AUDITOR GENERAL'S REPORT
ACTION REQUIRED

Software Licenses – Managing the Asset and Related Risks

Date:	February 4, 2015
To:	Audit Committee
From:	Auditor General
Wards:	All
Reference Number:	

SUMMARY

The Auditor General's Work Plan included a review of the software asset management process. The objective of the audit was to determine the adequacy of management controls over the use of software licenses and to examine the procedures being used to ensure the City complies with software license agreements.

Software license acquisition and maintenance is a significant investment for the City of Toronto. In 2014, the City spent approximately $14 million on acquisitions and $22 million on maintenance and support of more than 7,200 software titles. The total spent over the past five years was approximately $140 million.

This report contains fourteen recommendations along with management's response to each of the recommendations. The implementation of these recommendations will improve compliance with software licensing agreements and enhance efficiencies over the administration and management of information technology software assets.

RECOMMENDATIONS

The Auditor General recommends that:

1. City Council request the Chief Information Officer to ensure there is a software owner identified for all software assets and that activities to ensure compliance with software licensing agreements are performed in accordance with the divisional policy.

2. City Council request the Chief Information Officer to ensure there is adequate coordination between asset purchases and anticipated changes in corporate information technology configurations.

3. City Council request the Chief Information Officer to ensure key contract terms and conditions are summarized and used to facilitate effective contract management.

4. City Council request the Chief Information Officer to take appropriate action to ensure there is no significant further delay in the implementation of all relevant modules of the information technology asset management system.

5. City Council request the Deputy City Manager and Chief Financial Officer to ensure that divisional staff responsible for recording purchases in the financial information system are adequately trained on the appropriate account codes to be used and that procedures include sufficient reviews to provide assurance that correct codes are used.

6. City Council request the Chief Information Officer to develop a formal procedure for the coordination of acquisition of information technology with the City's agencies and corporations. Such procedures should include clearly defined steps to be taken to ensure agencies and corporations are made aware of all significant opportunities.

7. City Council request the Deputy City Manager and Chief Financial Officer to direct City divisions to facilitate, to the maximum extent possible, the automated collection and monitoring of software license related information.

8. City Council request the Chief Information Officer to implement a process to review and validate reasons for restrictions on the use of the data collection tool.

9. City Council request the Chief Information Officer to proceed with the software reconciliation process for those software titles where the software owner has been identified.

10. City Council request the Chief Information Officer to ensure software owners perform annual software reconciliations and report the results to the Information and Technology Division.

11. City Council request the Chief Information Officer to ensure that the inventory of software is completed as soon as possible and that software usage reports be developed and distributed to software owners for their review. Software owners should report back on license usage to the Chief Information Officer so that proper decisions can be made in relation to City software assets.

12. City Council request the Chief Information Officer to develop and implement procedures for the decommissioning and disposal of software assets.

Software Licenses – Managing the Asset and Related Risks

13. City Council request the Chief Information Officer to document policies and procedures for granting and maintaining administrative rights.

14. City Council request the Chief Information Officer to ensure that a comprehensive and functional database of users with administrative rights is established and maintained.

Financial Impact

The implementation of recommendations in this report will strengthen controls and improve compliance with software licensing agreements. The extent of any resources required or potential cost savings resulting from implementing the recommendations in this report is not determinable at this time.

DECISION HISTORY

The Auditor General's 2014 Audit Work Plan included a review of the management of software assets. This audit was selected due to the significance of expenditures on software and because of issues raised in previous Auditor General reports.

COMMENTS

This report provides the results of the Auditor General's review of City information technology software management practices. The City invests significant funds in software purchases and related licensing and maintenance costs.

The most common risks associated with poor software management are:

- Legal and financial exposures that can arise if there is a problem with the license

- Needless maintenance fees if the software is not being used

- Reputational damage that can arise from any legal dispute relating to non compliance with agreements

- Security threats because software versions are not being updated

The audit report entitled "Software Licenses – Managing the Asset and Related Risks" is attached as Appendix 1. Management's response to each of the recommendations contained in the report is attached as Appendix 2.

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Beverly Romeo-Beehler, Auditor General

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ATTACHMENTS

Appendix 1:   Software Licenses-Managing the Asset and Related Risks

Appendix 2:   Management's Response to the Auditor General's Report - Software Licenses-Managing the Asset and Related Risks

AUDITOR GENERAL'S REPORT

Software Licenses – Managing the Asset and Related Risks

February 4, 2014

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Auditor General

TORONTO

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EXECUTIVE SUMMARY

Review included in
Auditor General's
Work Plan

The Auditor General's Work Plan included a review of the software asset management process. This review was selected due to the significant funds spent on software licenses and previous Auditor General reports identifying a number of issues related to information technology software management practices.

Audit objective
and scope

The objective of this review was to determine the adequacy of management controls over the use of software licenses.

There are over 7,200 different software titles registered to the City. Of these, over 1,100 are licensed software and the remaining titles are freeware or non-licensed required software.

Total of $36
million spent on
software in 2014

In 2014, the City spent approximately $14 million on software acquisitions and $22 million on software maintenance and support. Over the last five years, approximately $46 million in acquisitions and $94 million in maintenance and support has been spent.

CIO is responsible
for managing
information
technology assets

The Chief Information Officer (CIO) is ultimately responsible for managing City information technology assets and must ensure that all required approval, tracking, reporting and management processes are in place.

Risks and impacts
of non-compliance

The most common risks associated with poor software management are:

- Legal and financial exposures that can arise if there is a problem with the license
- Needless maintenance fees if the software is not being used
- Reputational damage that can arise from any legal dispute relating to non compliance with agreements
- Security threats because software versions are not being updated

Key findings

Key issues identified in this review are:

Software acquired did not always consider pending changes

- In one instance the City purchased software that later required licenses upgrade due to hardware changes at the City. Although difficult to confirm, it appears that this may have cost the City in the range of $700,000 more than if the correct software had been acquired in the first place.

Not all software licenses are monitored for compliance

- Software owners are responsible to monitor their compliance with licensing agreements. I&T has identified owners for 77 per cent of licensed software. For those titles where the owner has not been identified, there does not appear to be anyone assigned responsibility for monitoring compliance with the license agreements.

Implementation of asset management system is behind schedule

- The Information & Technology Division, (I&T) is approximately one year behind schedule on its implementation of the asset management system acquired in 2012. To date, only major software titles have been captured in the system.

I&T access has been restricted

- I&T has a software tool that allows for the automatic collection of information on software installed on City computing equipment. For various reasons, certain divisions will not allow I&T to use this software tool on their systems.

Software usage is not monitored

- There are no centralized monitoring controls in place to ensure that software purchased, and subject to annual maintenance fees, is being used.

Reconciliations are not performed regularly

- Software license reconciliations, comparing software purchased to software installed, are not performed on a regular basis.

Administrative rights process needs strengthening

- Controls over granting users administrative rights, to allow for software installation and maintenance activities, need to be strengthened.

Finally, we would like to express our thanks for the cooperation received from I&T staff during this audit.

Conclusion	Addressing the recommendations in this report will improve both compliance with software licensing agreements and the efficient management of information technology software assets.

BACKGROUND

Software license grants rights to use the software	Computer software is generally installed and used in accordance with a license agreement. The license agreement contains the terms and conditions governing the legal use of the software. Licensees failing to adhere to these agreements may be held liable for penalties under copyright law.
A total of approximately $36 million spent on software in 2014	Software licenses and maintenance is a significant investment for the City of Toronto. In 2014, the City spent approximately $14 million on acquisitions and $22 million on maintenance and support of more than 7,200 software titles. The total spent over the last five years was approximately $140 million. Of the 7,200 software titles installed over 1,100 are licensed software and the remaining titles are freeware or non-licensed required software.
CIO is responsible for managing information technology assets	The Chief Information Officer, (CIO) is the single point of authority for managing City information technology assets and must ensure that all required approval, tracking, reporting and management processes are in place. In addition, certain City divisions have their own dedicated information technology staff due to the nature and scope of their needs.
City Council approved ITAM strategy in 2005	In 2005, in recognition of the need to diligently manage its information technology assets, City Council approved an Information Technology Asset Management (ITAM) strategy. The ITAM is a set of tools and related processes for tracking and managing the physical, financial and contractual aspects of information technology assets throughout their life cycle. Phase one of the project included capturing and tracking hardware assets and phase two was designed to upgrade the existing asset management system to include the tracking of software assets.

New asset management system acquired in 2012

In 2006, the City purchased an information technology asset management system for $1.5 million to track information technology assets through their lifecycle. At the time the system was implemented, formal operational processes, with established roles, responsibility and accountability were just being developed.

In 2012, I&T acquired a package of software to resolve several needs. The package included an optional asset management module at an additional cost of $1.6 million. It was determined that it would have been expensive to integrate and maintain the old asset management system so the decision was taken to purchase the asset management module of the new software package. This module is currently being implemented.

Asset Management Strategy slow to implement

Since 2006, I&T has been working on the ITAM strategy. Management expects to complete the data accumulation process related to software assets by the end of 2015 and will then be in a position to further the management of these assets. The time lag between approval of the strategy and its implementation appears to be related to the broad scope of the assets maintained by the City, the change from one asset management tool to another in 2012, and other demands on staff time. The strategy to track software assets is approximately one year behind schedule.

Two prior audits by the Auditor General

The Auditor General's Office previously conducted two reviews related to management of information technology assets:

Management of City Information Technology Assets
http://www.toronto.ca/legdocs/2006/agendas/committees/au/au060222/it003.pdf

Governance and Management of City Computer Software Needs Improvements
http://www.toronto.ca/legdocs/mmis/2011/au/bgrd/backgroundfile-35912.pdf

The 2006 report made a number of recommendations to improve controls over the acquisition, maintenance and disposal of information technology assets. Implementation of an asset management system was identified as a priority.

In the second report issued in 2011, we noted that although progress had been made on tracking and management of hardware assets, the Division had not been successful to any significant extent in improving its management of software assets.

AUDIT OBJECTIVES, SCOPE AND METHODOLOGY

Why we conducted this audit

The Auditor General's Work Plan included an audit of the software asset management process. This audit was selected due to the significance of expenditures on software and because of issues raised in previous Auditor General reports.

Audit objective

The objective of the audit was to determine the adequacy of management controls over the use of software licenses and to examine the procedures being used to ensure the City complies with software license agreements.

The audit focused on practices over software management in the City's Information and Technology Division (I&T), and divisions that maintain their own Information Technology Units, including Children Services, Employment and Social Services, Social Housing, Fire, Public Health and Water.

This audit covered the period from January 1, 2013 to May 31, 2014.

Audit methodology

Our audit methodology included the following:

- Review of policies and procedures
- Interviews with relevant City staff
- Review of financial information for years 2013 and 2014
- Examination of documents and records
- Evaluation of current management control processes
- Review of reports from other jurisdictions
- Other procedures deemed appropriate

Compliance with generally accepted government auditing standards	We conducted this performance audit in accordance with generally accepted government auditing standards. Those standards require that we plan and perform the audit to obtain sufficient, appropriate evidence to provide a reasonable basis for our findings and conclusions based on our audit objectives. We believe that the evidence obtained provides a reasonable basis for our findings and conclusions based on our audit objectives.

AUDIT RESULTS

A. MANAGING SOFTWARE LICENSE CONTRACTS

A.1. Not All Software Contracts Are Monitored for Compliance

Manage contracts to minimize risks	Management of software contracts minimizes risks by ensuring that licenses are used in compliance with agreements, are effectively deployed, and that costs are properly controlled. With over 7,200 different software titles being used by the City, proper delegation of responsibilities and oversight, is necessary.
Software owners are responsible for software license compliance	I&T requires that a software owner be identified for each software title. An I&T staff member is the identified owner for the major corporate software. For division specific software, the owner will be relevant divisional staff.

While contract compliance and reconciliation tasks are generally assigned to the software owner, I&T maintains the oversight responsibility of ensuring that software-management tasks are being adequately performed. |
| *77% of software owners have been identified* | I&T is in the process of identifying software owners starting with corporate contracts. At the time of our review, software owners were identified for 77 per cent of licensed software titles. Management advised that all owners are expected to be identified and informed of their responsibilities by early 2016. |

Not all contracts
are monitored
for compliance

I&T is required to provide to the software owners a list of software titles they are responsible for and where they are installed to confirm compliance with the license agreements. Currently, this information is not provided to divisions and software compliance validation has only taken place at the request of the division or software vendor.

For those titles where the owner has not been identified, there does not appear to be anyone assigned responsibility for monitoring compliance with the license agreements.

Vendor initiated
audits found
non-compliance

We understand there have been four audits of software compliance initiated by software companies. Each review found areas of non-compliance. In most cases, the City was allowed to bring their practice in line by purchasing the required additional software licenses. In one case however, the vendor insisted on levying charges for both new licenses and some back-dated maintenance fees. Although the combined license purchase and back-dated maintenance fees requested by the vendor was initially assessed at $167,000, the City was able to negotiate with the vendor for a reduced combined payment of $83,000.

In order to protect the City's interests and avoid penalties, reputation issues and unnecessary maintenance costs, the installed software should be validated to ensure compliance with the license agreement.

Recommendation:

1. **City Council request the Chief Information Officer to ensure there is a software owner identified for all software assets and that activities to ensure compliance with software licensing agreements are performed in accordance with the divisional policy.**

A.2. Acquired Software Did Not Meet its Intended Purpose

CIO approves
software
acquisitions

I&T assists divisions with software acquisitions including planning, business case preparation, developing legal documents and entering into contracts. Acquisition of software licenses requires an Information Technology Authorization Procurement Plan (ITAPP) form completed and signed off by the Chief Information Officer.

In 2012, City acquired software for $1.4 million	In April 2012, City Council granted authority to enter into an agreement for an enterprise application integration system at a cost of $1.4 million. The application supported the sharing of information between different systems. At the time of purchase, the applications that the software was needed for were clearly defined. The City purchased 66 licenses at a cost of $1.4 million.
In 2013, need for software upgrade identified	By February 2013, staff identified that, based on the April 2012 analysis, a higher class of license should have been purchased to meet the City's needs. The software purchased in 2012 needed to be upgraded at a cost of $1 million.
Supporting documentation was not on file	The business case supporting the $1.4M acquisition of the original licenses could not be located by I&T.

The business case would have included the ITAPP and market analysis that was conducted to verify that the right product was being purchased at the right price.

Without the business case, we relied on interviews with key IT personnel and briefing notes to calculate the loss to the City. |
| ***Additional cost estimated at $700,000*** | The total spent on the final solution was $2.4 million.

Through the interview process with those involved with the original purchase, we were advised that the cost of the right software would have been approximately $1.7 million, a difference of $700,000.

Adequate planning for license requirements in light of future hardware needs, would have avoided this unnecessary cost. |
| ***Important to be clear when informing Council*** | In February 2014, the CIO advised the Government Management Committee that the City needed to spend the additional $1 million to upgrade licenses. According to the CIO:

> "*since the implementation of the product, an upgrade of the environment is now necessary, requiring the upgrade of existing software licenses. The upgrade is needed to facilitate the new technology infrastructure being deployed by the City as part of the regular state of good repair.*" |

While technically correct, the new technology infrastructure was known in April 2012 when the licenses were originally purchased. The City simply purchased the wrong licenses.

Full disclosure of the error and the reasons why the upgrade was needed so quickly after the original purchase should have been made to the Government Management Committee.

Staff should ensure that information technology architecture plans and, software license purchases are properly planned and optimized. They should ensure that the business cases supporting their decisions are retained to be reviewed later to ensure transparency and accountability.

> **Recommendation:**
>
> 2. **City Council request the Chief Information Officer to ensure there is adequate coordination between asset purchases and anticipated changes in corporate information technology configurations.**

A.3.   Key Provisions of Software License Agreements Are Not Summarized

Software license agreements can be lengthy and complex

Software license agreements can be lengthy and complex making it difficult, particularly for divisional staff, to identify the critical terms that need to be closely monitored. The agreements vary between the software publishers, and terms and conditions within the agreements need to be understood to ensure compliance. Typically, software agreements include:

- user rights
- costs and compensation
- confidentiality obligations
- restrictions on use

Key terms and conditions are not summarized

In 2007, the City Manager directed that key contract terms and conditions should be summarized to facilitate effective monitoring of compliance. These summaries assist in capturing an accurate snapshot of entitlement as well as a mechanism to track that entitlement over time. In a 2011 audit, and again in the current audit, we noted that these contract summaries are not being prepared.

Accurately monitoring deployment and use of software will allow the City to maintain compliance with legal obligations within software contracts.

Recommendation:

3. **City Council request the Chief Information Officer to ensure key contract terms and conditions are summarized and used to facilitate effective contract management.**

B. INFORMATION & TECHNOLOGY DIVISION'S ASSET MANAGEMENT AND COORDINATION ROLE

B.1. Delayed Implementation of Asset Management Software

Delay in the implementation of ITAM system

I&T purchased new asset management software in 2012. The system has five modules. When the software is fully implemented, it is expected to provide efficient and effective end to end monitoring of information technology assets. The Division is approximately one year behind schedule on its implementation of the system. I&T expects to identify all the software owners and to complete the project implementation in 2016. To date, only major software titles have been captured in the system.

Divisional staff advise that implementation has been delayed because of the project's broad scope and the lack of sufficient resources to properly gather and input all the necessary data.

There are risks if the software monitoring is not effective	Software vendors are undertaking more software audits of customers. The City has been the subject of some of these audits by software vendors. Unauthorized use of software, even when it is unintentional, can have negative repercussions.

As long as the monitoring remains ineffective, the City risks:

- Legal and financial exposures that can arise if there is a problem with the license
- Needless maintenance fees if the software is not being used
- Reputational damage that can arise from any legal dispute relating to non compliance with agreements
- Security threats because software versions are not being updated

The best way to ensure compliance and optimize license usage is to utilize the automated software license management solution. |

Recommendation:

4.   City Council request the Chief Information Officer to take appropriate action to ensure there is no significant further delay in the implementation of all relevant modules of the information technology asset management system.

B.2.   Software Expenditures Are Not Accurately Recorded

Software expenditures were not correctly processed	City Divisions do not consistently use the correct account coding when entering software asset transactions into the financial information system. In a random sample of 25 software purchases, 11 software assets were not coded correctly.

Properly coding software assets is required to assess the reasonableness of software costs, track software assets and to assist in monitoring software compliance. |

> **Recommendation:**
>
> 5. **City Council request the Deputy City Manager and Chief Financial Officer to ensure that divisional staff responsible for recording purchases in the financial information system are adequately trained on the appropriate account codes to be used and that procedures include sufficient reviews to provide assurance that correct codes are used.**

B.3.   Opportunities for Better Coordination of Software Purchases with the City's Agencies and Corporations

Coordination with City agencies and corporations has improved

In previous information technology related reviews, we have commented on the need for a closer working relationship between the City and its agencies and corporations. In addition, the recent City-wide Shared Services Study also identified the potential benefits from increased collaboration across City entities.

Over the years, I&T has taken the following steps to improve co-operation across City entities:

- A standard clause is now used in City contracts providing other City entities an opportunity to purchase at City pricing.
- Blanket contracts for standard software assets are posted on the City's intranet site and available to all City entities.
- During the negotiation of the Microsoft contract, staff met with the major City agencies to explore their interests in participating in the acquisition process.
- Held regular meetings with the major City entities, (TTC, Police, TCHC and Library), to share information on developments in information technology activities and direction.

Establish criteria for coordinating software purchases

Although significant progress has been made, the coordination process is not guided by any formalized process or criteria so it remains somewhat ad hoc.

A formalized process, for example, may include the requirement that I&T be notified of any potential software purchases over a certain dollar amount or where there is a need to share information across entities. This will allow for better opportunities for I&T to coordinate software purchases.

Maximizing co-ordination of software acquisitions will help reduce overall costs and improve compatibility between entities.

Recommendation:

6. **City Council request the Chief Information Officer to develop a formal procedure for the coordination of acquisition of information technology with the City's agencies and corporations. Such procedures should include clearly defined steps to be taken to ensure agencies and corporations are made aware of all significant opportunities.**

C. SOFTWARE ASSET MANAGEMENT

C.1   Information Collected Using Software Tool is Incomplete

Software tool is used to search for installed software

I&T has acquired a software tool designed to automate the process of collecting information on software installed and used. This software scans City servers and computers and imports information into the ITAM. This information is subsequently used in managing and reconciling software use throughout the City.

Not every division allows access to their systems	Several City Divisions do not allow the data collection tool to access their electronic devices due to security, privacy or legislative restrictions. In other instances, the information cannot be collected due to specific technical problems.
	To ensure that the collection tool is used to the maximum extent possible I&T, in consultation with divisional staff, should review and evaluate the validity of the reasons for the denial of access. Where access is legitimately denied, it is important to task the Division to undertake their own reconciliation and forward the results to I&T.

Recommendations:

7. **City Council request the Deputy City Manager and Chief Financial Officer to direct City divisions to facilitate, to the maximum extent possible, the automated collection and monitoring of software license related information.**

8. **City Council request the Chief Information Officer to implement a process to review and validate reasons for restrictions on the use of the data collection tool.**

C.2.   Software Reconciliations Are Not Performed Annually

Software reconciliations ensure compliance with the agreements	Reconciliations of software usage and monitoring of license agreements ensures compliance with license agreements and helps to identify underutilized licenses. The software owners are responsible for performing the reconciliations.
Software reconciliations are not conducted annually	Currently, software license reconciliations in the City are not conducted on a regular basis. In the absence of a complete software owner listing, I&T has not provided owners the necessary information from its data collection software to facilitate the reconciliations.

Rather than wait for the identification of all software owners, the information needed to perform reconciliations should be provided to divisions for software titles where owners have been identified. This proactive approach will give the CIO greater assurance that, at least where the software license owners have been identified, software compliance and usage are being properly managed and controlled. This helps to demonstrate due diligence in monitoring for compliance with license agreements.

Reconciliation process in the Divisions needs improvement

We surveyed several divisions that restrict the use of data collection software in an effort to determine their reconciliation practices and challenges faced in managing their IT assets.

The Divisions reported difficulties in conducting accurate reconciliations due to the lack of centralized inventory of software assets and related supporting documentation. It is not surprising that there is not a centralized inventory of software assets because, as we discussed in previous findings, the ITAM is not fully updated and a portion of software assets are not properly recorded in the financial system.

Inventory records were not accurate and license demand was not managed properly

The survey also highlighted the need for Divisions to comply with the established reconciliation procedures to ensure a standardized process for tracking and reporting software inventory is in place. Our review of divisional software reconciliations, where they were being performed, found several instances that highlight where the inventory records were not accurate and license demand was not managed properly, demonstrating why the software reconciliations need to occur For example:

- One division had 62 uninstalled software licenses. Most of these licenses were acquired for specific capital projects which have ended. Although there are no maintenance fees attached to these licenses, lack of centralized asset management system prevented the division from re-allocating the unused licenses.

- In another division, 208 licenses were purchased at $330 each, but only 152 installed. During our audit, the division reviewed the software usage and determined that only 97 licenses are required to operate the program. Although a higher number of licenses may have been used initially, the fact that only 152 had been installed suggests too many licenses were acquired.

- One division could not provide records to show the extent to which licenses purchased had been installed and were being used.

Effective management of software inventory will ensure better compliance with license agreements. It will also help to identify cost-saving opportunities.

Recommendations:

9.   City Council request the Chief Information Officer to proceed with the software reconciliation process for those software titles where the software owner has been identified.

10.   City Council request the Chief Information Officer to ensure software owners perform annual software reconciliations and report the results to the Information and Technology Division.

C.3.   Software Usage is Not Monitored

Software usage should be analyzed

Software owners are responsible for ensuring the optimization of the purchased and installed software to avoid paying for unnecessary products and services. The City can save on licensing costs by reallocating unused licenses or by terminating maintenance on them.

ITAM is a valuable asset in helping manage software usage. It can generate software usage reports to help identify underutilized software.

Software usage reports are not generated

The audit confirmed that software utilization reports are not being generated because the software asset inventory records in ITAM system are incomplete.

As the database of software becomes complete and reliable, the division should ensure software usage reports are regularly produced, distributed, reviewed and appropriate action taken. The ability to accurately track software utilization reduces the risk of unused or under-utilized licenses.

Recommendation:

11. **City Council request the Chief Information Officer to ensure that the inventory of software is completed as soon as possible and that software usage reports be developed and distributed to software owners for their review. Software owners should report back on license usage to the Chief Information Officer so that proper decisions can be made in relation to City software assets.**

C.4. Guidelines for Disposal/Decommissioning of Software Assets Are Not Established

Software owners are responsible for disposal and decommissioning of software assets

The software owner is accountable for ensuring that software no longer required is removed from the environment securely. Failure to properly dispose of software creates a risk of violating software license agreements and of unauthorized users accessing the software. Currently, there are no formal procedures in place for disposal of software. Although we did not find any instances of improper software disposal, to ensure software is disposed of properly, the Division should document the process of removing software that is no longer in use.

Recommendation:

12. **City Council request the Chief Information Officer to develop and implement procedures for the decommissioning and disposal of software assets.**

D.   ACCESS RIGHTS TO INSTALL SOFTWARE

D.1.   Administrative Rights Authorization Process Needs Strengthening

Effective access management reduces the risk of unauthorized system access

A basic control in information technology environments is restricting the ability to install software and grant or change user access to both the system and its installed software. The ability to perform these functions is generally referred to as administrative rights. Effective control mechanisms over administrative rights are needed to reduce the risk of unauthorized access to information and systems.

We have previously made recommendations to strengthen administrative rights controls in a report titled, "Governance and Management of City Computer Software Needs Improvement". http://www.toronto.ca/legdocs/mmis/2011/au/bgrd/backgroundfile-35912.pdf

Administrative rights process was established to address previous audit issues

The CIO has made significant progress to address those issues, including establishing a process for granting and monitoring administrative rights.

However, some key controls still need to be implemented, including:

Improving controls over administrative rights process

- developing an administrative rights policy that defines the criteria and terms and conditions for granting and monitoring these rights for software owned by the City
- ensuring appropriate documentation is retained as evidence of approval of rights being granted
- ensuring there is an accurate record of users granted administrative rights.

Continued efforts are necessary to fully address concerns related to administrative rights.

Recommendations:

13. City Council request the Chief Information Officer to document policies and procedures for granting and maintaining administrative rights.

14. City Council request the Chief Information Officer to ensure that a comprehensive and functional database of users with administrative rights is established and maintained.

CONCLUSION

This report contains the findings related to our audit of the information technology software assets. This report contains 14 recommendations.

Addressing the recommendations in this report will improve compliance with software licensing agreements and enhance efficiencies over the administration and management of information technology software assets.

Management's Response to the Auditor General's Review of
Software Licenses – Managing the Asset and Related Risks

Rec No.	Recommendations	Agree (X)	Disagree (X)	Management Comments: (Comments are required only for recommendations where there is disagreement.)	Action Plan/Time Frame
1.	**City Council request the Chief Information Officer to ensure there is a software owner identified for all software assets and that activities to ensure compliance with software licensing agreements are performed in accordance with the divisional policy.**	X		The current 77 % of licensed software titles with identified software owners represents the large corporate software acquisitions and most of the City's licensed software asset value. I&T staff will continue to increase the percentage of identified software owners throughout 2015.	I&T staff will complete the identification of the balance of any significant (by $ value) software owners by Q2, 2016.
2.	**City Council request the Chief Information Officer to ensure there is adequate coordination between asset purchases and anticipated changes in corporate information technology configurations.**	X			I&T staff will develop a plan for ensuring the identification of software licence impacts associated with Information technology configuration changes.Q2, 2016
3.	**City Council request the Chief Information Officer to ensure key contract terms and conditions are summarized and used to facilitate effective contract management.**	X			I&T staff will provide summary of key contract terms and conditions by Q4 2015.

Rec No.	Recommendations	Agree (X)	Disagree (X)	Management Comments: *(Comments are required only for recommendations where there is disagreement.)*	Action Plan/Time Frame
4.	**City Council request the Chief Information Officer to take appropriate action to ensure there is no significant further delay in the implementation of all relevant modules of the information technology asset management system.**	X			The full implementation of ITAM System modules (Portfolio Management, Procurement Management, Contract Management, Software Asset Management, and Financial Management) will be completed by Q1, 2016.
5.	**City Council request the Deputy City Manager and Chief Financial Officer to ensure that divisional staff responsible for recording purchases in the financial information system are adequately trained on the appropriate account codes to be used and that procedures include sufficient reviews to provide assurance that correct codes are used.**	X			Deputy City Manager and Chief Financial Officer will issue the directive for Divisions to use the designated account code by Q2 2015.
6.	**City Council request the Chief Information Officer to develop a formal procedure for the coordination of acquisition of information technology with the City's agencies and corporations. Such procedures should include clearly defined steps to be taken to ensure agencies and corporations are made aware of all significant opportunities.**	X			The Chief Information Officer will develop a formal procedure to ensure collaboration between the City and City's agencies for the acquisition of Information Technology by Q1 2016.
7.	**City Council request the Deputy City Manager to direct City divisions to facilitate, to the maximum extent possible, the automated collection and monitoring of software licence related information.**	X			The Deputy City Manager will issue a memo directing divisions in partnership with the Information &Technology division to ensure the maximum possible usage of automated collection and monitoring of software license information. Q2, 2015.

Rec No.	Recommendations	Agree (X)	Disagree (X)	Management Comments: (Comments are required only for recommendations where there is disagreement.)	Action Plan/Time Frame
8.	City Council request the Chief Information Officer to implement a process to review and validate reasons for restrictions on the use of the data collection tool.	X			I&T staff will implement a process to review and validate reasons for restriction on the use of the software license and its usage monitoring. Q3, 2015.
9.	City Council request the Chief Information Officer to proceed with the software reconciliation process for those software titles where the software owner has been identified.	X			I&T staff will work with identified software owners to commence the software reconciliation process. Q2, 2015.
10.	City Council request the Chief Information Officer to ensure software owners perform annual software reconciliations and report the results to the Information and Technology Division.	X			I&T staff will work with identified software owners to complete the annual software licence reconciliations. This program will commence Q2, 2015 and expected completion will be Q2, 2016.
11.	City Council request the Chief Information Officer to ensure that the inventory of software is completed as soon as possible and that software usage reports be developed and distributed to software owners for their review. Software owners should report back on license usage to the Chief Information Officer so that proper decisions can be made in relation to City software assets.	X			I&T staff will complete the software inventory, develop necessary reports for software owners and request software licence usage analysis from the software owners. This program will commence Q2, 2015 and expected completion will be Q2, 2016.
12.	City Council request the Chief Information Officer to develop and implement procedures for the decommissioning and disposal of software assets.	X			I&T staff will develop the decommissioning and disposal of software assets procedures by Q3, 2015 and commence implementation by Q1, 2016.

Rec No.	Recommendations	Agree (X)	Disagree (X)	Management Comments: *(Comments are required only for recommendations where there is disagreement.)*	Action Plan/Time Frame
13.	**City Council request the Chief Information Officer to document policies and procedures for granting and maintaining administrative rights.**	X			I&T staff will update and revise the administrative rights policy and procedures documents by end of Q1, 2015.
14.	**City Council request the Chief Information Officer to ensure that a comprehensive and functional database of users with administrative rights is established and maintained.**	X			I&T staff have already revised the existing spreadsheet listing City staff with administrative rights as an interim measure. A comprehensive database program will be developed by Q4, 2015.