

Subject: 2022 Bridge and Culvert Inspection Program and Rehabilitation and Replacement Needs Analysis

Recommendation:

BE IT RESOLVED THAT Council receive Report #2023-0043-Public Works - 2022 Bridge and Culvert Inspection Program and Rehabilitation and Replacement Needs Analysis, for information.

Background:

In accordance with Ontario Regulation 104/97 passed pursuant to the *Public Transportation and Highway Improvement Act*, the Town of Pelham is required to undertake an inspection, under the direction of a Professional Engineer, for every bridge and major culvert at least once every two years. The Act states that:

"The structural integrity, safety and condition of every bridge shall be determined through the performance of at least one inspection in every second calendar year under the direction of a professional engineer and in accordance with the *Ontario Structure Inspection Manual*. O. Reg. 472/10, s. 2."

The inspection program for 2022 was completed by Ellis Engineering Inc. as part of planned spending in the 2022 Capital Budget. In addition to an inspection completed for each individual structure the report provided by the Engineer provides a summary and overall condition of the Town's Bridge and Major Culvert inventory.

All structures are classified as either "Bridge" or "Culvert" type structures according to the criteria contained in the Municipal Bridge and Culvert Appraisal Manuals. The definition is as follows:

"Box or open type structure ... and which has more than 600mm of cover shall be appraised as a culvert, and those with less than 600mm of cover shall be appraised as a bridge".

The technical classification of each structure is identified as either a "Bridge" or a "Culvert". In addition, each structure is provided a unique identification number. Further, Bridge and Culvert structures are classified as either

"Municipal" or "Structure". Bridges or culverts with a span less than 3.0m are classified as "Municipal" structures and do not require inspection every two years as required by Ontario Regulations 104/97. Structures with a span greater than 3.0m are classified as "Structure" and must be inspected once every two years, per regulation.

The Town has twenty-three (23) structures with a span of 3 m or greater. In 2022, twenty-three (23) structures were inspected in accordance with the regulations.

Analysis:

Each structure was given a priority ranking based on the condition of the structure. The priority ranking for each structure was based on the following categories: NOW, 1-5 Years, 6-10 Years, and Adequate. In addition to the priority rankings, the structures were classified with a General Overall Condition Rating and a corresponding Bridge Condition Index (BCI) value. See Appendix A for a summary of the categories used to classify the condition of the structures.

In addition, each structure was evaluated based on its overall condition and provided and given a Structure Condition Classification and Corresponding Bridge Condition index value (BCI). The BCI values were provided in the following ranges: Very Good (BCI 80 – 100), Good (BCI 70 – 79), Fair (BCI 60 – 69), and Poor (BCI 0 – 59). For specifics, please see Appendix A.

Based on the 2022 inspections the current condition of the structures in the Town of Pelham are as follows: Very Good (30% of the structures), Good (44% of the structures), Fair (17% of the structures), and Poor (9% of the structures). Based on the above analysis 74% of the structures are in Very Good to Good condition.

The overall network BCI is approximately 74.4. Based on the 2020 inspections the overall network BCI was 71.7. The slight improvement is attributed to the completed replacements of the Sixteen Road Culvert (Structure No. 22) and Balfour Street Culvert (Structure No.14).

Based on the needs analysis completed by Ellis Engineering approximately 43% of the structures are adequate and do not need any maintenance or rehabilitation work completed. Approximately 9% of the structures require maintenance and or rehabilitation in 6 to 10 years, 9% of the structures require maintenance or rehabilitation/replacement in 1-5 years, and 39% of the structures have immediate "NOW" needs. The "NOW" needs can range from minor scour protection works to full replacement and is based upon the

condition of each individual structure. Overall the Town's structures are in good condition (74% of the structures); however, it is critical to invest in minor maintenance and rehabilitation works in order to maintain the network.

A summary Table 5, in the report prepared by Ellis Engineering, indicates that the estimated cost (in 2022 dollars) of 6 to 10 year needs is \$139,000, 1 to 5 years is \$1,058,000, and NOW needs is \$1,511,000. The total estimated cost of structure needs is \$2,708,000.

In 2020 the total estimated cost of structure needs was \$4,148,000. The overall cost decrease from 2020 to 2022 is primarily due to the replacements of Sixteen Road Culvert (Structure No. 22) and Balfour Street Culvert (Structure No. 14). In addition, minor increases in cost for maintenance, rehabilitation and replacement are a reflection of increases in the cost of construction.

Staff has identified 2 structures with low BCI values including Cream Street culvert (Structure No. 12) with a current BCI of 45 and the Roland Road culvert (Structure No. 13) with a current BCI of 55. The Cream St culvert design and replacement will take place this year along with the Roland Road culvert design. The replacement of the Roland Road bridge is planned to be completed in 2024.

Financial Considerations:

There are no direct financial implications with respect to this report given that it is a report received for information only.

Alternatives Reviewed:

There are no alternatives for review as this is a report for information purposes only.

Strategic Plan Relationship: Risk Management

Maintaining a safe and reliable road network is critical to the Town of Pelham to ensure safe and efficient movement of all forms of transportation. Proper maintenance and investment into the Town's bridges and major culverts will ensure that the condition of our road network is sustained.

Consultation:

There was no consultation in the preparation of this report.

Other Pertinent Reports/Attachments:

Appendix A - Summary of Categories for Condition of Structures

Appendix B - 2022 Bridge and Culvert Inspection Program and Rehabilitation and Replacement Needs Analysis Summary Report, Ellis Engineering Inc.

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