited capacity for vehicles Provides unrestricted boat traffic Maintains intermittent road access for emergency services 	No The Ferry alternative will not be carried forward as it does not realistically address all the identified problem and opportunity statements noted above.
Tunnel A two-lane tunnel	 Provides year-round road access No mechanical issues or breakdown on new tunnel Lower maintenance costs when compared to existing bridge Maintains permanent road access, providing two lanes Improve traffic operations and reduces delays Eliminates need for closure of bridge Provides unrestricted boat traffic Provide continuous emergency services access 	Yes Carried forward to the Planning Phase which will include the development of alignment and tunnel structure type alternatives.
Movable Bridge A two-lane structure with pedestrian and vehicular facilities	 Provides year-round road access Modern movable bridge reduces risk of mechanical breakdown Modern movable bridge reduces maintenance and operating costs Provides two lanes, improves traffic operations and reduces delays, improve timing of bridge closure for boat access (modern turning mechanism is faster) Reduces wait times due to modern mechanics of movable bridges Provides improved emergency services access/reduces wait times due to modern movable bridge mechanics 	Yes Carried forward to the Planning Phase which will include the development of alignment and bridge structure type alternatives.
Fixed Bridge A fixed structure with a higher vertical clearance to provide clearance for boat navigation	 Provides year-round road access No mechanical issues and minimal maintenance costs when compared to existing bridge, ferry and movable bridge Maintains permanent road access, provides two lanes, improve traffic operations and reduces delays Eliminates need for closure of bridge Provides unrestricted boat traffic Provides continuous emergency services access 	Yes Carried forward to the Planning Phase which will include the development of alignment and bridge structure type alternatives



Existing Conditions January 25, 2023

4.0 Existing Conditions

Background studies and site-specific field investigations were carried out to help to assess existing environmental conditions, including cultural heritage, contamination, fisheries and aquatic resources, terrestrial resources, hydraulics/drainage, and land use. All work was carried out in accordance with the requirements of the *Environmental Reference for Highway Design* (2006), which provides standards for scope of work, evaluation of potential impacts and proposed mitigation measures for MTO undertakings.

The background reviews to identify existing conditions were carried out between spring 2019 and fall 2020. Significant environmental features and/or constraints identified as a result of the background studies were documented and considered during the development and evaluation of alternatives.

4.1 Natural Environment

An inventory of natural environment features within the study area was undertaken based on a review of previous and relevant studies, field investigations and information received from external agencies and the public during the course of this study.

4.1.1 Physiography, Geology and Soils

The study area traverses two (2) physiographic regions, Limestone Plains and Beaches. The Limestone Plains encompass most of the study area and are characterized by a thin cover of drift material and exposed limestone bedrock. The Beaches are former shorelines now stranded by the lowering of the lake level and isostatic uplift.

Based on a review of MECP water well records (WWR), subsurface conditions recorded by others within the Little Current urban area and on the north side of Goat Island consist of discontinuous sand deposits.

The study area is generally flat; however, land uses surround the North Channel are elevated several m above the water's edge. The topography of the surrounding area slopes north and east towards the lakes' shoreline, whereas Goat Island is generally flat, sloping towards the shoreline on all sides.

The Ministry of Natural Resources and Forestry (MNRF) mapping shows bedrock near surface or outcropping at surface over much of the study area, consistent with the recorded physiography of the area. This bedrock consists of Middle Ordovician-aged rocks of undifferentiated carbonate and clastic sedimentary deposits. Specifically identified as the Ottawa and Simcoe Groups, and the Shadow Lake Formation, they comprise limestone, dolostone, shale, arkose and sandstone. The Island of Manitoulin contains many karstic erosional features due to exposure of the limestone/dolostone bedrock at the surface. Where

overburden deposits are present, they consist of clay, silt, and sand most likely of Quaternary or Pleistocene age.

4.1.2 Drainage, Surface Water, Groundwater, and Source Water

According to the MECP Source Protection Information Atlas, the study area is located outside of a Source Water Protection (SWP) area. Potable water is supplied to the community of Little Current via a distribution system that sources water from the North Channel. This distribution system is not expected to extend to Goat Island as there is minimal development on the island.

The elevation of the local groundwater table is expected to generally align with the local topography, therefore it is anticipated that lateral regional groundwater in Little Current flows towards Lake Huron (i.e., to the north and northeast), and in a radial direction on Goat Island. Groundwater recharge zones are anticipated to be located on areas of higher elevation, where drift thickness is minimal, and where bedrock is exposed at or near ground surface. The presence of bedrock near surface in the study area with erosional features present, implies an area of recharge is present.

Based on a review of MECP WWRs, there are eight (8) water well records within or adjacent to the study area, including three (3) wells domestic supply, three (3) potable water supply, one (1) industrial supply, and one (1) observation well. It is assumed that residences located along Channelview Road are supplied by the municipal water system, or by their own surface water supply. There is one (1) potentially active potable water supply well located within the study area; however, the current status of WWR No. 3900428 is not known and may still be a supply well for an adjacent facility.

The MECP WWRs indicated static water levels of the bedrock wells at 3.5 m to 6.1 m below ground surface (BGS). There was insufficient data to generate a groundwater contour plan and therefore a groundwater flow could not be determined.

4.1.3 Designated Areas

Designated Areas have special or unique value and are defined by government authorities and/or the public, and through legislation, policies, or approved management plans. These areas may have a variety of ecological, recreational, or aesthetic features and functions that are highly valued. Designated Areas include but are not limited to: Provincially Significant Areas of Natural and Scientific Interest (ANSI), Provincially Significant Wetlands (PSW), heritage rivers and national and provincial parks. There are no existing provincial or national parks in the study area.



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4.1.4 Terrestrial and Aquatic Ecosystems

Terrestrial and aquatic ecosystem conditions were assessed as part of this study based on a review of existing/available information and field investigations. Background information was obtained from the MNRF and published resources, and field investigations were carried out in June and September 2019. The findings of these investigations are documented within in the *Terrestrial Ecosystems Existing Conditions Report* and *Fish and Fish Habitat Existing Conditions Report*, a copy of which is on file with MTO. All field investigations were conducted according to the MTO *Environmental Reference for Highway Desig*n (2013) and the MTO *Environmental Guide for Fish and Fish Habitat* (2009).

4.1.4.1 Fisheries and Aquatic Resources

Lakes, rivers, streams, ponds and many wetlands provide fish habitat. Intermittent and seasonally flooded areas can also provide important habitat for some fish species at certain times of the year. In-water structures such as logs, stumps and other woody debris, pools and riffle areas, riparian and aquatic vegetation, and groundwater recharge/discharge areas also provide fish habitat. Fish habitat includes watercourses that act as corridors that allow fish to move from one area to another.

The existing Highway 6 bridge crosses the North Channel of Georgian Bay on Lake Huron, connecting Goat Island and the northeast end of Manitoulin Island. Within the immediate study area, the portion of the North Channel that is crossed by the existing bridge is also called the Little Current Channel. Currents in the North Channel can change from westerly to easterly, depending on wave action and seiche.

No specific fish sampling records were available for the immediate study area; however, the North Channel is reported to support a diverse fish community characterized by warm, cool, and cold-water species, which the MNRF manages as a cold-water fishery. Common sportfish include Smallmouth Bass (*Micropterus dolomieu*), Largemouth Bass (*Micropterus salmoides*), Northern Pike (*Esox Lucius*), Walleye (*Sander vitreus*), Muskellunge (*Esox masquinongy*), Lake Trout (*Salvelinus namaycush*), Rainbow Trout (*Oncorhynchus mykiss*) and Pacific Salmon (*Oncorhynchus spp.*). Most of these species would be expected to use the channel seasonally.

During the June 2019 field investigations, the water level was high as indicated by inundated terrestrial shoreline vegetation. Large in-water rock cribs associated with the existing bridge piers provided fish habitat complexity. Aquatic vegetation was sparse, and there was little inwater cover, with the exception of boulder and cobble substrate.

Fish habitat features were more variable along the Manitoulin Island shoreline. Although aquatic vegetation was sparse, it was not limited to the water's edge. In addition to boulder and cobble, areas with predominantly sand substrate were observed.

In situ water quality recorded during the June 2019 field investigations indicated cool water temperatures (approximately 13°C) and high dissolved oxygen concentrations ranging from

11.1 to 12.1 mg/L, which is above the Provincial Water quality Objective for both cold-water and warmwater fish communities.

In addition to the North Channel, a small unmapped and unnamed drainage feature on Goat Island, east of Highway 6, was investigated during Stantec's June 2019 field investigations. At the time of the field visit, shallow isolated pockets of standing water were observed, and are assumed to be associated with recent precipitation events. The drainage feature did not have a defined streambed or banks, and it did not provide fish habitat; however, it was observed to convey surface water directly into the North Channel. In addition, there were numerous barriers to fish movement observed, specifically rocks and boulders across the drainage pathway.

Aquatic Species at Risk

One aquatic Species at Risk (SAR), Lake Sturgeon (*Acipenser fulvescens*), with Significant Habitat is present within the study area, as defined by the *MTO Best Management Practices Manual for Fisheries* (MTO 2018). While not observed during the June 2019 field visit, background data indicates the potential presence of this species within the study area. The Great Lakes – Upper St. Lawrence Population of Lake Sturgeon is designated as Endangered; therefore, the species and its habitats are protected by *Ontario's Endangered Species Act*, 2007.

Lake Sturgeon spawn in large rivers with high velocities over a variety of substrates, including gravel. General habitat requirements for Lake Sturgeon include diverse habitats, such as shallow sand bars with low velocity and deep water with moderate velocity over a variety of substrates. Substrate preference for general habitat is also variable and may vary between systems and populations. Based on the diversity of habitats (substrates and water depths) and the documented presence of Lake Sturgeon in Georgian Bay, the design and construction of the Recommended Plan will need to consider potential impacts to Lake Sturgeon and its habitats.

4.1.4.2 Terrestrial Ecosystems

The terrestrial ecosystem is defined as the interaction of land, air, water, and biotic components functioning as an ecological unit over space and time, and includes vegetation, wetlands, wildlife, and wildlife habitat. The primary terrestrial concerns related to transportation projects include loss of habitat or habitat function, and habitat fragmentation.

The study area has been influenced by human activity including agricultural activities, and residential, industrial and commercial land use. Based on available background data and field investigations carried out as part of the Terrestrial Ecosystems Existing Conditions Report, vegetation units and wildlife habitat were identified.



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Vegetation Communities

The study area is situated within Ecoregion 6E (Lake Simcoe-Rideau Ecoregion), and more specifically the Ecodistrict of 6E-17 (Gore Bay). Most of this Ecodistrict consists of Paleozoic dolomitic limestone bedrock near the surface or exposed. Approximately 84% of Ecodistrict 6E-17 remains in natural cover (primarily forest). The land is predominantly pasture and abandoned fields. Other land uses include gravel pits, quarries, and settlement areas.

Vegetation communities in the study area are characterized by shallow soils over flat calcareous (limestone) bedrock.

A detailed inventory of the vegetation communities observed within the study area at the time of the June 2019 field investigations are discussed within the Terrestrial Ecosystems Existing Conditions Report, which is on file with MTO. The study area generally consists of meadow, thicket, woodland, thicket, forest, wetland, Alvar and constructed vegetation communities.

Species of Conservation Concern

Significant species are considered at a number of levels, including globally, nationally and provincially. In Ontario, significant species include species that are provincially rare (with a Provincial S rank of S1 to S3) or listed as Endangered, Threatened, or Special Concern on the Species at Risk in Ontario list (SARO) and/or Schedule 1 of the federal *Species at Risk Act* (SARA).

The Ontario *Endangered Species Act, 2007* prohibits harm or harassment to Threatened or Endangered species, and damage or disturbance to their habitat. The ESA applies on all private and Crown owned lands in Ontario. Habitat protection under the ESA typically includes all habitats that directly or indirectly support SAR.

Federally protected Endangered, Threatened and Special Concern species are listed in Schedule 1 of the *Species at Risk Act, 2002* and apply only to federally owned lands. Fish species are protected under the *Fisheries Act* and migratory bird species are protected under the *Migratory Bird Convention Act*, both of which are afforded protection on all lands.

Provincial ranks (S-ranks) are used by the NHIC to set protection priorities for rare species and vegetation communities. They are based on the number of occurrences in Ontario and are not legal designations. By comparing the global and provincial ranks, the status, rarity, and the urgency of conservation needs can be determined. Species with provincial ranks of S1 to S3, and those tracked by the MNRF, are considered species of conservation concern. Provincial S-ranks are defined as follows:

- S1: Critically imperiled-usually fewer than 5 occurrences
- S2: Imperiled- usually fewer than 20 occurrences
- S3: Vulnerable- usually fewer than 100 occurrences
- S4: Apparently secure- uncommon but not rare, usually more than 100 occurrences
- S5: Secure- common, widespread, and abundant

S-rank followed by a "?" indicates that the rank is uncertain

The probability that a Significant Species may be present within the study area was assessed by comparing preferred habitat types to existing conditions documented within the background review and during the June 2019 field investigations. Significant Species with preferred habitat in the study area were considered likely to be present. Significant Species with no preferred habitat in the study area were assumed to be absent.

Based on a review of the background databases, 11 SAR and 18 SOCC may be present within the Study Area. The detailed findings of the background review are documented within the Terrestrial Ecosystems Existing Conditions Report, a copy of which is on file with MTO.

Rare Vegetation

Rare vegetation was identified and documented during the 2019 field investigation, including the scientific plant names, species statuses and locations. A total of 233 vascular plants were recorded, including:

- 150 native species have a provincial rank of S5, indicating they are common with a secure population in Ontario
- 30 native species have a provincial rank of S4, indicating they are uncommon to common, but not rare in the province and populations are apparently secure
- 5 provincially rare native species with a provincial rank of S2 or S3, indicating they are imperiled, and often susceptible to extirpation. There are usually few occurrences of the species. In the study area, they were restricted to high quality alvar areas
- 41 highly sensitive native plant species with a high coefficient of conservatism value of 8, 9
 or 10 were observed in the study area. This is a high number of sensitive plant species and
 it reflects the unique and sensitive nature of the alvar communities present in the study
 area

As noted above, vegetation communities in the study area are characterized by shallow soils over flat calcareous (limestone) bedrock. Alvars, which are unique vegetation communities that can grow in these conditions, are present in the study area and generally consist of open areas with sparse tree cover containing several characteristic plant species known as alvar indicators. The alvar communities identified in the study area are considered provincially rare in Ontario and most of these are also considered to be globally rare. Of the Alvar communities observed, five (5) are considered provincially at risk or of conservation concern.

Significant Wildlife Habitat

Significant Wildlife Habitat (SWH) is defined as habitat that is ecologically important in terms of features, functions, representation or amount of contribution to the quality and diversity of an identifiable geographic area or Natural Heritage System, and is protected under the *Provincial Policy Statement*, 2020.



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Significant Wildlife Habitat includes habitats that fall within any of the following four categories:

- Seasonal concentration areas: such as moose aquatic feeding and wintering areas, deer winter yards, colonial bird nesting sites, reptile hibernacula, and heronries
- Rare vegetation communities and specialized habitats for wildlife: such as old-growth forest, areas known to support an unusually high diversity of species or vegetation communities, raptor nesting habitat, areas with concentrations of cavity trees, and moose or bear foraging areas
- Habitats for species of conservation concern, such as special concern species or species ranked provincially S1-S3, excluding the habitats of endangered and threatened species
- Animal movement corridors

The following candidate SWH features were investigated in the study area:

- Seasonal Concentration Areas Bat hibernacula, deer wintering congregation areas and deer yards, colonially – colonial nesting bird breeding habitat (bank and clifftrees/shrubs and ground), waterfowl stopover and staging areas, shorebird migratory stopover area, raptor wintering areas, bat maternity colonies, reptile hibernacula, turtle wintering area, migratory butterfly stopover area, and landbird migratory stopover area
- Rare Vegetation Communities Sand barren, alvar, cliffs and talus slopes, prairie and savannah, old growth forest, other rare vegetation communities
- Specialized Habitat for Wildlife Waterfowl nesting areas, Bald Eagle and Osprey nesting/foraging and perching habitat, Woodland raptor nesting habitat, turtle nesting areas, seeps and springs, amphibian breeding habitat (woodland and wetland), woodland area sensitive breeding bird habitat
- Habitat for Species of Conservation Concern Open country bird breeding habitat, shrub/early successional bird breeding habitat, marsh bird breeding habitat, terrestrial crayfish, Special Concern and provincially rare (S1-S3) wildlife
- Animal Movement Corridors Amphibian movement corridors, deer movement corridors

Seasonal Concentration Areas

Seasonal concentration areas are those sites where large numbers of a species gather at one time of the year, or where several species congregate. Such areas include, but are not limited to deer yards, snake and bat hibernacula, waterfowl staging and moulting areas, raptor roosts, bird nesting colonies, shorebird staging areas, and passerine migration concentrations. Only the best examples of these concentration areas are usually designated as SWH. Areas that support a Species at Risk, or areas where a large proportion of the population may be lost if the habitat is destroyed, are examples of seasonal concentration areas which should be designated as significant.

The following candidate habitat for seasonal concentration areas was identified within the study area during field investigations:

- <u>Bat Maternity Colonies:</u> Present in forest community that has potential to provide habitat for bat maternity colonies but is considered low quality (i.e., young trees). Species can be found in mixed and deciduous forests and swamps with large diameter dead or dying trees with cavities
- Reptile Hibernacula: May be present throughout study area in places where there are crevices in the bedrock. No features were observed during field investigations. Species can generally be found in rock piles or slopes, stone fences or crumbling foundations
- <u>Turtle Wintering Area:</u> Turtle overwintering habitat was identified on Goat Island. Species
 can generally be found in permanent waterbodies and large wetlands with sufficient
 dissolved oxygen; man-made ponds are not considered SWH

Rare Specialized Habitat

Rare or Specialized habitats are two separate components. Rare habitats are those with vegetation communities that are considered rare in the province. Specialized habitats are microhabitats that are critical to some wildlife species. The SWH Criteria Schedules for Ecoregion 6E identifies a number of habitats that could be considered specialized habitats, such as habitat for area-sensitive species, forests providing a high diversity of habitats, amphibian woodland breeding ponds, turtle nesting habitat, highly diverse sites, seeps and springs. The following candidate habitats for rare or specialized habitat were identified within the study area:

- Sand Barren, Alvar, Cliffs and Talus Slopes: Alvar communities are present in the study area. This type of community includes areas of exposed bed rock and patchy soil development, near vertical exposed bedrock and slopes of rock rubble
- <u>Turtle Nesting Habitat:</u> Suitable turtle nesting areas were present in the form of road shoulders throughout the length of the study area when within range of aquatic features. Such areas contained loose gravel and exposed sand. Although gravel roadsides are generally suitable for turtles nesting, they are not considered candidate SWH. No other nesting areas were visible from the highway ROW and no nests were observed
- Amphibian Breeding Habitat (woodland and wetland): Swamp and fen communities in the study area have the potential to support breeding amphibians. Species can generally be found in treed uplands with vernal pools and wetland ecosites

Animal Movement Corridors

Migration corridors are areas that are traditionally used by wildlife to move to one habitat from another. This is usually in response to different seasonal habitat requirements. There are two types of animal movement corridors in Ecoregion 6E: amphibian and deer movement corridors. These corridors are identified after amphibian breeding habitat (woodlands) and/or deer wintering/yarding areas are confirmed. No deer wintering habitat was present within the study area; however, amphibians are assumed to be present based on amphibian breeding habitat observed during the June 2019 field visit.



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Avian Species and Migratory Birds

No bird species protected under the Migratory Birds Convention Act (MBCA), including nests and/or nesting behaviours were observed at the time of the June 2019 field visit, with the exception of an Osprey nest observed at the top of a hydro tower located within the study area. The field visit included an inspection of the existing bridge structure and culvert located at the Goat Island channel, although no protected bird species were observed. A flock of resident Rock Pigeons congregated on the swing bridge, and they were presumed to be breeding on the structure; however, this species is not protected under the MBCA.

4.1.4.3 Summary of Key Terrestrial and Aquatic Ecosystem Features

Detailed terrestrial and aquatic studies have been conducted as part of this study to confirm information gathered from secondary sources The main ecological characteristics of the region include:

- Predominantly Dry-Fresh Calcareous Bedrock Mixed Meadow/Mixed Thicket/Coniferous Woodland/Coniferous Forest/Mixed Swamp, and Sedge/Shrub/Meadow Alvar vegetation communities
- Many alvar indicators that are considered provincially rare in Ontario
- One (1) record of Lake Sturgeon, an aquatic Species at Risk (SAR)
- Several terrestrial Species of Conservation Concern (SOCC) recorded in the area including: Grooved Yellow Flax, Houghton's Flatsedge, Prairie Dropseed, Slender Blazingstar, Monarch, Eastern Milksnake, Snapping Turtle, Common Nighthawk, Eastern Wood-Pewee, Golden-winged Warbler, Grasshopper Sparrow, Wood Thrush
- Potential or Confirmed habitat for Species at Risk (SAR): SAR vegetation, Blanding's Turtle, Barn Swallow, Bobolink, Chimney Swift, Eastern Meadowlark, Eastern Small-footed Myotis, Little Brown Myotis, Northern Myotis
- Primarily sportfish species

4.2 Socio-Economic Environment

4.2.1 Land Uses

The study area is located within the Town of Northeastern Manitoulin and the Islands (NEMI) in Manitoulin District. The Little Current Swing Bridge is located on Highway 6 in the community of Little Current. The only roadway access to Manitoulin Island is provided via the Little Current Swing Bridge and Highway 6.

The land use south of the bridge is a core commercial area, with open space and residential settlements. North of the bridge, Goat Island, is open area with little to no urban development.

4.2.1.1 Official Plan

The NEMI Official Plan (2014) and District of Manitoulin Official Plan (2016) provide guidance for land use and development in the study area. No land use is designated on Goat Island to the north of the Little Current Swing Bridge. To the south of the swing bridge, the immediate area is designated as Open Space Area, surrounded by Arterial Commercial Areas. There are no areas marked for future development in or adjacent to the study area.

Two specific policy areas exist in the vicinity of the study area but are not located immediately adjacent to the swing bridge or study area. To the southeast of the study area, an area is designated for seasonal residential uses that only have access by water and have no access to maintained roads. The Official Plan indicates that four season residential uses may be permitted in this area if access is provided by a municipal road that is maintained year-round. The other specific policy area lies to the southwest of the study area, where endangered and/or threatened species have been identified through a habitat evaluation completed by a qualified professional.

4.2.1.2 Mineral Resources

There are no parcels of land that have been identified as Mineral Reserve, Aggregate Resource or Protected Areas in the study area. However, there are at least two aggregate operations in proximity to the community of Little Current that contribute to the region's economic growth.

4.2.2 Potentially Contaminated Property

A Contamination Overview Study (COS) was completed in 2019 to assess the potential presence of subsurface contamination in the study area associated with current or historical land uses in the area. The COS included desktop review of available datasets, as well as a site visit conducted in 2019.

Based on the findings of the COS, several potential sources of contaminating activities were identified, including records of historical spills, waste storage and handing, and rail operations, as well as current and former industrial operations and automotive storage, repair, and fueling operations. In addition, aboveground bulk fuel storage tanks were observed on Goat Island, within the limits of the study area. In total, approximately 29 properties were identified as having low, moderate or high potential for environmental concern within and/or in the vicinity of the study area. More detailed information is documented within the COS report, a copy of which is on file with MTO.

4.2.3 Business Impact Assessment

A Business Impact Assessment (BIA) was completed to consider potential changes in accessibility to existing business, current and future traffic volumes, market orientation



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(highway and tourism versus local customer-based), market trends and stability of classes of business, and community dependence (service and employment).

4.2.3.1 Regional Study Area

For the purposes of the BIA, a Regional Study Area (RSA) was established and consisted of Manitoulin District, located in northeastern Ontario. The area was formed in 1888 is primarily comprised of Manitoulin Island, the largest island in the District, and a number of smaller islands surrounding it. With an area of 2,766 km², Manitoulin Island is the largest freshwater island in the world and contains more than a hundred lakes on its own; the three most prevalent lakes are Lake Manitou, Lake Kagawong and Lake Mindemoya (Manitoulin Tourism 2015). Manitoulin Island separates the larger part of Lake Huron to its south, west from Georgian Bay, and the North Channel to its north.

Manitoulin is the world's largest freshwater island and is a popular area for boating and highway touring and affords tourists with numerous sandy beaches, scenic roadways, lighthouses, and museums to visit. During summer months the island's usual population (approx. 12,600) grows by more than a quarter due to tourists who come to the island for boating and other recreational activities in scenic areas. Manitoulin Island offers many sporting and recreational activities such as hiking, boating, fishing, hunting, horseback riding, cycling, mountain biking, and golfing. Several cycling and hiking trails and community events draw visitors to the area.

A wide range of cultural arts and entertainment activities are also offered throughout the island, such as eco-tourism and educational interpretative tours guided by Indigenous communities. The 24 communities within Manitoulin Island are involved in a diverse range of practices, from organic farming to hunting and trapping, and from permaculture to aquaculture, all of which attract tourists to the area. Over the past three decades the economy has shifted from manufacturing and resource-related jobs to service and knowledge-based jobs.

4.2.3.2 Local Study Area

A Local Study Area (LSA) comprising the Township of NEMI and Little Current, and Indigenous communities of Sucker Creek 23 (Aundeck-Omni-Kaning First Nation), Sheguiandah 24 (Sheguiandah First Nation), as well as other smaller communities was also established as part of the BIA. The majority (i.e., 84.4%) of the LSA population lives within the Township of NEMI. Formed in 1998 through the amalgamation of the former Little Current, Township of Howland and the McGregor Bay area, the Township of NEMI is located on the northeast side of Manitoulin Island within the Manitoulin District. Little Current is the largest community within NEMI, as well as its administrative centre. NEMI also includes several smaller communities and reserves, most of the smaller islands surrounding Manitoulin.

Historically, Little Current's lumbering trade was foremost in the region, and transformed the Town into a major commercial centre on Lake Huron. The local economy in the latter half of the 1900s was dependent on lumbering and farming. Today, the local economy continues to

include farming and lumbering but tourism is the main sector that brings commercial spending to the area.

The LSA is a summer destination for marine visitors, travelling along the North Channel as well as a desirable location for cottagers, enjoying the summer months. The economy of the LSA is currently driven by seasonal tourism activities and supported by retail and other small businesses that serve permanent residents, as well as the agricultural sector. The LSA is a popular summer tourist destination supported and sustained by recreational outfitters and operations that benefit from a large influx of summer residents and tourists. Like the RSA, the two most prevalent occupations in the LSA were sales and service occupations, and trades, transport, equipment operators and related occupations.

4.2.4 Student Transportation/Education Facilities

There are two schools in the community of Little Current, Little Current Public School and Cambrian College (Manitoulin Campus), and several other public, Anishnabek and high schools located throughout Manitoulin Island. Students The Little Current Swing Bridge provides the only year-round access for students and/or study transportation services requiring access to these schools, or to/from the island.

4.2.5 Marine Infrastructure

Six marinas operate in the community of Little Current. One marina is located to the southeast of the study area, while the other five marinas are located to the west. A water aerodrome is also located to the west of Little Current, on the north shore of Manitoulin Island.

4.2.6 Navigable Waters

Navigable waters include bodies of water that are used by vessels for any part of the year as a means of transport or travel for commercial or recreational purposes, or as a means of transport or travel for Indigenous peoples of Canada exercising rights recognized and affirmed by section 35 of the Constitution Act, 1982.

The Little Current Swing Bridge spans the North Channel, which is a scheduled navigable water protected under the *Canadian Navigable Waters Act (CNWA)*. The Navigation Protection Program (NPP), which administers the CNWA, helps keep Canada's navigable waters open for transport and recreation. Any major works that may interfere with navigation must apply for approval from the Minister of Transport.

4.2.7 Recreational Trails

Highway 6, including the Little Current Swing Bridge, has been identified as part of the Province-wide Cycling Network, which is a network of cycling routes across Ontario that will:

- Promote recreational cycling and cycling tourism
- Connect municipal cycling routes and places of interest



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- Identify areas of provincial infrastructure that should accommodate cycling
- Prioritize future cycling infrastructure investments on provincial highways

This corridor has been identified as part of the on-road cycling route, which follows the entirety of Highway 6, from Highway 17 north of Espanola, to South Baymouth.

The study area lies in District 12 of the Ontario Federation of Snowmobile Clubs (OFSC). Side roads in Little Current and portions of Lake Huron are used as snowmobile trails in the winter months; however, the existing bridge has not been identified as an OFSC trail crossing, nor has the North Channel beneath the bridge.

Many recreational trail systems are available throughout Manitoulin Island, such as walking trails through the Town of NEMI, as well as nearby hiking trails which lead pedestrians through forested areas.

The Little Current Recreational Walking Trail is approximately 7 km of interconnected trails, which generally encircles the town of Little Current. Trails includes the waterfront boardwalk downtown and the Information Booth Park. The Information Booth Park, which joins the Waterfront Trail, connects the south end of the bridge area to downtown Little Current.

4.2.8 Emergency Services

Emergency Services consist of police, fire, and medical response providers. The following is the summary of emergency services within the study area and on Manitoulin Island:

- Police service in the study area is provided by the Ontario Provincial Police (OPP) Little Current Detachment, the UCCM Anishnaabe Police Service, Wiikwemkoong Tribal Police Service
- Fire services are provided by Municipality of Central Manitoulin Fire Department, the Gore Bay/Allen Township Fire Department, the Northeastern Manitoulin and the Islands Fire Department and the Town of Assiginack Fire Department
- Manitoulin-Sudbury District Services Board provides ambulance service to the Chapleau, Espanola, Foleyet, Gogama, Gore Bay, Hagar, Killarney, Little Current, Massey, Mindemoya, Noëlville, and Wikwemikong. The EMS headquarters are located in Espanola
- The community of Little Current is served by the Manitoulin Health Centre, located approximately 500 m southwest of the existing bridge, as well as its Mindemoya Hospital location, situated approximately 40 km to the southwest. On the mainland, the nearest hospital is located within Espanola beyond which is Health Services North in Sudbury

4.2.9 Agriculture

There are no active agricultural lands or operations located directly within the study area. However, agricultural land is located in proximity to the study area. The Town of NEMI Official Plan does not identify any designated agricultural areas within the study area.

(3)

4.3 Cultural Heritage Environment

4.3.1 Archaeological Resources (Land)

Archaeological potential is established by determining the likelihood that archaeological resources may be present on a subject property. Archaeological potential criteria includes proximity to previously identified archaeological sites, distance to various types of water sources, soil type, and topography. Distance to modern or ancient water sources is generally accepted as the most important determinant of past human settlement patterns and considered alone, may result in a determination of archaeological potential. However, any combination of two or more other criteria, such as well-drained soils or topographic variability, may also indicate archaeological potential. Soil texture can be an important determinant of past settlement, usually in combination with other factors such as topography. The study area contains Farmington loam, which is moderately stony and has good drainage.

For Euro-Canadian sites, archaeological potential can be extended to areas of early Euro-Canadian settlement, including places of military or pioneer settlements; early transportation routes; properties listed on the municipal register or designated under the Ontario Heritage Act; and properties that local histories or informants have identified with possible historical events, activities or occupations. European settlement of Manitoulin Island began in the early 1800s with many settlers from southern Ontario emigrating to the island. The European settlement of Little Current began to increase in the 1860s with the establishment of a post office as well as saw and grist mills at Little Current.

It should be noted that extensive land disturbance can eradicate archaeological potential.

A Stage 1 Archaeological Assessment (under PIF #P415-0181-2019) of the study area was carried out in accordance with the *Standards and Guidelines for Consultant Archaeologists* (2011) and the *Ontario Heritage Act* (1990) to determine the potential for the presence of known and/or potential archaeological resources in the area based on a review of relevant background information and site visit conducted in May 2019. Based on the findings of the assessment, the following is noteworthy:

- The study area currently consists of existing roads, shorelines, undeveloped fields, woodlots, quarries and lake-bottom
- The existing Highway 6 ROW has limited archaeological potential due to previous ground disturbances
- The closest potable water source is Lake Huron, which is adjacent to, and bisects, the study area
- The settlement at Little Current was founded by Indigenous peoples in the 1850s in order to take advantage of the natural harbour. Later it was used to provide wood for the steamers that passed through as it was a shipping channel
- There are two registered archaeological sites located within 1 km of the study area. Both sites are pre-contact Indigenous sites of indeterminate time period or archaeological cultural affiliation

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Based on the above, the study area demonstrates potential for recovery of Indigenous and Euro-Canadian archaeological resources. However, many portions of the study area do not retain archaeological potential given that past disturbance associated with the development of roadways, ditches, quarries. In addition, there are low and permanently wet areas on Manitoulin Island and Goat Island within the study area, as well as steep slopes The remaining portion of the study area, consist of scrubland, grassland, woodlot, and retains potential for the recovery of archaeological resources.

A Stage 2 Archaeological Assessment was undertaken in September 2020 (under PIF #P415-0246-2020) for the lands within the preferred alignment identified as having archaeological potential, as identified within the Stage 1 Archaeological Assessment. The purpose of the Stage 2 assessment was to further assess the potential for the recovery of archaeological resources. The findings of the assessment indicated that there were no archaeological resources identified within the area, and that no further archaeological assessment activities were required within the area assessed. The report has been entered into Ontario Public Register of Reports

4.3.2 Marine Archaeological Resources

A marine archaeological overview assessment, under License #2020-11, was completed for the North Channel within the area of the preferred alignment, the findings of which indicated that the area is associated with several indicators of marine archaeological potential. While the marine portion of the study area may retain potential for submerged cultural resources associated with the original historical occupation, the study area has been subjected to complex changes in channel depth due to historical and modern dredging, strong currents, and fluctuations in water levels. The in-water geotechnical investigation undertaken as part of this study indicated that there is minimal to no soil over top of bedrock along the channel bottom within the area assessed, and therefore the preservation of in situ marine cultural resources is considered unlikely. In addition, there is also no historical documentation or accounts of historic wrecks within the study area.

As such, the potential for marine archaeological resources to be present in the area is considered low, and there is low to no potential for the identified for pre-contact Indigenous, post-contact Indigenous, and Euro-Canadian marine archaeological resources. MCM's letter dated November 8, 2020, confirmed that the report was entered into the Ontario Public Register of Reports from MCM.

4.3.3 Built Heritage Resources and Cultural Heritage Landscapes

A Cultural Heritage Resources Assessment Report, dated 17 December 2019, was undertaken by Stantec to identify any known or potential built heritage resources and/or cultural heritage landscapes within and adjacent to the study area. The report, based on a review of land use history and windshield survey conducted in May 2019 identified a total of 12 properties within the study area as having potential cultural heritage value or interest (CHVI). Each property was evaluated according to O. Reg. 9/06, the criteria for determining CHVI. In

addition, each potential heritage resource was considered both as an individual structure and as a landscape. Based on the findings, none of the properties, associated structures and/or landscapes were identified as having CHVI. As such, with the exception of the existing swing bridge, there are no known or potential built heritage resources and/or cultural heritage landscapes within or adjacent to the study area.

4.4 Indigenous Communities

The study area is situated within the traditional territory of the Anishnaabe. Manitoulin Island and the surrounding area is home to seven Anishinaabe Indigenous communities:

- Aundeck Omni Kaning First Nation
- Sheguiandah First Nation
- M'Chigeeng First Nation
- Sheshegwaning First Nation
- Whitefish River First Nation
- Wiikwemkoong Unceded Territory
- Zhiibaahaasing First Nation

With the exception of Wiikwemkoong, these Indigenous communities belong to the United Chiefs and Councils of Mnidoo Mnising (UCCMM).

These Anishnaabe communities have historic ties to the Confederacy of Three Fires (Odawa, Ojibway and the Pottawattomi Nations).

4.4.1 Historical Occupation

The study area has been potentially occupied from 7000 BC until the present day. Lake Huron was beneath the Wisconsin Glacier until approximately 7000 BC when Paleo-Indian groups moved into the area from the west or south. The earliest record of Euro-Canadian contact with Indigenous people from Manitoulin Island was in 1615 when Samuel de Champlain met with a group of Odawa at the mouth of the French River. The Odawa played an important intermediary role in the fur trade that developed during the early and mid-1600s (Cooper and Robertson 1992:22). A Jesuit mission on Manitoulin Island was reportedly created in 1648 by Father Joseph Poncet (Perkins 1989). The mission was established during a time of open warfare between the Huron and Haudenosaunee (Iroquois) First Nations and in 1650 the mission was abandoned after a raid by the Haudenosaunee. Following this attack, Manitoulin Island was mostly uninhabited, except for fishing and hunting activity (Pearen 1996:4-5). With the dispersal of the Huron, the Odawa role in trading was reduced due to conflict with the Haudenosaunee and the Algonkian 'Fire Nation' from the southern Lake Huron area (Cooper and Robertson 1992:22). As European settlement continued in the United States and southern Canada, Indigenous people began to resettle Manitoulin Island in 1833.



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4.4.2 Historic Treaties

Treaties were signed during a period of increasing land pressure from non-Indigenous settlers and industries arriving in the region. The Manitoulin Treaty of 1836 was signed with the Ottawa and Chippewas (the Odawa and Ojibway) on Manitoulin Island. The treaty negotiators, led by Lt. Governor Bond Head, sought to make Manitoulin Island a place of residence for those groups to reside. The negotiators noted the arrival of Europeans and wished to separate the territory from the settlers under the protection of the Crown. Communities in the region, including Wiikwemkoong, have claimed that the treaty did not include a surrender clause. Based on information reviewed, Bond Head's 1836 agreement did not remove land but rather brought it under the protection of the Crown and provided a written guarantee from the Lieutenant Governor that the land was theirs, although under the protection of the Crown for all "Indians" to reside on them.

Following the signing of the 1836 treaty, the treaty negotiators attempted to encourage Indigenous communities to move to Manitoulin Island was not successful. Instead, settler pressure continued to exert itself on Manitoulin Island and the surrounding region. Reserves were not set up on Manitoulin Island as part of the 1836 treaty.

By the mid-1800s, there was increased interest in what would become northern Ontario as settlers and merchants began seeking timber, minerals, and other resources. Increased population and interaction with the Indigenous populations in this area prompted a push for treaty negotiations. The 1850 Robinson-Huron Treaty was signed and included the surrender of lands north of Lake Huron. It also included the establishment of a system of reserves. Notably, the treaty included provisions to allow hunting and fishing. Whitefish River First Nation is a signatory of the Robinson Huron Treaty.

The 1862 Treaty was the result of Treaty Commissioner William McDougall, Superintendent General of Indian Affairs. The treaty included surrender language, namely that "it has been deemed expedient (with the view to the improvement of the condition of Indians as well as the settlement and improvement of the country) to assign the Indians now upon the island certain specific portions thereof to be held by patent from the Crown and to sell the other portions thereof fit for cultivation to settler...." (Manitoulin Island Treaty (1862), No. 94). Six reserve sites were established under the treaty.

Wiikwemkoong Unceded Territory asserts that they did not sign the 1862 treaty, and therefore the reserve lands remain unceded to the Crown. In 1997, the Wiikwemikoong Unceded Territory submitted a boundary claim to islands in Georgian Bay. Ontario received a mandate to begin negotiations with Wiikwemkoong and Canada in 2008.

4.5 Transportation Conditions

4.5.1 Provincial Highways

Within the study area, Highway 6 is classified as a north-south, 2-lane, undivided provincial highway (RCU – 100) that connects the community of Little Current and Manitoulin Island to the mainland areas of Northeastern Ontario. The posted speed limit of the highway is 80 km/h and the design speed is 100 km/h; however, this section of Highway 6 has two reduced speed zones: 1) a posted speed of 40 km/h begins for southbound traffic approximately 115 m north of Sim Street (entering the Town of Little Current); and 2) an advisory speed of 20 km/h is present for both northbound and southbound traffic at both ends of the single lane approaches to the Swing Bridge. A posted speed of 80 km/h begins for northbound traffic approximately 210 m north of the Swing Bridge.

4.5.2 Railways

Rail traffic to Manitoulin Island ended in the 1980s, at which time ownership of the bridge was transferred from the CP Rail to MTO. There is currently no active rail line in the study area, however, CP Rail maintains ownership of the abandoned rail line and associated rail yard situated on south shore of Goat Island, as well of portion of the study area within Little Current.

4.5.3 Utilities

Utility companies with infrastructure within the study area were requested to provide information on the location and types of the existing utility plants. **Table 4-1** provides a summary of the existing utility plants.

Table 4-1: Summary of Existing Utilities

Utility Company	Type & Location
Bell Canada	 Aerial on wood poles on east side of Highway 6 24 Fibre Optic submarine cable crossing North Channel, from south channel bank to east side of concrete pier, extending to north channel bank; as well as a 25 pair copper cable at the same location. The dip poles are highly visible on the island side 25-30 m away from the bridge while the mainland side is approximately 15 m away Aerial on wood poles on east side of Highway 6
Eastlink	 Aerial on wood poles on east side of Highway 6 Underwater fibre cable crossing North Channel, same as Bell Aerial on wood poles on east side, then crossing Highway 6 to west side at Sta 21+038



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Utility Company	Type & Location
Hydro One	 Distribution lines overhead on wood poles on east side of Highway 6, with a crossing at Sta 20+530 to a pole on the west side of the highway Underground distribution cable crossing Highway 6 at Sta 20+813 Overhead distribution lines on wood poles on east side crossing Highway 6 at Sta 21+632 Hydro sub-station approximately 55 m east of Highway 6 centreline at Sta 21+600 Overhead transmission lines cross Highway 6 from steel tower on east side to wood pole on west side at Sta 21+640 Overhead transmission lines on steel towers cross the North Channel (vertical clearance is estimated to be approximately 36 m above water level, based on correspondence from Hydro One)



Generation and Evaluation of Design Alternatives January 25, 2023

5.0 Generation and Evaluation of Design Alternatives

5.1 Generation of Design Alternatives

The purpose of this study was to identify a safe and reliable crossing of the North Channel via Highway 6 in the Town of Northeastern Manitoulin and the Islands. Given the number of possible alternatives that could be reasonably considered, a staged evaluation approach was carried out. As a first step, a long list design alternatives was identified, which included the initial development of seven corridor alternatives and five alternative structure types, as described below.

5.1.1 Corridor Alternatives

The development of the corridor alternatives was a systematic process that included consideration and input from the public, agencies and stakeholder groups to help identify project specific issues and impacts. The process began with identifying and evaluating a range of potential corridors that cross the North Channel from Little Current and connect back into Highway 6 to the north and structure type alternatives that correspond to each corridor alternatives. The corridor alternatives were developed based on the *Principles for Generating Alternatives in the Class EA for Provincial Transportation Facilities* (2000), with a goal of providing a cost-effective crossing while minimizing environmental and community related impacts during both construction and operation. The proposed corridor alternatives are summarized in the subsections below and illustrated in **Figure 4.**

5.1.2 Alternative Structure Types

Five alternative structure types were considered based on different highway alignments and bridge characteristics. Three (3) of the structure alternatives consisted of movable bridge types, including a bascule bridge, lift bridge and swing bridge. One structure alternative would generally maintain the existing alignment of Highway 6. Three of the alternatives would result in a new horizontal alignment to the highway, one that requires a significant realignment of Highway 6 approximately 650 m to the west of the existing bridge, and two of which would require a shift in the alignment Highway 6 approximately 80 m west and 80 m east of the existing bridge.

Table 5-1 provides a preliminary assessment of the alternative structure types that were considered at this stage of the planning process.



Figure 4: Corridor Alternatives





Table 5-1: Alternative Structure Types

Criteria	Swing Bridge A movable bridge with its primary structural support on a centre pivot pier, which allows for the spans to rotate horizontally, to allow taller boat access past the bridge	Vertical Lift Bridge A movable bridge which allows for the span to be raised vertically from each end to allow taller boat access past the bridge	Bascule (Double-Leaf) Bridge A movable bridge where the span can rotate vertically about its support(s) through the use of counterweights to open the two spans in the middle to allow taller boats unimpeded access under the bridge	Fixed Bridge A non-movable bridge (like most Ontario highway concrete bridges) which must be constructed high enough to allow taller boat access under the bridge	Tunnel A sub-surface (under the North Channel) fixed structure which must be constructed a safe distance below the bottom of the North Channel to sustain structural integrity and allows for unrestricted boat traffic
Geometrics & Safety	 Flatter roadway approach grades when compared to a fixed bridge or tunnel Unlimited vertical clearance for boat traffic in the open position Maintains existing horizontal navigational clearance (48 m) Maintains two navigation channels 	 Flatter roadway approach grades when compared to a fixed bridge or tunnel Limited vertical clearance (36 m) for boat traffic in the open position Maintains existing horizontal navigational clearance (48 m) Provides one navigation channel 	 Flatter roadway approach grades when compared to a fixed bridge or tunnel Unlimited vertical clearance for boat traffic in the open position Maintains existing horizontal navigational clearance (48 m) Provides one navigation channel 	 Requires steeper roadway approach grades when compared to a movable bridge Limited vertical clearance (36 m) for boat traffic Provides larger horizontal navigational clearance (55 m) compared to movable bridge alternatives Provides two navigation channels High level bridge elevation may be prone to high winds on bridge 	 Requires steeper roadway approach grades when compared to a movable bridge Unlimited vertical clearance for boat traffic Unlimited horizontal navigational clearance Does not provide a comfortable environment for pedestrians in an enclosed space
Reliability	 Mechanical breakdown could require temporary bridge closures Can experience alignment problems over time due to wear at the pivot machinery 	 Mechanical breakdown could require temporary bridge closures Typically more reliable than a swing bridge due to smaller movable span and smaller mechanical equipment 	 Mechanical breakdown could require temporary bridge closures Typically more reliable than a swing bridge due to smaller movable span and smaller mechanical equipment 	 A fixed bridge is significantly more reliable than a movable bridge with mechanical components Severe winter weather or high winds could require temporary bridge closures 	 A tunnel is more reliable than a movable bridge with mechanical components The roadway within the tunnel is protected from winter weather and high winds Malfunction of tunnel ventilation or electrical systems could require temporary tunnel closures



Constructability	 The structure type (movable) is not common in Ontario and requires specialized fabrication and construction techniques Construction could temporarily disrupt or delay boat access 	 The structure type (movable) is not common in Ontario and requires specialized fabrication and construction techniques Construction could temporarily disrupt or delay boat access 	 The structure type (movable) is not common in Ontario and requires specialized fabrication and construction techniques Construction could temporarily disrupt or delay boat access 	 The structure type (slab on girder) is common in Ontario and requires relatively standard construction techniques Construction could temporarily disrupt or delay boat access 	 Roadway tunnels are not common in Ontario and require specialized construction techniques No impact to boat access during construction Significantly higher construction risks when compared to the bridge alternatives
Cost	 Similar construction cost when compared to the fixed bridge (~ \$140 m range) Higher operating and maintenance costs when compared to the fixed bridge and tunnel alternatives 	 Similar construction cost when compared to the fixed bridge (~ \$130 m range) Higher operating and maintenance costs when compared to the fixed bridge and tunnel alternatives 	 Similar construction cost when compared to the fixed bridge (~ \$130 m range) Higher operating and maintenance costs when compared to the fixed bridge and tunnel alternatives 	 Similar construction cost when compared to the movable bridge alternatives (~ \$150 m range) No operating costs Maintenance (snow plowing) costs are similar to other bridges in Ontario 	 Significantly higher construction cost when compared to the bridge alternatives (~ \$500 m range) Requires operation costs for ventilation and electrical systems Lower maintenance (snow plowing) costs compared to bridge alternatives
Community	Minimal impacts to existing viewscapes The bridge type is sympathetic to the local heritage value of the existing bridge	 Moderate impacts to existing viewscapes The bridge type is not sympathetic to the local heritage value of the existing bridge The movable feature provides some uniqueness and provides opportunities for enhanced aesthetics 	 Minimal impacts to existing viewscapes The bridge type is not sympathetic to the local heritage value of the existing bridge The movable feature provides some uniqueness and provides opportunities for enhanced aesthetics 	 Significant impacts to existing viewscapes The bridge design is significantly different than the existing bridge, and is not sympathetic to the local heritage value of the existing bridge 	+ No impacts to existing viewscapes



Generation and Evaluation of Design Alternatives January 25, 2023

5.2 Description of Long List of Design Alternatives

As noted, each of the corridor alternatives considered was compatible with specific structure types. A long list of design alternatives was developed and evaluated at this stage of the planning process, as described herein.

Alternative 1 - Movable Bridge West of Goat Island

Alternative 1 incorporates the following key design features:

- A new movable bridge on a new alignment approximately 650 m west of existing bridge
- Alter the horizontal and vertical alignment of Highway 6 through Goat Island and Little Current
- Accommodates two lanes of traffic and pedestrian and cycling facilities
- Requires opening of the bridge to accommodate boat traffic
- Does not require a temporary detour and a temporary movable bridge

Alternative 2 – Movable Bridge West of Existing Bridge

Alternative 2 incorporates the following key design features:

- A new movable bridge on a new alignment approximately 80m west of existing bridge
- Minor horizonal and vertical alignment alterations to Highway 6
- Accommodates two lanes of traffic and pedestrian and cycling facilities
- Requires opening of the bridge to accommodate boat traffic
- Does not require a temporary detour and a temporary movable bridge

Alternative 3 – Movable Bridge Existing Alignment

Alternative 3 incorporates the following key design features:

- A new structure at the same location as the existing structure
- Maintain the existing horizontal and vertical alignment of Highway 6
- Accommodates two lanes of traffic and pedestrian and cycling facilities
- Requires opening of the bridge to accommodate boat traffic
- Requires a temporary detour and a temporary movable bridge

Alternative 4 – Movable Bridge East of Existing Bridge

Alternative 4 incorporates the following key design features:

- A new movable bridge on a new alignment approximately 80m east of existing bridge
- Minor horizonal and vertical alignment alterations to Highway 6
- Accommodates two lanes of traffic and pedestrian and cycling facilities
- Requires opening of the bridge to accommodate boat traffic

Does not require a temporary detour and a temporary movable bridge

Alternative 5a - Fixed Bridge West of Goat Island Hydro Sub-Station

Alternative 5a incorporates the following key design features:

- A new fixed bridge on a new alignment approximately 500 m east of existing bridge
- Accommodates two lanes of traffic and pedestrian and cycling facilities
- Provides free-flow traffic and will eliminate traffic delays
- Requires steeper approach grades compared to a movable bridge
- Significantly more reliable than a movable bridge
- Does not require a temporary detour and a temporary movable bridge

Alternative 5b - Tunnel West of Goat Island Hydro Sub-Station

Alternative 5b incorporates the following key design features:

- A new tunnel on a new alignment approximately 500 m east of existing bridge
- Accommodates two lanes of traffic
- Provides free-flow traffic and will eliminate traffic delays
- Requires steeper approach grades compared to a movable bridge
- Smallest environmental impacts compared to bridge alternatives
- Does not require a temporary detour and a temporary movable bridge

Alternative 6a - Fixed Bridge East of Goat Island Hydro Sub-Station

Alternative 6a incorporates the following key design features:

- A new fixed bridge on a new alignment approximately 700 m east of existing bridge
- Accommodates two lanes of traffic and pedestrian and cycling facilities
- Provides free-flow traffic and will eliminate traffic delays
- Requires steeper approach grades compared to a movable bridge
- Significantly more reliable than a movable bridge
- Does not require a temporary detour and a temporary movable bridge

Alternative 6b – Tunnel East of Goat Island Hydro Sub-Station

Alternative 6b incorporates the following key design features:

- A new tunnel on a new alignment approximately 700 m east of existing bridge
- Accommodates two lanes of traffic
- Provides free-flow traffic and will eliminate traffic delays
- Requires steeper approach grades compared to a movable bridge
- Smallest environmental impacts compared to bridge alternatives
- Does not require a temporary detour and a temporary movable bridge



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Alternative 7 - Tunnel By-Pass

Alternative 7 incorporates the following key design features:

- A new tunnel on a new alignment approximately 900 m east of existing bridge
- The new alignment by-passes the Town of Little Current
- Accommodates two lanes of traffic
- Provides free-flow traffic and will eliminate traffic delays
- Requires steeper approach grades compared to a movable bridge
- Does not require a temporary detour and a temporary movable bridge

5.3 Initial Screening of Long List of Design Alternatives

An initial screening was completed to assess the feasibility of the long list of design alternatives, prior to carrying out a detailed evaluation of a short list alternatives. Based on the findings of the screening exercise, Alternatives 1, 3 and 7 were screened out due to various engineering, environmental and community related reasons; however, the balance of the design alternatives were carried forward for further evaluation. The findings of the initial screening are briefly described herein.

Alternative 1 - Movable Bridge West of Goat Island

Alternative 1 was screened out due to the following reasons:

- Significantly impacts existing marinas and boat facilities
- Significantly impacts the existing road network and traffic patterns
- Impacts several residential properties
- The alignment is located in an area of potentially contaminated land on Goat Island

Alternative 2 – Movable Bridge West of Existing Bridge

Alternative 2 was carried forward because:

- It does not impact existing marinas and boating facilities
- It does not impact existing road network and traffic patterns

Alternative 3 – Movable Bridge Existing Alignment

Alternative 3 was screened out due to the following reasons:

- Required temporary detour and a temporary movable bridge
- Significantly impacts fish habitat and the riverbed in the North Channel due to the temporary bridge
- Cost is significantly higher when compared to other movable bridge alternatives due to the temporary movable bridge that is required

Alternative 4 – Movable Bridge East of Existing Bridge

Alternative 4 was carried forward because:

- It does not impact existing marinas and boating facilities
- It does not impact existing road network and traffic patterns

Alternative 5a – Fixed Bridge West of Goat Island Hydro Sub-Station

Alternatives 5a was carried forward because:

- It does not impact existing marinas and boating facilities
- It does not impact existing road network and traffic patterns

Alternative 5b - Tunnel West of Goat Island Hydro Sub-Station

Alternative 5b was carried forward because:

- It does not impact existing marinas and boating facilities
- It does not impact existing road network and traffic patterns

Alternative 6a - Fixed Bridge East of Goat Island Hydro Sub-Station

Alternatives 6a was carried forward because:

- It does not impact existing marinas and boating facilities
- It does not impact existing road network and traffic patterns
- The alignment avoids areas of potentially contaminated materials on Goat Island

Alternative 6b - Tunnel East of Goat Island Hydro Sub-Station

Alternatives 6b was carried forward because:

- It does not impact existing marinas and boating facilities
- It does not impact existing road network and traffic patterns
- The alignment avoids areas of potentially contaminated materials on Goat Island

Alternative 7 – Tunnel By-Pass

Alternative 7 was screened out due to the following reasons:

- It by-passes the Town of Little Current which has significant potential economic and community related impacts
- Significantly impacts the existing road network and traffic patterns

Based on the findings of the screening of the long list of design alternatives, a short list of design alternatives was carried forward for further evaluation, as described in Section 5.4.



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5.4 Evaluation of Short List of Design Alternatives

5.4.1 Evaluation Process

A detailed evaluation of the short list of design alternatives was carried out to identify an improvement plan that is cost-effective, addresses structural needs, provides safe operations, and provides reasonable local access, while minimizing the effects on the natural, social, and cultural environments. This is accomplished by identifying evaluation criteria along with their relative importance, and then ranking the overall scores of the design alternatives.

This process includes identifying evaluation criteria through the input received through the consultation process, the project team's experience on similar projects, provincial guidelines, and existing study area conditions. Draft evaluation criteria and associated weight factors were presented for public review and comment at Public Information Centre (PIC) 2, following which the evaluation criteria and weightings were reviewed and confirmed. As noted in Section 5.4.2, engineering criteria included bridge and highway engineering factors, traffic operations, constructability, and cost. Community criteria included considerations for visual aesthetics and cultural heritage, noise, businesses, recreation, property, contamination, and archaeology. Natural environment criteria included considerations for environmentally sensitive areas, species of conservation concern, fish and fish habitat, and terrestrial ecosystems.

A weight percentage was applied to each factor, which was based on project team assessment of the importance of the factor. The level of importance of each factor is relative to the other factors considered. As such, the higher the relative level of importance a factor has, the higher the associated weight value it was assigned.

The next step in the process included evaluating the short list of design alternatives. A comparative analysis of transportation and environmental effects associated with each alternative is undertaken based on the criteria, weightings, and measures. A reasoned argument approach was also applied to the evaluation, which considered the net environmental effects of each alternative.

A preliminary preferred plan is selected as the aggregate of design alternatives that achieve the best overall balance of transportation engineering, individual environmental factor impacts, and overall environmental impact, taking into consideration the net environmental effects by applying conceptual mitigation measures.

In the final step of the evaluation process, the short list of design alternatives are evaluated based on the total calculated scores by adding their weighted values. This is the basis for ranking the alternatives and, along with a reasoned argument assessment approach, helps to identify the overall Recommended Plan for the project.

With respect to the detailed evaluation of the movable bridge alternatives, the precise bridge type (bascule, lift or swing) was taken into consideration when applying the evaluation criterion. As such, a total of 10 design alternatives were subsequently subjected to the detailed

evaluation process. These design alternatives are briefly listed in **Table 5-2** and illustrated in **Figure 5** through **Figure 10**.

Table 5-2: Short List of Design Alternatives

Αl	ternative	Crossing Type	Alignment
2	Alternative 2a	Bascule Bridge	80 m west of existing bridge
	Alternative 2b	Lift Bridge	
	Alternative 2c	Swing Bridge	
4	Alternative 4a	Bascule Bridge	80 m east of existing bridge
	Alternative 4b	Lift Bridge	
	Alternative 4c	Swing Bridge	
5	Alternative 5a	Fixed Bridge	500 m east of existing bridge
	Alternative 5b	Tunnel	
6	Alternative 6a	Fixed Bridge	700 m east of existing bridge
	Alternative 6b	Tunnel	



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Figure 5: Alternative 2





Figure 6: Alternative 4





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Figure 7: Alternative 5a

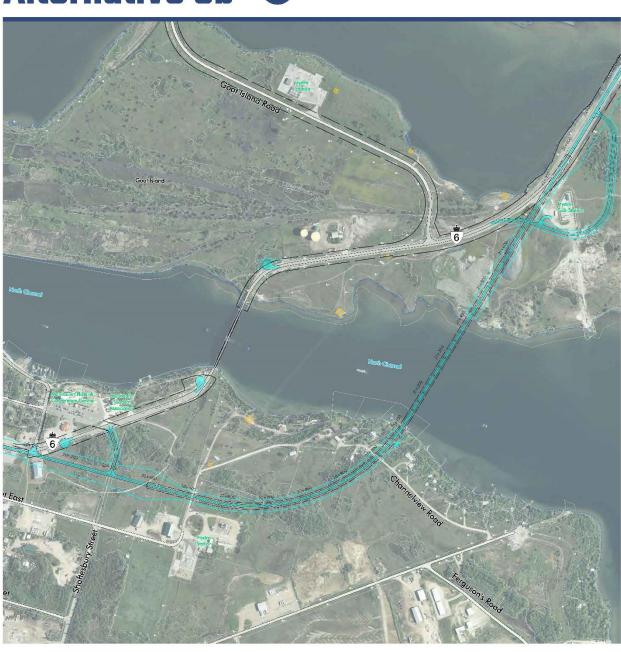




Figure 8: Alternative 5b

Alternative 5b Tunnel







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Figure 9: Alternative 6a

Alternative 6b Tunnel



Figure 10: Alternative 6b

Alternative 6a Fixed bridge







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5.4.3 Evaluation Criteria

In accordance with the MTO *Class EA for Provincial Transportation Facilities* (2000), a wide range of potential impacts to the natural, social, cultural environments in the study area are to be considered in the development and evaluation of design alternatives.

As noted in Section 5.7, the preliminary evaluation criteria were provided for public review and feedback as part of PIC 2. The criteria are independent variables, each of which may contribute a positive or negative influence on the overall suitability of an alternative based on the scoring methodology. Although it is important to explicitly consider the suitability of an alternative in terms of each criterion, it is also necessary to establish an overall composite score by determining appropriate weighting (relative importance) among the criteria. Each evaluation criterion is assigned a weight that represents its relative importance to the other criteria.

The weight for each criterion was determined based on a pairwise comparison of each criterion against another criterion. The comparison was based on engineering judgement, environmental significance, input received from external agencies, and input received from the public. The results for this process are depicted in **Figure 11**.

Table 5-3, **Table 5-4** and **Table 5-5** identify the evaluation criteria for this study including the factors considered for each criterion, and the methodology and measurement for the scoring of each factor.

Figure 11: Evaluation Criteria Weight

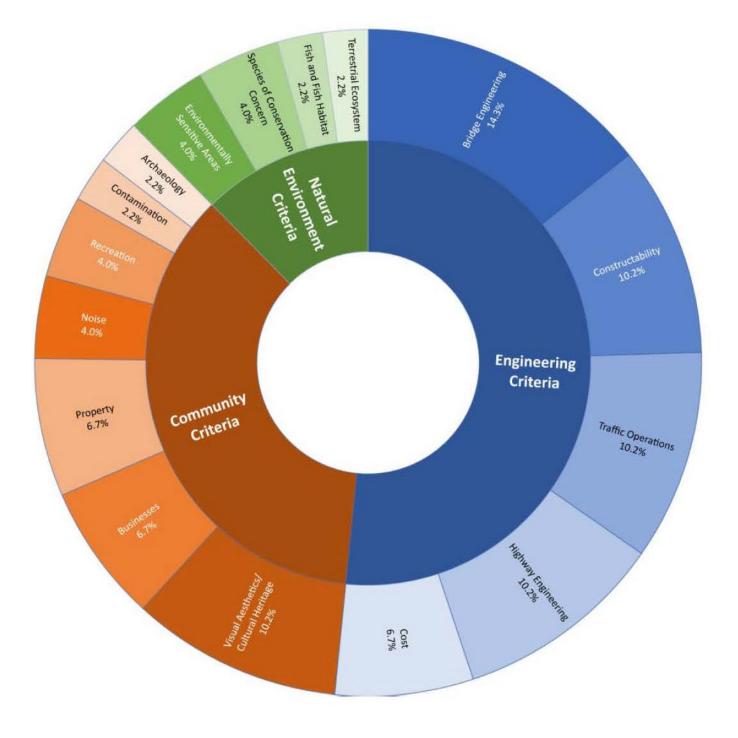




Table 5-3: Engineering Evaluation Criteria

	Engineering						
Criteria	The Best Improvement Plan	Factor	Factor Sub-Weight	Method of Measurement/ Scoring			
Traffic	Provides acceptable travel	Travel time	60%	Measure of total travel time across the bridge (Minutes)			
Operations (10.2%)	times across the bridge with the least emergency access waiting times	EMS access	40%	Number of hours available per year for emergency vehicle access across the bridge			
Highway	Meets the provincial design	Grade	40%	A measure of the steepest grade across the length of the crossing (%)			
Engineering (10.2%)	standards	Design speed	20%	The assumed driving speed over the crossing on which the crossing geometries are based on (km/h)			
	 Does not discourage active travel modes 	Potential to ice	15%	A measurement of the length of structure which has the potential to ice (m)			
	travermodes	Exposure to wind	15%	A measure of the structure height over water			
	 Has the least impact on existing utilities 	Utilities	10%	A measure of the length of impact on utilities (m)			
Constructability (10.2%)	Can be constructed using conventional construction	Conventional construction techniques/complexity	60%	Pairwise Comparison of construction techniques/complexity for each alternative			
	techniques	Foundation complexity	15%	Pairwise Comparison of foundation complexity for each alternative			
	Can be constructed with minimal impacts to traffic	Temporary impacts to traffic	10%	Pairwise Comparison of temporary impacts to traffic for each alternative			
	minima impacts to traine	Schedule risk delay	15%	A measure of the delay on the construction schedule due to schedule risk (months)			
Bridge	Is a crossing that is durable	Durability of superstructure	40%	Pairwise Comparison of durability of the crossing for each alternative			
Engineering (14.3%)	and reliable over its lifespan	Reliability	30%	Pairwise Comparison of reliability for each alternative			
(====,,		Structural redundancy	20%	Pairwise Comparison of structural redundancy for each alternative			
		Complexity of inspections	10%	Pairwise Comparison of the complexity of bridge inspections for each alternative			
Cost	Has the lowest total cost	Life cycle cost	70%	Total cost of the crossing across its life span (\$M)			
(6.7%)	across its lifespan	Cost risk	30%	The additional potential costs associated with unforeseen circumstances			



Table 5-4: Community Evaluation Criteria

Community								
Criteria	The Best Improvement Plan	Factor	Factor Sub-Weight	Method of Measurement/ Scoring				
Property (6.7%)	Has the least impact to private property	Area of impact to private property	30%	Measure of the area of private properties impacted (ha)				
(0.170)	proporty	Number of private properties impacted	70%	The number of private properties impacted				
Recreation (4.0%)	Has the least impact on recreational users using the	Boat access	25%	The number of hours per year during which there is boat access				
(4.070)	crossing and the surrounding	Available channel width	15%	A measure of the available channel width (m)				
	area	Tourism Centre impacts	10%	Pairwise Comparison of the impacts to the Tourism Centre for each alternative				
		Trails and park impacts	10%	Pairwise Comparison of the impacts to trails and parks for each alternative				
		Active transportation grade	20%	A measure of the grade for active travel modes (%)				
		Active transportation comfort	20%	Pairwise Comparison of the comfort levels associated with travelling using active modes for each alternative				
Businesses (6.7%)	Has the least impact on businesses	Business impacts	100%	Pairwise Comparison impacts to existing businesses for each alternative				
Visual Aesthetics	Does not impact the visual aesthetics of the area	Impacts to existing viewscapes	25%	Pairwise Comparison of impacts to the existing viewscapes for each alternative				
(10.2%)	aestnetics of the area	Sympathetic design	75%	Pairwise Comparison of how sympathetic the crossing design is to the aesthetics of the local area based on the existing situation				
Noise (4.0%)	Minimizes impacts at Noise Sensitive Receivers	Number of noise sensitive receivers	100%	Number of noise sensitive receivers that have the potential to experience an increase in noise				
Archaeology (2.2%)	Has the least impact on Archaeological resources	Area impacts to archaeological resources/potential areas	50%	The area of impact to registered archaeological resources and sites (ha)				
		Area impacts to marine archaeological potential areas	50%	The area of impact to marine archaeological potential areas (ha)				
Contamination (2.2%)	Minimized the number of properties impacted with potential sources of contamination	Number of properties impacted with potential sources of contamination	100%	The number of properties impacted				



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Table 5-5: Environment Evaluation Criteria

	Environment							
Criteria	The Best Improvement Plan	Factor	Factor Sub-Weight	Method of Measurement/ Scoring				
Terrestrial	Has the least impact on wildlife	Impact to wildlife habitat	85%	Identify area of wildlife habitat impacted (ha)				
Ecosystem (2.2%)	habitat and on trees and/or vegetation	Impact to woodlot areas	15%	Identify areas of woodlot impacted (ha)				
Species of Conservation Concern (4.0%)	Does not impact Species at Risk or habitat associated with Species at Risk	Impact to potential SAR habitat	100%	Identify area of impact to potential rare or Species-at-Risk habitat (ha)				
Environmentally Sensitive Areas (4.0%)	Has the least impact on Alvar areas	Impact to alvar habitat	60%	Identify areas of Alvar impacted (ha)				
Fish & Fish Habitat (2.2%)	Minimizes impacts to fish and fish habitat	In-water footprint	20%	Identify area of impact to identified fish habitat (m²)				

5.4.4 Advantages and Disadvantages

A summary of the advantages, disadvantages, and overall score of Alternatives 2 and 4 (movable bridges) is provided in **Table 5-6**.

Table 5-6: Advantages and Disadvantages of Alternative 2 and Alternative 4

Category	Criteria	Alternative							
		2a Bascule Bridge	2b Lift Bridge	2c Swing Bridge	4a Bascule Bridge	4b Lift Bridge	4c Swing Bridge		
B u	Traffic Operations	 + Provides two lanes of traffic and an improvement to the traffic operation compared to the existing situation - Does not provide continuous emergency services vehicle access and opening the bridge will result in traffic delays 							
gineeri	Highway Engineering		ides generally flat grades for es compared to other bridge	•	+ The roadway profile provides generally flat grades for pedestrians and cyclists - Alignment impacts fibre optic utility lines on the eastern side of existing bridge				
ay Enç	Constructability	- Structure type is not common in Ontario and requires specialized fabrication and construction techniques + Minimal impacts to the existing road network							
Highwa	Bridge Engineering	 Not as durable or reliable compared to fixed bridge or tunnel crossing alternatives Complexity of bridge inspections would be higher compared to fixed bridge or tunnel crossing alternatives 							
_	Life Cycle Cost	Approximately \$100 M	Approximately \$102 M	Approximately \$111 M	Approximately \$102 M	Approximately \$104 M	Approximately \$113 M		



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Category	Criteria	Alternative						
		2a Bascule Bridge	2b Lift Bridge	2c Swing Bridge	4a Bascule Bridge	4b Lift Bridge	4c Swing Bridge	
nment	Business & Property	+/- Minor: Potential impact properties + Minimal impact to Little (to 5 ha of private land and 2 Current Business Area	2 number of private	+ /- Minor: Potential impact to 6 ha of private land and 8 number of private properties + Minimal impact to Little Current Business Area			
Enviro	Recreation	fixed bridge and tunnel alt		omfort level compared to	+ Gentle roadway grade a fixed bridge and tunnel alt	nd higher active transport c ernatives	omfort level compared to	
tural E		Provides intermittent boaImpacts existing walking			+ No impacts to existing ware - Provides intermittent boards	ralking trails and municipal pat access	oark	
cial & Cul	Visual Aesthetics	+ Sympathetic Design	Impacts existingviewscapesSympathetic Design	+ Provides the most sympathetically designed structure	+ Sympathetic Design	Impacts existingviewscapesSympathetic Design	+ Provides the most sympathetically designed structure	
Soci	Archaeology	+ Minimal: Potential impact to 0.85 ha of archaeological resources +/- Minor: Potential impact to 1.1 ha of marine archaeological resources			+/- Moderate: Potential impact to 2.25 ha of archaeological resources +/- Minor: Potential impact to 1 ha of marine archaeological resources			
nment	Terrestrial Ecosystem	+ Lowest footprint on terre	strial ecosystems, species o areas when compared to oth	f conservation concern and				
vironm	Species of Conservation Concern		aroue miem eempareu te eur					
ral En	Environmentally Sensitive Areas							
Natu	Fish & Fish Habitat	+/- Moderate impact: 755 m ²	+/-Moderate impact: 1085 m ²	+/- Moderate impact: 972 m ²	+/- Moderate impact: 755 m ²	+/- Moderate impact: 1085 m ²	+/- Moderate impact: 972 m ²	
Overall \	Weighted Score	7.11	7.10	7.37	6.28	6.27	6.54	
* The follo	wing factors that a	are relevant to this study l	nad minor impacts in the s	ame degree or in the same	way for all the alternatives	s: Noise and Contamination	on.	

A summary of the advantages, disadvantages, and overall score of Alternatives 5 (fixed bridge) and Alternative 6 (tunnel) is provided in **Table 5-7**.



Table 5-7: Advantages and Disadvantages of Alternative 5 and Alternative 6

Category	Criteria		Alter	native		
		5a Fixed Bridge	5b Tunnel	6a Fixed Bridge	6b Tunnel	
gui	Traffic Operations	+ Provides two lanes of free-flowing tra+ Does not require bridge closure+ Provides continuous emergency serv				
Engineering	Highway Engineering	Requires steeper approach grades than a movable bridgeImpacts utility lines	- Requires steeper approach grades than a movable bridge	- Requires steeper approach grades than a movable bridge	- Requires steeper approach grades than a movable bridge	
Highway E	Constructability	+ Structure type common in Ontario and requires relatively standard construction techniques	- Roadway tunnels are not common in Ontario and require specialized construction techniques	+ Structure type common in Ontario and requires relatively standard construction techniques	- Roadway tunnels are not common in Ontario and require specialized construction techniques	
I	Bridge Engineering	+ Highest structural redundancy	+ Most durable crossing type	+ Highest structural redundancy	+ Most durable crossing type	
	Life Cycle Cost	+/- Approximately \$135 M	- Approximately \$436 M	+/- Approximately \$134 M	- Approximately \$437 M	
.	Business & Property	- Potential impact to 10 ha of private la - Potential impact to Little Current Bus	and 10 number of private properties iness areas	 Potential impact to 10 ha of private land and 10 number of private properties Potential impact to Little Current Business areas 		
Environment	Recreation	 Steep roadway grade and lower active transport comfort level compared to movable bridge alternatives Provides continuous boat access Impacts to tourism centre 				
Cultural En	Visual Aesthetics	- Does not provide a sympathetically designed crossing	 Does not provide a sympathetically designed crossing Does not impact existing viewscapes 	- Does not provide a sympathetically designed crossing	 Does not provide a sympathetically designed crossing + Does not impact existing viewscapes 	
ి	Noise	- Highest impact on noise sensitive red	ceivers			
Social	Archaeology	- Potential impact to 3.7 ha of archaeological resources	- Potential impact to 3.7 ha of archaeological resources	- Potential impact to 3.7 ha of archaeological resources	- Potential impact to 3.7 ha of archaeological resources	
		+/- Minor: Potential impact to 0.8 ha of marine archaeological resources	+/- Minor: Potential impact to 0.8 ha of marine archaeological resources	+/- Minor: Potential impact to 0.8 ha of marine archaeological resources	+/- Minor: Potential impact to 0.8 ha of marine archaeological resources	
#	Terrestrial Ecosystem	+ Largest footprint on terrestrial ecosys	stems, species of conservation concern	and environmentally sensitive areas who	en compared to other alternatives	
Natural Environment	Species of Conservation Concern					
Na	Environmentally Sensitive Areas					
ш	Fish & Fish Habitat	+/- Minor impact: 80 m ²	+ No impact	+/- Minor impact: 80 m ²	+ No impact	
Over	rall Weighted Score	5.93	5.56	5.69	5.34	
* The follo	wing factors that are relev	vant to this study had minor impacts	in the same degree or in the same way		I .	



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5.4.5 Quantitative Evaluation

A quantitative assessment that provides a score for each design alternative was completed based on the following methodology:

Each factor associated with the evaluation criteria was given a score for each of the fixed bridge, movable and tunnel design alternatives based on the methodology set out in Table 5-6 and:

- 1. The set of scores for each factor were normalized across the design alternatives
- 2. The criteria weightings and the factor sub-weightings were applied to the normalized scores
- 3. The total score for each design alternative was obtained and the alternatives were ranked according to the total score

A summary of the final weighted scores for the alternatives evaluated in detail is shown in **Table 5-8** and summarized in **Figure 12**.

It is important to note that the Preliminary Preferred Plan was not identified solely on the merits of mathematical calculations. The matrices and application of weightings to data or numeric values were used as a tool to identify the alternative with the greatest advantages and least disadvantages. When the matrices were completed, it was confirmed that the Preliminary Preferred Plan that was identified through the data gathering, analysis and evaluation process was the "best" plan, with the largest number of advantages and that the decision-making process that led to its selection was rational and took into consideration information received, including public and agency input.

Table 5-8: Overall Score of Alternatives Evaluated in Detail

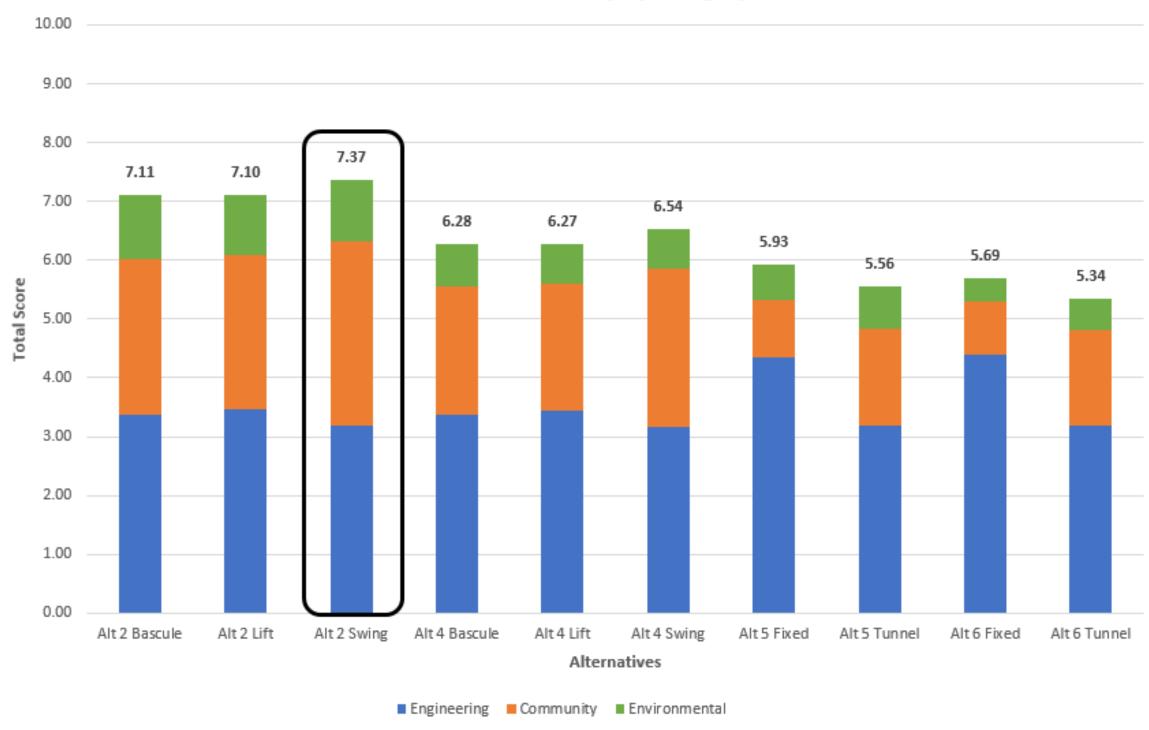
Alternative		Crossing		Criteria			
		Type	Highway Engineering	Social & Cultural Environment	Natural Environment	Weighted Score	
2	Alternative 2a	Bascule Bridge	3.38	2.65	1.09	7.11	
	Alternative 2b	Lift Bridge	3.46	2.63	1.02	7.10	
	Alternative 2c	Swing Bridge	3.18	3.15	1.04	7.37	
4	Alternative 4a	Bascule Bridge	3.36	2.19	0.72	6.28	
	Alternative 4b	Lift Bridge	3.44	2.17	0.66	6.27	
	Alternative 4c	Swing Bridge	3.17	2.69	0.68	6.54	
5	Alternative 5a	Fixed Bridge	4.34	0.98	0.62	5.93	
	Alternative 5b	Tunnel	3.18	1.66	0.72	5.56	
6	Alternative 6a	Fixed Bridge	4.39	0.92	0.38	5.69	
	Alternative 6b	Tunnel	3.19	1.62	0.53	5.34	



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Figure 12: Summary of Evaluation Results

Evaluation Summary by Category





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Based on the detailed evaluation, Alternative 2c (through-truss swing bridge located 80 m west of existing bridge) was carried forward as the Preferred Plan because it:

- Provides two lanes of traffic and an improvement to the traffic operation compared to the existing situation
- Roadway profile provides relatively flat grades for pedestrians and cyclists
- Minimizes impacts to the existing roadway network
- Does not impact existing utilities (bell fibre optic, hydro)
- Lower construction cost when compared to the fixed bridge or tunnel alternatives
- Smaller footprint when compared to the fixed bridge alternatives
- Lowest impacts to wildlife habitat and woodlot areas
- Lowest impacts to potential Species at Risk (SAR) habitat
- Lowest impacts to environmentally sensitive areas (alvar)
- Lowest impacts to existing residential properties
- Lowest impacts to noise sensitive receivers
- No change to access to Little Current business areas
- Minimal change to existing viewscapes from Little Current and the channel

A new sympathetically designed Swing Bridge will help maintain the character of the local and marine communities, which will help mitigate the heritage impacts associated with the removal of the old bridge.



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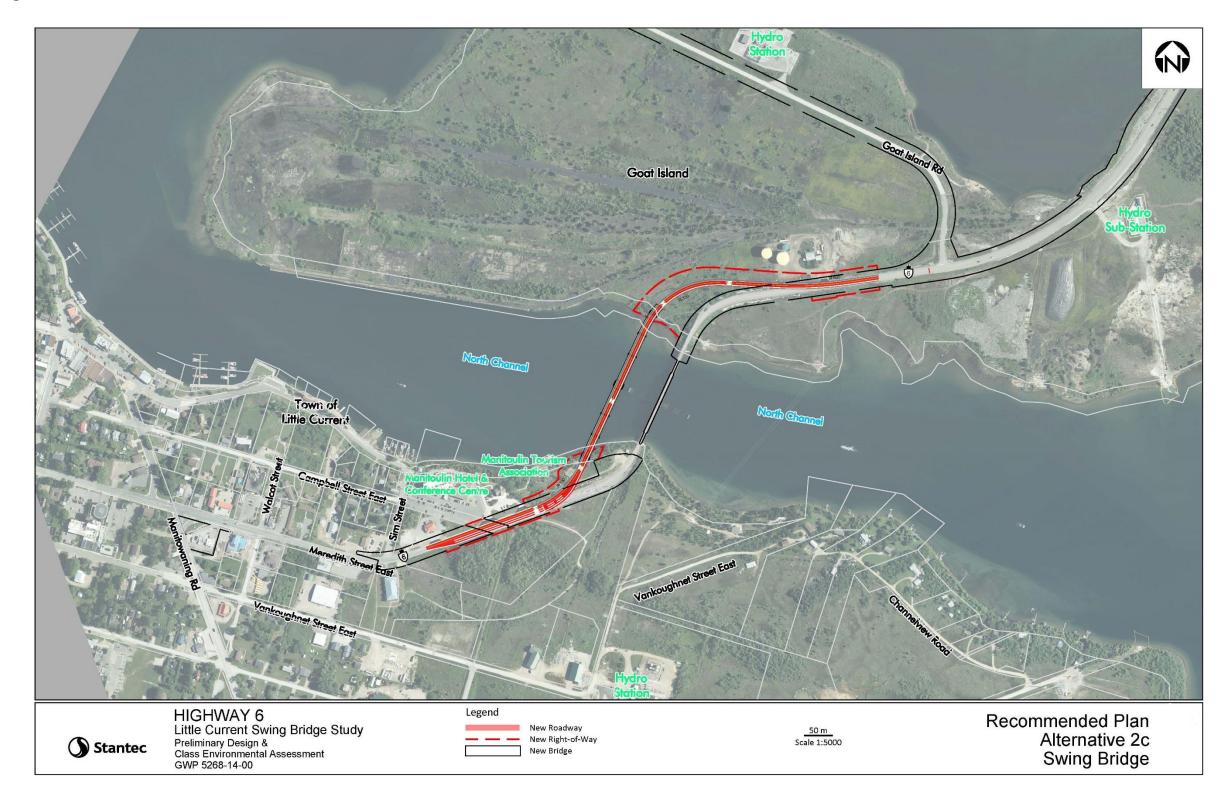
6.0 Recommended Plan

The Recommended Plan, shown in Figure 13, includes the replacement of the Little Current Swing Bridge with a new, through truss swing bridge located approximately 80 m west of the existing bridge. Additional drawings that illustrate details of the Recommended Plan are provided in **Appendix A**.



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Figure 13: Recommended Plan





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6.1 Design Criteria

Highway 6 within the study area is classified as a two-lane Rural Collector Undivided highway. The existing posted speed limit on Highway 6 is 80 km/h and the design speed is 100 km/h. However, this section of Highway 6 has two existing reduced speed zones. A posted speed of 40 km/h begins for southbound traffic approximately 115 m north of Sim Street (entering the Town of Little Current), and an advisory speed of 20 km/h is present for both northbound and southbound traffic at both ends of the existing single-lane approaches to the Swing Bridge. With the new swing bridge accommodating two-way traffic, a revision to the posted speed limit within the existing reduced speed zone will be investigated during the next stage of design. The existing posted speed of 80 km/h, which begins for northbound traffic approximately 210 m north of the Swing Bridge, will be maintained.

6.2 Highway 6

6.2.1 Alignment

The minimum design radius for horizontal curves with a 6% superelevation rate and design speed of 100 km/h is R=450 m. There are four existing horizontal curves within the project limits. Two existing horizontal curves will be retained, as they are both outside the proposed construction limits and satisfy the design requirement for their respective design speed. There will be three new horizontal curves within the construction limits due to the realignment of the highway. The entire new Highway 6 alignment (please refer to **Appendix A**) is located within reduced speed zones and satisfy the requirements for a minimum design speed of 60 km/h.

6.2.2 Cross-Section

The minimum cross-section for a two-lane rural highway with a design speed of 100 km/h and an AADT greater than 4000 vehicles is 3.75 m wide lanes with 2.5 m shoulders. There are two different cross-sections recommended for the new Highway 6 alignment.

South of the new bridge a cross-section comprising a 2.5 m paved southbound shoulder, one 3.75 m southbound lane, one 3.75 m northbound lane, and two 3.5 m northbound storage lanes with adjacent barrier curb on right is recommended. The storage lanes will start at station 20+233 and extend to station 20+400 to provide 167 m of vehicle queueing storage when the bridge is closed to vehicle traffic. The three northbound lanes will be reduced to one through a taper from station 20+400 to station 20+500 (please refer to **Appendix A**).

North of the new bridge across-section comprising a 2.5 m paved shoulder both sides, one 3.75 m southbound lane, and one 3.75 m northbound lane is recommended.

Three northbound traffic lanes will be provided on the approach to the bridge for vehicle storage during bridge openings to marine traffic. This will provide approximately 500 m of total

vehicle storage (i.e., 3 m x 167 m per lane) for northbound vehicles.in addition, the shoulders on Highway 6 throughout the project limits will be paved

Figure 14 and **Figure 15** illustrate the Highway 6 cross-sections south and north of the Little Current Swing Bridge.

Figure 14: Highway 6 Cross-Section South of Bridge

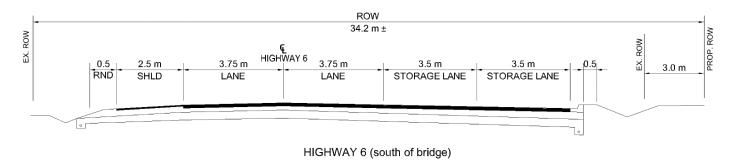
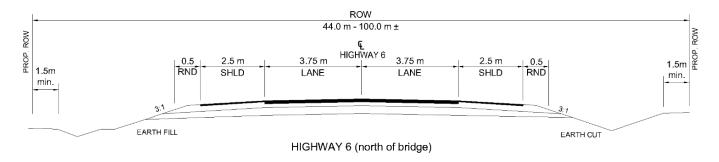


Figure 15: Highway 6 Cross-Section North of Bridge



6.2.3 Grading

Grading for cut and fill slopes will be designed in accordance with OPSD 200.010 and OPSD 201.010 and the MTO *Roadside Design Manual* (May 2020).

Crossfall on tangents will be -2.0% from centreline to edge of pavement. Superelevation on horizontal curves will be in accordance with MTO design standards.

6.2.4 Drainage

Highway 6 will be on a new horizontal alignment; however, the roadway will essentially provide the same impervious coverage as the current alignment. Given the proximity to a large body of water, the low erodibility of surrounding soils, and the relatively small increase in impervious coverage, end-of-pipe stormwater management (SWM) facilities are not anticipated to be required for water quantity control. A SWM design that will meet SWM design guidelines and policies as outlined in the MTO *Drainage Management Manual* (1997), the Ministry of the Environment *Stormwater Management Planning and Design Manual* (2003) and the MTO



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Highway Drainage Design Standards (HDSS) (2008) will be required during the next stage of design to minimize the impacts of the Recommended Plan.

6.2.4.1 Drainage Modelling

A bathymetric survey was completed on the North Channel on May 29 and 30, 2018. Areas outside of the channel were based on aerial photogrammetry. The hydraulic model extends approximately 500 m upstream and 800 m downstream of the bridge crossing.

Historical water levels recorded approximately 750 m west of the existing Swing Bridge include:

- 175.42 m Minimum Daily Water Level February 2013
- 176.46 m Average Water Level
- 177.69 m Maximum Daily Water Level November 1986
- 178.02 m Peak Instantaneous Water Level November 1985

Comparing the proposed conditions to MTO design standards provides the following results:

- The design flow water level is 178.25 m upstream of the proposed bridge with a water depth of approximately 9.0 m. The design water level meets the minimum clearance requirement of 1.0 m for a bridge crossing on a rural arterial undivided highway
- The check flow water level is 178.59 m upstream of the bridge and does not overtop the roadway (183.40 m)
- Water levels upstream of the proposed bridge are approximately 0.2 m lower than existing conditions due to the wider bridge span and lower velocities (and lower head loss) at the location of the proposed bridge
- The new bridge proposed as part of the Recommended Plan meets all MTO design standards

6.2.4.2 Roadside Drainage Facilities

It is anticipated roadside drainage facilities will consist of vegetated ditches as the primary water quality controls for enhancing the storm drainage from the highway/bridge. The MTO HDSS (SW-3) requires that roadside ditches have a minimum base width of 1.0 m and a minimum length of 40 m. The roadside ditches will be planted with vegetation to prevent erosion and trap sediments. Highway embankments can also be used to improve water quality where applicable.

More specifically, standard roadside ditches are required for areas of the new Highway 6 alignment where a rural cross-section is required. South of the new swing bridge, Highway 6 will have a semi-mountable curb adjacent to the right side, northbound storage lane. Roadway surface drainage to the east side will be controlled by the gutter and concrete curb outlets, to a scratch ditch on the east side. Additionally, roadway sub-drains will be required on Highway 6, south of the new swing bridge.

6.2.4.3 Channel Scour and Erosion Protection

Where earth fill is used in the banks adjacent to the bridge, slope protection will be provided consisting of 50% of the rip rap (rocks) having at least 400 mm diameter and placed in a minimum 600 mm thick layer. The slope protection will be placed to the toe of slope and extended approximately 5 m upstream and downstream of the edge of the structure.

6.2.4.4 Floating Debris and Ice

Floating Debris

The proposed bridge is higher and wider than the existing bridge and significant debris accumulation is not anticipated.

Ice Loads

Floating Ice

Assuming an ice thickness of 1.12 m with half of the ice above the surface, the proposed structure will consider flowing ice conditions at an elevation of 178.81 m (0.56 m above the design water level).

Ice Jam

MTO maintenance staff did not note any significant ice accumulation at the bridge site during the spring melt and runoff events.

Ice Forces

An effective ice strength of 1500 KPa and ice thickness of 1.12 m, dynamic ice forces will be used in calculating ice forces on the structure.

6.2.5 Entrances

The Recommended Plan will impact five existing entrances on Highway 6 within the study limits. **Table 6-1** provides a summary of impacted entrances as they relate to the new Highway 6 alignment.

Table 6-1: Summary of Impacts on Entrances

Side of Road	Entrance Type	Comment
Left	Commercial – Ice Cream Shop	Maintain existing with minor entrance adjustments
Left	Commercial – Manitoulin Hotel & Manitoulin Tourism Centre (shared)	Maintain existing with minor entrance adjustments



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Side of Road	Entrance Type	Comment
Left	Commercial – Manitoulin Tourism Centre	Maintain existing with minor entrance adjustments
Left	Other – Public parking lot	New entrance and new parking area for Swing Bridge Control Booth Operator
Left	Commercial/Industrial	Maintain existing with minor grade adjustments

6.2.6 Roadside Safety

Clear zone requirements will be provided in accordance with the Roadside Safety Manual. Embankments and guiderail will be designed as per MTO standards and policies during the next stage of design.

6.2.7 Traffic Signals

There are currently two sets of permanent traffic signals which control traffic crossing the existing single-lane bridge. These will be removed to facilitate the new Highway 6 alignment.

The proposed new Highway 6 alignment and new two-lane bridge will require a new set of permanent traffic signals at the approaches to both ends of the new Swing Bridge. A northbound stop bar, overhead traffic signals, as well as the vehicle queues in the two additional northbound storage lanes will be implemented to control the movement of northbound traffic.

A southbound stop bar and one set of traffic signals will be required to control southbound traffic movement.

In addition, vehicle barrier gate arms will be required approximately 20 m in advance of each approach to the new bridge.

6.2.8 Queueing Lanes

When the new bridge is operating and closed to traffic, it is expected that the maximum queue length will be 500 m for both the northbound and southbound directions. A queue of this length in the northbound direction will extend approximately to Walcot Street. Two additional auxiliary lanes, 167 m in length, to store vehicles are required to reduce the impact within the town while the bridge is closed to traffic. It is recommended that additional lane controls measures be implemented to direct drivers to the queue lanes to reduce the length of queuing. These measures include:

• Lane detectors to identify when a queue has reached a certain length and the lane is full

- Lane direction signals to identify which lanes are at capacity and to direct drivers to the appropriate lane
- Traffic signals at the start of the auxiliary lane to control which lanes are to re-enter the roadway based on their arrival sequence
- Signal timing or sensors to identify when a lane has cleared and that a new lane will be given green time

The operation and implementation of these measures will be investigated further during the next stage of design.

It is not expected that the queue in the southbound direction requires additional considerations.

6.2.9 Illumination

Existing illumination under MTO jurisdiction is present at the approaches to and on the existing bridge. Illumination requirements on Highway 6 will be maintained and will be completed during the next stage of design.

6.2.10 Utilities

Utility relocations will be required to accommodate the realignment of Highway 6. Potential utility conflicts are summarized in **Table 6-2**. Final utility relocations will be determined during the next stage of design.

Table 6-2: Summary of Utility Impacts

Utility Type	Approximate Length	
Utility Poles (Hydro One, Bell, Eastlink)	100 m	

6.3 Structures

The Recommended Plan includes replacement of the existing bridge with a new steel throughtruss swing bridge situated on a new alignment approximately 80 m west of the existing crossing. The following sections provide additional details of the new structure.

6.3.1 Span Arrangement

The configuration of the replacement structure will be similar to that of the existing bridge which has two movable swing spans and fixed spans at each approach. An overall bridge length of 273 m will position the new abutments immediately beyond the edge of water at each end. A six-span structure is proposed with two equal movable spans along with two fixed spans at each approach.

The span lengths for the swing component have been selected to match existing. Since the central pivot pier will be wider than that of the existing bridge, the resulting width available for



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navigation will be somewhat reduced. The proposed structure has spans of 40.0 m - 40.0 m - 56.5 m - 56.5 m - 40.0 m - 40.0 m. The movable spans will align approximately with those of the existing structure such that the navigation channel alignment is unchanged.

The bridge will be square with no skew. The north end of the bridge is within a 130 m radius curve of the roadway.

6.3.2 Cross-Section

The bridge cross-section will have two 3.75 m lanes.

A 1.5 m sidewalk will be provided on the west side separation railing between the sidewalk and the roadway.

In accordance with the MTO design, the required horizontal clearance from edge of lane to barrier is 1.5 m. The proposed cross-section is displayed in **Figure 16**.

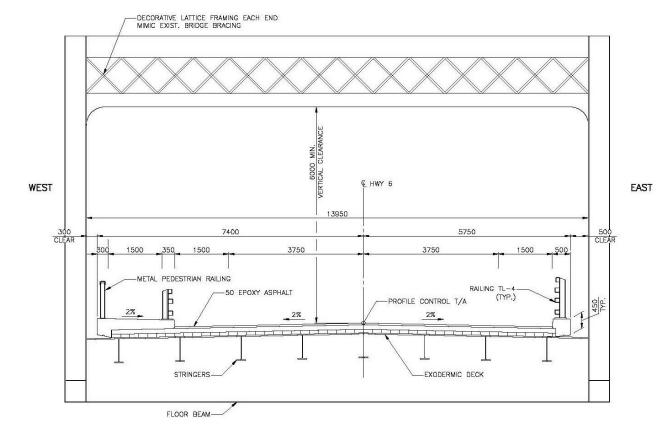


Figure 16: Proposed Cross-Section

6.3.3 Superstructures

6.3.3.1 Movable Spans

A through-truss system will be used for the swing span structure. A 'warren' style truss that is sympathetic to the existing bridge is preferred. The truss will be coated a black color similar to existing.

To reduce the risk of a vehicle strike, the clearance provided will be the maximum that can be achieved by the design. A 6.0 m minimum clearance is desired.

The clearance between the deck fascia and the truss will be confirmed at detailed design in collaboration with the Ministry.

A variety of deck systems are available for the movable spans. In general, efforts will be made to minimize the structure's mass as this will provide benefits in terms of the truss design and the machinery requirements to move the bridge. The following systems will be considered:

- Conventional Reinforced Concrete Deck
- Open Steel Grid Deck
- Grid Reinforced Concrete Deck
- Orthotropic Deck

MTO has advised that an exposed concrete riding surface will not be permitted and the standard waterproofing and asphalt system adds considerable weight. Polymer surface system will be considered given that they are effective in inhibiting the ingress of chlorides and have a minimal thickness.

6.3.3.2 Fixed Approach Spans

A slab-on-girder system supporting a 225 mm concrete deck will be provided at the approach spans. The deck will be waterproofed and paved.

The girders can be either steel or precast concrete. The girders can be curved to follow the road alignment at the north end of the bridge.

The steel girders will be coated to match the color of the truss.

6.3.4 Substructures

The abutments will be supported on spread footings founded on bedrock. Conventional cantilever abutment walls are appropriate. Wingwalls and retaining walls will be provided to prevent the roadway embankment from spilling into the watercourse.

Piers 1 and 5 are expected to consist of circular concrete columns and a pier cap. Each column will extend directly from a concrete drilled shaft caisson that is socketed into bedrock at the channel bed.

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Piers 2 and 4 will be shaft-type piers.

The pivot pier will be large, having a diameter approximately equivalent to the bridge width. It can be constructed using a "well" foundation that is sunk to bedrock. Alternatively, a precast "tub" can be floated into position and sunk onto a series of caissons to act as the formwork for the pier.

Given the size of the resting and pivot piers, mass placement concrete techniques will need to be employed to ensure a consistent curing temperature.

6.3.5 Vessel Collision Considerations

As per applicable guidelines, bridges over navigable waterways where there is a risk of vessel collision will have all elements designed for vessel impact or be suitably protected by fenders or similar devices. It can be inferred that this requirement would apply to bridges with relatively low risk of being hit such as this one where the cruise ships must wait for clearance before entering slowly into the bridge vicinity. The vessel impact design approach will be confirmed during the next stage of design.

6.3.6 Machinery for Swing Spans

The new bridge will utilize a centre pivot thrust bearing at the pivot pier to transfer the dead load of the span to the pier during operation. The bridge will be equipped with balance wheels to prevent the span from tipping during rotation.

Most of the machinery for the swing span, such as the motors, brakes, and other equipment will be in the operator's control room above deck level.

6.3.7 Barriers / Railings

A 3-rail system mounted on a concrete curb (SS110-39) will be used on the new bridge. The east railing will be extended to meet height requirements for cycling facilities. A metal pedestrian railing will also be provided at the outside edge of the sidewalk.

6.3.8 Foundations

Stantec conducted subsurface investigations and laboratory testing to determine founding conditions for a replacement structure. Six boreholes were drilled along the proposed new alignment, west of the existing structure, including four within the channel.

The land-based and near-shore boreholes encountered shallow layers of fill and gravel, typically less than 0.7 m thick. These soils are underlain by bedrock. Bedrock is exposed at the channel bed in the remaining three in-water boreholes. The dolomitic limestone bedrock is higher weathered at the surface, but quality improves with depth. Highly to completely weathered bedrock was inferred to extend to depths ranging from 0 m to 0.9 m. The sound bedrock is considered to have a strength of medium strong to very strong.

Shallow foundations seated on bedrock are recommended for the abutments.

For the piers, rock socketed caissons are preferred. Permanent steel liners, set a minimum of 300 mm into good quality rock, will be utilized. The depth of the socket will be established during the next stage of design; however, will be at least twice the caisson diameter. Axial capacity will depend on diameter and depth of the socket. A well-type foundation may be considered at the pivot pier.

Due to the shallow bedrock, there are no settlement or stability concerns associated with the approach embankments.

The design frost depth for this location is 1.7 m.

6.4 Construction Considerations & Staging

Construction of most of the Recommended Plan will be away from the existing road and bridge. Construction of these areas are not expected to affect existing traffic operations. During the new highway tie-in to the existing alignment, construction staging will include single-lane flagging.

Barges and other watercraft will be used by the contractor for access to pier construction areas, for the movement of equipment and materials, and for the delivery and erection of bridge components. Warnings consisting of signing, buoys, and lighting will be required in the channel to advise other boat operators of the hazards presented by construction operations. Detailed navigation protection plans will need to be prepared for approval by Transport Canada's Navigation Protection Program.

Timing restrictions for in-water work may dictate pier construction methodologies. Steel liners for pier columns must be installed within the allowable window. Once installed and seated, it's expected that work can continue inside the liners beyond the allowable in-water work period.

The truss structure is of a length and width that allow the span to be constructed off-site or nearby and moved into position with a barge.

The new bridge is relatively close to the existing structure and the channel alignments are remaining the same. Therefore, both swing spans will not be able to operate simultaneously. This will require a closure of the navigational channel for the period after installation of the new bridge and prior to demolition of the existing structure. If temporary restrictions on navigation are not possible, the erection will be scheduled during the non-navigation period of November through March. Testing of the operation of the new swing bridge can be expected to take one month.

Construction of the new bridge is expected to take four (4) years. Decommissioning of the existing bridge is anticipated to occur in the year following construction of the new bridge.



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7.0 Environmental Impacts and Mitigation

In accordance with the *Class EA for Provincial Transportation Facilities* (2000) and the *Environmental Reference for Highway Design* (2006), a description of the anticipated impacts associated with the Recommended Plan, and appropriate mitigation at a Preliminary Design level of detail, is described herein. The details of the Recommended Plan will be refined and finalized during the next stage of the planning design process, subsequent to the Class EA.

7.1 Natural Environment

Impacts to the natural environment have been minimized in part, by minimizing footprint impacts to undisturbed natural environments. This includes selecting a Recommended Plan that minimizes impacts to the rare and highly sensitive vegetation communities identified within the study area, as well as a structure design that imposes a reduced area of impacts to the bed of the North Channel, when compared to the other alternatives.

To the extent possible, project facilities and components will be sited to avoid and minimize interactions with wetlands, highly sensitivity habitats such as alvars, and areas of high archaeological potential; where avoidance is not possible, mitigation or compensation measures will be developed in consultation with the applicable regulatory authorities.

Although the Recommended Plan will have direct impacts to wildlife habitat and vegetation, impacts at the larger watershed and ecosystem scale are not expected to be significant.

7.1.1 Indigenous Rights

The North Channel and surrounding waters are located within the Traditional Territory of the Anishnaabe, and the protection of the water during construction activities is critically important. During the course of this study, it was requested that, given their respected and vital role as community advisors, a table of Elders (or Getsijg) be established as an advisory body before any work is undertaken within the water for this project. Further, it was noted that methods to mitigate potential impacts to the natural environment should be beyond the minimum standards.

During the next stage of planning and design for this project, engagement with Indigenous communities will be carried out at the initiation of the design and construction planning process.

7.1.2 Physiography, Geology and Soils

This study included a review of potential erosion and sediment control requirements for the Recommended Plan, based on the results of the geotechnical investigation and available background information, including soils and geological mapping.

Various mitigation techniques will be employed during construction to reduce the risk of impacts to natural environment features. Mitigation measures for sedimentation, erosion, and dust control will be implemented to prevent sediment and dust from entering sensitive natural features. An Erosion and Sediment Control Plan is recommended to be developed during the next stage of the planning and design process to confirm appropriate erosion and sediment protection measures when construction staging plans are developed.

The primary principles associated with sedimentation and erosion protection measures are to: (1) minimize the duration of soil exposure; (2) retain existing vegetation, where feasible; (3) encourage re-vegetation; (4) divert runoff away from exposed soils; (5) keep runoff velocities low; and (6) trap sediment as close to the source as possible. To address these

- The limits of construction (site boundaries) adjacent to all natural areas will be flagged and/or fenced prior to construction, and monitored during construction (along with sediment and erosion control measures)
- No equipment will be permitted to enter any natural areas beyond the sediment fencing or other delineator (site boundaries) during construction
- All materials requiring stockpiling (fill, topsoil, etc.) will be stabilized and kept a safe distance from any sensitive natural features

principles, the following mitigation measures are proposed:

- All exposed soil areas will be stabilized and re-vegetated. Seed and mulching, or seed and/or an erosion control blanket will be applied to disturbed sites promptly upon completion of construction activities
- Refuelling of equipment will be carried out away from any sensitive natural features to avoid potential impacts, in the event that an accidental spill occurs
- In addition to any specified requirements, additional sediment fencing or construction barrier will be available on site, prior to grading operations, to provide a contingency supply in the event of an emergency
- All sediment and erosion controls will be monitored regularly and properly maintained, as required. Controls will be removed only after the soils of the construction area have been stabilized and vegetation cover is re-established
- Any natural areas that are temporarily disturbed for access or construction will be restored to natural self-sustaining conditions
- Environmental controls will be monitored by an environmental inspector

7.1.3 Drainage, Surface Water, Groundwater, and Source Water

There is potential for impacts to surface water and groundwater as a result of construction activities and disturbance of contaminated soils, leaks and accidental spills during construction. Protection and mitigation measures for surface water and groundwater impacts will be confirmed during the next stage of planning design, and once construction methods and



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activities are identified. In the interim, preliminary proposed protection and mitigation measures include:

- Complete a drainage design to provide appropriate drainage capacity
- Direct runoff and overland flow away from working areas and areas of exposed soils
- Store all oils, lubricants and other chemicals in suitable containers and handle them in accordance with applicable regulations
- Do not permit refueling within 30 m of a watercourse
- During construction, identify best management practices for fuel management including secondary containment of temporary fuel storage
- Identify spill response plan for construction and clean up all spills immediately and dispose
 of contaminated materials in an approved manner. The MCEP will be informed of
 reportable spills
- Obtain draft Permit to Take Water (PTTW), if required

7.1.4 Potential Contaminated Property

The Recommended Plan is expected to impact two properties identified as having the potential to have contaminated subsurface soil and/or groundwater conditions. These properties include a portion of the former rail yard site located on Goat Island, and the location of a historical diesel spill that reportedly occurred along Highway 6 and adjacent to the existing tourism centre.

Based on the findings of the Contamination Overview Study (COS) completed as part of this study, the area on Goat Island has a high potential for environmental concern given the historic and existing presence of potentially contaminating activities being undertaken on-site. The historical spill along Highway 6 is considered to be of low potential for environmental concern, particularly since spill mitigation measures were implemented when the incident occurred.

Further on-site investigations are recommended at these sites during the next stage of design to confirm or refute the presence of contaminated subsurface soil and/or groundwater. In addition, the following mitigation measures are recommended:

- Further assessment, including Phase 1 and/or Phase 2 Environmental Site Assessment activities, are required to investigate the potential for contamination
- The selection of soil for analysis will include consideration and observations of unusual odours, staining, or debris/waste in the recovered material
- Excess soils will be managed in accordance with O.Reg. 406/19 (On-Site and Excess Soil Management) made under the Environmental Protection Act, R.S.O. 1990, c. E.19, as well as the MECP's Rules for Soil Management and Excess Soil Quality Standard, dated 2020
- Should excess water be generated during construction of the realigned roadway, water
 quality analysis will be conducted to determine appropriate management methods. This
 work will be done by a Qualified Person (QPESA as defined by Ontario Regulation 153/04)

 Should evidence of soil or water impacts be identified during construction, samples will be collected for laboratory analysis to confirm concentrations of potential contaminants to develop appropriate handing and health and safety guidelines

7.1.5 Fisheries and Aquatic Resources

Based on the Recommended Plan, in-water work will be required and there will be a new permanent footprint below the ordinary high-water mark due to the construction of bridge piers and a submarine cable. This summary of potential impacts is based on conceptual design information and will need to be updated during the subsequent planning and design phase of the project. Potential enhancement opportunities and/or habitat offsetting measures (if required) will also be identified at that time.

The permanent footprint of the Recommended Plan below the ordinary high-water level is approximately 972 m². The area is distributed among five in-water piers. The largest pier is the centre pier which will be located in deep water (i.e., approximately 8 m to 9 m deep, dependent on the water level of Lake Huron).

Habitat characteristics at the centre pier will be documented during the subsequent planning and design phase of the project. Potential impacts of construction of the submarine cable from the shore to the centre pier will also need to be determined when the location and construction methods are available.

Potential impacts to fish during construction include effects from vibration due to drilling/construction of piers and changes in water quality due to sediment or spills. Nearshore habitat beneath temporary in-water work pads for the construction of piers will be unavailable for use by fish during construction. The extent and duration of temporary disturbance will need to be determined during the next phase of design for this project.

In consultation with DFO, MTO has developed the *Best Management Practices Manual* (MTO 2020c) (i.e., Protocol) and a table of *Routine MTO Works* for activities within the MTO right-of-way that are not within a waterbody (i.e., Table 2). The Best Management Practices (BMPs) and Table 2 of the Protocol were developed for routine activities in or near water with minimal to no impacts to fish and fish habitat. Table 2 of the Protocol is not applicable to this project and there is no applicable BMP; therefore, a fisheries assessment (Step 4 of the Protocol) is required for construction of the Recommended Plan.

During the next planning and design phase of the project, the Preliminary Fisheries Assessment will need to be updated to determine the likelihood of the death of fish or harmful alteration, disruption or destruction (HADD) of fish habitat (Step 4 of the Protocol) based on the final design. Due to the nature and extent of in-water work, it is likely that a Request for Review form will need to be submitted to DFO (Step 6 of the Protocol) for review under the *Fisheries Act*.

The Fisheries Assessment can be updated for the Recommended Plan when final details of the bridge and construction methods/phasing are available, including:



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- Permanent footprint areas of in-water piers and any other permanent in-water structures or materials (e.g., rock protection)
- The size and location of temporary in-water work areas associated with bridge construction (e.g., platforms/work pads for pier construction)
- The duration of in-water work, including the duration for which temporary platforms/work pads will be in place
- Construction methods for isolation and de-watering of in-water work areas
- Construction methods for, and location of, the submarine cable(s)

Using the final design and construction details, the Fisheries Assessment will update DFO's Pathways of Effects (POEs) used in the Preliminary Fisheries Assessment to determine the residual effects of the project. MTO's Template Table D4 of the Protocol will be updated and submitted to MTO prior to preparation of a Request for Review form for DFO review.

A preliminary list of the POEs that may be applicable to construction of the new Highway 6 Swing bridge is provided below.

In-Water Activities:

- Placement of Material of Structures in Water
- Fish Passage
- Use of Industrial Equipment
- Addition or Removal of Aquatic Vegetation

In addition to the above POEs, a noise assessment may be required to address potential effects of drilling during construction of the bridge piers.

Land-Based Activities:

- Vegetation Clearing
- Excavation
- Use of Industrial Equipment
- Grading
- Use of Explosives

Residual effects of the above POEs are identified in MTO's Template Table D3 and summarized in Template Table D4 of the Protocol.

7.1.5.1 Likelihood of the Death of Fish or HADD of Fish Habitat

Additional field data are required to document potential habitat use at the proposed bridge location. Design details, construction methods and additional mitigation measures (if required) are necessary to update the Preliminary Fisheries Assessment and to determine if the project may result in the death of fish or HADD of fish habitat.

7.1.5.2 Potential Enhancement Measures

The need for habitat offsetting will be determined during the next stage of design. Opportunities for habitat enhancement identified during Stantec's 2019 field investigations include increases in habitat complexity and cover in shallow, nearshore areas. This could be achieved through the addition of boulders and/or rock piles; however, recreational use of the area must also be considered (e.g., boating). Opportunities for habitat enhancement at the piers of the proposed new bridge and restoration of the lakebed upon removal of the existing bridge will be considered during the next stage of design.

The MNRF's Upper Great Lakes Management Unit (Lake Huron) will be contacted during the next stage of design to determine if there are specific fisheries management objectives for the North Channel of Georgian Bay. If available, the objectives can be considered as potential habitat enhancement measures that may be incorporated as part of project design.

7.1.5.3 Mitigation Measures

Timing Windows

Works adjacent to aquatic resources that provide fish habitat, or have the potential to support fish habitat, are often restricted to certain periods to reduce the risk of construction-related impacts to fish during their most sensitive / vulnerable life cycles (i.e., during reproduction and early development stages of off-spring). Therefore, construction activities are often not permitted close to or within fish habitat during these periods.

In-water construction activities are permitted from July 16 to August 31 (i.e., no work from September 1 to July 15) (MNRF 2018); however, upon request from MTO, the MNRF may adjust the timing window upon review of the bridge design, construction plan, and mitigation measures. Due to the potential presence of Lake Sturgeon, review of the timing window by the Ministry of Environment, Conservation and Parks (MECP) is also recommended.

Ontario Provincial Standard Specifications

The following Ontario Provincial Standard Specifications (OPSS) are applicable to this project:

- **OPSS 180 –** General Specification for the Management of Excess Materials
- OPSS 182 General Specification for Environmental Protection for Construction in Waterbodies and on Waterbody Banks
- OPSS 517 Construction Specification for Dewatering
- OPSS 803 Construction Specification for Vegetative Cover
- **OPSS 804** Construction Specification for Temporary Erosion Control
- OPSS 805 Construction Specification for Temporary Sediment Control
- OPSS 825 Construction Specification for Placement of Aggregates in Waterbodies
- OPSS 1005 Material Specification for Aggregates Waterbody



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The OPSS are applicable to the following general activities:

- Equipment Use The use of equipment will be in accordance with OPSS 182
- Fish Salvage Fish salvage operations will be conducted in accordance with OPSS 182
- Dewatering and the Use of Pumps Dewatering activities and the use of pumps will be conducted in accordance with OPSS 517
- Preservation of Riparian Vegetation Removal of riparian vegetation will be in accordance with OPSS 182
- Erosion and Sediment Control The installation, monitoring, maintenance, and removal of temporary erosion and sediment control measures will be according to OPSS 182, OPSS 804 and OPSS 805
- Restoration of Disturbed Areas Vegetation protection and rehabilitation will be completed in accordance with OPSS 182 and OPSS 803 and OPSS 804
- Management of Excess Materials Excess material will be managed in accordance with OPSS 180
- Placement of Aggregates in Waterbodies The use of aggregate in waterbodies will be according to OPSS 825 and OPSS 1005

Other Mitigation Measures

Other mitigation measures may be required, pending the final details of bridge design and construction. Additional measures may include:

- Drill the piles for bridge piers using sealed casings (since turbidity curtains may not be effective in the area due to the water current)
- Measures associated with drilling to mitigate potential effects of vibration
- Measures associated with temporary in-water platforms/work pads, if required (e.g., materials, size, location, duration, installation and removal methods)
- Measures associated with submarine cable installation (e.g., install in a trench near shore, design and implement measures for the protection of fish, isolate in-water trenching, control of sediment)

7.1.5.4 Recommendations and Next Steps

The following additional tasks are recommended to support a Fisheries Assessment during the next stage of design of the project:

- Indigenous community members from member First Nations of the United Chief and Councils of Mnidoo Mnising Territory as well as Wiikwemkoong Unceded Territory will be consulted early in the process
- Document physical habitat characteristics at the proposed pier locations and at in water and nearshore work areas (e.g., work areas associated with installation of the submarine cable(s), temporary in-water work platforms and other areas that may be identified during the next stage of design where work will occur within 30 m of fish habitat)

- Following additional agency consultation with respect to aquatic SAR, and additional field data collection, complete a desktop assessment of anthropogenic noise (drilling activities required during construction of the new bridge piers) on fish with particular attention to Lake Sturgeon
- Once the next stage of design information and construction methods are available, consult
 with MECP and/or prepare and submit an Information Gathering Form. MECP will review
 the project to determine if the project contravenes the *Endangered Species Act* (based on
 the potential use of the area by Lake Sturgeon)
- If a change to the in-water timing window is required, a review of the timing window change will be undertaken
- The MNRF's Upper Great Lakes Management Unit (Lake Huron) will be contacted during the next stage of design to determine if there are specific fisheries management objectives for the North Channel of Georgian Bay. If available, the objectives can be considered during the design of potential habitat enhancement measures that may be incorporated as part of project design
- Update MTO's Template Table D4 (Fish and Fish Habitat Impact Documentation) of the Protocol and provide to MTO prior to completion of a Request for Review form

7.1.6 Terrestrial Habitat

Construction of the Recommended Plan will result in the direct loss of terrestrial habitat including vegetation communities within new route segments immediately north and south of the proposed bridge location, and roadside vegetation communities along the existing Highway 6 where realignment will occur. Direct loss is quantified by vegetation community type in **Table 7-1**.

There will be direct loss to three natural vegetation communities (SAR vegetation, FOMM8-1 and MEMR1c). The potential effects to communities are relatively low, as no new edges to natural features will be created.

Temporary and short-term disturbance to terrestrial habitat may also be required in the Recommended Plan area to accommodate construction. Additional details such as precise tree clearing requirements, will be determined during design. Standard mitigation is available to address construction disturbance including vegetation protection and revegetation strategies, as described in Section 11.0.



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Table 7-1: Vegetation Community Types in the Recommended Plan Area

Code	Description	Provincially Rare Community?	Approximate Area of Direct Loss (ha)
Natural			
SAR Vegetation		Yes	0.24
FOMM8-1	Fresh – Moist Poplar Mixed Forest	No	0.10
MEMR1a/ THDM4-1	Dry – Fresh Calcareous Bedrock Mixed Meadow / Native Deciduous Regeneration Thicket	No	1.19
MEMR1c	Dry – Fresh Calcareous Bedrock Mixed Meadow	No	0.07
Constructed			
CGL_2	Parkland	No	0.52
CVC_1	Commercial	No	0.11
CVC_3	Residential	No	0.38
CVI_1	Transportation	No	0.70
Disturbed	Disturbed Gravel Area	No	0.03
FOMM8-1	Fresh – Moist Poplar Mixed Forest	No	0.10
MEMR1a/THDM4-1	Dry – Fresh Calcareous Bedrock Mixed Meadow / Native Deciduous Regeneration Thicket	No	1.19
MEMR1c	Dry – Fresh Calcareous Bedrock Mixed Meadow	No	0.07

Potential Disturbance to Species at Risk

Habitat for SAR vegetation was identified within the Recommended Plan area. Construction may require removal of individual plants and disturbance to habitat.

Approximately 0.24 ha of SAR vegetation habitat is within the Recommended Plan area and may be disturbed by construction. Standard mitigation is available to address construction disturbance including habitat protection strategies.

If SAR vegetation cannot be avoided by refining work areas during the next stage of design, authorization under the ESA will be required for each identified species. The project is not eligible for exemption regulations under Ontario Regulation 242/08; therefore, a permit application under ESA Section 17.2(c) (overall benefit) would be required. The overall benefit permit application would require submission of the following documents to the MECP:

- Information Gathering Form (IGF)
- Avoidance Alternatives Form (AAF)
- 17.2(c) Permit Application Form (C-PAF)
- MECP must post the application to the Environmental Registry for public review and comment
- The Minister must determine if the application meets the following legal tests prior to issuing a permit:
- Either of the following conditions will be or have been met:
- Overall benefit to the species will be achieved within a reasonable time through requirements imposed by conditions of the permit, or
- The person who would be authorized by the permit to engage in the activity has agreed to pay any species conservation charge that is required by the permit
- Reasonable alternatives have been considered, including alternatives that would not adversely affect the species, and the best alternative has been adopted, and
- Reasonable steps to minimize adverse effects on the species are required by conditions of the permit

7.1.6.1 Other Potential Species at Risk

There is suitable habitat for the following SAR in the Recommended Plan area:

- Bobolink and Eastern Meadowlark (Threatened) MEMR1a/THDM4-1
- Eastern Small-footed Myotis, Little Brown Myotis and Northern Myotis (Endangered) large diameter canopy trees

Bobolink and Eastern Meadowlark were not detected during field investigations; however, additional preconstruction surveys are recommended using an accepted protocol such as the Ontario Ministry of Natural Resources' 'Bobolink Survey Methodology" (MNR 2012) to determine if these species are nesting in MEMR1a/THDM4-1 and to identify any required mitigation and authorization requirements under the ESA.

Endangered bats may use large diameter trees (generally greater than 10 cm diameter at breast height [DBH]) as maternity and summer roosts if present in the Recommended Plan area. Preconstruction surveys are recommended to determine if suitable roost trees will be removed and to identify any required mitigation and authorization requirements under the ESA.

Endangered Bats

To reduce the likelihood of accidental harm to bats, removal of trees greater than 10 cm DBH will occur outside the period when bats use trees for maternity roosts. Endangered bats typically give birth in late-May to early-June, and females fly with newborn young until they become excessively heavy. Young begin to fly in mid- to late- June, at age three to four weeks. Rearing is completed by August when the bats move to hibernacula (Broders et al. 2006, Cagle and Cockrum 1943, Gerson 1984).



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Therefore, to avoid endangered bats, tree removal will not occur between May 1 to August 31. If tree clearing is required between May 1 to August 31, maternity exit surveys may be conducted prior to the tree removals to determine if bats are using the trees. Maternity exit surveys are conducted during the evening and will include visual and acoustic surveys using accepted protocols.

Turtles & Snakes

Erosion and sediment control measures may also serve as a barrier for wildlife where construction abuts areas of natural vegetation, including SAR (Blanding's Turtle) and SOCC (Snapping Turtle and Milksnake).

A thorough visual search of the work area will be conducted by construction contractors before work commences in new a work area to locate any turtles or other wildlife, particularly between June 1 or after September 1 when nesting turtles are most active. If turtles or other wildlife are encountered during construction, work at that location will stop, and wildlife will be permitted reasonable time to flee the area on their own. If necessary, a qualified professional can move wildlife to a location that is both safe and suitable. Factsheets will be provided to assist contractors in the identification of potential SAR and SOCC (Blanding's Turtle, Snapping Turtle and Milksnake). Observations of SAR will be reported to MECP with 48 hours.

7.1.6.2 Potential Interference with Migratory Birds

In accordance with MTO's *Environmental Protection Requirements for Transportation Planning and Highway Design, Construction, Operation and Maintenance* all activities will be carried out to prevent the destruction of migratory birds or their nests and minimize the release of oil, oil wastes or any other substance harmful to migratory birds to any waters or any area frequented by migratory birds.

During field investigations, a flock of resident Rock Pigeons were observed on the swing bridge, and they were presumed to be nesting on the structure; however, this species is not protected under the MBCA.

Vegetation clearing during nesting periods in migratory bird breeding habitat can destroy active nests and violate the MBCA.

7.1.6.3 Potential Disturbance to Environmentally Sensitive Areas

There was one significant natural area within the Recommended Plan area that was identified as SAR vegetation. Approximately 0.24 ha of the SAR vegetation is within the Recommended Plan area and may be disturbed by construction. Standard mitigation and site-specific mitigation is recommended to address construction disturbance including vegetation protection and revegetation strategies (Section 11.0). Given the sensitive nature of alvar habitats, additional site-specific mitigation will be determined in consultation with the MNRF or other experts during the next stage of design, as appropriate.



Mitigation measures will be employed during construction to reduce the risk of impacts to the natural environment (terrestrial and aquatic). The primary principles associated with sedimentation and erosion protection measures to address impacts to the natural environment are to:

- Reduce the duration of soil exposure
- Retain existing vegetation, where feasible
- Encourage re-vegetation
- Divert runoff away from exposed soils
- Keep runoff velocities low
- Trap sediment as close to the source as possible

To address these principles, the following mitigation measures are recommended:

- Sediment fencing and/or other construction barrier will be used along construction areas that are adjacent to Environmentally Sensitive Areas, SAR habitat and SOCC habitat. Equipment and material stock piling will not be permitted within natural areas beyond the barrier fencing
- All materials requiring stockpiling (fill, topsoil, etc.) will be stabilized and kept a safe distance (>15 m) from natural areas
- All exposed soil areas within 120 m of sensitive natural features will be stabilized and revegetated, through the placement of seed and mulching or seed and an erosion control blanket within 15 days of soil exposure (45 days in all other areas) but no later than October 30
- Equipment will be refueled a minimum of 30 m away from sensitive natural features (e.g., wetlands and watercourses) to avoid potential impacts, if an accidental spill occurs
- In addition to any specified requirements, additional sediment fencing or other barrier will be available on site, prior to grading operations, to provide a contingency supply in the event of an emergency
- It is recommended that all erosion and sediment be monitored regularly and properly maintained, as required. Controls are to be removed only after the soils of the construction area have been stabilized and adequately protected until cover is re-established
- The Contractor is required to restore any disturbed natural areas to pre-construction conditions
- Banks of watercourses disturbed during site access or ditch construction will be restabilized to pre-construction configuration and condition (or better) using species native and naturally occurring to the area, where possible

7.1.6.5 Vegetation Protection

The primary mitigation strategy to protect vegetation communities and terrestrial habitat is to reduce the footprint of the new and realigned highway. This includes designing the new highway as close to existing grade as possible to reduce the requirement for roadside banks.



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Roadside banks are particularly problematic in alvar habitats because they alter drainage and create slopes that favor non-native plant species (MNRF 2014). If ditches are required in alvar habitat, they will also be constructed at grade without excavating into the alvar surface, if possible, to maintain sensitive alvar hydrology.

Sediment fencing or other construction barrier fencing will be used to separate work areas from Environmentally Sensitive Areas (i.e., SAR vegetation), SAR habitat and SOCC habitat.

Topsoil, seed banks and organic matter will be salvaged and reintroduced to any areas disturbed during construction, as appropriate. New seed will be introduced to disturbed substrates as soon as feasible following construction (within 15 days for areas less than 200 m from a waterbody or watercourse, and 45 days for other areas), and the sediment fencing and/or construction barrier will remain in place until vegetation cover is re-established.

Site specific revegetation plans will be prepared by a biologist or other qualified professional to preserve the ecological integrity of sensitive alvar communities. Planting plans will use native species mixes and avoid non-native grass and legumes that are typically used in roadside plantings and agriculture because they are common invaders of alvar habitats (MNRF 2014).

Implementation of revegetation efforts will be monitored to track and correct deficiencies with establishment and colonization of invasive or other non-desirable species that pose a threat to provincially rare alvars, and SAR and SOCC habitat.

During operations of the highway post-construction, herbicides will be avoided to control vegetation in roadside habitats and consideration will be given to de-icing compounds other than salt particularly in alvar habitat (MNRF 2014).

Site-Specific Mitigation

Preconstruction surveys for vegetation SAR and SOCC are recommended to review and refine the limits of work areas during the next stage of design, including surveys for:

- SAR vegetation
- SOCC plants

If possible, occurrences of SAR and SOCC will be avoided and protected during construction with sediment fencing or other barrier to prevent inadvertent trampling and sedimentation.

If it is not possible to avoid SAR and SOCC, individual plants of biennial will be salvaged and transplanted to a location that is suitable and out of harm's way. The salvage activity will be overseen by a biologist or other qualified professional, and a maintenance plan will be implemented, including provisions for watering transplants and weeding competitive plants.

Other mitigation measures for SAR vegetation may be required to authorize the activity under the ESA, including measures to achieve overall benefit under Section 17.2(c) of the ESA. Potential measures to achieve an overall benefit may include:

- Localized removal of select non-SAR vegetation to maintain open alvar habitats, address succession and remove competition to existing populations in the study area
- Undertaking assisted dispersal of seed heads to increase the likelihood that seeds fall on suitable substrate
- Seed collection and propagation in a controlled environment, and reintroduction of plants in suitable habitats in the study area

Monitoring to evaluate the effectiveness of overall benefit activities.

7.1.6.6 Protection of Migratory Birds

The Primary Nesting Period (PNP; the period when the percent of total nesting species is greater than 10%) for migratory bird species in the study area is April 15 to August 13 (Environment Canada 2014), although nesting may occur outside of this period, particularly for birds that nest multiple times within the breeding season. Activity must avoid active nests at any time.

7.1.6.7 Protection from Invasive Species

The Ontario Invasive Species Act, 2015 prohibits the import, possession, transport, or release of restricted species including invasive Common Reed (*Phragmites australis subsp. australis*) which was not recorded in the study area. Invasive species tend to be opportunistic and aggressive and will colonize disturbed substrates if left unattended. To protect vegetation communities including provincially rare alvars, and SAR and SOCC habitat, the following measures are recommended:

- Standard construction phase mitigation for sediment and erosion control are required to reduce substrate disturbance to the extent possible, and to revegetate disturbed areas with desirable species as soon as possible following disturbance (Section 11.0)
- Equipment and vehicles coming on site will be inspected inside and out prior to entering the site for debris such as mud or accumulation of dirt, plant material or snow/ice. Special Provision No. ENVR 0011 requires that equipment and vehicles are inspected as close to the site entrance as possible
- Equipment and vehicles with debris noted above will be cleaned in an area where risk of
 contamination is low, ideally on a mud free hard surface, at least 30 m away from
 watercourses or other drainage features, waterbodies, wetlands or other natural areas, if
 possible. Where risk of runoff is high, cleaning stations will be contained by a sediment
 fence and/or construction barrier as per standard erosion and sediment control
 specifications
- Large, accumulated debris may be removed using a compressed air device, high pressure
 hose or other device as necessary. Clean the top of equipment and vehicles first and work
 down, with particular attention to the undersides, wheels, wheel arches, guards, chassis,
 engine bays, grills and other attachments
- Clean inside vehicles by sweeping, vacuuming, or using a compressed air device, including the floor, foot wells, pedals, seats and under the seats



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- Cleaning is complete when no accumulations of dirt or snow/ice are visible on the vehicle exterior, radiators, and grills, and the vehicle interior is free of dirt, plant material and snow/ice
- Avoid driving through any wastewater when exiting the cleaning site

7.2 Socio-Economic Environment

7.2.1 Land Use

7.2.1.1 Business Impact Assessment

A range of mitigation and management actions will be implemented during construction, in cooperation with local businesses, affected landowners, and the Township of NEMI. Temporary and permanent detours and access will be provided, where necessary, to maintain continued access to residential and business properties. A Traffic Management Plan will be developed to maintain the safe and efficient movement of goods and traffic. To provide support to local businesses and affected landowners, a Business Continuity Plan and property acquisition program will be established which will aim to mitigate potential adverse effects on businesses and maintain the safe integration of project infrastructure into the built environment, respectively.

Short-Term Effects

In terms of business impacts, the temporary increase in commuting times and inconvenienced access to identified businesses within the vicinity of the project could result in minor but temporary declines in patron visits for some businesses; however, the likelihood of this occurring is low based on the application of mitigation and management measures, continued use of the existing road network and swing bridge during construction, and maintenance of access to businesses along Meredith Street East.

Businesses more likely to realize adverse effects are those whose market orientation primarily relate to seasonal regulars, tourists and other off-island customers. As such, food and accommodation businesses are more susceptible to changes in traffic and access, while businesses such as McQuarrie Motor Products Inc., which are more oriented to providing services to the local population, are considered more resilient. These types of impacts can be mitigated to some degree with signage along the newly constructed route, development of a Traffic Management Plan to maintain traffic movement, well-connected street networks, and access to businesses and other properties along the provincial highway, and business continuity planning to maintain access and parking for businesses and business operations. The extent to which identified businesses within the vicinity of project could experience adverse revenue effects is also dependent on the timing of construction.

Should construction, and in particular 'tie-in' phases, occur during seasonally high-revenue months (June through August) adverse effects could be more pronounced than seasonally

low-revenue months (November through May). Adverse effects to businesses situated beyond the local project area are anticipated to be negligible.

For some businesses, increased spending activity by the local labour force and project could off-set nuisance effects during construction. There will be a need for specialized services and materials.

Long-Term Effects

Once operational, the project will provide increased mobility and accessibility for Little Current as well as improved entry into Manitoulin Island. Business continuity planning and property acquisition programing will aim to mitigate potential adverse effects on businesses and maintain the safe integration of the project into the built environment, respectively. Long-term nuisance effects are expected to be similar to existing conditions. A Traffic Management Plan will be developed, including proper signage, to maintain the safe and efficient movement of goods and traffic. Ongoing consultation will address issues identified by affected landowners and stakeholders.

7.2.1.2 Property

The Recommended Plan is expected to result in the partial acquisition of approximately seven (7) properties, as summarized in **Table 7-2**.

Table 7-2: Summary of Impacted Property Type and Area

Property Type	Number	Area (ha)
Private	1	0.05
Public	6	2.05
Total	7	2.1

The preliminary property requirements are illustrated on the preliminary design plans, copies of which are provided in **Appendix A**.

7.2.1.3 Communities

There are no direct impacts to community facilities located in the Town of Little Current. There will be a minor alteration to the entrance of the Manitoulin Tourism Association building located directly to the west of the Recommended Plan. No other impacts/minor changes are anticipated to community facilities in the study area.

7.2.1.4 Student Transportation

No permanent impacts are anticipated to student transportation routes as a result of the Recommended Plan. There may be minor temporary delays for students/school transportation services that travel to or from the mainland; however, all student transportation services will be



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consulted during the next stage design, and will be notified of any delays prior to construction, if any.

7.2.1.5 Marine Navigation

For the purposes of the preliminary design for the Recommended Plan:

- The underside elevation of the new bridge will not be lower than that of the existing structure
- A minimum 45 m wide clearance is proposed for the new bridge, which is approximately 3 m less than the existing lateral clearance
- The bridge piers and superstructure will be designed for vessel impact in accordance with Annex A3.3 of the CHBDC
- According to the NPP, the construction of movable span bridges in Navigable Waters
 Listed in Schedule 1 of CNWA is designated as major works. In accordance with the
 CNWA, an Application for Approval for major works will be required to be submitted to the
 Minister of Transport during the next stage of design of this project. During the next stage
 of design, subsequent to this Class EA study, Transport Canada's NPP will review these
 recommendations as part of the formal permit application process

7.2.1.6 Active Transportation

The Recommended Plan includes a 1.5 m sidewalk located along the west side of the new bridge. In addition, a separation railing will be provided between the sidewalk and the roadway, and the horizontal clearance from the edge of the 3.75 vehicular lanes to the barrier/separation railing will be approximately 1.5 m. An additional railing, located on the east side of the bridge, will be extended to meet height requirements for cycling facilities.

There may be minor temporary delays or closures of the active transportation facilities on the existing swing bridge for tie-ins of the new structure into Highway 6.

7.2.1.7 Emergency Services

No permanent impacts are anticipated for emergency service providers that service the study area and surrounding communities. There may be temporary delays for EMS on Manitoulin Island during construction activities, including new tie-ins to Highway 6. All emergency service providers, including municipal, regional and Indigenous community services, will be consulted during the subsequent design stage, and will be notified of any delays prior to construction.

7.2.1.8 Municipal Services

No impacts to municipal services are anticipated as a result of the Recommended Plan.

7.2.1.9 Recreational Features

The Recommended Plan impacts the Information Booth Park (Town of NEMI municipal park) and a part of the Linear Waterfront Trail (municipal trail) that runs along the waterfront from the

existing swing bridge and connects to the marinas and waterfront in downtown Little Current. Impacts can be mitigated through design and reconfiguration/relocation of the existing park space a trail during the next stage of design, in consultation with the Town of NEMI.

7.2.2 Air Quality and Greenhouse Gas Assessment

7.2.2.1 Operational Air Quality

An air quality and greenhouse gas assessment was carried out to assess the predicted air quality levels associated with implementation of the project in accordance with the *Environmental Guide for Assessing and Mitigating the Air Quality Impacts and Greenhouse Gas Emissions of Provincial Transportation Projects* (MTO AQ Guide).

As part of the assessment, existing air pollutant emission data was obtained based on 2018 air quality and traffic data was characterized and compared against the air quality modelled for a future "build" (i.e., operation of the new bridge in 2038) and compared against the air quality measured for a future "no build" scenario (i.e., without construction of the new bridge in 2038). Greenhouse gas emissions were also evaluated as part of the assessment.

To assess changes in air quality, both sensitive (residences) and critical receptors (hospitals, retirement homes, childcare centres, etc.) located within 500 m from the project location were identified., along with potential future receptors (vacant lands along Highway 6). In total, the potential changes in air quality at thirty-nine (39) receptors were measured and compared against the applicable air quality standards (i.e., Ambient Air Quality Criteria (AAQC) and Canadian Ambient Air Quality Standards (CAAQS)).

The contaminants of potential concern considered in the assessment included nitrogen dioxide (NO2), carbon monoxide (CO), particulate matter with diameter less than 10 microm (PM10), particulate matter with diameter less than 2.5 microm (PM2.5), acrolein, benzene, 1,3-butadiene, benzo(a)pyrene (B(a)P), acetaldehyde and formaldehyde. Greenhouse gas (GHG) emissions in the form of CO2e were also quantified.

The findings of the assessment indicated the following:

- The maximum predicted concentration of CoPCs associated with operation of the project were below the applicable air quality standards, with the exception of B(a)P
- The maximum predicted cumulative (i.e., operation of the new bridge, including background air quality of CoPCs are below the applicable air quality standards, with the exception of B(a)P
- The maximum predicted B(a)P concentrations for the future "build" scenario are above the AAQC for existing conditions at three special receptors located closest to Highway 6 and within the Town of Little Current
- The maximum predicted B(a)P concentrations are below the AAQC for existing conditions at the remaining special receptors assessed, and is predicted to decrease in both future "build" and "no build" scenarios



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- The maximum predicted cumulative concentrations of B(a)P (operation of the new bridge including background air quality) also exceed the 24-hour and annual AAQCs at all special receptor locations, with background concentrations alone exceeding the 24-hour and annual average AAQC by 6% and 118%, respectively
- An incremental decrease in GHG emissions due to the future "build" scenario when compared to the future "no build" scenario

It should be noted that a decrease in maximum predicted concentrations is expected over time due to advances in cleaner fuels and emissions control technology, which are anticipated to lower all vehicle contaminant tailpipe emissions in the future. Based on the above, measures to mitigate the changes in air quality associated with operation of the project are not required.

7.2.2.2 Air Quality During Construction

Dust will be the primary CoPC during construction. CoPCs such as NO2 and VOCs will also be emitted from equipment used during construction. As the construction activities will be short-term and intermittent, emissions are expected to be minor in nature, provided adequate mitigation measures are implemented.

The Environment and Climate Change Canada's *Best Practices for the Reduction of Air Emissions from Construction and Demolition Activities* provides recommendations for mitigation measures to reduce construction emissions, including material wetting or use of chemical suppressants to reduce dust, use of wind barriers and limiting exposed areas which may be a source of dust, and equipment washing. It is recommended that these best management practices be followed during construction.

7.2.3 Noise Impact Assessment

7.2.3.1 Operational Noise

A noise impact assessment was carried out in accordance with the MTO's 2008 *Environmental Guide for Noise* (MTO guideline) to measure the anticipated change in traffic noise levels associated with operation of the new bridge and to assess the need to investigate noise mitigation measures.

To help to assess the change in future noise levels, Points of Reception (PORs), identified as Noise Sensitive Areas (NSAs) in the MTO guideline, including land uses such as residences, hospitals and/or nursing homes for the aged that have outdoor living areas associated with them, are identified within a 600 m of the new bridge. In addition, future sound levels at PORs are modelled for a future "Build" (future operation of the new bridge) and compared against the predicted sound levels modelled for a future "no build" scenario (i.e., continued operation of the existing bridge).

If the sound levels measured at the identified PORs are predicted to be less than 65 dBA and generate less than a 5 dB increase over the "no build" scenario, an investigation of noise mitigation is not warranted.

Based on the results of the assessment, the expected change sound levels measured for the PORs are expected to be less than 65 dBA and generate less than 5 dB increase. As such, the need to investigate noise mitigation as part of this project is not required.

7.2.3.2 Construction Noise

To minimize the potential for construction noise impacts, it is recommended that provisions be written into the contract documentation for the contractor, as outlined below.

- All equipment will be properly maintained to limit noise emissions. As such, all construction equipment will be operated with effective muffling devices that are in good working order
- The Contract Documents will contain a provision that any initial noise complaint will trigger verification that the general noise control measures agreed to are in effect
- In the presence of persistent noise complaints, all construction equipment will be verified to comply with MECP NPC-115 guideline
- In the presence of persistent complaints and subject to the results of a field investigation, alternative noise control measured may be required, where reasonably available. In selecting appropriate noise control and mitigation measures, consideration will be given to the technical, administrative and economic feasibility of the various alternatives

7.3 Cultural Heritage Environment

7.3.1 Marine Archaeological Resources

The Marine Archaeological Assessment determined that the potential for marine archaeological resources to be present in the area is considered low, and there is low to no potential for the identification for pre-contact Indigenous, post-contact Indigenous, and Euro-Canadian marine archaeological resources. Therefore, no impacts to marine archaeological resources are anticipated.

MCM's (formerly Ministry of Heritage, Sport, Tourism and Culture Industries) letter dated November 8, 2020, confirmed that the report was entered into the Ontario Public Register of Reports.

7.3.2 Archaeological Resources (Land)

The findings of the Stage 2 AA indicated that there were no archaeological resources identified within the area, and that no further archaeological assessment activities were required within the area assessed. Therefore, no impacts to archaeological resources are anticipated.

Should previously undocumented archaeological resources be discovered, they may be a new archaeological site and therefore subject to Section 48(1) of the *Ontario Heritage Act* (Government of Ontario 1990b). The proponent or person discovering the archaeological resources must cease alteration of the site immediately and engage a licensed consultant



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archaeologist to carry out archaeological fieldwork, in compliance with Section 48(1) of the *Ontario Heritage Act* (Government of Ontario 1990b).

The Funeral, Burial and Cremation Services Act, 2002, S.O. 2002, c.33 (Government of Ontario 2002) requires that any person discovering human remains must notify the police or coroner and the Registrar of Cemeteries at the Ministry of Government and Consumer Services. The UCCMM Tribal Council and Wiikwemkoong First Nation will also be notified.

7.3.3 Built Heritage Resources and Cultural Heritage Landscapes – Existing Little Current Swing Bridge

A Heritage Impact Assessment (HIA) was completed to assess the impacts of the project to the existing bridge and to recommend appropriate conservation and/or mitigation measures. The HIA was also be used to inform and support MTO's Request for MCM's Minister's consent for the removal or demolition of the existing bridge.

The proposed undertaking to remove and replace the Little Current Swing Bridge with a new structure will result in direct, permanent, adverse impacts to all identified heritage attributes of the bridge, including removal of:

- All features of the existing movable swing bridge, including but not limited to, truss, piers and abutments, spans, mechanical equipment, control room and walkway
- A landmark structure in a prominent location in the channel visible to the community and visitors from Highway 6 and Little Current
- All remaining tangible features associated with the historical Algoma and Eastern Railway

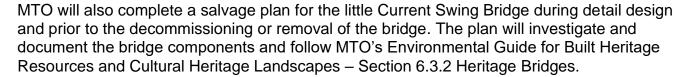
There would be no beneficial effects to CHVI resulting from the proposed undertaking. The character of the surrounding community will be significantly impacted by the removal of the PHPPS as well.

In order to mitigate the loss of the CHVI associated with the Little Current Swing Bridge due to the preferred alternative, a series of mitigative measures is proposed. These include, but are not limited to:

- Documentation of the bridge prior to removal
- Salvage, in whole or in part
- Sympathetic design of the replacement bridge, including use of salvaged materials in the new design where practicable; and
- Commemoration of the bridge

7.3.3.1 Salvage, Relocation and Interpretation and Commemoration Plan

MTO will develop an Interpretation and Commemoration Plan for the Little Current Swing Bridge, in consultation with MCM, the municipality, and as appropriate, with Indigenous communities and other parties. The plan should be completed by during and prior to the completion of detail design.



For incorporation of heritage bridges elements, specific details, such as the following, should be included in the contract documentation:

- A requirement for expertise in cultural resource removal with a specialized knowledge in bridge construction
- Specifications with instructions for the labelling, storage and reassembly of elements
- A requirement to have photographic documentation of the re-assembly and have it filed with the construction record

Commemoration of the bridge will include information on the role of the bridge in local history, iconography, and tourism. Operating for more than 100 years, the history of the bridge is intimately linked with the development of Manitoulin Island. It is the only remaining remnant of the historic the Algoma Eastern Railway and physical reminder of the railway's importance in the connection between northern and southern Ontario which facilitated development of mining, pulp and paper, and timber industries in the north that needed access to markets in the southern Ontario.

The goal of salvaging the bridge in whole or in part, is to provide a tangible artifact for interpretation in a publicly accessible space. A suitable location for commemoration of the bridge may be a large public park or vacant land where the structure and some component pieces of machinery could be situated alongside commemorative/interpretive material (such as interpretive display panels, public art, and links to online resources through QR codes or similar technology). Preferably, the new site would be in close proximity to the original location of the bridge to enhance interpretation of the display.

7.3.3.2 Sympathetic Design of New Bridge

The design of the replacement bridge has potential to mitigate the removal of the existing bridge by careful integration of the original bridge design or type in the design or type of the new bridge, with allowances for use of modern materials. In accordance with the OHBG guidance for sympathetic design for replacement bridges, any new structure should reflect the heritage attributes of the existing bridge. The new design will respect the design principles of the original bridge and its setting.

Given the prominent status of Little Current Swing Bridge in the community, the new bridge will be designed to be a landmark structure. The proposed use of a swing bridge type to replace the existing bridge will provide a sense of continuity with the current experience of bridge users; locals and tourists alike.

As defined in Section 4.5.1 of the OHBG, sympathetic design for replacement bridges can be accomplished through aspects of design and construction.



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The value of retaining the design and appearance of a bridge is also articulated in The Canadian Highway Bridge Design Code (CAN/CSA-S6-14), Clause 1.4.2.8, which states:

"In the design and the rehabilitation of structures, consideration shall be given to the appearance of the finished structure and its compatibility with the surroundings. Wherever possible, the appearance of a structure shall be such that it will be generally perceived as an enhancement to its surroundings."

Therefore, in addition to the guidelines above from the OHBG and the required provincial safety and code requirements, the following sympathetic design guidelines may also be considered to enhance compatibility of any replacement structure:

- Maintain a similar size and multiple span design to the original structure
- Be a movable swing bridge type to maintain a prominent presence in the channel and continue the history of a movable bridge in MTO northeastern region
- Include high-profile vertical elements in design, such as tall piers, trusses, or towers to allow the bridge to be a landmark within the channel crossing and enhance the visual character of the crossing through its form, utility, views, and connectivity
- Employ contemporary design language of form and materials to provide a new element or layer in the channel crossing that contributes to its surroundings
- Respect the historical character of the crossing and the original bridge structure using
 materials such as concrete piers and the use of steel as either structural or decorative
 elements (e.g., trusses, towers, girders, railings, light standards
- Include commemoration of the original swing bridge in a prominent location in a safe and accessible spot for the public (pending further investigation and discussions with the municipality, the business association and heritage stakeholders

Prior to enacting any of the above mitigation measures and decommissioning the existing bridge, the Little Current Swing Bridge should be fully documented to capture its cultural heritage value and retain a record of the bridge for archival purposes. The documentation materials can also be used in the Commemoration Plan. Documentation will include digital photography, reality capture using LiDAR scanning or photogrammetry to create a point cloud model and video recording of the swing bridge in operation. A documentation report will be created and will include research from the CHER, Statement of Cultural Heritage Value or Interest (SCHVI) and any available photographs and drawings. Documentation should follow the standards of the National Park Services (NPS) Historic American Engineering Record (HAER). Upon completion the documentation should be deposited in appropriate institutions. When sending the documentation to the institutions, MTO shall copy MCM on the cover letter.

An electronic copy of the HIA was made available for review for a 30-day comment period, from January 7, 2022, to February 7, 2022. A summary of the key activities undertaken during the review period is provided in Table 7-3.



Date	Activities
January 7, 2022	Commencement of HIA review period
	 Letter notification of commencement of the HIA review period and a copy of the HIA report sent to Indigenous community leadership, Municipal contacts, members of the NEMI BIA, and heritage-related organizations. A copy of the HIA report was attached to the letter notification
	The study website (<u>www.swingbridgestudy.ca</u>) was updated to indicate that a copy of the HIA was available for review upon request
January 17, 2022	A total of 11 individuals requested to receive a copy of the HIA report in response to the notification of commencement of the HIA review period
February 7, 2022	HIA review period concludes
	8 comments were directly received by the study team during the course of the HIA review period.

7.3.4 Minister of Citizenship and Multiculturalism's Decision

On November 2, 2022, the Minister of Citizenship and Multiculturalism provided written consent to the MTO for the removal of the existing bridge, subject to the following conditions:

- 1. Sympathetic Design of Replacement Bridge MTO must ensure that:
 - a. The existing Highway 6 Little Current Swing Bridge will be replaced with a sympathetically designed new two-lane structure that is a movable swing bridge design with through-truss components.
 - b. The new design will respect the design principles of the original bridge and its setting and integrate the original bridge type with allowances for use of modern materials and where feasible may incorporate salvaged components from the heritage bridge.
 - c. MTO will consult with the MCM, Town of Northeastern Manitoulin and the Islands, and key stakeholders to design a new landmark structure appropriate to the character of the area.
- Property Documentation Prior to the completion of detail design and in advance of decommissioning the existing bridge, MTO must:
 - a. Retain a qualified person(s) to fully document the existing historic bridge. At a minimum, this must include:



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- Measured drawings, photographic documentation and/or 3D modeling to fully document the existing Highway 6 Little Current Swing Bridge, its existing materials, components, and original location. Documentation is to meet the standards of the National Parks Services' Historic American Engineering Record in its approach.
- Reality capture including LiDAR scanning or photogrammetry to create a point cloud model of the bridge.
- Video/digital recording of the swing bridge in operation.
- b. Upon completion, the document record shall be deposited with appropriate institutions, including but not limited to the MTO Regional Office and the appropriate local archive or library or the Archives of Ontario. When sending the documentation to institutions, MTO shall copy MCM on the cover letter.
- Salvage and Relocation Plan Prior to the completion of Detail Design and in advance of decommissioning the existing bridge, MTO must:
 - a. Complete a salvage plan for the Little Current Swing Bridge that will investigate the feasibility of relocating the existing bridge in whole or in part.
 - b. Document the bridge components following MTO's Environmental Guide for Built Heritage Resources and Cultural Heritage Landscapes Section 6.3.2 Heritage Bridges, which states:
 - "For incorporation of heritage bridges elements, specific details, such as the following, should be included in the contract documentation:
 - A requirement for expertise in cultural resource removal with a specialized knowledge in bridge construction.
 - Specifications with instructions for the labelling, storage, and reassembly of elements; and
 - A requirement to have photographic documentation of the re-assembly and have it filed with the construction record."
- 4. Interpretation and Commemoration Plan During Detail Design MTO must:
 - a. Develop an Interpretation and Commemoration Plan for the Highway 6 Little Current Swing Bridge, in consultation with MCM, the municipality(s), and as appropriate, with Indigenous communities and other parties.
 - b. The Plan must:

- Commemorate the bridge at an appropriate location that is associated with the bridge (preferably close by the crossing) and be publicly accessible.
- Record the history of the bridge and its impact on the area.
- Include interpretive materials such as display panels and
- If feasible, incorporate the bridge, as a whole, or significant components of it such as the gears and the control booth.
- 5. Annual Updates Until all these conditions have been fully met, MTO will:
 - a. provide an annual report to the Director, Heritage Branch, MCM, an update on the status of the project and progress on implementing these conditions.

MCM will continue to be consulted during the design phase of the project. A copy of the Minister's letter of consent is provided in **Appendix B**.



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8.0 Public Consultation

The main objective of consultation in the Class EA process is to ensure that project information is shared in a meaningful way, and that consideration is given to all aspects of the environment from the earliest stages of planning. Communication with potentially impacted and/or interested parties is key in the planning process and provides a mechanism for the proponent to define and respond to issues prior to key decisions being made. Recognizing this, the study team initiated a comprehensive program from the onset of the study, as described herein.

All interested parties were offered early and ongoing opportunities to review study information and provide input to the decision-making process. To achieve this, a variety of communication strategies were used to engage the public, agencies, interest groups, property owners and community members. As a first step, a Consultation Plan was developed and described the following elements:

- Study notifications (Notices of Study Commencement, Study Design Report, Public Information Centre (PIC) 1, PIC 2, Online PIC 3 and TESR)
- Communication with external agencies in order to obtain pertinent technical information and identify the requirement for legislative or regulatory approvals related to the undertaking
- Meetings with municipal staff and Council (Town of Northeastern Manitoulin and the Islands and Manitoulin Municipal Association)
- Communication with adjacent property owners where work proposed is likely to have temporary impacts on their property
- Communication with affected property owners where temporary or permanent interest in property is required
- Communication with local residents, businesses, and local highway users
- Three Public Information Centres (August 22, 2018, July 17, 2019, and March 30, 2021)
- Two Community Engagement Events (Haweater Festival, Gore Bay Farmer's Market, and Island Summer Market)
- Two Business Owner Information sessions, one prior to PIC's 1 and 2
- 30-Day Comment Period for the Study Design Report and all related consultation
- Agency webinar to review the Study Design Report
- Notice of Study Completion/Transportation Environmental Study Report 30-Day Comment Period (January 25, 2023)

A copy of all public notification materials is provided in **Appendix C**.

All input received was incorporated into the project findings and recommendations, as appropriate, and responses were provided to all input received.

All project correspondence to/from the public was collected in accordance with the *Freedom of Information and Protection of Privacy Act.* Accordingly, with the exception of personal information, all public comments form part of the public record.

8.1 Project Website

A project website (swingbridgestudy.ca) was developed at the onset of the study to provide the public with easy access to project information, which was maintained throughout the study process, including background, project team member contact information, PIC materials links to project-specific documentation (i.e., study notifications, EA processes, SDR, TESR) and supplementary information.

8.2 Project Email Address

The project website allowed interested parties to contact the project team directly through the dedicated project email address, or by using the online comment form (secured with certified encryption).

8.3 Notice of Study Commencement

The purpose of the Notice of Study Commencement was to inform the public and external agencies about the study and to seek initial input in relation to the study. The notice briefly outlined the objective of the study, the Class EA process, study area location map and contact information for project team representatives.

The Notice of Study Commencement was communicated via newspaper advertisements in the *Manitoulin Expositor* and the *Sudbury Star* on Wednesday, July 4, 2018, and the *Manitoulin West Recorder* on Friday, July 6, 2018. It was also posted on the project website.

Individual notification letters were also sent to federal, provincial, and municipal agencies, property owners and stakeholder groups that were expected to have an interest in the study on June 29, 2018, and July 2, 2018. Letters to agencies requested information on the environmental (i.e., natural, social, or cultural) features of the study area and to seek their input on the project. The correspondence included a flyer with additional information about the study, including a map of the study area.

In addition, the following external agencies and stakeholders also received an agency comment sheet, requesting input by August 3, 2018:



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Provincial Agencies

- Ministry of Natural Resources and Forestry
- Infrastructure Ontario
- Ministry of Municipal Affairs and Housing
- Ministry of Northern Development and Mines

Federal Agencies

- Environment and Climate Change Canada
- International Joint Commission
- Transport Canada Ontario Region Office

Multiculturalism – Heritage Program

Ministry of Indigenous Relations and

 Transport Canada – Navigation Protection Program

Ministry of the Environment,

Conservation and Parks

Ministry of Citizenship and

Programs Unit

Reconciliation

Multiculturalism – Archaeology

Ministry of Citizenship and

Unit

Municipal Agencies

- Town of Northeastern Manitoulin and the Islands – Clerk, Chief Administrative Officer, Manager of Public Works, Director of Planning and Development, Economic Development
- Town of Gore Bay CAO/Clerk, Public Works Foreman
- Municipality of Central Manitoulin Chief Administrative Officer/Clerk, Roads Superintendent
- Township of Assiginack Clerk, Administrative Officer, Public Works Superintendent

- Municipality of Billings Clerk Treasurer, Public Works Superintendent
- Township of Burpee & Mills Clerk-Treasurer, Road Superintendent
- Municipality of Gordon/Barrie Island Chief Administrative Officer/Clerk-Treasurer, Roads Superintendent
- Township of Tehkummah-Reeve
- Manitoulin Municipal Association

Local Elected Representatives

- MPP Algoma-Manitoulin
- Town of Northeastern Manitoulin and the Islands – Mayor
- Town of Northeastern Manitoulin and the Islands Ward Councillors

Emergency Services

- Ontario Provincial Police Little Current
- Manitoulin-Sudbury District Services Board
- Northeastern Manitoulin and the Islands Fire Department
- Township of Assiginack Fire Department
- Township of Burpee & Mills Fire Department

- Municipality of Central Manitoulin Fire Department
- Gore Bay/Allen Township Fire Department
- Canadian Coast Guard/Fisheries and Oceans Canada
- UCCM Anishnaabe Police Service

School Boards/ Bus Service

- Rainbow District School BoardConseil Scolaire de District du Grand
- Conseil Scolaire de District du Grand Nord de l'Ontario
- Le Conseil Scolaire Catholique du Nouvel Ontario
- Sudbury Catholic District School Board
- Sudbury Student Services Consortium

Other Stakeholders

- Owen Sound Transportation Company
- Ontario Trucking Association
- Ontario Federation of Agriculture
- Manitoulin Snowdusters Club OFSC District 12
- LaCloche & Manitoulin Business Assistance Corporation (CFDC)
- Manitoulin Tourism Association

- Waubetek Business Development Corporation
- North Channel Martine Tourism Council
- Spider Bay Marina/Port of Little Current
- Canadian Pacific Railway
- Little Current Yacht Club
- Manitoulin Island Cycling Advocates (MICA)

A copy of the agency mailing list is provided within Appendix D.1.

It should be noted that staff from the Town of Northeastern Manitoulin and the Islands (NEMI) was kept informed throughout the duration of the study. Council meetings with the Town of NEMI were planned in advance of each PIC. In addition, council meetings with the Manitoulin Municipal Association were also held throughout the study. Where required, additional meetings were held with relevant agencies or municipalities to discuss project specific issues.



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A total of 88 comment sheets, letters, emails, and phone calls were received following the Notice of Study Commencement up to, and beyond the requested submission date of August 3, 2018. A copy of the comments received from agencies and public and associated responses are provided in. A copy of the notices issued in relation to study commencement is provided in **Appendix E.1**. A copy of the public and agency correspondence received following the Notice of Study Commencement is located in **Appendices E.9** and **D.5**, respectively.

8.4 Community Event 1

As part of the consultation program for this study, members of the project team attended the local Haweater Festival on August 4, 2018, in Little Current. An information booth about the project was on display at the time of the festival, at which time project team members spoke with approximately 60-65 people, spoke with 10 local business owners, handed out approximately 200 project flyers and 100 copies of the Notice of Public Information Centre (PIC) 1, left project flyers at two local marinas and at three local businesses (i.e., Loco Beanz, Boarderline, Manitoulin Tourism Association). The team members also spoke with approximately 35-40 summer residents (cottagers and boaters) who attended the festival. During discussions with festival attendees, the following comments were noted:

- Maintain the bridge as-is (30 comments)
- Replace the bridge (30 comments)
- Provide a tunnel (10-15 comments)
- Provide a two-lane bridge (approximately 20 comments)
- A clear span bridge is not the right choice for the island
- Highway 6 should not by-pass Town
- Large boats and cruise ships pass through the channel
- The bridge must accommodate boats

8.5 Public Information Centre 1

The first PIC was held on August 22, 2018, from 4:00 PM to 8:00 PM at the Manitoulin Hotel and Conference Centre. The purpose of the PIC was to generally introduce the project and associated background information, present and gather feedback on the problems and opportunities, the study area existing conditions, and the Alternatives to the Undertaking.

The PIC was held in a 'drop-in' style format where representatives from MTO and Stantec were available to discuss the study, answer questions, and receive input on the existing conditions in the study area.

The PIC was advertised in the *Manitoulin Expositor*, and the *Sudbury Star* on Wednesday, August 8, 2018, and the *Manitoulin West Recorder* on Friday, August 10, 2018. The Notice was also posted on the project website in advance of the meeting.

In addition, notification letters were mailed to external agencies, businesses, stakeholders, property owners and the general public on August 7 and August 8, 2018.

Approximately eleven (11) representatives from external agencies were present at the PIC, as well as 23 business owners, and 78 members of the general public.

In total, 59 letters and emails were received following PIC 1 and by the requested submission date of September 28, 2018. In general, comments included heritage preservation concerns, support for pedestrian and bicycle lanes, preference for solutions, and requests to be added to the project mailing list.

A copy of the information displayed at PIC 1, as well as the feedback received at and following PIC 1 is provided in **Appendix E.2**.

8.5.1 External Agency Meeting

As part of PIC 1, external agencies and municipal staff were invited to attend an External Agency Drop-In Meeting between 3:00 PM and 4:00 PM, in advance of the public session held at the same location. An invitation to attend the meeting was sent to external agencies on the project mailing list on August 14, 2018. External Agencies and stakeholders that were represented at the PIC included: MECP and the Township of Assiginack. Following the external agency meeting, comments were received from the Town of Gore Bay, MNRF, and the MCM.

A record of external agency representatives in attendance at this meeting is provided in **Appendix D.2**. A summary of agency correspondence is provided in **Appendix D.5**.

8.5.2 Business Owner Meeting

The first Business-Owner Session was held on August 22, 2018, at the Manitoulin Hotel and Conference Centre prior to the PIC 1. In total, 23 business owners attended the meeting. The purpose of the meeting was to provide an overview of the project and to provide an opportunity for project team members to discuss any initial questions, comments and/or concerns with local business owners.

In addition, information related to the Business Impact Assessment (BIA), subsequently completed as part of this study, was also provided to the business owners in attendance at the meeting. In addition, permission forms were provided to attendees to request their participation in the BIA. The business owners at the meeting expressed concern for the town being by-passed by tunnel or fixed bridge alternatives and noted that the swing bridge is a tourist attraction that helps generate business in Little Current.

8.6 Study Design Report

Study Design Reports (SDRs) are prepared early in the Planning phase of a project, in consultation with government agencies and other potentially affect parties, to outline a project's



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need and justification, define the study area, and discuss Alternatives to the Undertaking. In addition, the SDR documents the EA process commitments to be followed throughout the duration of the Class EA study, including the consultation process to be followed.

An SDR was completed following PIC 1 and made available for public review from November 22, 2018, to December 21, 2018, at the following locations:

Northeastern Manitoulin and the Islands	Gore Bay Union Public Library	Providence Bay Library 11 Mutchmor Street	Northeastern Manitoulin and the Islands Public
Municipal Building	15 Water Street	Providence Bay, Ontario	Library
14 Water Street East	Gore Bay, Ontario	Tuesday: 6:30pm –	50 Meredith Street West
Little Current, Ontario	Monday, Tuesday: 2pm –	8:30pm	Little Current, Ontario
Monday-Friday: 8:30am	5pm	Wednesday:1pm - 3:30pm	Tuesday, Wednesday,
– 4:30pm	Thursday: 2pm – 8pm	Friday: 1pm – 4:30pm	Friday: 10am – 5pm
	Friday: 10am – 1pm, 2 – 5pm		Thursday: 10am – 8pm
	Saturday: 10am – 1pm		Saturday: 10am – 4pm

The SDR was also made available on the project website (www.swingbridgestudy.ca). Additionally, digital copies were provided to any agencies and stakeholders who requested the report.

Notification of the SDR was sent via letter to federal, provincial, and municipal agencies, property owners and stakeholder groups expected to have an interest in the study on November 15, 2018. The letter correspondence included a flyer with additional information and a map of the study area. The Notice of the SDR was advertised in the *Manitoulin Expositor* and the *Sudbury Star* on Wednesday, November 21, 2018, and the *Manitoulin West Recorder* on Friday, November 23, 2018. The Notice was also posted on the project website.

In response to the SDR and associated notification, eleven comments were received from members of the public, which included preferences for a new swing bridge, tunnel or lift bridge, and comments related to the heritage value of the existing bridge and the evaluation of alternatives process. Comments were also received from the representatives of the MECP, Township of Assiginack and MCM. The MCM also provided suggested revisions to the SDR, which were incorporated following the 30-day comment period. The final SDR was made available for viewing at PIC 2 and was also posted on the project website.

A copy of the correspondence received in response to the SDR is provided in **Appendix E.3**.

8.7 Agency Webinar

An agency webinar was held in advance of PIC 2. The purpose of the webinar was to present and seek input on the existing study area conditions within the study area, problems and opportunities, the screening of Alternatives to the Undertaking, the preliminary design alternatives and the evaluation process. As part of the virtual presentation an overview the MTO's obligation to assess the existing bridge in accordance with the Ontario Heritage Bridge Conservation Options.

Invitations to participated in the webinar were issued via mail on June 28, 2019. The virtual webinar was held on July 9, 2019, from 2:00 PM to 4:00 PM and representatives from Transport Canada, MECP, MNRF, and MCM were in attendance. The webinar included a presentation by the project team, followed by a question-and-answer period.

As part of the webinar, there was a discussion regarding the heritage designation of the existing bridge. MCM noted that the existing bridge is a provincial heritage property and that, as per Provision F.4. of the Standards & Guidelines, the removal or demolition of any building or structure on a provincial heritage property will only be considered a last resort, after all other alternatives have been considered, subject to heritage impact assessment and public engagement. MCM also noted that in the case of a Provincial Heritage Property of Provincial Significance (PHPPS) the consent of the MCM Minister must be obtained.

A copy of the information presented at the Agency Webinar and the associated meeting notes are provided in **Appendix D.2**.

8.8 Community Event 2

The second community event for this project included a project information booth attended by project team members at the Gore Bay Farmer's Market and the Island Summer Market in M'Chigeeng on July 12, and July 13, 2019, respectively. The project team was available at the Gore Bay Farmer's Market on July 12, 2019, from 8:30 AM to 1:30 PM, at which time team members spoke to approximately 20-25 people, handed out project flyers and spoke with full time residents, summer residents and visiting boaters. The team members were available at the Island Summer Market in M'Chigeeng on July 13, 2019, from 9:00 AM to 2:00 PM, at which time members of the project team spoke with approximately 30-35 people and handed out project flyers.

During discussions with people at these markets, the following comments were noted:

- Overall cost will matter the most in choosing the right option
- Project team should do presentations in other communities
- Elderly people may have difficulty accessing the website for comments or display material
- Wait time for boasts is too long, need a better option
- No matter what the decision, keep the bridge in some way as it is a landmark of the island
- In favor of an immersion tunnel
- New option should by-pass town for less traffic congestion
- New option should go through town for businesses
- Two-lane reliable bridge required, currently people don't respect the traffic lights
- Need for a new bridge pro lift bridge
- Keep the bridge as a pedestrian bridge
- Need for a new bridge, especially for EMS to get off the island
- Keep 1 lane on the Swing bridge and 1 lane on the new bridge
- Fixed bridge height may be an issue in the winter due to ice and high winds



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Create an alternative boat channel north of Goat Island and keep bridge in place

8.9 Public Information Centre 2

The second PIC was held on July 17, 2019, from 4:00 PM to 7:00 PM, at the Manitoulin Hotel and Conference Centre to provide the public and stakeholders with an opportunity to review and comment on the assessment of Alternatives to the Undertaking, alignment alternatives, structure type alternatives, the evaluation process and criteria, the preliminary heritage conservation options assessment, project activities to date and next steps in the study process.

The PIC was held in a 'drop-in' style format where representatives from MTO and Stantec were available to discuss the study, answer questions, and receive input on the information shared as part of the PIC.

The PIC was advertised in the *Manitoulin Expositor* and the *Sudbury Star* on July 3, 2019, and the *Manitoulin West Recorder* on July 5, 2019. The Notice was also posted on the project website in advance of the meeting.

In addition, notification letters were mailed to external agencies, stakeholders, property owners and the general public on July 4, 2019.

Approximately seven (7) representatives from external agencies, 20 business owners, and 102 members of the general public attended PIC 2.

A total of 111 letters and emails were received at and/or following the PIC by the requested submission date of August 16, 2019. General comments included concern about the heritage conservation of the existing bridge, impacts to businesses, cost and timing, boating/navigation, property impacts, contaminated lands, alternative preferences, impacts to the natural environment, active transportation possibilities, consultation activities that have undertaken, potential impacts to emergency services, and traffic impacts. A copy of the information displayed, as well as the comments received, and the associated responses are provided in **Appendix E.4**.

8.9.1 External Agency Meeting

External agencies and municipal staff were invited to attend an External Agency Drop-In Meeting prior to PIC 2 from 3:00 PM to 4:00 PM, in advance of the July 17, 2019, public session held at the same location. An invitation to attend the meeting was sent to external agencies on the project mailing list on July 2, 2019. External Agencies and stakeholders that were represented at the PIC include: Town of Billings and Ministry of Energy, Northern Development and Mines. Following the external agency meeting, comments were received from the Township of Billings, the Town of NEMI, Manitoulin East Municipal Airport, and the Waterfront Regeneration Trust.

A record of external agency representatives in attendance at this meeting is provided in **Appendix D.2**. A summary of agency correspondence is provided in **Appendix D.5**.

8.9.2 Business Owner Meeting

As part of the consultation plan for this project, a second Business-Owner Session was held prior to the PIC from 2:00 PM to 3:00 PM, on July 17, 2019, at the Manitoulin Hotel and Conference Centre prior to the PIC. In total, 20 business owners attended the meeting. The purpose of the meeting was to provide an opportunity to review the assessment of Alternatives to the Undertaking, preliminary design alternatives, the proposed evaluation criteria and evaluation process, and address questions or concerns directly with representatives of the project team. In addition, business owners were asked to participate in a Business Impact Assessment (BIA) survey to assess potential impacts of the design alternatives on local businesses.

A copy of the survey responses is provided in **Appendix E.6**.

8.9.3 Property Owner Meeting

A property owner meeting was held on July 18, 2019, following the second PIC at the Manitoulin Hotel and Conference Centre. Potentially impacted property owners were invited to attend that meeting, and members of the project team and MTO Property Section representatives were present to discuss the alternatives presented at PIC 2, the MTO process to purchase property, dimensions of the proposed bridge alternatives, and potential construction impacts.

A copy of the notes taken at this meeting are provided in **Appendix E.7**.

8.10 Letter Notice of Study Update

On August 14, 2020, a letter notification was issued to staff representing the following municipalities, to provide a brief update on study progress, including the study team's intent to hold arrange for an online PIC 3 event, given that in person events may not be feasible for the foreseeable future:

- Town of NEMI
- Town of Gore Bay
- Township of Assiginack
- Municipality of Billings
- Township of Burpee and Mills
- Municipality of Central Manitoulin
- Municipality of Gordon/Barrie Island
- Township of Tehkummah

The letter also provided notification of archaeological and geotechnical investigations that were being planned within the study area in September 2020 (i.e., during the COVID-19 pandemic).

A copy of the letter notice is provided in **Appendix D.6.**



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8.11 Online Public Information Centre 3

A third PIC was held to present the preliminary findings of investigations, the evaluation of planning alternatives, the preliminary preferred plan and associated rationale, potential impacts and preliminary proposed mitigation measures, and next steps in the Class EA process. In light of the COVID-19 pandemic and associated physical distancing requirements, PIC 3 was held in an online format.

Online PIC 3 consisted of a recorded presentation that was hosted on the study website (www.swingbridgestudy.ca) beginning on March 30, 2021. Comments related to the online PIC were requested by April 30, 2021. Hardcopies of the presentation and transcript were available for mailout for those unable to access the online PIC 3 materials offered on the study website.

The online PIC was advertised in the *Manitoulin Expositor* on Wednesday, March 24, 2021, the *Sudbury Star* on Tuesday, March 23, 2021, and the *Manitoulin West Recorder* on Friday, March 26, 2021. The Notice was also posted on the project website in advance of the meeting.

In addition, notification letters were mailed to external agencies, stakeholders, property owners and the general public the week of March 18, 2021.

Statistics were gathered during the online PIC review period (i.e., from March 30, 2021, to April 30, 2021), to determine the number of viewers of the online presentation. The website visit statistics were broken down into the following two categories:

- Unique Visitors the total number of people that visited the website. The same person visiting the website multiple times during the PIC time period is only counted once
- Number of Visits the total number of visits by browsing session. If a visitor viewed another
 page on the site within 30 minutes of their last pageview, it is counted as the same visit. If a
 visitor returns to the study website 30 minutes after their last pageview, it counted as a
 separate visit

In total, 2,057 unique visitors and 4,533 visits were made to the project website during the online PIC review period. The online PIC presentation included a brief YouTube video, which accumulated a total of 11,731 views.

In total, 27 letters and emails were received during the online PIC review period. In general, comments consisted of concerns with heritage conservation with respect to the existing bridge, the existing bridge condition, boating/navigation, park space impacts, preferred solution, impacts to the natural environment, active transportation possibilities, and consultation undertaken as part this study. A copy of the information presented, as well as the comments received during the online PIC review period is provided in **Appendix E.5.**

8.12 Letter Notice of Study Update

On November 22, 2022, a letter notification was issued to staff representing the following municipalities, to provide a brief update on study progress, including receipt of the MCM Minister's consent for the removal of the existing bridge, as well as the estimated timing of the Notice of Study Completion:

- Town of NEMI
- Town of Gore Bay
- Township of Assiginack
- Municipality of Billings
- Township of Burpee and Mills
- Municipality of Central Manitoulin
- Municipality of Gordon/Barrie Island
- Township of Tehkummah

Given the lapse of time since PIC 3 (i.e., spring 2021), the letter provided an overview of the Recommended Plan, as well as notification that the MCM Minister had provided consent for the removal of the existing swing bridge on November 2, 2022.

The letter also provided a brief outline of the approximate timing and next steps of the study, including the completion of the TESR, the associated Notice of TESR Completion, and the subsequent 30-day comment period. It was also noted in the letter that the Notice of TESR Completion would be mailed and emailed to Indigenous communities, agencies, stakeholders, and other interested persons, as well as published in the *Manitoulin Expositor*, *Sudbury Star*, and *Manitoulin West Recorder* newspapers in early 2023. The letter also indicated that a hardcopy of the TESR would be couriered to their municipal offices.

An email response to the letter notification was subsequently received from the Township of Billings, requesting to receive a hardcopy of the TESR to make available in their municipal offices.

A copy of the letter notice is provided in **Appendix D.6.**

8.13 Municipal Consultation

In addition to providing local municipal staff notification of key study milestones and/or consultation events, the project team also made presentations to local municipal Councils. Presentations were generally made as part of regularly scheduled Council meetings in advance of PICs, and included an overview of the information to be shared at the associated PIC, followed by a question and answer period.

- Town of NEMI Council Meeting prior to PIC 1 on August 7, 2018
- Manitoulin Municipal Association Council Meeting on September 19, 2018
- Town of NEMI Council Meeting prior to PIC 2 on July 16, 2019



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- Town of NEMI Council Meeting (virtual) prior to PIC 3 on March 30, 2021
- MMA Council Meeting on April 21, 2021

It should be noted that a virtual presentation was made to the Algoma-Manitoulin MPP on April 7, 2021. However, the same information that was presented to the Town of NEMI Council was also presented to the MPP.

A copy of the information shared at each meeting, including a summary of the feedback received is provided in **Appendix D.4**.

8.14 Boating Survey/Consultation

A boating survey was developed to help the study team confirm the navigational vertical and horizontal clearance needs by collecting data related to existing boat and marine vessel sizes, boating habits, etc. that use the North Channel.

The boating survey was available in Survey Monkey format via a direct link offered on the project website between July 17 and October 9, 2019. The survey was also distributed as follows:

- Hard copies of the survey were available for attendees at PIC 2 (held on July 17, 2019)
- Letter notification of the survey were mailed to local marinas, boating organizations, and boating businesses on July 26, 2019, along with a request to post the notice of the boating survey in visible space at their marina, and to distribute the notice to any interested boaters that would be interested in participating in the survey
- Hard copies of the survey were mailed to boating stakeholders on July 26, 2019

It should be noted that letter notification of the survey included a brief introduction about the study, the purpose of the boating survey and a link to access the survey on the project website. A copy of the boating survey notice/poster was also attached to the letter notification.

In total, approximately 91 surveys were completed, nine (9) of which were hard copies. Based on the responses received through the boating survey, the following was noted:

- Most individuals taking the survey use the North Channel for recreation or commercial boating purposes (i.e., 95.56%)
- Boat lengths ranged between 7 ft to 65 ft
- Boat widths ranged between 5 ft to 24 ft
- Boat heights ranged between 5 ft to 75 ft
- Approximately 76% of recreational boats are motorized, the balance of which are sailboats or sailboats with motors
- Wiarton Harbor was the most popular departure point, followed by Harbourview or Spider Bay
- "Recreational only" was the top response for boat usage (i.e., 95%), followed by "shopping/errands" (37%) and "accessing fishing locations" (22%). Individuals could check more than one option

- Boaters use the North Channel at all times of day. There was no significant preference for time
 of use noted
- Nearly 60% of respondents indicated that they would not be more likely use the channel if they
 did not need to wait for the bridge to open, and nearly 40% of respondents indicated that they
 would be more likely to use the channel if they did not have to wait for the bridge to open.
 However, 39 respondents to the survey did not offer a response to this question
- No commercial/fishing or passenger/cruise ship operators completed the survey

The results of the survey are documented within a memorandum, a copy of which is provided in **Appendix E.8.**

8.15 Agency Correspondence

A number of agencies were consulted to verify the existing conditions of the study area, and to solicit feedback throughout the study on the alternative solutions, and requirements of the area. MCM is a key agency regarding the heritage recommendations for the existing Swing Bridge structure. Transport Canada was consulted regarding navigation requirements for the Swing Bridge, which will be utilized during the next stage of design stage. A copy of all agency correspondence is provided in **Appendix D.5.**

8.16 Summary of Public Comments

Over the duration of the study, many comments were received from the public that covered various themes including boating and navigation in the channel, active transportation facilities on the bridge, the significance of the existing bridge and associated viewscapes, emergency services access, and comments on the preferred plan. **Table 8-1** provides a summary of the main comments and themes and the associated response provided by the project team. With the exception of correspondence carried out at/following public consultation events, a copy of all remaining public correspondence is provided within **Appendix E.9**.



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Table 8-1: Summary of Public Comments and Responses

Comment	Response Provided and/or Action Taken				
Existing Bridge Condition					
 Article shows that the bridge is in good condition Concerns over safety and age of existing bridge The important landmark should remain in use 	The bridge is over 100 years old. Since 1985, the Ministry has invested almost \$18 million to maintain the bridge to provide a safe and reliable link between Manitoulin Island and the mainland. This has included extensive maintenance and replacement of the bridge deck, structural steel and centre bearing replacement, and pier and abutment repairs. This annual average investment of over \$500, 000 per year is much higher than other typical bridges in the provincial highway network (typically<\$100,000 per year). Furthermore, because of its age, the swing bridge often requires custom-fabricated components that are not readily available, resulting in longer repair times, traffic delays and increased costs due to manufacturing.				
	The bridge is inspected every two years following the Ontario Structural Inspection Manual (OSIM) to ensure its safety, quantify the material deteriorations and determine the Bridge Condition Index (BCI).				
	The single lane bridge with its unique operation and maintenance demands is over 100 years old and is nearing the end of its service life. The swinging operation depends on outdated mechanical and electrical systems with many obsolete moving parts that cannot be relied upon much longer.				
	The BCI is posted on the Ministry of Transportation's website and can be found at https://data.ontario.ca/en/dataset/bridge-conditions. Information for the Swing Bridge can be found within the table on Row 4824. The 2020 BCI is 73.56 and refers to the condition of the structure at the time of inspection. More information on the BCI is found on the MTO bridge safety page at http://www.mto.gov.on.ca/english/highway-bridges/ontario-bridges.shtml.				
Heritage of Existing Bridge					

- "Heritage site" needs to be maintained
- New bridge should retain the same design as the old bridge structure
- Pleased that repurposing components of the old bridge will be considered
- Keep old structure as an informative historical site
- Relocating the old bridge as a tourist attraction would be a PLUS
- "Heritage site" needs to be maintained
- Suggests moving current bridge to Goat Island as a monument and building a small info booth allowing vehicles to pull in and stop. Maybe repurpose old tourist info booth which currently has higher traffic accidents due to sudden stops in line of traffic
- Uncertain of the heritage options for the existing structure.
 Asked if the option to retain the current structure in place would mean that the existing bridge would be open for marine traffic, but would not be accessible for any other purposes

The existing bridge is a rare remaining example of the movable swing bridge type in Ontario and is the oldest known example in the province. The bridge is a landmark in the community and is of both local and provincial significance. It has historical associations with the development of railway lines in Northern Ontario and has contextual value as a character-defining landmark in the community that is physically, functionally, visually, and historically linked to its surroundings.

The *Ministry of Transportation Ontario Heritage Bridge Guidelines for Provincially Owned Bridges* outlines a process for identifying conservation options for heritage bridges when planning for any rehabilitation, widening, or replacement that may be required.

The following bridge conservation options were considered for the existing structure:

- 1. Retention of the existing bridge with no major modifications undertaken
- 2. Restoration of missing or deteriorated elements where physical or documentary evidence exists for their design
- 3. Retention of the existing bridge with sympathetic modification
- 4. Retention of the existing bridge with a sympathetically designed new structure in proximity
- 5. Retention of the existing bridge but close it to vehicular traffic and adapt it for a new use
- 6. Retention of the existing bridge as a heritage monument for viewing purposes only
- 7. Relocation of the existing bridge to a new location of continued or adaptive use
- 8. Removal and replacement of the existing bridge with a sympathetically designed structure

Conservation Options 1 through 6 retain the bridge in its existing location; however, these options were not selected based on a number of rationale, including but not limited to:



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Comment	Response Provided and/or Action Taken
 Suggested the existing bridge could be moved to land as a museum piece 	The single-lane bridge does not provide two-way traffic flow between Manitoulin Island and the mainland, which creates ongoing traffic delays for the movement of people and goods
Indicated options detailed to date should consider removal of old bridge	 The mechanical and structural components of the bridge will continue to deteriorate, which will require ongoing inspections, maintenance and repairs. This includes custom manufacturing of bridge components, which incurs significant capital costs The swing function of the bridge would no longer be operable as the bridge would be left or welded in the open position to allow for continuous flow of boat traffic through the channel Maintenance of two separate structures significantly increases maintenance and operating costs The presence of new piers and/or abutments in proximity to the existing piers and/or abutments is anticipated to create a navigational hazard and increases the risk for boat-bridge collisions Retention of the bridge in-situ could potentially attract recreational swimming and introduce a new significant safety concern within the channel Conservation Option 7, relocation of the existing bridge to a new location for continued or adaptive use, and Conservation Option 8, removal and replacement of the existing bridge with a sympathetically designed structure, will be carried forward for further
	consideration during the next stage of design, at which time further investigation of the technical and economic feasibility of Conservation Option 7 will be reviewed. The Preferred Plan includes the removal of the existing bridge, following construction of the new bridge. Based on the findings of the Heritage Impact Assessment, the following mitigation measures are recommended:
	 Design of new bridge is to be sympathetic to the existing bridge, and the feasibility of using new design or salvaged materials to commemorate, interpret, or pay homage to the existing bridge will be explored Prepare photographic documentation and measured drawings in accordance with appliable guidelines Undertake the salvage and relocation of the existing bridge, in whole are part, to a publicly accessible location, supplemented with a commemorative strategy Prepare a Strategic Conservation Plan (SCP) to provide guidance on the relocation, dismantling/reconstruction, and long-term conservation, use, repair, maintenance, and/or disposal of the bridge Provide opportunities for public input for the long-term conservation and commemoration of the bridge as part of preparation of the SCP Opportunities to salvage and re-use components of the existing structure in the new bridge as decorative or non-structural components will be investigated during the next stage of design. This may include elements such as steel truss members, plate
	girders, or wedges, gears, or parts of the control room, where integrating these elements is technically and economically feasible. Navigation
	-

- Prefer a bridge that has the capability to open for large ships and has an air draft of 40+ feet (majority of marine traffic could pass without opening)
- The North Channel is second only to the Mediterranean for Sailors. Water clarity and deep-water dockage make it ideal!
- Having a clearer passage through centre of channel once cribs and existing bridge are removed would make for safer passage

The Ontario Ministry of Transportation (MTO) recognizes that the North Channel through Little Current is part of Lake Huron, which is listed as a Scheduled Waterway in the Canadian Navigable Waters Act (CNWA). As such, Transport Canada and the associated Navigation Protection Program have been engaged as part of this study to help to identify, at a preliminary level, navigational clearance requirements at this location. In 2019, a boating survey was distributed amongst local marinas, boating organizations, boating stakeholders and boating-related businesses to help the study team confirm the navigational vertical and horizontal clearance needs by collecting data related to existing boat and marine vessel sizes, boating habits, etc. that use the North Channel. The data collected as part of this survey helped the study team determine the preliminary clearances for the new bridge.

As part of detail design of this project, a Notice of Major Works will be prepared and submitted to the Minister of Transport for review and approval. As such, the horizontal and vertical navigational clearances for the new bridge will meet the requirements of the



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- Protocol that gives cruise ships priority over road traffic cannot be changed
- Concerns expressed regarding the changes to the channel width, depth, and impacts on the already strong current. All upgrades should go through the Canadian Coast Guards Notices to Mariners program

Comment

- Consider placement of a current gauge in the channel, on the centre abutment
- Will the design consider increasing the bridge height or air draft to allow more boats to pass under the structure? This could reduce the number of bridge swings required
- Will the bridge allow sufficient space for future and possibly larger commercial vessels to pass through?

Response Provided and/or Action Taken

Navigation Protection Program. In addition, the Department of Fisheries and Oceans (DFO) have been circulated on all study notifications, and will be further engaged during the next stage of the planning and design process, following this Class EA study. A marine archaeological assessment was also undertaken as part of this study, the findings of which confirmed that dredging operations within the North Channel near Little Current have occurred almost annually since the turn of the 20th century to maintain the safe operation of shipping vessels. In addition, a boating survey was distributed to all marinas and their boaters in Little Current to obtain information on boating activity, including the size of vessels and frequency of visits. This information has helped the project teamwork with Transport Canada/the Navigation Protection Program to help to ensure that the Preferred Plan can accommodate present and future boating activity within the channel. It should be noted that, as part of the Preferred Plan, the existing swing bridge is proposed to be removed in part due to the potential navigational hazards and to help reduce the risk of boat-bridge collisions. We appreciate the suggestion to consider feedback from the Great Lakes Pilotage Authority and Canadian Coast Guard, and have

Preferred Solution

updated our study mailing list to include these authorities.

- Pleased with the preferred solution for a new double lane swing bridge
- Suggestions for new name for the new bridge
- Keeps the atmosphere and charm of the old bridge.
 Preserves the culture and history of the area. The Island needs more modernized access than the swing bridge
- Disagree with the preferred solution. Still limits marine traffic, emergency vehicles, and does not provide unrestricted traffic flow
- A tunnel would be a better suited option
- Should be more than two lanes to accommodate future traffic
- Bridge should not turn as often for marine traffic to pass through
- Long term, the bridge will still have mechanical issues. A bascule makes the most sense
- Preference to keep and maintain the existing bridge
- Many residents on Manitoulin Island would like to see the current structure maintained

Following a detailed evaluation of alternatives, the swing bridge was selected as the preferred plan because it best addresses the current and future transportation needs at the bridge crossing, while minimizing impacts to the community and the natural environment. Based on the feedback received at/following PICs 1 and 2, there is a strong desire to maintain the existing viewscapes and character of the area, and to minimize potential impacts to the natural and cultural environments. Increasing the vertical clearance of the new swing bridge would result in greater impacts the Highway 6 road profile, which would be raised several m and require significant embankments on both sides of the crossing. These approach embankments would result in significant impacts to ecological features, as well as increases in property requirements including entrance redesign/removal. This profile raise would also reduce the ability to provide a safe and comfortable environment for active transportation users.

The existing swing bridge is the oldest and longest known example of a swing bridge within the province, has historical associations with the development of railway lines in Northern Ontario and has contextual value as a character-defining landmark in the community that is physically, functionally, visually, and historically linked to its surroundings. Thus, a new swing bridge at a similar height to the existing bridge also provides a better opportunity to provide a sympathetic design that maintains the character of the local and marine communities.

Since 1985, the Ministry has invested almost \$18 million to maintain the bridge to provide a safe and reliable link between Manitoulin Island and the mainland. This has included extensive maintenance and replacement of the bridge deck, structural steel and center bearing replacement, and pier and abutment repairs. This annual average investment of over \$500,000 per year is much higher than other typical bridges in the provincial highway network (typically<\$100,000 per year). Furthermore, because of its age, the swing bridge often requires custom-fabricated components that are not readily available, resulting in longer repair times, traffic delays and increased costs due to manufacturing.

The purpose of this study is to identify a recommended plan that will address the current and future transportation needs at the bridge crossing as part of the Ministry's ongoing review of safety and operational needs for the provincial highway network. While the existing swing bridge was originally intended for predominantly railway travel, the new bridge will be designed to today's standards to service both vehicle travel and active transportation users, reducing the risk of malfunction and repair costs, as well as providing a reliable structure for the longer term.



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Comment	Response Provided and/or Action Taken
	Construction Timing
 A project timeline of construction of this project would be helpful It is important to move forward with the project as soon as practicable, due to stated concerns of risks related to the current bridge failing Replacement should be done as soon as possible before existing bridge fails 	Please note that timing has not been confirmed for the next stage of design or construction. The Little Current Swing Bridge Study is part of the MTO's ongoing review of the provincial highway network. Although the timeline for implementing the project are not confirmed, this planning study will assist the Ministry, municipalities, business owners, and private landowners with future planning and development within the study area.
	Cost
 What exactly is wrong with the current bridge? Is it a problem sourcing material to maintain it? Prefer to continue repairing old bridge – can do a lot of repairs for \$150 m but as an alternate; a two-lane lift or 	The Ontario Ministry of Transportation has a mandate for moving people and goods safely, efficiently and sustainably to support a globally competitive economy and a high quality of life. The existing bridge is nearing the end of its service life and the Ministry is conducting this planning study to identify an appropriate solution and plan for the only year-round crossing from the mainland to Manitoulin Island.
 bascule are good options Please provide estimates on maintenance and repair costs beyond the initial 5 years, for the next 20 years after that, for each bridge or tunnel option 	The annual average investment to maintain the existing bridge is over \$500,000 per year. Other bridges in the provincial highway network typically cost less than \$100,000 per year to maintain. Furthermore, due to its age, the swing bridge often requires custom-fabricated components that are not readily available, resulting in longer repair times and traffic delays. These components are also typically costly to manufacture.
 Spending \$1 m a year for maintenance, is a lot better than spending \$100 m or more for a new alternative 	In comparison, the maintenance cost of any of the other structure alternatives for the first 25 years will be relatively low. Typically, a minor rehabilitation of concrete, joint components, and deck pavement would be required within 25 years of construction. A single minor rehabilitation of any of the structure alternatives would result in an annual average maintenance cost that is much lower than the \$500,000 a year that the existing bridge requires to remain operational.
	Consultation
What consultation has been undertaken with Indigenous communities?	The project team has been in contact with Aundeck-Omni Kaning First Nation, the other member First Nations of the United Chiefs and Councils of Mnidoo Mnising, and Wiikwemkoong Unceded Territory since commencement of this study to help to ensure that opportunities to share information and participate in this study have been offered throughout the duration of this study. Notification of the following key study milestones has been provided to the Chiefs, as well as community members that expressed an interest in receiving notifications about this study:
	 Notice of Study Commencement and Request to Consult (June 29, 2018) Notice of Public Information Centre 1/Community Information Sharing Sessions (August 14, 2018)
	 Notice of Public Information Centre 2 / Community Information Sharing Sessions (July 3, 2019) Notice of Online Public Information Centre 3 (March 18, 2021)
	In addition, Community Information Sharing Sessions 1 and 2 were held at the Four Directions Community Centre on August 23, 2018, and July 25, 2019, respectively. Notification of these community events was also included in the community newsletter and posters were placed within high traffic areas of the community.
	Community Information Sharing Sessions 1 and 2 were also held within the other member UCCMM member nation communities and Wiikwemkoong Unceded Territory in 2018 and 2019.



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Comment	Response Provided and/or Action Taken
	In general, the feedback received from these Community Information Sharing Sessions included:
	 Priority to have two-way traffic with less delays Ensure that vehicle and boat traffic is accommodated for the long-term future Preserve the heritage value of the old bridge The existing bridge is a significant tourist attraction Indigenous communities have a special relationship with the water. It is traditional territory and impacts will be minimized Concerns regarding safety and the ability to travel on and off of the island in the case of an emergency
	In light of COVID-19 and associated physical distancing requirements, community information sharing/Public Information Centre (PIC) 3 was planned online. In response to requests to offer the PIC in Anishnaabemowin, a translated version of the recorded presentation and comment form was prepared for online review. In addition, copies of the English and translated materials were mailed to each of the Indigenous communities' administration offices for review and comment.
	Contaminated Land
 It is time for the contaminant on Goat Island to be cleaned up CPR and Vale should be forced to clean up Goat Island Contaminated area of Goat Island should not be an issue with this project – provincial or federal government needs to step in and have this cleaned up 	Your concern regarding the contaminated land on Goat Island has been noted by the project team. The contaminated materials on Goat Island are on private property, and the decision to remediate the land and dispose of the contaminated materials are the prerogative of the landowner. Any property impacted by future construction will be tested for contaminants and if the property is purchased, the MTO will be responsible for remediating the soil, as appropriate.
	Active Transportation
 Swing bridge remain open for pedestrians and cyclists Important to have access on foot and bike Allow for as much shoulder on the northbound lane of the bridge Allow space for cyclists to travel so they do not have to cycle 	The project team has noted your preference to retain the existing bridge and rehabilitate it for active transportation access (i.e., pedestrian and cycling access). This is one of several conservation options being considered as part of the heritage investigations being undertaking for this study. An evaluation of the conservation options and selection of an option will be undertaken and documented in the <i>Transportation Environmental Study Report</i> (TESR). The TESR will be available for a 30-day comment period following its completion in a later phase of the study.
 Allow space for cyclists to traverso triey do not have to cycle on the pedestrian sidewalk Walkway on west side of the bridge should be wider than the current one to allow cycling 	The Ontario Ministry of Transportation (MTO) recognizes that Highway 6 is designated as part of the Province-wide Cycling Network. The Preferred Plan, a new through-truss swing bridge, will maintain existing grades for active transportation users and is currently proposed to include a sidewalk on the west side of the bridge. In addition, a 1.5 m shoulder has been recommended on the structure that can accommodate cyclists, separated from pedestrians. The design of these active transportation facilities will be confirmed during detail design, the timing of which is currently unknown
	Emergency Services
 Feels important issues such as emergency vehicles can be addressed with advance warning systems to alert the controller and ensure the bridge remains open, or a helicopter which is normal practice in remote areas Sees only possible problem with current bridge to be multiparty emergencies – which can be covered by Orange helicopters 	Comment noted



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9.0 Indigenous Community Consultation

The appropriate Indigenous communities and/or organizations contacted with respect to this study were identified based on desktop research during the initial stages of the planning process. Through this review, the following Indigenous communities were identified as having a potential interest within the study, and were notified of the study commencement, Study Design Report completion, public information centres, community information sharing sessions within their respective communities, notification regarding geotechnical and archaeological fieldwork being undertaken in the study area, and the study completion:

- Aundeck-Omni-Kaning First Nation
- M'Chigeeng First Nation
- Sheguiandah First Nation
- Sheshegwaning First Nation
- Whitefish River First Nation
- Wiikwemkoong Unceded Territory
- Zhiibaahaasing First Nation
- United Chiefs and Councils of Mnidoo Mnising (UCCMM)
- Métis Nation of Ontario

9.1 Pre-Consultation Notice

The first point of contact for this study consisted of a pre-consultation letter that was issued to the above-mentioned communities via mail and email on April 23, 2018. The purpose of this letter was to indicate that Stantec Consulting Ltd. had been retained to undertake the planning and preliminary design of this study, and that the study team would be reaching out to Indigenous communities individually upon study commencement. The letter also requested that each Indigenous community provide the study team with any previously established consultation protocols or indicate how they wish to be consulted as part of this study.

A copy of this initial letter is provided within **Appendix F.1**.

9.2 Notice of Study Commencement

The Notice of Study Commencement and Request to Consult was sent via mail and email to the above noted communities on June 29, 2018. The purpose of this correspondence was to provide information related to the study purpose, the Class EA process, and to invite each Indigenous community to participate in the consultation process. Follow-up phone calls and emails were made to help ensure that communities had sufficient information to determine their level of interest in the study and to discuss any initial questions and/or concerns.

A copy of the Notice of Study Commencement and Request to Consult is provided within **Appendix F.1.**

9.2.1 Wiikwemkoong Unceded Territory and Chief and Council Meetings

Following the distribution of the Notice of Study Commencement and Request to Consult, designated representatives from Wiikwemkoong Unceded Territory indicated their interest in discussing the study further. As such, a meeting was held between the Chief, two other community representatives, and the study team on August 8, 2018. At this meeting, the study team provided an overview of the study process and information regarding problems and opportunities, alternatives to the undertaking, ongoing environmental investigations, the existing environment, and a tentative schedule of future consultation events. Following the presentation, a discussion was held to respond to questions and discuss any initial comments and/or concerns expressed by representatives of the Indigenous community.

Additionally, a follow-up meeting was held between the study team and the Wiikwemkoong Chief and Council as part of a regularly scheduled Council meeting on September 10, 2018, where a similar presentation was shared.

A copy of these presentations and associated meeting notes is provided in **Appendix F.6**.

9.3 Community Information Sharing Session 1

Community Information Sharing Sessions (CISSs) were held within four Indigenous communities to generally introduce the project and associated background information, present and gather feedback on the problems and opportunities, the study area existing conditions, and the Alternatives to the Undertaking.

CISS 1 was designed to engage Indigenous community members early in the study process to identify concerns and provide an opportunity for input by allowing community members to attend in-person to share their ideas and interests directly with members of the study team.

Four separate CISS 1 events were held within Indigenous communities, as follows:

- Aundeck-Omni-Kaning First Nation August 23, 2018
- Sheshegwaning First Nation August 24, 2018
- Wiikwemkoong Unceded Territory October 23, 2018
- M'Chigeeng First Nation October 24, 2018

CISS events were coordinated with designated representatives of the participating Indigenous communities and tailored letters were addressed to each First Nation Chief to provide the Notice



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of Public Information Centre 1, and to confirm CISS 1 details for each community. These letters were sent via mail and email on August 14, 2018.

Tailored posters providing information about each of the four CISS 1 sessions, including the date, time and location of each session, were provided to each community representative to post in community public spaces, including the administration or band offices, on their websites and social media pages, and within their monthly newsletters.

The CISS 1 events were organized to include a brief presentation, followed by a formal question and answer session. Comment sheets were provided to each of the attendees, who were encouraged to return comments either within the comment sheet box at the session, or to their local administration/band office following the event.

A copy of the CISS 1 Summary Report, including a copy of the notification letter and posters, the information presented, and a record of the feedback received and associated response from the project team is available within **Appendix F.2**.

9.3.1 Whitefish River Meeting

Following CISS 1, representatives from the Whitefish River First Nation indicated their interest in holding a meeting with the study team to discuss the study in further detail. As such, a meeting was held at their Council chambers on October 24, 2018, where the study team provided an overview of study background information, the MCEA process, alternatives to the undertaking, ongoing investigations, what future consultation events were being planned, and answered any questions and/or concerns attendees had.

A copy of the presentation and associated meeting notes are provided in Appendix F.6.

9.4 Study Design Report

The study team coordinated notification and review of the SDR with designated representatives of each participating First Nation and notification of the event was provided through tailored letters addressed to each First Nation Chief, along with the Notice of SDR. These letters were sent via mail and email on November 15, 2018.

Tailored notices providing information about the SDR, including notice that a copy of the SDR was available for review at community administration offices, were provided to each Indigenous community representative to share the notice with community members, along with a copy of a comment form to gather community member feedback on the SDR.

Copies of the SDR notices are provided in Appendix F.3.

9.5 Community Information Sharing Session 2

The purpose of CISS 2 was to present and gather feedback from interested Indigenous community members on the assessment of alternatives to the undertaking, alignment alternatives, structure type alternatives, the proposed evaluation criteria and evaluation process, heritage conservation options for the existing bridge, and project activities to date.

Five individual CISS 2 events were held within Indigenous communities, as follows:

- M'Chigeeng First Nation July 18, 2019
- Sheshegwaning First Nation July 19, 2019
- Whitefish River First Nation July 23, 2019
- Wiikwemkoong Unceded Territory July 24, 2019
- Aundeck-Omni-Kaning First Nation July 25, 2019

The study team coordinated the CISS 2 events with designated representatives of each participating First Nation and notification of the event was provided through tailored letters addressed to each First Nation Chief, along with the Notice of PIC 2. These letters were sent via mail and email on July 3, 2019.

Tailored posters providing information about each event, including the location, date and time, were provided to each Indigenous community representative to post in community public spaces including administration/band offices, on their websites and social media pages, and within their monthly newsletters.

Each CISS 2 session included a brief presentation, followed by a formal question and answer session. It should be noted that given limited attendance at the M'Chigeeng First Nation event, no presentation was provided, instead the event was hosted in an open house format with information displays available and study team members available to discuss questions, comments and/or concerns in an informal setting. Comment sheets were also provided at each CISS 2 event, and attendees were encouraged to return any completed comment sheets to the comment sheet box provided, or to their local administration/band office following the event. Each CISS event was also catered by a local community member.

Hard copies of the presentation, information displays, and comment forms were also provided to designated community contacts to offer an opportunity for those who were unable to attend to review the study information and provide feedback.

Additionally, a boating survey was made available at each of the five CISS 2 events to collect information from boaters to form a better understanding of the existing and potential boating activity within the study area.

A copy of the CISS 2 Summary Report, including a copy of the notification letter and posters, the information presented, and a record of the feedback received and associated response from the project team is available within **Appendix F.4**.



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9.5.1 UCCM Tribal Council Meeting

Following CISS 2, designated representatives from the United Chiefs and Councils of Mnidoo Mnising (UCCMM) indicated their interest in attending an individual meeting with the study team, which was held on February 24, 2020. At this meeting, the study team provided and overview of the study process, evaluation of alternatives to the undertaking, alignment and structural alternatives, evaluation criteria to be used in the assessment, feedback received to date, conservation opportunities for the existing bridge and next steps in the study process.

A copy of the presentation and associated meeting notes taken during this meeting is provided within **Appendix F.6**.

9.6 Letter Notice of Study Update

On August 14, 2020, a letter notification was issued to UCCMM Tribal Council and Chiefs of the member First Nations, as well as the Chief and staff at Wiikwemkoong First Nation, to provide a brief update on study progress, including the study team's intent to hold arrange for an online PIC 3 event, should in person events not be feasible for the foreseeable future. The letter also provided notification of archaeological and geotechnical investigations that were being planned within the study area in September 2020 (i.e., during the COVID-19 pandemic). The letter further indicated that the findings of the archaeological assessments will be documented within draft Stage 1 Marine Archaeological Assessment and draft Stage 2 Archaeological Assessment reports, and shared with the Indigenous communities for review and approval, when they became available. Responses to the letter notification were not received during the course of this study.

A copy of the letter notice is provided in Appendix F.4.

9.7 Online PIC 3

As indicated above, due to the COVID-19 pandemic and associated physical distancing requirements, in person events were not arranged and PIC 3 was held online on the study website between March 30, 2021, and April 30, 2021. Further details regarding the purpose and format of Online PIC are provided in Section 8.10; however, a description of how notification and information sharing with the Indigenous communities was carried out in lieu of an in person/CISS event is described herein.

Following conversations with designated representatives of each Indigenous community during the planning stage of Online PIC 3, the study team was informed that a portion of the Indigenous population within the study area is not fluent in written and/or spoken English, but rather Anishnaabemowin, and therefore may have difficulty viewing and listening to the Online PIC 3 presentation, as well as using the online comment form. As such, the study team retained a local organization (the Debajehmujig Theatre Group) to complete a full translation of the presentation (both the audio voiceover and transcript), as well as the comment form, into Anishnaabemowin to allow Indigenous community participants to choose a version suited to their preferred language. A

formal cover letter and Notice of Online PIC 3 was issued to the Indigenous communities on March 18, 2021, via mail and email.

Additionally, as not all members of the community have reliable internet services, arrangements were made to deliver hardcopies of the presentation materials and comment forms in both languages to each of the local Indigenous community administrative/band offices, so that they could be available upon request. The following was included within each hardcopy package couriered to local administrative offices on April 1, 2021:

- Five (5) hardcopies of the Online PIC 3 Presentation Slides (in English)
- Five (5) hardcopies of the Online PIC 3 Transcript (in both English and Anishnaabemowin)
- Twenty (20) hardcopies of the Online PIC 3 Comment Form (in both English and Anishnaabemowin)
- Five (5) hardcopies of an Online PIC 3 Poster tailored to each Indigenous community (in English)

These packages also included hardcopies of a tailored poster to provide each Indigenous community with the opportunity to advertise information on how to participate in PIC 3 by posting them at frequented public spaces, on their social media pages and website, and within their monthly newsletters. The posters also indicated that hardcopy materials of PIC 3 would be available at the local administrative office and provided contact information for the local community representative. Electronic copies of the posters were also emailed to local representatives on March 26, 2021, along with a request to post these notices within their local newsletters and social media outlets.

A copy of all Anishnaabemowin presentation materials, comment forms and Indigenous community posters provided for Online PIC 3 is available within **Appendix F.5.**

9.8 Letter Notice of Study Update

On November 22, 2022, a letter notification was issued to UCCMM Tribal Council and Chiefs of the members of Frist Nations, as well as the Chief and staff at Wiikwemkoong Unceded Territory, to provide a brief update on study progress, including receipt of the MCM Minister's consent for the removal of the existing bridge, as well as the estimated timing of the Notice of Study Completion. Given the lapse of time since PIC 3 (i.e., spring 2021), the letter provided an overview of the Recommended Plan, as well as notification that the MCM Minister had provided consent for the removal of the existing swing bridge on November 2, 2022.

The letter also provided a brief outline of the approximate timing and next steps of the study, including the completion of the TESR, the associated Notice of TESR Completion, and the subsequent 30-day public comment period. It was also noted in the letter that the Notice of TESR Completion would be mailed and emailed to UCCMM and its member First Nations, and Wiikwemkoong Unceded Territory, as well as published in the *Manitoulin Expositor*, *Sudbury Star*,



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and *Manitoulin West Recorder* newspapers in early 2023. The letter also indicated that a hardcopy of the TESR would be couriered to the administration office of each First Nation.

An email response to the letter notification was subsequently received from Wiikwemkoong Unceded Territory and M'Chigeeng First Nation indicating contact information changes within their organization. In addition, it was noted that they would like to continue to receive correspondence related to the study.

A copy of the letter notification is provided in **Appendix F.7.**



Notice of Study Completion January 25, 2023

10.0 Notice of Study Completion

The Notice of Study Completion was placed in local newspapers (*Manitoulin Expositor, Sudbury Star* and *Manitoulin West Recorder*) when the Transportation Environmental Study Report (TESR) was made available for public review. The Notice was also made available on the project website and distributed to agencies, key stakeholders, Indigenous communities, and the public on the project mailing list.

10.1 Future Consultation

During the subsequent stage of design stage of this undertaking, the external agencies, Indigenous and Métis communities, and property owners will continue to be contacted and consulted regarding design/construction details and commitments to future work as outlined in this document, where appropriate and/or necessary.

10.2 Future Commitments

Future consultation will be required during the next phase of planning and design to deal with all outstanding issues, including permits and approvals from external agencies (international, federal, provincial), consultation with Indigenous communities and detailed environmental investigations regarding impacts and mitigation, and engineering investigations to confirm the final design.

Future consultation is expected to include notification of the start of next phase of planning and design, and CISSs and a PIC near the completion of design stage to display plans, and to answer questions about the final design and proposed mitigation measures. The coordination of provincial, federal, and international permits and approvals is a key component of this project and for future project phases. A summary of proposed future consultation is in **Table 10-1**.

Table 10-1: Future Consultation with External Agencies

External Agency	Subject of Consultation
Fisheries and Oceans Canada	 Requirements of current MTO/DFO/MNRF Fisheries Protocol Confirm fisheries impacts, and final bridge recommendations Timing restrictions and other fisheries mitigation in contract package Fisheries Act Authorization, if required
Transport Canada	 Confirm navigational clearances during design stage Assist the Navigation Protection Program in any additional consultation requirements, as needed Obtain Canadian Navigable Waters Act Permit for Major Works
Ministry of Natural Resources and Forestry	 Natural environment (terrestrial and aquatic) timing restrictions and mitigation in contract package Confirm terrestrial impacts and mitigation

External Agency	Subject of Consultation
	 Determine if specific fisheries management objectives are available (MNRF Upper Great Lakes Management Unit) Endangered Species Act authorization/permit, if required
Ministry of Citizenship and Multiculturalism	MTO will comply with the conditions of the MCM Minister's Consent
Ministry of the Environment, Conservation and Parks	 Permit application under ESA Section 17.2(c) (overall benefit) Information Gathering Form (IGF) Avoidance Alternatives Form (AAF) 17.2(c) Permit Application Form (C-PAF) MECP must post the application to the Environmental Registry for public review and comment
Indigenous Communities	 Subsequent planning and design process engagement Construction planning within Traditional Territory and traditional waters of North Channel Detailed ecological field surveys participation and information sharing Construction timing, traffic management planning
Town of Northeastern Manitoulin and Islands, Manitoulin Municipal Association	Ongoing consultation during subsequent planning and design phase of project
CP Rail	Ongoing consultation during subsequent planning and design phase of project
Emergency service agencies (i.e., OPP, Fire, ambulance, UCCM and Wiikwemkoong Police Services, etc.)	Ongoing consultation during subsequent planning and design phase of project to minimize impacts to emergency response times during and after construction
All other agencies/groups involved in planning and preliminary design study	Ongoing consultation during subsequent planning and design phase of project
Utility companies	Ongoing consultation during subsequent planning and design phase of project

Other issues to be dealt with during subsequent planning and design process include:

- Property concerns and entrance closures through negotiations with individual property owners
- Additional details of the Recommended Plan such as tree clearing requirements



Summary of Environmental Effects, Proposed Mitigation and Commitments to Future Work January 25, 2023

11.0 Summary of Environmental Effects, Proposed Mitigation and Commitments to Future Work

A summary of environmental effects, proposed mitigation, and commitments to future work, as identified during the course of this study, is provided in **Table 11-1**, and forms a comprehensive 'checklist' of outstanding issues identified at the end of Class EA and Preliminary Design and will serve as a starting point for the subsequent planning and design phase of the project.



Summary of Environmental Effects, Proposed Mitigation and Commitments to Future Work January 25, 2023

Table 11-1: Summary of Environmental Effects, Proposed Mitigation and Commitments for Future Work.

Legend

DFO: Department of Fisheries and Oceans

MTO: Ministry of Transportation

MNRF: Ministry of Natural Resources and Forestry

MUN: Local Municipalities

PUB: General Public

EMS: Emergency Medical Services

RES/BUS: Local Residents/Business Owners

MECP: Ministry of Environment, Conservation and Parks

MCM: Ministry of Citizenship and Multiculturalism

STS: Student Transportation Services

UCCMM: Tribal Council: United Chiefs and Councils of Mnidoo

Mnising

I.D. #	Environmental Issues/Concerns and Potential Effects	Concerned Parties	I.D. #	Mitigation/Protection/Monitoring/Commitments to Further Work					
Natu	ntural Environment								
1.0	Surface Water	MTO	1.1	Complete drainage design to provide appropriate drainage capacity.					
	Potential impacts to surface water and	MECP UCCMM Tribal Council Wiikwemkoong	1.2	Direct runoff and overland flow away from working areas and areas of exposed soils.					
	groundwater from disturbance of contaminated soils, leaks and		1.3	Store all oils, lubricants and other chemicals in suitable containers and handle them in accordance with applicable regulations.					
	accidental spills		1.4	Do not permit refueling within 30 m of a watercourse.					
		First Nation	1.5	At minimum, best management practices will be applied for fuel management including secondary containment of temporary fuel storage.					
			1.6	Install debris platforms and/or collection systems to prevent dust, debris, effluent and visible emissions falling into watercourse.					
			1.7	Prepare and follow spill response plan for construction. All spills will be cleaned up immediately, and contaminated materials will be disposed of in an approved manner. The MECP will be informed immediately of all reportable spills.					
			1.8	Run-off from construction and stockpiles will be contained and discharged to prevent entry of sediment to water.					
			1.9	Obtain draft Permit to Take Water (PTTW), if required.					
2.0	Fish & Fish HabitatWorks adjacent to aquatic resources	MTO MECP MNRF DFO UCCMM Tribal Council Wiikwemkoong First Nation	2.1	Complete update to Preliminary Fisheries Assessment, including additional field data collection, to determine the likelihood of causing the death of fish or HADD of fish habitat (Step 4 of the Protocol).					
	that provide fish habitat, or have the potential to support fish habitat, may		2.2	Complete an assessment of potential effects of anthropogenic noise on fish during construction (drilling activities during construction of the new bridge piers), with particular attention to Lake Sturgeon.					
	present a risk of construction-related impacts to fish during their most sensitive / vulnerable life cycles		2.3	A comprehensive Erosion and Sediment Control Plan will be completed during next stage of planning and design. At minimum, the Best Management Practices set forth in the Environmental Guide for Erosion and Sediment Control During Construction of Highway Project will be followed.					
	(i.e., during reproduction and early development stages of off-spring)		2.4	Applicable in-water work restrictions (i.e., In-water construction activities are permitted from July 16 to August 31 (i.e., no work from September 1 to July 15) (MNRF 2018); however, upon request from MTO, the MNRF may adjust the timing window upon review of the bridge design, construction plan, and mitigation measures. Due to the potential presence of Lake Sturgeon, review of the timing window by the MECP will be undertaken during the next stage of planning and design.					
							2.5	Once construction methods are available, consult with MECP and/or prepare and submit an Information Gathering Form for review and determination if project contravenes the ESA (based on potential use by Lake Sturgeon).	
			2.6	An update to MTO's Template Table D4 (Fish and Fish Habitat Impact Documentation) will be completed prior to completion of a Request for Review form.					
			2.7	Any fish stranded within the work area will be salvaged and relocated.					
			2.8	Fish exclusion measures (i.e., block nets) to prevent fish from re-entering work areas will be implemented.					
			2.9	Fish and fish habitat management during flow diversion/dewatering.					
			2.10	Request for review form submitted to DFO (per Step 6 of the Protocol) for review under the Fisheries Act.					
			2.11	Vehicle and equipment refueling will be carried out away from the North Channel and any adjacent waterway.					



I.D. #	Environmental Issues/Concerns and Potential Effects	Concerned Parties	I.D. #	Mitigation/Protection/Monitoring/Commitments to Further Work
			2.12	A spill containment plan will be established prior to construction and remain on-site during construction activities.
			2.13	Opportunities to improve fish habitat and fish passage will be considered.
			2.14	Best Management Practice for Maintenance of Riparian Vegetation in existing right-of-way.
			2.15	Best Management Practice for Ditch Maintenance Within 30 m of a Waterbody will be followed.
			2.16	Exposed soil areas will be stabilized.
			2.17	All activities will adhere to Best Management Practices Manual for Fisheries.
3.0	Vegetation Potential for localized impacts to	MTO MECP	3.1	Right-of-Way clearing will be minimized to the extent possible. Any additional property holdings or Excess Material Management Areas adjacent to forest or wetland areas will be rehabilitated to forested vegetation communities to further reduce impacts.
	vegetation due to disturbance of common species	MNRF UCCMM Tribal	3.2	All vegetation clearing and grubbing activities will take place outside of the breeding bird window (April 1 to August 31 of any year), and comply with the Migratory Birds Convention Act (1994).
		Council Wiikwemkoong	3.3	Vegetation removal associated with construction related activities will be minimized, and where required Environmentally Sensitive Areas will be established to restrict access to sensitive areas during construction.
		First Nation	3.4	Stockpiling of materials will be kept away from adjacent natural areas.
			3.5	Stormwater discharge during construction will be directed away from adjacent natural areas.
			3.6	A comprehensive Erosion and Sediment Control Plan will be completed during next stage of planning and design. At minimum, the Best Management Practices set forth in the Environmental Guide for Erosion and Sediment Control During Construction of Highway Project will be followed.
			3.7	Topsoil, seed banks and organic matter will be salvaged and reintroduced to any areas disturbed during construction. New seed will be introduced to disturbed substrates as soon as feasible following construction (within 15 days for areas less than 200 m from a waterbody or watercourse, and 45 days for other areas) and sediment fencing or other barrier will remain in place until vegetation cover is re-established.
		3.8	Alvar communities will be avoided to the extent possible. These communities contain provincially rare native species, and highly sensitive native plants. Authorization under ESAs will be required if these communities are impacted. Sediment fencing or other construction barrier fencing will be used to separate work areas from the Environmentally Sensitive Areas, SAR habitat and SOCC habitat. A permit application under ESA Section 17.2(c) (overall benefit) will be required if impacts to alvar community cannot be avoided. The overall benefit permit application requires the following documentation to be submitted to MECP:	
				 Information Gathering Form (IGF) Avoidance Alternatives Form (AAF) 17.2(c) Permit Application Form (C-PAF)
4.0	Wildlife and Species at Risk (SAR)Potential for species at risk (SAR)	MTO MNRF	4.1	Interaction with SAR and other wildlife during construction may occur. The Contractor will ensure all SAR sighted or encountered are protected and avoided if under immediate threat from construction activities.
	habitat within or adjacent to the study area, and potential interactions with wildlife during construction MECP UCCMM Tribal Council Wiikwemkoong First Nation	MECP 4.2 UCCMM Tribal Council Wiikwemkoong	4.2	Once design details are confirmed, additional surveys will be carried out in potential habitat for SAR to confirm potential impacts to SAR species identified. The following SAR and provincially rare species are present within the study area: Grooved Yellow Flax, Houghton's Flatsedge, Prairie Dropseed, Slender Blazing-star, Monarch, Eastern Milksnake, Snapping Turtle, Common Nighthawk, Eastern Wood-Pewee, Golden-winged Warbler, Grasshopper Sparrow, Wood Thrush.
			4.3	Preconstruction surveys will be carried out to determine the presence and/or absence of breeding occurrences of Bobolink and Eastern Meadowlark, as well as suitable maternity roost trees for Endangered bats. If species observed to be present, additional mitigation and authorization requirements under the ESA will be determined.
			4.4	Wildlife fence will be installed without breaks or gaps along their entire length. Fencing will be removed immediately after site specific work has been completed. Removals will be in accordance with OPSS 510.
		4.5	If impacts cannot be avoided through design, appropriate mitigation measures will be developed as required in accordance with the most up to date legislation at that time, including any applicable approvals under the Endangered Species Act.	



I.D. #	Environmental Issues/Concerns and Potential Effects	Concerned Parties	I.D. #	Mitigation/Protection/Monitoring/Commitments to Further Work					
			4.6	A thorough visual search of machinery and the work area for turtles or other wildlife, particular between June 1 or after September 1, when nesting turtles are most active will occur before work commences each day by construction contractors to avoid interaction with wildlife. If encountered, work will stop and wildlife will be permitted reasonable time to flee the area on their own. If necessary, a qualified professional can move wildlife to a location that is both safe and suitable. Factsheets will be provided to assist contractors in the identification of potential SAR and SOCC (Blanding's Turtle, Snapping Turtle and Milksnake). Observations of SAR will be reported to MECP within 48 hours.					
			4.7	To avoid potential impacts to endangered bats, tree removal will not occur between May 1 to August 31, if required. If tree clearing is required between May 1 to August 31, maternity exit surveys may be conducted prior to the tree removals to determine if bats are using the trees. Maternity exit surveys are conducted during the evening and will include visual and acoustic surveys using accepted protocols.					
			4.8	Candidate habitat for seasonal concentration areas for Bat Maternity Colonies, Reptile Hibernacula and Turtle Wintering Areas. Proper mitigation and avoidance will be determined.					
5.0	Migratory Birds and Protected Nests Potential for protected birds to establish nests on existing structures	MTO MNRF	5.1	Active nests (nests with eggs or young birds), and birds will be protected under the Migratory Birds Convention Act (MBCA). Tree removal will occur outside the Primary Nesting Period (PNP) of April 15 to August 13.					
6.0	Erosion and Sedimentation Erosion and sedimentation during	MTO MNRF	6.1	A comprehensive Erosion and Sedimentation Control Plan will be developed, prior to construction. Erosion and sedimentation control measures will be implemented in accordance with the Contract Documents to avoid or mitigate impacts to adjacent habitats, and property inside or outside of the right-of-way.					
	activities associated with construction have the potential to impact the watercourses and drainage ditches within the study area		6.2	At minimum, the Best Management Practices set forth in the Environmental Guide for Erosion and Sediment Control During Construction of Highway Project will be followed.					
			6.3	Impacts at approaches to watercourses, including installation of sediment control fencing or construction barrier, slope restoration and stabilization during construction, will be minimized to the extent possible.					
			6.4	Sloped areas will be inspected regularly during construction to identify erosion problems and seepage areas and plan for appropriate temporary stabilization and drainage measures.					
			6.5	Depending on the proposed grading determined during design, rip rap may be required to protect the embankments.					
			6.6	The limits of construction (site boundaries) adjacent to all natural areas will be flagged and/or fenced prior to construction, and monitored during construction (along with erosion and sediment control measures).					
								6.7	No equipment will be permitted to enter any natural areas beyond the sediment fencing (site boundaries) during construction. Equipment arriving on-site will be inspected inside and out prior to entering the site for debris such as mud or accumulation of dirt, plant material or snow/ice. Special Provision No. ENR 0011 requires that equipment and vehicles are inspected as close to the site entrance as possible. Equipment will be cleaned in an area where risk of contamination is low, ideally on a mud free hard surface, at least 30 m away from the North Channel or other drainage features, waterbodies, wetlands or other natural areas. Where risk of runoff is high, cleaning stations will be contained by sediment fence as per standard erosion and sediment control specifications.
			6.8	All materials requiring stockpiling (fill, topsoil, etc.) will be stabilized and kept a safe distance from any sensitive natural features.					
			6.9	All exposed soil areas will be stabilized and re-vegetated. Native seed and mulching, or seed and an erosion control blanket will be applied to disturbed sites promptly upon completion of construction activities.					
			6.10	Refueling of equipment will be carried out away from any sensitive natural features to avoid potential impacts, in the event that an accidental spill occurs.					
			6.11	In addition to any specified requirements, additional sediment fence will be available on site, prior to grading operations, to provide a contingency supply in the event of an emergency.					
			6.12	All sediment and erosion controls will be monitored regularly and properly maintained, as required. Controls will be removed only after the soils of the construction area have been stabilized and vegetation cover is re-established.					
			6.13	Any natural areas that are temporarily disturbed for access or construction will be restored to natural self-sustaining conditions.					
			6.14	Environmental controls will be monitored by an environmental inspector.					



I.D. #	Environmental Issues/Concerns and Potential Effects	Concerned Parties	I.D. #	Mitigation/Protection/Monitoring/Commitments to Further Work							
Soci	al and Economic Environment										
8.0	Land Use and Property	MTO	8.1	Maintain access to private entrances and sideroads during construction.							
	 Potential direct and indirect impacts to adjacent properties, including disruption during construction Temporary delay or disruption to EMS providers during construction 	CP NEMI Wiikwemkoong First Nation UCCMM Tribal	8.2	Notify the public, Indigenous communities and associated emergency service providers, OPP, fire department and ambulance of start of the next stage of design, construction staging, start of construction, etc. to minimize delay in emergency response times during and after construction.							
			8.3	Maintain liaison/coordinate construction with responding agencies (including school boards).							
			8.4	Engage with impacted property owners to review, discuss and\ confirm impacts to property and associated mitigation measures.							
		Council	8.5	Consult general public through newspaper notices and directly affected/adjacent property owners through correspondence at the start of the subsequent design process.							
			8.6	Hold Public Information Centre and Community Information Sharing Sessions during the next stage of design to display and seek input on detailed plan and construction staging.							
			8.7	Establish and confirm construction staging and laydown areas.							
			8.8	Prepare a detailed Traffic Management Plan.							
	 Subsurface Contamination Portions of Goat Island have been identified as having the potential for environmental concern 	МТО	8.9	Undertake Phase 1 and/or 2 Environmental Site Assessment (ESA) activities to confirm the presence or absence of on-site soil and/or groundwater contamination.							
	Management of Excess Materials Excess materials may be encountered during construction at the sites and require proper management/disposal	MTO MECP	8.10	Excess materials generated during construction will be managed in accordance with O.Reg. 406/19. All materials and debris will be removed upon completion of the work, in accordance with O.Reg. 406/19.							
9.0	Potential noise increase during construction associated with some equipment (e.g., boom trucks, pile	MTO MUN RES/BUS PUB	9.1	Once equipment and construction schedules are finalized, construction equipment sound levels will be reviewed to confirm that nose emissions are within the permissible limits. If higher than permissible limits, noise control options will be explored.							
			9.2	All equipment will be properly maintained to limit noise emissions. As such, all construction equipment will be operated with effective muffling devices that are in good working order.							
	drivers, dump trucks and paving machines)		9.3	The contractor will be required to adhere to standard noise restrictions (i.e., proper maintenance of equipment, no unnecessary idling).							
	machines)		9.4	The Contract Documents will contain a provision that any initial noise complaint will trigger verification that the general noise control measures agreed to are in effect.							
			9.5	In the presence of persistent noise complaints, all construction equipment will be verified to comply with MECP NPC-115 guideline.							
											9.6
10.0	Archaeological Resources Previously unknown/deeply buried artifacts/human remains could be uncovered during construction	MTO MCM UCCMM Tribal Council Wiikwemkoong First Nation	10.1	Should previously undocumented archaeological resources be discovered, they may be a new archaeological site and therefore subject to Section 48(1) of the Ontario Heritage Act (Government of Ontario 1990b). The proponent or person discovering the archaeological resources must cease alteration of the site immediately and engage a licensed consultant archaeologist to carry out archaeological fieldwork, in compliance with Section 48(1) of the Ontario Heritage Act (Government of Ontario 1990b).							
				The Funeral, Burial and Cremation Services Act, 2002, S.O. 2002, c.33 (Government of Ontario 2002) requires that any person discovering human remains must notify the police or coroner and the Registrar of Cemeteries at the Ministry of Government and Consumer Services. The UCCMM Tribal Council and Wiikwemkoong First Nation will also be notified.							
11.0	Built Heritage Resources and Cultural Heritage Landscapes	МТО	11.1	Sympathetic design and replacement of the existing bridge will respect the design principles of the original bridge and its setting and integrate the original bridge type with allowances for use of modern materials and where feasible used salvaged components from the heritage bridge, where feasible.							



I.D. #	Environmental Issues/Concerns and Potential Effects	Concerned Parties	I.D. #	Mitigation/Protection/Monitoring/Commitments to Further Work
	Heritage Property of Provincial Significance (Removal and relocation of all or part of the existing bridge)	MCM		Consultation with MCM, Town of NEMI, and key stakeholders will be carried out to design the new structure.
		Public UCCMM Tribal Council		A salvage plan for the existing bridge will be undertaken during the next stage of design. The plan will investigate and document the bridge components and follow MTO's Environmental Guide for Built Heritage Resources and Cultural Heritage Landscapes – Section 6.3.2 Heritage Bridges, including incorporation of heritage bridges elements, and specific details, such as the following, should be included in the contract documentation:
		Wiikwemkoong First Nation		 A requirement for expertise in cultural resource removal with a specialized knowledge in bridge construction Specifications with instructions for the labelling, storage and reassembly of elements; and A requirement to have photographic documentation of the re-assembly and have it filed with the construction record
				Interpretation and Commemoration Plan for the Little Current Swing Bridge, in consultation with MCM, the municipality, and as appropriate, with Indigenous communities and other parties will be completed during the next stage of design and will include:
				 Commemorate the bridge at an appropriate location that is associated with the bridge (preferably close by the crossing) and publicly accessible Record the history of the bridge and its impact on the area Include interpretive materials such as display panels and, if feasible, the entire bridge or significant components of it such as the gears and the control booth
				Prior to decommissioning and replacement of the bridge, documentation of the historic structure will be conducted, including:
				 Photographic documentation in accordance with the NPS HAER guidelines (recommended in the absence of established Canadian documentation guidelines) Measured drawings in accordance with the NPS HABS/HAER guidelines (recommended in the absence of established Canadian documentation guidelines) Reality capture including LiDAR scanning or photogrammetry to create a point cloud model of the bridge
				Video/digital recording of the swing bridge in operation
			11.2	MTO will comply with the conditions of the MCM Minister's Consent
12.0	Air Quality Potential for dust from construction activities to adversely affect nearby land uses and watercourses	MTO MECP RES/BUS PUB	12.1	The Environment and Climate Change Canada's Best Practices for the Reduction of Air Emissions from Construction and Demolition Activities will be followed. At minimum, best practices during construction will include material wetting or use of chemical suppressants to reduce dust, use of wind barriers and limiting exposed areas which may be a source of dust, and equipment washing.
13.0	Utilities	МТО	13.1	Utilities will be contacted during next stage of planning and design to confirm location of existing utilities and potential conflicts.
	Impacts to existing utilities during construction	UTL		



Monitoring January 25, 2023

12.0 Monitoring

The planning and preliminary design phase of the project is now complete. Specific mitigation measures identified in this report will require confirmation during the next design phase and monitoring during construction.

Monitoring will be conducted by on-site construction supervisory staff to make sure that environmental protection measures, as outlined in this report and confirmed during subsequent design phases, and included in the contract package, are implemented. This includes making sure that the implementation of mitigating measures and key design features is consistent with commitments made to external agencies prior to construction.

For certain activities, monitoring by a Qualified Environmental Specialist will be required.

In the event that protective measures do not address concerns identified or if major problems develop, the appropriate agency will be contacted to provide additional input.

In the event that the impacts of construction are different than anticipated, or that the method of construction is such that there are greater than anticipated impacts, the Contractor's method of operation will be modified to reduce those impacts.



Appendix A Preliminary Drawings



Appendix B Minister of Citizenship and Multiculturalism's Decision



Appendix C Public Notifications



Appendix D Agency Consultation



D.1 Agency Mailing List



D.2 Agency Meeting



D.3 Agency Webinar



D.4 Municipal Consultation



D.5 Agency Correspondence



D.6 Letter Notices of Study Updates



Appendix E Public Consultation



E.1 Notice of Study Commencement



E.2 Public Information Centre 1



E.3 Study Design Report



E.4 Public Information Centre 2



E.5 Public Information Centre 3



E.6 Business Owner Meeting



E.7 Property Owner Meetings



E.8 Boating Survey/Consultation



E.9 Public Correspondence



Appendix F Indigenous Community Consultation



F.1 Notice of Study Commencement

F.2 Community Information Sharing Session 1



F.3 Study Design Report



F.4 Community Information Sharing Session 2

F.5 Online Public Information Centre 3



TRANSPORTATION ENVIRONMENTAL STUDY REPORT

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F.6 Meetings



F.7 Letter Notices of Study Updates

