

TECHNOLOGY SERVICES DIVISION - FULLY IMPLEMENTED AUDIT RECOMMENDATIONS (Not Verified by the Auditor General)

As of October 1, 2021

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Report Title: Disaster Recovery Planning for City Computer Facilities**Report Date: 3/3/2008**

No.	Recommendation	Management Comments as of Oct 1, 2021
5	<p>The Chief Information Officer review the backup and storage procedures of City information technology units for: (a) compliance with acceptable standards and practices for data backup and storage requirements; and (b) provide divisions with the opportunity to participate in existing data storage arrangements within the City or with the outside service provider.</p> <p>High Priority</p>	<p>a. S136 City of Toronto Backup & Restore Operations Standard has been approved by Enterprise Architecture Review Board on March 4, 2021 and published on TECHWeb http://insideto.toronto.ca/itweb/policy/pdf/backup-restore-operations.pdf . Compliance to the approved Standard will be monitored thereafter.</p> <p>b. Divisions have been provided the opportunity starting in Q1 2018 to participate in the existing data storage arrangements. Currently providing access to data storage arrangements within the City (e.g. Clerks, 311) and outside service provider (e.g. Toronto Water & Toronto Public Health are currently using I&T offsite tape storage provider.</p>

Report Title: Review of the City SAP Competency Centre**Report Date: 6/15/2010**

No.	Recommendation	Management Comments as of Oct 1, 2021
7	<p>The Chief Information Officer develop SAP Competency Centre performance measures and standards. Such measures and standards should monitor ongoing performance.</p> <p>High Priority</p>	<p>SAP Performance reports are received from the HP Service Management system on a monthly basis to monitor the on-going performance for SAP related Service Requests and Incidents against SLA. Starting in May 2021, these performance metrics were added to the standing agenda to be reviewed and discussed monthly with the Corporate Business Partners and are now part of the regular meeting cadence and part of monitoring SAP Support against the SLA.</p>

Report Title: Controls Over Telecommunication Expenses Need Improvement**Report Date: 6/10/2014**

No.	Recommendation	Management Comments as of Oct 1, 2021
4	<p>City Council request the City Manager to direct divisions to review controls over access and use of group wireless devices. The inventory of group wireless devices should be reviewed and those not</p>	<p>A Usage and Inventory report is issued to All Divisions on a monthly basis since 2019. A process and set of associated tools have been developed to guide divisions in their periodic reporting of wireless devices inventory. Updates received from the Divisions based on the usage report are used to process cancellation if needed. A memo to Divisions was sent in 2015 and a revised memo is sent by the office of CTO in Sept 2021.</p>

required should be cancelled.	
High Priority	

Report Title: Software Licenses - Managing the Asset and Related Risks

Report Date: 2/4/2015

No.	Recommendation	Management Comments as of Oct 1, 2021
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.	Annual Reconciliation Process is in place with Software Owners using real-time Software data and financials from ITAM system. Follow-up and Point of Attention meetings are held to address any delta with gaps/results are addressed accordingly. Note: Better tooling (ServiceNow) is planned for 2022 that will reduce time spent on data matching.
	High Priority	

Report Title: IT Infrastructure and IT Asset Management Review Phase 1: Establishing an Information Technology Roadmap to Guide the Way Forward for Infrastructure and Asset Management

Report Date: 01/30/2018

No.	Recommendation	Management Comments as of Oct 1, 2021
1	City Council request the City Manager, in consultation with the Chief Information Officer, to establish appropriate governance and accountabilities to ensure that divisions with Information Technology services operating independently from the Information and Technology Division follow Corporate Information Technology policies, procedures, and standards in acquiring and managing Information Technology services.	An IT Asset Management Governance Committee has been setup with membership from Divisional IT, IT Procurement, and led by Technology Services Division. This committee governs the policies, procedures and standards in managing IT Assets and aligns with the City Asset Management Committee.
2	City Council request the Chief Information Officer to: a. ensure that the inventory in the Corporate Information Technology asset management system is updated (including assets directly managed by the Information and Technology Division, as well as assets managed by other City divisions); b. perform periodic reviews and reconciliations of data captured within the	a. ITAM system is up-to-date, with categorization, ownership, and access granted to Asset Owners from TSD and Divisional IT. Included in the CTO Reinforcement Memo to the Divisions to ensure data integrity in the ITAM system with periodic validation review process. b. Semi-annual process is in place that enables the periodic review and reconciliation of assets. Asset owners are provided reports and are required to

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	<p>Corporate Information Technology asset management system to ensure the system is accurate and complete; c. implement available tools and reporting functionality within the Corporate Information Technology asset management system to support ongoing asset monitoring; and d. use the data available within the corporate asset management system to inform strategic technology planning, including maximizing the use of assets and managing the costs to maintain them throughout their lifecycle.</p> <p>High Priority</p>	<p>attest to the validity or discrepancy of the report and provide their sign-off and plan for reconciliation.</p> <p>c. Access and Training of the ITAM system functions and reporting were provided to enable Asset Owners in keeping their assets up-to-date, and making meaningful decisions. Included in the CTO Reinforcement Memo to the Divisions by Sep 2021.</p> <p>d. Data reporting sourced from ITAM system is provisioned to Asset Owners in support of planning. Sending CTO Memo to the Divisions by Sep 2021 to reinforce the need for Strategic Technology Planning sessions that include an agenda to discuss/decide around Asset Usage resulting to Efficiencies and Cost Management</p> <p>Note: Better tooling (ServiceNow) is planned for 2022 that enables Strategic Technology Asset Planning dashboard with real-time stats.</p>
3	<p>City Council request the Chief Information Officer to leverage data obtained through various network tools to inform the City's network and strategic planning teams.</p>	<p>A Standard Operating Procedures document was created to leverage data and to inform City's network and strategic planning teams in Q2 2019.</p>
7	<p>City Council request the Chief Information Officer to ensure that the Strategic Technology Roadmap identifies opportunities for harmonizing lifecycle management and standardizing technologies in Information Technology infrastructure in order to achieve operational efficiencies, reduce costs, and source assets strategically.</p> <p>High Priority</p>	<p>Technology Services Division has created a formal Intake Group review process, which enables a centralized evaluation of all work requests coming to TSD. Intake Group determines if the work request can be fulfilled by normal operational processes or if it is new functionality. Intake process is enabled through ServiceNow Demand Management Module. The process document and extract from the tool (ServiceNow) is attached as evidence. All the new functionality initiatives are sent to Enterprise Architecture Review Board (EARB). EARB is a decision making body to review and approve all architectures to ensure compliance with standards based enterprise architecture. Terms of Reference for EARB and the decision tracker are attached for review. EARB is included in the Project Gating process which is managed through TSD Portfolio Management Team. The project gating guidance document is attached as evidence. Setting up of Intake and EARB ensures that any new work request coming</p>

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		to TSD is assessed for lifecycle management and standardization of technology. It is an endeavor to achieve operational efficiencies and reduce IT footprint by early assessment and centralized view of all requests.
8	City Council request the Chief Information Officer to conduct periodic architecture reviews to strengthen security, eliminate redundancies, and identify opportunities to modernize the Information Technology environment.	<ul style="list-style-type: none"> • Architectural reviews aimed at technology research, validation and strategy development for the purpose of eliminating redundancies and modernizing Technology environment have been incorporated into the Enterprise Architecture work plan in Q1 2020 and conducted throughout 2020. • Electronic Registry to track and report on technology reviews, technology research and validation initiatives and its statuses has been created. • The Enterprise Architecture Review Board (EARB) has been established in Q2 2020 with the purpose of identifying opportunities for modernization and optimization of City Technology environment, ensuring Technology Standard compliance, initiating specific Architecture Reviews, reviewing assessment outcomes and providing Architecture directions. The Standard Operating Procedure for the Architecture Review process has been created and formalized.
9	City Council request the Chief Information Officer to expedite efforts to mature its processes and capabilities to support Cloud services. High Priority	Technology Services Division has developed IT Cloud Strategy and have been performing ongoing reviews of the projects through Cloud Architecture Review Board (CARB). TSD's Cloud First approach supported by IT Cloud Strategy along with Cloud Governance mechanism has ensured maturity in Cloud services.
10	City Council request the Chief Information Officer to ensure that all Information Technology business cases describe how the new Information Technology project or lifecycle management refresh aligns with the strategic technology roadmap; and include an evaluation of cloud versus on-premise solution.	<ul style="list-style-type: none"> • New business cases have been designed and is piloted throughout 2021 for the purpose of better describing the alignment between business cases and corporate Strategy, Program roadmaps and Cloud strategy and a scoring matrix have been developed to quantitatively assess the alignment according to standardized criteria. • Content within business case templates have been updated to closer align with Corporate

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		<p>security standards on the transmission, storage and/or processing credit card payment to the City's cardholder data environment as well as the review and approval of new requests by the City's PCI compliance team.</p> <ul style="list-style-type: none"> The EARB has been established to govern the Enterprise Architecture review process based on organizational priorities including the Technology strategic plan. Architectural reviews aimed at technology research, validation and strategy development have been incorporated into the new business case submission process and underway in 2021. These reviews assess process, cloud vs. on-premise viability, standardized operating procedures, and artifacts for the purpose of eliminating redundancies and modernizing Technology environment. An Electronic registry was implemented to track and report on the statuses of business case reviews.
11	<p>City Council request the Chief Financial Officer, in consultation with the Chief Information Officer, to develop a tool to communicate the total cost impacts (operating and capital) of Information Technology projects to provide clarity wherever increased operating budget pressures from cloud services are offset by savings in capital costs.</p> <p>High Priority</p>	<ol style="list-style-type: none"> The Cloud Cost Benefits Analysis Tool was developed in partnership by Technology Services Division and the Financial Planning Division Teams to communicate the Total Impacts (Operating & Capital) of Cloud proposed projects to provide clarity wherever increased operating budget pressures from cloud services are offset by savings. The Cloud Computing Framework as published on the TECHweb (City Intranet) which provides guidance on the evaluation, acquisition, implementation and management of cloud computing services for the City of Toronto and applicable when adopting cloud services in the City includes the Cloud Cost Benefit Analysis Tool as a requirement. To ensure this Tool is completed for all cloud service projects, it has been formally incorporated into the IT Procurement Process since November 22, 2019. The Information Technology Authorization Procurement Plan (ITAPP), which is the intake document for all citywide technology procurements and routed through I&T Division, also includes a section to provide information on the use of the Cloud Cost Benefit Analysis Tool prior to submitting the request to procure (Section 12-b-2).

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12	<p>City Council request the Chief Information Officer, to coordinate with the Chief Purchasing Officer on implementing category management for the procurement of Information Technology equipment, services and solutions, utilizing the strategic technology roadmap to lower the total cost of Information Technology.</p> <p>High Priority</p>	<p>Technology procurements identified as part of Wave 1 corporate activity that commenced in early 2019 for implementing Category Management and Strategic Sourcing in the City.</p> <p>Two strategic sourcing initiatives were completed in 2020:</p> <ol style="list-style-type: none"> 1. One for a Managed Security Service Provider awarded in July - the procurement process commenced in the Technology Division but contract negotiations and award was done by the Office of the CISO once this section was set up as an independent division and the second for IT Professional Services (5 contracts awarded in October to preferred vendors and back up vendors) 2. Additional strategic sourcing opportunities identified through category profiling with timing to align with contract expiry dates and project milestone plans.
14	<p>City Council request the Chief Information Officer to enhance the existing process to monitor and update Information Technology policies, procedures and standards on a periodic basis.</p>	<p>Policies: The high-level process is to develop the work plan for updating policies on an annual basis. The annual policies plan will be approved by the TSD Senior Management Team. Each update will engage relevant stakeholders and analyze possible changes. For policies, the City Manager Office's policy excellence approach will be used to determine when approvals are required in addition to the Chief Technology Officer. TSD has updated the TSD policy review process and published our policy review workplan in June 2021. This process has been followed to set review/revisions for existing TSD policies as well as new policies, which are added to the workplan. Both the process and the workplan are available under "Document Development" on the TSD policies webpage: http://insideto.toronto.ca/itweb/policy/</p> <p>Procedures & Standards: Annual review of Standards is conducted. This will identify Standards that are missing, to be updated or to be retired. TSD's Standards Framework is developed and approved by Enterprise Architecture Review Board. It lists the work plan for all technical standards.</p>
15	<p>City Council request:</p>	<p>Technology Services Division reached out to City Manager's Office for distribution of the memo. Due to pandemic, it was advised that Chief Technology</p>

No.	Recommendation	Management Comments as of Oct 1, 2021
	<p>a. the City Manager forward this report to agencies and corporations for review; and</p> <p>b. the heads of the major agencies and corporations review the issues and recommendations included in this report and consider the relevance to their respective organizations for implementation.</p>	<p>Officer distributes the memo to all major Agencies and Corporations, as shared by City Manager Office. Basis advise from City Manager Office; Chief Technology Officer distributed the memo advising all major Agencies and Corporations to review the issues and recommendations included in the Audit Report in Oct 2020.</p>

Report Title: Information Technology Infrastructure and Asset Management Review: Phase 2: Establishing Processes for Improved Due Diligence, Monitoring and Reporting for Effective IT Projects and Asset Management

Report Date: 6/28/2018

No.	Recommendation	Management Comments as of Oct 1, 2021
1	<p>City Council request the Chief Information Officer to: a. Develop a process to ensure timely synchronization of IT asset purchases recorded in SAP with IT Asset Management (ITAM) System records. b. Expedite reconciliation of network assets and update them in the ITAM System. c. Develop secure communication mechanisms (or an alternate process) to allow for the update of segregated networks' IT assets in the ITAM System. d. Provide ITAM System access to other City divisions (where required) including adequate training to assist them in understanding the system.</p> <p>High Priority</p>	<p>a. SAP and ITAM systems have been integrated to synchronize asset purchases with procedure to log Asset into database once purchased.</p> <p>b. HP Network Node Manager and ITAM System have been integrated to reconcile network devices with ongoing exception reporting activities with procedure to log Asset into database once purchased.</p> <p>c. Exceptions and Restrictions processes established. Validation is in-progress.</p> <p>d. Data collection within segregated networks are through Configuration Management and feed from Divisions.</p> <p>Access and Training provided to applicable Divisions per asset type based on their role and responsibility.</p> <p>Fire and Paramedics are segregated, and findings show that their assets were not found in the ITAM. A process has been established for reporting of these assets and will be operationalized by Q4, 2021.</p>

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3	<p>City Council request the Chief Information Officer to develop a reporting mechanism and criteria for reporting to the Executive Modernization Committee and respective Executive Project Sponsors on project implementation delays and unused software licences with reports to include as a minimum:</p> <ul style="list-style-type: none"> a. Accumulated financial impact of delays. b. Unused assets, licences and solutions. c. Forgone benefits as a result of project implementation delays. d. Plans in place to mitigate the impact of delays. <p>High Priority</p>	<p>In 2020, updates were made to the Capital project Change Requests and On Hold/Cancellation forms to ensure greater accountability with project implementation delays, financial impacts and mitigation strategies.</p> <p>In addition, monthly Project Status reporting forms were updated to provide clarity on the status of project health and provide greater details for mitigating projects 'back on track'. Similarly, monthly and quarterly Variance Reports for monitoring spend, commitments in place, status updates, timing, project year end spend and any additional relevant commentary were developed.</p>
4	<p>City Council request the Chief Financial Officer to coordinate with the Executive Director of Human Resources and Chief Information Officer to:</p> <ul style="list-style-type: none"> a. Expedite the adoption of the SAP Employee Self-service solution throughout the City to maximize licence use and save costs incurred from printing and distribution of pay stubs. b. Review the existing IT environment to evaluate options to allow staff that do not have a work computer to have access to Employee Self-service solution. <p>High Priority</p>	<ul style="list-style-type: none"> a) Increased adoption of employee self-serve by rolling out Employee Self Service (ESS) to all Union Staff with Novell IDs, access to a City computer and printer. Implementation took place in September 2019. Employees can access their T4 and time bank balances Online. b) The Employee Access Management technology architecture proposal that outlined the technology to enable employee external access to the employee self service portal was presented to the Enterprise Architecture Review Board (EARB) July 9, 2020. The EARB, as the Governance body accountable for Enterprise Architecture directions, has directed the Office 365 implementation project to include in its scope the roll out of the recommended employee access management technology (Microsoft Azure AD Premium P1) to all City employees, including employees without City-issued devices.
5	<p>City Council request the Chief Information Officer to conduct an assessment of the City's existing physical servers for identification of opportunities for adoption of cloud services and/or virtualization.</p> <p>High Priority</p>	<p>TSD has completed an assessment of the City's existing physical servers in Q4 2020 to identify the opportunity for adoption of cloud services or virtualization and can be considered as Fully Implemented.</p>
6	<p>City Council request the Chief Information Officer to implement ongoing monitoring of</p>	<p>Cloud consumption controls and process is an ongoing process and are being followed since</p>

No.	Recommendation	Management Comments as of Oct 1, 2021
	<p>cloud consumption levels by divisions to ensure any necessary adjustments to the service delivery model are identified and implemented on a timely basis to avoid incurring excessive costs.</p> <p>High Priority</p>	<p>Q4 2017 and can be considered as Fully Implemented.</p>
7	<p>City Council request the Chief Information Officer to formalize criteria to identify critical network assets to be covered by the corporate support and maintenance contract and communicate to the responsible divisions the advantages of inclusion in the City contract.</p> <p>High Priority</p>	<p>Guideline has been published on TECHWeb to assist Divisions to determine criteria to identify devices to be covered by the Corporate network devices maintenance contract. Click here for details http://insideto.toronto.ca/itweb/purchasing/blanket-contracts/network-devices/index.html</p>
8	<p>City Council request the City Manager to forward this report to the major agencies and corporations for their review and consideration of the relevance of the recommendations to their respective organizations.</p>	<p>Technology Services Division reached out to City Manager's Office for distribution of the memo. Due to pandemic, it was advised that Chief Technology Officer distributes the memo to all major Agencies and Corporations shared by City Manager Office. Basis advise from City Manager Office; Chief Technology Officer distributed the memo advising all major Agencies and Corporations to review the issues and recommendations included in the Audit Report in Oct 2020.</p>

Report Title: IT Projects Implementation: Information Privacy and Cybersecurity Review

Report Date: 2/3/2021

No.	Recommendation	Management Comments as of Oct 1, 2021
2	<p>City Council request the Chief Technology Officer to enhance the City's incident response process by:</p> <ul style="list-style-type: none"> a. ensuring that all incidents are logged in a consistent manner and addressed and communicated to the appropriate stakeholders in a timely manner; b. actively monitoring remediation actions and ensuring that processes are in place to test the post-remediation environment; c. coordinating with the City Clerk to integrate the privacy incident response process with the Office of the Chief 	<p>TSD has an Enterprise IT Service Management (ITSM) Process that follows the IT Infrastructure Library (ITIL) v3 framework. This process includes incident and problem management resolution activities that includes cyber-related incidents. The processes were built in collaboration with the Office of the CISO. This process includes a detailed incident response process that is governed by a Security Operations Centre that is chaired by the office of the CISO. To further enhance the process, CTO will ensure: a. Mandatory compliance of critical systems with the ITSM process including (not limited to) incident</p>

No.	Recommendation	Management Comments as of Oct 1, 2021
	<p>Information Security Officer's Cyber Incident Response Plan and the Technology Services Division's Major Incident Management Process; and d. integrating the applicable sections of the Technology Services Division's Major Incident Management Process into the Office of the Chief Information Security Officer's Cyber Incident Response Plan.</p> <p>City Council request the Chief Technology Officer to consider the actions in Part 3 above in addition to the previous recommendation in the supplementary report (June 19, 2019) from the Auditor General headed "Establishment of City Wide Cyber Security Breach Incident Management Procedures Required" (Item 2019.AU3.12a).</p> <p>(Amended by Audit Committee - added part d)</p> <p>High Priority</p>	<p>logging, stakeholder communication, tracking remediation actions, testing post-remediation environment, The City Clerk's privacy incident response plan will be integrated with the Office of the CISO's Cyber incident response plan and Technology Services Division's Major Incident Management process.</p>