



The Corporation of the Town of Tecumseh

Public Works & Engineering Services

To: Mayor and Members of Council

From: Phil Bartnik, Director Public Works & Engineering Services

Date to Council: January 25, 2023

Report Number: PWES-2023-02

Subject: 2022 Bridge and Culvert Needs Study
Structures with Spans Greater than 3.0 m

Recommendations

It is recommended:

That Report PWES-2023-02 2022 Bridge and Culvert Needs Study, Structures with Spans Greater than 3.0m, **be received**.

Background

In accordance with Ontario Regulation 104/97 passed pursuant to the *Public Transportation and Highway Improvement Act*, the Town of Tecumseh is required to undertake an inspection, under the direction of a Professional Engineer, for every bridge and culvert (with spans greater than 3.0 m) at least once every two years.

Council, at its regular meeting held January 25, 2022, gave approval to Report [PWES-2022-03](#) that authorized Administration to proceed with the Public Works & Engineering Services 2022 Capital Works Projects, including the 2022 Bridge and Culvert Needs Study (Motion: RCM-23/22). Dillon Consulting Ltd. (Dillon) was retained to provide engineering services on this project based on their past completion of the 2003, 2008, 2014, 2016, 2018 and 2020 Bridge and Culvert Needs Studies.

Comments

Dillon carried out a Bridge and Culvert Needs Study in 2022 for 16 bridge and culvert structures with spans greater than 3.0 m, including two pedestrian bridges, located within the Town of Tecumseh.

An inventory of bridges and culverts, including location, structure type, year of construction and the year of last major rehabilitation, is provided in Attachment 2 of this report.

During site inspections of each structure, data was collected and inspection reports were completed that detail the structural condition, including defects, deficiencies and maintenance needs.

The Bridge Condition Index (BCI) provides an indication of the change in condition state of an individual bridge over a period of time. The BCI, combined with site observations of each structure, is used as a planning tool to assist with prioritizing structure improvements.

The BCI ratings range from 0 to 100, where a bridge with:

- i. 70 to 100 is in 'good' condition.
- ii. 60 to 70 is in 'fair' condition.
- iii. less than 60 is in 'poor' condition.

The BCI was completed for all 16 bridge and culvert structures with a comparison to previous studies from 2003 to 2022. Refer to the table provided in Attachment 2.

Key Findings

Key findings and recommendations contained within the 2022 Bridge and Culvert Needs Study are as follows:

- Two of the 16 structures were identified to have deficiencies where rehabilitation of the structure is recommended.
- The average BCI value calculated for 2022 is 77.7 which is slightly lower than the BCI value of 78.4 that was calculated for the 2020 study. The average BCI of 77.7 indicates that the Town is maintaining its infrastructure in overall good condition.
- The decrease in BCI can be attributed to the standard decline in structure condition over time, and the accelerated deterioration of Pedestrian Bridge No. 1.

- There are two potential roadside safety deficiencies identified for structures 1005 and 1010 with recommended improvements, based on the 2017 MTO Roadside Design Manual.
 - Structure 1005 is a concrete slab on steel girder (bridge) located over Pike Creek at Baseline Road. It is recommended to extend the steel beam guide rail at the eastbound approach to relocate the steel beam energy attenuating terminal.
 - Structure 1010 is a corrugated steel pipe arch (culvert) located over West Townline Drain at Malden Road. It is recommended to maintain and extend the steel beam guide rail.

Recommended Rehabilitation

Key rehabilitation work includes:

- Pedestrian Bridge No. 1 – the coating system on the bridge has failed and corrosion of the floor system has accelerated since the last inspection. Based on consultation with the bridge fabricator, the cost to replace the structure is similar to that of a rehabilitation. Replacement of the bridge is recommended within **one to five years**. Costs are estimated at \$210,000.
- Structure 1016, Collins Drain at Outer Drive – rehabilitation is required in **six to ten years** to address the potential lack of waterproofing on the top of deck and the leaking wide crack observed on the culvert soffit. Costs are estimated at approximately \$235,000.

Conclusion

The Town is maintaining its structures (with spans greater than 3.0 m) in overall good condition.

A full copy of the [2022 Bridge and Culvert Needs Study](#) has been posted on the Town's website.

Consultations

Financial Services
Dillon Consulting Ltd.

Financial Implications

The estimated capital needs allocation over the ten-year study period (to 2032) is approximately \$445,000 (incl. HST and construction contingencies and engineering). The final estimated costs for structure rehabilitation or replacement will vary on the results of detailed investigations, and/or changes to the proposed scope of work during detailed design.

The recommendations contained in the 2022 Bridge and Culvert Needs Study, Structures with Spans Greater than 3.0m form the basis for prioritizing bridge projects in the Public Works & Engineering Services Five Year Capital Works Plan.

Administration will consider the needs of the road network when determining priorities for the structures. By combining road and structure works there may be opportunities for additional cost savings and a reduction in traffic disruptions.

Link to Strategic Priorities

Applicable	2019-22 Strategic Priorities
<input type="checkbox"/>	Make the Town of Tecumseh an even better place to live, work and invest through a shared vision for our residents and newcomers.
<input checked="" type="checkbox"/>	Ensure that Tecumseh's current and future growth is built upon the principles of sustainability and strategic decision-making.
<input type="checkbox"/>	Integrate the principles of health and wellness into all of Tecumseh's plans and priorities.
<input checked="" type="checkbox"/>	Steward the Town's "continuous improvement" approach to municipal service delivery to residents and businesses.
<input type="checkbox"/>	Demonstrate the Town's leadership role in the community by promoting good governance and community engagement, by bringing together organizations serving the Town and the region to pursue common goals.

Communications

Not applicable ☒

Website ☐

Social Media ☐

News Release ☐

Local Newspaper ☐

This report has been reviewed by Senior Administration as indicated below and recommended for submission by the Chief Administrative Officer.

Prepared by:

Cheryl Curran, BES
Project Technician

Reviewed by:

Tom Kitsos, CPA, CMA, BComm
Director Financial Services & Chief Financial Officer

Reviewed by:

Phil Bartnik, P.Eng.
Director Public Works & Engineering Services

Recommended by:

Margaret Misek-Evans, MCIP, RPP
Chief Administrative Officer

Attachment Number	Attachment Name
1	Bridge Needs Study Executive Summary
2	Town of Tecumseh Bridge and Culvert Inventory
3	Location Map of Bridge and Culverts
4	Bridge Condition Index 2003 to 2022