City of Mississauga
Internal Audit Report

TRANSPORTATION & WORKS DEPARTMENT
MIWAY TRANSIT DIVISION
TRANSIT BUSINESS SYSTEMS SECTION
TRANSIT MASTER (IBUS) APPLICATION AUDIT

April 11, 2025

City Manager's Department
Internal Audit Division

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Transportation & Works Department
MiWay Transit Division
Transit Business Systems Section
Transit Master (iBus) Application Audit

BACKGROUND

MiWay is Ontario's third-largest municipal transit service provider, operating conventional, fixed-route transit service. Some of the goals of the service, amongst others, include:

- Ensuring the safety of customers, employees and all other road users;
- Providing reliable and on-time transit service;
- Providing excellent customer service, treating everyone with courtesy and respect; and
- Delivering timely and accurate service information to customers.

MiWay's fleet is comprised of 500 hybrid electric and clean diesel buses, operating on 65 transit routes with over 3,000 stops.

To maintain reliability, safety, and punctuality, each bus is equipped with a device, known as the Integrated Vehicle Logical Unit (IVLU), that connects with the Transit Master (iBus) application to enhance real-time information and communication capabilities on the road. The iBus application provides functionalities such as:

- real-time vehicle tracking (e.g. location, speed, on-time vs. delayed, etc.);
- ability to make announcements to comply with the Accessibility for Ontarians with Disabilities Act (AODA) legislation;
- live status updates on buses; and
- analytics and reporting capabilities to support decision-making and improve service delivery.

The annual maintenance cost of the Transit Master (iBus) application is approximately $900,000. There are approximately 1,200 users of the system, including transit operators, route supervisors and operational staff.

The Transit Master (iBus) application is managed by the Transit Business Systems (TBS) Section, which is part of the MiWay Transit Division under the Transportation & Works Department. The section is comprised of 21 non-union staff reporting to the Manager of Transit Business Systems. Along with managing the Transit Master (iBus) application, the team is also responsible for supporting other Transit-related applications (e.g. scheduling/planning management, asset/inventory management, fuel management, Presto payment system, trip planner, vehicle maintenance, reporting platforms, etc.) and a multitude of intelligent transportation system physical assets (e.g. cameras, sensors, mobile display units, passenger counters, fareboxes, radio communications, etc.)

SCOPE

The audit examined change management controls, record-keeping, communication and monitoring of the Transit Master (iBus) application for the period July 2023 to July 2024.

Out of Scope

The audit did not review the following:
- Scheduling and planning of bus routes;
- Integration with GTFS/GTFS-RT server, security cameras, passenger counter, or other systems;
- Maintenance of buses; and
- Compliance with legislation such as Ministry of Transportation (MTO) bus maintenance requirements as they primarily focus on health and safety, Accessibility for Ontarians with Disabilities Act (AODA) specific to announcements on the bus, etc.

AUDIT OBJECTIVES

The audit was conducted in accordance with the Global Internal Audit Standards. The purpose of the audit was to ensure that:

A) The change management control processes for requesting, approving, and implementing application and data changes are established and adhered to;

B) The Transit Master (iBus) application gathers and retains detailed, accurate, and complete data;

C) The Transit Master (iBus) application effectively communicates information from Control Centre to bus and vice versa;

D) Communication of technology issues aligns with Divisional procedures; and,

E) Business capacity and resources are sufficient to support the Transit Master (iBus) application.

SUMMARY OF OBSERVATIONS

Based on the audit work performed, change management processes, including requesting, approving, and implementing application and data changes, are generally well established. Most processes are appropriately documented (i.e. process maps, Standard Operating Procedures, etc.), and staff involved are aware of their roles within the processes. Additionally, data is continuously transmitted from buses to the Transit Master (iBus) application, with periodic data backups and other contingency plans in place.

There is an opportunity to enhance operational effectiveness by improving record-keeping of incidents, developing knowledge base material for first-tier support staff, and maintaining up-to-date information for IVLU devices. Strengthening these controls could contribute to identifying trends and maintaining data integrity of the assets.

Management noted that considerable progress has been made in transitioning from informal to streamlined and documented processes for managing work related to the Transit Master (iBus) application and other applications/hardware supported by the team. Our recommendations are intended to complement the ongoing work and contribute to continuous improvements.

A detailed list of observations and recommendations was provided to management. Appendix A outlines the detailed recommendations and management action plans. The main observations and recommendations are summarized below.

Improve record-keeping of incidents and develop knowledge-base material

The TBS team uses an enterprise IT management application to manage incidents (e.g. issues, any unplanned interruptions, etc.).

Best practices established by the Information Technology Division to log incidents were inconsistently practiced by the TBS team, which resulted in blank fields, incorrect resolution codes, and insufficient or no information on how issues were resolved. While the inconsistent practices were not widespread, missing, inadequate or incorrect details can misrepresent the accuracy of incidents and can impact compliance with established best practices.

First-tier support staff (e.g. IT Service Desk) generally log incidents in the enterprise IT application and allocate the ticket to the appropriate team that supports the application. A high-level analysis of incidents related to the Transit Master (iBus) application showed that approximately 30% of the incidents were related to issues with launching the application. TBS staff noted that information/documentation on recurring issues has not been shared with first-tier support staff in recent years as technical expertise is typically required to troubleshoot issues. Providing first-level support staff with fundamental troubleshooting techniques for recurring issues can help reduce resolution times and enhance client satisfaction, given that the Transit Master (iBus) application is relied upon by Transit staff 24/7.

Maintain up-to-date information for the Integrated Vehicle Logical Units (IVLU)

Along with other intelligent transportation system assets, each bus is equipped with an IVLU, a core computer managing other components on the bus. In November 2022, the TBS team migrated inventory data of the IVLUs to an Enterprise Asset Management (EAM) application (primarily used by Transit Maintenance).

The audit validated that the inventory management and maintenance of the IVLU devices underwent periodic inspections including assets' physical condition, ensuring in-use and in-stock units were appropriately secured and safeguarded, assets were tagged, and approximately 10% of excess inventory is maintained for business continuity purposes.

The audit identified a total of 936 IVLU devices. Six hundred and nine (609) IVLU devices had an 'installed' status, while the remaining 327 had other statuses (e.g. awaiting disposition, awaiting rebuild, in stock, scrapped, etc.). Data discrepancies noted in the Enterprise Asset Management application, specific to IVLU devices, included:
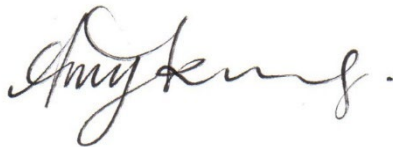
- The EAM application listed 609 IVLU devices with an 'installed' status, but currently there are 500 active buses. Staff indicated that this discrepancy was related to the transition of the data from its legacy process to the EAM application;
- While a Receipt Date was recorded for the IVLU device, 92% of the records did not record a Last Install Date; staff noted that this is due to IVLU device being pre-installed on the bus.

Data integrity issues (i.e. reliability, accuracy, and completeness) in a system can lead to real issues going undetected, operational inefficiencies and misinformed business decisions.

CONCLUSION

The streamlined processes around change management are generally effective; however, there are opportunities to improve record-keeping of incidents, develop knowledge base material for first-tier support staff, and maintain up-to-date information for IVLU devices. These improvements aim to enhance the overall operational effectiveness.

A total of four (4) recommendations resulted from this audit. Management has agreed to complete all four by the end of 2025.

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Director, Internal Audit

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             Information Technology (IT) Auditor

             Josie Wang, CPA, CIA, CFE
             Internal Auditor

Rec	Recommendation	Priority (H/M/L)	Comments/Status	Category
1	That refresher training be provided to the Transit Business Systems team to follow established best practices for logging, assigning, and resolving incidents within ServiceNow.	M	Agreed. The IT Lead has advised our team to submit a Work Request to allow time to collaborate with the approved vendor to arrange further training sessions focused on following established best practices for logging, assigning, and resolving incidents within ServiceNow.\n\nTo be completed by December 31, 2025.	Effectiveness and efficiency of operations and programs
2	That the Transit Business Systems team develop and share knowledge base articles with the IT Service Desk, detailing troubleshooting techniques for common issues (e.g. launching the Transit Master [iBus] application) as the application is relied upon by Transit staff 24/7.	M	Agreed. The Transit Business Systems team will develop and share knowledge base articles with the IT Service Desk on common/recurring issues.\n\nTo be completed by October 31, 2025.	Effectiveness and efficiency of operations and programs
3	That asset information be updated and accurately managed in the Enterprise Asset Management application.	M	Agreed. The Integrated Vehicle Logical Units asset information in the Enterprise Asset Management application will be updated to ensure it accurately reflects the number of current active buses.\n\nTo be completed by June 30, 2025.	Reliability and integrity of financial and operational information
4	That the Transit Business Systems team work with Information Technology (IT) to establish a process to periodically (e.g. annually) review access to the Transit Master (iBus) application to ensure access is only granted to staff who require it to perform their duties and responsibilities.	M	Agreed. Access is currently being reviewed and staff that no longer require access will be removed. The Transit Business Systems team will work with IT to establish a process to periodically review access to the Transit Master (iBus) application.\n\nTo be completed by December 31, 2025.	Safeguarding of assets and information