



***Transportation Services – Traffic Signals  
and Illuminations Maintenance Audit  
July 2019***

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## 1.0 Management Summary

Audit Services has completed an audit of Transportation Services – Traffic Signals and Illuminations Maintenance. The review was performed to determine if the Region is in compliance with the relevant sections of the Municipal Act 2001, Ontario Regulation 239/02 - Minimum Maintenance Standards for Municipal Highways as it relates to traffic signals and subsystems and road illuminations under the Region's jurisdiction.

The assessment also included a review of contract T-15-92 Traffic Signals and Illuminations Maintenance. This contract governs the delivery of routine / planned work, service delivery expectations for locates and high / low priority repair work assigned by the Region.

Our audit was conducted in accordance with the *International Standards for the Professional Practice of Internal Auditing*.

Based on the work Audit Services performed, it was concluded that the Region is generally in compliance with the relevant sections of the Minimum Maintenance Standards for routine maintenance activities involving traffic signals and subsystems and road illuminations. Resolving locates as per the Ontario One Call requirements are also being met. Emergency work is identified as high priority which requires contractor response within stipulated contract time limits.

Opportunities for improvement were noted that included tracking of response times as per contract T-15-92 for contractor performance management purposes, preparing reconciliations for planned / routine work to help confirm all applicable locations were maintained and ensuring maintenance documentation is submitted by the contractor on a timely basis. Obsolete inventory at the contractor's location should also be reviewed for potential disposal.

Strengths noted during our review included knowledgeable and experienced management and staff that help to ensure the Region remains Minimum Maintenance Standards compliant. Implementation of CityWorks is scheduled in early 2020 to replace the limited functionality of the current Traffic Operations System. CityWorks will provide new management reporting and work scheduling capabilities to help ensure ongoing routine maintenance programs continue being delivered on a consistent basis. Requested emergency repair documents were readily available. Timeline requirements for locate requests were in compliance with legislation.

Should the reader have any questions or require a more detailed understanding of the risk assessment and sampling decisions made during this audit, please contact the Director, Audit Services.

Audit Services would like to thank Transportation Services – Traffic Signal Operations staff and management for their co-operation and assistance provided during the audit.

## 2.0 Introduction

Traffic Signals Operations, within the Roads and Operations Branch of Transportation Services, is tasked with overseeing that:

- Traffic signal systems and subsystems are routinely inspected and repaired at least semiannually.
- Street lights are maintained through monthly patrols.
- The Region's railway traffic warning systems are maintained as per the Region's Traffic Signal Illumination Maintenance Contract best practices on a quarterly basis.
- Flashing beacons are inspected annually and performing illuminations maintenance at York Region Transit transit terminals.
- Emergency or high priority work is completed as per contract requirements and locates are performed in a timely manner as per Ontario One Call.

These tasks are accomplished through an intake process that includes Traffic Signals Operations issuing work orders for routine / planned maintenance; concerned citizen contacting the Region with concerns; York Region Police and internal staff. Whether routine maintenance or intake from other sources, all work is keyed into Traffic Operations System. A work order is created and sent to our contractor to perform the work and report back to the Region as to the resolution. As per the contract, for low priority work the time to resolve the issue is 10 days for permanent repairs. For high priority work the expected response time to the work site is 90 minutes. The contractor then has one hour to make the site safe, and 24 hours for permanent repairs. During storm episodes a recalculation of those times may provide the contractor with more time to respond.

Whether routine / planned or high / low priority work is being performed, the work is captured on a Traffic Signal Maintenance Record. This record is manually completed by the contractor. The maintenance record will contain information that includes:

- Date and time the call for work was received, date and time of arrival at the work site and date and time of departure.
- Name of the contractor employee performing the work.
- If the work was a permanent repair or a temporary fix. In cases of a temporary fix, a new maintenance record will be needed for the permanent repair.
- Geo-location for the asset in need of repairs.
- Materials, labour, equipment used.

The maintenance record provides the Region with evidence that the Minimum Maintenance Standards are being met. All completed work orders must be supported by this maintenance record.

Routine / planned maintenance work captured on the maintenance record includes:

- Semiannual intersection inspections and conflict monitoring checks – this is a Minimum Maintenance Standards requirement.

- Bimonthly patrols of illuminations under the Region’s jurisdiction – the Minimum Maintenance Standards are for annual inspection, however to even out the work flow to the contractor, the Region cycles the luminaire inventory six times per year.
- Annual flashing beacon inspections are a requirement of the Region’s Traffic Signal and Illumination Maintenance Contract.

Paper copies of maintenance records are submitted to the Region by the contractor for payment purposes. An electronic version of the maintenance record, prepared by the contractor, is also uploaded into the Transportation Operations System. This system is a relatively simple Microsoft Access based asset inventory and work order system. It was initially developed in the 1990s, and is lacking many current day management controls such as capturing who enters / deletes / changes data. Management reporting capabilities are very limited and cannot be provided without a high degree of manual effort to extract data and prepare that data into a usable report. The system cannot be used to preload routine maintenance for automatic issuance at a set time.

CityWorks will be replacing the Transportation Operations System in early 2020. CityWorks will provide many scheduling and management reporting features not currently available.

Based on our review, locates are in compliance with legislation. Locates are currently processed through CityWorks through the Dispatch Office. A record of the locate request is also entered into the Transportation Operations System. Management reporting of the numbers of locates processed and time taken to process was readily available. As per the legislation, the required delivery time for a locate to be performed is 5 days. However this can vary depending on the requesting contractor’s anticipated dig date or alternate agreement between the Region and the requesting contractor.

We estimated that 92% of locates were completed at 60 days and emergency locates accounted for 4.4% of total locates for 2018.

## **3.0 Objectives and Scope**

### **AUDIT OBJECTIVES**

The objectives of this engagement were to:

- Determine how the work covered in the contract is assigned to ensure:
  - Legislative requirements are met for luminaries, traffic control signal systems and traffic control signal sub-systems.
  - Routine maintenance is adequately performed for flashing beacons and York Region Transit transit terminal illuminations.
  - Emergency work and utility locates are performed on a timely basis.
- Determine how the work is issued, monitored and approved for invoice payment.
- Determine if there are adequate internal controls over new, reclaimed and discarded inventory.
- Determine if records for each signalized intersection are complete and readily accessible.

## **AUDIT SCOPE**

The audit objectives were accomplished through:

1. A review of the applicable sections of the Municipal Act 2001, Ontario Regulation 239/02 - Minimum Maintenance Standards for Municipal Highways.
2. A review of contract T-15-92 to determine contract requirements for the work.
3. A review of the intake and tracking process for complaints to final resolution.
4. A review of a sample of payments of invoices associated with the work.
5. A review of physical parts inventories and inventory records.

## 4.0 Detailed Observations

### 4.1 Tracking and reporting of contractor times

#### Observation

For high and low priority work Traffic Signals Operations does not currently track contractor notification, response and work completion times, nor does it require the contractor to call into the Dispatch Office to record arrival and work completion times. These times are currently self-recorded by the contractor on the maintenance record.

Self-recording arrival and departure times without verification cannot ensure that time reporting is being captured accurately.

The Region's contract states that the Region may apply liquidating damages per occurrence where the contractor has not responded to or completed the work within a set period of time.

The Traffic Operations System has the facility to collect and process time information if the data is uploaded from the contractor.

A review of 25 high priority non storm related work assignments dated 2019 revealed that in approximately 10 assignments (40%) response times were greater than the 1.5 hours allowed by the contract. There were 2 work assignments, or 8%, where we could not determine the response time.

#### Recommendation

The contractor should be required to call into the Region's Roads and Traffic Operations Centre to record arrival and departure times for high and low priority work. This would help to ensure that times are captured accurately.

Contractor notification, arrival and departure times to and from work sites should be reviewed as a vendor performance management tool. Management benchmarks for acceptable response times are stipulated in the contract.

Management should investigate management reporting for this function under CityWorks.

#### Management Response

Although there are opportunities for improvement in the existing tracking process for documenting contractor arrival and departure times, past practice has not resulted in any damages by or against the Region resulting from recorded response times. The contractor has operated and was compensated in accordance with the terms of the contract.

Management will explore resources and methods to allow for tracking of arrival and departure times for high and low priority work, through the Region's Roads and Traffic Operations Centre.

Management reporting function under CityWorks to be investigated for implementation by year-end 2020 and in time for new contract to commence April 2021.

## 4.2 Formal reconciliations for routine maintenance

### Observation

Reconciliations for routine maintenance work are not being prepared to help ensure all locations requiring maintenance have been accounted for and recorded correctly into the Transportation Operations System.

#### ***Conflict Monitor Check and Intersection Inspection***

Based on our review of records submitted for conflict monitor checks and intersection inspections, we noted that the spring and fall maintenance routines for 2016, 2017, 2018 and spring 2019 inventory numbers rarely matched. Each signalized intersection contains one conflict monitor. Thus if 842 intersections were maintained, then 842 conflict monitors would have also been maintained.

Further review noted that the conflict monitor checks and intersection inspections had occurred, and maintenance records had been collected for these maintenance periods; however the work was incorrectly entered as illumination relamp / clean repair codes. This repair code was created for an ongoing group re lamping project.

#### ***Flashing Beacons Inspection***

A review of records for flashing beacons inspections noted that maintenance records had not been collected for 2017 and 2018. The work had been issued by the Region and the work had been performed by the contractor, however the contractor had not submitted the maintenance documents.

#### ***Repair codes for Luminaire Patrols and Flashing Beacon Inspections***

A review of records for luminaire patrols and flashing beacon inspections noted that repair codes for these two activities are being uploaded into the Transportation Operations System under the repair codes for illumination relamping and cleaning, and, flashing beacon inspections to indicate that the work has been performed. Luminaire patrols should not be keyed under the illumination relamping and cleaning repair code, and, the flashing beacon inspections repair code does not actually exist.

Luminaire patrols from 2016 to present day were being uploaded into the system under the repair code for illumination relamping and cleaning. Prior to 2016 the repair code for monthly patrols was 229. This appears to have happened when the current contractor assumed the responsibility of the maintenance contract.

The repair code “FBI” for flashing beacons inspections has been uploaded since 2013.



***Rail Pre-emptive testing***

A review of rail pre-emptive testing as of May 2019 noted that these tests had not been performed for 2019. Rail pre-emptive testing should be performed quarterly in accordance with the Region's Traffic Signal and Illumination Maintenance Contract best practices. There are three locations within the Region where railway crossings occur at a signalized intersection and are at grade. One of the four tests performed annually also requires a member of the railway authority to be present.

Records show the rail pre-emptive testing was compliant with the annual testing with the Railway Authority.

**Recommendation**

A formal reconciliation of conflict monitor checks, intersections inspections, flashing beacon inspections and luminaire patrols should be performed at the end of every maintenance period. This will help to ensure the correct number of locations had maintenance performed, were keyed into the system correctly and the maintenance records were submitted.

Management should ensure that all flashing beacons inspection records are collected and clarify the acceptable repair codes for each of these routine inspections with the contractor.

Management should ensure that all rail pre-emptive testing occurs as required by the Region's Traffic Signal and Illumination Maintenance Contract best practices.

Management should also investigate automating the scheduling of this testing in CityWorks.

**Management Response**

Although there are opportunities for improvement in reconciling routine maintenance activities, existing records have not resulted in any damages by or against the Region. The contractor was compensated in accordance with the terms of the contract.

Implementation of CityWorks will assist management with reports to reconcile planned maintenance activities at the end of each maintenance period (complete end of Q3- 2020).

Management has requested the Contractor enter the flashing beacons inspection records into the system as individual maintenance entries (individual entries to be completed by end of Q1-2020).

Work Order for rail pre-emptive testing was issued to Contractor to ensure testing occurs as required by the Region's Traffic Signal and Illumination Maintenance Contract. Automated scheduling of this testing through CityWorks will be explored in 2020.

### **4.3 Reassessing the requirement to collect private information at accident sites**

#### **Observation**

As per the current contract, the contractor is required to collect driver information in situations where a Regional asset has been damaged and the driver of the vehicle is still at the accident scene. As per discussion with the Corporate Services - Access & Privacy Office, the requirement to collect driver information from a driver in a personal vehicle (not a commercial vehicle) cannot be performed unless the Region supplies the contractor with formal information re the authority of the Region to collect that information.

#### **Recommendation**

Management should determine if the collection of private driver information by the contractor is necessary. If so, management should, through discussion with the Corporate Services - Access & Privacy Office, consider supplying the contractor with a notice from the Region re the authority of the Region to collect the information.

If not necessary, management should formally communicate to the contractor to refrain from collecting personal information from drivers of non-commercial vehicles.

Collection of driver information from a commercial vehicle would still be valid.

#### **Management Response**

Collection of private driver information by the Contractor is not necessary. Management will instruct the Contractor not to carry-out this activity. This requirement in the specifications (Section 8.0 Preparation of Service Logs) will be removed from future Traffic Signal and Illumination Maintenance contracts.

### **4.4 Inventory deemed old and obsolete**

#### **Observation**

The contractor is currently maintaining a large supply of old and obsolete Region owned equipment for spare parts. These parts are for older controller cabinets at some intersections. The Region has determined that this equipment is obsolete and should be disposed.

#### **Recommendation**

Management should determine a reasonable number of spare parts to keep, considering that the older model controller cabinets are being replaced every year and there is a decreasing number of older cabinets in service. Once that number is determined, management should ensure the contractor disposes of any excess parts.

### **Management Response**

Management will determine the number of acceptable spare parts and instruct the Contractor to dispose of excess quantities by end of 2020.

## **4.5 Electronic devices to automate the work order to resolution process**

### **Observation**

Once a work order is created and sent to the contractor there is a fair amount of manual effort to upload the data collected as the work order is resolved:

- Time capture is manual and not always accurate. During testing of 30 high priority work orders we noted that time of day was being captured in different ways or missed altogether.
- Using incorrect repair codes, as noted in Observation 4.2.
- In order for maintenance record information to be uploaded into the system it must first be transcribed by the contractor from the paper maintenance record into an electronic version of the maintenance record. Times of arrival, departure times, dates, repair codes, comments from the contractor employee about the work performed are a few elements needing to be transcribed.
- The paper maintenance record must then be agreed to the electronic version before being uploaded into the system. Any noted errors require additional uploads to correct the error.

### **Recommendation**

Management should investigate the use of electronic devices (tablets, smartphones) to automate and replace the current manual steps required for the Transportation Operations System. The expansion of CityWorks capabilities into Traffic Signal Operations provides an opportunity to automate many of the manual steps involved in the capture of data relating to the maintenance of transportation assets. To help ensure all data collected is complete and accurate, drop down menus also can be incorporated to match problem codes to repair codes.

### **Management Response**

Management will investigate the use of electronic devices under CityWorks, if feasible, to automate maintenance information with a goal to implement in Traffic Signal and Illumination Maintenance Contract by end of 2022.

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