

BRIDGE No.02 (GREENOCK)

Schedule 'B' EA: Phase 2

Presentation to Council
Recommended Preferred Solution
Municipality of Brockton
February 9, 2021



AGENDA

1. Overview of Municipal Class EA Process
2. Define Problem Statement
3. Present Background Information
4. Identify Alternatives
5. Evaluation and Re-Assessment of Alternatives
6. Recommended Preferred Solution
7. Next Steps

PHASE 1

Problem or Opportunity

- ✓ Problem Statement: Identify and describe the problems and/or opportunities.

PHASE 2

Alternative Solutions

- ✓ Identify and evaluate alternatives, taking into consideration all 'environments'.
- ✓ Consult with the public, review agencies and Indigenous Communities.
- Select a Preferred Solution and confirm EA requirements.
- If a **Schedule B** project, issue Notice of Completion. Satisfy 30-day Part-II Order period.

**WE ARE
HERE**

PHASE 3

Alternative Design Concepts for Preferred Solution (Schedule C)

- Identify and evaluate alternative design concepts and mitigation measures.
- Consult with the public, review agencies and Indigenous Communities.
- Select a Preferred Design Solution.

PHASE 4

Environmental Study Report (ESR)

- Complete an ESR.
- Issue Notice of Completion for **Schedule C** project.
- Satisfy 30-day Part-II Order period.

PHASE 5

Implementation (If no Part-II Order period received)

- Complete contract drawings and tender.
- Proceed to construction.
- Monitor environmental provisions and commitments.

PROJECT STATEMENT

Inspection Reports for the aging Riversdale Bridge note advanced deterioration of the superstructure and substructure to a point where the bridge is no longer able to fulfill its intended function and, therefore, consideration should be given to addressing a long-term solution.



BACKGROUND



- Single-lane
- Cultural heritage value: Pratt through truss bridge
- Recently closed to vehicular and pedestrian traffic
- Structure accommodated a low to 'significantly' low volume of vehicles

PUBLIC CONSULTATION

Public consultation was completed in the Fall. In general, comments received can be summarized as follows:

1. Emergency Services: Access and Time
2. Concerns Regarding Alternate Routes (Winter and Detours due to Emergencies)
3. Agricultural Community and Traffic Movements
4. Snowmobile Trail Network
5. Pedestrian Use and Recreational Pursuits
6. Traffic Volumes and Counts
7. Municipal Allocation of Funds
8. Bridge Maintenance
9. Flooding Issues North of the Bridge
10. Bridge Heritage

A summary of the comments and general responses to the comments was included with the Staff Report.

These comments were considered in the re-assessment of alternatives

ALTERNATIVE SOLUTIONS

ALTERNATIVE 1 DO NOTHING

- Baseline for comparative purposes.
- Would lead to catastrophic failure.

ALTERNATIVE 2 BRIDGE REHABILITATION

- The completion of major repairs to elements identified as being deficient.
- Could extend the useful life of the bridge.

ALTERNATIVE 3: BRIDGE REPLACEMENT

Option 3A: Replacement with a single lane bridge

Option 3B: Replacement with a two-lane bridge

Option 3C: Replacement with a structure suitable for recreational purposes (non-vehicular)

ALTERNATIVE 4 BRIDGE REMOVAL

- Road would be closed with turn-around opportunities provided at each side.
- Considers that the bridge carries a low to 'significantly' low traffic volume.

ALTERNATIVE 5 BRIDGE RETENTION & ADAPTATION

- Continued use of the bridge in-situ for non-vehicular use.
- Adaptations for active transportation purposes (i.e. walking and biking).

EVALUATION CRITERIA

		DESCRIPTION
	General	Ability to address the Problem Statement.
ENVIRONMENT	Technical	Technical considerations generally include: <ul style="list-style-type: none"> ▪ Type and complexity of construction ▪ Future maintenance requirements (short and long term) ▪ Bridge and road design standards
	Social	Potential effects on communities, locally and regionally, such as: <ul style="list-style-type: none"> ▪ Bridge usage, traffic movements and availability of alternate routes ▪ Access to emergency services ▪ Active transportation usage and connection to trail networks
	Natural	<ul style="list-style-type: none"> ▪ Protection of the natural and physical environment. ▪ Includes consideration for water, wildlife, air and vegetation, as well as species at risk and environmentally sensitive areas.
	Cultural	<ul style="list-style-type: none"> ▪ Protection of archaeological and/or cultural heritage resources. ▪ This includes cultural landscapes, fixed archaeological structures on land or water, and built environments (i.e., bridges, buildings, etc.).
	Economic	<ul style="list-style-type: none"> ▪ Considers relative construction costs and longer term operating and maintenance costs. ▪ Considers the Municipality's overall transportation system and potential capital commitments.

EVALUATION OF ALTERNATIVES

ALTERNATIVE 1: DO NOTHING

Does not address the problem



Wide vertical crack in northwest wingwall.
Crack expected to be full depth.



Large perforation at
top of cross-beam
resulting in significant
section loss.

Large vertical crack
and spalling at south
corner of west
abutment.



EVALUATION OF ALTERNATIVES

ALTERNATIVE 2: REHABILITATION

- Repairs could be significant and complex.
- Capital costs are estimated to be \$800K to \$1.1M.
- Ongoing capital investments into repairs may still be required.
- Load postings likely, with usage subject to the findings of routine inspections.
- Would accommodate recreational activities (i.e., walking and snowmobiling, etc.).
- Cultural Heritage: Retention would be preferred.
- Short-term solution: Service life only marginally extended.
- Long-Term: Would delay the need to address the problem.

EVALUATION OF ALTERNATIVES

ALTERNATIVE 3A/B: REPLACEMENT (Vehicular Crossing)

Two vehicular bridge replacement options were considered:

- A. Single lane (4.2 m wide): Capital cost = \$1.5M to \$2.0M
- B. Two lanes (7.0 m wide): Capital cost = \$2.0M to \$2.3M

Road design standards:

- A. Single-lane: Southbound road approach & one-lane bridge would not meet the design standards.
 - B. Two-lane: Southbound road approach would not meet the design standard, but lack of visibility would be less of a safety issue with separate lanes.
- Maintenance costs would initially be low.
 - Service life = ± 75 years
 - Would maintain this river crossing, primarily for local vehicular and pedestrian traffic.
 - The snowmobile trail could be re-established, although it has been re-routed to the south of Highway 9.

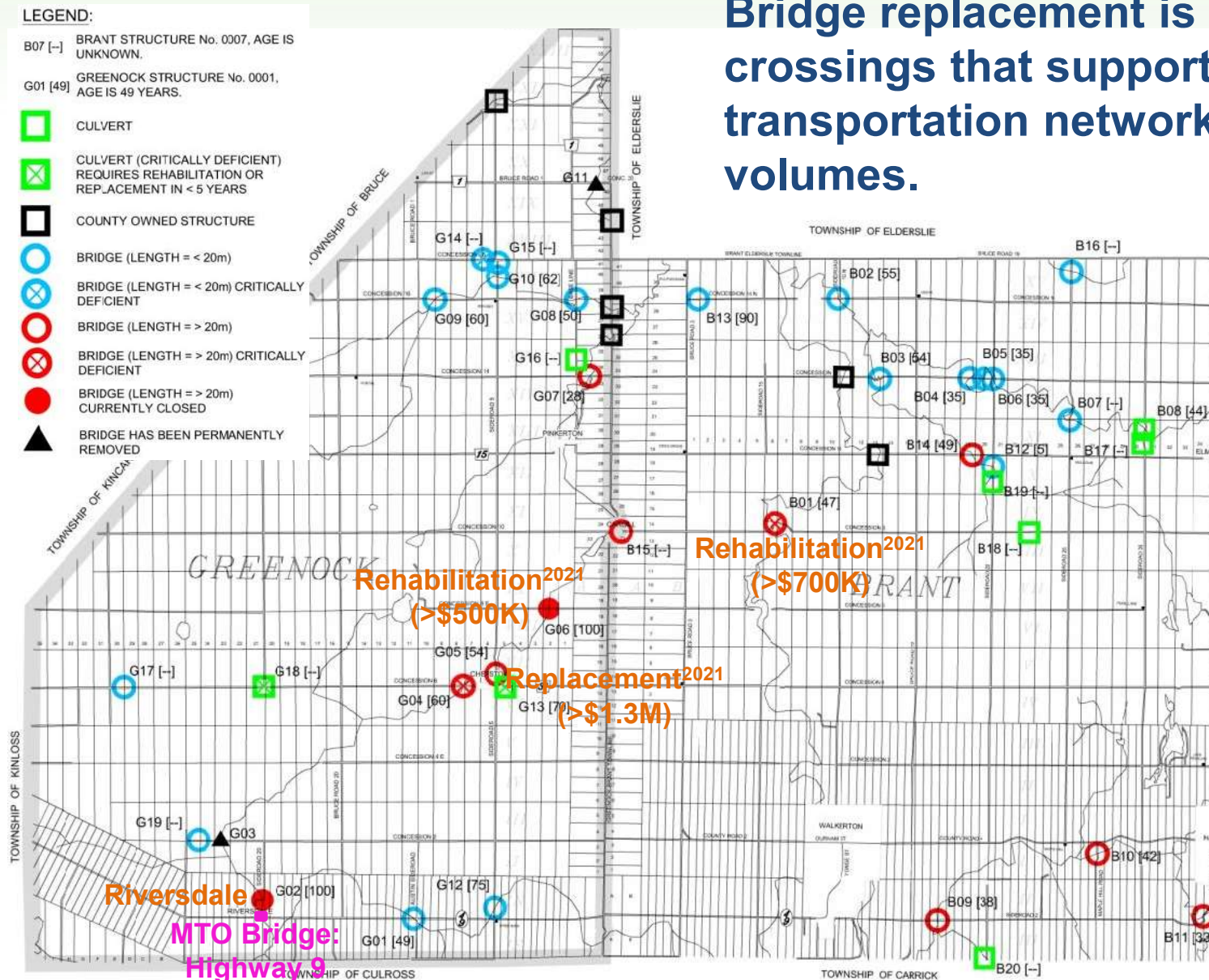
ALTERNATIVE 3A/B: REPLACEMENT (Vehicular Crossing)

Bridge replacement is typically favored for crossings that support a more 'regional' transportation network and/or higher traffic volumes.

	Total	Deficient*
Culverts	8	2
<10 m	9	1
10-20m	10	0
Bridges		
20-30m	3	1
30-50m	3	2
50-70m	3	1
>70m	1	0
Removed	[2]	----
TOTAL	37	7

* Structures that will require significant repairs or replacement within 5 years.

There are 35 structures in use. Two bridge are currently closed.



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Bridge No.02 (Greenock), Schedule 'B' EA: February 2021

ALTERNATIVE 3A/B: REPLACEMENT (Vehicular Crossing)

- Currently, the Municipality is responsible for the maintenance of 37 structures within its overall transportation system.
- Costs associated the existing infrastructure can be significant.
- The crossing primarily accommodates local traffic movements and has limited connectivity to the broader road network.
- Considering the low traffic volume and the limited connectivity (i.e., the bridge primarily services one concession block), the costs associated with maintaining this vehicular crossing may outweigh the benefits.

EVALUATION OF ALTERNATIVES

ALTERNATIVE 3C: REPLACEMENT (Non-Vehicular Crossing)

- Limited to recreational activities, such as walking, biking and snowmobiles, etc.
- Capital cost estimated to be \$1.0M to \$1.5M
- Maintenance costs would initially be low.
- Service life = ± 75 years
- Would meet applicable design standards.
- Vehicular traffic could use other available routes.
- Snowmobile trail through this area could be re-established.

ALTERNATIVE 3: REPLACEMENT

CAPITAL COST COMPARISON

Replacement Option	Estimated Cost	Comments
3A. One-Lane Bridge (Width = 4.2 m)		
Cast-in-Place (CIP)	\$1.5M to \$1.8M	
Prefabricated Steel	\$1.5M to \$1.8M	
Timber Structure*	\$1.7M to \$2.0M	Not fabricated locally; Specialized
Bailey (or Acrow)	Similar Price Range	Lifespan: Possibly shorter than other options
3B. Two-Lane Bridge (Width = 7.0 m)		
CIP Concrete	\$2.0M to \$2.3M	
Prefabricated	Not likely a viable option due to cost and complexity	
3C. Recreational Bridge for Pedestrians and Snowmobiles (Width = 2.0 m)		
Prefabricated Steel	\$1.0M to \$1.2M	Increased Width = Increased \$\$
Prefabricated Fiberglass*	\$1.3M to \$1.5M	Fully enclosed due to span; Specialized
Timber Structure*	\$1.1M to \$1.3M	Not fabricated locally; Specialized

Notes:

- Cost estimates are considered preliminary. Design alternatives, details and associated costs for a given replacement option would be subject to further review during the design phase.
- * Local contractors are not familiar with the structure type. Costs associated with maintenance and repairs may be greater.

EVALUATION OF ALTERNATIVES

ALTERNATIVE 4: BRIDGE REMOVAL

Considers the following:

1. Traffic Volume:

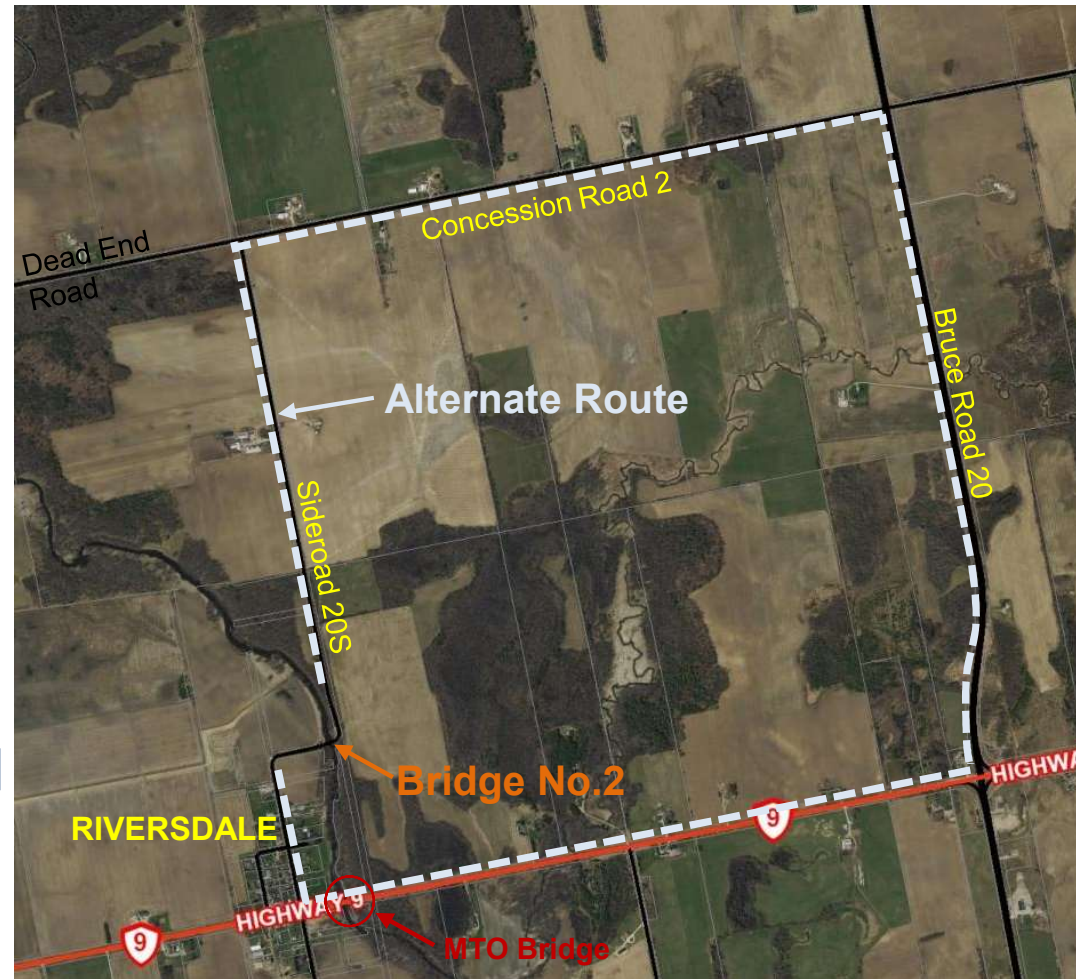
Low to 'significantly' low.

2. Local Road:

Bridge facilitates access to one concession block. Therefore, is not an integral part of the regional transportation system.

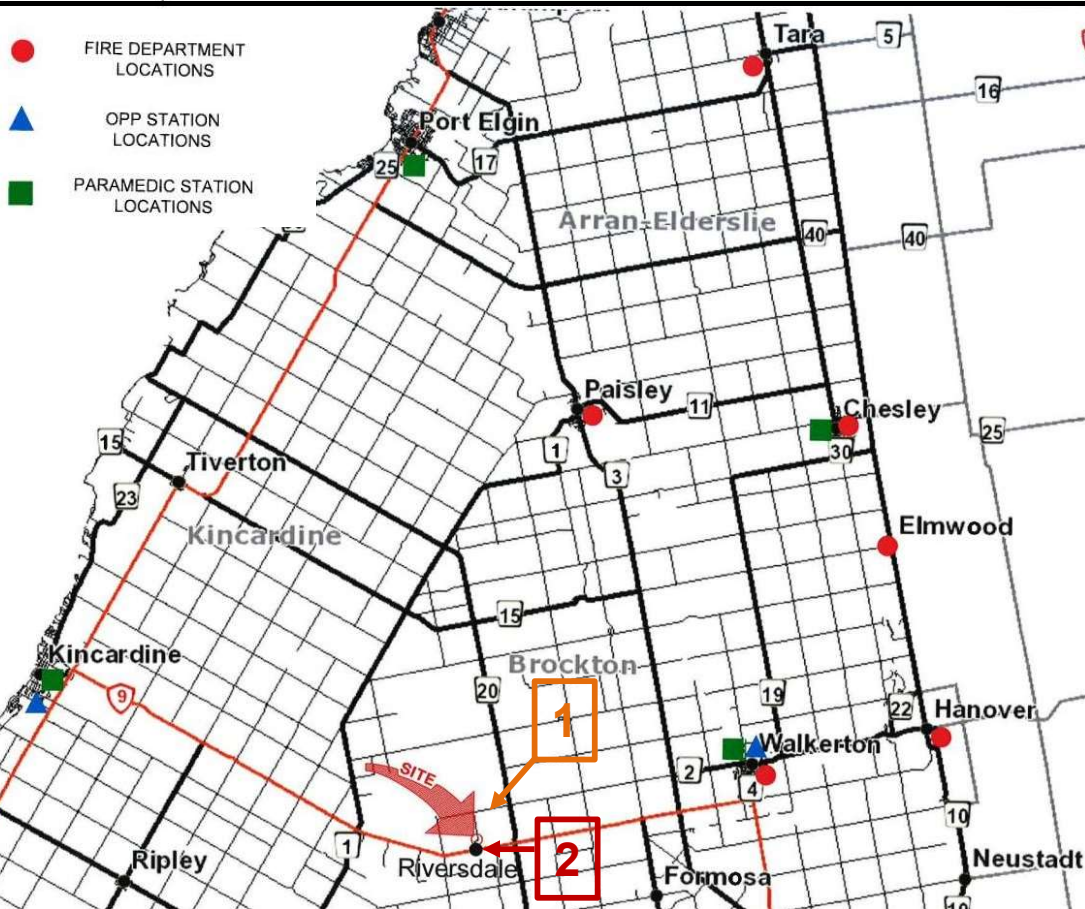
3. Alternate Route:

Between Riversdale and Sideroad 20S would be up to ± 8 km (or less than 10 minutes).



BRIDGE REMOVAL

Bridge would not provide improved access or travel times for emergency response.



Emergency Services:

1. Access to Sideroad 20S from BR20 (via Conc Rd. 2)
2. Access to Riversdale via Highway 9

Capital Costs:

Estimated to be \$300K to \$400K.

Maintenance:

No longer required.

Social Impacts:

- Vehicular traffic can use other available roads.
- Cyclists and pedestrians would be required to use alternate routes and/or options.
- The snowmobile trail could continue to use trail developed south of Highway 9.

EVALUATION OF ALTERNATIVES

ALTERNATIVE 5: BRIDGE RETENTION/ADAPTATION

- Limited to recreational activities.
- Repairs could be significant and complex.
- Capital costs are estimated to be \$800K to \$1.1M.
- Ongoing capital investments into repairs may still be required.
- Vehicular traffic could use other available roads.
- Safety concerns: Efforts to prevent vehicular access are often compromised.
- Cultural Heritage: Retention would be preferred.
- Short-term solution: Service life for non-vehicular purposes only marginally extended.
- Long-Term: Would delay the need to address the problem.

ASSESSMENT OF ALTERNATIVES

		ENVIRONMENTS					RANKING
		Technical	Social	Cultural	Natural	Economic	
1	Do Nothing	Does not address the problem					Ø
2	Rehabilitation			★			
3A	Replacement (one-lane)		★				
3B	Replacement (two-lane)	★	★			★	Recommended Replacement Alternative
3C	Recreational Bridge	★	★			★	
4	Removal	★			★	★	Recommended (based on assessment)
5	Retention/Adaptation			★			
EA SCHEDULE FOR RECOMMENDED SOLUTION: SCHEDULE 'B'							

RECOMMENDED PREFERRED SOLUTION

BRIDGE REMOVAL IS THE RECOMMENDED PREFERRED SOLUTION

This recommendation primarily reflects, based on our analyses, the interpreted relative economic value versus social impact of a structure in this location relative to the economic value and social impact to the broader community. In consideration of Council's broader economic awareness, should Council choose to consider the local social value more highly and choose to pursue a replacement alternative, then Alternative 3B, replacement with a two-lane structure, would be recommended.

NEXT STEPS

- ❑ Council Selection of a *Preferred Solution*.
- ❑ Finalize Project File.
- ❑ Advertise Notice of Project Completion.
- ❑ 30-day Review Period and, for Indigenous Communities, Part II Order Request Period.
- ❑ Proceed to implementation (tender and construction).