

AUDITOR GENERAL

Halifax Regional Municipality



Transit Technology Project Management Audit

April 2021

April 26, 2021

The following audit of **Transit Technology Project Management**, completed under section 50(2) of the Halifax Regional Municipality Charter, is hereby submitted to the Audit and Finance Standing Committee of Regional Council.

Respectfully,

Original signed by

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Auditor General
Halifax Regional Municipality

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Transit Technology Project Management Audit

Effectively managing day-to-day completion of transit technology projects

Project budgeting needs significant improvement

Lack of detailed budget support



- For original Transit Technology program budget
- For annual capital budget requests to Regional Council
- Has been turnover but current management there since 2017-18



Ongoing for eight years

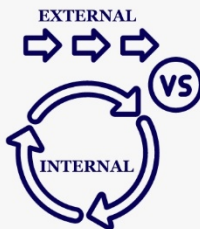


- Original timeline – 5 years
- Management told us this was not realistic
- Still no overall completion date for all outstanding projects

Day-to-day project management



- Have steering committees
- Regular project monitoring
 - Scope, cost, milestones



Lack of business case

- No cost benefit analysis of using external project manager
 - May be factors which mean this is good solution
 - We expected consideration of internal versus external

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Audit Results

Conclusion

Overall, Halifax Transit is effectively managing the day-to-day completion of its Transit Technology projects but project budgeting needs significant improvement.

We found project cost, scope and timelines are regularly monitored; steering committees oversee project completion. However, Halifax Transit management could not provide support for the original Transit Technology program budget, or for annual changes to that budget which were approved as part of HRM's capital budget process.

We found Transit Technology vendor selection and contract award processes followed HRM procurement policy; contracts included terms that provided value-for-money and protected the public interest. However, management did not analyze the cost versus benefit of the decision to use external project management resources.

Program Budget, Project Management, and Project Timelines

Lack of detailed capital budget support

Halifax Transit management could not provide support for the original Transit Technology program budget or annual changes to that budget over time. We expected management to have a detailed, approved budget and to track this against actual forecasted costs per project over time.

In 2012, the Transit Technology roadmap estimated costs of \$35 to \$51 million to complete several projects. Each year, Halifax Transit requested Regional Council approve annual capital budget funding for that year's planned project work.

As of December 31, 2020, \$23.3 million had been spent of the approved Transit Technology project budget of \$32.7 million. (We did not audit expenses to date.) Two projects were complete, four were ongoing, and three were on hold.

Transit management could not provide support for its annual capital budget requests to Regional Council. While there has been turnover in key Transit management roles since the program started in 2013-14, we found annual estimates provided by current management since 2017-18 also lacked adequate support. We expected management to have detailed estimates for its annual summary capital funding requests to Regional Council.

The external project management company's December 31, 2020 Transit Technology program forecast was \$40 million, \$7.3 million more than the total approved program budget. Transit management told us they believe these additional funds will not be needed if the projects on hold are not pursued. However, since there are no detailed budgets by project, management had nothing to support this statement. This information is key to accurate forecasting.

Recommendation 1

Halifax Transit should develop Transit Technology project forecasts that support annual capital project budget requests and ensure overall Transit Technology program budget estimates have adequate supporting documentation.

Management Response

Management agrees with the recommendation. In recent years, Halifax Transit has made efforts to improve the budget forecasting for Halifax Transit Technology Program projects. Previously, existing project documentation (e.g. contracts, statements of work, etc.) and historical costs have been utilized during the capital budget planning cycle. Going forward, the same resources will be utilized; however, project forecasts will be documented in detail and will clearly indicate all assumptions and data used in creating the forecasts to support detailed annual capital project budget requests. Work to document the forecasts used in 2021-22 project budget will begin immediately and completed within 3 months. This process will become standard practice for future budget cycles.

We also found financial information for all Transit Technology projects is recorded in one capital account in HRM's financial system. The system does not have a breakdown of expenditures by Transit Technology project. Financial information for Transit Technology projects is tracked in a separate spreadsheet. Managing costs of large projects outside the financial system creates inefficiencies and increases the risk of error since information must be entered twice.

We determined other HRM business units may also use a single capital account to record capital projects. While this makes sense for routine capital spending (such as certain roadwork, general building upgrades), larger, distinct projects should be tracked separately in the financial system.

We understand there is a planned upgrade to HRM's financial system. Management told us this will include a module to better track individual projects. In the interim, adding more capital accounts for large projects would allow costs to be more efficiently tracked.

Recommendation 2

HRM should establish processes to track individual project capital accounts in its financial system for large, distinct projects.

Management Response

Management agrees with the recommendation. Implementation of Project Systems within the SAP Business Transformation Program will provide this functionality through the use of WBS work breakdown structure. HRM will determine a definition of large distinct project and apply this approach to all projects that meet that criteria, once the functionality exists. Individual capital accounts will be created for all new large Halifax Transit Technology Program projects. The new accounts will be created as part of the 2022-23 capital budget cycle.

Day-to-day project management was good

Two steering committees oversee the Transit Technology program and regularly monitor projects. Committee members include Halifax Transit management. Project goals, objectives, scope and risks were identified for completed and ongoing projects.

There is an external project management office to monitor project issues, risks, scope and timelines. This Office includes an overall program manager, and individual project managers. We found the external program manager provided monthly status updates to the steering committees; these included timelines, issues, and progress to date. We found no significant gaps in monthly committee reporting from April 2014 and December 2020. Individual project status reports detailing progress, issues, scope, cost and milestones were completed weekly since the start in 2014.

We looked at project change orders. Having a formal change order process helps ensure necessary project changes move forward with management's knowledge and agreement. Most of the change orders met approval requirements.

- There were 17 change orders; eight of these were contract increases.
 - Fifteen of 17 met project charter approval requirements and statement of work requirements.
 - Two of 17 were approved by the Transit Manager, Technical services instead of the Director as required by the program charter. These were in the early stages of the program. Since all subsequent change orders were properly approved, we are satisfied with the process.

Five-year plan ongoing for eight years, still not complete

The Transit Technology program began in 2012 and was expected to take five years. It has been ongoing for eight years and management has not established a revised completion date.

In 2012, HRM developed a five-year Transit Technology roadmap to identify technology, service delivery, and system gaps. The road map identified 33 projects to be implemented over a five-year period. In 2014, these were consolidated into nine projects.

Transit management told us the original five-year plan was unrealistic; they believe it underestimated the complexity.

Of the two finished projects, the Driving Simulator was completed in a reasonable time frame; the Automated Vehicle Location project took longer than anticipated. The four ongoing projects are also taking longer than expected. The external program manager told us longer timelines are caused by many factors, including expanded project scope, HRM staff and management turnover, and steering committee turnover.

<p style="text-align: center;">Status of Transit Technology Projects</p> <p style="text-align: center;">• • •</p> <p>Completed</p> <ul style="list-style-type: none">● Automated Vehicle Location● Driving Simulator <p>Ongoing</p> <ul style="list-style-type: none">● Program Management Office● Fixed Route Planning, Scheduling & Operations● Fare Management● Paratransit <p>On-hold</p> <ul style="list-style-type: none">● Automated Vehicle Management● Security Systems● Yard Management

Length of Project Implementation and Status

Project Name	Project Implementation Phase (months)			Status
	Planned Duration	Actual/Estimated Duration	Additional Time Versus Planned	
Automatic Vehicle Location	9	47	38	Completed
Driving Simulator	5	7	2	Completed
Fixed Route* (Phases 1 to 3)	27	54	27	Phase 1 in progress Phase 2 and 3 not started
Fare Management (Phases 1 and 2)	19	19	–	Project under evaluation
Paratransit Phase 1	7	13	6	Phase 1 completed Phase 2 and 3 not started
Project Management Office	60	72	12	Program management completed, project management ongoing

* Planned length is for phases 1 to 3. Actual/Estimated length for phase 1 only.

Management established timelines for some, but not all, ongoing or future project phases. We expected management to have a realistic, planned completion date for the program, to allow effective project coordination and evaluation.

Recommendation 3

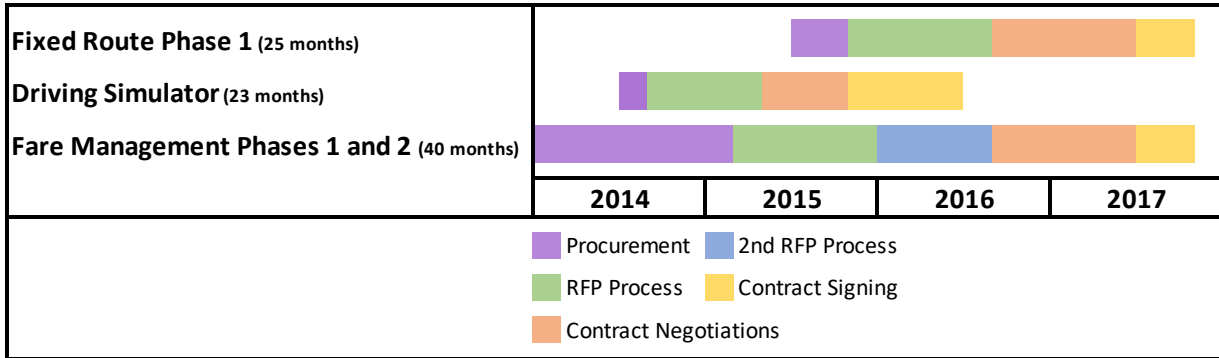
Halifax Transit should establish reasonable timelines for all outstanding Transit Technology project milestones.

Management Response

Management agrees with the recommendation. Efforts to better define the project timelines for in-flight projects are already underway. This work is part of the project planning for projects that are not in-flight. A more clear, defined timeline for each in-flight project will be completed within the next six months and will be completed for projects not yet in-flight as planning commences for each project.

The external program manager told us no timeline was established for contract negotiation. It appears Halifax Transit did not consider the impact of contract negotiations with vendors on the original five-year program timeline. Negotiated requests for proposals for three projects took several months before contracts were signed. This process impacted the program timeline. In addition, the initial request for proposal for Fare Management was cancelled nine months after the issue date and a new request for proposal was subsequently issued.

Duration of Negotiated Request for Proposals



Contracts and Vendor Selection

Contracts have adequate terms

We found contracts for Transit Technology projects have adequate terms and conditions to achieve value-for-money and protect the public interest. Contracts included sections relating to termination, suspension of service, service standards, and other key terms and conditions. Where applicable, HRM also obtained discounts under the terms of the contracts.

Two of the nine Transit Technology projects were completed. The project managers checked that vendors implemented the technical requirements for both projects and users signed off both projects.

No business case for external program management office versus internal resources

Transit Technology projects were managed by an external program management office. No business case was completed to compare the costs and benefits of external resources over HRM’s project management office. We analysed project management costs to compare using external resources versus employing a similar mix of internal resources. We found potential savings of at least \$1.6 million could have been achieved with internal resources.

Potential Savings on Project Management

Description	Value
External project management resource cost	\$3.5 million
Using HRM's project management office	\$1.9 million
Potential savings	\$1.6 million
Potential savings (%)	46%

There may be other factors that could require HRM to contract external resources, such as experience in the subject matter, or the availability of internal resources. A comprehensive business case should have examined these areas to determine the most cost effective and beneficial solution.

Fixed Route phase one is the only active project currently managed by external resources. Halifax Transit management told us they believe they can manage future phases of other projects with internal Halifax Transit resources.

Recommendation 4

HRM should establish a cost-benefit analysis process that considers relevant costs and qualitative factors when deciding between internal and external project management resources for capital projects.

Management Response

Management agrees that there is currently no formal documented process for completing such analysis. However, there is informal analysis process applied when a project team is being configured. Generally, the team considers availability, needs of the business unit, experience level and skills of resources required to successfully execute work. The use of external resources is also standard industry practice as this enables the PMO to manage an increased volume or peaks of project work as required by the organization while balancing ongoing costs. For consistency, management agrees that a documented process should be created to institutionalize a formal process. This process will be created by Q4 2021.

Vendor selection and contract award process followed HRM Procurement Policy

We found Transit Technology project vendor selection followed HRM procurement policy. We cannot say whether the vendor selection process was fair. This process predates our 2018 Procurement Audit which reported a lack of support for scores given to proponents and issues with conflict of interest declarations. In 2020, our follow-up review concluded the related recommendations from this audit had been implemented.

Other Matters

The audit also addressed other matters which will be reported in-camera (see Appendix 2).

Background

In 2012, HRM developed a multi-year, comprehensive Transit Technology Program Roadmap to support Halifax Transit's strategic objectives. The roadmap recommended 33 projects and estimated a cost range of \$35.1 million to \$51.5 million to develop and implement the projects over a five-year period (2013-14 – 2017-18).

In 2014, the external Program Management Office was established to manage and deliver the projects. The projects were subsequently consolidated into nine projects, some with multiple phases.

1. Halifax Transit Technology Program Management Office
2. Automated Vehicle Location (AVL+)
3. Fixed Route Planning, Scheduling and Operations
4. Driving Simulator
5. Fare Management
6. Paratransit
7. Automated Vehicle Management / Mechanical Integration
8. Security Systems
9. Yard Management

About the Audit

We completed a performance audit of the management of Transit Technology Projects.

The purpose of the audit was to determine whether HRM effectively manages the Transit Technology projects to ensure value-for-money. Our role is to express an independent audit opinion of this area.

The objectives of the audit were to assess whether:

- Halifax Transit Technology projects are effectively managed; and
- Vendor selection and contract award processes followed the procurement policy and considered value-for-money.

We developed the criteria for this audit. These were discussed with, and accepted as appropriate by, Halifax Transit management.

1. Project goals, objectives and scope should be established.
2. Project governance roles and responsibilities should be clearly defined.
3. Project risks should be identified, monitored and addressed.
4. Project scope, cost and timelines should be monitored, and issues identified addressed.
5. Vendor selection processes should be fair and consistent with HRM procurement policy.
6. Vendor contract terms should protect public interest and provide value-for-money.

Our audit period covered 2011 to December 2020. Information from outside the audit period was considered as necessary. Our audit scope did not include Halifax Transit's submissions to the 2021-22 HRM budget process. This process was ongoing when we completed the audit.

Our audit approach included: interviewing management; reviewing internal policies, procedures and programs; and examining documentation.

This audit was conducted in accordance with the Canadian Standard on Assurance Engagements (CSAE) 3001 Direct Engagements published by the Chartered Professional Accountants of Canada.

We apply CPA Canada's Canadian Standard on Quality Control 1. Our staff comply with the independence and ethical requirements of the Chartered Professional Accountants of Nova Scotia Code of Conduct.

Appendix 1 – Recommendations and Management Responses

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Appendix 2 – In-camera

Reported in-camera in separate document.

Contact Information

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