



## The Corporation of the Town of Tecumseh

Public Works & Environmental Services

**To:** Mayor and Members of Council

**From:** Phil Bartnik, Director Public Works & Environmental Services

**Date to Council:** April 23, 2019

**Report Number:** PWES-2019-22

**Subject:** 2018 Bridge & Culvert Needs Study (Structures with Spans > 3.0m)

---

### Recommendations

It is recommended:

**That** Report No. PWES-2019-22 2018 Bridge & Culvert Needs Study (Structures with Spans > 3.0m) **be received**;

**And that** the recommendations contained within the 2018 Bridge & Culvert Needs Study (Structures with Spans > 3.0m) **form the basis for prioritizing** projects when completing the annual Public Works & Environmental Services Capital Works Plan.

### Background

At the December 12, 2017 Regular Meeting of Council, Council approved the recommendations (Motion RCM-441/17) of PWES Report No. 57/17 titled "2018-2022 Public Works & Environmental Services Capital Works Plan" that authorized Administration to proceed with the 2018 capital works projects including the completion of the 2018 Bridge & Culvert Needs Study for structures with spans greater than three metres.

Dillon Consulting Limited was retained to conduct the study based on their past experience on the Town's bridge and culvert structures and completion of the 2003, 2008, 2014 and 2016 Bridge and Culvert Needs Studies.

### Comments

The purpose of the Bridge and Culvert Needs Study (BCNS) was to assess the existing bridges and culverts with a span greater than three metres in the Town of Tecumseh and to

prepare a comprehensive plan for improving and maintaining these structures for the next ten year period.

The eighteen (18) structures located in the Town, and included in this study, were classified as a Bridge or Culvert according to CAN/CSA S6-14 Canadian Highway Bridge Design Code (see Table 1 below). The structures were inventoried and appraised according to the Ontario Structure Inspection Manual (OSIM) published by the Ministry of Transportation of Ontario, recent field inspections, and discussions with the Town.

Inspections of Bridges and Culverts are to take place every two years as legislated by O.Reg 472/10 under the Public Transportation and Highway Improvement Act, which states:

- s.2(3): 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

**Table 1: Bridge and Culvert (Structures with Spans > 3.0m) – Inventory**

Structure ID	Structure Location	Structure Type	Year Constructed	Year of Last Major Rehab
1002	Pike Creek at 12 <sup>th</sup> Concession Road	Concrete Rigid Frame (Bridge)	1961	2016
1003	Pike Creek at 12 <sup>th</sup> Concession Road	Concrete Slab on Steel Girder (Bridge)	1965	2013
1004	Sullivan Creek at 12 <sup>th</sup> Concession Road	Concrete Non-Rigid Frame (Bridge)	1965	---
1005	Pike Creek at Baseline Road	Concrete Slab on Steel Girder (Bridge)	1955	2014
1006	Sullivan Creek at Baseline Road	Concrete Rigid Frame (Culvert)	2015	---
1009	Pike Creek at Malden Road	Concrete Rigid Frame (Culvert)	2007	---
1010	West Townline Drain at Malden Road	Corrugated Steel Pipe Arch (Culvert)	1995	---
1011	Malden Road Drain at South Talbot Road	Concrete Rigid Frame (Bridge)	2007	---
1013	Merrick Creek at 8 <sup>th</sup> Concession Road	Concrete Non-Rigid Frame (Culvert)	1965	---

Structure ID	Structure Location	Structure Type	Year Constructed	Year of Last Major Rehab
1014	Colchester Townline Drain at 6 <sup>th</sup> Concession Road	Concrete Non-Rigid Frame (Culvert)	1955	---
1015	Merrick Creek Drain at 6 <sup>th</sup> Concession Road	Concrete Rigid Frame (Culvert)	2007	---
1016	Collins Drain at Outer Drive	Concrete Rigid/Non-Rigid Frame (Culvert)	1975	2005
1021	Pike Creek at 12 <sup>th</sup> Concession Road	Corrugated Steel Pipe Arch (Culvert)	1965	---
1028	East Townline Drain at St Thomas Street	Concrete Rigid Frame (Bridge)	1975	---
1029	East Townline Drain at Little River Blvd	Concrete Rigid Frame (Bridge)	1975	---
2001	Colchester Townline Drain at 8 <sup>th</sup> Concession Road	Corrugated Steel Pipe Arch (Culvert)	Unknown	---
1	Lakewood Park over Lakewood Park Channel	Bowstring Pratt Truss (Bridge)	2016	---
2	Malden Road Over Pike Creek	Pratt Truss (Bridge)	2015	---

### Bridge Condition Index

The Bridge Condition Index (BCI) was developed by the Ministry of Transportation as a means of combining the inspection information obtained through the OSIM data into a single value. The BCI is calculated using asset management principals based upon the remaining economic worth of the structure. The value takes into consideration that the structure is composed of a number of distinct elements that begin at a certain condition from the point of construction or rehabilitation, and that deteriorate over time.

The index is a planning tool to assist the Town in scheduling improvements. The BCI is the ratio of current approximate value of a structure, to its estimated replacement cost and should not be used to rate or indicate the safety of a structure or an individual element.

The BCI is organized into ranges of **0** to **100**, where **100** would represent a newly constructed structure, free of any immediate repair needs. Generally the BCI ratings are considered as (i) **70 to 100** - 'good' condition; (ii) **60 to 70** - 'fair' condition; (iii) less than **60** - 'poor' condition.

The average BCI of 77.0 as calculated from the results of the 2018 Bridge and Culvert Needs Study indicates that the Town is maintaining their infrastructure in overall good condition. Current BCI values for each structure were compared to the BCI values from the previous four Needs Study Reports and are provided in Attachments No. 2 and 3.

### **Recommended Structure Improvements**

A total of five of the 18 structures investigated were identified with significant deficiencies, and rehabilitation of the structures within five years was recommended. These structures are listed below:

- Structure No. 1004 – Sullivan Drain at 12<sup>th</sup> Concession Road
- Structure No. 1013 – Merrick Creek Drain at 8<sup>th</sup> Concession Road
- Structure No. 1014 – Colchester Townline Drain at 6<sup>th</sup> Concession Road
- Structure No. 1028 – East Townline Drain at St. Thomas Street Bridge
- Structure No. 1029 – East Townline Drain at Little River Road Bridge

The rehabilitation of Structures No. 1004, 1013, and 1014 have recently been tendered and the works are anticipated to be completed by fall 2019.

Temporary repairs on Structure 1028 and 1029, consisting of large steel plates placed on the culvert to slab above the soffit deterioration were carried out in July 2016. These Structures are slated to be removed as part of the Manning Road Improvements Phase 2 which could take place as early as 2020.

Structure No. 1016 Collins Drain at Outer Drive, was the only structure identified needing rehabilitation within the six to ten year timeframe, which will include concrete repairs to the original culvert structure, waterproofing of the deck and full replacement of the asphalt surface. The estimated cost for this work is \$235,000.

### **Consultations**

Financial Services  
Dillon Consulting Limited

### **Financial Implications**

The 2018 Bridge & Culvert Needs Study (Structures with Spans > 3.0m) identified \$235,000 in recommended rehabilitations within the six to ten year timeframe. These recommended works will be incorporated within the Public Works & Environmental Services Capital Works Plan.

The Bridge Lifecycle Reserve is projecting deficits, of over \$1M, within the next six years due to recent and proposed bridge and culvert works. The annual \$390,000 allocation will likely be sufficient on a longer-term basis; however it is not enough to fund the existing backlog of work that was required over the previous number of years.

Administration will consider funding adjustments required to meet the near term funding shortfall as part of the 2020 budget process. Access to grants, other reserves, debt, increasing lifecycle allocations and deferring other projects will be considered.

## Link to Strategic Priorities

Applicable	2017-18 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 the Town of 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 the Town 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:

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

Reviewed by:

Luc Gagnon, CPA, CA, BMath  
Director Financial Services & Treasurer

Recommended by:

Margaret Misek-Evans, RPP, MCIP  
Chief Administrative Officer

<b>Attachment Number</b>	<b>Attachment Name</b>
1	2018 Bridge & Culvert Needs Study, Dillon Consulting Limited, Dated January 16, 2019 – Executive Summary
2	Bridge & Culverts Location Plan
3	Summary of Bridge Condition Index between 2003 and 2018
4	Bridge Condition Index Trends