November 26, 2015

Mayor, Members of Audit Committee and Council:

I am pleased to present the Annual Report of the Office of the Auditor General of the City of Ottawa.

Respectfully,

Ken Hughes
Auditor General
Staff of the Office of the Auditor General

Suzanne Bertrand
Sonia Brennan
Alina Chimet
Ken Hughes
Ed Miner
Janet Onyango
Louise Proulx
Lise Renaud
Margaret Sue
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Overview of Activities

In 2015, we completed audits and follow-ups that were in process at the end of 2014. We also began working on audits and follow-ups that had been previously approved by Council. Due to the election in the fall of 2014 we submitted our Annual Report and 2015 Annual Audit Work Plan to Audit Committee in March. Our Annual Report on the Fraud and Waste Hotline was presented to the Audit Committee in June. In October we presented Follow-up reports to the Audit Committee. We completed and updated the City-wide comprehensive risk analysis, an assessment of the City’s programs and services against specific selection criteria and risks. This is an important tool for auditors to assist in the determination of and related priority of the areas to be audited. In preparation for the development of the 2016 Annual Audit Work Plan (AAWP) we met with City Councillors and senior City staff to discuss the areas proposed for the plan. The proposed 2016 AAWP is presented to the Audit Committee at the same time as this Annual Report.

Eight new audits and were also completed since my last report in March. These include:

- Audit of 3-1-1 Contact Centre
- Audit of Accounts Payable
- Audit of Infrastructure Services - Administrative Management
- Audit of Infrastructure Services – Technical Management
- Audit of IT Risk Management
- Audit of IT Security Incident Handling and Response (presented in camera)
- Audit of Species at Risk
- Audit of Winter Operations – Capacity Planning and Performance Measurement

In addition, as the related litigation is concluded, the following audit is also presented:

- Audit of Mackenzie King Bridge Resurfacing

It should be emphasized that recommendations arising from audits represent the Auditor General’s suggested course of action to resolve the issues identified, however, once these recommendations and management responses are approved they become direction from Council. As such, progress in implementing these recommendations has been viewed as fulfilling Council’s direction.
As audits are developed, depending on the nature of the findings, it may be more suitable to issue some related audit elements in separate reports, for example, less significant issues may also be addressed through the issuance of management letters provided directly to management. Since the last report to the Audit Committee, we have issued three management letters.

Based on the advice of the City Clerk and Solicitor, the following audit will be presented once any related arbitration and/or litigation are concluded:

- 2011 Audit of the Procurement Process – Springhill Landfill

**Fraud and Waste Hotline**

The City’s Fraud and Waste Hotline is an anonymous and confidential vehicle for City staff and the general public to report suspected fraud or waste. Our Office continues to be responsible for the administration of the City’s Fraud and Waste Hotline which is available for employees as part of the City’s Fraud and Waste Policy. Our Office reviews all cases submitted through the Hotline, however Council approval would be sought prior to conducting any specific audits that might arise from these reports. The bulk of the investigations related to the reports are done by City management and reviewed by the OAG. There has been a significant increase in the number of reports to the Hotline. The OAG resources required to support the hotline has now reached 2 full FTE’s or significantly higher at times due to higher case volume and the nature of cases. In 2015 we conducted a review of the Hotline to determine if any operational enhancements were required or feasible. We implemented a number of enhancements to the hotline and we will be issuing a full report of the Hotline’s activity at a future Audit Committee meeting.

**Tabling Protocol**

The Auditor General reports directly to Audit Committee, a standing Committee of Council and reports annually on all audit reports completed during the course of the year. This is generally to be done in the fall, unless it is an election year, in which case the report would be deferred until after the new Council has completed budget deliberations for the year. In addition to presenting audit reports annually, we will also present a report on the activity of the Fraud and Waste Hotline. This will generally be done mid-year. Our Office also conducts follow-ups on previously completed audits. These follow-ups present an evaluation of management’s progress in implementing previous audit recommendations. Follow-ups will be presented as they are completed, generally once or twice a year. This will allow the Audit Committee to focus discussion on this significant activity.

The by-law governing the OAG can be found in Appendix A.
**Budget**

Beginning in 2012, the annual budget for the Office of the Auditor General is in accordance with the budget strategy for the Term of Council. The 2015 budget for the City of Ottawa Auditor General’s Office was $1,751,000.

Table 1 below compares the 2015 audit budgets of major Canadian municipalities. The City of Ottawa Auditor General’s Office budget, as a percentage of the municipal operating budget is 0.06%. Notwithstanding differences between audit functions, compared to other major Canadian cities, the City of Ottawa Auditor General’s Office budget is below the group average of 0.08% and median of 0.07%.

It should be noted that there are some differences in the functions undertaken by the various audit organizations in the table. These include:

- The City of Ottawa Auditor General’s Office is responsible for the administration of the City’s Fraud and Waste Hotline. Not all the audit organizations in the table operate, and therefore incur, the costs associated with administering a Fraud and Waste Hotline.

- Although the City of Toronto Auditor General does not conduct the attest audit, the related external audit fees are included within their Office’s operating budget. The City of Toronto also has a separate Internal Audit Division which reports to the City Manager and this is included in the table below.
<table>
<thead>
<tr>
<th>Municipality or Regional Municipality</th>
<th>Land area (km²)</th>
<th>Population</th>
<th>2015 Municipal Gross Operating Budget ($000s)</th>
<th>2015 Audit Gross Operating Budget ($000s)</th>
<th>Audit Budget as a % of the Municipal Operating Budget</th>
<th>2015 FTEs</th>
</tr>
</thead>
<tbody>
<tr>
<td>Toronto</td>
<td>630</td>
<td>2,800,000</td>
<td>11,500,000</td>
<td>5,851</td>
<td>0.05%</td>
<td>37.5</td>
</tr>
<tr>
<td>Ottawa</td>
<td>2,790</td>
<td>952,000</td>
<td>3,073,000</td>
<td>1,751</td>
<td>0.06%</td>
<td>8</td>
</tr>
<tr>
<td>Vancouver</td>
<td>115</td>
<td>604,000</td>
<td>1,223,000</td>
<td>724</td>
<td>0.06%</td>
<td>5</td>
</tr>
<tr>
<td>Calgary</td>
<td>825</td>
<td>1,231,000</td>
<td>3,500,000</td>
<td>2,324</td>
<td>0.07%</td>
<td>14</td>
</tr>
<tr>
<td>Greater Sudbury</td>
<td>3,227</td>
<td>164,000</td>
<td>512,000</td>
<td>350</td>
<td>0.07%</td>
<td>2</td>
</tr>
<tr>
<td>Edmonton</td>
<td>684</td>
<td>878,000</td>
<td>2,362,000</td>
<td>2,274</td>
<td>0.10%</td>
<td>14</td>
</tr>
<tr>
<td>Halifax</td>
<td>5,490</td>
<td>418,000</td>
<td>869,000</td>
<td>965</td>
<td>0.11%</td>
<td>10</td>
</tr>
<tr>
<td>Montreal</td>
<td>365</td>
<td>1,900,000</td>
<td>4,883,000</td>
<td>6,023</td>
<td>0.12%</td>
<td>34</td>
</tr>
<tr>
<td>Winnipeg</td>
<td>464</td>
<td>709,000</td>
<td>994,000</td>
<td>1,230</td>
<td>0.12%</td>
<td>7</td>
</tr>
</tbody>
</table>

Note: FTEs: Full-time equivalents

- Toronto includes the Office of the Auditor General ($4,717,000 & 29.5 FTEs) and Internal Audit ($1,134,000 & 8 FTEs). Office of the Auditor General budget includes external audit fees related to the attest audit. Audit Gross Operating Budget does not include approved 2015 Capital Budget for new Fraud & Waste Hotline case management system ($565,000) or audit management software ($130,000).

- The minimum funding level for the Auditor General’s Office is defined in the Cities and Towns Act of Quebec where the OAG is also responsible for the attest audit. In Quebec the budget of the OAG is mandated to be at least 1% of the total budget of the municipality. They generally range from 1.11% to 1.7% of the gross municipal budget.
Executive Summaries of each Audit

The following section presents executive summaries for each of the following audits. As per protocol, the AG is required to report on any audit recommendation where management and the OAG disagree. For this reporting period, there were no disagreements.

- Audit of 3-1-1 Contact Centre
- Audit of Accounts Payable
- Audit of Infrastructure Services - Administrative Management
- Audit of Infrastructure Services – Technical Management
- Audit of IT Risk Management
- Audit of Mackenzie King Bridge Resurfacing
- Audit of Species at Risk
- Audit of Winter Operations – Capacity Planning and Performance Measurement

Acknowledgement

We wish to express our appreciation for the cooperation and assistance afforded the audit team by management.
Audit of 3-1-1 Contact Centre

Introduction
The Audit of 3-1-1 Contact Centre was included in the 2014 Audit Plan of the Office of the Auditor General (OAG), approved by Council on March 26, 2014.

Background
The 3-1-1 Contact Centre (3-1-1), the City’s centralized contact centre is part of the Client Operations branch of the ServiceOttawa department. It provides information to residents, businesses and visitors about City programs, services, policies, procedures, permits, fee structures, etc. 3-1-1 is open 6 days a week for all types of inquiries and services (by telephone and by e-mail), and 24/7 for urgent requests (e.g., traffic lights not functioning, broken water mains and By-law complaints).

In 2014, 3-1-1 created approximately 250,000 service requests received by telephone and e-mail and answered 500,000 calls from both internal and external clients. It operated with 30.4 FTEs (agents, senior agents, coordinators) and had an operating budget of $2.4 million.

Two of the ServiceOttawa department’s branches directly support 3-1-1: Knowledge and Web Services (KWS) and Quality Assurance and Continuous Improvement (QA&CI). The KWS branch ensures the content of the knowledge base, the City’s centralized source of information, is accurate and up-to-date. The QA&CI branch is responsible for 3-1-1’s quality assurance programs. It tracks and monitor clients’ satisfaction through “client surveys” and monitors the accuracy and completeness of the information provided by phone through a “listen-in” program.

Audit Objectives
The objectives of the audit were to:

- Assess the adequacy of the processes used to notify individual Councillors of emerging issues within their ward.
- Assess the adequacy of the performance management system, including quality assurance.
- Assess the adequacy of the management of wait times; and, timeliness of email responses.
- Assess the accuracy of information provided by the 3-1-1 Contact Centre.
- Assess if 3-1-1 utilizes its resources efficiently and effectively to provide optimal customer-service.
Assess the implementation of support systems (i.e., CSM or Lagan and WFO or Verint) as they pertain to 3-1-1.

Assess the status of implementation of the 2007 Audit of the 3-1-1 Contact Centre recommendation (incomplete during the 2009 Follow-Up Audit) “That 3-1-1 management follow through on Council’s direction to investigate the possibility of outsourcing the 3-1-1 Contact Centre.”

Summary of Key Findings
During the audit, we noted the following findings related to:

- Notification to Councillors of emerging issues;
- Quality Assurance process;
- Service level for phone calls: calculation and reporting;
- Reporting the number of requests for service (Service Requests);
- Service level for email requests;
- Wait time management;
- Accuracy of articles in the knowledge base – the City’s centralized source of information;
- Accuracy of the information provided to callers by the 3-1-1 agents;
- Resource (staff) utilization;
- Workforce Optimization software (WFO) and Citizen Services Management (CSM) system implementation;
- The possibility of outsourcing the 3-1-1 Contact Centre; and
- Occupational Health and Safety.

Notification to Councillors of emerging issues
Practices and Standard Operating Procedures (SOP’s) in three operating departments relating to notifying Councillors of emerging issues in their wards are clear, consistent and adequate, if adhered to. However, Drinking Water Service’s notification SOPs are not being adhered to for planned outages, a situation that is being remedied.
The Office of the Emergency Management’s role in notifying Councillors of issues is clearly set out in program and procedure documents.

Currently the information shared with the Councillors comes daily via Councillor Consent reports and is filtered depending if the caller has agreed to share the service request (SR) information with the Councillor or not. There are opportunities to use the Open Data database for notifications as it contains complete information on all the SRs without personal information of the requestor.

3-1-1 agents do not consistently ask callers for their email address and whether the information from the SR can be shared with their Councillor, decreasing the number of the SRs that are shared via Councillor Consent reports.

Quality Assurance Process

Overall, most callers are satisfied with the 3-1-1 service as indicated by the surveys taken by callers after the end of the call (IVR survey, offered to every second caller). However, there are periods when callers are less satisfied and this information is not currently reported at ServiceOttawa’s departmental management team meetings.

The quality assurance process in place is adequate, where the QA analysts are listening and scoring calls taken by different agents. However, the call selection for the “listen-in” process is random with no weighting given to agents’ past performance.

Service level for phone calls: calculation and reporting

3-1-1’s service level target is to answer 80% of calls within 120 seconds. This service target has not been formally approved and no support was provided for why this service level was selected.

Calls that are abandoned (hang-ups) within the first 120 seconds are treated as answered calls in the Semi-Annual Performance Report to Council, providing a potentially misleading view of performance. Abandoned calls are not otherwise disclosed or analyzed in the service level reports to Council.

Reporting of total number of requests for service

The process for compiling the SR information presented in the Semi-Annual Performance Report to Council is manual, time-consuming and prone to human error as it involves combining data from multiple systems. As a result
the figures presented in the Semi-Annual Performance Report to Council with regards to the service requests contained a number of small errors.

Service level for email requests

- There are 2 different service levels for emails, one for the general public (5 business days) and another for the Councillors (2 business hours). Neither of these service levels have been approved and they were not regularly achieved in 2014.

- The vast majority emails are responded to during business hours and are not assigned to agents working shifts outside of business hours. Agents working outside business hours may have the capacity to respond to more emails and improve the response times.

Wait time management

Wait times impact on customer satisfaction and service level performance. During our 12 “listen-in” sessions, wait times varied from 0 to 16 minutes. 3-1-1 has no consistent practices nor written procedures with thresholds to manage the wait times on a continuous basis to ensure consistency of response.

Accuracy of articles in the knowledge base— the City’s centralized source of information

- The knowledge base is the repository for the roughly 1,900 articles that are the primary source of information for 3-1-1 agents. The information in knowledge base articles is reviewed for accuracy by subject matter experts and channeled through a network of staff who are Single Points of Contact (SPOCs). SPOCs are responsible to ensure that all of their applicable knowledge base articles are up-to-date and accurate. However, some of the SPOCs were given this responsibility without being provided with access to the knowledge base or being given a list of the articles they are responsible for.

- The articles in the knowledge base should be reviewed regularly to ensure they remain accurate. A sample of articles was confirmed with the SPOCs and 60% of the articles were inaccurate, not up-to-date or no longer needed, increasing the risk that 3-1-1 agents could provide the wrong answers to callers.

- Some of the articles in the knowledge base include hyperlinks to other internal or external sources, as well as the link to the article in the other official language. Testing found that hyperlinks did not function for 14% of the
information links and 8% of the language links. This increases to risk of longer calls as 3-1-1 agents need to use other sources to find the information that the caller requires.

Accuracy of the information provided to callers by 3-1-1 agents

- During our 12 “listen-in” sessions we were impressed with 3-1-1 agents’ knowledge and experience as they were able to respond easily and quickly to a broad range of questions. However, perhaps as a result agents respond to most calls without accessing the knowledge base. 3-1-1 management relies on the agents accessing the knowledge base to ensure that they provide up-to-date information.

- Training of agents was reviewed and no issues were found. All new agents had taken the core training program, all agents were receiving coaching sessions and mandatory training relating to accessibility, health and safety, WHMIS, etc. was complete.

- Some callers need to be transferred to the Social Services or the Tax and Water Billing and Collection call centre. However, 6% of all calls were transferred back to the IVR (Interactive Voice Response) instead of directly to these other lines. Once transferred to the IVR, the caller has to select the applicable line. This process results in a longer call for the caller but gives the agent a ten-second “break” between calls.

Resource (staff) utilization

- 3-1-1 was not fully staffed in 2014 with an FTE vacancy rate of 10%. This may have been one of the reasons that the Client Operations branch overspent its overtime budget in 2014. It may also have been a factor in why 3-1-1 employees took more sick leave days than the City of Ottawa average and had 14% employee turnover.

- The Contact Centre had one unbudgeted casual position in 2014, however during the year casual employees collectively worked hours that were equivalent to 3.7 FTEs. Therefore the use of casual agents is not accurately reflected in the 3-1-1’s financial budget.

- The agents working the overnight shift (11pm to 7am) may be underutilized. They answer fewer calls per hour than the day shift, respond to few emails and only process a limited number of death registrations.
Workforce Optimization software (WFO) and Citizen Services Management (CSM) system implementation

- The contract for the CSM system and implementation was competitively tendered and properly authorized as the contract was signed in accordance with the City Purchasing By-law.

- We identified opportunities to improve the CSM system. The system provides only an “Open” or “Closed” status on SRs. This limited information may be insufficient for a resident following up an SR. In addition system reliability can be improved as it was observed that at times the system slows down and stops responding.

- The business case used to justify the WFO project was not adequately compelling to justify the project. The benefits set out in the business case were either “soft” (increasing customer satisfaction) or potentially measurable but with no targets.

- The WFO solution was contracted via an amendment to an existing 2010 contract for the VOIP solution. There were two WFO solutions that could have worked on City’s VOIP platform: the system that was implemented and a competitor’s system. The rationale for selecting one product over the other was not fully disclosed in the Contract Approval Request or in the supporting Business Case.

- The WFO system implementation is almost complete; however some functionality required by 3-1-1 (agents’ screen capture while they take calls) has not been fully implemented. The quality assurance process is expected to improve once this functionality is implemented. The issue delaying implementation relates to storing information from external systems on City servers and was discovered late in the project.

- Not all the benefits expected from the Workforce Management (WFM) module of the WFO system have been realized since its implementation in March 2015. The process remains manual in many aspects and factors like seniority, long-term assignments, unavailability are not taken into consideration by the software when preparing the by-weekly schedule. The WFM module is also not linked with SAP, therefore the overtime and sick leave data is still maintained manually in Excel spreadsheets.
The possibility of outsourcing the 3-1-1 Contact Centre

- The 2007 Audit of 3-1-1 recommended investigation of the possibility of outsourcing the 3-1-1 Contact Centre. This investigation has not been completed. Management plans to include it as an option in a future business case.

Occupational Health and Safety

- No occupational health and safety concerns were identified.

Recommendations and Management Responses

Recommendation 1

That ServiceOttawa department review with Councillors’ Offices the replacement of the Councillor Consent report with Open Data, which is currently available and/or solicit suggestions from Councillors’ Offices as to how to improve the usefulness and efficiency of the Councillor Consent report as well as topics of interest where Councillors would like more information.

Management Response

Management agrees with this recommendation.

The Councillor Consent Report was created as part of the ServiceOttawa Program to improve the sharing of important ward and city-wide information to the public. The current format of the Consent Report was designed, at that time, to be imported into the Councillors’ Constituent Case management tool (ACT). As indicated by the audit, open data does not provide personal information to Councillors and as such cannot fulfill the information sharing requirement that Councillors find useful. In addition, the Consent Report is also comprised of information gathered as part of the online service request process, which does not require staff resources.

Management agrees that improvements to the open data reports currently available online and through the Councillors’ Portal would be beneficial to Councillors when looking at trends in call types and volumes both in their ward and across the city. ServiceOttawa will survey Councillors and provide results back to Council on the value of the continued use of the Councillor Consent Report in Q1 2016. ServiceOttawa will also review options for making 3-1-1 open data more user friendly to meet the needs of Councillors as part of the Open Data project by Q3 2016.
**Recommendation 2**
That, in addition to reviewing overall aggregate results from post call satisfaction surveys, ServiceOttawa department analyze more meaningful data elements to identify periods where scores are significantly lower (e.g., weekend, overnight) and make operational changes to improve customer service and satisfaction.

**Management Response**
Management agrees with this recommendation.

According to the audit’s findings, during 2014, callers were satisfied or very satisfied with 3-1-1 service (scoring 87%). Satisfaction scores are one of over 50 operational and strategic measures the management team looks at regularly to inform service decisions and service improvements.

ServiceOttawa will conduct a detailed analysis of post call satisfaction surveys for 2014 to determine if there are any periods where scores are significantly lower and operational improvements can generate measureable impacts on client satisfaction, by Q2 2016.

**Recommendation 3**
That ServiceOttawa department establish a process to select agents for quality assurance evaluations based on both past-performance and ensuring full coverage of agents.

**Management Response**
Management agrees with this recommendation.

The audit found that the quality assurance process is adequate and acknowledged that the team sessions used to ensure consistency, proper calibration, subjectivity, and scoring, as well as the post-call satisfaction surveys offered through the IVR is best practice.

Currently the selection of agents who are to be monitored is done randomly or is based on a request from a supervisor and is compared against a baseline quality score created at the onset of the quality program. The ServiceOttawa department will formally document the process to select agents for quality assurance based on past performance while ensuring full coverage of agents and the process for notifying Coordinators by Q1 2016.
**Recommendation 4**

That ServiceOttawa department conduct a detailed financial analysis of various service level standards for calls and for emails and seek formal approval from Senior Management and Council.

**Management Response**

Management agrees with this recommendation.

Service levels are established considering client satisfaction balanced with the financial resources available within the municipality. These service standards are targets set by the municipalities based on their resourcing, call volumes and offered services to achieve a desired satisfaction threshold.

The 3-1-1 service was established in 2005. Performance against 3-1-1’s service standard has been reported to Council through the budget process and the Semi-Annual Performance Report to Council since 2006.

Being mindful of 2016 budget directions approved by Council on October 14, 2015, management will conduct a detailed financial analysis of various service level standards for calls and emails and will seek formal approval of the service level and associated budget from Senior Management and Council prior to budget in Q3 2017.

**Recommendation 5**

That ServiceOttawa department report to Council and Senior Management on all wait times and abandoned calls and disclose how service levels are calculated in the Semi-Annual Report to Council. In addition consult with Corporate Programs and Business Services department on what other measures would be useful to stakeholders.

**Management Response**

Management agrees with this recommendation.

Reporting on 3-1-1 measures was established in 2006 based on available data and Council needs at that time. Management included how service levels are calculated in the Q2/Q3 2015 Semi-Annual Report to Council and will report wait times and abandoned calls in the Semi-annual Report beginning in Q1 2017. Management will also consult with the Corporate Programs and Business Services department as to what other 3-1-1 related measures would be useful to stakeholders.
Recommendation 6
That ServiceOttawa department conduct a full analysis of abandoned calls, within and beyond the service level threshold, to support strong decision-making around resourcing and service level standards critical to the Contact Centre.

Management Response
Management agrees with this recommendation.

ServiceOttawa will conduct an analysis of abandoned calls within and beyond the service level threshold using available data by Q1 2016.

Recommendation 7
That ServiceOttawa department verify the accuracy of information provided to Council and that documentation of management’s review and approval be retained.

Management Response
Management agrees with this recommendation.

The Semi-Annual Report to Council was developed in 2006 using multiple systems and manual processes. With the reduced use of legacy systems, ServiceOttawa will now report data from an identified single database source which will be provided to Council in future reports. Furthermore, as of Q3 2015, the source data, and management review and approval are being retained. Management considers this recommendation complete.

Recommendation 8
That ServiceOttawa department in collaboration with Information Technology Services investigate improvement to systems and processes used for handling 3-1-1 emails.

Management Response
Management agrees with this recommendation.

Service requests received via email are now being processed in the Citizen Services Management (CSM) system. While 3-1-1 emails continue to be used by a very small segment of users, ServiceOttawa will forward the improvements related to email handling as user requirements to Information Technology Services (ITS), to investigate further email improvements that can be achieved through an upgrade of the current CSM system. These user requirements will be submitted to ITS by Q1 2016.
Recommendation 9
That ServiceOttawa department report on email service levels as part of the Semi-Annual Performance Report to Council.

Management Response
Management agrees with this recommendation.
Management recognizes that email service level is an important measure of client experience and as such, management agrees that email service level should be set and reported as part of the Semi-Annual Report to Council. Management will report the service level of 311@ottawa.ca in the Semi-Annual Report beginning in Q1 2017.

ServiceOttawa has established a specific internal operating method to support Councillor constituent work via an email channel separate from 311@ottawa.ca. As this method is an internal organizational process it will not be reported in the public Semi-Annual Report to Council.

Recommendation 10
That ServiceOttawa department conduct benchmarking with comparable Canadian municipalities in order to compare cost per call, cost per email, and other relevant measures to gain an independent perspective on performance and identify specific areas for improvement.

Management Response
Management agrees with this recommendation.

The current process to compare metrics across municipalities is done through the Ontario Municipal Benchmarking Initiative (OMBI). At present, 3-1-1 services are not part of the reporting through OMBI. By Q1 2016, management will recommend to the Corporate Programs and Business Services department that 3-1-1 performance metrics be considered as part of the OMBI program.

Recommendation 11
That ServiceOttawa department determine the most cost efficient way to meet its email performance standards. Consider utilizing agents working periods with lower call volumes and training staff where required.

Management Response
Management agrees with this recommendation.
ServiceOttawa recognizes that the email channel continues to be a service channel for a very small portion of 3-1-1 service users. With the implementation of the Workforce Management tool in the spring of 2015, management has the ability to definitively identify times of day and days in a week that can accommodate email processing. ServiceOttawa will develop a procedure that will direct emails to be processed during periods of lower call volumes by Q3 2016.

**Recommendation 12**
That ServiceOttawa department establish a procedure for decreasing the wait times and assigning available Client Service Representatives to the phone during periods of high call volume.

**Management Response**
Management agrees with this recommendation.

Call volumes at the 3-1-1 Call Centre are impacted by weather events such as snowfall and wind, seasonal trends such as spring thaws and program registration processes, and service delivery changes. Wait times on the phone are managed through the creation of a work schedule that considers daily and seasonal trends year-over-year and the financial envelope provided for the Client Operations branch. The schedule is created using the new Workforce Management tool that was implemented in March 2015 based on historical and seasonal call trends. Decisions on managing daily wait times are made in real time based on the experience and judgement of the Senior Agents, Coordinators and the branch Manager.

Management will establish a procedure that includes a set of criteria to guide the judgement of 3-1-1 management in managing wait times and assigning Client Service Representatives during periods of unanticipated high call volume by Q2 2016.

**Recommendation 13**
That ServiceOttawa department provide each SPOC with access to the knowledge base and advise them of every KBA related to the department for which they have responsibility.

**Management Response**
Management agrees with this recommendation.
The knowledge base was part of the CSM development and implementation in 2011/2012 through the ServiceOttawa Program. Given the extensive scope of the activities required to create an enterprise knowledge base, the initial development consisted of converting existing sources of information directly into the knowledge base. The departmental responsibility for ensuring that articles are accurate and up to date rests with the department's identified point of contact (SPOC). Each SPOC will be provided a list of articles for which they are responsible and access to the knowledge base by Q4 2015.

Recommendation 14
That ServiceOttawa department ensure that departments provide KWS with English and French versions of each KBA so they can be uploaded simultaneously or within a very brief timeframe.

Management Response
Management agrees with this recommendation.

Primary responsibility for ensuring that articles are accurate and up-to-date rests with the department's identified point of contact (SPOC). ServiceOttawa will send a formal reminder to all SPOCs and department heads to ensure that they post articles in both official languages. ServiceOttawa will request that department heads confirm in writing that all knowledge articles are posted in French and English and are checked as part of their annual review process. This work will be completed by Q4 2015.

Recommendation 15
That ServiceOttawa provide ongoing regular information sessions or other effective methods to increase awareness of the knowledge base and any other access available to Councillors' Offices and/or City employees so they can obtain information directly.

Management Response
Management agrees with this recommendation.

ServiceOttawa will develop a knowledge base e-learning module that will be posted on Ozone and the Councillors’ Portal. In addition, a briefing note will be added to the orientation materials for use when training new staff in Councillors’ offices by Q3 2016.

Recommendation 16
That ServiceOttawa review current access and usage of the knowledge base and reassign access where appropriate.
Management Response

Management agrees with this recommendation.

ServiceOttawa is working with Information Technology Services to investigate improvements through the CSM upgrade project, which will implement a new knowledge base tool. Roles, responsibilities and access will be reviewed with each operating department by Q4 2016.

Recommendation 17

That ServiceOttawa department implement a formal process to review each KBA at least annually, as per the Writing Guideline for KBAs.

Management Response

Management agrees with this recommendation.

Each SPOC will be provided a list of articles they are responsible for so that they can review and revise as required. ServiceOttawa will implement a formal annual review procedure by Q2 2016.

Recommendation 18

That ServiceOttawa department further automate the life-cycle management of the KBAs, including but not limited to, last reviewed date, assigning SPOCs and SMEs within the system, as well as system generated reports or other mechanisms to identify KBAs for review.

Management Response

Management agrees with this recommendation.

ServiceOttawa will include the ability to automate the review notification process as a user requirement to Information Technology Services as part of the CSM upgrade project and, will provide departments with the required access to manage their own knowledge articles by Q4 2016.

Recommendation 19

That ServiceOttawa department investigate the CSM system for any functionality that would allow KBAs to be more easily uploaded to the knowledge base and not cause hyperlinks to fail.

Management Response

Management agrees with this recommendation.
ServiceOttawa will submit as a requirement, the ability to more easily upload articles to the knowledge base without breaking hyperlinks to Information Technology Services, who will work with the vendor to determine whether the upgraded version of CSM will meet the requirements. This will be completed as part of the CSM upgrade project by Q4 2016.

Recommendation 20
That ServiceOttawa department ensure the practice of re-transferring callers to the IVR is discontinued.

Management Response
Management agrees with this recommendation.

The audit identified specific incidents of transferring calls back to the IVR instead of transferring directly to the appropriate department. Management from the 3-1-1 Contact Centre have advised staff through a written communiqué that this transfer practice is not the appropriate transfer procedure within the call centre. Recent checks by the QA&CI branch have shown that this practice is no longer an issue. QA&CI will continue to monitor for this practice through their “listening in” program. Management considers this recommendation complete.

Recommendation 21
That ServiceOttawa department revisit the viability of allowing agents to access their WFM schedule remotely.

Management Response
Management agrees with this recommendation.

Since the time of the audit, 3-1-1 has implemented the following functionality: forecasting schedules based on historical call volumes and trends; building schedules based on historical call trend identifying long and short term unavailability of staff and implementing agents’ ability to book themselves off using the Verint tool. Currently staff cannot access this schedule remotely due to a security concern cited by the ITS department. ServiceOttawa will request reconsideration of the current decision by Q1 2016.

Recommendation 22
That ServiceOttawa department investigate if the WFM currently has the functionality required, and start using this (i.e., algorithm to populate lunch and breaks and flags to indicate unavailable agents), or evaluate the purchase of new functionality to automate processes (where benefits outweigh the costs).
Management Response
Management agrees with this recommendation.

ServiceOttawa implemented the Workforce Management tool in March 2015 and trained a new Workforce Management Analyst. Now that WFM has been implemented, is functional and the Workforce Management Analyst has used the tool for six months, ServiceOttawa will build the business rules required to automatically assign breaks and lunches to agents by Q3 2016.

Recommendation 23
That ServiceOttawa department ensure that agents ask each caller for their email address and approval to share information with their ward Councillor; or, that they revisit the need for this report with Councillors, in conjunction with recommendation 1.

Management Response
Management agrees with this recommendation.

Management, through a formal communiqué to agents, has reiterated the responsibility to ask each caller who is placing a service request if they wish to share information with the Councillor. Pending confirmation of the usefulness of the Council Consent Report, as per work to be done related to Recommendation 1, Quality Assurance will continue to monitor whether consent requests are being made. Management considers this recommendation complete.

Recommendation 24
That ServiceOttawa department have an authorized individual document their approval of overtime in advance, and create and implement a 3-1-1 overtime procedure.

Management Response
Management agrees with this recommendation.

Client Operations branch has a combined overtime budget (3-1-1 and Client Service Centres) of $38,000 per year. For 3-1-1, overtime is used to address urgent situations that impact service level. The overall compensation budget is managed through the creation of a work schedule based on available funded hours. The agent schedule is developed using the WFM tool and approved by the Coordinator in 3-1-1 every two weeks. The schedule is then reviewed daily by the Workforce Management Analyst and if necessary, the Coordinator of 3-1-1. The Coordinator of 3-1-1 determines if shifts will be filled (i.e. due to staff absence) or if additional shifts will be added (i.e. due to a weather event
creating sustained high call volumes and significant degradation of service level) and provides verbal approval.

ServiceOttawa will develop a departmental overtime procedure to ensure there is documentation in accordance with corporate policy by Q1 2016.

**Recommendation 25**
That ServiceOttawa department complete a full review of their organizational structure and staffing strategies to ensure the most cost effective and efficient methods are used to deliver service. This would include capacity modelling and costing of staff mix alternatives in addition to on-going scheduling decisions.

**Management Response**
Management agrees with this recommendation.

Since the time of the audit, ServiceOttawa has used the new Workforce Management tool to develop the optimal schedule of FT, PT and casual employees based on historical call volumes and seasonal trends to meet the service level. Management is currently in the process of developing a staffing plan and management structure to support the schedule to the degree possible given its current FTE complement.

ServiceOttawa will review capacity using the workforce management technology to identify required hours of service and a costing to achieve the most efficient staff utilization within the terms and conditions of the collective agreement by Q2 2016.

**Recommendation 26**
That ServiceOttawa department adjust the number of unbudgeted FTEs within the casual pool to reflect more closely actual operational requirements.

**Management Response**
Management agrees with this recommendation.

Since the time of the audit, ServiceOttawa has used the new Workforce Management tool to develop the optimal schedule of FT, PT and casual employees based on historical call volumes and seasonal trends to meet the service level. Management is currently in the process of developing a staffing plan and management structure to support the schedule to the degree possible given its current FTE complement.
ServiceOttawa will adjust the number of unbudgeted FTEs within the casual pool to reflect more closely actual operational requirements identified by the optimal schedule given 3-1-1’s current FTE complement by Q2 2016.

Recommendation 27
That ServiceOttawa department review the hours worked by casual agents and determine if, for some, this creates a part-time employee relationship and adjust their scheduling practices accordingly.

Management Response
Management agrees with this recommendation.

Until March 2015, development and management of the schedule was done using Excel spreadsheets. Since the time of the audit, ServiceOttawa has used the new Workforce Management tool to develop the optimal schedule of FT, PT and casual employees based on historical call volumes and seasonal trends to meet the service level. Management is currently in the process of developing a staffing plan and management structure to support the schedule to the degree possible given its current FTE complement. As part of this exercise the hours worked by casual agents will be reviewed and if required scheduling practices will be adjusted by Q2 2016.

Recommendation 28
That ServiceOttawa department conduct an analysis of workload during the evening and overnight shifts to determine if there is idle capacity and consider assigning additional workload.

Management Response
Management agrees with this recommendation.

Since the time of the audit, ServiceOttawa has used the new Workforce Management tool to develop the optimal schedule of FT, PT and casual employees based on historical call volumes and seasonal trends to meet the service level. Management is currently in the process of developing a staffing plan and management structure to support the schedule to the degree possible given its current FTE complement and will assign additional workload (such as responding to emails) by Q2 2016.
**Recommendation 29**
That ServiceOttawa in collaboration with Information Technology Services investigate and address if the imposed limit of 10 results for searches is still required; the “find” function within a knowledge base article causes the system to stop responding (freeze); and, the CSM system slows down and stops responding (freezes).

**Management Response**
Management agrees with this recommendation.

ServiceOttawa will forward the deficiencies identified by the audit: 1) Knowledge base search limit, 2) freezing and, 3) the “find” function to Information Technology Services, to confirm if these deficiencies will be addressed as part of the CSM upgrade by Q1 2016.

**Recommendation 30**
That ServiceOttawa department in collaboration with operating departments investigate providing additional detailed status information in the CSM system.

**Management Response**
Management agrees with this recommendation.

Service status is an important communication method to the public on service requests. Service status reporting was examined during the implementation of the CSM in the ServiceOttawa Program. Enterprise statuses were not implemented in the ServiceOttawa Program due to the technical and business transformation complexity in standardizing status reporting and integrating with multiple back end systems.

Management will refer the status investigation done to date through the ServiceOttawa Program to the Senior Management Committee for further consideration as part of the ServiceOttawa Program close-out process by Q2 2016.

**Recommendation 31**
That the City document and disclose all key decisions and assumptions in Contract Approval Requests.

**Management Response**
Management agrees with this recommendation.
Standard procurement practice, as per the Procurement By-law, was followed in that Verint was procured through an amendment to an existing competitively completed VoIP contract. Included in the Contract Approval Request (CAR) was an explanation for why the extension of the VoIP contract was the appropriate procurement vehicle and the rationale for the selection of Verint as the business solution. Accompanying the CAR was a business case outlining rationale for the WFO but not how the specific business requirements were achieved by the identified vendor. The CAR was approved by the ServiceOttawa Program Director, the Executive sponsor, Steering Committee Chair and Deputy City Manager of City Operations as well as appropriate resources within the Procurement branch. Management considers this recommendation complete.

**Recommendation 32**

**That ServiceOttawa department implement the recommendations from the Communication Channel Integration Project Close-out report that are applicable to its on-going operations and current projects.**

**Management Response**

Management agrees with this recommendation.

The CCI project was part of the ServiceOttawa program and the close-out report is pending final approval. Should there be recommendations that are directed to ServiceOttawa as part of the approved close-out report, they will be implemented accordingly.

**Recommendation 33**

**That City Manager’s Office update the City’s project management methodology to require a review of all corporate applicable previous lessons learned in the initiation of all new projects.**

**Management Response**

Management agrees with this recommendation.

As part of the City’s project management methodology, staff are required to complete a set of mandatory project deliverables, one of which is a Project Close-out Report. One element of this report is the documentation of lessons learned from the project, including the capture of any formal recommendations from project post-mortem or lessons learned sessions. The City also has a Project Management Community of Practice, which has membership from all City departments, and regularly uses the forum to share knowledge and project successes, challenges and lessons.
The Corporate Programs and Business Services department will update the City’s project management methodology by Q2 2016 to require a review of all corporate applicable previous lessons learned in the initiation of all new projects.

**Recommendation 34**
**That ServiceOttawa department investigate the possibility of outsourcing the 3-1-1 Contact Centre.**

**Management Response**
Management agrees with this recommendation.

Within Council’s Strategic Plan for 2015-2018, Council has identified Phone and Counter service delivery as a priority. ServiceOttawa will explore alternative service delivery methods, one of which will be outsourcing, as part of a business case. Options will be recommended to Senior Management and Council as applicable based on findings by ServiceOttawa Management in the business case in Q4 2016.

**Potential savings**
There were no quantifiable potential savings identified during the audit. Recommendations to automate a number of processes could create efficiencies for 3-1-1 operations.

**Conclusion**
The 3-1-1 Contact Centre provides the residents and elected officials with a valuable service and information about the City’s programs and procedures. 3-1-1 agents are courteous, knowledgeable and service-oriented.

While overall 3-1-1 clients are satisfied with the service that they receive, there are opportunities to better support the agents serving them. The information in the knowledge base that agents rely upon could be more up-to-date and accurate and their scheduling could be improved.

We identified opportunities to improve the reporting to Management, Senior Management and Council in the areas of wait times, abandoned calls and email processing. The City’s policies and procedures related to notifying Councillors of emerging issues in their wards are clear, consistent and generally adequate.
There are also opportunities to further streamline processes by improving two key systems used by 3-1-1 that were purchased and implemented in 2011 (CSM) and 2013 (WFO). Lastly we found that management has not yet investigated the possibility of outsourcing the 3-1-1 Contact Centre as recommended in our 2007 audit, however they plan to include this option in an upcoming business case.
Audit of Accounts Payable

Introduction
The Audit of Accounts Payable (AP) was included in the 2014 Audit Plan of the Office of the Auditor General (OAG), approved by City Council in March 2014.

Background
The City of Ottawa (“the City”) processes a high volume of accounts payable transactions annually – in 2014, 350,588 transactions were processed with a combined value of $3.08 billion\(^1\). Payments are processed through the Accounts Payable unit (“the unit”) of Supply branch, Finance department. The AP unit is comprised of approximately 28 personnel led by a program manager who reports to the Chief Procurement Officer.

AP activities are governed by the Purchasing By-law, Payments to Vendors Policy (revised February 12, 2015) and associated procedures. The policy and procedures apply to all City staff involved in paying a vendor for goods and services; although they do not apply to the City’s local boards or elected officials. It is the responsibility of all City staff to ensure that the conditions for payment have been met before approving or proceeding to payment.

AP activities are conducted in accordance with the Delegation of Powers Policy and with the Delegation of Authority By-law (2013-71/2014-435).

Vendor invoices received by the City are processed in SAP, the City’s financial information system, using one of the following methods:

- **MarkView (automated invoice processing)** (2014 activity – 157,356 transactions, representing $957 million). This process allows for the receipt of an invoice electronically from a vendor (or if received manually, scanned and submitted) and processed by MarkView, whereby the system will read key fields in the invoice for processing. Once processed, an AP clerk reviews the MarkView transaction details against the original invoice for completeness and accuracy prior to proceeding with the verification and payment process.

- **Direct Post (batch processing for high volume invoices or payees)** (2014 activity – 150,799 transactions, representing $1.04 billion). For some routine, high volume, low risk invoices (i.e., utilities, telecommunications), the

\(^1\) Accounts Payable: 2014 Year in Review, City of Ottawa
batch details of an invoice are uploaded from the vendor or the applicable City department directly into SAP for review and processing.

- **Non-MarkView (manual invoice processing)** (2014 activity – 42,433 transactions, representing $1.08 billion). Although not the preferred option, there continues to be a need for invoices to be received and input manually into SAP directly (e.g. for confidentiality purposes). The majority of these invoices are processed by the Financial Services units (FSU) within individual departments across the City.

The two pie charts below depict the breakdown of the number of invoices and dollar amounts by MarkView, Direct Post and Non-MarkView in 2014. For the number of invoices the breakdown is as follows: MarkView 45%; Direct Post 43%; and Non-MarkView 12%. For the dollar amount the breakdown is as follows: MarkView 31%; Direct Post 34%; and Non-MarkView 35%.

### Audit Objectives

The overall objective of this audit was to provide an independent assessment of the control framework in place to ensure appropriate, accurate, timely and efficient processing of the City’s vendor payables in accordance with its policy and legislative requirements.

There were two specific objectives established for the audit, as follows:

**Audit Objective No. 1:**

Assess whether the accounts payable control framework, including roles and responsibilities, has been designed to ensure compliance to applicable policy and legislative requirements, to mitigate identified risks and that it is operating as intended.
Audit of Accounts Payable

Criteria:

- Standards, procedures and tools related to the accounts payable processes are clearly documented, consistent and are made available to stakeholders which support compliance to applicable AP policy and legislative requirements.
- Roles, responsibilities and accountabilities are clearly defined and understood amongst stakeholders and employees have the necessary training, tools, resources and information to carry out their responsibilities.
- Segregation of duties (SOD) is adequate to reasonably mitigate the risk of potential inaccuracies and/or fraud.
- Effective risk management processes are in place to identify, assess, prioritize, mitigate and report on risks impacting AP.
- Appropriate key application controls embedded within the AP system have been designed and are operating effectively to ensure the accuracy of invoice processing and payments and adherence to applicable policy and legislative requirements.
- Appropriate manual controls embedded within the AP processes have been designed and are operating effectively to ensure the accuracy of invoice processing and payments and adherence to applicable policy and legislative requirements.
- Effective and timely reporting related to AP is provided to management and senior management to inform decision making.
- A program to monitor performance and compliance has been designed and is operating effectively to allow for the identification and follow-up on anomalies, trends and opportunities for improvement.

Audit Objective No. 2:
Evaluate the overall efficiency and effectiveness in the management and operation of the accounts payable function including identifying areas of potential savings in processes.

Criteria:

- Accounts payable has established performance standards throughout its processes and tracks and reports against them on an ongoing basis.
- Management of the AP program continuously assesses the function, including the design of manual and automated controls, for potential areas of savings/efficiencies.
- Best practices and identified opportunities for efficiencies have been implemented and are achieving the expected results.
Audit Scope
The scope of the audit included all business processes and systems related to the processing of vendor payments by the City – including MarkView, non-MarkView processed invoices and Direct Post. In addition, other forms of payments (i.e., EFT, cheque and pre-authorized payment) and duplicate payments were included in the audit scope as were the vendor maintenance process related to ensuring appropriate segregation of duties with AP activities.

Payments processed by Purchasing card (Pcard) and petty cash were not in scope for this audit. Further, the audit did not include reimbursements to employees or period end accruals. Finally, information technology general controls were not addressed as part of the audit.

The period under review for this audit was from July 1, 2014 to June 30, 2015.

Summary of Key Findings
The audit identified a management control framework for AP that has established roles and responsibilities, formalized policies and procedures, an embedded risk management program and has designed both automated and manual controls to enable the payment of approved and accurate vendor invoices. Opportunities were identified to strengthen specific controls in place and to enhance the automation and tools available to enable efficiencies/cost savings within the AP process. The key findings from this report are described below.

The roles, responsibilities and accountabilities of AP stakeholders are well defined and understood and are well supported by standards, procedures and tools.

Through document review and interviews with key stakeholders, the audit found that the roles, responsibilities and accountabilities of AP stakeholders, both internal and external to the AP unit, are clearly defined and understood amongst employees. Furthermore, the audit noted consistency between the documented expectations of those involved in the AP process and their understanding of their responsibilities. Reporting structures were also well defined through a maintained organizational chart and an established governance structure.

The roles and responsibilities of AP representatives are well supported by documented policies and procedures that are made available through the City’s intranet site as well as through ongoing training/support. Detailed procedures for carrying out AP-related tasks are well documented and available to all stakeholders. Training materials related to MarkView 8.1 are available on the intranet and ongoing, in-person MarkView training sessions are provided to all staff upon request. AP unit staff noted that they felt well supported by senior AP staff and
supervisors who make themselves available when staff have questions or concerns. Training is also provided to stakeholders external to the AP unit, including FSU representatives and business unit managers.

Although the training is meeting the current needs of the AP unit, with increased process automation, the AP unit is re-focusing more on the use of data analytics and business intelligence, as further discussed below. As this shift occurs, it will become increasingly important for AP management to assess the skills/qualification and training needs of AP unit staff to ensure alignment with these new roles and responsibilities.

**AP maintains a well-established risk management process that enables the identification, assessment, mitigation and monitoring of key risks.**

In 2014, in alignment with the City’s ERM Policy, the AP unit created a risk registry that is currently maintained and supported by a broader risk management process. The registry is maintained as a living document that is updated by management within the unit and is provided to senior management and the Senior Management Committee on a bi-annual basis to feed into the Corporate Risk Profile. The risk registry identifies risks and opportunities to the unit and subsequently assigns a rating of the impact and likelihood, trend, status and mitigation action plan. In reviewing the AP risk registry, the audit found consistency between the key risks identified through interviews and the registry and that all medium-high and high risks had an established mitigation plan. The registry also demonstrated progress against the mitigation plans for all high risks and the majority of medium-high risks.

It was noted through documentation review that the risk registry was last updated in December 2014. While this may meet current business needs, new risks will emerge as AP shifts its role to increased reliance on data analytics and business intelligence. Accordingly, as this shift occurs, it will be important for AP to update the registry more often to identify, assess and mitigate emerging risks.

**While access controls have been effectively designed within MarkView/SAP, there is an opportunity to more formally assess and resolve potential segregation of duties issues as access is requested.**

The City has leveraged its existing Enterprise Resource Planning (ERP) solution – SAP, in conjunction with MarkView, the workflow solution, to establish Segregation of Duty (SOD) controls within the AP process. SOD was tested through the comparison of the pre-established roles/access determined by management against the actual access that a sample of AP staff had to SAP. We found that the ability to approve an invoice or to confirm goods/services receipt within the system is based on established delegation of authorities. As a result, depending on the nature of the invoice and the dollar value of that invoice, only an approval from individuals with
the sufficient authorization level can allow the invoice to proceed to the next stage of processing.

In addition to embedding invoice approvals and goods/services receipt within the system, the City has also embedded the SOD within the approval process so that an individual does not have excessive access within the system to allow them to control multiple phases of the AP process. These access rights reflect a recent exercise the City has undertaken to transition to position-based access, which means that system access is based on standardized expectations of an individual’s role and responsibilities within the organization. Accordingly, the audit found that SOD has been well designed within the AP process and has leveraged the existing system capabilities to ensure that access to the system is based on the role held by the individual.

As a result of testing the SOD, we found that individuals did not have access to control the entire AP process and would require at least one additional individual to complete the processing and payment of a vendor invoice. Testing further confirmed that an appropriate process has been established and is operational to grant/remove access to the system in a timely manner.

There are situations where an individual might need additional system access over and above what has been assigned based on their position. For these cases, the City has a process to request, review, approve and grant such access through SAP. System tools are available to assist in the review process, which would highlight potential SOD issues that the granting of this enhanced access could cause. While this process was verbally described and it was noted that documentation is maintained through a SOD conflict report, no evidence could be provided to demonstrate that the process was consistently and formally applied. Although a process has been established to identify potential SOD conflicts annually, without formally maintaining documented evidence confirming that additional access requests will not cause potential SOD issues prior to the approval and granting of such access, there is the risk that granting this additional access will result in a SOD conflict.

**While the key application controls in place within MarkView/SAP are operating effectively, there are opportunities to increase the use of application controls and reduce the amount of manual controls.**

In leveraging the key system that supports AP processing across the City, AP alongside the IT team has implemented several key application controls within MarkView and SAP as a cost-effective way to improve data integrity and enforce appropriate authorization. The key application controls that the audit team tested and found to be operating effectively included:
• MarkView Workflow and Authorizations: Workflows have been configured to ensure that appropriate approvals (and secondary approvals where relevant) are obtained for invoice processing. Note that this control was tested through review of workflow documentation and observation of a sample transaction in the system.

• Three-way Match: A three-way match has been appropriately configured within SAP to require matching of the goods/service receipt and invoice against a purchase order (as applicable) in order for the payment to be processed. Furthermore, it was found that the account determination within SAP is appropriately configured to automatically post to the liability suspense account upon goods receipt and invoice receipt.

• Payment Proposals: To enforce SOD, AP has appropriately configured payment proposals within SAP so that the same person cannot initiate and approve the same transaction. This requires two people to be involved in the payment proposal process.

• Locked Vendors: While archiving is currently not performed within SAP, the AP unit instead locks vendors that have been inactive for an extended period of time to prevent any invoices from being processed against them.

While the audit found the key application controls listed above to be configured appropriately, the following were noted as opportunities to configure application controls to more effectively mitigate key risks within the AP process:

**Duplicate Invoices**

A key set of application controls within SAP relates to the check for duplicate invoices prior to payment. Within SAP, there is a field that can be configured to enforce a check of duplicate invoices for all vendors which would automatically identify potential duplicates attempted to be processed within the system. Under the duplicate invoice check, the system cross references a number of fields, such as vendor, currency, company code, invoice amount, document number and invoice date to determine whether the invoice that is being processed is a duplicate. Although this application control is available within SAP, it is currently configured as optional and is therefore, not automatically applied as a mandatory check for all vendors payments.

As a result, reliance is placed on AP staff to manually select this field when they are creating a new vendor record or updating an existing vendor record. If the field is not selected when creating a vendor, there is a risk that duplicate payments can be processed for that vendor and manual compensating controls must be relied upon to detect duplicate payments. Accordingly, the SAP system settings are not
appropriately configured to always enforce a duplicate invoice check and to prevent potential duplicate invoices from being processed.

A detective, compensating control is in place to identify duplicate payments that have been processed. The AP unit undertakes an analysis of potential duplicates using an analytics tool on an ad hoc basis. The last review of potential duplicates was performed in 2014 based on 2013 data. We performed data analytics to identify potential duplicates for the period under review. The audit found three (3) sets of invoices that were processed and paid twice, which resulted in a total of $13,989.78 in duplicate payments. The audit team noted that there were different reasons for why each of the duplicates occurred and no systemic issue was identified. While this amount represents a small percentage of the total dollar value processed through AP, it still represents overpayments by the City and demonstrates that the current, manual compensating controls are not fully effective.

Vendor Maintenance

A key application control within the SAP vendor maintenance is the configuration of the sensitive vendor master fields and whether particular data fields require approval by an independent person for new or updated vendors. Vendor master fields are critical to sound control over vendor payments as sensitive information, such as banking information, is maintained for vendors and forms the basis of payment. Access to modify this information requires strong controls (specifically SOD) to mitigate the risk of potential fraud.

The audit found that no sensitive fields have been defined for which a dual control is enforced. As such, when an employee creates a new vendor or updates the information of an existing vendor in SAP, no approval is required before the change becomes active in the system. This finding was also noted in a report issued by the City’s Compliance Team in October 2014 when they undertook a process review of the Vendor Master File Maintenance process.

Instead of configuring the sensitive vendor master fields within SAP, a manual, detective control is in place. AP performs a secondary review of all vendor changes processed before 9:00 the following day, at which time payments against approved invoices are released. Although this manual control was found to be operating effectively, as further discussed below, there is still a risk that a senior AP staff member may not review vendor changes in time to detect errors in the vendor master information before an applicable payment may be released.
While the key manual controls related to the AP processes were effective in design, there are opportunities to improve the consistency of their operation. The audit found that the manual controls in place within the AP process have been designed effectively and while some are operating effectively, others had some exceptions noted.

It was determined that from the sample of vendor invoices selected, 20% were paid late and 5% did not leverage an available discount. From examining the audit logs associated with these transactions, significant duration elapsed while the invoice was in the custody of the business unit for approval. There appeared to be multiple back and forth comments between the approver of the invoice (i.e. business owner) and the FSU representative, in place to support that individual. Upon discussion of the results with the AP unit, it was acknowledged that efforts are required to ensure the timely processing of invoices when they are in the custody of the business units and reliance is placed on these users’ familiarity and comfort with the system. To address this, the AP unit has enhanced its training opportunities to users. For example, senior staff within AP regularly offer MarkView training course for business users focusing on coding and approving invoices within the system. In addition, the Finance 101 course required to be completed by all managers has an AP component included – focused on roles and responsibilities to ensure timely approval and accurate processing of vendor invoices.

Because it is known that delays in reviewing and approving invoices cause delays in payment and the potential to not lose potential discounts\(^2\), AP management implemented priority functionality within MarkView to notify users when potential discounts were coming due. It was acknowledged that while this functionality was in place, the notifications were not effective in distinguishing the high priority invoices. Clarifying the message in the notification would highlight those invoices that require priority action – i.e., available discount coming due or invoice about to be paid late. This urgency associated with the notification will allow the business user to prioritize those specific invoices for immediate action.

The priority routing could be more effective if the system was able to use the date the invoice was received in the payment terms rather than the date on the invoice. Currently, the new functionality in MarkView does not capture the entire population of potential discounts and invoices coming due because it relies on terms fed by SAP, which calculates based on the invoice date. While the City is currently tracking the amount of missed discounts, it is not tracking the amount spent on penalties as

\(^2\) It was highlighted in the Accounts Payable 2014 Year in Review that 16,243 discounts were missed, totaling a potential savings loss of $603,437.
a result of late payments. As a result, the City does not have a view to how much is being lost as a result of late penalties.

A performance monitoring program has been established for AP overall; however, there is an opportunity to provide business units with information on their results in order to remind users of their AP responsibilities and accountabilities.

The AP unit, on an ongoing basis, conducts analysis on the results of the City, relative to AP processing and associated performance indicators. This includes monthly dashboards which report on Validation Statistics (average validation queue volume, average invoices validated daily and days to turn over the validation queue), PO Queue Statistics (average PO queue volume, average PO invoices processed daily and days to turn over the PO queue), Vendor Maintenance (new EFT enrollees and payments: EFT vs. cheque) and Discount Analysis (total discounts offered, discounts taken – dollar value and number of invoices past due).

Annually, an overall report is prepared to highlight the results and activities of AP during the previous year. This report highlights the number and type of invoices processed/payments made, lead times (i.e., duration between invoice date and first action taken by AP), discounts taken/missed and the status of initiatives taken during the year. Due to a lack of a holistic analytics tool, described below, the AP team is challenged to extract and manipulate the available data within existing systems to provide value added information and analysis to senior management on AP results.

While most analysis is performed on a City-wide basis, limited analysis and reporting results are provided to business units on their individual results. As noted above, delays in processing can be attributable to the length of time the invoice is in the custody of the business units; however, they may not have visibility to the overall impact of these delays as all they see are individual invoices to be processed. There is an opportunity to leverage the tools/analysis in place within the AP unit to provide periodic reporting to business units on their specific results relative to AP – i.e., discounts available but not taken, late payments, average days taken to approve an invoice. This type of reporting that is attributable to an individual business unit allows them to see their performance/impact and could initiate the conversation with their FSU representative and the AP unit on opportunities to improve their results.
To date, system functionality has been focused on the efficiency and effectiveness of controls within the AP process. There are opportunities to leverage existing and available technology to ensure the efficiency and effectiveness of AP operations.

A significant amount of automation has been leveraged to increase the efficiency and effectiveness of vendor invoice approval and processing. One example is the automated workflow embedded within MarkView to move vendor invoices through their life cycle to payment. Another example is the scanning technology in place to scan key elements of an invoice to automatically populate within the financial system (in place of manually entering each key element of the invoice). Based on the results reported by AP, for the 2014 fiscal year, 45% of all invoices were processed (i.e. those processed through MarkView) using this automation.

While this level of automation has and continues to improve the efficiency and effectiveness of the controls, the monitoring activities that are in place continue to be more manual, requiring the use of different tools and reports to provide the information required. Examples of such situations are described below:

Monitoring for Potential Discounts

While the current system capabilities allow for monitoring of upcoming available discounts, there is a challenge with the key field used to monitor this. The default date for monitoring available discounts is the invoice date (i.e. the date noted on the invoice). The City’s Payments to Vendors Policy states that the term of payment is “the date the invoice is received and accepted or the goods/services are accepted, whichever date is later”. Many organizations default to the invoice date as a baseline for counting the due date of the invoice and the opportunity to leverage a discount if it is being offered and as a result, most systems are designed to monitor based on that field. Because of the current City policy, this default date is not appropriate as a baseline for monitoring. The current capabilities of the system do not allow for monitoring potential discounts as the receipt/acceptance date of the invoice is not currently being captured. As a result, a manual exercise of monitoring available discounts is performed by the AP unit and by the FSU representatives to highlight and prioritize these invoices through the process.

The AP unit is currently considering a potential system enhancement that would allow automated monitoring of available discounts based on invoice receipt/acceptance date.
Monitoring the Performance/Productivity of AP Activities

Recognizing the need to continuously monitor and strive to improve the overall performance of AP activities, the AP unit undertakes ongoing formal and informal monitoring activities to assess performance against past results and benchmarks. These activities are all undertaken with an aim to continuously improve productivity and efficiency of the AP activities. The range of information being monitored and reviewed by AP include aged payables, discounts available vs. taken and the productivity of individual AP staff members. The AP unit leverages their membership within the Ontario Municipal Benchmarking Initiative (OMBI) to share best practices and compare results. In OMBI’s 2013 report, it benchmarked 14 municipal Accounts Payable functions to assess how much it costs to process an invoice. The City of Ottawa was ranked as the second highest, with a cost of $8.71 per invoice.\(^3\)

As noted above, the AP unit is challenged with the analytical tools currently in place to ensure the monitoring/reporting activities themselves are efficient and appropriate. Tools are needed to complement the existing system to allow more efficient and effective monitoring of performance against performance indicators and to identify cost savings/improved customer service opportunities. These tools and the associated support to enable them will be required to move the AP unit to a higher functioning AP organization.

Invoice Validation

As noted above, scanning technology has been implemented to allow for automated population of key fields in the financial system directly from an electronic invoice to avoid manual entry of the invoice into the system. While there continue to be some invoices that are manually processed, more invoices are being processed in this automated fashion, through MarkView. As the software scans the invoices, it looks for key pieces of information from the invoice and flags to the AP user what fields it is unsure of for review, validation and update, as required. The technology has been designed so that over time, it will “learn” how to read invoices from specific vendors to increase the accuracy of the interpretation of the software with the intention to decrease the amount of manual intervention required. This “learning” capability has been disabled due to a lack of training on this functionality and as a result, the workload involved in currently managing/maintaining this functionality is more cumbersome than manually reviewing invoices. However, because this functionality has not been enabled, AP staff are currently reviewing every field populated by the

software to ensure accuracy prior proceeding through the AP process. This continued manual review of all fields does not allow the AP unit to maximize efficiency of the initial processing of invoices.

Overall, without the tools in place to allow for effective monitoring of the AP activities, the AP unit will not be in a position to assess and continuously improve these activities towards maximum effectiveness and cost savings.

**Recommendations and Management Responses**

**Recommendation 1**

That the City formalize the requirement to retain documentation which demonstrates that in cases where enhanced system access (beyond the standard access associated with the position) is granted, potential SOD conflicts have been assessed and resolved prior to approval.

**Management Response**

Management agrees with this recommendation.

The Financial Process, Compliance & Systems unit within the Finance department has a formal process in that all access requests are approved by the supervisor of the individual requesting the access and by the business process owner within the Finance department. All requests are submitted to the SAP Support Center within the IT department. A standard SAP report is run for each request that identifies any segregation of duties issues. If there is one identified, action is taken to remove the conflict. Effective immediately, the Financial Process, Compliance & Systems unit will retain on file documentation which demonstrates that in cases where enhanced system access (beyond the standard access associated with the position) is granted, potential SOD conflicts have been assessed and resolved prior to approval. Management considers this recommendation to be complete.

**Recommendation 2**

That the City enforce the mandatory duplicate invoice check for all vendors within SAP and that the City formally undertake a duplicate invoice check analysis at least on an annual basis.

**Management Response**

Management agrees with this recommendation.
AP has performed the duplicate invoice check analysis annually over the past two years. The requirement to perform this analysis has been formalized in the AP “List of AP Monitoring Reports”.

AP has requested a configuration change be made to SAP that will default to apply the duplicate check to all vendors. IT has advised that, as per the current IT work plan and scope of work identified in this recommendation, this change will be completed by Q1 2016.

**Recommendation 3**

That the City configure the sensitive vendor master fields in SAP to require approval by an independent person before changes to vendor information go live in the system.

**Management Response**

Management agrees with this recommendation.

AP has requested that the system be configured to require a secondary review of all fields when a Vendor Master Record is created or changed. IT has advised that, as per the current IT work plan and scope of work identified in this recommendation this change will be completed by Q3 2016.

**Recommendation 4**

That the City refine system enhancements in MarkView to allow notifications to users to include a level of priority.

**Management Response**

Management agrees with this recommendation.

Management has clarified the message that is sent to users when they are notified of a high priority invoice to be approved. Management considers this recommendation to be complete.

**Recommendation 5**

That the City establish a process to track and report on late penalties paid as a result of AP internal processes.

**Management Response**

Management agrees with this recommendation.

AP will establish a process to track and report on late penalties paid by the end of Q2 2016.
Recommendation 6

That the City enhance its current AP reporting program to include periodic reporting of AP results to individual business units.

Management Response

Management agrees with this recommendation.

AP currently prepares a performance dashboard that is shared with Finance senior management. The dashboard presents information at the City-wide level. AP will modify the dashboard and provide relevant information to the Financial Services unit beginning in Q2 2016.

Recommendation 7

That the City implement the tools necessary to allow for efficient monitoring and analytics such as: automated monitoring of potential discounts based on invoice receipt date, enabling the population of invoices and validation of only those fields highlighted for review and productivity analysis, throughput analysis by individuals/activities against performance indicators.

Management Response

Management agrees with this recommendation.

In order to maximize the efficiency of operations through automation, AP has researched the following system enhancements;

- A configuration change to enable SAP to pay invoices based on receipt date rather than invoice date;
- A vendor self-serve package that will allow vendors to submit to and review their own accounts; and
- Analytics software that will allow tracking and monitoring of invoices, operations, errors, and productivity.

Management is preparing a business case for the tools identified above. The business case will be completed by Q1 2016 and will be presented to Corporate IT Management Team (CITMT) for review and approval at the next meeting.

Potential Savings

A strong management control framework in place over AP enables direct cost savings through the payment of invoices on their due date to avoid penalties, taking advantage of available vendor discounts and avoiding paying the same invoice multiple times.
AP has taken steps to ensure it identifies and prioritizes invoices for processing that have available discounts so that they are taken advantage of. This includes leveraging available modules within MarkView to highlight these high priority invoices. Although this has increased AP’s ability to take advantage of discounts being offered by vendors, it is limited to those invoices where the invoice date is close to the date received. To take full advantage of discounts being offered by vendors, AP recognizes the need for a system change to read the receipt date rather than the invoice date. It should be further acknowledged that to ensure discounts are taken, AP relies on departments to complete their responsibilities relative to invoice processing in a timely manner when notified of a potential discount available

Additionally, although the amount may not be significant, visibility to penalties paid for late payments would allow the City to be aware of money that is being lost as a result of inefficient/ineffective internal processes. Prioritized, escalated notifications of invoices coming due for payment should help minimize these losses.

There are further opportunities to leverage existing technology to prevent the erroneous payment of vendor invoices more than once. Examples of duplicate payments were found and although there are mechanisms to collect this money back, the process to do so requires additional employee time.

Opportunities for potential savings have been identified by the AP unit through enhanced analytics/monitoring tools and were confirmed by this audit. The AP unit intends to leverage tools available to monitor activities and identify potential process changes intended to result in efficiencies and cost savings. An example of such monitoring includes throughput within the AP process. By identifying weaknesses in the process, opportunities to streamline will be identified and over time, this could result in net savings to the City through less people involved in processing a single transaction – impacting the total cost to process that invoice.

4 It was highlighted in the Accounts Payable 2014 Year in Review that 16,243 discounts were missed, totaling a potential savings loss of $603,437.
Conclusion

An appropriate foundation has been established to enable the processing of approved and accurate vendor invoices for goods and services received by the City. This foundation includes the formal establishment of roles and responsibilities, the design and implementation of manual and automated controls within the life cycle of a vendor invoice and back end monitoring to ensure the controls are working as intended. However, the audit noted specific areas where controls should be strengthened and consistently applied. Further, there are opportunities to leverage existing and available technologies to ensure the City is efficient in processing vendor invoices, maximizing opportunities for cost savings and monitoring performance of the activities across the City.
Audit of Infrastructure Services - Administrative Management

Introduction
The Audit of the Infrastructure Services department (ISD) was included in the 2013 Audit Plan of the Office of the Auditor General and approved by Council on October 12, 2012. The audit was conducted in two distinct streams – the audit of the technical management of ISD, and the audit of the administrative management of ISD. This is the executive summary of the audit of the administrative management of ISD.

Background
The Infrastructure Services department (ISD) is responsible for asset management of the City’s roads, sidewalks, sewers, water mains, bridges, culverts, buildings, parks and other structures. It is also responsible for the design, construction and administration of the work required for new construction and the rehabilitation and renewal of the City’s infrastructure as described above as well as for transit facilities, expansion/modifications of pumping stations, water reservoirs and elevated tanks, sewage and water treatment facilities, stormwater management facilities and solid waste facilities.

ISD consists of the following branches:
- Asset Management – planning of infrastructure works, including renewal and coordination of capital projects identified by client departments;
- Design and Construction: East, West and Buildings and Parks (three branches) – implementation of renewal work and new infrastructure; and,

The functions undertaken by ISD are:
- Asset inventory, inspections, renewal planning;
- Design of rehabilitation, replacement and new infrastructure works;
- Construction, contract administration and inspection of construction;
- Surveys;
- Right of Way information approvals;
- Design and construction standards; and
- Quality Assurance services.
Audit Scope and Objectives
The scope of the overall Audit of the Infrastructure department comprises the overall structure of the ISD in terms of the required services, evaluation of the program management and monitoring systems. The scope of this stream of the audit is the administrative management of ISD. The audit objectives are:

Audit Objective No. 1: Preparation of ISD’s Operating and Capital budgets
- Evaluate the process to establish ISD’s Operating and Capital 2013 budgets.

Audit Objective No. 2: Overtime, Sick Leave and Vacation
- Evaluate the process to capture data, report and manage overtime, sick leave and vacation.

Audit Objective No. 3: Training Process
- Evaluate the adequacy and completeness of the training process.

Audit Objective No. 4: Potential Savings
- Identify areas of potential savings for the City in the administrative management and operations of ISD.

Approach
Information was obtained through data mining, data analysis, documentation review and interviews. For analytical purposes we reviewed the period 2010 to 2012, with a detailed examination of 2012.

Summary of Key Findings
The Infrastructure Services department (ISD) met the process and timeline requirements set out by Council for the preparation of its draft operating and capital budgets. The current process of quarterly reviews of each branch's operating budget status could be improved by moving to monthly reviews, a change that management has indicated that they will adopt in 2014.

ISD's capital budgets are significant, with $869 million of new projects approved from 2010 to 2012. Multi-year projects are budgeted and approved on a project basis and not on a fiscal year basis. We found project budgets to be properly authorized, however, there is no budget management for all capital expenditures planned for the year. As a consequence, interim reporting of actual capital expenditures during the year versus budgeted capital expenditures does not exist. Estimating and managing capital expenditures by year could assist in cash-flow management and improve general management over-sight and control of projects.
The costs for change orders are not easily identifiable in the financial reporting system as these costs are coded to the same General Ledger accounts as all other construction costs. As well, costs for Outside engineering services are recorded in the same General Ledger accounts regardless of the project phase. Separate General Ledger accounts to account for the costs for change orders as well as for outside engineering services by phase would improve financial reporting and control.

**Overtime, Sick Leave and Vacation**

ISD has successfully reduced its overtime costs over the years, from $1.1 million in 2005 to $325,000 in 2012. Our review of a sample of 2012 overtime transactions found that all had been properly authorized as per the City’s policy and ISD’s procedure documents.

ISD staff take significantly fewer sick days, on average, than other City employees. In 2012 ISD averaged 4.1 sick days per employee versus an overall City average of 11.0 days. Our testing of a sample of 2012 ISD sick leave transactions found all had been properly approved. We did find that staff in two of ISD’s five branches report their time and leave on paper forms, as opposed to directly into the City’s financial reporting system (SAP). Having these staff enter their time directly into SAP would be more timely and efficient and would reduce the risk of input errors.

**Training Processes**

ISD spent $76,776 for outside training in 2012. We reviewed a sample of these expenditures and found two cases where the training was approved by an employee that was not properly authorized. In these instances, ISD management may not have been aware of the training and the related costs.

The City’s Learning and Development Policy requires that learning activities relate to “development plans identified in the employee’s Individual Contribution Agreement (ICA)”. Our review of a sample of 2012 ICA’s for ISD employees found that none had been completed on time therefore they could not have been used as intended in mid-year reviews or final evaluations. However, for the development plans in our sample that were eventually completed, we found 89% of the employees did complete the planned training.

The City’s Learning and Development Policy, also states that General Managers are responsible for “Developing and approving learning plans for their respective departments”. ISD does not have a learning plan and as a result it is possible that training could be undertaken that is not consistent with ISD’s goals and priorities. At the time of the audit, ISD had a draft “Training Policy” document and which was reviewed and found to be consistent with the Learning and Development Policy.
The Learning and Development Policy does not provide guidance on the content and form that a departmental learning plan should take. Human Resources department staff acknowledged this and indicated that the Policy will be reviewed and this requirement will be addressed.

**Recommendations and Management Responses**

**Recommendation 1**

That the City implement monthly financial reporting and analysis on Operating Budgets for each branch in ISD.

**Management Response**

Management agrees with this recommendation and it has been implemented.

Starting in April 2014, monthly operating reports are generated automatically by the Finance department and released to management following the month-end financial close. After the release, Finance staff provides management with an analysis of any major variances.

**Recommendation 2**

That the City implement a capital project expenditure reporting process that would allow all planned spending for the year to be compared with actual spending.

**Management Response**

Management agrees with this recommendation.

Departmental staff will work with Finance to update capital spending plans and produce reports comparing planned and actual spending by the end of Q2 2015.

**Recommendation 3**

That the City change the financial reporting system to separately account for:

a) Costs associated with change orders; and,

b) Costs associated with outside engineering services for the design phase versus the construction phase.

**Management Response**

Management agrees with this recommendation.
Project controls and processes will be amended to enhance the ability of the General Manager and Managers to obtain financial summaries of change order costs, and differentiate external engineering design costs from contract administration costs.

ISD will work with Finance to implement this recommendation by Q4 2015.

**Recommendation 4**
That ISD:

a) Use the “leave-vacation” code as a reason for incurring overtime where applicable; and,

b) Monitor the costs associated with overtime incurred by staff covering the workload of personnel who are on vacation.

**Management Response**
Management agrees with this recommendation.

A Management Directive will be issued in Q2 2015 to clarify the existing use of leave-vacation codes. An enhanced process for tracking and monitoring overtime incurred for vacation cover-off will be implemented by Q4 2015.

**Recommendation 5**
That ISD revise the department’s internal overtime procedure documents to ensure they address overtime for all ISD personnel.

**Management Response**
Management agrees with this recommendation.

Management will revise the department’s internal overtime procedure documents to clarify the application of the procedure for all staff. This will be completed by Q2 2015.

**Recommendation 6**
That the City should change ISD’s time reporting process so that all branch staff enter their time and leave directly into the SAP system.

**Management Response**
Management agrees with this recommendation.

This recommendation will be implemented by Q4 2016 through the Integrated Departmental Management Plan Program.
Recommendation 7
That ISD develop and review Individual Contribution Agreements for ISD employees in accordance with the “Typical Performance Cycle” set out in the Program Guide For Managers and Professional Exempt (MPE) and Civic Institute of Professional Personnel (CIPP).

Management Response
Management agrees with this recommendation.

Management will undertake measures to improve compliance with the “Typical Performance Cycle” set out in the Program Guide for Managers and Professional Exempt (MPE) and Civic Institute of Professional Personnel (CIPP), during the 2015 performance review process, and complete an assessment of compliance by Q2 2016.

Recommendation 8
That ISD complete the Development Plan sections of the Individual Contribution Agreements for ISD employees.

Management Response
Management agrees with this recommendation.

Management will undertake measures to improve compliance during the 2015 performance review process, and complete an assessment of compliance by Q2 2016.

Recommendation 9
That ISD issue an ISD Learning Plan that is consistent with the City’s Learning and Development Policy.

Management Response
Management agrees with this recommendation.

The department’s existing employee training profiles, job function outlines and job descriptions will be used as base information to support the Infrastructure Services Department Competency Development Project being undertaken as part of the Integrated Departmental Management Plan Program.

The Competency Development Project includes objectives to assess roles and competencies, skills to support new processes, evolving roles and expectations of the department as well as leveraging shared service expertise and support, where appropriate, to align the program training strategy with the broader
training/learning strategy for the City. The Competency Development Project will be completed by Q2 2017.

**Potential Savings**

**Reduce overtime during the busy construction period**
Overtime during the busy construction period (May to September) may possibly be reduced by not approving continuous vacations for ISD construction staff during this period. During the 2012 busy construction period, ISD incurred $133,435 in overtime costs.

**Conclusion**
Administrative management of ISD is basically sound, although opportunities exist to improve controls and realize savings.
Audit of Infrastructure Services – Technical Management

Introduction
The Audit of the Infrastructure Services department (ISD) was included in the 2013 Audit Plan of the Office of the Auditor General and approved by Council on October 12, 2012. The audit was conducted in two distinct streams – the audit of the technical management of ISD, and the audit of the administrative management of ISD. This is the executive summary of the audit of the technical management of ISD.

Background
The Infrastructure Services department (ISD) is responsible for asset management of the City’s roads, sidewalks, sewers, water mains, bridges, culverts, buildings, parks and other structures. It is also responsible for the design, construction and administration of the work required for new construction and the rehabilitation and renewal of:

- The City’s infrastructure
- Transit facilities
- Pumping stations, water reservoirs and elevated tanks
- Sewage and water treatment facilities
- Stormwater management facilities
- Solid waste facilities.

ISD consists of the following branches:

- Asset Management – planning of infrastructure works, including renewal and coordination of capital projects identified by client departments
- Design and Construction: East, West and Buildings and Parks (three branches) – implementation of renewal work and new infrastructure

The functions undertaken by ISD are:

- Asset inventory, inspections, renewal planning
- Design of rehabilitation, replacement and new infrastructure works
- Construction, contract administration and inspection of construction;
- Surveys
- Right of Way information approvals
- Design and construction standards
Quality Assurance services.

A number of audits have been conducted on specific areas of ISD, namely the 2009 Audit of Bridge Maintenance Process and the Audit of a Specific Bridge, the 2010 Audit of the Mackenzie King Bridge Contracts, and the 2012 Audit of Construction Supervision Services. This audit encompasses the overall processes of ISD, but at a higher level of detail.

Audit Scope and Objectives
The scope of the audit included the technical operation of the Infrastructure Services department. The audit objectives are:

Audit Objective No. 1 – Compliance with applicable Federal and Provincial Guidelines and Regulations
Criteria:
- Confirmation of compliance with the various Provincial and Federal requirements (e.g. Public Transportation and Highway Improvement Act, Municipal Act, Capital Investment Plan Act, Fish and Wildlife Conservation Act, Planning Act, Public Lands Act, Environmental Protection Act, Ontario Water Resources Act, Occupational Health and Safety Act, Environmental Assessment Act,
- Evaluation of the programs for Structure Inspections and Renewal, Watermain and Sewer Inspections

Audit Objective No. 2 – Compliance with the objectives of the Comprehensive Asset Management Program set by the City.
Criteria:
- Effectiveness of the Infrastructure inventories and inspections, design of renewal works, cost of renewal construction.
- Completeness of reporting of results to Committee and Council

Audit Objective No. 3 - Structure of ISD within the City in terms of responsibilities.
Criteria:
Ensure there is no duplication of responsibilities with Planning and Growth Management, Drinking Water Services, and Drainage and Wastewater Services and other City departments

Audit Objective No. 4 - The process and methodologies used for selection of consultants and contractors
Criteria:
Audit Objective No. 5 - The effectiveness of program management and project monitoring
Criteria:
- Ensure appropriate processes for review and approvals of study report and designs
- Ensure adequate processes for construction inspections

Audit Objective No. 6 - The control systems used for delivery of the projects within budget and schedule
Criteria:
- Ensure appropriate program management
- Ensure Project Managers and Inspectors responsibilities and reporting are complete
- Adequate design process, standards, reviews, control
- Adequate construction supervision, process, standards, reviews, control

Audit Objective No. 7 - The processes and methodologies used for control of change orders and costs in design and construction.
Criteria:
- Evaluate process:
  - Change order methods
  - Approval of change orders
  - Recording of change orders

Audit Objective No. 8 - Identify areas of potential savings for the City in the technical management and operations of ISD
Criteria:
- Determine if potential savings are possible through a more efficient and effective technical management and operation of ISD
- Issues related to ISD were identified in previous audits, namely responsibility for redesign costs, recovery of change orders due to errors, exercising of contract liquidated damages, project oversight and others. This audit did specifically follow-up on the status of recommendations made in these audits. The audit also did not compare the costs of renewal work to the costs being paid by other municipalities in Ontario.
Audit Approach
The audit included the following tasks:

- Review legislative framework
- Review City’s policies, procedures, standards and practices.
- Review industry procedures, standards and practices.
- Review background data.
- Obtain and review files for 20 selected projects for compliance to applicable policies, procedures and standards.
- Conduct interviews with individuals involved in the various aspects of the operation of the ISD.
- Prepare Draft Report for fact verification.
- Conduct additional interviews for confirmation of issues, if necessary.
- Submit Draft Report for Management Review.

Summary of Key Findings
The Financial Services unit indicated that in 2012, ISD had 359 Municipal Capital Projects and 577 Buildings and Parks Capital Projects. The total 2012 Capital Project budget for ISD was $497,880,000, with Budget Adjustments of $52,192,000, for total Authority of $550,072,000. These amounts represent additions made to the pre-existing list of approved capital projects as the City does not budget its capital projects by year.

As part of the audit, 20 projects were selected for examination, as listed in Table 1. The budget values in Table 1 are the overall budget values for each project, including adjustments, as provided by the Financial Services unit – Planning and Infrastructure.

Table 0-1: Projects Selected for Audit Examination

<table>
<thead>
<tr>
<th>Project Description</th>
<th>Budget ($000s)</th>
<th>Status as of November 2013</th>
</tr>
</thead>
<tbody>
<tr>
<td>Irving-Laurentian-Carling-Lynwood-Oakville</td>
<td>940</td>
<td>Project design underway since September 2013</td>
</tr>
<tr>
<td>Hurdman-St Laurent Watermain Relocation</td>
<td>24,808</td>
<td>Construction started August 2013.</td>
</tr>
<tr>
<td>Belfast (Trainyards - 120 m north)</td>
<td>600</td>
<td>Construction was being completed in November 2013.</td>
</tr>
<tr>
<td>Project Description</td>
<td>Budget ($000s)</td>
<td>Status as of November 2013</td>
</tr>
<tr>
<td>------------------------------------------------------------------------------------</td>
<td>----------------</td>
<td>----------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Olmstead (Jeanne Mance-McArthur)</td>
<td>400</td>
<td>Tendered Nov. 4, 2013, closing November 21, 2013. Construction was postponed to 2014 due to time of the year.</td>
</tr>
<tr>
<td>ORAP- Combined Sewer Overflow Storage</td>
<td>17,500</td>
<td>Project under design. Construction in 2017 will be coordinated with the 2017 sesquicentennial celebrations.</td>
</tr>
<tr>
<td>Acres Pump Station Overflow</td>
<td>2,000</td>
<td>Tendered 10 October 2013. Originally scheduled for February 2013 tender</td>
</tr>
<tr>
<td>Rideau River O-Train Bridge</td>
<td>3,000</td>
<td>Project on hold since March/April 2013, due to risk of not being able to complete the work in the window allowed.</td>
</tr>
<tr>
<td>Chapman Mills Station and Park &amp; Ride</td>
<td>10,000</td>
<td>Substantial completion</td>
</tr>
<tr>
<td>Transitway Rehab. - East Transitway, St. Laurent Blvd. Overpass Transitway &amp; Transitway Structures - East Transitway, St. Laurent Sta. Central &amp; East Tunnels</td>
<td>1,860</td>
<td>Completed</td>
</tr>
<tr>
<td>Bronson Ave., Phase 1 (Laurier to Arlington) incl. Bronson Ave. Emergency Retaining Wall Repair (NE Corner of Laurier)</td>
<td>30,000</td>
<td>Completed</td>
</tr>
<tr>
<td>Minto Bridges (Phase1)</td>
<td>2,200</td>
<td>Substantial Completion</td>
</tr>
<tr>
<td>Rideau St. Reconstruction Phase 1 (Dalhousie to Chapel)</td>
<td>14,510</td>
<td>Substantial Completion</td>
</tr>
<tr>
<td>Youville Storm Sewer Lining &amp; Headwall</td>
<td>6,000</td>
<td>Completed</td>
</tr>
<tr>
<td>Holland Avenue Watermain (Scott St to Tyndall St)</td>
<td>3,400</td>
<td>Completed</td>
</tr>
<tr>
<td>Clarendon Ave / Harmer Ave / Ruskin St / Inglewood Pl – Road, Sewer and Watermain Renewal</td>
<td>10,590</td>
<td>Substantial Completion</td>
</tr>
<tr>
<td>Project Description</td>
<td>Budget ($000s)</td>
<td>Status as of November 2013</td>
</tr>
<tr>
<td>---------------------------------------------------------</td>
<td>----------------</td>
<td>----------------------------</td>
</tr>
<tr>
<td>Champagne O-Train Corridor Multi-Use Pathway (PH1)</td>
<td>3,000</td>
<td>Completed</td>
</tr>
<tr>
<td>Woodroffe Ave (Hwy 417 to 170m N. of Baseline) Sanitary Sewer &amp; Watermain Construction</td>
<td>8,000</td>
<td>Completed</td>
</tr>
<tr>
<td>Bulk ICD / Floatables (Trap installation in downtown core)</td>
<td>3,550</td>
<td>Completed</td>
</tr>
<tr>
<td>Moodie Dr. and Robertson Rd Intersection Modification</td>
<td>16,122</td>
<td>Completed</td>
</tr>
<tr>
<td>Reconstruction of Meadowlands Dr. (Inverness to Tiverton) Phase III</td>
<td>16,200</td>
<td>Substantial Completion</td>
</tr>
<tr>
<td>Total Budget Value</td>
<td>174,680</td>
<td></td>
</tr>
</tbody>
</table>

The projects listed in Table 1 are in various stages of the project delivery process. Some of them are in preliminary design, others are in detail design, and others are completed or substantially completed in 2013. No projects from Design and Construction Buildings and Parks were selected for review because only two of them fit the criteria. There was no indication of budget concerns for these two projects.

The findings relating to these projects are summarized below by Audit Objective.

**Audit Objective No. 1 - Compliance with applicable Federal and Provincial Guidelines and Regulations**

The ISD operates with due compliance with the Federal and Provincial guidelines and regulations that directly pertain to its activities.

Although we did not exhaustively examine the 20 projects for compliance in this regard, our review of the 20 projects confirmed that ISD carries out project delivery in general compliance with these guidelines and regulations.

The program for Structure Inspection and Renewal and for Watermain and Sewer inspections is managed by Asset Management branch (AMB). As part of the Comprehensive Asset Management Program, the City determined the status of the infrastructure and its condition in 2012.
Review of the methodology used to determine the condition of the infrastructure showed that it was being performed in a rational way. The methodology used to establish the condition rating of bridges and bridge-culverts, buildings, and parks is well established and is relatively straightforward to apply, since in most cases the infrastructure can be readily inspected and its condition assessed consistent with industry standards. For watermains and sewers direct inspections are more difficult and costly, since in many cases the infrastructure needs to be taken out of service to inspect it and they are not readily visible. Review of the methodology used to establish the condition and inspection needs for watermains and sewers shows that it followed a rational measurable process, based on various proxy indicators (for example, age, material, soils, etc.). The City has indicated that they will improve the methodology used for watermains and sewers as more information becomes available from the condition of watermains and sewers as they are replaced. The processes are consistent with current standards.

Audit Objective No. 2 - Compliance with the objectives of the Comprehensive Asset Management Program set by the City.

The Comprehensive Asset Management (CAM) Program was approved by Council in October 2012, including the CAM Policy, the State of the Asset Report, and the CAM Strategy.

The CAM Framework used to develop the CAM Program and Policy requires that the City undertakes Demand Management, Lifecycle Management, and Financial Management programs, culminating in Asset Management Plans for all departments.

Since the CAM Program and Policy were approved by Council, the City has completed the Infrastructure Master Plan and the Transportation Master Plan. In both instances, the components of the plan have been developed taking into account the principles of the CAM Policy.

At present the CAM Strategy is being implemented, as such not all Departmental Asset Management Plans are yet complete. Furthermore, the Levels of Service to be established as per the CAM Strategy are also not complete.

The last report on the CAM Program was provided in October 2012. ISD indicated at the time that an update would be provided at the same time as the refresh to the Long Range Financial Plan (LRFP) so that the CAM report would provide the basis for the LRFP update. As such, no updated CAM Program was given to Council in 2013 because the City was still working on the LRFP.
Audit Objective No. 3 - Structure of ISD within the City in Terms of Responsibilities

The Infrastructure Services department (ISD) is responsible for Asset Management and for Design and Construction, including new infrastructure required to accommodate growth, the infrastructure and transportation master plans, and renewal of the existing infrastructure. The examination of the responsibilities of ISD and other departments found little chance of duplication of responsibilities.

The mandate and scope of responsibilities of ISD is not duplicated in other departments within the City. ISD makes a significant effort to communicate within it and with other City departments. The involvement of ISD representatives in committees and task forces composed of staff from ISD and other departments indicates that the level of communication at manager and program manager level is such that duplication of responsibilities appears unlikely.

An aspect of this audit was to determine whether duplication of responsibilities could be eliminated. Review of the information provided by the City and interviews with staff did not show that there are any gaps in responsibilities.

Audit Objective No. 4 - The Process and Methodologies Used for Selection of Consultants and Contractors

The Project Delivery Manual and Appendices (PDM) prepared by ISD contain specific procedures and documentation to make sure that all procurement of services and construction is carried out with the full knowledge of, and based on standards set by, the Supply branch.

The process used to select consultants is based on the estimated cost of the services required. If the cost is below the dollar amount threshold, the ISD Project Manager selects one consultant from a roster of consultants who have been pre-qualified using a Request for Standing Offer process, directed by Supply branch. The City indicated that in May 2012 the cost of services threshold for Engineering Services was raised to $250,000 from $150,000. The Purchasing By-law states that the limit is $150,000 and that Supply branch can authorize exceptions, which it did in this case.

Table 2 summarizes the number of projects (assignments) where the consultants were selected from the Standing Offer, the number of projects that exceeded the threshold at completion of the project and the corresponding value of the services.
Table 0-2: Number of Standing Offer Assignments Exceeding $250,000 Threshold

<table>
<thead>
<tr>
<th>Year</th>
<th>Number of Contracts Assigned (Issued) Using Standing Offer</th>
<th>Total Value of Consulting Services Standing Offer</th>
<th>Number of Assignments</th>
<th>Total Fee Value</th>
<th>Percentage of Total Value of Consulting Services Standing Offer</th>
</tr>
</thead>
<tbody>
<tr>
<td>2012</td>
<td>336</td>
<td>$ 22,863,662</td>
<td>5</td>
<td>$2,221,302</td>
<td>9.7%</td>
</tr>
<tr>
<td>2013</td>
<td>340</td>
<td>$ 18,500,504</td>
<td>3</td>
<td>$933,926</td>
<td>5.0%</td>
</tr>
</tbody>
</table>

The “Number of Contracts Assigned Using Standing Offer” column includes amendments which are not considered new contracts. The total number of new contracts was 248 in 2012 and 232 in 2013.

The “Total Value of Consulting Services Standing Offer” and “Percentage of Total Value of Consulting Services Standing Offer” columns include call ups made by ISD against two separate standing offers - Professional Engineering Services and Infrastructure Design Services, which includes professional engineering and architectural services.

The total value (including Standing Offer contracts) of professional and consulting services for ISD (including amendments each year) were:

Table 0-3: Total Value of Professional and Consulting Services for ISD (including amendments)

<table>
<thead>
<tr>
<th>Year</th>
<th>Number of Contracts Awarded including RFP and Standing Offer</th>
<th>Total Value of Professional and Consulting Services</th>
<th>Number of Contracts Assigned (Issued) Using Standing Offer</th>
<th>Total Value of Consulting Services Standing Offer</th>
<th>Percentage of Value Awarded Using Standing Offer</th>
</tr>
</thead>
<tbody>
<tr>
<td>2012</td>
<td>443</td>
<td>$53,469,101</td>
<td>336</td>
<td>$22,863,662</td>
<td>43%</td>
</tr>
<tr>
<td>2013</td>
<td>488</td>
<td>$55,652,525</td>
<td>340</td>
<td>$18,500,504</td>
<td>33%</td>
</tr>
</tbody>
</table>

The “Number of Contracts Awarded including RFP and Standing Offer” column includes amendments which are not considered separate contract awards.
The total value of contracts for professional and consulting services awarded using the Standing Offer represent an average of 37% of the total value of consulting services for 2012 and 2013.

The City indicated that the intention is to use the $250,000 as the threshold for services that included design and contract administration services. However, some ISD project managers enter into a standing offer contract for design only (under the threshold) and then amend the contract at a later date to include the contract administration component. These amendments increase the dollar value of the contracts over the threshold. In effect, the Standing Offer was used for projects that should have been procured using a Request for Proposal, not the Standing Offer process. This contravenes the intent of the Purchasing By-law. Had the RFP process been followed, a greater emphasis on the price component of the proposals would have resulted, with added assurance that the City was receiving best value.

Selecting one consultant only for each assignment processed under the terms of the Standing Offer removes price competition from the process at that point, since Standing Offer assignments are awarded at rates approved when the consultant’s Standing Offer was accepted by the City. Requesting quotations under the Standing Offer from two or three consultants is expected to have a significant effect on the cost of consulting services. The procurement process should be modified to require more than one quotation.

The potential for savings in the use of Standing Offers is consistent with our findings in the 2005 Audit of the Procurement Process. That audit found that there should be better management of Standing Offers with a greater emphasis on price. This was still the case in 2009 when the follow-up to the 2005 audit was completed. The 2009 follow-up audit found that in the issuance of the Standing Offers for engineering services, there was no real ranking to reflect best value and call-ups were not being made in relation to price.

For projects costing more than the dollar threshold for Standing Offer selection, ISD prepares a Terms of Reference, and the Supply branch issues a Request for Qualifications and/or a Request for Proposals, as the case may merit. Evaluation of the proposals and selection of the consultant based on this method is done under the direction and supervision of Supply branch.
For Standing Offers call-ups, the Project Manager provides the consultant with Scoping Documents and other documentation that allows the consultant to provide a proposal. The Terms of Reference for consultant selection are prepared by the Project Manager for both Requests for Quotations and Requests for Proposals. Only if the project is unusual or high profile does the Program Manager review the Terms of Reference. In our opinion, the Program Manager should routinely review the Terms of Reference. If that had been the case in the Standing Offer contracts noted above, several of them might have been procured using an RFP potentially resulting in cost savings.

The City has indicated that call-ups valued at greater than $100,000 are reviewed and recommended for approval by Supply and the General Manager, ISD to the Deputy City Manager, Planning and Infrastructure. Call-ups less than $100,000 are approved by Supply on behalf of the General Manager, ISD.

During the review of files it was noted that in one project the City’s project manager, who was responsible for the selection of the supplier from the Standing Offer and approval of the project budget, left the City’s employment approximately two months after letting the contract. The former City employee then went to work for the supplier as its project manager on the same project. This is a potential conflict of interest. The value of the consulting services contract was $304,000 and the total budget for this project is $3.55 Million.

Although the supplier did not seek formal authorization from the City for this individual to work on the project; the City was aware of the situation and accepted it. Although the City requires in Requests for Qualifications and Requests for Proposals that suppliers disclose and resolve to the satisfaction of the City any potential conflicts of interest, the City procedures for Standing Offer call-ups do not require formal notification of potential conflict of interest; however, they should be amended to require formal notification.

For the construction phase of the projects, the ISD Project Manager supervises the preparation of the construction drawings and the corresponding specifications and special provisions. Once the design documentation is complete and it has received approval of the client department, the ISD Project Manager transmits the documentation to Supply branch, who then takes the project through the tender process, receipt of bids, evaluation of bids, assessment of contractor references, and award of contract. The ISD Project Manager is involved in the bid evaluation process. In the files examined during this audit there was an appropriate bidding process.

Table 4 summarizes the total value of construction contracts for ISD (including amendments each year):
Table 0-4: Total Value of Construction Contracts for ISD (including amendments)

<table>
<thead>
<tr>
<th>Year</th>
<th>Number of Construction Contracts Awarded</th>
<th>Total Value of Contracts</th>
</tr>
</thead>
<tbody>
<tr>
<td>2012</td>
<td>538</td>
<td>$321,471,187</td>
</tr>
<tr>
<td>2013</td>
<td>502</td>
<td>$271,833,785</td>
</tr>
</tbody>
</table>

**Audit Objective No. 5 - The Effectiveness of Program Management and Project Monitoring**

ISD reports on project budget and schedule status using Project Status Update (PSU) reports which are issued monthly by each Project Manager. These reports are intended to inform the Program Managers, branch Managers and General Managers of the project status. PSUs are also issued to councillors every month.

The PSUs are part the City’s Program Management and Project Monitoring regime. In 2006 the Infrastructure Services department prepared a Project Management Manual (PMM001) which was used until 2012 by the City for the delivery of projects. The manual was updated in 2012 and was rolled out in the Spring of 2013, titled the Project Delivery Manual (PDM). The PDM provides an overview of the basic project management delivery concepts that guide project management for the Infrastructure Services department at the City. The manual supports all ISD staff in the delivery of capital projects. It is also a reference for those departments who receive capital project delivery services from ISD.

The PDM provides detailed step-by-step direction to the ISD Design and Construction branches for the delivery of projects, including sample documentation for the various tasks that Project Managers must execute. The processes encompass the range of projects that are undertaken by ISD and are sufficiently detailed to enable the branch Manager to confirm that the Program Managers and Project Managers are delivering their responsibilities. However, our review of the 20 project files listed in Table 1 indicates that while processes are in place, they are not being consistently followed (see Tables 5 and 6 below).

Training documents provided by ISD show that introductory sessions were presented to ISD staff in 2012. The PDM was also provided to consultants working for the City at that time. However, it is not referenced in the Terms of Reference that form part of the procurement process, and therefore its use is not a formal requirement for consultants. The PDM should be referenced in the Terms of Reference as a requirement to be followed by consultants.
Twenty projects were examined to determine the extent to which the PMM001 and PDM were applied by City Project Managers. Some of the projects selected started when the PMM001 was in force, but were completed in 2013, when the PDM was in force.

From the requirements of the PMM001 and PDM manuals, the key aspects listed in Table 5 were examined for all projects.

Table 0-5: PMM001/PDM Requirements Reviewed

<table>
<thead>
<tr>
<th>Item No.</th>
<th>Item Description</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Project scoping report</td>
<td>Document that describes the project scope, work plan, project schedule, budget and cash flow.</td>
</tr>
<tr>
<td></td>
<td>or project intake form</td>
<td></td>
</tr>
<tr>
<td>2.</td>
<td>Project schedule</td>
<td>The Project Manager (PM) prepares a Project Task Breakdown and a Project Schedule.</td>
</tr>
<tr>
<td></td>
<td>prepared by project</td>
<td>In most cases, as discussed below, the PM relies on the project schedules prepared by the consultant</td>
</tr>
<tr>
<td></td>
<td>manager</td>
<td>and the contractor.</td>
</tr>
<tr>
<td>3.</td>
<td>Project budget, cash</td>
<td>The PM determines cost estimates for the project budget, provides to the Program Manager at start of</td>
</tr>
<tr>
<td></td>
<td>flow and invoice</td>
<td>project and once a year a project cash flow; reviews and approves invoices from suppliers.</td>
</tr>
<tr>
<td></td>
<td>approvals</td>
<td></td>
</tr>
<tr>
<td>4.</td>
<td>Monthly project review</td>
<td>The PM is required to submit monthly reports to the Program Manager.</td>
</tr>
<tr>
<td></td>
<td>and reporting</td>
<td></td>
</tr>
<tr>
<td>5.</td>
<td>Project team initiation</td>
<td>Meeting with internal and external project teams.</td>
</tr>
<tr>
<td></td>
<td>meeting</td>
<td></td>
</tr>
<tr>
<td>6.</td>
<td>Consultant selection</td>
<td>Information on how the consultant was selected (Standing Offer selection, Request for Qualifications,</td>
</tr>
<tr>
<td></td>
<td>process data</td>
<td>Request for Proposal).</td>
</tr>
<tr>
<td>7.</td>
<td>Preliminary design</td>
<td>Preliminary design report and drawings.</td>
</tr>
<tr>
<td></td>
<td>documentation</td>
<td></td>
</tr>
<tr>
<td>8.</td>
<td>External stakeholder</td>
<td>Meeting with stakeholders (defined as those who have interest in the project, e.g. BIA, NCC,</td>
</tr>
<tr>
<td></td>
<td>meetings</td>
<td>Community Associations, etc.)</td>
</tr>
<tr>
<td>9.</td>
<td>Update scope, budget</td>
<td>Upon completion of preliminary design, PM to update the project scope, budget and schedule, if</td>
</tr>
<tr>
<td></td>
<td>and schedule</td>
<td>necessary. Inform the Program Manager or Manager of the changes.</td>
</tr>
<tr>
<td>Item No.</td>
<td>Item</td>
<td>Description</td>
</tr>
<tr>
<td>---------</td>
<td>-------------------------------------------</td>
<td>---------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>10.</td>
<td>Preliminary design review</td>
<td>The PM to review the preliminary design, modify as necessary to meet requirements.</td>
</tr>
<tr>
<td>11.</td>
<td>Public communications</td>
<td>Consult with Ward Councillor to determine if public notification or meeting is required.</td>
</tr>
<tr>
<td>12.</td>
<td>Sign-off for approval to proceed to detail design (not required for smaller projects)</td>
<td>PM to secure sign-off from program manager and client representative, using form. Sign-off is not required in clearly defined municipal rehabilitation or structure renewal projects.</td>
</tr>
<tr>
<td>13.</td>
<td>Review at 50% and 75% value points</td>
<td>Review work progress vs. fees paid and ability to complete with remaining fees. This is not a requirement in the PDM.</td>
</tr>
<tr>
<td>14.</td>
<td>Invoice and fee status summary</td>
<td>Maintaining and updating of invoice and fee status summary</td>
</tr>
<tr>
<td>15.</td>
<td>Consultant appraisal for each completed assignment</td>
<td>For projects greater than $500,000, complete appraisal at end of each phase.</td>
</tr>
<tr>
<td>16.</td>
<td>Detail design Terms of Reference (ToR), scope, budget, schedule</td>
<td>PM confirm project scope, prepare terms of reference, update budget and schedule.</td>
</tr>
<tr>
<td>17.</td>
<td>Review of detail design</td>
<td>Formal review of detail design</td>
</tr>
<tr>
<td>18.</td>
<td>Utility circulations</td>
<td>PM requests an Utility circulation</td>
</tr>
<tr>
<td>19.</td>
<td>Approvals submissions</td>
<td>PM prepares applications and documents for approvals.</td>
</tr>
<tr>
<td>20.</td>
<td>Public notifications</td>
<td>PM to arrange a public notification or public meeting for the detail design.</td>
</tr>
<tr>
<td>21.</td>
<td>Detail design review</td>
<td>Review detail design based on results of utility circulations and public meeting.</td>
</tr>
<tr>
<td>22.</td>
<td>Design approval form</td>
<td>PM to secure sign-off using form.</td>
</tr>
<tr>
<td>23.</td>
<td>Contract tender package</td>
<td>Contract tender package to be prepared consistent with City’s standards.</td>
</tr>
<tr>
<td>24.</td>
<td>Bid analysis</td>
<td>PM to review bids, do a tender bid comparison.</td>
</tr>
<tr>
<td>25.</td>
<td>Commence work order</td>
<td>Letter authorizing the contractor to start work upon notification from Supply branch that all contract requirements are met.</td>
</tr>
<tr>
<td>26.</td>
<td>Pre-construction inspections</td>
<td>Photos, video of site, video inspections of existing buildings, seismic monitoring, noise and air quality monitoring (if required).</td>
</tr>
<tr>
<td>Item No.</td>
<td>Item</td>
<td>Description</td>
</tr>
<tr>
<td>---------</td>
<td>----------------------------------</td>
<td>----------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>27.</td>
<td>Preconstruction meeting</td>
<td>Meeting of PM, Contractor, Consultant, and stakeholders.</td>
</tr>
<tr>
<td>28.</td>
<td>Updated status/schedule and final cost forecast</td>
<td>PM to provide an updated status report to Program Manager, including a Final Forecast cost.</td>
</tr>
<tr>
<td>29.</td>
<td>Weekly site visits</td>
<td>PM to visit the site weekly, normally with the inspector.</td>
</tr>
<tr>
<td>30.</td>
<td>Payment certificates</td>
<td>PM to issue payment certificates on a regular basis.</td>
</tr>
<tr>
<td>31.</td>
<td>Change orders and documentation</td>
<td>PM to manage changes to the contract, including requests for changes in the work and extra work, and approval of change orders up to the limits set by management.</td>
</tr>
<tr>
<td>32.</td>
<td>Quality assurance testing</td>
<td>PM to arrange for and review quality assurance testing</td>
</tr>
<tr>
<td>33.</td>
<td>Inform the division manager if significant budget variations are expected.</td>
<td>Self-explanatory.</td>
</tr>
<tr>
<td>34.</td>
<td>Project management reports – monthly project review and reporting</td>
<td>Before the Project Status Reports were instituted, this was done using Appendix D3 of the PMM001.</td>
</tr>
<tr>
<td>35.</td>
<td>Contractor performance appraisal</td>
<td>Complete form at end of contract</td>
</tr>
<tr>
<td>36.</td>
<td>Project close-out documentation and report</td>
<td>PM to review the project with the aim to determine potential improvements for future projects. PM to review the project file and ensure that all the required documentation is included.</td>
</tr>
</tbody>
</table>

Table 6 summarizes the findings for the 20 projects reviewed.
It is noted that in the initial review of the project files the results of the application of the requirements of the PDM was far from acceptable. For several requirements the level of compliance was quite low. It was acknowledged that in some cases the results are due to the files reviewed not being complete since some of the projects were on-going; therefore, during the audit the City was provided in both cases with a second opportunity for the project managers to complete the file documentation. Where additional information was provided it was included in the evaluation. During the fact verification phase of the audit the City provided the information that was missing from the files, resulting in the outcome in Table 6.

Table 0-6: Summary of Findings from Project Reviews – 20 Projects reviewed

<table>
<thead>
<tr>
<th>Item No.</th>
<th>PMM001/PDM Requirement</th>
<th>No. of Compliant Projects</th>
<th>No. of Applicable Projects</th>
<th>Compliance (Based on Applicable Projects)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Project scoping report or project intake form</td>
<td>20</td>
<td>20</td>
<td>100%</td>
</tr>
<tr>
<td>2.</td>
<td>Project schedule prepared by project manager</td>
<td>20</td>
<td>20</td>
<td>100%</td>
</tr>
<tr>
<td>3.</td>
<td>Project budget, cash flow and invoice approvals</td>
<td>20</td>
<td>20</td>
<td>100%</td>
</tr>
<tr>
<td>4.</td>
<td>Monthly project review and reporting</td>
<td>20</td>
<td>20</td>
<td>100%</td>
</tr>
<tr>
<td>5.</td>
<td>Project team initiation meeting</td>
<td>19</td>
<td>20</td>
<td>95%</td>
</tr>
<tr>
<td>6.</td>
<td>Consultant selection process data</td>
<td>20</td>
<td>20</td>
<td>100%</td>
</tr>
<tr>
<td>7.</td>
<td>Preliminary design documentation</td>
<td>19</td>
<td>19</td>
<td>100%</td>
</tr>
<tr>
<td>8.</td>
<td>External stakeholder meetings</td>
<td>17</td>
<td>18</td>
<td>94%</td>
</tr>
<tr>
<td>9.</td>
<td>Update scope, budget and schedule</td>
<td>19</td>
<td>19</td>
<td>100%</td>
</tr>
<tr>
<td>10.</td>
<td>Preliminary design review</td>
<td>18</td>
<td>19</td>
<td>95%</td>
</tr>
<tr>
<td>11.</td>
<td>Public communications</td>
<td>15</td>
<td>16</td>
<td>94%</td>
</tr>
<tr>
<td>12.</td>
<td>Sign-off for approval to proceed to detail design (not required for smaller projects)</td>
<td>11</td>
<td>15</td>
<td>73%</td>
</tr>
<tr>
<td>13.</td>
<td>Review at 50% and 75% value points</td>
<td>14</td>
<td>18</td>
<td>78%</td>
</tr>
<tr>
<td>14.</td>
<td>Invoice and status summary</td>
<td>18</td>
<td>18</td>
<td>100%</td>
</tr>
<tr>
<td>15.</td>
<td>Consultant appraisal for each completed assignment</td>
<td>4</td>
<td>8</td>
<td>50%</td>
</tr>
<tr>
<td>Item No.</td>
<td>PMM001/PDM Requirement</td>
<td>No. of Compliant Projects</td>
<td>No. of Applicable Projects</td>
<td>Compliance (Based on Applicable Projects)</td>
</tr>
<tr>
<td>---------</td>
<td>----------------------------------------------------------------------------------------</td>
<td>---------------------------</td>
<td>---------------------------</td>
<td>-------------------------------------------</td>
</tr>
<tr>
<td>16.</td>
<td>Detail design ToR, scope, budget, schedule</td>
<td>18</td>
<td>18</td>
<td>100%</td>
</tr>
<tr>
<td>17.</td>
<td>Review of detail design</td>
<td>18</td>
<td>18</td>
<td>100%</td>
</tr>
<tr>
<td>18.</td>
<td>Utility circulations</td>
<td>18</td>
<td>18</td>
<td>100%</td>
</tr>
<tr>
<td>19.</td>
<td>Approvals submissions</td>
<td>15</td>
<td>15</td>
<td>100%</td>
</tr>
<tr>
<td>20.</td>
<td>Public notifications</td>
<td>15</td>
<td>15</td>
<td>100%</td>
</tr>
<tr>
<td>21.</td>
<td>Detail design review</td>
<td>17</td>
<td>17</td>
<td>100%</td>
</tr>
<tr>
<td>22.</td>
<td>Design approval form</td>
<td>12</td>
<td>15</td>
<td>80%</td>
</tr>
<tr>
<td>23.</td>
<td>Contract tender package</td>
<td>18</td>
<td>18</td>
<td>100%</td>
</tr>
<tr>
<td>24.</td>
<td>Bid analysis</td>
<td>17</td>
<td>17</td>
<td>100%</td>
</tr>
<tr>
<td>25.</td>
<td>Commence work order</td>
<td>16</td>
<td>17</td>
<td>94%</td>
</tr>
<tr>
<td>26.</td>
<td>Pre-construction inspections</td>
<td>15</td>
<td>15</td>
<td>100%</td>
</tr>
<tr>
<td>27.</td>
<td>Preconstruction meeting</td>
<td>15</td>
<td>15</td>
<td>100%</td>
</tr>
<tr>
<td>28.</td>
<td>Updated status/schedule and final cost forecast – monthly</td>
<td>15</td>
<td>15</td>
<td>100%</td>
</tr>
<tr>
<td>29.</td>
<td>Weekly site visits</td>
<td>15</td>
<td>15</td>
<td>100%</td>
</tr>
<tr>
<td>30.</td>
<td>Payment certificates</td>
<td>15</td>
<td>15</td>
<td>100%</td>
</tr>
<tr>
<td>31.</td>
<td>Change orders and documentation</td>
<td>14</td>
<td>14</td>
<td>100%</td>
</tr>
<tr>
<td>32.</td>
<td>Quality assurance testing</td>
<td>14</td>
<td>14</td>
<td>100%</td>
</tr>
<tr>
<td>33.</td>
<td>Inform the division manager if significant budget variations are expected.</td>
<td>12</td>
<td>13</td>
<td>92%</td>
</tr>
<tr>
<td>34.</td>
<td>Project management reports – monthly project review and reporting</td>
<td>15</td>
<td>15</td>
<td>100%</td>
</tr>
<tr>
<td>35.</td>
<td>Contractor performance appraisal</td>
<td>2</td>
<td>4</td>
<td>50%</td>
</tr>
<tr>
<td>36.</td>
<td>Project close-out documentation and report</td>
<td>5</td>
<td>5</td>
<td>100%</td>
</tr>
</tbody>
</table>

Note: Applicable Projects are those that had advanced sufficiently to have the requirement applicable to them.

Table 7 below provides further information of the findings with respect to PDM compliance (summarized in Table 6 above) that have percentage of compliance lower than 100%.

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Table 0-7: Discussion of PMM001/PDM Requirement with Compliance < 100%

<table>
<thead>
<tr>
<th>Item No.</th>
<th>PMM001/PDM Requirement</th>
<th>% Compliance</th>
<th>Discussion</th>
</tr>
</thead>
<tbody>
<tr>
<td>5.</td>
<td>Project team initiation meeting</td>
<td>95%</td>
<td>The initiation meeting is an opportunity for the project team to meet and to discuss issues and concerns, obtain clarification on issues and requirements.</td>
</tr>
<tr>
<td>8.</td>
<td>External stakeholder meetings</td>
<td>94%</td>
<td>These meetings assist in communicating the project to the stakeholders and in understanding stakeholder issues and concerns.</td>
</tr>
<tr>
<td>10.</td>
<td>Preliminary design review</td>
<td>95%</td>
<td>The preliminary design sets the overall configuration of the project. A formal design review helps to identify and disclose any issues.</td>
</tr>
<tr>
<td>11.</td>
<td>Public communications</td>
<td>94%</td>
<td>Some communications are at the Councillor’s discretion; the direction given by the Councillor should be recorded fully.</td>
</tr>
<tr>
<td>12.</td>
<td>Sign-off for approval to proceed to detail design (not required for smaller projects)</td>
<td>73%</td>
<td>Should be completed to ensure that the Client department has agreed explicitly to the preliminary design concepts.</td>
</tr>
<tr>
<td>13.</td>
<td>Review at 50% and 75% value points</td>
<td>78%</td>
<td>This is a formal step that is not being completed explicitly. It should be done formally to confirm that there is sufficient budget left to complete the work remaining. The preliminary design review sets the overall configuration of the project. A formal design review helps disclose any issues.</td>
</tr>
</tbody>
</table>
Audit of Infrastructure Services – Technical Management

<table>
<thead>
<tr>
<th>Item No.</th>
<th>PMM001/PDM Requirement</th>
<th>% Compliance</th>
<th>Discussion</th>
</tr>
</thead>
<tbody>
<tr>
<td>15.</td>
<td>Consultant appraisal for each completed assignment</td>
<td>50%</td>
<td>The consultant appraisal provides a record for other PMs to use when selecting consultants.</td>
</tr>
<tr>
<td>22.</td>
<td>Design approval form</td>
<td>80%</td>
<td>The PM is required to secure sign-off from the Client and others prior to proceeding to tender.</td>
</tr>
<tr>
<td>25.</td>
<td>Commence work order</td>
<td>94%</td>
<td>The CWO is issued after Supply confirms that the contract requirements have been met; it is a milestone that clearly records the project start date.</td>
</tr>
<tr>
<td>33.</td>
<td>Inform the division manager if significant budget variations are expected.</td>
<td>92%</td>
<td>This is partially covered by PSU. A copy of the PSU should be kept in the file.</td>
</tr>
<tr>
<td>35.</td>
<td>Contractor performance appraisal</td>
<td>50%</td>
<td>This is important for reference by other PMs.</td>
</tr>
</tbody>
</table>

**Budget Control**

Budget control requirements have good compliance. The requirement to review the budget and schedule at the 50% and 75% value points in relation to the deliverables was a requirement of the 2006 Project Manager Manual, but not the current Project Delivery Manual. It was listed as it was a requirement when the project started. There is a compliance rate of 78% compliance. ISD has indicated that the use of the Project Status Updates provides a tool for project managers and program managers to be aware of the status of the budget and schedule throughout the project, rather than at two finite points during project development.

The review of budget at 50% and 75% value points helps the PM review the fees paid vs the deliverables and work completed, and to take corrective action if necessary to make sure that the budget is not exceeded.

The current reporting tool is the PSU. However, the PSU does not necessarily provide the detail information the PM needs to review the status of expenditures vs. budget and project progress including status of deliverables.
The PSU is intended for overall status updates. Financial status, budgets and expenditures are recorded in the City SAP system, which is the source of budget and expenditure data. Management noted that Project Managers, Program Managers and Managers do monitor and control project budgets on a regular basis through a variety of mechanisms. Managers check SAP, Ozone or have regular discussions with the Financial Services unit (FSU) to review and monitor financial data.

**Project Schedule**
Project Managers are using project design schedules provided by the consultants and construction schedules prepared by contractors.

Requirement No. 13 provides the PM with a milestone that lets them review the overall project schedule and budget to take any corrective action, and should be done consistently by all project managers. However, this is no longer a requirement of the Project Delivery Manual.

**Communications**
Communications within the Project Team and external stakeholders and the public have good compliance. Items No. 5, 8 and 11 have the potential for some improvements to bring the items to 100% compliance.

**Project Reviews**
The low compliance rate for required formal sign-offs, such as at completion of preliminary design and detail design could result in misunderstandings with respect to scope and acceptability of the solutions to the client, leading to potential cost overruns and delays.

Although there is evidence that the projects are being reviewed during preliminary design and detail design, the formal sign-off should serve as a clear notification to the Client and the program managers and managers that the project is moving to the next phase.
Quality Assurance

Discussions with Managers and Program Managers showed that the selection and assignment of Project Managers is based on workloads and the competencies of the Project Managers. However, ISD does not maintain a database of the skills, experience and specialized training of the program and project managers. This means that the branch Manager does not have the means to confirm that the Program Manager and the Project Manager selected for a given project are indeed the most suitable. A database of program manager and project manager training and experience would be useful in assigning the most appropriate project manager. We estimate that approximately 50 staff would be put into such a database.

The PDM contains a number of milestones where the projects are to be reviewed by Program Managers, the branch Manager, the General Manager, and the client (i.e. the originating department or branch such as Real Estate or Environmental Services). We found that the required reviews are occurring consistently, but in some cases they are not being documented properly. The PDM requires two formal sign-off instances and provides forms to record the formal sign-off to be completed prior to proceeding to detail design and prior to proceeding to tender. Although there is evidence in the files that the project managers are following a process to obtain feedback from the Client and the Program Managers, the form is not being formally completed consistently.

Construction inspections are being undertaken by City inspectors or consultants, depending on the availability and the workload of City inspectors. The Project Delivery Manual states that inspections of work in specialties that are not within the ISD’s core competencies must be assigned to a qualified engineering consultant. This direction is appropriate and prudent. This audit did not examine construction services or inspections, as they were audited in the 2012 Audit of Construction Supervision.

Consultant Appraisal and Contractor Appraisal forms for each completed assignment are not being completed consistently. ISD has explained that the forms at present do not have any effect on the evaluation of consultants and contractors for award of subsequent assignment or contracts. With the development of the supplier evaluation process with Supply branch, these forms will become an important component of the evaluation of suppliers for future projects.
Audit Objective No. 6 - The Control Systems Used for Delivery of the Projects within Budget and Schedule

Control of costs and schedules during the life of the project is the primary responsibility of the Project Manager, backed up and supervised by the Program Manager. Through its PDM, the City has provisions for the required steps to be taken during the project to control costs and maintain the schedule. For example, the PDM requires that the Project Manager submits a budget and cost forecast to the Financial Services unit every three months. We found however that there was no documentation in the files to confirm if this was done in any of the projects reviewed.

The PDM also requires that the financial situation of the projects be reported to the General Manager on a monthly basis. The reports that are being used to do this are the Project Status Update (PSU) reports. They are issued monthly by each Project Manager and are intended to inform the Program Managers, branch Managers, and General Managers of the project status. Until December 2013, the branch Managers and the General Manager received a list of projects and the PSUs, but without a summary of the projects that had any concerns. Since then, they are also receiving a Dashboard sheet which summarizes at a glance the status of all the projects.

The PSUs are intended to help inform the corresponding councillors of the projects within their wards. However, review of the documentation provided to councillors showed that it consists of a table of PSUs and a link to a site in the City Council network where each councillor must navigate through the site to retrieve the required information. Councillors do not receive the Dashboard information that is provided to the General Manager. In the sample set of PSUs provided to Councillors the date of completion of the contract listed in the table was not the actual expected date of completion. In some cases, even though the project was known to be delayed, the City left the earlier contractual completion date in the PSU. The date shown in the PSU should be the most current estimate of the expected completion date.

Design process, standards, reviews, and control are well explained in the PDM, and are commensurate with standard process that would be used in design offices for project delivery. Similar conclusion applies to construction supervision, process, standards, reviews, and control.
The reported overall performance of delivery of the construction projects indicates that over 90% of the projects are tendered as scheduled. However, review of the twenty files showed that control of the schedule may be a reason for concern within ISD. Based on the review of the projects, we concluded that the processes are being followed in general terms. However, some of the projects have fallen substantially behind their original schedule and this has impacted the ability to implement them when planned.

Audit Objective No. 7 - The Processes and Methodologies Used for Control of Change Orders and Costs in Design and Construction.
Change orders are generally required to accommodate a change in field conditions relative to those expected in the design.

Approval of change orders in the City follows a specific procedure: Once the need for the change is confirmed, the Project Manager requests a formal cost estimate from the contractor. If the cost estimate is acceptable and the amount is below the Delegated Authority sum (generally the contingency allowance for the project), the Project Manager can authorize the change order. If the value of the change order exceeds the delegated authority level, the change orders must be reviewed by the Program Manager.

Recording of change orders is done by the Project Manager in the progress payment certificates. A record of all documentation pertinent to the change order is filed.

Program Managers and managers have access to the change order data for a specific project. However, there is no centralized summary of change order amounts that summarizes the total sum of change orders per project that can be reviewed by the Managers and General Manager. Providing an overall summary of the original contract value and the change order total for each active project would allow the General Manager to review the overall health of the projects by using a dashboard. The procedure should be modified to provide the branch Manager and the General Manager with a monthly summary of change orders to allow them to monitor and review the change orders.

At present, the Project Manager has authority to approve change orders up to the value of the project contingency, except that change orders with a value of $25,000 or more must be approved by the Program Manager. There is no upper limit to the Program Manager authority, unless the project contingency is exceeded.
Audit Objective No. 8 - Identify Areas of Potential Savings for the City in the Technical Management and Operations of ISD

Review of the technical management and operations of ISD revealed the following opportunities for Potential Savings:

Selection of consultants from the Standing Offer should be modified to require obtaining submissions from three suppliers. If the cost of services procured by the Standing Offer is reduced by 5% based on cost competition, the City could save roughly $1.0 million per year.

In cases where the initial RFP for services included only design and tender services, any subsequent contracts or amendments for contract administration services should be subject to requesting proposals from at least three suppliers. In two of the projects we reviewed, the value of contract administration services totalled roughly $1.0 million. These contracts were awarded essentially as sole source contracts to the suppliers that were originally selected to provide design and tender services.

The City could undertake a review to determine if there could be cost savings by adding construction supervisors and inspectors to undertake contract administration and inspection of a larger proportion of projects, in lieu of consultants. This would apply to bridges, roads, watermains, and sewers. However, there is not sufficient data at present to enable this audit to quantify any potential savings from this recommendation.

Recommendations and Management Responses

Recommendation 1
That the City complete the service based Asset Management Plans and Levels of Service as soon as possible.

Management Response
Management agrees with this recommendation.

As part of the City's draft 2015-2018 Strategic Priorities, advancing the Comprehensive Asset Management (CAM) Program has been identified as a Term of Council priority. This includes undertaking Service-Based Asset Management Plans and Levels of Service for all service areas by the end of Q4 2018.

Recommendation 2
That for the hiring of consultants the City modify its procedures and/or the contract terms and conditions to include wording that the hourly, per diem or
other unit rates offered by the proponent for call-ups greater than $150,000, the hourly, per diem or other unit rates will be discounted by a minimum of ten percent (10%).

**Management Response**

Management agrees with the recommendation. Finance department/Supply branch will revise the standing offer effective Q2 2016.

**Recommendation 3**

That ISD ensure that the procurement process for consultants includes the requirement that the Project Delivery Manual be followed.

**Management Response**

Management agrees with this recommendation.

ISD, in consultation with Finance department/Supply branch, will amend the procurement process to emphasize the requirement for consultants to follow the department’s policies, procedures and guidelines that relate to ISD project delivery.

This will be completed by Q4 2015.

**Recommendation 4**

That ISD ensure that the requirements of the Project Delivery Manual are being completed.

**Management Response**

Management agrees with this recommendation.

Through the department’s Integrated Departmental Management Plan (IDMP) Program, there will be a continued effort to enhance compliance with the requirements of the Project Delivery Manual (PDM). The PDM will be going through another significant update by Q2 2017.

**Recommendation 5**

That ISD develop and maintain a database of training, skills and experience for the program managers and project managers.

**Management Response**

Management agrees with this recommendation.

ISD will continue to leverage SAP as the database for training. Through the Competency Development Project as part of the department’s Integrated
Departmental Management Plan (IDMP) Program, processes will be enhanced to track skills and experience of project delivery staff. The Competency Development Project will be completed by Q2 2017.

**Recommendation 6**
That the City arrange for the Project Status Update and Dashboard to be provided to Councillors on a monthly basis, highlighting any areas of concern.

**Management Response**
Management agrees with this recommendation.

Project status updates have been provided monthly to councillors since Q2 2012. The dashboard document was originally used as an internal management tool. The project status update will be amended to highlight any areas of concern currently contained in the dashboard by Q2 2016.

In addition, there is greater oversight by Executive Committee (EC) due to the requirements under the ‘Project Status Report for EC’ to report on a quarterly basis.

**Recommendation 7**
That the City modify the project control system to permit the General Manager and the Managers to obtain summaries at department and branch level of all the change orders and their potential impact on project budgets.

**Management Response**
Management agrees with this recommendation.

Project controls will be amended in SAP to enhance the ability of the General Manager and Managers to obtain summaries of project change orders. The amendments will be completed by Q4 2015.

**Recommendation 8**
That the City undertake an evaluation of the potential cost savings of increasing the inspection staff to meet City needs for inspections, in lieu of using consulting firm staff.

**Management Response**
Management agrees with this recommendation.
In 2008, ISD completed a Competitive Service Delivery Review (CSDR). This review has guided the department in terms of services most effectively delivered by internal staff versus external consultants. The CSDR will be refreshed by Q4 2018 after completion of the department's Integrated Departmental Management Plan Project.

**Potential Savings**

Engineering service contracts have been in the range of $7 to $10 million annually. The modifications to the procedures and/or the contract terms requiring a reduction of 10% on the rates will deliver a saving of around $350,000 annually. There may be further opportunities for savings by revising the application of the Standing Offer limits, by requiring proposals for contract administration services when the estimated cost exceeds the Standing Offer limits, and by using more in-house construction inspectors.

**Conclusion**

The City’s Infrastructure Services department has in place the project management and construction inspection processes required to deliver the services required of the department. However, review of sample files disclosed that those processes are not being applied consistently by all project managers. There are specific areas that require further attention of management. These include project schedule, budget control, communications, quality assurance and project reviews. Other issues were identified in previous audits, namely responsibility for redesign costs, recovery of change orders due to errors, exercising of contract liquidated damages, project oversight and others.
Audit of IT Risk Management

Introduction
The City of Ottawa’s Audit Plan for 2014, as approved by Council in March 2014, included audits of Information Technology (IT) and related investments. This Audit of IT Risk Management, along with an Audit of IT Security Incident Handling and Response, were completed in accordance with the 2014 Audit Plan.

Background
Throughout the City, IT-based solutions and innovations have supported the achievement of a variety of operational and strategic objectives. The role of technology is expected to continue a steep growth pattern as new and innovative solutions are developed. However, while there are opportunities for IT to support the City’s strategic objectives, there are a variety of traditional and emerging IT risks that must be considered and effectively managed at the highest level.

For an organization of the complexity and size of the City of Ottawa, the breadth and depth of potential IT-related risks is significant. Whether it’s maintaining operational or administrative capabilities, protecting valuable or sensitive assets, supporting compliance or enabling achievement of business or strategic imperatives, there is an inherent risk relating to IT in nearly every City activity or function. As such, while there is obviously a technical element of IT risk, business managers from across the City are ultimately the most important stakeholders in the management of IT risks.

The City’s Approach to IT Risk Management

The Enhanced Risk Management (ERM) Framework
In 2010, Council approved a conceptual Enhanced Risk Management (ERM) Framework and Enhanced Risk Management Policy. By 2011, the Framework had been implemented across the City. The Framework outlines roles and responsibilities for risk management, the City’s risk management process, and provides other resources and tools for departmental managers and others with responsibilities under the Framework and Policy. Since 2011, City departments have annually conducted risk analysis activities which have led to the development of the Corporate Risk Profile (CRP).
IT Risk
IT risks are those associated with the use, ownership, operation, involvement, influence and adoption of IT within an organization. It consists of IT-related events that could impact the organization’s ability to achieve its goals and objectives. Like most risks, they can occur with uncertain frequency and magnitude. Examples of IT risks include the loss/corruption of information assets, and the inability to provide IT-dependent business functions.

IT Risk Management Framework
The management of IT risks is supported through a number of policies, processes and practices at both an enterprise-wide and at a more granular level (e.g., at the IT project level or incident response level). At the enterprise level, IT-related risks are explicitly captured within the ERM Framework. While the Information Technology Services (ITS) department is the single most significant source of IT risks, IT risks were identified by 65% of all departments in 2014.

The ITS department plays an important role in the management of IT risks at the project and systems level. In addition to providing training/awareness sessions related to IT risks, ITS is responsible for developing IT related policies and guidance to support the management of IT risks.

ITS has a formal and broad responsibility for the management of IT risks, however, there are independent IT groups that serve in a few departments where one or more business applications or systems that, while often connected to enterprise architecture, operate fully or in part, autonomously from ITS. These include Transit Services department, Traffic Operation branch, Drinking Water Services branch and Wastewater Services branch.

Audit Objectives and Scope
The overall objective of this audit was to provide an independent assessment relating to the adequacy and effectiveness of the City’s IT Risk Management governance, policies, practices and procedures. Three (3) specific audit objectives were considered:

Objective No. 1: Assess if IT Risk Management Governance at the City effectively supports management of the City’s IT-related risks.

Objective No. 2: Assess if the City’s IT Risk Management Framework of policies, practices and procedures are adequately designed and aligned with the City’s ERM Framework.
Objective No. 3: Assess if the City’s IT Risk Management policies, practices and procedures are effectively supporting the identification, evaluation, mitigation and monitoring of IT risks across the City.

The scope of this audit included IT risk management activities across the City of Ottawa. It involved an examination of both the design and effectiveness of controls (policies, practices and procedures). We reviewed roles, responsibilities and accountabilities as they exist both within ITS and across all City business lines and departments that use IT. This included an examination of IT risk management in areas where independent technology groups exist.

Summary of Key Findings

Governance, Executive Leadership and Support
The City has a strong committee structure for addressing IT risk management. Following the audit of IT Governance, tabled in March 2015, the reporting structure was strengthened, although this audit noted areas where improvement was required.

The City has experienced a high rate of turnover in the Director, ITS and Chief Information Officer (CIO) position over the past few years including extended periods where the position was occupied by a temporary replacement. A new Director, ITS and CIO was hired in the spring of 2015. We noted, that the ITS Staff interviewed as part of this audit were positive and enthusiastic regarding the new CIO’s leadership, strategic direction and support.

Notwithstanding this positive development, the City has yet to develop a comprehensive Governance component of an Information Technology Risk Management (ITRM) Framework including clear and consistent responsibilities and accountabilities for City executives and management embedded in an ITRM Framework. In particular, the effectiveness of the existing ITRM Governance is impacted by several factors including:

a) Absence of an ITRM Framework with a comprehensive Governance component;

b) The method of prioritizing, selecting and funding IT initiatives;

c) Authority of Corporate Information Technology Management Team (CITMT); and

d) Authority of the CIO.

Each of these issues are discussed further below.
**Governance Component to an ITRM Framework**

While the City does have some components of an effective ITRM Framework embedded in the ERM, there is no stand-alone ITRM Framework with governance capable of supporting a mature risk culture. Effective governance within an ITRM would help to provide clear guidance on the City’s IT risk appetite and IT risk tolerance as well as oversight on their application. Without clear direction and oversight on these key components, it is not possible to develop an effective ITRM Framework (refer to the next section, entitled “IT Risk Management Framework Design and Alignment” for additional discussion of ITRM Framework).

**Prioritization and Funding of IT Projects**

IT projects are brought forward for consideration by individual departments. Departments are required to identify each project’s source of funding and are encouraged to only bring forward funded projects. Notwithstanding instances where unfunded projects have been identified and approved as priority investments, this approach means that approved projects may not always be aligned with corporate priorities.

There is little flexibility for required adjustments to the ITS infrastructure budget and/or other departmental budgets for high priority IT projects as a large portion of IT budgets are controlled by individual departments, not ITS. Some departments (Transit, Traffic, and Water) have large IT budgets and independent IT groups. These budgets are typically based on historical requirements which have then become part of their baseline budget. This scenario supports the continued investment in IT risk management within some departments while IT deficiencies and related risks in other business lines are not addressed.

In addition, there are a variety of funding mechanisms, often with specific constraints. For example, the water and sewer surcharge funding can only be used for very specific water and sewer related activities.

Therefore, there is a significant risk that high priority IT risks are not being adequately addressed on a timely basis if funding is not readily available to the business owner. This applies to ageing IT infrastructure owned by ITS as well as new and existing initiatives owned/managed by independent groups such as Water, Transit, Traffic and other Information Management/Information Technology which belongs to other departments.
Authority of CITMT

While the concept of the Corporate IT Management Team (CITMT) approval process is sound, the process is hindered by the process described earlier whereby projects submitted to CITMT for consideration in the annual corporate IT plan are typically only those which are already funded. Funding may be sourced from individual departmental budgets, external sources such as the Province of Ontario, or with “earmarked” funding. As such, the funding status of IT projects, rather than a City-wide and risk-based priority ranking system, is a significant factor in determining which projects are considered by CITMT for inclusion in the annual corporate IT plan.

This decentralized approach to funding IT projects and absence of a City-wide priority ranking system impacts the effectiveness of CITMT’s authority relative to its mandate. Specifically its mandate is “to plan, provide oversight and strategic direction necessary to:

- Deliver an annual corporate IT plan with a clear connection to the Corporate Strategic Plans as approved by council and its boards;
- Represent individual departmental and corporate needs;
- Support ITS in delivering on its mandate to provide innovative and cost effective technology solutions to deliver maximum business value;
- Base decisions on corporate strategic plan.”

CITMT terms of reference also state that “CITMT serves as the corporation’s primary agent of technology direction, having been given the authority by the Executive Committee to exercise leadership when undertaking its roles”. While not explicitly stated in the terms of reference, CITMT has an implicit responsibility for leadership in recommending a corporate IT plan that is reflective of risk-based IT priorities across the City. CITMT’s authority to discharge this responsibility is hindered by the current IT project funding model as well as the City’s existing capability to identify and prioritize City-wide IT risks as discussed later in this report. As a result, decisions made regarding IT investments/expenditures may not always be aligned with overall corporate priorities and/or risk management objectives.

Authority of CIO

The job description for the Director, ITS and CIO position (both roles are performed by the same position) states that, in addition to directing the operations of the ITS department, from a corporate perspective the CIO is to provide strategic leadership for planning and implementation of a broad range of business and enterprise IM/IT initiatives, to support the City’s service delivery objectives.
The position is to play a major leadership role in organizing, managing, and strengthening a comprehensive IT/IM infrastructure that will support and transform the administrative and service delivery areas of the City, and support its mandate. As well, the position is to oversee the implementation of departmental strategies, conduct long range fiscal planning with respect to IT and IM and serve as senior advisor regarding IM/IT issues to Council, Committees of Council and Counsellors to disseminate strategic direction, advice and technical information.

However, the CIO’s actual ability to influence and manage is limited as staff responsible for IT in various departments and agencies (e.g. Ottawa Public Health, Transit, Water, Wastewater, etc.) are not functionally accountable to the CIO and lines of authority are not always clear. Further, the audit team was not able to identify any clear and formal description, in the job description or otherwise, of the CIO’s authorities or responsibilities regarding the City-wide IT risks.

The lack of clarity around the authority of the CIO impedes his ability to:

- Promote a culture that supports ITRM objectives including influencing change at an executive level and introducing IT change management throughout the City and influencing/managing City-wide spending related to IM/IT;
- Align City-wide IT funding with the highest priority City-wide IT strategic initiatives;
- Tackle the highest priority City-wide IT risks on a timely and strategic basis; and
- Ensure compliance with policies, procedures and enforce central reporting of ITRM activities.

The reporting structure to and from the CIO is not consistent with best practises. The RISK IT framework recommends that the CIO position be responsible for all City-wide processes including Risk Governance, Risk Evaluation and Risk Response and that all subordinate IT management roles report to the CIO.

This would enable the CIO to both inform and advise the City Manager, who would have ultimate accountability for managing IT risk including funding of mitigation strategies and opportunities, as the CIO would control and answer for all IT related staff. It would also enable the CIO to better influence decisions to ensure that overall corporate priorities, such as maintaining the integrity of existing infrastructure and ensuring security receive the appropriate priority and related funding.

Ultimately however, to truly manage IT risk, and act on the opportunities which will transition the City of Ottawa into a leading “smart city, the CIO should have the authority, resources and ability to perform all the following:

- Manage Costs – Control the impact of IT spend on the enterprise;
• Keep the lights on – Ensure the IT and security needs are up and running;
• Act as an information broker - Provide insight to support business decisions;
• Generate ideas and solutions – Enhance business processes by being an active business partner;
• Deliver transformation – Prepare and develop the organization for change; and
• Bring business model innovation – Shape the future of the business with the right technology.

**IT Risk Management Framework Design and Alignment**

The City has yet to develop a comprehensive IT Risk Management (ITRM) Framework. While there are a variety of ITRM activities occurring (e.g. at the project and system level), as noted for Objective 1, the City has no clearly defined ITRM framework that serves to bridge the gap between ERM and more granular ITRM.

ERM processes are continuing to mature, including the relatively new and developing explicit classification of IT risk categories. Specifically, in 2015 the Technology Risks were changed from ten sub-categories, that were difficult to differentiate among, to six very different types of sub-categories – (1) Maintenance and Lifecycle, (2) Resource Unavailability, (3) Service Disruptions or Losses, (4) Social Media, (5) Software and Hardware renewal and (6) System failure. The new Technology risks provide much better alignment with types of IT risks than before and will provide clarity for grouping these risks moving forward.

However, while the City recently started identifying specific IT risks and embedding them in the ERM framework, there are many deficiencies in the documentation to support the identification, assessment and mitigation of IT risks. In particular, the design effectiveness of the existing ITRM framework is reduced by several factors including:

• Insufficient documented and approved ITRM framework with a supporting policy and procedures suite;
• Insufficient processes for the identification and assessment of City-wide IT risks;
• Weaknesses in challenge mechanisms for assessment of proposed/possible corrective measures;
• Insufficient training of ITS staff, IT professionals outside ITS and others who are non-IT professionals yet are tasked with performing IT risk assessment;
• Undocumented IT risk universe that would serve to support oversight and inform decision-makers; and
Incompleteness of Business Technology Plan including how the plan is based on mitigating the highest risks/priorities as well as related timelines, costs and sources of financing.

Given the low maturity level of most City departments for ITRM and the broad and technical nature of IT risks, procedures and guidance at both the corporate and departmental level are not sufficient to ensure that the identification, evaluation, communication, mitigation, and monitoring of the most important IT risks is consistent, appropriate and timely. In addition, IT issues and priorities that are critical to City-wide objectives do not necessarily rise to the top.

These issues are discussed further below.

**ITRM Framework – Responsibilities and Accountabilities**

Responsibilities for those providing input to ITRM documents such as risk registers are not fully developed, beyond completion of the Corporate Risk Profile as part of the ERM process. We would have expected to find clear, and consistent responsibilities and accountabilities for all employees involved in the ITRM process, including a RACI (Responsible – Accountable – Consulted – Informed) type model embedded in an ITRM Framework with a supporting policy suite and processes. As noted earlier in this report, leading practices developed by ISACA were used to assess the effectiveness of the City’s ITRM. Specifically **Responsibility** (those who must ensure that the activities are completed successfully) and **Accountability** (those who own the required resources and have the authority to approve the execution and/or accept the outcome of an activity) within specific **RISK IT** processes were assessed. These deficiencies in the City’s ITRM framework impact the City’s ability to:

- Integrate the management of IT risk into the overall ERM, thus allowing risk-return-aware decisions;
- Ensure there is an effective challenge mechanism to support both completeness and accuracy of the risks identified and the assessments of impact;
- Make well-informed decisions about the extent of the risk, and the risk appetite and risk tolerance of the enterprise, and
- Understand how to respond to the risk.
Policies and Procedures
Existing corporate level policies and procedures, including the Information Risk Management Policy, are consistent with the ERM Framework, however there is limited guidance or formal controls for departments, including those with independent IT groups, on their authority or responsibilities when engaging in activities that may impact the City’s IT risk profile. Existing policies focus primarily on security threats and breaches of confidentiality of information, such as the Responsible Computing Policy or the Technology Devices Policy. However, there is a lack of policy guidance around other IT-related risks such as Use of Cloud-based or other 3rd party systems or services.

In addition, most departments:
- Have not developed their own policies, processes/procedures which reflect their unique IT risks, business objectives and environment; and,
- Rely on the annual ERM processes, ITS intervention, and/or potentially limited scope activities (e.g. Vulnerability Assessments - VAs) to address IT risk management.

Training and skill sets
The City conducts user training for IT systems and IM applications. However, while there is a large focus on security, there is a lack of training concerning the efficient use of IT resources.

In some business units, people who have little or no technical training are being tasked, under the ERM Framework, with the identification of risks and/or related mitigation strategies. As a result, there are gaps and weaknesses in the identification, assessment and mitigation of critical IT risks (security, confidentiality, integrity, availability, reputational, operational, compliance/legal, strategic, business continuity, etc.).

City-wide Business Technology Plan and ITS Strategic Plan
The 2011-2014 ITS Strategic Plan outlines how ITS will support the previous Term of Council Vision by providing information on strategic objectives and related ITS initiatives, and how they tie with the City’s strategic priorities. While it includes brief details of ITS’ strategic initiatives including ownership, description and performance measures, it is limited in scope insofar as it presents a departmental view rather than a City-wide view of the City’s IT strategy.
The Business Technology Plan (BTP), however, does provide a City-wide view. The BTP provides a summary of planned activities including those related to ServiceOttawa, new projects, ongoing business initiatives and operational support. The audit team reviewed documentation (project charters, storyboards, risk assessments, change management strategies, and implementation plans, etc.) for three (3) IT projects in the BTP. While not all projects demonstrated a clearly documented linkage to corporate priorities, the most recently completed of the sample did include a clear reference to Council priorities and how the project would service to support these priorities. It will be important, going forward, that such linkages are consistently demonstrated.

**IT Risk Universe**

The process of identifying IT risks is first impeded by the absence of a full inventory of the IT universe across the City (applications, business owners, networks, interdependencies, etc.). In addition, there is no complete risk register (risks, impact, mitigation strategy, and status, etc.) that is developed with input from trained and qualified IT professionals.

This is a significant risk as there are several departmental IT groups which operate fully or in part independently from ITS (e.g. within Water, Wastewater, Transit, and Traffic). In addition to these independent IT groups, some departments operate applications which are not within the City’s direct control (e.g. provincially mandated applications used by Ottawa Public Health). Further, there are a number of examples where business lines have acquired third party applications and/or leveraged cloud-based solutions for their business without ITS’s involvement. Such applications inherently present IT risk to the City to the extent they are accessed via City computers, use City networks, and/or are otherwise connected to the City’s IT infrastructure. This risk is potentially high, particularly where such applications contain personal and/or confidential information of the citizens of Ottawa.

In addition, there are legacy systems which continue to operate and rely on ageing IT infrastructure. These systems typically place considerable demand on resources responsible to support the ongoing operation and maintenance of these applications and related IT infrastructure.

Without a documented, complete and comprehensive inventory of all IT components and applications relying on the City’s IT infrastructure, it is not possible to build a comprehensive risk register which identifies the IT risks, potential impact and required mitigation/corrective action.
Audit of IT Risk Management

IT Risk Management Approach Effectiveness

The issues related to governance and design noted earlier have significant implications on the effectiveness of ITRM across the City. While the ERM and Corporate Risk Profile processes and policies are followed and IT risks are routinely identified, evaluated and mitigated through the ERM or other activities, the following concerns exist regarding the completeness and quality of the final product:

- There is neither the culture nor capacity to support a complete and holistic view of IT risks and the effective management of these risks;
- Outputs may not have been subject to sufficient analysis, consideration and challenge by people with appropriate and sufficient skill sets/competencies to effectively perform this function;
- Some IT related issues may not be appropriately identified, assessed and subsequently escalated to both inform (awareness) and mitigate (plans and funding);
- It is not clear if all risks related to ageing infrastructure, data storage, network capabilities, etc. have been identified; and
- There is not always a linkage between the identification of a critical risk with the provision of sufficient resources allocated for effective mitigation.

For example, analysis of the IT category in the Corporate Risk Profile (CRP) revealed very little/no identification of some IT specific risks such as those raised in the Security Incident Handling report including out-sourcing, 3rd party software, cloud computing, oversight of IT vendors, disaster recovery/business continuity, software license management, end user computing, IT infrastructure loads and costs for IM demand.

Without a complete and comprehensive IT risk universe, there cannot be a common view of IT risks and the City cannot make risk-aware decisions. That is, the City cannot make decisions that consider the full range of opportunities and consequences from reliance on IT for success. As importantly, it is not possible for City staff to have a full understanding of all potential IT risks within the IT universe. That is, City staff, especially ITS, do not know what risks they are not aware of, and cannot anticipate what corrective measures are required.

Recommendations and Management Responses

Recommendation 1
That the City Manager develops a robust Governance component of an ITRM Framework which:

- Is aligned to the ERM Framework.
• Includes clearly defined roles, responsibilities, and authorities of City Executives and Management.
• Clearly establishes the basis for a corporate risk culture, including risk tolerance and risk appetite guidelines.
• Ensures that all mitigation strategies for risks identified as being above acceptable tolerance levels are considered for inclusion in the Annual Corporate IT Plan based on risk/priority, regardless of whether there is pre-approved funding identified.

Management Response
Management agrees with this recommendation.

The City Manager will work with ITS and the Corporate Programs and Business Services department to develop a robust Governance component of an ITRM framework. Work done to implement this recommendation will be completed in conjunction with work being done to implement Recommendation 5. This recommendation will be complete by Q4 2016.

Recommendation 2
That the City Manager and City Treasurer undertake an assessment of IT spending to explore alternative funding models which will provide better alignment between mitigation of prioritized City-wide IT risks and funds available/provided and provide long term savings through improved, targeted IT spending.

Management Response
Management agrees with this recommendation.

The City Manager, CIO and City Treasurer will work to identify and implement a budgeting/funding model that will allow for the funding of risk items that are deemed unacceptable. This funding model will form a part of the ITRM framework referenced in Recommendation 5. This recommendation will be complete by Q2 2016.

Recommendation 3
That the City Manager take steps to strengthen the effective authority of CITMT including expanding reviews to include all City-wide IT risks and proposed/recommended mitigation strategies.

Management Response
Management agrees with this recommendation.
The City Manager, in conjunction with ITS will take steps to strengthen the effective authority of CITMT as part of the work being undertaken to implement Recommendation 1. Processes will be developed to incorporate the role of a senior oversight body in the risk mitigation decision-making process. This work will be completed by Q4 2017.

**Recommendation 4**

That the City Manager take steps to strengthen and confirm the role, responsibility and accountability of the Director, ITS and CIO position including consideration of alignment with the best practices identified in the ISACA *RISK IT* Framework as well as functional reporting of all City departments and agencies to the CIO for all IT matters.

**Management Response**

Management agrees with this recommendation.

The City Manager will take steps to strengthen and confirm the role, responsibilities and accountabilities of the Director, IT and CIO. In addition, as part of work done to implement Recommendation 1, the City Manager will consider best practices as identified in the ISACA *RISK IT* Framework in determining appropriate functional reporting for IT matters. This recommendation will be complete by Q4 2016.

**Recommendation 5**

That the CIO develop a robust ITRM Framework which:

- Is aligned to the ERM Framework;
- Incorporates the recommended Governance component of an ITRM framework (Refer to recommendation #1);
- Includes clearly defined roles, responsibilities, and authorities for all City employees involved in ITRM;
- Incorporates a well-documented audit universe/inventory and a risk register;
- Incorporates a well-developed challenge mechanism conducted by trained and qualified IT professionals;
- Ensures that all mitigation strategies for risks identified as being above acceptable tolerance levels are communicated to Senior Management in a comprehensive and effective manner.

**Management Response**

Management agrees with this recommendation.
The current ERM framework will be reviewed and the ITRM framework will be enhanced to include the policies, processes and authorities for the entire corporation. Risk tolerance guidelines will be developed to include the process whereby unacceptable risks will be escalated to the appropriate authorities. The annual budgeting exercise will include a risk mitigation component where unfunded risk reduction costs will be identified. This recommendation will be complete by Q4 2017.

**Recommendation 6**  
That the CIO, in conjunction with the development of the ITRM Framework, develop a supporting policy and procedure suite that:

- Incorporates all required processes for completion of the ITRM Framework including a robust challenge mechanism;
- Specifies the skill sets and training required of those responsible for completion of departmental components of the ITRM documents;
- Embeds the strengthened role of the CIO.

**Management Response**  
Management agrees with this recommendation.  

Policies and procedures will be developed to incorporate the ITRM framework with appropriate challenge mechanisms. Requisite skills and training will be identified and included as part of the phasing in of the framework. This recommendation will be complete by Q4 2017.

**Recommendation 7**  
That all City departments, with direction and support from ITS:

- Ensure departmental staff preparing ITRM documents have the requisite skills and tools to adequately and completely prepare all required ITRM documents;
- Develop departmental processes which ensure that all components of the business line are included in required ITRM documents;
- Develop review and challenge mechanisms designed to ensure that all ITRM documents are completed to an appropriate level of granularity which fully facilitates the understanding of IT risks, impact and the management and tracking of strategies related to the mitigation of IT risks.

**Management Response**  
Management agrees with this recommendation.
City management, with assistance from ITS, will include training, document preparation, risk escalation, challenge processes, tracking mechanisms and reporting as part of the enterprise wide roll-out of the ITRM framework. This recommendation will be complete by Q4 2017.

**Recommendation 8**

That the CIO as well as and City-wide managers continue to improve the identification and assessment of IT and related mitigation strategies, while using the ITRM Framework recommended in recommendations 1 and 2.

**Management Response**

Management agrees with this recommendation.

The principle of continuous improvement will be applied as the ITRM framework program is phased in to ensure continuous and improved identification and assessment of IT risk and related mitigation strategies. A senior oversight body, currently being established, will oversee the maturation of the ITRM framework. Once the ITRM framework is implemented, ITS will conduct assessments of new or emerging IT mitigation strategies on an annual basis.

**Potential Savings**

We believe the net impact of these recommendations will lead to overall efficiencies for the City in the following ways:

- Improved direction, advice and reporting of IT activities on a City-wide basis will lead to economies of scale and better decision making for IM/IT related decisions before they are made.
- Improved identification, assessment and mitigation initiatives will protect the City against potential system failures or security breaches, including cyber-attacks, which could interfere with business activities to the extent they could impact the life safety and daily lives of residents. The costs of repairing/restoring these activities could also be catastrophic. It could also undermine the public’s confidence in the management of the City.
- Improved policies and procedures for minimizing waste could result in immediate savings to the city. For example, IT infrastructure loads and IT platform costs to support IM demand are always high, especially if IM demand (e.g. applications, email management) is not rigorously controlled and monitored through policies, practices and awareness. Closer monitoring of the risk/cost of having more IT infrastructure than required could result in direct saving.
- Notwithstanding these potential savings, it must be noted that necessary changes to upgrade/replace the City’s infrastructure and to adequately increase
the City’s IT security protection will require significant investment in coming years.

Conclusion
Based on our review of the completed IT risk related documents and strategies, we have determined that there is a low maturity level of most City departments for IT Risk Management. This is primarily due to the Governance and Leadership issues identified in the key observations. The four ITRM Governance recommendations identified in the key observations will be required to be implemented prior to development of the remaining ITRM Framework recommendations (recommendations 5 through 8). Once the Governance component of the ITRM is completed, the remaining components will be much easier to efficiently develop and implement.

Without the recommended development of an ITRM Framework, including the roles, responsibilities and accountabilities, funding model and policy suite, the potential vulnerability of the IT risks could have significant impacts on the City’s business lines. We highly recommend that the City develop the Management Action Plan for these recommendations, in consultation with the leading practises identified by ISACA in COBIT and the RISK IT Framework.
Audit of Mackenzie King Bridge Rehabilitation

Introduction
The Audit of the Mackenzie King Bridge Rehabilitation was undertaken as a result of a Fraud and Waste Hotline report, dated September 10, 2010, received from a member of the public.

Background
The Office of the Auditor General (OAG) carried out a preliminary assessment to examine the documentation relating to design and construction of the Mackenzie King Bridge rehabilitation.

Based on the findings of the Preliminary Assessment Report, the OAG decided to carry out an audit of the 2007 and 2009 Mackenzie King Bridge paving contracts.

Audit Objectives

Audit Objective No. 1
Examine the asphalt rehabilitation procedures used by the City for the Mackenzie King Bridge.

Criteria:
- Coordination of asphalt contracts with other structure renewal planning
- Input by Infrastructure Management structure specialists
- Asphalt rehabilitation procedures used in other structures, as background for procedures used in this bridge
- Use of waterproofing membrane in Ontario
- Comparison with other jurisdictions

Audit Objective No. 2
Examine and evaluate the studies, processes and methodologies used by the City to select the asphalt rehabilitation methods, including the selection of Rosphalt modified hot mix asphalt placed without waterproofing membrane.

Criteria:
- Pavement design criteria and procedures
- Mix design specifications, including selection of asphalt cement
- Mix design testing and verification, including inspection and testing
- Comparison with other methodologies
• Checking of Rosphalt references
• Testing

Audit Objective No. 3
Examine the scheduling of contracts for pavement rehabilitation, including coordination of work with structure renewal requirements.

Criteria:
• Program coordination with Infrastructure Management
• Timing of contract preparation in light of inspection results
• Frequency of resurfacing required
• Scheduling of design meetings

Audit Objective No. 4
Examine the qualifications of City staff and testing laboratory, and the use of consultants used to provide advice on the pavement rehabilitation.

Criteria:
• Review City staff qualifications in relation to complexity of decisions required
• Capabilities and certifications of City materials testing laboratory
• Review methodology used to decide between in-house vs. consultant design
• Review the involvement of pavement specialists on the project

Audit Scope
The scope of the audit comprised the maintenance procedure for the Mackenzie King Bridge, including the resurfacing and superstructure maintenance. The audit examined the scheduling of asphalt rehabilitation contracts for the bridge, the alternative solutions examined and the procedures used for selection of asphalt rehabilitation methods, including coordination with the structure renewal procedures.

The audit examined the investigations done by the City to resolve the problem of rutting and shoving of the asphalt and leakage into the NAC garage resulting in a need for a strategy that could deal with both; and the use of Rosphalt modified hot mix asphalt placed directly on the bridge concrete deck, including an assessment of this practice as a reasonable practice.

The audit encompassed the following tasks:
• Obtain and review all files for the project
• Review background data on the bridge and Rosphalt
• Review the City’s policies, procedures, standards and practices
• Review industry procedures, standards and practices
• Conduct interviews with individuals involved in the 2007 and 2009 contracts and those responsible for inspection and maintenance of the bridge
• Conduct a site visit

Summary of Key Findings
1. The Mackenzie King Bridge (MKB) is located on the Central Transitway. The pavement on the bridge is subject to severe loading conditions, due to the number of buses using the bridge transit lanes, the slow operating speed of the buses on the bridge, and the number of bus stops and starts on the bridge.

2. When the MKB was transferred to the Regional Municipality of Ottawa-Carleton (RMOC) in 1996, the City accepted responsibility for maintaining the bridge above the National Arts Centre (NAC) parking garage. Leakage into the NAC parking garage has been a concern of the NAC and the City since at least early 2004; the City investigated the infiltration problems in 2005 and a report was completed in February 2006. The report concluded that the leakage problems were due to several factors; leakage through the deck was not one.

3. The City has had problems with the durability of the asphalt on the Mackenzie King Bridge (MKB) since about 2003. A list provided by the City of projects since 2001 shows that the City repaired the pavement on the bridge each year from 2004 to 2007; these repairs consisted of milling the existing asphalt in spots on the bus lanes and repaving.

<table>
<thead>
<tr>
<th>Year</th>
<th>Rehabilitation Description</th>
<th>Approximate Area (m²)</th>
<th>Approximate Cost</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>2001</td>
<td>No work identified on MKB</td>
<td>n/a</td>
<td>n/a</td>
<td>n/a</td>
</tr>
<tr>
<td>2002</td>
<td>No work identified on MKB</td>
<td>n/a</td>
<td>n/a</td>
<td>n/a</td>
</tr>
<tr>
<td>2003</td>
<td>No work identified on MKB</td>
<td>n/a</td>
<td>n/a</td>
<td>n/a</td>
</tr>
<tr>
<td>Year</td>
<td>Rehabilitation Description</td>
<td>Approximate Area (m²)</td>
<td>Approximate Cost</td>
<td>Comments</td>
</tr>
<tr>
<td>------</td>
<td>--------------------------------------------</td>
<td>-----------------------</td>
<td>------------------</td>
<td>------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>2004</td>
<td>Eastbound and Westbound lanes</td>
<td>n/a</td>
<td>n/a</td>
<td>No details available</td>
</tr>
<tr>
<td>2005</td>
<td>Spot locations eastbound lane at QE Driveway overpass</td>
<td>720</td>
<td>$16,000</td>
<td>Cost based on 6 areas of 4 m x 30 m</td>
</tr>
<tr>
<td>2006</td>
<td>Spot locations, Elgin Street to Waller</td>
<td>720</td>
<td>$35,000</td>
<td>Strategy by former pavement engineer, cost based on 6 areas of 4 m x 30 m, Removed waterproofing membrane at areas of repaving</td>
</tr>
<tr>
<td>2007</td>
<td>Spot locations, eastbound and westbound, west of Nicholas overpass</td>
<td>700</td>
<td>$23,000</td>
<td>Cost based on 6 areas of 4 m x 30 m</td>
</tr>
<tr>
<td>2008</td>
<td>Remove waterproofing, Elgin to Waller, EB and WB transit lanes</td>
<td>4,000</td>
<td>$625,000</td>
<td>Resurface using Rosphalt 50 modified hot mix asphalt, with no waterproofing membrane</td>
</tr>
<tr>
<td>Year</td>
<td>Rehabilitation Description</td>
<td>Approximate Area (m²)</td>
<td>Approximate Cost</td>
<td>Comments</td>
</tr>
<tr>
<td>------</td>
<td>-----------------------------</td>
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<td>----------</td>
</tr>
<tr>
<td>2009</td>
<td>Remove RMHMA, install new waterproofing and paving, Elgin to Waller, EB and WB Transit lanes</td>
<td>4,000</td>
<td>$718,000. Approximately $80,000 to $100,000 of this amount was for coordinated structural work and not resurfacing</td>
<td>Contract to repair work done in 2008; included bridge structural work coordinated within the same contract</td>
</tr>
<tr>
<td>2010</td>
<td>No work required on MKB</td>
<td>n/a</td>
<td>n/a</td>
<td>n/a</td>
</tr>
</tbody>
</table>

4. The City commissioned a pavement rehabilitation study in 2004 to investigate alternatives to the annual milling and paving of the bridge, which concluded that annual milling and paving was the most cost-efficient solution. The report recommended, based on life cycle cost financial analysis of the alternatives, to continue to mill and pave annually at an annual estimated cost of $33,000 (2004$), replace the entire surface course every 15 years at an estimated cost of $169,400, including engineering (2004$), and replace the waterproofing and asphalt every 30 years at an estimated cost of $621,500, including engineering (2004$). The report notes that the conclusions are based on annual repairs being required in the critical areas and a service life of 30 years for the existing waterproofing. Information provided by the City indicates that this $51,548 report was commissioned by the former Structures and Transit division within Infrastructure Services. The Structures Engineer reporting to that unit, as well as the Pavement Engineer, were involved in the study.

5. Up to 2007, the City was following the recommendations of the 2004 Pavement Rehabilitation report.

6. Information in correspondence provided by the City indicates that until 2006 the waterproofing on the bridge was working, although indications are that it had moved with load, and that the 2005 work possibly had resulted in some overmilling in spots, causing thinning of the waterproofing membrane, but not perforation of the same.
7. The City’s former pavement engineer (2002-2008) believed that the instability of the asphalt on the MKB was caused by slippage of the asphalt in relation to the waterproofing membrane, caused by the waterproofing protection board acting as a slip plane. For the 2006 pavement repairs on the bridge, the resurfacing was scoped to include removal of the waterproofing membrane and placement of Stone Mastic Asphalt (SMA) directly on the concrete deck without a waterproofing membrane. Less than six months later the pavement was reported to be in good condition (i.e., no rutting or shoving). This supported the engineer’s belief regarding stability of the hot mix asphalt. However, the leakage problems in the NAC parking garage were considerably worse than before the waterproofing membrane was removed, and there was evidence of water infiltration through the bridge concrete deck.

8. Rosphalt is a polymeric asphalt additive, manufactured by Royston Industries, a division of Chase Construction Products. The Rosphalt asphalt additive is applied to the hot mix asphalt (HMA) during the production of the asphalt concrete. In this audit, Rosphalt modified hot mix asphalt will be referred to as RMHMA.

9. According to Royston’s marketing and product information, Rosphalt 50 is a dry mix asphalt additive that provides a waterproof wearing surface that will not rut or shove. The product information states that RMHMA is used as a single-system waterproofing and wearing course for bridge decks, in contrast with conventional asphalt and waterproofing installations, which consist of a waterproofing membrane placed on the bridge deck, covered with backer-board protection, covered with hot mix asphalt. The Rosphalt 50 additive is intended to reduce the permeability of the HMA, eliminating the need to place a waterproofing membrane and protection board.

10. Based on the results of the 2006 pavement rehabilitation work (which used SMA without a waterproofing membrane), the City decided to remove the waterproofing membrane and asphalt along the full length of both the eastbound and westbound bus lanes on the bridge, and to repave the bus lanes for the entire length of the bridge, using hot mix asphalt modified with Rosphalt 50 (RMHMA), placed directly on the bridge concrete deck, without a waterproofing layer. The premises for this decision were (a) the interface between the waterproofing membrane and the hot mix asphalt was considered to provide a slip plane which prevented the hot mix from adhering to the concrete deck, and permitted it to shove and rut; and (b) the RMHMA would be sufficiently impermeable to provide sufficient waterproofing of the concrete deck to permit
removal of the standard waterproofing membrane without adverse effect to the concrete deck.

11. Standard practice for municipal and provincially owned bridges in Ontario is to use a waterproofing membrane and asphalt to protect the bridge decks. This is also the City of Ottawa practice. Not using a waterproofing membrane is very unusual. In the references provided by Royston for the use of the Rosphalt 50, only two bridges are located in Ontario, and those were done in the mid-1980s. The Ministry of Transportation of Ontario (MTO) has used Rosphalt 50 in three contracts in the last two years as a stop-gap measure and on a trial basis.

- The MTO generally uses waterproofing membrane and hot mix asphalt on bridge concrete decks.
- The MTO has used Rosphalt 50 additive on a trial basis in three recent contracts, in situations where the MTO cannot use their normal waterproofing system. Rosphalt is being used temporarily until the bridge deck can be completely rehabilitated.
- MTO structural staff is responsible for making the waterproofing decision. Normal waterproofing system is a hot applied rubberized asphalt waterproofing membrane, which cannot be used when the deck surface is rough.
- The MTO contact indicated that the paving company had some problems with getting the correct aggregate gradation. Rosphalt in the US kept sending it back. If gradation is not right then asphalt will not have the correct density and will not be waterproof.
- Municipalities in Ontario generally use waterproofing and asphalt on concrete decks. In some applications bridge decks are provided with a concrete overlay as the wearing surface, but this is not a common practice.
- The Ontario Good Roads Association was contacted to enquire whether they are aware of municipalities in Ontario who may have used the Rosphalt additive, but they were not aware of the use of the product.
- The auditor contacted the City of Guelph Engineering department, as the City of Guelph’s Edinburgh Street Bridge is listed in the reference provided by Royston for projects where the Rosphalt additive has been used, which is on a road used by buses. The City advised us that they do not have the files for this contract, as it was done in 1986.
- It is notable that the product has not been used in either the City of Toronto or the City of Montreal, two cities with routes with significant bus loads.
12. There is no documentation in the files provided by the City to attest that the decision to use the RMHMA was preceded by appropriate tests, financial studies, and preparation of specifications. The review of references appears to have been limited to the New Brunswick department of Transportation, who have used the Rosphalt 50 product on highway bridges, which have much different traffic and axle loading conditions than the Mackenzie King Bridge.

13. The grinding and resurfacing work done in 2006 suggested that the removal of the membrane helped to reduce the rutting and shoving; however, it resulted in a higher leakage rate. This resulted in the City’s consideration of other waterproofing products, including Rosphalt, which was subsequently selected as it provided the opportunity to address both rutting and leakage concerns.

14. Review of the documentation on the asphalt stability problems on the bridge indicates that more advanced examination of the reasons for the instability of the hot mix could have been warranted. Tests that could have provided additional insight into the rutting, shoving, and shear forces between the asphalt mix and the waterproofing membrane, such as the Asphalt Pavement Analyzer, the Repeated Load Permanent Deformation test, Fatigue testing and the Superpave Shear Tester (SST), appear to have been warranted. There is no documentation on file attesting that any of these or equivalent tests were conducted prior to making the decision to use the RMHMA.

15. The decision to use RMHMA was made without documentation of evaluation of other options, such as waterproofing membranes not requiring a protection board, or higher grade performance graded asphalt cements. Management has indicated that the option of using other waterproofing systems was discussed and considered, but was not retained because of concerns that it would not address the root cause.

16. The decision to remove the waterproofing membrane and to place RMHMA was done by the former pavement engineer without formal approval by the Structures Section of Infrastructure Management (now Asset Management). Correspondence in the file indicates that the Structures Section had serious reservations about the removal of the waterproofing, but these were not communicated clearly and forcefully enough to the former pavement engineer.

Management has indicated as follows: Discussion did take place at the staff level, including with the Structures section, before the decision to proceed with the RMHMA was made. The challenges with the Mackenzie King Bridge (MKB) structure were well understood. Similar rutting problems were encountered at
Transit Stations and addressed by replacing the asphalt with a concrete resurfacing. This solution was not applied to MKB because it is a bridge with unique challenges and constraints. Had the Structures section not supported the proposed direction, this issue would have been escalated, to Management, which it was not.

17. As noted in Items No. 3 and 10, the City milled and repaved areas of the bridge in 2006, removing the waterproofing membrane and placing SMA directly on the concrete deck. Approximately seven months passed between the time when the City became aware that the deck was leaking at the location where the waterproofing membrane was removed in 2006 and when the City moved to resurface the entire length of the bus lanes using RMHMA; however, there is no documentation of the reasons why there was such a long a time gap between the two events. A project of such magnitude would have warranted sufficient study and preparation of tender documents.

18. The decision to resurface the bus lanes, made in 2007 and implemented in 2008, appears to have not taken into consideration the previous reports commissioned by Infrastructure Management relating to evaluation of alternative pavement rehabilitation strategies.

19. Based on the 2004 pavement rehabilitation study and the rehabilitation work done from 2004 to 2007, both inclusive, the City could have continued to spend up to $33,000 annually for another 15 years before milling and repaving the entire bus lanes. Instead, the City spent $625,000 in a pavement rehabilitation scheme that was unsupported by adequate investigations, testing, and financial analysis.

Management has indicated as follows: The bridge was renewed in 1998 and it would be unreasonable to expect that it would be another 15 years beyond 2004 before resurfacing would be required. Because of the frequent repairs and the fact that shortly after the repairs were done the pavement started showing signs of failure, staff worked collaboratively to find an innovative solution. Based on the history of the bridge, its unique challenges and the premature pavement failures, staff concluded that the 2004 plan warranted a different approach.

As noted in Point 4 above, the 2004 report was reviewed and accepted by senior engineering staff within the City, so it would be expected that the assumptions in the report were vetted by them. Management has now stated that those assumptions are unreasonable. If the City was not in agreement with the assumptions made in the 2004 report, further discussion should have taken
place to ensure that the report’s assumptions were correct. If there was
disagreement with the report, it should have been modified to address the
revised assumptions regarding the useful life of the asphalt and waterproofing.

20. After making the decision to resurface using RMHMA, the City proceeded to
request a quotation from the contractor who was undertaking the 2007
Transitway Rehabilitation Contract. The total cost was $625,000.

21. Based on this information, the City requested quotations from three contractors,
but without preparing a formal Request for Quotations.

The City proceeded on the basis that the work was urgent and time was limited
due to the impending closure of the asphalt plants.

Management has advised that Article 23 of the Purchasing By-law, Special
Circumstance Purchases, delegates authority to the Director, or Deputy City
Manager, as appropriate, to authorize the purchase of construction as is
considered necessary to remedy the special circumstance without regards to the
requirement for a bid solicitation. In this instance, the department opted to solicit
quotations and award the contract to the lowest responsive bidder. This is
considered preferable to a non-competitive contract award, which is permitted
under Article 23, as pricing was provided in a competitive, although informal,
environment. Moreover, the award to the lowest responsive bidder was
approved in accordance with the Purchasing By-Law.

22. The City did not prepare a Specification specifically for the application of the
RMHMA, but used a Standard Specification for a new product application. This
resulted in some confusion within the City during construction as to the warranty
implications of controlling the RMHMA specifications.

23. The former pavement engineer who was responsible for the selection of the
RMHMA strategy for the MKB left the City in early 2008. No other staff at the
City had the experience or training to vet the decisions made by Royston and/or
the contractor with respect to the RMHMA mix design.

24. As a result of the lack of experience with and training in the Rosphalt additive,
the QA Section and Construction Services left it to Royston and the contractor to
prepare the mix design, test it, and control it during construction. Quality
assurance testing was performed on the asphalt cement content and aggregate
gradation on production samples to confirm conformance with supplier mix
formula.
25. The Royston literature indicates that they will use the PG grade specified by the owner. The asphalt grade (PG 70-34) specified in the contract was modified to a lower grade (PG 58-34) by Royston during the mix design. Approval of this change by the City is not documented.

Management has stated that the City recognized that it was dealing with a proprietary product and wanted to ensure that the responsibility for the warranty remained with Royston. Without knowing the proprietary composition of the Rosphalt additive, staff followed Royston’s recommendation regarding the PG grade since staff could not confirm the reaction between the Rosphalt additive and the polymer in the PG 70-34.

26. Although the Quality Assurance (QA) Section had valid concerns and offered what would have been helpful suggestions to the contractor regarding the mix design tests, these were not addressed. The City indicated that they did this to avoid nullifying the contract warranty, but we believe that the lack of experience with Rosphalt and the lack of a specific specification made it practically impossible for the City to test and verify the material.

27. The City staff responsible for the design of the 2007 contract appear to have had the necessary qualifications.

28. The City Quality Assurance staff consists of engineers with substantial experience in testing of materials, but they are not certified either by the Canadian Standards Association (CSA) or the Canadian Council of Independent Laboratories (CCIL). The City Quality Assurance lab does not have the required CCIL certification.

29. CCIL certification is voluntary, but the certification program ensures that materials testing labs meet correlation and proficiency requirements. The Ontario Provincial Standard Specifications for Municipal and Provincial contracts require that testing of materials be done in CCIL-certified labs. MTO requires that all their testing be done in CCIL (or equivalent) certified labs.

30. The lack of CCIL or equivalent certification places the City's lab at a disadvantage in relation to labs that are CCIL-certified, particularly in cases of disputes. In cases of disputes, testing is referred to an independent lab.

31. The City's Quality Assurance lab has a total of 7.98 FTEs, a 2011 budget of $871,594, and anticipates recovering $803,022 from the Capital Works program by way of services. The QA lab currently outsources up to 80% of the City's
bulk asphalt testing and 100% of the structural concrete testing to certified laboratories.

32. In the absence of the former pavement engineer, or someone with similar qualifications, the City did not involve a consultant to assist with the pavement mix design and quality control issues, although it became clear after 2008 that the City staff did not have the required training and experience to be able to manage the results [for the City] of the new pavement technology.

33. Correspondence and other documentation provided by the City shows that the RMHMA was breaking up significantly and that leakage through the bridge deck had become a serious concern for the NAC parking garage, other users of the space under the bridge, and the bridge deck.

34. In 2009, the City decided to remove the RMHMA from the bus lanes, install a new waterproofing membrane and resurface using Superpave asphalt based on the City’s standard specifications. The 2009 contract in the amount of $718,000 included approximately $100,000 for bridge structural work as well as the cost of removing the RMHMA placed in 2008, concrete deck preparation, installation of waterproofing, and placing the new asphalt. This contract was tendered in accordance with the City’s Purchasing By-law, using the City’s standard tender documents format.

35. No spot milling and repaving is currently programmed in 2011 for the asphalt placed in 2009, but it is recognized that it will require annual spot milling and repaving, in a similar manner as the asphalt placed in 1998 needed maintenance a few years after being placed. Management has indicated that the 2011 program will only be confirmed after field verification as it is too early to confirm that no repairs will be undertaken in 2011.

36. The City is currently planning to undertake a study of alternative pavement and waterproofing options for the MKB, to determine what options may be available to resurface the bridge bus lanes to provide a stable, durable and appropriate solution to the asphalt rutting and shoving and leakage problems.

37. The various investigations and the peer review indicate that the RMHMA did not perform as intended. In October 2010, the City indicated that the matter had been referred to the City’s Legal Services, with the intention of determining what legal recourse is available to the City for damages.

Legal Services were first consulted concerning a possible claim against the contractor or manufacturer in June of 2010. At that time, an initial expert report...
on the causes of the problems with the RMHMA was obtained and reviewed by Infrastructure Services. Subsequently, a second expert report was obtained in the form of a peer review of the first report. Management considers that currently the results are inconclusive. To preserve the City’s legal rights, a claim was issued on March 1, 2011 in order to ensure that the limitation period did not expire. The claim has not been served pending the acquisition of an expert report (prior to mid-August 2011).

38. The consultant retained by the City to review the possible reasons for the failure of the RMHMA is headed in Ottawa by the former City Pavement Engineer. We consider that in cases where a project has had a problem, the City should not retain the engineer responsible for the original design to provide advice on the possible solutions to the problem. Management has stated that staff retained the former Pavement Engineer based on his unique skill set and in-depth knowledge of the file. An independent consultant conducted a peer review of the report completed by the former City staff member.

Recommendations and Management Responses

**Recommendation 1**
That the City modify its procedures to ensure that pavement work on structures be scoped with the specific agreement and approval by the Structures Section of Asset Management.

**Management Response**
Management agrees with this recommendation, and it has been implemented.

The Asset Management branch has documented procedures related to resurfacing on structures and associated approval processes. This information was provided to the auditor during the audit review process.

**Recommendation 2**
That the City modify its procedures to ensure that application of new technologies be preceded by a sufficiently detailed, tested and documented investigation of alternatives and costs, and that application receives specific management approval.

**Management Response**
Management agrees with this recommendation.

In May 2011, the General Manager, Infrastructure Services issued a departmental directive outlining requirements to be followed when piloting new technologies. Management will monitor amendments that may be required to
further clarify the directive. The audit recommendation will be reflected in the next amendment, which is expected in Q4 2011.

**Recommendation 3**  
*That the City ensure that the specifications for application of new technologies be vetted by management in the same or more strict manner than the production of standard specifications.*

**Management Response**  
Management agrees with this recommendation.

In May 2011, the General Manager, Infrastructure Services issued a departmental directive outlining requirements to be followed when piloting new technologies. Management will monitor amendments that may be required to further clarify the directive. The audit recommendation will be reflected in the next amendment, which is expected in Q4 2011.

**Recommendation 4**  
*That the City modify its procedures when applying a new technology to ensure that all departments who will be involved in the implementation have proper training on the new technology.*

**Management Response**  
Management agrees with this recommendation.

In May 2011, the General Manager, Infrastructure Services issued a departmental directive outlining requirements to be followed when piloting new technologies. Management will monitor amendments that may be required to further clarify the directive. The audit recommendation will be reflected in the next amendment, which is expected in Q4 2011.

**Recommendation 5**  
*That the City ensure that the application of new technologies be preceded by a documented investigation of references, including an assessment of whether the referenced applications had similar conditions as those known or anticipated in the City’s site.*

**Management Response**  
Management agrees with this recommendation.

In May 2011, the General Manager, Infrastructure Services issued a departmental directive outlining requirements to be followed when piloting new technologies. Management will monitor amendments that may be required to
further clarify the directive. The audit recommendation will be reflected in the next amendment, which is expected in Q4 2011.

**Recommendation 6**
That the City modify its procedures to include all major rehabilitation work on structures, including major resurfacing work, in its guidelines for renewal options.

**Management Response**
Management agrees with this recommendation, and it has been implemented.

This requirement has already been reflected in the Asset Management branch’s Structures Best Practice Guide.

**Recommendation 7**
That the City review its requirement for a Quality Assurance lab, including staff requirements.

**Management Response**
Management agrees with this recommendation.

The services provided by the Quality Assurance section have been previously reviewed with a change in focus from a high dependence on materials testing towards specialty services. A further review will be conducted regarding the lab testing services. This review will be completed by Q3 2012.

**Recommendation 8**
That the City develop guidelines for the engagement of consultants to assist with unusual or new situations in construction projects where the required expertise or experience is not available within the City.

**Management Response**
Management agrees with this recommendation.

This is consistent with the procurement processes already in place through the Standing Offer, Request for Qualification and Request for Proposal processes.

**Recommendation 9**
That the City modify its procedures for situations in which projects have presented problems to ensure that the reviewing engineer is different from the design engineer; and that this procedure applies to both individual engineers and engineering firms.

**Management Response**
Management agrees with this recommendation.

For future projects that require further review or investigation after project completion, the engineering firm and engineer assigned for review will be different than the firm/engineer who originally undertook the work. This will be reflected in a departmental directive by Q4 2011.

**Recommendation 10**

That the City modify its procedures so that in cases where a project is found to have a design problem, the City retain an engineer different from the one responsible for the original design to provide advice on the possible solutions to the problem.

**Management Response**

Management agrees with this recommendation.

For future projects that require further review or investigation after project completion, the engineering firm and engineer assigned for review will be different than the firm/engineer who originally undertook the work. This will be reflected in a departmental directive by Q4 2011.

**Recommendation 11**

That the City request Legal Services to consider recovering the costs associated with both the 2008 and 2009 resurfacing contracts.

**Management Response**

Management agrees with this recommendation, and it has been implemented.

As acknowledged in the audit report, this has already been initiated. The contract information was submitted to Legal Services prior to the date the audit was initiated. Management considers that no further action by Infrastructure Services is required.
Conclusion
The Mackenzie King Bridge is part of the OC Transpo Central Transitway, with large volume of bus traffic, operating at slow speeds and making frequent starts and stops. The MKB is also part of the NAC parking garage where leakage has been a chronic problem. These are onerous conditions on the pavement, and the City has had to mill and repave portions of the bridge annually due to deformation such as rutting and shoving in the most severe portions. A 2004 study of options for pavement rehabilitation concluded that annual pavement repairs were the most economical solution: spend an average of $33,000 (2004$) annually for 30 years, mill and repave the entire surface course every 15 years at an estimated cost of $169,400, including engineering (2004$), and replace the waterproofing and asphalt every 30 years at an estimated cost of $621,500, including engineering (2004$). The City could have continued to spend $33,000 until 2019. It is noted that the assumptions in the 2004 report were vetted by the City.

Although the 2004 report was vetted by senior engineers, management now states that the bridge was renewed in 1998 and that it would be unreasonable to expect that it would be another 15 years beyond 2004 before resurfacing would be required. Management indicates that because of the frequent repairs and the fact that shortly after the repairs were done the pavement started showing signs of failure, staff worked collaboratively to find an innovative solution; based on the history of the bridge, its unique challenges and the premature pavement failures, staff concluded that the 2004 plan warranted a different approach.

The decision to remove the waterproofing and asphalt, and repave using Rosphalt modified hot mix asphalt did not heed the previous study result, was made without proper design and testing, and without following alternative evaluation methods that were formalized in the guidelines for structure renewal. Management indicates that the decision was made in consultation with affected parties, including the Structures section, and recognizing the complexities of this structure to address both rutting and leakage issues. The total cost of removing the waterproofing on the bus lanes for the entire length of the bridge and repaving using Rosphalt 50 modified hot mix asphalt was $625,000 in 2008.

The decision to remove the badly damaged Rosphalt modified hot mix asphalt and repaving using conventional waterproofing and asphalt appears to be justified based on the amount of damage to the RMHMA and the leakage to the NAC parking garage. The cost of this work in 2009 was $718,000, including approximately $100,000 in structural bridge work that was coordinated with the resurfacing contract.
A portion of the cost of the 2008 and 2009 repaving contracts (a total of $1,243,000) could have been avoided if the City had continued with the program of milling and repaving only those sections of the bridge pavement requiring repair in accordance with the recommendations of the 2004 Pavement Rehabilitation Report. It is expected that the annual spot milling and repaving will need to resume within a few years, as the asphalt placed in 2009 will require maintenance. This strategy did not address the leakage concerns in the NAC parking garage, which the 2005 report concluded originated from sources other than infiltration through the bridge deck.
Audit of Species at Risk

Introduction
The Audit of Species at Risk was included in the Office of the Auditor General’s 2014 Audit Plan, approved by Council in March 2014.

Background
Although the City of Ottawa (hereafter the "City") is Canada’s fourth largest city by population (data of 2011), it has the largest land area among Canada’s major cities. More than a third of this area is forested and includes wetland. Agricultural lands make up another third of the area. The urban part of the City is therefore surrounded by natural habitats, which contain species that are considered as being at risk. From 2006 to 2011, the population in Ottawa increased by 9%, stressing the existing infrastructure and calling for an extension of the urban area. Urban development of the city, both by the City (road infrastructure, water drainage, etc.) and private proponents, may impact these natural habitats and the species living there. It is therefore important for the City, in planning its development, to take into consideration the protection of species at risk (SAR). The protection of SAR is also an issue in urban area where many species such as the Chimney Swift and the Barn Swallow live.

In Ontario, SAR are protected either at the provincial or the federal level and the City must ensure compliance with regulations at both levels.

Regulation for the Protection of Species at Risk in Canada
In Canada, the Species at Risk Act (SARA) prohibits any person from killing, harassing, capturing or taking an individual of a wildlife species that is listed as an extirpated species, an endangered species or a threatened species. No person can either damage or destroy the residence of one or more individuals of a wildlife species that is listed as an endangered or threatened species or that is listed as an extirpated species if a recovery strategy has recommended that the species be reintroduced into the wild in Canada.

These restrictions only apply in federal lands unless the Minister of the Environment of Canada recommends application on provincial lands. However, for aquatic species and birds that are migratory, these restrictions apply all across Canada.

The SARA recognizes that species not considered as being at risk at the federal level might be protected under provincial legislation. It is therefore important to have access to both provincial and federal SAR lists.
Regulations for the Protection of Species at Risk in Ontario

Endangered Species Act, 2007

At the provincial level, species at risk are protected by the Endangered Species Act, 2007 (ESA). This Act is administered by the Minister of Natural Resources and Forestry (MNRF). This Act, classifies species that are considered at risk into one of four categories:

- **Extirpated**: the species is still alive, lived at one time in the wild in Ontario, but no longer lives in the wild in Ontario;

- **Endangered**: the species lives in the wild in Ontario, but its extinction or extirpation is imminent;

- **Threatened**: while the species that lives in the wild in Ontario is not endangered, there are reasons to believe that if steps are not taken it might become endangered in the future;

- **Special concern**: the species lives in the wild in Ontario and may become either endangered or threatened in the future due to a combination of biological characteristics and identified threats.

Approved changes to the lists are published online in Ontario’s Environmental Registry (hereafter the "EBR"). The ESA prohibits any person from killing, harming, capturing or taking a living member of a species that is listed on the Species at Risk in Ontario List as an extirpated, endangered or threatened species. Additionally, no person can either damage or destroy the habitat of a species that is listed on the Species at Risk in Ontario List as an endangered or threatened species.

Regulatory Exemptions

In some circumstances, the Minister may authorize a specific activity that would otherwise be prohibited under the Act. In the municipal context, activities that can receive such an exemption from the Minister are classified into two groups: development and infrastructure projects, and ditch and drainage work.

Exemption Process for Development and Infrastructure Projects

In order to receive authorization, a municipality must register the activity and the species that would potentially be impacted with the MNRF before the activity starts, take steps to minimize the negative impacts, create and implement a mitigation plan, report sightings of rare species, monitor and report on the effectiveness of the mitigation measures and report annually to the MNRF on these measures.
Exemption Process for Drainage Activities
For drainage work, the Drainage Act gives municipalities the responsibility of realizing drainage work when it is needed and requested by landowners. Municipalities are also responsible for maintaining and repairing existing drains. The costs of these activities are the responsibility of landowners.

In order to minimize maintenance and repair activities on a drain, Ontario Regulation 242/08 provides for an exemption from the ESA, if the following conditions are respected:

- The municipality must, before doing any maintenance work, submit a notice of drainage to the MNRF;
- The municipality must prepare a mitigation plan;
- The mitigation plan must be updated at least every five years;
- The municipality must prepare an annual report that presents the steps taken to minimize the adverse effects of drainage work.

In order to further ease the impact of the Drainage Act without placing a municipality in conflict with the ESA, the MNRF entered into an agreement with municipalities, including the City of Ottawa. This agreement removes the obligation to comply with the applicable clauses of the ESA, 2007. It lists the drains where species at risk could be found and contains a mitigation plan for these species. Therefore, under this agreement, the City could simply report annually to the MNRF when drainage works are realized on one of these sensitive drains. In Ottawa, this agreement started on June 29, 2010 and ended on June 30, 2015.

Since July 1, 2015, the City continues to be exempted from the applicable clauses of the ESA. However, in comparison with the approach followed in the previous Agreement where the City had to notify the MNRF before beginning any drainage work, the City was provided an opportunity to register all drains and all potential species at risk in a one-time registry process.

Provincial Policy Statement
The Provincial Policy Statement (PPS) is a general document that "sets the policy foundation for regulating the development and use of land and provides for appropriate development while protecting resources of provincial interest, public health and safety, and the quality of the natural and built environment". The PPS recognizes that natural heritage shall be protected and that development or site alteration shall not be permitted in defined areas such as significant wetlands and the habitat of endangered and threatened species.
Despite these restrictions, development can be authorized if it is shown that ecological functions in these areas will not be negatively impacted by the project. PPS application at the city's level is made under the City of Ottawa Official Plan that is described later. The requirements for demonstrating that there is no negative impact on a habitat are described in the Plan.

**Protection of Species at Risk in Ottawa**

The City of Ottawa Official Plan serves as a framework for the city's development through 2031. It is a legal document that addresses the requirements found in the PPS under the Ontario *Planning Act*. It includes sections on environmental integrity and the protection of species at risk.

For projects where the City is the proponent, based on the size of the project, the City may have to perform an Environmental Assessment (EA) process following either a streamlined approach, for projects pre-approved by the Ontario Ministry of the Environment, or an individual EA. Most of the time, the City will receive support from an external consultant to perform the EA. The EA process requires the City to assess whether or not the project is located in the habitat of species at risk and if such species have been observed in the area.

External proponents for development projects must demonstrate in an Environmental Impact Statement (EIS) that their projects will not have significant negative impacts on the environment, including on the species at risk and their habitats. If the project is located in an area where species at risk may live, the proponent must propose mitigation measures. The City analyzes the EIS prior to authorizing the project and may ask for project changes if deemed necessary.

While protecting species at risk is a legal obligation, the City is also deeply committed to doing so. In 2003, the City adopted an environmental strategy to protect and strengthen local ecological features, including habitats and biodiversity. The City defined its roles and mandates with respect to biodiversity as protecting the habitat through environmental designations, monitoring and assessing biodiversity, preparing species status lists for the City and educating the population. The City also pledged to prepare a biodiversity strategy (later called the wildlife strategy).

Finally, activities performed on a daily basis by the City (such as maintenance work, mowing, upgrading gravel roads, renewing bridges, replacing culverts) may impact species at risk. Staff working in these areas need to adopt adequate practices to comply with the SARA and the ESA.

**Audit Objectives and Scope**

The objectives of the audit were to:
1. Assess whether the City of Ottawa has a clear understanding of the regulatory requirements related to the protection of species at risk;
2. Assess whether the City adequately manages information and complies with regulations related to the protection of species at risk and their natural habitats.

The audit scope includes the policies, guidelines, frameworks and regulations that have been adopted by the City since 2012.

**Summary of Key Findings**

**City Protocols and Guidelines**

2. These protocols and guidelines comply with the regulations as they refer to legal documents such as the ESA and the SARA.
3. These protocols and guidelines do not provide a complete list of species at risk, rather they refer to different external sources for species identification. One of these sources is a document maintained by the Ottawa Stewardship Council, a volunteer organization, which is incomplete and not up-to-date.
4. Protocols or “best management practices” for City maintenance activities are missing.

**Locating Natural Habitats to Avoid Impacts**

5. The City complies with the PPS by identifying the natural heritage system in Ottawa and with the MNRF by not disclosing the most expected locations of species at risk as this is considered sensitive information.

**Protection of Species at Risk in Infrastructure Renewal Projects**

6. For infrastructure renewal projects, such as upgrading gravel roads, renewing bridges, resurfacing roads and replacing culverts, the City does not have to conduct an EA, but must comply with both SARA and ESA. Therefore, since 2013, the Infrastructure Services department performs an annual screening of the projects for the next two years that are included in its renewal program. The objective of this screening is to identify projects that might impact species at risk. The methodology for this screening approach was developed by the City in collaboration with a consultant and submitted for comments to the MNRF. For each project where a risk is assessed, a report provides mitigation measures.
Protection of Species at Risk in Major Projects

7. For major infrastructure projects, the City must perform an EA (or a streamlined EA) to demonstrate that the project will not impact the environmental characteristics (such as species at risk and their habitats) or that mitigation measures will be implemented to minimize such impacts. In the time between the completion of the EA and beginning the project, changes could occur in the environment or the legislation, which would make the EA conclusions outdated. The City does not have a protocol to review a project’s environmental context prior to its realization to ensure there have been no changes. Without such a protocol, the City may not identify major projects for which additional mitigation measures are required due to changes in environmental regulations.

Protection of Species at Risk in PWD Maintenance Activities

8. For maintenance activities related to roads, parks, buildings and forestry, the Public Works department (PWD) believes that it is not possible to have a species at risk in a non-sensitive area, and therefore no special mitigation measures are undertaken. However, the City’s Land Use and Natural Systems (LUNS) unit believes that species at risk may be located throughout Ottawa, not only in sensitive areas. Therefore, there is a possibility that PWD maintenance activities in non-sensitive areas will hurt a species at risk or impact their habitats.

9. In sensitive areas, PWD follows the mitigation measures provided in the Wildlife Protocol for Road and Construction/Rehabilitation Projects. However, these mitigation measures are specific to construction work, and do not apply to maintenance activities such as grading or roadside brushing or mowing.

Protection of Species at Risk in Drainage Maintenance Activities

10. In the application of the 2010 Agreement with MNRF, the City went beyond its requirements. The Municipal Drainage unit (MDU) notifies the MNRF of the scheduled maintenance work on any drains, rather than only for those drains identified by the MNRF as being in a sensitive area and occurring during a sensitive period, as described in the Agreement. Even if such a notification can be resource intensive, depending on the complexity of the project, the MDU preferred to ensure that the City complied with the ESA and the exemption for drainage work.

11. The 2010 Agreement with MNRF for drainage work ended on June 30, 2015, but the exemption from the applicable clauses of the ESA is still possible. To do so, municipalities needed to register all the drains for which they wanted to maintain this exemption. The City registered all the drains for the Ottawa area (there are over 700 drains) using this single registration process. The City also increased
the number of species at risk that might be found around these drains from three to fourteen. Therefore, the City will not have to notify the MNRF each time drain maintenance is required.

12. In addition to this one time registration, in order to comply with the regulation and to be exempted for drainage work from the ESA, the City must have a mitigation plan. The Drainage Superintendents Association of Ontario (DSAO) has produced a standardized mitigation plan, which has been approved by the MNRF. The City must now adapt that plan with actions that are specific to registered species at risk.

Access to Species at Risk Training

13. The LUNS unit, the City’s key resource for species at risk, gave seven external conferences, in-house ad hoc presentations and on-demand introductory sessions on the changes in legislation on species at risk and on how the City’s activities comply. As well, in 2013, LUNS unit staff members, with environmental planners from the Development Review Rural Services branch, attended training given by the MNRF about improvements in the implementation of the ESA. However, other than these ad hoc presentations, the City does not have a mandatory protection of species training program for regular or temporary new employees.

Roles and Responsibilities

14. The LUNS unit is responsible for policy development, but not the City’s compliance with the regulations. Each department is responsible for their own compliance. Therefore, the City does not have any resource responsible for controlling the application of protocols and guidelines related to the protection of species at risk. In order to complete the management of species at risk process, operational staff should work in collaboration with the staff responsible for species at risk policy development.

15. In the City’s wildlife strategy, the Planning and Growth Management department (PGMD) recommended the creation of a Wildlife Resource Officer position. The officer would be responsible to develop and implement policies and procedures to ensure compliance with the ESA in the City’s operations and maintenance and in working with the LUNS unit to implement species at risk planning and policies. At that time, the analysis for creating this position was postponed until the 2015-2018 term of Council, when the staff reviewed the business case for this position.
List of Species at Risk in Ottawa

16. The City’s main tool for managing species at risk is its list of species that are considered as being at risk in Ottawa. There is no obligation for the City to have such a list, but the LUNS unit took the responsibility of creating and keeping it up to date, and informing specific internal and external resources about any changes to this list. The main reason for having this list is the delay between the MNRF’s announcement on the EBR of a change in the Ontario list and the update of that list on the MNRF website. However, the City’s list is not available to all City staff working with SAR.

17. In addition to the LUNS unit’s list, other lists are available to City staff. These are the list of species on the City’s website (which contains more than just SAR); the list made by the LUNS unit but without species considered as of special concern; the OSC Handbook; the MNRF website; and the SARA Schedule 1 at the federal level. These lists do not provide similar information. Therefore, staff may make a wrong decision regarding the need for a mitigation measure or present an incomplete request to the MNRF if they use the wrong list.

18. From a compliance point of view, the City must take every decision related to the protection of species at risk based on the information provided or at least validated by MNRF and Environment Canada. The internal list made by the LUNS unit should be seen as a tool that centralizes the information from different sources (provincial and federal requirement) and gives an overview of upcoming modifications to official documents.

19. There is no documentation for the process to maintain the LUNS unit’s list. Currently, one employee is responsible for updating it based on the notifications posted by the MNRF on the EBR and to communicate these changes to selected City staff and external resources. However, if this individual leaves this position there is a risk that the City would not be able to update its list more quickly than the MNRF updates its own.

Wildlife Strategy Action Plan

20. Since its adoption in 2013, much work has been done on the action plan in the City’s Wildlife Strategy. The construction protocol has been updated. The PGMD hosted five sessions to inform residents about wildlife and worked with the "Let’s Talk Science" program to develop a backyard wildlife education kit for use in schools, and the City’s website section on wildlife has been updated. The last three recommendations in this strategy, including the creation of a Wildlife Resource Officer position, were all deferred until the next Council mandate (2015-2018). However, this mandate has now started and there has been no further action on these recommendations.
21. From an operational standpoint, we found that the PGMD has demonstrated the need for this new resource. However, the department has not demonstrated the financial benefits associated with such a position. The only benefits currently identified for this position relate to reducing the costs of repairing damage to road culverts and road beds caused by beavers. This is an issue in Ottawa from a wildlife strategy standpoint and is not related to a species at risk.

Recommendations and Management Responses

Recommendation 1
That the City only refer to legislative bodies for the identification of species at risk in its area in compliance with the ESA, 2007, and the SARA.

Management Response:
Management agrees with this recommendation.

Departments will ensure that City documents refer to the appropriate legislative bodies (ESA 2007 and SARA) for the identification of SAR. This applies to documents that reside in Planning and Growth Management, Public Works, Infrastructure Services, and Environmental Services.

Stakeholders will be directed to MNRF as the final authority for the identification of SAR at any given time.

Existing documents and web page references will be updated by Q2 2016.

Recommendation 2
That the City develop an approach to review the environmental context and the appropriate regulations of major infrastructure projects before they are realized to ensure compliance with the requirements regarding protection of species at risk and their habitats.

Management Response:
Management agrees with this recommendation.

The City will develop an approach to review the environmental context and appropriate regulations for major infrastructure projects prior to commencement of the project in order to ensure compliance with current requirements regarding protection of species at risk and their habitats. This approach will be developed by Q3 2016.

Recommendation 3
That the City adopt BMPs for maintenance activities in both sensitive and non-sensitive areas in order to protect the species at risk and their habitats.

Management Response:
Management agrees with this recommendation.

Public Works will develop appropriate BMPs for roads maintenance, parks, buildings and forestry activities covering both sensitive and non-sensitive areas by Q2 2016.

**Recommendation 4**
That the City develop its own mitigation plan with respect to the species at risk that might be found around the drains located all across the Ottawa area.

**Management Response:**
Management agrees with this recommendation and it has already been implemented.

When preparing to do drainage work Environmental Services (Municipal Drain unit) reviews the Ministry of Natural Resources and Forestry (MNRF) website immediately prior to planned works to determine the most up to date species at risk (SAR) in the general area of the municipal drain.

As noted in the audit, on June 30, 2015, the Agreement, based on Regulation 242/08, with the MNRF ended. Under new procedures, Environmental Services has registered over 700 drains using the single registration process; as part of the registration process the City increased the number of species at risk that might be found around City drains from three to fourteen. In the now expired Agreement, the Ministry provided a mitigation plan, however, moving forward, under the new process, the Municipal Drainage unit will be following approved mitigation plans agreed to by MNRF, Ontario Ministry of Agriculture, Food and Rural Affairs (OMAFRA) and the Drainage Superintendents Association of Ontario (DSAO). Immediately prior to beginning each project ESD will refer to the MNRF SAR registry to determine which species are at risk.

**Recommendation 5**
That the City provide all new staff members who may encounter species at risk with a short training session that provides basic information on the species at risk in Ottawa, what to do when a species is encountered and the available City resources for additional information.

**Management Response:**
Management agrees with this recommendation.

The responsibility for providing training and ensuring that all new staff are trained will be considered within the organizational review to be completed as part of Recommendation 6. This review will be completed by Q3 2016.
**Recommendation 6**  
That the City review its organizational structure in order to be able to provide a complete internal service for protection of species at risk in compliance with legislation by providing services in policy development, policy implementation and policy application control.

**Management Response:**  
Management agrees with this recommendation.

The City will undertake a review of the resources currently involved in policy development, implementation and compliance as it relates to SAR to determine whether the risk of non-compliance currently exists and whether a centralized service delivery model would be beneficial. This review will be completed by Q3 2016.

**Recommendation 7**  
That the City improve communication between the different services and units having to comply with the regulations related to species at risk to ensure all of them have access to the most relevant and up-to-date list of species at risk in Ottawa.

**Management Response:**  
Management agrees with this recommendation.

The City will include a review of internal communication as part of the study referred to in Recommendation 6. This review will be completed by Q3 2016.

**Recommendation 8**  
That the City develop a process for updating the Ottawa SAR List.

**Management Response:**  
Management agrees with this recommendation.

As part of the review referenced in Recommendation 6, Management will look at all processes required to ensure that staff have access to the most up to date information related to species at risk. This review will be completed by Q3 2016.

**Potential Savings**  
The potential savings for the City of Ottawa in the management of species at risk are minimal. To date, on technical aspects, the City has overly exceeded its obligations. For example, it is not mandatory for the City to have its own species at risk list. But it has been demonstrated that by investing in this additional task, the
City has a good tool for identifying the species that are protected under the ESA, 2007, and the SARA, even better than the information available on the MNRF website. By working only with the publicly available list of species at risk, which is not up to date, the City could unintentionally omit the development of mitigation measures for a species at risk that is not listed. And then, the MNRF could refuse to authorize or register a project due to the lack of mitigation measures. Such a situation would cost time and money for the City who would have to resubmit the request or could lead to legal infractions if SAR are harmed. Therefore, by exceeding its obligations, the City avoids costs and delays. However, it is not possible to assess the real current saving of this as the cost of the extra work for the creation of the Ottawa SAR List is unknown as well as the amount of time the MNRF could refuse a project. In such context, it is not recommended that the City stop doing the extra work.

By implementing a review process before starting an infrastructure project for which an EA was produced some time previously, the City could avoid delays if the environmental conditions or legislation context have changed. However, the size of such savings in avoiding delays and the risk of legal infractions (fines) depends, among other elements, on the type of project and the time of the year the project was supposed to start. However, it is clear that delaying a major construction project for several weeks may cost the City thousands of dollars. And to have an efficient review process, the City must use the most up to date information related to species at risk. Again, this justifies the creation of the Ottawa SAR List.

**Conclusion**

Overall, the City has a good understanding of the requirements that must be fulfilled to comply with the regulations on the protection of species at risk. The City has a team with experience and knowledge that is recognized and shared by almost all staff members that have to deal with these requirements. The City is aware of both provincial and federal restrictions for protecting species at risk. More importantly, the City understands the exemptions to these restrictions and uses these exemptions to facilitate its day-to-day activities in the maintenance of drains.

The PGMD has produced, in recent years, several protocols and official documents to guide the City in complying with these regulations. However, the management of species at risk still needs operational improvements. The mitigation measures that are followed by the PWD are not specific enough for the maintenance activities the department undertakes.
No standard control is performed to make sure the mitigation measures are adequately applied by the different departments or even contractors. For major infrastructure projects, there is no protocol to review the environmental and legislative contexts of a project before starting the work on site. In the past, this has caused delays in the realization of a project due to a change in the legislation related to species at risk.

For smaller infrastructure renewal projects, the City screens all the projects that will be undertaken in the following months to identify those for which an issue with species at risk may occur. Such an approach could be used for larger infrastructure projects.

Finally, the communication process should be reviewed to make sure all departments and units having to deal with species at risk have the most relevant and appropriate information to make informed decisions. The City has an excellent up-to-date list of species at risk in the Ottawa area, but it is not available to all staff members having to deal with such species. The City should improve the sharing of this information and use it as a reference for identifying species at risk in Ottawa instead of referring to several sources. Another good communication tool is training. However, there is no official and mandatory training at the City on the topic of species at risk. There are training sessions, but they are provided on an ad hoc basis, when requested by a department or a unit, and there is no training or information sessions for new employees who may encounter species at risk during their employment.

A municipality cannot act efficiently to protect species at risk without a good understanding of the requirements and appropriate policies. On the other hand, a municipality cannot be sure to fully comply with the regulations by having only a good knowledge of the topic, complete policies and appropriate tools. Staff members in the field need support to implement these policies and tools. Based on our observations, we believe this is what the City should work on now.
Audit of Winter Operations – Capacity Planning and Performance Measurement

Introduction
The Audit of Winter Operations, included in the Office of the Auditor General (OAG) 2014 Work Plan, was approved by Council in March 2014.

Background
The City of Ottawa Winter Operations, operating under the Road Services branch within the Public Works department (PW), is tasked with maintaining the Nation’s Capital’s roads and pathways by providing snow removal and ice control services. In addition PW provides year round services such as pothole repair and litter collection. Commuters, businesses, and residents rely on these services. On average, 236 cm of snow falls in Ottawa every winter. The City has approximately 5,621 km of roads, 2,175 km of sidewalks and 233 km of Transitway and Highway 174 to maintain on a regular basis. All roads and highways cleared must meet the established City standards which surpass the standards in the Ontario Regulations.

In 2013, the City of Ottawa’s annual budget for Winter Operations was $55.3 million; the 2013 expenditures were $79.2 million. Services are delivered from 17 Yards spread across five zones in four geographic areas. Winter Operations provide services using a mix of internally owned and staffed equipment and contracted resources.

Based on information provided by PW approximately 590 employees were engaged in the City of Ottawa Winter Operations activities as at February 1, 2013.

In 2014, Public Works completed their Corporate Risk Profile which identified areas of risk which could impact their operations. A Winter Operations Risk Scan was conducted by the OAG in 2014. Items from the Corporate Risk Profile supplemented by information obtained through documentation review and interviews with key Winter Operations Staff are the basis for this audit.

Audit Objectives and Scope
The objectives of the audit were to:

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1 Includes select City pathways only.
2 Source: http://ozonehome.city.a.ottawa.ca
3 Regulation 239/02, Minimum Maintenance Standards for Municipal Highway
1. Assess the effectiveness of the planning process related to establishing operational capacity and related budget requirements for Winter Operations.

2. Assess the adequacy of key performance monitoring, indicators, and their measurement of the work undertaken.

3. Assess the effectiveness of the controls and management over receipts and usage of materials such as salt, sand, brine, and grit.

4. Assess how Occupational Health and Safety (OHS) is addressed in the activities of Winter Operations.

5. Assess the adequacy of succession planning for key staff involved with Winter Operations.

6. The scope of the audit included the capacity planning process and operations conducted during the winter of 2014/15.

**Summary of Key Findings**

1. PW currently has no formal or documented process that considers resource capacity requirements for Winter Operations in their annual planning and/or budgetary cycle.

2. The current Council Approved Standards (Maintenance Quality Standards or MQS) for snow and ice control were adopted in May of 2003 as part of a service level harmonization process post-amalgamation. Since that time they have not been systematically reviewed or assessed for financial impact.

3. The current mix of internal and external services is primarily based on historical and/or legacy systems that were in place at the time of amalgamation (2001). The sole full service contract was put in place prior to amalgamation by the City of Kanata. Since that time there has not been a review to determine if PW has the optimum degree or mix of internal and external service providers for snow and ice control activities.

4. The City actively participates in OMBI to benchmark with other municipalities. In reviewing the latest information from OMBI it was noted that Ottawa had:
   - the second best standard for meeting provincial standards after a winter storm event;
   - among the highest ratio of owned versus contracted equipment (see table below); and,
• the highest lane/km cost for winter control services.

**Table 0-1: Ratio of municipally owned units vs. total fleet units including contactor owned units (OMBI 2013 Report)**

<table>
<thead>
<tr>
<th></th>
<th>Hamilton</th>
<th>London</th>
<th>Ottawa</th>
<th>Toronto</th>
<th>York</th>
<th>Windsor</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total Number of Lane Km</td>
<td>6,399.0</td>
<td>3,526.3</td>
<td>11,850.6</td>
<td>14,703.0</td>
<td>4,093.2</td>
<td>2,397.8</td>
</tr>
<tr>
<td># of municipally owned plows / salters / combination units</td>
<td>115</td>
<td>39</td>
<td>236</td>
<td>109</td>
<td>26</td>
<td>10</td>
</tr>
<tr>
<td># of contract plows / salters / combination units</td>
<td>49</td>
<td>48</td>
<td>88</td>
<td>666</td>
<td>68</td>
<td>17</td>
</tr>
<tr>
<td>% of municipally owned units vs. Total</td>
<td>70%</td>
<td>45%</td>
<td>73%</td>
<td>14%</td>
<td>28%</td>
<td>37%</td>
</tr>
</tbody>
</table>

5. PW does not have a documented process to identify potential operational efficiencies to realize cost reductions. Detailed information on staff allocation by activity is not presently considered, analysed and included in the planning process for potential operational changes or to identify efficiencies.

6. When there is no requirement to apply abrasives or plow/clear snow, staff is assigned to miscellaneous duties. There is no formal or documented list of tasks to be addressed on a priority basis. These duties can be of lower priority and available more cost effectively from commercial sources. In a harsh winter, up to 25% of time is allocated to Yard, Litter, On-call and “other” duties which relates to approximately 40 distinct activities. In a mild winter this percentage would likely be greater due to a reduced call for abrasives, plowing and clearing activities as there can be extreme swings in activity levels and costs due to weather. The volume of work related to these miscellaneous activities in unquantified. Without a clearly demonstrated need some of this work could potentially be eliminated to reduce costs.

7. The current allocation of activities is represented in the Chart and table below.
Chart 1: PW Top Five Activities: Winter 2014/15

Table 0-2: PW Top Five Activities: Winter 2014/15

<table>
<thead>
<tr>
<th>Activity</th>
<th>Percent of Labour Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>Application of winter chemicals - pre-wet salt</td>
<td>13%</td>
</tr>
<tr>
<td>Snow removal and disposal - road surface</td>
<td>10%</td>
</tr>
<tr>
<td>Application of abrasives and/or chemicals to sidewalks</td>
<td>9%</td>
</tr>
<tr>
<td>Application of winter chemicals - dry salt</td>
<td>9%</td>
</tr>
<tr>
<td>On call</td>
<td>9%</td>
</tr>
<tr>
<td>All other activities</td>
<td>50%</td>
</tr>
</tbody>
</table>

8. The City continues to expand its use of technology in operations. All City and contracted roadway snow clearing vehicles are equipped with one of two task specific GPS. To date Management has not conducted the analysis to determine whether the intended benefits of these investments in technology have been realized.

9. For overnight parking bans the City has a detailed communication plan. Management believes it would not be practical to implement a “rolling ban” for snow related overnight parking bans as is utilized in some municipalities. Such a practice might overcome the stated lack of sufficient enforcement.
officers to cover the entire City through more focused attention to problem areas.

10. Monthly variance reporting includes appropriate and relevant measures such as comparison of budgeted to actual and detailed costs by category. Reporting could be enhanced by providing commentary on performance associated cost drivers such as; monthly lane/Km cost, impact of monthly precipitation and average temperature and the amount of staff time spent on-call as well as on other duties not directly related to snow and ice control, such as litter and yard duties.

11. The key performance measurement indicators (KPIs) used in Winter Operations are the Council-approved Standards which are detailed in the Maintenance Quality Standards (MQS). These are not routinely reported on, whether internally to PW, or to Committee or Council. Some are tracked as part of responding to the annual OMBI Survey.

12. Performance indicators have been developed and are reported on in the Service Excellence Scorecard (SES).

All time is accounted for either as productive (time worked) and non-productive (sick, vacation, etc.) A further breakdown of time worked on duties not directly related to Winter Operations or of a lower priority and/or available internally or externally at lower cost is not reported.

13. The SES reports do not include the information available in the OMBI report such as time to meet MQS after a storm event or overall cost per lane kilometer.

14. Procedures for the Supervisor’s review of the adequacy of snow clearing activities are largely unstructured and experience-based. Monitoring reports are exception-based. There is no documented assurance that MQS are being applied consistently across the City or that standards are being met or over-achieved.

15. PW has a proactive means to plan for and respond to winter storms. The City has a weather reporting service provider (AMEC) which provides meteorological access 24/7.

16. The Standard Operating Procedure for salt deliveries allows for acceptance of deliveries with a high variance and does not specify the number of times a random weighing should be performed. There is no monitoring in place to ensure the portable weigh scales are used at every yard throughout the
winter season and that contractors are not notified in advance. There is no evidence that salt spreaders are calibrated at least twice per winter, as required in the Standard Operating Procedure. There was less than recorded salt in ending inventory in 2013/2014, 2012/2013 and 2011/2012. Winter Operations attributes the difference to compaction of materials, moisture absorption and limitations with equipment accuracy. Other possible reasons like inaccurate usage measurement, inaccurate amounts being received or loss of materials due to misappropriation are not explored.

17. An annual reconciliation of winter materials is performed once at the end of the winter season. No periodic reconciliations are performed throughout the year.

18. As of June, 2015, 96% of workers and 95% of Supervisors in the Roads Services branch have completed their Occupational Health and Safety Awareness Training and Public Works is 50% complete with assessing the risks in Winter Operations’ occupations related to Hazard Identification and Risk Assessment (HIRA).

19. Succession planning in Winter Operations is an active consideration. The succession plan is updated on an annual basis, which is consistent with the requirement in the City of Ottawa Succession Management Guide.

Recommendations and Management Responses

**Recommendation 1**
That Public Works develop and document a planning process methodology to establish the optimal capacity of resources, both internal and external, to provide efficient and effective Winter Control services.

That this methodology include specific processes to identify and assess:

a. The costs, benefits and efficiencies of outsourcing resources, both staff and equipment, to establish the optimal mix of internal and external resources;

b. Resourcing to match activity requirements (i.e. demand) which are clearly determined to be legitimate work activities to ensure idle capacity is reduced to the minimum level;

c. Opportunities for efficiencies and/or outsourcing through an in depth review and analysis of activities at the level of Winter Operations overall, including a mix of severe and mild winters;
d. The impact of adjustments to MQS to bring them in line with Provincial Standards;
e. The impact of new developments, historical weather patterns, and information gathered from relevant technologies such as GPS and vehicle weather sensors;
f. Potential operational changes in order to realize cost reductions;
g. Historical data and general weather patterns to ensure mild winters are factored into the analysis; and,
h. The real cost of depreciation and overhead.

Management Response
Management agrees with this recommendation.

Public Works is currently developing a planning process methodology through the Roads Services Winter Operations Review. As part of this Review, the mix of internal and external resources is being analysed in order to provide efficient and effective winter operations services.

The Review findings and subsequent recommendations will be presented to the Transportation Committee and Council in Q2 2016.

Recommendation 2
That Public Works review the Climate Change Adaption Strategy to ensure:
a. that it is still current and relevant;
b. the steps taken to date have been effective; and,
c. the MQS triggers incorporate measures to address changing weather patterns such as freezing rain, rain on snow and wet snow.

Management Response
Management agrees with this recommendation.

As part of the Roads Services Winter Operations Review, historical weather patterns along with work completed as part of the 2006 Climate Change Adaption Strategy, will be analyzed and will inform any recommendations that may be made specific to the Maintenance Quality Standards.

The Review findings and subsequent recommendations will be presented to the Transportation Committee and Council in Q2 2016.
**Recommendation 3**  
That Public Works assess the impact on costs of adjustments to MQS to bring them in line with Provincial Standards including reporting the results and changes to Committee and Council on a mid-term basis.

**Management Response**

Management agrees with this recommendation.

Adjustments to the Maintenance Quality Standards are currently being investigated through the Roads Services Winter Operations Review, comparing costing between the City’s current Maintenance Quality Standards and the provincial Minimum Maintenance Standards.

The Review findings and subsequent recommendations will be presented to the Transportation Committee and Council in Q2 2016.

**Recommendation 4**  
That Public Works assess the costs, benefits and efficiencies of outsourcing resources to establish an optimal mix of internal and external resources. That this include:

a. a comparison of City Forces costs to costs for comparable commercial services;

b. an in-depth review and analysis of activities at the level of Winter Operations overall, including a mix of severe and mild winters, with an objective of resourcing to match activity requirements (i.e. demand) which are clearly determined to be legitimate work activities reducing idle capacity to the minimum level; and,

c. the true cost of overhead and depreciation.

**Management Response**

Management agrees with this recommendation.

Public Works is currently developing a planning process methodology through the Roads Services Winter Operations Review. As part of this Review, the mix of internal and external resources is being analysed in order to provide efficient and effective winter operations services.

The Review findings and subsequent recommendations will be presented to the Transportation Committee and Council in Q2 2016.
Recommendation 5
That Public Works ensure that the intended benefits of the investments in technology are being obtained.

Management Response
Management agrees with this recommendation.

To ensure that the intended benefits of ‘Where is My Plow’ and Webtech are being realized, Public Works will continue to review performance reporting in order to identify that the intended KPI’s are being achieved. The public will have access to ‘Where is My Plow’ for winter 2015-16 for the first time since making the tool available to supervisors, managers and the 3-1-1- Call Centre. As part of the public launch, a feedback process has been developed for the application. Public Works will review all feedback received from the public in order to analyze the effectiveness of ‘Where is My Plow’ upon conclusion of the winter season. This analysis will be completed by Q3 2016.

Recommendation 6
That Public Works develop a practice to occasionally track any differences between the application rates of abrasives of City vehicles and contracted vehicles to ensure compliance with rates established in the Roads Manual.

Management Response
Management agrees with this recommendation.

To ensure compliance with the Material Application Policy, Public Works will develop a report using the data available in Webtech that will monitor and track any differences in the application rates of salt and abrasives for both City vehicles and contracted vehicles. The report will be developed by Q2 2016.

Recommendation 7
That Public Works identify and assess potential operational changes in order to realize cost reductions.

Management Response
Management agrees with this recommendation.

Public Works is currently developing a planning process methodology through the Roads Services Winter Operations Review. As part of this Review, the mix of internal versus external resources is being analysed in order to provide efficient and effective winter operations services.
The Review findings and subsequent recommendations will be presented to the Transportation Committee and Council in Q2 2016.

**Recommendation 8**
**That Public Works consider charging the owners of illegally parked vehicles for the cost of towing required during snow clearing activities.**

**Management Response**
Management agrees with the recommendation.

Public Works will work with By-law Services to investigate the feasibility of charging owners of illegally parked vehicles for the cost of towing required during snow clearing activities. This review will be completed by Q4 2016.

**Recommendation 9**
**That Public Works conduct the analysis to determine if steps can be taken to initiate a “rolling ban” in order to minimize the number of residents receiving tickets unnecessarily.**

**Management Response**
Management agrees with this recommendation and it has been implemented.

Public Works has completed a review of the winter overnight parking ban and has presented the findings of this review to the Transportation Committee and Council. As a result, on October 14, 2015 Council approved the following changes to the Winter Overnight Parking Ban:

- Expansion of the Authority of the General Manager of Public Works to allow for greater flexibility to implement or not implement an overnight parking ban based on public safety or operational requirements;
- Free parking in City-owned parking garages for time periods in which an overnight winter parking ban has been implemented; and
- Amendments to the fee structure for on-street parking permits to reflect the true maintenance costs associated with on-street parking during the winter months.

As part of this review, consultations were conducted with internal stakeholders and the public, which identified some concerns with a rolling ban including communications to residents on when different areas of the City would be impacted in addition to the increased costs associated with signage.
Recommendation 10
That Public Works review the feasibility of enhancing monthly financial reporting through providing commentary on performance associated cost drivers. This would include items/activities such as: monthly lane/Km cost, impact of monthly precipitation and average temperature and the amount of staff time spent on-call as well as on other duties not directly related to snow and ice control, such as litter and yard duties.

Management Response
Management agrees with this recommendation.

Public Works will review the feasibility of including commentary on performance associated cost drivers such as lane/km cost, impact of precipitation and average temperature and the amount of staff time spent on non-winter activities in the monthly Service Excellence Scorecard for Roads Services in order to enhance monthly financial and performance reporting. This review will be completed by Q2 2016.

Recommendation 11
That the City improve its KPI reporting by:

a. Including the information included in the OMBI report such as time to meet MQS after a storm event and Lane per Km costs. That this information is also included in semi-annual reports to the Transportation Committee.

b. Identifying staff time for non-winter control activities (and including On-Call) in SES.

c. Identifying time to complete Service Requests in number of days.

Management Response
Management agrees with this recommendation.

Public Works will review the feasibility of enhanced and more frequent KPI reporting such as time to meet MQS after a storm event and Lane per Km costs. The review will be completed by the end of Q2 2016.

Based on the results of this review, Public Works will incorporate any required enhancements specific to staff time associated with non-winter control activities including on-call into the Roads Services Service Excellence Scorecards so that KPI’s can be tracked on a monthly basis. The implementation of this recommendation will be completed by the end of Q3 2016.
As part of the Client Journey Experience Initiative, Public Works with the assistance of Service Ottawa, is looking at establishing a quality standard related to the client experience and satisfaction with the services provided by Roads. As a result of this initiative, specific targets for 3-1-1 SR response time will be established and reported on the City/PW Balanced Scorecard. The implementation of this recommendation will be completed by the end of Q3 2016.

**Recommendation 12**
That the City develop a Standard Operating Procedure (SOP) which outlines an adequate process for the supervisor review of the adequacy of snow clearing activities.

**Management Response**
Management agrees with this recommendation.

Public Works will develop a Standard Operating Procedure, which outlines the process for snow clearing activities in accordance with the Maintenance Quality Standards.

This Standard Operating Procedure will be completed immediately and will be ready for implementation as part of the 2015/16 winter response plan.

**Recommendation 13**
That the City develop a Standard Operating Procedure (SOP) which outlines the process as well as roles and responsibilities for pre-event communications for operational supervisors.

**Management Response**
Management agrees with this recommendation.

A Standard Operating Procedure, which outlines the process as well as roles and responsibilities for pre-event communications will be completed for operational supervisors.

This Standard Operating Procedure will be completed immediately and will be ready for implementation as part of the 2015/16 winter response plan.

**Recommendation 14**
That the City develop a Standard Operating Procedure (SOP) which outlines the process for the supervisor to establish and prioritize assignments for staff when there is no requirement for snow clearing activities.
Management Response

Management agrees with this recommendation.

Public Works will develop a Standard Operating Procedure for Supervisors that will outline the process to establish and prioritize work activities when there is no requirement for snow clearing activities. This SOP will build on the current practice investigating service requests in relation to weather conditions factoring in a number of variables such as mild weather, potholes, winter drainage, presence of litter and/or freeze/thaw cycles.

This Standard Operating Procedure will be completed immediately and implemented during the 2015/16 winter season.

Recommendation 15
That Winter Operations assess why a 15% threshold is used to determine if a salt shipment is acceptable or not and whether the threshold should be lowered.

Management Response

Management agrees with this recommendation.

Public Works has conducted an assessment that concluded that there are a number of factors that can impact weighing of salt delivery trucks including the accuracy of the scale, if they are being weighed on level ground, moisture content of the salt and to a lesser extent the burning of fuel. A survey of best practices specific to the weighing of salt will be conducted as part of the Roads Services Winter Operations Review in order to determine an acceptable threshold. This survey will be completed by Q2 2016.

Recommendation 16
That Winter Operations put in place a monitoring process to ensure the portable weigh scales are used throughout the season. That Winter Operations consider setting a minimum number of times random weighing will be performed per season. That Winter Operations ensure random weighing is performed at all yards that receive salt.

Management Response

Management agrees with this recommendation.

The current Standard Operating Procedure will be updated and processes will be put in place to ensure that the monitoring and frequency is followed.

The revisions to the SOP will be implemented for the 2015-16 winter season.
Recommendation 17
That Winter Operations ensure that all Operations Technicians and other staff do not notify the delivery trucks in advance that they will be weighed.

Management Response
Management agrees with this recommendation.

This requirement will be incorporated into the Standard Operating Procedure referred to in Recommendation 16 and will be implemented for the winter of 2015-16 season.

Recommendation 18
That Winter Operations obtain a clear understanding of the reasons behind the difference between the SAP ending inventory of salt in the accounting system compared to the actual physical amount counted as remaining in the domes.

Management Response
Management agrees with this recommendation.

Public Works will conduct a survey of best practices to obtain a clear understanding of the reasons behind the difference between the SAP ending inventories of salt in the accounting system compared to the actual physical amount counted as remaining in the domes as part of the Roads Services Winter Operations Review. This survey will be completed by Q2 2016.

For the 2015-16 winter season, salt dome inventory reports will also be provided to management on a bi-weekly basis, which will alert Managers to any inconsistencies in salt reporting.

Recommendation 19
That the Roads Services branch ensure that the individuals who had not completed the Occupational Health and Safety Awareness Training complete the training as soon as possible and/or as soon as they return from their leave.

Management Response
Management agrees with this recommendation.

As of Q3 2015, 99% of Roads Services Supervisors and 98% of Roads Services Workers respectively had completed the training.
Public Works will continue to train and monitor new Roads Services employees through the on-boarding process and returning to work from leave.

**Recommendation 20**

That Public Works ensure the Hazard Identification and Risk Assessment for Winter Operations be completed by addressing the highest risk workplaces and occupations first.

**Management Response**

Management agrees with this recommendation.

Corporate Health and Safety is leading the Hazard Identification and Risk Assessment project across the City with support from Public Works. All positions within Roads Services were reviewed and grouped into three groups by priority from highest to lowest. As of October 22, 2015, HIRA’s for all priority 1 and 2 categories, which are the highest risk workplaces and occupation, are 100% complete. HIRA’s for the priority 3 group, which includes office staff, will be completed by Q4 2015.

**Potential Savings**

Our analysis of several types of activities indicates that there may be opportunities for the City to identify savings. The demand for these miscellaneous activities has not been quantified to clearly demonstrate the need and legitimacy which indicates that there is a high likelihood that these activities could be reduced to lower costs. This would require PW to use available activity sheet information and MMS data to conduct a review to ensure the City has the optimal mix of internal and contracted services for Winter Operations.

Other potential savings could be achieved through a review of and changes to current MQS to bring them in line with provincial standards and better controls over receipt and use of materials.

**Conclusion**

Overall, the City has MQS higher than Provincial MMSMH standards, a high ratio of owned to contracted equipment and the associated operators and better post-storm clean up times than most municipalities.

While response times and the ratio of owned to contracted equipment do not in and of themselves determine the cost per lane km they would appear contribute to the City having the highest cost per lane Km in OMBI, although prevailing weather patterns and the mix of road classes under maintenance can differ significantly from municipality to municipality.
In the absence of a full analysis to determine the best mix of internal and external services, there is a risk that City staff is spending time on tasks that are available commercially at lower cost. This increases as the severity of winter is diminished and contributes to the risk that the City may be paying more than necessary for Winter Control services.

PW is collecting information related to MQS performance indicators but is not currently providing this to Management and Committee and Council.
Annual Audit Work Plans

Methodology
The methodology used to develop our audit plans includes the following key steps:

- Meetings with Councillors and Senior Managers;
- Audit Universe Risk Assessment
- Review of budget documentation;
- Review of former audits conducted at the City;
- Review of audit plans from other municipalities;
- Input from Auditor General’s staff;
- Meetings with external auditors and review of management letters; and,
- Assessment of programs and services against selection criteria and risk analysis.

Several specific selection criteria were used to identify potential projects and select the audits outlined in the plan, including:

- Program/Service has direct impact on citizens;
- Risk/Impact of service disruption on public safety, convenience, financial exposure;
- Discussions with Council, Senior Management;
- Budget size (including number of staff);
- Last time audited; and,
- Fraud and Waste Hotline reports received.
Appendix A – By-law no. 2013 – 375 and no. 2015-11
A by-law of the City of Ottawa to establish the position and duties of Auditor General of the City of Ottawa, including statutory powers, and to repeal By-law No. 2009-323.

The Council of the City of Ottawa enacts as follows:

DEFINITIONS
1. In this by-law, “Auditor General” means the Auditor General of the City of Ottawa.

ESTABLISHMENT OF THE POSITION OF AUDITOR GENERAL

APPOINTMENT OF AUDITOR GENERAL
3. (1) City Council shall by-law appoint a person to the position of Auditor General for a non-renewable term to be determined by Council, and shall specify the terms and conditions of such appointment.

(2) The current Auditor General of the City of Ottawa is appointed as the Auditor General of the City of Ottawa for a fixed term of seven (7) years, which shall commence on December 15, 2013, and shall continue until December 31, 2020, unless terminated earlier by Council.

(3) The appointment of a person to the position of Auditor General may be made, suspended or revoked only by a two-thirds majority vote of all members of City Council.

(4) The Auditor General must be designated in Ontario as a chartered accountant, a certified general accountant, or a certified management accountant.

ACCOUNTABILITY
4. The Auditor General is independent of the City administration.

5. The Auditor General shall report to City Council, or to a Committee of Council as may be directed by City Council.
RESPONSIBILITIES

AUDITS

6. (1) Subject to and in accordance with the provisions of this By-law, the Auditor General shall be responsible for assisting City Council in holding itself and its administrators accountable for the quality of stewardship over public funds and for the achievement of value for money in municipal operations.

(2) Despite subsection (1), the responsibilities of the Auditor General shall not include the matters described in clauses 296(1)(a) and (b) of the Municipal Act, 2001, S.O. 2001, c.25, as amended.

(3) The Auditor General shall be responsible for carrying out financial (excluding attest), compliance, and performance audits of:
   (a) all programs, activities and functions of all City departments and agencies, and of the offices of the Mayor and Members of Council;
   (b) local boards of the City as defined in Part V.1 of the Municipal Act, 2001, S.O. 2001, c.25, as amended, and as may be further prescribed in Schedule “A” to this by-law;
   (c) municipally-controlled corporations as defined in the Municipal Act, 2001, S.O. 2001, c.25, as amended, and as may be further prescribed in Schedule “B” to this by-law;
   (d) grant recipients as defined in Part V.1 of the Municipal Act, 2001, S.O. 2001, c.25, as amended; and,
   (e) any other agencies, boards, commissions and corporations as Council may from time to time create or identify.

(4) At the request of Council or a board of directors, the Auditor General may conduct financial (excluding attest), compliance and performance audits of autonomous organizations that have an agreement with the City that contains provisions for an audit by the City.

(5) The audit work plan shall be approved by Council. Approved audits shall be conducted at such time and to the extent that the Auditor General considers appropriate, and the Auditor General shall establish such protocols and procedures that are necessary for the conduct of such audits, consistent with the City of Ottawa Audit Standards (modified from the Standards for the Professional Practice of Auditing), as approved by Council on June 13, 2012.
(6) The Auditor General shall not call into question or review the merits of the policies and objectives of Council.

INVESTIGATIONS OF FRAUD, MISAPPROPRIATION AND OTHER SIMILAR IRREGULARITIES
7. The Auditor General shall be responsible for the administration of the Fraud and Waste Hotline relating to any suspected acts of fraud, theft, misappropriation or other similar irregularity in accordance with the Corporate Policy on Fraud and Other Similar Irregularities as approved by City Council, and the Auditor General shall establish such protocols and procedures that are necessary for the conduct of such investigations.

DUTY TO FURNISH INFORMATION
8. In accordance with subsection 223.20(1) of the Municipal Act, 2001, S.O. 2001, c.25, as amended, the City, the local boards referred to in Schedule “A”, the municipally-controlled corporations referred to in Schedule “B”, and the grant recipients shall give the Auditor General such information regarding their powers, duties, activities, organization financial transaction and methods of business as the Auditor General believes to be necessary to conduct his or her duties under this by-law.

ACCESS TO INFORMATION
9. In accordance with subsection 223.20(2) of the Municipal Act, 2001, S.O. 2001, c.25, as amended, the Auditor General is entitled to have free access to all books, accounts, financial records, electronic data processing records, reports, files and all other papers, things, or property belonging to, or used by the City, a local board referred to in Schedule “A”, a municipally-controlled corporation referred to in Schedule “B”, or a grant-recipient, as the case may be, that the Auditor General believes to be necessary to perform his or her duties under this by-law.

NO WAIVER OF PRIVILEGE
10. A disclosure to the Auditor General under Sections 8 or 9 does not constitute a waiver of solicitor-client privilege, litigation privilege, or settlement privilege.

ANNUAL AUDIT PLAN
11. (1) In each year subsequent to the year of appointment, the Auditor General shall submit an annual audit plan for the next following year to City Council for information by December 31st of each year.

(2) The Auditor General may, at his or her discretion, prepare a longer term audit plan for submission to City Council.
(3) No deletions or amendments to the annual audit plan shall be made except by the Auditor General.

(4) Despite subsection (3), the Auditor General may, if requested by City Council or a board of directors, audit and report on additional matters.

REPORTING
12. (1) No later than December 31st of the next year following the tabling of the audit plan prescribed in subsection 11(1), the Auditor General shall provide to City Council a Notice of Tabling of the Annual Report.

(2) The Auditor General may, as directed by Council or at his or her discretion, report on a more frequent basis to City Council or any Committee thereof.

OFFICE OF THE AUDITOR GENERAL
13. (1) The Auditor General is authorized to establish an Office of the Auditor General including a managerial hierarchy and administrative policies and procedures.

(2) The Auditor General is authorized to appoint, promote, demote, suspend and dismiss, subject to any applicable personnel policies adopted by Council, all employees of the Office of the Auditor General.

(3) The Auditor General is authorized to review the performance of personnel within the Office of the Auditor General subject to any personnel policies applicable to the employees of the City.

(4) The Auditor General is authorized to retain the services of any individual or corporation for the purposes related to the operation of the Office of the Auditor General and to execute all agreements and contracts required for the provision of such services subject to the provisions of the City’s Purchasing By-law.

ANNUAL BUDGET
14. (1) The annual budget of the Office of the Auditor General shall be in accordance with the budget strategy for the Term of Council.

(2) Requests by City Council or a board of directors pursuant to subsection 11(4) shall be subject to the provision of appropriate funding.
DUTY OF CONFIDENTIALITY
15. The Auditor General and any person acting under his or her instructions shall be subject to the duty of confidentiality provided in Section 223.22 of the Municipal Act, 2001, S.O. 2001, c.25, as amended.

IMMUNITY FROM TESTIMONY
16. Neither the Auditor General nor any person acting under the instructions of the Auditor General is a competent or compellable witness in a civil proceeding in connection with anything done under Part V.1 of the Municipal Act, 2001, S.O. 2001, c.25, as amended, or of this by-law.

REPEAL
17. By-law Number 2009-323 of the City of Ottawa entitled “A by-law of the City of Ottawa to establish the position and duties of the Auditor General of the City of Ottawa and to repeal By-law No. 2005-84”, as amended, is repealed.

ENACTED AND PASSED this 11th day of December, 2013.

CITY CLERK

MAYOR
SCHEDULE “A”

Local Boards
- City of Ottawa Superannuation Fund
- Cumberland Village Heritage Museum Board
- Nepean Museum Board
- Ottawa Municipal Campsite Authority
- Pineview Municipal Golf Club Board of Management
- CARP Airport Authority (formerly the West Carleton Airport Authority)
- Crime Prevention Ottawa
- Property Standards Committee
- Bank Street B.I.A.
- Barrhaven BIA
- Byward Market
- B.I.A. Carp Village B.I.A.
- Glebe B.I.A.
- Heart of Orleans B.I.A.
- Manotick B.I.A.
- Preston Street B.I.A.
- Downtown Rideau Improvement Area B.I.A.
- Somerset Chinatown B.I.A.
- Somerset Village B.I.A.
- Sparks Street Mall Authority / Sparks Street Mall B.I.A.
- Vanier B.I.A.
- Wellington West B.I.A.
- Westboro B.I.A.
SCHEDULE “B”

Municipally-Controlled Corporations
1. Hydro Ottawa Holding Inc./Société de Portefeuille d’Hydro Ottawa Inc.
2. Ottawa Community Housing Corporation/La Société de Logement Communautaire d’Ottawa
BY-LAW NO. 2013 - 375

A by-law of the City of Ottawa to establish the position and duties of Auditor General of the City of Ottawa, including statutory powers, and to repeal By-law No. 2009-323.

Enacted by City Council at its meeting of December 11, 2013.

LEGAL SERVICES
VB: G04-01-STAT AG
COUNCIL AUTHORITY:
City Council – October 23, 2013 Motion 63/3
BY-LAW NO. 2015-11

A by-law of the City of Ottawa to amend by-law No. 2013-375 of the City of Ottawa to establish the position and duties of the Auditor General of the City of Ottawa, including statutory powers.

The Council of the City of Ottawa enacts as follows:

- Subsection 3(4) of By-law No. 2013-375 entitled “A by-law of the city of Ottawa to establish the position and duties of Auditor General of the City of Ottawa, including statutory powers, and to repeal By-law No. 2009-323” is repealed and the following subsection (4) is substituted in its place:

  The Auditor General must be designated in Ontario as a chartered professional accountant (formerly known as chartered accountant, a certified general accountant, or a certified management accountant).

- Subsection 12(1) of said By-law No. 2013-375 is repealed and the following subsection (1) is substituted in its place:

  No later than December 31st of the next year following the tabling of the audit plan prescribed in subsection 11(1), the Auditor General shall provide to City Council a Notice of Tabling of the Annual Report, except in an election year when timelines for the Auditor General’s Annual Report will be determined by the Auditor General, in consultation with the Mayor and the Chair of the Audit Committee, and may be tabled after December 31st of the next year following the tabling of the audit plan.

ENACTED AND PASSED this 28th day of January 2015.

CITY CLERK

MAYOR
BY-LAW NO. 2015-11

A by-law of the City of Ottawa to amend By-law No. 2130375 of the City of Ottawa to establish the position and duties of the Auditor General of the City of Ottawa, including statutory powers.

Enacted by City Council at its meeting of January 28, 2015

LEGAL SERVICES

G04-01 STAT AG
Council Authority:
City Council December 3, 2014
Agenda Item 1&
Delegation of Authority By-law (2014-435), Schedule “A”, s.63