MUNICIPALITY OF ARRAN-ELDERSLIE
BRIDGE INFRASTRUCTURE
MASTER PLAN

WELCOME

PUBLIC INFORMATION MEETING
SEPTEMBER 19, 2023

BMROSS
engineering better communities

MUNICIPAL CLASS ENVIRONMENTAL ASSESSMENT

SUMMARY OF MASTER PLAN PROCESS:

- LONG RANGE PLANS DESIGNED TO INTEGRATE INFRASTRUCTURE REQUIREMENTS WITH ENVIRONMENTAL ASSESSMENT PLANNING PRINCIPLES
- EXAMINES A GROUP OF RELATED PROJECTS IN ORDER TO OUTLINE A FRAMEWORK FOR PLANNING FOR SUBSEQUENT PROJECTS AND/OR DEVELOPMENTS
- INVOLVES CONSULTATION WITH THE PUBLIC, REGULATORY AGENCIES AND ADJACENT PROPERTY OWNERS

SCOPE OF THIS STUDY:

- iNVESTIGATE GROUP OF OLDER BRIDGES IN ARRAN-ELDERSLIE AND DEVELOP RECOMMENDATIONS FOR THEIR FUTURE USE
- CONSIDER WHETHER THE CROSSINGS SHOULD BE REPLACED, REPAIRED OR POTENTIALLY CLOSED
- DEVELOP AN EVALUATION MATRIX THAT COMPARES THE DIFFERENT CROSSINGS IN ORDER TO IDENTIFY PREFERRED OUTCOMES
- CONSULT WITH RESIDENTS, INDIGENOUS COMMUNITIES AND REVIEW AGENCIES
- PROVIDE A PROPOSED PHASING PLAN FOR THE STRUCTURES TO IMPLEMENT OVER A 20 - 25 YEAR TIMEFRAME
- PREPARE A REPORT DOCUMENTING THE MASTER PLAN PROCESS AND STUDY RECOMMENDATIONS

PROJECT TIMELINES

September 2019 – Initial Public/Agency Notifications

Winter 2020 – Cultural Heritage Report Completed

Winter 2020/21– Engineering Review of Bridges

Winter 2021/22 – Develop Evaluation Matrix

Summer 2022 – Identify Preliminary Recommendations

Fall 2022 – Develop Cost Estimates/Repair Timelines

February 2023 – Presentation to Council

September 2023 – Public Information Meeting

Fall 2023 – Finalize Recommendations based on Feedback

Fall 2023 – Finalize Class EA Master Plan Process

CULTURAL HERITAGE EVALUATION

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; • Plaque on bridge 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; • E4 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; • E4 is a representative and increasingly rare example of a single lane, one span, pony truss bridge; • Associated with the Arran Vale 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 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; • E22 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.

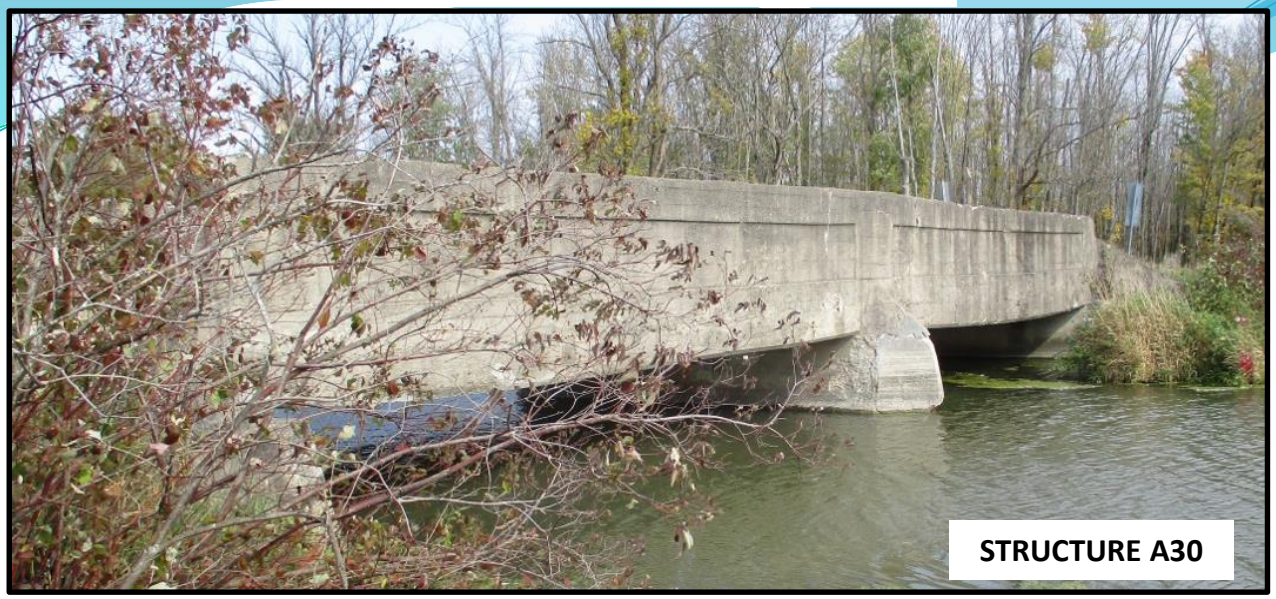
STUDY BRIDGES

WILSON BRIDGE – A11

RUFF BRIDGE – A24

STRUCTURE A29

STUDY BRIDGES

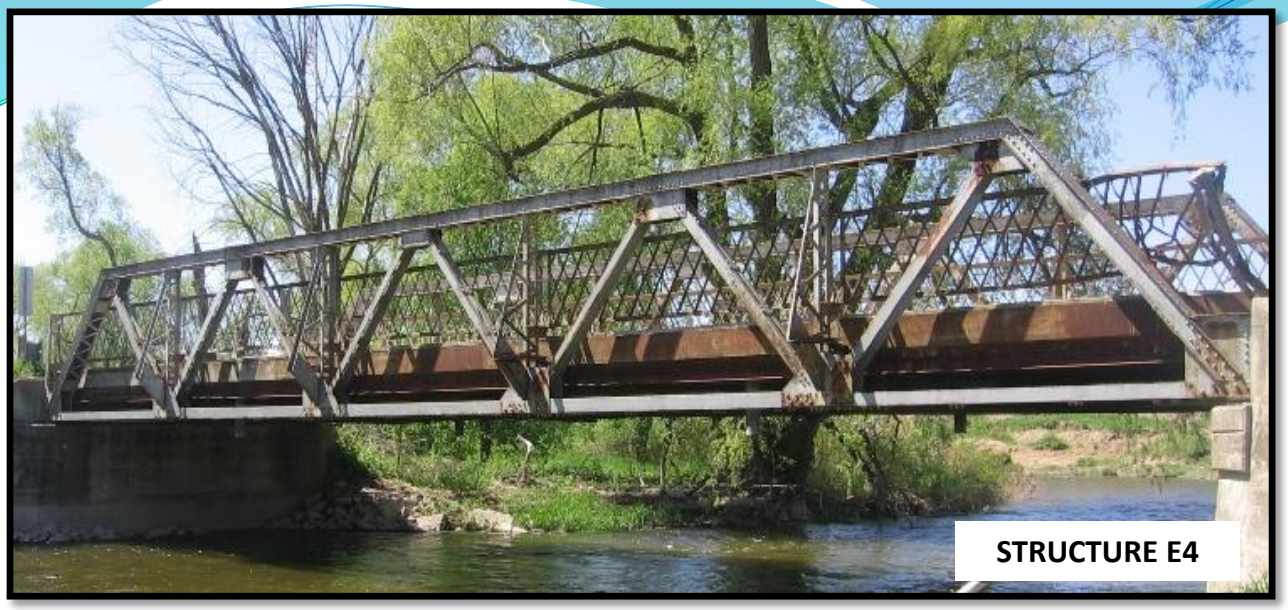


STRUCTURE A30

PRIEBE BRIDGE – E1

ARRANVALE BRIDGE – A14

STUDY BRIDGES



STUDY BRIDGES

PEARCES BRIDGE – E12

STRUCTURE E14

STRUCTURE E15

STUDY BRIDGES

STRUCTURE E16

STRUCTURE E17

STRUCTURE E22

STUDY BRIDGES

STRUCTURE E24

HUNTS BRIDGE – A5

Bridge Deficiencies

- Road Capacity
  - 10 of 17 bridges are single lane (< 6m wide)
- Deterioration
  - Concrete and steel deterioration
  - Railing damage from vehicle strikes
  - Footings exposed and deteriorated

Evaluation Matrixes

Approach 1 – Using Multiple Factors

Approach #1

Initial approach to identifying bridge closures, which utilizes BCI, Load Limit, Traffic Counts, Road Types, Detour Lengths (if closed), Road Connectivity and Replacement Costs, to identify bridges for Closure. Table 1.1 is the matrix used to identify the bridges. Table 1.2 is a proposed timeline for implementation of either closures, repairs or replacements.

Table 1.1: Potential Bridge Closure Assessment Matrix – 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	Score	Replace$	Score x 2	Road Connectivity	Score	Total
E4 - Allens	Truss-1920	50	10	18/29/36	10	459	10	HCB	5	8.2km	10	$2,018,040	30	Yes	5	80
E9	Beam-1930	26	20	25	5	280	10	LCB	10	12.2km	5	$875,850	10	Yes	5	65
E1 – Priebe	Truss-1938	40	15	10	15	216	20	Gravel	15	8.1km	10	$2,194,590	30	Yes	5	110
E10	T-Beam-1930	48	10	11	10	162	20	LCB	10	12.2km	5	$1,015,710	20	Yes	5	80
E12– Pearces	Truss-1930	46	10	8	15	162	20	Gravel	15	7.6km	15	$2,544,240	30	Some	10	125
A11 – Wilson	Conc. Arch-1910	45	10	12	10	112	20	Gravel	15	8.1km	10	$689,370	10	None	15	90
A29	Conc. slab-1930	56	5	25	5	100	20	Gravel	15	7.9km	15	$829,230	10	Some	10	80
A14–Arranvale	Truss-1920	45	10	14	10	99	30	Gravel	15	5.2km	15	$2,529,780	30	Yes	5	115
A24 – Ruff	Conc. slab-1920	29	20	25	5	99	30	Gravel	15	5.2km	15	$673,830	10	Yes	5	100
E24	Truss-1920	53	5	10	15	98	30	Gravel	15	8.2km	10	$1,614,000	20	None	15	110
A5 – Hunts	Conc. Arc-1910	63	5	9	15	84	30	Gravel	15	7.1km	15	$1,155,570	20	Some	10	110
A30	Conc. slab-1930	38	10	12	10	77	30	Gravel	15	8.8km	10	$1,598,460	20	Some	10	105
E22	Truss 1920	46	10	3	15	68	30	Gravel	15	8.1 km	10	$1,691,700	20	None	15	115
E16	T-Beam-1930	31	15	15	10	67	30	Gravel	15	12.2km	5	$875,850	10	Yes	5	90
E17	Truss-1930	38	15	11	10	53	30	Gravel	15	8.2km	10	$1,963,650	20	None	15	115
E14	T-Beam-1930	34	15	25	5	50	30	Gravel	15	12.2km	5	$899,160	10	Yes	5	85
E15	T-Beam-1920	41	10	25	5	50	30	Gravel	15	12.2km	5	$875,850	10	Yes	5	80

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: <100 = 15, 100-250 = 10, > 250 = 5

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

Detour Length: < 8 = 15, 8-10= 10, >10 = 5

Replace Cost: < 1 mil = 5, 1–2 mil = 10, > 2 mil = 15

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

Approach 2 – Based on Location

Table 2.1: Potential Bridge Closure Assessment Matrix – Recommended Closures Option A - Option B - +

Structure ID	Type & Age	Avg. Traffic Counts	Score X 2	Road Type[1]	Score	Detour	Score	Replace$	Score x 2	Road Connectivity	Score	Total
E4 - Allens	Truss-1920	459	10	HCB	5	8.2km	10	$2,018,040	30	Yes	5	60
E9	Beam-1930	280	10	LCB	10	12.2km	5	$875,850	10	Yes	5	40
E1 – Priebe	Truss-1938	216	20	Gravel	15	8.1km	10	$2,194,590	30	Yes	5	80
E10	T-Beam-1930	162	20	LCB	10	12.2km	5	$1,015,710	20	Yes	5	60
E12– Pearces	Truss-1930	162	20	Gravel	15	7.6km	15	$2,544,240	30	Some	10	90
A11 – Wilson	Conc. Arch-1910	112	20	Gravel	15	8.1km	10	$689,370	10	None	15	70
A29	Conc. slab-1930	100	20	Gravel	15	7.9km	15	$829,230	10	Some	10	70
A14–Arranvale	Truss-1920	99	30	Gravel	15	5.2km	15	$2,529,780	30	Yes	5	95
A24 – Ruff	Conc. slab-1920	99	30	Gravel	15	5.2km	15	$673,830	10	Yes	5	75
E24	Truss-1920	98	30	Gravel	15	8.2km	10	$1,614,000	20	None	15	90*
A5 – Hunts	Conc. Arc-1910	84	30	Gravel	15	7.1km	15	$1,155,570	20	Some	10	90
A30	Conc. slab-1930	77	30	Gravel	15	8.8km	10	$1,598,460	20	Some	10	85
E22	Truss 1920	68	30	Gravel	15	8.1 km	10	$1,691,700	20	None	15	90
E16	T-Beam-1930	67	30	Gravel	15	12.2km	5	$875,850	10	Yes	5	65
E17	Truss-1930	53	30	Gravel	15	8.2km	10	$1,963,650	20	None	15	90
E14	T-Beam-1930	50	30	Gravel	15	12.2km	5	$899,160	10	Yes	5	65
E15	T-Beam-1920	50	30	Gravel	15	12.2km	5	$875,850	10	Yes	5	65

* 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: <100 = 15, 100-250 = 10, > 250 = 5

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

Detour Length: < 8 = 15, 8-10 = 10, >10 = 5

Replace Cost: < 1 mil = 5, 1–2 mil = 10, > 2 mil = 15

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

Potential Impacts

- Social Environment
  - Loss of Access
  - Property Values
  - Impacts to Businesses
- Economic Environment
  - Capital Construction Costs
- Cultural Environment
  - Loss of Cultural Heritage Value
- Natural Environment
  - Impacts to terrestrial Habitat
  - Species at Risk/Fish Habitat
  - Flooding

FRESHWATER MUSSEL HABITAT – STRUCTURE E12

IMPACT ON FLOODPLAIN

ACCESS FOR AGRICULTURAL EQUIPMENT