



Enterprise Asset Management Program Update

Date: February 22, 2024
To: TTC Board
From: Chief Capital Officer

Summary

This report provides the TTC Board with an update on the TTC’s Enterprise Asset Management (EAM) Program and the work completed to date. In addition, it highlights the future work plan to build on and mature the TTC’s asset management capabilities.

The intent of the EAM Program is to mature the TTC’s asset management capabilities to align with international best practice. The program will establish a framework for governance, standardize practices, and ensure asset sustainability. It will build on existing operational and technology efforts in order to improve asset performance, extend asset lifespan, and enhance the safety and condition of the TTC network.

Recommendations

It is recommended that the TTC Board:

1. Receive this report for information.

Financial Summary

Funds for this program are included in the TTC’s 2024-2033 Capital Budget and Plan under Program 3.9 – Enterprise Asset Management, State of Good Repair to implement the TTC’s Enterprise Asset Management Program, which was approved by the TTC Board at its meeting on December 20, 2023, and by City Council on February 14, 2024.

The 10-Year Capital Plan includes a total of \$59.25 million for the Enterprise Asset Management Program, comprising of the following cash flow funding by year:

Project Name	2024 Budget	2025	2026	2027	2028	2029-2033	10-Year Total
Enterprise Asset Management	4,250	5,250	5,250	5,500	6,000	33,000	59,250

**(in thousands)*

In support of the EAM program, the TTC is enabling its asset management planning and work order processing capabilities with the implementation of IBM Maximo, an industry leading technology solution. Funds for the implementation scope of work is also included in the the Council-approved TTC's 2024-2033 Capital Budget and Plan under Program 7.19 – Enterprise Asset Management System, State of Good Repair. The total project cost for the Enterprise Asset Management (IT) system is approximately \$29.93 million, comprising of costs to the end of 2023 of \$12.14 million and approved funding in the 2024-2033 Capital Budget and Plan of \$16.9 million. A budget adjustment to account for the \$0.9 million of unspent funds in 2023 being carried forward to 2024 will be included in the 2024 Capital Budget Adjustments for Incremental Carry Forward Funding and Future Year commitments report that will be subject to City Council approval, bringing the approved funding in the 2024-2033 Capital Budget and Plan to \$17.8 million.

Through the progression of the EAM Program, additional funding may be required to fund any additional technology solutions that may be necessary and will be included in future capital budget submissions for the Board's consideration and approval.

The Chief Financial Officer has reviewed this report and agrees with the financial impact information.

Equity/Accessibility Matters

The EAM Program seeks to ensure that TTC assets meet the performance requirements set out by the TTC in its corporate policies and plans. This includes levels of service requirements relating to equity and accessibility. These requirements provide accessibility objectives for TTC services that ensure decisions are made that align with customer' needs and the guidance of the Advisory Committee on Accessible Transit (ACAT).

Decision History

In accordance with Provincial Regulation, [Asset Management Planning for Municipal Infrastructure Regulation, O. Reg. 588/17 \(as amended by O. Reg. 193/21\)](#), the [City of Toronto Corporate Asset Management Policy CAM-001](#) was adopted by City Council on June 19, 2019 and came in to effect on July 1 of the same year. It provides the framework to develop a whole government asset management approach that will ensure long-term asset sustainability, demonstrate a commitment to good stewardship of the City's infrastructure assets, and support improved accountability and transparency to the community through the adoption of appropriate asset management practices.

The TTC Board authorized the award of a contract in the amount of \$7,155,703, inclusive of HST, for Enterprise Asset Management Professional Services at its meeting on April 13, 2023. This contract provides expert EAM professional services for a duration of up to three years to accelerate the establishment of the TTC's EAM practice, implement the TTC's EAM Program and its sustainment; develop the TTC's Asset Management and Investment Plan that must meet asset management regulatory

compliance milestones set out in the Ontario. Reg. 588/17, as amended. The contract includes two optional, one-year extensions at the TTC's sole discretion.

[TTC Enterprise Asset Management \(EAM\) Program: Contract Award for Professional Services.](#)

At the December 8, 2021, meeting, the TTC Board adopted the capital project portfolio improvements report. The report advised the Board of priority actions taken that continuously improve the way in which the TTC's Capital Program is being planned, managed, and delivered. The portfolio ranges from significant major construction, procurement and technology projects/programs, to more routine ongoing state-of-good-repair programs.

[Continuous Improvement in Capital Project Management](#)

Issue Background

The Province enacted the [Asset Management Planning for Municipal Infrastructure Regulation, O. Reg. 588/17 \(as amended by O. Reg. 193/21\)](#) effective January 1, 2018, to ensure that municipalities have a comprehensive and sustainable plan for managing their infrastructure assets. The regulation requires municipalities to prepare and maintain a comprehensive asset management plan that includes an inventory of their infrastructure assets, condition assessments, life-cycle cost analysis, and risk assessments. The plan must also include strategies for financing and prioritizing infrastructure projects, as well as monitoring and reporting on their progress.

The City of Toronto, at the core of a region with a population of 6.47 million, generates 26% of Ontario's GDP and 10% of the national GDP annually. One of the key factors for the continued success of Toronto as a thriving social and economic hub will be contingent on a reliable, frequent, and safe public transit system that creates access to opportunity for everyone. The TTC is the public transit agency responsible for serving Toronto's 630 square kilometres geography. Foundational to the mobility of the region, pre-pandemic, the TTC moved more than 525 million customers annually enabling them to access employment, education, services, and social connection through an integrated mass transit network.

The TTC is an asset-intensive organization with a portfolio value of more than \$25 billion, consisting of vehicles, tracks, signals, stations, industrial equipment, as well as other assets. The purpose of these assets is to enable the TTC to provide transit service to Toronto and deliver the value that a high-quality transit service provides to Canada's largest urban centre and economic hub. In order to ensure the TTC's assets are able deliver the best possible service, the TTC has committed to maturing its asset management capability by delivering an EAM Program.

What is asset management?

Effective asset management ensures that an organization's assets are managed in a way that balances the achievement of the required level of performance while managing risk and reducing whole-life cost. It involves the development of strategies and plans aligned to an organization's corporate objectives that are based on life cycle decision making. Asset management practices are not new to transit organizations, and there

are many examples of other transit organizations that use asset management to ensure the achievement of corporate objectives. Two specific organizations are the Metropolitan Atlanta Rapid Transit Authority, which has achieved certification against ISO 55001 and Regional Metropolitan Transport Authority in Montreal, which is in the process of implementing an asset management program.

With respect to the TTC, asset management provides an opportunity to address the many asset-related challenges:

Challenge	How asset management will help
Constrained funding for State of Good Repair	Ability to show link between spending on assets and on performance, enabling prioritization decisions to be made. Demonstration to funders that the TTC is optimizing costs across the whole asset life cycle.
Aging infrastructure base	Enables the TTC to review different options using a risk-based approach to optimize state-of-good-repair (SOGR) maintenance and renewal activities.
Asset performance below desired levels	Development of operations and maintenance policies, which identify the correct balance between cost, risk, and performance.
Onboarding of new assets	Development of standardized approaches to operations and maintenance activities.
Growth in demand as a result of population increases in the City and GTA	Identification of demand changes ahead of time, and feed into decision-making on investment.
Need to meet net zero goals and adapt to climate change	Inclusion of net zero deadlines in decision-making criteria. Whole-life costing and performance analysis to take into account greenhouse gas emissions and requirements to improve resilience to extreme weather events. Improved ability to quantify and systematically reduce material consumption and life cycle carbon of assets

The EAM Program assesses the current state and projects future needs of the existing capital assets in order to ensure informed and proactive decision making. The outcome of this program is evidence-based investments and capital financing strategies that maintain the assets and services in state of good repair and aligns with the TTC’s objectives.

Asset Management Best Practice

Given the continuous growth in infrastructure funding deficits and increased service demands, asset-intensive organizations worldwide have recently focused on the need to manage infrastructure more holistically. As such, there has been a concerted global effort by asset managers to collaborate and develop an effective approach to asset management. This collaboration has resulted in the development of a set of global standards administered by the International Standards Organization (ISO). These standards, known as ISO 55000 suite of standards, provide a framework to establish asset management policies, objectives, processes, and governance that guide an organization in achieving its strategic objectives. These standards reflect the latest thinking and best practices in asset management and promote a culture of proactive and continual improvement that results in an organization realizing increased value from its assets. The TTC is committed to this approach and intends on aligning with the requirements set out in the ISO 55000 suite of standards.

Regulatory Context

The Government of Ontario has indicated that asset management planning is important to the Province. As such, in 2016, the Province passed Bill 6, Infrastructure for Jobs and Prosperity Act.

This legislation helps to strengthen municipal asset management planning by way of regulation. Subsequently, Ontario Regulation 588/17 was enacted in December 2017. The regulation aims to implement best practices throughout the municipal sector to deal with the many challenges, including aging assets, increased capital funding needs, growing infrastructure gaps, and climate change. The regulation mandates a multi-year phased implementation with the next phase coming due in July of this year. By July 1, 2024, the TTC is required to develop an Asset Management Plan, setting out the state of the TTC's asset portfolio and detailing the amount of investment required to maintain the currently levels of service the TTC provides. This will feed into the overall Asset Management Plan for the City of Toronto. The last and final phase will be due on July 1, 2025, in which municipalities must have a financial plan in place that addresses the life cycle needs of all assets. Subsequent to the final phase, the regulations mandate regular asset management plan updates.

The Province has encouraged municipalities to consider compliance with the regulation as a starting point. In fact, it is recommended that municipalities commit to a program that goes "beyond compliance." Aligning the TTC with industry best practice, as defined by the ISO 55000 suite of standards, will allow the TTC to meet this objective.

Comments

Asset Management Maturity at TTC

At the April 13, 2023 Board meeting, a contract was awarded to the engineering consultant, SNC-Lavalin (which has been renamed to AtkinsRéalis) for professional services to accelerate the establishment of the TTC's asset management practice by providing:

- An as-is review and discovery of the TTC's current asset management landscape, including a gap assessment with Ontario Reg. 588/17 and benchmarking against industry best practices;
- Development of future "to-be" design for the end-to-end asset management practice, as well as organizational change management, knowledge transfer, and training plans;
- Implementation of business processes and best practices as well as the necessary tools and templates to accelerate delivery;
- Establishing a TTC asset management plan that is compliant with applicable legislation, including Ontario Reg. 588/17 by legislated milestone dates; and
- The provision of knowledge transfers to the TTC team to enable the TTC to fulfill its EAM obligations and ensure the sustainability of the TTC's practice.

Significant progress has been made since the award of the contract. The as-is review was completed by AtkinsRéalis, and a report containing the recommendations for maturity improvements is currently being finalized. It is anticipated that the report will be published before the end of Q2 2024. In addition, the preparation of the 2024 Asset Management Plan (AMP) that is compliant with Ontario Reg. 588/17 is in its final stages. The AMP will be presented to the Board at its April 11, 2024 meeting for review and endorsement.

Following the completion of the as-is review, AtkinsRéalis has worked with TTC staff to develop a multi-year asset management maturity improvement roadmap. When fully developed, it will consist of a portfolio of different programs, each of which having a series of projects. A summary diagram of the roadmap has been included as Appendix 1. The roadmap is divided into four "Journey" segments consisting of Setting Foundations, Building and Embedding, Maturing and Developing, and Continuously Improving and Innovating. Details of each of the segments will be provided to the Board at a future meeting.

Aligning the TTC's EAM Program with current international best practice will enable many elements required for keeping assets in state of good repair. A mature asset management program will support the TTC's asset management capabilities by:

- Enhancing data collection and improving the quality of the information used for optimized decision-making;
- Leveraging state-of-the-art technology, such as machine learning and artificial intelligence;

- Supporting the adoption of achievable and affordable levels of service that mitigate risks and promote long-term sustainability; and
- Supporting the life cycle and financial strategies that address needs and prioritizes funding allocation. The prioritization is based on financial capacity and organizational objectives.

TTC 2024 and 2025 Asset Management Plans

To meet the requirements of Ontario Regulation 588/17, the TTC is developing the first iteration of the Asset Management Plan (AMP) to be published in 2024.

For 2024, the TTC’s Asset Management Plan must include the following information:

1. For each asset category, the current levels of service being provided.
2. The current performance of each asset category, determined in accordance with the performance measures established by the municipality.
3. For each asset category,
 - I. a summary of the assets in the category,
 - II. the replacement cost of the assets in the category,
 - III. the average age of the assets in the category, determined by assessing the average age of the components of the assets,
 - IV. the information available on the condition of the assets in the category, and
 - V. a description of the municipality’s approach to assessing the condition of the assets in the category.
4. For each asset category, the life cycle activities would need to be undertaken to maintain the current levels of service.

The timeline for delivering the 2024 AMP is as follows:

Date	Action
February 16, 2024	Draft AMP issued to Project Steering Committee and AM Working Group for review
February 16 – March 29, 2024	TTC internal review and update of the AMP
April 11, 2024	TTC Board review and endorsement of the AMP
April 12, 2024	TTC AMP Submission to the City of Toronto

In 2025, the TTC is required to deliver its 2025 AMP that must build on the 2024 Plan to include the following:

1. For each asset category, the levels of service that the municipality proposes to provide for each of the following 10 years.
2. An explanation of why the proposed levels of service are appropriate for the municipality.
3. The proposed performance of each asset category for each year of the 10-year period.

4. A life cycle management and financial strategy that sets out the following information with respect to the assets in each asset category for the 10-year period:
 - I. An identification of the life cycle activities that would need to be undertaken to provide the proposed levels of service.
 - II. An estimate of the annual costs for each of the 10 years of undertaking the life cycle activities identified.
 - III. An identification of the annual funding projected to be available to undertake life cycle activities and an explanation of the options examined by the municipality to maximize the funding projected to be available.
 - IV. If, based on the funding projected to be available, the municipality identifies a funding shortfall for the life cycle activities identified.

A high-level timeline for the production of the 2025 AMP is shown below:

Date	Action
March 2024	Commence 2025 AMP planning
April 2024	Board report covering 2024 and 2025 AMP
March – October 2024	AMP data collection and analysis
November 2024 – January 2025	Draft AMP using content of analysis
February 2025	TTC Board review and endorsement of the AMP
March 2025	Provision of AMP to City of Toronto

Capital Investment Plan

The initial TTC Capital Investment Plan (CIP) was introduced in 2019. The CIP outlined the results of a comprehensive review of the TTC’s SOGR needs and the capital requirements necessary to provide transit service that is safe, efficient, reliable, affordable and equitable. Since then, the CIP has been a rolling plan, updated annually to reflect refined estimates based on emergent capital needs, new priorities or revised SOGR assessments. For future CIP plans, the maturing of the TTC’s asset management program is expected to result in plans that better inform the CIP.

As previously reported to the Board, the 2024-2038 Capital Investment Plan totals \$47.855 billion in base capital needs over a 15-year period, of which \$12.398 billion is funded, leaving \$35.457 billion in unfunded capital needs.

TTC Asset Management Policy

The EAM Program objective is to develop a specific Asset Management Policy for the TTC. This Policy will explicitly state the TTC’s commitment to adopting asset management, embedding it within the organization and improving organizational maturity in this area. It will guide a future Asset Management Strategy and Asset Management Plans by detailing the principles that the TTC will use for asset management delivery. It will also act as a means of communicating the TTC’s commitment to asset management to employees and to external stakeholders.

A TTC Asset Management Policy is currently being developed that complies with best practice as set out in ISO 55000 suite of standards. This Policy will align with the City of Toronto Corporate Asset Management Policy and the Provincial Regulation. The Policy will also facilitate the maturing of asset management at the TTC to realize more value from assets. It will result in a better balance between risk, life cycle needs and service objectives.

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Signature

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Attachments

Attachment 1 – TTC Asset Management Maturity High-Level Roadmap

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Appendix 1: TTC Asset Management Maturity High-Level Roadmap

AM Resource Phase 1 – A central EAM team stood-up from the outset with support across TTC to design and launch the AM Framework		AM Resource Phase 2 – An expanded central EAM team now working with other dedicated AM resources across TTC as the ‘AM guiding mind’ for joint decision-making		AM Resource Phase 3 – The central EAM team is working closely with other dedicated AM resources across TTC as business-as-usual while continually developing AM capability	
AM Journey	SETTING FOUNDATIONS	BUILDING & EMBEDDING		MATURING & DEVELOPING	CONTINUOUSLY IMPROVING & INNOVATING
	2024 (Year 1)	2025 & 2026 (Yr 2 & 3)	2027 & 2028 (Yr 4 & 5)	2029 & 2030 (Yr 6 & 7)	Beyond / Ongoing Journey
<p>Outcomes by Year 1 – We are working much more collaboratively in ensuring the performance of our assets, and in reacting together to better address availability and reliability challenges.</p> <p>We have focused on the data needed both for compliance and for the Maximo project, and we now have the foundations of an AM Framework that meets minimum compliance has been approved via our governance structure and has the necessary support of our teams.</p> <p>We also have a plan for early adopter / demonstration projects.</p>		<p>Outcomes by Year 3 – We have reviewed and adapted our approach. We have embraced new ways of working, we are making risk-based investment decisions, and we are consciously taking an enterprise-wide approach to whole life asset planning, costing, and management. We have met all legislative requirements and now have asset plans in place that are informing capital / financial planning.</p> <p>Outcomes by Year 5 – We can now better articulate and defend our investment requirements and plans to our stakeholders. We are looking ahead with confidence to fulfil our objectives for growth and zero emissions.</p> <p>Asset Management is now becoming a way of doing business.</p>		<p>Outcomes by Year 7 – We have reviewed and adapted our approach. We have empowered all our employees through an effective and responsive AM framework. We are actively embracing and deriving benefit from new technology and innovations to improve our approach still further.</p> <p>Looking beyond – As well as continuing to provide outstanding service for our customers, we have also achieved our objectives for growth and zero emissions.</p> <p>Our leading approach to AM is widely recognized.</p>	