MUNICIPALITY OF ARRAN-ELDERSLIE

BRIDGE INFRASTRUCTURE MASTER PLAN

BMROSS
engineering better communities

MUNICIPALITY OF ARRAN-ELDERSLIE

BRIDGE INFRASTRUCTURE MASTER PLAN

March 5, 2026,

B. M. ROSS AND ASSOCIATES LIMITED
Engineers and Planners
62 North Street
Goderich, Ontario N7A 2T4
Phone: (519) 524-2641
www.bmross.net

File No. 19195

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

APPENDICES

Appendix A Watershed Report Cards
Appendix B Planning Documents
Appendix C OSIM Reports
Appendix D Cultural Heritage Evaluation Report
Appendix E Consultation Program

B. M. ROSS AND ASSOCIATES LIMITED
Engineers and Planners
62 North Street, Goderich, ON N7A 2T4
p. (519) 524-2641 **www.bmross.net**

File No. 19195

MUNICIPALITY OF ARRAN-ELDERSLIE

BRIDGE INFRASTRUCTURE MASTER PLAN

FINAL REPORT

1.0 INTRODUCTION

1.1 Purpose of the Report

The Municipality of Arran-Elderslie initiated a Bridge Infrastructure Master Plan process in September 2019 to define the best strategy for resolving deficiencies identified with a group of aging bridges situated in Arran-Elderslie. The 17 structures, which were all constructed between 1910 and 1940, are expected to require significant rehabilitation or replacement in the next 20 years and, as a group, represent a significant capital commitment for the Municipality. The Master Plan review process will consider a range of factors associated with each bridge, including current and anticipated traffic volumes, capacity, local and regional transportation linkages, expected replacement costs, and potential heritage value. The process followed the procedures set out in the Municipal Class Environmental Assessment (Class EA) document, dated October 2000, as amended in 2007, 2011, 2015 and 2024. B. M. Ross and Associates Limited (BMROSS) was engaged to conduct the Master Plan process on behalf of the proponent.

The purpose of this report is to document the Master Planning process followed for this project. The report includes the following major components:

- An overview of the general project area.
- A summary of deficiencies associated with the existing structures.
- A review of specialized investigations completed in support of the Master Plan.
- A description of the alternative solutions considered for resolving the defined problems.
- A synopsis of the decision-making process conducted to select a preferred alternative.
- A detailed description of the preferred alternative.

The Bridge Infrastructure Master Plan established through this process sets out a preferred long-term strategy for transportation infrastructure within the defined study area. In this regard, the Master Plan will become the basis for, and be used in support of, future investigations for specific projects required to implement this strategy.

1.2 General Description of Master Plans

Master Plans are long-range plans that integrate infrastructure requirements for existing and future land uses with environmental assessment planning principles. These plans examine existing infrastructure systems within defined areas to outline a framework for planning subsequent works. Master Plans typically exhibit several common characteristics. They:

- Address the key principles of successful environmental planning.
- Provide a strategic level assessment of various options to better address overall system needs and potential impacts and mitigation.
- Address at least the first two phases of the Municipal Class EA process.
- Are generally long-term in nature.
- Apply a system-wide approach to planning that relates infrastructure either geographically or by a particular function.
- Recommend an infrastructure servicing plan that can be implemented through the completion of separate projects.
- Include a description of the specific projects needed to implement the Master Plan.

1.3 Integration with the Class EA Process

1.3.1 Class EA Project Phases

The Bridge Infrastructure Master Plan has been completed by the planning and design process of the Municipal Class Environmental Assessment. The Class EA is an approved planning document which describes the environmental assessment process that proponents must follow in order to meet the requirements of the Environmental Assessment Act (EA Act).

The Class EA approach allows for the evaluation of alternatives methods of carrying out a project and identifies potential environmental impacts. The Class EA process is self-regulatory, and municipalities are expected to identify the appropriate level of environmental assessment based upon the project they are considering. The Class EA planning process is divided into five project phases which are described below and illustrated in Figure 1.1.

- Phase 1 - Problem identification.
- Phase 2 - Evaluation of alternative solutions to the defined problems and selection of a preferred solution.
- Phase 3 - Identification and evaluation of alternative design concepts in selection of a preferred design concept.

- Phase 4 - Preparation and submission of an Environmental Study Report (ESR) for public and government agency review.
- Phase 5 - Implementation of the preferred alternative and monitoring of any impacts.

1.3.2 Classification of Project Schedules

Projects associated with Master Plans are classified to different project schedules according to the potential complexity and the degree of environmental impacts that could be associated with the project. There are four levels of schedules:

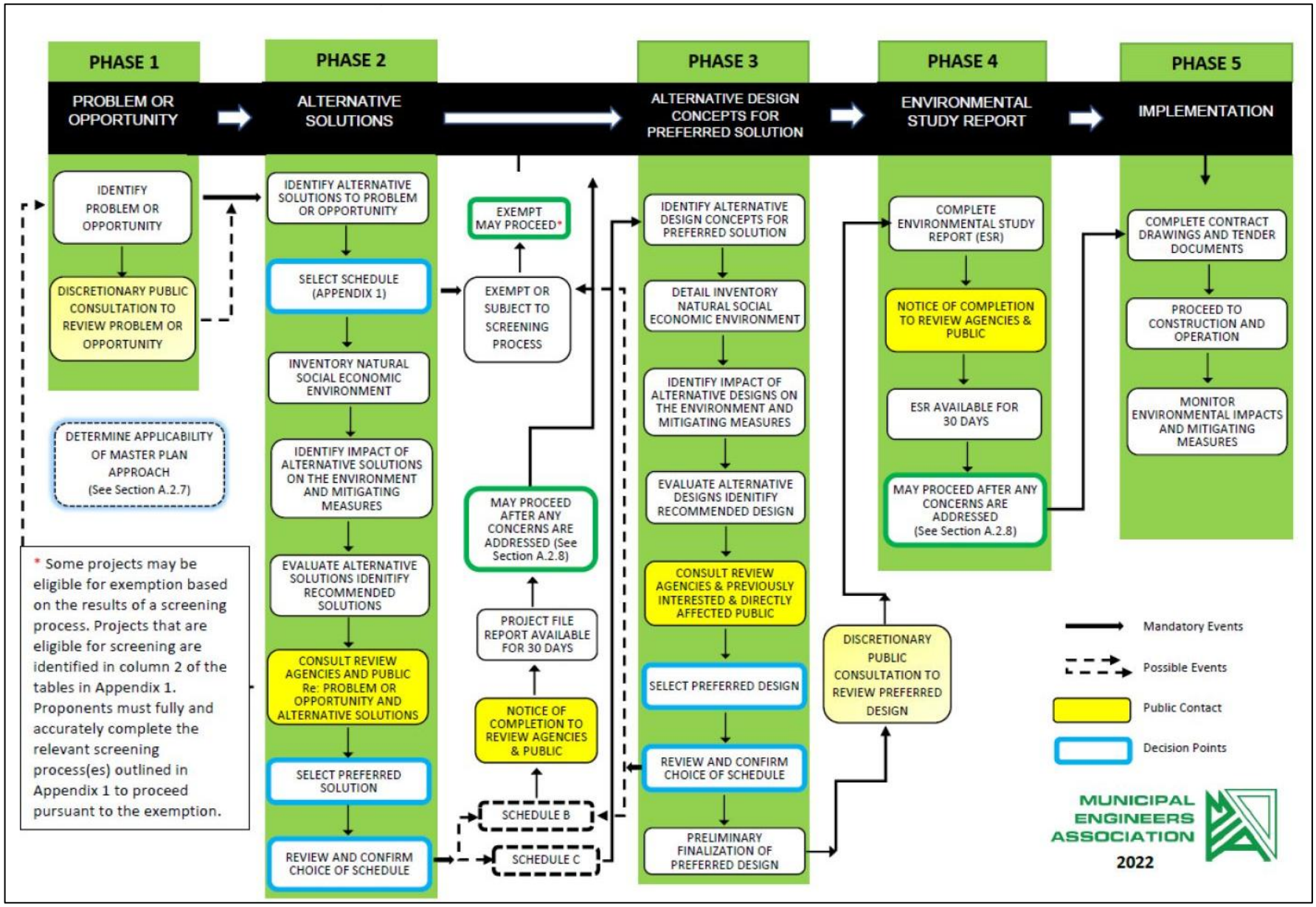
Exempt – Projects are exempt from Environmental Assessment Act requirements;

Eligible for Screening – Projects eligible for exemption based on the results of the screening process(es);

Schedule B – Projects approved following the completion of a screening process that incorporates Phases 1 and 2 of the Class EA process; and

Schedule C – Projects approved following the completion of the full Class EA process.

The Class EA process is self-regulatory and municipalities are expected to identify the appropriate level of environmental assessment based upon the project they are considering.


PHASE 1
PROBLEM OR OPPORTUNITY
PHASE 2
ALTERNATIVE SOLUTIONS
PHASE 3
ALTERNATIVE DESIGN CONCEPTS FOR PREFERRED SOLUTION
PHASE 4
ENVIRONMENTAL STUDY REPORT
PHASE 5
IMPLEMENTATION
IDENTIFY PROBLEM OR OPPORTUNITY
DISCRETIONARY PUBLIC CONSULTATION TO REVIEW PROBLEM OR OPPORTUNITY
DETERMINE APPLICABILITY OF MASTER PLAN APPROACH (See Section A.2.7)
* Some projects may be eligible for exemption based on the results of a screening process. Projects that are eligible for screening are identified in column 2 of the tables in Appendix 1. Proponents must fully and accurately complete the relevant screening process(es) outlined in Appendix 1 to proceed pursuant to the exemption.
IDENTIFY ALTERNATIVE SOLUTIONS TO PROBLEM OR OPPORTUNITY
SELECT SCHEDULE (APPENDIX 1)
INVENTORY NATURAL SOCIAL ECONOMIC ENVIRONMENT
IDENTIFY IMPACT OF ALTERNATIVE SOLUTIONS ON THE ENVIRONMENT AND MITIGATING MEASURES
EVALUATE ALTERNATIVE SOLUTIONS IDENITIFY RECOMMENDED SOLUTIONS
CONSULT REVIEW AGENCIES AND PUBLIC Re: PROBLEM OR OPPORTUNITY AND ALTERNATIVE SOLUTIONS
SELECT PREFERRED SOLUTION
REVIEW AND CONFIRM CHOICE OF SCHEDULE
EXEMPT MAY PROCEED*
EXEMPT OR SUBJECT TO SCREENING PROCESS
MAY PROCEED AFTER ANY CONCERNS ARE ADDRESSED (See Section A.2.8)
PROJECT FILE REPORT AVAILABLE FOR 30 DAYS
NOTICE OF COMPLETION TO REVIEW AGENCIES & PUBLIC
SCHEDULE B
SCHEDULE C
IDENTIFY ALTERNATIVE DESIGN CONCEPTS FOR PREFERRED SOLUTION
DETAIL INVENTORY NATURAL SOCIAL ECONOMIC ENVIRONMENT
IDENTIFY IMPACT OF ALTERNATIVE DESIGNS ON THE ENVIRONMENT AND MITIGATING MEASURES
EVALUATE ALTERNATIVE DESIGNS IDENITIFY RECOMMENDED DESIGN
CONSULT REVIEW AGENCIES & PREVIOUSLY INTERESTED & DIRECTLY AFFECTED PUBLIC
SELECT PREFERRED DESIGN
REVIEW AND CONFIRM CHOICE OF SCHEDULE
PRELIMINARY FINALIZATION OF PREFERRED DESIGN
DISCRETIONARY PUBLIC CONSULTATION TO REVIEW PREFERRED DESIGN
COMPLETE ENVIRONMENTAL STUDY REPORT (ESR)
NOTICE OF COMPLETION TO REVIEW AGENCIES & PUBLIC
ESR AVAILABLE FOR 30 DAYS
MAY PROCEED AFTER ANY CONCERNS ARE ADDRESSED (See Section A.2.8)
COMPLETE CONTRACT DRAWINGS AND TENDER DOCUMENTS
PROCEED TO CONSTRUCTION AND OPERATION
MONITOR ENVIRONMENTAL IMPACTS AND MITIGATING MEASURES
Mandatory Events
Possible Events
Public Contact
Decision Points
MUNICIPAL ENGINEERS ASSOCIATION
2022

1.4 Master Plan Framework

1.4.1 Alternative Approaches

The Class EA document provides proponents with four approaches for conducting Master Plan investigations, given the broad nature and scope of these studies. Proponents are encouraged to adapt and tailor the Master Planning process to suit the needs of the study being undertaken, providing that at a minimum, the assessment involve an evaluation of servicing deficiencies followed by a review of possible solutions (i.e., Phases 1 and 2 of the Class EA process). Table 1.1 summarizes the primary components associated with the four Master Plan approaches outlined within the MEA Class EA document.

Table 1.1 - Summary of Master Planning Approaches

Approach	Key Characteristics	Project Implementation
# 1	- Master Plan prepared at the conclusion of Phases 1 and 2 of the Class EA process. - Completed at a broad level of assessment. - Serves as basis for future investigations associated with specific Schedule B and C projects.	- Schedule B and C projects would require further Class EA investigations.
# 2	- Master Plan prepared at the conclusion of Phases 1 and 2 of MEA Class EA process. - More detailed level of investigation and consultation completed, such that it satisfies requirements for Schedule B screenings. - Final public notice for Master Plan serves as Notice of Completion for individual Schedule B projects.	- Schedule B projects are approved. - Schedule C projects must complete Phases 3 to 4 of Class EA process.
# 3	- Master Plan prepared at the conclusion of Phase 4 of Class EA process. - Level of review and consultation encompasses Phases 1 to 4 of the Class EA process. - Final public notice for Master Plan serves as Notice of Completion for Schedule B and C projects reviewed through the Master Plan.	- Class EA investigations are not required for projects reviewed through the Master Plan.
# 4	- Integration of Master Plan with associated Planning Act approvals. - Establishes need and justification in a very broad context. - Best suited when planning for a significant geographical area in the long term.	- Depending on level of investigation associated with the Master Plan, Class EA investigations may be required for specific projects.

1.4.2 Applied Framework

For the purposes of the Bridge Infrastructure Master Plan it was determined during the course of the investigation that Approach #1 would be the most appropriate planning framework to utilize for this assessment. The Master Plan therefore defines broad infrastructure requirements within the study area and will serve as a basis for additional infrastructure works associated with the implementation of project specific components. The level of consultation completed in conjunction with the Master Plan was sufficient to satisfy the MEA Class EA process associated with 'Exempt' Activities. The decision to apply Approach #1 for this Master Plan was based upon the following rationale:

- The level of review completed in conjunction with the Master Plan was not sufficient to satisfy the MEA Class EA process associated with Schedule B activities.
- The majority of the works identified through the Master Plan are 'Exempt' or pre-approved activities; therefore, the additional level of assessment was not warranted in conjunction with the study.
- There was insufficient detail associated with future infrastructure needs (bridge replacement designs) to complete the level of assessment required for Schedule B activities.

Upon completion, the Master Plan will form the basis for additional assessments required to support projects identified as part of the preferred infrastructure plan.

1.4.3 Approval Requirements

The Master Plan is subject to approval from the Municipality of Arran-Elderslie but does not require formal approval under the EA Act. A Completion Notice will be issued at the conclusion of the Master Plan. Any projects identified within this Master Plan that are considered Schedule B or C activities will be required to complete additional investigations, to satisfy the requirements of Class EA process, prior to approval, design and construction.

The Master Plan will be made available for public review and, subject to consideration of the proposed works and any comments received through consultation, the Master Plan will be approved by Municipal Council. Regulatory approvals will be required from federal and provincial review agencies for some components of the work and will be obtained once final engineering designs have been completed, prior to project implementation.

1.5 Study Co-ordination

BMROSS conducted the Class EA Master Plan process on behalf of the proponent, the Municipality of Arran-Elderslie. Municipal staff provided updates to Council on the status of study investigations and provided direction and recommendations on study investigations and results.

2.0 STUDY AREA DESCRIPTION

2.1 Background Review

A background review was carried out to obtain a general characterization of the project area and to identify factors that could influence the selection of alternative solutions to the defined problem. The background review for the Master Plan process incorporated these activities:

- Assembly of information on the existing structures and the environmental setting.
- Review of deficiencies at each bridge site.
- Preliminary assessment of the identified deficiencies and potential remediation.

A desktop analysis of the project setting was completed as part of the background review process. The following represent the key sources of information for this analysis:

- BMROSS. Ontario Structure Inspection Manual (OSIM) reports and files.
- Saugeen Valley Conservation Authority (SVCA). Website and Mapping Services.
- Grey Sauble Conservation Authority (GSCA). Website and Mapping Services.
- Government of Canada. Species at Risk Public Registry website.
- Ministry of Natural Resources (MNR). Natural Heritage Information Centre (NHIC) website.
- Municipality of Arran-Elderslie. Files and discussions with staff.

2.2 General Environmental Setting

2.2.1 Municipality of Arran-Elderslie

The Municipality of Arran-Elderslie is located in the northwest portion of Southern Ontario at the easterly extent of Bruce County, just south of the Bruce Peninsula. The Municipality is bounded to the west by the Municipality of Saugeen Shores, to the south by the Municipality of Brockton, by Grey County to the east, and by the Town of South Bruce Peninsula to the north. The project study area encompasses the entire extent of the Municipality with bridge locations evenly distributed throughout the jurisdiction. The limits of the study area boundary, as illustrated on Figure 2.1 (attached), are bounded by Bruce Road 3 to the west, Bruce Road 17 to the north, the Grey Bruce Line to the east, and Bruce Road 19/Brant-Elderlslie Road to the south.

Arran-Elderslie was formed in January 1999, when the Townships of Arran and Elderslie, along with the Villages of Paisley and Tara and the Town of Chesley were amalgamated to form the Municipality of Arran-Elderslie. The new Municipality has a population of more than 6,800 permanent residents and a land base of approximately 460 km^2. In general, Arran-Elderslie is comprised of three urban centres (being Paisley, Tara and Chesley), and a number of small rural settlements dispersed throughout a predominately rural landscape.

The Municipality also includes an abundance of natural areas with two main river systems; the Saugeen and Sauble Rivers, traversing the study area. The two river systems, and their associated branches, have posed significant barriers to transportation in the Municipality since overland transportation routes were first surveyed in the mid-19th century. The Municipality currently maintains 62 bridges and culverts, with spans that are greater than 3 metres, creating a significant capital commitment which is required to maintain the structures in a safe condition for the travelling public. The seventeen (17) bridges that are included in the Master Plan study were all constructed before 1940 and are expected to require significant rehabilitation or complete replacement within the next 20 years. This study seeks to prioritize those projects, identify suitable rehabilitation methods or replacement structures and identify potential crossings for future closure and permanent removal.

2.2.2 Project Study Area

The project study area encompasses the entire Municipality of Arran-Elderslie with additional emphasis on the individual bridge locations, as well as the County and municipal transportation network connecting the various bridge crossings. Arran-Elderslie is bisected by two major river systems; the Saugeen River watershed to the south and west and the Sauble River watershed to the northeast. Five of the structures included in the Master Plan are located within the limits of the Sauble River (north) watershed, while twelve are located within the North Saugeen or Lower Main Saugeen River sub-watersheds. Figure 2.2 illustrates the project study area limits as well as the hydrological divide between the Sauble and Saugeen River systems.


A5
South Elevation - 2024
A11
East Elevation - 2024
A14
East Elevation - 2024
A24
West Elevation - 2024
A29
North Elevation - 2024
A30
North Elevation - 2024
E1
East Elevation - 2024
E4
South Elevation - 2024
E9
South Elevation - 2024
E10
East Elevation - 2024
E12
West Elevation - 2024
E14
South Elevation - 2024
E15
North Elevation - 2024
E16
North Elevation - 2024
E17
East Elevation - 2024
E22
East Elevation - 2024
E24
West Elevation - 2024
PORT ELGIN
TARA
PAISLEY
CHESLEY
BRUCE ROAD 17
CONCESSION 4 ARRAN
CONCESSION 2 ARRAN
ELDERSLIE ARRAN
BRUCE ROAD 40
CONCESSION 10 ELDERSLIE
CONCESSION 8 ELDERSLIE
CONCESSION 6 ELDERSLIE
CONCESSION 2 ELDERSLIE
BRUCE ROAD 11
BRUCE ROAD 19
BRANT ELDERSLIE
CONCESSION 6
CONCESSION 2
CONCESSION 12
SIDEROAD 13 & 14
SIDEROAD 18 & 19
SIDEROAD 28 & 29
SIDEROAD 35 & 36
THE RIVER ROAD
BLIND LINE
B LINE
BRUCE ROAD 3
BRUCE ROAD 7
BRUCE ROAD 10
SIDEROAD 5 SOUTH ARRAN
SIDEROAD 10 SOUTH ARRAN
SIDEROAD 15 ARRAN
SIDEROAD 20 ARRAN
SIDEROAD 25 SOUTH ARRAN
SIDEROAD 5 ELDERSLIE
SIDEROAD 15 SOUTH ELDERSLIE
SIDEROAD 25 ELDERSLIE
MILL ROAD
GREY BRUCE LINE
BRUCE SAUGEEN TOWNLINE
GREY SAUBLE CONSERVATION
SAUGEEN VALLEY CONSERVATION
TOWN OF SAUGEEN SHORES
MUNICIPALITY OF ARRAN-ELDERSLIE
MUNICIPALITY OF BROCKTON
TOWNSHIP OF GEORGIAN BLUFFS
A11
A24
A14
A5
A29
A30
E24
E22
E14
E16
E15
E17
E12
E10
E9
E4
E1
SOUTH BRUCE PENINSULA
GEORGIAN BLUFFS
ARRAN-ELDERSLIE
CHATSWORTH
SAUGEEN SHORES
KINCARDINE
BROCKTON
WEST GREY
KEY PLAN
NOT TO SCALE
N
PROJECT AREA
SCALE 1 : 100,000
BMROSS
engineering better communities
MUNICIPALITY OF ARRAN-ELDERSLIE
BRIDGE INFRASTRUCTURE MASTER PLAN
GENERAL LOCATION PLAN
DATE
JAN. 2026
PROJECT No.
19195
SCALE
AS SHOWN
FIGURE No.
2.1

2.2.3 Hydrology

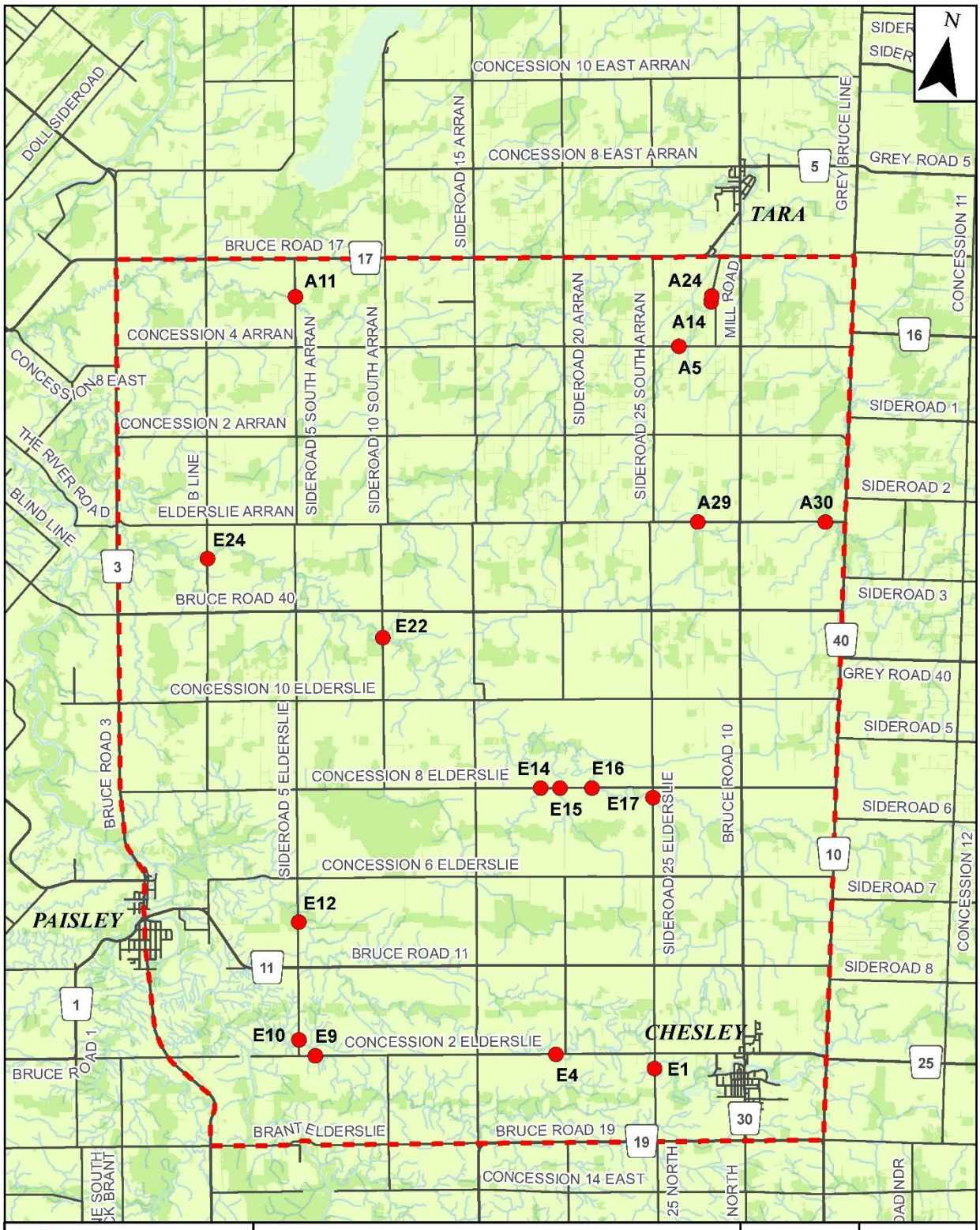
As discussed, two major river systems bisect the study area; the Saugeen River watershed to the south and west and the Sauble River watershed to the northeast. Five of the structures included in the Master Plan are located within the limits of the Sauble River (north) watershed, while twelve are located within the North Saugeen or Lower Main Saugeen River sub-watersheds.

The North and Lower Main Saugeen Rivers extend in a southeast to northwest orientation through the municipality and are utilized by local fishermen and canoeists; a launch site is currently situated on the northwest riverbank at the McCurdy Bridge, in the southwest extent of the project study area limits. The Saugeen River is located within the watershed limits of the Saugeen Valley Conservation Authority (SVCA) and is one of the largest river systems in southwestern Ontario, draining 2360 km^2 of predominantly rural Ontario from the community of Dundalk west towards its outlet at Lake Huron. The presence of numerous coldwater streams in the upper reaches of the watershed provide excellent habitat for a variety of salmonoid species such as Brook Trout, Rainbow Trout, Brown Trout and Chinook Salmon. Bass and Pike are also found within the Saugeen River watershed making it an important recreational fishery in the area.

Within the Saugeen watershed portion of the study area, 3 of the structures span the North Saugeen River (Structures E1, E4, E12). The remaining structures span tributaries of the Main Saugeen including Vesta Creek (E9 & E10), Snake Creek (E16, E17, E22, E24), a tributary of Snake Creek (E14 & E15), and Burgoyne Creek (A11). Five of the structures are located within the Sauble River basin and are regulated by the Grey Sauble Conservation Authority (GSCA). Three structures span the Sauble River or a first order tributary (A14, A24, A30), while two structures span the Calhoun Drainage Works (A5, A29) which discharges to the Sauble River at Tara.

The land use of the basin is predominately agricultural in nature with forest cover varying from 15 to 25 percent in the South Sauble headwaters area (northeast portion of study area) to 19 percent in the west and southwest portion of the basin within the Saugeen River watershed.

Approximately twenty percent of the watershed remains in forest cover. Land uses within both watersheds are very similar with agricultural uses being the predominant form. Appendix A contains sub-watershed report cards for the two main river systems, which were compiled by the associated Conservation Authority where the drainage basins are located.



Study Area ● Structure

BMROSS engineering better communities

MUNICIPALITY OF ARRAN-ELDERSLIE

BRIDGE INFRASTRUCTURE MASTER PLAN

PROJECT STUDY AREA

DATE	PROJECT No.
FEB. 2022	19195
SCALE	FIGURE No.
1 : 120,000	2.2

2.2.4 Sensitive Natural Features in the Vicinity of the Bridge Sites

a) General

As discussed, the project study area is located in northeast Bruce County within the Sauble River and Saugeen River watersheds, which are managed by the GSCA and the SVCA respectively. The landscape is comprised of rural farmland with rolling terrain bisected by the many river systems. A review of sensitive natural heritage features located in the vicinity of the project area was carried out as part of the Master Plan background review. The MNR's NHIC database was consulted to verify the current status of significant natural areas in the vicinity of the bridge sites. A description of significant features within the study area is included below.

b) Significant Wetlands

There are three provincially significant, and one regionally significant wetland located within, or in close proximity to, the study area limits. These are described in more detail below. There are also a number of locally significant wetlands on the landscape which have not been formally evaluated. Where present, we have identified the proximity of these features to the Master Plan structures.

i. Elderslie Swamp Wetland Complex - Regionally Significant Wetland, Significant Woodland

The Elderslie Swamp is a regionally significant wetland complex located within the south portion of the study area, east of Paisley and northwest of Chesley. This natural area has also been identified as a significant woodland due to size (>40 ha) and is approximately 490 ha in size. There are no structures in close proximity to this wetland.

ii. Tara Floodplain Wetland Complex – Provincially Significant Wetland

The Tara Floodplain Wetland Complex is a provincially significant wetland located approximately 6.5km southeast of Tara along the floodplain limits of the Sauble River, and is 137 ha in size. The site is situated in close proximity to Structure A30 which spans the Sauble River along the Elderslie Arran Line.

iii. Nuttley Fen – Provincially Significant Wetland

Nuttley Fen is a provincially significant wetland located in the central west portion of the study area. Although only 6.9 ha in size, this natural area was identified as significant due to the rarity of fens within the landscape**.** Fens, as described by the Canadian Wetland Classification system, are "peatlands characterized by a high water table, but with very slow internal drainage by seepage. Similar to bogs, the surface water in fens is also generally nutrient poor and the peat layer is at least 40 cm thick. The vegetation in fens usually reflects the water quality and quantity available, resulting in three basic types: graminoid fens without trees or shrubs, shrub fens, and treed fens. Dominant plants include black spruce, tamarack, sedges, grasses, and various mosses.". There are no structures located in close proximity to the Nuttley Fen.

iv. Arran Lake Wetland Complex – Provincially Significant Wetland

The Arran Lake Wetland Complex is a Provincially Significant Wetland located just north of the study area limits in the northwest corner of Arran-Elderslie. It is described as a lacustrine wetland because it is associated with Arran Lake, which is also a popular recreational area. The wetland complex is over 1100 ha in size and is dominated by marsh. There are no structures located in close proximity to this feature.

c) Areas of Natural and Scientific Interest

There are three Areas of Natural and Scientific Interest (ANSI's) located within the project study area. ANSI's take two forms; Earth Science, which are representative of significant geophysical land forms, and Life Science, which are representative of significant terrestrial features within the landscape, such as wetlands and woodlands. The three ANSI's in Arran-Elderslie are earth science. Earth science ANSI's represent the best examples of glacial landforms within the eco-district. They are described in more detail below:

i) Dobbinton Esker

The Dobbinton Esker is located south of Tara adjacent to the easterly extent of the study area boundary. Eskers are typically long ridges comprised of gravel or sediment deposited as glaciers retreated. They are often winding in nature. The Dobbinton Esker is 353 ha in size and is located within 1.2 km of structure A30, which spans the Sauble River along the Elderslie Arran Line.

ii) Tara Moraine

The Tara Moraine is located immediately east of Tara and is approximately 850 ha in size. A moraine is a glacial landform deposited following the retreat of glaciers from the landscape. There are no structures located in close proximity to this feature.

iii) Arkwright Drumlins

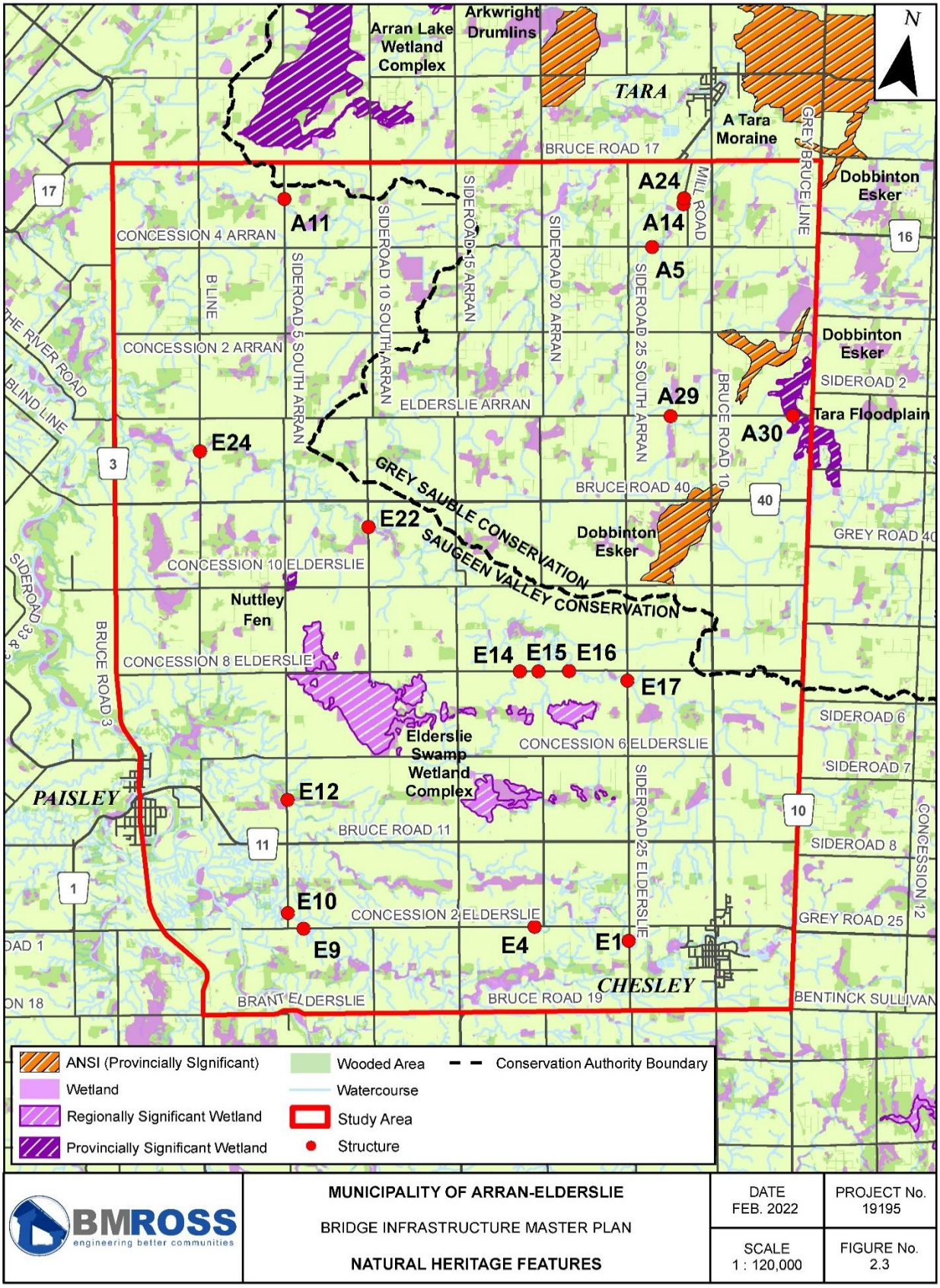
Located northwest of Tara, the Arkwright Drumlins are north of the study area limits and are not situated in close proximity to any of the study bridges. Drumlins are elongated hills formed from glacial deposits as glaciers receded. The formations typically taper in the direction of the receding glaciers.

Table 2.1 summarizes the bridge sites and relative proximity to each of the sensitive natural heritage feature described above. The location of sensitive natural features in relation to the bridge sites is illustrated on Figure 2.3.

Table 2.1: Proximity to Sensitive Natural Heritage Features

Structure ID	Provincially Significant Wetland (PSW)	Area of Natural and Scientific Interest (ANSI)	Regionally Significant Wetland	Locally Significant Wetland	Significant Woodland (>40ha)	Aquatic Species at Risk (SAR)	Watercourse
E1	9.7km- Kinghurst Swamp to the east	8.5km - Dobbinton Esker (Earth Science ANSI)	4km - Elderslie Swamp Wetland Complex	10m to the west	1.7km southwest	No	North Saugeen River
E4	9.9km- Nuttley Fen to the northwest	8.6km – Dobbinton Esker	2.7km – Elderslie Swamp Complex	830m to the southeast	750m southeast	No	North Saugeen River
A5	4.3km- Tara Floodplain - southeast	2.5km- Dobbinton Esker- southeast	10km- Elderslie Swamp Wetland Complex- southeast	100m northeast	1.67km northeast	No	Calhoun Drain
E9	7.4km- Edengrove Wetland Complex	10.9km- Saugeen River Section- south	4.8km- Ederslie Swamp Wetlands Complex- northeast	510m northwest	560m southwest	No	Vesta Creek
E10	7.7km- Edengrove Wetland Complex	11.2km- Saugeen River Section- south	4.9km- Elderslie Swamp Wetland Complex- northeast	65m west	780m south	No	Vesta Creek
A11	1.2 km- Arran lake Wetland Complex	6.5km- Arkwright Drumlins	10.1km- Elderslie Swamp Wetland Complex- southeast	12m west	200m west	No	Burgoyne Creek
E12	5km- Nuttley Fen to the north	9.9km- Dobbinton Esker	2.2km- Elderslie Swamp Wetland Complex- northeast	10m northwest	2.2km northeast	Yes, Rainbow Mussels	North Saugeen River
A14	4.6km- Tara Floodplain- southeast	3.7km- Arkwright Drumlins- northwest	11.8km- southwest Elderslie Swamp Wetland	10m southwest	522m west	No	Sauble River
E14	5.7km- Nuttley Fen- northwest	3.6km- Dobbinton Esker- northeast	850m- Elderslie Swamp Wetland complex- south	780m north	810m south	No	Snake Creek Tributary

Structure ID	Provincially Significant Wetland (PSW)	Area of Natural and Scientific Interest (ANSI)	Regionally Significant Wetland	Locally Significant Wetland	Significant Woodland (>40ha)	Aquatic Species at Risk (SAR)	Watercourse
E15	6.1km- Nuttley Fen- northwest	3.3km- Dobbinton Esker- northeast	835m- Elderslie Swamp Wetland Complex - southeast	760m north	835m southeast	No	Snake Creek Tributary
E16	6.8km- Nuttley Fen- northwest	2.8km- Dobbinton Esker- northeast	685m- Elderslie Swamp Wetland Complex- south	700m south	680m south	No	Snake Creek
E17	6.8km- Tara Floodplain- northeast	2.4km- Dobbinton Esker- northeast	920m- Elderslie Swamp Wetland Complex-Ssouthwest	260m northwest	805m southwest	No	Snake Creek
E22	2km- Nuttley Fen- to the southwest	6.6Km- Dobbinton Esker- northeast	2.5km- Elderslie Swamp Wetland Complex- southwest	100m east	2.2km east	No	Snake Creek
E24	3.6km- Nuttley Fen- southeast	10.9km- Dobbinton Esker- southeast	4.8km-Elderslie Swamp Wetland Complex- southeast	217m northeast	82m west	No	Snake Creek
A24	4.6km- Tara Floodplain- southeast	2.8km- Tara Moraine- northeast	11.7km- Southwest Elderslie Swamp Wetland	10m- northeast	498m west	No	Sauble Creek Tributary
A29	2.4km- Tara Floodplain- east	1.6km- Dobbinton Esker- northeast	7km- Elderslie Swamp Wetland Complex	200m southwest	2.7km east	No	Calhoun Drain
A30	0km- Tara Floodplain- overlapping	1.2km- Dobbinton Esker- northwest	8.3km- Elderslie Swamp Wetland Complex	0m overlapping	0m overlapping	No	Sauble River


N
Arran Lake Wetland Complex
Arkwright Drumlins
TARA
A Tara Moraine
BRUCE ROAD 17
GREY BRUCE LINE
Dobbinton Esker
A24
A14
A11
A5
MILL ROAD
CONCESSION 4 ARRAN
SIDEROAD 5 SOUTH ARRAN
SIDEROAD 10 SOUTH ARRAN
SIDEROAD 15 ARRAN
SIDEROAD 20 ARRAN
SIDEROAD 25 SOUTH ARRAN
B LINE
THE RIVER ROAD
BLIND LINE
CONCESSION 2 ARRAN
ELDERSLIE ARRAN
A29
A30
Tara Floodplain
SIDEROAD 2
BRUCE ROAD 10
E24
GREY SAUBLE CONSERVATION
SAUGEEN VALLEY CONSERVATION
BRUCE ROAD 40
E22
Dobbinton Esker
GREY ROAD 40
CONCESSION 10 ELDERSLIE
Nuttley Fen
SIDEROAD 33 &
BRUCE ROAD 3
CONCESSION 8 ELDERSLIE
E14 E15 E16
E17
SIDEROAD 6
Elderslie Swamp Wetland Complex
CONCESSION 6 ELDERSLIE
SIDEROAD 7
PAISLEY
E12
BRUCE ROAD 11
SIDEROAD 8
CONCESSION 12
SIDEROAD 25 ELDERSLIE
E10
CONCESSION 2 ELDERSLIE
GREY ROAD 25
E9
E4
E1
CHESLEY
BRANT ELDERSLIE
BRUCE ROAD 19
BENTINCK SULLIVAN
ANSI (Provincially SIgnificant)
Wetland
Regionally Significant Wetland
Provincially Significant Wetland
Wooded Area
Watercourse
Study Area
Structure
Conservation Authority Boundary
BMROSS
engineering better communities
MUNICIPALITY OF ARRAN-ELDERSLIE
BRIDGE INFRASTRUCTURE MASTER PLAN
NATURAL HERITAGE FEATURES
DATE FEB. 2022
PROJECT No. 19195
SCALE 1 : 120,000
FIGURE No. 2.3

2.2.5 Species at Risk

An evaluation for the presence of significant species and their associated habitats within the study area has been incorporated into the project planning process. A review of available information on species and habitat occurrences determined that the study area may contain species and/or associated habitats that are legally protected under Provincial and Federal species at risk legislation. The protection for species at risk and their associated habitats is directed by the following federal and provincial legislation:

- The Federal *Species at Risk Act, 2002* (SARA) provides for the recovery and legal protection of listed wildlife species and associated critical habitats that are extirpated, endangered, threatened or of special concern and secures the necessary actions for their recovery on lands not federally owned, only aquatic species, and bird species included in the Migratory Bird Convention Act (1994), are legally protected;
- The Provincial Endangered Species Act, 2007 (ESA) provides legal protection of endangered and threatened species and their associated habitat in Ontario. Under the legislation, measures to support their recovery are also defined;
- Ministry of Natural Resources, Species at Risk by Area (MNR, 2019b); and
- Natural Heritage Information Centre, Make a Natural Heritage Map (MNR, 2019a)
    - No square data within the study area. Agricultural fields to the east are within NHIC 1km grids: 17MJ6009 and 17MJ6109.
    - Environment Canada, Species at Risk Public Registry. SARA Schedule 1 Species List (Environment Canada, 2018).

Based on the information available for the occurrence of species at risk and their associated habitats from the following sources, a summary of federally and provincially recognized species with the potential to be present within the project study area, are listed in Table 2.2:

Table 2.2: Species at Risk within Bruce County and the Study Area

Type	Species Common Name	Species Scientific Name	Federal Status	Provincial Status
Bird	Bald Eagle	*Haliateetus leucocephalus*	N/A	Special Concern
Bird	**Barn Swallow**	***Hirundo rustica***	**N/A**	**Threatened**
Bird	Bank Swallow	*Riparia riparia*	N/A	Threatened
Bird	Black Tern	*Chlidonias niger*	N/A	Special Concern
Bird	**Bobolink**	***Dolichonyx oryzivorus***	**N/A**	**Threatened**
Bird	Canada Warbler	*Wilsonia canadensis*	Threatened	Special Concern
Bird	Cerulean Warbler	*Setophaga cerulea*	Special Concern	Threatened
Bird	Chimney Swift	*Chaetura pelagic*	Threatened	Threatened
Bird	Common Nighthawk	*Chordeiles minor*	Threatened	Special Concern
Bird	**Eastern Meadowlark**	***Sturnella magna***	**N/A**	**Threatened**
Bird	Eastern Whip-poor-will	*Antrostomus vociferus*	Threatened	Threatened
Bird	Eastern Wood-Pewee	*Antrostomus vociferus*	N/A	Special Concern
Bird	Grasshopper Sparrow	*Ammodramus savannarum*	N/A	Special Concern
Bird	Golden-winged Warbler	*Wermivora chrysoptera*	Threatened	Special Concern
Bird	Henslow`s Sparrow	*Ammodramus henslowii*	Endangered	Endangered
Bird	King Rail	*Rallus elegans*	Endangered	Endangered
Bird	Least Bittern	*Ixobrychus exilis*	Threatened	Threatened
Bird	Loggerhead Shrike	*Lanius ludovicianus migrans*	Endangered	Endangered
Bird	Louisiana Waterthrush	*Seiurus motacilla*	Special Concern	Threatened
Bird	Olive-sided Flycatcher	*Contopus copperi*	Threatened	Special Concern
Bird	Peregrine Falcon	*Falco peregrinus*	Special Concern	Special Concern
Bird	Piping Plover	*Charadrius melodus*	Endangered	Endangered
Bird	Red-headed Woodpecker	*Melanerpes erythrocephalus*	Threatened	Special Concern
Bird	Short-eared Owl	*Asio flammeus*	Special Concern	Special Concern
Bird	Wood Thrush	*Hylocichla mustelina*	N/A	Special Concern
Bird	Yellow Rail	*Coturnicops noveboracensis*	Special Concern	Special Concern
Fish	**Greater Redhorse**	***Moxostoma valenciennesi***	**N/A**	**Threatened**
Mussel	Fawnsfoot	*Truncilla donaciformis*	N/A	Endangered
Fish	Northern Brook Lamprey	*Ichthyomyzon fossor*	Special Concern	Special Concern
Fish	Pugnose Shiner	*Notropis anogenus*	Endangered	Threatened

Type	Species Common Name	Species Scientific Name	Federal Status	Provincial Status
Mussel	**Rainbow Mussel**	***Villosa iris***	**Special Concern**	**Special Concern**
Fish	Redside Dace	*Clinostomus elongatus*	N/A	Endangered
Insect	Hungerford`s Crawling Water Beetle	*Brychius hungerfordi*	N/A	Endangered
Insect	West Virginia White	*Pieris virginiensis*	N/A	Special Concern
Mammal	American Badger, jacksoni supspecies	*Taxidea taxus jacksoni*	Endangered	Endangered
Mammal	Eastern Small-footed Bat	*Myotis leibii*	N/A	Endangered
Mammal	Gray Fox	*Urocyon cinereoargenteus*	Threatened	Threatened
Mammal	Little Brown Bat	*Myotis lucifugus*	Endangered	Endangered
Mammal	Northern Long-eared Bat	*Myotis septentrionalis*	Endangered	Endangered
Mammal	Tri-colored Bat	*Perimyotis subflavus*	Endangered	Endangered
Plant	American Ginseng	*Panax quiquefolius*	Endangered	Endangered
Plant	American Hart`s-tongue Fern	*Asplenium scolopendrium var. americanum*	Special Concern	Special Concern
Plant	Broad Beech Fern	*Phegopteris hexagonoptera*	N/A	Special Concern
Plant	Butternut	*Juglans cinerea*	Endangered	Endangered
Plant	Dwarf Lake Iris	*Iris lacustris*	Special Concern	Special Concern
Plant	Eastern Prairie Fringed Orchid	*Platanthera leucophaea*	Endangered	Endangered
Plant	Gattinger`s Agalinis	*Agalinis gattingeri*	Endangered	Endangered
Plant	Hill`s Pondweed	*Potamogeton hillii*	Special Concern	Special Concern
Plant	Hill`s Thistle	*Cirsium hillii*	Threatened	Threatened
Plant	Houghton`s Goldenrod	*Solidago houghtonii*	Special Concern	Threatened
Plant	Lakeside Daisy	*Tetraneuris herbacea*	Threatened	Threatened
Plant	Pitcher`s Thistle	*Cirsium pitcheri*	Endangered	Threatened
Plant	Tuberous Indian-Plantain	*Arnoglossum plantagineum*	Special Concern	Special Concern
Reptile	Eastern Ribbonsnake	*Thamniphis sauritus*	Special Concern	Special Concern
Reptile	Massasauga Rattlesnake	*Sistrunrus catenatus*	Threatened	Threatened
Reptile	Queensnake	*Regina septemvittata*	Endangered	Endangered
Turtle	Blanding`s Turtle	*Emydoidea blandingii*	Threatened	Threatened
Turtle	Northern Map Turtle	*Graptemys geographica*	Special Concern	Special Concern
Turtle	**Snapping Turtle**	***Chelydra serpentina***	**Special Concern**	**Special Concern**
Turtle	Spotted Turtle	*Clemmys guttata*	Endangered	Endangered

The list of potential species at risk within the study is based on the list for the County of Bruce, as provided by the MNR. The County incorporates a large area and a wide variety of environs that include terrestrial and aquatic habitat. The study areas associated with the Master Plan typically incorporate riparian habitat features within adjacent agricultural lands. The species listed in Table 2.2 were generated based on their occurrence within the entire county and may not necessarily occur within the study area. A review of occurrence data from the NHIC, identified Bobolink, Snapping Turtle, Eastern Meadowlark, Rainbow Mussel and Greater Redhorse as occurring in proximity to one of the bridge sites. These species have been highlighted within the table.

2.2.6 Breeding Birds

The Atlas of Breeding Birds of Ontario (2001-2005) was used to identify bird species with breeding habitat in proximity to the study area. The study area lies within several 100 km2 areas covered in the Atlas (Squares 17TMK80 – 17TMK82) in Region 8: Bruce County. Within the squares there were between 99 and 91 breeding bird species identified. This includes species at risk such as: Chimney Swift, Bank Swallow, Barn Swallow, Eastern Meadowlark and Barn Swallow. Both Barn Swallows and Cliff Swallows are known to nest on bridge structures. Should active nests be identified on a structure that is proposed for repair or replacement, measures will be undertaken to minimize impacts to the species until the nest is no longer active.

2.2.7 Aquatic Species at Risk

Aquatic Species at Risk are aquatic based species that either live in, or rely on, an aquatic habitat for a significant portion of their life cycles. In conjunction with information gathered from Fisheries and Oceans Canada (DFO), a publicly available aquatic species at risk mapping tool was utilized to determine the potential presence of aquatic species at risk and their associated critical habitat within the vicinity of the proposed project.

One freshwater mussel species was identified as potentially being present within the Saugeen River system near B ridge E12, east of Paisley. The Rainbow mussel is a freshwater mussel species designated as Special Concern (SC). A search for mussels would need to be undertaken before in-water activities occur at the crossing. Any mussels that are found would need to be transferred to an area of suitable habitat upstream from the bridge site.

Potential impacts to the above-noted species will be considered as part of the evaluation of alternatives stage of the Class EA process. In addition, consultation will be initiated with DFO, MNR, GSCA and SVCA, as part of the approval process to identify any potential impacts to the identified species from the proposed project components.

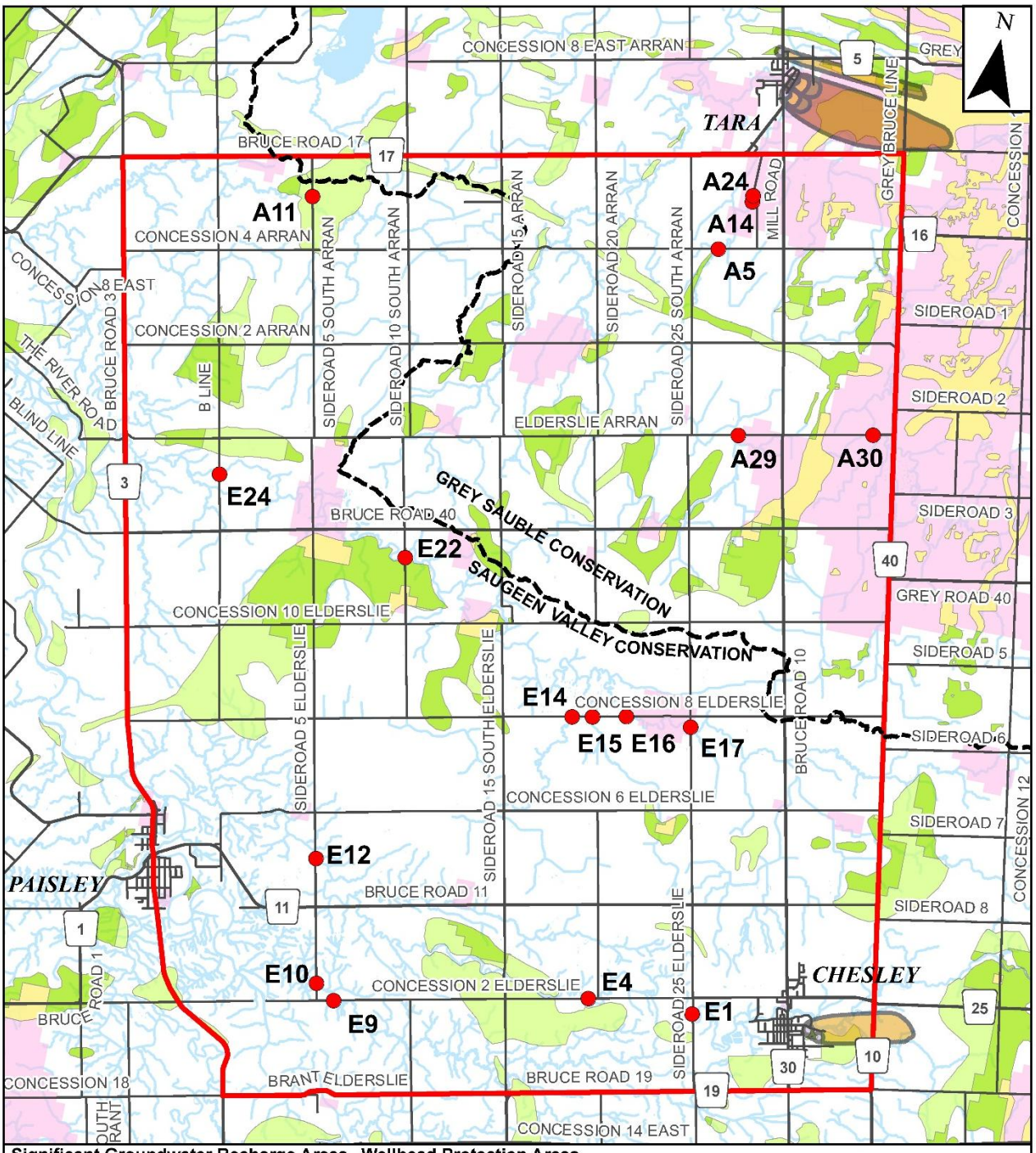
2.3 Source Water Protection

The intent of the Clean Water Act (CWA), 2006, is to "*protect existing and future drinking water*" sources in Ontario. Under the Act, source protection areas and regions were established, giving Conservation Authorities the duties and powers of a drinking

water source protection authority (Government of Ontario, 2006). A focus on the development, implementation, monitoring, and enforcement of documentation, information, and policies related to source water protection is highlighted within this duty.

The study area is located in the Saugeen, Grey Sauble, Northern Bruce Peninsula Source Protection Region. The study area falls within both the Saugeen and Grey Sauble Source Protection Areas, defined by the two major watersheds, the Sauble River and Saugeen River, as discussed previously in this report. The Assessment Report for the Source Protection Region was consulted to determine if any portions of the study area have been identified as vulnerable or susceptible to groundwater threats and issues.

Based on the location of the project structures, there are no Municipal water sources in close proximity to any of the crossings. No vulnerable drinking water areas or policies exist for the locations and project components based on the Assessment Report (2014) and Source Protection Information Atlas mapping tool. Figure 2.4 shows the location of the structures in relation to vulnerable areas identified through Source Water Protection mapping. The Saugeen, Grey Sauble, Northern Bruce Peninsula Sources Protection Region will be contacted as part of the Class EA Master Plan consultation process and will have the opportunity to provide specific comments in regard to potential drinking water threats.



BMROSS engineering better communities	**MUNICIPALITY OF ARRAN-ELDERSLIE** BRIDGE INFRASTRUCTURE MASTER PLAN **SOURCE WATER PROTECTION**	DATE FEB. 2022	PROJECT No. 19195
		SCALE 1 : 120,000	FIGURE No. 2.4

2.4 Climate Change

As part of the Class Environmental Assessment process, the impacts associated with climate change need to be evaluated. Some of the phenomena associated with climate change that will need to be considered include:

- Changes in the frequency, intensity, and duration of precipitation, wind, and heat events;
- Changes in soil moisture;
- Changes in sea/lake levels;
- Shifts in plant growth and growing seasons; and
- Changes in the geographic extent of species ranges and habitats.

There are two approaches that can be utilized to address climate change in project planning. These are as follows:

1) Reducing a project's impact on climate change (climate change mitigation):
    a. Impact of greenhouse gas emissions related to the project.
    b. Are there alternative methods to completing the project that would reduce any adverse contributions to climate change?
2) Increasing the project's and local ecosystem's resilience to climate change (climate change adaptation):
    a. How vulnerable is the project to climate-related severe events.
    b. Are there alternative methods of carrying out the project that would reduce the negative impacts of climate change on the project?

Through the evaluation of the alternatives phase of the Class EA, a consideration of each of these approaches should be completed and included in the final determination of the preferred approach to completing a project.

2.5 Socio-Economic Environment

2.5.1 Provincial Planning Statement

The Provincial Planning Statement (2024) was issued under Section 3 of the *Planning Act* and provides policy direction on matters of provincial interest. Land use planning decisions must be consistent with the policy statements. A number of the policies contained within the PPS have relevance to the current project. These are as follows:

Section 3.1 General Policies for Infrastructure and Public Service Facilities

1. *Infrastructure* and *public service facilities* shall be provided in an efficient manner while accommodating projected needs.

Planning for infrastructure and public service facilities shall be coordinated and integrated with land use planning and growth management so that they:

(a) are financially viable over their life cycle, which may be demonstrated through asset management planning;

(b) leverage the capacity of development proponents, where appropriate; and

(c) are available to meet current and projected needs.

2. *Before consideration is given to developing new infrastructure and public service facilities:*

   (a) the use of existing infrastructure and public service facilities should be optimized; and

   (b) opportunities for adaptive re-use should be considered, wherever feasible.

3. *Infrastructure and public service facilities should be strategically located to support the effective and efficient delivery of emergency management services, and to ensure the protection of public health and safety in accordance with the policies in Chapter 5: Protecting Public Health and Safety.*
4. *Public service facilities should be planned and co-located with one another, along with parks and open space where appropriate, to promote cost-effectiveness and facilitate service integration, access to transit and active transportation.*

Section 3.2 Transportation Systems

1. *Transportation systems should be provided which are safe, energy efficient, facilitate the movement of people and goods, are appropriate to address projected needs, and support the use of zero-and low-emission vehicles.*
2. *Efficient use should be made of existing and planned infrastructure, including through the use of transportation demand management strategies, where feasible.*
3. *As part of a multimodal transportation system, connectivity within and among transportation systems and modes should be planned for, maintained and, where possible, improved, including connections which cross jurisdictional boundaries.*

Section 4.1 Natural Heritage

1. *Natural features and areas shall be protected for the long term.*
2. *The diversity and connectivity of natural features in an area, and the long-term ecological function and biodiversity of natural heritage systems, should be maintained, restored or, where possible, improved, recognizing linkages between and among natural heritage features and areas, surface water features and ground water features.*

4. *Development and site alteration shall not be permitted in:*
    a) *significant wetlands in Ecoregions 5E, 6E and 7E1; and*
    b) *significant coastal wetlands.*
5. *Development and site alteration shall not be permitted in:*
    a) *significant wetlands in the Canadian Shield north of Ecoregions 5E, 6E and 7E1;*
    b) *significant woodlands in Ecoregions 6E and 7E (excluding islands in Lake Huron and the St. Marys River)1;*
    c) *significant valleylands in Ecoregions 6E and 7E (excluding islands in Lake Huron and the St. Marys River)1;*
    d) *significant wildlife habitat;*
    e) *significant areas of natural and scientific interest; and*
    f) *coastal wetlands in Ecoregions 5E, 6E and 7E1 that are not subject to policy 4.1.4.b),*

unless it has been demonstrated that there will be no negative impacts on the natural features or their ecological functions.

6. *Development and site alteration shall not be permitted in fish habitat except in accordance with provincial and federal requirements.*
7. *Development and site alteration shall not be permitted in habitat of endangered species and threatened species, except in accordance with provincial and federal requirements.*

Section 5.2 Natural Hazards

1. *Planning authorities shall, in collaboration with conservation authorities where they exist, identify hazardous lands and hazardous sites and manage development in these areas, in accordance with provincial guidance.*
2. *Development shall generally be directed to areas outside of:*
    a) *hazardous lands adjacent to the shorelines of the Great Lakes -St. Lawrence River System and large inland lakes which are impacted by flooding hazards, erosion hazards and/or dynamic beach hazards;*
    b) *hazardous lands adjacent to river, stream and small inland lake systems which are impacted by flooding hazards and/or erosion hazards; and*
    c) *hazardous sites.*
3. *Development and site alteration shall not be permitted within:*
    a) *the dynamic beach hazard;*

b) defined portions of the flooding hazard along connecting channels (the St. Marys, St. Clair, Detroit, Niagara and St. Lawrence Rivers);

c) areas that would be rendered inaccessible to people and vehicles during times of flooding hazards, erosion hazards and/or dynamic beach hazards, unless it has been demonstrated that the site has safe access appropriate for the nature of the development and the natural hazard; and

d) a floodway regardless of whether the area of inundation contains high points of land not subject to flooding.

4. Planning authorities shall prepare for the impacts of a changing climate that may increase the risk associated with natural hazards.

2.5.2 Adjacent Land Uses

Land uses located adjacent to the bridge sites include: lands used to pasture livestock, actively cultivated agricultural lands, rural farm buildings, rural residential properties, and natural environment features.

2.5.3 Land Use Planning

The Arran-Elderslie Official Plan (OP) and Zoning By-Law were consulted to determine land use designations in the project study area. Urban settlement areas within the Municipality are regulated through the local OP, while rural areas within the remainder of the Municipality are regulated by the Bruce County OP. Given the location of the structures, all of the sites are included in policies identified through the Bruce County OP. Agricultural lands located adjacent to the bridge sites are predominantly designated as 'Hazard', for the watercourses and associated valley lands, and 'Agricultural Areas', for the agricultural landscape in the Bruce County OP. Several of the structures in the north half of the municipality also contained areas designated as 'Rural Areas'.

The Arran-Elderslie Zoning By-Law was very similar with a majority of the sites being zoned Environmental Protection (EP) and (A1) General Agriculture. Structure A11, which is located in the northwest corner of the Municipality having 4 different zones in proximity to the crossing. The bridge site is zoned EP and adjacent sites were zoned A1, M1 (Extractive Industrial), and HI (Hamlet Industrial). Copies of relevant planning documents are included within Appendix B. Several policies within the Bruce County OP and Arran-Elderslie By-Law have relevance to the current project as follows:

Section 4.6 – Transportation, in The County of Bruce OP states the following:

4.6 TRANSPORTATION

4.6.2 General Policies

1. The County Council supports the planning, design and operation of a fully integrated County transportation network composed of Provincial highways, County roads, local roads, scenic roads, railways, recreational trails, airports, and harbours.

Section 3 of the Arran-Elderslie Zoning By-Law (# 36-09) states the following:

Section 3 - General Provisions For All Zones

3.1 Permitted Uses

3.1.1 Services and Utilities

1. Nothing contained in this By-law shall prevent the Corporation; any agency or department of the Federal, Provincial or County Government; any utility company; any railway company, or any local or County Board or Commission from:

a) Installing a watermain, sanitary sewer main, sewage or water pumping station, storm sewer main, gas main, electric power transformer/distribution station, transmission tower, communications tower, pipeline, overhead or underground electric line, cable service, or telephone line, road or street subject to there being no outdoor storage of goods, materials or equipment in any yard.

Both of these policies indicate that public utilities, including roads and bridges, are permitted in all land use designations if it is determined that it is for the public good.

2.5.4 Social Environment

The Municipality of Arran-Elderslie is predominantly a rural municipality with agricultural-related uses as the main land use activity. Also present in the community is a large population of Old Order Mennonites. Based upon their cultural beliefs they utilize horse and buggies to travel the transportation network. Impacts to this community will be further evaluated as part of the evaluation of alternatives component of the Class EA process.

2.6 Cultural Environment

2.6.1 Archaeological Resources

Based upon input received from the Ministry of Citizenship and Multiculturalism (MCM) an assessment of potential impacts to archaeological resources, built heritage resources, and cultural heritage landscapes, must be undertaken in conjunction with the Class Environmental Assessment process. To aid in this review, the Ministry provides screening tools to complete for each of these categories. Copies of the Screening Check Lists are included within Appendix C. Based upon the results of the Archaeological Potential checklist, a Stage 1 & 2 Archaeological Assessment may need to be completed for some of the projects if the recommended improvements involve disturbance of previously undisturbed native soils.

2.6.2 Built Heritage Resources

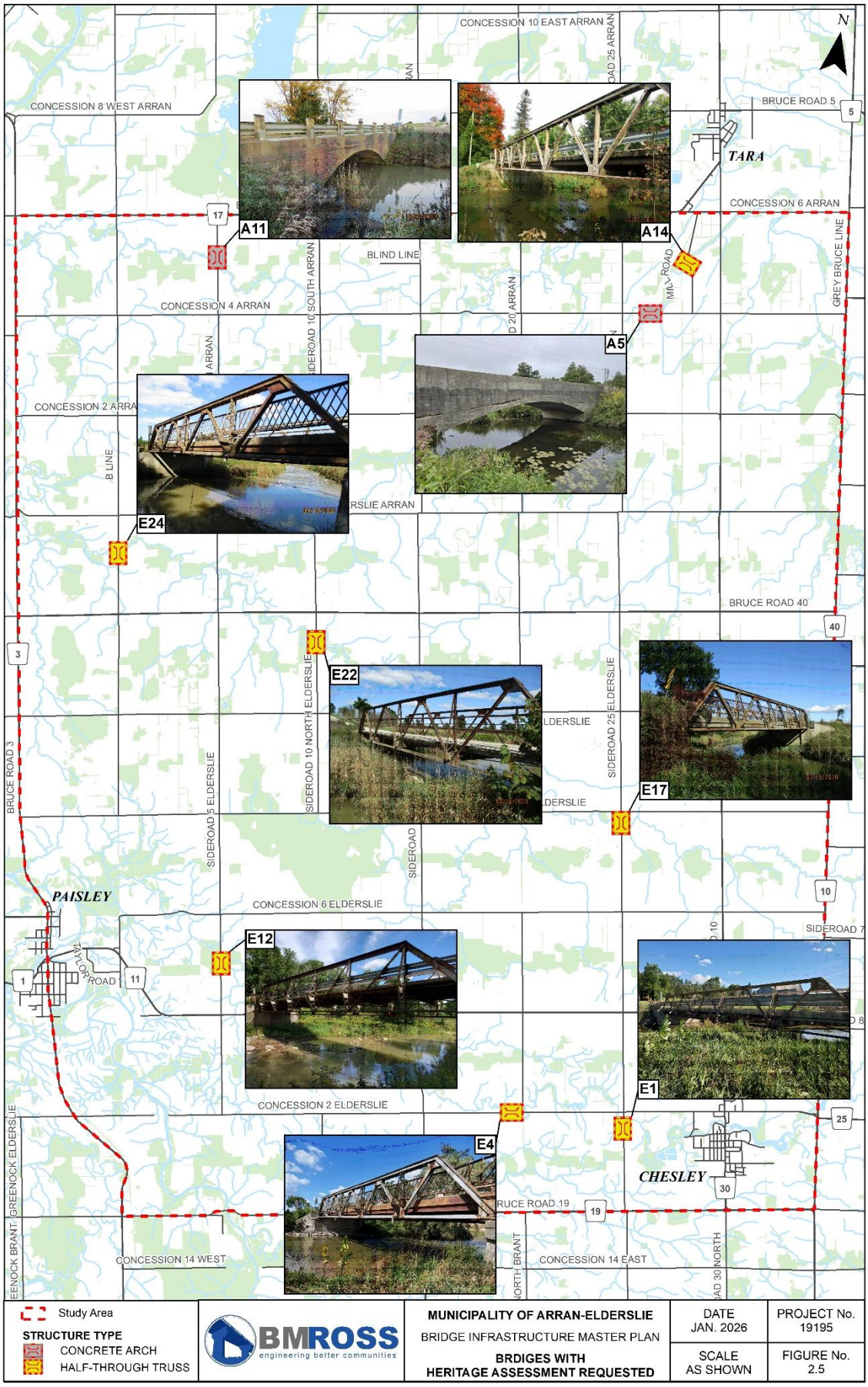
MCM has provided a screening tool to determine the presence of Built Heritage Resources. Titled, Criteria for Evaluating Potential for Built Heritage Resources and Cultural Heritage Landscapes, this tool was used to determine which structures had potential for built heritage resources to be present. It was subsequently determined that

nine of the structures would require the completion of Cultural Heritage Evaluations (CHER), to confirm if built heritage resources would potentially be impacted by the project.

Accordingly, AECOM was retained to complete the Cultural Heritage Evaluation Reports for the 9 structures. A summary of the results is included within Section 2.8.2 of this report. Figure 2.5 shows the location of the structures included in the Cultural Heritage Evaluation Report.

2.6.3 Cultural Heritage Landscapes

A Cultural Heritage Landscape is defined within the 2024 Provincial Planning Statement (PPS) as: “a defined geographic area that may have been modified by human activity and is identified as having cultural heritage value or interest by a community, including an Indigenous community. The area may include features such as buildings, structures, spaces, views, archaeological sites or natural elements that are valued together for their interrelationship, meaning or association.” Section 4.6 of the PPS states that “Protected heritage property, which may contain built heritage resources or cultural heritage landscapes, shall be conserved.” There are no designated Cultural Heritage Landscapes within the Municipality of Arran-Elderslie.


N
CONCESSION 10 EAST ARRAN
CONCESSION 8 WEST ARRAN
BRUCE ROAD 5
TARA
CONCESSION 6 ARRAN
A11
A14
BLIND LINE
CONCESSION 4 ARRAN
A5
GREY BRUCE LINE
CONCESSION 2 ARRAN
E24
BRUCE ROAD 40
E22
E17
BRUCE ROAD 3
PAISLEY
CONCESSION 6 ELDERSLIE
E12
E1
CONCESSION 2 ELDERSLIE
E4
CHESLEY
BRUCE ROAD 19
CONCESSION 14 WEST
CONCESSION 14 EAST
Study Area
STRUCTURE TYPE
CONCRETE ARCH
HALF-THROUGH TRUSS
BMROSS
engineering better communities
MUNICIPALITY OF ARRAN-ELDERSLIE
BRIDGE INFRASTRUCTURE MASTER PLAN
BRDIGES WITH
HERITAGE ASSESSMENT REQUESTED
DATE
JAN. 2026
PROJECT No.
19195
SCALE
AS SHOWN
FIGURE No.
2.5

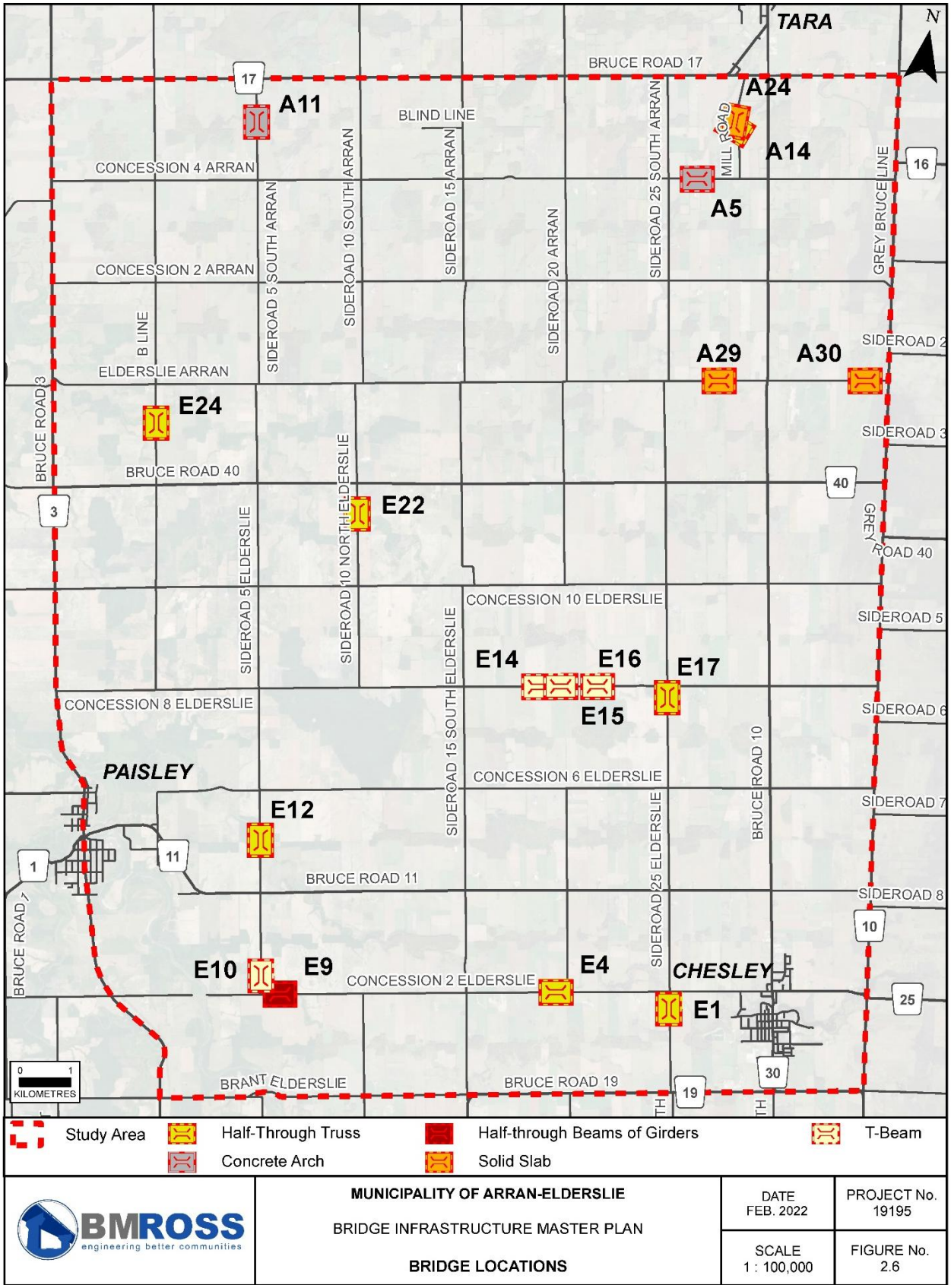
2.7 Bridge Descriptions

The following section provides a brief description of each bridge included in the Master Plan study. Distinguishing features of each structure are identified, including notable deficiencies. Deficiencies associated with the bridges were identified during recent engineering inspections conducted by BMROSS in the fall of 2024 and are summarized within 2024 Ontario Structure Inspection Manual (OSIM) reports provided in Appendix C. Structures are identified by an A# or an E#. The A represents structures located within the former Arran Township, while the E represents structures located within the former Elderslie Township. Some structures have a formal name associated with the crossing while others are only identified by the structure number. Figure 2.6 illustrates the location of each structure described below.

2.7.1 Structure A5 – Hunts Bridge

Spanning the Calhoun Municipal Drain, the Hunts Bridge is located on Concession 4 Arran, southwest of the community of Tara in the northeast corner of the Municipality. The bridge is a concrete earth filled arch bridge constructed circa 1910 with a load limit posting of 9 tonnes. Due to its narrow width, the structure is identified as a single lane crossing. The last inspection of the bridge occurred in August 2024. Patch repairs to the abutments, sidewalls and concrete arch were recommended. Since the top of the arch is covered with backfill and not about to be inspected, it is recommended the top of the arch be inspected before doing the other repairs to get a better understanding of the amount of repairs needed to the arch. The photo below illustrates the south elevation.

Structure A5 – Hunts Bridge


TARA
N
BRUCE ROAD 17
17
A11
A24
A14
A5
BLIND LINE
MILL ROAD
CONCESSION 4 ARRAN
SIDEROAD 5 SOUTH ARRAN
SIDEROAD 10 SOUTH ARRAN
SIDEROAD 15 ARRAN
SIDEROAD 20 ARRAN
SIDEROAD 25 SOUTH ARRAN
GREY BRUCE LINE
16
CONCESSION 2 ARRAN
B LINE
ELDERSLIE ARRAN
A29
A30
SIDEROAD 2
E24
BRUCE ROAD 3
SIDEROAD 3
BRUCE ROAD 40
40
3
E22
SIDEROAD 10 NORTH ELDERSLIE
SIDEROAD 5 ELDERSLIE
GREY ROAD 40
CONCESSION 10 ELDERSLIE
SIDEROAD 5
E14
E16
E17
E15
CONCESSION 8 ELDERSLIE
SIDEROAD 15 SOUTH ELDERSLIE
SIDEROAD 6
PAISLEY
CONCESSION 6 ELDERSLIE
BRUCE ROAD 10
SIDEROAD 7
E12
1
11
BRUCE ROAD 11
SIDEROAD 25 ELDERSLIE
SIDEROAD 8
10
BRUCE ROAD 7
E10
E9
E4
CONCESSION 2 ELDERSLIE
CHESLEY
E1
25
0
1
KILOMETRES
BRANT ELDERSLIE
BRUCE ROAD 19
19
30
Study Area
Half-Through Truss
Concrete Arch
Half-through Beams of Girders
Solid Slab
T-Beam
BMROSS
engineering better communities
MUNICIPALITY OF ARRAN-ELDERSLIE
BRIDGE INFRASTRUCTURE MASTER PLAN
BRIDGE LOCATIONS
DATE
FEB. 2022
PROJECT No.
19195
SCALE
1 : 100,000
FIGURE No.
2.6

2.7.2 Structure A11 – Wilson Bridge

Constructed circa 1910, Wilson Bridge spans Burgoyne Creek along Sideroad 5 South Arran in the northwest portion of the Municipality. The bridge is a single-span, concrete earth filled arch that can accommodate a single lane of traffic and covers a total structural area of 52.2 square meters. The bridge has a load posting of 12 tonnes. Following completion of the 2024 OSIM inspection, no immediate repairs were identified. Photos of the bridge are included below.

Structure A11 – Wilson Bridge

2.7.3 Structure A14 – Arranvale Bridge

The Arranvale Bridge is located on Mill Road, south of the community of Tara. The bridge spans the Sauble River and was constructed circa 1920. This single-span, steel half-through truss bridge was last inspected in 2024. A broken bottom chord was repaired in 2020 as a result of the inspection that year. In 2024 some repairs to the deck boards were recommended. The single lane crossing is currently posted with a 14 tonne load limit. The photos below demonstrate the overall structural layout of the crossing and show the broken bottom chord which was repaired following the inspection.

Structure A14 – Arranvale Bridge

2.7.4 Structure A24 – Ruff Bridge

Located immediately north of the Aranvale Bridge on Mill Road, the Ruff Bridge is a concrete slab bridge constructed circa 1920. The bridge spans a tributary of the Sauble River and is defined as a 2 lane bridge. The last inspection, completed in 2024 recommended replacement of the crossing in the next 1-5 years. A photo of Ruff Bridge is shown below along with a view of the existing soffit and ongoing concrete spalling which exposes the rebar.

Structure A24 – Ruff Bridge

2.7.5 Structure A29

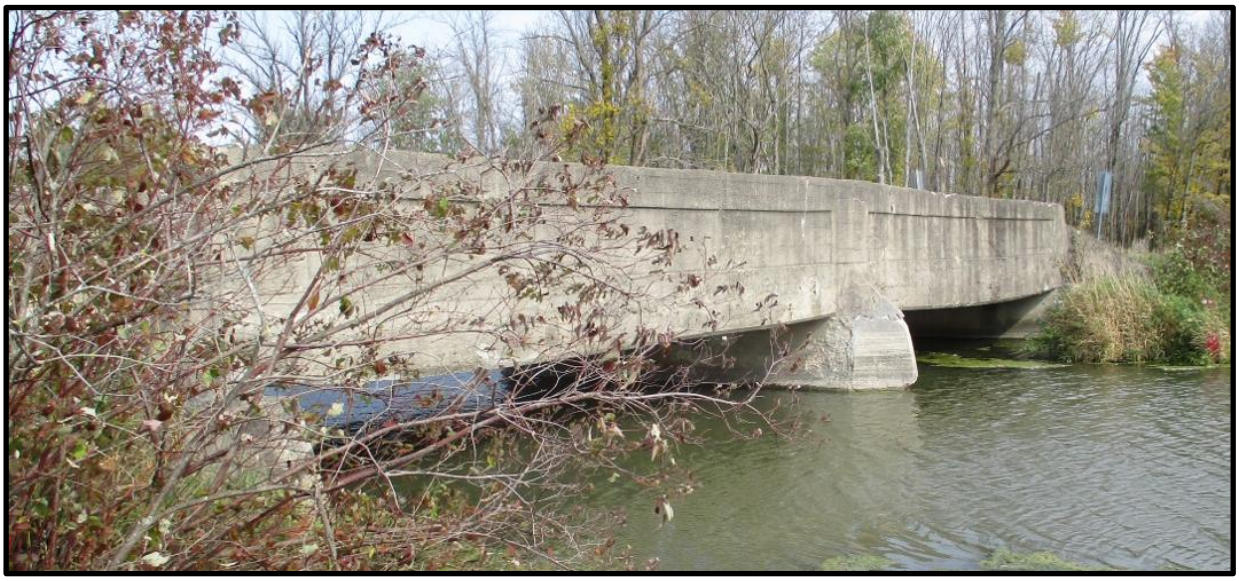
Constructed in the 1930's, structure A29 is a solid concrete slab bridge located on the Elderslie-Arran Road, which is the boundary road between the former Townships of Arran and Elderslie. The bridge is a single-lane crossing which spans the Calhoun Municipal Drain. This bridge as well as structure A30 were downloaded from the County in 2008. The last inspection in 2024 recommended patch repairs to the deck top and soffit. A photo of the bridge and soffit is shown below.

Structure A29

2.7.6 Structure A30

This crossing is located approximately 3 km east of structure A29, just before Grey-Bruce Line. Spanning the Sauble River, this bridge was constructed in the 1930's and is a solid concrete slab bridge with a deck width of 5.9 metres making it a single-lane crossing. This structure was downloaded from the County of Bruce in 2008 along with structure A29. The last inspection in 2024 identified concrete repairs required for the deck top, pier and barriers which should be completed within the next 1-5 years. The crossing has a load posting of 12 tonnes. A photo of the bridge is shown below.

Structure A30



2.7.7 Structure E1 – Priebe Bridge

The Priebe Bridge is located west of Chesley on Side Road 25 North, spanning the North Saugeen River. The bridge is a single-lane steel half-through truss bridge placed at the crossing in 1938. MTO records for the structure indicated that it was repurposed and moved to the site in 1938 to replace a timber bridge previously at the crossing. It is assumed therefore, that the structure predates 1938. The most recent inspection of the crossing, completed in 2024, recommended immediate repairs to including replacement of the deck stringer and the deck top as well as miscellaneous other repairs. This work was completed in 2024. The photo below of the Priebe Bridge shows the overall structural layout and the soffit (underside of the deck).

Structure E1 – Priebe Bridge

2.7.8 Structure E4

Structure E4 is located on Concession 2 Elderslie spanning the North Saugeen River, just downstream of the Priebe Bridge. Constructed circa 1920, this single span, steel half-through truss bridge was last inspected in 2024. Replacement of the damaged lattice on the inside of the truss is recommended. The crossing is currently posted with a 18/29/36 tonne load limit and the structure's width would allow 2 lanes of vehicular traffic. The photos below demonstrate the overall structural layout of the crossing.

Structure E4

2.7.9 Structure E9

Spanning Vesta Creek southeast of Paisley, Structure E9 is a half-through beam bridge located on Concession 2 Elderslie. The bridge was constructed in 1930 and has a deck width of 6.4 metres making this a two-lane crossing. The last inspection in 2024 identified repairs required to the bridge deck, beams, barriers and abutments, which should be completed within the next 5 years. A photo of the bridge and damaged beam is shown below. Note the numerous cliff swallow nests located on the underside of the structure.

Structure E9

2.7.10 Structure E10

Structure E10 also spans Vesta Creek immediately downstream of Structure E9. The bridge is a T-beam bridge located on Sideroad 5 Elderslie southeast of Paisley and was constructed circa 1930. The crossing was last inspected in 2024. No immediate repairs were identified as a result of the inspection. The crossing is currently posted with a 11-tonne load limit and can accommodate two lanes of traffic. The photos below demonstrate the overall structural layout of the crossing and cliff swallow nests.

Structure E10

2.7.11 Structure E12 – Pearces Bridge

Pearces Bridge is located on Sideroad 5 Elderslie spanning the North Saugeen River. This two-lane, single-span steel half-through truss bridge was constructed circa 1930 and was last inspected in 2024. The crossing is currently closed due to structural concerns about the condition of the stringers supporting the deck. Given the number of repair needs and the fact that the south abutment appears to have shifted, it has been recommended that the bridge be replaced instead of being repaired. The photo below demonstrates the overall structural layout of the crossing.

Structure E12

2.7.12 Structure E14

Structure E14 is located on Concession 8 Elderslie and is a concrete T-beam bridge which spans a tributary of Snake Creek, east of Paisley near the centre of the Municipality. Constructed circa 1930 the crossing has a deck width of 6.3m making it a 2-lane bridge. The last inspection in 2024 identified repairs required to the bridge beams and abutments, which should be completed within the next 5 years. A photo of the bridge and abutment is shown below.

Structure E14

2.7.13 Structure E15

Structure E15 is located immediately east of E14 on Concession 8 Elderslie, also spanning a tributary of Snake Creek. The bridge is a concrete T-beam bridge constructed circa 1920. The crossing was last inspected in 2024. Some repair needs were identified as a result of the inspection which are recommended for completion within 5 years. The crossing has a deck width of 6.4m making it a 2-lane bridge crossing. The photo below demonstrates the overall structural layout of the crossing and concrete deterioration.

Structure E15

2.7.14 Structure E16

Also located on Concession 8 Elderslie, east of Structures E14 and E15, Structure E16 is a concrete T-beam bridge that spans Snake Creek. Constructed circa 1930 the crossing has a deck width of less than 6m making it a single lane bridge. The last inspection in 2024 included a recommendation to replace the bridge within the next 5 years. Given the structure is a single lane bridge and has a significant amount of repair needs we believe it is more cost effective in the long term to replace instead of repairing this structure. The bridge currently has a load posting of 15 tonnes. A photo of the bridge and abutment is shown below.

Structure E16

2.7.15 Structure E17

Structure E17 is located northwest of Chesley on Side Road 25 Elderslie, spanning Snake Creek. The bridge is a single lane steel half-through truss bridge constructed circa 1930. The most recent inspection of the crossing, completed in 2024, recommended repairs to the deck, curbs and abutments within the next 5 years. The photo below illustrates spalling and corrosion to the underside of the concrete deck.

Structure E17

2.7.16 Structure E22

Structure E22 is located on Concession 10 North Elderslie spanning Snake Creek, northeast of Paisley. Constructed circa 1920, this single-span, steel half-through truss bridge was last inspected in 2024. Repairs were recommended for several structural components of the crossing, due to deterioration and corrosion. The crossing is currently posted with a 3 tonne load limit and can accommodate a single lane of traffic. The photos below demonstrate the overall structural layout of the crossing.

Structure E22

2.7.17 Structure E24

Structure E24 is located north of Paisley on the B Line spanning Snake Creek. The bridge is a single lane steel half-through truss bridge constructed circa 1920. The bridge has a current load posting of 10 tonnes. The most recent inspection of the crossing, completed in 2024, recommended repairs to the bridge barriers within the next 5 years, which were damaged due to multiple vehicle strikes. There are also recommendations to repair the concrete abutments. The photo below shows damage to the existing barriers.

Structure E24

2.8 Background Studies

2.8.1 General

A number of background reports were commissioned at the start of the Master Plan process to gain a better understanding of the project study area and to aid in the selection of preferred Master Plan alternatives. The specialized studies and evaluations completed in conjunction with the Master Plan include:

- Cultural Heritage Evaluation Report, which examined the cultural significance of 9 of the structures.
- Traffic Analysis, which examined traffic volumes on roads within the study area and identified major linkages within the transportation network through the Municipality.

2.8.2 Cultural Heritage Evaluation Report

i. Background

In accordance with the Ontario Heritage Act, R.S.O. 1990, which is administered by the Ministry of Citizenship and Multiculturalism, a Cultural Heritage Evaluation Report (CHER) is required for older structures to determine if built heritage resources are present. If determined to be present, a Heritage Impact Assessment (HIA) would then be triggered if changes or modifications to identified cultural features were proposed. A CHER was completed for the nine structures identified as requiring the assessment under the current check-list guidelines.

ii. Methodology

AECOM was retained to determine if built heritage resources were present at each structure and to provide recommendations for future works. Field reviews were conducted on February 3, 2020 which included a site visit to each structure as well as an examination of historical records associated with each bridge on file with the County, Municipality, and Ministry of Transportation. Current photos were also provided by BMROSS collected during recent bridge inspections.

iii. Cultural Heritage Evaluation

The CHER completed for the Bridge Infrastructure Master Plan utilized criteria provided in Ontario Regulation 9/06 of the *Ontario Heritage Act*. The criteria assessed three primary characteristics of a structure being the design or physical value of the structure, the contextual value, and the historic or associative value. Each of the nine bridges were evaluated based upon the criteria. A summary of key heritage elements was included for structure. The report also provided a brief description of other relevant provincial legislation that might have an impact on the cultural heritage of each bridge, including the Provincial Policy Statement (PPS), Ministry of Transportation, and local Official Plan policies. Sections 27 and 29 of the *Ontario Heritage Act* allow a municipality to list or designate a property or structure that is deemed to have cultural value or interest.

Table 2.3 provides a summary of the cultural heritage evaluation completed for the nine structures included in the Bridge Infrastructure Master Plan. Figure 2.5 shows the location of the 9 bridges included in the assessment as well as an image of the crossing.

iv. Recommendations

Based on the results of archival research: an analysis of the bridge's design and construction methods, comparative analysis, field investigations, and application of Ontario Regulation 9/06; all nine of the bridges were determined to have cultural heritage value or interest. The following recommendations should be implemented in conjunction with the assessed structures:

i) Heritage Impact Assessments (HIAs) are required for the structures should a bridge be replaced or undergo major rehabilitation in the future (PPS 2014). The HIA's will be completed according to the MTCS Ontario Heritage Tool Kit (2006) and will mitigate impacts to the heritage attributes of the nine bridges identified in the report.

ii) Consider listing the nine bridges in a heritage register maintained by Bruce County under the Ontario Heritage Act, Section 27, as recommended in Section 4.10.1 of the Bruce County Official Plan.

iii) This report shall be submitted to the Municipality of Arran-Elderslie heritage staff and the Ministry of Citizenship and Multiculturalism for review.

A summary of the key heritage features identified for the nine structures is included in Table 2.3. A copy of the Heritage Evaluation report is included within Appendix D.

Table 2.3: Cultural Heritage Evaluation Summary

Bridge Name	Cultural Heritage Characteristics
Structure E1 Priebe Bridge	• Steel five-panel, rivet-connected, Warren pony truss bridge installed at the site in 1938; • E1 is a representative and increasingly rare example of a single-lane, one span, pony truss bridge; • Bridge plaque indicates it was built by the Dickson Bridge Works Co. Ltd. • Has design or physical value and historic or associate value.
Structure E4 Allens Bridge	• Steel five-panel, rivet-connected, Warren pony truss bridge installed at the site in 1920; • E4 is a representative and increasingly rare example of a single lane, one span, pony truss bridge; • Constructed by the Sarnia Bridge Company with design by Fred B. James, the County Engineer. • Has design or physical value and historic or associate value.
Structure E12 Pearces Bridge	• Steel five-panel, rivet-connected, Pratt pony truss bridge built in 1930; • E12 is a representative and increasingly rare example of a single lane, one-span, pony truss bridge; • Constructed by the Ontario Bridge Company. • Has design or physical value and historic or associate value.
Structure A14 Arranvale Bridge	• Steel six-panel, rivet-connected, Warren pony truss bridge built in 1920; • A14 is a representative and increasingly rare example of a single lane, one-span, pony truss bridge; • Associated with the Arranvale Mill, located adjacent to the site. • Has design or physical value, historic or associate value, and contextual value.
Structure E17	• Steel five-panel, rivet-connected, Warren pony truss bridge built in 1930; • E17 is a representative and increasingly rare example of a single lane, one-span, pony truss bridge; • Retains the original metal post and lattice railings; • Has design or physical value and contextual value.
Structure A5 Hunts's Bridge	• Single span, earth-filled solid concrete spandrel arch bridge, circa 1910; • A5 is an early and rare survivor of its bridge type; • Single lane construction; • Has design or physical value.
Structure E22	• Steel four-panel, rivet-connected, Warren pony truss bridge built in 1920; • E22 is a representative and increasingly rare example of a single lane, one span, pony truss bridge; • Relocated to the site in 1942 from the Goderich area. Abutments designed by the Ontario Bridge Company. • Has design or physical value.
Structure A11 Wilson's Bridge	• Single span, earth-filled solid concrete spandrel arch bridge, circa 1910; • A11 is an early and rare survivor of its bridge type; • Single lane construction; • Has design or physical value.
Structure E24	• Steel four-panel, rivet-connected, Warren pony truss bridge built in 1920; • E24 is a representative and increasingly rare example of a single lane, one span, pony truss bridge; • Retains the original metal post and lattice railings; • Has design or physical value.

3.0 CLASS EA MASTER PLAN PROCESS

3.1 Overview

As discussed in Section 2.0 of this report, Arran-Elderslie currently owns and maintains 17 aging structures which are dispersed throughout rural areas of the Municipality. As a group they represent a significant potential capital expenditure to the municipality, should they all require replacement within the next 10-20 years. In order to address this situation Arran-Elderslie authorized BMROSS to undertake a Bridge Infrastructure Master Plan utilizing the Class Environmental Assessment planning process, to investigate potential outcomes associated with the structures. The overall goal of the Master Planning process can be summarized as follows:

> *To develop a long-range Infrastructure Master Plan for 17 aging structures located in Arran-Elderslie and to identify outcomes for each of the structures which will include replacement, rehabilitation, or retirement, to be implemented over a 15-20 year timeframe.*

The following sections of this report document the environmental assessment process conducted during the Master Planning process, as well as the identification of a preferred outcome for the Bridge Infrastructure Master Plan. The key components of the process are summarized below:

- A description of the identified transportation infrastructure deficiencies.
- Identification of practical options to resolve deficiencies in the long-term
- An evaluation of potential impacts associated with the identified alternatives
- Selection of a preferred infrastructure alternative.
- Identification of a conceptual implementation plan.
- Synopsis of issues related to the implementation of the infrastructure plan.

3.2 Problem Identification

Arran-Elderslie is located in the northeast part of Bruce County and is primarily a rural municipality containing two major river systems. The municipality currently maintains 62 bridges and culverts with spans greater than 3 metres creating a significant capital commitment required to maintain the structures in a safe condition for the travelling public. The seventeen (17) bridges included in the Master Plan (MP) study were all built before 1940 and will likely require repair or replacement within the next 10 to 20 years.

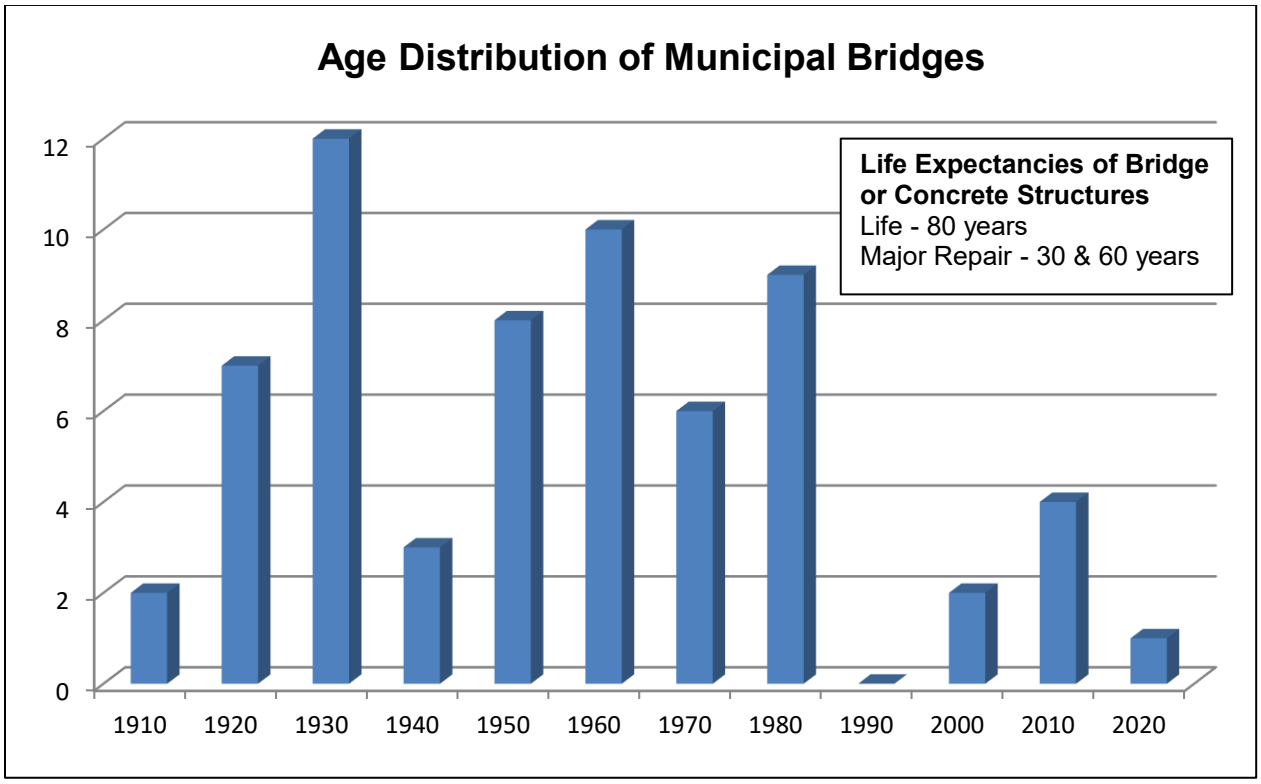
Section 1.4 of this report indicates that the investigation followed MP Approach #1, which addresses Phases 1 and 2 of the Class EA process but does not complete sufficient investigations to satisfy the requirements for Schedule ‘B’ or ‘C’ activities. Phase 1 of this process involves the identification of the problems which need to be

addressed. Given the structural deficiencies identified through the MP, the following problem statement was developed to summarize issues central to this analysis:

> *The 17 study area bridges pose a significant capital commitment to the Municipality, given their age and current state of deterioration. Given limited financial resources, a plan needs to be developed to address the necessary repairs, and identify a schedule for completing the work, and also identifying crossings for potential closure and removal.*

Figure 3.1 illustrates the age distribution of the 62 structures currently maintained by the Municipality.

Figure 3.1



3.3 Alternative Solutions

3.3.1 General

At the start of the Master Plan process, a number of possible outcomes were considered for each of the structures being assessed through the study. The range of alternatives being reviewed could include the replacement, repair, or retirement (closure) of each of the structures. A brief description of the work associated with each of the Master Plan outcomes is described in Table 3.1.

Table 3.1 - Primary Components of the Identified Alternatives

Structural Options	Related Works
Replacement	- Replace the existing structure with a new concrete bridge designed in accordance with established standards of the latest edition of the Canadian Highway Bridge Design Code. - Reconstruct road approaches to accommodate the new bridge and to address existing approach road deficiencies. - Install rock rip-rap erosion protection around piers and abutments.
Repair	- Replace all deteriorated components of structure with sympathetic components in accordance with established standards of the latest edition of the Canadian Highway Bridge Design Code.
Retirement (Repair and Eventual Closure)	- Replace deteriorated components of the structure with required components in accordance with established standards in order to maintain the structure in a safe condition. - Establish a timeline for eventual closure of the crossing. - Close crossing to vehicular traffic through installation of barricades. - Consider alternative uses such as pedestrian or recreational. - Remove bridge structure and salvage if possible. - Remove piers and abutments and associated road approaches. - Restore any disturbed sections of the riverbank and channel.

3.3.2 Identification of Alternative Solutions

Alternative 1 – Continue to repair or replace crossings. This option means that the Municipality would continue maintaining, repairing, and replacing bridge structures as necessary to ensure the transportation network stays safe and connected, provided these investments continue to be financially sustainable within municipal budgets.

Alternative 2 – Close some crossings identified through the completion of additional investigations, and either replace or repair the remaining crossings. This option means that several bridges will eventually be closed to traffic and removed, while the remaining crossings will be either repaired or replaced, depending on the current state of deterioration.

Alternative 3 – Do Nothing. The do nothing option is a consideration during any Master Plan Class EA process. This option would propose that no improvements or changes be made to address the identified problem. During the Master Plan planning and design process, this alternative may be implemented at any time prior to implementation of the preferred option. A decision to “do nothing” would typically be made when the costs of all other alternatives, both financial and environmental, significantly outweigh the benefits.

3.4 ADDITIONAL STUDY INVESTIGATIONS

To assist with the identification of outcomes for the 17 study area bridges, the following evaluations were completed as part of the Master Plan.

i) **Evaluation Matrix**: An evaluation matrix was developed to assist with determining outcomes for the study bridges. Various criteria was collected for each bridge in order to compare potential outcomes and rank the structures.

ii) **Engineering Review**: An updated Ontario Structural Inspection Manual (OSIM) report was completed for each crossing. The inspection included an updated Bridge Condition Index (BCI), identification of repairs and cost estimates for repairs and/or replacement of the crossing. Timelines for the work were also included.

3.5 Evaluation Matrix

The evaluation matrix ranked information collected through the additional assessments for each of the crossings. Scores were developed for each of the evaluated aspects, which were used to identify outcomes for the crossings. Higher scores were assigned to aspects that would support a potential future closure. A description of each criteria utilized in the assessment is detailed below. The Matrix results are shown in Table 5.2.

3.5.1 Bridge Condition Index (BCI)

BCI is a rating system used by engineers to assess the state of deterioration present in a crossing. The lower the BCI, the worse the condition of the bridge. The table below provides details on the BCI scoring system. For the evaluation matrix, a lower BCI results in a higher score on the matrix. Table 3.2 shows the BCI rating system.

Table 3.2 - Bridge Condition Index

Rating	Maintenance schedule
Good: BCI Range 70 -100	Maintenance is not usually required within the next five years
Fair: BCI Range 60 -70	Maintenance work is usually scheduled within the next five years. This is the ideal time to schedule major bridge repairs to get the most out of bridge spending.
Poor: BCI Less than 60	Maintenance work is usually scheduled within one year.

3.5.2 Load Limit

A load limit is a weight restriction assigned to a crossing based on the structure strength and integrity of the crossing. A triple load limit, see structure E4, defines a separate limit for the number of axles on a vehicle (single/double/triple). It was determined that the lower the load limit, the higher the crossing should score on the matrix.

3.5.3 Traffic Counts

Traffic Counts record the number of vehicles that use an identified road section within a defined 24 hour period. The lower the count, the fewer vehicles using the road. A higher number was assigned to roads with the lowest counts. Given that this factor would have a significant bearing on whether a bridge should be closed, the score was doubled for this factor. Three years of traffic counts were averaged for this factor.

3.5.4 Road Type

Road type simply refers to the type of road surface where the bridge is located. Three types are present within the Municipality: gravel, Low Class Bituminous (*LCB*), and High Class. Bituminous (HCB). HCB is the best class of roads, while gravel is the poorest. The lower the road condition, the higher it was scored on the matrix.

3.5.5 Detour Length

For each of the crossings, the shortest detour distance was calculated, with the distance being measured from one end of the bridge along the shortest route, stopping at the other end of the bridge. The shorter the detour route, the higher the score on the matrix, assuming a shorter detour would be less impactful to residents.

3.5.6 Replacement Cost

A replacement cost was calculated for each of the crossings to determine the potential economic impact associated with full replacement. Bridges with higher replacement costs scored lower on the matrix.

3.5.7 Road Connectivity

An assessment of road connectivity was completed to determine the potential impact on the transportation network of the various potential closures. Major transportation corridors (County Road corridors or Provincial Highways) were identified and illustrated on a map showing the bridge locations. Traffic counts were also shown on the map. If a bridge was located on a transportation corridor, between two corridors or in close proximity to other bridges, it was rated higher. Crossings with low connectivity had a higher score on the matrix.

3.5.8 Community Feature

Proximity to key community features was included in the assessment matrix. These include hospitals, EMS, schools, public works yards, and churches. Bridges located in close proximity to a community feature or along a route used to access a feature, received a lower score on the matrix.

Table 3.3 - Potential Bridge Closure Assessment Matrix – Approach #1

Initial approach to identifying bridge closures, which utilizes BCI, Load Limit, Traffic Counts, Road Types, Detour Lengths (if closed), Road Connectivity, Community Features and Replacement Costs, to identify bridges for potential closure. Option A selected 4 bridges with the highest score in the matrix. Option B selected an additional 4 bridges.

Recommended Closures Option A - **Option B -** +

Structure ID	Type & Age	BCI	Score	Load Limit	Score	Avg. Traffic Counts	Score X 2	Road Type[1]	Score	Detour Length	Score	Replace$	Score x 2	Road Connectivity	Score	Community Feature	Score	Total
E4 - Allens	Truss-1920	50	**10**	18/29/36	**10**	459	**10**	HCB	**5**	8.2km	**10**	$2,573,700	**30**	Yes	**5**	EMS Route	**5**	**85**
E9	Beam-1930	26	**20**	25	**5**	280	**10**	LCB	**10**	12.2km	**5**	$1,107,375	**10**	Yes	**5**	EMS Route	**5**	**70**
E1 – Priebe	Truss-1938	40	**15**	10	**15**	216	**10**	Gravel	**15**	8.1km	**10**	$2,763,325	**30**	Yes	**5**	School (near)	**5**	**105**
E10	T-Beam-1930	48	**10**	11	**10**	162	**20**	LCB	**10**	12.2km	**5**	$1,286,925	**10**	Yes	**5**	EMS Route	**5**	**75**
E12–Pearces	Truss-1930	46	**10**	8	**15**	162	**20**	Gravel	**15**	7.6km	**10**	$3,073,000	**30**	Some	**10**	School (far)	**10**	**120**
A11 – Wilson	C. Arch-1910	45	**10**	12	**10**	112	**20**	Gravel	**15**	8.1km	**10**	$867,975	**10**	None	**15**	None	**15**	**105**
A29	C. slab-1930	56	**5**	25	**5**	100	**20**	Gravel	**15**	7.9km	**10**	$1,047,525	**10**	Some	**10**	None	**15**	**90**
A14– Arranvale	Truss-1920	45	**10**	14	**10**	99	**20**	Gravel	**15**	5.2km	**15**	$3,232,150	**30**	Yes	**5**	Work Shed	**5**	**110**
A24 – Ruff	C. slab-1920	29	**20**	25	**5**	99	**20**	Gravel	**15**	5.2km	**15**	$371,000	**10**	Yes	**5**	Work Shed	**5**	**95**
E24	Truss-1920	53	**5**	10	**15**	98	**20**	Gravel	**15**	8.2km	**10**	$2,055,000	**20**	Some	**10**	School (far)	**10**	**105**
A5 – Hunts	C. Arch-1910	63	**5**	9	**15**	84	**20**	Gravel	**15**	7.1km	**15**	$1,466,475	**10**	Yes	**5**	Work Shed (far)	**10**	**95**
A30	C. slab-1930	38	**10**	12	**10**	77	**30**	Gravel	**15**	8.8km	**10**	$2,035,050	**20**	Some	**10**	None	**15**	**120**
E22	Truss 1920	46	**10**	3	**15**	68	**30**	Gravel	**15**	8.1 km	**10**	$2,154,750	**20**	None	**15**	School (far)	**10**	**115**
E16	T-Beam-1930	31	**15**	15	**10**	67	**30**	Gravel	**15**	12.2km	**5**	$1,107,375	**10**	Some	**10**	None	**15**	**110**
E17	Truss-1930	38	**15**	11	**10**	53	**30**	Gravel	**15**	8.2km	**10**	$2,503,875	**20**	None	**15**	None	**15**	**130**
E14	T-Beam-1930	34	**15**	25	**5**	50	**30**	Gravel	**15**	12.2km	**5**	$1,137,300	**10**	Some	**10**	None	**15**	**105**
E15	T-Beam-1920	41	**10**	25	**5**	50	**30**	Gravel	**15**	12.2km	**5**	$1,107,375	**10**	Some	**10**	None	**15**	**100**

Scoring System: [1]**LCB – Low Class Bituminous, HCB – High Class Bituminous**

BCI: <30 = 20, 30-40 = 15, 41-50 = 10, >50 = 5

Load Limit: <10 = 15, 11-20 = 10, > 20 = 5

Traffic: <80 = 15, 81- 200 = 10, > 200 = 5

Road Type: Gravel = 15, LCB = 10, HCB = 5

Detour: < 7.5 = 15, 7.6-10 = 10, >10.1 = 5

Replace $: 1.5 mil = 5, 1.5–2 mil =10, > 2 mil = 15

Rd Connection: none = 15, some = 10, Yes = 5

Community Feature: None = 15, Some = 10, Yes = 5

Table 3.4 - Potential Bridge Closure Assessment Matrix – Approach #2

Another approach to identifying bridge closures removes the BCI and Load Limit Scores and just focuses on Traffic Counts, Road Types, Detour Lengths (if closed), Community Feature proximity and Road Connectivity, to identify bridges for closure. With this approach, the focus is on the location and function of the bridge, rather than the current condition. Again, Option A shows the 4 crossings with the highest scores and Option B shows the next 4 crossings with the highest score.

Recommended Closures Option A - **Option B -** +

Structure ID	Type & Age	Avg. Traffic Counts	Score X 2	Road Type[1]	Score	Detour Length	Score	Replace$	Score x 2	Community Feature	Score	Road Connectivity	Score	Total
E4 - Allens	Truss-1920	459	**10**	HCB	**5**	8.2km	**10**	$2,573,700	**30**	EMS Route	**5**	Yes	**5**	**65**
E9	Beam-1930	280	**10**	LCB	**10**	12.2km	**5**	$1,107,375	**10**	EMS Route	**5**	Yes	**5**	**45**
E1 – Priebe	Truss-1938	216	**10**	Gravel	**15**	8.1km	**10**	$2,763,325	**30**	School (near)	**5**	Yes	**5**	**75**
E10	T-Beam-1930	162	**20**	LCB	**10**	12.2km	**5**	$1,286,925	**10**	EMS Route	**5**	Yes	**5**	**55**
E12– Pearces	Truss-1930	162	**20**	Gravel	**15**	7.6km	**10**	$3,073,000	**30**	School (far)	**10**	Some	**10**	**95**
A11 – Wilson	Conc. Arch-1910	112	**20**	Gravel	**15**	8.1km	**10**	$867,975	**10**	None	**15**	None	**15**	**85**
A29	Conc. slab-1930	100	**20**	Gravel	**15**	7.9km	**10**	$1,047,525	**10**	None	**15**	Some	**10**	**80**
A14–Arranvale	Truss-1920	99	**20**	Gravel	**15**	5.2km	**15**	$3,232,150	**30**	Work Shed	**5**	Yes	**5**	**90**
A24 – Ruff	Conc. slab-1920	99	**20**	Gravel	**15**	5.2km	**15**	$371,000	**10**	Work Shed	**5**	Yes	**5**	**70**
E24	Truss-1920	98	**20**	Gravel	**15**	8.2km	**10**	$2,055,000	**20**	School (far)	**10**	None	**15**	**90**
A5 – Hunts	Conc. Arc-1910	84	**20**	Gravel	**15**	7.1km	**15**	$1,466,475	**10**	Work Shed (far)	**10**	Yes	**5**	**75**
A30	Conc. slab-1930	77	**30**	Gravel	**15**	8.8km	**10**	$2,035,050	**20**	None	**15**	Some	**10**	**100**
E22	Truss 1920	68	**30**	Gravel	**15**	8.1 km	**10**	$2,154,750	**20**	School (far)	**10**	None	**15**	**100**
E16	T-Beam-1930	67	**30**	Gravel	**15**	12.2km	**5**	$1,107,375	**10**	None	**15**	Yes	**5**	**80**
E17	Truss-1930	53	**30**	Gravel	**15**	8.2km	**10**	$2,503,875	**20**	None	**15**	None	**15**	**105**
E14	T-Beam-1930	50	**30**	Gravel	**15**	12.2km	**5**	$1,137,300	**10**	None	**15**	Yes	**5**	**80**
E15	T-Beam-1920	50	**30**	Gravel	**15**	12.2km	**5**	$1,107,375	**10**	None	**15**	Yes	**5**	**80**

* If scores are tied for one or more structures, the structure with the highest traffic count is moved to the lower category

Scoring System: [1]**LCB – Low Class Bituminous, HCB – High Class Bituminous**

Traffic: <80=15, 81-200 = 10, > 200 = 5

Road Type: Gravel = 15, LCB = 10, HCB = 5

Detour Length: < 7.5 = 15, 7.6-10 = 10, >10.1 = 5

Replace Cost: < 1.5 mil = 5, 1.5 –- 2 mil = 10, > 2 mil = 15

Road Connectivity: none = 15, some = 10, yes = 5

Community Feature: None = 15, Some = 10, Yes = 5

3.6 Results

The Matrix evaluation results were initially presented to Municipal council for their information at a Council meeting held on February 13, 2023 and then subsequently presented to the public at a meeting held on September 23, 2023 at the Chesley Community Centre (see Section 4.0 for additional information). Based on feedback received from residents following the Public Meeting, the matrix was revised and the 'Community Features' component was added to Approach #1.

Criteria utilized in the matrix was then revised (updated inspections and traffic counts) and the results tallied. The revised matrix recommendations were then presented to Council at a meeting held on January 29, 2024. At this meeting, Approaches # 1 and #2 were revised to identify six of the 17 project bridges for potential closure rather than 8. The same six structures were identified using both approaches and are described in more detail in Table 3.5 below and are illustrated in Figure 3.2.

Table 3.5 - Potential Bridge Outcomes

Bridge	Affected Road	Description	Closure Timeline
E17	Sideroad 25	Steel Truss – 1938	BC1 38 – Close 5-10 yrs
E22	Sideroad 10 N	Steel Truss – 1920	BC1 46 – Repair/Close – 15-20 yrs
A11	Sideroad 5 S	Concrete Arch – 1910	BC1 45 – Repair/Close – 20-25 yrs
E12	Sideroad 5 S	Steel Truss – 1930	BC1 46 – Repair/Close – 15-20 yrs
A30	Elderslie-Arran Line	Concrete Slab – 1930	BC1 38 – Repair/Close – 20-25 yrs
E24	B Line	Steel Truss – 1920	BC1 53 – Repair/Close – 20-25 yrs

3.7 Engineering Review

3.7.1 Design Considerations

In order to evaluate the potential impacts associated with the crossings identified for replacement, an engineering analysis was completed by BMROSS' structural engineering staff. The evaluation included a review of each bridge site and associated road approaches to determine the size and configuration required for a new bridge crossing to be constructed at each location. Figure 3.3 illustrates the typical deck cross-section to be used for the new structures.

Insert Figure 3.2 – Potential Bridge Closures

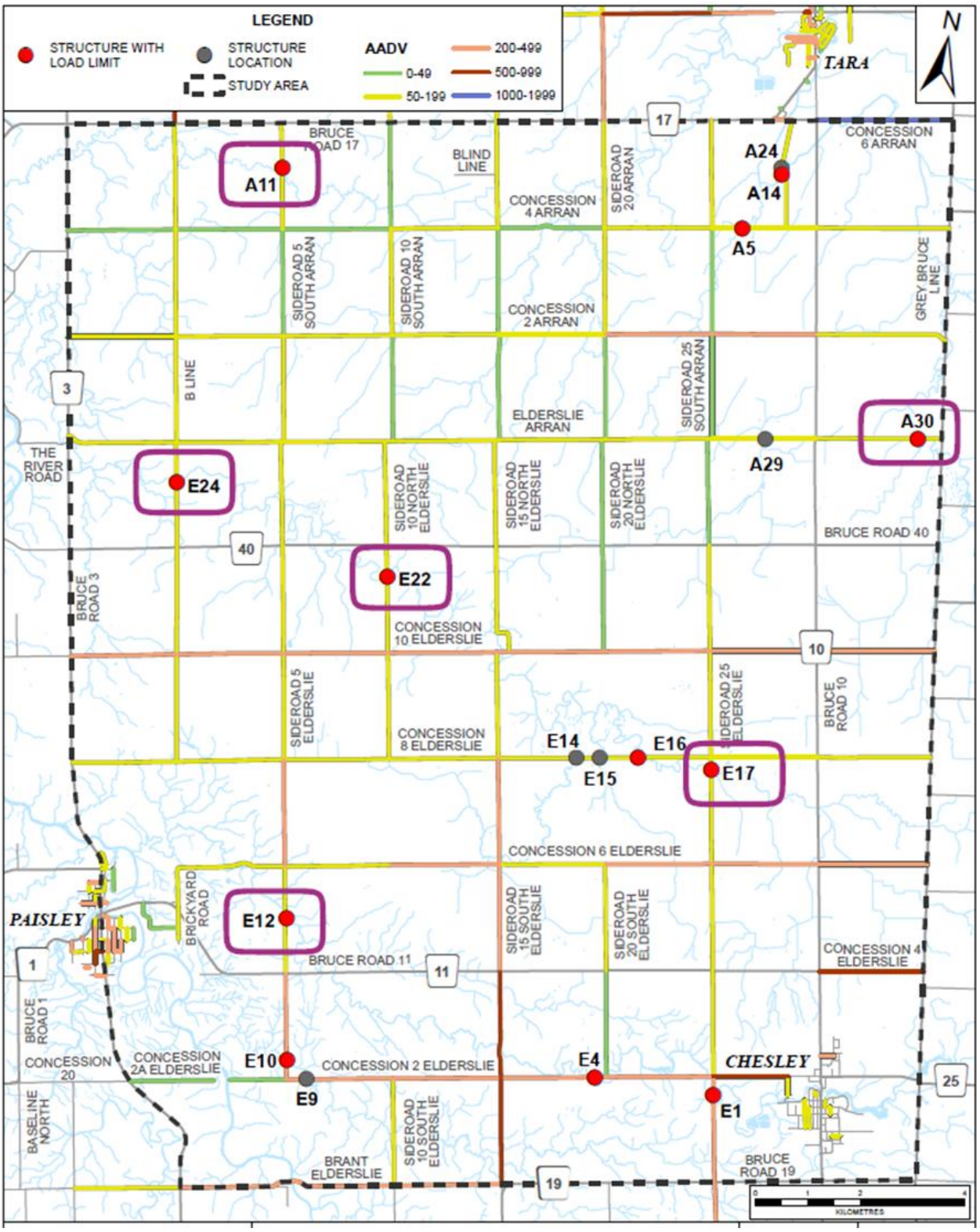
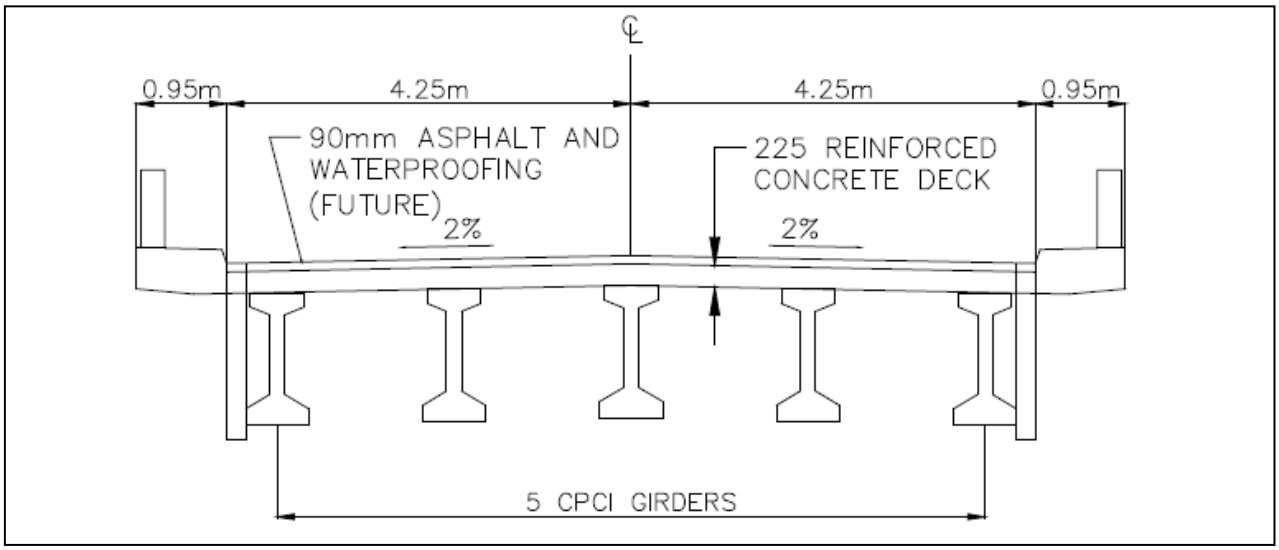


Figure 3.3 - Proposed Bridge Deck Cross-Section



3.7.2 Estimated Construction Costs

In order to estimate construction costs associated with the bridges being reviewed, a slightly larger span was assumed for each of the crossings to minimize impacts on aquatic habitat and improve hydraulics. Table 3.6 summarizes the existing and proposed bridge spans and widths for each crossing, as well as associated road reconstruction costs.

Table 3.6 - Bridge Design Considerations: Estimated Costs

Bridge Crossing	Existing span/width	Proposed span/width	Anticipated Bridge Cost	Road Work	Total Cost
E17 – (Truss 1938)	21.3/m5.6m	24.5m/10.5m	$2,443,875	$60,000	$2,503,875
E4 – Allens (truss-1920)	21.9m/6.4m	25.2m/10.5m	$2,513,700	$60,000	$2,573,700
A5 – Hunts (Arch-1910)	12.3m/4.9m	14.1m/10.5m	$1,406,475	$60,000	$1,466,475
E9 - Beam-(1930)	9.1m/6.4m	10.5m/10.5m	$1,047,375	$60,000	$1,107,375
E10 -T-Beam (1930)	10.7m/6.4m	12.3m/10.5m	$1,226,925	$60,000	$1,286,925
E12– Pearces (Truss-1930)	27.1m/5.7m	31.2m/10.5m	$3,112,200	$150,000	$3,262,200
A14–Arranvale (Truss-1920)	27.3m/5.45m	31.4m/10.5m	$3,132,150	$100,000	$3,232,150
E14 – T-Beam (1930)	9.4m/6.3m	10.8m/10.5m	$1,077,300	$60,000	$1,137,300
E15 – T-Beam (1920)	9.1m/6.4m	10.5m/10.5m	$1,047,375	$60,000	$1,107,375
E16 – T-Beam (1930)	9.1m/6.4m	10.5m/10.5m	$1,047,375	$60,000	$1,107,375
A24 – Ruff Slab (1920)	6.9m/7.0m	7.9m/10.5m	$788,025	$60,000	$848,025
A29 – Conc. Slab (1930)	8.6m/5.7m	9.9m/10.5m	$987,525	$60,000	$1,047,525
E22 – Truss (1920)	18.3m/4.9m	21m/10.5m	$2,094,750	$60,000	$2,154,750
E24 – Truss (1920)	17.4m/5.7m	20m/10.5m	$1,995,000	$60,000	$2,055,000
A30 – Conc. Slab (1930)	17.2m/5.9m	19.8m/10.5m	$1,975,050	$60,000	$2,035,050
A11 – Wilson Arch (1910)	7.0m/5.8m	8.1m/10.5m	$807,975	$60,000	$867,975
E1 – Priebe Truss (1938)	23.2m/5.4m	26.7m/10.5m	$2,663,325	$100,000	$2,763,325

3.8 Evaluation of Alternatives

3.8.1 General Process

Phase 2 of the Class EA process involves the evaluation of the defined alternatives and is conducted by examining the technical, economic, social, cultural, and environmental considerations associated with implementing any alternative. Mitigation measures that could lessen environmental impacts are also defined. A preferred solution or solutions is then selected. Several activities were incorporated into this assessment process, including a land use analysis, an engineering evaluation, a traffic assessment, and consultation with affected stakeholders, and regulatory agencies.

3.8.2 Assessment Methodology

The evaluation of alternatives process was carried out using a comparative assessment methodology designed to predict the nature and magnitude of environmental impacts resulting from each defined option and to assess the relative merits of the alternative solutions. The evaluation method involves these principal tasks:

- Identification of existing environmental conditions (baseline conditions, inventories).
- Assessment of existing land use activities, infrastructure, natural features, and socioeconomic characteristics (i.e., environmental scoping).
- Review of proposed alternatives and related works.
- Determination of the level of complexity required to complete the impact assessment.
- Identification of environmental components and sub-components that may be affected by the defined alternatives (i.e., define evaluation criteria).
- Prediction of environmental impacts (positive, negative) resulting from the construction and operation of the defined options.
- Identification and evaluation of measures to mitigate adverse effects.
- Selection of a preferred alternative following a comparative analysis of the relative merits of each option.

3.8.3 Identification of Environmental Components and Sub-Components

Section 3.3.3 of this report listed the alternative solutions that were identified to resolve the identified deficiencies. As part of the evaluation process, it is necessary to assess what effect each option may have on the environment and what measures can be taken to mitigate the identified impacts. The two main purposes of this exercise are to:

- Minimize or avoid adverse environmental effects associated with a project.
- Incorporate environmental factors into the decision-making process.

By definition, the EA Act generally separates the “environment” into five general elements:

- Natural environment.
- Social environment.
- Cultural environment.
- Economic environment.
- Technical environment.

The identified environmental elements can be further subdivided into specific components and sub-components, which have the potential to be adversely affected by the construction and/or operation of the alternative solutions. Table 3.2 summarizes the environmental components considered of relevance to this Class EA.

Table 3.7 - Summary of Project-Related Environmental Components

Element	Component	Sub-Component
Natural	Aquatic	• Aquatic Resources • Fisheries
	Atmosphere	• Air Quality • Noise
	Surface Water	• Water Quality/ Quantity
	Terrestrial	• Amphibians & Reptiles • Birds & Mammals • Vegetation
	Geologic	• Physiographic Features and Soils • Drainage Characteristics
Social	Neighbourhood	• Disruption • Quality of Life
	Community	• Health and Safety
Cultural	Heritage	• Cultural Heritage Resources
		• Archaeological Resources
Economic	Project Area	• Capital and Operational Costs • Property Values
	Community	• Property Taxes
Technical	Transportation	• Traffic Patterns/ Volumes • Vehicular Safety • Accessibility
	Infrastructure	• Road Capacity/ Routes • Infrastructure complexities
	Design Complexity	• Bridge Design Code
	Climate Change	• Climate change adaptation or impacts

3.8.4 Impact Analysis

The environmental effects of each project alternative on the identified environmental features are generally determined through an assessment of the following impact predictors (i.e., impact criteria):

- Nature (direct, indirect, cumulative).
- Magnitude (level of effect, loss of function).
- Location/ Extent (where effect occurs, number/ volume affected).
- Scale (localized or regional effects).
- Timing (seasonality of effects, immediate or delayed impacts).
- Duration (period of impact).
- Frequency (intermittent or continuous).
- Reversibility (extent of recovery, recovery time).
- Socio-economic and cultural context (characteristics of affected community).

For the purposes of this Master Plan Class EA process, criteria have been developed to predict the magnitude of environmental effects resulting from the implementation of a proposed alternative. Table 3.3 summarizes the impact criteria.

Table 3.8 - Criteria for Impact Determination

Level of Effect	General Criteria
High	Implementation of the project could threaten the sustainability of feature and should be considered a management concern. Additional remediation, monitoring and research may be required to reduce impact potential.
Moderate	Implementation of the project could result in a resource decline below baseline, but impact levels should stabilize following project completion and into the foreseeable future. Additional management actions may be required for mitigation purposes.
Low	Implementation of the project could have a limited impact upon the resource during the lifespan of the project. Research, monitoring, and/or recovery initiatives may be required for mitigation purposes.
Minimal/ Nil	Implementation of the project could impact upon the resource during the construction phase of the project but would have a negligible impact on the resource during the operational phase.

Given these criteria, the significance of adverse effects is predicated on these considerations:

- Impacts from a proposed alternative assessed as having a Moderate or High level of effect on a given feature would be considered significant.
- Impacts from a proposed alternative assessed as having a Minimal/ Nil to Low level of effect on a given feature would not be considered significant.

3.9 Environmental Effects Analysis

The potential interactions between the identified alternatives and environmental features (Table 3.2) were examined as part of the evaluation of the alternatives phase. The purpose of this analysis was to determine, in relative terms, the environmental effects of constructing and operating each identified option on the defined environmental components and sub-components (using the impact criteria described in Table 3.3). In this regard, the level of effect for the environmental interactions was rated as High, Moderate, Low and Minimal/ Nil. Potential mitigation measures were also considered as part of this evaluation.

Table 3.4 summarizes the outcome of the environmental effects analysis carried out for the structures included in the Bridge Infrastructure Master Plan.

Table 3.9 - Summary of Environmental Effects Analysis

Alternative	Environmental Component	Factor Under Consideration	Level of Effect	Potential Impacts
Alternative 1 Repair or Replace all Crossings	Natural Environment	Aquatic	Low to Moderate	• Construction-related activities may result in temporary impacts on aquatic habitat features • Work would occur during normal in-water timing windows to minimize impacts. • Consultation with DFO would be undertaken.
		Atmosphere	Low	• Minor impacts may occur during construction, but would not continue during operation of the facilities. • Improved road network might result in increased traffic volumes and associated emissions.
		Surface Water	Low to Moderate	• Some impacts to water quality may occur during construction, however sediment and erosion control measures would be implemented during construction. • Disturbed areas would be restored following construction.
		Terrestrial	Low to Moderate	• Riparian vegetation will be impacted during construction but will be restored upon completion of the work.
		Geologic	Low	• Few impacts are anticipated during construction, as a majority of the crossings would be reconstructed in the same location as existing with few significant excavations required.
	Social Environment	Neighbourhood	Low to Moderate	• Minor impacts to adjacent properties may occur during construction. • Impacts would be temporary and upon completion, there would be an improved road network available for use.
		Community	Low	• Minor impacts to traffic movement would occur during construction, however there would be an improved road network available upon completion of the work.

Alternative	Environmental Component	Factor Under Consideration	Level of Effect	Potential Impacts
		Cultural Heritage Resources	Cultural Environment	• All of the structures were determined to have cultural heritage value. • Replacement of the crossings may result in loss of some of these attributes.
		Archaeological Resources	Low to Moderate	• New construction within previously undisturbed areas would require the completion of a Stage 1 & 2 Archaeological Assessment.
	Economic Environment	Project Area	Low	• Should not result in local economic impacts, given that no crossings will be closed.
		Community	High	• Replacement or repair of all the crossings will be a significant capital expenditure to the Municipality that may result in increased taxes.
	Technical Environment	Transportation	Low to Moderate	• Minor impacts to the transportation network will occur during bridge replacement projects. • However the network will be improved upon completion with higher capacity crossings.
		Infrastructure	Low	• May impact underground utilities. • Will be addressed during the detailed design stage.
		Design Complexity	Low	• A majority of the crossings are smaller spans that cross creeks and secondary channels, limiting the design complexity. • A few crossings are of larger watercourses that may require more complex designs.
		Climate Change	Low	• Replacement of all the crossings would result in a more resilient transportation network within the Municipality, as current deterioration would be addressed.

Alternative	Environmental Component	Factor Under Consideration	Level of Effect	Potential Impacts
Alternative 2 Close Some Crossings	Natural Environment	Aquatic	Low to Moderate	• Construction-related activities may result in temporary impacts to aquatic habitat features • Work would occur during normal in-water timing windows to minimize impacts. • Consultation with DFO would be undertaken.
		Atmosphere	Low	• Minor impacts may occur during construction, but would not continue during operation of the facilities. • Improved road network might result in increased traffic volumes and associated emissions.
		Surface Water	Low to Moderate	• Some impacts to water quality may occur during construction, however sediment and erosion control measures would be implemented during construction. • Disturbed areas would be restored following construction.
		Terrestrial	Low to Moderate	• Riparian vegetation will be impacted during construction but will be restored upon completion of the work.
		Geologic	Low	• Few impacts are anticipated during construction, as a majority of the crossings would be reconstructed in the same location as existing with few significant excavations required.
	Social Environment	Neighbourhood	Moderate to High	• There may be minor disturbances to adjacent properties during the construction phase for those structures being replaced. • Impacts could be high for property owners and members of the Mennonite Community located immediately adjacent to the crossing that will eventually be closed.
		Community	Moderate to High	• Although there would be a reduction in the overall transportation network, impacts would not be as significant for the entire community where alternate routes would be available around the closed crossings. • Impacts to the Mennonite community would potentially be significant if the crossing to be closed is located along transportation corridors used regularly by the community.

	Cultural Environment	Cultural Heritage Resources	Moderate	• All of the structures were determined to have cultural heritage value. • Replacement or closure of the crossings may result in loss of some of these attributes.
		Archaeological Resources	Low	• New construction within previously undisturbed areas would require the completion of a Stage 1 & 2 Archaeological Assessment.
	Economic Environment	Project Area	Low to Moderate	• May result in minor impacts to immediately adjacent landowners if regular detours are required.
		Community	Moderate	• Closure of some of the crossings will be less costly for the Municipality than replacement of all the structures.
	Technical Environment	Transportation	Moderate	• Minor impacts to the transportation network will occur during bridge replacement projects. • Overall the transportation network will be improved upon completion with higher capacity crossings throughout the Municipality. • Transportation network will be negatively impacted along road sections where crossings will be closed.
		Infrastructure	Nil	• May impact underground utilities. • Will be addressed during the detailed design stage.
		Design Complexity	Low to Moderate	• A majority of the crossings are smaller spans that cross creeks and secondary channels, limiting the design complexity. • A few crossings are of larger watercourses that may require more complex designs. • May be difficult to keep structures open longer through repairs prior to permanent closure. Will need to ensure the safety for the traveling public.
		Climate Change	Low	• Closure of some of the crossings should not result in greater impacts associated with climate change, provided that those that are replaced are designed to address potential increases in flows and velocities.

Alternative	Environmental Component	Factor Under Consideration	Level of Effect	Potential Impacts
Alternative 3 Do Nothing	Natural Environment	Aquatic	Nil	• No expected impacts.
		Atmosphere	Nil	• No expected impacts.
		Surface Water	Low	• Could result in localized impacts to aquatic habitat if a bridge were to fail and block a channel.
		Terrestrial	Nil	• No expected impacts.
		Geologic	Nil	• No expected impacts.
	Social Environment	Neighbourhood	Moderate	• A number of the crossings are in poor condition and need to be repaired or replaced in order to maintain the safe condition of the transportation network.
		Community	Moderate	• No expected impacts. A number of the crossings are in poor condition and need to be repaired or replaced in order to maintain the safe condition of the transportation network.
	Cultural Environment	Cultural Heritage Resources	Nil	• No impacts anticipated.
		Archaeological Features	Nil	• No impacts anticipated.
	Economic Environment	Project Area	Low	• Least expensive option in the short term.
		Community	Moderate	• Least expensive option initially, however without addressing the deterioration present, costs could escalate over time resulting in greater expenses in the long term.
	Technical Environment	Transportation	Low	• No impacts anticipated unless a crossing should fail which would result in a reduction in service until the crossing could be replaced.
		Infrastructure	Nil	• No expected impacts.
		Design Complexity	Low	• No impacts anticipated initially. • Should a crossing fail due to deterioration, replacement under a tight timeframe could be more complex.
		Climate Change	Moderate	• Existing crossings in a deteriorated condition would be more susceptible to climate-related impacts such as increased flows and velocities.

3.10 Evaluation Summary

Three alternative solutions were initially identified for evaluation. These were:

Alternative 1: Repair or replace all the crossings.

Alternative 2: Closure of some of the study bridges.

Alternative 3: Do Nothing

The environmental impacts, which include impacts to the natural, social, cultural, economic and technical environments, were summarized in Table 3.9.

Alternative one, replacement or repair of all the study bridges will result in impacts to the natural environment during the construction phase but will be the least impactful to the social environment, by replacing all of the crossings with higher capacity crossings designed to current standards. This option will also impact the economic environment by being more costly to the Municipality due to capital costs associated with the repair or replacement of all the crossings.

Alternative two, the closure of some of the crossings will have similar impacts on the environment for those crossings that are being replaced. However, impacts to the social environment will be significant, particularly to adjacent property owners, agricultural operators and the Mennonite community, if a bridge to be closed is used regularly by those utilizing a horse and buggy as their primary means of transportation.

Alternative three, the ‘do nothing’ alternative, has very few impacts initially. However, it does not address the current deterioration present at many of the crossings which, if not addressed, could make the crossings unsafe and lead ultimately to structural failure.

3.11 Identification of a Preliminary Preferred Solution

Based on the results of the assessments as reported above and a review of the potential social impacts associated with the project, Arran-Elderslie Council indicated a preference for Alternative 1, repair or replacement of all the crossings. There are a number of attributes associated with this Alternative which justified its selection as the preferred option for addressing the deterioration present within the study area bridges.

- Addresses existing deterioration present at the bridge crossings.
- Provides full-capacity crossings for use by residents and the traveling public at a majority of the crossing locations.
- Most logical choice given potential impacts to the transportation network and social impacts to the agricultural community and Mennonite communities.
- The transportation network will be improved overall by replacing many of the study area bridges with full-capacity crossings.

4.0 CONSULTATION PROGRAM

4.1 Public Consultation

Public consultation is an integral component of the Class EA process. During Phases 1 and 2 of the Master Plan Study, consultation was undertaken to obtain input from the public, indigenous communities, project stakeholders and review agencies. The components of the consultation plan used during the initial phases of the Master Plan Study are summarized in this section of the report and documented in Appendix E.

4.1.1 Notice of Study Commencement

The Municipality of Arran-Elderslie issued a Notice of Study Commencement for the Master Plan process on September 18, 2019. The notice introduced the purpose and intent of the Class EA Master Plan process, indicated that a group of older bridges was being considered as part of the assessment, and advised that some of the study bridges may be identified for permanent closure and removal. A copy of the notice is included in Appendix E of this report. No comments were received as a result of the Initial Notice.

Contents:	General study description, summary of proposed works, key plan
Issued:	September 18 and 25, 2019
Placed In:	Paisley Advocate, Owen Sound Sun Times, and Hanover Post Municipal Website and Newsletter
Input Period:	October 31st, 2019

4.1.2 September 19th, 2023 - Public Information Meeting

A public meeting was arranged to provide project information to residents on the Master Plan alternatives identified for the project. Notice of the public meeting was mailed to adjacent property owners, placed on the Municipal Website, published in the local newspaper and emailed to residents on the EA contact list. The meeting was held at the Chesley Community Centre on September 19th, 2023, from 6:00 p.m. to 8:40 p.m. Project details were presented by staff from BMROSS using a PowerPoint presentation. A question-and-answer session followed the presentation. Display boards were also mounted around the perimeter of the room with additional project details. The general purpose of the meeting was to provide residents with the following:

- A description of the bridges included in the Master Plan study.
- A summary of deficiencies associated with the existing structures.
- A brief overview of the Master Plan process and where the project stands today.
- Review of the alternatives, including a description of the evaluation method.
- A description of next steps and moving forward.

Approximately 48 residents were in attendance. Notes can be found in Appendix E along with a copy of the presentation material. A summary of feedback received following the public meeting is included in Table 4.1 below.

Table 4.1 - Public Comments – September 19 Public Meeting

Resident	Comments	Action Taken
Arran-Elderslie Resident September 19th, 2023 Comment during Public Meeting	- Landowner asked how farmers with land on both sides of a bridge are supposed to transport manure and milk after the structure is closed. - The bridge located on the 4th of Arran supports significant agricultural traffic. If closed, he said farmers would need to drive through urban areas or cross through the watercourse. - Questioned when traffic counts were taken. In harvest season he thought there would be a larger volume of traffic. It was also suggested that there is often a lot of snow built up on the road near bridge A5.	- Comments noted and filed
Arran-Elderslie Resident September 19th, 2023 Comment during Public Meeting	- A resident asked if the BCI and traffic counts were collected during COVID-19 when there were fewer people on the road.	- Explained that several years of traffic counts were used, not just during COVID.
Arran-Elderslie Resident September 19th, 2023 Comment during Public Meeting	- A resident expressed concerns over how the meeting was advertised. They felt that notifications being sent only to residents living adjacent to the bridges was not sufficient. More than just the property owners use the study bridges.	- Municipal staff said that other methods would be considered for subsequent meetings.
Arran-Elderslie Resident September 19th, 2023, Comment during Public Meeting	- A resident asked why the Arranvale Bridge, which was damaged due to an overweight truck using the structure, wasn't paying directly for the cost of fixing the damage. - They felt that taxpayers' money shouldn't be paying these costs. It was suggested that the closure of the Invermay Bridge affects the ability of traffic to move around the area as well.	- Municipal staff indicated that charges are being pursued against the truck driver.
Arran-Elderslie Resident September 19th, 2023 Comment during Public Meeting	- A resident noted structure E1–Priebe Bridge brings up concerns with transportation as there is an Amish community to the north and the school is located to the south. - Young children regularly ride bicycles over the bridge on their way to school. She added that a small detour for an automobile can be very long for a bike rider or horse and buggy. Also, the individual did not feel comfortable with their children riding through Chesley if the bridge was closed.	- Comments noted and filed
Arran-Elderslie Resident September 19th, 2023 Comment during Public Meeting	- A resident asked if dead-end roads that will be created when a bridge closes will pose a problem for snowplows. Would those roads continue to be maintained in the winter?	- Municipal staff said that a turn-around would be built if a bridge was closed. - Road would still be plowed if properties front on the road.
Arran-Elderslie Resident September 19th, 2023 Comment during Public Meeting	- A resident asked how the bridge replacement costs were determined and why simple steel truss bridges are no longer being constructed.	- BMROSS staff explained that a formula is used based on width of the crossing. - Truss bridges are no longer constructed due to steel costs.
Arran-Elderslie Resident September 19th, 2023 Comment during Public Meeting	- A resident asked why the study team had not investigated simpler solutions, such as box culverts. It was also suggested that structure A24 is larger than it needs to be.	- BMROSS said that box culverts may be possible. - Several options are considered when a bridge is replaced, including hydrology.

Resident	Comments	Action Taken
Arran-Elderslie Resident September 19th, 2023 Comment during Public Meeting	- A resident asked if a private property owner could install a box culvert on their own property – who is really checking	- BMROSS explained that permits are required from Conservation Authorities and DFO.
Arran-Elderslie Resident September 19th, 2023 Comment during Public Meeting	- A resident asked, based on a comment in the presentation, if there are other municipalities doing similar assessments.	- BMROSS said that several municipalities they work with are undertaking similar studies.
Arran-Elderslie Resident September 19th, 2023 Comment during Public Meeting	- A resident suggested that access to different services such as emergency responders (Fire, OPP, Ambulance) as well as the location of the public works building should be analyzed as well, for public safety and operational purposes	- Municipal staff said they would add the information to the assessment.
Arran-Elderslie Resident (via Fax) Received October 5th, 2023	- I am writing with a deep concern for the E1- Priebe Bridge, which we use on a very regular basis to reach the homes of other families within our Old Order Amish group. - The bridge is also a HUGE necessity for the children who cross it daily by foot or bicycle to get to school. Having horse and buggy as our main source of transportation, our community relies heavily on this bridge when going to church or other community events within our homes. - Removing this bridge would force all traffic and young school children to go through town, as the next block west does not have a road between HWY 19 and Concession 2, thus traveling an extra block further would make it impossible for our daily walks to school. - We along with our farming neighbours also know it is not practical to force all the local farm equipment through our small town of Chesley. - As mentioned at the meeting there is no need for a “fancy” bridge, only requesting a wide economical bridge that would make it possible for everyone to access the opposite side of the river. - Thanks again for requesting the voice of the residents who know the IMPORTANCE of KEEPING the “Priebe” crossing accessible and keeping us updated with all further planning.	- Comments noted and filed.
Arran-Elderslie Resident (via Fax) Received. October 5th, 2023	- Priebe Bridge (E1) Thoughts for Consideration: As residents on the highway south of the Priebe Bridge we have the following concerns, should the bridge be closed? - The Priebe Bridge serves as a vital crossing for farm equipment which if closed may funnel this large equipment through the downtown core of Chesley. - Amish children that live on the north side of the bridge use this crossing daily to bike or walk to school which is located on Concession 14 between Sideroad 30 and Sideroad 25. These children would have farther to travel to school and would have to go through downtown Chesley as well. - Amish families use this crossing to commute to help each other, for church services, and social events. - There is no road from Bruce Rd. 19 to Concession 2 where Sideroad 20 should be, therefore this makes a double block to travel from Bruce Rd .19 to Concession 2. If you live between Sideroad 25 and Sideroad 15. As a member of the Amish community, I can personally relate to how difficult this long drive would be given the fact that our primary mode of transportation is horse and buggy. - For residents on both sides of the bridge we would have a long drive to access the opposite end of town should a closure of Chesley’s Main Street happen again - Several years ago, a child on Concession 2 west of Sideroad 25 wandered away and got lost. The Priebe Bridge served as the main crossing for police and other search and rescue personnel to cross to the opposite side of the	- Comments noted and filed.

Resident	Comments	Action Taken
	block to alert the neighbours to search their outbuildings as well as follow leads while the search was underway. Had the bridge not been there, Chesley's Main Street and Sideroad 15 would have become the crossing points and would have further delayed the search and rescue personnel with the long drive in what became a long search and rescue effort. - We ask for your consideration in this matter.	
Arran-Elderslie Resident (via Fax) Received. October 6th, 2023	- I believe that closing the Priebe Bridge on Sideroad 25 would have a very severe negative impact on our community. - Neighbours use it daily for commuting to and from work. - School children use it daily going to and from school. - Farmers need it to access their fields. - We who drive horses and buggies need it on Sundays as well. - These are only a few reasons, but I trust you will make responsible decisions in this matter.	- Comments noted and filed.
Arran-Elderslie Resident (via Fax) Received October 10th, 2023	- Concerns that we have on the E1. Priebe Bridge: - I cross that bridge 5 days a week to go to work. - Our children also cross that bridge to go to school on the 14th of Brant Twp., therefore we can keep them from going through town on their scooters or pony cruiser. - This would take a lot of extra time to go around the block with horse and buggy if the bridge would not be there not only for work and school but also for our church services.	- Comments noted and filed.
Arran-Elderslie Resident (via email) Received October 10th, 2023	- I live at 117 Arran-Elderslie Town Line (50 acres). I've lived there with my wife and two kids since 2018. In addition to this farm, I also own 97 acres on Sideroad 2 (Con 13 E, Pt Lot 7) in Sullivan Township. - My dad owns 100 acres (95 workable) at 877 Bruce Road 40 and my sister owns 91 acres (36 workable) just north of Burgoyne. - With support from my family, I'm the primary operator of about 300 acres on a part-time basis, I also own and operate a small consulting business to which I devote 50-60 hours - every week, and several rental investment properties in Saugeen Shores which I manage directly. - Long term my financial plan is to make a living from farming however at this time I simply do not have the capital to purchase any farm outright and operate it without an outside source of income. With the long-term plan in mind, we agreed to purchase the Sideroad 2 farm in 2022, the primary selling feature was and still is the 2.4km away the farm sits from our home on the Arran-Elderslie Townline. With so many other daily obligations making the large capital payments on this farm only makes sense because it's close and can be cropped and operated essentially when time permits. To access this farm we must cross the bridge just to the east (Bridge A30 per the bridge Infrastructure Master Plan). The alternative route with that bridge closed is 7.8km making it a similar distance to my father's farm which I am fortunate to operate at a small fraction of the cost. - Additionally, my wife works in Owen Sound at the hospital and the west passageway to the county line is an integral part of our day-to-day lives; both domestically and professionally. - I understand that in both Approach #1 and #2 per the Bridge Infrastructure Plan, the A30 bridge could be up for closure which would decapitate our farming operation and create multiple inconveniences for my family as well as the 5 other individuals who operate agriculture on this road. - Furthermore, two different school buses use that bridge twice daily. This is the primary route of access for the Ginrich Pit (Walker-Aggregates), and the primary route of access for the local butcher (Bauman Meats). The Arran-Elderslie Fire Department uses that bridge for filling pump trucks. - The bridge is a small local attraction for viewing of an eagle's nest (south) as well as a pike fishing hotspot, not to mention that both farm operators (north and south of road) graze cattle on both east and west of the bridge and the largest landowner on this road commutes using horse and carriage. - Please allocate whatever funding is necessary to ensure this bridge remains open.	- Comments noted and filed

Resident	Comments	Action Taken
Arran-Elderslie Resident Received (via email) October 10th, 2023	- This was presented as information, not a decision, and more of a prediction. I live next to the Arranvale Bridge which on both option one and option two would be marked for eventual closure. - When would this closure happen? The present council making this recommendation will not likely still be sitting at the table when the final decision needs to be made. When does it become deemed as "beyond reasonable repair" or "structurally unsound"? Again, I understand that this is a study and a prediction- not a decision but it still is not logical to me that this bridge is on the list in options 1 and 2 whereas other bridges of a similar age such as the one on the 4th of Arran right by Concession 15 Sideroad was not even on the list of the 17 bridges that were studied. How did you decide which bridges were on the short list of 17 of the 64 bridges in the Municipality? - Council has previously decided to close two bridges on Sideroad 15 of Elderslie Township between Concessions 10 and 8. Instead of closing the road, as they will do in the decisions related to this bridge study, they built a new road?!? - A road where there are no houses. When I asked why, I was told that Sideroad 15 is deemed as a main artery for the Township. Who decides that? Isn't it all relative? I live on Mill Road so to me and the other 6 households on that road, it is a main artery! As well, it is a main artery for the Arran works department, as their shop is located on Mill Road as well. I see Mill Road as more of a main artery as people live on it and use it more than this newly built road where there are no houses. - I appreciate that the public has been given an opportunity for consultation but only in the last month of a study that has been taking place since 2019. The information was put together for February of 2023 but not shared until September, leaving only one month for public consultation. Plus, not all residents of Arran-Elderslie are fully informed about this Master Bridge Plan. Do those who do not live adjacent to any of the targeted structures deserve a chance to know and be heard as well? I received a letter about the public information event but not everyone did who has a direct interest in these structures. - Has anything beyond money been truly considered in these options? If you say that people's opinions matter, well I guess that is relative as they have one month out of a four-year study to voice them. The bridge right next to my house is on the closure list for both options and not one person has spoken to me about it. - I see that the Arranvale Bridge has "no immediate repairs" needed. This was after an enormous double-tank fuel truck was stuck on the bridge. The truck damaged the guard rail and signage at the north entrance. Even after that, the bridge does not need immediate repairs, yet it needs to be on this list deemed for CLOSURE. I don't understand why this label is even needed right now. This long-range plan is only going to incite possible panic, hard feelings, and disappointment. In the rural parts of Arran-Elderslie, we pay the same amount of taxes that those in the more serviced areas who get gas, high-speed internet, water, sewer, and so on yet it will be the rural areas affected by these closures. The obvious services we pay for like garbage, recycling, and road maintenance will become more difficult for us to receive with the proposed closures. - If the bridge does close, what about snow removal? It was stated that a turnaround would have to be constructed for the snow removal trucks. If you look at the Arranvale Bridge, I am not sure where these turnarounds would be built. - Also, I would like to address the Hunt Bridge's possible closure from Option 2. This is completely illogical to me. If the municipality thinks that Sideroad 15 between Concessions 8 and 10 in Elderslie is an artery, then Concession 4 of Arran is most definitely a main artery. Especially since the closure of the Invermay Bridge, people are using Sideroad 25 from Front Road 17 to cut to Concession 4 to access either Bruce Road 10 or the Bruce-Grey Townline. - I appreciate the opportunity to submit my comments.	- Comments noted and filed.
Arran-Elderslie Resident Received (via email) October 16th, 2023	- Thank you for having a public meeting to gather more information, before presenting recommendations to the municipality. - My comments are concerning the Priebe Bridge on Sideroad 25, designated E1 in your report. - I think there would be some major concerns if the bridge was closed.	- Comments noted and filed.

Resident	Comments	Action Taken
	1. There are many farmers who have farmland that use the bridge on a daily basis. If the bridge was closed, the closest route is to continue on the 2nd of Elderslie and go through the Main Street of Chesley, then right onto County Rd. 19 then right onto Sideroad 25. That would add at least 20 – 30 minutes for each trip on a tractor. There are faming demands that are seasonal, so the farmer traffic on Chesley Main Street would be like this. Spring would be manure spreaders, plows, seed drills among others going through town. In the summer that would mean hay wagons. Late summer would be grain bins and combines. Fall would be again manure spreaders and plows, as well as cattle trailers. I'm not sure that the town of Chesley residents would appreciate the farm machinery on their streets many times a day, let alone the increased time for our farmers. In addition, the estimated distance to go around on your plan is 8.1 km, however if they were not able to go through main street Chesley, the other alternative is 12 km which certainly increases the time/gas for the farming community. 2. There is horse and buggy traffic, along with children's bicycles as that population goes through the Sideroad for school and church. It is not feasible for that population to go through Chesley as they proceed to school and church. 3. It is commonly used as a bypass to Chesley Main Street. Police cars, delivery vans, construction workers commonly use this. Again, the alternative is Main Street Chesley. 4. There is a concern that it will take Fire Trucks and Ambulance services a longer time to reach residents on that road since they are based closer to Concession 2 and now would need to go through Chesley as well. 5. Snowplowing in the winter would certainly become more onerous. There would have to be turnarounds created at both ends of the bridge so that farmers, Amish, and residents could continue to access the farmland and their homes. From the conversation at the meeting, that would mean regular snowplows would no longer be used and instead plow trucks, which would require more time to open the roads. 6. The letters about the meeting were sent to those who live near the bridges mentioned. Others rent land on the roads with affected bridges and have concerns as well. Many of them did not find out until later. This will certainly affect whether they continue to rent the land, as well as landowners selling land. Will the closure of a bridge affect the price of land or who will rent the land in the future? 7. The final thing we wish to ask, is that you look again at the bridges. I gather from the meeting that some are now dry riverbeds. If this is so, can they be replaced with culverts, thus reducing the overall costs of replacement? Those that do not have a large amount of water, could also be replaced with culverts, or square culverts again reducing the overall costs. - Thank you for considering these concerns as you present to the Municipality of Arran-Elderslie regarding Bridge construction, maintenance, and closure in the coming years. - Signed, The landowners of Sideroad 25 Arran-Elderslie, and the farmers, and renters that have land on both sides of the bridge or need to travel over the bridge to reach their land.	
Arran-Elderlie Resident Received (via email) October 31st, 2023	- Thanks for taking the time to go over your finding of our bridges. It disappointed us that all residents of our municipality were not informed of what is being proposed. - If our ancestors before us were able to build these during their time I believe we must find a way to keep as many of them open as possible for traffic no doubt has increased substantially since that time. - One area not discussed that evening is how traffic would change if some of the bridges were indeed brought up to double lane standards with better weight limits. Trucks and farm equipment would then avoid going through Tara, Chesley and Paisley. - Discussion with as many residents at least 5km around each bridge is certainly warranted. - Thanks	- Comments noted and filed.

Resident	Comments	Action Taken
June 2024 – E12: Pearce's Bridge – Closed to traffic due to deterioration		

Arran-Elderslie Residents (via mail)
July 24, 2024
	- I would like to thank the Council for the efforts they invest to improve and maintain Arran-Elderslie. We hope that decisions continue to be made for the good of the Township and its citizens.
	- Recently we have been affected by the closure of the bridge on Sideroad 5 between Bruce Road 11 and Conc. 6. We understand that studies are being done about this issue this summer. We request that this letter could be part of that study.
	- We are located on Bruce Road 11 on Lot 6 and Pt. Lot 7. We are part of the Mennonite community that uses horse-drawn vehicles for our primary way of transportation. Our school is located on Sideroad 5 between Conc. 6 & 8. With the bridge closure we will have 15-20 minutes further to and from school, making 30-40 minutes more road time per day. We are grateful that the scholars can ride their bicycles across the barricaded bridge when weather permits. I do have a concern for their personal safety while riding on that stretch of road. The risk of being abducted is heightened if no random traffic travels that stretch. Our next closest school is also 20 minutes away.
	- Here are a few more points to consider:
	  - Sideroad 5 is a convenient Paisley bypass for Port Elgin to Chesley or Walkerton traffic or vice versa.
	  - There are two permanent residences on this aforementioned stretch of road. One is north and one is south of the closed bridge. This means the road will need to be maintained from both ends.
	  - If this bridge remains closed and the Lockerby Road or bridge would be closed for whatever reason, our alternative route would be going west to Paisley, then go north or going east 2 blocks to Sideroad 15 then north to get to the Sideroad 5 neighbourhood north of Conc. 6. This would be about a 60 minute detour (Please note that Sideroad 10 north and south of Bruce Road 11 are closed).
	- We humbly ask that Sideroad 5 between Bruce Road 11 and Conc. 6 could be made passable for regular traffic. We would appreciate and value the convenience of travelling this scenic road.
	- We are willing to communicate more if you have questions. Thank you for your attention.
	- Letter signed by 11 members of the Mennonite Community.
		- Comments noted and filed.

4.1.3 December 17, 2025 Public Meeting

A second public meeting was arranged in order to update Project Stakeholders and members of the public on the Preferred Approach identified by Municipal Council for the Bridge Infrastructure Master Plan Notice of the public meeting was mailed to adjacent property owners, placed on the Municipal Website, published in the local newspaper and emailed to residents on the EA contact list. The meeting was held at the Arran Elderslie Municipal Office on December 17th, 2023, at 6:00 p.m. Project details were presented by staff from BMROSS using a PowerPoint presentation. A question-and-answer session followed the presentation. The general purpose of the meeting was to provide residents with the following:

- A review of the Master Plan timeline and key components included in the study.
- A review of the alternatives, including a description of the evaluation method.
- A description of the Preferred Approach selected by Council.
- A description of next steps and moving forward.

Ten residents were in attendance at the meeting. Notes can be found in Appendix E along with a copy of the presentation material. No feedback was received as a result of the meeting.

4.2 Review Agency and Stakeholder Circulation

Input into the Class EA process was solicited from government review agencies and identified stakeholders by way of email correspondence. Agencies and organizations that might have an interest in the project were sent an information package detailing the purpose of the Class EA process, a description of the proposed study scope, and a general location plan illustrating the 17 bridge locations. The package was circulated to 13 review agencies and stakeholder groups on September 13, 2019. They were asked to comment on the project on or before October 25, 2019. Appendix E contains a copy of the information circulated to review agencies and stakeholder groups. Table 4.2 summarizes the comments received.

Table 4.2 - Summary of Review Agency and Stakeholder Comments: Notice of Commencement Phase

Agency	Comments/ Concerns	Response Taken
Craig Newton, MECP Sept. 27, 2019 (via email)	- Advised on key components of the Class EA process that must be included in the MP. - The Municipality has a responsibility to conduct adequate consultation with Aboriginal and Métis communities as part of the EA process. A list of communities to be contacted was provided. - The crown is delegating procedural aspects of the consultation to the Municipality. EA report must also address the impacts of Climate Change and Source Water Protection policies in the report.	- Information noted and filed. - Response sent by email
Matt Armstrong SVCA Sept. 27, 2019 (via email)	- Will be the contact for SVCA for this file. - Please advise of any site meetings and proposals for these structures as SVCA review and permits may very likely be required. - The proponent must contact DFO regarding potential impacts to fish and fish habitat.	- Response sent by email.
Andrew Sorenson Grey Sauble Conservation Authority Oct. 31, 2019 (via email)	- The following structures will require permits for replacement and/or removals. • Structure A5 – Conc. 4 – Arranvale Creek • Structure A14 - Mill Road – Sauble River • Structure A24 - Mill Road - Sauble River (Braided channel) • Structure A29 – Elderslie Arran Line – Arranvale Creek • Structure A 30 – Elderslie Arran Line - Have hydraulic reports associated with flood plain mapping in Tara and Invermay (CCL 1979-1993) and are aware of a study completed for the Grey Bruce Line Sauble River flood plain and related crossings. (Gamsby and Mannerow Ltd.1990?). This study completed some flood plain mapping at a coarse scale and A30 is contained within the mapped floodplain area. The remainder of the sites are located outside of the engineered flood plain mapping study limits. - Our main goal in our permitting process is to ensure the flood issues are not aggravated through replacement and capacity continues to be able to be conveyed during precipitation events.	- Responded by email indicating that site visits would be arranged eventually once outcomes were identified for each of the bridges.

4.2.1 Project Update

In conjunction with the September 19, 2023 Public Meeting, a project update letter was prepared and sent to the Agency Contact list initially contacted when the Master Plan was started. Contacts were advised of the Public Meeting and advised that presentation details could be provided upon request. The correspondence was sent to 13 agencies and organizations on September 15, 2023, along with preliminary recommendations for the various bridge crossings. Table 4.3 contains input received from agencies resulting from the project update letter.

Table 4.3 - Summary of Review Agency and Stakeholder Comments: First Project Update

Agency	Comments/ Concerns	Response Taken
Kyle Hope, Regulations Officer, Saugeen Conservation (via email) October 4th, 2023	- Acknowledged that EA is in the preliminary stages and that proposed works are general, however, as the Master Plan is developed staff can provide more detailed application requirements for repair or replacement of all bridges identified within the SVCA jurisdiction. - This will require approval under the Ontario Regulation 169/06 for water crossings. SVCA policy states that work will be permitted if it has been demonstrated to SVCA that the interference is acceptable on the natural features and hydrologic and ecological functions of the watercourse. - Circulation of project updates, as the project develops, is desired	• Information noted and filed.
Rudra Kartik (MTO) (via email) September 20, 2023	- Confused about the reasoning behind the initial contact and request for input. - Indicated that the project area is near an MTO controlled highway. - No future notification of project details is needed with this agency	- Response sent by email.
Alison Gordon, MNRF (via email) September 22, 2023	- Is interested in receiving project information when it becomes available. - No heritage screening of natural heritage or other resource values for the project. - It is the proponent's responsibility to be aware and comply with all relevant federal and provincial legislation.	- Information noted and filed

Agency	Comments/ Concerns	Response Taken
Erika Leclerc Heritage Planner, Ministry of Citizenship and Multiculturalism November 30, 2023 (via email)	- MCM's interest in this master plan relates to its mandate of conserving Ontario's cultural heritage, which includes archaeological resources, built heritage resources and cultural heritage landscapes. **Archaeological Resources** - Any undertakings included as part of the master plan should be screened using the Ministry's *Criteria for Evaluating Archaeological Potential* and *Criteria for Evaluating Marine Archaeological Potential* (if shoreline or in-water work is proposed) to determine if an archaeological assessment is needed. If the EA project area exhibits archaeological potential, then an archaeological assessment (AA) should be undertaken by an archaeologist licensed under the Ontario Heritage Act and submitted for MCM review prior to the completion of the master plan. **Built Heritage Resources and Cultural Heritage Landscapes** - The Ministry's Criteria for Evaluating Potential for Built Heritage Resources and Cultural Heritage Landscapes should be completed to help determine whether this EA project may impact known or potential built heritage resources and/or cultural heritage landscapes. - Where a known or potential built heritage resource or cultural heritage landscape may be directly and adversely impacted, and where it has not yet been evaluated for Cultural Heritage Value or Interest (CHVI), completion of a Cultural Heritage Evaluation Report (CHER) is required to fully understand its CHVI and level of significance. The CHER must be completed as part of the final EA report. If a potential resource is found to be of CHVI, then a Heritage Impact Assessment (HIA) will need to be undertaken and included in the final EA report. Please send the HIA to MCM for review and make it available to local organizations or individuals who have expressed interest in review.	- Information noted and filed. - CHER's completed for 9 bridges. - Report forwarded to MCM for review.

4.2.2 Second Project Update

A second project update letter was sent out to agencies and stakeholders in conjunction with the December 17, 2025 Public Meeting. Similar to the first update letter, contacts were provided details about the Public Meeting and given an opportunity to review the meeting presentation. The correspondence was sent to the same agencies and organizations on December 13, 2025, along with details of the Preferred Approach selected by Council for the bridge crossings. Table 4.4 contains input received from agencies resulting from the project update letter.

Table 4.4 - Summary of Review Agency and Stakeholder Comments: Second Project Update

Agency	Comments/ Concerns	Response Taken
Michele Luker Corridor Management Officer (via email) January 21st, 2026	- Thank you for the opportunity to review the Bridge Infrastructure Master Plan for the Municipality of Arran – Elderslie. - The bridges are located outside of MTO's permit control area, therefore there are no comments.	• Information noted and filed.

4.3 Consultation with Indigenous Communities

4.3.1 Aboriginal Consultation Process

The Crown has a duty to consult with Indigenous and Métis communities if there is a potential to impact Indigenous or treaty rights. This requirement is delegated to project proponents as part of the Class EA process; therefore, the project proponent has a responsibility to conduct adequate and thorough consultation with Aboriginal communities as part of the Class EA consultation process.

4.3.2 Background Review

To identify Indigenous Communities potentially impacted by the project the Aboriginal and Treaty Rights Information System (ATRIS) was consulted. A search was conducted for Indigenous Communities, including their traditional territories, within a 50 km radius of the project study area. Utilizing this process, six aboriginal communities were identified in conjunction with this project as follows:

- Chippewas of Saugeen First Nation;
- Chippewas of Nawash First Nation;
- Saugeen Ojibway Nation (SON) – Chippewas of Saugeen & Chippewas of Nawash;
- Historic Saugeen Métis;
- Metis Nation of Ontario; and
- Great Lakes Métis Council.

4.3.3 Initial Consultation Phase

In conjunction with issuance of the Notice of Commencement, correspondence was circulated to the communities noted above which provided a map of the study bridge locations and general information about the purpose of the Master Plan study. Appendix E contains a copy of the information circulated to Indigenous Communities. A summary of the comments received is included below.

Table 4.5 - Summary of First Nations Consultation: Initial Consultation Phase

Aboriginal Community	Comments	Response Taken
Doran Ritchie, Manager of Resources and Infrastructure SON Sept. 18, 2019 (via email)	• SON is aware that the bridges in Arran-Elderslie are older and in need of repair. • Their involvement will be limited to the following: • New work outside of existing footprints that would require archaeological assessments. • Projects requiring a Fisheries Act Authorization or that impacts Species at Risk. • Would like to continue to be informed of progress and be advised of individual replacements, fisheries reports, and road closures.	- Confirmed receipt via email and advised that further details would be provided when available
Chris Hachey Historic Saugeen Métis Sept. 18, 2019 (via email)	• The Historic Saugeen Métis (HSM) Lands, Resources and Consultation Department appreciates the opportunity to be consulted on this project. • HSM interests related to the study largely focus on environmental effects/sustainability and the potential for archaeological resources associated with future development. • HSM looks forward to further consultation regarding this project as information becomes available.	- Response sent by email.

4.3.4 Project Update

In conjunction with the September 19, 2023 Public Meeting, a project update letter was prepared and sent to the Indigenous Contact list initially contacted when the MP was started. Contacts were advised of the Public Meeting and told that presentation details could be provided upon request. The correspondence was sent to the same indigenous communities originally contacted. Table 4.5 contains input received as a result of the project update letter.

Table 4.6 - Summary of First Nations Consultation: First Project Update

Aboriginal Community	Comments/ Concerns	Response Taken
Georgia McLay Coordinator, Lands, Waters & Consultation Historic Saugeen Métis October 16, 2023 (via email)	- The Historic Saugeen Métis (HSM) has reviewed the Bridge Infrastructure MP for the Municipality of Arran Elderslie and have no objections or opposition to the plan as presented. - We do have interest in the archaeological potential of sites in which bridges will be replaced/repaired. As the project proceeds, we would appreciate any updates and new information as it becomes available. - Thank you for the opportunity to review this matter.	- Confirmed receipt via email and advised that further details would be provided when available.

4.3.5 Second Project Update

A second project update letter was sent out to Indigenous Communities in conjunction with the December 17, 2025 Public Meeting. Similar to the first update letter, FN contacts were provided details about the Public Meeting and given an opportunity to review the meeting presentation. The correspondence was sent to the same communities on December 13, 2025, along with details of the Preferred Approach selected by Council for the bridge crossings. Table 4.6 contains input received as a result of the project update letter.

Table 4.7 - Summary of First Nations Consultation: Second Project Update

Aboriginal Community	Comments/ Concerns	Response Taken
Neala MacLeod Farley Coordinator, Lands, Waters & Consultation Historic Saugeen Métis December 15, 2025 (via email)	- Thank you for providing notice regarding the Municipality of Arran-Elderslie Bridge Infrastructure Master Plan preferred approach. - The HSM department of Lands, Waters, and Consultation has reviewed the relevant documents and has no comments or concerns at this time.	- Information noted and filed.
Charlene Leonard Resources and Infrastructure Manager SON	- I am reaching out to you on behalf of the Saugeen Ojibway Nation Environment Office. - Our team has reviewed the attached correspondence regarding the Bridge Infrastructure Master Plan for the Municipality of Arran-Elderslie.	- Information noted and filed. - Advised that we would reach out if studies were being undertaken.

Aboriginal Community	Comments/ Concerns	Response Taken
	- We are requesting consultation for archaeology on upcoming works. - Please feel free to contact me with further questions or concerns. Miigwetch	-

4.4 Consultation Summary

The public consultation program developed for this project was directed toward property owners located in the immediate vicinity of the bridge sites, federal/provincial review agencies and Indigenous communities. Following the first Public Meeting, where 8 of the study bridges were identified for potential closure, significant input was received from the Mennonite Community as well as residents living in close proximity to one of the bridges identified for potential closure. This input from residents had a big impact on the final outcome of the Master Plan. Standard feedback was received from federal and provincial review agencies.

5.0 Evaluation of the Preliminary Preferred Alternative

5.1 Framework of Analysis

Following the selection of Alternative 1 – Continue to repair or replace all of the study bridges, as the preliminary preferred alternative, a study framework was developed to further evaluate the potential impacts of implementing this alternative. The purpose of this review was to assess the environmental interactions resulting from the construction and operation of the preferred alternative and to determine if the identified interactions would generate potential environmental impacts. The assessment of the preferred alternatives incorporated these activities:

- Assessment of construction and operational requirements of the proposed works.
- Consultation with the public, stakeholders, review agencies & Indigenous groups.
- Prediction of the environmental interactions between the proposed works and the identified environmental components.
- Identification of specific environmental features that may be impacted, in a significant adverse manner, by the proposed works.
- Evaluation of the potential impacts of the project on the specific environmental features, including residual effects following mitigation.

5.2 Identification of Potential Impacts

5.2.1 General

In reviewing the various assessment criteria identified in Section 3.8 of this report and additional comments received during the consultation program, a number of specific environmental components were identified that could be adversely affected by the implementation of the preferred Master Plan alternative. Potential impacts can be

classified into two general categories; (1) construction-related impacts, being impacts that are generally short term in nature and generally related to physical alterations at the bridge sites, and (2) long-term impacts, which are generally related to implementation of the preferred option and typically affect cultural and social aspects of the environment.

The table below outlines the potential impacts of specific components of bridge construction on the identified environmental elements. Specific mitigation measures for the identified impacts are discussed in the following sections. The table identifies impacts directly related to bridge reconstruction and repair which are generally short-term in nature and of limited duration. Impacts of a greater magnitude and duration (traffic volume, cultural, social impacts) related to the potential bridge closures and removals, are also reviewed in the following section.

Table 5.1 - Construction-Related Environmental Effects

	Environmental Components Key Project Works and Activities	Geology and Hydrology Resources	Aquatic Resources	Significant Environmental Features	Cultural Heritage Resources	Social Environment	Economic Environment	Technical Environment
1	**Construction Component**							
	Contractor mobilization to the site	○	○	○	○	●	○	○
	Establish temporary storage areas	○	●	○	○	●	○	○
	Site Clearing	○	●	○	●	○	○	○
	Install sediment control devices	○	●	○	○	○	○	○
	Implement traffic control plan	○	○	○	○	●	○	○
	Excavation	●	●	○	●	●	○	●
	Removal of existing structure	○	●	○	●	○	○	○
	Dewatering	●	●	○	○	●	○	●
	In-water work, if required	●	●	○	●	●	○	●
	Construction of abutments and piers	●	●	○	●	●	○	●
	Reconstruction of approach roads	○	○	○	●	●	○	●
	Grading	○	●	○	○	●	○	○
	Site restoration (seeding/topsoil)	○	○	○	○	○	○	○

● Potential for adverse effect ○ No adverse effect expected

5.3 Impact Assessment and Mitigation

5.3.1 Potential Adverse Impacts

Based upon the findings of the environmental effects analysis (Table 3.9) and the environmental interactions analysis (Table 5.1), the preferred option has the potential to adversely impact upon a number of specific environmental components, as follows:

- Natural Environment
- Social Environment
- Cultural Environment
- Economic Environment

Potential impacts to each identified component are described in this section of the report along with measures to mitigate the impacts. As noted above, potential impacts have been categorized as either short-term or long term and reviewed accordingly. The selection of mitigation measures was based upon consideration of three broad approaches to mitigation; avoidance, minimization of adverse effects, and compensation.

5.3.2 Natural Environment

(a) Aquatic Habitat

Implementation of the preferred alternative will involve the eventual reconstruction of all the study bridges. Many of the bridges will be repaired initially, and then eventually replaced once repairs are no longer feasible. It is anticipated that several of the crossings will require construction of new pier(s) within the river channel resulting in a loss of fish habitat at those locations. For each of the bridge replacement options being considered, the extent of in-stream work required will result in temporary disruption to the channel during construction of the in-water pier and removal of the former structure. To minimize the extent of impacts, aquatic habitat assessments will be conducted prior to construction to identify critical habitat features at each of the bridge sites and to assist with the development of a work plan that will avoid impact on these areas. All in-water construction will be timed to occur during periods of low flow, during approved timing windows established by the DFO. Approvals will also be obtained from the Saugeen Valley or Grey Sauble Conservation Authority and from the Federal Department of Fisheries and Oceans (DFO). Upon completion of the proposed works, the river bed and any adjacent habitat disturbed in conjunction with the construction will be restored to pre-existing conditions.

(b) Terrestrial Habitat

None of the study area bridges are located within or immediately adjacent to significant natural heritage features. However, bridge construction will temporarily impact terrestrial features such as trees, shrubs, and riparian habitat features. These areas will be restored upon completion of construction and removal activities will be timed to avoid periods when nesting birds may be present. Several of the bridges show the presence

of bird nests underneath the structures. To minimize impacts on breeding birds, the structures will be netted in advance of construction to limit access to the nests. Inactive nests will be removed. Alternative nesting habitat structures will also be erected in the vicinity of the crossing to provide alternative habitat during the construction period.

(c) Species at Risk (SAR)

Based upon the background review of natural heritage features, one of the bridge sites was identified as having aquatic SAR (rainbow mussel – Special Concern) potentially present. To address potential impacts, a mussel search would be conducted in advance of construction and any identified species would be transferred to an area of similar habitat upstream of the work area. Consultation would also be undertaken with DFO.

5.3.3 Social Environment

(a) Traffic Movement – Short Term

During construction, access across bridge structures under construction will be limited or closed completely. Where a crossing is being replaced, traffic will be detoured onto adjacent local roads. Bridges scheduled for repair may also be closed for some periods, although restrictions will typically be of a shorter duration. For all potential road and bridge closures, appropriate signage would be provided prior to the road closure and throughout the construction period. The overall impact of these anticipated short-term closures is expected to be minor in nature, considering the minimal traffic volume evident at the various bridge sites and the availability of suitable detour routes in the vicinity of the crossings. Ultimately, each affected crossing will be replaced with an improved river crossing with fewer capacity restrictions.

(b) Traffic Movement – Long Term

All of the bridges included in the Master Plan study are single-lane bridges, many with restricted load capacities. Upon completion of the project, bridges that are scheduled for replacement will be designed to accommodate 2 lanes of traffic and have no load restrictions. Although none of the structures are located on major transportation corridors, the improvements to the bridge crossings and approach roads may result in increased traffic volumes along the affected road sections. Given the proximity of numerous county roads adjacent to the study area, it is not anticipated that traffic volumes will increase substantially as a result of the upgrades.

(c) Impacts to Navigation

The Saugeen River system serves as a popular route for recreational watercraft (canoes/kayaks) with a river access point currently present in the community of Paisley. Although no dedicated access points are identified adjacent to study bridges, the river could still be used recreationally by residents. During construction on larger waterways, navigable openings will be maintained at all times and warning signs will be placed up and downstream of the crossings to warn of construction.

5.3.4 Cultural Heritage Resources

(a) Structural Heritage

The cultural heritage assessment completed by AECOM identified cultural heritage values associated with eleven of the study bridges. None of the structures evaluated was identified as being provincially rare and have not been designated for preservation by local municipal or county councils. Heritage Impact Assessments (HIA) will be required for the structures, based on current provincial guidelines. Heritage recommendations forthcoming from the reports will be considered during the detailed engineering design stage. A copy of the Cultural Heritage Evaluation Report completed in conjunction with the Master Plan is found in Appendix C.

(b) Archaeological Resources

It is understood that a Stage 1 & 2 Archaeological Assessment will be required for projects that will result in disturbance to previously undisturbed native soils as a result of construction. During the detailed design phase for the various structures, it will be determined whether an archaeological assessment is required, based on the level of disturbance that is anticipated.

5.3.5 Economic Impacts

Implementation of the preferred Master Plan approach is anticipated to cost more than 30 million (2025) to replace all 17 structures included in the Master Plan. This represents a significant financial burden to the Municipality. Several measures have been identified which could mitigate the potential economic impacts of the proposed works. They are as follows:

- **Project Phasing.** The Infrastructure Master Plan is intended to be implemented over the next 25 to 30 years. This will allow the Municipality an opportunity to finance the project over an extended period and plan for future capital expenditures.

- **Grant Programs**. The federal and provincial governments routinely introduce grant programs to assist smaller communities with the construction of infrastructure projects, such as the Investing in Canada Infrastructure Program (ICIP). Arran-Elderslie recently received funding through this program for the replacement of Sopers Bridge, which is an older slab concrete bridge in the Municipality, slated for construction in 2022.

- **Capital Works Financing**. The study partners could apply for debt financing through the Ontario Strategic Infrastructure Financing Authority (OSIFA) loan program (coordinated by Infrastructure Ontario). OSIFA provides long-term, low-interest financing to municipalities for capital infrastructure projects.

- **Capital Bridge Reserve –** Each year the Municipality sets aside money for the construction of capital bridge projects. In light of the significant infrastructure needs represented by the study bridges, this reserve amount should be increased significantly.

6.0 CONCLUSIONS AND PROJECT IMPLEMENTATION

6.1 Master Plan Study Conclusion

Based upon the findings of the environmental impact evaluation and input received from agencies, stakeholders, and the general public, no significant impacts were identified with Alternative 1 that could not be mitigated. In this regard, implementation of the proposed Master Plan projects appears to be appropriate for the study area and should not result in significant adverse environmental effects (particularly if the mitigation measures are incorporated into the construction plan). The merits of this option were also seen to substantially outweigh those identified for the other alternatives.

6.2 Selection of a Preferred Alternative

Given the foregoing, Alternative 1 – Continue to repair and replace all of the study bridges, was selected as the preferred solution to the identified problem. This option was presented to, and supported by, the Arran-Elderslie Municipal Council at their November 24, 2025 meeting.

6.3 Approvals

Implementation of Master Plan projects will be subject to the receipt of all necessary approvals. Following a review of existing legislation, it was determined approvals from four agencies will be required to permit construction of the proposed works. This section of the report identifies the applicable legislation and summarizes the intent of the associated approval process.

a) Conservation Authorities Act

Implementation of the preferred option involves construction on lands regulated by the SVCA and GSCA. In accordance with the Conservation Authorities Act, applications will be submitted to the appropriate CA for approval before construction. Hydrology reports will also be prepared and submitted in support of the applications. The application will define measures to protect sensitive lands during construction to minimize the negative impacts of the project on the natural features of the area. Site restoration and post-construction enhancements to disturbed areas will also be presented.

b) Federal Fisheries Act

The works associated with the preferred alternative may be subject to the Federal *Fisheries Act*. In accordance with established procedure, a Request for Project Review will be submitted to DFO in advance of construction to determine if bridge construction activities may result in a harmful alteration, disruption, or destruction (HADD) of fish habitat. If it is determined that the project has the potential to result in a HADD, a compensation plan may be required before the DFO issues authorization for the project to proceed.

c) License to Collect Fish for Scientific Purposes

For projects that require the channel to be isolated as part of the construction plan, a License to Collect Fish for Scientific Purposes must be obtained from NDMNRF in advance of construction in order to transfer fish and other aquatic life outside of the isolated area.

d) Ontario Heritage Act

As recommended in conjunction with the Cultural Heritage Assessments completed by AECOM, Heritage Impact Assessments may be required for those structures being significantly altered in conjunction with the Master Plan.

e) Stage 1 & 2 Archaeological Assessments

Part VI of the Ontario Heritage Act establishes guidelines for archaeological assessments. In accordance with these guidelines Stage 1 & 2 assessments will be required for those projects that will result in disturbances to previously undisturbed native soils in the vicinity of the bridge sites.

6.4 Implementation Timeline

Projects identified for implementation through the Master Plan process have been categorized into a general implementation timeline, based primarily upon the state of deterioration of each of the bridges and resources available to implement each component of the plan. Note, it is impossible to accurately predict the remaining life of a bridge or predict the future replacement cost, especially when you don't know when it will have to be replaced. That said, for the purposes of approximating the future costs to maintain the bridges, we provided probable timelines and costs in 2024 dollars. Table 6.1 illustrates the anticipated timeline for implementation of each of the individual projects included as a component of the Master Plan.

The timelines proposed above are based on the current condition of the bridges. Availability of municipal funding may result in alterations to the proposed schedule. Temporary closures may be necessary if funding is not immediately available. It will be important to monitor the condition of the bridges over the implementation phase of the Master Plan and make adjustments when necessary to address changing conditions that may affect public safety.

Table 6.1 - Implementation Timeline: Preferred Master Plan Alternative – Alternative 1

Structure ID	Recommended Outcome	Repair Timeline	Replace Timeline
E1 – Priebe	Replace	N/A	20-25 Years
E4 - Allens	Repair then Replace	5-10 Years	15-20 Years
E9	Repair then Replace	1-5 Years	15-20 Years
E10	Replace	N/A	15-20 Years
E12– Pearces	Replace	N/A	0-5 Years
E14	Repair then Replace	1-5 Years	10-15 Years
E15	Repair then Replace	1-5 Years	10-15 Years
E16	Replace	N/A	1-5 Years
E17	Repair then Replace	1-5 Years	15-20 Years
E22	Repair then Replace	1-5 Years	20-25 Years
E24	Repair then Replace	5-10 Years	20-25 Years
A5 – Hunts	Repair then Replace	5-10 Years	20-25 years
A11 – Wilson	Repair then Replace	10-15 Years	25-30 Years
A14–Arranvale	Repair then Replace	5-10 Years	20-25 Years
A24 – Ruff	Replace	N/A	5-10 Years
A29	Repair then Replace	5-10 Years	20-25 Years
A30	Repair then Replace	1-5 Years	20-25 Years

6.5 Anticipated Costs

While it is anticipated that all the structures should experience repairs or replacement within the next 20 years, it is anticipated that if some structures are repaired they will not need to be replaced until up to 30 years within the future. Therefore, it is anticipated that the Master Plan, will be implemented within the next 30 year time frame. Table 6.2 illustrates anticipated costs for each project over the implementation timeline.

Table 6.2 - Anticipated Project Costs

Structure ID	Type & Age	BCI	Repair Costs*	Replacement Costs*
E1 – Priebe	Truss-1938	34	N/A	$2,763,325
E4 – Allens	Truss-1920	51	$62,000	$2,573,700
E9	Beam-1930	33	$244,800	$1,107,375
E10	T-Beam-1930	39	N/A	$1,286,925

E12– Pearces	Truss-1930	40	N/A	$3,073,000
E14	T-Beam-1930	31	$136,500	$1,137,300
E15	T-Beam-1920	37	$94,000	$1,107,375
E16	T-Beam-1930	26	N/A	$950,000
E17	Truss-1930	38	$164,300	$2,503,875
E22	Truss 1920	40	$44,000	$2,154,750
E24	Truss-1920	52	$28,000	$2,055,000
A5 – Hunts	Conc. Arc-1910	56	$177,800	$1,466,475
A11 – Wilson	Conc. Arch-1910	45	N/A	$867,975
A14 – Arranvale	Truss-1920	45	$35,000	$3,232,150
A24 – Ruff	Conc. Slab-1920	41	N/A	$371,000
A29	Conc. Slab-1930	54	$93,000	$1,047,525
A30	Conc. Slab-1930	38	$229,200	$2,035,050

* 2024 Cost Estimates

6.6 Study Recommendations

The following represent the key study recommendations developed following the evaluation of alternatives phase of the Master Planning process:

1. Alternative 1 be implemented as the preferred long-term strategy to address deficiencies associated with a group of aging bridges located in the Municipality of Arran-Elderslie.
2. Implementation of the Master Plan may require additional investigations to evaluate the potential environmental impacts of specific construction-related activities needed to implement the projects.
3. Heritage Impact Assessments (HIAs) may be required for the study bridges before demolition or removal.
4. Stage 1 & 2 Archaeological Assessments may be required in advance of construction if previously undisturbed native soils will be excavated and disturbed as part of individual bridge reconstruction activities.
5. Implementation of the Master Plan should be conducted with reference to the project phasing strategy detailed in section 6.0 of this report.
6. Impact mitigation measures discussed in Section 5.0 of this report should be incorporated into the detailed construction plans for each crossing.
7. The Master Plan should be reviewed on a regular basis to evaluate the accuracy of key assumptions (e.g., rate of deterioration/availability of funding) and to confirm the suitability of the implementation sequence. The Master Plan should be modified, as required, to address changes to the environmental setting and local bridge conditions.

8. That additional funds be placed in the bridge reserve fund on an annual basis to help fund the needed repairs and replacements that are anticipated for the study bridges.

6.7 Class EA Requirements

6.7.1 Master Plan Approval

The Bridge Infrastructure Master Plan prepared for Arran-Elderslie was developed following an approved Master Planning process, as set out by the Class EA document. The Master Planning process incorporated the completion of Phases 1 and 2 of the Class EA process. The Master Plan will be approved for implementation subject to successful completion of the Class EA Master Plan Process.

6.7.2 Requirements for Master Plan Completion

The following activities are required in order to complete the formal Class EA Master Plan process:

- Issue a Notice of Study Completion for the Master Plan.
- Make the Master Plan Report available for public review in conjunction with the publication of the Notice of Study Completion.
- Obtain feedback from the public, stakeholders and agencies.
- Make the revised Master Plan report available for public/agency review.
- Address outstanding issues resulting from the Notice of Completion.
- Advise the Municipality and the MECP when the Master Plan process is complete.

6.7.3 Final Public Consultation

A Notice of Study completion will be published for the project on March 5, 2026. The Notice will provide a brief description of the Master Plan process and indicate the projects recommended for implementation through the Master Plan. The Notice will be published in the Owen Sound Sun Times for two consecutive weeks, and posted on the municipal website. It will also be emailed or mailed to the list of review agencies and Indigenous communities identified at the start of the Class EA process as well as to project stakeholders and residents on the EA contact list. The following summarizes the distribution of the notice.

Contents:	Preferred Master Plan solution, key project components
Issued:	March 5, 2026
Placed In:	Sun-Times (March 5 and 14, 2026)
Distributed To:	13 review agencies, 6 Indigenous Communities, adjacent property owners, EA contact list.

The 30-day review period for the Notice will conclude on April 4, 2026.

7.0 SUMMARY

This report documents the Master Plan process which was conducted by the Municipality of Arran-Elderslie to resolve the deficiencies identified with seventeen older bridges located within the municipality. The 17 structures, which were all constructed between 1910 and 1950, require significant rehabilitation or replacement in the next 20 years and, as a group, represent a significant capital commitment for the Municipality.

The Master Plan process included an extensive background review of the study area in order to characterize and identify potential impacts associated with the natural, social, cultural, technical, and economic environments. A number of specialized studies and investigations were conducted to assist with the characterization of the environment. In order to involve the general public, two public meetings were held to provide project details to potentially affected property owners. The outcome of the Master Plan process, which identified a preferred implementation option for each structure included in the study, being to repair or replace all of the study bridges, was reached following a detailed analysis of a range of potential Master Plan options.

The Bridge Infrastructure Plan developed through the Master Planning process will require the construction of major infrastructure works (e.g., new bridge construction, bridge repair, and reconstruction of approach roads) and will be implemented over a twenty-five to thirty-year time frame. While it is impossible to accurately predict the remaining life of a bridge, the Master Plan sets out a series of recommendations for project implementation, including a probable timeline for construction and anticipated capital costs for each structure.

All of which is respectfully submitted.

B. M. ROSS AND ASSOCIATES LIMITED

Per _____
Ken Logtenberg, P. Eng.
Project Manager

Per _____
Kelly Vader, RPP, MCIP
Environmental Planner

:hv

References

1. Municipal Engineers Association, Municipal Class Environmental Assessment, October 2000, as amended in 2007, 2011, 2015 and 2024.

2. Department of Fisheries and Oceans Canada. Aquatic Species at Risk Mapping. Website. 2025.

3. Chapman, L.J. and Putnam, D.F. The Physiography of Southern Ontario. Third Edition. 1984.

4. Province of Ontario, Provincial Planning Statement, 2024.

5. County of Bruce, County of Bruce Official Plan, May 20, 1997.

6. Bruce County Planning and Economic Development Department, The Corporation of the Municipality of Arran-Elderslie By-Law 36-09, June 29, 2009 - Consolidated January 2019.

7. Grey Sauble Conservation Authority. Grey Sauble Watershed Report Card 2018.

8. Ministry of Natural Resources (Ontario). Species at Risk in Ontario.

9. Ontario Breeding Bird Atlas. 2025 website. www.birdsontario.org.

10. AECOM. Cultural Heritage Evaluation Report Arran-Elderslie Bridge Master Plan Structures: A5, A11, A14, E1, E4, E12, E17, E22, E24, March 2020.

11. B.M. Ross & Associates Ltd. Ontario Structural Inspection Reports (OSIM). December 2024.