Audit of Information Technology Asset-Management Controls - DOA - Information and Technology Management Division

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March 2, 2015

Honorable Tom Barrett, Mayor
Members of the Common Council
City of Milwaukee
Milwaukee, Wisconsin 53202

Dear Mayor Barrett and Council Members:

The attached report summarizes the results of the audit of the Information Technology (IT) Asset- Management Controls, administered by the Department of Administration (DOA) – Information and Technology Management Division (ITMD). The objectives of the audit were the following: assess the adequacy of internal controls over IT asset-planning, procurement, deployment, management, and retirement, including the protection of confidential data; assess the adequacy of the policies and procedures for the timely acquisition of IT assets, consistent with best practice; and determine whether the appropriate, capital-asset information is being recorded and maintained, in order to provide Milwaukee with an adequate foundation to build a standardized replacement cycle for City IT resources.

Overall, the audit concluded that the internal controls, in place over the ITMD asset-management process, are adequately designed and operating effectively. The ITMD utilizes the sound practice of keeping all personal computers under warranty on a five-year rotating cycle. However, for certain controls, identified within this report, several enhancements should be made in the control design or operational effectiveness, to further improve the process. This report, as outlined below, identifies four recommendations to address these issues.

Audit findings are discussed in the Audit Conclusions and Recommendations section of this report, which is followed by Management's response.

Appreciation is expressed for the cooperation extended to the auditors by the staff of the ITMD.

Sincerely,

Aycha Sirvanci, CPA
Audit Manager

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I. Audit Scope and Objectives

The scope of the audit is the 2014 Information Technology (IT) asset-management practice, administered by the City of Milwaukee ("the City") Department of Administration (DOA) – Information Technology Management Division (ITMD) and includes personal computers (PCs), laptops, and tablets. The IT asset-management process encompasses IT asset planning, procurement, deployment, management, support, and asset retirement. The audit includes the disposal of the City's surplus, obsolete (i.e., scrap) IT assets, and the measures taken to protect confidential information upon asset retirement. The audit excludes the IT controls and processes performed by departments that have not been administratively centralized within ITMD. The audit scope does not include the Police and Fire Departments, Water Works, Municipal Court, Library, or the Assessor's Office. The audit excludes the ITMD datacenter mainframe's IT assets and cell phones. For audit testing purposes, the time frame under examination was limited to 2014 activity.

The audit's emphasis is on the adequacy of internal controls over the ITMD asset-management process and procedures. Furthermore, the audit focuses on the policies and procedures for the timely acquisition of IT assets, as they relate to consistency with best practice and whether appropriate, capital-asset information is being recorded and maintained. The overarching aim of these measures is to provide the City with an adequate foundation to build a standardized replacement cycle for City IT resources. Lastly, the audit focuses on the adequacy of the overall IT governance process over IT asset-management activities.

The objectives of the audit were as follows:

> ➢ Assess the adequacy of internal controls over IT asset-planning, procurement, deployment, management and retirement, including the protection of confidential data;
> ➢ Assess the adequacy of the policies and procedures for the timely acquisition of IT assets, consistent with best practice; and

> ➢ Determine whether the appropriate capital-asset information is being recorded and maintained, in order to provide Milwaukee with an adequate foundation, upon which to build a standardized replacement cycle for City IT resources.

Audit procedures were executed during November and December 2014.

There are six stages in the lifecycle of an IT asset. The following list contains those stages, along with some of the associated activities of each stage:

1. Planning – Assessing IT-asset needs, setting standards for configuration and retention, aligning purchase plans to goals, and negotiating volume discounts.

2. Procurement – Requisitioning, approving requisitions, ordering, receiving, and validating orders.

3. Deployment – Tagging assets, entering asset information into a repository, configuring assets, and installing assets.

4. Management – Inventory/counting, monitoring usage of some software, managing contracts for maintenance and support, and monitoring asset age and configuration.

5. Support – Adding and changing configurations, repairing devices, and relocating equipment and software.

6. Asset Retirement – Removing assets from service, deleting storage contents, disposing of equipment, and removing identified assets from inventory.

The audit evaluated the ITMD asset-management process by using the criteria and process-control standards, as established by the Information Systems Auditing and Control Association, and other best-practice sources, cited within the footnotes throughout this report.

The audit's methodology included developing an understanding of controls and procedures for each activity stage of the IT asset-management process. The audit procedures were developed to

evaluate the processes and controls, to meet the audit's objectives that included process walk-throughs, inspection of relevant control documentation, system-flowchart analysis, physical PC-inventory counts, and detailed tests of controls. Specific procedures and tests were conducted that:

> ➢ Assessed whether the records on the PC warranty and inventory reports were complete, accurate, and valid;
>
> ➢ Re-calculated the PC budget-forecast figures for reasonableness and traced the supporting figures to the source reports, for accuracy verification;
>
> ➢ Selected a sample of PCs from the inventory report and traced each computer to the proper, physical location, while verifying the manufacturer's serial number and accuracy of the PC asset-record content;
>
> ➢ Selected a sample of PCs from certain user departments and traced each physical PC back to the PC-inventory list, verifying the accuracy of the PC asset-record content;
>
> ➢ Determined the adequacy of the policies and procedures for the timely acquisition of IT assets, consistent with best practice; and
>
> ➢ Assessed the adequacy of the IT governance process over the asset-management controls, processes, and activities.

The audit was conducted in accordance with generally accepted government auditing standards (GAGAS). Those standards require that the audit obtain sufficient, appropriate evidence to provide a reasonable basis for the findings and conclusions based on the audit objectives. Internal Audit believes that the evidence obtained provides a reasonable basis for the audit's findings and conclusions based on the audit objectives.

II. Organization and Fiscal Impact

The City of Milwaukee's DOA provides planning, policy, and management functions, which assist the Mayor, Common Council, and City departments. The DOA's mission is to make Milwaukee one of the nation's most-attractive cities in which to live, work, and conduct business. Through these efforts, DOA supports the City's community goals. Key functions include: providing analysis and recommendations on fiscal issues that impact the City; developing the annual City budget; influencing local, state, and federal government-policy actions; increasing grant funding; distributing grant funding to City agencies and neighborhood organizations; and managing procurement processes, citywide.[1] In addition, DOA is the key, operating entity for the delivery of City IT services through the ITMD.

The ITMD's mission is to lead the City in using and sharing information via ways that will provide the maximum efficiency and greatest benefit to Milwaukee's citizens, businesses, and City government. The City utilizes information systems with the purpose of adding value to the community, an ideal that is achieved by delivering high-quality services at the lowest-possible cost. The Information Services section supports and maintains the City's servers, workstations, laptops, printers, and other computing devices for the majority of City departments. Additonally, Information Services performs the following functions: manages email; provides hardware support for the City's Internet site and web-based applications; implements anti-virus and malware protection; conducts system backups and offsite disaster-recovery; and operates centralized systems that maintain and provide data so as to support critical departmental activities. The Policy and Administration section provides policy planning and research, develops and monitors information standards, and coordinates citywide initiatives among City departments.

The ITMD is in the process of a major consolidation of IT operations and support for a number of City departments, including the following: Administration (DOA); City Development (DCD); Election Commission; Employee Relations (DER); Health; Mayor's Office; Port of Milwaukee; and the Administration, Infrastructure, and Operations divisions of Public Works (DPW). This consolidation represents a significant reorganization and requires that the ITMD assume

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[1] *City of Milwaukee 2015 Proposed Plan and Executive Budget Summary*

substantial IT operations and support for these departments. Additional ITMD growth is expected in the future, as well.

For 2015, the ITMD expects to deploy approximately 242 computers with a budgeted amount of $230,200. This equates to an average, individual computer cost of approximately $951, which includes a five-year warranty. Of the roughly 1,091 desktop computers within the ITMD service area, the entire five-year, replacement-cycle cost is estimated at $1,151,000.

III. Audit Conclusions and Recommendations

The ITMD utilizes the sound practice of keeping all PCs under warranty on a five-year rotating cycle. In recent years, PC costs have decreased to the point where it is more economically prudent to eliminate costly and time-consuming computer repairs by simply purchasing new computers under warranty from the manufacturer. Through the IT asset-management cycle, the ITMD utilizes various planning tools to ensure end users have the right PCs, laptops, or tablets, at the right time, all while minimizing or eliminating system downtimes and business disruption events that can lead to lost productivity and service interruptions to citizens.

Overall, the audit concluded that the internal controls in place over the IT asset-management process, administered by the ITMD, are adequately designed and operating effectively. However, for certain controls, identified within this report, several enhancements should be made in the control design or operational effectiveness, to further improve the process. The personal-computer (PC) warranty report is a valuable planning tool, but it will require expansion in 2015 to include the newly-consolidated service area. The substantial growth and consolidation of IT activities into the ITMD has created the need to enhance the combined forecast documentation. The PC inventory report is automated and appears complete, but a sample, physical count of devices has not been performed in accordance with best practice. Internal Audit independently re-calculated the PC budget figures for 2014 and found them to be reasonable. Lastly, the ITMD management and staff are quite knowledgeable about departmental policies and procedures, enabling them to execute their IT asset-management activities in both a responsible and accountable manner. However, the policies and procedures used are not well documented.

This report specifies the following four recommendations to address these issues:

1. Continue coverage expansion of the PC warranty report to include the newly-consolidated service area.
2. Enhance the documentation for the five-year, PC-forecast cycle.
3. Perform a sample, physical count of the PC, laptop, and tablet inventories.
4. Document the policies and procedures of IT Asset Management.

The following audit observation does not constitute a recommendation; however, management should take this item under advisement.

1. Verify and monitor that the new computer-recycling vendor generates appropriate data destruction reports.

Additional details, regarding the recommendations for improvement, are provided in the remaining sections of this report.

A. Consolidation of IT Support into the ITMD

The 2015 budget continues to consolidate City IT and management under the ITMD. Also, the ITMD will be centralizing the purchase of City desktop computers and instituting a standardized replacement cycle for City IT resources. For departments supported by the ITMD, centralization means computer replacements will be budgeted and purchased by the ITMD. Furthermore, restructuring efforts continue along the established path of a more-centralized approach to IT development and maintenance.[2]

PC Warranty Report

Best practice recommends that a remaining-warranty list be created, maintained, and actively utilized as a documented input for forecasting, planning, and computer-related purchasing

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[2] *City of Milwaukee 2015 Plan and Budget Summary*

decisions. The remaining-warranty information on each PC, within the ITMD service area, is needed as a basic input, to calculate correctly the number of PCs with warranty expiration and identify future replacement needs and dates. The audit objective was to determine whether the appropriate capital-asset information is being recorded and maintained, in order to provide the City with an adequate foundation for building a standardized, replacement cycle of City IT resources. At the time of the audit, the ITMD was in the process of adding the newly-acquired PC warranty information to the existing warranty report.

Recommendation 1: Continue coverage expansion of the PC warranty report to include the newly-consolidated service area.

The consolidated PC warranty report will help ensure that appropriate capital-asset information is being recorded and maintained, in order to provide the City with an adequate foundation upon which to build a standardized replacement cycle for City IT resources.

Documentation of the Five-Year Forecast Cycle

Best practice requires the calculation and forecast for PCs to be based on accurate warranty information and inventory data. A noteworthy, authoritative source outlines and defines the questions that should be answered by the IT asset-management recordkeeping, reporting, and planning process.

The following are considered the seven key questions for an effective and sustainable asset-management plan[3]:

1. What do we have and where is it? (*Inventory*)
2. What is it worth? (*Costs/replacement value*)
3. What is its condition and expected remaining service life or warranty life? (*Condition and capability analysis*)
4. What is the level of service expectation, and what needs to be done? (*Capital and operating plans*)

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[3] *Managing Infrastructure Assets – National Guide to Sustainable Municipal Infrastructure 2004*

5. When do you need to do it? (*Capital and operating plans*)

6. How much will it cost and what is the acceptable level of risk(s)? (*Short- and long-term financial plan*)

7. How do you ensure long-term affordability? (*Short and long-term financial plan*)

The substantial growth and consolidation of IT activities into the ITMD has created the need to enhance the combined forecast documentation.

Recommendation 2: Enhance the documentation for the five-year PC forecast cycle.
Documentation for the five-year forecast cycle should identify and demonstrate that sufficient PC-budget funding exists in each year of the five-year cycle. The existing documentation should be augmented to demonstrate that the City has met its due diligence responsibilities, with regard to the capital, financial-planning process. One objective of the documentation is to show that there are no future asset bubbles on the horizon (i.e., a need to purchase more PCs in any given year than what budget funds permit).

B. PC Inventory Verification

PC Inventory Count

Best-practice criteria for IT asset management requires that an inventory of the organization's PCs be created, maintained, and validated for the purposes of City planning and budgeting. Conducting periodic, sample inventory counts of PCs, laptops, tablets, and other devices facilitates accurate inventory records and ensures the appropriate capital-asset information is being recorded and maintained. Thus, the City establishes an adequate foundation to build a standardized replacement cycle for City IT resources. By not having performed a sample, physical count of devices, the System Center Configuration Manager (SCCM) inventory report has not been verified for completeness.

Recommendation 3: Perform a sample, physical count of PC, laptop, and tablet inventories.

In accordance with best practice, to validate the completeness, accuracy, and validity of the inventory report, a sample, physical count of PCs and other devices should be performed, periodically. There are five, key areas of consideration when executing a physical count, which includes the following:

1. Communicating proper information to the counters;
2. Verifying correct item information;
3. Implementing an appropriate method to capture and compare the physical count with inventory records;
4. Determining the number of requisite counts to perform before a count is accepted as final; and
5. Completing the count in a timely manner.[4]

C. Policies and Procedures

The ITMD management and staff are quite knowledgeable about departmental policies and procedures, enabling them to execute their IT asset-management activities in both a responsible and accountable manner. However, the policies and procedures used are not well documented. The ITMD should have written policies that govern IT asset-management activities, requirements, and timelines. The ITMD should deploy control activities that, through policies, establish clear expectations and, through procedures, put policy into action.

Points of Focus[5]

> ➢ Establish policies and procedures to support deployment of Management's directives. Controls are built into business processes through specific policies and procedures.

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[4] *General Accounting Office (GAO) Executive Guide – Best Practice in Achieving Consistent, Accurate Physical Counts of Inventory and Related Property, March 2002.*
[5] *An Overview of the COSO 2013 Framework, Principle Number 12 Policy – Points of Focus* (August 8, 2013).

> ➢ Establish responsibility and accountability for executing policies and procedures. Management assigns responsibility and accountability for the controls in the business unit or function where the risk resides.

> ➢ Responsible personnel perform controls in a timely manner.

> ➢ Responsible personnel take corrective action by investigating and acting on matters identified as being a result of executing the control.

> ➢ Competent personnel, who possess sufficient authority, perform controls with diligence and sustained focus.

> ➢ Periodically, in addition to providing necessary updates, Management reassesses policies and procedures, in order to determine the continued relevance of established controls.

Not utilizing a well-developed system of control-related policies, procedures, and best practice poses undue risk to the consistent and reliable completion of Management's goals, objectives, required operations, and the disruption of critical City services.

Recommendation 4: Document IT asset-management policies and procedures.

The ITMD should document IT asset-management policies and procedures that govern and address the six, defined elements of the IT asset-management process, noted below.

There are six stages in the lifecycle of an IT asset. The following lists those stages and some of the activities that each stage includes, as they relate to essential policy elements:

> ➢ Planning – Assessing IT-asset needs, setting standards for configuration and retention, aligning purchase plans to business goals, and negotiating volume discounts;

> ➢ Procurement – Requisitioning, approving requisitions, ordering, receiving, and validating orders;

> ➢ Deployment – Tagging assets, entering asset information into a repository, configuring assets, and installing assets;

- Management – Inventory/counting, monitoring usage of some software, managing contracts for maintenance and support, and monitoring asset age and configuration;
- Support – Adding and changing configurations, repairing devices, and relocating equipment and software; and
- Asset Retirement – Removing assets from service, deleting storage contents, disposing of equipment, and removing identified assets from active inventory.

Throughout future budget cycles, a well-developed set of policies and procedures would support and promote departmental consistency and continuity of the IT asset-management process.

D. Audit Observation

The following audit observation does not constitute a recommendation; however, management should take this item under advisement.

New Vendor Recycling Contract

The computer-recycling vendor unexpectedly terminated its contract with the City of Milwaukee, on June 30, 2014, requiring Procurement Services to search for and choose a new vendor. The City did not have the services of a PC recycler for several months. At the time of the audit, the new vendor had made only its initial pickup of recycling goods. Since this is the first period of recycling activity, the form, frequency, and content of recycling information reports, issued by the vendor, are not known. The vendor contract specifies the recycling-information reporting requirements, but the actual reporting performance had not yet occurred, due to the newness of the contract at the time of the audit. Thus, the overall procedure of computers being sent for destruction verses the documentation of destroyed computers is still in the process of being established and assessed for overall effectiveness.

The City of Milwaukee's policies and need for adherence to best practice require that all confidential data be destroyed on any discarded City PC, laptop, tablet, or related device. The verification of data destruction should be documented and retained.

Observation 1 – Verify and monitor that the new computer-recycling vendor generates appropriate data destruction reports.

To ensure the protection of confidential City data, the new vendor process should be monitored on an ongoing basis, to verify the destruction of confidential City data on discarded PCs, laptops, tablets, and similar devices. This activity should be supported by documentation, with the aim of demonstrating that the City of Milwaukee has met its due-diligence responsibilities, in regard to the protection of the City's confidential data.

Tom Barrett
Mayor

Sharon D. Robinson
Administration Director

Nancy A. Olson
Chief Information Officer

Department of Administration
Information and Technology
Management Division

March 2, 2015

Aycha Sirvanci
Audit Manager
City Comptroller's Office
City Hall, Room 400

RE: Response to the Audit of Information Technology Asset-Management Controls

Ms. Sirvanci,

Thank you for the opportunity to respond to the draft audit report on the Department of Administration – Information Technology and Management Division's IT asset management processes. We found the audit process to be thorough and objective, and we appreciate the work your staff has done. ITMD's responses to the four recommendations and one observation are as follows:

1. <u>Continue coverage expansion of the PC warranty report to include the newly-consolidated service area.</u>

    Efforts to include PC warranty information for all departments supported by ITMD are underway. The newly-consolidated departments previously maintained their own inventories in various formats, requiring some manual effort to accurately migrate inventory data into ITMD's system. The complete inventory is will be complete by October 2015.

2. <u>Enhance the documentation for the five-year PC forecast cycle.</u>

    The 2015 Adopted Budget moved PC replacement money into ITMD's budget for all departments supported by ITMD. There are bubbles in the current inventory, as expected. These bubbles will be remedied by maintaining current funding levels for the next five years, resulting in every PC supported by ITMD being on warranty.

3. <u>Perform a sample, physical count of PC, laptop, and tablet inventories.</u>

    ITMD performs physical counts of units prior to ordering replacements each year.
    Each unit designated for replacement is inspected and verified before any orders are placed.
    This process in ongoing and we consider this recommendation to be met.
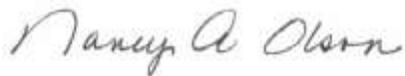
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4. Document IT asset-management policies and procedures.

   ITMD is working currently to update all asset management policies and procedures. This will be complete by the end of 2015.

Observation 1 – Verify and monitor that the new computer-recycling vendor generates appropriate data destruction reports.

   While ITMD actively monitors and verifies the data destruction reports, it is important to note that staff cleans all hard drives and data storage prior to sending units for recycling. Data destruction is performed to Department of Homeland Security NIST 800-88 standards.

Sincerely,

Nancy A Olson

Nancy A Olson
Chief Information Officer

MILWAUKEE