THE DISTRICT MUNICIPALITY OF MUSKOKA

To: Chair and Members
Muskoka District Council

From: Mark Misko
Director, Engineering and Transportation

Date: May 20, 2025

Subject: Award Authority for Silver Bridge

Report: 7(2025)-4

Recommendation

WHEREAS it is recognized that bridges within the District of Muskoka's Road Network provide critical links and are essential to connect communities;

AND WHEREAS the Silver Bridge (Structure ID 16001) located within the Town of Bracebridge experienced a critical failure and has been fully closed to vehicular and pedestrian traffic since January 6, 2025;

AND WHEREAS an investigation has been underway since January 6, 2025, to determine the feasibility of restoration of services to the Silver Bridge under its current failed condition;

AND WHEREAS any future investigative and restoration work will involve establishing safe access onto the bridge itself;

NOW THEREFORE BE IT RESOLVED THAT notwithstanding section 9.3.3 of Policy FI-007-2020 (Procurement Policy) the Chief Administrative Officer (CAO) and Commissioner of Finance and Corporate Services **be delegated the authority** to approve the award of any emergency purchase(s) necessary to complete additional investigative or immediate rehabilitation associated with the safety and/or restoration of services to Silver Bridge to a total limit of $5,000,000 plus HST;

AND THAT the 2025 Tax Support Capital Budget and Forecast **be amended** as outlined in the following table:

Project	Current Amended Budget	Proposed Amendment	Total Proposed Budget
313082 BB MR 16 Silver Bridge #016001	$899,725	$4,100,275	$5,000,000
Total Expenditures	**$899,725**	**$4,100,275**	**$5,000,000**

Sources of Financing	Current Amended Budget	Proposed Amendment	Total Proposed Budget
Roads Capital Reserve Fund	$899,725	$4,100,275	$5,000,000
Total Sources of Financing	**$899,725**	**$4,100,275**	**$5,000,000**

AND THAT staff prepare information reports to be presented to the Engineering and Public Works Committee in the month following any such award and include updated project cost forecasts;

AND THAT subject to the satisfaction of the District Solicitor; the CAO and Commissioner of Engineering and Public be authorized to execute any contract and related documents on behalf of the District.

Origin

During routine winter sidewalk maintenance on January 6, 2025, Town of Bracebridge Operations staff identified unusual issues clearing the snow on the bridge and notified District staff. The District's Engineering team attended the site to assess the issue and observed a shift in the bridge that was not present when Silver Bridge was last inspected in November 2024 and immediately took measures to close the bridge. A Senior Structural Engineer was brought in on January 7, 2025to assess, recommend the next steps, and determine the cause of the sudden shift in the bridge. Their immediate recommendation was to close the bridge to all access until further determination on the cause of the failure had been made and suitable rehabilitation or replacement could be completed to ensure safe access to the public. The bridge has remained closed to all access since that time.

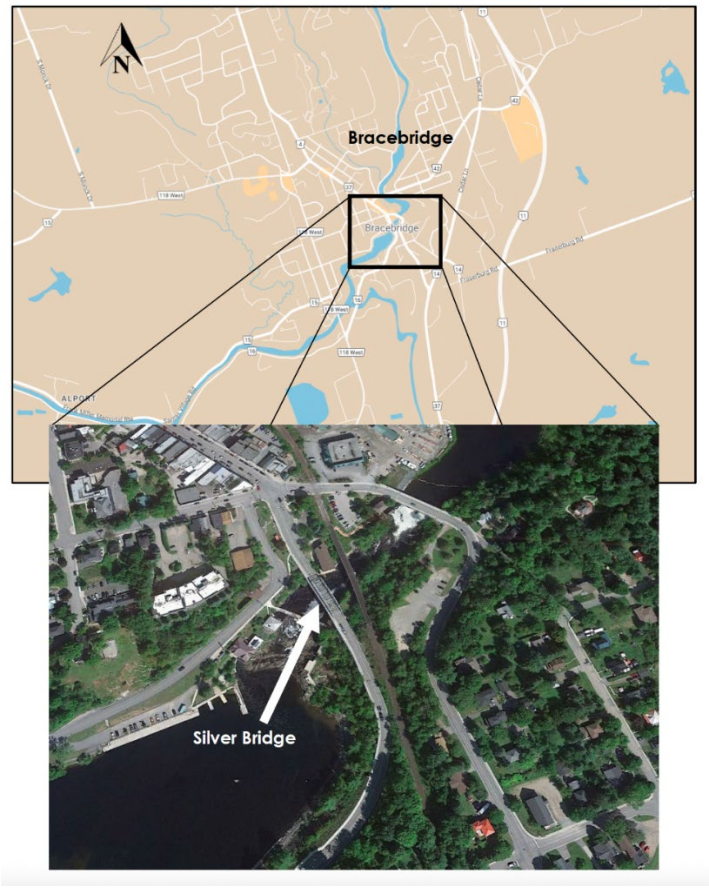
This report is to obtain staff authority to proceed with installation of structural components to allow further investigative work and begin restoration efforts. This report is being considered at District Council to speed up the typical two-month Committee/Council cycle. This expedited process will allow the maximum amount of work to take place during the 2025 construction season.

Staff are also seeking authority to amend the existing budget allocation for Silver Bridge to reflect estimated costs to complete additional investigative and rehabilitation work with the objective of restoring an acceptable, safe level of service to the bridge.

Background

The Silver Bridge is a three-span (14.25 m, 46.25 m, 14.25 m) steel through truss bridge that was constructed in 1929. The structure was previously rehabilitated in 1985, and included deck and soffit rehabilitation, abutment and pier repairs, expansion joint replacement, truss repairs, coating, and a new bearing arrangement. It was rehabilitated/upgraded again in 2001, which included deck and sidewalk replacement, miscellaneous structural steel repairs to the main span, pier modifications, replacing the pony trusses on the approach spans with steel girders, railing rehabilitation, and recoating structural steel.

The location of the bridge is shown below for reference:



Between its last inspection in November 2024 and the January closure, a significant failure occurred on the eastern truss which resulted in an approximate 75-100mm downward shift as well as an approximate 25mm lateral shift as shown below.

Figure 1 – Deformed barrier indicating loss of elevation

In particular and shown below, shearing and buckling of the gusset plates on both the northwest and southwest ends of the west truss and bottom chord connection points were noted as the primary points of failure.

Figure 2 – Buckling of gusset plate at northwest bearing

Figure 3 – Buckling of gusset plate at southwest bearing

Since the initial failure was noted and immediate closure put in effect, DM Wills (the District's structural consultant of record for all structural appraisals) has completed the

following tasks (it should be noted that all analysis has been completed in the context of assessing the feasibility of rehabilitating the existing bridge):

1. Completion of a modeled load transfer analysis to determine the capacity of the bridge in its current state. Results recommended that the bridge remain closed until repaired or replaced.
2. Given the age and retrofit additions (such as a sidewalk), development of a modeled capacity analysis of the existing bridge and compared the capacity of the structure to the requirements of the Canadian Highway Bridge Design Code. This was completed to ensure that any rehabilitation would meet current design codes and standards. Preliminary results indicate that the current bridge design meets applicable requirements for modern traffic loads.

While the above results would support the rehabilitation of the existing bridge, additional confirmation of the following will include:

- Failed Condition Analysis – an assessment of the load redistribution patterns following the gusset plate failure to identify secondary members now experiencing excessive stress.
- Field Investigation – correlate observed failure with the section loss noted and update analysis with observed (and measured) conditions.
- Detailed Connection Modeling – analyze the forces on each of the joints connecting the individual steel pieces that make up the bridge to ensure they are not overloaded.

Field analysis for the above items were initiated on site starting April 30, 2025, with final results of the analysis pending. Initial input from the field investigation indicates that the observed failure is related primarily to corrosion on the inner side (cavity) of the gusset plate connections between the bottom chord and western truss (as shown in the photos above) which were not visible until the failure took place.

Analysis

Section 9.3.3 of the Procurement Policy allows the CAO and Commissioner of Finance and Corporate Services a spending limit up to $500,000 when it is required under *one* of the following circumstances. Staff believe that more than one (if not all) of the emergency purchase criteria are met:

(i) Prevent or alleviate serious delay;
(ii) Maintain Essential Services or to prevent the disruption of Essential Services;
(iii) An unexpected interruption of a Public Service;
(iv) Maintain security and/or order;
(v) Protect public property; and/or
(vi) Protect human, animal or plant life;

Given the criticality of the Silver Bridge failure, as well as anticipated costs associated with bridge work, staff are recommending increasing the CAOs emergency spending limit to allow the expedited award of work as well as to ensure that staff spending authorities are aligned with the complex nature of these civil works.

It is important to note that staff are only seeking authority to initiate additional analyses, and any work required to safely stabilize the bridge in advance of any permanent rehabilitation or replacement works. The long-term rehabilitation and/or replacement of the bridge will be subject to a more formal tender process and the approval of Engineering and Public Works Committee and/or Council prior to proceeding, as appropriate.

As part of the requested increase in expenditure limits, next steps for the bridge involve additional assessment as well as undertaking any immediate required work to restore the bridge to an operational level of service in advance of any long-term restoration. The objective of requesting an increase in the emergency purchase limit is aligned with initial recommendations and cost estimates to complete further detailed and confirmatory analysis and also seeks to restore an acceptable, short-term level of service to the bridge.

Re-establishment of services on the bridge will also require additional consideration for temporary support during rehabilitation. Once this is determined, rehabilitation work may proceed. The scope of work associated with this approach generally includes:

1. Determination and provision of a temporary support structure;
2. Replacement of structural steel including truss chords, gusset plates, bearings and vertical supports;
3. Concrete deck repairs and bearing replacements; and
4. Additional rehabilitation work identified in previous OSIM inspections (which is allocated within project 313082)

Although an enhanced inspection of the bridge, with the assistance of an aerial lift device and a drone, was completed to better understand the bridge's condition, the emergency nature of the work poses uncertainties. It is important to note, the unknown extent of concealed deterioration in inaccessible areas may only be discovered once work commences, potentially requiring additional repairs beyond the initial scope. There remains a potential for additional damage to be discovered during rehabilitation as components are exposed and examined more thoroughly.

Financial Considerations

Project 313082 (MR 16 Silver Bridge 016001) currently has a total capital allocation of $899,725 with a total of $85,000 spent to date. Given the critical failure of the bridge, it is anticipated that additional investigative and immediate rehabilitation associated with the safety and/or restoration of services to Silver Bridge will likely exceed the current capital amounts.

Staff are recommending delegated authority up to $5 million plus HST, made up of the following work and estimated costs. The cost summary below outlines forecasted estimates which align with the requested budget amendment:

Task	Estimate ($)
Determination of and provision of a temporary support structure	$2,700,000.00
Replacement of structural steel including truss chords, gusset plates, bearings and vertical supports	
Concrete deck repairs and bearing replacements	
Additional rehabilitation work identified in previous OSIM inspections	$1,400,000.00
Available Budget (Project 313082)	$900,000.00
Total Requested Emergency Expenditure Limit	**$5,000,000.00**

To expedite the approval processes, staff recommend using delegated authority under the emergency purchase provisions of the procurement by-law with an increase in the delegated authority up to $5 million plus HST for this project only. To support this request, staff are requesting a budget amendment as outlined in the following table:

313082 BB MR 16 Silver Bridge #016001	**Contract Award**	**Forecast to Complete**	**Total Proposed Project Budget**
Contract	$0	$4,100,000	$4,100,000
Contingency (18%)	$0	$738,000	$738,000
Non-rebatable HST	$0	$85,149	$85,149
In-House Costs	$0	$50,000	$50,000
Other Project Costs	$0	$26,851	$26,851
Total Expenditures	**$0**	**$5,000,000**	**$5,000,000**

Sources of Funding	**Contract Award**	**Forecast to Complete**	**Total Proposed Project Budget**
Roads Capital Reserve Fund	$0	$5,000,000	$5,000,000
Total Sources of Financing	**$0**	**$5,000,000**	**$5,000,000**

Staff note that while there are sufficient funds within the Roads Capital Reserve to support the proposed amendment in 2025, the reserve is in a significantly overcommitted balance based on the approved 2026 capital plan. Staff will undertake a review and reprioritization of the 2026 capital plan to ensure that the reserve returns to a more sustainable balance as part of the 2026 Fall Economic Update.

As required with emergency procurements, staff will present information reports to the Engineering and Public Works Committee in the month following any such emergency award and include updated project cost forecasts.

It is expected that an Environmental Assessment will commence in approximately 2040 to plan for the long-term rehabilitation and/or replacement of the bridge. It is expected that this project will follow the normal (and formal) tender process in accordance with the Procurement Policy.

Climate Change Implications

The District assesses climate implications in all staff reports using the Clean Air Partnership's 'Municipal Climate Lens Tool' to consider climate impacts or benefits associated with any project, program or initiative. There is no climate impact related to this report.

Communications

Pending approval of the recommendation, staff will be communicating and coordinating the consideration, approval and award of subcontractor and supplier work packages to initiate the next phase of investigation and/or work.

Information reports on the status of the project, updates on the award of any work packages and project cost projections will be reported through the Engineering and Public Works Committee.

Strategic Priorities

This report includes information or recommendations that impact or influence the following Strategic Plan Objectives:

- Objective 6 Service alignment – Modernize municipal services and deliver them in the way that makes most sense – best value, efficiency, and outcomes for residents.
- Objective 8 Future thinking – Plan and invest so that we have the services and infrastructure our residents and communities need – now and in the future.

Respectfully submitted,

Mark Misko, C.E.T., Director of Engineering and Transportation; and
James Steele, P.Eng., Commissioner of Engineering and Public Works