CITY OF HAMILTON

CITY MANAGER'S OFFICE
Audit Services Division

TO: Chair Members Audit, Finance and Administration Committee	**WARD(S) AFFECTED:** CITY WIDE
COMMITTEE DATE: September 9, 2013	
SUBJECT/REPORT NO: Follow Up of Audit Report 2011-09 - Information Technology - Software Asset Management (AUD13025) (City Wide)	
SUBMITTED BY: Ann Pekaruk Director, Audit Services City Manager's Office **SIGNATURE:**	**PREPARED BY:** Ann Pekaruk 905-546-2424 x4469

RECOMMENDATION

That Report AUD13025, respecting the follow up of Audit Report 2011-09, Information Technology – Software Asset Management, be received.

EXECUTIVE SUMMARY

Audit Report 2011-09, Information Technology – Software Asset Management, was originally issued in March, 2012 and management action plans with implementation timeline were included in the Report. In April, 2013, Internal Audit conducted a follow up exercise to determine if appropriate and timely action had been taken. Of the 16 recommendations that management agreed to in the original Report, two have been completed, three are in progress, seven are initiated and four remain incomplete.

Alternatives for Consideration – Not Applicable

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

Financial: The implementation of several recommendations was dependent on additional capital funding for a comprehensive asset management tool and for meeting requirements for PCI compliance. Requests for capital funding have been delayed pending the result of the IT Governance Review.

Staffing: Assigning a single point of authority for the management of software assets and the related staffing issues will be addressed in the future IT Governance Review.

Legal: Without the development and practice of effective software licence management procedures, the City is exposed to potential liability of lawsuits and/or fines for non-compliance with licence agreements.

HISTORICAL BACKGROUND (Chronology of events)

Audit Report 2011-09, Information Technology – Software Asset Management, was originally issued in March, 2012. The Report provided 16 recommendations identifying opportunities for strengthening software asset management practices and internal controls and improving the effectiveness and efficiency of software asset management.

It is normal practice for Internal Audit to conduct follow up reviews within a 12-18 month period following issuance of the original report in order to determine whether action plans committed to by department management have been implemented.

POLICY IMPLICATIONS/LEGISLATED REQUIREMENTS

Pay Card Industry Data Security Standard (PCI DSS)

RELEVANT CONSULTATION

The results of the follow up were provided to management responsible for the administration of the City's software asset management in the Information Technology (IT) Division, part of the Corporate Services Department.

OUR Vision: To be the best place in Canada to raise a child, promote innovation, engage citizens and provide diverse economic opportunities.
OUR Mission: WE provide quality public service that contribute to a healthy, safe and prosperous community, in a sustainable manner.
OUR Values: Accountability, Cost Consciousness, Equity, Excellence, Honesty, Innovation, Leadership, Respect and Teamwork

ANALYSIS / RATIONALE FOR RECOMMENDATION
(include Performance Measurement/Benchmarking Data, if applicable)

The report attached as Appendix "A" to Report AUD13025 contains the first three columns as originally reported in Report 2011-09 along with an added fourth column indicating Internal Audit's comments as a result of the follow up work.

Two of the 16 recommendations that have been fully implemented are: revising the Corporate Purchasing Policy to require the IT Division's involvement and approval for software purchases; and prohibiting the development or purchasing of new software (including applications) assets with the involvement of the IT Division.

There are three recommendations whose implementations are in progress. They include: restricting the granting of administrative rights only to specific staff; preventing the installation of software on City-owned computers by other than IT staff; and tracking software assets by hardware asset tags.

Among the seven initiated recommendations are: establishing and implementing a strategy for the effective management of software assets; documenting business policies and procedures in order to address and define key processes for the management of software assets; monitoring the compliance of software on City computers with license agreements an PCI Standards; developing and maintaining a complete and accurate inventory of all software on City computers; managing all corporate contracts for the software installed on City computers by contract management staff in the IT Division; and evaluating and reporting upon the effectiveness of software asset management processes using defined key performance measures.

Four recommendations remain not completed. They are: performing a risk assessment for software asset management processes; centralizing responsibility and accountability for all software assets and IT related staff in the IT Division; and reconciling software licence purchases against actual computer deployment.

Audit Services conducted this follow up process in conformity with the *International Standards for the Professional Practice of Internal Auditing*. A specific standard requires Audit Services to establish a follow up process to monitor and ensure that management actions have been effectively implemented or that senior management has accepted the risk of not taking action.

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ALTERNATIVES FOR CONSIDERATION

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

Not applicable.

ALIGNMENT TO THE 2012 – 2015 STRATEGIC PLAN:

Strategic Priority #2
Valued & Sustainable Services

WE deliver high quality services that meet citizen needs and expectations, in a cost effective and responsible manner.

Strategic Objective
2.1   Implement processes to improve services, leverage technology and validate cost effectiveness and efficiencies across the Corporation.

Strategic Priority #3
Leadership & Governance
WE work together to ensure we are a government that is respectful towards each other and that the community has confidence and trust in.
3.4   Enhance opportunities for administrative and operational efficiencies.

APPENDICES / SCHEDULES

Appendix "A" to Report AUD13025

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CITY OF HAMILTON
INTERNAL AUDIT REPORT 2011-09
CORPORATE SERVICES – INFORMATION TECHNOLOGY - SOFTWARE ASSET MANAGEMENT
FOLLOW UP

#	OBSERVATIONS OF EXISTING SYSTEM	RECOMMENDATION FOR STRENGTHENING SYSTEM	MANAGEMENT ACTION PLAN	FOLLOW UP (APRIL 2013)
1.	Risk Assessment for Software Asset Management A risk assessment to determine key risk areas for the management of software assets has not occurred. Risks need to be assessed to ensure processes can be implemented to eliminate or reduce critical high risks related to software assets and to prioritize the issues identified in this report.	That a risk assessment of the software asset management processes be performed.	Agreed. In 2006, Information Services (IS) spent $50,000 and hired FlexITy Solutions to complete a Business Impact Assessment for all applications and summarize the high level risks. IS will categorize software assets into high, medium and low risk. Estimated completion: Q4, 2012.	Not Completed. A risk assessment for software asset management processes has not been performed.

CORPORATE SERVICES – INFORMATION TECHNOLOGY - SOFTWARE ASSET MANAGEMENT
FOLLOW UP - APRIL 2013

#	OBSERVATIONS OF EXISTING SYSTEM	RECOMMENDATION FOR STRENGTHENING SYSTEM	MANAGEMENT ACTION PLAN	FOLLOW UP (APRIL 2013)
2.	<u>Software Asset Management Plan and System</u> A software asset management plan or strategy currently does not exist.	That the IS Division develop and implement a plan for the effective management of software assets that is reviewed and updated annually to reflect changes in the City's software asset management requirements. This should be done in conjunction with the risk assessment recommended in #1 above.	Agreed. IS currently has a software tool called SMS that captures all executable files. However, it does not easily identify software without significant manual effort. IS will include the cost for a comprehensive asset management tool (with automatic detection capabilities) in the IS 2013 Capital Budget submission (once it is approved).	Initiated. Research has been conducted with comparator municipalities in order to inform the creation of a software asset management plan. As of April 2013, it has not been determined if a future capital budget submission will be required as the extent of the IT division's management of software assets has not yet been defined. This item is dependent on the outcome of the IT Governance Review.

CORPORATE SERVICES – INFORMATION TECHNOLOGY - SOFTWARE ASSET MANAGEMENT
FOLLOW UP - APRIL 2013

#	OBSERVATIONS OF EXISTING SYSTEM	RECOMMENDATION FOR STRENGTHENING SYSTEM	MANAGEMENT ACTION PLAN	FOLLOW UP (APRIL 2013)
2.	<u>Software Asset Management Plan and System (Cont'd.)</u> There is no asset management system in use by the Information Services (IS) Division to manage all software assets at the organizational-wide level. This exposes the City to the risk that the organization is not being cost effective with approximately $3 million of annual corporate software spending.	That the implementation of a comprehensive asset management tool (that has automatic detection capabilities) be considered by the IS Division as part of the plan.	Agreed. IS expects that the full implementation of a comprehensive asset management tool would require 12 months to complete after selection and purchasing the tool. Estimated completion: Q4, 2014.	Initiated. Automatic detection capabilities for desktop software assets are currently being utilized with the System Center Configuration Manager (SCCM) 2007 application. SCCM is not a complete asset management system for software assets. The decision has not yet been made to upgrade to SCCM 2012 or another IT asset management tool. This item is dependent on the outcome of the IT Governance Review.

**CORPORATE SERVICES – INFORMATION TECHNOLOGY - SOFTWARE ASSET MANAGEMENT
FOLLOW UP - APRIL 2013**

#	OBSERVATIONS OF EXISTING SYSTEM	RECOMMENDATION FOR STRENGTHENING SYSTEM	MANAGEMENT ACTION PLAN	FOLLOW UP (APRIL 2013)
3.	Policy & Procedures There are no business policies and procedures for the management of software assets. Without defined business policies and procedures, it is difficult for management to be held accountable for purchases and maintenance of software assets.	That business policies and procedures be written, implemented and distributed to staff in order to address and define key processes in the management of software assets.	Agreed. The policies and procedures will be developed by Q4, 2012 for desktop software assets. This will include all software that is included in the standard image such as MS Office, Windows and MacAfee. These policies and procedures will then be reviewed to see if they can be leveraged to include other software assets, specifically non-desktop software. Estimated completion: Q4, 2013.	Initiated. Procedure flowcharts for desktop software assets have been created. Business policies and procedures have not been developed for the management of any other software assets or related workflows.

CORPORATE SERVICES – INFORMATION TECHNOLOGY - SOFTWARE ASSET MANAGEMENT
FOLLOW UP - APRIL 2013

#	OBSERVATIONS OF EXISTING SYSTEM	RECOMMENDATION FOR STRENGTHENING SYSTEM	MANAGEMENT ACTION PLAN	FOLLOW UP (APRIL 2013)
4.	<u>Single Point of Authority for Management of Software Assets</u> Information technology is essential to operations throughout the organization, regardless of department, division or program. There is currently no single point of authority to ensure that a co-ordinated and standardized City-wide program exists for the management of software assets. Divisions at the City have the ability to purchase and develop software without consultation with or the involvement of the IS Division. There is no requirement in the current purchasing policy for the IS Division to be involved in software purchases and development.	That the responsibility and accountability for the management of all software assets be centralized in the IS Division.	Agreed. Currently, management of all software assets is not within IS's scope of responsibilities. However, this recommendation will be considered as part of the IS Governance Review included in the 2011 SMT Work Plan under Service Delivery Review. SMT will develop an IT governance model and identify areas for improvement, consolidation and savings (e.g. investigate rationalization of systems and improve internal processes). Estimated completion: Q1, 2013.	Not completed. The IT Governance Review has not yet occurred. It was given approval to proceed at the April 24, 2013 Council Meeting. A completion date for this review has not been determined.

CORPORATE SERVICES – INFORMATION TECHNOLOGY - SOFTWARE ASSET MANAGEMENT
FOLLOW UP - APRIL 2013

#	OBSERVATIONS OF EXISTING SYSTEM	RECOMMENDATION FOR STRENGTHENING SYSTEM	MANAGEMENT ACTION PLAN	FOLLOW UP (APRIL 2013)
4.	Single Point of Authority for Management of Software Assets (Cont'd.)	That the IS Division request a revision to the Corporate Purchasing Policy to require the IS Division's involvement and approval for software purchases.	Agreed. IS will request a revision to modify the Corporate Purchasing Policy. Estimated completion: Q2, 2012.	Completed. The Procurement By-law was revised to require the IT Division's involvement.
		That other divisions be prohibited from developing and maintaining any new software (including applications) assets without the involvement of the IS Division.	Agreed. Once the Policy is modified and approved, IS will work with Procurement to communicate the changes to the City departments and SMT. Estimated completion: Q2, 2012.	Completed. The Procurement Section communicated the revised By-law to the City departments.

CORPORATE SERVICES – INFORMATION TECHNOLOGY - SOFTWARE ASSET MANAGEMENT
FOLLOW UP - APRIL 2013

#	OBSERVATIONS OF EXISTING SYSTEM	RECOMMENDATION FOR STRENGTHENING SYSTEM	MANAGEMENT ACTION PLAN	FOLLOW UP (APRIL 2013)
4.	<u>Single Point of Authority for Management of Software Assets (Cont'd.)</u> A large number of software assets (applications, in particular) are not managed by the IS Division. Examples include the Hansen (Public Works) and Amanda (Planning and Economic Development) applications. They are maintained and supported by non-IS divisions who hire their own IS staff. However, the IS Division maintains the databases that are utilized by these applications. The total volume and scope of software (including applications) managed by divisions outside of the IS Division is currently unknown and the maintenance of software assets is fragmented across the organization. Inefficient spending on software assets may result due to the fact that many different divisions are doing separate purchasing. There is an increased risk of rogue applications and hardware with non-supported software. The collection and maintenance of corporate data with a high level of integrity does not occur because not all applications are supported by the IS Division.	That IS staff currently working in other departments report directly to management in the IS Division.	Agreed. This issue will be addressed by SMT and is identified in the 2011 SMT Work Plan under Service Delivery where SMT will develop an IT governance model. Estimated completion: Q1, 2013.	Not completed. The IT Governance Review has not yet occurred. It was given approval to proceed at the April 24, 2013 Council Meeting.

**CORPORATE SERVICES – INFORMATION TECHNOLOGY - SOFTWARE ASSET MANAGEMENT
FOLLOW UP - APRIL 2013**

#	OBSERVATIONS OF EXISTING SYSTEM	RECOMMENDATION FOR STRENGTHENING SYSTEM	MANAGEMENT ACTION PLAN	FOLLOW UP (APRIL 2013)
5.	<u>Software Downloads (Administrative Rights)</u> All staff with approved access to a desktop computer have the capability to install unlicensed software onto their assigned machines. The risk is that unauthorized software can be downloaded on City-owned computers. This rogue software could compromise the City's information network, resulting in a system failure that leads to lost productivity.	That a business process be developed granting administrative rights to specific staff in the IS Division.	Agreed. Only those resources that require administrative access will have such access. Where possible, the process will restrict access to staff that work in the IS Division. However, IS expects that there will be a requirement for some limited department resources to obtain administrative access. IS will authorize the individuals that need this type of access within the departments. Estimated completion: Q4, 2012.	In progress. A business process to restrict Administrative Rights has been developed and is being utilized as part of the roll-out of new hardware (i.e. desktops & laptops) that is equipped with Windows 7. All machines with Windows 7 have restricted Administrative Rights. The business process also addresses how administrative rights are restricted for IS personnel that perform system maintenance and user support.

**CORPORATE SERVICES – INFORMATION TECHNOLOGY - SOFTWARE ASSET MANAGEMENT
FOLLOW UP - APRIL 2013**

#	OBSERVATIONS OF EXISTING SYSTEM	RECOMMENDATION FOR STRENGTHENING SYSTEM	MANAGEMENT ACTION PLAN	FOLLOW UP (APRIL 2013)
5.	Software Downloads (Administrative Rights) (Cont'd.)	That all computers be configured to prevent the download/installation of any software by staff other than those that work in the IS Division.	Agreed. IS will lockdown all desktops as part of the desktop roll-out program. This lockdown will not allow staff to install software. Estimated completion: Q4, 2012.	In Progress. Approximately 19% of machines in the organization have been upgraded to Windows 7 by the end of Q1, 2013. The roll-out of new machines and retro-fitting existing machines with Windows 7 is continuing, with about 100 machines per month being replaced with Windows 7 units. All machines configured with Windows 7 have restricted Administrative Rights. The expected completion date is April, 2014.

**CORPORATE SERVICES – INFORMATION TECHNOLOGY - SOFTWARE ASSET MANAGEMENT
FOLLOW UP - APRIL 2013**

#	OBSERVATIONS OF EXISTING SYSTEM	RECOMMENDATION FOR STRENGTHENING SYSTEM	MANAGEMENT ACTION PLAN	FOLLOW UP (APRIL 2013)
6.	Monitoring of Software Compliance There is very limited monitoring to ensure valid licences exist for the software downloaded on City computers. It is not known if the City is in compliance with software licence agreements, resulting in exposure to potential liability (i.e. fines). Further, monitoring desktop configurations for unsupported and/or unauthorized software is a requirement of PCI (Payment Card Industry) Standards. The City is required to be compliant with these standards in order to be able to accept credit card payments.	That the IS Division verify and continue to monitor the compliance of software on City computers with the respective licence agreements. Any non-compliance should be rectified to ensure software complies with licence agreements and with PCI Standards.	Agreed. The new process for locking down of desktops will prevent staff from installing software without going through the IS Change Management Procedure. Estimated completion: Q4, 2012. IS will include the cost for the appropriate monitoring tool in the 2013 Capital Budget submission. With approval, IS expects that this would be complete when the comprehensive asset management tool (addressed in #2 above) is fully implemented.	Initiated. Some progress has been made with the current roll out of Windows 7 which does not grant Administrative Rights to users. A comprehensive asset monitoring tool has not yet been implemented. A Capital Budget submission was not completed for the 2013 budget.

**CORPORATE SERVICES – INFORMATION TECHNOLOGY - SOFTWARE ASSET MANAGEMENT
FOLLOW UP - APRIL 2013**

#	OBSERVATIONS OF EXISTING SYSTEM	RECOMMENDATION FOR STRENGTHENING SYSTEM	MANAGEMENT ACTION PLAN	FOLLOW UP (APRIL 2013)
7.	Reconciliation of Software Licence Purchases Purchased software licences are not reconciled against actual deployment on computers. The City does not know if it is over or under purchasing software licences. The risk exists that if the City is over-purchasing, too much money is being spent on software licences. If the City is under-purchasing, the City is exposed to the risk of lawsuits and/or potential fines.	That a process for reconciling software licence purchases against actual computer deployment be developed and implemented by the IS Division. Any issues with over or under purchasing that are identified in the reconciliation process should be resolved by the IS Division.	Agreed. The Computer Acceptable Use Policy must be complied with by all staff. It clearly indicates that all software installed on a City computer must be licensed. The new process for the locking down of desktops will prevent staff from installing software without going through the IS Change Management Procedure. Software that is licensed for servers is reconciled.	Not completed. No procedure for reconciling software deployed to licenses purchased has been developed.
8.	Tracking of Software Assets Any tracking of software assets (which is minimal) is currently performed by user, not by hardware items. Tracking software by user makes it difficult to ensure there is a proper number of licences and to detect unauthorized software downloads with automated detection tools.	That software assets be tracked by hardware (asset tags) instead of by users, where applicable.	Agreed. This information will be tracked in the Software Asset Management Tool referenced in #2 above. The asset management tool will be enhanced to capture information with respect to the license agreement and type.	In progress. New machines that have been deployed are being tracked with asset tags. Software is being tracked by hardware asset tag for these new machines. As of April 15, 2013, 41% of machines had been replaced and were using the new asset tag system.

**CORPORATE SERVICES – INFORMATION TECHNOLOGY - SOFTWARE ASSET MANAGEMENT
FOLLOW UP - APRIL 2013**

#	OBSERVATIONS OF EXISTING SYSTEM	RECOMMENDATION FOR STRENGTHENING SYSTEM	MANAGEMENT ACTION PLAN	FOLLOW UP (APRIL 2013)
9.	Inaccurate/Incomplete Software Inventories In IS, there is a listing of known inventories of applications and related databases and desktop software. The IS Division estimates that this software inventory listing is only 60% accurate. In addition, as noted in observation #5, there may be further software on the City's computers of which IS is not even aware and thus, does not appear on the listing. Without complete and accurate inventory records, it is unlikely that effective management of software assets can occur.	That the IS Division develop a complete and accurate inventory of all software on City computers and keep it up to date.	Agreed. The current list will be reviewed and updated for improved accuracy. This list will focus on applications that have a medium to high business assessment impact. The inventory of all software that has a medium to high business assessment impact will be completed by Q1, 2013 and the supporting business processes to keep it accurate will be completed by Q2, 2013.	Initiated. An inventory listing of software applications has been developed. A process to keep the application inventory listing up to date has not been completed.

CORPORATE SERVICES – INFORMATION TECHNOLOGY - SOFTWARE ASSET MANAGEMENT
FOLLOW UP - APRIL 2013

#	OBSERVATIONS OF EXISTING SYSTEM	RECOMMENDATION FOR STRENGTHENING SYSTEM	MANAGEMENT ACTION PLAN	FOLLOW UP (APRIL 2013)
10.	Lack of Contracts During the audit, contract management staff in the IS Division provided only one contract for software assets in their possession even though there are additional software contracts currently in effect throughout the City. This exposes the City to the risk of not being cost-effective with approximately $3 million of corporate spending annually on software (including annual licence and maintenance fees).	That, going forward, contract management staff in the IS Division manage all corporate contracts for the software installed on City computers. Annual maintenance fees should also be included in order to take advantage of possible cost efficiencies.	Agreed. A new section was established in the IS Division for contract management. It focuses on major IS contracts for cellular, printers and desktops. Moving forward, this section will manage all corporate contracts that the IS Division is responsible for. The following is a list of some of the corporate contracts in the IS repository: Microsoft (Office, Windows Desktop, SCCM, CAL's, SQL Server Windows Server); PeopleSoft; Oracle; Adobe; Cisco UCSS_ESW Software Maintenance (IP telephony system); Intergraph (Geomedia, Trackforce); McAfee (Anti-virus); Avotus (IPT Call monitoring and billing software); Blackberry (BES); Inova (voice recording software); Citrix (remote access software); Symantec (security monitoring software); Crystal Enterprise (reporting software); and PCSD Globalscan (print management software).	Initiated. The IT Division has established a Section for contract management. Many corporate contracts (for annual licenses and maintenance fees) relating to Information Services are currently being managed by this Section. However, there are additional contracts that are being managed by the IT Division, but not by the contract management staff. These include: PeopleSoft, McAfee, Avotus, Symantec and Crystal Enterprise Reporting. It is still not within the IT Division's mandate to manage all information technology-related contracts at the City. This will be dealt with in the IT Governance Review.

**CORPORATE SERVICES – INFORMATION TECHNOLOGY - SOFTWARE ASSET MANAGEMENT
FOLLOW UP - APRIL 2013**

#	OBSERVATIONS OF EXISTING SYSTEM	RECOMMENDATION FOR STRENGTHENING SYSTEM	MANAGEMENT ACTION PLAN	FOLLOW UP (APRIL 2013)
10.	Lack of Contracts (Cont'd.)		It is currently not part of the mandate of IS to manage contracts for all software. Contracts for departmental applications are managed by the departments. However, the IS Governance Review (noted in #4) will consider the role of contract management. Estimated completion: Q1, 2013.	The IT Governance Review has not yet been completed. It was given approval to proceed at the April 24, 2013 Council Meeting.
11.	Performance Measurement Software asset management is not currently measured in terms of success or failure. Key deliverables have not been identified. Without defined measures for success, it is unknown how well software assets are being managed at the City.	That key performance measures (metrics) for the management of software assets be defined. These performance measures should be reported to the Senior Management Team (SMT) and Council on a regular basis.	Agreed. Key performance measures for software asset management will be defined by Q4, 2012. IS will commence reporting on those metrics to SMT by Q4, 2013.	Initiated. Key performance measures have been defined. Data is to be collected monthly with annual reporting to SMT that is scheduled to commence in Q4, 2013.