



# Asset Management Journey

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# | Agenda

1. Background
2. MAXIMO Implementation
3. 2023 Asset Management Deliverables
4. Standardizing Approach
5. Data Sharing
6. Technology Enablement
7. Enterprise Governance & Execution



# Background

✓ **3<sup>rd</sup> Largest Transit System in North America**

✓ **Daily Trips (Average Business Day)**

- Revenue Passengers: 610,954  
(Fares Collected)

✓ **Passenger Trips (2021): 197,842,140**

- Buses: 111,979,186
- Subway Trains: 68,648,664
- Streetcars: 15,726,092
- Scarborough RT Trains: 1,448,198

✓ **Total Number of Employees 15,251**

✓ **Vehicles Group**

- Bus: 2,071
- Streetcars: 204
- Subways: 876
- Non-Revenue Vehicles: 74 (Rail)  
1,111(Surface)
- Maintenance Facilities: 16 (Total)

✓ **Kilometers of Routes / Lines**

- Bus: 6,486.9
- Streetcar: 350.6
- Subway:
  - Yonge-University: 38.4
  - Bloor-Danforth: 26.2
  - Sheppard: 5.5
  - Scarborough RT: 6.4



# Background



# Background Governance

## **Regulatory need for change**

- *Ontario Reg. 588/17 under the Infrastructure for Jobs and Prosperity Act, 2015, S.O. 2015, c. 15*, requiring TTC to comply with new regulations in asset management planning and practices by 2025.

## **Push toward modernization and governance, a TTC corporate objective**

- In efforts to innovate for the long-term, and, as a result of a 2021 TTC asset management maturity assessment, Operations & Infrastructure (O&I) previously Infrastructure & Engineering (I&E) began its transition to a new Linear Asset Management system.
  - This transition entails adoption of a new modern asset management framework and processes in an effort to comply with regulations.



# Background

## Asset Management Guiding Principles

*“The coordinated activity of an organization to realize value from its assets” Source: ISO 55000*

<b>Purpose</b>	To generate outstanding value for our customers				
<b>Role</b>	To be the leader in transit for Canada				
<b>Vision</b>	To ensure sustainability of TTC services through effective stewardship of assets and the management of risks while optimizing asset value and assurances of evidence-based decision-making				
<b>Strategy</b>	To use data-driven optimized value based decisions to improve safety, reliability and capacity of our assets to deliver exceptional service for our customers and stronger partnerships with all stakeholders.				
	Integration of asset management plans with budgets and long term financial plans.				
	Coordinate asset management planning for interrelated infrastructure assets with separate ownership structures by pursuing collaborative opportunities with related organizations and jointly-owned municipal bodies, wherever viable and beneficial.				
<b>Holistic &amp; Integrated</b>	<b>Safety &amp; Reliability</b>	<b>Value Based Decision-Making</b>	<b>Customer Focus</b>	<b>Sustainability</b>	

● Comply with Regulation 588/17

● Transform for financial sustainability

Move more customers safely & reliably



# Background

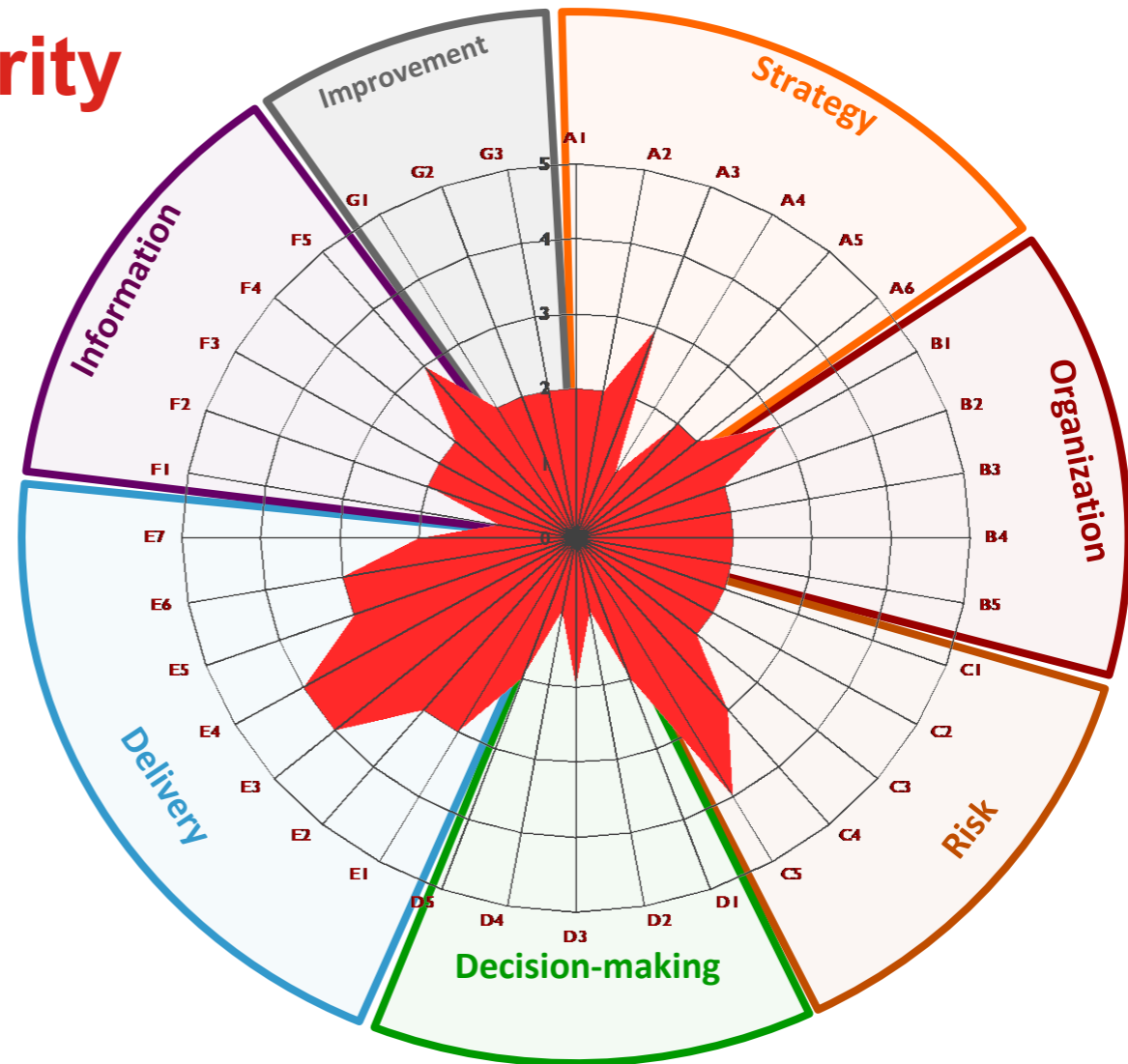
## Asset Management Maturity

(I&E, Vehicles, ITS)

Final average OVERALL score of **2.5**

- **2** means: ad-hoc process, developing, not documented
- **3** means: competent, generally used and documented
- Overall, TTC has some competent areas and some developing areas
- **Lowest scores:** Strategy, Decision-Making
- **Highest score:** Delivery

**This is a typical score for organizations just starting asset management**



# Background Partnerships across the TTC

## Enterprise Level



- Provide an integrated and consistent approach to asset management planning and budgeting throughout the organization working with various business units
- Development of policies, framework, standards, guidelines, tools, and oversight.
- Definition of service profiles, levels of services, and corporate reporting
- Corporate risk and performance management
- Budgeting and Capital planning to establish capital investment plan and 10-year capital budget (corporate level)

## Operational Level



### Asset Management:

- Asset risk management and performance monitoring
- Conducting regular conditional assessments
- Asset lifecycle management – maintenance and asset State of Good Repair (SOGR) strategies and planning
- Operational level capital planning

### Capital project delivery:

- Delivery of capital projects to procure, build, or SOGR of assets

### Maintenance Function:

- Work program – Corrective, preventative, proactive, predictive maintenance

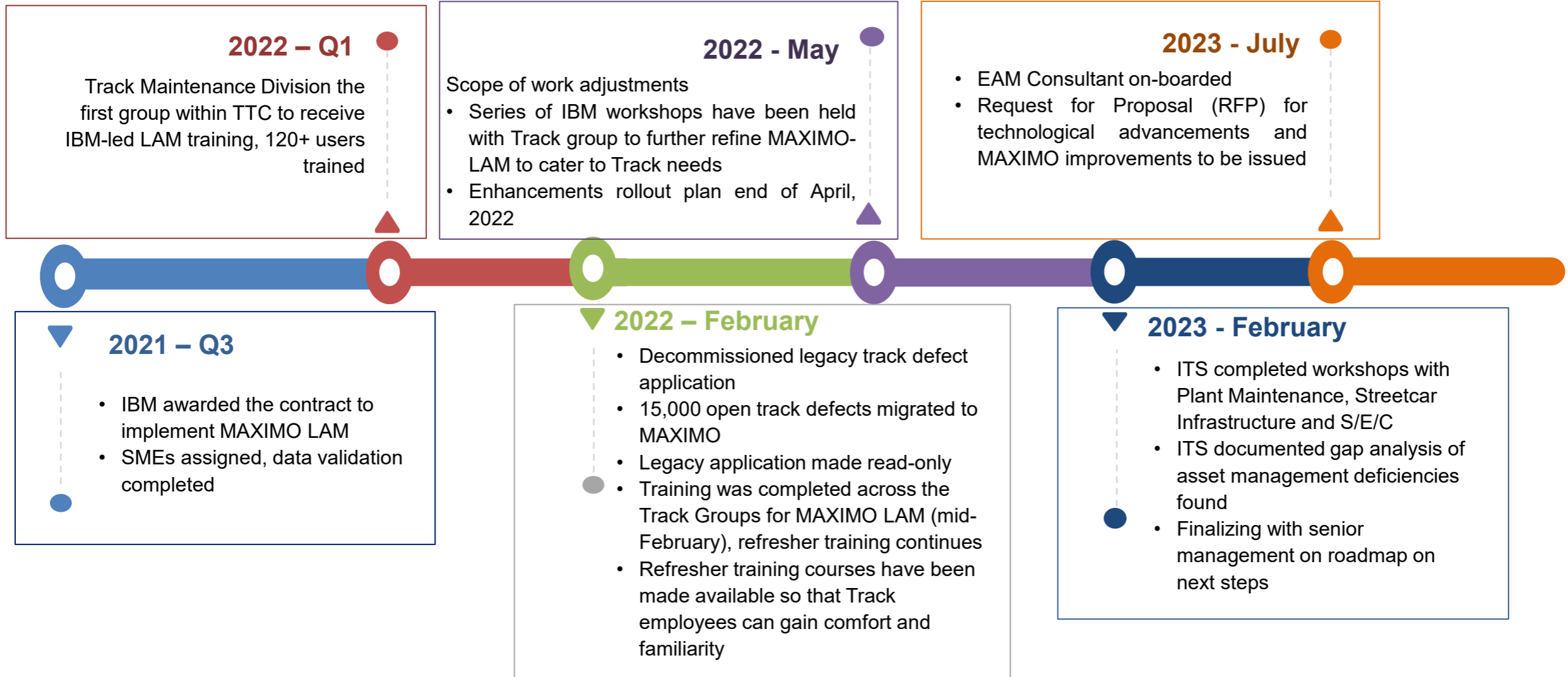
## Technology Enablement



- Implementation of a standard enterprise asset management information system throughout the TTC (i.e., Maximo) and decommission legacy systems (i.e., IFS, MOWIS, Excel spreadsheets)
- Migrate asset master data into the Maximo asset management system and enable Geographical Information System (GIS) mapping for Linear Assets.
- Enable asset maintenance planning and work management processes for each asset class
- Implementation of asset accounting and asset cost controlling within TTC's enterprise financial system (i.e., SAP)
- Implementation of reporting and asset management dashboards

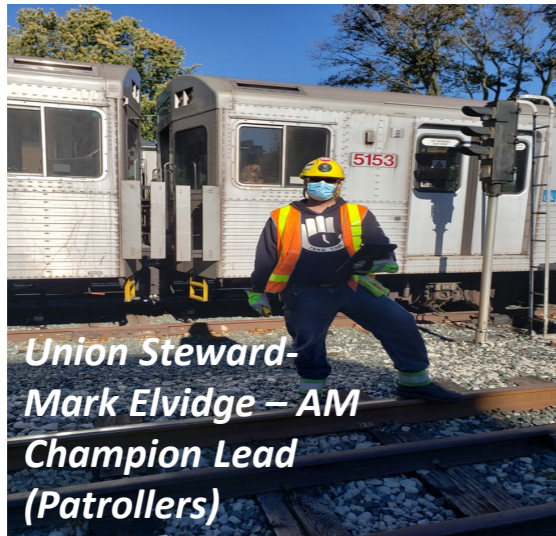


# MAXIMO Implementation



# MAXIMO Implementation LAM Training

## Phase 1 Identification of AM Champion (Golden Apples)



**FACE TO FACE  
LEARNING**

## Phase 2 In-person Training With User Guides



## Phase 3 e-Maximo LAM Modules



**eLEARNING**



# On-going AM 2023 Initiatives

- Continuous MAXIMO-LAM in-house training for Track Maintenance
- Review of Asset Maturity Roadmap with EAM Consultants
- Assessing requirements for resources in AM
- MAXIMO technological advancements
- Change management

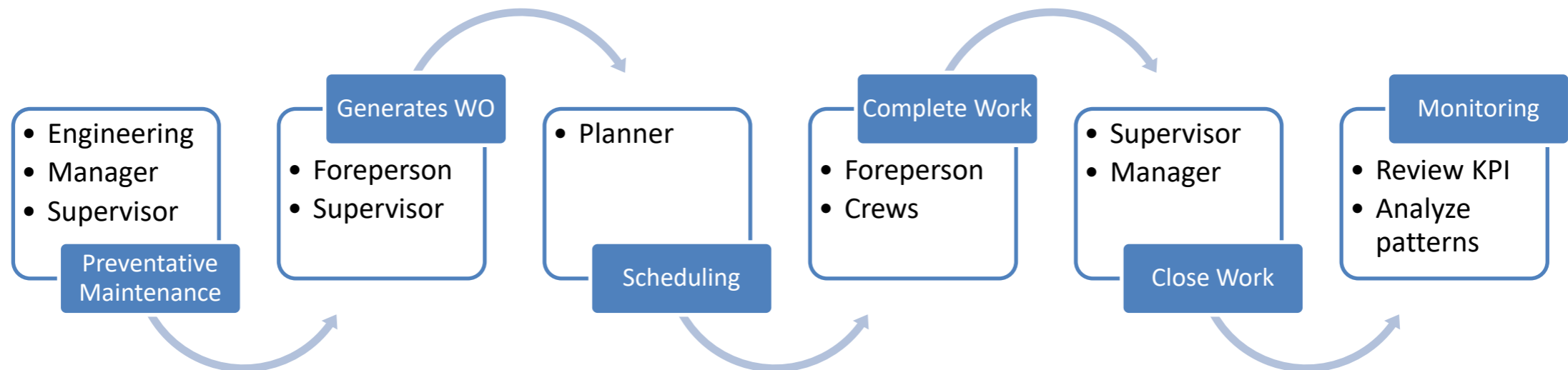


# RACI: MAXIMO

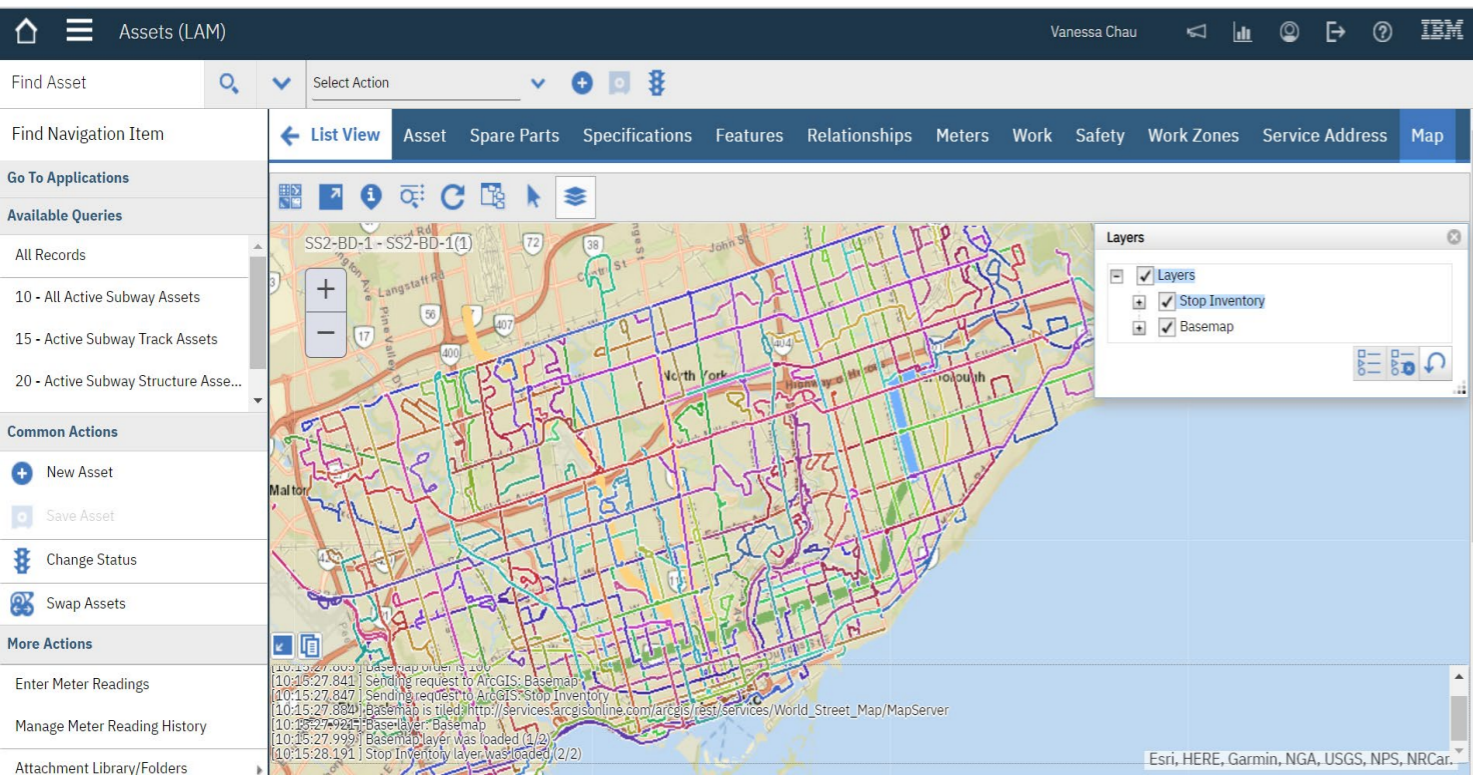
## Maintenance Planning

- An attempt to standardize our business across our division and across the TTC to simplify our MAXIMO security profiles
- Challenge - different people have done things differently and a common approach to PMs, service requests and defect response is needed

### Preventative Maintenance Concept:



# Data Sharing



- Upcoming decision points on next steps across enterprise on ultimate GIS solution but G Tech currently approved and functional in Overhead Engineering

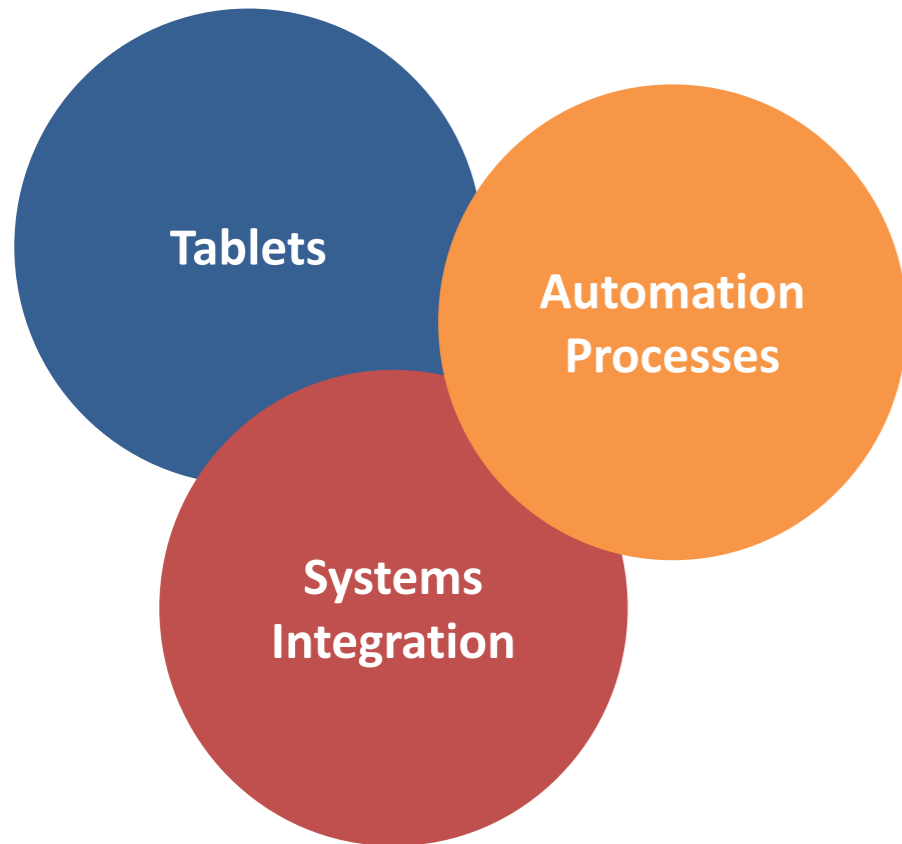
- Needs of an enterprise GIS solution:
  - Interface with various utility companies
  - Seamless integration of GIS solution with MAXIMO LAM (proposed in-house integration)

## Future expansion possibilities:

- Coordinate Data sharing with other Agencies.
- Further integration with real time info gathering.
- Integration with LiDAR and asset condition scans
- Ensure change management and training features implemented



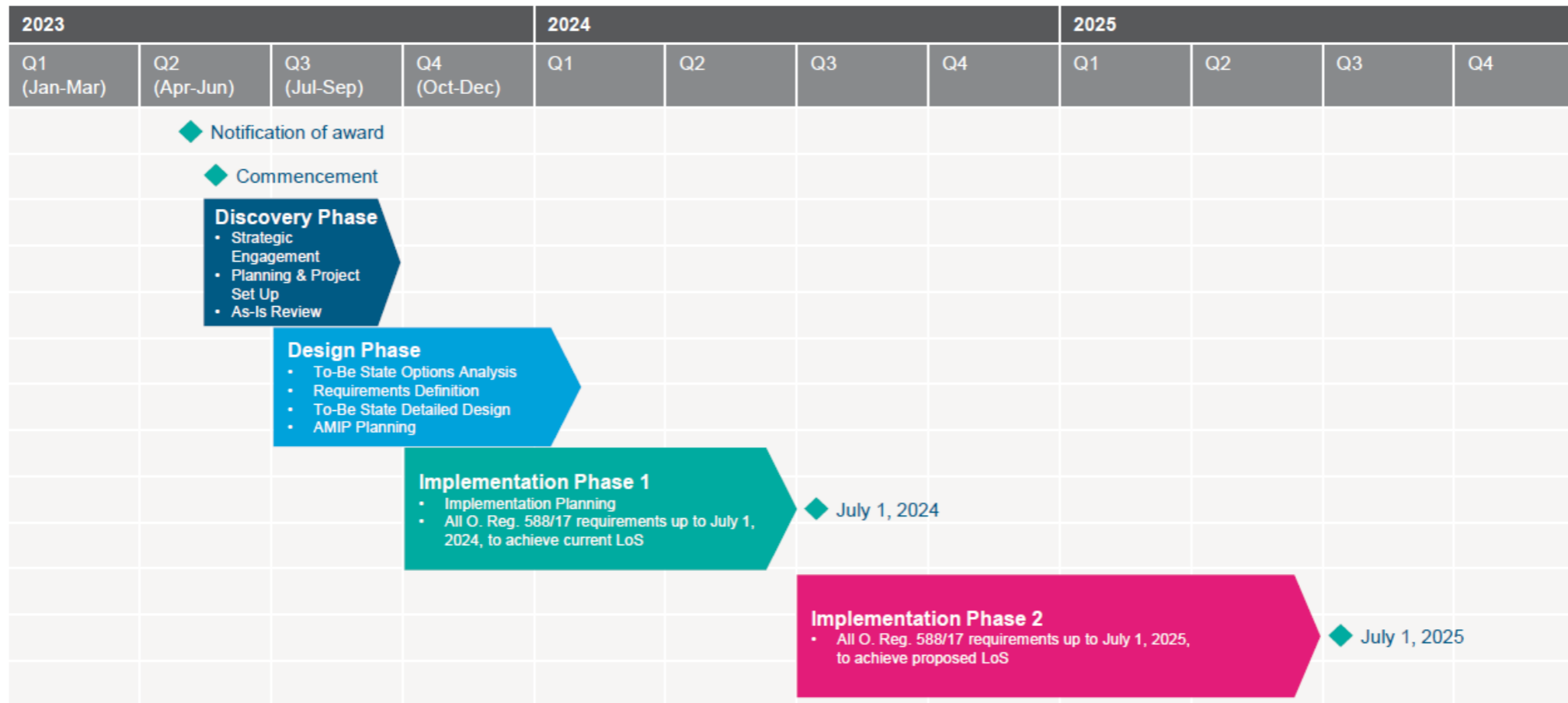
# Technology Enablement



- Plant Maintenance and Streetcar Infrastructure have access to tablets to review/update/close work orders in real time while on site
- Track & Structures – deployment of tablets to improve real time accessibility of work orders through in-house support
- Vendor to provide Signal / Electrical / Communication with Maximo Mobile support
- Improvements required by all departments –
  - Complete asset upload into MAXIMO
  - Automation of work orders for scheduled maintenance
  - Integration of MAXIMO and GIS

# Enterprise Governance & Execution

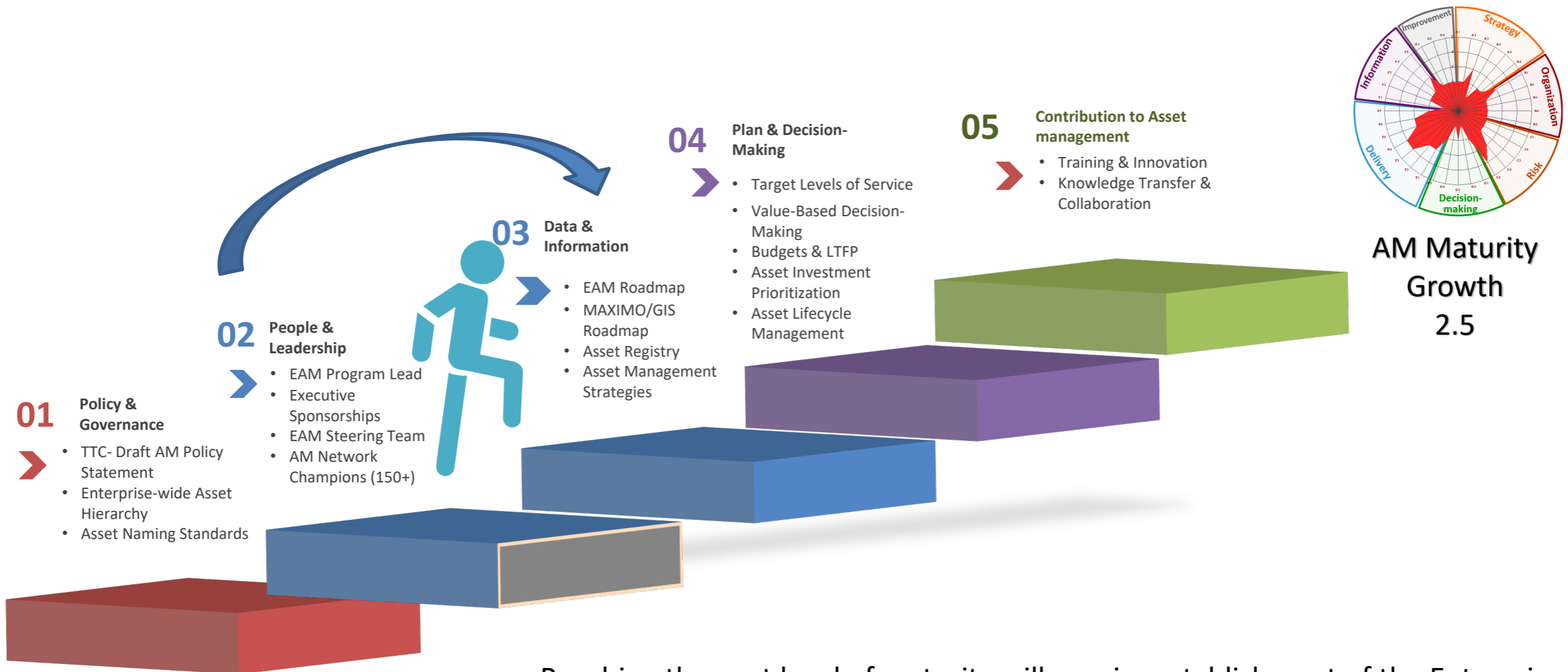
- ✓ Support of Atkins as EAM Consultants to meet July 2025 O Reg
- ✓ Introduction of Enterprise Asset Management Department led by Sam Sidawi







# Asset Management Maturity Assessment



Reaching the next level of maturity will require establishment of the Enterprise



# Training – Global Institute of Asset Management

## Training – AM Network Champions

### AM Training Curriculum – Benefits

- Provides Asset Management Champions within the TTC with more extensive knowledge and understanding of Asset Management
- Primes the team with tools required to develop Asset Management Plans

Round 1 – November 2021 – AM Steering Team – Foundations Training

Round 2 - March 2022 – AM Network Leads – Global IAM Certificate Training

### IAM Training Course Hierarchy



# RACI: MAXIMO

## Maintenance Planning

<b>Role</b>	<b>General function</b>
<b>Quality Assurance/Quality Control Inspector</b>	Inspects and creates defects
<b>Maintenance/Preventative Maintenance (PM) Crew</b>	Completes Preventative/ Corrective/ Emergency Maintenance
<b>Foreperson</b>	Oversees and coordinates on site work/ Completes work order/ Creates work order from defect
<b>Supervisor</b>	Oversees and coordinates work/ Closes work order
<b>Managers</b>	Oversees department/ Reviews data for improvements
<b>Labor Planner (Credentials)</b>	Schedules courses/ Updates credentials/ Maintains a labor schedule
<b>Work Planner (Scheduler)</b>	Coordinates track access and schedules work
<b>Engineering/Technologist</b>	Manages PM module/ Data analyzing/ Material management and standards
<b>Data Custodian/Owner - EAM</b>	Data Management



# AM Guiding Principles

## Toronto Transit Commission Agency Strategic Asset Management Policy (Guiding Principles)

**Purpose**  
Under O.Reg. 588/17, Asset Management Planning for Municipal Infrastructure (the "Regulation"), the Toronto Transit Commission (TTC) is required to prepare a strategic asset management policy (the "Policy") which meets the criteria laid out in the Regulation.

The purpose of this Policy is to guide the TTC in the development of its asset management plan and to set out how the TTC will improve its asset management planning practices over time in order to better identify infrastructure challenges and opportunities as well as finding innovative solutions.

**Asset Management Standard**  
The TTC has adopted the International Standards Organization (ISO55000) definition of asset management. ISO55000 is the global standard with respect to physical asset management. The TTC views asset management as, "the coordinated activity of an organization to realize value from its assets" (Source: ISO55000).

The purpose, role, vision and strategy for the TTC's Policy along with its guiding principles adopted from the Infrastructure for Jobs and Prosperity Act, 2015 are as follows:

**Purpose** To generate outstanding value for our customers  
**Role** To be the leader in transit for Canada  
**Vision** To ensure sustainability of TTC services through effective stewardship of assets and the management of risks while optimizing asset value and assurances of evidence-based decision-making  
To use data-driven optimized value based decisions to improve safety, reliability and capacity of our assets to deliver exceptional service for our customers and stronger partnerships with all stakeholders  
**Strategy** Integration of asset management plans with budgets and long term financial plans  
Coordinate asset management planning for interrelated infrastructure assets with separate ownership structures by pursuing collaborative opportunities with related organization and jointly-owned municipal bodies, wherever viable and beneficial

Holistic and integrated	Safety and reliability	Value based decision-making	Customer focus	Sustainability
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Guiding principles of asset management planning adopted from the Infrastructure for Jobs and Prosperity Act, 2015 as follows:

<b>Safety and reliability</b> Maintain all assets and technologies in a state of good repair to ensure they are safe and reliable	<b>Value based decision-making</b> Utilize data and a formal, consistent and methodical system to drive decisions and demonstrate value for money	<b>Sustainability and resilience</b> Manage our assets to achieve sustainable service delivery while considering climate change mitigation and adaptation
<b>Holistic and integrated</b> Take a holistic integrated process approach to lifecycle management, in alignment with land-use planning framework	<b>Compliance</b> Demonstrate compliance of everything we do with relevant regulation, legislation, standards and industry codes including O.Reg. 588/17	<b>Customer focused and continuous improvement</b> Driving continuous improvement and innovative asset management solutions for our customers

Our most critical asset remains our employees. Through coaching, training, the application of integrated innovative technologies, and improved processes, we shall ensure our workforce's ability to identify and meet asset management needs, and to deliver our customer service and value for every fare and tax dollar spent at TTC.

  
Rick Leary  
Chief Executive Officer

**"The coordinated activity of an organization to realize value from its assets" Source: ISO 55000**

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## O. Reg. 588/17: ASSET MANAGEMENT PLANNING FOR MUNICIPAL INFRASTRUCTURE

City's Policy and TTC's guiding principles to facilitate development of our Infrastructure Asset Management Plan



# Risks

#	Title	Type	Owner	Current Status	Risk and Impact if not Mitigated	Mitigation Plan & Result/Impact	Mitigate by Date	CM
1	Managing Change	Performance, Cost	Head, T&S	●	<ul style="list-style-type: none"> <li>Delayed adoption of MAXIMO-LAM program</li> <li>Various levels of support from field employees</li> </ul>	Obtaining change management consultant at Enterprise level for support in I&E and Vehicles Groups* Improved communication, support and buy-in  <i>*Change management is a continuous process</i>	11/4/22 Consultant onboard	●
2	Adoption in Track	Performance, Cost	Head, T&S	●	<ul style="list-style-type: none"> <li>Various levels of comfort adopting new processes and a new system, can cause delay in rollout</li> </ul>	Continuous training provisions, learning modules, computer-based training, leveraging senior SMEs for driving local level change, thinking at an enterprise level	May, 2022	●

**Current Status:** ● Low ● Medium ● High

**Capacity to Mitigate (CM):** ● Capabilities meet requirements ● Improvement in capabilities is required ● Capabilities don't exist or are not yet established

