

TECHNOLOGY LIFECYCLE MANAGEMENT

PROGRAM EVALUATION AND AUDIT



**METROPOLITAN
COUNCIL**

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Council Lacks Formal Processes to Manage Technology Assets throughout Lifecycle

What We Found

What's Working Well

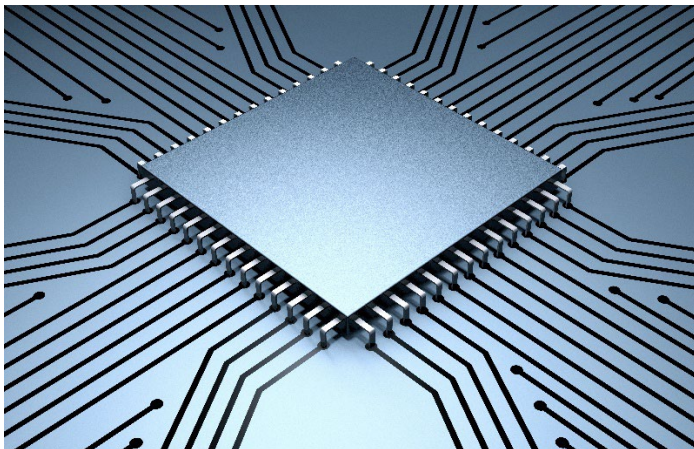
Environmental Services (ES) and Metro Transit strive to replace technology assets in a timely, cost-effective manner. All divisions strive to extend technology asset lifecycles through maintaining and servicing assets. ES and Metro Transit have some manual metrics tracking procedures to support maintenance processes and lifecycle management.

What Needs Improvement

Technology asset lifecycle planning processes are inconsistent and frequently involve manual tracking for programmable logic controllers (PLCs) and fare equipment. ES and Metro Transit lack key controls for technology asset lifecycle management in all lifecycle categories.

What We Recommend

The Regional Administrator and General Managers of Council divisions should develop and implement asset lifecycle management procedures and work instructions informed by industry best practices for critical technology assets. Senior management should work to define criticality and ensure technology lifecycle management processes are implemented for all critical assets not managed by the Information Services (IS) department.



Why We Did This Work

This audit evaluated the Council's existing controls for planning and managing asset lifecycles, and controls in place for lifecycle planning for technology assets and applications.

What We Reviewed

We interviewed ES and Metro Transit staff to assess gaps between current technology asset lifecycle management practices and industry best practices included in the ISACA, COBIT Framework.

How We Did This Work

Audit evaluated lifecycle management documents, processes, and tools for ensuring the proper management of technology assets throughout the lifecycle. Audit drew a sample of devices for testing and interviewed staff who manage sampled technology assets.

Summary of Findings

Number	Description	Recommendation	Follow-up Action	Page
Observation 1	Processes are inconsistent and frequently inadequate for technology asset lifecycle management.	The Regional Administrator and General Managers should develop and implement asset lifecycle management procedures and work instructions informed by industry best practices for critical technology assets. Senior management should work to define criticality and ensure technology lifecycle management processes are implemented for all critical assets not managed by the IS department.	Confirm	<u>9</u>

Background

Technology asset lifecycle management is the process of managing the entire asset lifecycle from its inception, development, service, and until disposal of the asset. A technology asset is the information, hardware, or software used by an organization in carrying out business objectives and activities.

ISACA guidance in the *COBIT 2019 Framework: Governance and Management Objectives*¹, states that organizations should:

- Manage I&T assets through their life cycle to make sure that their use delivers value at optimal cost, they remain operational (fit for purpose), and they are accounted for and physically protected.
- Ensure that those assets that are critical to support service capability are reliable and available.
- Manage software licenses to ensure that the optimal number is acquired and deployed in relation to required business usage, and the software installed is in compliance with license agreements.

Figure 1: COBIT Management Objectives²



The COBIT 2019 Framework has management objectives grouped into four relevant domains related to asset lifecycle management. The COBIT 2019 framework additionally notes that it is a framework related to governing and managing all I&T an organization puts in place to achieve organizational goals, including but not limited to I&T managed by the Information Services (IS) department. They are:

1. **Align, Plan, and Organize (APO)** objectives are primarily concerned with creating long-term technology plans that identify organizational needs and the proper technology use cases to meet those needs, and creating processes that can facilitate acting on lifecycle plans.
2. **Build, Acquire, and Implement (BAI)** objectives are set to determine the benefits of acquiring specific systems or providing specific IT services, seeking external guidance for best practices, tracking costs and assets to optimally acquire/use resources, and setting up layers of approval to ensure stakeholder input and awareness.

¹ COBIT 2019 Framework: Governance and Management Objectives (Illinois: ISACA, 2019), 209.

² ISACA®, *COBIT® 2019 Framework: Introduction and Methodology*, USA, 2018

3. **Deliver, Support, and Service (DSS)** objectives are set to manage IT processes related to management controls; tracking all I&T assets and their current use or function; creating a servicing system that retains all service information. DSS also involves setting objectives related to maintenance schedules that consider the risk of the technology failing, the likelihood of failure, and the technology's error rate or history of failing based on key metrics.
4. **Monitor, Evaluate, and Assess (MEA)** objectives focus on creating standardized metrics to better understand how efficient and effective current I&T use cases are, and how to evaluate current or emerging technologies to best meet organizational goals. MEA metrics are used as a guide for organizations to understand current and emerging technologies and how technology meets current management objectives.

Objective

The audit evaluated the Council's controls for lifecycle planning, managing, and disposing of technology assets and applications. The audit also evaluated the Council's control activities regarding technology asset management, given the absence of policy and procedure to structure lifecycle management activities. The audit also reviewed of the Council's adherence to ISACA's *COBIT 2019 Framework*³.

Scope

The scope for this audit was technology asset and application lifecycle management activities from January 1, 2022, through December 31, 2022. The audit reviewed all available lifecycle management documents, processes, and tools.

Methodology

Audit conducted interviews with IS and division staff, including staff in Metro Transit and Environmental Services (ES), involved in asset management to understand the Council's control activities for technology asset lifecycle management. The audit evaluated lifecycle management documents, processes, and tools used to manage the entire technology assets lifecycle. Audit reviewed programmable logic controllers (PLCs) managed by ES and Metro Transit and fare equipment to sample device-specific management practices for testing.

Limitations

The Council does not have any policies or procedures in place for lifecycle management. Audit observed in the IS Contract Administration audit, completed in June of 2023, that the lifecycle management practices for laptop and server hardware do not have a formally documented lifecycle plan or refresh, which led us to place laptop and server assets out of scope for this audit.

³ *COBIT 2019 Framework: Governance and Management Objectives* (Illinois: ISACA, 2019).

Thrive 2040

This audit will consider the Council's *Thrive MSP 2040* outcomes of Sustainability and Accountability. Several audit objectives focused on sustainability through efficient use of Council assets from the start of an asset's lifecycle to its eventual disposal. The audit addressed accountability by viewing current practices compared to industry best practices and governance frameworks.

Recognition

Audit appreciates the assistance from the IS department, and ES and Metro Transit divisions provided during the audit. We are encouraged by the response to the issues identified and the recommendations made within this report. Council staff were forthcoming and helpful during interviews.

Observations

Processes are inconsistent and frequently inadequate for technology asset lifecycle management.

ES and Metro Transit lack key controls at all stages of the technology asset lifecycle management for the assets we reviewed as part of this audit, PLCs, and fare equipment. For technology planning, implementation, servicing, and monitoring, divisions generally lack automated tracking for key metrics, controls, and configuration history. Council staff noted there was no formal approval process at asset lifecycle stages, and a lack of benchmarking processes to evaluate current practices and compare them to technology lifecycle management best practices.

For PLCs, ES and Metro Transit rely on manual tracking, such as work orders or emails, to log on-call services and monitor PLC issues and fail rates. Per Council staff, work order systems may not facilitate service management well for all business lines. Specifically, they may not relate to servicing of specific assets unless the asset is properly associated with the work order. System logging and reporting on services thus may not adequately track or report technology issues or failures.

Metro Transit has some metrics to track the lifecycle of fare collection equipment. However, maintenance metrics are often used as a substitute for lifecycle metrics. General maintenance does not always track asset-specific information to support lifecycle management efficiency and effectiveness metrics.

The COBIT® 2019 Framework: Governance and Management Objectives recommends that organizations follow several lifecycle management best practices, including but not limited to:

- Adopt resource management principles to inform the controls in asset plans and evaluation tools for optimal use of IT resources.
- Track and manage internal controls that include best practices surrounding routine maintenance, to maintain accurate records on current assets and their maintenance schedules and create a logging and monitoring system that tracks individual asset work history.
- Implement standardized data collection and analysis methodologies to track asset replacement needs.

The Council currently has no policies or procedures that require the use of industry standard technology lifecycle management best practices. Additionally, we learned during conversations with ES and Metro Transit staff that they try to extend the life of an asset for as long as possible to save on the costs of ordering new equipment.

Council staff's efforts to extend the lifespan of assets to conserve financial resources create the risk that assets may not be serviced or replaced promptly, and proactively. Failure to track service metrics risks preventing the Council from correctly budgeting for asset servicing or replacement. Without adequate metrics for asset lifecycle management, the Council risks being unable to measure asset efficiency in meeting operational objectives and not implementing lifecycle management best practices risks creating barriers to achieving organizational goals.

Recommendation:

1. The Regional Administrator and General Managers should develop and implement asset lifecycle management procedures and work instructions informed by industry best practices for critical technology assets. Senior management should work to define criticality and ensure technology lifecycle management processes are implemented for all critical assets not managed by the IS department.

Management Response: The Council's current policy FM 8-1 Management of Regional Assets Policy provides shared strategic direction consistent with the recommendations. IS, ES, and MT leadership will review the current policy and evaluate the need for additional supportive procedures related to technology lifecycle management.

As part of the BPSI program, the Council is in the process of acquiring a new Enterprise Asset Management System (EAMS). This system will support asset lifecycle planning and management for Council non-IS assets managed by ES and MT.

ES, specific to their PLCs and the findings and recommendations of this audit, will document a PLC lifecycle management plan as part of their overall effort (currently underway) to replace all their PLCs and HMI system. MT is planning to develop a framework for tactical asset management plans (AMPs), which include lifecycle management strategies. The intent is to develop and maintain AMPs for MT-managed asset groups including PLCs and fare equipment.

Timetable: Policy review will occur in 2024. EAMS implementation is projected for 2025-26. Divisional work on asset lifecycle planning is ongoing.

Staff Responsible: Chief Information Officer (RA); Director, Asset Management (MT), Director, Operation Support Services (ES).

Audit Follow-Up: Confirm

Conclusions

Public sector organizations often face a mix of challenges in managing technology assets. Best practices in technology lifecycle management can ensure the business enjoys lower costs and maximizes the value of technology. While planning, tracking, managing, and servicing technology assets is occurring, the Metropolitan Council divisions would benefit from implementing lifecycle management principles, metrics, and practices. Maintenance services and technology support required for compliance with regulation is a first step, but additional lifecycle management focus can extend asset life while better ensuring the resources for maintaining and replacing assets are known. Monitoring, evaluating, and assessing technology lifecycle management processes can further ensure organizations are linking technology to organizational goals and objectives and updating or maintaining technologies that are best suited to its mission and strategy.



August 18, 2023
Matthew J. LaTour, Director Program Evaluation & Audit
Chief Audit Executive

Appendix A

Program Evaluation and Audit recommendations are categorized according to how Audit will follow-up on them. The categories are:

- **Retest** — Audit will retest the area using the same or similar procedures after a recommendation has been implemented and sufficient time has passed for the changes to take effect. The retest will take place on a specified timetable. The recommendation will be closed once the change has occurred. A new audit project will be opened for retesting and any new findings will include new recommendations.
- **Confirmation** — Audit will confirm that an adequate risk response has been completed on the agreed upon timeline. The recommendation will be closed once the change has taken place.
- **Assess Risk** — Audit will not plan for specific follow up to these recommendations. Audit will discuss the area as part of its annual risk assessment activities and consider future audit work in the area.

Distribution List

All audit reports are reported to the general public and are available on www.metrocouncil.org. This audit report was distributed to the following parties:

- Members of the Audit Committee
- Regional Administrator
- General Manager/Division Director
- Department Director
- Process Manager



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