

**CITY OF HAMILTON**

**CITY MANAGER'S OFFICE**  
**Audit Services Division**

<b>TO:</b> Chair and Members Audit, Finance and Administration Committee	<b>WARD(S) AFFECTED:</b> CITY WIDE
<b>COMMITTEE DATE:</b> June 11, 2012	
<b>SUBJECT/REPORT NO:</b> Audit Report 2012-02 - Bridge Maintenance Program (AUD12011) (City Wide)	
<b>SUBMITTED BY:</b> Ann Pekaruk Director, Audit Services City Manager's Office	<b>PREPARED BY:</b> Ann Pekaruk 905-546-2424 x4469
<b>SIGNATURE:</b>	

**RECOMMENDATION**

- (a) That Report AUD12011 respecting Audit Report 2012-02, Bridge Maintenance Program, be received;
- (b) That the Management Action Plans as detailed in Appendix "A" of Report AUD12011 be approved; and
- (c) That the General Managers of Public Works and Community Services be directed to instruct the appropriate staff to have the Management Action Plans (attached as Appendix "A" to Report AUD12011) implemented.

**EXECUTIVE SUMMARY**

The 2012 Internal Audit work plan approved by Council included an audit of the Bridge Maintenance Program. The audit included a review of processes used for the maintenance of the City's bridges including inspections, records and inventories, methodology used for assigning maintenance priorities and rehabilitation contracts and oversight controls. Recommendations were made to strengthen these processes and identify opportunities for administrative improvements.

The results of the audit are presented in a formal Audit Report (2012-02) containing observations, recommendations and management responses. Audit Report 2012-02 is attached as Appendix "A" to Report AUD12011.

***Alternatives for Consideration – Not Applicable***

**FINANCIAL / STAFFING / LEGAL IMPLICATIONS** (for Recommendation(s) only)

**Financial:** The implementation of recommendation two (Trails and Parks) is estimated to cost \$42,000 in additional funding to inspect bridges in these areas.

**Staffing:** None.

**Legal:** In order to undertake condition assessments for privately owned bridges over or under City roads or obtain inspection results from third party owners, the stipulations must be in the terms of the agreements between the City and the owners. Agreements would have to be re-drafted as requirements are not in all current agreements.

**HISTORICAL BACKGROUND** (Chronology of events)

The audit was scheduled as part of the 2012 Internal Audit work plan approved by Council. The audit fieldwork was completed in February 2012. The results of this audit are attached as Appendix "A" of Report AUD12011.

The Audit, Finance and Administration Committee receives and approves final audit and review reports as part of its responsibilities for the oversight of governance and control.

**POLICY IMPLICATIONS**

- Ontario Public Transportation and Highway Improvement Act - Regulation 104/97 Standards for Bridges.

**RELEVANT CONSULTATION**

Appendix "A" to Report AUD12011 includes action plans which reflect the responses of management responsible for the administration of bridge inspections in the City's Environment & Sustainable Infrastructure (ESI) Asset Management Division of the Public Works Department and the Recreation Division of the Community Services Department.

**ANALYSIS / RATIONALE FOR RECOMMENDATION**

(include Performance Measurement/Benchmarking Data, if applicable)

There are approximately 400 bridges and culverts owned by the City of Hamilton. The average expected life span of a bridge is 60 to 70 years. Factors that influence the lifespan include bridge design, materials used during construction, maintenance, volume of traffic, freeze/thaw cycle and exposure to salt used during the winter. Corrosion, cracking and other damage can all affect a bridge's load carrying capacity.

The Ontario Public Transportation and Highway Improvement Act (OPTHIA) Regulation 104/97 requires bridges with a span of greater than or equal to three meters to be inspected every two years. Third party structural engineers are hired under the roster system to conduct detailed visual inspections of bridges or culverts in accordance with regulation 104/97.

The audit found that the City has been compliant with Regulation 104/97 by inspecting its bridges every two years and taking appropriate corrective measures to rectify any issues that were identified. Inspection information is captured in the ESI Asset Management section's computerized management system (Ontario Bridge Management System or OBMS). These details help staff prioritize the maintenance requirements of the bridges.

A formal Audit Report (2012-02) containing observations, recommendations and resulting management action plans was issued. Five recommendations to improve the bridge maintenance program were included in Audit Report 2012-02 (attached as Appendix "A" of Report AUD12011). Among the recommendations are:

- City obtaining appropriate inspection documentation from the owners of privately owned bridges that cross over City roads;
- Bridges in the City's parks and on City golf courses and trails that carry vehicular traffic being inspected by a professional engineer;
- Inspection procedures for bridges at the parks, golf courses and trails being finalized; and
- Procedures for prioritizing bridge maintenance and rehabilitation being developed and clarified.

Management has indicated that obtaining inspection documentation from owners of private bridges over City roads is not within the provisions of most of the agreements with third parties and these bridges are not within the City's responsibility per the Regulation (i.e. out of scope). Management is hiring an engineer to inspect one of the private bridges and will undertake a condition assessment of the two pedestrian walkways as the applicable agreements have such terms. Bridges on trails and in parks will be inspected by City staff and an engineer will be hired, if necessary.

**ALTERNATIVES FOR CONSIDERATION**

(include Financial, Staffing, Legal and Policy Implications and pros and cons for each alternative)

Not applicable.

**CORPORATE STRATEGIC PLAN (Linkage to Desired End Results)**

Focus Areas: 1. Skilled, Innovative and Respectful Organization, 2. Financial Sustainability, 3. Intergovernmental Relationships, 4. Growing Our Economy, 5. Social Development, 6. Environmental Stewardship, 7. Healthy Community

***Financial Sustainability***

- ◆ Delivery of municipal services and management of capital assets/liabilities in a sustainable, innovative and cost effective manner.

**APPENDICES / SCHEDULES**

Appendix "A" to Report AUD12011

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**CITY OF HAMILTON  
INTERNAL AUDIT REPORT 2012-02  
PUBLIC WORKS - BRIDGE MAINTENANCE PROGRAM**

#	OBSERVATIONS OF EXISTING SYSTEM	RECOMMENDATION FOR STRENGTHENING SYSTEM	MANAGEMENT ACTION PLAN
1.	<p><u>Bridge Inspections</u></p> <p>The <i>Ontario Public Transportation and Highway Improvement Act</i>, Regulation 104/97 Standards for Bridges, requires all bridges that are part of the road allowance (i.e. cross over City roads) to be inspected biennially under the direction of a professional engineer. Public Works has ensured that all of the 392 City owned bridges have been inspected and any required maintenance or repairs were promptly completed.</p> <p>However, there are three known privately owned bridges crossing over roads whose inspection within the past two years has not been verified by the City. One of these bridges is scheduled to be inspected by the City during 2012 (Cootes Drive). The City has not ascertained if the owners of the other two privately owned pedestrian bridges (King Street West, York Boulevard) have had them inspected as per the Act.</p> <p>Without the verification and proof of inspections, the City runs the risk of not being able to prove its compliance with the regulations. Inspections help reduce the potential liability from falling debris or crumbling structures.</p>	<p>That the City obtain appropriate documentation from the owners of private bridges in order to verify that the structures were inspected and maintained in accordance with the <i>Ontario Public Transportation and Highway Improvement Act</i>.</p>	<p>Disagreed. These bridges/structures do not form part of the road allowance and thus, are out of scope. They are not the City's responsibility as the City does not inspect assets, structures, etc. that it does not own. Further, the OPTHIA (Reg 104/97) only requires inspection by the authority that caused the structure to be built (i.e. the owner).</p> <p>The City has several privately owned bridges (CNR, CPR, MTO, etc.) that cross over or under City roads that the owner will not provide and has no duty to provide any information with regard to the condition unless by agreement.</p> <p>City Facilities will be undertaking the condition assessment of the two pedestrian walkways (King Street West and York Boulevard) as they are required by agreement.</p>

**PUBLIC WORKS - BRIDGE MAINTENANCE PROGRAM  
MARCH 2012**

#	OBSERVATIONS OF EXISTING SYSTEM	RECOMMENDATION FOR STRENGTHENING SYSTEM	MANAGEMENT ACTION PLAN
2.	<p><u>Bridges – Golf Courses, Trails and Parks</u> In addition to the 392 City owned bridges that are part of the road allowance, there are 52 bridges in the two City-owned golf courses and in public parks and trails that are maintained by the staff of the respective facilities. There currently is no legislated requirement for a professional engineer to inspect these bridges on a periodic basis. However, 12 of these bridges are used by vehicles. The wear and tear on the structures by vehicular traffic increases the risk of accidents and injury that may occur should the bridges fall into a state of disrepair.</p>	<p>That vehicular bridges in the City's parks and on golf courses and trails be inspected at periodic intervals by a professional engineer.</p>	<p><u>Golf Courses</u> Agreed. Management will confirm with a Professional Engineer to have the two vehicle bridges on the golf courses inspected at periodic intervals. The cost of \$1,000 to have the vehicle bridges inspected is within the Golf Course Operating Budget. To be completed by November 2012.</p> <p><u>Trails &amp; Parks</u> Disagreed. There is no legislated requirement for this and thus, the inspections are out of scope for the Department. The estimated cost to have engineers inspecting the 12 vehicular bridges is \$42,000.00, which would require Council approval for an increase in the Parks' budget (assuming these bridges are in parks). However, management does agree that inspections of bridges by staff are to be performed at periodic intervals. Based on demonstrated need through these inspections, an engineer will be hired on a case-by-case basis.</p>

**PUBLIC WORKS - BRIDGE MAINTENANCE PROGRAM  
MARCH 2012**

#	OBSERVATIONS OF EXISTING SYSTEM	RECOMMENDATION FOR STRENGTHENING SYSTEM	MANAGEMENT ACTION PLAN
2.	<p><u>Bridges – Golf Courses, Trails and Parks (Cont'd.)</u> There is no finalized procedure for the inspections of the bridges at the golf courses, trails and parks to ensure they are safe and properly maintained. Without appropriate guidelines and expectations, it may be difficult for management to hold staff accountable for such work. In addition, new staff would not have consistent, written guidelines to which they could refer.</p>	<p>That management finalize and approve the procedures for inspections of the bridges at the golf courses, trails and parks. Once issued, these documents should be reviewed on a regular basis (annually) and revised, as required.</p>	<p><u>Golf Courses</u> Agreed. Management will finalize and approve the procedures for inspections of the bridges at the respected golf courses. The documents will be reviewed on a regular basis (annually) and revised, as necessary. To be completed by November 2012.</p> <p><u>Trails &amp; Parks</u> Agreed. The procedure for bridge inspection is currently being developed and implementation is to begin in the summer of 2012. A full assessment of all the parks' and trails' bridges is being conducted in 2012 by Asset Management.</p>

**PUBLIC WORKS - BRIDGE MAINTENANCE PROGRAM  
MARCH 2012**

#	OBSERVATIONS OF EXISTING SYSTEM	RECOMMENDATION FOR STRENGTHENING SYSTEM	MANAGEMENT ACTION PLAN
3.	<p><u>Procedures for the Prioritization of Bridge Projects</u></p> <p>The Asset Management section of the Environment and Sustainable Infrastructure (ESI) division has developed a procedure explaining how bridge projects requiring rehabilitation or replacement are prioritized. However, there are a variety of factors which are considered when deciding on which projects to complete first. The procedure does not provide for a weighting of factors and ESI management and staff use their experience and judgment when applying the factors.</p> <p>The Operations and Maintenance section of Roads Operations division, which primarily deals with or oversees repairs and maintenance under \$50,000, does not have a procedure that includes how it prioritizes the bridge work that it undertakes.</p> <p>When there are unclear or no written procedures to refer to, the employee carrying out the process relies on personal understanding and experience which could result in incorrect, incomplete or inconsistent application. It would also be problematic and inefficient for a successor to commence his/her duties within a short period of time.</p>	<p>That the ESI Asset Management section clarify the existing procedure for selecting and prioritizing the bridge projects requiring rehabilitation or replacement by including detailed factors and their weighting, as needed.</p> <p>That the Operations and Maintenance section develop and implement a detailed procedure that includes the process for prioritizing the bridge projects requiring maintenance.</p>	<p>Agreed. The process is on-going and will be completed by the end of Q3, 2012.</p> <p>Agreed. The Operations and Maintenance section will prepare a procedure which formalizes their current approach of using provincial best management practices and professional judgment.</p>