

## **Subject:** 2020 Bridge and Culvert Inspection Program and Rehabilitation and Replacement Needs Analysis

### **Recommendation:**

**BE IT RESOLVED THAT Council receive Report #2020-0157 for information purposes.**

### **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 2020 was completed by Ellis Engineering Inc. as part of planned spending in the 2020 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, by Ontario law. The Biennial inspection for 'Structures' may be increased to four years, according to the criteria contained in the Ontario Structure Inspection Manual (OSIM), if the following criterion is met:

*"For culverts with 3m to 6m spans and retaining walls, the inspection interval can be increased to four years if the culvert or retaining wall is in good condition and the engineer believes that the culvert or retaining wall condition will not change significantly before the next inspection."*

The Town has twenty-three (23) structures with a span of 3 m or greater.

In 2020, 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). See Appendix A.

Based on the 2020 inspections the current condition of the structures in the Town of Pelham are as follows: Very Good (22% of the structures), Good

(56% of the structures), Fair (9% of the structures), and Poor (13% of the structures). Based on the above analysis 78% of the structures are in Very Good to Good condition.

The overall network BCI is approximately 71.7. Based on the 2018 inspections the overall network BCI was 67.9. The slight improvement is attributed to the completed replacement of the Poth Street Culvert (Structure No. 24).

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 4% of the structures require maintenance and or rehabilitation in 6 to 10 years, 4% of the structures require maintenance or rehabilitation/replacement in 1-5 years, and 48% 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 (78% 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 2020 dollars) of 6 to 10 year needs is \$977,500, 1 to 5 years is \$21,100, and NOW needs is \$3,149,500. The total estimated cost of structure needs is \$4,148,000.

In 2018 the total estimated cost of structure needs was \$4,607,500. The overall cost decrease from 2018 to 2020 is primarily due to the replacement of Poth Street Culvert. In addition, minor increases in cost for maintenance, rehabilitation and replacement are a reflection of increases in the cost of construction.

### **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.

**Other Pertinent Reports/Attachments:**

Appendix A - Summary of Categories for Condition of Structures

Appendix B - 2020 Bridge and Culvert Inspection Program and Rehabilitation and Replacement Needs Analysis Summary Report, Ellis Engineering Inc.

**Consultation:**

There was no consultation in the preparation of this report.

**Legal Consultation, If Applicable:**

There was no legal consultation in the preparation of this report.

**Prepared and Recommended by:**

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**Approved and Submitted by:**

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