Corporate Asset Management Plan 2025

MISSISSAUGA

Table of Contents

EXECUTIVE SUMMARY 6
- Mississauga's Current State 4
- Mississauga's Funding Challenges 6
- Advancing Mississauga's Asset Management Program 7

INTRODUCTION 3
- Our Community 9
- Provincial Reporting Requirements 9
- State of the Infrastructure 13

FINANCING STRATEGY 22
- Financial Management & Funding Sources 25
- Infrastructure Gap 28
- Approaches to Closing the Gap 31

CONTINUOUS IMPROVEMENT & CONCLUSION 32
- Continuous Improvement 33
- Conclusion 36

NAVIGATING THE PLAN 37
- State of the Infrastructure (SOI) 38
- Levels of Service (LOS) 41
- Demand Drivers 43
- Risk Management 43
- Lifecycle Management Strategy 45
- Financing Strategy 48
- Continuous Improvement 48

GLOSSARY 49

Appendix 1: All Proposed Levels of Service Measures 51

DETAILED AM PLANS 71
- STORMWATER ..... A
- ROADS ..... B
- FACILITIES PLANNING & DEVELOPMENT C
- PARKS, FORESTRY & ENVIRONMENT ..... D
- TRANSIT (MIWAY) ..... E
- FIRE & EMERGENCY SERVICES ..... F
- INFORMATION TECHNOLOGY ..... G
- CORPORATE FLEET ..... H
- RECREATION & CULTURE I
- GENERAL GOVERNMENT (PRINT & MAIL SERVICES) ..... J

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Executive Summary

Executive Summary

As stipulated by Ontario Regulation 588/17 of the *Infrastructure for Jobs and Prosperity Act 2015*, the City of Mississauga has prepared its 2025 Corporate Asset Management (CAM) Plan to encompass the City's infrastructure assets, and to expand upon its 2024 iteration by including proposed levels of service where possible assets owned by other municipalities or corporations have not been included in the City's plans.

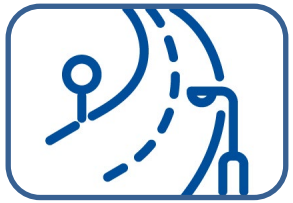
The City's CAM Plan serves as a strategic, tactical, and financial document ensuring the activities, resources and timelines required for municipal infrastructure are met, while balancing costs, opportunities, and risks against the desired performance of assets.

View of Mississauga City Hall
from Community Commons Park

The purpose of a CAM Plan is to:

- Comply with the legislative requirements of O.Reg. 588/17
- Support funding applications to the federal and provincial levels of government
- Inform future business cases for infrastructure investments to support municipal services now and for future growth
- Understand the current state of asset management systems (i.e., documents, processes and procedures, resources, framework, tools, technologies, data, and the assets) and inform future workplans for continuous improvement in asset management
- Establish proposed levels of service (LOS) metrics with a clear line of sight to strategic goals and objectives
- Support asset lifecycle management strategies and sustainability while addressing service needs
- Quantify the current and proposed infrastructure gap and develop approaches to address shortfall
- Implement AM practices to manage the infrastructure gap, accommodate future growth and sustain desired service levels

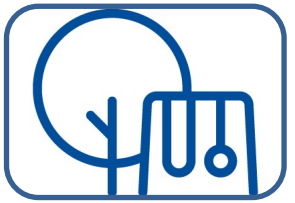
There are 10 detailed Service Area plans developed within the CAM Plan. They are as follows:

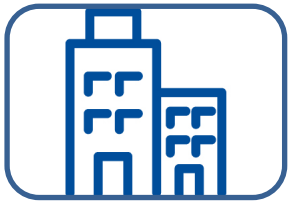

Roads

Stormwater

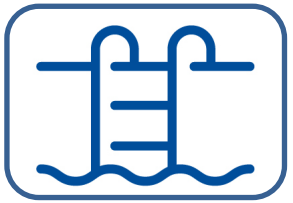
Corporate Fleet

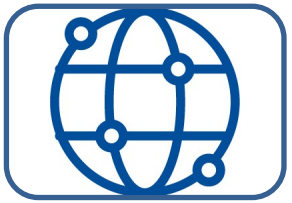
Transit (MiWay)

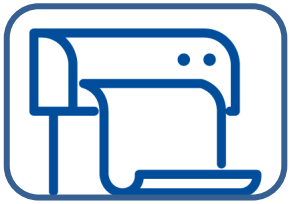

Parks, Forestry & Environment


Facilities Planning & Development

Fire & Emergency Services


Recreation & Culture


Information Technology


General Government (Print & Mail Services)

As with every asset management plan, it portrays a snapshot-in-time based on the best and most reliable data available. The 2025 Corporate Asset Management Plan is based on 2023 year-end asset data, unless otherwise stated, and relies on the 2024-2033 Capital Plan and 2024-2027 Operating Plan for its financial analyses.

Mississauga's Current State

As assets age over time, it is important that this infrastructure is maintained to minimize disruption in providing services. This includes conducting proactive lifecycle activities such as regular inspections, performing condition assessments, maintaining assets in a State of Good Repair (SoGR), and planning for eventual replacement when assets no longer function as intended or fail to provide the desired level of service.

For this iteration, the City's asset portfolio has a current replacement value of $18.8 billion as shown in Figure 1. The methodology used to calculate replacement value is identified in each detailed plan, with the majority using the latest tender or market prices.

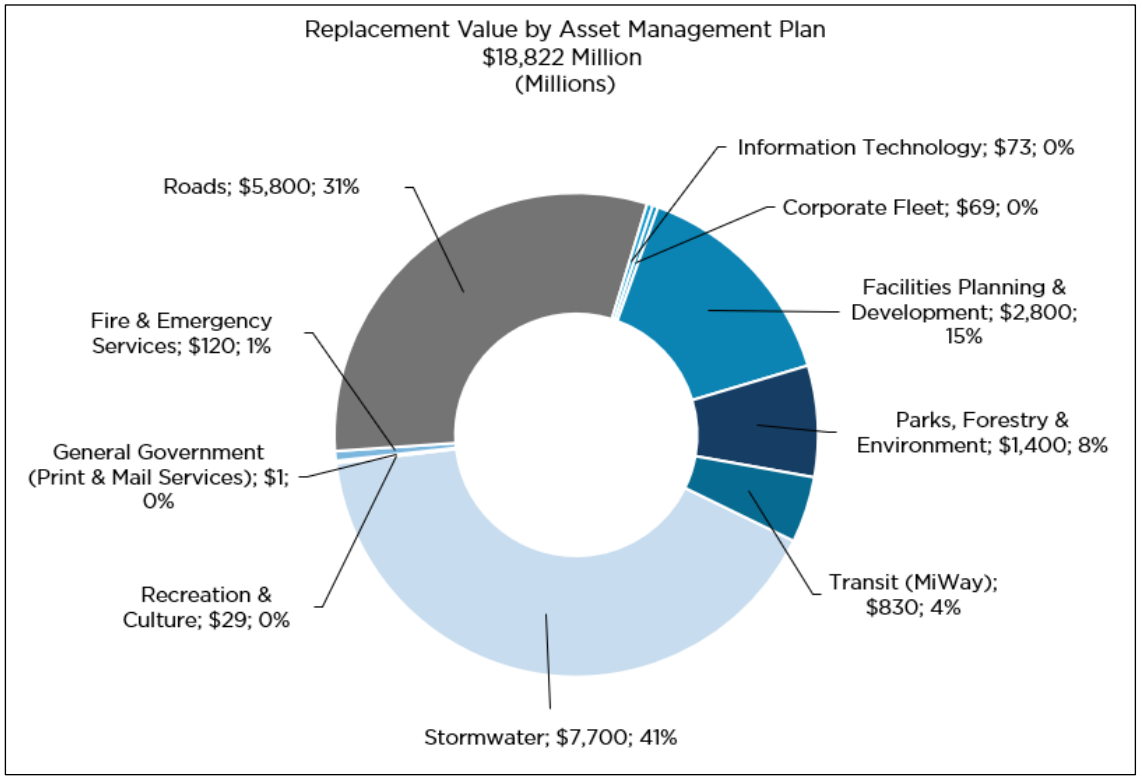
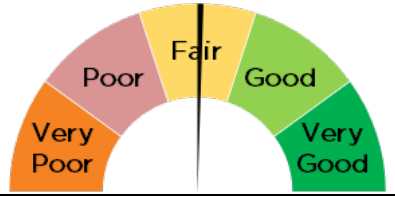


Figure 1: Replacement Value by Asset Management Plan

In addition, the City utilizes a five-point condition rating scale to assess the state of its infrastructure. The average condition of all assets within each asset management plan ranges from Fair to Good as illustrated in Table 1. For many assets, age is used as a proxy for condition. However, age may not always be the best determinant of performance or condition, which is why performing regular condition assessments has been identified as a key continuous improvement item for all Service Areas.

Table 1: Summary of Average Condition of Assets

Roads 	Stormwater	Facilities Planning & Development
Corporate Fleet	Parks, Forestry & Environment	Information Technology
Recreation & Culture	Transit (MiWay)	Fire & Emergency Services
	General Government	

Mississauga's Funding Challenges

Building and maintaining infrastructure is one of many key strategic goals in the City of Mississauga's Strategic Plan, as well as a top priority in the City's Asset Management Plans. These goals and objectives are achieved by applying sound asset management practices, inventorying what the City owns, conducting regular inspections, prioritizing work needs, preparing appropriate asset renewal projections and programs to address asset renewal needs, and monitoring and reporting on projected asset conditions.

As such, the City included a three per cent infrastructure levy in the 2024 budget to primarily provide funding to maintain and replace its critical infrastructure. The City also relies on the stormwater charge to provide funding to maintain and replace its stormwater infrastructure. The City receives some infrastructure funding from the federal and provincial governments.

An organized and consistent approach to Asset Management (AM) across the City ensures that the City continues to focus its limited resources where they are most needed. However, current funding levels are not sufficient to meet current service level needs for State of Good Repair (SoGR), and as such, the City has a current average annual infrastructure gap of $123.1million for the next 10 years (2024-2033 forecast).

In addition, staff have identified proposed or target levels of service in this iteration of the plan, some of which pose additional budget and/or resource pressures.

Aerial night view of City Hall

Advancing Mississauga's Asset Management Program

One of the goals of the asset management plan is to identify and document the City's current asset management practices in addition to recognizing areas for improvement. In doing so, it was identified that asset management activities were being performed and reported by each Service Area, but there lacked a standardized approach to asset management as an organization.

A Corporate Asset Management (CAM) office was established within the Finance Division to implement provincial legislative requirements across the organization and develop a standardized approach in the application of asset management principles across all service areas. The benefits to this approach include standardizing asset condition reporting metrics, developing a single source of information for all City assets, consolidating asset information at an organizational level, and providing guidance to leadership and Council for making funding investments.

The City's current asset management program was assessed, using a maturity assessment questionnaire, adapted from ISO 55000 and the International Infrastructure Management Manual (IIMM), through workshops with City staff.

The questionnaire assesses each Service Area's maturity as it relates to its AM processes, roles and responsibilities, frameworks and strategies, and much more.

Overall, the City is at an intermediate level of asset management maturity. Continuous improvement (CI) actions have been identified within each of the detailed asset management plans in order to improve the City's asset management program and advance its level of maturity. Continuous improvements in asset management practices will advance the City's ability to provide more detailed information on all City assets at the organizational level. It will provide enhanced clarity on operational and funding priorities, identify any potential cost savings, and ensure right-time investment opportunities. The current collaborative, interdepartmental AM governance structure ensures the consistent implementation of AM practices across the organization and allows the City to be well positioned for future AM initiatives.

Asset Management Maturity Assessment (adapted from IIMM and ISO 55000)

Introduction

Our Community

The City of Mississauga is a young and vibrant city with a diverse community of 717,961[1] people that call it home. It is the seventh-largest city in Canada, located just a 30-minute drive from downtown Toronto and a 90-minute drive from the U.S. border. As the City continues to grow, advance on its priorities, and invest in critical infrastructure, Mississauga becomes a place where companies large and small want to locate. This provides local jobs and stimulates economic investment. Mississauga's population and employment growth forecasts are expected to remain strong over the next 25 years. Mississauga has sufficient land to accommodate projected growth to 2041 and beyond.

Provincial Reporting Requirements

The City's assets play an integral role in service delivery across the entire organization. A formal asset management governance structure has been established to deliver a Corporate Asset Management (CAM) Plan that addresses provincial requirements contained in O. Reg. 588/17 over a phased time frame. The following AM governance structure is approved and supported by senior leadership. The City established a Corporate Asset Management (CAM) Office that is responsible for the City's Strategic AM Policy, providing AM guidance and ensuring a coordinated and consistent approach for AM Plans across the organization.

In 2012, the Province published *Building Together: Guide for Municipal Asset Management Plans*. The City at that time prepared asset management plans for buildings, stormwater management, linear transportation, and transit. The City of Mississauga participated in provincial consultations; a report proposing changes to the legislation was adopted by Council on July 5, 2017, and comments were submitted to the Province. Regulations were amended based on feedback by stakeholders, and the Province enacted O. Reg. 588/17 – Asset Management Planning for Municipal Infrastructure under the *Infrastructure for Jobs and Prosperity Act (IJPA), 2015*.

The Regulation provides standard requirements for municipal asset management planning and supports asset resiliency and sustainability. The regulation came into effect on January 1, 2017. The Regulation requires each Ontario municipality to prepare a Strategic AM Policy and publish AM plans approved by their Councils in accordance with a set of scheduled timelines as shown in Table 2 below.

[1] Based on 2021 Census data.

Table 2: O. Reg. 588/17 Asset Management Timelines

Due Dates	AM Requirements	Status
July 1, 2019	• Strategic AM Policy that articulates guiding principles, commitments, roles, and responsibilities. Five-year review cycle	Completed June 2019
July 1, 2022	• Prepare CAM Plan for core infrastructure assets (i.e., roads, structures and stormwater), and include asset inventories, age, condition, current customer and technical Levels of Service (LOS), lifecycle costs and strategies, asset demands from growth and continuous improvement actions	Completed September 2021
July 1, 2024	• Prepare CAM Plan to include all City infrastructure assets, and include asset inventories, age, condition, current customer and technical Levels of Service (LOS), lifecycle costs and strategies, asset demands from growth and continuous improvement actions	Completed June 2024
July 1, 2025	• Council-approved CAM Plan for all City assets indicating the proposed service levels for the following ten years, including the financial strategy to maintain assets at the approved level of service • Strategic AM Policy five-year review	In Progress
July 1, 2026, and Onwards	• Annual AM progress update to Council on or before July 1 of each year • Annual refresh of CAM Plan	Annual update to Council

Strategic Planning Alignment

The City is regularly engaged in a range of planning processes designed to meet strategic objectives, comply with regulations, and communicate the approach to planning for successful outcomes on multiple initiatives.

The following is a description of other City plans and documents that need to align with the CAM plan:

- The City's Strategic Plan, Our Future Mississauga, directs the shape of the City in all areas including land-use planning, infrastructure, service delivery and asset management. It identifies the Vision for the Future supported by five Strategic Pillars for Change: move, belong, connect, prosper, and green
- The Official Plan – The CAM Plan incorporates infrastructure related to land-use policies for long-term growth and development
- Budget and Business Plan – The CAM Plan identifies the infrastructure needs, service levels, policies, processes, and budgets
- Master Plans – The CAM Plan uses goals and projections from master plans to align better decision-making
- Regulations – The AM plans must follow government regulations
- By-Laws, standards, and policies – The CAM Plan will influence policies and by-laws related to asset management practices and industry standards

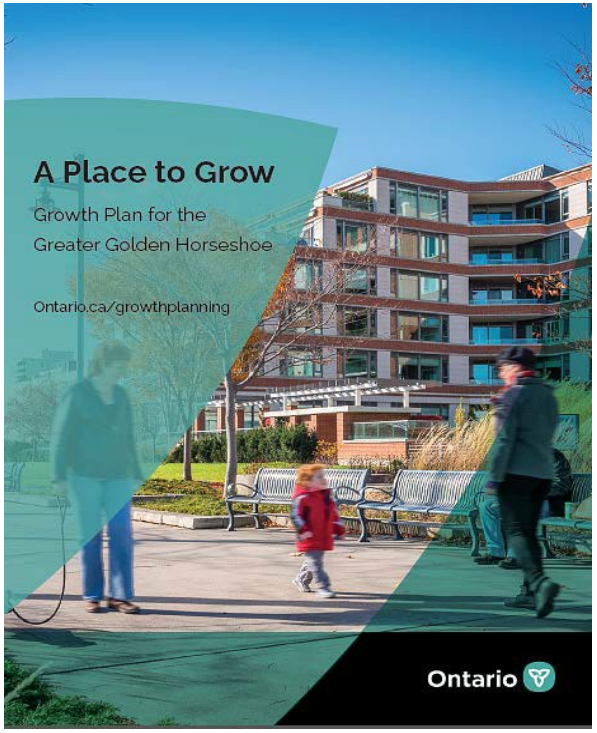
The Five Pillars in the City's Strategic Plan

Alignment with the Golden Horseshoe Growth Plan

The Province enacted the *Places to Grow Act, 2005* and subsequently adopted a framework to build strong and prosperous communities by managing growth within the Greater Golden Horseshoe Area (GGHA). The O. Reg. 588/17 is aligned with the GGHA to ensure infrastructure required as a result of growth, is planned and managed to optimize infrastructure during the land-use planning process for population and employment growth.

The Region of Peel's population, which includes the City of Mississauga, the City of Brampton and the Town of Caledon residents, is forecasted to be almost 1.8 million in 2031 and will reach almost two million residents by 2041[2]. The Region of Peel projects the City of Mississauga's population to reach 842,000 by 2031 and 920,000 by 2041. The number of people employed in the City is projected to reach approximately 535,000 by 2031 and 565,000 by 2041[3].

To plan for new infrastructure, the City updates its growth requirements plan every five years in preparation of the City Development Charge Background Study and By-law. Development charge revenues collected during the building permit process fund the construction of growth-related capital infrastructure required to maintain service levels for new residents and business employment in the City.



[2] A Place to Grow – Growth Plan for the Greater Golden Horseshoe, May 2019, Schedule 3, Employment in the Region of Peel
[3] Growth Forecasts Draft Endorsed for Consultation 2016-2041

State of the Infrastructure

The City of Mississauga was incorporated in 1974 with the amalgamation of the Town of Mississauga, and villages of Port Credit and Streetsville together with portions of the townships of Toronto Gore and Trafalgar. The amalgamation consolidated existing infrastructure assets of various types to serve as the foundation for the newly established City. Since then, Mississauga has changed rapidly from a city where there was continuous development of large tracts of greenfield, to a city that is experiencing intensification through high-density development.

As a result, the City's infrastructure grew significantly over a relatively short period of time to accommodate Mississauga's rapid growth into Canada's seventh-largest City. The City's infrastructure is, on average, in Fair to Good condition. Some assets are relatively young in their lifecycle whereas other assets are reaching the end of their lives and need replacement, refurbishment, or disposal. A solid asset management plan addresses the various needs of all critical infrastructure.

Assets Included in the Plan

This CAM Plan includes all infrastructure assets that are owned and managed by the City as of 2023 year-end. However, some assets have been excluded from this iteration due to low data confidence and/or pending ownership. Excluded assets are identified in each detailed asset management plan. The City has captured and categorized its asset data using the following hierarchy:

- Asset Management Plan - the highest level of asset category, typically representative of a service group
- Asset Class - aggregate of municipal infrastructure assets that provide the same type of service
- Asset Type - grouping assets with common characteristics that distinguish those assets as a group
- Asset Sub-Type – a granular breakdown of asset types based on unique attribute information

Elements of the CAM Plan

The City's CAM Plan includes the following components:

- **State of Infrastructure** – Summary of City assets with a breakdown of quantities, current replacement values, condition and age
- **Levels of Service (LOS)** – Framework of customer and technical LOS metrics for City services as mandated by O.Reg. 588/17 and/or

determined by staff
- **Demand Drivers** – Identification of demand drivers impacting service delivery and sustainability; alignment with municipal strategic plans and growth plans
- **Lifecycle Management Strategy** – Identification of lifecycle activities, costs, and risks associated with maintaining current service levels and achieving proposed levels of service where established
- **Financing Strategy** – Identification of various funding sources and infrastructure gap based on available funding and funding needs for 10-year forecast (2024-2033) for current and/or proposed levels of service delivery
- **Continuous Improvement** - Identification of actions for continuous improvement to City AM program

Data Sources for Asset Management Plans

The information within this CAM Plan comes from a combination of different City system sources including:

- Infor (Hansen) Computerized Maintenance Management System (CMMS) – used extensively for the operational management of linear and fixed assets
- CityWide Asset Manager Module (Public Sector Digest) – utilized for financial reporting on Tangible Capital Assets (TCA)
- SAP software – runs the business data platform to store and retrieve financial data as requested. This data helps with business planning and decision-making
- Questica – a financial tool used to track capital and operating budgets and staffing labor and benefit costs
- Environmental Systems Research Institute (ESRI) software – the City leverages geographic information systems to collect, organize and integrate data to improve asset management practices
- RoadMatrix Pavement Management System (RPMS) – stores the road location as well as geometric and pavement condition data. It is an analytical tool used to identify road pavement strategies and forecasts for preventative maintenance, renewal, and reconstruction timing
- Bridge Total Management System (TMS) – stores bridge and culvert location, geometric, component information and condition information collected through a biennial inspection program in accordance with the Ontario Structural Inspection Manual (OSIM). It is an analytical tool used to provide management strategies and forecasts. It is also used for inspection, renewal and replacement of structures or their individual components
- Trapeze EAM & Hastus – software tools that specialize in intelligent transportation systems and manage transit assets, including bus timetabling, resource optimization, and work order management
- FASTER – Fleet Management Information System that allows staff to track vehicles and equipment, issue and manage work orders, manage parts inventory and purchasing, and

track fuel consumption and other associated costs
- Vanderweil Facility Advisors (VFA) – houses an inventory of all City buildings, and is used to support budget modeling, requirements forecasting and capital planning for the Facilities Planning & Development portfolio
- Excel and SharePoint – for assets that do not belong in any dedicated asset management software
- Precise ParkfolioNeo is the solution that is provided by the Municipal Parking vendor, containing all pay & display machine history and data
- Streetlight Control Monitoring System is used to control light levels and monitors the status of streetlights
- Avigilon Control Centre Video Management Software is designed to provide easy and secure remote access to the CCTV Traffic Monitoring cameras
- WinFuel is a monitoring system that tracks fueling and fluid information for fleet assets, and automatically integrates with the FASTER system
- Service Now is a new software solution that IT acquired to store, manage, track and report on the IT inventory
- ACTIVENet is a software solution that manages facility, registration and memberships. It is also used as a reporting tool for some culture assets

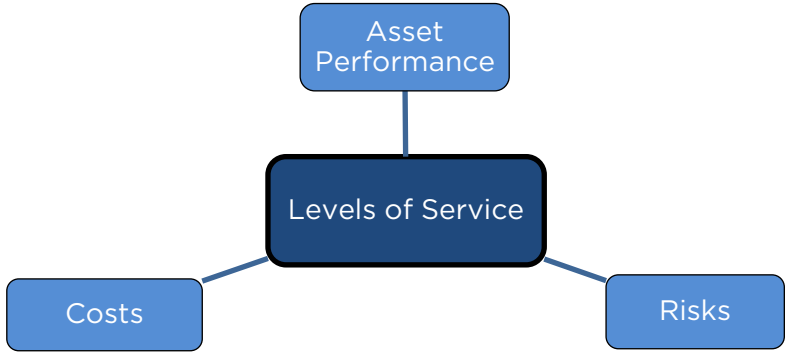
CAM Plan Assumptions and Limitations

A detailed list of assumptions and limitations are identified in each asset management plan. In addition, every asset class receives a data quality index (DQI) to indicate the level of data confidence and reliability available. The DQI is explained in more detail in the Navigating the Plan section below.

Levels of Service

Mississauga delivers over 200 services which include public transit, libraries, recreation programs, snow clearing, parks, street tree maintenance, fire and emergency services, and much more. One of the fundamental priorities for City business planning is to "deliver the right services" to residents, businesses, and visitors. This involves optimizing the utilization of assets to achieve service levels that reflect a balance between stakeholder expectations and fiscal responsibility.

In other words, to provide the desired level of service performance, staff must constantly balance the costs of maintaining assets in a state of good repair with the risks associated to the long-term sustainability of the City.



Levels of Service Trade-Off

In compliance with O.Reg. 588/17 for the July 1, 2025, requirements, the City has expanded upon its established levels of service from the last plan in 2024, by identifying proposed or target service level performance measures, where possible. Staff determined their proposed levels of service by leveraging existing or forthcoming legislative requirements (e.g., Minimum Maintenance Standards, Ministry of Transportation, Building Code Act), target service levels identified in other plans (e.g., provisions in Future Directions master plans, Climate Change Action Plan), and best industry practice in alignment with the City's strategic goals.

Along with determining proposed levels of service, staff identified the associated lifecycle activities and costs to achieve those targets, the risks, and any funding shortfalls based on projected available funding.

Any identified funding shortfalls will be included in the Business Planning and Budget process for Council's consideration, in order to achieve the proposed levels of service.

Demand Drivers

There are many internal and external drivers that affect the City's ability to achieve and sustain its desired levels of service. Some examples of demand drivers include:

- Population growth and demographic changes
- Regulatory pressures and changes
- Aging infrastructure
- Technological advancements
- Funding and resource limitations
- Climate change

It is important to understand how these drivers are projected to change in the future, how they may impact the use of assets and service delivery, and to have a demand management plan to adapt to or mitigate the consequences associated with these drivers.

Integrating Climate Change into Asset Management

Climate change is one of the most consequential demand drivers on a global scale, and the City of Mississauga is committed to working with the community across all levels to address the risks climate change presents. Within the context of asset management, climate change is a threat to sustainable service delivery as it amplifies the risk of asset failure, reduces asset service life, and can increase the cost of managing risk and delivering levels of service.

Proactive risk and asset management will improve the overall resilience of asset systems. This Plan integrates climate change within the context of asset risks, costs, and service objectives with the intention of developing an integrated and cost-effective set of actions to maintain and enhance levels of service as a result of changing climate conditions.

The Mississauga Climate Change Action Plan was developed in 2019 and outlines the City's commitment to climate change **mitigation** and **adaptation**. It identified concrete actions and steps to take to improve the City's resiliency and sustainability.

In 2023, a climate change risk and vulnerability assessment (CCRVA) was undertaken to better understand the hazards and risks associated with climate change as it relates to specific assets. The assessment identified opportunities and actions to increase resilience and capacity to withstand and respond to current and future climate events. As staff continue to quantify the effects of climate change and determine the costs associated with managing those climate change hazards/risks, they will integrate the outcomes into their asset management programs and levels of service framework.

Lifecycle Management Strategy

Lifecycle management encompasses a wide range of practices and activities associated with the holistic management of assets and the services they provide. From the early planning stages to an asset's disposal, these strategies are determined by a range of planning processes including asset management planning, master planning, and strategic planning exercises that consider the internal and external drivers for service delivery outcomes. A key objective is to effectively deliver the desired levels of service at the lowest feasible cost while managing the risk and performance of the asset.

Lifecycle Needs vs. Budget

As per O. Reg 588/17, a 10-year forecast of the lifecycle needs to be performed to maintain current level of service and/or achieve proposed levels of service is required for each asset class. Figure 2 shows the total 10-Year Lifecycle Needs vs. Budget for all detailed Service Area plans.

The lifecycle needs are categorized into different activity types that includes non-asset solutions, operations & maintenance, renewal & rehabilitation, replacement, acquisitions/expansions/rebuilds, and disposals. These activity types are described within the Navigating the Plan section 45below.

Some of the assumptions that govern the Lifecycle Management Strategy section include the following:

- Lifecycle needs are forecasted based on staff expertise and available reliable data (e.g., remaining useful life, physical condition, third-party recommendations, etc)
- The costs of any non-asset solutions, acquisition/expansions/rebuilds, and operations & maintenance lifecycle activities are assumed to balance to the budget
- 10-year Operating Budget consists of the 2024-2027 Operating Budget and assumes the annual budget for Years 5-10 to be the same as Year-4.
- 10-year Capital Budget from the 2024-2033 Capital Budget Forecast
- All values are shown in 2024 dollars and do not include inflation

Lifecycle activities only include asset-related operating and capital expenditures. Examples of excluded expenditures include land acquisitions and overhead costs. A unique list of excluded projects is identified in each detailed Plan.

Most of the lifecycle activity needs have been assumed to equal the budget except renewal, rehabilitation, and replacement. Due to the high degree of reliability, only those lifecycle activities have been considered in this iteration of the asset management plan. The City will expand its analysis to include all lifecycle activities once data quality and reliability is deemed sufficient for them.

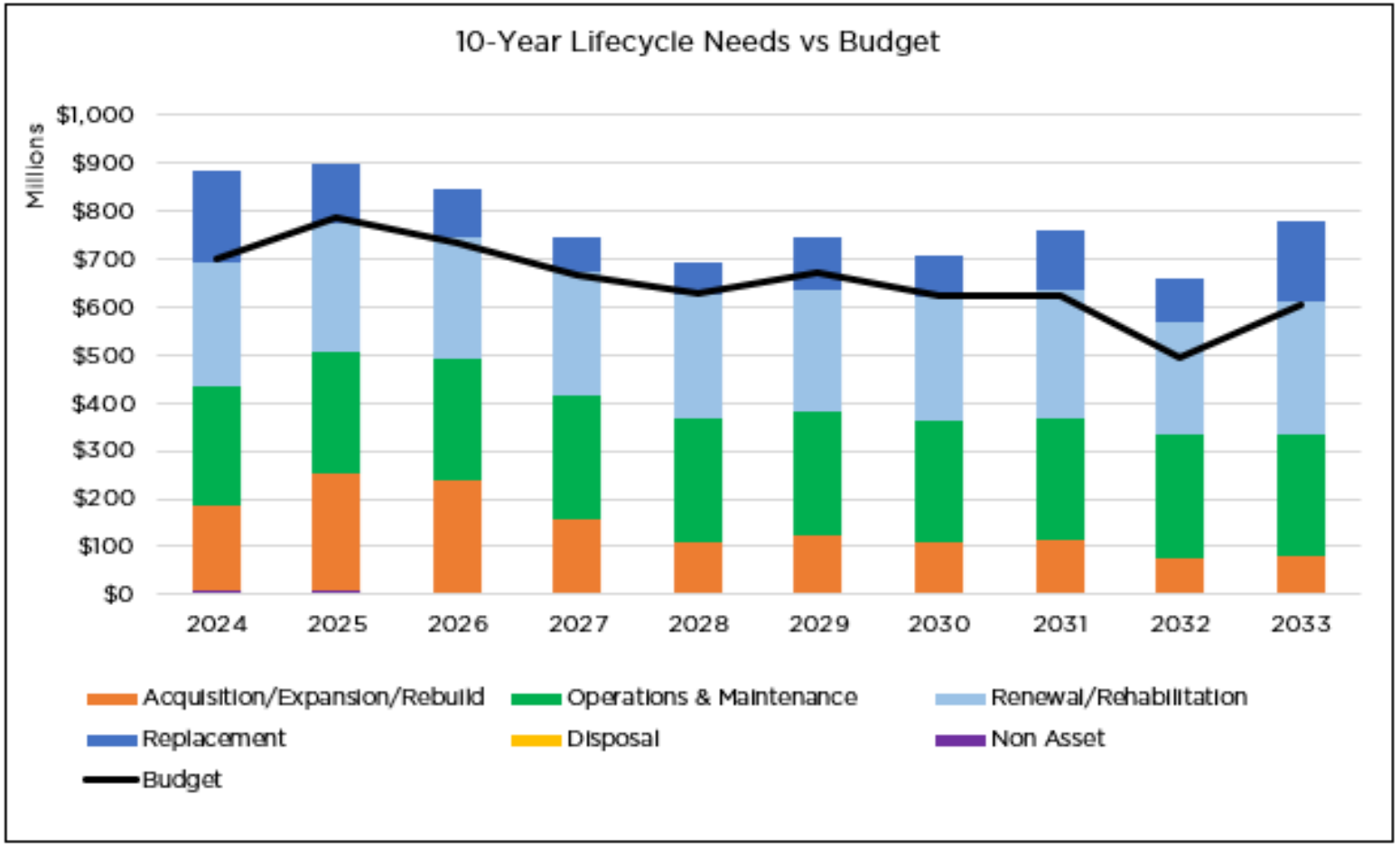


Figure 2: Total 10-Year Lifecycle Needs vs. Budget for all Service Area plans

Over the next 10 years, the City's average annual budget, included in the 2025 CAM Plan, is $6.52 billion as shown in Figure 3.

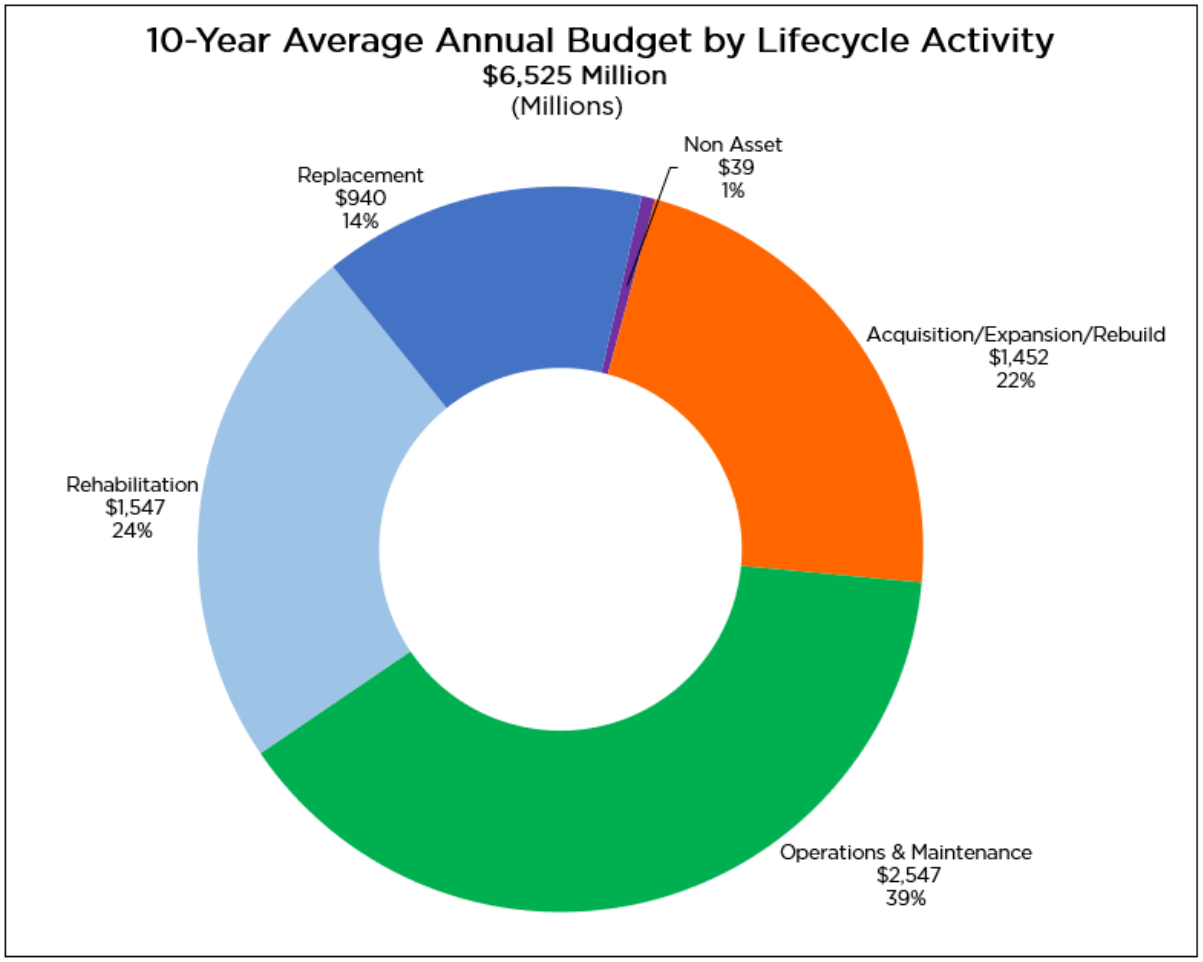


Figure 3: Average Annual Budget breakdown by Lifecycle Activity

Table 3 shows 10-year annual average budget breakdown by Asset Management Plan. 81 per cent of the capital and operating budget is spent on State of Good Repair (SoGR) and 19 per cent on Growth projects.

Table 3: Budget Breakdown by Asset Management Plan

Asset Management Plan	SoGR Budget Type ($ Millions)			Growth Capital Budget ($ Millions)	Total Budget ($ Millions)
	Operating	Capital	Total		
Roads	56.6	87.0	143.6	53.4	196.9
Stormwater	8.3	15.2	23.5	15.9	39.4
Facilities Planning & Development	59.5	68.1	127.6	20.7	148.4
Fire & Emergency Services	9.9	8.8	18.8	1.1	19.9
Transit (MiWay)	63.4	57.4	120.8	14.0	134.8
Parks, Forestry & Environment	35.7	24.3	60.0	19.9	79.9
Corporate Fleet	7.6	4.3	11.9	0.5	12.5
Recreation & Culture	1.0	2.1	3.1	0.1	3.2
Information Technology	7.3	9.2	16.5	-	16.5
General Government (Print & Mail Services)	1.0	0.0	1.0	-	1.0
Total Budget	**250.3**	**276.6**	**526.8**	**125.7**	**652.5**
% of Total Budget	**38%**	**42%**	**81%**	**19%**	**100.0%**

Financing Strategy

Financing Strategy

Building and maintaining infrastructure is one of many key strategic goals in the City of Mississauga's Strategic Plan as well as a top priority in the City's Asset Management Plans. These goals and objectives are achieved by applying sound asset management practices, inventorying what the City owns, conducting regular inspections, prioritizing work needs, preparing appropriate asset renewal projections and programs to address asset renewal needs, and monitoring and reporting on projected asset conditions.

The financing strategy for this asset management plan outlines the key funding and revenue sources used to finance asset management related lifecycle activities based on the 2024-2027 Operating and 2024-2033 Capital Budget Forecast. It also summarizes the infrastructure funding gap based on the required lifecycle activity needs to maintain assets in a state of good repair and/or to achieve proposed levels of service, where determined, for the next 10 years.

Several financing strategies are available to fund the City's capital program such as various reserve funds, recoveries, development charges (DCs) and debt.

As illustrated in Figure 4, the estimated available funding for the next 10-year period (2024-2033) is $6.52 billion. The primary sources of funding are operating revenue sources at 38 per cent and tax reserve funds at 33 per cent which are primarily used to support capital infrastructure renewal needs.

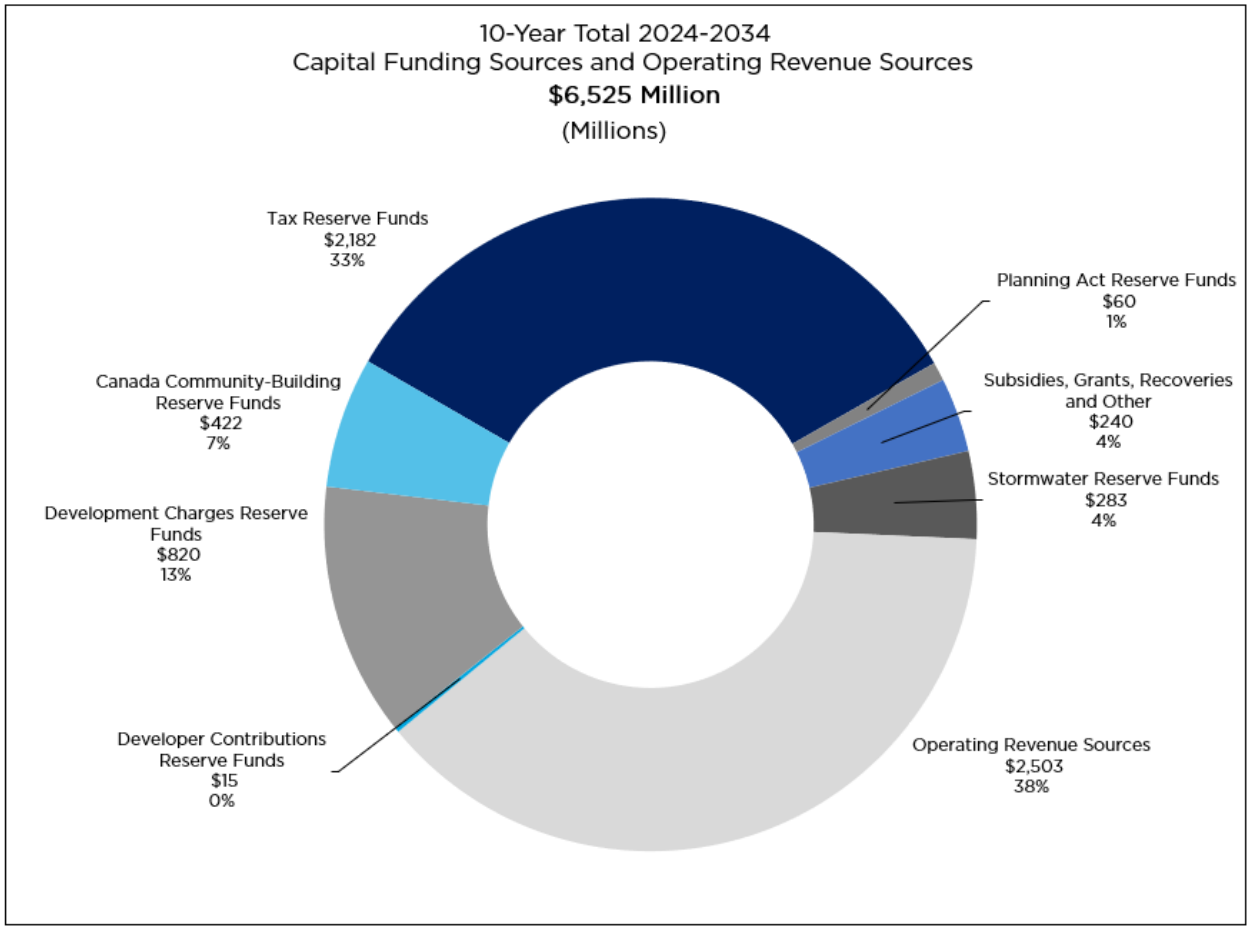


Figure 4: Capital Funding Sources & Operating Revenue Sources

Financial Management & Funding Sources

Operating Budget and Funding (Operating Revenue Sources)

Operating budget provides for the normal operating expenditures with the day-to-day delivery of services. Annually recurring expenses related to capital assets are included in the operating budget (e.g., utilities, building and sidewalk maintenance, etc.). The City uses a combination of property tax, user fees, investments, stormwater charge revenue, charges/levies, and other revenue to fund the operating budget.

Capital Budget Financing

The Capital Budget provides for significant expenditures to acquire, construct, or improve land, buildings, roads, engineering structures, stormwater, machinery and equipment, including IT network infrastructure used in providing municipal services.

Capital expenditures result in the acquisition of, enhancement to or extension of the typical useful life of a fixed asset. Some of the annually recurring costs related to capital assets (e.g., licensing fees) are included in the operating budget.

The City of Mississauga's capital program is financed through recoveries from other levels of government, various reserve funds (e.g., tax and development charges) and debt. The amount of funding projected to be available determines the size of the capital program over the next 10 years.

Capital Prioritization

The City employs a capital prioritization model to assist in the decision-making process for allocating limited capital funds. The prioritization ensures that a balance of lifecycle projects, enhancements and high priority new services are included in the capital program. Capital projects are classified as either:

- State of Good Repair (SoGR) - These projects ensure existing infrastructure is maintained in good condition or replaced when necessary
- Improve/Growth - These projects apply to service enhancements that increase current service levels or provide new capital initiatives

Recoveries

The City of Mississauga receives federal and provincial government grant funding. Only formally approved grant funding is included in the budget.

Reserves

Reserves are generally used to mitigate the impact of fluctuations in operating costs and revenue. Reserves are established at the discretion of Council, often as part of an overall strategy to fund programs or special projects and to stabilize the operating budget. The Stormwater program has a separate reserve which is fully funded from the Stormwater Charge.

Reserve Funds

Reserve funds are established by Council for a specific purpose. They contain funds that have been set aside as directed by a requirement of provincial or federal legislation, or a decision of Council. These reserve funds are used to conduct major repairs, renovations or rehabilitation of buildings or large equipment; acquire new assets; and replace older assets that have reached the end of their lifecycle.
Some funding sources are available for specific services. For example:

- The Canada Community-Building Fund Reserve Fund may be used to fund transit, facilities, roads, bridges, and parks projects)
- The CIL Parkland Reserve Fund primarily funds parkland acquisitions, and to a limited extent may be used to fund other public recreational projects
- Development Charges to fund growth-related infrastructure projects

Tax-based reserve funds are used to finance capital infrastructure needs. The tax-funded Capital Reserve Fund provides the majority of funding for capital projects excluding Stormwater projects. The Capital Reserve Fund is funded, in turn, through contributions from the operating budget. These contributions grow annually through the Capital Infrastructure and Debt Repayment Levy. The Stormwater Program has separate reserve funds to assist with long-term financial stability and financial planning. These funds are set aside to help offset future capital needs and are fully funded from the stormwater rate charge.

More details on all reserves and reserve funds can be found in the annual Business Plan and Budget document.

Capital Infrastructure and Debt Repayment Levy

Repairing and rehabilitating aging infrastructure requires an increased focus on the funding of the City's asset renewal needs. To this end, enhanced infrastructure funding strategies and mechanisms have been developed to assist the City in addressing its infrastructure funding challenges.

Most notably, the Capital Infrastructure and Debt Repayment Levy of three per cent on the prior year's tax levy provides funding necessary to maintain our current assets. The levy is allocated between funding capital infrastructure directly and funding debt principal and interest costs. The Capital Infrastructure and Debt Repayment Levy does not apply to the Stormwater program.

Debt Management

Long-term debt is a critical component in funding new construction and replacing and upgrading capital assets for the City of Mississauga. Taking on long-term debt allows the City to spread out the cost of capital projects over the useful lives of the assets. The amount of debt the City issues each year is determined by how much funding will be yielded by a portion of the Capital Infrastructure and Debt Repayment Levy.

The *Municipal Act, 2001* limits the amount of debt that any city can hold. Debt repayment costs must remain within 25 per cent of own-source revenue (that is, revenue that is earned by the City directly, such as the

tax levy, and not revenue like provincial or federal grant funding). The City of Mississauga's debt policy is more conservative than the provincial limits. The City's debt policy requires that annual debt repayment be limited to 15 per cent of own-source revenue as shown in Figure 5.

The City's debt management program ensures that it remains well within its prescribed debt policy. Careful and conservative spending in the short run ensures that funds are available for longer-term capital initiatives while keeping tax rates manageable.

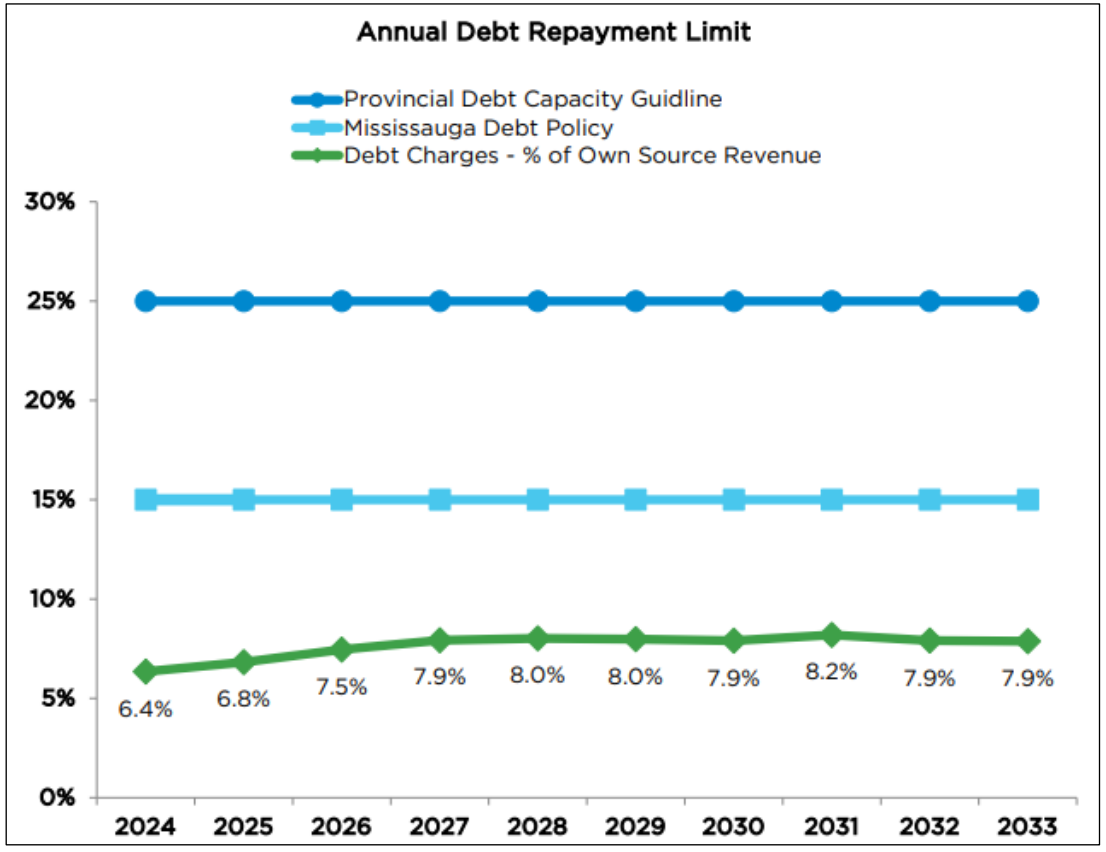


Figure 5: Annual Debt Repayment Limit (2024-2033)

Long-Range Outlook

The Long-Range Financial Plan (LRFP) is an essential tool for long-term planning for the City. The LRFP model provides an indication of the City's future operating, capital, debt, and reserve and reserve fund (R&RF) requirements — given current conditions. The City uses its long-range financial model to ensure that assumptions made in the current year's Business Plan & Budget are sustainable for the future. The strength of the model lies in its ability to identify implications of future strategies and initiatives as they are proposed, to confirm the financial impacts of these strategies, and to determine affordability and impacts on the City's financial position. The LRFP is an important tool to assess affordability into the future and address funding requirements for city-building initiatives.

Each year, the model is updated to reflect the current Business Plan & Budget with informed projections for operating expenditures beyond the four-year period. City staff use this model to ensure projected funding levels for R&RFs are sufficient to finance the capital program as presented.

Infrastructure Gap

The 2024-2027 Business Plan and 2024 Budget presents operating and capital budgets that ensure the City can continue to maintain its assets in a state of good repair (SoGR). The City included a three per cent infrastructure levy in the 2024 budget to provide funding to maintain and replace its critical infrastructure.

The continued application of the infrastructure levy funds, and sustained funding from federal and provincial government partners (e.g., the Canada Community-Building Fund), provide the City with funding that can be applied to effectively manage its infrastructure.

There continues to be, however, an infrastructure gap – a gap between how much is required to maintain assets and service levels and how much funding is available. An infrastructure gap can impact the timing or scope of lifecycle activities and interventions that can be undertaken against assets and thereby affect the desired levels of service.

This can result in:

- Impacts to levels of customer satisfaction
- Increased risk of Public health & safety
- Increased liability and claims
- Impacts to operations

The infrastructure funding gap is the difference between the annual average lifecycle needs (funding needed) and the annual average budget (funding available) for the next 10 years as is shown in Figure 6. Continued implementation of asset management best practices, as well as assistance from senior levels of government through continued infrastructure funding programs, will provide opportunities to address some elements of the infrastructure funding gap. The 10-year average annual infrastructure gap, for City of Mississauga, is $123.1 million.

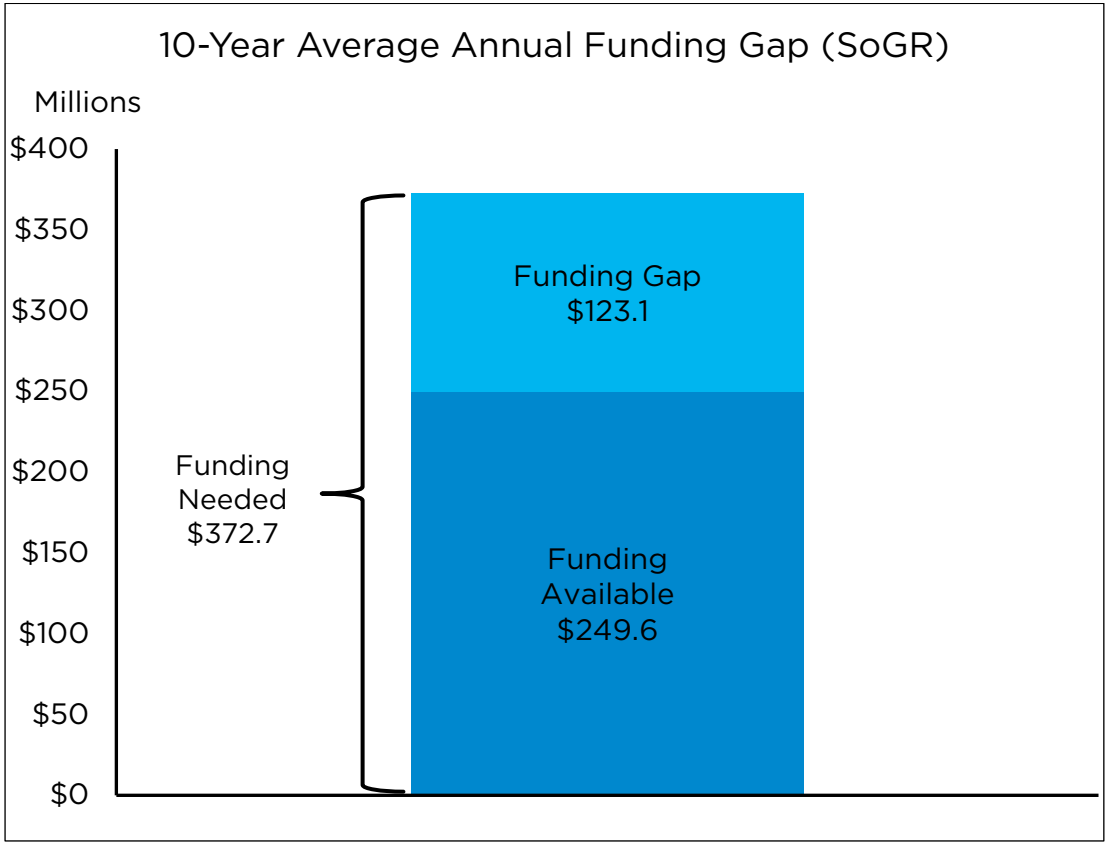


Figure 6: 10-Year average annual funding gap (SoGR) for the City

Table 4 shows the breakdown of the 10-year annual average infrastructure gap, 2024-2033, for each detailed asset management plan with the Roads and Facilities Planning & Development accounting for the majority of the infrastructure gap at 65 per cent and 21 per cent, respectively.

Table 4: 10-year Average Annual Funding gap (SoGR)

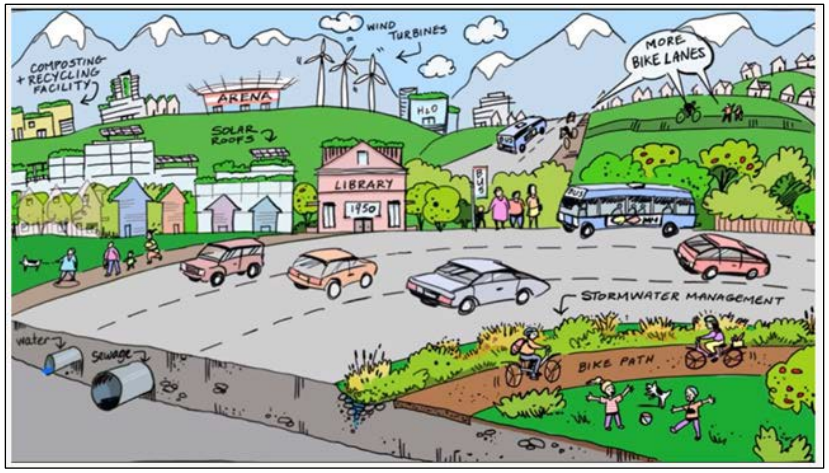
Detailed Asset Management Plan	Funding Available ($ Millions)	Funding Needed ($ Millions)	Infrastructure Funding Gap ($ Millions)
Roads	84.0	164.7	80.6
Facilities Planning & Development	51.1	77.1	26.0
Transit (MiWay)	57.1	60.6	3.5
Parks, Forestry & Environment	22.0	32.4	10.4
Stormwater	12.3	12.3	0.0
Fire & Emergency Services	7.7	8.0	0.3
Information Technology	9.0	9.0	0.0
Corporate Fleet	4.3	6.6	2.3
Recreation & Culture	2.0	2.0	0.0
General Government (Print & Mail Services)	0.0	0.0	0.0
Total	**249.6**	**372.7**	**123.1**

Since the development of this plan, additional funding has been approved in the 2025-2034 Capital Budget, thanks in part to the three per cent tax levy, thereby reducing the average annual SoGR infrastructure gap from $123.1 million to $90.4 million.

Approaches to Closing the Gap

Common asset management practices can be utilized to reduce or close the infrastructure gap. By implementing sound asset management practices, the City can reduce the size of its infrastructure backlog. The following AM strategies will be explored to achieve a reduction in the City's infrastructure funding gap:

- Improve Data Quality – Ensure asset inventories are comprehensive, contain accurate condition assessments and performance data is available on a more granular level
- Implement a Standardized Risk Framework – Develop a standardized risk assessment methodology for asset classes across the organization formalized through a Council-approved Corporate Risk Policy. This would establish levels of tolerances for each asset class to prioritize asset investment needs and appropriate levels of service, potentially reducing funding needs
- Enhance Project Co-ordination – Explore additional opportunities to enhance co-ordination of capital projects between Service Areas within the City and with external organizations. Overall cost efficiencies can be achieved during asset rehabilitation and replacement by better aligning capital programs
- Determine Proposed Levels of Service – Continue to track current service delivery performance, and establish desired targets that optimize funding and bridge the infrastructure gap
- Acquire and implement an asset investment planning (AIP) tool –Run different levels of service analyses and asset performance modelling using various budget scenarios and risk criteria. Improve prioritization within and across Service Areas



Federation of Canadian Municipalities (FCM) video - Why Invest in Asset Management

Continuous Improvement & Conclusion

Continuous Improvement

Continuous improvement in asset management practices will advance the City's ability to provide more detailed information on all City's assets at the organizational level. This will provide enhanced clarity on funding priorities, discover any potential cost savings, and identify the right time for investment opportunities.

Implementing a Corporate Asset Management program across the organization has advanced the following AM activities:

- Established the City's first Strategic AM Policy
- Established an AM governance structure and core working team
- Established an AM reporting framework
- Expanded overall awareness and knowledge about AM
- Engaged a vendor using mobile laser imaging, detection and ranging (LiDAR) to scan, map and collect all the right-of-way assets in the City
- Developed LOS metrics for all asset classes

Continuous improvement is an essential part of any asset management plan. Several recommendations are presented in this plan to support the development of standardized asset management practices in the City of Mississauga. A sample of continuous improvement actions are listed in Table 5 below. In addition, specific continuous improvement activities/initiatives are listed in the Continuous Improvement sections of each detailed asset management plan.

Table 5: List of Continuous Improvement Actions and Status

Category	Recommendation	Status	Strategy
People	Promote adoption of AM policy to support staff working in the AM environment	Ongoing	Conduct strategy sessions with service area teams to address strengths, weakness, opportunities, and barriers in fully adopting all components in the AM Policy.
	Implement Department Capacity Planning	Completed	Use information identified within service specific asset management plans to build a business case for resources necessary to deliver annual asset management work plans.
	Foster AM training to the Working Group (AMWG), Steering Committee (AMSC), LT and Members of Council	Ongoing	Monitor foundational AM courses and AM planning certifications available and distribute information to relevant groups.
Business Processes	Continue to update AM Plans for the Service Areas	Ongoing	Deliver a comprehensive AM Plan focusing on the highest priority assets in each service area to comply with O. Reg. 588/17 requirements.
	Evaluate current capabilities and develop a work plan toward AM maturity	Ongoing	Conduct periodic audits on AM system (e.g., business process, resources, tools).
	Implement an Enterprise Risk Management Framework	In Progress	Prioritize critical and vulnerable infrastructure.
	Align AM process templates with financial templates	Completed	Work with Corporate Finance to standardize templates to capture relevant asset lifecycle cost information.
	Include operational costs when calculating the infrastructure gap	In Progress	Determine operational data to consolidate asset information that can be used for infrastructure gap calculation.
Assets	Perform ongoing Service Level Agreements (SLA) review	Ongoing	Use the SLA to document roles, responsibilities, and expectations between service areas. Liaise with external stakeholders (e.g., Metrolinx) to determine assets ownership, maintenance, and renewal responsibilities.

Category	Recommendation	Status	Strategy
	Conduct regular data governance Review	In Progress	Perform annual reviews to update and document who is responsible for what aspect of the asset lifecycle.
	Continue updating asset hierarchy and asset registers	Completed	Improve asset database for enabling most asset management functions.
Tools/Technology	Procure an Asset Investment Planning (AIP) Tool	In Progress	CAM Office is in the process of procuring and implementing an Asset Investment Planning (AIP) solution to support long-term sustainable decision-making and service level delivery. The AIP tool will allow staff to run different scenarios with variable funding envelopes, service level targets and risk tolerances to determine the most effective strategies to implement. The acquisition and implementation of the AIP solution is anticipated to be completed by late 2026.
	Develop Enterprise Asset Management Reports and Dashboard for Assets	In Progress	Develop a set of standardized dashboards and reports that will reduce the manual tasks required to generate the measures legislated for the AM Plans.
	Use Mobile LiDAR to capture Right-of-Way (ROW) assets	Completed	Process the data collected by LiDAR to allow assets and features to be imported into GIS for analysis and visualization.
	Develop consistent asset attributes across systems	In Progress	Provide strategic alignment among subsystems (e.g., VFA, RoadMatrix, EMSI, Faster, SAP, CityWide, etc.).

Conclusion

The City of Mississauga's infrastructure supports a wide range of services to residents, businesses, and visitors. This infrastructure serves as the critical foundation in achieving the City's Vision: A Place Where People Choose To Be.

As of 2023 year-end, the City's combined assets have a replacement value of $18.8 billion, in overall Fair to Good condition. The City recognizes the importance of maintaining its infrastructure to deliver services. The City leverages federal and provincial funding programs to control the size of the infrastructure gap and minimize the impact to taxpayers. An asset management plan provides information on the current levels of service, complete asset inventories, assets condition, age and the costs involved to operate, maintain, renew, replace, expand, or dispose assets. The ultimate goal is to have a long-term, financially sustainable plan that optimizes service delivery and available funding.

Adopting new asset management practices will require financial investments in systems and staff to achieve improved reporting and analysis at the asset level. As a result of having better information at the asset level, senior staff and ultimately, Council, can make more informed decisions for establishing target service levels and focused asset-investment decisions.

Navigating the Plan

This section of the CAM Plan defines how to read and interpret the information provided in the detailed asset management plans. Every plan starts with an introduction and "Key Stats" summary.

State of the Infrastructure (SOI)

Asset Hierarchy

A breakdown of the asset hierarchy consisting of the asset class, asset type and asset sub-type in some cases is provided. A summary table of the asset classes along with their current replacement values, average condition and average annual infrastructure funding gap is shown.

Additional Assets

Each Service Area reports only on the assets that they directly manage and maintain. However, from a service delivery perspective, there may be other assets that are managed by other Service Areas that play a critical role. To showcase the full scope of assets that feed into a Service Area's ability to deliver services, a summary table has been developed, within each detailed plan, that includes these assets.

Asset Management Tools and Systems

Every plan lists the various tools and systems that staff utilize to inventory data, conduct analyses, carry out service requests and work orders, map assets or perform reporting.
Table 6 provides a brief summary of the data quality index scale and how to interpret the grade scores.

Dashboards

For each asset class within a detailed asset management plan, a dashboard has been created to summarize the current state of the infrastructure. Each dashboard includes a breakdown of the number of current active assets, their age, estimated useful life, condition, and replacement value as of the determined cut-off date (i.e., 2023 year-end for this iteration). The condition of the assets is also illustrated through graphs, by replacement value and asset type, for more detail.

Data Quality Index

In addition, a data quality index (DQI) is included in the dashboards, and provides a measure of how reliable, complete and accurate the information used in the plans is to support asset management decision-making. The DQI applies a five-point rating scale, using grade letters from A (Very Good) to E (Very Poor), towards asset inventory, condition information, and replacement value methodology.

Table 6: Data Quality Index and Descriptions

Grade Score	Description
A – Very Good	• Data is highly reliable and is based on sound records, procedures, investigations, and analysis, documented properly and agreed as the best method of assessment • Dataset is complete and estimated to be accurate ± 2 per cent
B – Good	• Data is moderately reliable based on sound records, procedures, investigations, and analysis, documented but has minor shortcomings, for example some of the data is old, some documentation is missing and/or reliance is placed on unconfirmed reports or some extrapolation • Dataset is complete and estimated to be accurate ± 10 per cent
C – Fair	• Data mildly reliable and is based on sound records, procedures, investigations, and analysis which is incomplete, unsupported, or extrapolated from a limited sample for which grade A or Grade B data are available. Dataset is substantially complete but up to 50 per cent is • extrapolated data and estimated to be accurate ± 25 per cent
D – Poor	• Data is unreliable and is based on unconfirmed verbal reports and/or cursory inspections and analysis • Dataset may not be fully complete, most data is estimated or extrapolated and estimated to be accurate ± 40 per cent
E – Very Poor	• Unreliable/Uncertain data being utilized

Asset Condition

It is important to determine the physical condition of an asset in order to deliver the required service. The condition rating for asset classes is assigned using one of the four following methods:

- Existing condition rating systems (e.g., Pavement Quality Index, Bridge Condition Index, Facilities Condition Index, etc.)
- Estimated based on age and the remaining estimated useful life of the asset
- Estimated based on the weighted average of physical condition, capacity, and functionality, or any other available and pertinent attribute information
- Estimated based on subject matter expert opinion, in the absence of condition or age

Based on data availability, the appropriate method is used to determine the condition of assets based on a five-point scale that has been adopted by the City in alignment with best industry practice. Table 7 provides an example of the five-point condition rating scale with accompanying definitions for each rating.

Table 7: Condition rating scale and definitions

Condition Rating	Condition Definitions
Very Good	**Fit for the Future -** The asset is generally in very good condition, typically new, or recently rehabilitated
Good	**Adequate for Now** - Some asset elements show general signs of deterioration that require attention. A few elements exhibit deficiencies
Fair	**Requires Attention -** The asset shows general signs of deterioration and requires attention with some elements exhibiting significant deficiencies
Poor	**Approaching End of Life** - The asset is in poor condition and typically below established standards, with many elements approaching the end of their useful service life
Very Poor	**Requires Imminent Renewal -** The asset is below established standard conditions with widespread signs of advanced deterioration. Many components have surpassed the end of its useful service life and requires urgent renewal

Levels of Service (LOS)

This section of the plan documents the level of service (LOS) measures that have been prescribed by O. Reg. 588/17 and/or established by staff. As part of establishing levels of service measures, it is critical to build a strong line of sight from the high-level strategic goals and objectives of the City to the operational and technical asset-specific objectives as shown in Figure 7.

Governing Legislation

Every plan contains a summary table of the legislative requirements that govern the Service Areas and assets they manage. These requirements can include regulations, by-laws, policies and standards, and can guide the levels of service measures that staff establish and track.

Levels of Service

LOS metrics are categorized into two types within each detailed plan. They are:

- Community LOS - qualitative metrics expressed in plain language that describe customer and other stakeholder expectations/understanding of services being provided by the City
- Technical LOS - quantitative metrics that translate the customer expectations into technical and trackable performance measures

Current and Proposed Levels of Service

In accordance with O.Reg. 588/17, Service Area staff have reported on their current community and technical levels of service, utilizing 2023 year-end data. Additionally, staff have reported on their proposed or target levels of service for 2024-2033 and provided background information on how those proposed levels of service were determined.

When determining a proposed level of service, staff evaluated maintaining status quo/current, increasing or decreasing service levels. Staff analyzed the risks associated with those options, the changes to lifecycle activities, costs and resource requirements.

Based on this analysis, proposed levels of service were classified into the following three types:

1. Proposed levels of service that pose a budget implication, capital and/or operating. These service levels require consideration by Council during the Business Planning and Budget process in order to be achieved
2. Proposed levels of service that are achievable with current funding and resources. These service levels require no additional effort from Staff or decision by Council
3. Proposed levels of service that are “to be determined (TBD).” These service levels are continuous improvement for staff to develop

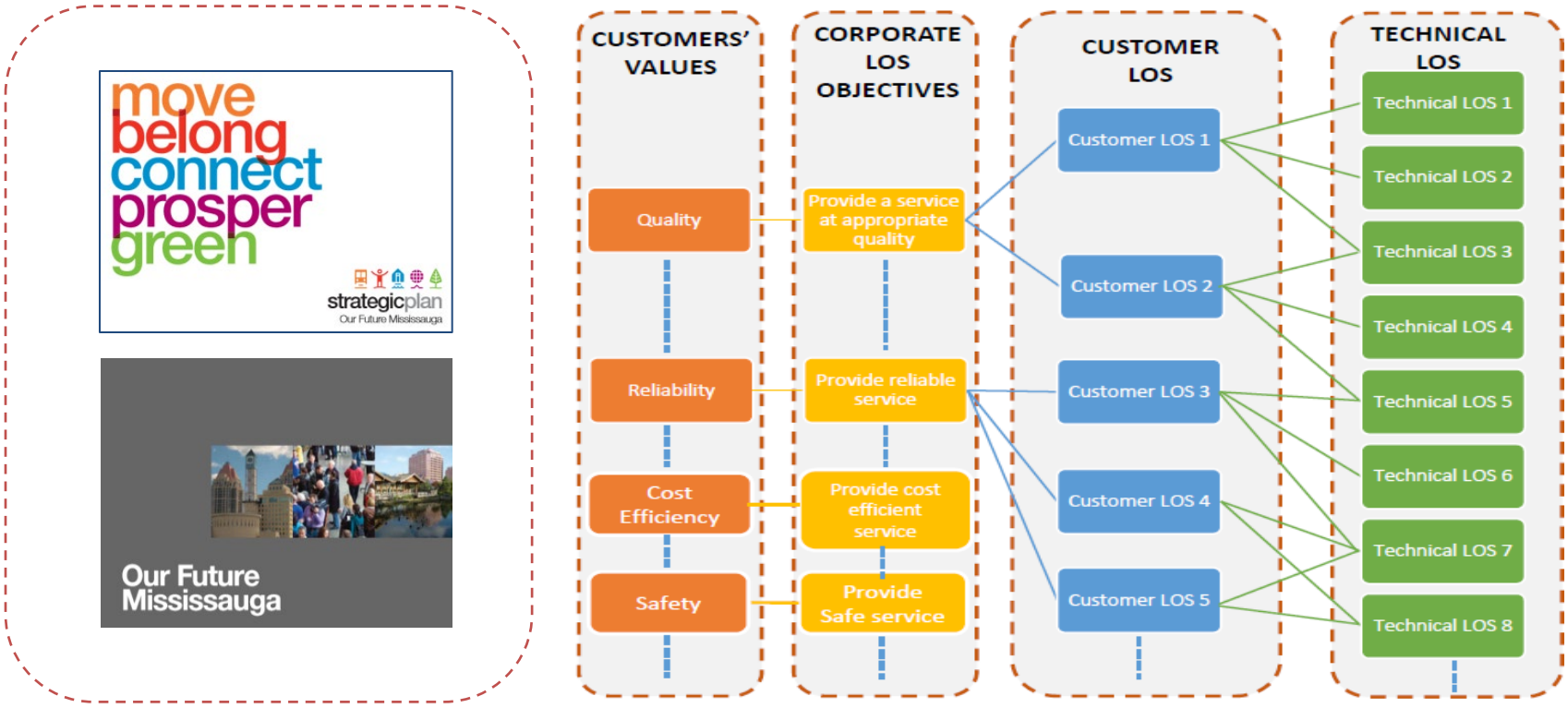


Figure 7: Line of Sight from Strategic Goals to Technical Levels of Service

Demand Drivers

Each demand driver section identifies a list of the top drivers and challenges that affect service delivery and asset management for each detailed asset management plan. The list also summarizes how the demand driver is projected to evolve, what impact it has on City services, and whether or not the City has a demand management plan in place to manage these issues.

As staff continue to quantify the effects of these demand drivers and identify feasible demand management strategies, they will integrate them more concretely into their asset management programs through the levels of service frameworks and lifecycle management strategies.

Risk Management

By having holistic and comprehensive risk management models, City staff are able to prioritize their assets and projects more effectively to achieve their desired service levels. From a City-wide perspective, a corporate risk policy and framework has been developed by the Legal Services Division. The CAM office will leverage this policy and framework as they develop a corporate asset management risk framework that can help prioritize across various types of assets and services at the City.

From an asset-specific perspective, each asset management plan identifies the methodology that staff currently utilize to prioritize assets within their purview. Some asset groups are more advanced, utilizing a formalized asset risk model whereas others are still in the early stages of developing a model and quantifying their risk methodology. Risk management formalization is a continuous improvement item as Service Areas advance their asset management program and data quality.

The CAM office utilizes a 5x5 risk matrix for asset-specific risk as shown in Table 8, by quantifying the consequences of failure (CoF) and likelihoods of failure (LoF) metrics and multiplying the results together as shown in Figure 8.

The consequence of failure (also known as asset criticality) relates to the economic, environmental, social, or regulatory impact of an asset failure on service delivery. While the loss of some assets or components may have little impact on service delivery and negligible, the loss of others may severely impact services and lead to serious injuries, heavy financial losses or non-compliance with laws and regulations.

The likelihood of failure considers how probable asset failure is based on various metrics that are unique to each asset group. LoF metrics include performance indicators such as assessed condition, age, location or geographical information, material, and more.

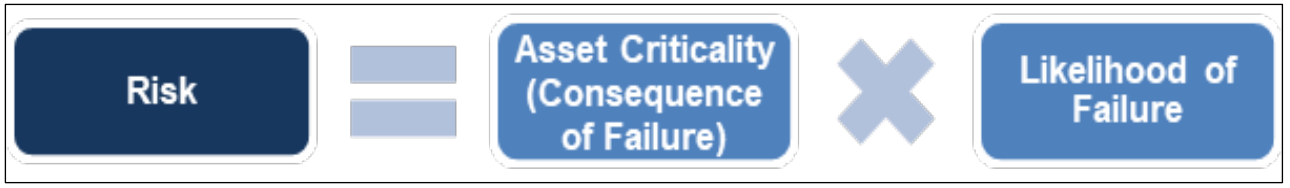


Figure 8: Risk Calculation

Table 8: Risk Matrix

Likelihood of Failure (LoF)	Consequence of Failure (CoF)				
	Negligible	Minor	Moderate	Significant	Severe
Very Likely	Low	Medium	High	Very High	Very High
Likely	Very Low	Low	Medium	High	Very High
Possible	Very Low	Low	Medium	High	High
Unlikely	Very Low	Low	Low	Medium	High
Very Unlikely	Very Low	Very Low	Low	Medium	Medium

Lifecycle Management Strategy

The lifecycle management strategy section identifies the many actions and activities staff employ on assets to sustain desired service levels at the lowest lifecycle cost ownership and while managing risk.

These lifecycle activities are broken down into the following seven types, as reported in each of the detailed asset management plans. Table 9 provides numerous examples of different strategies and actions that the City employs on its assets, broken out by the six lifecycle activity types.

- Non-Asset Solutions - Activities that do not alter the condition or performance of assets or services but provide staff with valuable information for their effective management. They include master plans, studies, surveys, and more. With the goal of providing asset management planning in an efficient and effective manner, these non-asset solutions become critical
- Operations and Maintenance (O&M) - Operations and Maintenance typically includes minor activities that preserve the condition or performance of assets and ensures the longevity of assets in line with their design and operational requirements. There are unplanned/reactive O&M activities that are carried out on an as-needed basis to reinstate service, and there are planned/proactive activities that are carried out on a set frequency to prevent disruptions and keep assets operational
- Renewal/Rehabilitation - Significant activities designed to extend the useful life of assets, and by extension, the services they contribute to. These activities involve the renewal, rehabilitation or replacement of parts or components of an asset that require significant intervention
- Replacement - Replacement activities occur once an asset reaches the end of its useful life, cannot provide the intended function or performance, and renewal/rehabilitation is not a viable treatment option. Replacement activities typically denote a like-for-like asset replacement
- Acquisitions - Expansion/Rebuild/New - These activities expand services to previously non-serviced areas or to accommodate growth; they provide new or enhanced services beyond the current capacity and/or functionality of the existing assets
- Disposal/Demolition - Activities associated with the disposal or decommissioning of an asset. Disposal activities and associated costs are typically embedded within other lifecycle activities at the City

As per O. Reg 588/17, a 10-year forecast of the lifecycle activities that need to be performed to maintain current levels of service and/or achieve proposed levels of service are identified in each detailed asset management plan. Any relative assumptions and/or limitations have been noted within those sections.

Table 9: Examples of Lifecycle Actions by Activity Type

Lifecycle Activity Types	Examples of Lifecycle Strategies or Actions
Non-Asset Solutions	• Standard Operating Procedures (SOPs) • Master Plans/Future Directions • Public notices, engagement surveys • Climate Change Action Plan • Road Needs Studies (RNS) • Building Condition Assessments (BCA) • Ontario Structural Inspection Manuals (OSIMs) • Natural Heritage & Urban Forest Strategy • Service demand studies on the assets (i.e., studies or modelling that consider capacity, future needs)
Operations & Maintenance	• Utilities, snow plowing and salting, sweeping, debris removal, pest control, tree pruning • Waterproofing of bridge decks, catch basin cleaning, storm sewer flushing • Flow monitoring program to determine the full scale of its network problems • Legislated fire equipment inspections • Anti-graffiti protective coating for public art assets • Repairing of lighting, power and electrical of parking lot lighting, park lighting, sports field and court lighting • Traffic signal repairs from spring and fall inspections • Install and repair security cameras, card readers and existing systems • Playground inspections in alignment with Canadian Standard Association (CSA) guidelines • Tree inspections and pruning every seven years
Renewal/ Rehabilitation	• Road rehabilitation treatments (resurfacing, mill and pave) • Pipe re-lining • Roof replacement, boiler replacement, HVAC replacement • Playground component replacement (e.g., swings, slides) • Parking lot rehabilitation • Refurbishment of fire vehicles • Multi-use trail rehabilitation

Lifecycle Activity Types	Examples of Lifecycle Strategies or Actions

Replacement	• Bridge replacement as recommended through biennial inspections
	• Complete open-cut replacement, pipe replacement
	• Trail reconstruction
	• Asset condition/performance are monitored regularly, but in general, assets are replaced at end-of-life:
	  ○ Playground every 25 years; Park shelters every 20 years; Artificial turf fields every 10-12 years
	  ○ Vehicles, buses, furniture, and equipment (golf carts, radio), Transit Bus stops/pads
	  ○ Personal protective equipment (PPE) replacement

Disposal/ Demolition	• Road right-of way property disposal or repurposing • Dispose of assets under regulation or by-law because an asset is no longer functional • Disposal of demolished assets a part of replacement of the structure • Disposal of IT hardware to a vendor for the purpose of either destroying and issuing a certificate of destruction, or recycling it at no cost • Trade-in program for recreation fitness equipment
Acquisition/Expansion/ Rebuild	• Constructing or procuring new assets (e.g., roads, buildings, buses, traffic signals) • Expanding/new garage facilities (e.g., incorporating additional and/or new fleet technology) • On-street transit priority infrastructure (e.g., queue jump lanes, bypass lanes) • On-street bus stop infrastructure (e.g., new or larger shelters, bus shelter pads, pedestrian landing pads, concrete bus landing pads) • New tree planting and boulevard landscapes

Financing Strategy

The financing strategy section outlines the key funding and revenue sources used to finance asset management-related lifecycle activities within each detailed asset management plan. For this iteration, staff utilized the 2024-2033 capital budget forecast and 2024-2027 operating budget forecast.

In addition, an infrastructure gap exercise was conducted, for each asset class within the detailed plans, to compare the required lifecycle needs to the available budget for the next 10 years to maintain current levels of service. Any relative assumptions and/or limitations have been noted within this section.

As staff advance their asset management programs and improve their data quality, the infrastructure gaps will become more accurate and reliable.

Continuous Improvement

Each detailed asset management plan has a continuous improvement section that lists various opportunities or actions that staff have identified to improve their asset management program in the short-term and long-term. The lists include what the action items are, what assets are impacted/involved, the estimated timing to complete the continuous improvement task, the benefits of the tasks to the asset management program, and what resources are required to complete the work.

As part of evaluating current capabilities and developing the work plan towards asset management maturity, the CAM Office conducts periodic internal maturity assessments for each of the asset classes, with the latest being completed in 2023 for all asset classes. The results of the latest maturity assessment are documented within each detailed asset management plan in this section. The results are recorded for benchmarking and annual progress updates are reported to Council.

Glossary

Term	Description
Asset	An item, thing, or entity that has potential or actual value to the City, including but not limited to tangible assets, natural assets, heritage or culturally significant assets and information assets
Asset Hierarchy	A classification system that is used to group assets with similar characteristics or functions
Asset Management (AM)	Co-ordinated activities by the City to realize value from its assets in the achievement of its organizational objectives
Asset Management Plan (AMP)	Documented information that specifies the activities, resources and timeframe required for an individual asset, or group of assets, to achieve the City's asset management objectives
Asset Management Steering Committee (AMSC)	Committee comprised of Directors and/or Senior Managers across the organization that come together to make decisions on asset management program
Asset Management Plans (AMPs)	An Asset Management Plan (AMP) is a tactical plan for managing an organization's infrastructure and other assets to deliver an agreed standard level of service.
Asset Management Working Group (AMWG)	Cross-departmental/divisional team of subject matter experts that governs and maintains the City's assets in compliance with the Strategic Asset Management Policy
Budget	Planned expenditures for a specified time period along with the proposed means of financing these expenditures
Capital Budget	Multi-year program adopted by Council comprised of an approved capital program for the current year and a planned program for the succeeding nine years
City	Corporation of the City of Mississauga
Climate Change	Change in global or regional climate patterns
Consequence of Failure (CoF)	An element of a risk framework that identifies an asset failure that has the highest potential on impacting the delivery of services

Glossary

Term	Description
Continuous Improvement (CI)	Specific actions taken to advance asset management reporting, data collection etc.
Corporate Asset Management (CAM)	Program developed in the Corporate Services Department, Finance Division
Current Replacement Value (CRV)	The cost of rebuilding or replacing an asset with one of equivalent capacity, functionality and performance (like-for-like)
Estimated Useful Life (EUL)	The estimated time or cycles an asset will continue to function reliably before it requires repair, replacement, or is no longer able to perform its intended function
Green Infrastructure	An infrastructure asset consisting of natural or human-made elements that provide ecological and hydrological functions and processes and includes natural heritage features and systems, parklands, stormwater management systems, street trees, urban forests, natural channels, permeable surfaces and green roofs
Infrastructure Gap	A gap between how much is required to maintain assets and service levels and how much funding is available
Levels of Service (LOS)	As defined by ISO 55000, parameters which reflect the social, political, environmental and economic outcomes that the City delivers. There are two types of levels of service: Community (qualitative measures) and Technical (quantitative and trackable measures).
Lifecycle activities	Activities undertaken with respect to a municipal infrastructure asset over its service life, including constructing, maintaining, renewing, operating and decommissioning, and all engineering and design work associated with those activities
Likelihood of Failure (LoF)	The probability of an asset to fail in the short-or long-term
Risk Management	A formal process to assess risk to an asset in order to determine risk tolerance, a range of outcomes, and the probability of occurrence, to determine required actions to mitigate risk exposure
State of Good Repair (SoGR)	The condition where a capital asset is able to operate and maintain the expected levels of service
Tangible Capital Assets (TCA)	A legislative reporting requirement specified by Section PS 3150 in the Public Sector Accounting Board Handbook to identify asset inventories, additions, disposals, and amortization on an annual basis.

Appendix 1: All Proposed Levels of Service Measures

1. Proposed Levels of Service with budget implications

Service Area	Asset Class	Technical Metric	Current Measure	Proposed Measure	Additional information
Roads	Street Lighting	Per cent of street-light luminaires that are within 55% of their useful life.	35%	87% by 2033	This condition is based on a combination, of aged-based information, verifying the SCMS Database, with the City's ESRI Database, when the LED conversion began. Within 55% of useful life is considered fair condition.
Facilities Planning & Development	All	Average facility condition index (FCI) by Asset Class	Corporate:0.06 Fire: 0.08 Library: 0.02 Parks: 0.23 Recreation:0.13 Transit: 0.02 Works: 0.41	Corporate:0.10 Fire: 0.10 Library: 0.15 Parks: 0.15 Recreation:0.15 Transit: 0.15 Works: 0.15	Initially based on 10-year targets that were approved in 2009 by Council. The targets were reviewed in 2023 and updated to align with City priorities.
Facilities Planning & Development	All	% of assets with high-very high risk rating	21.10%	0-20%	Based on the portfolio replacement value, across all years.
Facilities Planning & Development	All	Actual vs Target reinvestment rate	1.8% vs. 2.5%	1.8% vs. 2.5%	A measure of how much funding is available to meet capital state of good repair lifecycle needs (Actual) versus how much funding is required (Target).

2. Proposed Levels of Service achievable with current budget and resources

Service Area	Asset Class	Technical Metric	Current Measure	Proposed Measure	Additional information
Stormwater	Stormwater Management Facilities (SWMF)	Percentage of SWMF inspections completed annually	100%	Meet Ministry of Environment, Conservation and Parks (MECP) requirements	Annual facility inspections are required to comply with Municipal Consolidated Linear Infrastructure Environmental Compliance Approvals
Roads	Road Pavement	Per cent of existing centre-line kilometers of roads that meet the 2041 growth capacity targets.	95%	100% by 2041	2022 DC Background Study
Roads	Structures	Per cent of bridges and major culverts in the municipality that meet the 2041 growth capacity targets.	91%	100% by 2041	2022 DC Background Study
Roads	Roadside Trail Network	Per cent of new sidewalks constructed in high priority areas as identified in the latest Pedestrian Master Plan	2%	100% by 2051	Using data from 2021 Pedestrian Master Plan, Network Prioritization. Prioritization considers road classification, proximity to schools

Appendix 1: All Proposed Levels of Service Measures

Service Area	Asset Class	Technical Metric	Current Measure	Proposed Measure	Additional information
					and transit, and other factors.
Roads	Road pavement/Roadside Trail Network	Per cent of road corridors that meets the requirements identified in the Cycling Master Plan.	46%	100% by 2043	Includes all cycle tracks, bike lanes, multi-use trails, and shared routes on road corridors in Mississauga, including regional roads. Using data from 2018 Cycling Master Plan.
Roads	Street Lighting	Number of streetlights per lane kilometers.	8.3	Maintain Status Quo	N/A
Roads	All	Actual vs. target capital reinvestment rate by asset class.	1.4% vs. 2.8%	1.4% vs. 2.8%	A measure of how much funding is available to meet capital state of good repair lifecycle needs (Actual) versus how much funding is required (Target).
Roads	Road Pavement	For arterial roads in the municipality, the average pavement	59	Maintain Status Quo	Calculated using Pavement Quality Index

Appendix 1: All Proposed Levels of Service Measures

Service Area	Asset Class	Technical Metric	Current Measure	Proposed Measure	Additional information
		condition index value.			
Roads	Road Pavement	For collector roads in the municipality, the average pavement condition index value.	57	Maintain Status Quo	Minor and Major Collector roads included
Roads	Road Pavement	For local roads in the municipality, the average pavement condition index value.	57	Maintain Status Quo	N/A
Roads	Structures	Per cent of bridges and major culverts where the condition is rated poor and very poor, that are identified in the 10-year capital plan.	89%	100%	Structures identified in the capital plan includes structures identified for rehab or replacement, or as part of an investigations project.
Roads	Roadside Trail Network	Per cent of critical vehicle safety barriers where the condition is rated fair or better	98%	100%	Critical barriers provide protection from roadside hazards and pedestrian safety.
Roads	Municipal Parking	Per cent of municipal parking lots where the condition is rated fair or better.	96%	96%	N/A

Appendix 1: All Proposed Levels of Service Measures

Service Area	Asset Class	Technical Metric	Current Measure	Proposed Measure	Additional information
Roads	Municipal Parking	Per cent of parking machines where the condition is rated fair or better.	100%	95% to 100%	This is based on physical condition, not technological requirements.
Roads	Traffic Signals and Related Electrical Devices	Per cent of speed-awareness devices that are within 50% of their useful life.	95%	100%	Within 50% of useful life is considered fair condition.
Roads	Roadside Infrastructure	Per cent of regulatory/warning signage that pass the retro-reflectivity testing.	TBD	100%	Warning and Regulatory signs only.
Roads	Roadside Trail Network	Per cent of sidewalks that undergo snow clearing during winter event.	70%	100% in 2026	N/A
Roads	Intelligent Transportation Systems (ITS)	Per cent of speed awareness devices that meet functional needs.	85%	100%	Technical requirements meet operational needs.
Roads	Street Lighting	Per cent of street lights that use energy- efficient LED lighting.	99%	100% by 2025	N/A
Roads	Municipal Parking	Per cent of permeable surfaces that are functioning.	100%	100%	Municipal Parking defines functioning as: reasonable amount of water infiltration, with no

Appendix 1: All Proposed Levels of Service Measures

Service Area	Asset Class	Technical Metric	Current Measure	Proposed Measure	Additional information
					cracks or holes that cause an unsafe surface for drivers and pedestrians.
Roads	Municipal Parking	Per cent of municipal parking lots that meet current accessibility requirements.	35%	50% by 2026	Lots are compliant until a parking lot is renewed, at which time, the lot is updated with the most current accessibility standards.
Roads	Municipal Parking	Per cent of parking machines that meet current accessibility requirements.	100%	100%	N/A
Roads	Traffic Signals and Related Electrical Devices	Per cent of intersections that are equipped with Accessible Pedestrian Signals (APS) pushbuttons.	27%	100% by 2035	As of 2025 budget cycle, the required funding has been approved to meet this target.
Parks, Forestry & Environment	Parks Infrastructure	Percent of bridges with loading or dimensional restrictions.	0%	Maintain status quo	Mandated metric by O.Reg. 588/17.
Parks, Forestry & Environment	Boulevard Landscapes	Number of hectares of boulevard	2.10%	Maintain Status Quo	N/A

Appendix 1: All Proposed Levels of Service Measures

Service Area	Asset Class	Technical Metric	Current Measure	Proposed Measure	Additional information
		landscapes as a percentage of total hectares of road allowance in Mississauga.			
Parks, Forestry & Environment	Parks Infrastructure	Average bridge condition index (BCI).	70	To align with Roads Service Area direction	BCI scores are updated biennially through OSIMs.
Parks, Forestry & Environment	All	Per cent of assets in fair or better condition.	84%	>70%	Inclusive of all Asset Classes in PF&E.
Parks, Forestry & Environment	All	Actual vs. Target Reinvestment Rate.	1.6% vs. 2.3%	1.6% vs. 2.3%	A measure of how much funding is available to meet capital state of good repair lifecycle needs (Actual) versus how much funding is required (Target).
Transit	Revenue-Generating Vehicles	Revenue Passengers per Capita	59.6	67	Transit has defined a target of 79.0 revenue passengers per capita by 2049 according to the City's budget. The prorated target by 2033 is 67.0 revenue passengers per capita.

Appendix 1: All Proposed Levels of Service Measures

Service Area	Asset Class	Technical Metric	Current Measure	Proposed Measure	Additional information
Transit	Revenue-Generating Vehicles	On-Time Performance Average	64%	Minimum 80%	This target is anticipated to be achieved over the 10-year period.
Transit	All	% of vehicles that exceed their estimated useful life	Non-Revenue Vehicles: 4.6% Conventional Buses (Standard 40′): 5.6% Conventional Buses (Articulated 60′): 0.0% Hybrid Buses (Standard 40′): 0.0% Hybrid Buses (Articulated 60′): 0.0%	0.00%	The City has the funding capacity to replace all vehicles required over the next 10-years.
Transit	All	% of assets in Fair or Better Condition by Asset Class	Revenue-Generating Vehicles: 63.3% Equipment & Systems: 67.7% Right of Way: 94.3% Stormwater: 100%	Revenue-Generating Vehicles: 80% or higher Equipment & Systems: 80% or higher Right of Way: 70% or higher Stormwater: Align with Stormwater Service Area	The City has the funding capacity to replace vehicle assets required over the next 10-years. There is a need to increase spending for equipment and systems and right of way infrastructure to achieve the target levels of service.

Appendix 1: All Proposed Levels of Service Measures

Service Area	Asset Class	Technical Metric	Current Measure	Proposed Measure	Additional information
Transit	All	Labour Hours Attributed to Preventative Maintenance as a % of Total Labour Hours (Vehicles)	52%	70%	Transitioning towards preventative maintenance activities rather than reactive maintenance will reduce unexpected delays, potential loss of revenues, and vehicle downtime.
Transit	All	Labour Hours Attributed to Reactive Maintenance as a % of Total Labour Hours (Vehicles)	48%	30%	N/A
Transit	All	Actual vs Target Reinvestment Rate by Asset Class	7.0% vs. 7.4%	7.0% vs. 7.4%	A measure of how much funding is available to meet capital state of good repair lifecycle needs (Actual) versus how much funding is required (Target).
Transit	All	Revenue/Cost Ratio (Fare Revenue to Gross Cost)	40.90%	Maintain Status Quo	Based on municipal comparators as per the CUTA factbook.

Appendix 1: All Proposed Levels of Service Measures

Service Area	Asset Class	Technical Metric	Current Measure	Proposed Measure	Additional information
Fire & Emergency Services	All	First Arriving Apparatus - Travel Time (seconds) (75th percentile) - ALL calls.	336	240	N/A
Fire & Emergency Services	All	First Arriving Apparatus - Travel Time (seconds) (75th percentile) - FIRE calls.	320	240	N/A
Fire & Emergency Services	All	Travel time for seven apparatus to a fire in a confirmed high rise (90th percentile).	956	610	N/A
Fire & Emergency Services	All	Travel time for five apparatus to a fire in a defined high-risk occupancy (90th percentile).	792	480	N/A
Fire & Emergency Services	All	% fire facilities that meet AODA and other legislative compliance.	90%	90%	N/A
Fire & Emergency Services	All	% fire fleet that meet MTO inspection schedules.	100%	100%	N/A
Fire & Emergency Services	All	% fire fleet that meet FIRE & EMERGENCY SERVICES planned	100%	100%	N/A

Appendix 1: All Proposed Levels of Service Measures

Service Area	Asset Class	Technical Metric	Current Measure	Proposed Measure	Additional information
		inspection schedules (on-time).			
Fire & Emergency Services	All	Preventative Maintenance Ratio.	35%	60%	N/A
Fire & Emergency Services	All	Actual vs. Target Reinvestment Rate.	0.64% vs. 0.67%	0.64% vs. 0.67%	N/A
Corporate Fleet	All	Percentage of fleet availability.	86%	90% within the first 5 years	This metric considers demand maintenance, preventative maintenance and parts downtime.
Corporate Fleet	All	Percentage of assets that are in fair or better condition.	52%	>60%	Staff plan to replace all critical Very Poor assets within the next 2 years.
Corporate Fleet	All	Percentage compliance with scheduled preventative maintenance.	N/A	80%	Staff were unable to calculate current performance for this metric due to system limitations. It is identified as a continuous improvement item.
Corporate Fleet	All	Actual vs Target Reinvestment Rate.	0.62% vs 0.95%	0.62% vs 0.95%	A measure of how much funding is available to meet capital state of good repair lifecycle

Appendix 1: All Proposed Levels of Service Measures

Service Area	Asset Class	Technical Metric	Current Measure	Proposed Measure	Additional information
					needs (Actual) versus how much funding is required (Target).
Corporate Fleet	All	Percentage of fleet that meet and/or exceed compliance with Ministry of Transportation (MTO) standards.	N/A	100%	Staff were unable to calculate current performance for this metric due to system limitations. It is identified as a continuous improvement item.
Corporate Fleet	All	Average satisfactory safety rating (SSR) for Commercial Vehicles Operators Registration.	11.0 SSR	<35.0 SSR	Satisfactory safety rating (SSR) includes all corporate fleet and MiWay commercial Motor Vehicles.

3. Proposed Levels of Service that are continuous improvement

Service Area	Asset Class	Technical Metric	Current Measure (2023)	Additional information
Stormwater	All	Percentage of properties in municipality resilient to a 100-year storm.	92%	Mandated metric by O.Reg. 588/17. Staff require support from the conservation authorities to determine target performance.
Stormwater	All	Percentage of the municipal stormwater management system resilient to a 5-year storm.	94%	Mandated metric by O.Reg. 588/17. Staff require support from the conservation authorities to determine target performance.
Stormwater	Storm Sewers	Percentage of storm sewer network closed-circuit television (CCTV) inspections completed annually.	9%	Staff complete 10% CCTV inspections annually
Stormwater	Watercourses	Percentage of watercourse reach inspections completed annually.	36%	Based on the length of reach inspections relative to the total number of City-owned/maintained reaches
Stormwater	All	Capital Budget/ Total Budget Allocation	81%	This metric is based on the approved 2024 Business Plan and Budget. It is the total allocation of funds towards capital investment over total Service Area budget

Appendix 1: All Proposed Levels of Service Measures

Service Area	Asset Class	Technical Metric	Current Measure (2023)	Additional information
Roads	Road Pavement	Number of lane-kilometers of arterial roads (Class 1 and 2) as a proportion of square kilometers of land area of the municipality.	2.7	Mandated metric by O.Reg. 588/17.
Roads	Road Pavement	Number of lane-kilometers of collector roads (Class 3 and 4) as a proportion of square kilometers of land area of the municipality.	6.9	Mandated metric by O.Reg. 588/17.
Roads	Road Pavement	Number of lane-kilometers of local roads (Class 5 and 6) as a proportion of square kilometers of land area of the municipality.	9.7	Mandated metric by O.Reg. 588/17.
Roads	Structures	Per cent of bridges in the municipality with loading or dimensional restrictions.	3%	Mandated metric by O.Reg.588/17. Loading capacity unknown for many structures. Includes bridges only, not culverts.
Roads	All	Average risk rating by asset class.	TBD	Risk formalization is a continuous improvement item.
Roads	Road Pavement	Per cent of paved lane kilometers where the condition is rated fair or better.	62%	N/A

Appendix 1: All Proposed Levels of Service Measures

Service Area	Asset Class	Technical Metric	Current Measure (2023)	Additional information
Roads	Structures	For bridges in the municipality, the average bridge condition index value.	70	Calculated using Bridge Condition Index (BCI)
Roads	Structures	For structural (major) culverts in the municipality, average bridge condition index value.	68	Calculated using Bridge Condition Index (BCI)
Roads	Structures	Per cent of bridges and major culverts where the condition is rated fair or better.	92%	Calculated using Bridge Condition Index (BCI)
Roads	Structures	Per cent of minor culverts where the condition is rated fair or better.	88%	Calculated using Bridge Condition Index (BCI)
Roads	Structures	Per cent of minor culverts where the condition is rated poor and very poor, that are identified in the 10-year capital plan.	27%	N/A
Roads	Structures	Per cent of retaining walls where the condition is rated fair or better.	95%	Calculated using BCI as a bridge condition index for major retaining walls, and visual condition (1 to 5 rating) for minor retaining walls.
Roads	Structures	Per cent of structures that meet current active transportation requirements	24%	As per pedestrian master plan minimum sidewalk width requirements, and cycling

Service Area	Asset Class	Technical Metric	Current Measure (2023)	Additional information
				master plan cycling facilities (MUT, cycle tracks, etc.)
Roads	Roadside Infrastructure	Per cent of noise walls where the condition is rated fair or better.	97%	N/A
Roads	Roadside Infrastructure	Per cent of wayfinding signs where the condition is rated fair or better.	TBD	Does not include regulatory and warning signs. A condition of fair or better identifies no deficiencies.
Roads	Roadside Infrastructure	Per cent of sign posts where the condition is rated fair or better	TBD	N/A
Roads	Roadside Trail Network	Per cent of sidewalks and engineered walkways where the condition is rated fair or better.	53%	Condition is based on age. Sidewalk condition assessment is scheduled for 2025.
Roads	Roadside Trail Network	Per cent of multi-use paths where the condition is rated fair or better.	99.80%	Condition is based on 2020 condition data.
Roads	Street Lighting	Per cent of street-light poles that are within 60% of their useful life.	37%	This condition is based on a combination, of aged-based information, verifying the Alectra Database, with the City's ESRI Database. Also, no field inspections are currently being done. Within 60% of

Appendix 1: All Proposed Levels of Service Measures

Service Area	Asset Class	Technical Metric	Current Measure (2023)	Additional information
				useful life is considered fair condition.
Roads	Street Lighting	Per cent of Erin-Style poles that are within their useful or functional life.	20%	With the current budget, 100% of Erin style poles will be replaced by 2059.
Roads	Traffic Signals and Related Electrical Devices	Per cent of signalized intersections that are within 60% of their useful life.	82%	Condition is based on age. Within 60% of useful life is considered good condition.
Roads	Traffic Signals and Related Electrical Devices	Per cent of traffic-controller cabinets that are within 90% of their useful life.	47%	Condition is based on age. Within 90% of useful life is considered good condition.
Roads	Traffic Signals and Related Electrical Devices	Per cent of CCTV cameras that are within 50% of their useful life.	77%	Condition is based on age. Within 50% of useful life is considered good condition.
Roads	Roadside Trail Network	Per cent of sidewalks and engineered walkways that meet standard width requirements	TBD	N/A

Appendix 1: All Proposed Levels of Service Measures

Service Area	Asset Class	Technical Metric	Current Measure (2023)	Additional information
Roads	Roadside Trail Network	Per cent of multi-use trails that meet standard width requirements.	87%	While the width requirement may be met, a trail or sidewalk may be partially obstructed by a pole or other fixed object. The number of partial-obstruction locations within the roadside trail network is currently unknown.
Parks, Forestry & Environment	Trees	Number of trees as a percentage of total plantable area of municipality.	TBD	Future Metric
Parks, Forestry & Environment	Natural Areas	Number of hectares of natural areas as a percentage of available parkland in Mississauga.	TBD	Future Metric
Parks, Forestry & Environment	Amenities	Per cent of assets with risk rating of high/very high.	TBD	Future Metric
Parks, Forestry & Environment	Amenities	Per cent compliance with scheduled preventative	TBD	Future Metric

Service Area	Asset Class	Technical Metric	Current Measure (2023)	Additional information
		maintenance within established SLA timelines.		
Parks, Forestry & Environment	Amenities	Per cent of Environics survey results with satisfied/very satisfied with park services.	84%	Survey conducted annually among residents in the City of Mississauga.
Parks, Forestry & Environment	Trees, Boulevard Landscapes, Natural Areas	Per cent of emergency maintenance completed within established SLA timelines.	94%	N/A
Parks, Forestry & Environment	Trees, Boulevard Landscapes, Natural Areas	Per cent of routine maintenance completed within established SLA timelines.	84%	N/A
Parks, Forestry & Environment	Trees, Boulevard Landscapes, Natural Areas	Per cent compliance within established SLA timelines.	86%	N/A
Parks, Forestry & Environment	Trees, Boulevard Landscapes, Natural Areas	Number of participants as a percentage of total participant spaces available.	TBD	Future Metric
Fire & Emergency Services	All	Annual reduction in tonne carbon dioxide equivalent (tCO2e) for Fire Fleet.	65 tCO2e or 7%	N/A
Fire & Emergency Services	All	% fire assets with high or very high criticality rating in fair or better condition.	TBD	N/A

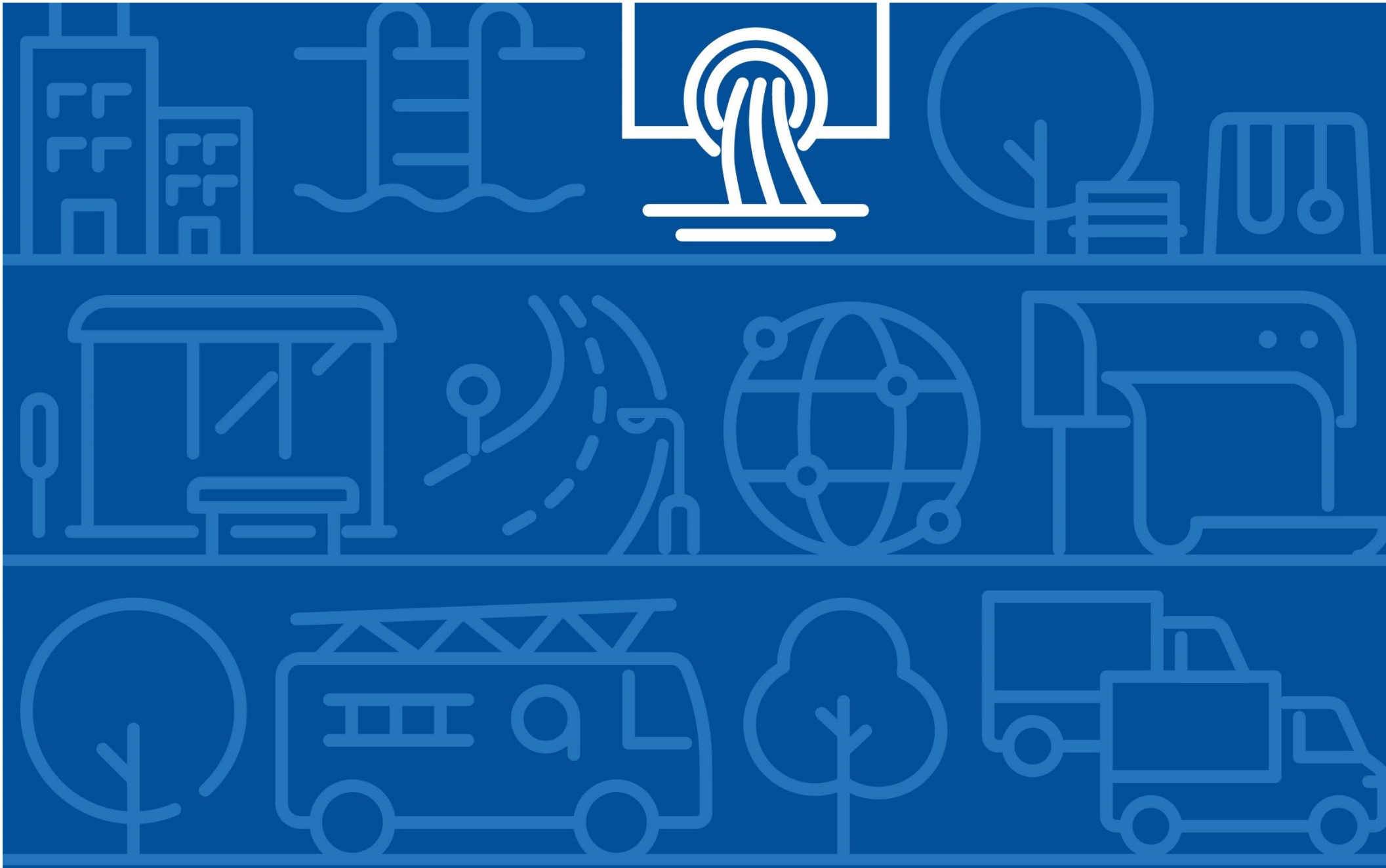
Appendix 1: All Proposed Levels of Service Measures

Service Area	Asset Class	Technical Metric	Current Measure (2023)	Additional information
Fire & Emergency Services	All	% fire assets with moderate, low or very low criticality rating in fair or better condition.	TBD	N/A
Fire & Emergency Services	All	% assets in very poor condition.	24.90%	N/A
Fire & Emergency Services	All	% of population receiving public fire safety education.	5%	N/A
Fire & Emergency Services	All	% of staff trained to NFPA 1031 (Fire Inspector) Standards – captains.	24%	N/A
Fire & Emergency Services	All	% of staff trained to NFPA 1035 (Public Educator) Standards - suppression staff.	54%	N/A
Fire & Emergency Services	All	% of fire inspections completed on high-risk properties.	96%	N/A

Detailed AM Plans

Table of Contents

STORMWATER ..... A
ROADS ..... B
FACILITIES PLANNING & DEVELOPMENT C
PARKS, FORESTRY & ENVIRONMENT ..... D
TRANSIT (MIWAY) ..... E
FIRE & EMERGENCY SERVICES ..... F
INFORMATION TECHNOLOGY ..... G
CORPORATE FLEET ..... H
RECREATION & CULTURE I
GENERAL GOVERNMENT (PRINT & MAIL SERVICES) ..... J



Corporate Asset
Management Plan **2025**

Stormwater

Table of Contents

Introduction 3
Key Stats 4
State of the Infrastructure 5
- Asset Hierarchy 5
- Asset Class - Summary 6
- Assets Used by Stormwater – Managed By Other Service Areas 6
- Asset Management Tools & Systems 7
- Dashboards 7

Levels of Service 17
- Governing Legislation for Stormwater Service Area 17
- Community Levels of Service Framework 18
- Technical Levels of Service Framework 19

Demand Management 24
- Demand Drivers, Projections and Management Plans 25

Risk Management 37
- Asset-Specific Risk Methodology 37

Lifecycle Management 42
- Lifecycle Strategies 42
- Lifecycle Needs vs. Budget 52
- Budget Breakdown 56

Financing Strategy 58
- Capital Funding Sources and Operating Revenue Sources 60
- Infrastructure Gap 61

Continuous Improvement & Maturity 64
- Maturity Assessments 64
- Continuous Improvement Plan 69

Introduction

The Stormwater Service Area plans, develops, constructs, maintains and renews the stormwater management system, which protects property, infrastructure and the natural environment from erosion and flooding and enhances water quality. The Stormwater management system includes Storm Sewers, Stormwater Management Facilities (SWMF) and Watercourses and is one of the largest assets owned and operated by the City. These assets deliver critical drainage services that are underscored by recent extreme storm events and increasing impacts of climate change and intensification.

As summarized in Key Stats, the total Stormwater replacement value is $7.7 billion, and the overall condition of the stormwater system is Good. Stormwater's largest asset class is the Storm Sewer network which accounts for 87 per cent[1] of the total assets followed by Watercourses at 10 per cent and Stormwater Management Facilities accounting for three per cent.

[1] By proportion of Current Replacement Value

Key Stats

Current Replacement Value (CRV)	Average Condition	Current Maturity Level
$7.7 billion	Good	Intermediate
Average Annual Infrastructure Gap – Current LOS		Average Annual Infrastructure Gap – Proposed LOS
$0.0		Ongoing Analysis

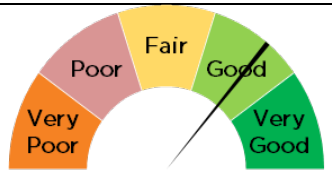
State of the Infrastructure

Asset Hierarchy

Table 1: Stormwater Service Area Hierarchy

Asset Class	Asset Type
Storm Sewers	Sewers
	Culverts
	Inlets/Outlets
	Junction
Stormwater Management Facilities (SWMF)	Cells
	Channels
	Pipe
	Inlet
	Headwall
	Control Structure (SWMF Outlet)
	Safety
	Structure
	Pumping Stations
	Underground Chamber
Watercourses	Watercourses

Asset Class - Summary

Asset Class	Current Replacement Value (Millions)	Average Condition	Average Annual Infrastructure Gap – Current LOS (Millions)
Storm Sewers	$6,800		$0.0
Stormwater Management Facilities (SWMF)	$236		
Watercourses	$697		

The average annual funding gap to meet proposed levels of service is an ongoing analysis that staff are conducting for all their asset classes.

Assets Used by Stormwater – Managed By Other Service Areas

Assets Used by Stormwater	Managed By	Quantity	Current Replacement Value (Millions)
Vehicles & Equipment	Corporate Fleet	2	$0.09

Asset Management Tools & Systems

The City maintains its inventory data in various systems, with each system serving a specific function and purpose.

GIS Esri is used to house and map the City's storm sewer and other stormwater assets.

Access/Excel is used to track stormwater management facility and watercourse inventories and inspection records.

CityWide is the City's Tangible Capital Asset (TCA) System. The system was introduced in 2008 to capture infrastructure valuation information about the City's major assets.

Infor is the computerized maintenance management system used throughout the City to record and manage service requests, work orders and permits. Requests for service are tracked from two primary channels: the offices of the Mayor and members of Council and the 3-1-1 Citizen Contact Centre. Work orders are processed daily for a variety of defined maintenance activities. Details tracked include labour, materials, maintenance contracts, and vehicles and equipment used to perform daily work activities. The ability to track work performed to a specific asset has not yet been fully deployed but it will form part of the overall strategy as the City advances its asset management practices.

Each of these systems plays an integral role in supporting decision-making about City services and infrastructure. The inventory information contained within each of these systems is comprehensive, reliable, and reasonably accurate and has been used to support the development of this plan.

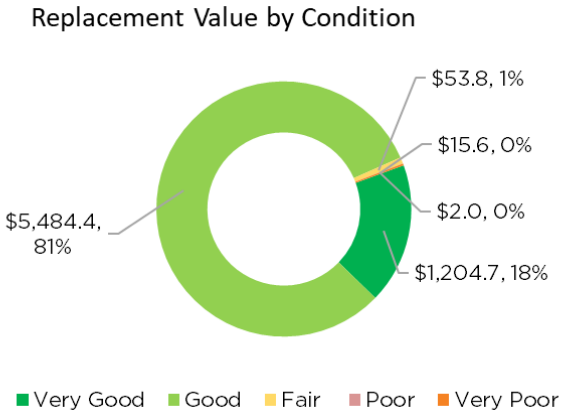
Dashboards

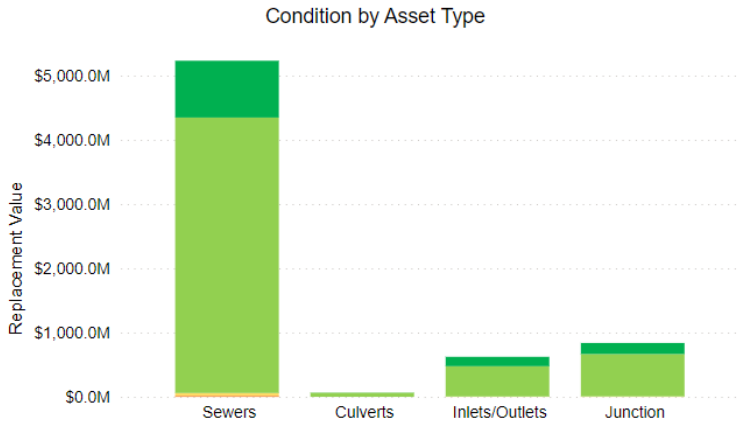
The following dashboards provide a summary of the state of the current infrastructure for each asset class. The information in this plan was prepared using 2023 year-end data. In charts, graphs and tables where money is represented in thousands of dollars ($000), figures have been rounded to the nearest thousand. This means that the totals shown may not always balance perfectly, due to rounding.

Dashboard – Storm Sewers

Data Quality:	Asset Inventory	Condition	Replacement Value
	B	B	A

Current Replacement Value: $6.8 Billion





Asset Type	Quantity	Average Age (Years)	Estimated Useful Life (Years)	Current Replacement Value (000s)
Sewers	1,887 km	34	95	$5,232,000
Culverts	0.8 km	51	100	$66,300
Inlets/Outlets	116 Ea.	39	100	$623,300
Junctions	28,553 Ea.	35	100	$838,800

Background Information

Storm Sewers is the largest of the three asset classes within the Stormwater Service Area. As shown in the dashboard, the asset class is valued at $6.8 billion with the majority attributed to storm mains and trunk sewers. Based on age, the overall condition of the network is in a strong position with 99 per cent of the network in Very Good to Good condition. Asset attribute information is continually reviewed and updated which results in an overall increase in data quality and accuracy for this asset class.

Condition

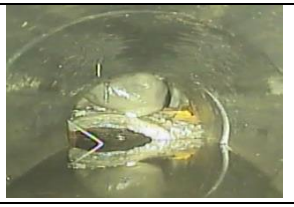
Currently, the Stormwater Service Area is utilizing age/remaining useful life as a proxy of condition as illustrated in Table 2 for the Storm Sewers. The overall age-based condition rating of Storm Sewers is Good. There is a small percentage (less than one per cent) of assets that are rated in Poor and Very Poor condition, due to some assets reaching the end of their estimated useful life. The Stormwater Service Area leverages available condition inspection records for decision making and has developed a digital repository for these inspections, which is linked to asset IDs in a geospatial database. Condition inspection ratings will replace age-based condition in future iterations.

Some assets have been excluded from this iteration of the asset management plan. They include:

- Service Connections
- Ditch & Driveway Culverts
- Minor Culverts
- Catch basin laterals (partial)
- Fittings
- Overland flow routes
- Assets with missing size attributes which could not be estimated

Trunk Storm Sewer under Dundas St. W

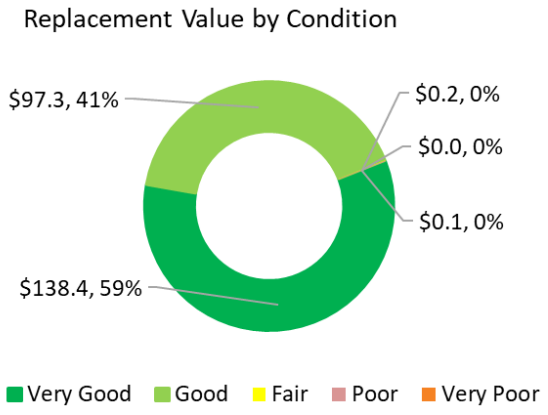
Table 2: Condition Rating Scale

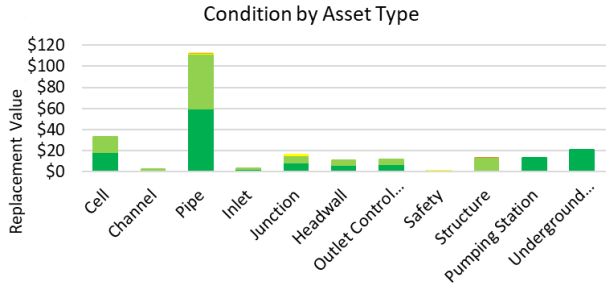
Condition Rating	% of Remaining Useful life (RUL)	Description	Example
Very Good: Fit for the Future	RUL ≥ 75%	The infrastructure in the system or network has greater than or equal to 75% of its remaining useful life. It is generally in very good condition, typically new or recently rehabilitated.	
Good: Adequate for Now	75% > RUL ≥ 35%	The infrastructure in the system or network has less than 75% (and greater than or equal to 35%) of its remaining service life. It is in good condition.	
Fair: Requires Attention	35 > RUL ≥ 13%	The infrastructure in the system or network has less than 35% (and greater than or equal to 13%) of its remaining service life. It is in fair condition.	
Poor: Approaching End of Life	13% > RUL ≥ 3%	The infrastructure in the system or network has less than 13% (and greater than or equal to 3%) of its remaining service life. It is in poor condition and mostly below operable state, with many elements approaching the end of their service life.	
Very Poor: Requires Renewal	RUL < 3%	The infrastructure in the system or network has less than 3% of its remaining service life. It is in very poor, unacceptable condition and should be replaced or rehabilitated.	

Dashboard – Stormwater Management Facilities (SWMF)

Data Quality:	Asset Inventory	Condition	Replacement Value
	C	B	A

Current Replacement Value: $236.0 Million





Asset Type	Quantity	Average Age (Years)	Estimated Useful Life (Years)	Current Replacement Value (000s)
Cell	86 Ea.	22	98	$33,300
Channel	3.5 km	24	87	$2,600
Pipe	47 km	21	90	$111,700
Inlet	138 Ea.	19	100	$3,550
Junction	229 Ea.	21	99	$15,700
Headwall	174 Ea.	23	100	$11,100
Outlet Control Structure	33 Ea.	26	95	$11,300
Safety	100 Ea.	27	70	$40
Structure	44 Ea.	20	61	$13,100
Pumping Stations	2 Ea.	5	43	$13,100
Underground Chambers	3 Ea.	3	83	$20,600

Background Information

The Stormwater Service Area's 80 Stormwater Management Facilities (SWMF) range in function but are predominantly quantity (dry) and quality control (wet) ponds. The Stormwater Management Facilities asset class is comprised of cells, channels (swales, overflow routes), sewers (SWMF Inlet pipes, SWMF Outlet pipes, Berm pipe), Junctions (SWMF Inlet and outlet MHs), Outlets (SWMF Inlet endwalls), Control Structures (SWMF Outlet structures), Inlets (SWMF Outlet headwalls and catch basins), Underground Chambers, Pumping Stations, Safety (signs), and Structures (berms, retaining walls etc.).

Some assets have been excluded from this iteration of the asset management plan. They include:

- Dry ponds (partial)
- Low impact development features (partial)
- Manufactured treatment devices (i.e. oil grit separators)

Condition

SWMF assets are in Good or Very Good condition based on age. Table 3 provides a description of ratings and visual examples of various conditions for the assets. Most of the assets are less than 30 years old and are moving towards the middle of their service lives. Ongoing changes to condition are recorded through the facility inspection and monitoring program.

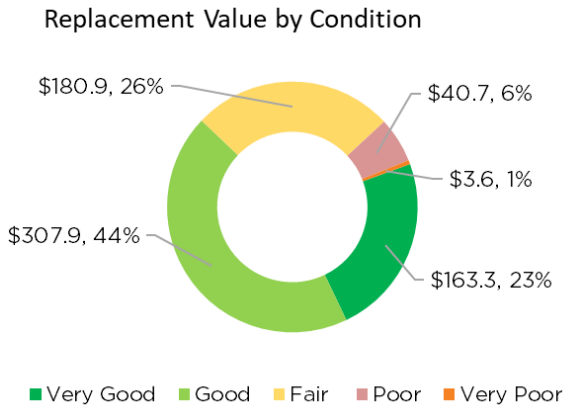
Water Quality and Quantity Control Facility behind Tahoe Blvd.

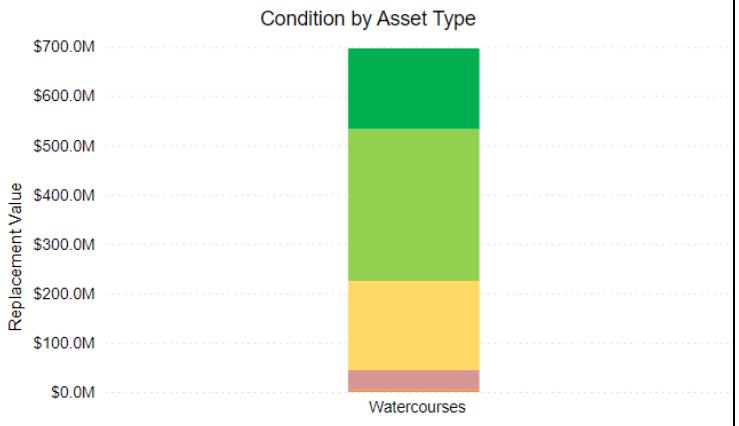
Table 3: SWMF Condition Rating

Condition Rating	% of Remaining Useful life (RUL)	Definition	Example
Very Good: Fit for the Future	RUL ≥ 75%	Asset is in very good condition or better. It is new or recently rehabilitated. Asset is fit for the future.	
Good: Adequate for Now	75% > RUL ≥ 35%	Asset is in good condition. Asset may have received repair or maintenance work. Asset is generally approaching mid-stage of expected service life.	
Fair: Requires Attention	35 > RUL ≥ 13%	Asset is in fair or adequate condition. Asset shows signs of deterioration with some elements showing defects. Asset requires attention in the short-term.	
Poor: Approaching End of Life	13% > RUL ≥ 3%	Asset is in poor condition and is at risk of affecting service. Large portion of the asset system exhibits significant deterioration, and the condition is below standard. Asset is approaching end of service life and is not fit for future use.	
Very Poor: Requires Renewal	RUL < 3%	Asset is in very poor condition and is in major risk of affecting service. Large portion of the asset system exhibits significant deterioration, and the condition is below standard. Asset is approaching end of service life. Asset is not fit for use.	

Dashboard – Watercourses

Data Quality:	Asset Inventory	Condition	Replacement Value	Current Replacement Value:	$696.5 Million
	C	C	C		





Asset Type	Quantity	Average Age (Years)	Estimated Useful Life (Years)	Current Replacement Value (000s)
Watercourses	160 km	-	-	$696,500

Background Information

The watercourse network is comprised of 32 creeks or rivers of which 160 kilometres are City owned/maintained and have been divided into smaller sections called “reaches". In Mississauga, there are approximately 40 kilometres of additional watercourses under ownership of various stakeholders including other government bodies or private lands that are excluded from this AM Plan. A reach map of the full watercourse network is provided in Figure 3. The watercourse network includes natural and engineered assets. The engineered infrastructure is generally installed for erosion control or conveyance and is often comprised of materials like gabion baskets and armour stones. Natural assets include materials like stone, soil and plantings and provide a variety of watercourse functions and services.

The asset inventory for the watercourse network has not been fully developed and componentized at this time. The replacement values of the watercourses were completed by applying an average unit cost to the reach length and a cost adjustment factor to estimate the value of engineered and natural assets based on known characteristics of the reaches. A spatially referenced watercourse inventory is currently in development in ArcGIS, and future plans will utilize this dataset for a more accurate inventory breakdown and detailed valuation.

Condition

Age information is not readily available, and the detailed watercourse inventory is currently in development in ArcGIS. However, Stormwater staff routinely inspect the watercourse network based on the defined reach network to identify issues and re-assess known problem sites. As part of these inspections or Urban Channel Assessments (UCA), the reaches are given a condition score/stability index as detailed in Table 4. This scoring is based on visual indicators of geomorphic processes. These stability index scores are translated to a 5-point scale to create condition proxy ratings for the watercourse reaches in the interim.

A detailed breakdown of watercourse asset types have been excluded from this iteration of the asset management plan. Future plans may include:

- Bank – erosion control, toe protection, revetments, etc.
- Instream – riffle/pool, drop structures, grade control, flow deflection, etc.
- Channel – fully lined, natural, etc.

Table 4: Watercourses Condition Rating

Condition Rating	UCA/Stability Index	Definition	Example
Very Good: Fit for the Future	UCA/Stability Index Score: 0.0 – 0.10	Asset is in very good condition or better. It is new or recently rehabilitated. Asset is well maintained. Asset is fit for the future.	
Good: Adequate for Now	UCA/Stability Index Score: 0.11 – 0.20	Asset is in good condition. Asset may have received repair or maintenance work. Asset is generally approaching mid-stage of expected service life.	
Fair: Requires Attention	UCA/Stability Index Score: 0.21 – 0.30	Asset is in fair or adequate condition. Asset shows signs of deterioration with some elements showing defects. Asset requires attention.	
Poor: Approaching End of Life	UCA/Stability Index Score: 0.31 – 0.44	Asset is in poor condition and is at risk of affecting service. Large portion of the asset system exhibits significant deterioration, and the condition is below standard. Asset is approaching end of service life. Asset is not fit for future use.	
Very Poor: Requires Renewal	UCA/Stability Index Score: 0.45 – 1.0	Asset is in very poor condition and is in major risk of affecting service. Large portion of the asset system exhibits significant deterioration, and the condition is below standard. Asset is approaching end of service life. Asset is not fit for use.	

Levels of Service

Governing Legislation for Stormwater Service Area

Legislation	Requirements
Conservation Authorities Act, 1990	Provides guidance for the organization and delivery of programs and services that further the conservation, restoration, development and management of natural resources in watersheds in Ontario.
Development Charges Act, 1997	Provides municipalities with the ability to levy charges to fund growth-related municipal infrastructure, on the principle that growth pays for growth.
Drainage Act, 1990	Provides a procedure whereby the municipality may provide a legal outlet for surface and subsurface waters not attainable under common law.
Emergency Management and Civil Protection Act, 1990	Provides requirements for emergency management.
Environmental Protection Act, 1990	Provides for the protection of the natural environment through regulations regarding discharge of contaminates into the natural environment.
Fish and Wildlife Conservation Act, 1997	Regulates hunting, trapping, and fishing practices and aims to preserve at- risk wildlife, as well as the conservation of wildlife.
Lakes and Rivers Improvements Act, 1990	Provides legislation for the design, construction, operation, maintenance and safety of dams in Ontario.
Municipal By-Laws	Regulations approved by Council to safeguard and protect persons and properties.
Municipal Government Act, 2001	Practices and procedures; Accountability and transparency; Finance.
Occupational Health and Safety Act, 1990	Rules governing health and safety in Ontario's workplaces.
Ontario Water Resources Act, 1990	Provides guidance in the inspection and maintenance frequency of stormwater management facilities (i.e., storm ponds).
Planning Act, 1990	Provides direction on municipal planning activities.

Community Levels of Service Framework

Core Value	LOS Objective	Performance Measure	Current Performance
Scope	Provide stormwater services reliably to residents.	Description, which may include maps, of the user groups or areas of the municipality that are protected from flooding, including the extent of the protection provided by the municipal stormwater management system.	See maps and descriptions provided in Figure 1, Figure 2 and Figure 3. The resiliency of buildings[2] (via riverine and/or urban flooding) to 100-year storm events was estimated by development age as follows: Pre-1949, 95%; 1950- 1969, 93%; 1970-1989, 89%; Post-1990, 95%. The resiliency of the SWM system[3] to 5-year storm events was estimated by development age as follows: Pre-1949, 92%; 1950-1969, 86%; 1970-1989, 89%; Post-1990, 91%.
Quality	Maintain the stormwater management system to protect the community.	Level of investment in the stormwater management system through the planning and delivery of Capital and Maintenance Programs.	Stormwater Business Plan & Budget is updated annually[4]. Staff utilize various criteria such as asset remaining useful life or performance indices to determine potential candidates for rehabilitation or replacement. Table 2, Table 3 and Table 4 provide a breakdown of the condition rating scale used for each Asset Class.

[2] Based on Credit Valley Conservation's (CVC) dual-drainage model for the Cooksville Creek watershed. The percentage of buildings resilient to riverine and urban flooding during a 100-year storm was modelled for various development eras (i.e., pre-1949, 1950- 1969, 1970-1989, 1990+) and the results were applied City-wide based on the estimated age of development.

[3] Based on CVC's dual-drainage model for the Cooksville Creek watershed. The percentage of the storm network with 5-year storm or greater capacity was modelled for various development eras (i.e., pre-1949, 1950-1969, 1970-1989, 1990+) and the results were applied City-wide based on the estimated age of development. Storm sewers outside of the Cooksville area that were known to have a smaller capacity were also adjusted for in this estimate.

[4] The Stormwater Business Plan & Budget documents how and where the City plans to allocate resources/funds to deliver stormwater programs and services.

Technical Levels of Service Framework

Core Value	LOS Objective	Asset Class	Performance Measure	Current Performance (2023)	Target Performance (2024-2033)	Background Information
Scope	Provide stormwater services reliably to residents.	All	Percentage of properties in municipality resilient to a 100-year storm.	92%[5]	TBD	Mandated metric by O.Reg. 588/17. Staff require support from the conservation authorities to determine target performance.
			Percentage of the municipal stormwater management system resilient to a 5-year storm.	94%[6]	TBD	
Good Stewardship	Assess the stormwater management system to limit impacts to the community.	SWMF	Percentage of SWMF inspections completed annually.	100%	Meet Ministry of Environment, Conservation and Parks (MECP) requirements	Annual facility inspections are required to comply with Municipal Consolidated Linear Infrastructure Environmental Compliance Approvals.
		Storm Sewers	Percentage of storm sewer network closed-circuit television (CCTV)	9%	TBD	N/A

[5] Current Performance measurement based on Credit Valley Conservation's (CVC) dual-drainage model for the Cooksville Creek watershed. The percentage of buildings resilient to riverine and urban flooding during a 100-year storm was modelled for various development eras (i.e., pre-1949, 1950- 1969, 1970-1989, 1990+) and the results were applied City-wide based on the estimated age of development.

[6] Current Performance measurement based on CVC's dual-drainage model for the Cooksville Creek watershed. The percentage of the storm network with 5-year storm or greater capacity was modelled for various development eras (i.e., pre-1949, 1950-1969, 1970-1989, 1990+) and the results were applied City-wide based on the estimated age of development. Storm sewers outside of the Cooksville area that were known to have a smaller capacity were also adjusted for in this estimate.

Core Value	LOS Objective	Asset Class	Performance Measure	Current Performance (2023)	Target Performance (2024-2033)	Background Information
			inspections completed annually.			
		Watercourses	Percentage of watercourse reach inspections completed annually.	36%	TBD	Based on the length of reach inspections relative to the total number of City-owned/maintained reaches.
Affordability	Provide the community with affordable service.	All	Capital Budget/Total Budget Allocation.	81%	TBD	This metric is based on the approved 2024 Business Plan and Budget. It is the total allocation of funds towards capital investment over total Service Area budget.

The Stormwater Service Area completed a study in 2024 that examined the current Levels of Service measures reported on in the asset management plan. The completed study reviewed the current measures, benchmarks, and alignment with service area goals. The study concluded that some of the reporting measures were repetitive and as a result 2025 measures have been consolidated. The study also proposed new measures that would help demonstrate the Service Area's dedication to providing the community with the best service based on budget allocation.

The vast majority of the City is serviced by storm sewers and/or open ditches. However, the ditch and minor (driveway) culvert asset inventories have not been formally established at this time. The majority of the City's storm sewer system is designed for a 10-year storm event.

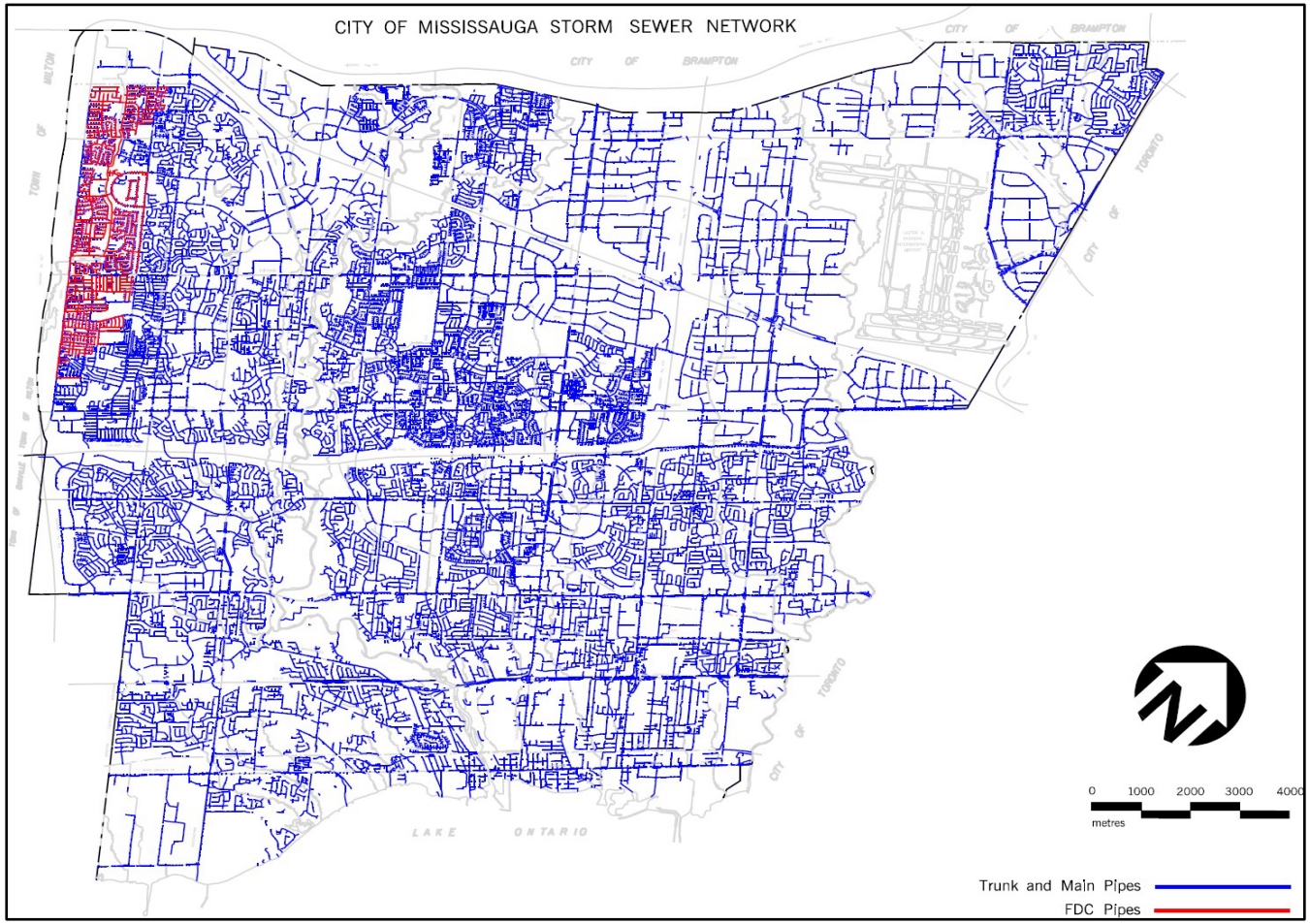


Figure 1: Storm Sewer Network

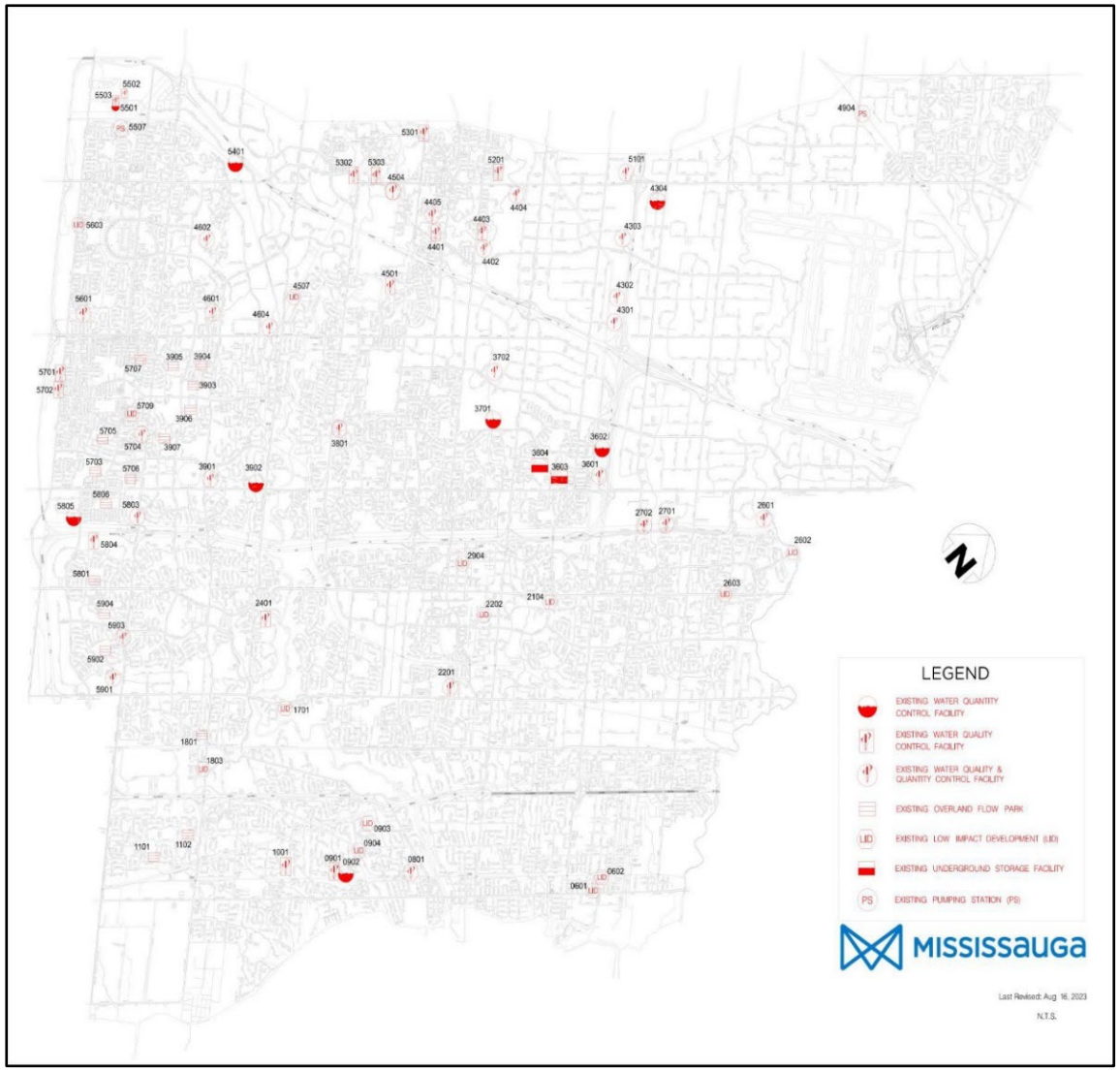


Figure 2: SWMF Inventory Map

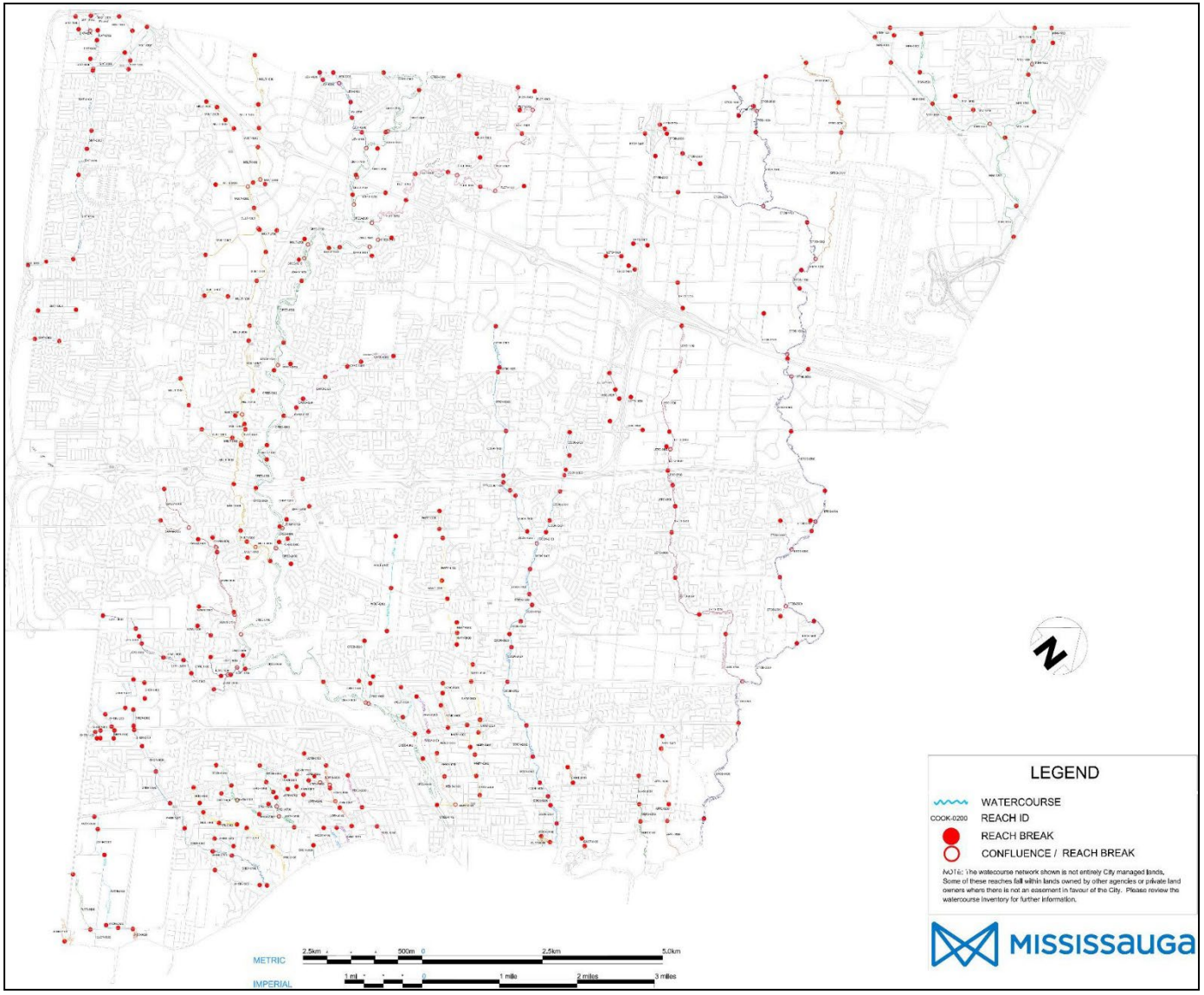


Figure 3: Watercourses Network Map

Demand Management

The City's stormwater management system is designed to collect stormwater from private and public properties across the city. The system also accommodates stormwater from upstream municipalities (e.g., Brampton, Caledon). The Stormwater Service Area maintains a network of sewers and related assets that transport stormwater to the receiving watercourses (e.g., creeks, rivers) or directly to Lake Ontario. Stormwater Management Facilities support the system by providing water quality and/or quantity control. Together the system helps to protect the water quality of creeks and Lake Ontario (the City's source of drinking water) and lowers the risk of flooding that can damage property and the environment.

The Stormwater Service Area is planning for the future by recognizing the pressures and challenges ahead resulting from aging stormwater infrastructure, extreme weather events, climate change and new legislation/regulations among other factors. There is an increasing need to plan and deliver effective and timely stormwater services, build a more resilient stormwater management system, and establish sustainable service levels. Strategies to meet these demands include continuous improvements of stormwater programs and services, increasing contributions to the Pipe Reserve Fund, the effective delivery of capital projects and studies and implementation of the Stormwater Master Plan and Asset Management Plan. These actions also align with the City's vision and strategic plan.

Lake Saigon Stormwater Management Facility

Demand Drivers, Projections and Management Plans

Demand Driver	Current Position	Projection	Impact on Services	Demand Management Plan
Aging Stormwater Infrastructure	The majority (94%) of the stormwater management system is currently in 'Good' or 'Very Good' condition. As such the Operations, Maintenance, Inspection (OMI) and Capital needs are relatively stable at this time.	As the City's stormwater infrastructure ages, the overall condition will decrease. The operating and maintenance costs are expected to increase as a result.	Aging infrastructure without intervention can lead to more unplanned service disruptions; emergency repairs; and associated budget stresses.	Develop and maintain a comprehensive asset management plan to formalize OMI, and Renewal and Rehabilitation (R&R) activities and maximize the useful service life of stormwater assets. In turn this will inform the level of investment required and Stormwater Charge revenue needed.
New Legislation & Regulations	There are a number of existing laws and regulations which dictate how the City provides stormwater management services. These are identified in Governing	In general, environmental awareness is strong and regulations are becoming stricter or formalized. Asset management regulations have recently been established and are expected to become more prescriptive.	New legislation may increase operating and capital pressures. Examples include continuously evolving species-at-risk habitat legislation that can limit construction timing windows, and excess soil management	Remain informed of changes to legislation and adjust maintenance and operating programs and budget accordingly.

Demand Driver	Current Position	Projection	Impact on Services	Demand Management Plan
	Legislation under Levels of Service. Current legislation has the greatest effect on capital rehabilitation and renewal projects where there may be significant impacts associated with the work.	Legislation is subject to change based on changing governments.	requirements that can add additional delays and costs to infrastructure improvement projects. New legislation could also require additional stormwater management practices to reduce stormwater runoff, improve water quality or implement infrastructure that is more resilient to climate change (e.g., low impact developments (LID) infrastructure, on-site storage, etc.). This could increase the asset service life but potentially increase capital and operating costs.	

Demand Driver	Current Position	Projection	Impact on Services	Demand Management Plan
			Minimum service requirements (e.g., inspection frequency) or minimum maintenance standards could also be legislated for critical stormwater infrastructure. Include the ECA process in this section.	
City Growth & Development	The majority of greenfield lands in the City have already been developed. Existing developments from different eras/generations have different stormwater characteristics and infrastructure standards. In general, older	Future development will largely be redevelopments of existing sites due to the limited land availability. Land use is also expected to intensify (i.e., more units/area). Development applications will be required to meet the latest stormwater management requirements to mitigate the effects of this	More intensive development will generally increase the amount of impervious cover on a site. Without effective stormwater management measures to mitigate these impacts, additional stormwater runoff will be produced which will add new stresses to the existing stormwater management system.	Continue to review and update the City's stormwater management requirements for development to mitigate the impacts of stormwater runoff from increased impervious area. Contemplate opportunities to upsize stormwater infrastructure to

Demand Driver	Current Position	Projection	Impact on Services	Demand Management Plan
	neighbourhoods (pre-1950s) have much less impervious cover than today. Storm sewers have been common since the 1950s, however, modern stormwater management practices were established in the 1990s to mitigate the additional runoff caused by additional impervious cover.	increased intensification (i.e., by satisfying City's stormwater management criteria).		accommodate additional runoff.
Environmental Awareness	Environmental awareness is perceived to be generally strong in the younger, upcoming generation.	When the younger generation reaches voting age, they may demand a higher level of service for water quality and water quantity infrastructure (as it affects the environment).	Anticipated increased environmental awareness in future generations could lead to increased demand for a higher service level (e.g., greater expectations that the	Monitor changes in public satisfaction (e.g., survey, Business Plan) of stormwater services and consider adjusting investment accordingly to meet desired level of service.

Demand Driver	Current Position	Projection	Impact on Services	Demand Management Plan
			City make additional investment) for water quality and water quantity infrastructure.	
Asset Management Planning	Asset Management is a relatively new concept for Ontario Municipalities. Ontario Municipalities are required to develop an asset management plan for core infrastructure by 2021 and an enhanced plan by 2025.	Effective asset management planning is expected to become standard practice.	Effective asset management planning should allow the City to make effective risk-based decisions. The asset management plan should include inspection programs and maintenance strategies to identify problems and intervene at the right times to fund rehabilitation and replacement works. The results should be cost-effective spending on the right assets, at the right time to	Continue to implement asset management principles and procedures and identify/document continuous improvements through updated maturity assessments and asset management plans.

Demand Driver	Current Position	Projection	Impact on Services	Demand Management Plan
			maximize an assets useful service life.	
Technology	New techniques such as trenchless rehabilitation are expensive, evolving and may be limited contractor availability. The technology and industry are relatively new, and few qualified contractors are available.	The cost to rehabilitate aging stormwater assets should become more affordable in the future as the marketplace for qualified contractors becomes more competitive.	Stormwater rehabilitation projects may become more affordable in the future as the technology becomes more available and competitive in the marketplace.	Monitor and learn about changes to available renewal technologies. Communicate with other municipalities to discuss changes in best industry practice.
CLIMATE CHANGE DEMAND DRIVERS[7] [8]				
More frequent and extreme	The existing stormwater management	The frequency, volume, and intensity of rainfall events is expected to	Risk of private/public property flood and erosion damage (e.g., damage to	Coordinate with Roads Service Area to align storm sewer upgrade

[7] Auld, H., Switzman, H., Comer, N., Eng, S., Hazen, S., and Milner, G. 2016. *Climate Trends and Future Projections in the Region of Peel. Ontario Climate Change Consortium: Toronto, ON*

[8] Climate Risk Institute (CRI), Emmons & Olivier Resources Inc. (EOR), Nodelcorp, and Climalogik. 2023. Climate Change Risk and Adaptation Assessment for Asset Management. Prepared for the City of Mississauga, Ontario.

Demand Driver	Current Position	Projection	Impact on Services	Demand Management Plan
rainfall events leading to flooding	system collects stormwater runoff and provides safe conveyance/control via storm sewers, ditches, facilities and watercourses before discharge to Lake Ontario. The capacity of Mississauga's minor system is generally designed for a 10-year storm using historical rainfall data. Where available, overland flow routes collect flows that exceed the capacity of the minor system. Some older developments were designed with now	increase across all seasons and all return periods. For example, one in 10-year, 15-minute duration rainfall is projected to increase by 30% and 90% in the 2050s and 2080s, respectively.	private homes, businesses, institutions, public lands and road right-of-way). Flooding can result in damage to structures and surrounding areas, particularly when these structures are undersized or blocked. Risk of litigation against the City as result of damage to private property. When over capacity, smaller culverts may blow out, with disruption in road access in the area of the failure and overland flow affecting other parties and assets. Infrastructure potentially failing earlier than expected due to increased	projects with road renewal activities, where possible. Trends for intense rainfall events are expected to increase into the 2080s, further limiting the capacity of bridges and culverts to pass the flows without overtopping. When data available, implement tracking of events and locations of overtopping to identify infrastructure with a higher likelihood of failure. Plan and implement studies to identify priorities and implement system improvements to mitigate risk to the

Demand Driver	Current Position	Projection	Impact on Services	Demand Management Plan
	out-dated design standards.		demand/stress (e.g., pipe/facility failures, erosion control failures). Existing infrastructure may need to be up-sized or retrofitted to provide the same service level and/or resiliency (e.g., upsizing storm sewers/culverts, improving resiliency of facilities and erosion control works, etc.). New infrastructure may be required to mitigate risks (e.g., flood storage facilities, storm relief sewers, low impact developments, etc.). Risk of more unplanned failures/emergency responses (e.g., road washouts, sinkholes, flood related clean-up/repairs).	stormwater management system. Leverage development design standards to limit compounding impacts on the receiving stormwater management system.

Demand Driver	Current Position	Projection	Impact on Services	Demand Management Plan
			Increased storms and heavy rainfall events can slow down and increase the maintenance and repair costs associated with delivering adequate level of service. Increased capital and operating costs. The imperviousness of the watersheds draining to creeks and rivers in the City highlight the need to disconnect and reduce imperviousness such as with GI to slow and treat that runoff.	
Increased risk of long-duration freezing rain events leading to ice storms	Road salt is applied to roadways to mitigate freezing rain events and as a result is discharged into the stormwater	The frequency of freezing rain events lasting six hours or more for the typically coldest months could increase in southwestern and	Additional road salt application may reduce the expected useful life of stormwater infrastructure (e.g., through corrosion, etc.) and further impact water quality in	Works Operations and Maintenance have begun to use brine as part of their regular winter program to reduce salt concentrations.

Demand Driver	Current Position	Projection	Impact on Services	Demand Management Plan
	management system.	south-central Ontario by 40% by the 2050s.	watercourses and Lake Ontario.	When data is available, monitor impacts of freezing rain and adjust capital and operating programs and budgets accordingly.
Increased frequency and intensity of extreme weather events	High wind and ice events can cause tree limbs and woody debris to fall, which can accumulate in watercourses and other stormwater infrastructure.	A warmer, hotter, and seasonally varying future climate provides conditions favorable for extreme events such as lightning and thunderstorms, snowstorms, freezing rain, ice accretion, extreme winds, droughts, wildfires, riverine flooding, and storm surges. The occurrence of wind gusts is likely to increase in the future in line with more	More debris (woody organic, urban) accumulating in the stormwater management system (catch basins, sewers, creeks, ponds) poses risks to maintaining network drainage and limiting potential flooding and/or erosion. Increased risk of debris jams/blockages and associated impacts; additional costs for debris clean-up. Stormwater conveyance systems can be impacted from wind and storm	Monitor changes to extreme events and adjust operating programs and budget accordingly.

Demand Driver	Current Position	Projection	Impact on Services	Demand Management Plan
		energetic atmospheric circulation patterns. Heat events in the summer are expected to increase which are favorable conditions for convective storms.	events when debris clogs inlets and pipes leading to a decrease in capacity. Although stormwater systems are typically designed to withstand heavy rainfall, systems can quickly become overwhelmed if undersized or blocked.	
More frequent extreme heat days (>30 degrees Celsius)	Extreme heat or drought events could raise temperatures, decrease seasonal baseflow in watercourses and impact water quality. Stormwater management facilities with permanent pools act as a heat sink	An increase in the frequency and intensity of warm extremes are expected. Not only are warm temperature extremes projected to be more severe, but they are also projected to be frequent on average. For example, the number of days where the daily maximum temperature is more than 35°C is projected	An increase in extreme heat can lead to warmer water within and being discharged into the City's watercourse network, which can negatively affect water quality/availability and aquatic habitats.	When data is available, monitor changes in extreme heat day events and adjust capital improvement programs and budget accordingly. Consider actions to mitigate this risk (e.g., updates to stormwater management criteria, LID practices, cooling BMPs, increased

Demand Driver	Current Position	Projection	Impact on Services	Demand Management Plan
	for solar radiation and discharge into the City's watercourses.	to increase by 10 times in the 2050s and 37 times in the 2080s. The number of heatwave days will likely increase by 38 days in the 2050s and 67 days in the 2080s.		riparian/pond vegetation, etc.).
Changing freeze-thaw cycles	Changing freeze thaw cycles may lead to more frequent ice jams in culverts.	Warmer winter temperatures could imply more freeze-thaw cycles in the short and medium term. However, it is important to note that risks related to freeze-thaw decreases from medium in the 2050s to low in the 2080s since the number of days with a freeze-thaw cycle may decrease in the long term.	Freeze-thaw events are expected to continue into the 2050s with an expected decrease into the 2080s, resulting in less ice related impacts and degradation from de-icing materials in the long-term.	Tracking the events and locations of overtopping to identify locations with higher/increasing likelihood of failure. Tracking related operations and maintenance (O&M) expenditures identify when budgets needed to deal with the related impacts can be redistributed.

Risk Management

Asset-Specific Risk Methodology

Asset-level risk is calculated by multiplying the assets' Consequence of Failure (CoF) score with the Likelihood of Failure (LoF) score. For this asset management plan, criticality is used to determine the CoF. However, in subsequent asset management plans, the CoF may also consider other aspects such as disruption, safety, financial impact, environmental impact, reputation to the organization, etc., in addition to criticality. The criticality of an asset is the inherent consequence of the loss of its function, including its impact on the function of a system or network of assets. While the loss of some assets or components may have little impact on service delivery and negligible risk of damage/injury, the loss of others may severely impact public services, and may lead to private property damages, significant financial losses or fatalities.

For each of the asset classes (Storm Sewers, Stormwater Management Facilities and Watercourses), criticality criteria have been identified for each major asset (such as size, type or location of the asset). Asset Criticality rates how critical the asset is to deliver the required service. A numerical score is assigned based on the applicable descriptions in Table 5.

Table 5: Asset Criticality Ranking

Criticality	Description	Score
Very Low	• Easy to replace • Can be non-operational for multiple months without significantly impacting core service delivery to many users	1
Low	• Somewhat difficult to replace • Can be non-operational for multiple weeks without significantly impacting core service delivery to many users • Asset does not perform a safety function or meet a regulatory requirement	2
Medium	• Moderately difficult to replace • Outages of more than a couple of days may significantly impact core service delivery to many users • Asset may perform a safety function or meet a regulatory requirement	3
High	• Highly mission-sensitive asset with no redundancy • Mission-critical asset with very limited redundancy • Significant community investment	4
Very High	• Mission-critical and unique asset • Significant service disruption from any outage • No redundancy • Significant community investment	5

Using the outputs from the State of Infrastructure (SOI) analysis and the ranking descriptions in Table 6 the likelihood of asset failure for each asset type or component is assigned. The remaining useful life in Table 6 is used to assign likelihood of failure, where data is available.

Table 6: Likelihood of Failure Ranking

Likelihood	Description	Score
Very Low	• Remaining useful life is >75% of the asset lifespan • Assets are generally in very good condition, typically new or recently rehabilitated	1
Low	• Remaining useful life is between 75% and 35% of the asset lifespan • Assets are in good condition	2
Medium	• Remaining useful life is between 35% and 13% of the asset lifespan • Assets are in fair condition and will be subject to mid-life interventions	3
High	• Remaining useful life is between 13% and 3% of the asset lifespan • Assets are in poor condition and mostly below standard, with many elements approaching the end of their service life	4
Very High	• Remaining useful life is less than 3% of the asset lifespan • Assets are in very poor, unacceptable condition and should be replaced or rehabilitated	5

Once the asset consequence and likelihood have been scored, the risk rating can be calculated. The risk matrix in Table 7 shows the scale for the total score and rating.

Table 7: Risk Matrix

Risk Rating Matrix		Consequence of Failure (CoF)				
		Very Low (1)	Low (2)	Medium (3)	High (4)	Very High (5)
Likelihood of Failure (LoF)	Rare (1)	1 Very Low	2 Very Low	3 Very Low	4 Very Low	5 Very Low
	Unlikely (2)	2 Very Low	4 Very Low	6 Low	8 Medium	10 Medium
	Possible (3)	3 Very Low	6 Low	9 Medium	12 High	15 High
	Likely (4)	4 Very Low	8 Medium	12 High	16 High	20 Very High
	Almost Certain (5)	5 Very Low	10 Medium	15 High	20 Very High	25 Very High

A risk rating breakdown for each Asset Class is shown below.

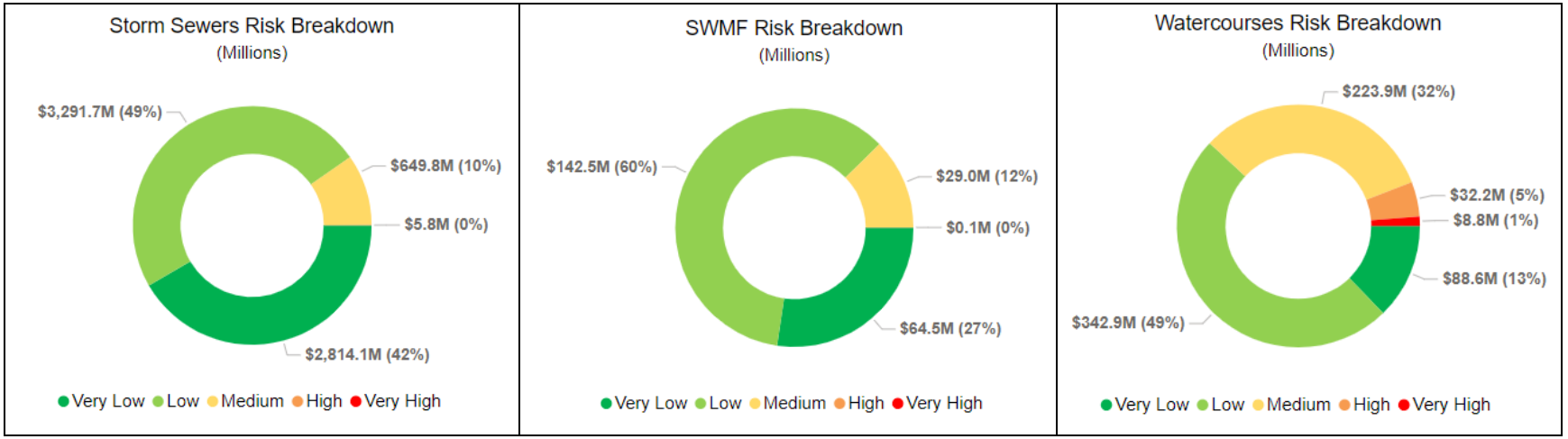


Figure 4: Risk Rating Breakdown per Asset Class

Overall, the bulk of the Stormwater Service Area's assets are categorized as Very Low to Low Risk. For the Storm Sewers approximately 90 per cent of the assets are Very Low or Low risk with only 10 per cent of the assets in the Medium category. Similarly, for the SWMF, 87 per cent of the assets are in the Very Low to Low risk category with 12 per cent categorized as Medium risk. Over half of the Watercourse assets, 62 per cent, are categorized as Very Low to Low risk with 32 per cent categorized as Medium risk.

Lifecycle Management

Lifecycle Strategies

All Stormwater Assets

Current and Proposed Lifecycle Activities	Risks associated with Lifecycle Activities
Non-Asset Solutions: Activities that do not alter the condition or performance of assets or services but provide staff with valuable information for their effective management.	
• **Master Plans**: Development of comprehensive plans such as the Stormwater Master Plan to guide long-term infrastructure management • **Flood and Water Quality Studies**: Includes flood evaluation, prioritization, and rehabilitation studies (e.g., CRAMS, MCRS), along with water quality studies to address potential risks • **Development Charge (DC) Studies**: Conducting studies to assess and manage the impact of new developments and growth on infrastructure needs • **Feasibility studies** • **Development Requirements:** Reviewing and updating development requirements for effective stormwater management • **Data Collection and Data Management**	• **Impacts to Strategic Planning**: Master Plans and other studies are needed to guide long-term planning decisions such as budgeting, project prioritization, and capital planning • **Impact to DC Studies**: Without Development Charge (DC) studies, the City cannot determine appropriate funding needed for growth-related projects or meet legislated requirements • **Impact to Asset Data Tracking**: Missing or outdated data can impact informed decision-making for maintenance and capital programs • **Service Request and Work Order Tracking**: Failure to track service requests and work orders makes it difficult to ensure that maintenance work is completed, and customer needs are addressed • **Geospatial Mapping Limitations**: Without geospatial mapping, staff cannot effectively visualize, store, or maintain large asset inventories or integrate them with condition and inspection programs

Current and Proposed Lifecycle Activities	Risks associated with Lifecycle Activities
Acquisition/Expansion/Rebuild: These activities expand services to previously non-serviced areas or to accommodate growth; they provide new or enhanced services beyond the current capacity and/or functionality of existing assets.	

• **New Design and Construction:**
  ○ Storm sewer assets and pipe upgrades
  ○ Stormwater management facilities to manage water quantity and quality
  ○ Watercourse assets to minimize erosion and to increase capacity
• **Land Acquisition:** Acquiring land for the purpose of expanding the stormwater infrastructure network
	• **Infrastructure Planning Impacts:**
	  ○ Inadequate planning and implementation of infrastructure to manage existing and potential growth pressures
	• Inability to mitigate climate change impacts and other demand factors

Storm Sewers – Current and Proposed Lifecycle Activities

Current and Proposed Lifecycle Activities	Risks associated with Lifecycle Activities
Operations & Maintenance: Minor activities that preserve the condition or performance of assets and ensures the longevity of assets in line with their design and operational requirements.	

• **Inspections**: Regular inspections are conducted as required, including a 10-year cycle for smaller diameter mains and inspections for larger infrastructure based on age and criticality. Additional visual checks for blockages are carried out in high-risk areas after major storms
• **Operations**:
  ○ **Street Cleaning**: Annual spring street cleaning helps prevent debris accumulation
  ○ **Catch Basin Cleaning**: Conducted every three years, ensuring stormwater systems remain clear
  ○ **Debris & Graffiti Removal**: Regular removal of debris and graffiti is part of ongoing operations
• **Patrols and Safety Checks**: Road patrols are performed to assess general safety issues and check for blockages in known problem areas, especially after storms
• **Preventive Maintenance**: Proactive system flushing is carried out to prevent blockages, helping maintain smooth system operations
	• **Inspection Failures**: Failing to inspect key infrastructure elements such as leads, mains, manholes, catch basins, inlets, outlets, culverts, and ditches can result in unexpected operational and structural issues, potentially leading to blockages, flooding, or damage to roadways
	• **Street Sweeping**: Inadequate street sweeping can cause debris accumulation in the stormwater system, impacting water quality and clogging drainage systems
	• **Catch Basin and Manhole Maintenance**: Failure to clean and maintain catch basins and manholes can cause debris buildup, blockages, and water quality issues. It may also lead to operational and structural failures
	• **Drainage Issues**: Lack of inspection or maintenance of inlets, outlets, and culverts can lead to drainage problems, such as ponding water, localized flooding, or structural damage
	• **Pipe and Root Management**: Failure to flush pipes or remove intruding roots can cause blockages, premature asset failure, and flooding. Emergency repairs to pipes, manholes, and catch basins are critical to prevent further damage and flooding

Current and Proposed Lifecycle Activities	Risks associated with Lifecycle Activities
• **Reactive Maintenance**: Includes flushing blocked pipes or manholes, performing emergency repairs, cutting roots, clearing leaves, and responding to spills or damage • **Emergency Repairs**: Immediate repairs are conducted as needed, including responding to emergencies like spills and fence damage	• **Spill Response**: Failing to respond to spills can negatively affect water quality and lead to regulatory compliance issues
Renewal/Rehabilitation: Significant activities designed to extend the useful life of assets components.	
• **Trenchless Rehabilitation**: Utilizes trenchless methods for the rehabilitation of pipes, culverts, or ditches, reducing disruption and maintaining system integrity • **Mid/Later-Life Replacement**: Involves replacing grade adjustment units, manhole covers, and grates as needed during the mid to later life of the infrastructure • **Repairs and Erosion Protection**: Local repairs, erosion protection, and grate replacements are carried out for inlets and outlets during their later life stages	• **Storm Mains Rehabilitation**: Failing to rehabilitate storm mains can lead to structural failures • **Manhole and Catch Basin Adjustments**: Not adjusting manholes or catch basins properly can cause damage to the roadway and pose risks to vehicles • **Broken Manhole Lids/Grates**: Failing to replace broken manhole lids or catch basin grates can lead to damage to the roadway and vehicles • **Grate Repairs**: Neglecting grate repairs can result in blockages, flooding, and potential compliance issues • **Culvert Renewal**: Failing to renew culverts can cause structural failure

Current and Proposed Lifecycle Activities	Risks associated with Lifecycle Activities
Replacement: Replacement activities occur once an asset reaches the end of its useful life, cannot provide the intended function or performance, and rehabilitation is not a viable option.	
• **Grade Adjustment Units**: Replace or add grade adjustment units when broken or compromised, typically at mid-life • **Maintenance Hole Covers/Lids**: Replace as required at mid-life and later life stages • **Grates**: Replace grates as necessary during mid-life and later life stages • **End-of-Life Replacements**: Replace components as they reach the end of their life cycle	• **Leads**: Not replacing broken leads can cause drainage and structural issues in the roadway • **Mains**: Failure to replace mains can lead to drainage, structural, and safety problems in the roadway • **Catch Basins**: Not replacing catch basins can cause drainage, structural, and safety issues • **Inlets**: Failure to replace inlets can cause upstream drainage and structural problems • **Outlets**: Not replacing outlets can lead to drainage, structural, and safety issues in the roadway • **Culverts**: Failing to replace culverts can result in drainage, structural, and safety concerns in the roadway
Disposal/ Demolition: Activities associated with the disposal or decommissioning of an asset.	
• **Retire/Decommission**: Assets are retired or decommissioned at End of Life if asset is no longer required	• **Conflict and Safety Impacts**: Failure to decommission assets properly can lead to conflicts with other utilities in the right of way as well as safety issues

Stormwater Management Facilities– Current and Proposed Lifecycle Activities

Current and Proposed Lifecycle Activities	Risks associated with Lifecycle Activities
Operations & Maintenance: Minor activities that preserve the condition or performance of assets and ensures the longevity of assets in line with their design and operational requirements.	
• **Sediment and Debris Removal**: Sediment surveys are conducted every 5 years, with debris removal performed as needed, including from grates, fencing, and access routes • **Graffiti Removal**: Graffiti is removed as required • **Vegetation Control**: Vegetation is removed from fencing, grates, and along access routes when necessary • **Annual and Functional Inspections**: Annual condition inspections are carried out, with functional inspections occurring twice annually • **Preventive Maintenance**: Includes sediment removal when required • **Reactive Maintenance**: Involves algae treatment, minor repairs, fence repairs, vegetation and debris removal, erosion repairs, emergency repairs, sign repairs, and mitigation of issues like beaver activity	• **Condition Inspections**: Failing to complete condition inspections can result in unexpected operational and structural issues • **Sediment Surveys**: Not conducting sediment surveys may lead to loss of water quality and function in ponds • **Channel and Structure Inspections**: Neglecting inspections of channels or structures can cause blockages, erosion, and other operational issues • **Debris Clearing**: Failure to clear debris can cause blockages, flooding, and safety concerns, especially in fencing and around inlets/outlets • **Signage Inspections**: Neglecting to inspect signage may impact compliance with legislation and expose the city to liability risks • **Vegetation Control**: Not clearing vegetation from grates and fencing can lead to flooding, safety risks, and compliance issues • **Algae Treatment**: Failure to address algae growth can result in water quality and aesthetic issues • **Fence and Access Road Maintenance**: Not maintaining fences and access roads can create safety hazards and increase capital costs

<table>
<tr><th>Current and Proposed Lifecycle Activities</th><th>Risks associated with Lifecycle Activities</th></tr>
<tr><td></td><td>• Channel and Structure Maintenance: Neglecting channel and structure maintenance can result in erosion, blockages, and flooding
• Graffiti Removal: Failure to remove graffiti can lead to aesthetic concerns
• Beaver Management: Not managing beaver impacts can cause safety hazards, blockages, and flooding</td></tr>
<tr><td colspan="2">Renewal/Rehabilitation: Significant activities designed to extend the useful life of assets components.</td></tr>
<tr><td>Mid-Life:
• Localized patching and repairs for pipes, manholes, and inlet/outlet structures
• Erosion protection repairs
• Localized point repairs for pipes, manholes, and inlet structures

Later Life:
• Liner replacement for pipes and structures
• Larger-scale patches and repairs
• Inlet grate repair or replacement
• Sluice gate and outlet grate repair or replacement</td><td>Impacts to Structure and Performance of Assets:
• Liner Replacement: Failure to replace liners can cause unintended water infiltration and make sediment removal projects more difficult
• Structure Renewal: Neglecting to renew or rehabilitate structures can lead to structural failure
• Inlet Rehabilitation: Failing to rehabilitate inlets can result in structural failure, blockages, and excessive downstream erosion
• Outlet Rehabilitation: Not rehabilitating outlets can lead to structural failure, blockages, and upstream flooding</td></tr>
</table>

Current and Proposed Lifecycle Activities	Risks associated with Lifecycle Activities
Replacement: Replacement activities occur once an asset reaches the end of its useful life, cannot provide the intended function or performance, and rehabilitation is not a viable option.	
• **Replacement**: of rip-rap or gabions around channel signs, inlets and outlets *(cells are not replaced)*	• **Channel Materials**: Failing to replace channel materials can lead to structural failure, erosion, or flooding issues • **Signs**: Not replacing signs may result in compliance or public safety issues • **Inlets**: Failure to replace inlets can cause structural failure, blockages, and flooding • **Outlets**: Neglecting to replace outlets can lead to structural failure, blockages, and flooding
Disposal/ Demolition: Activities associated with the disposal or decommissioning of an asset	
• **Landfilling :** Channel materials, structures, signs, inlet and outlet structures are generally landfilled at the end of their life	• N/A

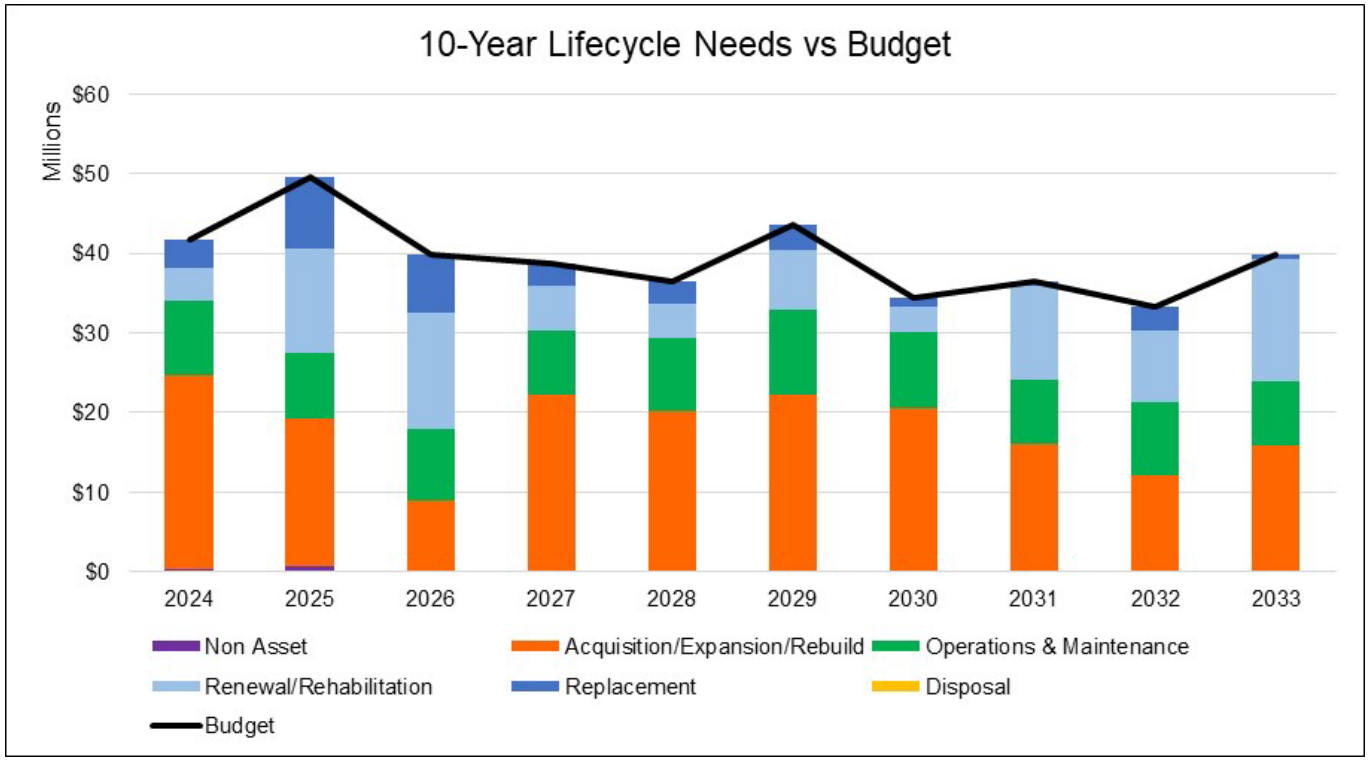
Watercourses– Current and Proposed Lifecycle Activities

Current and Proposed Lifecycle Activities	Risks associated with Lifecycle Activities
Operations & Maintenance: Minor activities that preserve the condition or performance of assets and ensures the longevity of assets in line with their design and operational requirements.	
• **Inspection**: Reach inspection program to document and assess the condition of assets and problem sites. Occurs at a frequency varying from one to five years • **Woody Debris Program**: Monitors and removes debris blockages at critical locations at least twice a year • **Adaptive Management Program**: Inspects and assesses the stability of recently completed maintenance projects, typically conducted annually for three years • **Deposition Program**: Monitors and measures material (typically stones) deposition in the channel, aligned with the reach inspection schedule • **Beaver Program**: Monitors beaver impacts and dam-related issues, with frequent monitoring (at least weekly initially) and revised as needed • **Preventative Maintenance**: Clears debris blockages and beaver dams to prevent erosion and flooding, with beaver trapping as required	• **Reach Inspection Program**: Not completing reach inspections can lead to unexpected watercourse asset failures, causing flooding and erosion issues • **Woody Debris Inspections**: Failure to inspect for woody debris can result in undetected blockages, leading to flooding • **Adaptive Management Inspections**: Neglecting adaptive management inspections can result in undocumented changes to maintenance work • **Deposition Program Inspections**: Not completing deposition program inspections can lead to undocumented changes at deposition sites • **Beaver Monitoring Program**: Failing to monitor beaver activity can result in adjacent flooding or erosion • **Debris Removal**: Failure to remove debris blockages from the watercourse can lead to erosion or flooding of private or public property

Current and Proposed Lifecycle Activities	Risks associated with Lifecycle Activities
• **Reactive Maintenance**: Involves the removal of debris as needed	
Renewal/Rehabilitation: Significant activities designed to extend the useful life of assets components.	
• **Early Life Activities:** None • **Mid-Life/Later Life**: Minor Erosion Control Works (Partial Replacement of Bank- approximately 20m-30m length)	• **Impacts to Structure and Performance of Assets:** Failure to complete works in a timely manner can lead to additional erosion or flooding issues; damage to private or public property
Replacement: Replacement activities occur once an asset reaches the end of its useful life, cannot provide the intended function or performance, and rehabilitation is not a viable option.	
• **Replacement:** Replacement of entire bank where there is risk to surrounding property and adjacent infrastructure (Capital Works)	**Flooding Impacts and Damage**: Failure to complete replacement works in a timely manner can lead to additional erosion or flooding issues; damage to private or public property
Disposal/ Demolition: Activities associated with the disposal or decommissioning of an asset.	
• **Landfilling:** The majority of materials left over from watercourse infrastructure are removed and landfilled • **Reuse/Repurposing:** Some erosion control materials may be re-used or repurposed during renewal projects (e.g., armourstones, rip rap)	• N/A

Lifecycle Needs vs. Budget

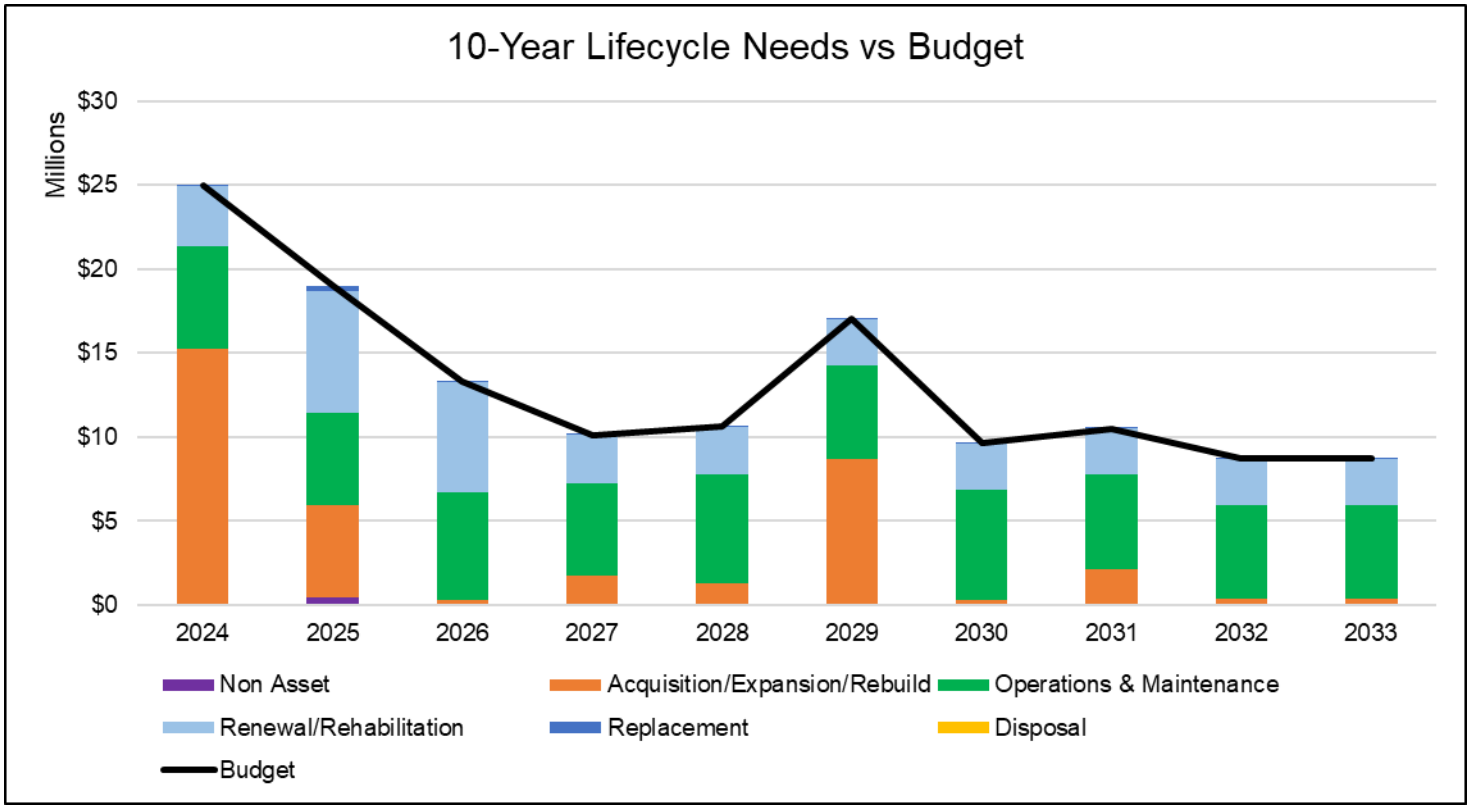
Stormwater Service Area



Within the next 10 years, available budget is sufficient to meet all lifecycle needs. Rehabilitation and replacement needs fluctuate over the years to account for storm sewer renewals, SWMF pond dredging projects and other activities as assets reach end-of-life or their performance/function deteriorates. Acquisitions account for activities such as storm sewer oversizing, erosion control efforts and other growth-related projects.

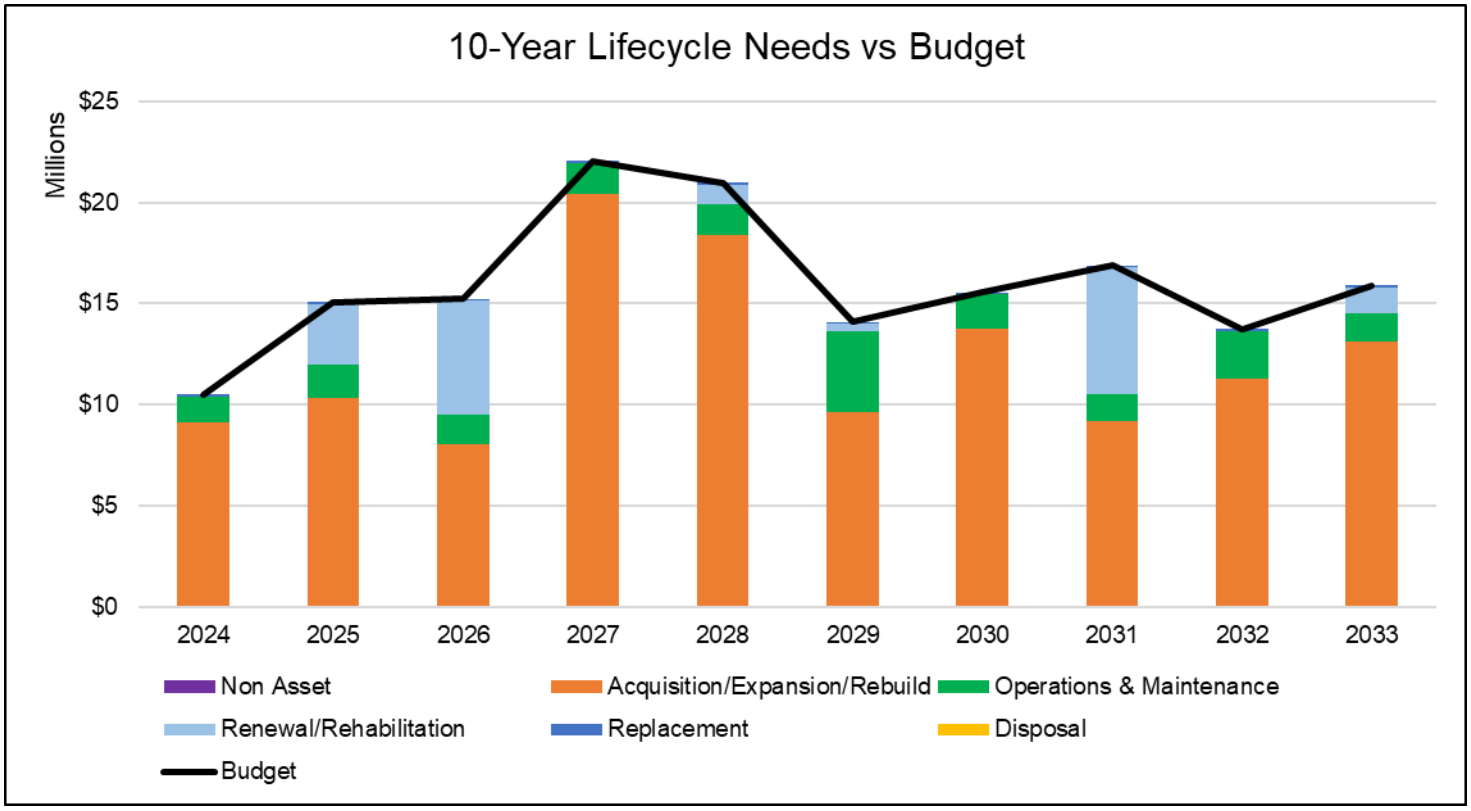
As part of continuous improvement, staff will continue to quantify and analyze the lifecycle needs required as proposed levels of service are determined, along with any resourcing requirements.

Storm Sewers



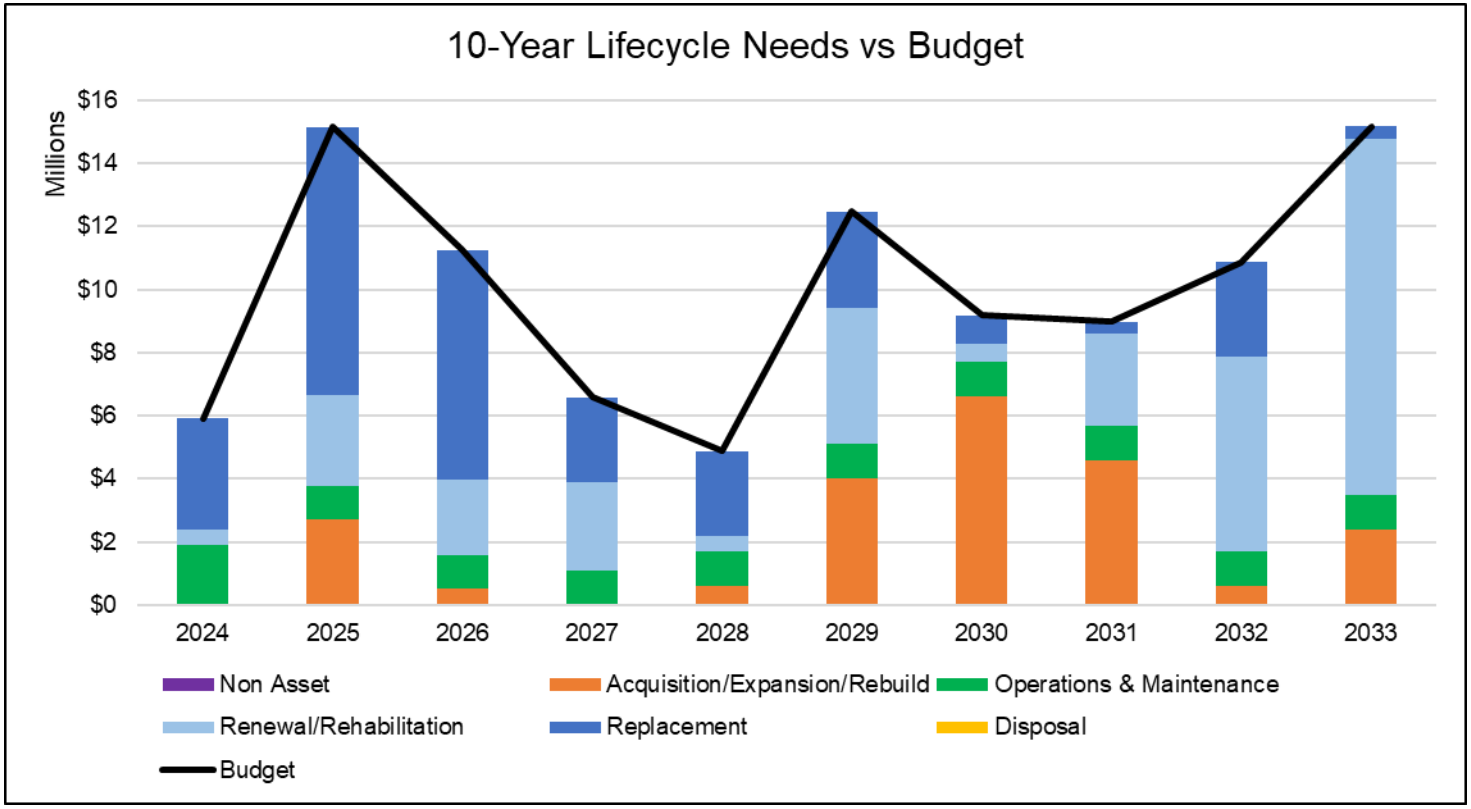
The majority of storm sewer assets are in Good-Very Good condition, thus requiring minimal replacement in the next 10-year forecast. Some storm sewer renewals and O&M activities, such as sewer CCTV condition assessments and surveying, are scheduled over the next 10 years. The acquisition/expansion/rebuild activities, in 2024 primarily and in subsequent years, account for storm sewer oversizing and drainage improvement projects across the City.

Stormwater Management Facilities (SWMF)



Since SWMF facility assets are in good-very good condition, partly owing to their long estimated useful lives, the majority of the lifecycle needs forecasted are related to acquisition/expansion/rebuild activities. These activities can include constructing low impact development (LID) areas in coordination with roadway projects or drainage improvements to assist with 100-year flood protection.

Watercourses



Approximately seven per cent of the watercourses assets are in poor-very poor condition, requiring major replacement in the next three years (2024-2026), while the remaining assets are in fair or better condition, needing maintenance and/or rehabilitation over the years. Acquisition/expansion/rebuild activities such as creek or river erosion control projects are scheduled closer to the end of the 10 years (2029-2031).

Budget Breakdown

Over the next 10 years, Stormwater average annual capital and operating budget is a $39.4 million as shown in Figure 5. The majority of the budget is allocated towards Acquisition, Expansion and Rebuild capital activities accounting for approximately 46 per cent of the budget. Operations and Maintenance activities account for the second largest portion of the Lifecycle budget with 22.5 per cent which is tied with Renewal and Rehabilitation capital activities accounting for 22.5 per cent of the budget.

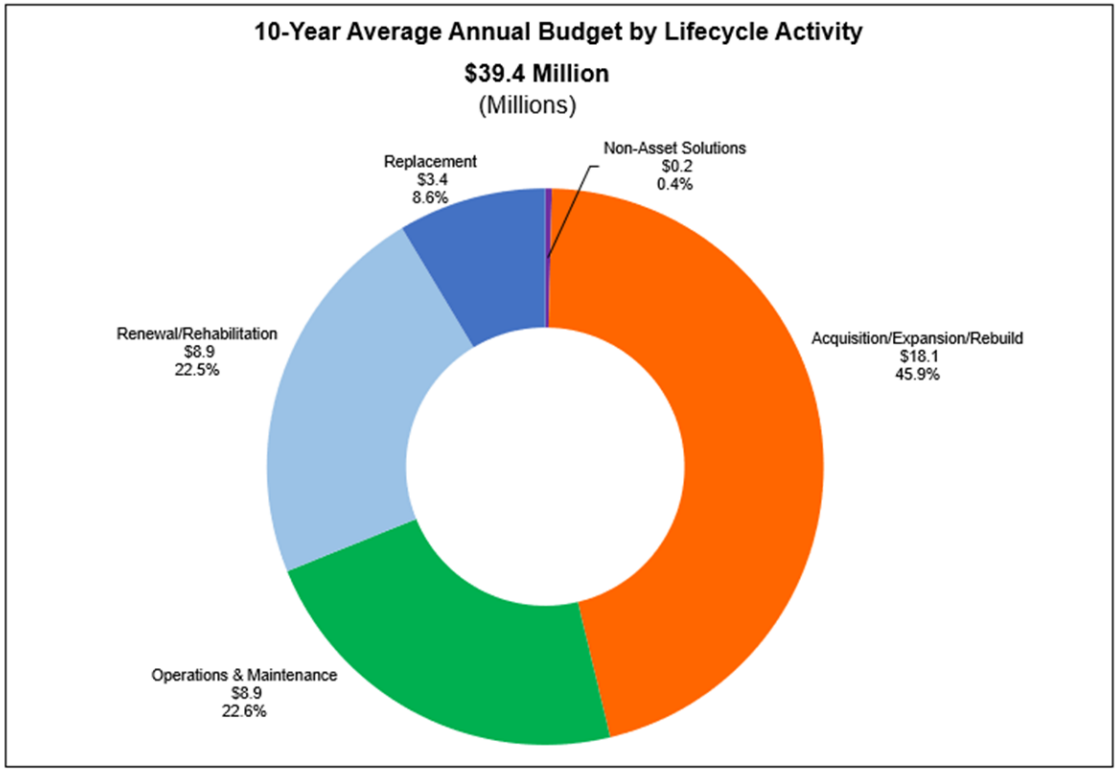


Figure 5: Breakdown of Budget by Lifecycle Activity

Table 8 shows 10-year annual average budget breakdown by Asset Class. The majority of the operating and capital budget is spent on State of Good Repair (SOGR) for Stormwater assets versus Growth[9].

Table 8: Budget Breakdown by Asset Class

Asset Class	SOGR Budget Type ($ Millions)			Growth Capital Budget ($ Millions)	Total Budget ($ Millions)
	Operating	Capital	Total		
Storm Sewers	5.5	4.1	9.6	3.6	13.2
Stormwater Management Facilities (SWMF)	1.4	2.4	3.8	12.2	16.0
Watercourses	1.4	8.7	10.1	-	10.1
Other[10]	-	-	-	0.1	0.1
Total	8.3	15.2	23.5	15.9	39.4

[9] "Growth", also referred to as "Improve" projects, are projects that apply to service enhancements that increase current service levels or service capacity that provide new capital initiatives

[10] Other" asset class denotes lifecycle activities that span over multiple asset classes within the Service Area such as plans, studies and other non-asset solutions

Financing Strategy

The City of Mississauga is committed to providing quality Stormwater services through safe, reliable infrastructure. Building and maintaining infrastructure is one of many key strategic goals in the City of Mississauga's Strategic Plan as well as a top priority in the City's Asset Management Plans.

At the core of the City's need to achieve a sustainable stormwater business model is the need to implement sound asset management practices. This involves inventorying what the City owns, conducting regular inspections, prioritizing work needs, preparing appropriate asset renewal projections and programs to address asset renewal needs, developing financial strategies to effectively manage those programs over the lifecycle of stormwater infrastructure, and monitoring and reporting on projected asset conditions. These commitments are key concepts underling the Stormwater Program and what's funded by the Stormwater Charge.

To determine the stormwater charge rate, service levels and operating and capital needs are set to reflect infrastructure priorities, inflationary pressure and reserve fund contributions needed now to plan for funding challenges foreseen with replacing costly assets (e.g., pipes) in the future. Furthermore, service level changes and the resulting stormwater rate reflect a balance between fiscal responsibility and resident service expectations. The stormwater rate is established on an annual basis during the Fees & Charges approval process and approved by Council.

The financing strategy for this asset management plan outlines the key funding and revenue sources used to finance stormwater asset management related lifecycle activities based on 2024-2027 Operating and 2024-2033 Capital Budget Forecast. Several financing strategies are available for funding the City's various capital programs such as various reserve funds, recoveries, development charges (DCs) and debt. These are explained in more detail in the Corporate Asset Management Section of the City's Asset Management Plan.

Financial Management & Funding Sources

Operating Budget

Operating budget provides for the normal operating expenditures with the day-to-day delivery of services. Annually recurring expenses related to capital assets are included in the operating budget–for example, operations and maintenance, administration costs, etc. The City uses a combination of Stormwater Charge Revenue and user fees to fund the Stormwater operating budget.

Capital Program Financing

The Capital Budget provides for significant expenditures to address current and future infrastructure needs that include stormwater ponds, flood relief, pipe infrastructure, watercourse erosion control and drainage studies. Capital expenditures result in the acquisition of, enhancement to or extension of the typical useful life of a fixed asset. The Stormwater capital program is funded by the Stormwater Charge Revenue (drawn from Stormwater Capital Reserve Fund and the Pipe Reserve Fund), Development Charges (DCs) and Developer contributions.

Reserves and Reserve Funds

The Stormwater Service Area has separate reserves and reserve funds that were established by Council to assist with long-term financial stability and financial planning. These funds are set aside to help offset future capital needs, obligations, pressures and costs and are fully funded from the Stormwater rate charge. They are drawn upon to finance specific-purpose capital and operating expenditures as designated by Council, to minimize Stormwater Charge fluctuations due to unanticipated expenditures and revenue shortfalls and to fund ongoing and future infrastructure programs

Reserves

The Stormwater Fiscal Stability Reserve is funded entirely from the Stormwater Operating Budget. If needed, these funds will offset any unanticipated fluctuations in revenue or expenses which occur during the year.

Reserve Funds

Reserve funds are segregated, restricted and provide for capital replacements. The Stormwater Capital Reserve Fund provides funding for infrastructure needs related to ponds and erosion control along watercourses. The Stormwater Pipe Reserve Fund provides for the renewal of the City's pipe infrastructure.

The Development Charges Reserve Fund accumulates funds collected under the City's Development Charges By-law as permitted under the Development Charges Act, 1997 and funds growth-related projects. These funds are obligatory in nature and reported as deferred revenue on the City's Financial Statements. Other reserve funds include Developer Contributions.

Capital Funding Sources and Operating Revenue Sources

As illustrated in Figure 6, the estimated available funding for the next 10-year period (2024-2033) for Stormwater is $394 million. The primary sources of funding are Stormwater Reserve Funds (Capital and Pipe Reserves) at 72 per cent and Operating Revenue Sources at 21 per cent.

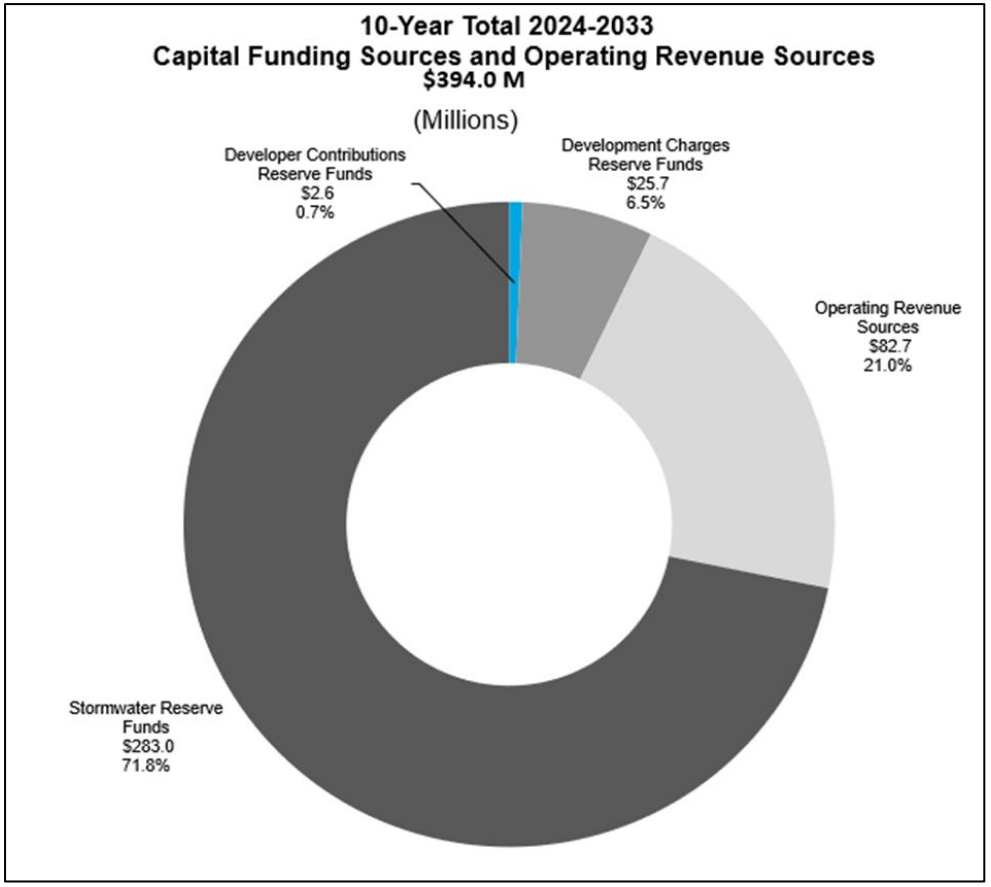


Figure 6: Capital Funding Sources and Operating Revenue Sources

Infrastructure Gap

Short-Term Infrastructure Funding Gap

The Stormwater Service Area has been self-funded since the implementation of the Stormwater Charge Program in 2016. A founding principle of the program is to fully fund the stormwater operating and capital programs plus an annual reserve contribution for future storm sewer renewal. The City's Business Plan and Budget are approved on an annual cycle, this allows the service area to review and prioritize operating pressures and capital projects and allocate the required funding in an agile manner. The short-term infrastructure funding gap is the difference between the stormwater needs and the available revenue over the 10-year period based on the current capital, operating and pipe reserve programs. As a result of Stormwater's self-funded model, the service area does not have a funding gap for the 2024-2033 business planning and budget cycle. For example, new Watercourse and SWMF projects as well as renewals are funded primarily by Capital reserves, and partially by development charges so it is expected that as the stormwater system grows or requires renewal/rehabilitation, the Stormwater Charge will fund these pressures accordingly.

Long-Term Infrastructure Funding Gap

The long-term infrastructure funding gap considers the estimated lifecycle of the asset. For storm sewers it is estimated utilizing a 100-year renewal forecast (typical sewer lifespan) of existing infrastructure compared to the projected available funding over this same period. The storm sewer renewal program is funded from the Pipe Reserve.

An annual contribution model to the pipe reserve and preliminary target was established prior to the onset of the Stormwater Charge and was based on initial estimates of a one per cent annual contribution of the total replacement value. For example, the replacement value was approximately $2.1 billion in 2019 which equates to an initial target reserve fund contribution of roughly $21 million per year.

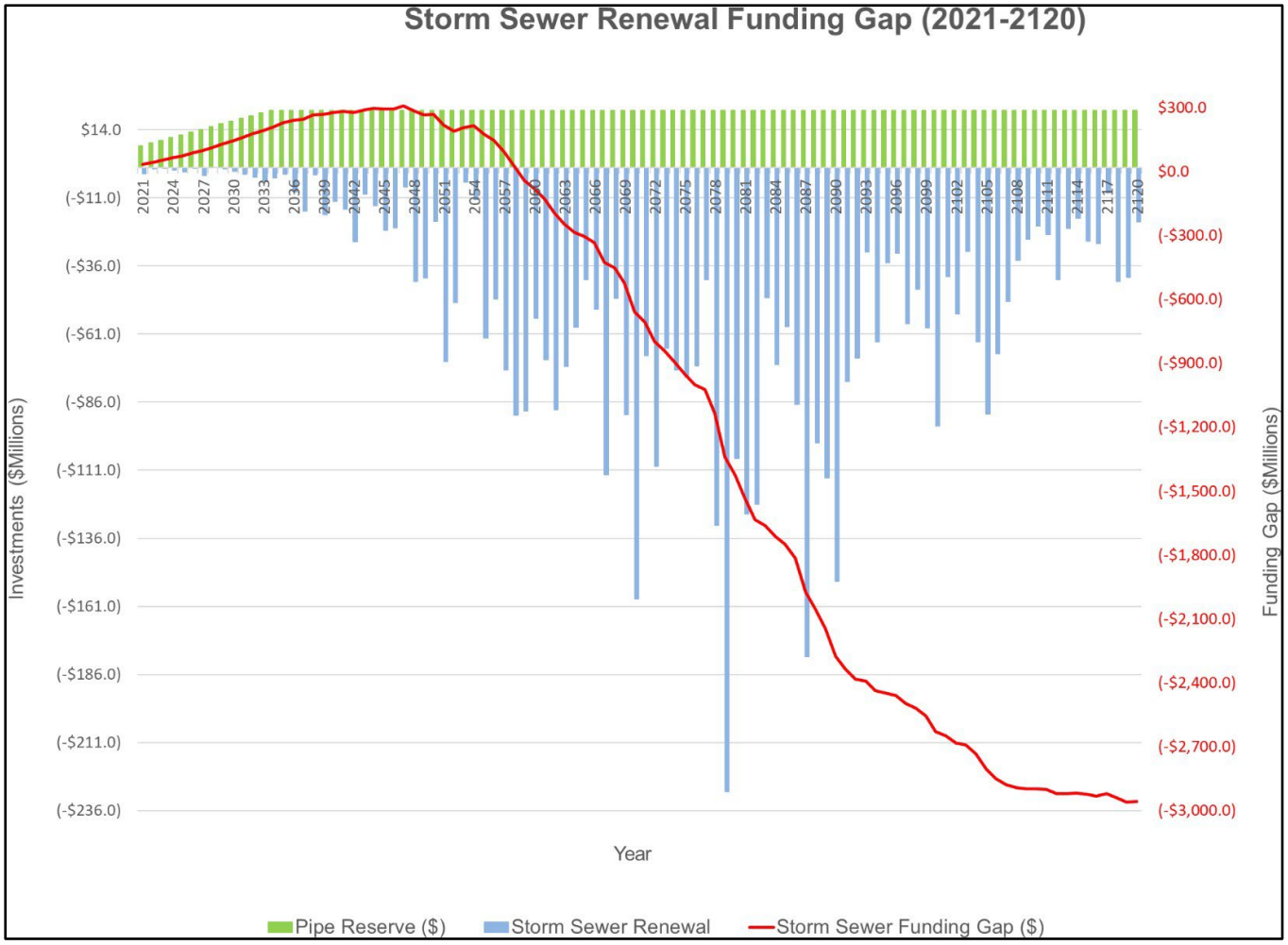


Figure 7: Potential Long-term Funding Scenario for Storm Sewers

[26] The Storm Sewer Renewal Funding Gap (2021-2120) was produced in 2021 to provide an estimate 100-year renewal forecast

As shown in Figure 7 this strategy for funding long-term pipe renewal proposes to increase contributions by $1 million annually until reaching the estimated target of $21 million and then maintaining that contribution moving forward. In this potential scenario, increasing pipe renewal costs over the 100-year period far exceed contributions resulting in a significant funding gap for storm pipe infrastructure.

Through the completion of the State of Infrastructure reporting and efforts to quantify replacement values more accurately, the Stormwater Service Area acknowledges the preliminary replacement value and related contribution target was grossly underestimated. Today's pipe replacement value is estimated at $6.8 billion and growing due to rising material and inflation costs. With a much larger total replacement value, continuing with the above contribution model and one per cent target is no longer practical to achieve.

Regardless, the scenario reinforces that a long-term funding gap remains that requires the appropriate strategies to invest for the future.

In the interim, contributions to the pipe reserve will continue to increase by $1 million each year. Meanwhile, staff continue to better quantify and plan for Stormwater's long-term infrastructure needs through continuous improvement. In this regard, leveraging sewer condition data, development of pipe renewal/replacement strategies and Stormwater Charge revenue forecasting will allow for further refinement of the long-term funding gap and establishing the appropriate pipe reserve target and contribution.

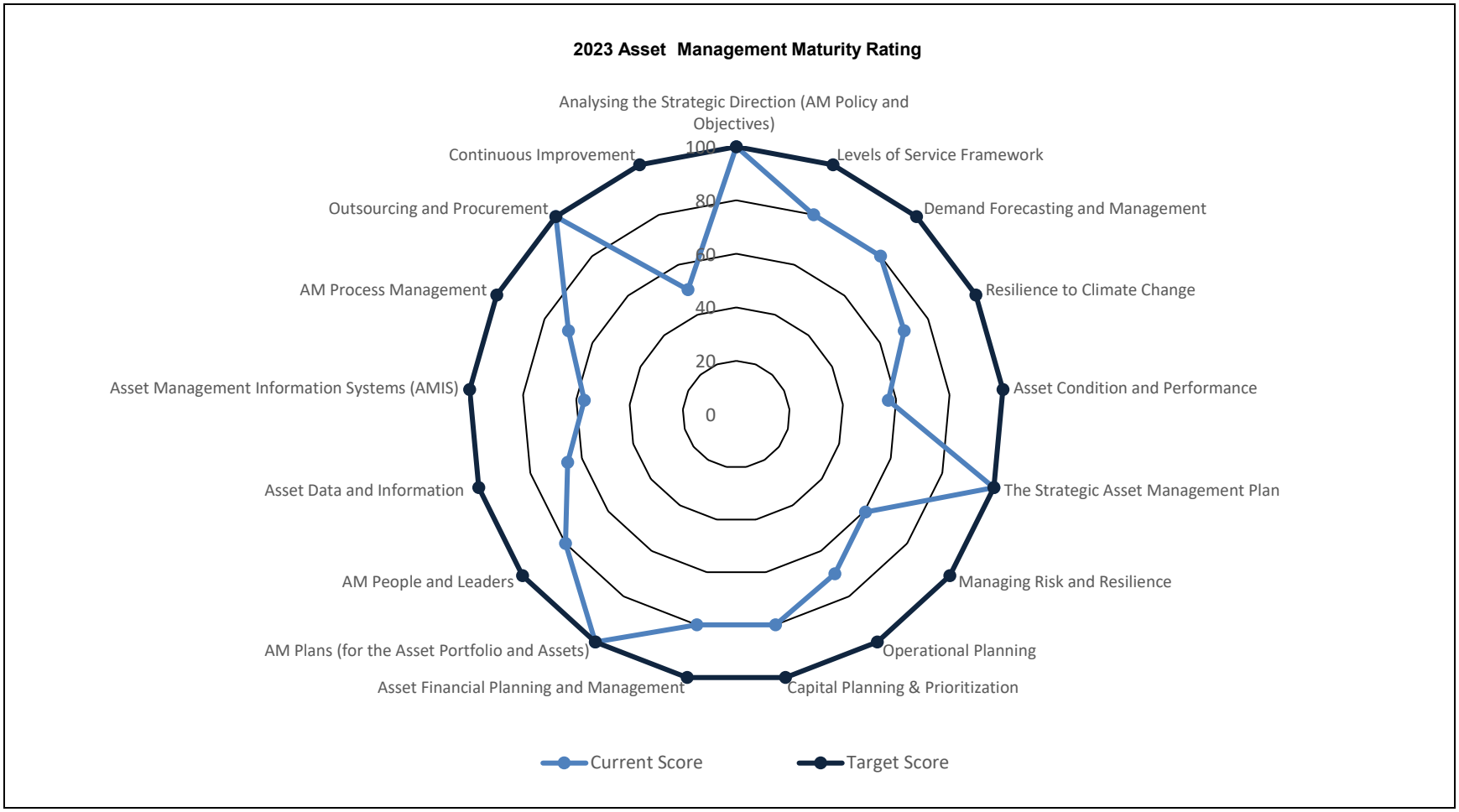
Continuous Improvement & Maturity

Maturity Assessments

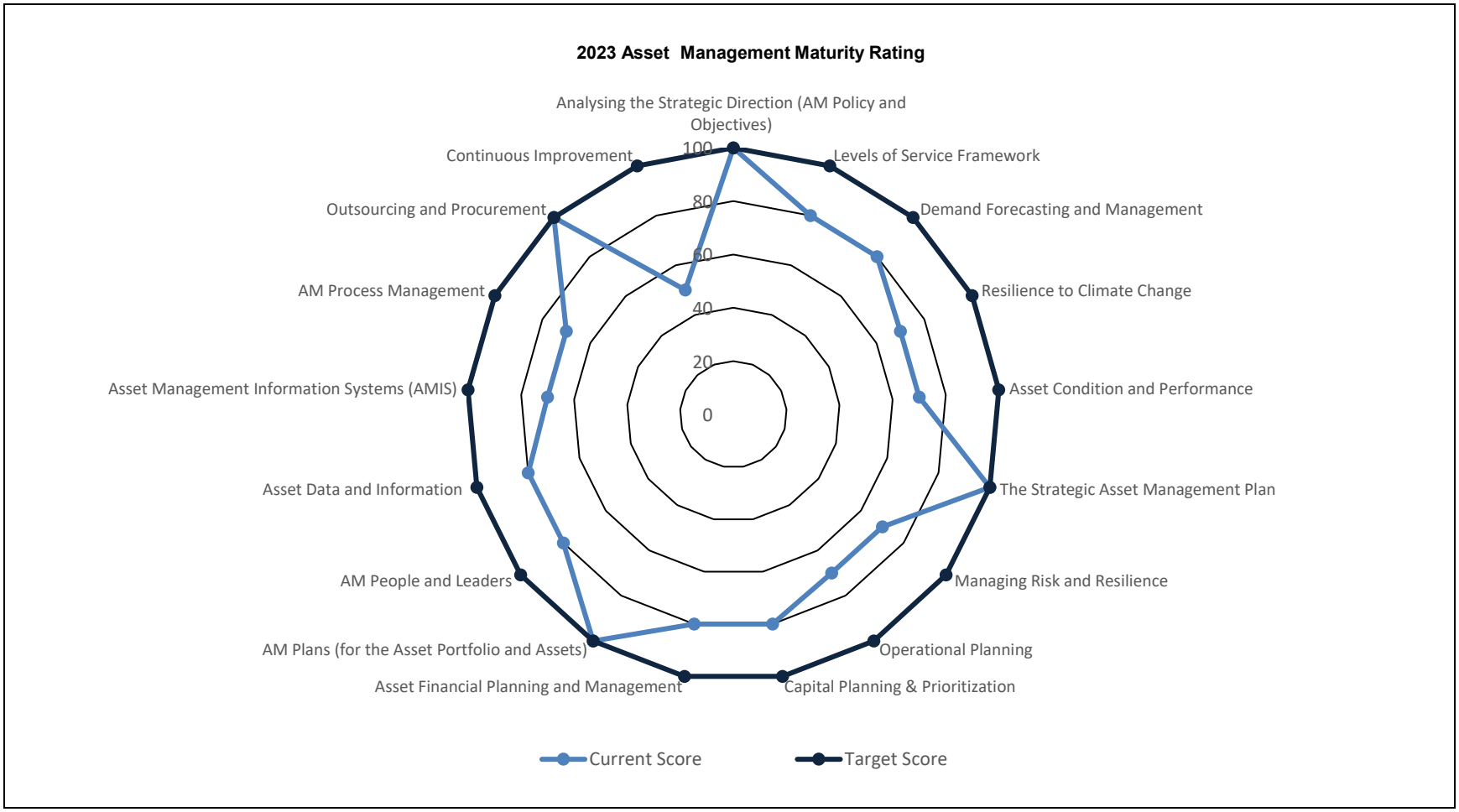
The Stormwater Service Area has been dedicated to improving their asset management awareness and practices through a systematic and planned approach. A detailed improvement roadmap was developed for the 2021 Asset Management Plan. This roadmap detailed several tasks that would provide a guided approach to implementing improvements for various asset management practices. Since the development of this roadmap several significant tasks have been completed which have led to essential improvements in data collection, data management and overall asset lifecycle planning. These improvements are detailed in the Continuous Improvement Plan.

The radar graph(s) below are based on a 2023 maturity assessment. As the service areas mature in each category, they will expand outwards towards the outer ring (Target).

Maturity Assessment - Stormwater

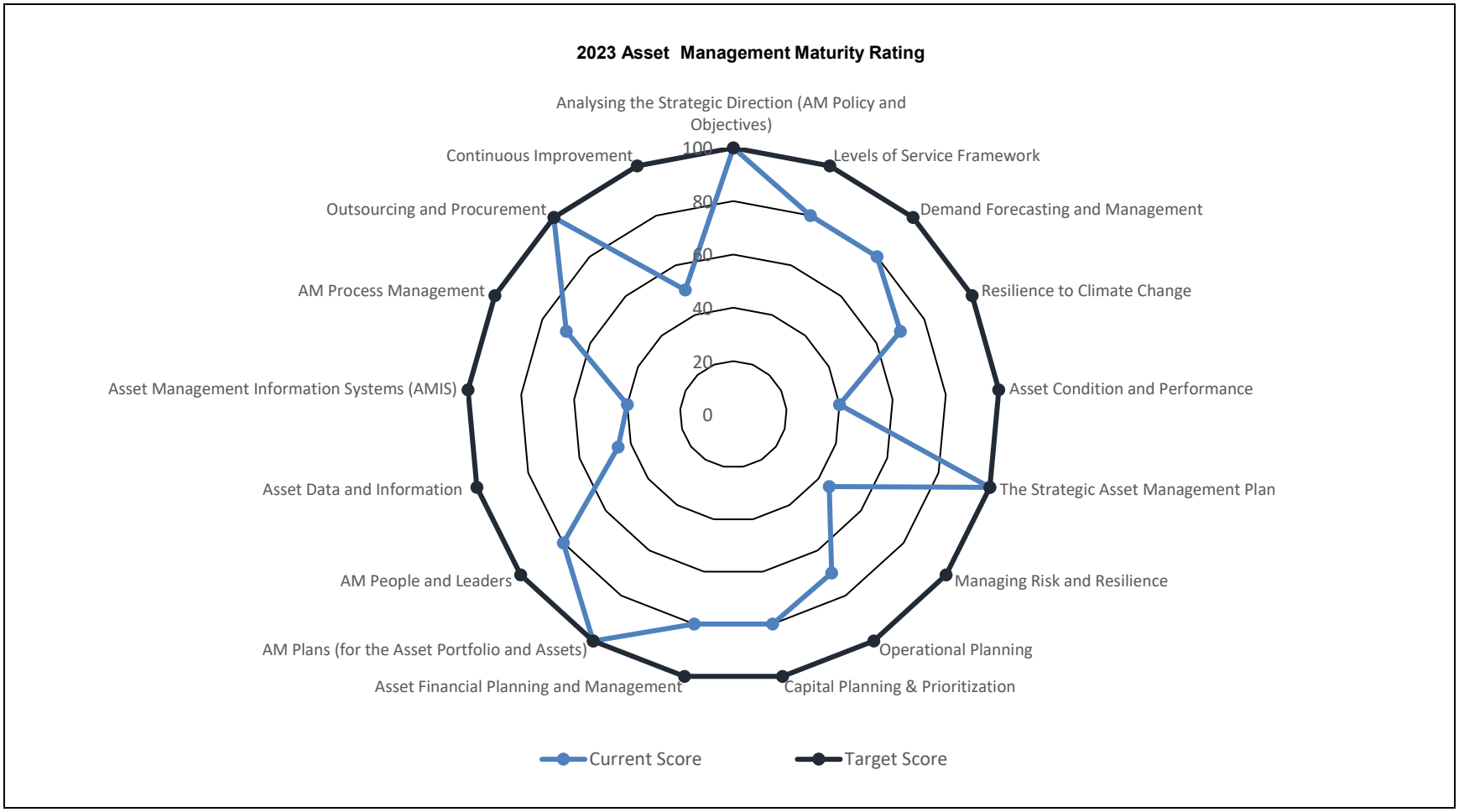


Maturity Assessment – Storm Sewers



Maturity Assessment – Stormwater Management Facilities

Maturity Assessment – Watercourses



Continuous Improvement Plan

Task No	Continuous Improvement Task	Asset Class	Estimated Timing	Value/Impact	Required Resources
State of Infrastructure (SOI)					
SOI-01	Consolidate CCTV assessments into GIS inventory.	Storm Sewers	2020-2022 (Complete)	Centralizes condition data and provides single source of information.	Internal
SOI-02	Develop process to update asset register from the latest CCTV condition database.	Storm Sewers	2022 (Complete)	Ensures that database is up to date at the conclusion of each new CCTV inspection project.	Internal
SOI-03	Conduct visual condition assessments for culverts, MHs, CBs, inlets and outlets and a condition assessment program for all culverts.	Storm Sewers	2024-2025	Improved tracking of assets.	Internal
SOI-04	Conduct city-wide review of asset ownership (e.g., Storm Sewer, Stormwater Management Facilities, Watercourse, Transportation assets).	All	2020-2021 (Complete)	Improved tracking of assets and responsibility to maintain/manage assets.	Internal
SOI-05	Identify major and minor culverts.	Storm Sewers	2022 (Complete)	Some culverts are large in size and require condition inspections, which should be differentiated from the rest of the culverts.	Internal

Task No	Continuous Improvement Task	Asset Class	Estimated Timing	Value/Impact	Required Resources
SOI-06	Formalize inventory, assign unique IDs and create assets/features by asset component (GIS).	SWMF, Watercourses	2025-2026 (in-progress)	Improved completeness and accuracy of the information within the database to improve tracking and management of assets and identifying funding requirements.	Internal
SOI-07	Underground facilities and pump stations, LID features, dry ponds – establish inventory.	SWMF	2025 (in-progress)	Provides a more complete database.	Internal
SOI-08	Roll-up individual component condition assessments to an overall assessment score.	SWMF, Watercourses	2025-2026	Ensures all assets are considered in overall assessment score of parent assets.	Internal
SOI-09	Enhance condition assessment method to account for built and natural components within the reach.	Watercourses	2025-2026	Ensures all assets are considered in overall assessment score of parent assets.	Internal
SOI-10	Link condition and inspection data to asset ID.	SWMF, Watercourses	2025-2026	Provides a complete, digitized inventory.	Internal
SOI-11	Expand condition scoring system to a 5- point scale (to align all 3 Stormwater Groups).	All	2021-2024 (Complete)	Establish consistency in scoring and comparability among assets in the Stormwater Department.	Internal
SOI-12	Identify and populate missing attribute data	All	2024-2026	Provides a complete, single source of information.	Internal

Task No	Continuous Improvement Task	Asset Class	Estimated Timing	Value/Impact	Required Resources
	(type, size, material).				
SOI-13	Link EUL to asset ID.	SWMF, Watercourses	2021-2024 (Complete)	Provides a more complete data register to monitor, track and analyze.	Internal
SOI-14	Link work and failure history data to asset ID.	All	2025-2027	Links the history of the asset to its identifying information for improved monitoring.	Internal
SOI-15	Populate Infor Inventory from GIS Datasets (Asset IDs).	All	2024-2027 (in-progress)	Improved monitoring of assets.	Internal
SOI-16	Review and Improve Risk Factors.	All	2021-2024 (Complete)	More accurate risk assessment, as more data becomes available.	Internal
SOI-17	Complete valuation for culverts, fittings, and pipe/null inlets in future AMP update.	Storm Sewers	2025-2026	Improved accuracy of valuation.	Internal
SOI-18	Separate the cost of lateral pipes and service connections for future valuation assessment.	Storm Sewers	2025-2026	Improved accuracy of valuation.	Internal
SOI-19	Attribute all node IDs to an associated pipe ID.	Storm Sewers	2021-2022 (Complete)	Improved valuation and risk assessment of nodes based on the size and criticality of connected linear assets.	Internal
SOI-20	Consider contracting out condition assessment for structures (control outlets) and formalize	SWMF	2021-2023	Improved tracking and renewal needs based on observed remaining life rather than age- based remaining life.	Internal

Task No	Continuous Improvement Task	Asset Class	Estimated Timing	Value/Impact	Required Resources
	valuation and remaining useful life.				
SOI-21	Develop unit costs for asset types/materials and establish formal process for maintaining rates.	All	2021-2024 (Complete)	Improved accuracy of valuation.	Internal
Levels of Service (LOS)					
LOS- 01	Consider implementing additional recommended customer and technical levels of service metrics.	All	2023-2024 (Complete)	More accurate measurement of level of service achieved.	Internal/External
LOS-02	Review operations and maintenance LOS.	All	2022-2024 (Complete)	Allow for improved accuracy of operations and maintenance funding needs to meet LOS.	Internal
Lifecycle Activities (LCA)					
LCA- 01	Implement recommended lifecycle management strategy improvements.	All	2025-2026	Improve management of assets, which can increase the lifespan of assets and better prepare the City for replacement and rehabilitation.	Internal

Task No	Continuous Improvement Task	Asset Class	Estimated Timing	Value/Impact	Required Resources
LCA - 02	Improve alignment of Operating Budget cost center codes.	All	2023-2025 (Complete)	Align cost center names with defined Operations and Maintenance tasks for easier reporting.	Internal
LCA - 03	Develop a predictive performance model to forecast assets future condition based on budget, levels of service and/or lifecycle strategies changes.	All	2025-2026	Improve understanding of impact on assets resulting from budgetary, lifecycle strategies or LOS changes.	External
Risk Management (RM)					
RM-01	Assess appropriate criteria for facility signs when assessing criticality.	SWMF	2023-2024 (Complete)	Improved risk assessment.	Internal
RM -02	Develop likelihood of failure criteria to assess risk of natural assets.	Watercourses	2025-2026	Improved accuracy of risk rating and avoided assumptions.	Internal
RM -03	Collect data required to improve asset criticality criteria.	All	2023-2025	Improved criticality rating of assets.	Internal
RM -04	Develop methodology and collect data required to improve asset likelihood of failure criteria.	All	2025-2026	Improved likelihood of failure assessment.	Internal

Task No	Continuous Improvement Task	Asset Class	Estimated Timing	Value/Impact	Required Resources
Financing Strategies (FS)					
FS-01	Develop a process for understanding renewals and funding needs for Watercourse assets.	Watercourses	2025-2026	Understand funding needs and any potential gaps in current funding.	Internal
FS-02	Increase confidence in long-term funding strategy for Watercourses and SWMF and report infrastructure gaps if they exist.	SWMF, Watercourses	2025-2026	Understand future revenue structure for SWMF and Watercourses.	Internal
FS-03	Assign Capital Program attributes to each project: Renewal (%), Expansion (%) and Lifecycle Activity.	All	2021 (Complete)	Improve capital budget information and future AM reporting.	Internal

Corporate Asset
Management Plan **2025**

Roads

Table of Contents

Introduction 3
Key Stats 4
State of the Infrastructure 5
- Asset Hierarchy 5
- Asset Class - Summary 7
- Assets Used by the Roads Service Area – Managed By Other Service Areas 8
- Asset Management Tools & Systems 9
- Dashboards 11

Levels of Service 41
- Governing Legislation for Roads Service Area 41
- Community Levels of Service Framework 43
- Technical Levels of Service Framework 45

Demand Management 54
- Demand Drivers, Projections and Management Plans 55

Risk Management 65
- Asset-Specific Risk Methodology 65

Lifecycle Management 67
- Lifecycle Strategies 67
- Lifecycle Needs vs. Budget 99
- Budget Breakdown 113
- Capital Expansion and Improvement Projects 115

Financing Strategy 116
- Capital Funding Sources and Operating Revenue Sources 116
- Infrastructure Gap 117

Continuous Improvement & Maturity 130
- Maturity Assessments 130
- Continuous Improvement Plan 140

Appendix A 144
Appendix B 147
Appendix C 155

Introduction

At the core of a vibrant and modern City is its transportation network. Roadways are a key component of that transportation network and provide many benefits. They support services that are essential for the community in terms of quality of life, public safety, sustainability, and economic benefit. Valued at over $5.8 Billion, as shown in Key Stats, Mississauga's roadway infrastructure is the second-largest asset class owned and operated by the City of Mississauga. Roadways are comprised of a variety of asset types that include road pavement, bridges and culvert structures, sidewalks, multi-use trails, cycle tracks, traffic signals, street lights, on-street parking facilities, signs, noise walls, and more.

In Mississauga, the Roads Service Area is responsible for managing roadway-related infrastructure. Roads' mission is to plan, develop, construct and maintain a multi-modal transportation system that safely and efficiently moves people and goods, respects the environment, supports the development of Mississauga as a 21st century city, and serves the municipality's social, economical and physical needs.

With a continued focus on urban mobility, asset management, service delivery, and our people and culture, Roads will continue to provide responsible roadway-related infrastructure services. The goals of the Roads Service Area are to:

- Provide safe conditions for all travellers by supporting hazard-free travel and striving for zero fatalities
- Maintain Roads infrastructure in a state of good repair through application of progressive asset management practices to achieve cost containment and value for money
- Plan, design, and construct an adaptable transportation network for all users and modes of transport, with a focus on creating a safe and efficient urban mobility system
- Optimize parking policies to recognize parking as a key tool that influences city-building, transportation choices, and economic development, while also serving residents and businesses
- Sustain service delivery to support housing initiatives and ensure business continuity for development approvals, and post-approval conditions and processes

Key Stats

Current Replacement Value (CRV)	Average Condition	Current Maturity Level
$5.8 Billion	Fair	Intermediate
Average Annual Infrastructure Gap – Current LOS		Average Annual Infrastructure Gap – Proposed LOS
$80.6 Million		Ongoing Analysis

State of the Infrastructure

Asset Hierarchy

Table 1: Roads Service Area Hierarchy

Asset Class	Asset Type
Road Pavement	Arterial Roads
	Major Collector Roads
	Minor Collector Roads
	Local Roads
Structures	Bridges
	Major Culverts
	Minor Culverts
	Major Retaining Walls
	Minor Retaining Walls
Roadside Trail Network	Sidewalks
	Engineered Walkways
	Multi-Use Trails
	Cycling Supportive Elements
Street Lighting	Street Light Plants
	Luminaires
	Monitor Control Systems

Traffic Signals and Related Electrical Devices	Traffic Controller Cabinets
	Emergency Vehicle Pre-Emption
	Traffic Signal Plants
Roadside Infrastructure	Signs and Posts
	Noise Walls
	Vehicle Safety Barriers
Municipal Parking	Parking Lots
	Parking Machines
Operational Equipment	Specialized Equipment
	Domes/Storage
	Brine Systems
Intelligent Transportation Systems (ITS)	CCTV Cameras
	Speed Awareness Devices

Asset Class - Summary

Asset Class	Current Replacement Value (Millions)	Average Condition	Average Annual Infrastructure Gap – Current LOS (Millions)
Road Pavement	$3,500		$63.9
Structures	$843.6		$5.2
Roadside Trail Network	$539.8		$6.6
Street Lighting	$493.4		$4.3
Traffic Signals and Related Electrical Devices	$210.5		$0.0
Roadside Infrastructure	$144.3		$0.3

Municipal Parking	$12.9		$0.2
Operational Equipment	$11.7		$0.3
ITS (Intelligent Transportation Systems	$1.0		$0.03

The average annual funding gap to meet proposed levels of service is an ongoing analysis that staff are conducting for all their asset classes. At this time, only Municipal Parking and Intelligent transportation Systems (ITS) have determined that their current funding gap also applies to their proposed service level needs.

Assets Used by the Roads Service Area – Managed By Other Service Areas

Assets Used by Roads	Managed By	Quantity	Current Replacement Value (Millions)
Vehicles & Equipment	Corporate Fleet	222 Ea.	$23.9
Buildings	Facilities Planning & Development	12 Ea.	$46.9

Asset Management Tools & Systems

The City maintains its inventory information in various systems, with each system serving a specific function and purpose. Spatial information for the City's roadway assets is created and maintained within the City's Geographic Information System (GIS) environment. In recent years, the City has decided to migrate all of its spatial information to an Esri GIS mapping software. The Esri software forms the foundation of the City's linear and non-linear transportation assets database. The GIS information is imported into four computerized systems: Infor, RoadMatrix, BridgeTMS (Bridge Total Management System) and CityWide.

Infor is the computerized maintenance management system used by the Roads Service Area and other services throughout the City to record and manage service requests, work orders and permits. Requests for service are tracked from two primary channels: the offices of the Mayor and members of Council and the 3-1-1 Citizen Contact Centre. Work orders are processed daily for a variety of defined maintenance activities. Details tracked include labour, materials, maintenance contracts, and vehicles and equipment used to perform daily work activities. The ability to track work performed to a specific asset has not yet been fully deployed but it will form part of the overall strategy as the City advances its asset management practices. Infor's permit system enables the City to track and record work performed by third-party utility and construction agencies working within the City's roadway corridors. Collectively, these three modules enable the Roads Service Area to oversee a variety of work activities happening within the roadway corridor. Staff will continue to advance and expand the use of Infor.

RoadMatrix is the asset analysis system used to manage the City's road pavement, sidewalk, and multi-use trails. The system contains extensive information about the City's road pavement and multi-use trail assets including its physical characteristics, classification, age, condition, and major work history information. The RoadMatrix system is used to develop maintenance and long-range capital plans for the renewal of the City's pavement assets. It also enables the City to monitor pavement deterioration over time, forecast future renewal activities, and determine the financial resources required to sustain the road pavement and multi-use trail infrastructure to a certain level of service or condition.

BridgeTMS is the asset analysis system used to manage the City's bridge, culvert, and retaining wall structures. Not only does the system contain detailed information about each of the City's structures, but it also contains detailed OSIM (Ontario Structural Inspection Manual) information collected every two years as required under O. Reg. 472/10. Similar to RoadMatrix, this system is primarily used to develop maintenance and long-range capital plans for the renewal of our

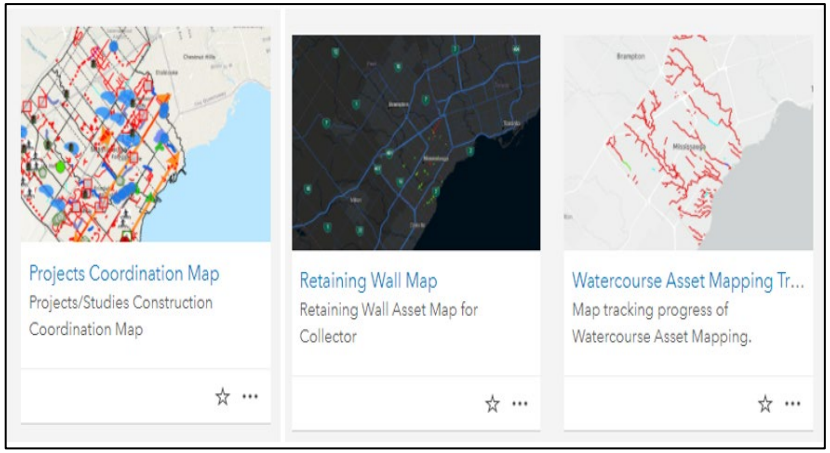
structures. It too allows the City to forecast the future renewal and replacement activities needed to support its long-range capital plans. This system will be used in the future to store OSIM-related data for retaining wall inspections.

CityWide is the City's Tangible Capital Asset (TCA) System. The system was introduced in 2008 to capture infrastructure valuation information about the City's major assets.

Numerous additional systems including Precise ParkfolioNeo, Streetlight Control Monitoring System (SCMS), and Avigilon Control Centre Video Management Software are used to help manage various other transportation assets.

Precise ParkfolioNeo is the solution that is provided by the Municipal Parking vendor, containing all pay & display machine history and data.

The City uses a **Streetlight Control Monitoring System** to control light levels and monitors the status of street lights. The lighting control system was provided by Dimonoff Inc., a supplier of adaptive lighting control systems. The controls include a node on each luminaire and wireless gateway to connect the nodes and monitor the luminaires at a remote location. The system acts as a network to connect street lighting assets and report (in real-time) their state of operation. The system software communicates with the approximately 50,000 street lights that are distributed across the City.



Example of GIS Esri Software Mapping

Avigilon Control Center Video Management Software is designed to provide easy and secure remote access to the CCTV Traffic Monitoring cameras. This allows Traffic Systems staff to respond to planned and unplanned events in a timely manner in order to provide proactive traffic management. The Avigilon Control Center Video Management Software is operated and maintained by the City's Security Services Section with Traffic Systems serving as a client. To date, there are 87 CCTV Traffic Monitoring Cameras, under the jurisdiction of the City of Mississauga, installed on the Avigilon Control Center Video Management Software and used by Traffic Systems staff to monitor traffic conditions along the arterial roadways.

Each of these systems plays an integral role in supporting decision-making about City services and

infrastructure. The inventory information contained within each of these systems is comprehensive, reliable, and reasonably accurate and has been used to support the development of this plan.

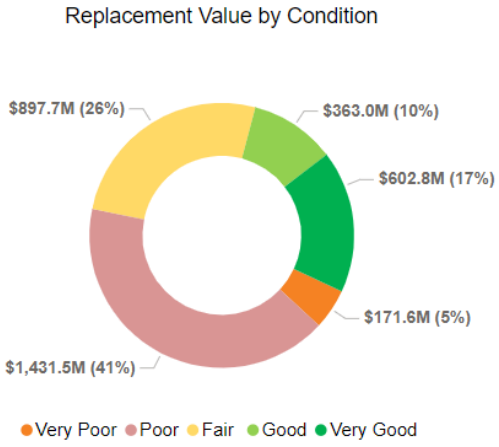
Dashboards

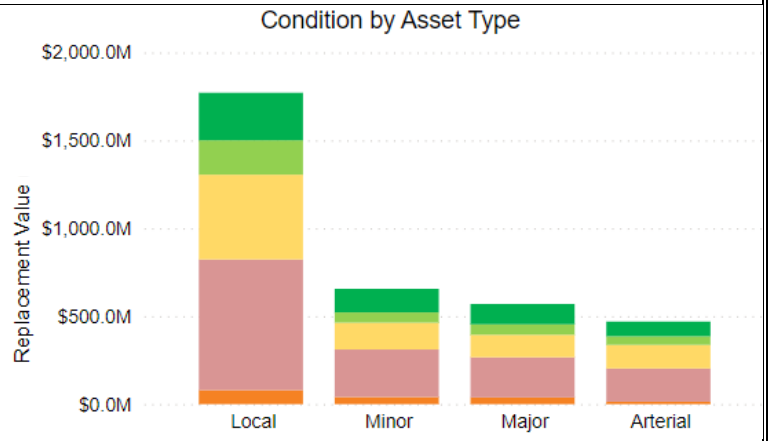
The following dashboards provide a summary of the state of the current infrastructure for each asset class. The information in this plan was prepared using 2023 year-end data. In charts, graphs and tables where money is represented in thousands of dollars ($000), figures have been rounded to the nearest thousand. This means that the totals shown may not always balance perfectly, due to rounding.

Asset Class: Road Pavement

Data Quality:	Asset Inventory	Condition	Replacement Value
	A	A	A

Current Replacement Value: $3.5 Billion





Asset Type	Quantity	Average Age (Years)	Estimated Useful Life (Years)	Current Replacement Value (000s)
Arterial Roads	800 Lane km	39.0	50	$469,500
Major Collector Roads	958 Lane km	42.5	50	$569,800
Minor Collector Roads	1,056 Lane km	43.7	50	$655,800
Local Roads	2,829 Lane km	43.0	75	$1,771,400

Background Information

The City's Road Pavement assets include Arterial, Major Collector, Minor Collector, and Local roads.

Asset Condition: Road Pavement

The City collects condition and digital image information of its road pavements to populate RoadMatrix every four years. The most recent pavement condition survey took place in 2021, with the next survey planned for 2025. The City procures consulting services to collect the pavement condition data. The consultant typically uses a specialized vehicle to collect pavement surface distresses, defects, and ride-quality information. Surface distresses and defects such as cracks and surface distortions are recorded, categorized, loaded into RoadMatrix, and computed into a Surface Distress Index (SDI), which reflects the surface condition of the entire pavement section. The pavement's ride quality, which is a measure of the roughness of the pavement, is collected using a laser profiler on the specialized vehicle. The collected data is loaded into RoadMatrix, and a Ride Condition Index (RCI) value is computed.

The SDI and RCI are then used to calculate an overall Pavement Quality Index (PQI) that represents the overall condition of the entire pavement section. A PQI score of 100 would represent a perfectly constructed road with no surface distress and excellent ride quality. A score of 20 would represent a road that has been severely compromised and is no longer providing its intended level of service.

In order to standardize the condition scoring across different asset categories, condition information is compiled into a five-point grading system. Appendix A illustrates how the information is translated into the City's 1 to 5 rating scale.

Road Pavement in Very Good Condition

Age Summary: Road Pavement

While each component of a roadway deteriorates at a different rate, the City uses the pavement's overall condition rating and age as indicators to determine when maintenance, rehabilitation or reconstruction are required. Figure 1 shows the average age of the City's road surfaces and the average age of the overall road pavement structure (by road classification) in comparison to the entire pavement structure's expected useful life. The expected useful life of the

overall pavement structure was determined through an internal review and consultation process. The useful life values were derived from the lifecycle information contained within the City's pavement management system along with the professional judgement of the City's engineering, transportation infrastructure management, and maintenance staff that participated in the review.

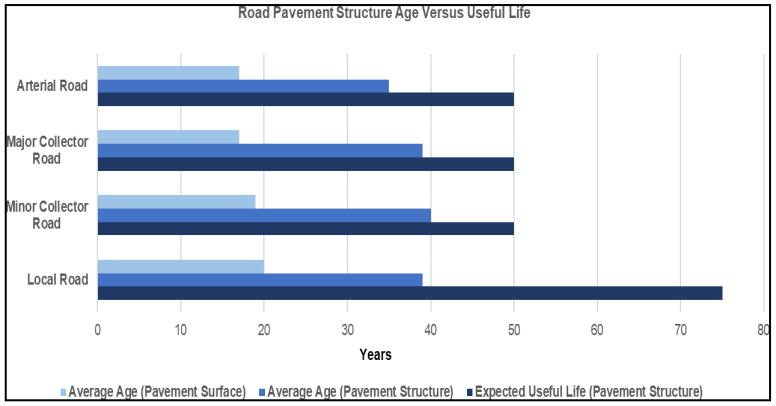


Figure 1: Road Pavement Structure Age vs. Useful Life

The expected useful life of the overall pavement structure is dependent on the periodic renewal or replacement of the pavement surface and/or base layer of the pavement structure (typically asphalt) and the curb components as required. The useful life of pavement asphalt material ranges from 20 years for arterials, major collectors and minor collector roads, to 30 years for local roads. Over the lifecycle of the pavement structure, the City expects to renew a portion of the asphalt and curb components at least twice before full reconstruction of the entire pavement structure is required. The expected useful life of the entire pavement structure ranges from 50 years for arterial, major collector and minor collector roads to 75 years for local roads. When a road is identified for renewal, the City's engineering and technical staff will determine the extent of pavement, granular materials and curbs that are required to be replaced.

It is important to note that the longevity of a pavement structure will depend on a variety of factors, including construction methods, materials used, the local soil and climate conditions, water infiltration into the base and sub-base, and traffic loads and volumes.

The City has had a formal pavement rehabilitation program since 1985. This program has enabled the City to maintain its road network in a state of good repair. The graph in Figure 2 provides a view into the extent of road pavements that have been renewed over the last 30 years. As the collector and arterial roads approach their expected end of life, one can theoretically expect to see the number of reconstruction activities increase. Transportation Infrastructure Management personnel monitor these trends and update lifecycle models within the RPMS accordingly.

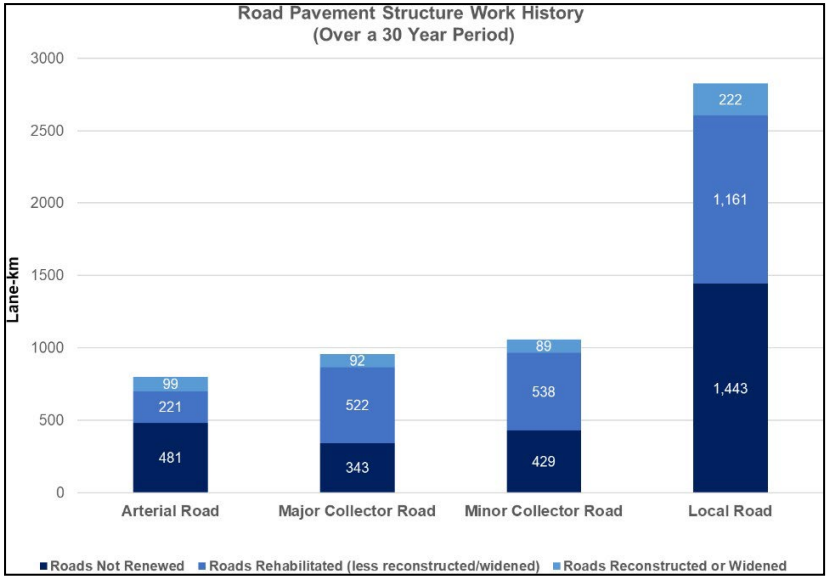


Figure 2: Road Pavement Structure Work History (Over a 30-year period)

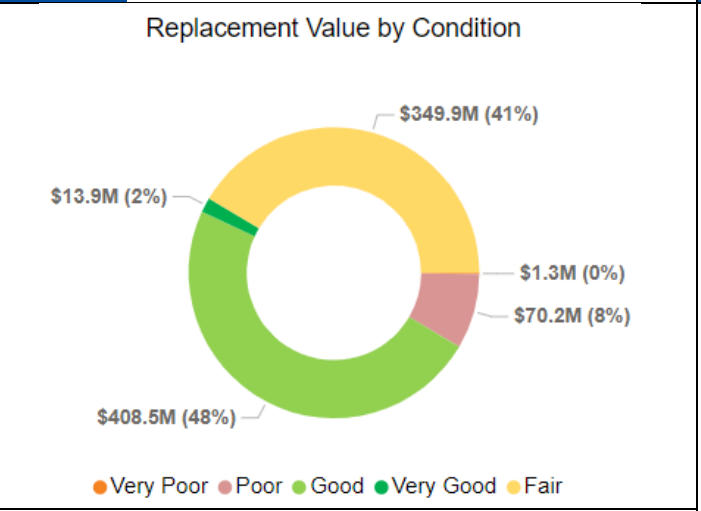
Data Assumptions and Limitations

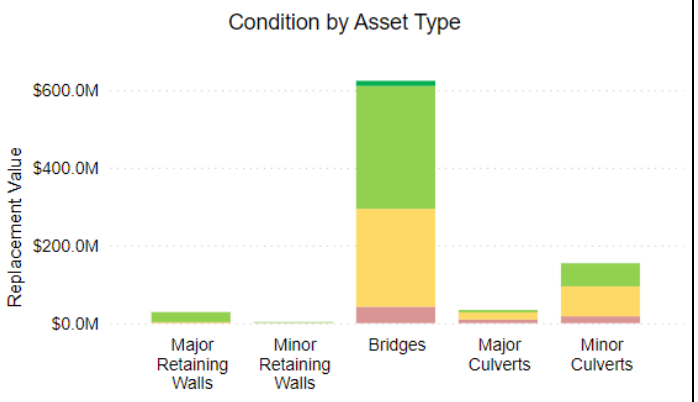
- **Replacement values** are calculated using the latest unit rates from the previous year's resurfacing contracts. The replacement cost captures the whole road pavement structure which is comprised of granular sub-base, asphalt or concrete base, asphalt or concrete surface, and curbs
- The **average age** of the road pavement takes into consideration the age of the entire pavement structure. In previous AMPs, the average age was calculated based on the road surface only. While the overall pavement structure is aging, the road network appears to be much newer because the pavement surface is being replaced multiple times over the life of the overall pavement structure

Asset Class: Structures

Data Quality :	Asset Inventory	Condition	Replacement Value
	B	B	A

Current Replacement Value: $843.6 Million





Asset Type	Quantity	Average Age (Years)	Estimated Useful Life (Years)	Current Replacement Value (000s)
Bridges	132 Ea.	43.5	100	$623,800
Culverts (Major)	13 Ea.	43.2	60-70	$34,000
Culverts (Minor)	107 Ea.	40.5	60-70	$154,300
Major Retaining Walls	5.2 km	45	60	$28,700
Minor Retaining Walls	3.2 km	61.7	60	$2,800

Background Information

At an estimated replacement value of $812 million, the City's 252 bridge and culvert structures cross a variety of natural and man-made features. From watercourses, rivers and streams to highways and railways, these structures connect our residents to communities, commerce and recreational opportunities. The overall condition rating of the City's bridge and culvert structures is Good. Similar to our road pavements, the City's structures are also aging but at a different rate than our road network.

Retaining Walls are classified into two separate groupings: Major Retaining Walls and Minor Retaining Walls.

Major Retaining Walls are structurally designed retaining walls that satisfy the following criteria:

1) Walls with an exposed (aboveground) height of greater than 2.0 metres,

2) Walls that are within a distance of twice their exposed height from the edge of the roadway, and

3) Walls designated by staff as structurally significant (potential impact to pedestrians, utilities, etc.).

Minor Retaining Walls are retaining walls that have an exposed height between 0.6 metres to 2.0 metres and are outside the distance requirement from the roadway to be classified as a major wall.

Example Major Retaining Wall

Asset Condition

In accordance with O. Reg. 472/10, road-related bridges and large culverts are inspected every two years. The inspection and condition information is catalogued and verified using the methodology outlined in the Ontario Structural Inspection Manual (OSIM). The bridge and culvert condition data is based on the 2021 OSIMs.

The City utilizes the Bridge Condition Index (BCI) to assess and indicate overall condition of Bridge and Culvert Structures. BCI is a commonly used condition rating defined in the MTO's OSIM guidelines and is calculated by assessing and rating each individual component of the structure to determine the current value. It is a measure that helps the department understand the bridge inventory and is just one of the

commonly used methods to see what structures may need repairs, maintenance and rehabilitation. Comparatively, the other measure that the City regularly uses is the Net Asset Salvage Value Index (NASVi). This is calculated as a percentage of the overall replacement value of the structure in comparison to the value of work identified on it.

Major retaining walls have been added to the OSIM inspection list to be evaluated using the same criteria and methodology as the other structure assets. Minor retaining walls are inspected by staff in the field using a 1-10 scale (10 being excellent) and the inspection and condition information is stored on the City's GIS system.

Age Summary: Structures

Bridge, culvert and retaining-wall structures come in all shapes and sizes and can be constructed using a number of different materials like concrete, steel or even wood. They are also comprised of a variety of components that require periodic maintenance, repair, rehabilitation or replacement. Depending on the type of structure, the components can include footings, structural retaining walls, parapet walls, abutments, piers, steel, wood or concrete beams, bearing seats, handrails, sidewalks, decks, drains, and expansion joints, just to name a few.

The expected useful life for structures varies between 60 and 100 years depending on the type of structure.

The useful life values for bridges and culverts are derived from the lifecycle information contained within the City's BridgeTMS system. The useful life value for retaining walls was derived from a market survey completed by staff. The longevity of these structures will depend on a variety of factors including construction methodology, the materials used, the local climate and other environmental conditions like exposure to chlorides (salts), loads and frequency of use. Taking all factors into account, the expected useful life for the various types of structures is determined through review and consultation, employing the professional judgement of City engineering staff and structural engineering consulting services retained by the City.

Example Rail Bridge

The graph in Figure 3 shows the average age for bridge, culvert, and major retaining wall structures in relationship to the expected useful life by structure type. The graph also shows the average number of

years since the structures were last renewed. While all of the City's structures are aging, the bridge and culvert network appears to be much newer in appearance and condition because the structures are being monitored regularly, and timely maintenance and renewal activities are taking place. Typically, structures are scheduled for renewal when they reach their mid-life and are replaced when they reach their end of life. Transportation Infrastructure Management staff monitor these trends and update lifecycle models and treatments accordingly. The retaining wall network is aging and is closer to the end of the assets' useful lives as shown. This reflects the lack of renewal events for these assets and the need for the City to prioritize them more proactively.

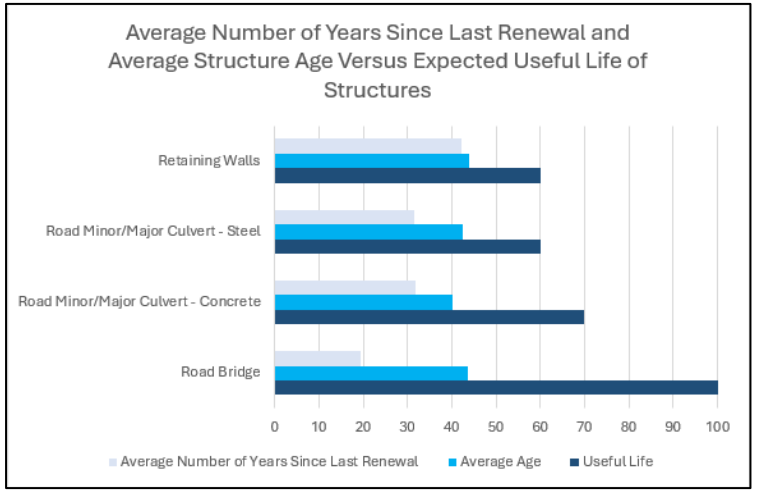


Figure 3: 2021 Graph - Useful Life vs. Structure Age vs. Years since Renewal

Data Assumptions and Limitations

- **Replacement values** – for bridges and culverts are determined by the City's inspection consultant, considering current construction costing, bridge type, and size. The replacement values for retaining wall structures are determined by using unit costing derived from past construction data and values gathered from market research. The values are applied to each retaining wall based on their dimensions to determine an overall replacement cost. Costing information for different materials for retaining walls is not available. The same unit costing has been used for all retaining walls, regardless of material. The City will continue to refine the replacement value framework as more information becomes available
- **Installation Dates** – It is assumed that construction dates for retaining walls are the same as the registered/built date of the road unless more accurate installation dates are available. For this reason, age is simply an estimate and may not be accurate
- **Useful life** – for retaining walls is set at 60 years. This is based on market research of other municipal asset management plans conducted by asset management staff. It is assumed that these will become more accurate as the City renews these assets over time. The existing useful lives of

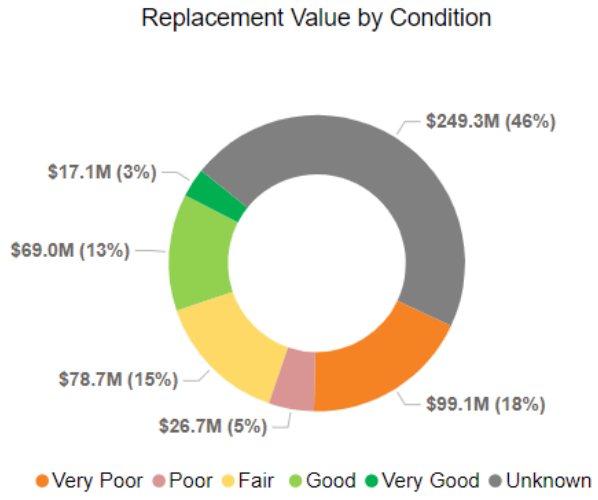
bridges remains set at 100 years with concrete culverts at 70 years and steel culverts at 60 years

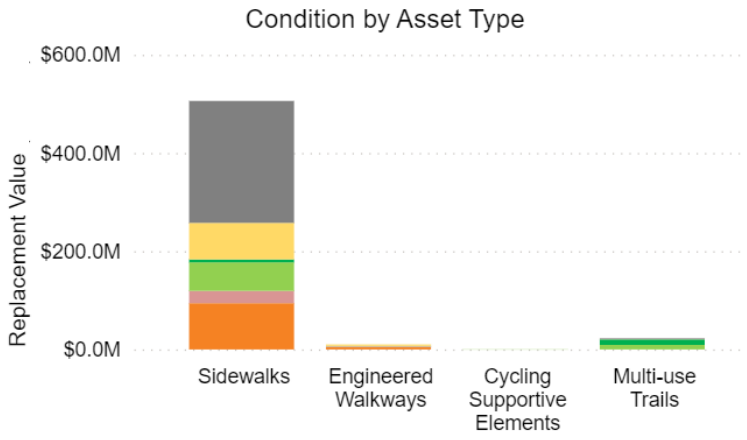
- Retaining Walls vs. Knee Walls – All walls found to be under 60 cm in exposed height are classified as knee walls and are not a part of this plan. Retaining walls that have not been identified are not included in the inventory. The City will continue to identify additional retaining walls for inclusion in the inventory
- Ownership – There are a number of retaining walls where ownership is unknown or unconfirmed. These have been assumed to be privately owned if they are retaining private property or landscaping

Asset Class: Roadside Trail Network

Data Quality:	Asset Inventory	Condition	Replacement Value
	C	C	A

Current Replacement Value: $539.8 Million





Asset Type	Quantity	Average Age (Years)	Estimated Useful Life (Years)	Current Replacement Value (000s)
Multi-Use Trails	122 km	13.7	30	$26,300
Sidewalks	2,414 km	42.6	50	$502,800
Engineered Walkways	22 km	48.1	50	$10,200
Cycling Supportive Elements	519 Ea.	7.9	10	$500

Background Information

The Roadside Trail Asset Class includes Multi-use Trails, Sidewalks, and Engineered Walkways.

Asset Condition: Roadside Trail Network

The City collects pavement condition and digital image information of its multi-use trail assets to populate in the Roadmatrix application typically every four years. The most recent condition survey took place in 2020, with the next survey planned for 2025. The City procures consulting services to collect pavement condition data for the City's trail network. The scope of work includes the assessment of current pavement roughness, surface distresses and other criteria, as well as the provision of a full set of digital imagery. Data collection for trails — specifically regarding pavement condition — consists of a pavement-surface distress survey (both visual and semi-automated) completed by experienced raters. The consultant also adopts the Ontario Ministry of Transportation (MTO) surface-condition rating methods for flexible surfaces and rigid surfaces for evaluating along the pavement surface distresses index (SDI). The pavement's ride quality, which is a measure of roughness of the pavement, is collected using rRuf, a specialized and automated data-collection application for mobile phones (iPhone) that uses the device's accelerometers to produce a segmented Class 3 response based on roughness. The mobile phone is mounted on a tricycle for the roughness surveys and image collection.

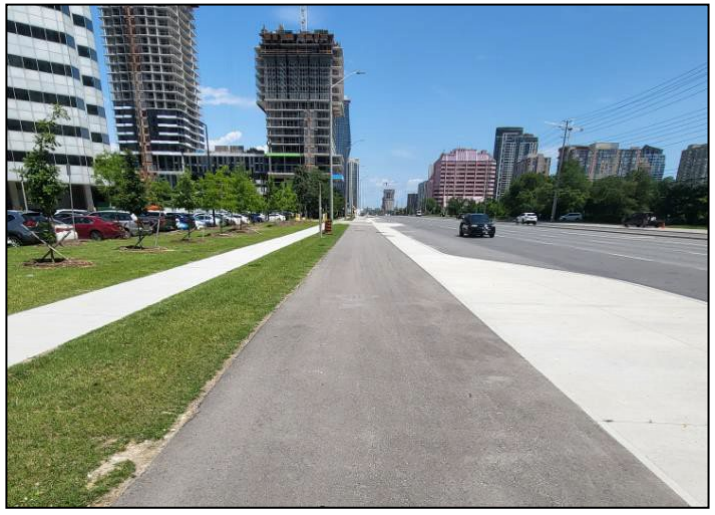
Currently, sidewalks and engineered walkway inventories are kept in Esri. The condition of sidewalk and engineered walkway assets has been estimated based on age and remaining useful life (RUL) as described in Appendix A on the basis that as an asset reaches its expected life, its condition will deteriorate. This approach is commonly used for assets, where measured condition data is not readily available. Appendix A shows the translation used to assign a 1 to 5 condition rating based on asset age (expressed as the percentage of its lifespan remaining), and a description for each rating.

All sidewalks are inspected annually in accordance with Municipal Maintenance Standards (MMS) to identify deficiencies. A condition survey to collect condition information for sidewalks and engineered walkways is planned for 2025. This will be used to replace the currently aged base condition approach.

Currently, Cycling Supportive Elements include bike racks. These undergo inspections yearly. Bike racks are installed by multiple groups such as MiWay and Active Transportation. Once installed, these assets become the responsibility of the Roads Service Area to maintain.

Age Summary: Roadside Trail Network

Roadside Trail Network structure is typically comprised of granular sub-base materials, asphalt or concrete-base materials and asphalt or concrete-surface materials. While each component deteriorates at a different rate, the City uses the pavement's overall condition rating and age as indicators to determine when maintenance, rehabilitation or reconstruction is required. The expected useful life of the overall pavement structure is determined through an internal review and consultation process. The useful life values are derived from the City's tangible capital asset (TCA) information along with the professional judgement of the City's engineering, transportation infrastructure management, and maintenance staff that participated in the review.



Example Multi-Use Trail and Sidewalk

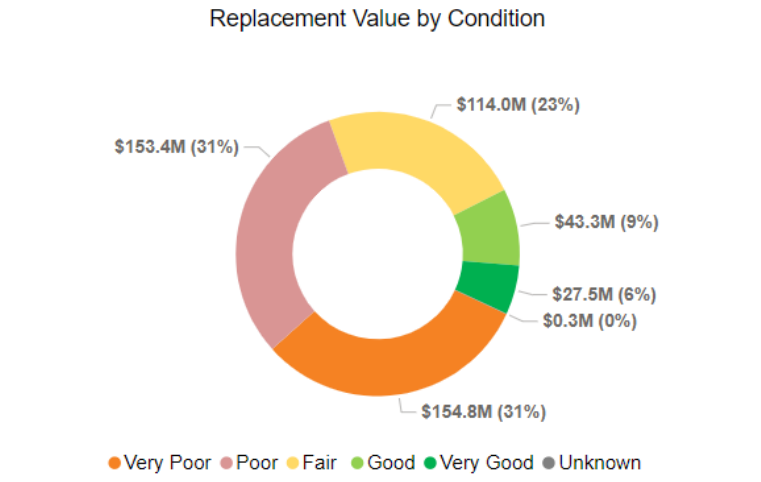
Data Assumptions and Limitations

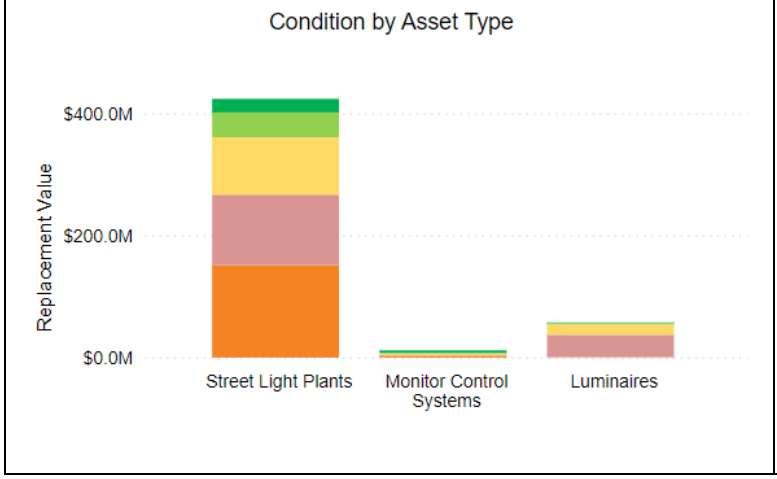
- **Installation Date** – Where available, the installation date is assumed to be the same as the asset it is built adjacent to (e.g., a sidewalk is assumed to have been built at the same time as the road). Where the installation date of the road asset is missing, or inaccurate, the install date is assumed to be unknown, and excluded from the condition calculations
- **Replacement Values** – are calculated using the latest unit costs available. These do not include excavation costs for any Roadside Trail Network assets, and for engineered walkways replacement values do not include the cost of curb installation
- **Trail Width** – for trails missing width information, a 1.5m width for sidewalks and 3m for engineered walkways is assumed based on minimum standard widths
- **Estimated Useful Life** – for all assets are based on the City's TCA policy

Asset Class: Street Lighting

Data Quality :	Asset Inventory	Condition	Replacement Value
	B	C	A

Current Replacement Value: $493.4 Million





Asset Type	Quantity	Average Age (Years)	Estimated Useful Life (Years)	Current Replacement Value (000s)
Street Light Plants (Poles/Arms/ Cables)	33,315 Ea.	36.1	50	$424,000
Luminaires	46,847 Ea.	8.8	15	$57,500
Monitoring Control System	46,261 Ea.	8.8	10	$11,900

Background Information

The City's Street Lighting Asset Class consists of the following:

- Street Light Plants – includes poles, brackets and cables required to provide adequate lighting throughout the City
    - Poles (Concrete, wood, steel, aluminum)
    - Brackets (Standard and Decorative)
    - Cables (Underground wiring)
- Luminaires – includes luminaires attached to a Street Light Plant asset, consisting of Light Emitting Diodes (LEDs), Non-LEDs, underpass, lawn, bollard, and mercury vapour lights
- Monitoring Control System – includes adaptive control nodes attached to each luminaire to control lights, provide analytical data for the accuracy and validity of operational and energy consumption, as well as gateways to provide a mesh network-communication system to all street lights

Asset Condition and Age Summary: Street Lighting

As of 2024, the City has begun the process of establishing cyclical condition inspections of its street lighting assets. In the meantime, asset condition is estimated using age information generated from Esri. The average age is determined from the installation dates from the City's database. The condition scale used is the average age of the total number of street lighting assets compared to the life expectancy of the asset.

Table 2: Useful Life Based on Pole Material

Material	Estimated Useful Life
Concrete	50 years
Erin Style Pole (Direct buried steel)	40 years

Pole material is used to estimate the useful life of street light plants as shown in Table 2.

The City is in the process of inspecting street light plants and has inspected approximately five per cent. Once a more representative percentage has been inspected, this will be used to calculate asset condition instead of age.

Gateways were replaced in the last two years and are under warranty. Their condition was assumed to be very good.

Street light luminaires were converted to LED in 2013 along with the monitoring control system. As this was a new and emerging technology, several issues led to decreased useful life conditions. When communication was lost as part of the mesh network, lights would default to the "On" position. Therefore, lights were on for 24 hours per day instead of the expected average of 12 hours. This has resulted in street lights where the actual condition of the asset is worse than what is reflected by its age.

The age profile identifies a large number of assets from 1970s to 1990s. Based on their age-based condition, these assets will require renewal funding within the next 5 to 15 years. The renewal funding will be ongoing due to growth of the city from the 1990s to mid-2000s. The useful life of poles is 40 to 50 years, and due to the deferral of $20 million renewal budget to future years, many poles have reached an overall age as high as 60 years. LED luminaires and new adaptive control nodes were installed between 2013 and 2015, as part of the conversion project and should be considered for replacement within the next five years.

Data Assumptions and Limitations

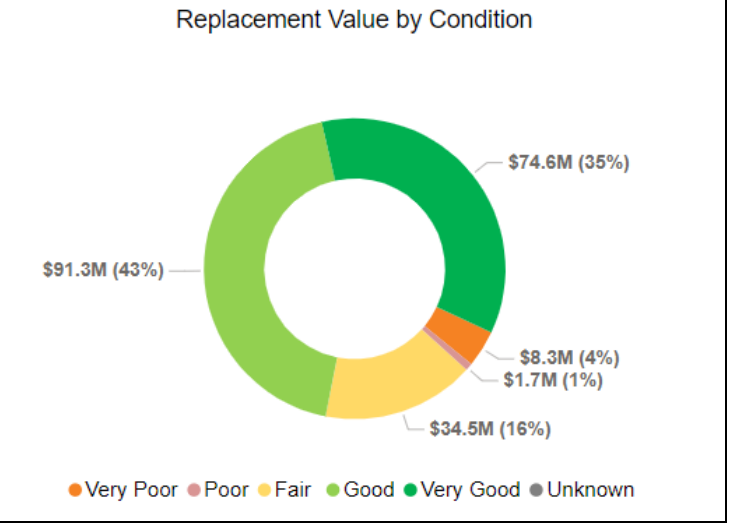
- Condition ratings are estimated using an age-based method and may not reflect the real-world condition of the assets. As of 2024, the City performs cyclical asset condition inspections every five years, and visual checks on a regular basis, to address assets that may pose a public safety concern. In-depth condition assessments will be part of the improvement plan for asset management
- Replacement values were based on current unit costs from tenders. Replacement values do not include bracket arms

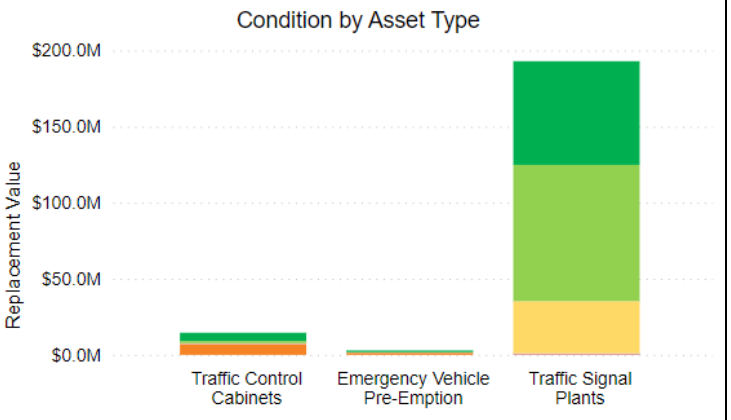
Street Light Maintenance

Asset Class: Traffic Signals & Related Electrical Devices

Data Quality:	Asset Inventory	Condition	Replacement Value
	B	C	C

Current Replacement Value: $210.5 Million





Asset Type	Quantity	Average Age (Years)	Estimated Useful Life (Years)	Current Replacement Value (000s)
Traffic Signal Plants	667 Ea.	16.9	50	$193,000
Traffic Controller Cabinets	579 Ea.	13.5	20	$14,600
Emergency Vehicle Pre-Emption	582 Ea.	13.5	20	$2,900

Background Information

The City's Traffic Signals and Related Electrical Devices Asset Class consists of Traffic Signal Plants, Traffic Controller Cabinets, and Emergency Vehicle Pre-Emption.

The Traffic Signal Plant is a combined assembly (of poles, heads, conduits, cables, pushbuttons, LEDs, vehicle detection, handwells, and power supplies) with a useful life span of 50 years when properly maintained under normal conditions. The Traffic Controller Cabinets and Emergency Vehicle (fire) Pre- Emption System can be expected to have a useful life of 20 years. This considers the rapid technological advances in the transportation industry. Currently, the City attempts to use traffic signal equipment until it has reached its expected end of life or deemed a risk to the overall system. In lieu of replacing the entire assembly, viable parts may be salvaged from retired assets to keep current signals operational.

Asset Condition and Age Summary: Traffic Signals and Related Devices

The condition of traffic signals and related electrical device assets is estimated based on age and remaining useful life as described in Appendix A on the basis that as an asset reaches its expected life, its condition will deteriorate. Appendix A shows the translation used to assign a 5-point condition rating based on asset age (expressed as the percentage of its remaining useful life).

The City conducts an annual inspection program for all traffic signals and related electrical devices. The following checks and tests are performed to ensure safe and operational equipment comply with the latest safety standards:

- Spring and fall inspections at all traffic-signalized intersections (including Pedestrian Crossovers (PXO) type 'B' and 'C') as part of routine maintenance
- Spring and fall monitor checks for all traffic-signalized intersections as part of routine maintenance
- Annual testing of the emergency vehicle (fire) pre-emption system for all traffic-signalized intersections as part of routine maintenance
- Annual inspection of all school flashers and warning beacons as part of routine maintenance
- Annual inspection of lane designation poles as part of routine maintenance
- Annual inspection of closed-circuit television (CCTV) cameras as part of routine maintenance

All defective traffic signals and related electrical devices are repaired or replaced within the times specified in accordance with the City's standards, the

Minimum Maintenance Standards for Municipal Highways, and Ontario Traffic Manuals.

The City also collects data through routine maintenance programs, as well as preventative and emergency maintenance. The information provided includes replacements costs, age, maintenance history, and condition of the traffic-signal infrastructure. The data generated by the traffic signals electrical maintenance contractor helps decision makers determine the lifecycle of the intersections.

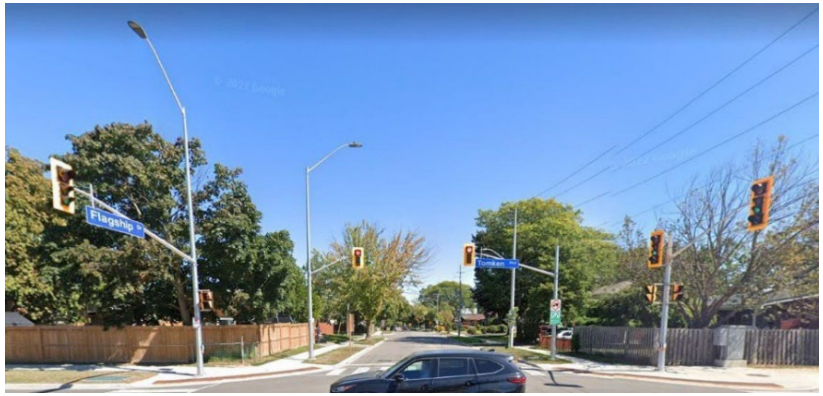
Data Assumptions

- **Installation dates** of the entire traffic signal plant is assumed to be the same date as when it was built (e.g. a pole was assumed to have been installed at the same time as the traffic signal plant was built, even though a pole may have been replaced due to motor vehicle collisions). This may also apply to any other Traffic Signal Plant components, or Traffic Controller Cabinet, or Emergency Vehicle (fire) Pre-Emption System
- **Replacements costs** for traffic signal plants is based on the current market value (i.e., labour, materials, equipment and general overhead and handling charges)

Data limitations:

- All traffic signal and related electrical devices are currently stored in separate excel spreadsheets
- Additional information needs to be entered or populated manually into these spreadsheets
- Maintenance logs performed by service personnel for repairs are not fully electronic

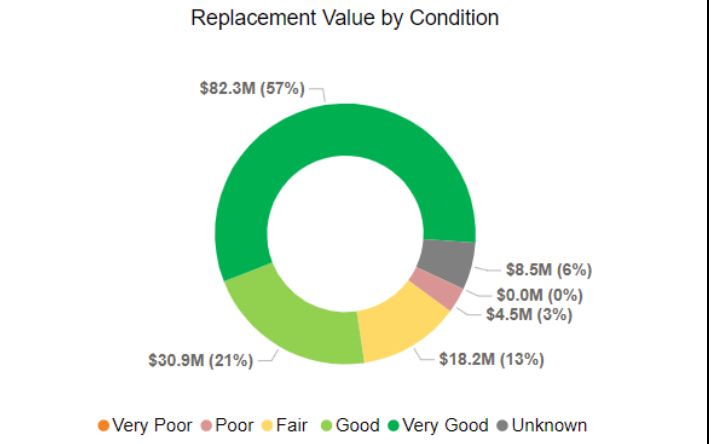
The traffic signals and related electrical devices are designed to accommodate various road users. There is a potential risk for unforeseen failures and damages due to power outages, severe weather events, construction activities, motor vehicle collisions, and malfunctioning equipment which can increase maintenance costs and affect the City's ability to sustain its desired service levels.

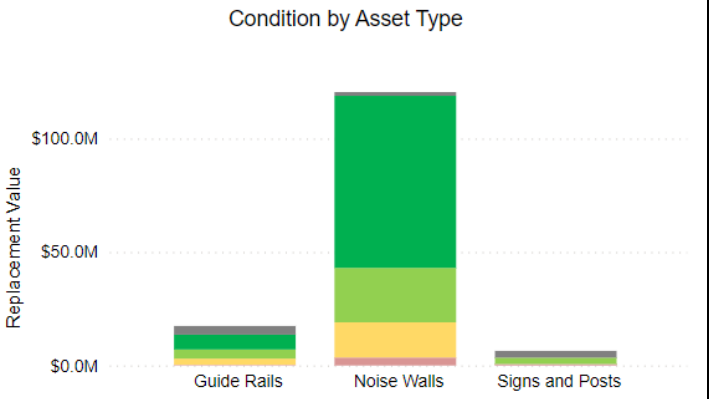


Example Traffic Signal Plant

Asset Class: Roadside Infrastructure

Data Quality:	Asset Inventory	Condition	Replacement Value	Current Replacement Value:	$144.3 Million
	B	C	C		





Asset Type	Quantity	Average Age (Years)	Estimated Useful Life (Years)	Current Replacement Value (000s)
Signs and Posts	116,323 Ea.	-	10-50	$6,400
Noise Walls	35,979 m	14	30-50	$120,500
Vehicle Safety Barriers	34,179 m	-	30	$17,400

Background Information

The City's Roadside Infrastructure Asset Class consists of Noise Walls, Vehicle Safety Barriers, and Signs and Posts.

Noise Walls

Asset Condition

The condition of noise walls is evaluated every two years during a visual inspection by City staff. The Noise Wall Condition rating scale is used during visual inspections and gives each asset a condition score between one and 10. A rating of one is considered poor condition, and a rating of 10 is considered excellent condition.

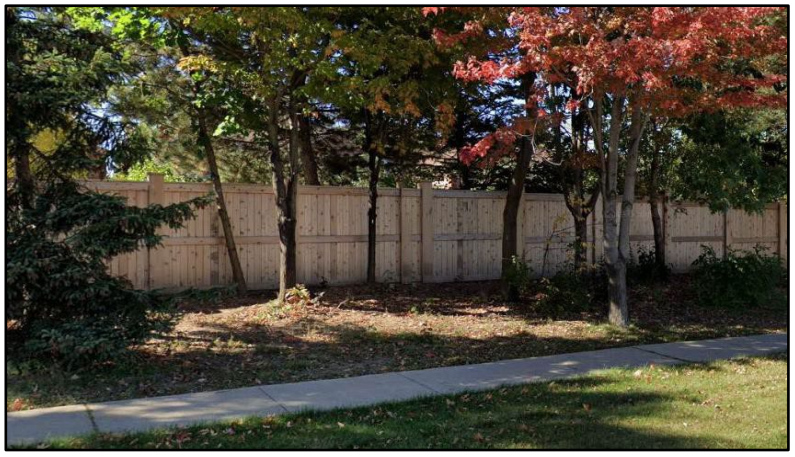
Age Summary

Construction material is used to estimate useful life as shown below:

Material/Asset Sub Type	Estimated Useful Life
Concrete/Composite/Brick	50 years
Wood/Vinyl	30 years

Data Assumptions and Limitations

- **Ownership** for all noise walls has not yet been confirmed. Some private walls are currently assumed as City-owned, and require review
- **Installation dates** are missing for some noise walls. Various dates are assumed by looking at historic Google mapping, and identifying the earliest sign of installation
- **Replacement values** are calculated based on a unit cost per metre. The unit costs include materials, labour, administration, and other applicable costs. They are updated yearly based on the latest tendered construction contract



Example Wooden Noise wall

Vehicle Safety Barriers

Asset Condition

Vehicle Safety Barriers, which includes guide rails, concrete barriers, and end treatments, were inspected in 2020. This is assumed to be the current asset condition. In the future, Vehicle Safety Barriers will be inspected at regular intervals, every two to four years.

Data Assumption and Limitations

- **Installation dates** for guide rails are missing, thus age is unknown
- **Replacement values** are based on guide rail length, and do not consider different end-treatment types

Signs and Posts

Asset Condition and Age Summary

Visual condition data is collected yearly for all regulatory signs and posts using a pass or fail rating scale. A pass indicates no deficiencies were found, while a failure indicates the sign is damaged, missing, illegible, obscured, worn, etc. Retro-reflectivity testing for warning and regulatory signs is also typically performed annually. Condition is not currently collected for wayfinding signs. Many signs are mounted on existing supports that have been captured by the Street Lighting or Traffic Signals Asset Classes. The remainder are mounted on one of four types of posts: Wooden 4x4, U- channel, 3-in OD Post, and Telespar. The construction material is used to estimate the useful life of the sign posts as shown below.

Material/Asset Sub Type	Estimated Useful Life
Signs	10 to 15 years
Aluminum Post	50 years
Wooden Post	20 years

Generally, all posts are replaced with wooden 4x4 posts if they are damaged or reach the end of their useful lives, with the exception of 3-in OD posts, which are replaced like for like.

Data Assumptions and Limitations

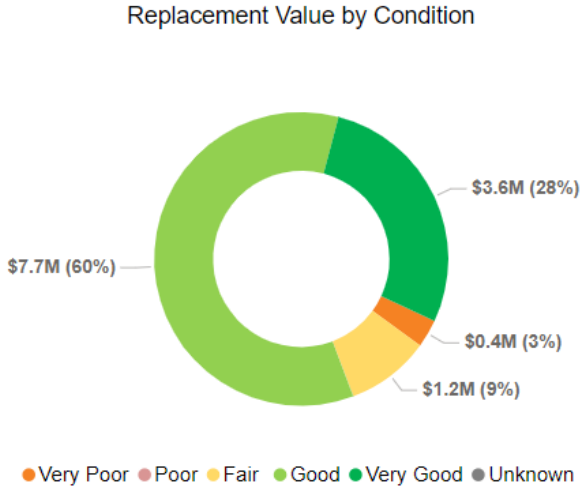
- **Useful life** assumptions for signs are made based on manufacturer material warranties. For example, the sheeting manufacturer has a 10-year warranty on their signs
- **Replacement value** for signs and posts is based on current pricing of replacement material, generalized by sign type. Where replacement values are not available, such as non-regulatory signs, an average cost of $50/sign is assumed. Replacement value does not include the cost of fasteners and brackets
- **Installation dates** of signs and posts are unknown
- **Condition** of posts is unknown

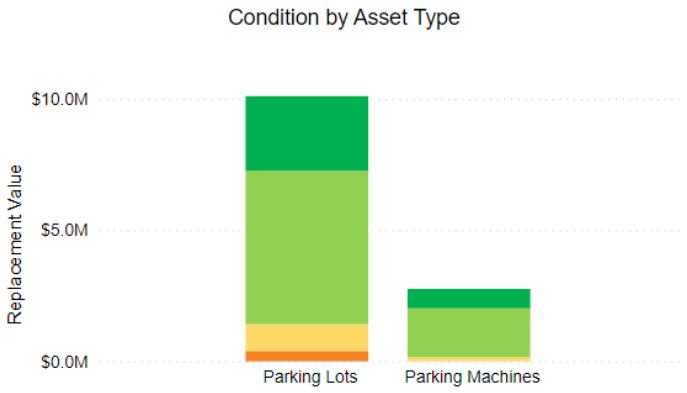
Example Signs

Asset Class: Municipal Parking

Data Quality:	Asset Inventory	Condition	Replacement Value
	B	C	C

Current Replacement Value: $12.9 Million





Asset Type	Quantity	Average Age (Years)	Estimated Useful Life (Years)	Current Replacement Value (000s)
Municipal Parking Lots	20 Ea.	18.1	20	$10,100
Parking Machines	247 Ea.	10.8	22	$2,800

Background Information

The City's Municipal Parking Asset Class consists of Municipal Parking Lots and Parking Machines.

Asset Condition

Municipal Parking Lots

The condition of municipal parking lots is assessed annually, and includes inspection of pavement condition, curbs, lighting, fences, and pavement markings. The average condition of the parking lot surface also takes into consideration the history of the parking lot including the last time it was resurfaced. While the overall parking lot is aging, pavement longevity is determined by factors such as the weather, winter maintenance and most importantly vehicular usage.

The condition scale used to grade the above-mentioned components is a five-point scale with one being Very Good, and five being Very Poor.

Pay-and-Display Machines

The condition of parking machines looks at the external condition of the unit (paint & rust), the solar panel condition, and age of components.

The average condition of a pay-and-display machine is estimated yearly by the last time the machine was refurbished along with the frequency of repairs as logged within the Precise ParkLink database. While the pay-and-display machines are aging, the life cycle of the machines is determined by factors such as the weather, maintenance and most importantly, usage. Machine condition is also influenced by emerging advancement in the technology and the legislated required upgrades to the machines.

The typical life cycle of a pay-and-display machine is 20 years, assuming three refurbishments (one every five years).

Data Assumptions and Limitations

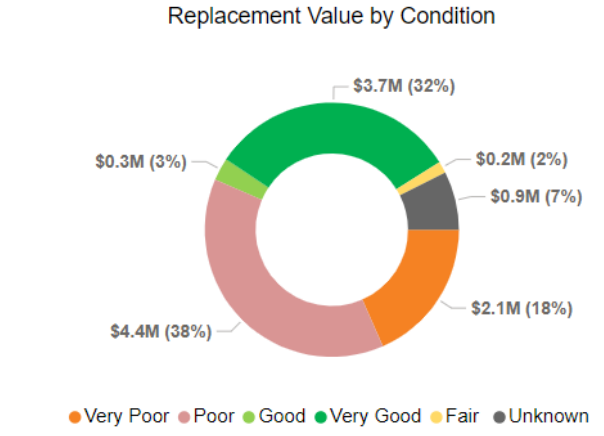
- **Replacement value** for parking lots is determined by historical cost plus the amortization of the parking lot. Replacement value for parking machines is determined by the set price given by the vendor, in agreement with the purchase contract

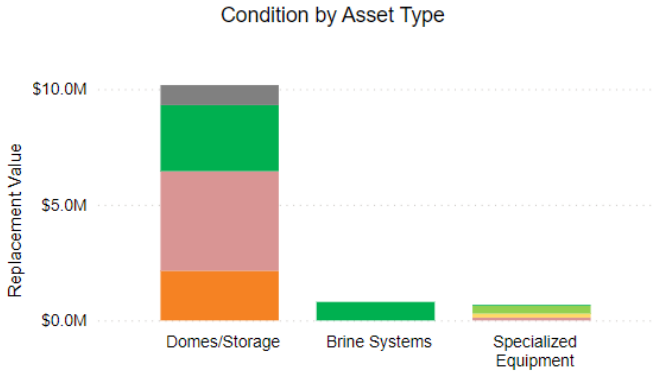
Example Parking Machine

Asset Class: Operational Equipment

Data Quality:	Asset Inventory	Condition	Replacement Value
	C	C	A

Current Replacement Value: $11.7 Million





Asset Type	Quantity	Average Age (Years)	Estimated Useful Life (Years)	Current Replacement Value (000s)
Domes/Storage	19 Ea.	27.3	30	$10,177
Brine Systems	10 Ea.	6	15	$800
Specialized Equipment	24 Ea.	3.1	6-10	$700

Background Information

Specialized equipment is broken down into two sub-types:

- Sign Shop Equipment
- Survey Equipment

Sign shop equipment has a replacement value of just under $90,000, with an estimated useful life of 10 years. The average age of the sign shop equipment, which includes two plotters, and a cutting table is four years.

Survey equipment includes a combination of total stations, data collectors, and GPS units and has a replacement value of just under $600,000, with an estimated useful life of six years.

Asset Condition

- The condition of Brine Systems is estimated using average age. As the Mavis and West Credit tanks were both installed in 2022, they are assumed to be in very good condition
- The condition of specialized equipment, including sign shop equipment and surveying equipment is based on age
- The condition of domes/storage facilities are currently assessed through the Facility Condition Index (FCI), conducted through F&PM staff. In the future, this will be assessed through a condition assessment

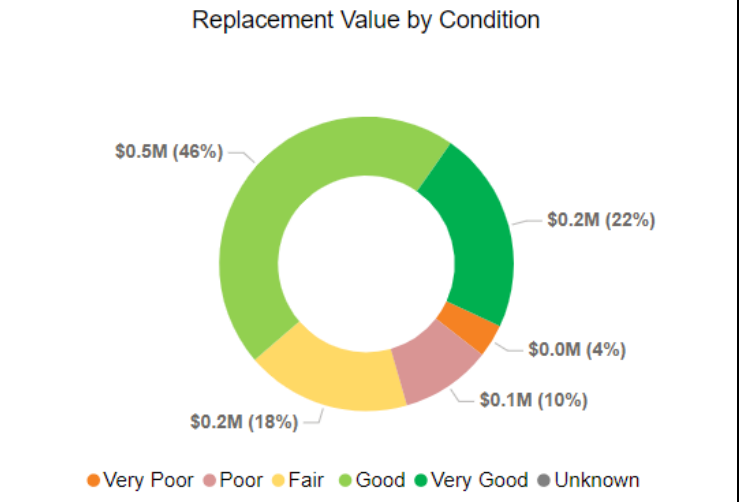
Data Assumptions and Limitation

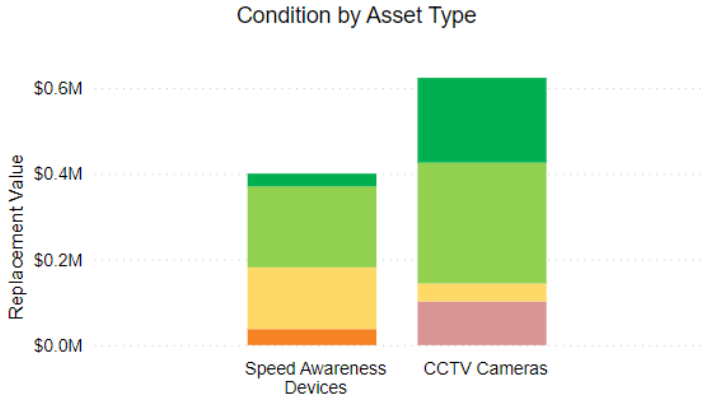
- The age of some sign shop equipment, such as the cutting table are unknown. The condition is thus assumed to be unknown
- **Replacement value** for domes is based on replacing two existing domes with one larger dome. Replacement value for brine systems is determined by a unit cost per system

Asset Class: Intelligent Transportation Systems (ITS)

Data Quality:	Asset Inventory	Condition	Replacement Value
	B	C	C

Current Replacement Value: $1.0 Million





Asset Type	Quantity	Average Age (Years)	Estimated Useful Life (Years)	Current Replacement Value (000s)
CCTV Cameras	104 Ea.	3	15	$600
Speed Awareness Devices	54 Ea.	10.8	10	$400

Background Information

The City's Intelligent Transportation Systems (ITS) Asset Class consists of CCTV Cameras and Speed Awareness Devices.

CCTV Cameras

Asset Condition

Since Traffic Management is a client of Security Services, who operate and maintain the system on the City's behalf, costs to replace CCTV Traffic Monitoring Cameras are confirmed by Security Services.

The make, model and installation date of the CCTV Traffic Monitoring Cameras are tracked by staff using the ATMS Dashboard. Tracking the make, model and installation date of the CCTV Traffic Monitoring Cameras allows staff to identify any cameras that are either non-HD or between 10-15 years old, which is the life expectancy for pan-tilt-zoom (PTV) cameras. As part of an annual expansion program of CCTV Traffic Monitoring Cameras within the City, spare cameras are purchased for the purpose of replacing older, non-HD cameras.

Since CCTV Traffic Monitoring Cameras are not static and provide pan-tilt-zoom (PTZ) capabilities, average conditions of a CCTV Traffic Monitoring Camera depends on usage, internal hardware components and weather conditions. Asset conditions can also be influenced by emerging advancements in technology.

In addition, a visual inspection of the camera, control equipment and wiring is also performed to assess the condition of the CCTV camera and potential replacement.

CCTV Camera mounted on Street Light Pole

Age Summary

The life expectancy for PTZ cameras is 10 to 15 years. There are 15 cameras that were installed between 2008 and 2011 that are approaching the end of their service life.

Data Assumptions and Limitations

- **Replacement values** for the CCTV Traffic Monitoring Cameras is based on the current market value obtained from Security Services and the City's Traffic Signal Electrical Maintenance Contractor (e.g., equipment, programming and labour costs)

- **Installation dates** - Although all the CCTV Traffic Monitoring Camera data is kept on the ATMS Dashboard and excel spreadsheet, there are several installation dates that are currently unknown. As a result, additional information needs to be entered or populated manually into the ATMS Dashboard and spreadsheet
- **Data limitation** - One of the limitations is when space/capacity is not available on the Network Video Recorders (NVRs), or additional hard drives are needed to increase capacity on the NVRs. If this were to occur, video will not be recorded on the NVRs and provided upon request

Incorporating routine inspections and identifying or replacing end-of-life CCTV Traffic Monitoring Cameras ensures staff are able to proactively monitor traffic conditions and respond to planned and unplanned events in a timely manner. This will become more critical as the number of CCTV Traffic Monitoring Cameras approach end of service life and the number of annual installations increase to provide the ability to monitor traffic conditions on a larger scale.

Speed Awareness Devices

Asset Condition

Condition ratings for Speed Awareness Devices are calculated based on age. No inspections are currently performed.

Age Summary

The estimated useful life of speed awareness devices is approximately seven to 10 years. The City's inventory includes a variety of different types of equipment purchased from different vendors and with different specifications and capabilities, as this technology changes over time.

Data Assumptions and Limitations

- **Replacement values** for speed awareness devices are based on recent equipment-purchase costs for similar equipment
- **Location data** is not relevant as the equipment is mobile and rotated monthly, however staffs tracks the location of all equipment installed

Example Speed Awareness Devices

Levels of Service

Governing Legislation for Roads Service Area

Legislation	Requirements
Accessibility of Ontarians with Disabilities Act, 2005	Provides accessibility standards to benefit all Ontarians
Building Code Act, 1992	Provides requirements to adhere to construction and safety practices
Conservation Authorities Act, 1990	Provides guidance for the organization and delivery of programs and services that further the conservation, restoration, development and management of natural resources in watersheds in Ontario
Development Charges Act, 1997	Provides municipalities the ability to levy charges to fund growth-related municipal infrastructure, on the principle that growth pays for growth
Emergency Management and Civil Protection Act, 1990	Provides requirements for emergency management
Environmental Protection Act, 1990	Provides for the protection of the natural environment through regulations regarding discharge of contaminates into the natural environment
Fish and Wildlife Conservation Act, 1997	Regulates hunting, trapping, and fishing practices and aims to preserve at- risk wildlife, as well as the conservation of wildlife
Fisheries and Oceans Canada (DFO)	Provides guidelines and laws to protect the habitat of fisheries in proximities to roadways and bridges
Municipal By-Laws	Regulations approved by Council to safeguard and protect persons and properties
Municipal Government Act, 2001	• Practices and procedures • Accountability and transparency • Finance
O. Reg 239/02: Minimum Maintenance Standards	• Provides requirements for minimum standards of repair for municipal highways

O. Reg. 472/10 and O. Reg. 104/97: Standards for Bridges - Ontario Structure Inspection Manual	• Defines which structures must be inspected routinely
O. Reg. 588/17: Asset Management Planning for Municipal Infrastructure	• Provides policies and guidelines for levels of service considerations in stormwater management assets
Occupational Health and Safety Act, 1990	• Rules governing health and safety in Ontario's workplaces
Ontario Heritage Act, 1990	Provides guidance for the organization and delivery of programs and services that further the conservation, restoration, development and management of natural resources in watersheds in Ontario
Ontario Water Resources Act, 1990	Provides guidance in the inspection and maintenance frequency of stormwater management facilities (i.e., storm ponds)
Planning Act, 1990	Provides direction on municipal planning activities

Community Levels of Service Framework

Core Value	LOS Objective	Asset Class	Performance Measure	Current Performance
Scope	Transportation assets provide a network with a reasonable level of connectivity and are capable of supporting all planned modes of transportation.	Road Pavement	Description, which may include maps of the road network in the municipality and its level of connectivity.	Maps are included in Appendix B.
		Structures	Description, which may include maps of the structure network in the municipality.	Maps are included in Appendix B.
		Structures	Description of the traffic that is supported by municipal bridges (e.g., heavy transport vehicles, motor vehicles, emergency vehicles, pedestrians, cyclists).	The City's road bridges and AT bridges have been designed in accordance with the standards and requirements of the Bridge Design Code at the time of construction. The bridges have been designed to carry heavy transport vehicles, motor vehicles, emergency vehicles, pedestrians, and/or cyclists.

Performance	Transportation assets are maintained in a state of good repair and are safe and reliable for drivers, pedestrians and cyclists.	Road Pavement	Description or images that illustrate the different levels of road class pavement conditions.	Images are included in Appendix C.
		Structures	Description or images of the condition of bridges and how this would affect use of the bridges.	Images are included in Appendix C.
		Structures	Description or images of the condition of culverts and how this would affect use of the culverts.	Images are included in Appendix C.
		All other asset classes	Description or images of the condition of transportation assets and how this would affect their use.	For the majority of these assets, the condition is based on age. Images of condition are included in Appendix C for those that are not age-based.

Technical Levels of Service Framework

Core Value: Scope

LOS Objective: Transportation assets provide a network with a reasonable level of connectivity and are capable of supporting all modes of transportation.

Core Value: Scope				
Asset Class	Performance Measure	Current Performance (2023)	Target Performance (2024-2033)	Background Information
Road Pavement	Number of lane-kilometers of arterial roads (Class 1 and 2) as a proportion of square kilometers of land area of the municipality.	2.7	TBD	
Road Pavement	Number of lane-kilometers of collector roads (Class 3 and 4) as a proportion of square kilometers of land area of the municipality.	6.9	TBD	
Road Pavement	Number of lane-kilometers of local roads (Class 5 and 6) as a proportion of square kilometers of land area of the municipality.	9.7	TBD	
Road Pavement	Per cent of existing centre-line kilometers of roads that meet the 2041 growth capacity targets.	95%	100% by 2041	
Structures	Per cent of bridges and major culverts in the municipality that meet the 2041 growth capacity targets.	91%	100% by 2041	Based on 2022 background study.
Structures	Per cent of bridges in the municipality with loading or dimensional restrictions.	3%	TBD	Loading capacity unknown for many structures. Includes bridges only, not culverts.

Core Value: Scope				
Asset Class	Performance Measure	Current Performance (2023)	Target Performance (2024-2033)	Background Information
Roadside Trail Network	Per cent of new sidewalks constructed in high priority areas as identified in the latest Pedestrian Master Plan.	2%	100% by 2051	Using data from 2021 Pedestrian Master Plan, Network Prioritization. Prioritization considers road classification, proximity to schools and transit, and other factors.
Road Pavement/ Roadside Trail Network	Per cent of road corridors that meets the requirements identified in the Cycling Master Plan.	46%	100% by 2043	Includes all cycle tracks, bike lanes, multi-use trails, and shared routes on road corridors in Mississauga, including regional roads. Using data from 2018 Cycling Master Plan.
Street Lighting	Number of street lights per lane kilometers.	8.3	Maintain Existing Service Levels	N/A

Core Value: Performance

LOS Objective: Transportation assets are maintained in a state of good repair and are safe and reliable for drivers, pedestrians and cyclists.

Core Value: Performance				
Asset Class	Performance Measure	Current Performance (2023)	Target Performance (2024-2033)	Background Information
All	Average risk rating by asset class.	TBD	TBD	Risk formalization is a continuous improvement item.

Core Value: Performance				
Asset Class	Performance Measure	Current Performance (2023)	Target Performance (2024-2033)	Background Information
Road Pavement	Actual vs. target capital reinvestment rate.	1.7% vs. 3.6%		A measure of how much funding is available to meet capital state of good repair lifecycle needs (Actual) versus how much funding is required (Target).
Structures		1.1% vs. 1.7%		
Roadside Infrastructure		0.0% vs. 0.2%		
Roadside Trail Network		1.0% vs. 2.2%		
Street Lighting		0.5% vs. 1.2%		
Municipal Parking		1.2% vs. 2.6%		
Traffic Signals		3.2% vs. 3.2%		
Intelligent Transportation Systems (ITS)		20.1% vs. 23.1%		
Operational Equipment		3.8% vs. 6.1%		
Road Pavement	For arterial roads in the municipality, the average pavement condition index value.	59	Maintain Existing Service Levels	This is calculated using PQI.
Road Pavement	For collector roads in the municipality, the average pavement condition index value.	57	Maintain Existing Service Levels	Collector includes Major and Minor
Road Pavement	For local roads in the municipality, the average pavement condition index value.	57	Maintain Existing Service Levels	
Road Pavement	Per cent of paved lane kilometers where the condition is rated fair or better.	62%	TBD	

Core Value: Performance				
Asset Class	Performance Measure	Current Performance (2023)	Target Performance (2024-2033)	Background Information
Structures	For bridges in the municipality, the average bridge condition index value.	70	TBD	This is calculated using BCI as a bridge condition index.
Structures	For structural (major) culverts in the municipality, average bridge condition index value.	68	TBD	This is calculated using BCI as a bridge condition index.
Structures	Per cent of bridges and major culverts where the condition is rated fair or better.	92%	TBD	This is calculated using BCI as a bridge condition index.
Structures	Per cent of bridges and major culverts where the condition is rated poor and very poor, that are identified in the 10-year capital plan.	89%	100%	Structures identified in the capital plan includes structures identified for rehab or replacement, or as part of an investigations project.
Structures	Per cent of minor culverts where the condition is rated fair or better.	88%	TBD	This is calculated using BCI as a bridge condition index.
Structures	Per cent of minor culverts where the condition is rated poor or very poor, that are identified in the 10-year capital plan.	27%	TBD	
Structures	Per cent of retaining walls where the condition is rated fair or better.	95%	TBD	This is calculated using BCI as a bridge condition index for major retaining walls, and visual condition (1 to 5 rating) for minor retaining walls.
Structures	Per cent of structures that meet current active transportation requirements.	24%	TBD	As per pedestrian master plan minimum sidewalk width requirements, and cycling master plan cycling facilities (MUT, cycle tracks, etc.)

Core Value: Performance				
Asset Class	Performance Measure	Current Performance (2023)	Target Performance (2024-2033)	Background Information
Roadside Infrastructure	Per cent of noise walls where the condition is rated fair or better.	97%	TBD	
Roadside Infrastructure	Per cent of wayfinding signs where the condition is rated fair or better.	TDB	TBD	Does not include regulatory and warning signs. A condition of fair or better identifies no deficiencies.
Roadside Infrastructure	Per cent of sign posts where the condition is rated fair or better.	TBD	TBD	
Roadside Infrastructure	Per cent of critical vehicle safety barriers where the condition is rated fair or better.	98%	100%	Critical barriers provide protection from roadside hazards and pedestrian safety.
Roadside Trail Network	Per cent of sidewalks and engineered walkways where the condition is rated fair or better.	53%	TBD	Condition is based on age. Sidewalk condition assessment is scheduled for 2025.
Roadside Trail Network	Per cent of multi-use paths where the condition is rated fair or better.	99.8%	TBD	Condition is based on 2020 condition data.
Street Lighting	Per cent of street-light luminaires where the condition is rated fair or better.	35%	87% by 2033	This condition is based on a combination, of aged-based information, verifying the SCMS Database, with the City's ESRI Database, when the LED conversion began. Within 55% of useful life is considered fair condition.
Street Lighting	Per cent of street-light poles where the condition is rated fair or better.	37%	TBD	This condition is based on a combination, of aged-based information, verifying the Alectra Database, with the City's ESRI Database. Also, no field

Core Value: Performance				
Asset Class	Performance Measure	Current Performance (2023)	Target Performance (2024-2033)	Background Information
				inspections are currently being done. Within 60% of useful life is considered fair condition.
Street Lighting	Per cent of Erin-Style poles that are within their useful or functional life.	20%	TBD	With the current budget, 100% of Erin style poles will be replaced by 2059.
Municipal Parking	Per cent of municipal parking lots where the condition is rated fair or better.	96%	96%	
Municipal Parking	Per cent of parking machines where the condition is rated fair or better.	100%	95% to 100%	This is based on physical condition, not technological requirements.
Traffic Signals and Related Electrical Devices	Per cent of signalized intersections where the condition is rated good or better.	82%	TBD	Condition is based on age. Within 60% of useful life is considered good condition.
Traffic Signals and Related Electrical Devices	Per cent of traffic-controller cabinets where the condition is rated good or better.	47%	TBD	Condition is based on age. Within 90% of useful life is considered good condition.
Intelligent Transportation Systems (ITS)	Per cent of speed-awareness devices where the condition is rated fair or better.	95%	100%	Within 50% of useful life is considered fair condition.
Intelligent Transportation Systems (ITS)	Per cent of CCTV cameras where the condition is rated good or better.	77%	TBD	Condition is based on age. Within 50% of useful life is considered good condition.

Core Value: Operational

LOS Objective: Transportation assets are operationally safe for drivers, cyclists, and pedestrians— year-round and during all weather conditions.

Core Value: Operational				
Asset Class	Performance Measure	Current Performance (2023)	Target Performance (2024-2033)	Background Information
Roadside Infrastructure	Per cent of regulatory/warning signage that pass the retro-reflectivity testing.	TBD	100%	Warning and Regulatory signs only.
Roadside Trail Network	Per cent of sidewalks that undergo snow clearing during winter event.	70%	100% in 2026	
Intelligent Transportation Systems (ITS)	Per cent of speed awareness devices that meet functional needs.	85%	100%	Technical requirements meet operational needs.

Core Value: Efficiency and Environmental Stewardship

LOS Objective: Transportation assets are designed and operated in an energy-efficient and environmentally sustainable manner

Core Value: Efficiency and Environmental Stewardship				
Asset Class	Performance Measure	Current Performance (2023)	Target Performance (2024-2033)	Background Information
Street Lighting	Per cent of street lights that use energy-efficient LED lighting.	99%	100% by 2025	
Municipal Parking	Per cent of permeable surfaces that are functioning.	100%	100%	Municipal Parking defines functioning as: reasonable amount of water infiltration, with no cracks or holes that cause an unsafe surface for drivers and pedestrians.
Roadside Trail Network	Per cent of sidewalks and engineered walkways that meet standard width requirements.	TBD	TBD	
Roadside Trail Network	Per cent of multi-use trails that meet standard width requirements.	87%	TBD	While the width requirement may be met, a trail or sidewalk may be partially obstructed by a pole or other fixed object. The number of partial-obstruction locations within the roadside trail network is currently unknown.
Municipal Parking	Per cent of municipal parking lots that meet current accessibility requirements.	35%	50% by 2026	Lots are still in compliance until a parking lot is renewed, at which time, the lot is updated with the most current accessibility standards.

Core Value: Efficiency and Environmental Stewardship				
Asset Class	Performance Measure	Current Performance (2023)	Target Performance (2024-2033)	Background Information
Municipal Parking	Per cent of parking machines that meet current accessibility requirements.	100%	100%	
Traffic Signals and Related Electrical Devices	Per cent of intersections that are equipped with Accessible Pedestrian Signals (APS) pushbuttons.	27%	100% by 2035	As of 2025 budget cycle, the required funding has been approved to meet this target.

Demand Management

Mississauga continues to mature as a city. Aging infrastructure and the need to balance service levels with affordability pose significant pressures and challenges for the Roads Service Area.

The safety of the City's road users and traffic congestion remain high on the public agenda. Growth within Mississauga and surrounding municipalities continues to put additional pressure on the City's road infrastructure.

Vision Zero and the Transportation Master Plan

Adopted by Mississauga in 2018, Vision Zero is a strategy to eliminate all traffic-related serious and fatal injuries. The strategy prioritizes the safety and access of our most vulnerable road users.

The City completed a comprehensive Transportation Master Plan (TMP) in 2019 to guide the planning for Mississauga's transportation networks over the next 25 years. The TMP developed a vision for the future of mobility in Mississauga and established an overarching policy framework and action plan to guide investment in transportation infrastructure and services. The City looks for new ways to enhance its infrastructure to provide people with more options for modes of travel to, from, around and through Mississauga such that past investments continue to serve present needs well into the future.

The TMP complements the City's Vision Zero strategy and outlines a variety of road-safety objectives, including:

- Ensuring that roads, sidewalks, and trails are designed to prioritize the safety of pedestrians, cyclists, and other vulnerable travellers
- Ensuring that speeds are well-matched with the types of activity happening in the roadway and along the street
- Ensuring that people feel safe and secure when travelling in Mississauga by any transportation mode

The current position and projections for demand drivers that may impact future service delivery and use of assets are routinely assessed by the City through transportation planning exercises, including Development Charges Background Studies, Corridor Transportation Studies, and other initiatives.

The City is currently undertaking the Transit and Road Infrastructure Plan (TRIP) that will confirm and identify city-wide long-term transit and road network needs.

Demand Drivers, Projections and Management Plans

Demand Driver	Current Situation	Projection	Impact on Services	Demand Management Plan
Road users looking for safe roads that eliminate fatal and serious injury collisions.	Vision Zero was adopted by Mississauga in 2018. The TMP (2019) identified key recommendations to reduce fatal and serious injury collisions as part of a Vision Zero program.	To achieve no collisions that cause death or serious injury.	Ensuring that people are safe and secure when travelling in Mississauga by any transportation mode. Shifting the prioritization of vulnerable road users like pedestrians and cyclists over level of service for vehicular traffic.	Incorporate the 5 Es of road safety into all lifecycle-planning activities to achieve Vision Zero. The five Es are: • Engineering • Evaluation • Education • Empathy • Enforcement
Forecasted population growth increase and intensification throughout the City, triggering increased road use and traffic congestion.	Mississauga is a popular destination for employment, business and services. The average daily vehicle volume of the arterial and major collector road network is currently around 5,626[1] vehicles per lane. This is based on the 10-year	The average daily traffic volume is expected to reach 7,504[1] vehicles per lane by 2041. Demand for speed mitigation measures have increased each year since 2016 and the trend is expected to continue.	With limited capacity to continue to widen roads in the City, traffic congestion, and noise will continue to increase. With limited capacity to deploy speed mitigation measures,	Introduce, encourage and implement other modes of transportation such as higher order transit, high occupancy vehicle lanes, ride share, cycling and walking. Complete the planned network buildouts for transit, roads, cycling and walking, including

[1] 2022 Development Charges Transportation Background Study

Demand Driver	Current Situation	Projection	Impact on Services	Demand Management Plan
	historical average of vehicles per lane. Increases in vehicle volumes and speeds, combined with changes in transportation modes, creates increased demand for speed-mitigation measures.		response time is increased, and the duration of deployed resources decreases.	grade separations and intersection improvements, as identified in the Development Charges Transportation Background Study, TRIP study, and the Cycling and Pedestrian Master Plans. Introduce new speed mitigation programs and technology to meet increased demand. May need to advance planned program expansions to meet demands.
Growing infrastructure needs (e.g., cyclists, transit, LRT, pedestrians, emergency response) and shifts in modes of transportation.	Shifting from a vehicle-oriented right of way to a multi-modal and complete street environment. Accommodating the user demands by implementing and operating new traffic signal infrastructure needs.	Increase in cycling, pedestrian and public transportation activity. Project delivery and maintenance and operating costs are expected to increase.	Need for higher-order transit (BRT and LRT) high-occupancy vehicle lanes and additional cycling and pedestrian infrastructure. Increase in pedestrian, bicycle and transit-signal demands. Impact on level of	Incorporate pedestrian, cycling and transit improvements into major road and bridge improvement and renewal projects. New traffic signal installation and modernization programs. Continued collaboration among the Transportation Projects, Traffic

Demand Driver	Current Situation	Projection	Impact on Services	Demand Management Plan
			service/operation at intersections with high vehicle, pedestrian, transit and cycling demands.	Planning, Traffic Operations, Road Safety, Active Transportation and Transit teams to identify traffic signal improvement needs.
Increase in transit -related projects, as well as other coordinated road-improvement projects.	Noise walls, retaining walls, and other roadway assets are constructed along the Transitway and other major collector and arterial corridors.	Asset inventories are projected to increase along transit corridors, such as the Hazel McCallion Line and the Dundas BRT, as well as through the City of Mississauga's noise wall program.	Creation of new assets.	Creation of new assets will need to be budgeted under the 10-year program.
Changing development patterns leading to denser and more compact neighbourhoods.	CCTV Traffic Monitoring Cameras are typically installed at major/major intersections, 'hot spot' locations where reoccurring congestion occurs, adjacent to GO Stations where traffic patterns increase during GO train arrivals and where proposed intensification is	As the City of Mississauga starts to incorporate more of a 'complete street' concept, the need to expand coverage to monitor traffic conditions will be required.	Although expanding the CCTV Traffic Monitoring coverage will result in staff being able to verify and respond to an incident in a timely manner, this will also lead to an increase in cost for maintaining the devices.	Adjust the maintenance and operating budgets accordingly to offset the costs for purchasing and maintaining the devices.

Demand Driver	Current Situation	Projection	Impact on Services	Demand Management Plan
	planned (e.g., Lakeshore Road).			
Increase in commuters and traffic from outside the City.	Mississauga is a popular destination for employment, business and services from commuters from outside the City.	Commuters will continue to come to the City from nearby municipalities.	Need to manage traffic during peak periods and offer options for various modes of transportation.	Advocating for regional transit connections, improving transit service and active transportation infrastructure.
Growing infrastructure needs across the municipalities in the Greater Toronto & Hamilton Area and limited supply of available contractors are driving increased project-delivery costs.	Construction costs to deliver road-related projects have increased by an average 10% from the previous contract.	Project-delivery costs are expected to increase significantly each year based on recent trends. Maintenance and operating costs are also expected to increase annually.	Reduced number of road-related capital projects that can be funded and delivered annually. Reduced number and volume of maintenance initiatives that can be funded and completed annually.	Tender road capital renewal and maintenance contracts early in the year to ensure that bids remain competitive.
Changes in residential living situations. Example: multiple tenants, children living longer at home, parents moving in with children, etc.	Due to various economic factors, there have been changes in the way people select their living situation. Various factors, including high rent costs, mortgage-approval difficulties, and renting a	With a greater increase in residents within a single household, there is more often a demand for more parking options in order to avoid parking enforcement fines.	A revised approach to parking is required to better adopt to the changes in residential areas. Providing a centralized permit system along with alternative parking	Municipal Parking currently has a Parking Matters 2.0 project to provide a better permit system for residents along with an expanded lower-driveway boulevard program.

Demand Driver	Current Situation	Projection	Impact on Services	Demand Management Plan
	residential home to multiple tenants.		options for residents is critical.	
Industry Guideline Changes (AODA, Vision Zero, OTM, Ontario One Call, Hydro, Railway).	Follow current and new practices outlined.	Applying new standards and procedures.	Adapt to new guidelines, cost impacts to signals (e.g., protected phasing, reflective backboards, new hydro line upgrades/ rebuilds).	Implement new standards, procedures and guidelines with new or reconstructed traffic signals. Update Standard Operating Procedures (SOPs).
Increasing public expectations around expected noise levels in Outdoor Living Area (OLA).	Noise policy states that noise walls are warranted where the noise level in the OLA adjacent to arterial and major collector roadways exceeds 60 dBA.	Increase in service requests and residents inquiring about the installation of noise walls.	Increased creation of noise wall assets.	Continue to rely on the Noise Wall policy and noise testing to determine the need for noise walls in established residential areas where none currently exist (i.e., noise wall retrofit).
Increasing public expectations around condition of Roadside Trail Network.	The City is responsible and does not currently have a renewal program for its sidewalks and engineered walkways within the road right-of-way and/or pedestrian network.	There will be new levels of service for the Roadside Trail Network. Maintenance level of service may increase in the future.	New tools/software required and increased cost to deliver service.	Leverage a roadside trail network management system and develop a sidewalk and engineered walkway inspection program to determine optimal time and strategies to renew roadside trail network assets in a cost-effective manner and

Demand Driver	Current Situation	Projection	Impact on Services	Demand Management Plan
				to manage user expectations.
Advancements in technologies of Traffic Signals and CCTV cameras.	There are currently 136 locations within Mississauga where CCTV Traffic Monitoring Cameras have been installed. Out of the 136 cameras, there are 22 non-High Definition (HD) cameras, resulting in a less than desirable footage quality.	As technologies continue to advance, older assets may become obsolete, or more expensive to maintain. With the non-HD cameras reaching end of life, the cost to maintain and operate these devices is expected to go up.	Introducing new technology will increase cost and maintenance required. Additional space is required for new equipment and extra inventory, or parts are required to maintain and operate new technologies. Reducing the number of CCTV Traffic Monitoring Cameras within Mississauga would result in staff not being able to verify an incident and pro-actively make signal timing revisions to help manage traffic congestion in a timely manner.	Continue to evaluate new technologies (pilot), align with industry standards, work with surrounding areas and with boundary jurisdictional agencies (i.e., Peel, MTO, GTAA, Halton, Brampton, Toronto), continually review spacing requirements. Establish an annual replacement program to replace older CCTV Traffic Monitoring Cameras that have/ are reaching end of life and budget accordingly.
Introduction of new applications and technology	Residents are exposed to paid parking technologies within	New technology introduction and future vendor	New technology introduction with Municipal Parking	Municipal Parking currently has a Parking Matters 2.0 project,

Demand Driver	Current Situation	Projection	Impact on Services	Demand Management Plan
for more convenient ways to pay for parking.	other municipalities/private lots and therefore begin to expect the same technologies are introduced within Mississauga.	contract amendments/improvements with Municipal Parking is at the decision of LT and Council. The procurement of new technologies is also dependent on the availability of other internal stakeholders.	allows for better understanding of user habits, along with more data centric decision-making for future strategies.	which aims to procure a new pay-by-phone application. In addition, Municipal Parking is looking to undertake a technology study to allow for the identification of future opportunities.
Changes to development parking rates for both commercial and residential spaces.	When the City receives a development application (depending on the characteristics of the location), a developer may ask to build a structure with a reduced parking rate.	Reduction in parking rates required to be provided by the developer, impacts the resident behaviours regarding living situation/decision for vehicle ownership/exploring car-share options.	With intensification across the city, there is a significant demand for on-street parking, which impacts business owners, visitors and tenants.	Municipal Parking currently has a Parking Matters 2.0 project to provide a better permit system and the involvement in other studies within Planning and Development that allow for effective management of Municipal Parking.

Demand Driver	Current Situation	Projection	Impact on Services	Demand Management Plan
More frequent and extreme rainfall events leading to flooding.	When an extreme rainfall event is forecasted, the City's Incident Management Team is activated. Work crews are dispatched to clear all inlet and outfall locations to remove debris. During the event, work crews are dispatched to flood-prone areas.	Drainage demands on roads will impact the life cycle management of various road assets. With projected increases of approximately 2°C by mid-century, the frequency of extreme rainfall events is projected to increase (e.g., events that currently occur every 20 years will occur every 14 years2).	Increases in rainfall leading to flooding will interrupt road service and increase need for demand maintenance.	Monitor the flooding activities and adjust maintenance and operating budget accordingly for road repair. Work with Stormwater Service Area to identify roads that do not meet minimum storm sewer design requirements and/or adequate overland flow routes and align storm sewer and drainage upgrade projects with road-renewal activities. May need to advance road-renewal projects to align with critical drainage-improvement projects.
Increased risk of long duration, freezing rain	When a freezing rain event or ice storm is forecasted, the City activates the Incident	The frequency of freezing rain events lasting 6 hours or more for	An increase in freezing rain events will draw limited resources away from planned	Monitor freezing rain activities, adjust maintenance and operating plans, and

[2] Auld, H., Switzman, H., Comer, N., Eng, S., Hazen, S., and Milner, G. 2016. *Climate Trends and Future Projections in the Region of Peel. Ontario Climate Change Consortium: Toronto, ON*

Demand Driver	Current Situation	Projection	Impact on Services	Demand Management Plan
events leading to ice storms.	Management Team and the winter response team. Work crews are dispatched to monitor roadways, apply brine and/or salt accordingly and both look for and respond to fallen tree limbs or other infrastructure assets that have disrupted road services.	the typically coldest months could increase in southwestern and south-central Ontario by 40% by the 2050s.	maintenance activities and disrupt road service. An increase in long duration, freezing rain events will disrupt road service and increase the need for demand maintenance on roadside assets. It also increases the risk of other infrastructure failing such as signals and light poles.	budget accordingly for road repairs and service restoration. Adjust the incident response plan as needed.
Changing winter temperatures leading to changes in freeze-thaw cycles.	Freeze-thaw cycles lead to potholes and crack-sealing repairs. Heavy rains forecasted during a thaw cycle may result in flooding due to blocked storm inlets. Work crews are dispatched to clear all inlet locations to remove ice debris and minimize a disruption in road service.	The regional average number of freeze-thaw cycles is expected to decrease from 90 days per year to between 65 to 45 days per year by the end of the century — due to the overall warming of the local atmosphere.	If freeze-thaw cycles are expected to decline, then we should see a decrease in the need for demand-maintenance activities (for pothole repairs, crack sealing, minor asphalt & concrete repairs, as well as storm-inlet clearing during the winter).	Monitor changes to freeze/thaw events and adjust maintenance, operating programs and budget accordingly.
Increased frequency of high winds (e.g., gusts	When high wind events are expected, the incident management centre is activated and work crews	The frequency of wind gusts ≥ 70 km/h are projected to increase in the	We expect that high wind events will cause roadside appurtenances like	Investigate opportunities to improve designs for more wind-resistant

Demand Driver	Current Situation	Projection	Impact on Services	Demand Management Plan
of 90km/h or greater) including tornadoes, microbursts, etc.	are dispatched to patrol, monitor, and correct damages affecting road service.	area from Windsor to east of Toronto by about 17% by the 2050s compared to the historical period 1994-2007.	tree's, noise walls, fences and signs to be damaged and an increase in litter clean-up following the events. Service disruption may occur should a tree or branch fall and block the roadway or power lines.	fences, noise walls and sign-mounting systems.
More frequent, extreme-heat days (over 30 degrees Celsius).	Extreme-heat days will trigger failures in our infrastructure like the buckling of roads, curbs and sidewalks. Work crews are dispatched to make the area safe and to remove any loose debris. Temporary repairs are made followed by the scheduling of permanent repairs.	As the overall temperature locally increases due to climate change, it is expected with confidence that the frequency and intensity of extreme temperature events will also increase.	Increase in risk to users of roads and sidewalks. Increase in demand maintenance required.	Investigate opportunities to improve designs and materials used for pavement and concrete. Monitor changes in extreme-heat day events and adjust maintenance, operating programs and budget accordingly.

Risk Management

Asset-Specific Risk Methodology

Asset-specific risks are determined by assessing the asset's 'consequence of failure' (CoF) and 'likelihood of failure' (LoF). While the loss of some assets or components may have little impact on service delivery and negligible risk of damage or injury, the loss of other assets such as roads and bridges can severely impact public services and may lead to private property damages or even fatalities. The criticality of an asset is therefore linked to the inherent consequence of the loss of its function, including related impacts on the function of a system or network of assets.

For the purposes of this asset management plan, the overall condition of an asset is used as a proxy for determining risk; in particular, its likelihood of failure. In subsequent updates to this asset management plan, a formal risk assessment tool will be developed to inform decision-making and prioritization for a variety of asset classes and their components.

Road Pavement Risk

The Roads Service Area addresses risk information related to road pavement in a number of ways, including:

- Professional judgement is used in decision-making throughout all lifecycle activities and takes into consideration aspects of criticality, such as disruption to users, public safety, financial impact, environmental impact, and reputation to the organization
- Road pavements are regularly inspected in accordance with Provincial Minimum Maintenance Standards (MMS) and critical defects are addressed in accordance with prescribed treatments and timelines
- Road pavement condition surveys are performed every four years to monitor the overall pavement performance. Information from the condition survey is fed into the City's Road Pavement Management System (RPMS) to produce both capital and maintenance plans, as well as to determine if a funding gap exists
- Traffic volume data and road classification are entered into the RPMS, along with pavement condition, to inform the priorities for road renewal
- Pavement sections with higher Cost Effectiveness (CE) get higher on the ranking for treatment selection, as addressing these sections at the optimal time will minimize rehabilitation costs and maximize the useful life of the asset
- The City's capital prioritization methodology includes an assessment of each project's importance by taking into consideration the risks

associated with not undertaking the project, should funding not be approved

Risk Frameworks

Staff are developing a formal risk model for various asset classes within the Roads Service area. A high-level example of it is shown in Figure 4. This analysis looks at a high-level risk and does not dive deeper into individual-component risk within each asset class.

Currently, the risk assessment is limited to just the risk framework for a few assets. In the future, a risk framework and analysis will be completed for each asset class and compared across asset classes within the Roads Service Area.

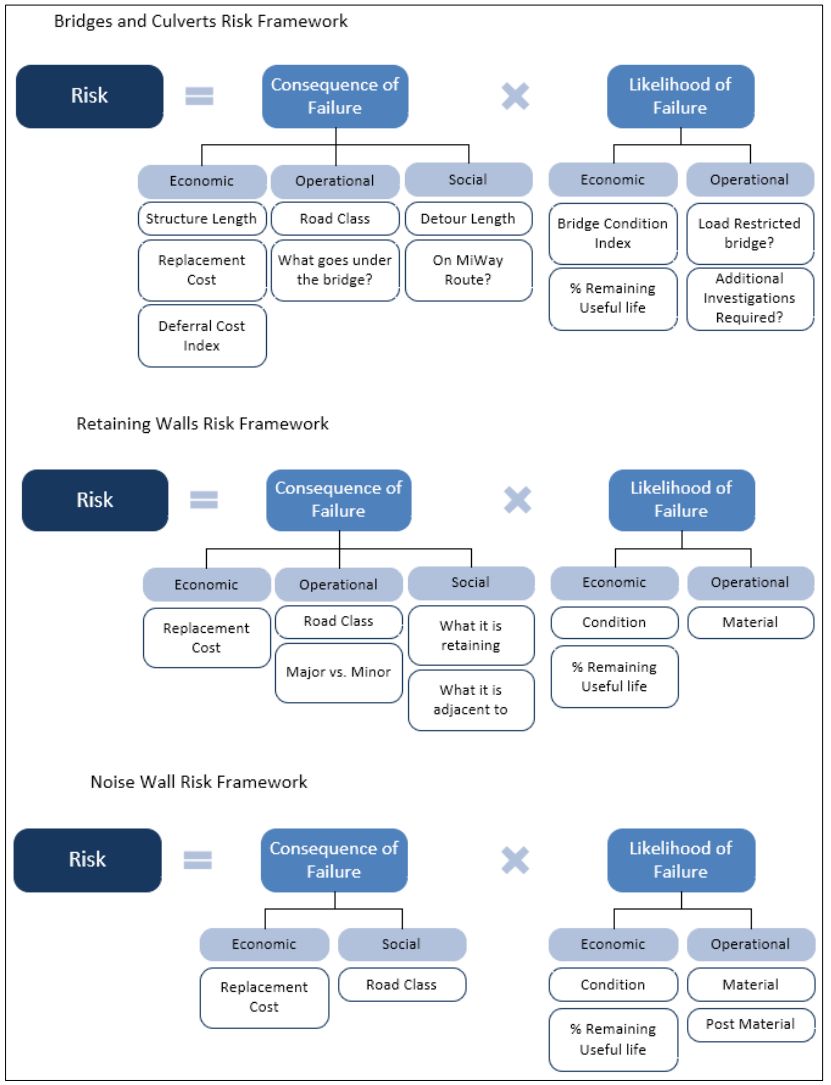


Figure 4: Risk Model for Various Asset Types

Lifecycle Management

Lifecycle Strategies

Road Pavement – Current and Proposed Lifecycle Activities

Current and Proposed Lifecycle Activities	Risks associated with Lifecycle Activities
Non-Asset Solutions: Activities that do not alter the condition or performance of assets or services but provide staff with valuable information for their effective management.	
• New pavement moratorium practice • Implementing action items of Transportation Master Plan (TMP) and Cycling Master Plan (CMP) • Implementing the road-network improvement priorities developed in the Development Charges Transportation Background Study (DCTBS) **Proposed** • Update road degradation fees • Update Enhanced Restoration Guidelines for Hard Surface Utility Cuts by utility agencies	• The pavement moratorium process is utilized to prevent Public Utility Agencies (PUAs) from damaging new pavements during the first five years of the pavement's life • The TMP, CMP, and DCTBS are used to plan for growth-related projects and transportation projects that align with the City's strategic goals and objectives
Operations & Maintenance: Minor activities that preserve the condition or performance of assets and ensures the longevity of assets in line with their design and operational requirements.	
• Pavement Condition Survey • Coordinate construction and renewal activities with Public Utility Agencies (PUA) and other levels of government • Road Patrols	• A pavement condition survey is completed every four years to monitor and report on the overall performance of road pavement over time. The helps make maintenance and capital planning decisions, thereby minimizing hidden or unexpected failures • Coordinating construction activities with PUA members allows stakeholders to identify scheduling conflicts as well as opportunities to partner with agencies to reduce

Current and Proposed Lifecycle Activities	Risks associated with Lifecycle Activities
• Minimum maintenance standards inspections including routine patrols, winter-weather monitoring, sidewalk inspection and sign testing • Road sweeping • Debris, waste removal and spills response • Leaf collection • Graffiti removal • Winter operations including anti-icing, salting, plowing and snow removal • Road Occupancy Permit administration • Warranty inspections on works performed by contractors and others • Crack sealing • Pothole or asphalt patching • Roadway pavement and curb repairs • Utility restorations • Pavement marking re-application **Proposed** • Explore additional pavement treatments through trials	cutting into pavement and reducing its expected service life • Maintenance inspections include routine road patrols which are in place to identify and respond to hazards within the roadway, and winter weather patrols to ensure winter conditions are documented and adequately responded to • Minimum maintenance standard inspections are in place to ensure that the roadway is reviewed on a regular cycle and to identify and manage risks • Routine roadway sweeping and debris and waste removal activities at regular intervals prevent storm drains from being blocked, protect the natural environment, and maintain an acceptable aesthetic appearance. Spills response ensures that spilled chemicals and other substances are removed from roadway assets, minimizing damage/safety concerns • Leaf collection is completed in mature parts of the City and assists in keeping catch basins clear as well as removing leaves from the roadway that can be a safety issue • Graffiti removal in a timely manner maintains acceptable appearance of roadway/structure assets • Having a winter operating plan and activities allows the City to keep roads safe and passable over the winter season in line with MMS and Council-approved levels of service • Road Occupancy Permit administration allows the City to ensure activities within the right-of-way are conducted in compliance with City requirements and to ensure that City assets are adequately protected or restored if damaged

Current and Proposed Lifecycle Activities	Risks associated with Lifecycle Activities
	• Crack sealing prevents water from getting into the road base, leading to asset failure, especially during freeze-thaw cycles. This practice, when applied properly, will ensure the expected pavement life is achieved • Timely road and curb repairs can extend the useful life of the roadway asset • Part of the Road Occupancy Permit administration process includes undertaking permanent hard-surface restorations. This ensures oversight over restorations to keep assets in best possible condition • Pavement markings require re-application annually to ensure visibility to roadway users
Renewal/Rehabilitation: Significant activities designed to extend the useful life of assets components.	
• Roadway Rehabilitation Program (includes the renewal of pavement, curbs, boulevards, sidewalks and multi-use trails) • Milling and paving of large sections of pavement up to 90 mm in depth • Cold-in-place recycling for arterial and major collector roads	• Failing to renew roadway pavements in a timely manner can put users at risk of injury, can lead to premature asset failure and loss of use of the asset and increase deferral cost for the reconstruction of the roadway asset at a later date • The use of cold in-place recycling can restore old pavement to the desired profile, eliminate existing wheel ruts, restore the crown and cross slope, and eliminate pothole, irregularities and rough areas. It can also eliminate transverse, reflective, and longitudinal cracks

Current and Proposed Lifecycle Activities	Risks associated with Lifecycle Activities
Replacement: Replacement activities occur once an asset reaches the end of its useful life, cannot provide the intended function or performance, and rehabilitation is not a viable option.	
• Full reconstruction of a roadway (includes the installation of new drainage systems, curbs, boulevard treatments, trails and sidewalk infrastructure)	• Failing to replace the pavement structure in a timely manner can lead to premature asset failure, loss of use of the asset and can put users at risk of vehicle damage
Disposal/ Demolition: Activities associated with the disposal or decommissioning of an asset.	
• Stop-up and close the road, declare the right of way land as surplus, and sell the parcel of land	• Declaring unused road parcels as excess land can allow the City to reduce its liability exposure and generate revenue to support other priorities
Acquisition/Expansion/Rebuild: These activities expand services to previously non-serviced areas or to accommodate growth; they provide new or enhanced services beyond the current capacity and/or functionality of existing assets.	
• New Road Construction • Roadway realignment • Road widenings (may be done in conjunction with a renewal activity) • Complete Streets retrofit (allocating space for additional modes of travel and/or assets or amenities) • Roadway feasibility studies, Environmental Assessments, and design works	• Timely implementation of new road construction allows the City to manage growth related demands on the road network • Roadway realignments are required to improve safety or operational issues • Road widening activities are required to improve service capacity and alleviate congestion • Undertaking a variety of transportation studies enables the City to thoroughly assess the needs of the road network at every level and determine service improvements requirements

Typical Road Pavement Lifecycle Model

For illustration purposes, a typical lifecycle model for the management of road pavements is provided in Figure 5 below.

Operations & Maintenance activities typically occur throughout the life of the asset. They ensure that the asset is functioning as intended and is safe for users.

Early Life Interventions like crack sealing, minor repairs and minor resurfacing over a localized area or small section of pavement are some of the treatment options considered when an asset is in the first quarter of its life.

Mid-Life Intervention activities are considered when an asset is in the second or third quarter of its life. For road pavement assets, these interventions would include larger section resurfacing, full roadway rehabilitation and cold, in-place recycling rehabilitation.

Later Life Intervention activities are considered when an asset is approaching or at the end of its lifespan. For road pavements, this includes road reconstruction, decommissioning or removing the stretch of roadway that no longer is required, or upgrading the asset to include additional service or service capacity.

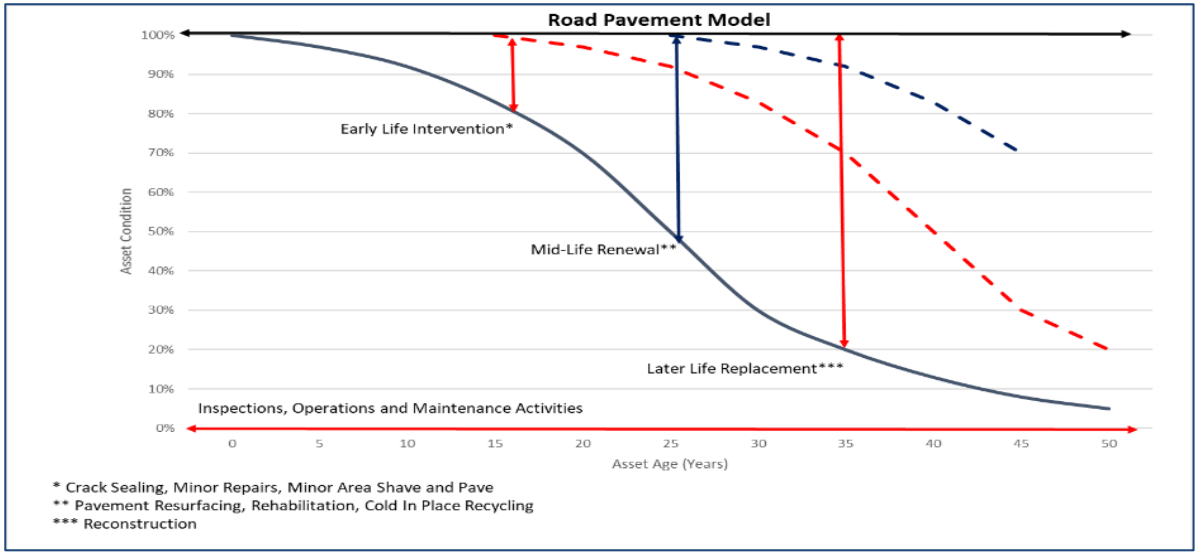


Figure 5: Typical Road Pavement Lifecycle Model

Structures– Current and Proposed Lifecycle Activities

Current and Proposed Lifecycle Activities	Risks associated with Lifecycle Activities
Non-Asset Solutions: Activities that do not alter the condition or performance of assets or services but provide staff with valuable information for their effective management.	
• Implementing action items resulting from the Transportation Master Plan (TMP), Cycling Master Plan (CMP), and Pedestrian Master Plan (PMP) • Implementing the road network improvement priorities developed in the Development Charges Transportation Background Study (DCTBS)	• The TMP, CMP, PMP, and DCTBS are used to plan for transportation infrastructure improvement projects that align with the City's strategic goals and objectives
Operations & Maintenance: Minor activities that preserve the condition or performance of assets and ensures the longevity of assets in line with their design and operational requirements.	
• Bridge and culvert (OSIM) inspections every two years (OSIM = Ontario Structure Inspection Manual) • Major retaining wall (OSIM) inspections every two years and staff inspections of minor retaining walls every four years • The bridge, culvert and retaining wall power washing and graffiti removal program • Bridge and culvert snow removal and clearing • Repair bridge, culvert, and retaining wall components (sidewalks, retaining walls, handrails, fences and guiderails) identified from biennial and staff-led inspections • Reactive/demand maintenance identified by City staff or members of the public	• Biennial bridge, culvert and major retaining wall inspections are completed every two years to identify and prioritize maintenance works and to comply with provincial regulations • Bridge-structure power washing removes debris, de-icing chemicals and chlorides from bridge structure components to keep the structures clean, operating properly and extends the life of the structures • Snow removal from bridge and culvert structures allows pedestrians and drivers to cross bridges safely throughout the year • Completing minor repairs of bridge and culverts ensure they are in satisfactory condition, including safety devices such as guide rails, barrier walls and speed attenuators

Current and Proposed Lifecycle Activities	Risks associated with Lifecycle Activities
	• Failing to repair components of a bridge, culvert, or retaining wall may put users at risk of injury • Failing to repair components can lead to premature asset failure and loss of use of the asset • Failing to repair components can lead to an increased cost of renewal of the structure at a later date
Renewal/Rehabilitation: Significant activities designed to extend the useful life of assets components.	
• The Bridge, Culvert and Retaining Wall Renewal Program is based on the structure's age, condition and deferral cost and the results of the condition survey • Replacing pressure-treated lumber on AT bridge deck surfaces with more slip-resistant materials	• Failing to address potential issues with deck surface materials may put users at risk of injury • Failing to renew structures in a timely manner can put users at risk of injury • Failing to renew structures in a timely manner can lead to premature asset failure and loss of use of the asset • Failing to renew structures can lead to the increased deferral cost of renewal of the structure at a later date or lead to a premature need for the structure to be • replaced
Replacement: Replacement activities occur once an asset reaches the end of its useful life, cannot provide the intended function or performance, and rehabilitation is not a viable option.	
• The Bridge, Culvert and Retaining Wall Renewal Program is based on the structure's age, condition and hydraulic capacity and the results of the condition survey • Replacing coated steel Active Transportation Structures with galvanized steel structures	• Failing to replace structures in a timely manner can lead to premature asset failure, loss of use of the asset and puts users at risk of injury • Failing to revise construction materials used in certain applications, such as coated steel on structures that are

Current and Proposed Lifecycle Activities	Risks associated with Lifecycle Activities
	regular salted as part of winter maintenance activities, can lead to premature end of structure life
Disposal/ Demolition: Activities associated with the disposal or decommissioning of an asset.	
• Demolition and disposal of structures completed as part of construction • Closing a structure that is identified by an inspection as being no longer fit for use • Re-grading to allow for removal of retaining walls	• Structures that no longer meet load or capacity requirements can fail and lead to loss of use and puts users at risk
Acquisition/Expansion/Rebuild: These activities expand services to previously non-serviced areas or to accommodate growth; they provide new or enhanced services beyond the current capacity and/or functionality of existing assets.	
• Installation of a new bridge or culvert where none previously existed • Bridge and culvert widenings associated with a road widening or flood mitigation project • Installation of grade separations • Newly constructed or newly found retaining walls • New Active Transportation structures and Active Transportation improvements to existing structures	• Timely implementation of a new structure allows the City to manage the growth-related demands on the road network • Missing opportunities to expand structures to include active transportation improvements can lead to reduced access for and uptake of cycling and pedestrian modes of travel • The installation of grade separation can alleviate congestion at rail crossing locations. • Incorrect growth assessments may result in over or under-utilized asset capacity

Typical Bridges & Culvert Structures Lifecycle Model

For illustration purposes, a typical lifecycle model for the management of bridge and culvert structures is provided in Figure 6 below. This is an average representation and does not necessarily illustrate the differences between the various structure types in the City's inventory.

Operations & Maintenance activities typically occur throughout the life of the asset. They ensure that the asset is functioning as intended and is safe for users. These activities include biennial inspections, annual power-washing of critical components, and minor repairs such as broken or loose concrete removals and crack sealing. Maintenance activities on AT structures may also include wooden deck repairs.

Early-Life Intervention activities typically involve structure rehabilitation. Concrete deck patching, waterproofing and paving, corrosion protection, joint repairs, concrete sidewalk, abutment, parapet wall and soffit repairs are some of the treatment options that may be considered when a structure is in the first quarter of its life.

Mid-Life Intervention activities typically involve a second rehabilitation. Treatments that may be considered when an asset is in the second or third quarter of its life include deck overlay, joint replacement, bearing replacement, sidewalk and parapet wall replacement and concrete patching.

Later-Life Intervention activities are considered when an asset is approaching, or at the end of its lifespan. For road structures, this includes bridge replacement, decommissioning or removal of the structure and upgrading the asset to include additional service or service capacity for vehicle travel and/or active transportation.

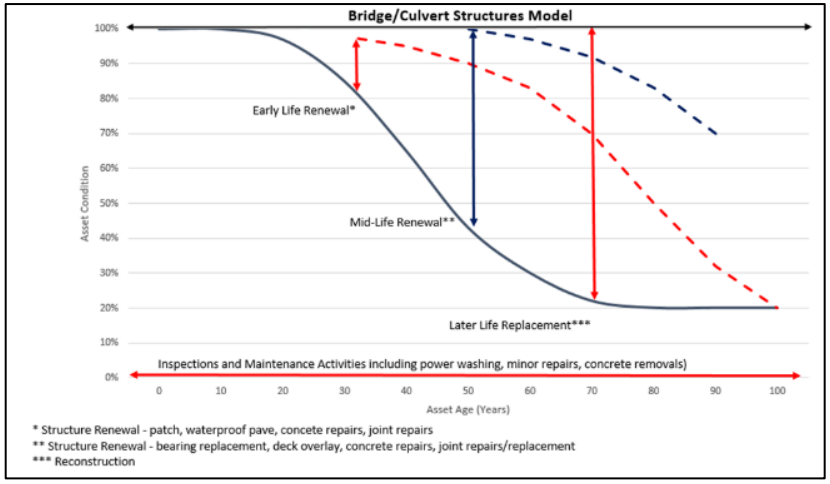


Figure 6: Typical Bridge Lifecycle Model

Roadside Trail Network– Current and Proposed Lifecycle Activities

Current and Proposed Lifecycle Activities	Risks associated with Lifecycle Activities
Non-Asset Solutions: Activities that do not alter the condition or performance of assets or services but provide staff with valuable information for their effective management.	
• Accessibility of Ontarians with Disabilities Act (AODA) compliance • Implementation of Vision Zero Action Plan **Proposed** • Implementing a centralized Roadside Trail inventory system • Implementing connectivity identified in the Cycling Master Plan • Implementing the Trail Network improvement priorities developed in the Development Charges Study. Road Pavement Management System (RPMS) for multi-use trails	• Guiding principles within AODA are followed to meet technical design requirements • Vision Zero principles are considered to plan projects in order to eliminate fatalities and serious injuries in our Roadside Trail Network system • The Cycling Master Plan, Development Charges Transportation Background Study, and Transit and Road Infrastructure plan are used to plan for growth- related projects and transportation projects that align with the City's strategic goals and objectives
Operations & Maintenance: Minor activities that preserve the condition or performance of assets and ensures the longevity of assets in line with their design and operational requirements.	
• Implement future Roadside Trail Network Condition Surveys for all asset types • Annual Sidewalk Inspection program as part of Minimum Maintenance Standards requirements • Winter operations including anti-icing, salting, plowing and snow removal • Implement Crack Sealing program for roadside trails for multi-use trail assets • Roadside trail replacement	• Multi-Use trail assets are surveyed every 4 years to monitor and report on the overall performance over time. The information is used to make maintenance and capital planning decisions. In addition to annual inspection, other asset types will be surveyed/added to the survey routine • Minimum Maintenance Standard Inspections are in place to ensure that sidewalks are reviewed on a regular cycle and to identify and manage risks • Having a winter operating plan and activities allows the City to keep roadside trails safe and passable

Current and Proposed Lifecycle Activities	Risks associated with Lifecycle Activities
	over the winter season in line with MMS and Council-approved levels of service • Crack sealing prevents water from getting into the base, leading to asset failure, especially during freeze-thaw cycles. This practice, when applied properly, will ensure the expected life is achieved • Deficient sidewalks identified during inspection or through complaints, such as tripping hazards and poor drainage, can be corrected by jacking or grinding or via replacement of cracked or damaged bays • Part of the Road Occupancy Permit Administration process includes undertaking permanent hard-surface restorations. This ensures oversight over restorations to keep assets in best possible condition
Renewal/Rehabilitation: Significant activities designed to extend the useful life of assets components.	
• Roadside trail jacking and/or grinding • Utility restorations on roadside trails	• Failing to renew roadside trails in a timely manner can put pedestrian and cyclists at risk of injury, lead to premature asset failure and loss of use of the asset, and increase deferral cost for the reconstruction at a later date
Replacement: Replacement activities occur once an asset reaches the end of its useful life, cannot provide the intended function or performance, and rehabilitation is not a viable option.	
• Implementing a Roadside Trail Rehabilitation program • Milling and paving the top surface of Multi-use trails • Replacement of bike racks	• Failing to replace the roadside trail structure in a timely manner can lead to premature asset failure, loss of use of the asset and can put pedestrians and cyclists at risk

Current and Proposed Lifecycle Activities	Risks associated with Lifecycle Activities
Disposal/ Demolition: Activities associated with the disposal or decommissioning of an asset.	
• Full reconstruction of a roadside trail including sub-base & sub-grades, installation of new drainage systems, curbs, fences and boulevard treatments. • Roadside trail replacement as part of a major infrastructure project	• Roadside trail asset will be demolished or disposed of as a result of a new major infrastructure project
Acquisition/Expansion/Rebuild: These activities expand services to previously non-serviced areas or to accommodate growth; they provide new or enhanced services beyond the current capacity and/or functionality of existing assets.	
• Roadside trail disposal as part of a major infrastructure projects • Roadside trail construction to complete network connection identified in the City's Cycling Master Plan • Part of the major infrastructure project such as Enhanced/Integrated Projects • New bike racks are installed as part of roads projects, Active Transportation initiatives, and MiWay projects	• Implementation of new roadside trail improves network connectivity and manages growth demands on trail network • Roadside trail constructions are required to improve safety, operational issues and network connectivity • Timely implementation of Enhanced or Integrated projects will help support roadside trail needs and Vision Zero initiatives for maintaining safety and accessibility

Street Lighting – Current and Proposed Lifecycle Activities

Current and Proposed Lifecycle Activities	Risks associated with Lifecycle Activities
Non-Asset Solutions: Activities that do not alter the condition or performance of assets or services but provide staff with valuable information for their effective management.	
• Master Plan – Vison Zero • City must adopt new policies to address lighting levels on new and existing infrastructure	N/A
Operations & Maintenance: Minor activities that preserve the condition or performance of assets and ensures the longevity of assets in line with their design and operational requirements.	
Operations: • Currently Alectra Power Services (APS) is responsible to respond 24/7 to all emergency requests • Potential planned action - City staff are available to respond and attend to customer requests 24/7. On-call coverage to address programming issues • Energy consumption Proposed: • Establish an inspection program Maintenance: • Scheduled preventative maintenance • Hydro Rebuilds – Relocating luminaires as Alectra Utilities replaces/relocates poles • Currently remediating entire street-lighting network to ensure system is working efficiently and effectively • Scheduled inspections done on as-needed basis • Looking to formalize an inspection program to regularly review poles • Warranty on luminaires -10 years, Warranty on nodes – 5 years	Operations: • Enough resources are required to complete a series of unplanned, urgent work requests that are submitted in close succession Maintenance: • Completing planned maintenance activities while managing reactive maintenance activities creates challenges • Premature asset failure may occur due to incorrectly planned maintenance activities • Increasing the mesh network and number of devices will require additional maintenance resources • A potential hazard exists when the City becomes aware that an area is not up to standard in terms of street lighting requirements and needs to

Current and Proposed Lifecycle Activities	Risks associated with Lifecycle Activities
• Warranty will cover replacement of nodes and luminaires if malfunctioning	react in a timely manner
Renewal/Rehabilitation: Significant activities designed to extend the useful life of assets components.	
N/A	N/A
Replacement: Replacement activities occur once an asset reaches the end of its useful life, cannot provide the intended function or performance, and rehabilitation is not a viable option.	
• Use of modelling software by adopting the latest technology that maintains current levels of service (i.e., AGI Software) • Replacement of poles at the end of their useful life (e.g., Erindale Style pole) with standard 32.5 ft concrete pole • Replacement of luminaires at the end of their useful life • Replacement of non-LED light to LEDs Proposed: • Establish a replacement program at a set frequency	• Replacing non-LED with LED lights leads to cost savings and lower maintenance • Failing to replace luminaires at the end of their useful life can lead to issues with illumination
Disposal/ Demolition: Activities associated with the disposal or decommissioning of an asset.	
• Dispose of assets under regulation or bylaw if asset is no longer functional • Warranty items allow us to return to the vendor and reuse	• Being in non-compliance with legislative requirements and environmental best practices

Current and Proposed Lifecycle Activities	Risks associated with Lifecycle Activities
Acquisition/Expansion/Rebuild: These activities expand services to previously non-serviced areas or to accommodate growth; they provide new or enhanced services beyond the current capacity and/or functionality of existing assets.	
• Forecasting land use for residential/commercial construction or improvements • All City projects must be reviewed by Street Lighting to ensure required illumination levels are being achieved • Projects that accommodate pedestrian traffic, new signalized intersections, additional fixtures or new sidewalk installation must be reviewed to ensure lighting levels achieved (Vision Zero projects, multi-use trails, etc.) • Acquisition of new assets from development (LRT, Lakeview, Brightwater)	• With street light standards and requirements changing frequently, the cost for expansion and rebuild projects could increase significantly

Typical Street Lighting Lifecycle Model

Street lighting assets are typically replaced on an as-needed, reactive basis once they reach or surpass their estimated useful life or the assets fail. Currently, there is no lifecycle replacement model to proactively plan for the replacement of this aging infrastructure. This is a critical issue which leads to higher maintenance costs, puts added pressure on existing limited staff and resources, and places the City in serious legal risk should any incidents occur due to operational failures or failures resulting from shortfalls in timely asset replacements.

As part of the lifecycle replacement program, these assets need to be physically inspected to determine their condition and aid the street lighting team in their prioritization of assets for proactive replacement.

A proactive street lighting lifecycle replacement model would achieve the following:

- Improve reliability and sustainability of the street lighting network
- Minimize health and safety, legal, and economic risks on the City and its residents
- Prioritize asset replacements and rehabilitations based on sound physical condition data
- Assess the adequacy of maintenance and capital budgets
- Coordinate lifecycle intervention with other roadway assets
- Ensure full time dedicated resources are being fully utilized

Traffic Signals and Related Electrical Devices – Current and Proposed Lifecycle Activities

Current and Proposed Lifecycle Activities	Risks associated with Lifecycle Activities
Non-Asset Solutions: Activities that do not alter the condition or performance of assets or services but provide staff with valuable information for their effective management.	
• Implementing action items of Transportation Master Plan (TMP), Cycling Master Plan (CMP), Pedestrian Master Plan (PMP), Vision Zero Action Plan (VZAP) • Exploring the implementation /digitalization of an asset management inventory system • Developing and maintaining SOPs • Compliance with Minimum Maintenance Standards • Compliance with OTM Manuals, AODA, HTA, NEMA and ATC standards, ESA and CSA standards • iNet traffic management – used to manage traffic signal controller infrastructure, view real-time traffic signal information, upload/download traffic signal timings to traffic signal controllers, alert when specific intervention is required, and access historical information regarding the status and performance of the traffic signal controllers	• Increased risk to the City which includes liability (legal inquiries), safety hazards to the road users, negative public reputation • Developing and maintaining SOPs provide guidance to staff to avoid mismanagement of the traffic signal assets • Asset management inventory system would enhance the process of management of the traffic signal assets by improved time of reporting
Operations & Maintenance: Minor activities that preserve the condition or performance of assets and ensures the longevity of assets in line with their design and operational requirements.	

Current and Proposed Lifecycle Activities	Risks associated with Lifecycle Activities
• Electrical contractor available to respond 24/7 to all emergency requests • Inspectors and staff, and 311 call service are available to respond during normal business hours • Dispatch is available after business hours • Routine inspections and testing • Preventative maintenance activities — changing filters in controller cabinets, cleaning CCTV cameras, etc. • Emergency maintenance activities - replacing damaged signal poles, push buttons, failed LED modules or vehicle detectors • Connection to communication systems (IT, ATMS) — ensure connection to iNet Traffic Control System, CCTV cameras • Hydro maintenance activities performed by Alectra — Maintenance of Street Lighting luminaires on traffic signal poles and maintenance of traffic signal power supplies • Graffiti removal • Aboveground and underground infrastructure repair due to third-party damages (MVA, construction, etc.), outdoor elements, and unanticipated natural events	• All defective traffic signals and related electrical devices shall be repaired or replaced within the times specified in accordance with the Minimum Maintenance Standards for Municipal Highways • Failure to maintain traffic signals increases risk to the City which includes liability (legal inquires), safety hazards to the road users, and negative public reputation • Keeping communication operational is essential for troubleshooting of the traffic signal assets. The lack of communication can increase the road users' delay, safety hazard, and have a negative impact on environment • Losing power at signalized intersections creates a safety hazard to all roadway users • Graffiti removal in a timely manner maintains acceptable appearance of roadway/structure assets • Failure to maintain and assess the railway infrastructure with the owner near signalized intersections creates safety concerns and negative reputation
Renewal/Rehabilitation: Significant activities designed to extend the useful life of assets components.	
• LED Replacement Program (7-10 years) • Signal equipment accessories renewal (APS, countdowns, etc.) —Renewed when damaged, malfunctioning, or during intersection rebuild	• Failure to renew traffic signals increases the risk to the City which includes liability (legal inquires), safety hazards to the road users, and negative public reputation

Current and Proposed Lifecycle Activities	Risks associated with Lifecycle Activities
• LED modules and countdowns — renewed based on life cycle replacement (7-10 years as part of the capital budget) • New Sidewalk Program — moving signal pole and cabinet location based on conflicts with the aboveground infrastructure and new sidewalk installation	• Infrastructure depreciates quicker when not maintained or renewed and is prone to more failures (maintenance costs increase) and additional risk • Damages to traffic signal assets with these capital programs
Replacement: Replacement activities occur once an asset reaches the end of its useful life, cannot provide the intended function or performance, and rehabilitation is not a viable option.	
• Yearly Traffic Signal Modernization Program based on infrastructure age, condition and deferral cost • Yearly Traffic Cabinet Replacement Program • Emergency Vehicle Pre-Emption System Replacement Program • Roadway Rehabilitation Program — replacement of damaged loops once work is completed	• Risks of not replacing infrastructure can lead to catastrophic failures, standards and specifications not up to date with current practice, increased maintenance costs, safety to public and negative reputation
Disposal/ Demolition: Activities associated with the disposal or decommissioning of an asset.	
• Demolition and disposal of entire traffic signal plant completed as part of construction and maintenance activities in an environmentally friendly manner • Traffic signal inventory items disposed by City	• Improper disposal can lead to adverse affects to the environment and can pose a risk for reuse of obsolete equipment by others (i.e., safety to public)
Acquisition/Expansion/Rebuild: These activities expand services to previously non-serviced areas or to accommodate growth; they provide new or enhanced services beyond the current capacity and/or functionality of existing assets.	

Current and Proposed Lifecycle Activities	Risks associated with Lifecycle Activities
• New traffic signals are installed when warranted as part of: ○ New road construction, roadway realignment, or road widening (may be done in conjunction with a renewal activity) ○ New developments ○ MUT expansion (bicycle signals), PXOs, etc. ○ Upgrades to existing signals, expansion to existing assets Proposed • Equip intersections with Accessible Pedestrian Signals (APS)	• Overall maintenance budget increase • increase of supply and demand to repair equipment • Increase of inventory and staff workload • If traffic device in not implemented based on guidelines, this may increase and risk liability to the City, and public safety to all road users

Roadside Infrastructure (Noise Walls and Vehicle Safety Barriers) – Current and Proposed Lifecycle Activities

Current and Proposed Lifecycle Activities	Risks associated with Lifecycle Activities
Non-Asset Solutions: Activities that do not alter the condition or performance of assets or services but provide staff with valuable information for their effective management.	
• Facilitating training courses and fostering cultural change • Managing and forecasting the demand services within the City	• Plan/Reports/Recommendations • Asset life is not extended or cost of managing asset increases
Operations & Maintenance: Minor activities that preserve the condition or performance of assets and ensures the longevity of assets in line with their design and operational requirements.	
• Biennial inspection of City noise walls • Inspection of Vehicle Safety Barriers (VSB) • Graffiti removal • Triggered by customer requests and biennial condition assessments • Fix broken posts, panels, or rails • Replace damaged panels and rails	• Biennial inspections of City-owned noise walls drive the capital budget and planning process • Completing planned maintenance activities extends the service life of the assets, and ensures appropriate noise attenuation levels are met
Renewal/Rehabilitation: Significant activities designed to extend the useful life of assets components.	
• Renewal of noise walls and VSB is not typically done. Work is done through maintenance or replacements	• N/A
Replacement: Replacement activities occur once an asset reaches the end of its useful life, cannot provide the intended function or performance, and rehabilitation is not a viable option.	

Current and Proposed Lifecycle Activities	Risks associated with Lifecycle Activities
• Replacement is based on biennial condition assessment, and typically occurs at the end of the asset's useful life • At the moment, the City is not replacing any City-owned noise walls as most are in good condition and do not require replacement	• Once noise walls have reached the end of their useful life, their condition will deteriorate, and the walls may be prone to failure
Disposal/ Demolition: Activities associated with the disposal or decommissioning of an asset	
• The City typically does not currently dispose or demolish noise walls or VSB	• N/A
Acquisition/Expansion/Rebuild: These activities expand services to previously non-serviced areas or to accommodate growth; they provide new or enhanced services beyond the current capacity and/or functionality of existing assets	

• Acquisition of new assets through various programs:
  ○ Noise wall program — Retrofit (Private fence to City noise wall)
  ○ Noise wall program — Replacement (Private noise wall to City noise wall), prioritized based on biennial inspections
  ○ New subdivision developments or transit-related projects
  ○ Prioritized based on coordination with road improvement projects, followed by the condition of existing infrastructure (fences or privately owned noise walls that qualify for replacement under the City's noise policy)
	• Without the retrofit of fences to noise walls, or the installation of new noise walls, OLA noise levels may increase above the desired 60 dBA threshold as per the City's noise attenuation barrier policy
	• The replacement program allows for noise walls originally built on private property to be re-built on City property. The City is slowly taking ownership of all noise walls along major collector and arterial roadways, to reduce the impact of the City's roadway noise

Roadside Infrastructure (Signs and Posts)– Current and Proposed Lifecycle Activities

Current and Proposed Lifecycle Activities	Risks associated with Lifecycle Activities
Non-Asset Solutions: Activities that do not alter the condition or performance of assets or services but provide staff with valuable information for their effective management.	
• Preparation of Standard drawings • Preparation of Internal SOPs for: sign fabrication, sign installation, support installation, maintenance	• Guidelines and manuals provide consistency throughout the City and Ontario
Operations & Maintenance: Minor activities that preserve the condition or performance of assets and ensures the longevity of assets in line with their design and operational requirements.	
• Annual visual inspection of signs and support • Annual retro-reflectivity testing (beginning in 2024) • Sign fabrication on request • Re-affix/adjust loose signs • Graffiti/sticker removal • Temporary sign installation when required	• Damaged road signs can create a hazard for roadway users • Inspection identifies deficiencies, maintenance reduces deficiencies. Signs in poor condition could lead to collisions • Increased risk to the City, condition of signs can be challenged in the event of a collision • Maintenance activities help meet minimum maintenance standards • Snow build up on signs
Renewal/Rehabilitation: Significant activities designed to extend the useful life of assets components.	
• N/A	• N/A
Replacement: Replacement activities occur once an asset reaches the end of its useful life, cannot provide the intended function or performance, and rehabilitation is not a viable option.	

Current and Proposed Lifecycle Activities	Risks associated with Lifecycle Activities
• Replacement of signs as identified during annual inspections • Replacement currently based on warranty. In the future, this will be based on retro-reflectivity results, prioritizing regulatory signs • Replace posts when damaged, leaning, or in poor condition • If signs fade or fail retro-reflectivity within warranty period, sign contractor will replace • During replacement: • Aluminum from signs is recycled or re-sheeted with a new image • Non-salvageable signs are recycled • 14 ft. posts are cut down to 6 ft. and re-used as island markers • Damaged posts are recycled	• Replacement keeps signs in good condition to meet the requirements of the Traffic Act and OTM Guidelines • Replacement keeps signs in a condition so that they are enforceable
Disposal/ Demolition: Activities associated with the disposal or decommissioning of an asset.	
• Removal or decommissioning of signs determined by Traffic Operations • Transferring signs to existing traffic control or street light poles, in order to remove signpost	• When a sign is damaged, removing signs and posts from site ensure the area is clear of hazards • Re-using signs and posts leads to cost savings and environmental benefits
Acquisition/Expansion/Rebuild: These activities expand services to previously non-serviced areas or to accommodate growth; they provide new or enhanced services beyond the current capacity and/or functionality of existing assets.	

Current and Proposed Lifecycle Activities	Risks associated with Lifecycle Activities
• Fabrication and installation of new signs at the discretion of Traffic Operations — no parking signs, speed limit reductions, new initiatives (slow street, etc.)	• Failure to fabricate and install signs would fall short of service provider expectations. Traffic Operations would be unable to complete new initiatives

Municipal Parking – Current and Proposed Lifecycle Activities

Current and Proposed Lifecycle Activities	Risks associated with Lifecycle Activities
Non-Asset Solutions: Activities that do not alter the condition or performance of assets or services but provide staff with valuable information for their effective management.	
• Parking Master Plan, approved by Council in 2019 • PM2 study to review the parking permit program, the parking fee structure, and deliver a strategy to implement new technologies to manage and deliver parking programs • Current build design guidelines to construct Municipal parking lots	
Operations & Maintenance: Minor activities that preserve the condition or performance of assets and ensures the longevity of assets in line with their design and operational requirements.	
• Regular parking lot inspection to calculate cost and expected date for improvement (if required) • Graffiti removal from parking machines • Machine errors are flagged within the parking management system, maintenance staff are alerted and respond to the error accordingly (reset proponent or replace part)	• Regular lot inspections • Ensure compliance with all safety • Helps with forecasting of future expenses for lot maintenance and repair • Mitigates any lot hazards which could lead to future problems, lawsuits, resident complaints
Renewal/Rehabilitation: Significant activities designed to extend the useful life of assets components.	

Current and Proposed Lifecycle Activities	Risks associated with Lifecycle Activities
• Parking lot resurfacing or rehabilitation including concrete work, shave-and-replace asphalt, adjust catch basins, and line painting • Parking machine refurbishment, including replacement of various components, typically occurs every 5 years Proposed • As parking lots are renewed, ensure lots meet current accessibility requirements	• Lot resurfacing or rehabilitation costs are higher than forecasted due to changes in material costs • Anticipated completion timelines may be subject to longer periods due to material availability issues
Replacement: Replacement activities occur once an asset reaches the end of its useful life, cannot provide the intended function or performance, and rehabilitation is not a viable option.	
• Parking machine replacement typically occurs after the third refurbishment cycle, in the event of technology upgrade, or if machine is damaged to the extent, it cannot be repaired	• Supply chain shortages can make it difficult to meet the required number of machines during the roll-out process
Disposal/ Demolition: Activities associated with the disposal or decommissioning of an asset.	
• N/A	• N/A
Acquisition/Expansion/Rebuild: These activities expand services to previously non-serviced areas or to accommodate growth; they provide new or enhanced services beyond the current capacity and/or functionality of existing assets.	
• Expansion of paid parking areas across the City as per the PMPIS and the Parking Demand Forecasting Study	• Not being able to acquire land to meet the projected parking demand

Operational Equipment– Current and Proposed Lifecycle Activities

Current and Proposed Lifecycle Activities	Risks associated with Lifecycle Activities
Non-Asset Solutions: Activities that do not alter the condition or performance of assets or services but provide staff with valuable information for their effective management.	
• Update to Yard Master Plan	
Operations & Maintenance: Minor activities that preserve the condition or performance of assets and ensures the longevity of assets in line with their design and operational requirements.	
• Brine systems are inspected annually at the beginning of the season (Sept/Oct), and pumps are tested • Continual system checks throughout the year • Conduct regular inspections of salt domes and complete any necessary repairs	• System checks ensure no leaking, nothing is seized, and that everything is working smoothly
Renewal/Rehabilitation: Significant activities designed to extend the useful life of assets components.	
• Parts are replaced on Brine systems as needed	
Replacement: Replacement activities occur once an asset reaches the end of its useful life, cannot provide the intended function or performance, and rehabilitation is not a viable option.	
• Replacement of surveying equipment occurs at the end of useful life • Replacement of Domes at the end of their useful life, as identified in the Yard Master Plan	• Failure of domes and brine tanks have significant impacts on winter operations and our liability to perform operations meeting required legislations
Disposal/ Demolition: Activities associated with the disposal or decommissioning of an asset.	
• Disposal of equipment occurs at the end of lifecycle when equipment is no longer operational	N/A

Current and Proposed Lifecycle Activities	Risks associated with Lifecycle Activities
Acquisition/Expansion/Rebuild: These activities expand services to previously non-serviced areas or to accommodate growth; they provide new or enhanced services beyond the current capacity and/or functionality of existing assets.	
• Will expand into new facilities as indicated in the Yard Master Plan	N/A

ITS (CCTV Cameras) – Current and Proposed Lifecycle Activities

Current and Proposed Lifecycle Activities	Risks associated with Lifecycle Activities
Non-Asset Solutions: Activities that do not alter the condition or performance of assets or services but provide staff with valuable information for their effective management.	
• Implementing action items from the Transportation Master Plan (TMP), Vision Zero Action Plan, Avigilon Control Centre • Exploring the implementation/digitalization of an asset management inventory system • Developing and maintaining SOPs • CCTV Traffic Monitoring Cameras Within Municipal Road Allowance Policy	• The TMP and Vision Zero Action Plan are used to plan for growth-related projects and transportation projects that align with the City's strategic goals and objectives • Cost of managing an asset increases rather than decreases
Operations & Maintenance: Minor activities that preserve the condition or performance of assets and ensures the longevity of assets in line with their design and operational requirements.	
• City Maintenance contractor is available to respond during normal business hours to replace broken cameras, repair connection issue, etc. • City of Mississauga staff available to respond during normal business hours, to troubleshoot with the contractor • City's Security Services and vendor are available during the normal business hours, to perform camera programming, and ensure CCTV cameras are viewable on Aviglion • Yearly inspections performed by contractors and others	• Ensures enough resources available to complete work requests that are submitted • Annual inspections are in place to identify, document and correct any defects to ensure normal operating conditions • Timely repairs can extend the useful life of the asset • Inspections help with forecasting future expenses for maintenance and repair, while completing planned maintenance activities and managing reactive maintenance activities • Incorrect assumptions regarding expected useful life of asset • Higher costs due to changes in material costs

Current and Proposed Lifecycle Activities	Risks associated with Lifecycle Activities
• CCTV cameras are replaced as a result of damages caused by motor vehicle collisions, construction, outdoor elements and unanticipated natural events	• Anticipated delivery date may be subject to longer periods due to material availability issues
Renewal/Rehabilitation: Significant activities designed to extend the useful life of assets components.	
• N/A	• N/A
Replacement: Replacement activities occur once an asset reaches the end of its useful life, cannot provide the intended function or performance, and rehabilitation is not a viable option.	
• CCTV cameras are replaced based on age and condition • CCTV cameras are replaced when adopting the latest technology that maintains current levels of service	• Failing to replace asset in a timely manner can lead to loss of use of the asset and increase deferral cost for the asset at a later date
Disposal/ Demolition: Activities associated with the disposal or decommissioning of an asset.	
• Asset disposed by City once it reached end of useful life or no longer meets operational needs	• Increases the need to dispose of the roadside asset once end of life is reached
Acquisition/Expansion/Rebuild: These activities expand services to previously non-serviced areas or to accommodate growth; they provide new or enhanced services beyond the current capacity and/or functionality of existing assets.	
• Annual CCTV Camera Expansion Program	• Timely implementation of new assets allows staff to manage traffic demand on the road network • Incorrect growth assessments may result in over- or under-utilized asset capacity

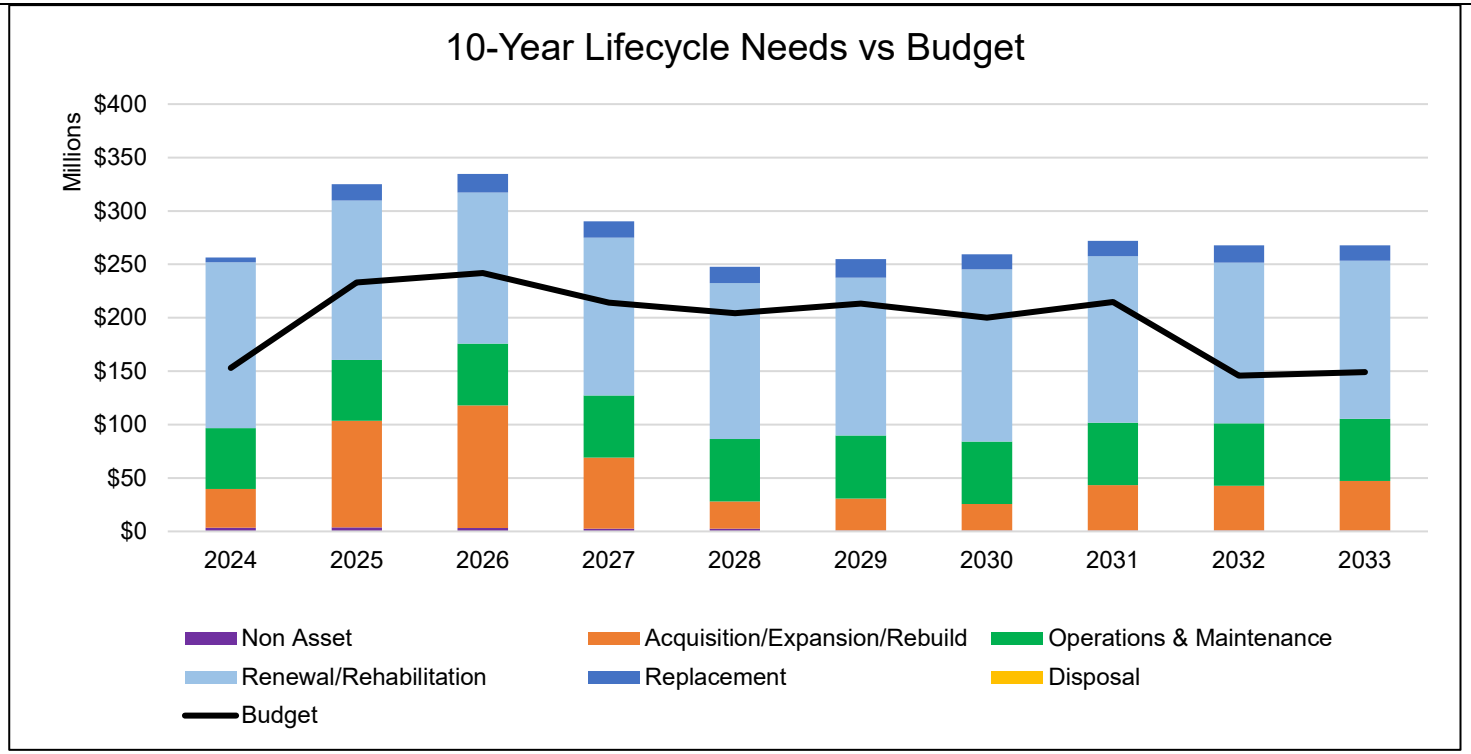
ITS (Speed Awareness Devices) – Current and Proposed Lifecycle Activities

Current and Proposed Lifecycle Activities	Risks associated with Lifecycle Activities
Non-Asset Solutions: Activities that do not alter the condition or performance of assets or services but provide staff with valuable information for their effective management.	
• Implementing action items from the Transportation Master Plan (TMP), Vision Zero Action Plan, Avigilon Control Centre • Developing and maintaining SOPs	• The TMP and Vision Zero Action Plan are used to plan for growth-related projects and transportation projects that align with the City's strategic goals and objectives • Cost of managing an asset increases rather than decreases
Operations & Maintenance: Minor activities that preserve the condition or performance of assets and ensures the longevity of assets in line with their design and operational requirements.	
• WOM Signs and Pavement Markings unit is available to respond during normal business hours to repair, relocate or troubleshoot equipment in the field • TSRS staff are responsible for responding to enquiries or requests and request field work from WOM • WOM Signs and Pavement undertakes routine maintenance of equipment in the field, with TSRS staff responsible for any work required by the supplier or purchase of replacement parts • Equipment is rotated to new locations or inspected on a regular basis. Typically rotated or inspected monthly • Snow cleared off solar panels • Batteries swapped out if not charged sufficiently, especially in the winter	• Enough resources available to complete work requests that are submitted • Annual inspections are in place to identify, document and correct any defects to ensure normal operating conditions. Timely repairs can extend the useful life of the asset. Completing planned maintenance activities while managing reactive maintenance activities. Forecasting future expenses for maintenance and repair

Current and Proposed Lifecycle Activities	Risks associated with Lifecycle Activities
Renewal/Rehabilitation: Significant activities designed to extend the useful life of assets components.	
• Technology is continually changing, impacting components and communication features. Batteries also have a limited lifecycle and require regular replacement • Battery replacement (average every 3 years), as needed • Replacement of other components if not functioning	• Higher costs due to changes in material costs • Equipment availability can vary as supply chain issues are constantly changing and technology is vendor-specific
Replacement: Replacement activities occur once an asset reaches the end of its useful life, cannot provide the intended function or performance, and rehabilitation is not a viable option.	
• Replacement due to damages caused by motor vehicle collisions, outdoor elements and unanticipated natural events. Replacement parts are obtained through operating budget • Capital budget has been requested for 2024 to allow for lifecycle replacement. Equipment is replaced once no longer operational or when outdated technology impacts operations	• Failing to replace asset in a timely manner can lead to loss of use of the asset and increase deferral cost for the asset at a later date • Upgrading the technology allows us to add functionality and improve monitoring
Disposal/ Demolition: Activities associated with the disposal or decommissioning of an asset.	
• Disposal of equipment occurs at the end of lifecycle when equipment is no longer operational	• N/A
Acquisition/Expansion/Rebuild: These activities expand services to previously non-serviced areas or to accommodate growth; they provide new or enhanced services beyond the current capacity and/or functionality of existing assets.	
• No regular planned expansion program since it began in 2005 • Expansion has been ad-hoc, as funding has been made available	• Timely implementation of new asset allows staff to meet resident and Council expectations

Lifecycle Needs vs. Budget

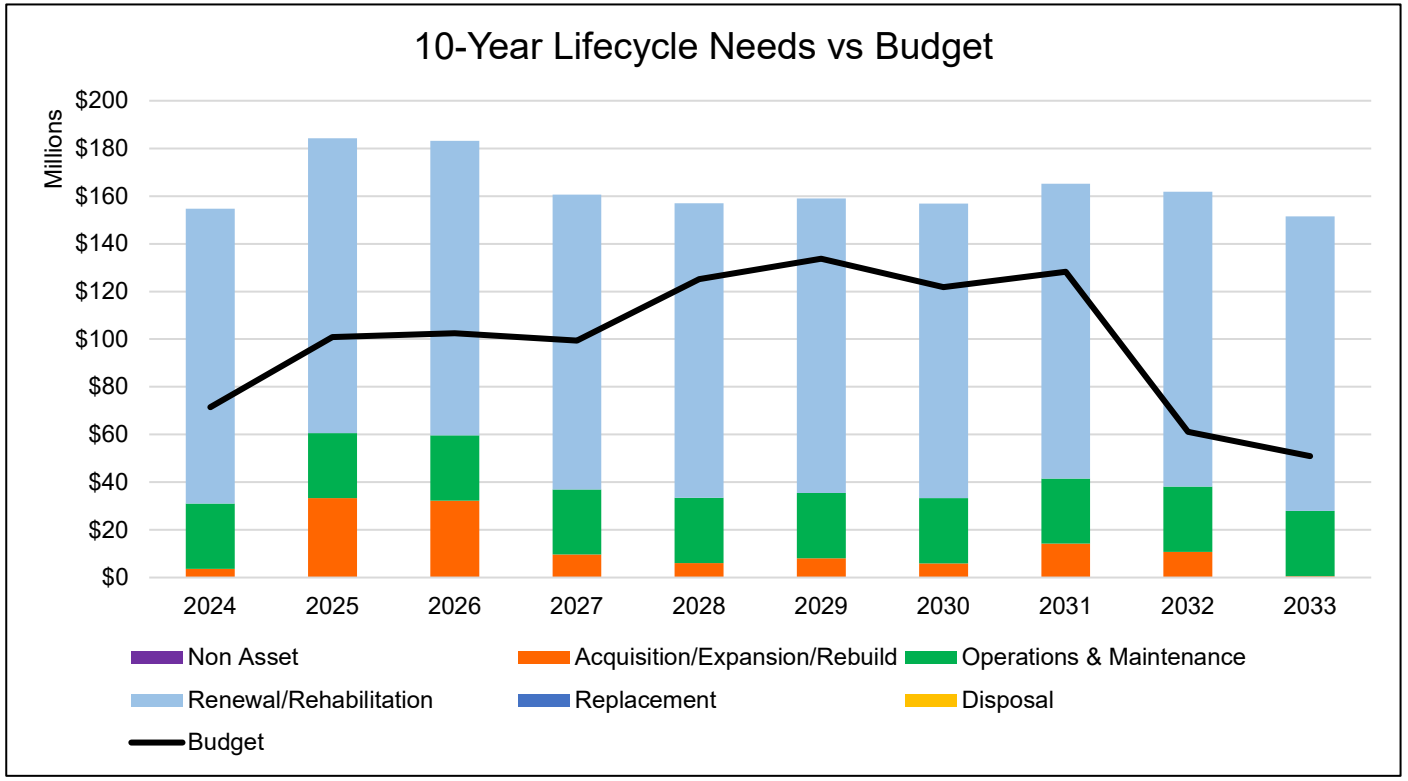
Roads Service Area



Roads Service Area staff meet quarterly with utility agencies and stakeholders responsible for stormwater, water/wastewater, gas, hydro, telecommunications, urban forestry, and other assets to discuss and schedule future maintenance, renewal and growth plans and to ensure that all infrastructure activities are coordinated to minimize disruption for users, avoid scheduling conflicts, maximize opportunities, and minimize throw-away costs.

As part of continuous improvement, staff will continue to quantify and analyze the lifecycle needs required as they refine their proposed levels of service, where they have been established, along with any resourcing requirements as a result.

Road Pavement



One of the benefits of being able to forecast the City's road pavement needs is that the locations of these future projects can be coordinated with the renewal and improvement needs of other assets located within the roadway corridor. Roads Service Area staff meet quarterly with utility agencies and stakeholders responsible for stormwater, water/wastewater, gas, hydro, telecommunications, urban forestry, and other assets to discuss and schedule future maintenance, renewal and growth plans and to ensure that all infrastructure activities are coordinated to minimize disruption for users, avoid scheduling conflicts, maximize opportunities, and minimize throw-away costs.

Averaging approximately $50 million per year, the Roadway Rehabilitation Program is one of the City's largest capital expenditures. The program not only ensures that road pavement structure is renewed, but it also ensures that sidewalk and roadside appurtenance assets are renewed or replaced as required.

Background Information

Figure 7 represents the expected road pavement condition profile over the next 25 years based on the currently forecasted 10-year funding level of approximately $57 million annually, subject to Council approval of the Road Rehabilitation Program. As a result of the annual investment shortfall, the City's RPMS system model predicts that the City's road network will reach a state of deterioration, whereby the proportion of the road pavements in Poor to Very Poor condition will increase from 42 per cent in 2025 to 58 per cent in 2029.

The forecasted condition profile indicates that the current level of planned capital investment is not sufficient to maintain the City's road pavements in fair or better condition. Should the needs for pavement renewal continue to out-strip available funding, Roads will need to increase operating costs to provide repair treatments and increase road patrols to extend the useful life of pavement assets and manage road user risk. City Maintenance and Operations staff will be monitoring maintenance and repair requirements annually and adjust their operating budgets.

Service Level Analysis and Options

An approach to establishing the optimal capital investment is to forecast the major lifecycle activities required to maintain the desired road pavement performance or level of service. The graph in Figure 7 below shows the condition profile of road pavement assets changing over the next 25 years. The analysis considers the current condition of pavements, the rate that the condition is expected to degrade, and appropriate condition triggers for rehabilitation/replacement activities to forecast the condition profile into the future.

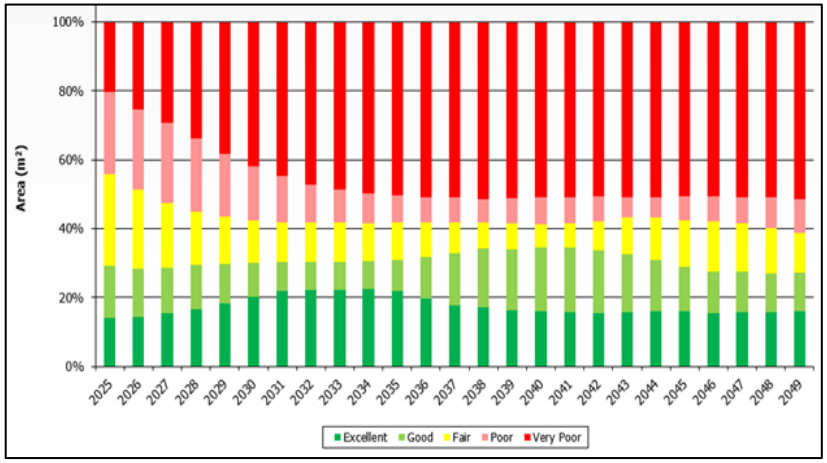


Figure 7: Forecasted 25-year Condition Profile (Road Pavement)

For the purposes of this asset management plan, three levels of capital investment for the Roadway Rehabilitation Program were analysed:

1. Maintaining the currently forecasted 10-year funding level of approximately $57 million annually
2. Investing an additional $23 million and lowering the average pavement condition target to 56 PQI or overall Fair condition
3. Investing an additional $67 million to maintain an average network pavement condition target of 72 PQI or overall Good condition

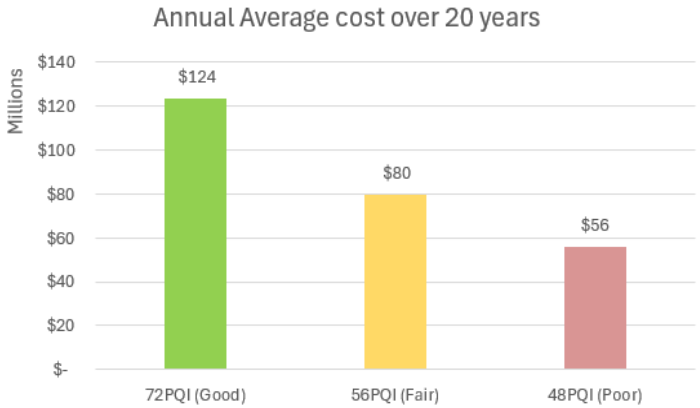


Figure 8: Roadway Pavement Performance based on Three Funding Scenarios

The results for all three scenarios are shown in Figure 9. The red line represents the current funding of $57 million annually and indicates that the average condition of the road network would deteriorate to the Poor category. The orange line represents an increase in the annual funding level by $23 million and indicates that the roads would deteriorate to the average condition in the Fair category. The green line represents an additional $67 million investment which would result in the average network condition being in the Good category.

For the purposes of this plan, the City will continue to use 72 PQI as an indicator of its Road Pavement's state of good health. The City will continue to look at proposed level of service targets to help analyze various investment options. In addition to the above three scenarios, analyses will be performed to incorporate different levels of service by road type. With the use of a new Asset Investment Planning (AIP) tool that will be available shortly, the City will develop a more detailed approach to assigning targets and will continue to incorporate risk. This will lead to more accurate calculations on infrastructure funding gap. These proposed LOS will require additional resources to deliver the work, such as additional Capital Works project managers.

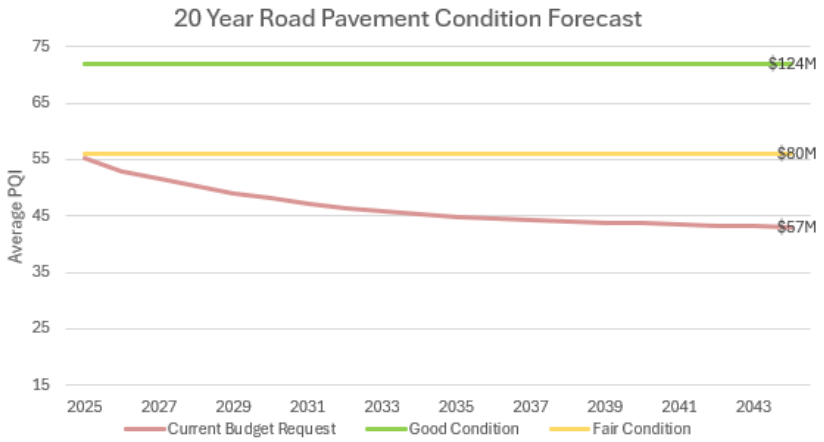
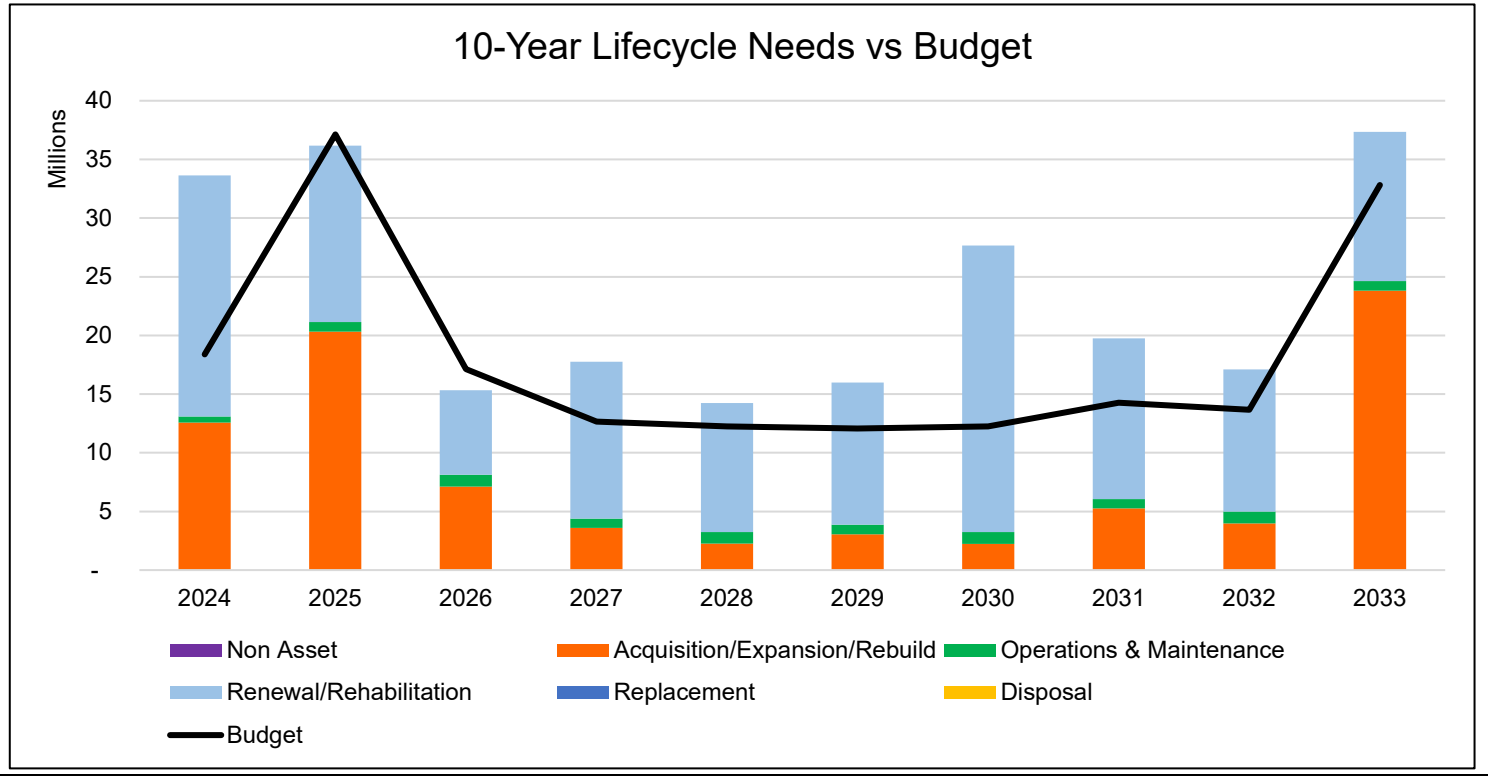


Figure 9: 20 Year Road Pavement Condition Forecast

The next pavement condition survey is scheduled for 2025. The data collected by the survey will be reviewed and analyzed in 2026 to reassess future pavement condition trends under various annual renewal funding scenarios. These results will be provided during the next Asset Management Plan update cycle.

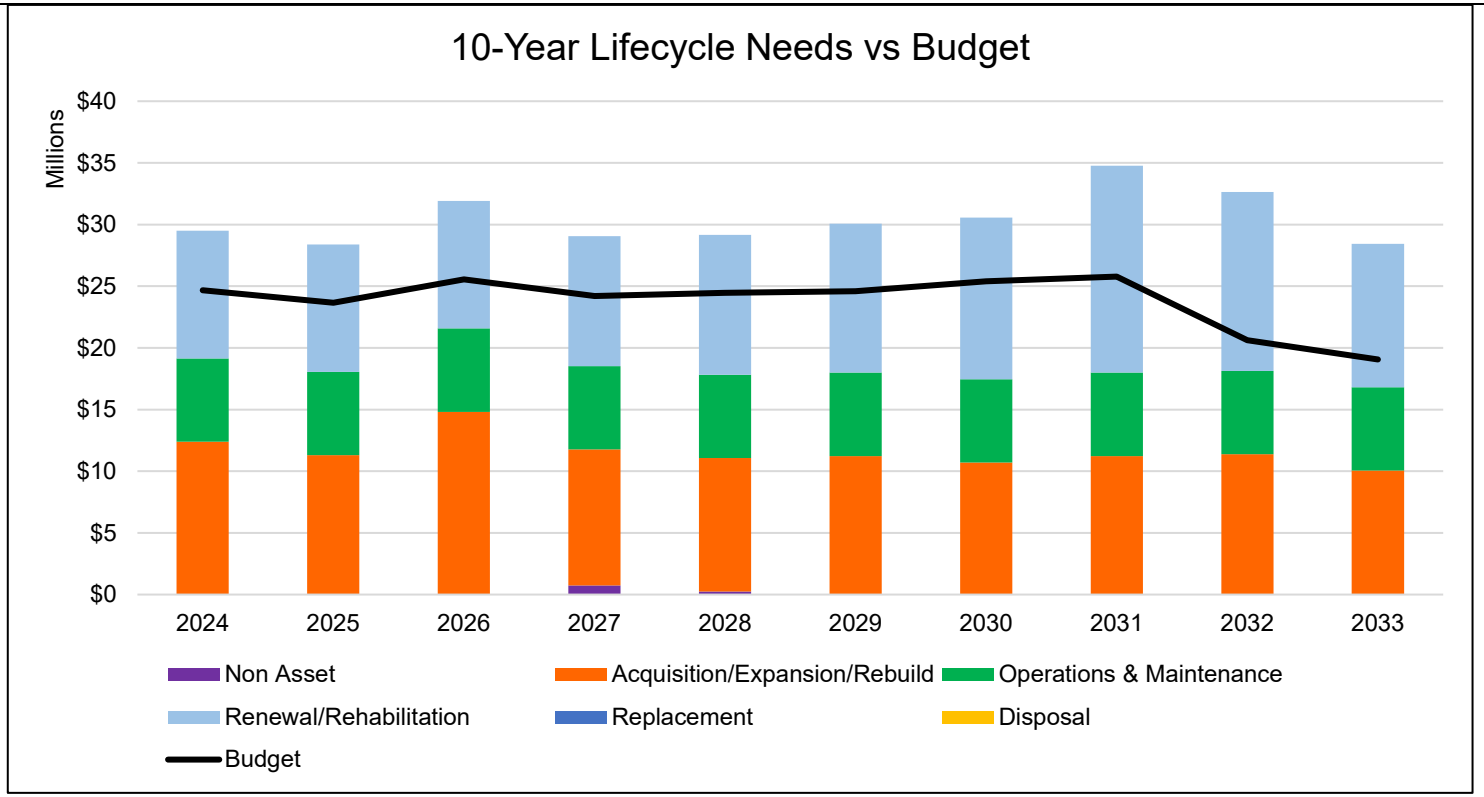
Structures



The City is now past Early-Life Renewal and is into the Mid-Life Renewal phase for many of these assets. Ideally, this phase is the second time the structure is rehabilitated and as referenced previously, the activities that are associated with it can include deck repairs/overlays, joint and bearing replacements and sidewalk replacement, along with general concrete repairs. For many structures, these needs are being identified earlier than expected due to missed renewal opportunities earlier in the structure lifespan.

The bulk of these assets are currently in the middle third of the asset lifecycle. The current average age of these structures is 41 years, with the older structures found on the City's larger arterial roads.
The current renewal needs exceed the available funding for structures in every year of the 10-year capital forecast. This gap is expected to increase beyond the 10-year window. With the current resources, staff can achieve the current proposed levels of service within the next 10 years.

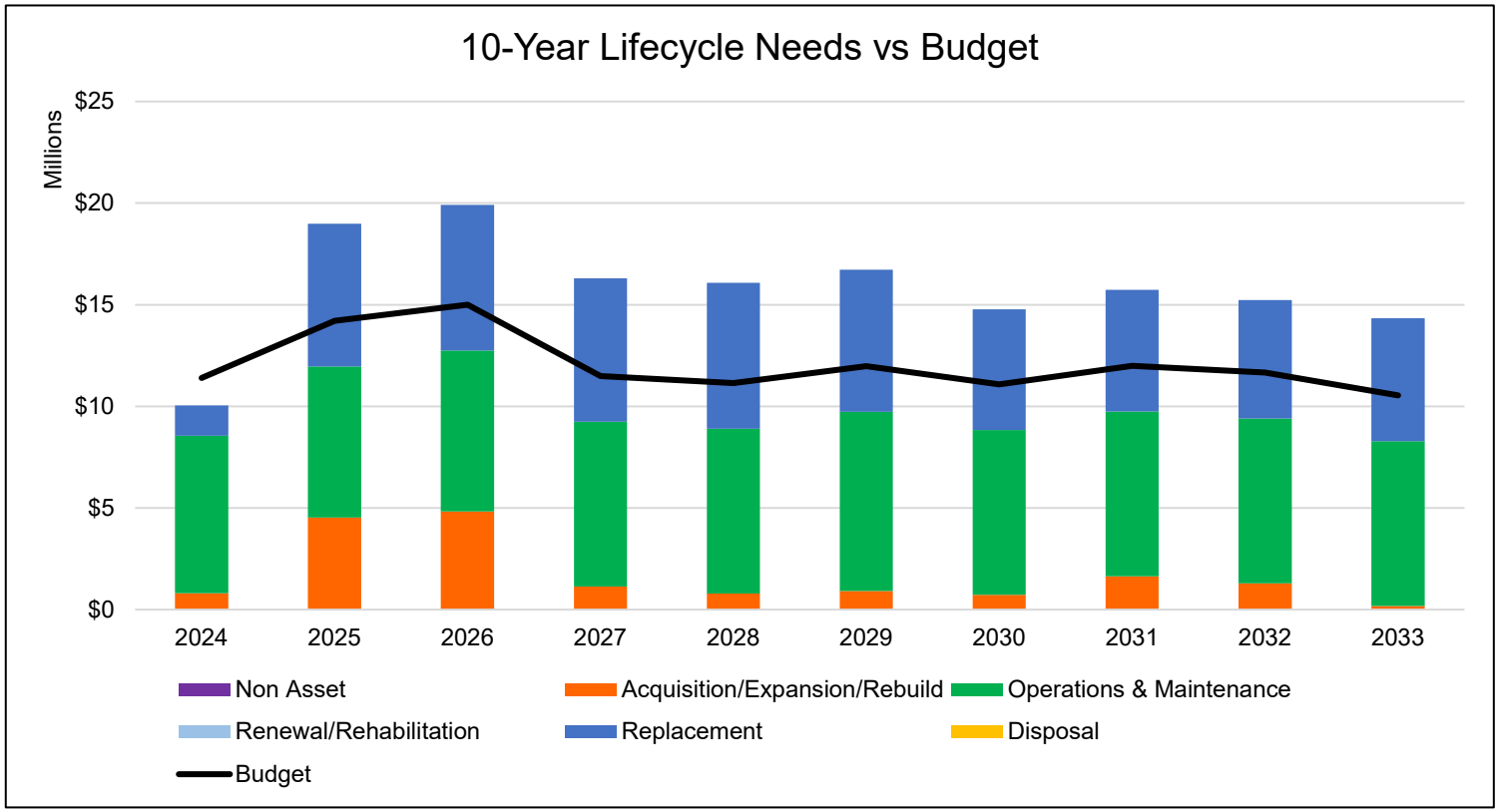
Roadside Trail Network



Due to incomplete data sets for the age of sidewalks and engineered walkways, and a lack of condition information at this time, replacement costs are assumed to be evenly distributed over the useful life period of 50 years. This analysis will be updated once a detailed sidewalk condition assessment is conducted in the next few years.

Renewal needs for multi-use trails are derived from RoadMatrix, using a similar model to road pavements. Using current condition information, the analysis provided a forecasted cost to maintain the current PQI. The forecast shows the anticipated budget required to replace sidewalks as described above and maintain multi-use trails at 78 PQI. With the current resources, staff can achieve the current proposed levels of service within the next 10 years. Once a condition survey is completed for sidewalks and engineered walkways, there will be updates to the proposed LOS which may require additional resources.

Street Lighting



Approximately 63 per cent of all street light poles (concrete, aluminum, steel and wood) which were installed over 30 - 40 years ago and are deemed to be in either Poor or Very Poor condition based on their age. Furthermore, 64 per cent of LED luminaires primarily installed in 2013/2014 are deemed to be in fair condition and due for lifecycle replacement by 2024/2025, while non-LED lights are in Poor to Very Poor condition based on their age. Other street light plant components such as cables and brackets are also coming up for lifecycle replacements.

It is critical that the City implement a proactive Street light Asset lifecycle replacement program to ensure continuity and long-term sustainability of street light operations. To achieve this, staff have commenced a detailed lifecycle

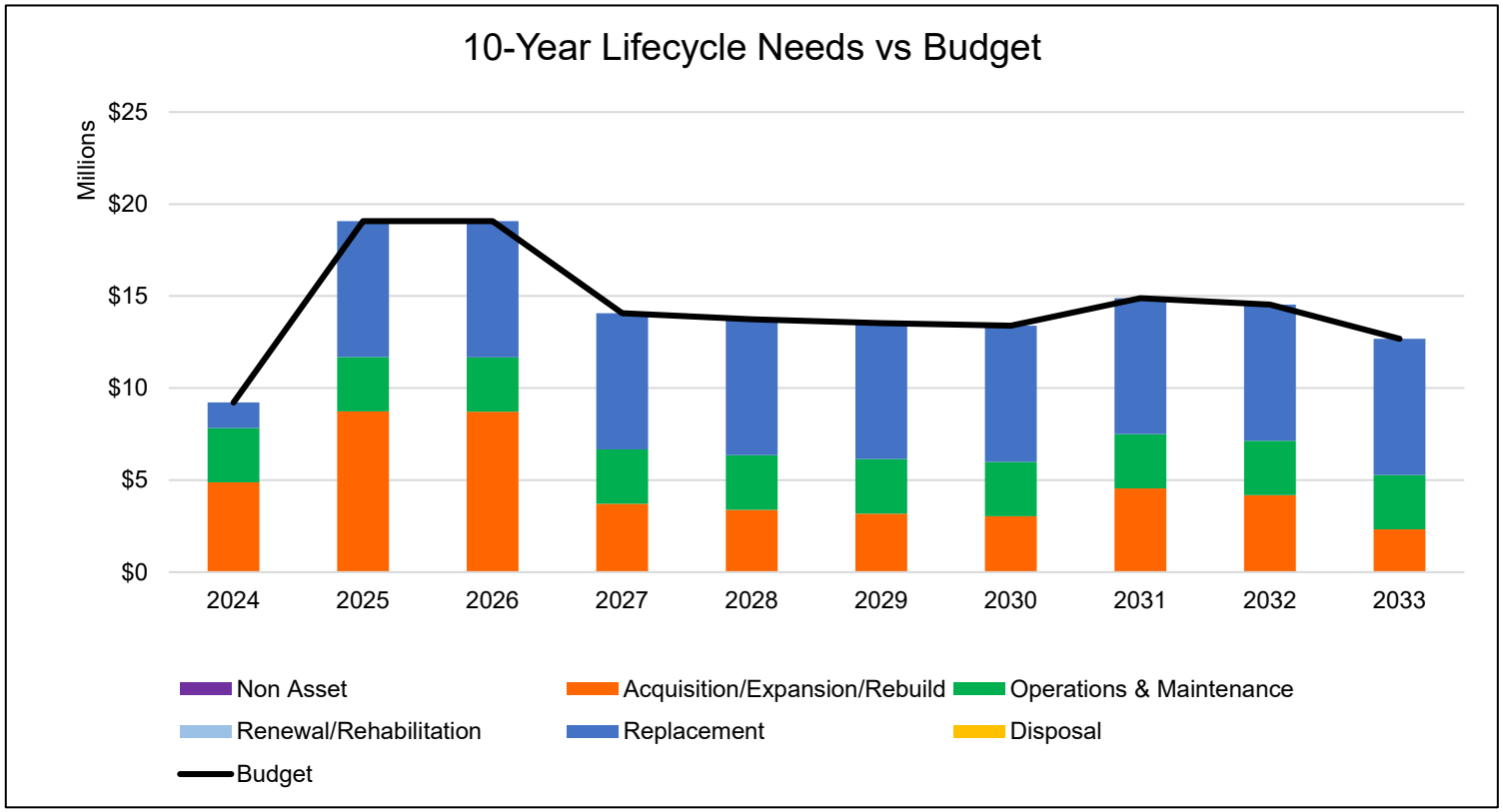
model for each asset category. In consideration of street light assets approaching or that have exceeded the end of their useful life, a long-range financial forecast has been developed based on the following assumptions:

- Based on inventory data from Esri Software
- Current replacement cost and renewal cost based on 2023 pricing
- Street Light Plant Renewal calculation is based on age of the infrastructure; no physical inspections have been conducted yet
- Luminaire renewals are based on the recent remediation process and warranty expiring in 10 years after installation (as per Tangible Capital Assets (TCA) the life expectancy for LED luminaires is 15 years. However, the life expectancy was shortened because of lights staying on during the day)
- Adaptive Nodes renewals will happen at the same time as Luminaire renewal

Although not yet factored into the lifecycle forecast above, significant resources will be required in order to implement a robust street light replacement program to sustain current service levels and achieve proposed levels of service within the next 10 years. The following resources may be required:

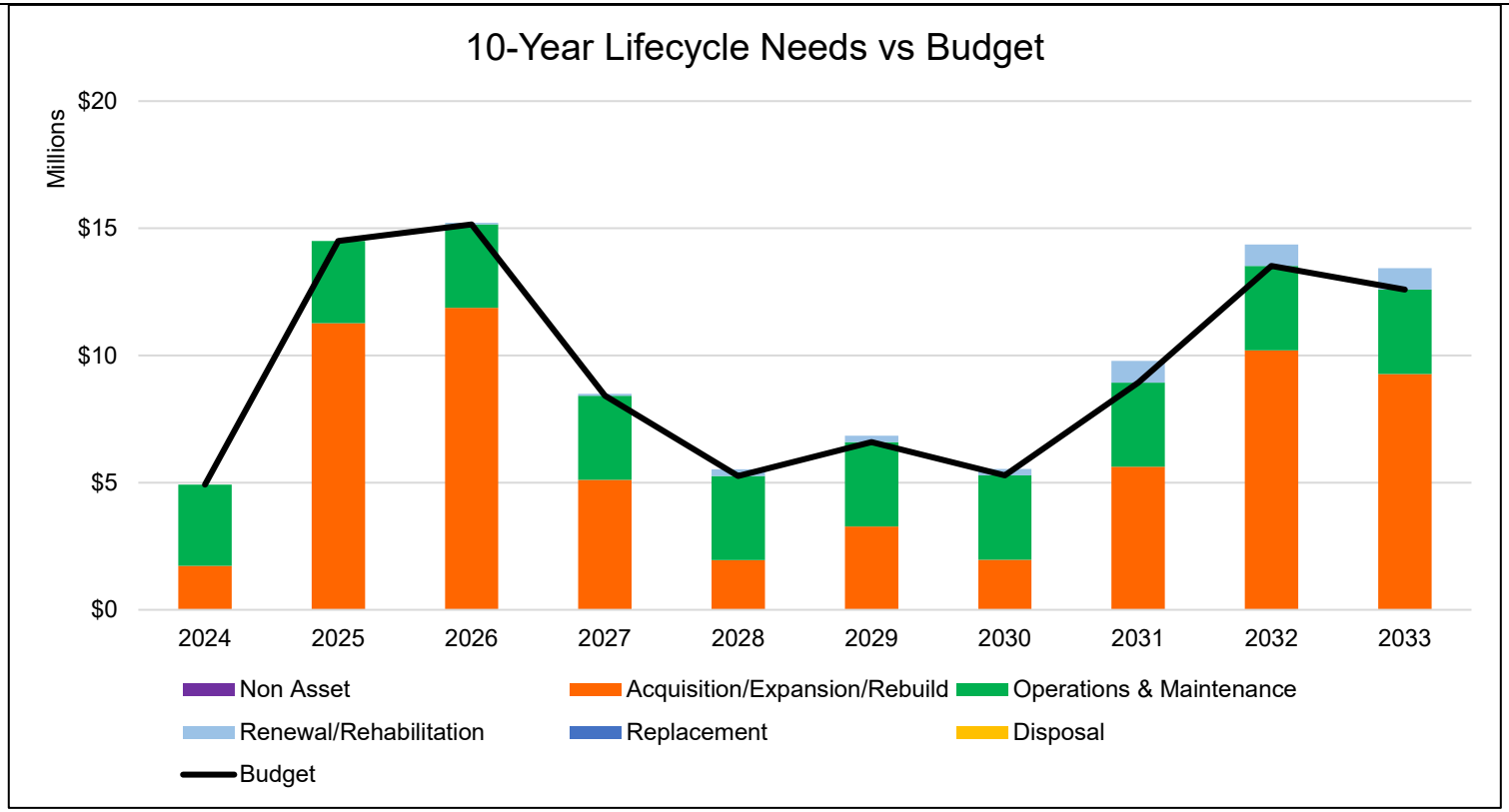
- Additional staffing resources required
- Physical inspection plan - asset condition inspections with set frequency will ensure that reliable and accurate decisions are being made
- Increased space needs for inventory of assets

Traffic Signals and Related Electrical Devices



The City of Mississauga's traffic signals and related electrical devices were analyzed using age and useful life as an indicator for replacement. Traffic Signal assets are replaced at the end of their useful life, while Traffic Signal LED Modules within the Traffic Signal Plants are replaced every 10 years. The forecast does not illustrate the current Emergency Vehicle Pre-Emption (EVP) system, as a new EVP is now being reviewed to upgrade and replace the existing system, which will include vehicles such as Fire, Transit and other public services deemed priority. Also, the forecast does not include signal infrastructure for agencies within the City's boundaries such as Region of Peel, Ministry of Transportation, Greater Toronto Airport Authority and Halton Region, which the City currently operates and maintains. With the current resources, staff can achieve the current proposed levels of service within the next 10 years.

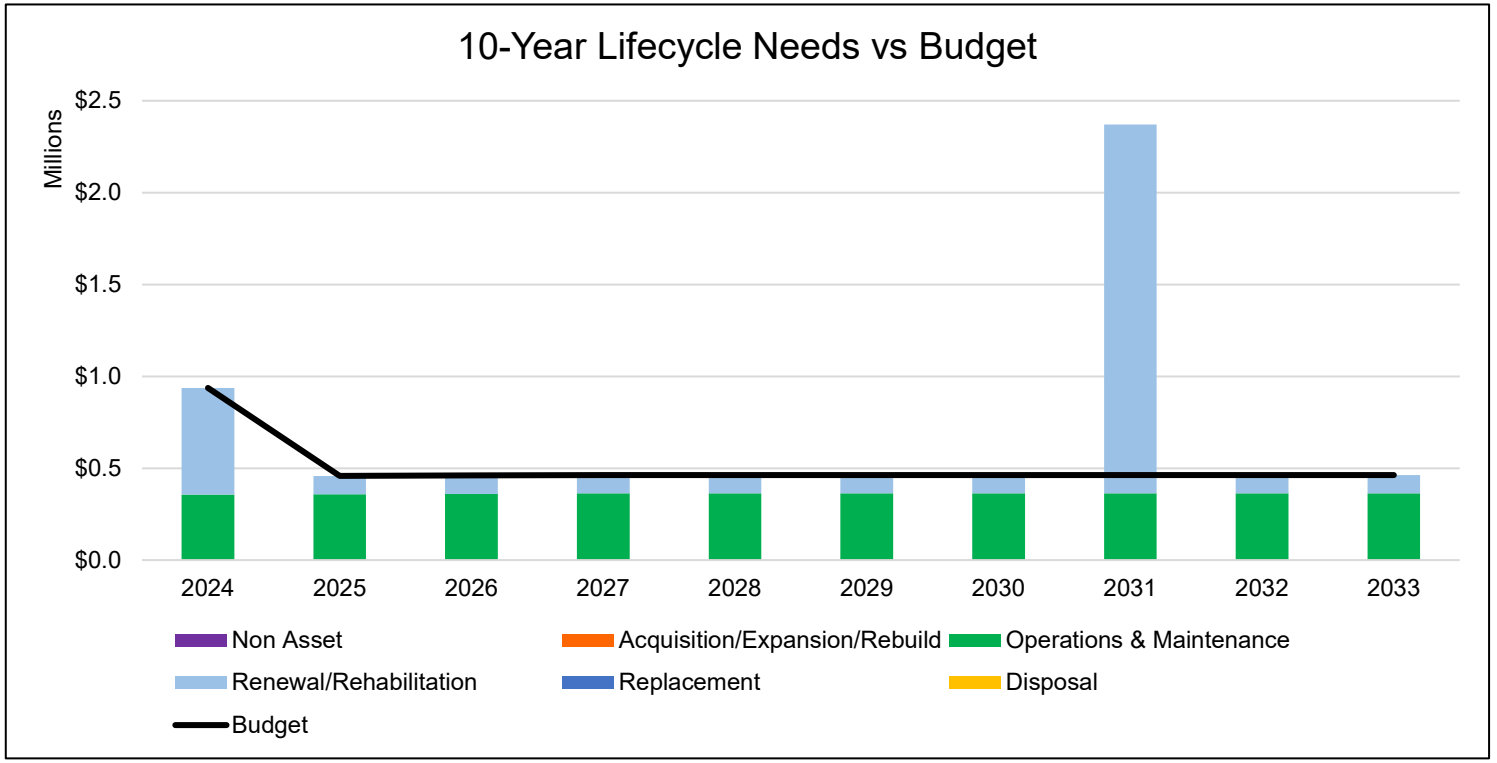
Roadside Infrastructure



Since the installation cost of new signs and posts is typically bundled into roadway improvement projects, they do not have any capital budget, and the replacement of existing signs and posts is typically funded by operating budgets. The following forecast shown in this section relates specifically to noise walls only.

Currently, most City-owned noise walls are in Fair to Very Good condition. There are only two noise walls identified for replacement in the next seven years (one in 2022 and one in 2026). Confirmation of ownership is required prior to any replacements. Aside from these two walls, there are no expected noise-wall replacements until the year 2029.
With the current resources, staff can achieve the current proposed levels of service within the next 10 years. As the City's Noise Walls continue to age, the target performance may become more difficult to meet which may require additional resources.

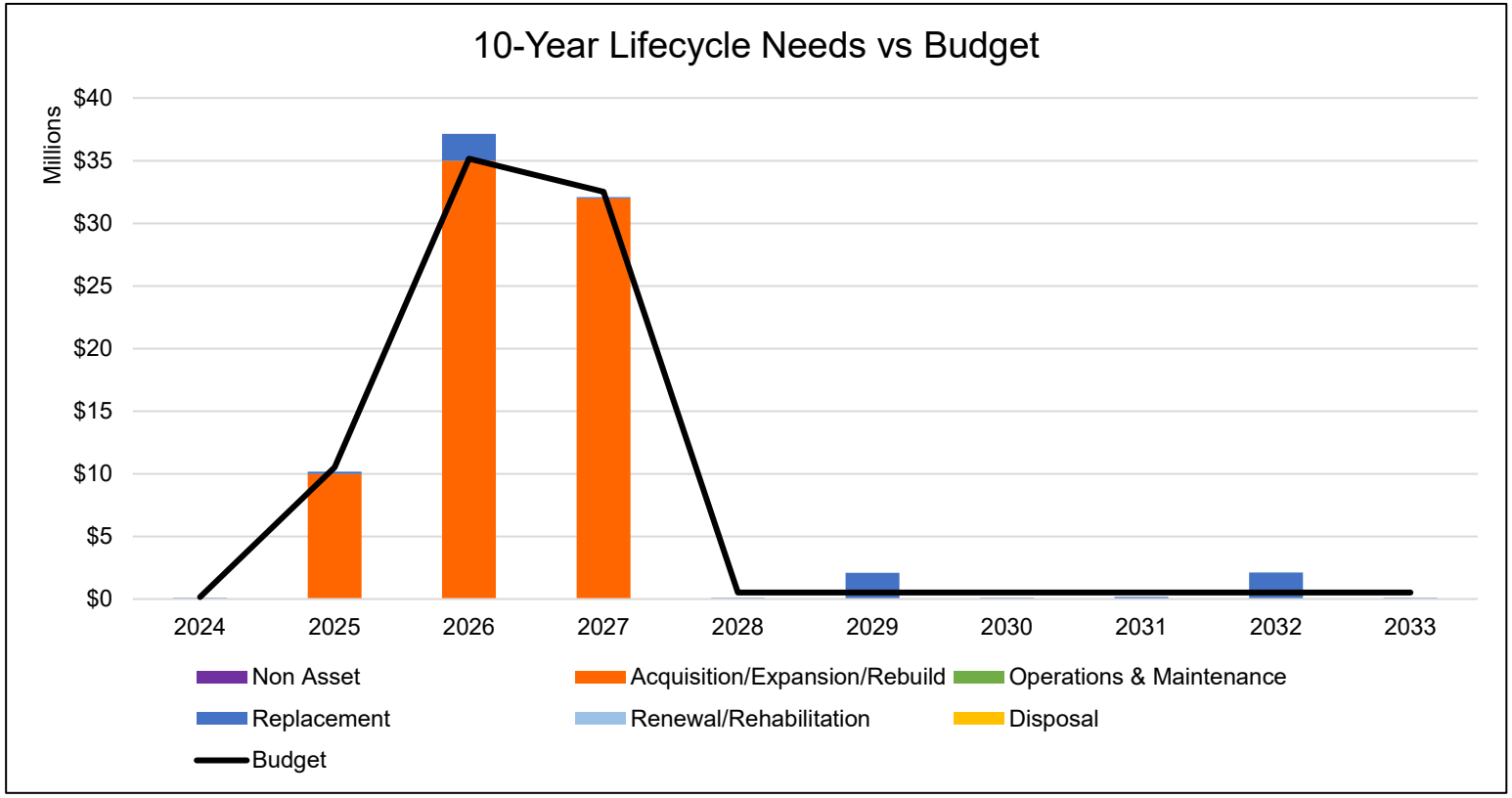
Municipal Parking



The current Municipal Parking financial position is one that aims to support the objectives of the Council-approved Parking Master Plan, with the goal of expanding Municipal Parking's footprint, along with staying current with market trends. As the City's paid parking market matures, Municipal Parking undertakes yearly visual inspections of all municipal parking lots in order to ensure all locations meet required standards. Refurbishment year is estimated based on the current parking lot condition as shown by the renewal/rehabilitation forecast.

Currently, the machines are planned for installation and to stay in appropriate working order for approximately seven years. At which date, conversations with the vendor will be necessary in order to determine the possible lifecycle refurbishment or renewal of the hardware. With the current resources, staff can achieve the current proposed levels of service within the next 10 years.

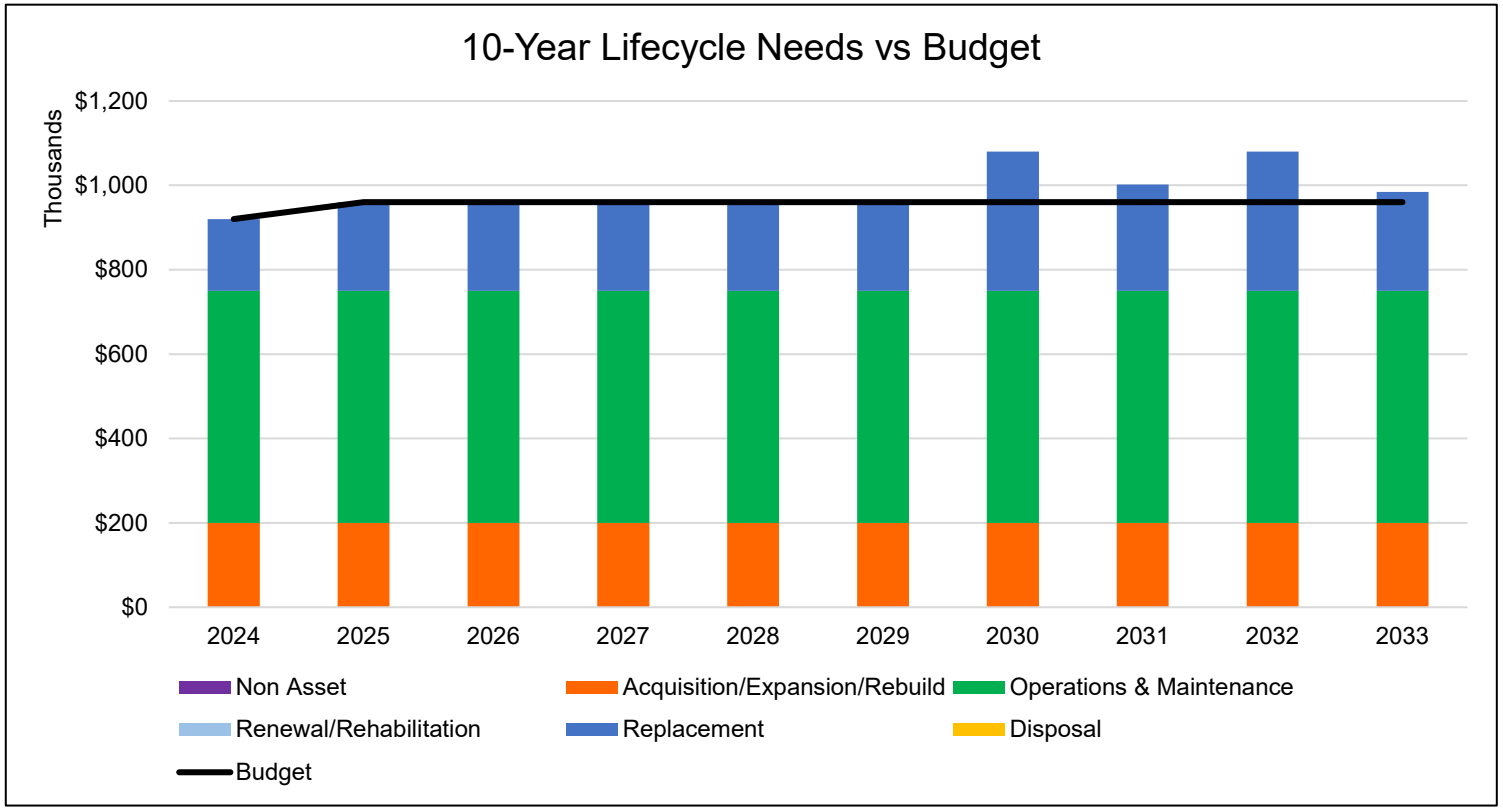
Operational Equipment



Domes are planned to undergo a staged replacement over the next 2 to 5 years. Every few years, two domes at each yard will be replaced with one large dome. Once the Yard Master Plan Update is complete, this will serve to better inform the replacement of the domes. Based on a 15-year useful life of Brine Systems, there are currently no Brine Systems scheduled for replacement.

Based on a 6-10 year lifecycle, specialized equipment including surveying equipment and sign shop equipment is planned to be replaced at the end of its use-full life. With the current resources, staff can achieve the current proposed levels of service within the next 10 years.

Intelligent Transportation Systems (ITS)



Based on a 15-year useful life of CCTV cameras, there are currently no CCTV traffic monitoring cameras scheduled for replacement. However, as the oldest cameras were installed in 2015, an annual replacement program should be introduced in 2030 to start replacing CCTV cameras that have reached their end of life, as shown by the forecast.

With the current resources, staff can achieve the current proposed levels of service within the next 10 years. Staff have accounted for upgrades to technical requirements for speed awareness devices within the next 10 years.

Budget Breakdown

Over the next 10 years, Roads plans to spend an average of $196.9 million annually on road assets, with the majority of the budget being used for rehabilitation activities at 37.4 per cent, operations & maintenance activities at 30.2 per cent, and acquisition/expansion activities at 26.8 per cent.

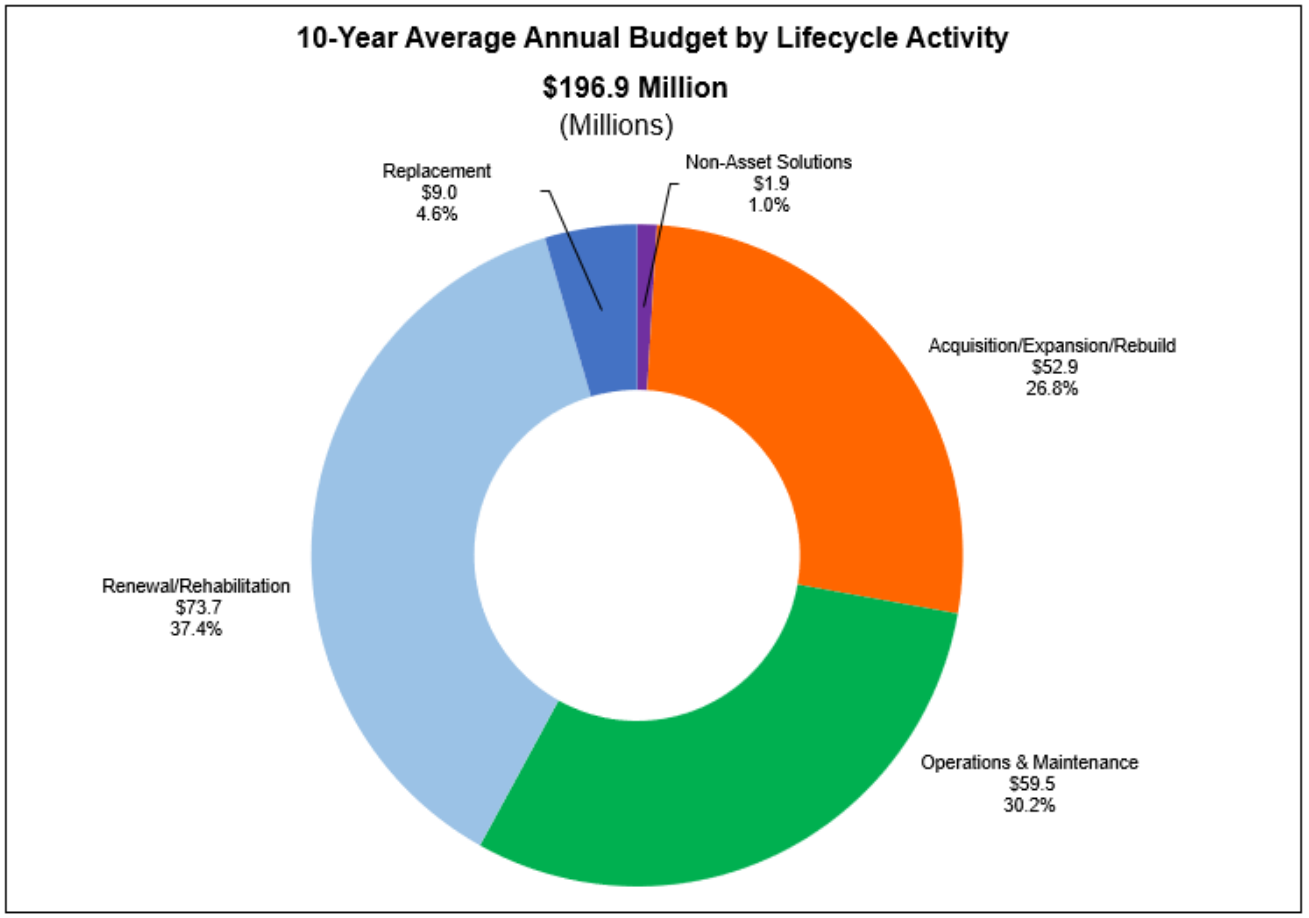


Figure 10: Breakdown of Budget by Lifecycle Activity

Table 3 shows the 10-year annual average budget breakdown by asset class. The majority of the of the operating and capital budget is spent on State of Good Repair (SOGR) of Roads assets.

Table 3: Budget breakdown by Asset Class

Asset Class	SOGR Budget Type ($ Million)			Growth Capital Budget ($ Million)	Total Budget ($ Million)
	Operating	Capital	Total		
Road Pavement	26.8	60.3	87.0	12.5	99.5
Roadside Infrastructure	3.3	1.4	4.7	4.8	9.5
Structures	0.5	9.3	9.8	8.4	18.3
Roadside Trail Network	6.6	5.6	12.2	11.6	23.8
Traffic Signals and Related Electrical Devices	3.0	6.8	9.7	4.7	14.4
Intelligent Transportation Systems (ITS)	0.6	0.2	0.8	0.2	1.0
Street Lighting	7.9	2.5	10.4	1.7	12.1
Municipal Parking	0.4	0.1	0.5	-	0.5
Operational Equipment	-	0.4	0.4	7.7	8.1
Other[3]	7.6	0.4	7.9	1.8	9.8
Total	**56.6**	**87.0**	**143.6**	**53.4**	**196.9**

[3] "Other" asset class denotes lifecycle activities that span over multiple asset classes within the service area such as plans, studies, and other non-asset solutions.

Capital Expansion and Improvement Projects.

In addition to prioritizing the investments needed to maintain existing assets, staff also identify infrastructure expansion or improvement needs in the Capital Plan for roads and structures. These expansion projects, typically identified through planning studies, may be required to accommodate development growth or service improvements. The table below lists the road improvements identified in the Roads 10-year Capital Plan.

Growth Projects	Approximate Project Timing	Growth Projects	Approximate Project Timing
Goreway Drive Grade Separation	2014 - 2025	Webb Drive – Confederation Pkwy to Kariya Drive	2026, 2027
Square One Drive - Confederation Pkwy to Rathburn Rd W - Hurontario St. to Rathburn Rd. E	2025, 2031	City Centre Drive Extension • City Century Drive to Hurontario • Public Road to Burnhamthorpe	2031
Winston Churchill – The Collegeway to Burnhamthorpe Road	2026 – 2027	Clarkson Road/Lakeshore Road Intersection - Design & Construction	2024 - 2025
Ninth Line Widening – Eglinton Avenue West to Derry Road West	2025 – 2027	Creditview Road Widening from Bancroft Road to Old Creditview Road	2024- 2028
Stavebank AT Bridge across QEW	2021 – 2025	Tenth line – Drew Road to Argentia Rd	2032
Kariya Drive – South of Elm Dr, to Central Pkwy W	2023 - 2034	Central Parkway East – Hurontario Street to Burnhamthorpe Road	2025 – 2026
Old Derry Road/Old Credit view Road – from Creditview Road to Second Line W	2026 – 2029	Intersection Improvements (Various Locations)	2024 - 2032
Mavis Road Widening – Twain Avenue to Hwy 407	2026 – 2027	Drew Road – Torbram Road to 660m East of Torbram Road	2032
Winston Churchill Blvd – Derry Road to Erin Centre Blvd	2032	Mavis Rd – CPR Crossing to Burnhamthorpe Road	2032

Financing Strategy

Capital Funding Sources and Operating Revenue Sources

The estimated available funding for the next 10-year period (2024-2033) for Roads is approximately $2.0 billion. The primary sources of funding are Operating Revenue Sources at 28.7 per cent, Tax Reserve Funds at 35.1 per cent, which is primarily used to support capital infrastructure renewal needs, and Development Charges Reserve Funds at 19.5 per cent, supporting growth projects.

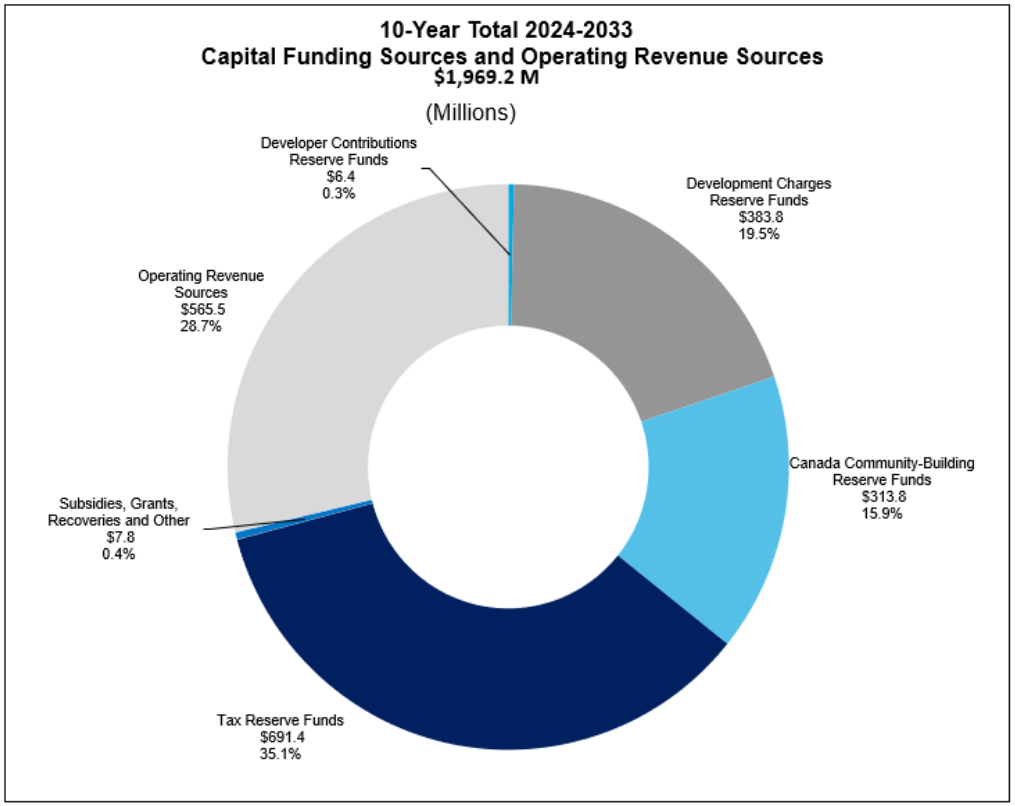
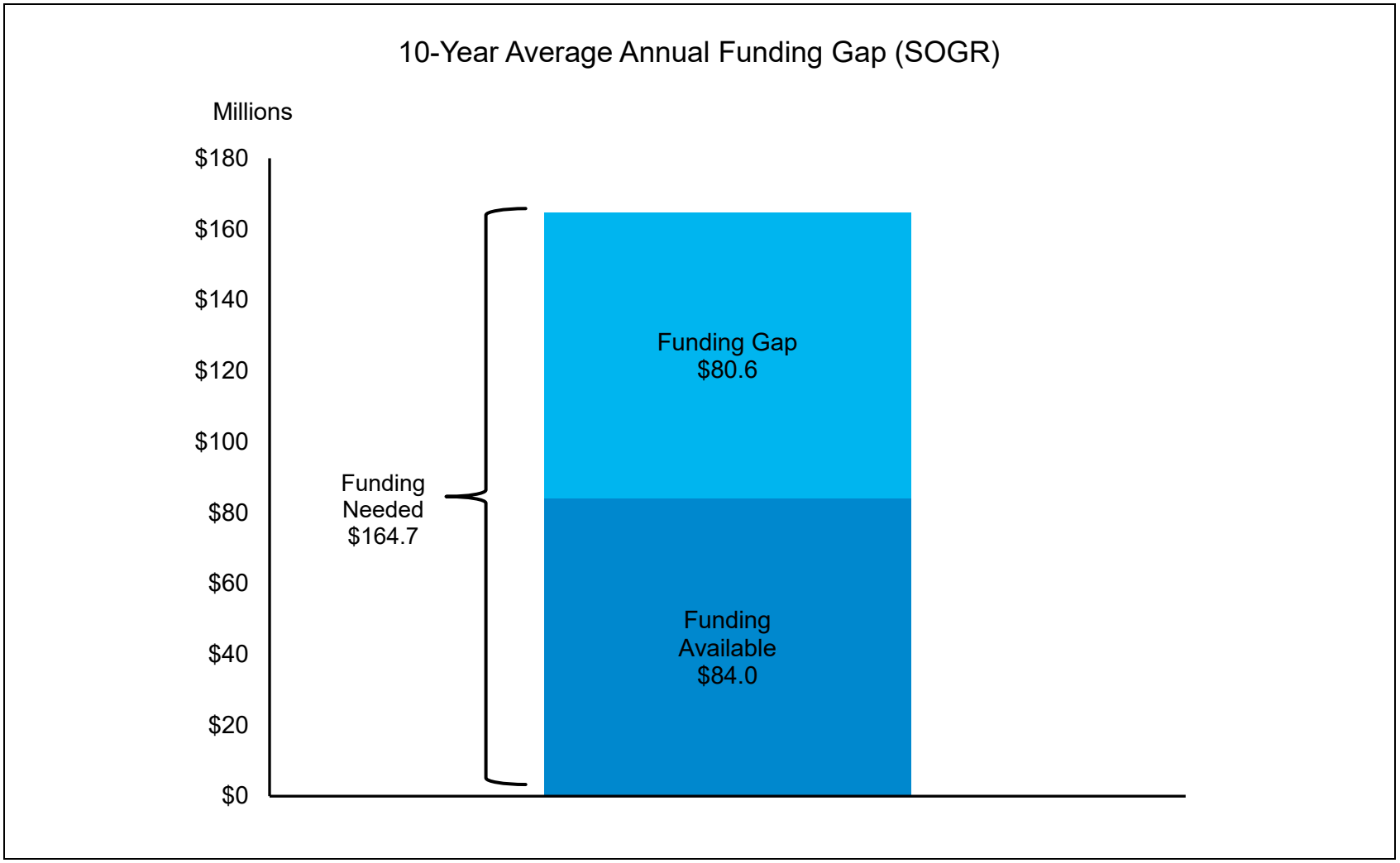


Figure 11: Capital Funding Sources and Operating Revenue Sources

Infrastructure Gap

Roads Service Area



As demonstrated in the state of infrastructure section of this plan, road-related infrastructure is aging. In addition to aging infrastructure, the cost to deliver road-related capital projects is escalating faster than the rate of inflation. City staff have been monitoring construction price increases over the past few years and have seen year-over-year increases in construction tenders ranging from 10-20 percent. This means that the City's forecast for future construction projects is outpacing the rate of inflation. As a result, the City's ability to maintain all road pavements in a state of good repair is constrained by the level of investment dollars available to fund this growing pressure.

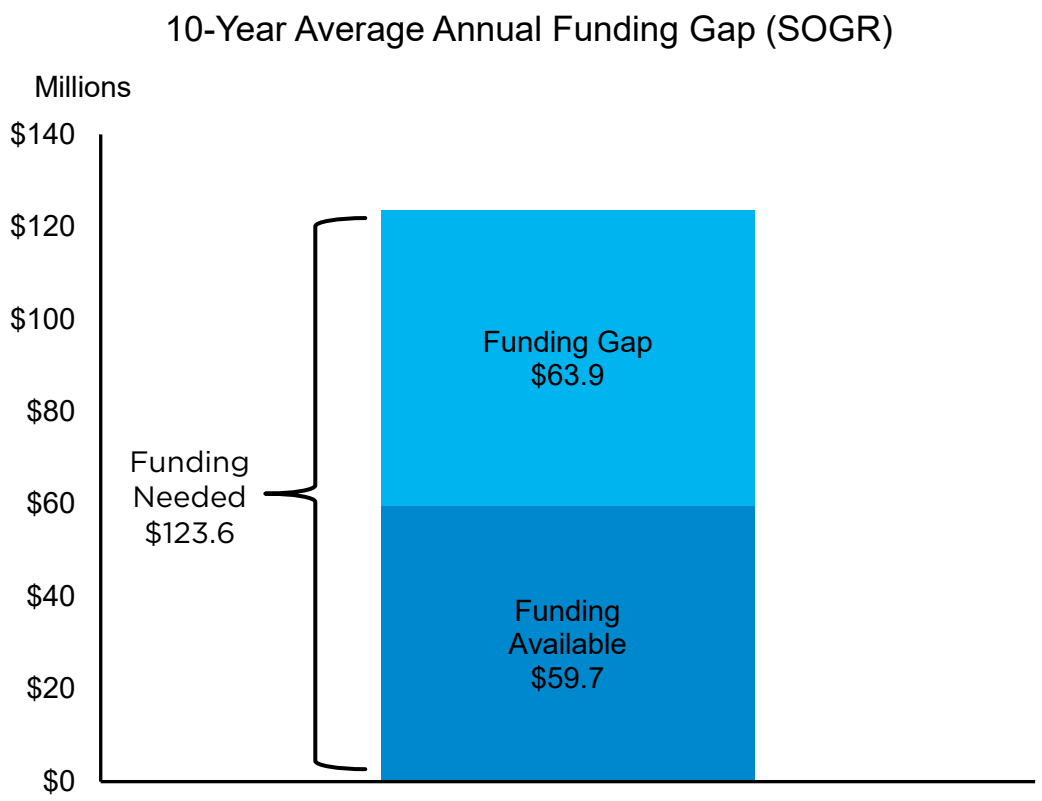
The City's infrastructure funding needs for Roads is estimated to be $164.7 million annually. The City's ability to fund all needs for road infrastructure is constrained and can only invest approximately $84.0 million in road related projects annually, leaving a funding gap of $80.6 million annually.

As the City continues to advance its asset management maturity, the accuracy of the funding gap will continue to improve.

The infrastructure gap does not consider the pressures that come along with operations, maintenance, acquisition, and expansion. The infrastructure gap focuses on rehabilitations and replacements to keep assets in a state of good repair.

As part of continuous improvement, staff will continue to evaluate the affordability and sustainability of proposed levels of service, where they have been established, and integrate their asset management program with the annual budgeting process.

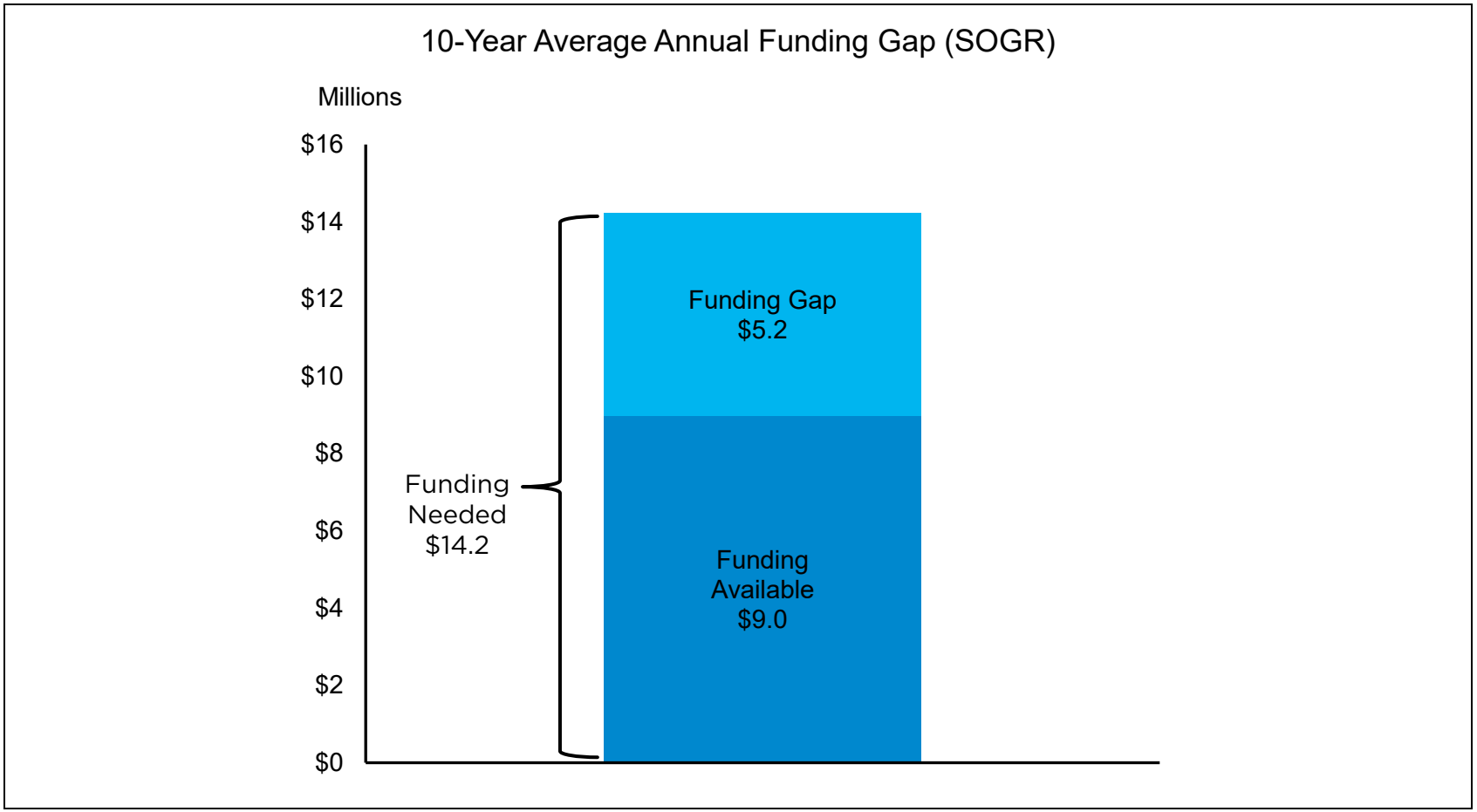
Roads Pavement



The 10-year average annual funding needed to maintain road pavements in a state of good repair creates an average annual funding gap of $63.9 million. This assumes maintaining the average network pavement condition at 72 PQI.

The City will continue to work on setting proposed LOS for Road Pavements. This will replace the 72 PQI that is currently being used to determine the infrastructure gap. The City cannot currently afford the proposed LOS nor maintaining the roads at their current condition.

Structures

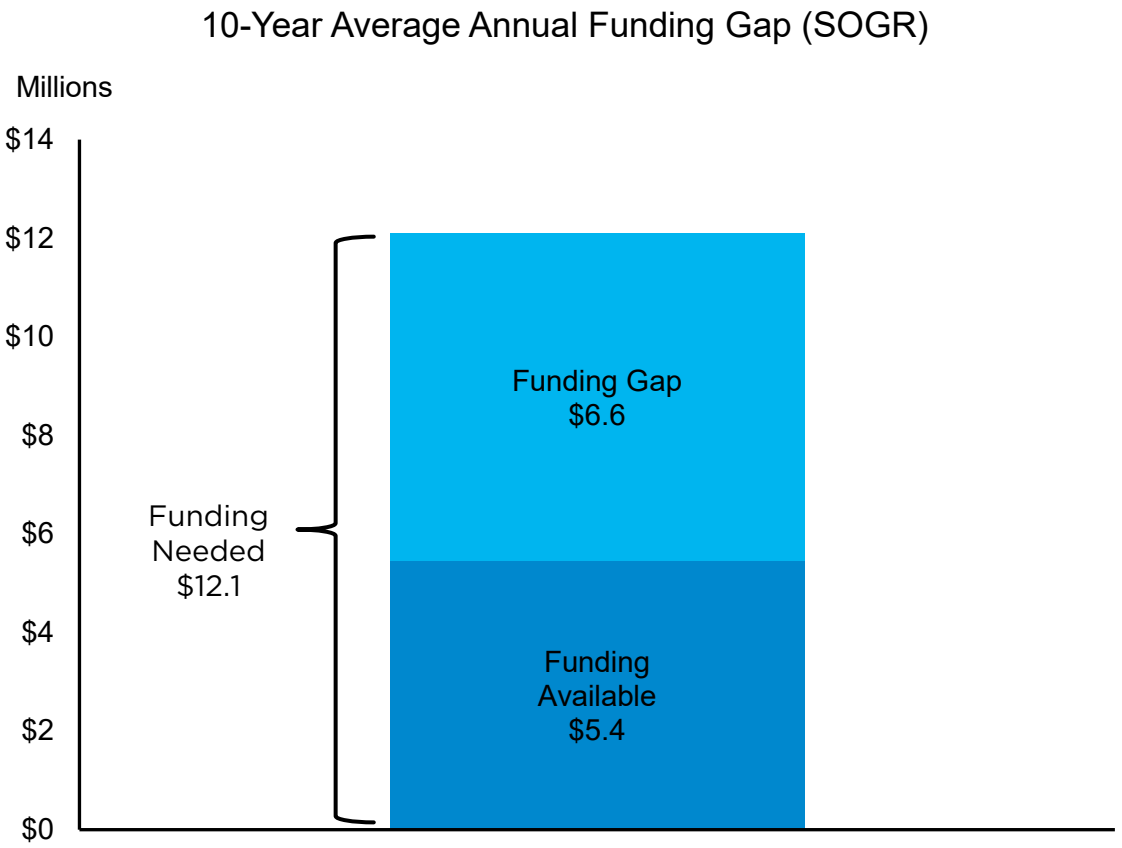

10-Year Average Annual Funding Gap (SOGR)
Millions
$16
$14
$12
$10
$8
$6
$4
$2
$0
Funding Needed $14.2
Funding Gap $5.2
Funding Available $9.0

After analyzing the needs of road structures, staff determined that the current budget allotment is insufficient to meet the requirements for timely infrastructure renewal. The current funding stands at approximately $9 million per year while the estimated funding to address identified needs has been calculated at an annual average of $14.2 million, a shortfall of approximately $5.2 million annually.
The City's road structures are continuing to age. The increasing age of existing infrastructure has resulted in more structure replacements or significant rehabilitation works. This and the rising costs of construction have both contributed to the increased infrastructure gap.

Additionally, few structure projects programmed in the capital budget are like-for-like replacements or rehabilitations. There is an identified need to align with both current structure construction standards and Council-approved master plans such as the Pedestrian Master Plan and Cycling Master Plan. Many of the City's constructed structures do not have sufficient space in their current configurations to accommodate active transportation infrastructure.

Extending this infrastructure through often results in more costly capacity improvements to existing structures. This is typically accomplished through the widening of current structures or through full structure replacements. There is currently a study underway to evaluate all current structures for compliance with these master plans and proactively identify needs, priorities, and high-level costs.
Costs used to determine the infrastructure gap are high level only and will be refined during the detailed investigation and design phases of renewal projects.
Currently, there is no additional funding gap as a result of proposed LOS. As the City continues to set LOS targets, additional funding gap will be determined.

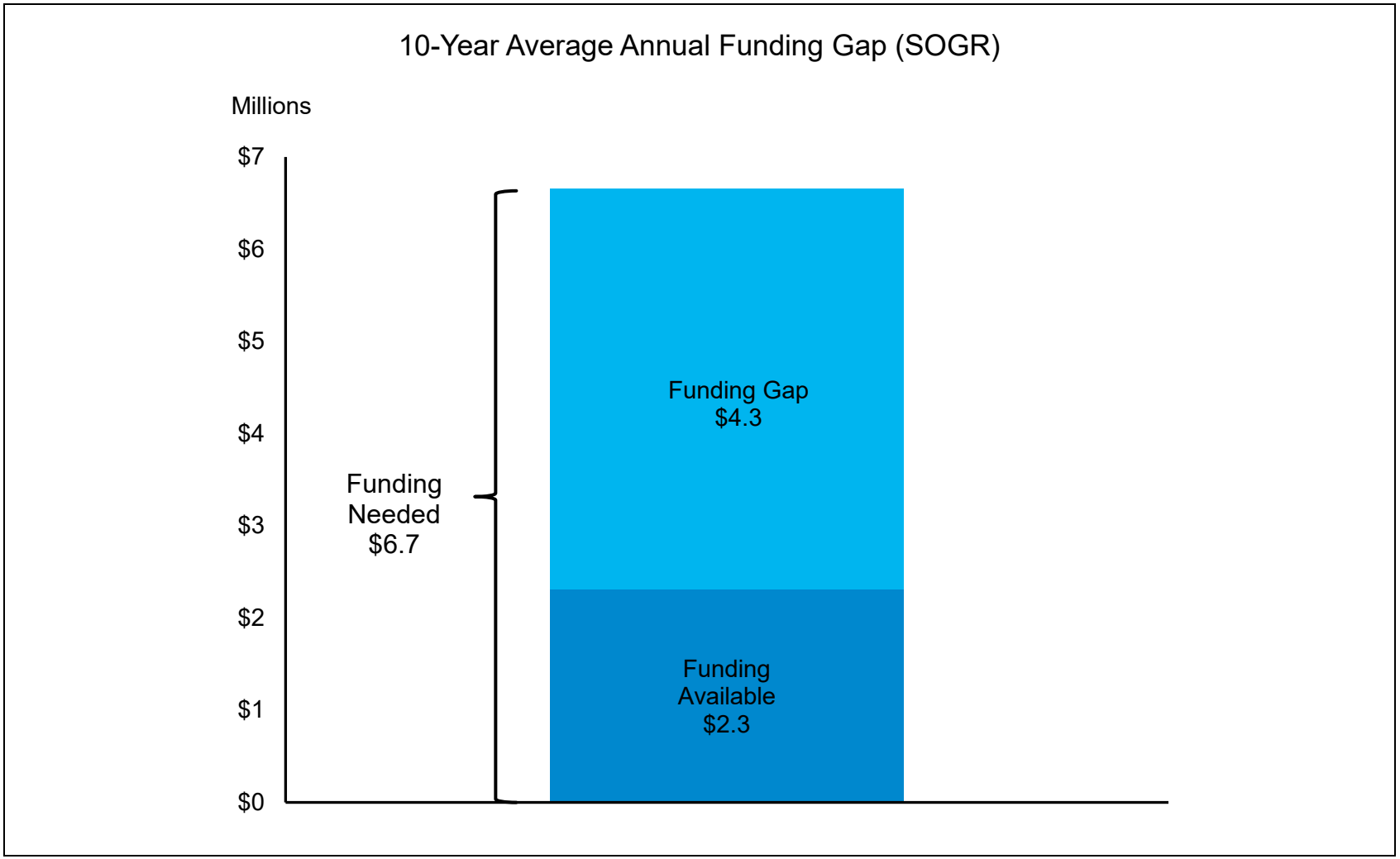
Roadside Trail Network



The 10-year average annual funding needed in comparison to the funding available creates an average annual infrastructure gap of $6.6 million. As the City's roadside-trail network assets age past their recorded useful life and are not replaced or renewed, the infrastructure gap and the need to maintain the network in a state of good repair will continue to increase.

Currently, there is no additional funding gap as a result of proposed LOS. As the City continues to set LOS targets, additional funding gap will be determined.

Street Lighting



There is no comprehensive and robust asset lifecycle replacement plan for street lighting assets to date. For 2024, the small replacement budget was dedicated to replacing Erindale style street light poles. These poles are directly buried into the ground and with the interaction of salt and ground minerals, they have started to deteriorate below grade. As such, an annual replacement program was established in 2019.
The estimated asset renewal cost in 2024 and 2025 would be approximately $92 million dollars. This accounts for 19 per cent of street light plant assets and 88 per cent of luminaires (i.e., almost entire inventory of adaptive nodes that control LED luminaire operations).

From 2028 onwards, LED luminaires begin to approach their end of life, thus requiring a huge financial outlay for replacements. Given this end of useful life information of street light assets, a Phased Asset Replacement Program is recommended, which stretches out the plan beginning in 2025, and allows for a more realistic and feasible implementation.

The recommended asset life cycle replacements implementation starting in 2025 and continuing beyond 2025, will allow for a realistic asset replacement program for luminaires. With the 2024 10-year budget, this indicates an average annual funding gap of $4.3 million.

Street lighting staff are aware of some of the additional resource requirements needed to meet and sustain some of the proposed service levels. Further analysis needs to be conducted to ascertain the full infrastructure gap once proposed targets have been determined for all levels of service metrics.

Traffic Signals and Related Electrical Devices

Within the next 10 years, there is minimal infrastructure gap. This means the City is projected to have sufficient funds to maintain the traffic signals and related electrical devices infrastructure in a state of good repair, as most of the assets are still within their expected useful life.

However, the budget to replace traffic signals includes replacement of other assets related to the intersection such as sidewalks, tactile plates, pavement markings, signs and road pavements. The analysis only considers the traffic signals replacement need. Additionally, as standards and technology change, traffic signal infrastructure must be re-designed, updated, and replaced to meet new standards. As such, the infrastructure gap demonstrated through this analysis is lower than in reality.

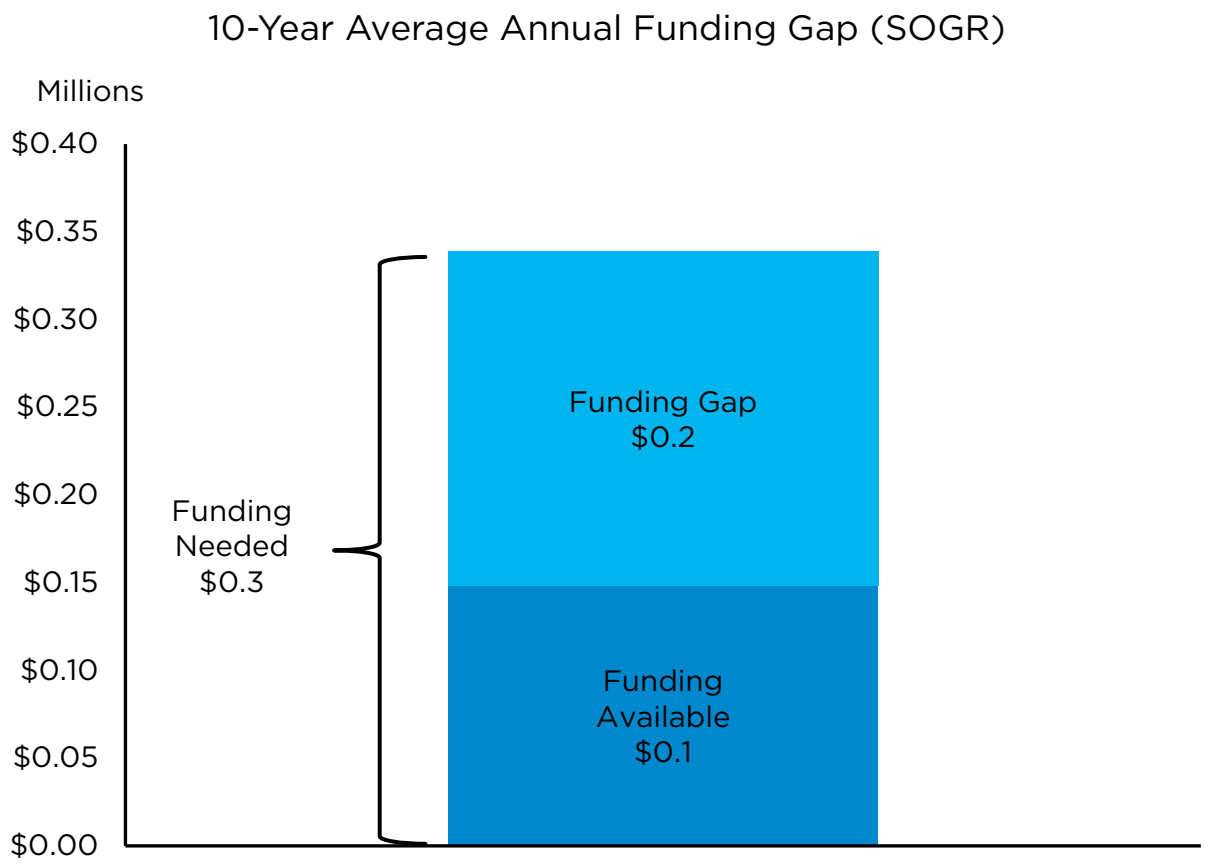
As of 2025 budget cycle, the required funding has been approved to meet the APS pushbutton LOS target.

Roadside Infrastructure

For this iteration, there is no infrastructure gap as there are no City noise wall replacement needs. However, as the City continues to acquire private noise walls and fences, and City-owned noise walls age past their recorded useful life, the need to maintain the network in a state of good repair will continue to increase.

As part of the City's noise wall retrofit program, the City converts privately owned noise walls and fences that meet required noise levels to City-owned assets. The replacement of privately owned noise walls is based on condition, with the intent to replace the walls that are in very poor condition. The noise walls will stay under private ownership until the City takes responsibility of the assets. Until then, it is the responsibility of the property owner to maintain these noise walls. As such, these replacements rank lower when prioritizing SGR replacements and have not been included in the forecast. Currently, there is no additional funding gap as a result of proposed LOS. As the City continues to set LOS targets, additional funding gap will be determined.

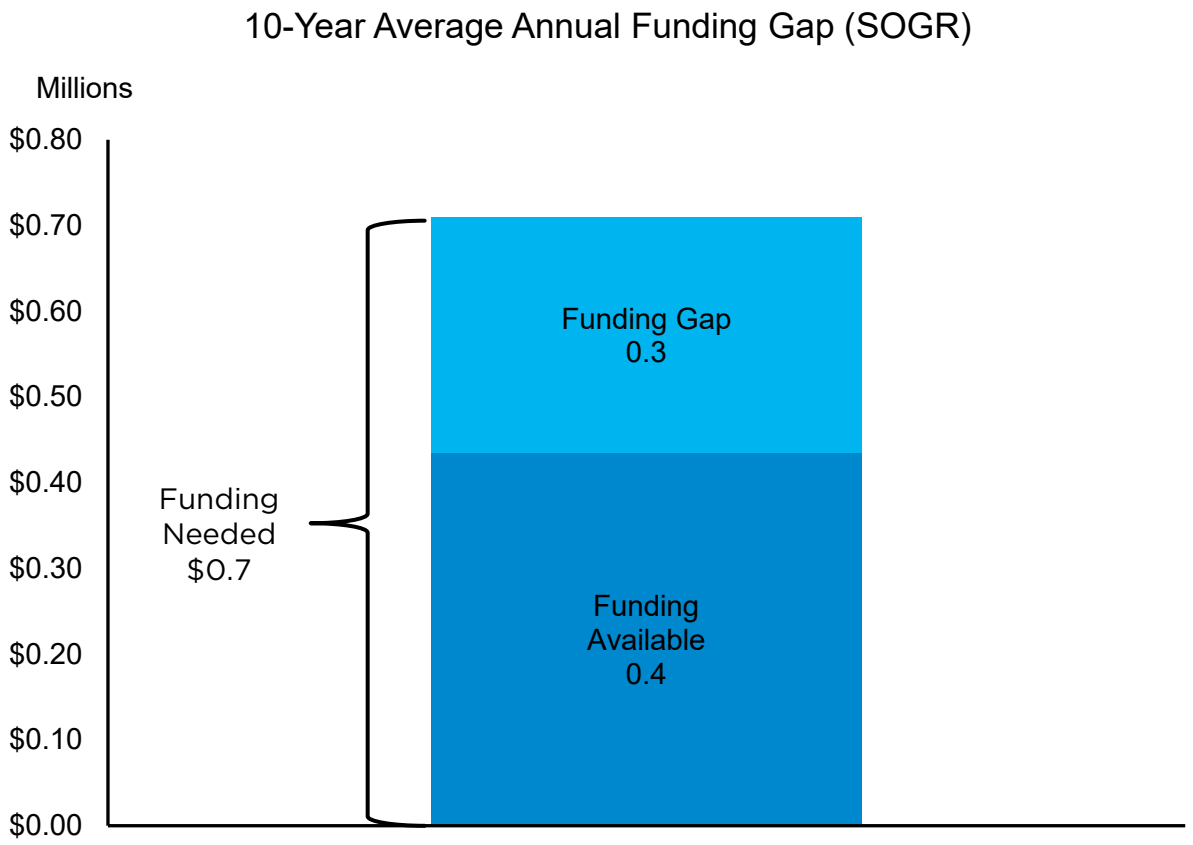
Municipal Parking



In the current state of Municipal Parking, there is an annual average infrastructure gap of approximately $0.2 million.

Currently, there is no additional funding gap as a result of proposed LOS. As the City continues to set LOS targets, additional funding gap will be determined.

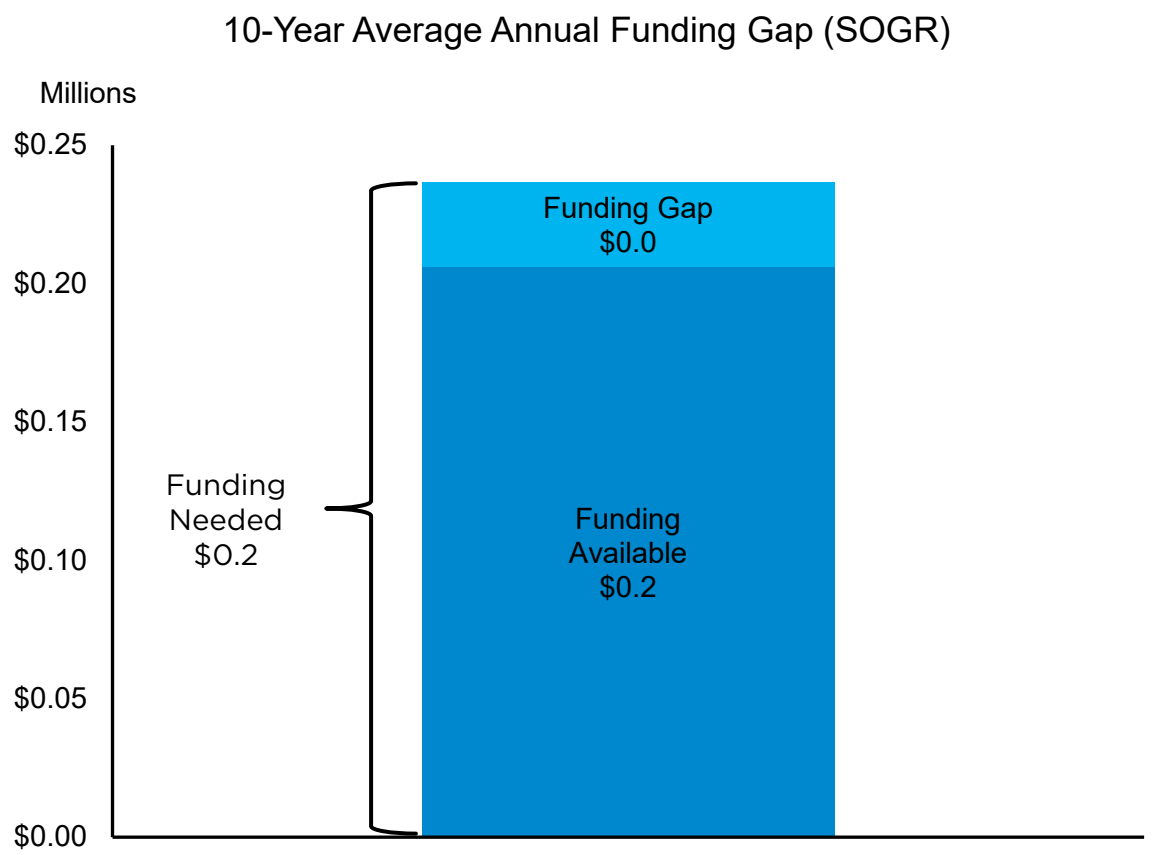
Operational Equipment



The 10-year average annual funding needed in comparison to the funding available creates an average annual infrastructure gap of $0.3 million.

Currently, there is no additional funding gap as a result of proposed LOS. As the City continues to set LOS targets, additional funding gap will be determined.

Intelligent Transportation Systems (ITS)



The overall average annual infrastructure gap for Intelligent Transportation Systems is $30,600 and only begins in year 2030.

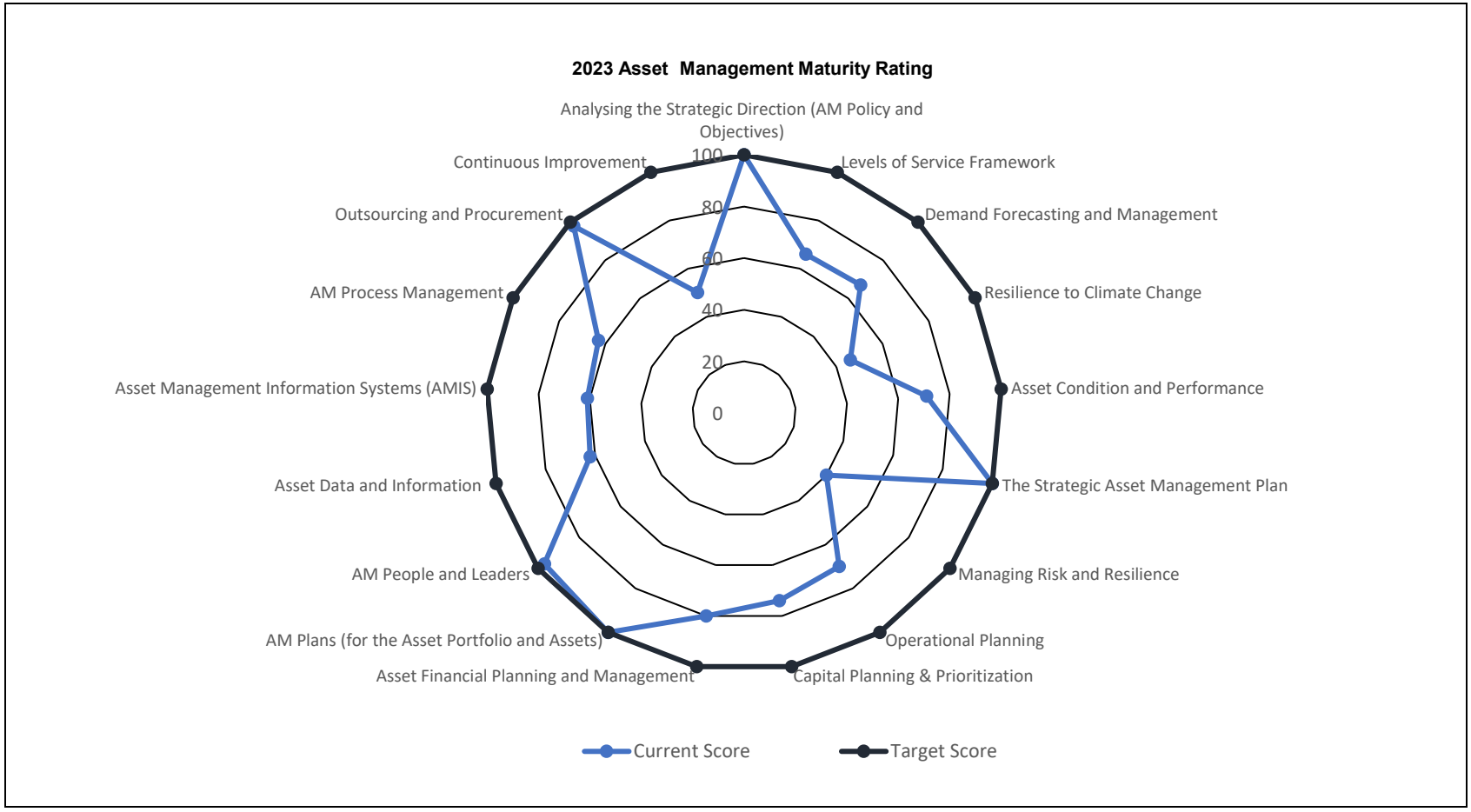
Currently, there is no additional funding gap as a result of proposed LOS. As the City continues to set LOS targets, additional funding gap will be determined.

Continuous Improvement & Maturity

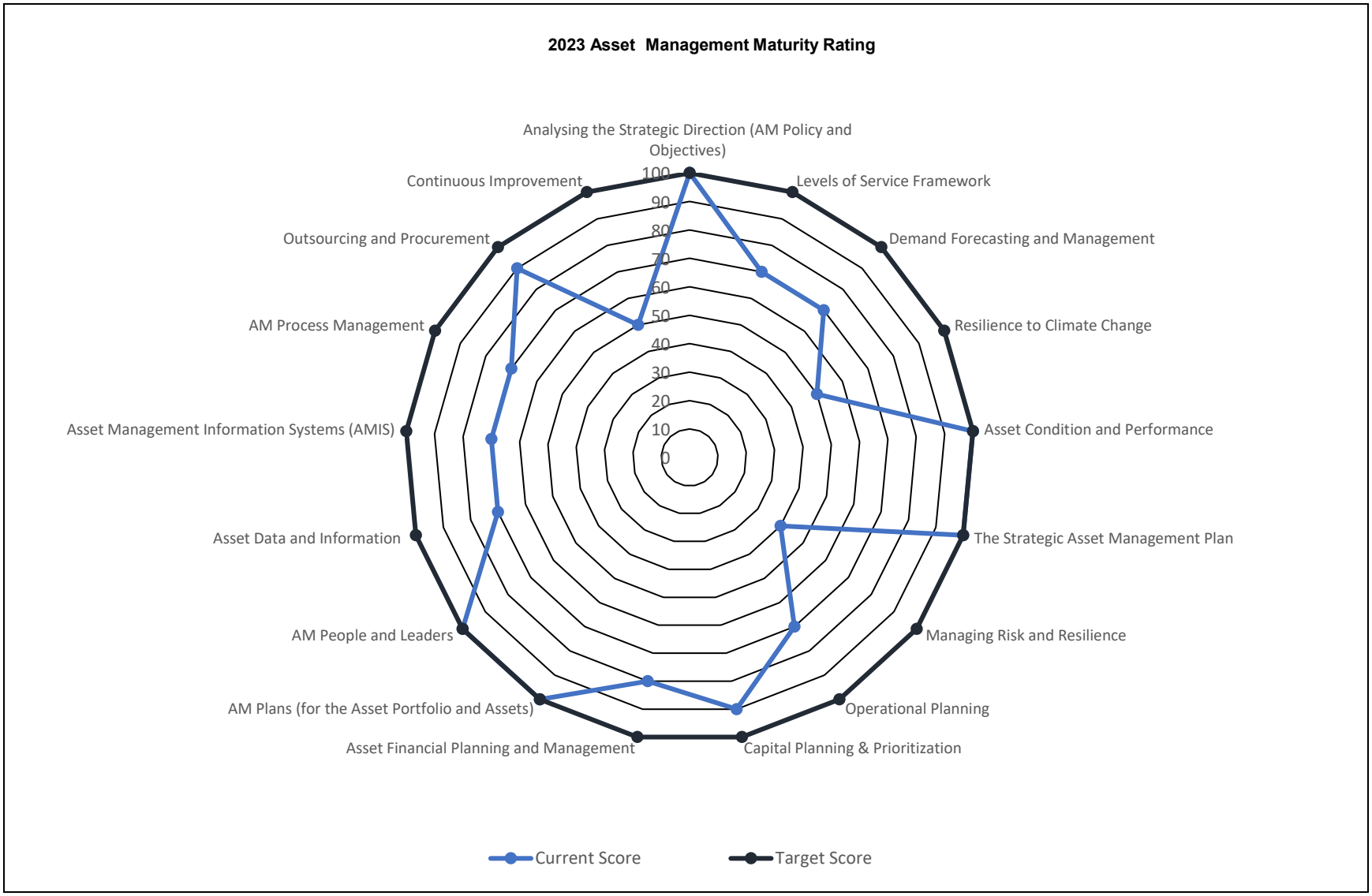
Maturity Assessments

The radar graph(s) below are based on a 2023 maturity assessment. As the service areas mature in each category, they will expand outwards towards the outer ring (Target).

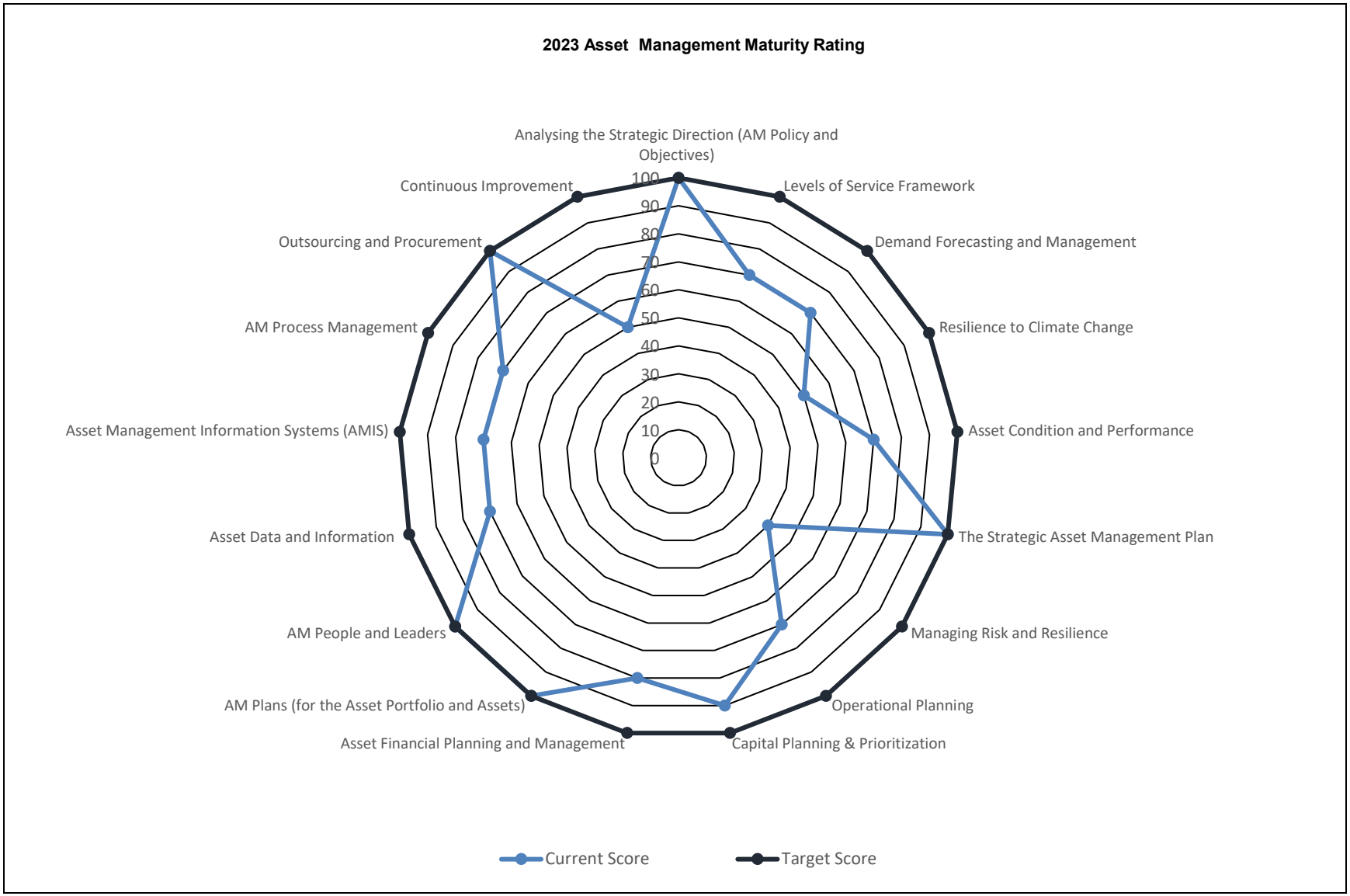
Maturity Assessment – Roads Service Area



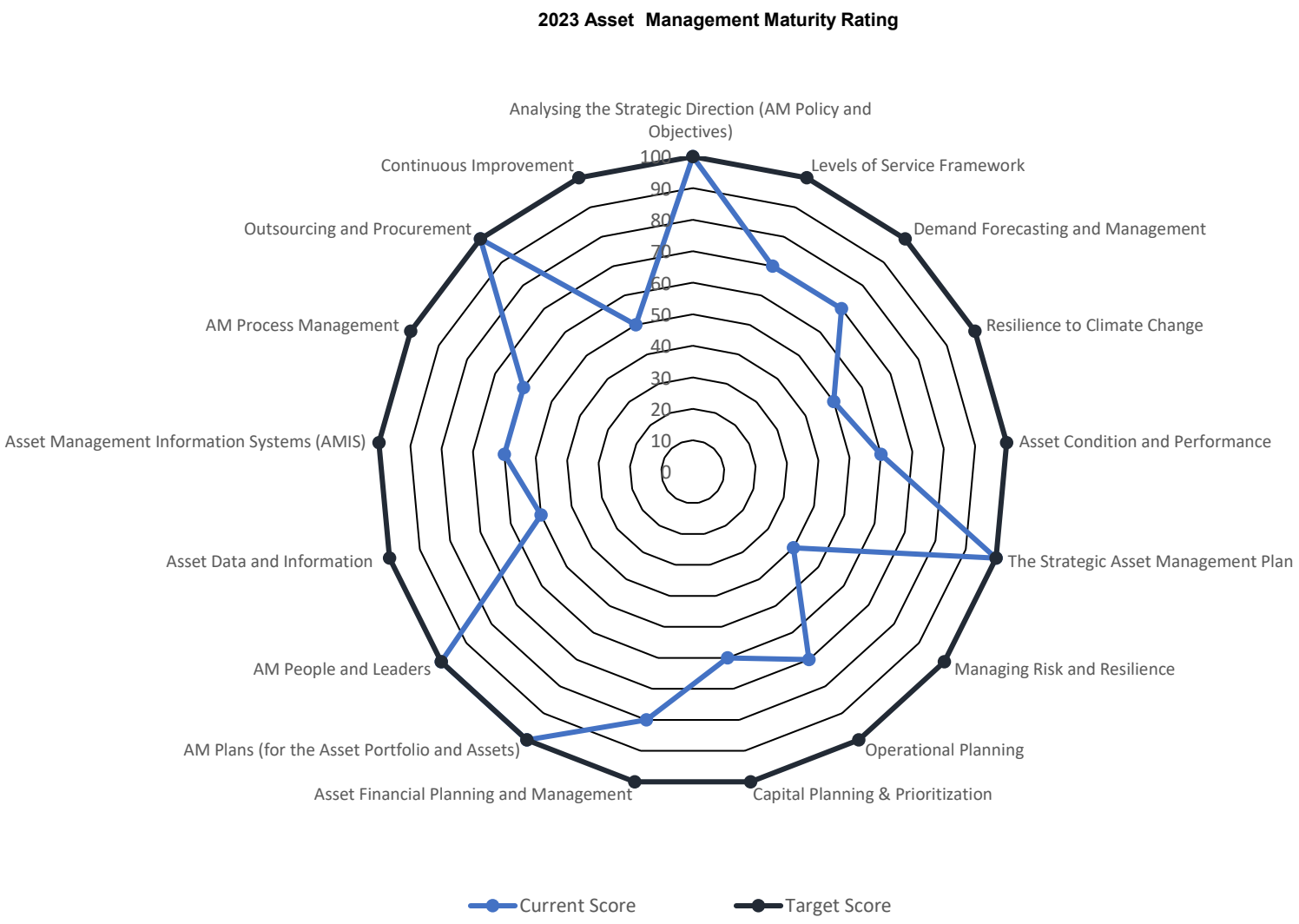
Maturity Assessment – Road Pavement



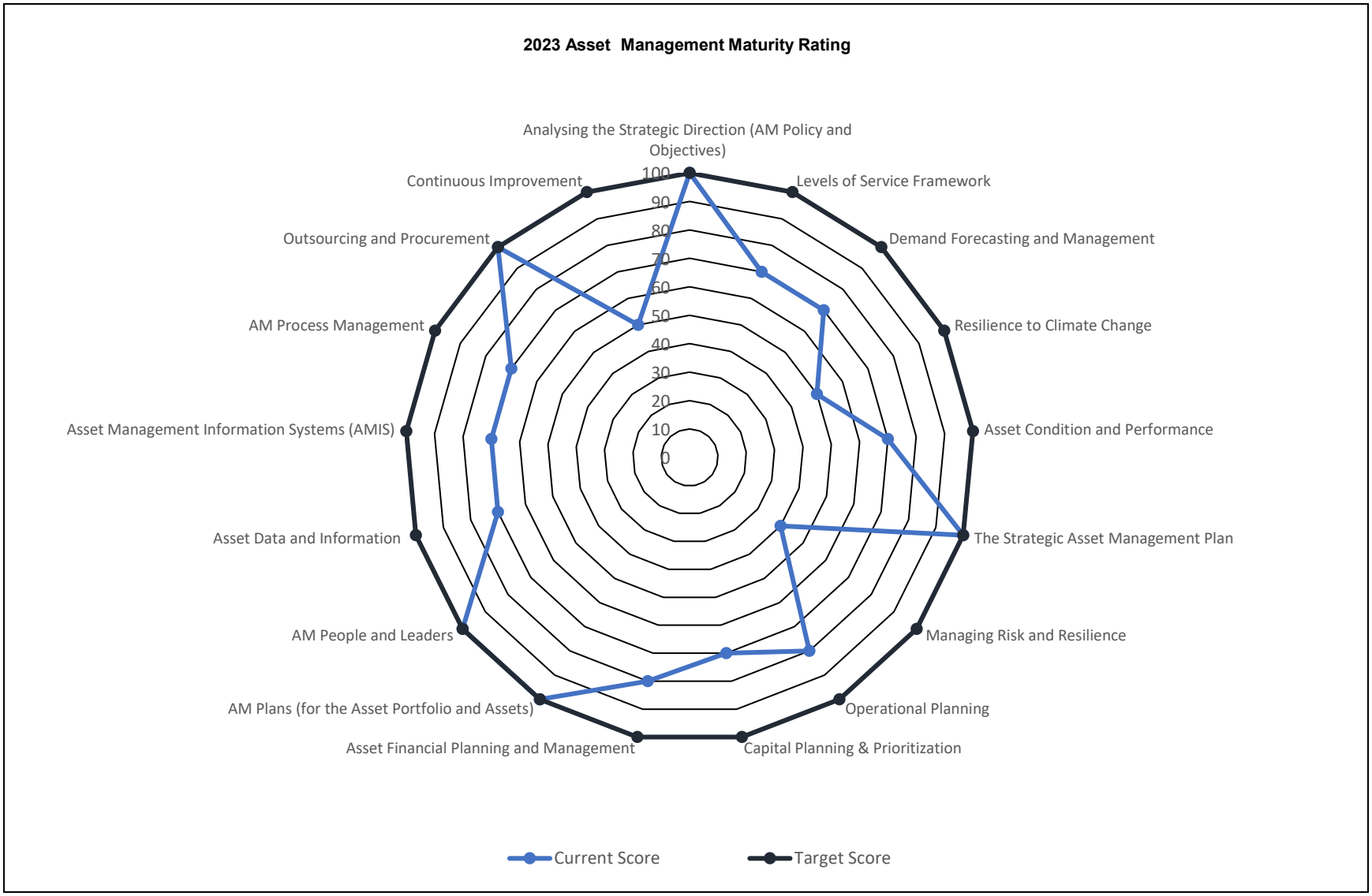
Maturity Assessment – Structures



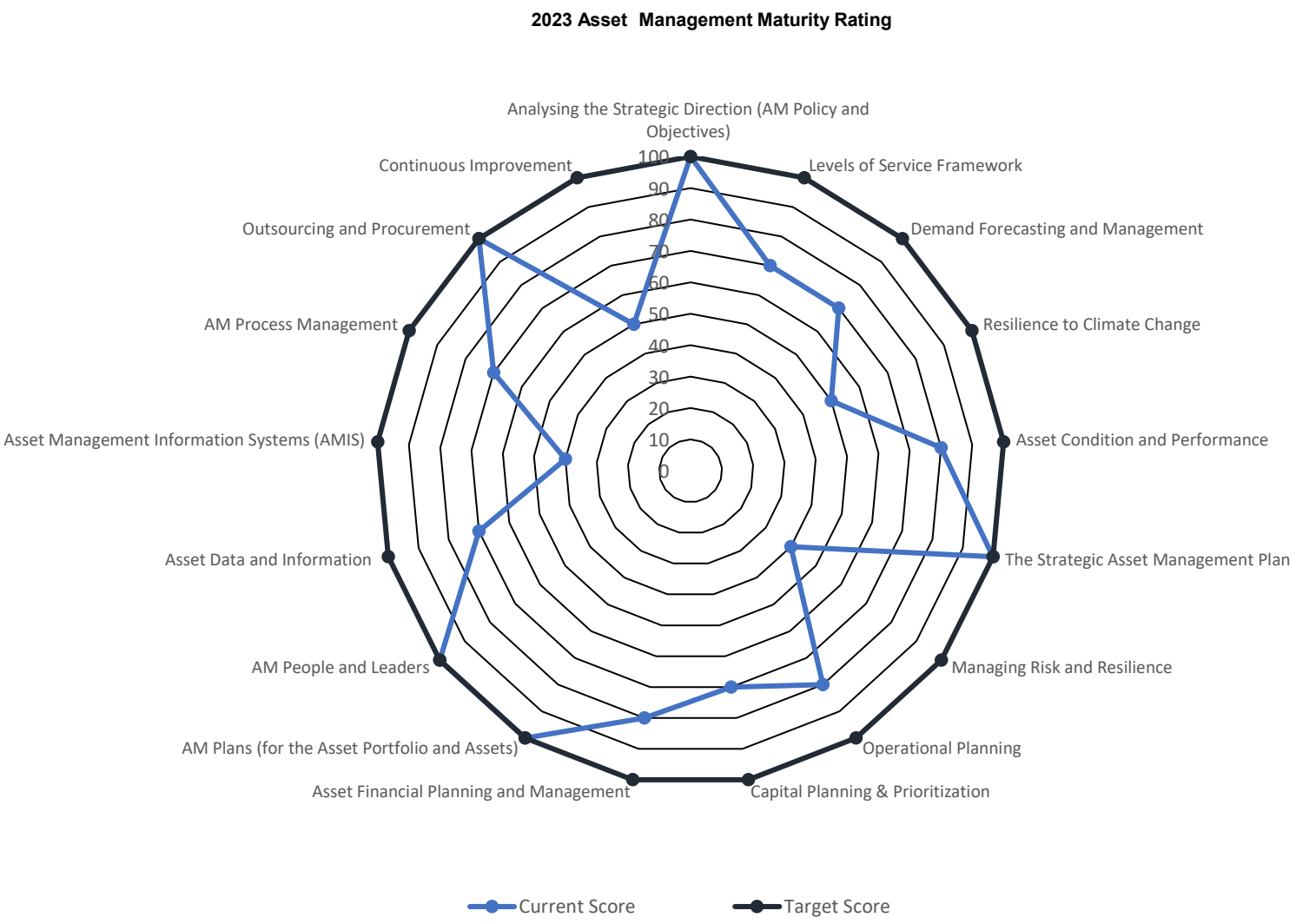
Maturity Assessment – Roadside Trail Network



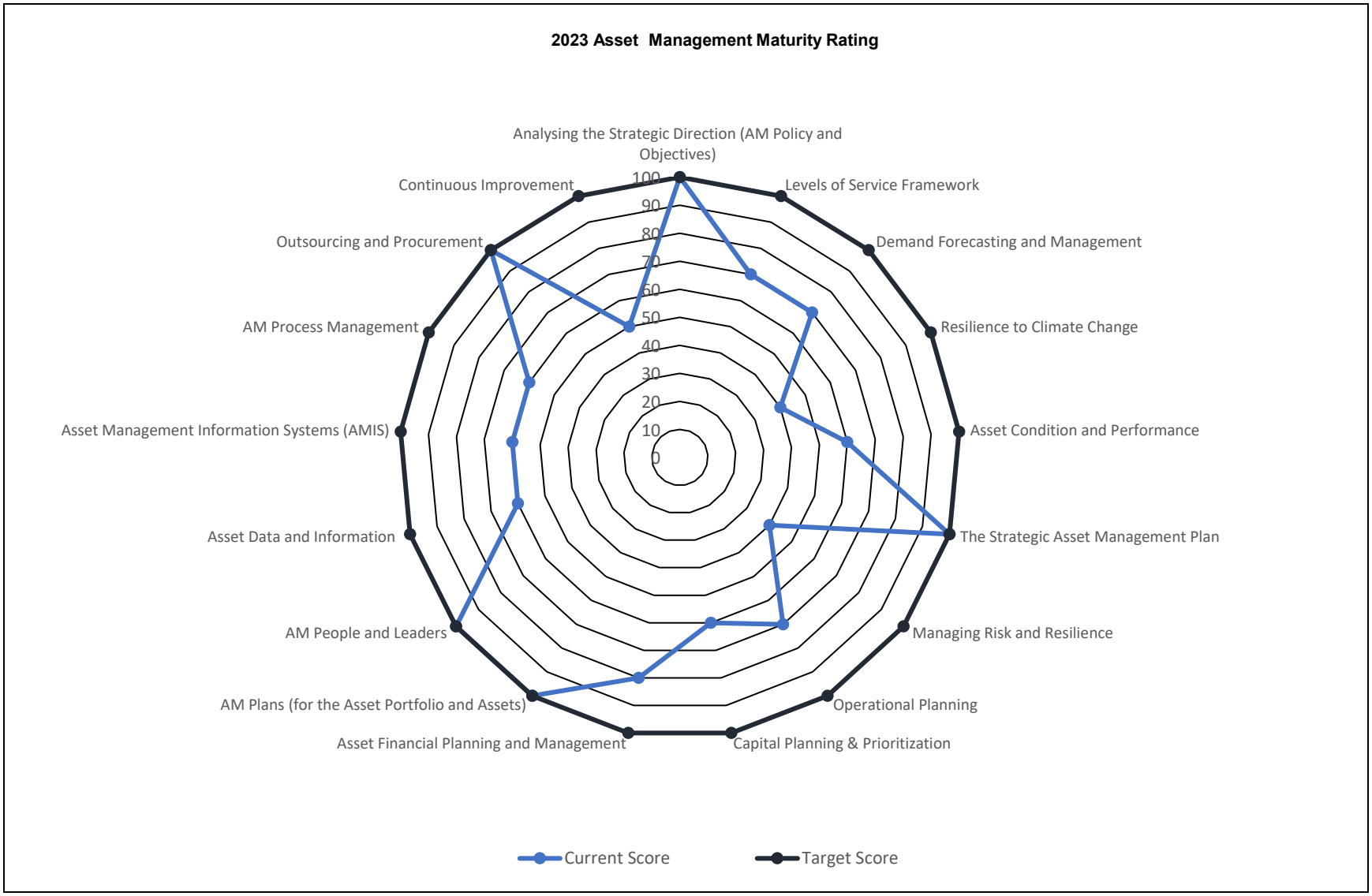
Maturity Assessment – Street Lighting



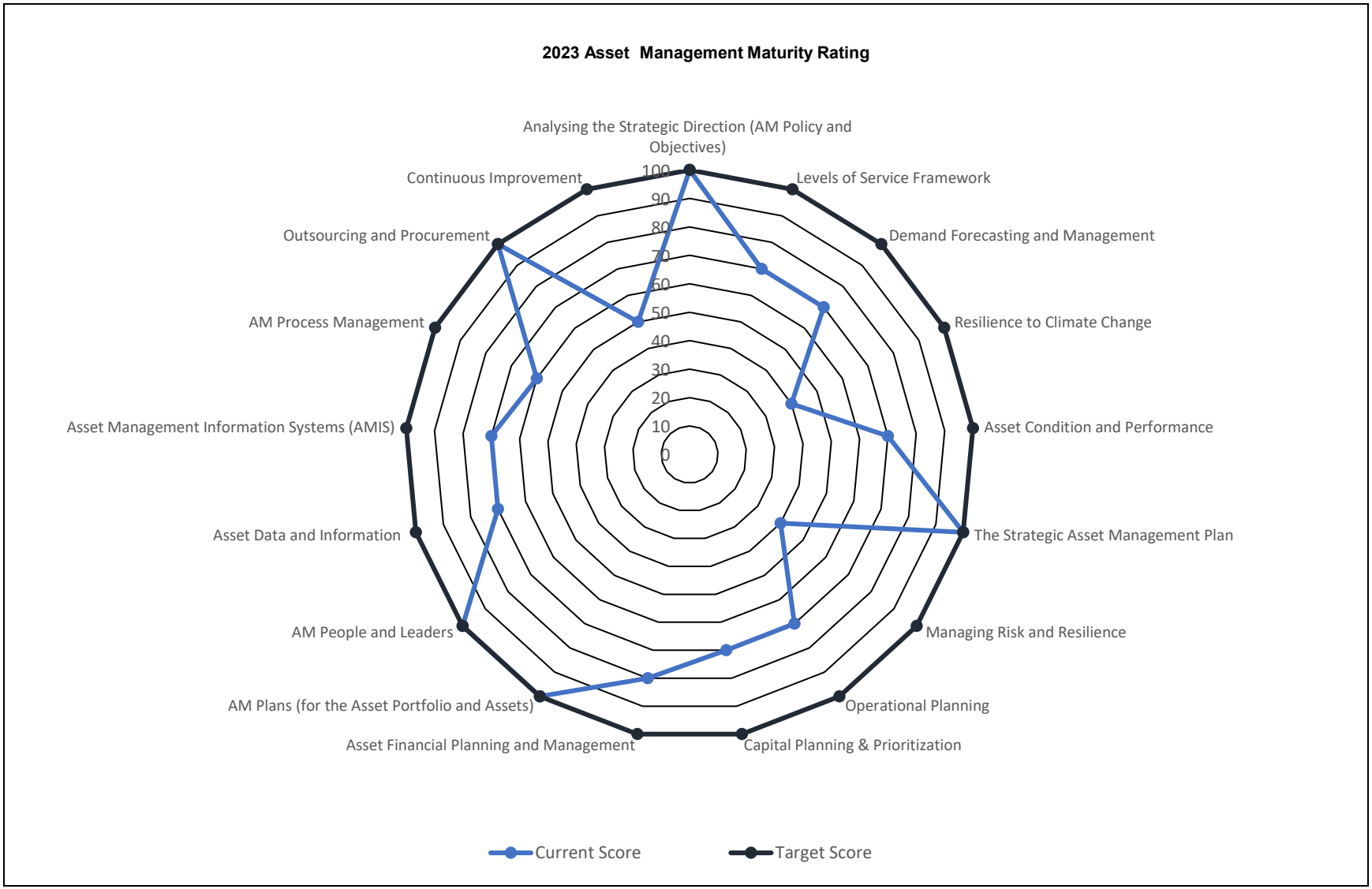
Maturity Assessment – Traffic Signals and Related Electrical Devices



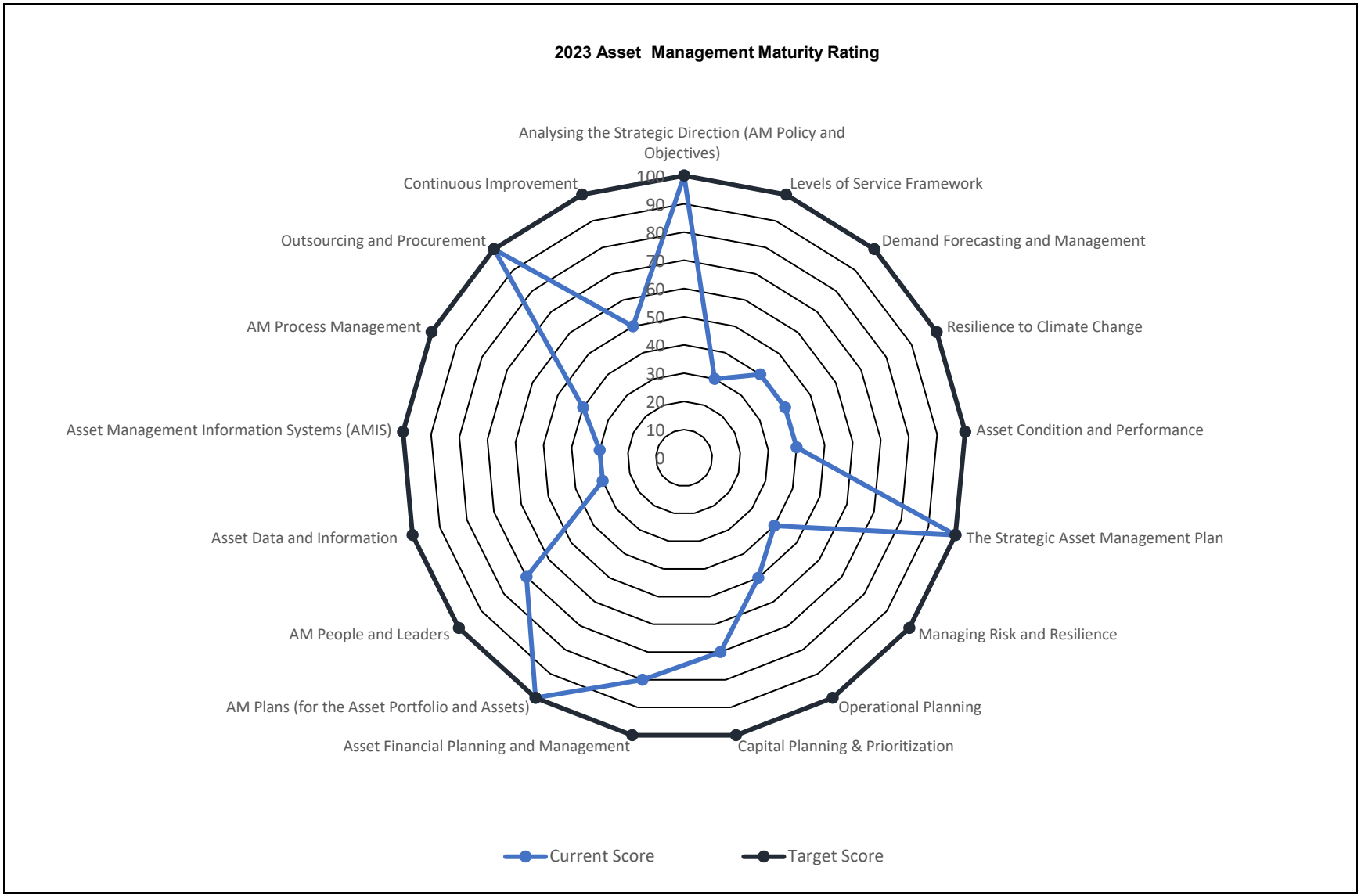
Maturity Assessment – Roadside Infrastructure



Maturity Assessment – Municipal Parking



Maturity Assessment – Operational Equipment



Maturity Assessment – Intelligent Transportation Systems (ITS)

Continuous Improvement Plan

Task No	Continuous Improvement Task	Asset Class	Estimated Timing	Value/Impact	Required Resources
State of Infrastructure (SOI)					
SOI-01	Review replacement cost models and develop a sustainable framework for periodically updating and reporting on replacement costs.	All	2024-2025	Replacement costs contained within CityWide, the City's Tangible Capital Asset System, are based on historical costs. Replacement and renewal costs change over time and may be significantly understated.	Internal
		Structures	2024-2025	Updates the current costing data in relation to the recent expenses from capital projects. Allows staff to isolate administrative costs vs. replacement costs.	
		Signs and Posts	2024-2025		
SOI-03	Review and update ownership and installation-date information.	Roadside Trail Network	2024-2025	Ensures accurate asset information to help make informed decisions.	Internal
		Roadside Infrastructure	2024-2025		
SOI-04	Expand use of Infor to track capital delivery contracts against roadway assets.	Road Pavement	2022-2026	Better asset lifecycle costing and improve processing time for TCA reporting.	Internal
		Structures			
SOI-05	Catalogue all asset types within the City's GIS environment.	All	2023-2025	Developing the catalogue, inventory and data model will enable the service area to better manage the data.	Internal

Task No	Continuous Improvement Task	Asset Class	Estimated Timing	Value/Impact	Required Resources
SOI-06	Use of LiDAR for data collection of non-core assets in the right of way.	All	2023-2025	Having accurate information about the location of each asset will be used to better plan inspection, renewal and replacement activities. The activity will also serve to validate the accuracy of existing asset inventory information.	External
SOI-07	Expand use of Infor Contract Management and Infor Mobile Technology.	All	2024-2025	This activity facilitates the allocation of capital costs to the appropriate asset type and provides for better lifecycle costing and valuation. Will also reduce processing time for TCA reporting.	Internal
SOI-08	Expand hierarchy to include additional assets, and asset sub types.	All	2025-2027	Includes all asset types within asset class, ensuring a complete asset class.	Internal
SOI-09	Update the Maturity Assessment and Continuous Improvement Plan and report back to Leadership Team.	All	Ongoing	Providing Leadership Team and Council with regular updates on the progress made towards asset management planning will ensure that we continue to mature in our asset management practices.	Internal
Levels of Service (LOS)					
LOS-01	Review condition assessment framework.	Road Pavement Structures Street Lighting	2022-2025	In addition to being required to meet O. Reg. 588/17, level of service targets enable the service area to track progress against established targets.	Internal

Task No	Continuous Improvement Task	Asset Class	Estimated Timing	Value/Impact	Required Resources
		Roadside Infrastructure			
LOS-02	Develop condition assessment framework for all high priority assets identified.	All	2024-2025	Provides a consistent approach to collect information that will allow service groups to identify and prioritize infrastructure needs.	Internal and External
LOS-03	Define target level of service for all major asset categories.	All	2025	In addition to being required to meet O. Reg. 588/17, having levels of service established will enable the service area to track progress against targets.	Internal
LOS-04	Work with Corporate Finance to formalize performance targets and sustainable funding for all roads assets.	All	2025	O. Reg. 588/17 requires the establishment of service level targets by 2025.	Internal
Lifecycle Activities (LCA)					
LCA-01	Utilize the lifecycle information within RPMS and BTMS to explore and develop enhanced repair and preservation approaches and strategies.	Road Pavement Structures	2024-2025	Enhanced and expanded inspection, preservation, repair and renewal strategies can extend the life of both road and structure assets and improve overall performance of assets.	Internal
LCA-03	Review lifecycle costing assumptions and allocations.	All	2024-2025	Ensuring the correct allocations and lifecycle costing assumptions are used	Internal

Task No	Continuous Improvement Task	Asset Class	Estimated Timing	Value/Impact	Required Resources
				will lead to more detailed forecasts for operating and capital budgets.	
LCA-04	Develop a risk assessment framework for all priority assets within the Roads Service Area.	All	2024-2026	A risk framework will enable the Roads Service Area to better prioritize funding availability across asset classes.	Internal and External
Financing Strategies (FS)					
FS-01	Leverage asset management data to drive business plans and budgets.	All	2025-2026	Aligns asset information that directly impacts budget decisions and planning.	Internal
FS-02	Acquire new Asset Investment Planning (AIP) system.	All	2024-2025	Integrates strategic planning, budget, service level targets, and long-term capital expenditure decision-making, using data from asset lifecycles. Could potentially replace road pavement, sidewalk, trails, and structures management systems.	Internal and External

Appendix A

The table below outlines the different condition ratings used across Roads. Where condition information is not available, a condition score is assumed based on the age and remaining useful life.

Condition Rating Scale Per Asset Class

Asset Class	Asset Type	Condition Rating Scale	Condition Rating				
			Very Good	Good	Fair	Poor	Very Poor
Road Pavements	All	PQI (Pavement Quality Index)	80 - 100	70 - 79	55 - 69	20 - 54	0 - 20
Structures	Bridges and Culverts	BCI (Bridge Condition Index)	90 - 100	70 - 89	60 - 69	30 - 59	0 - 29
	Retaining Walls	10-point scale	9 - 10	7 - 8	5 - 6	3 - 4	1 - 2
Roadside Trail Network	Sidewalks and Engineered walkways	% RUL (Remaining Useful Life)	>75%	36% - 75%	14% - 35%	3% - 13%	< 3%
	Multi-use Trails	PQI	80 - 100	70 - 79	55 - 69	54 - 20	0 - 19

Asset Class	Asset Type	Condition Rating Scale	Condition Rating				
			Very Good	Good	Fair	Poor	Very Poor
	Cycling Supportive Elements	% RUL	> 80%	60% – 79%	30% – 59%	10% - 29%	< 9%
Street Lighting	Street Light Plants	% RUL	> 80%	60% - 79%	40% - 59%	20% - 39%	< 19%
	Luminaires	% RUL	> 73%	60% - 72%	46% - 33%	26% - 32%	< 25%
	Monitoring Control Systems	% RUL	> 80%	50% - 79%	20% - 49%	10% - 19%	< 10%
Traffic Systems and RED	Traffic Signal Plant	% RUL	> 72%	42% - 71%	12% - 41%	2% - 11%	< 2%
	Traffic Controller Cabinets and Emergency Vehicle Pre-Emption	% RUL	> 25%	10% - 24%	5% - 23%	0% - 4%	< 0%
Roadside Infrastructure	Noise Walls	10-point scale	9 - 10	7 – 8	5 – 6	3 – 4	1 – 2
	Signs and Posts	Pass or Fail	-	Pass	-	Fail	-

Asset Class	Asset Type	Condition Rating Scale	Condition Rating				
			Very Good	Good	Fair	Poor	Very Poor
Municipal Parking	Parking Lots	%RUL	85%	55%	24%	8%	1%
	Parking Machines	Physical condition	Very Good	Good	Fair	Poor	Very Poor
Intelligent Transportation Systems (ITS)	CCTV Cameras	% RUL	> 80%	53% - 79%	33% - 52%	6% - 32%	< 5%
	Speed Awareness Devices	% RUL	> 60%	20% - 59%	0% - 19%	Not functional	Not functional

Appendix B

Community Levels of Service

Mississauga's Road and Bridges Network, Level of Connectivity and Road Classification Distribution.

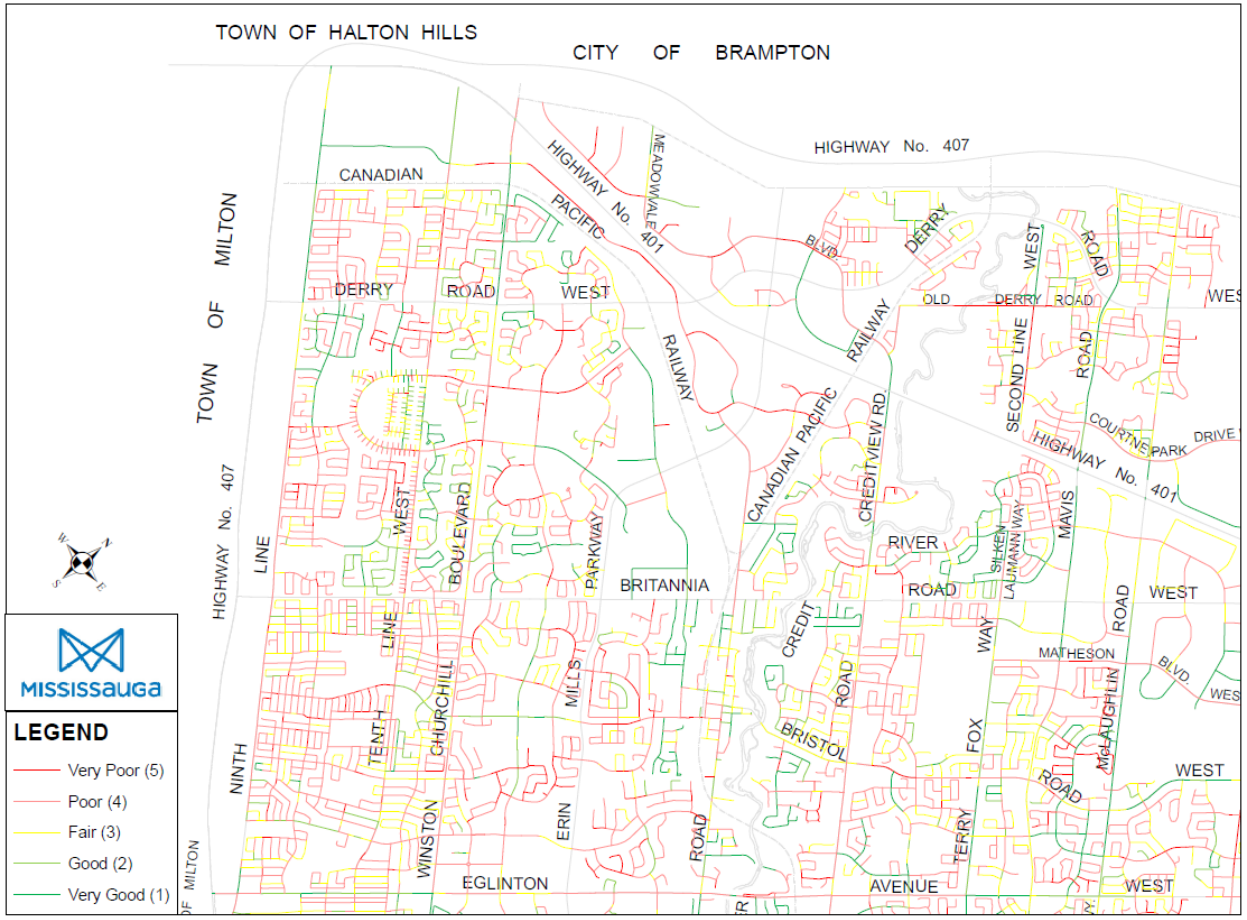


Figure 12: Mississauga's Current Road Pavement Conditions (Northwest Quadrant)

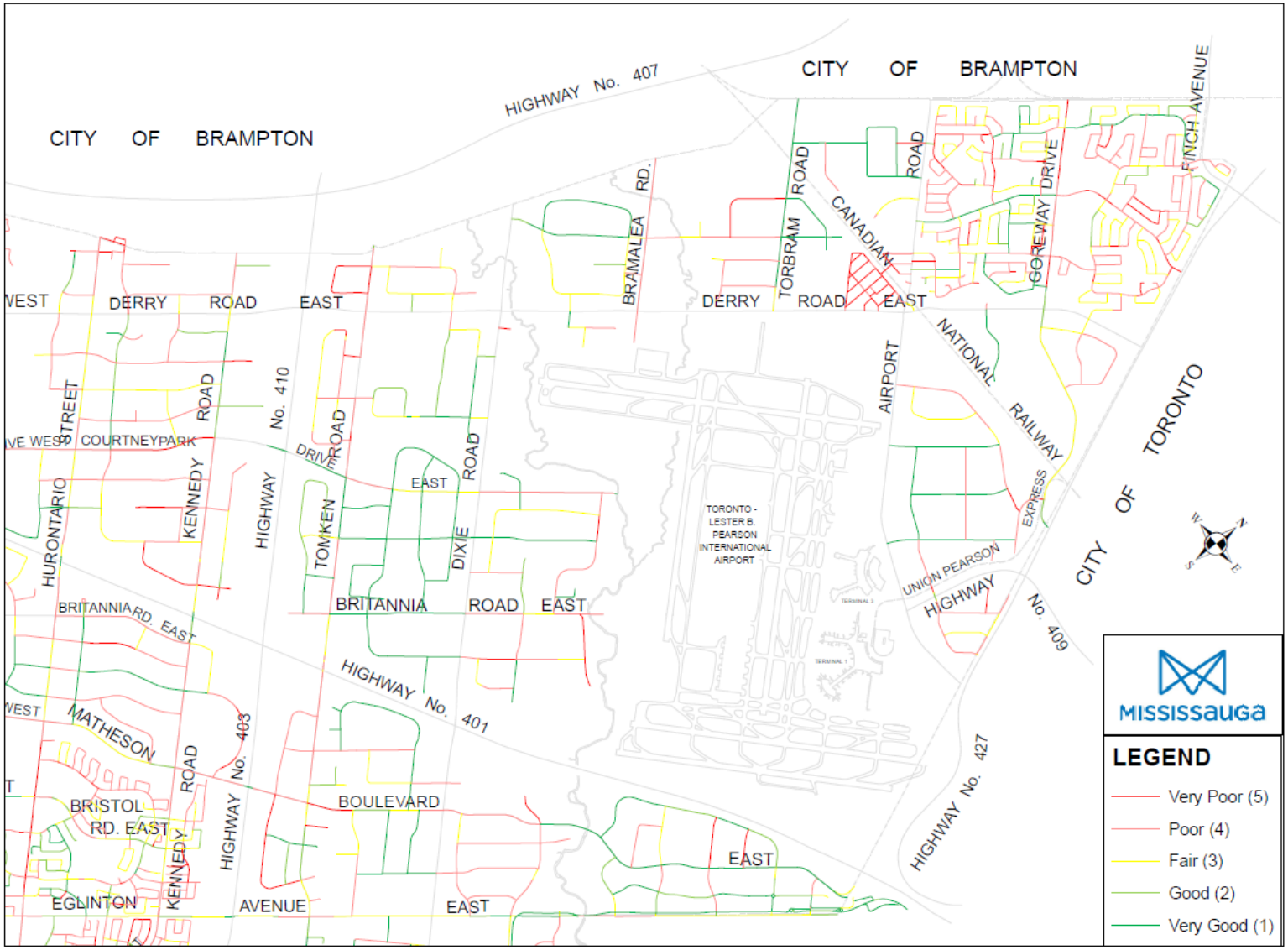


Figure 13: Mississauga's Current Road Pavement Conditions (Northeast Quadrant)

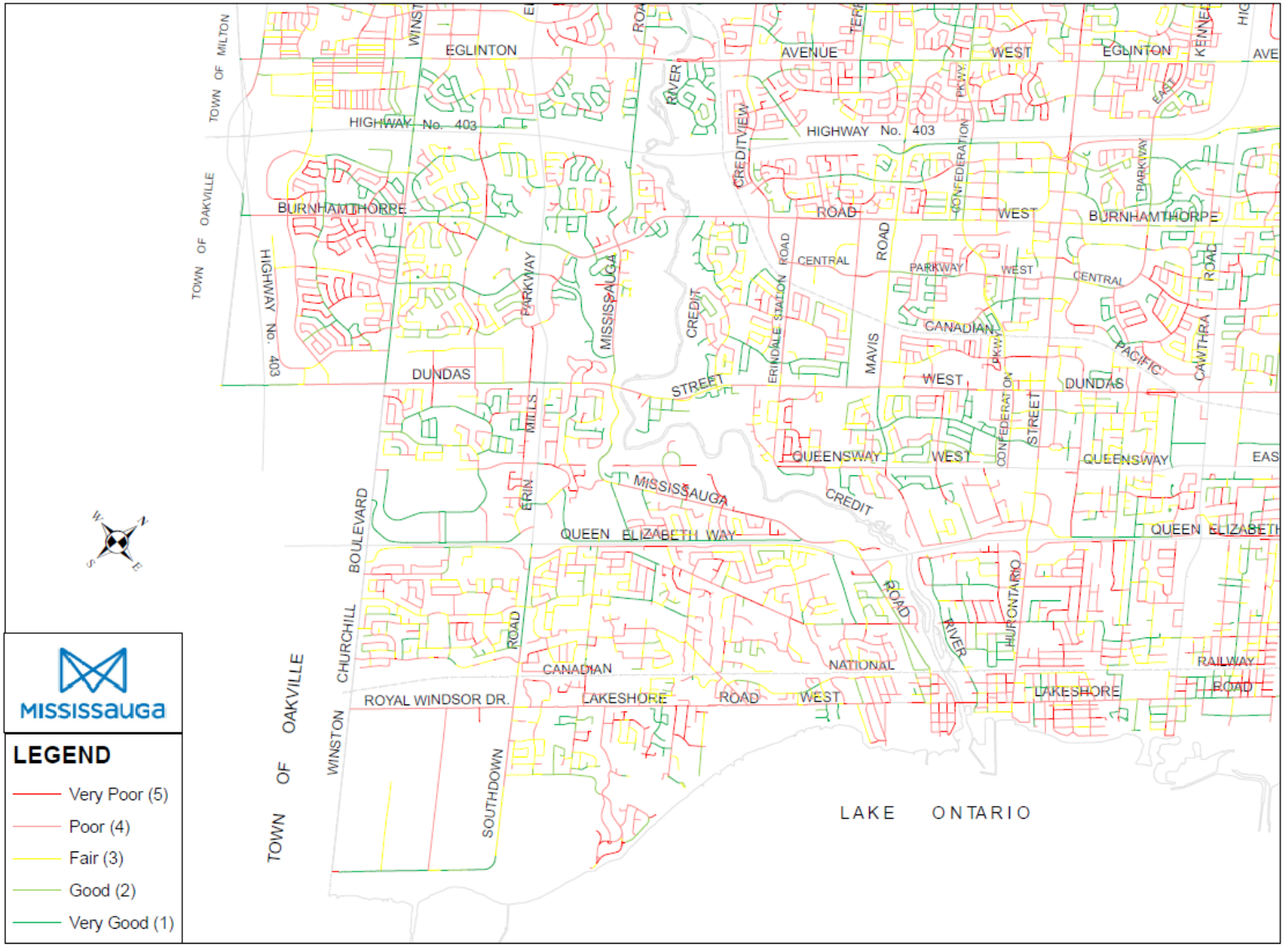


Figure 14: Mississauga's Current Road Pavement Conditions (Southwest Quadrant)

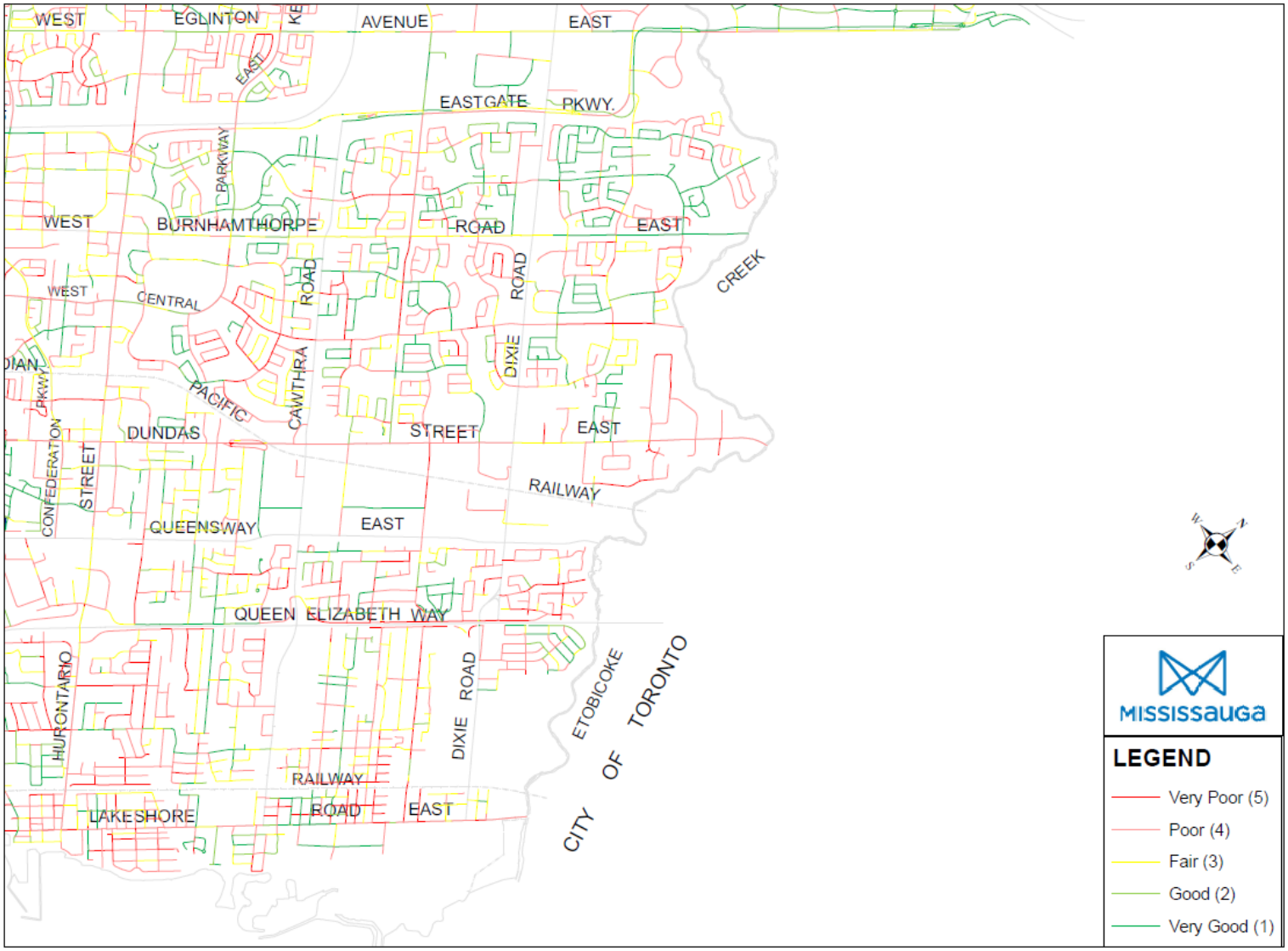


Figure 15: Mississauga's Current Road Pavement Conditions (Southeast Quadrant)

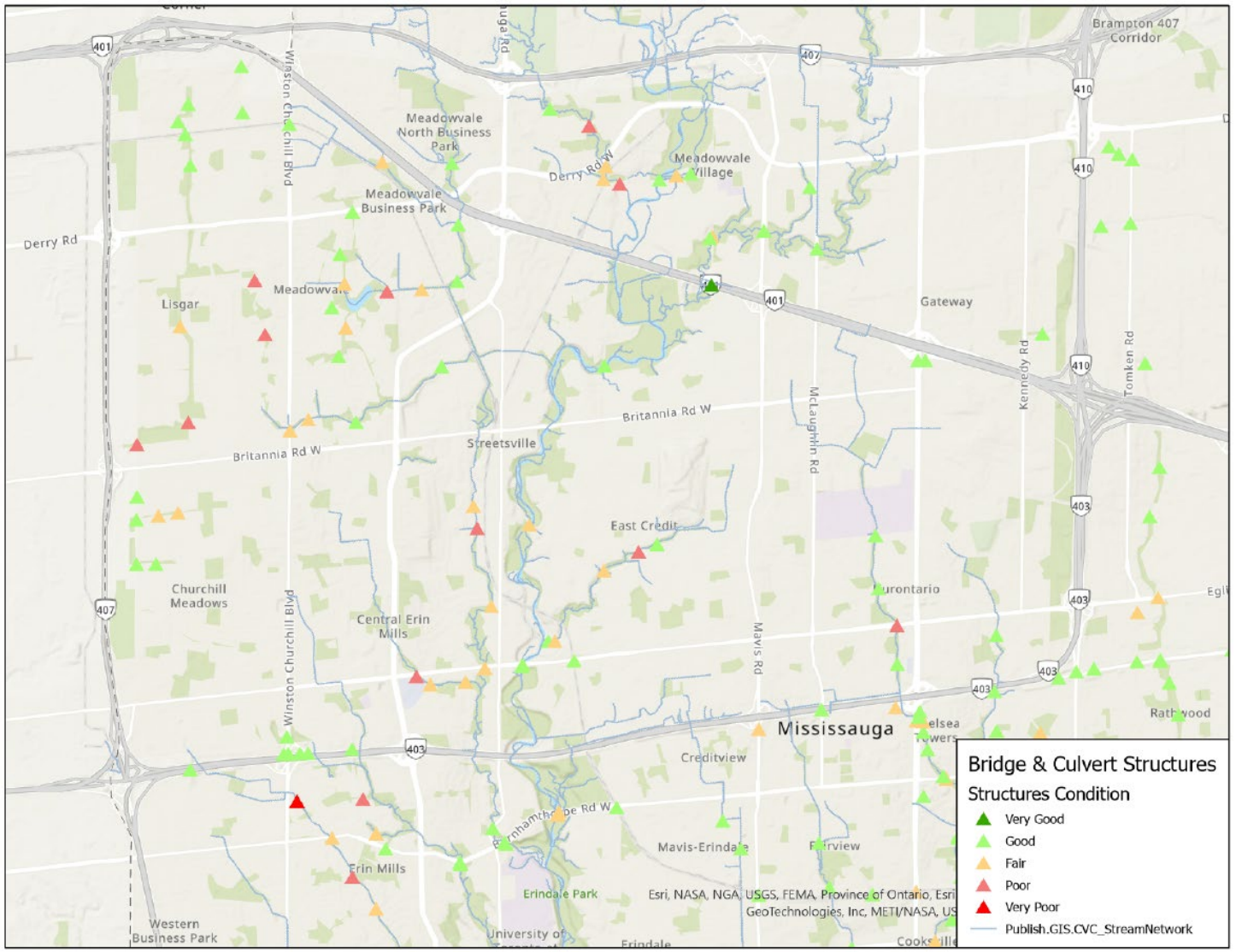


Figure 16: Mississauga's Current Bridge and Culvert Conditions (Northwest Quadrant)

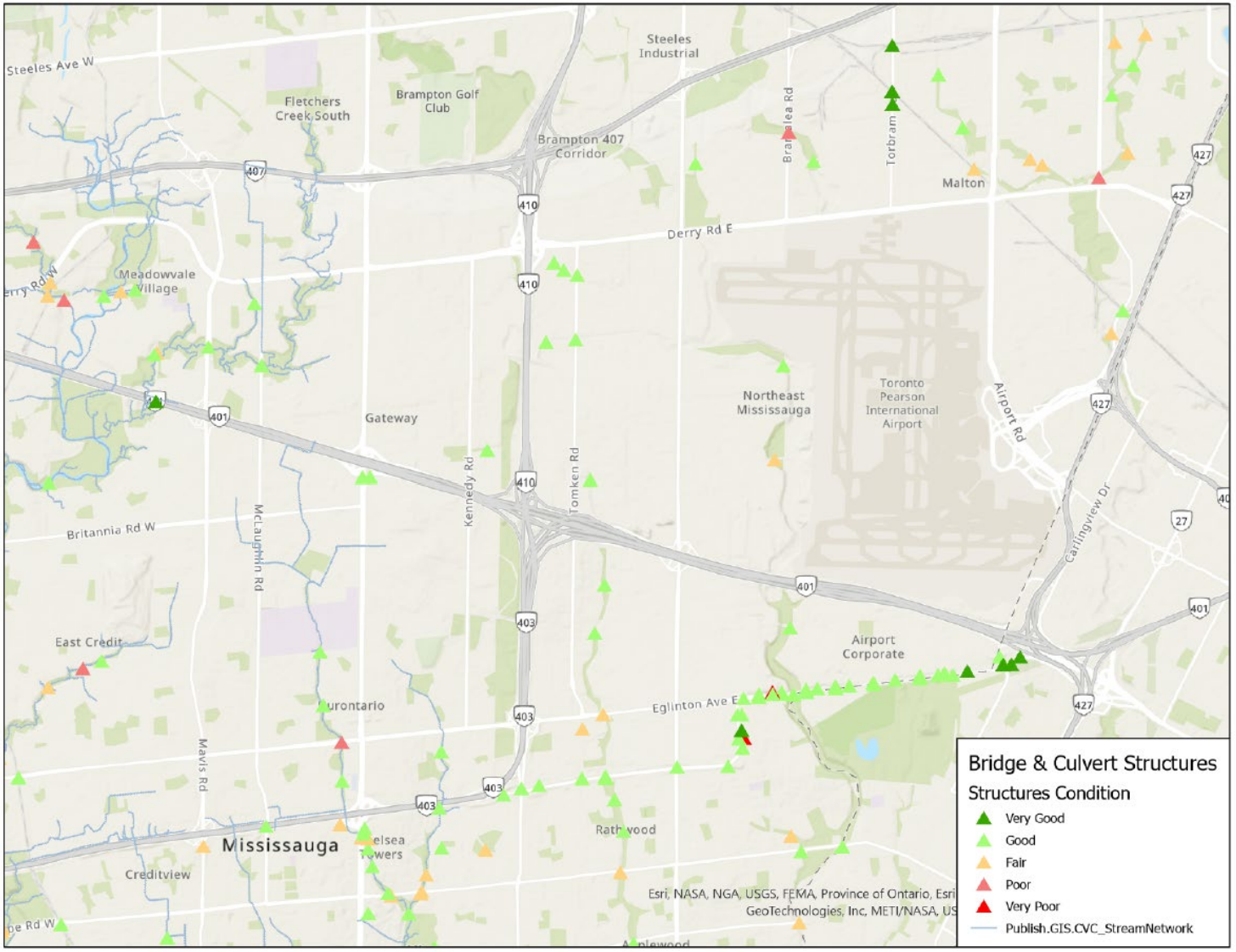


Figure 17: Mississauga's Current Bridge and Culvert Conditions (Northeast Quadrant)

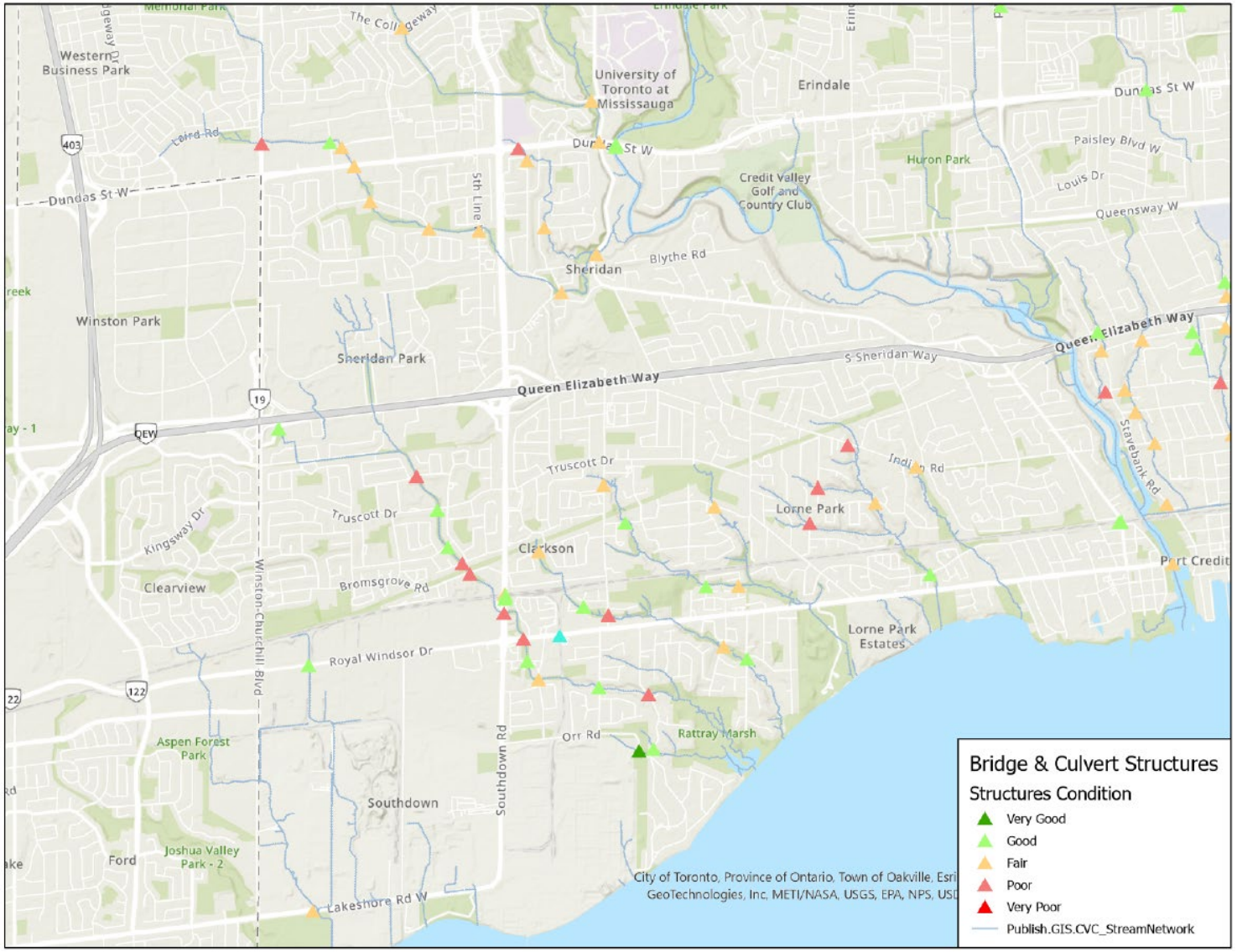


Figure 18: Mississauga's Current Bridge and Culvert Conditions (Southwest Quadrant)

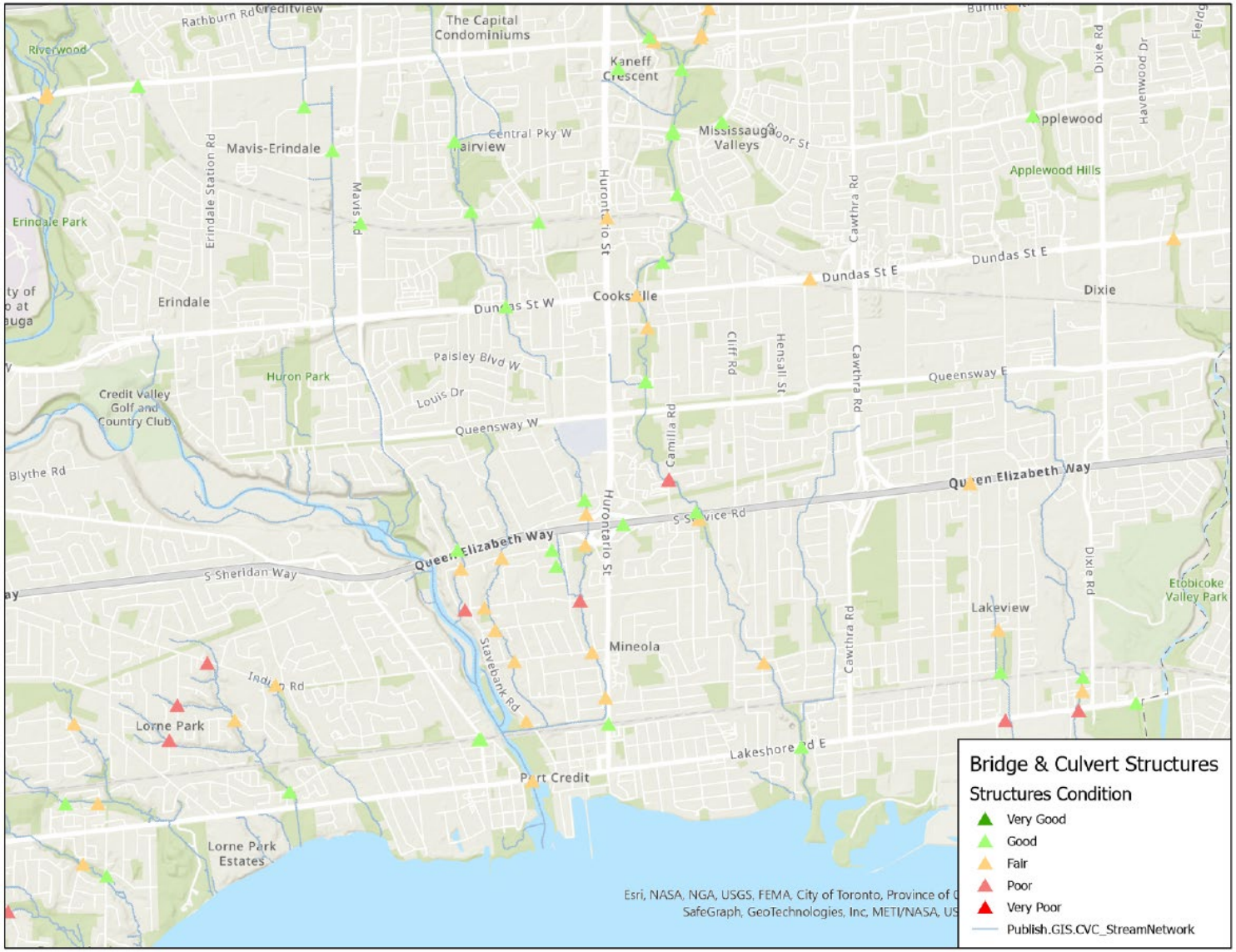


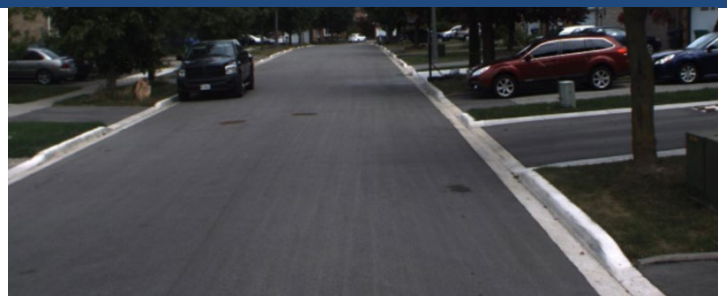
Figure 19: Mississauga's Current Bridge and Culvert Conditions (Southeast Quadrant)

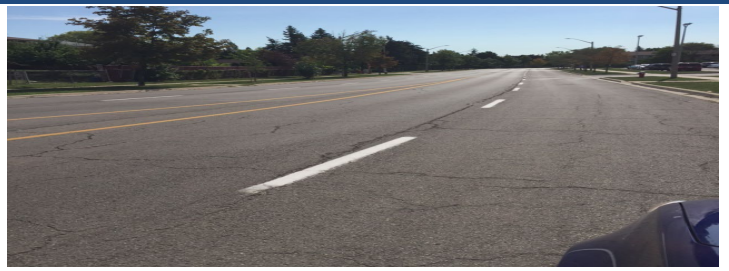
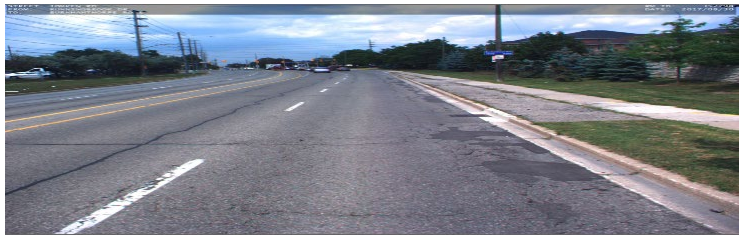
Appendix C

Level of Service Images and Descriptions

Road Pavements

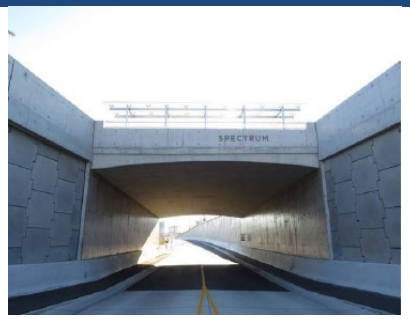
The City retains a consultant to collect pavement surface distresses/defects and ride quality information every four years. The most recent pavement condition survey took place in 2021, with the next survey planned for 2025. Pavement surface distress such as cracks and distortions are computed as Surface Distress Index (SDI), and pavement ride quality, which is a measure of the roughness of the pavement, is measured as Ride Condition Index (RCI). The SDI and RCI are used to calculate the overall Pavement Quality Index (PQI) that represents the overall condition of the entire pavement section out of a score of 100. A PQI score of 100 would represent a perfectly constructed road section with no surface distress and excellent ride quality. A score of 20 would represent a road that has been severely compromised and is no longer providing its intended level of service. While the images below show typical condition scores, they do not consider the ride comfort index (RCI), which is generated based on the roughness of the pavement.

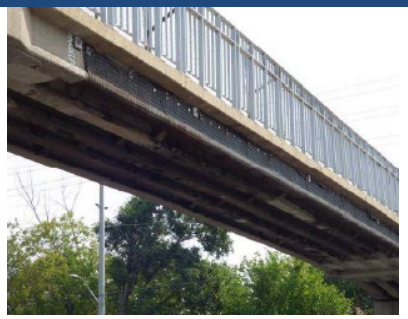
Condition Rating Scale		Rating Definition		PQI Rating
1	Very Good		Asset is in very good condition or better. It is new or recently rehabilitated. Asset is well maintained. Asset has a remaining service life (RSL) that exceeds 15 to 20 years. Asset is fit for future use.	80-100

Condition Rating Scale		Rating Definition		PQI Rating
2	Good		Asset is in good condition. Asset may have received repair or maintenance work. Asset is approaching mid-stage of expected service life. Asset has a remaining service life (RSL) of 10 to 15 years.	70-79
3	Fair		Asset is in fair or adequate condition. Asset shows signs of deterioration with some elements showing defects. Asset requires attention. Asset has a remaining service life (RSL) of 5 to 10 years.	55-69
4	Poor		Asset is in poor condition and is at risk of affecting service. Large portion of the asset system exhibits significant deterioration, and the condition is below standard. Asset is approaching end of service life. Asset has a remaining service life (RSL) of 1 to 5 years. Asset is not fit for future use.	20-54

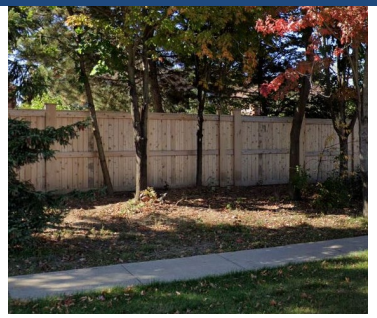
Condition Rating Scale			Rating Definition	PQI Rating
5	Very Poor		Asset is in very poor condition and is in major risk of affecting service. Large portion of the asset system exhibits significant deterioration, and the condition is below standard. Asset is approaching end of service life. Asset has a remaining service life (RSL) of 1 to 2 years. Asset is not fit for use.	0-19

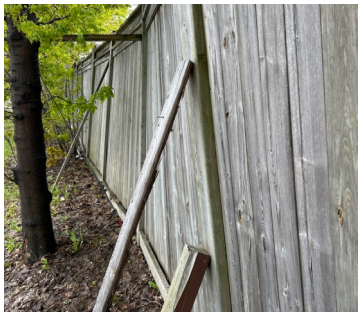
Structures

Condition Rating		Rating Definition			BCI
1	Very Good			The asset is typically new or recently rehabilitated.	90-100
2	Good			The asset is in good condition. Some elements show general signs of deterioration that may require attention. A few elements exhibit minor deficiencies.	70-89
3	Fair			The asset shows further signs of deterioration and requires attention. Some elements exhibit moderate deficiencies. Asset is in acceptable condition and components are functioning as intended.	60-69

Condition Rating		Rating Definition			BCI
4	Poor			The asset is approaching low standards. Many elements are approaching the end of their service life. A large portion of the elements exhibit significant deterioration.	30-59
5	Very Poor			The asset is in unacceptable condition with widespread signs of advanced deterioration.	<29

Noise Walls

Condition Rating		Rating Definition			Condition Score	Remaining Useful Life
1	Very Good			The asset is typically new or recently rehabilitated. No visible defects or isolated mild defects.	9-10	> 75%
2	Good			The asset is in good overall condition, with minimal/moderate isolated defects.	7-8	35% - 74%
3	Fair			The asset is in fair condition with moderate number of defects. Barrier may need some minor repairs or attention.	5-6	13% - 34%

Condition Rating		Rating Definition		Condition Score	Remaining Useful Life
4	Poor		The asset is in poor condition with noticeable amounts of defects. The barrier is below its operable state, with many elements approaching the end of their service life.	3-4	3% - 12%
5	Very Poor		The asset has an extensive number of defects or has sections that have failed. The barrier is in unacceptable condition and should be replaced or rehabilitated.	1-2	<3 %

Regulatory and Warning Signs

Condition Rating	Rating Definition	Condition Score
Good		**Pass** -The asset is in good overall condition, with no deficiencies.
Poor		**Fail** - The asset is in poor condition. The sign is damaged, missing, illegible, obscured, or worn.

Corporate Asset
Management Plan **2025**

Facilities Planning & Development

Table of Contents

Introduction 3
Key Stats 4
State of the Infrastructure 5
- Asset Hierarchy 5
- Asset Class - Summary 6
- Assets Used by Facilities & Property Management – Managed By Other Service Areas 7
- Asset Management Tools & Systems 8
- Dashboards 8

Levels of Service 18
- Governing Legislation for Facilities & Property Management 18
- Community Levels of Service Framework 19
- Technical Levels of Service Framework 20

Demand Management 22
- Demand Drivers, Projections and Management Plans 24

Risk Management 28
Lifecycle Management 32
- Lifecycle Strategies 32
- Lifecycle Needs vs. Budget 35
- Budget Breakdown 43

Financing Strategy 45
- Capital Funding Sources and Operating Revenue Sources 45
- Infrastructure Gap 46

Continuous Improvement & Maturity 53
- Maturity Assessments 53
- Continuous Improvement Plan 54

Introduction

City facilities play an important role in a community and offer places where the public can gather for recreational, artistic, social or cultural activities. These facilities and the associated essential infrastructure are necessary for City departments to deliver services and programs to residents that significantly impact quality of life, prosperity and sustainability within the community. Valued at approximately $2.8 billion, as shown in Key Stats, Mississauga's Facilities Planning & Development (FPD) detailed asset management plan is comprised of a variety of asset types that include facilities, site infrastructure, park lighting and paved parking owned and operated by the City of Mississauga.

Smaller, non-conditioned structures such as sheds, canopies, domes, and shelters have been excluded from this iteration of the FPD detailed asset management plan.

In Mississauga, Facilities Planning & Development along with Facilities, Operations, Energy & Maintenance are responsible for maintaining most of the City's facilities and associated infrastructure, comprised of buildings of various sizes, age and complexity totaling close to 5.6 million square feet of space.

The goals of Facilities Planning & Development are to:

- Maintain City buildings and site infrastructure
- Ensure compliance with all applicable legislation
- Provide professional project management services
- Develop and maintain integrated capital plans and a long-term facility asset management strategy
- Ensure the secure, safe use and enjoyment of City facilities, parks and the transit system
- Ensure accessibility principles are incorporated into all business functions across City services
- Ensure the strategic configuration of office space to increase use of underutilized spaces,
- Simultaneously achieving Facilities, Operations, Energy & Maintenance's goal to support and promote actions to mitigate climate change through energy conservation and environmental sustainability
-

This asset management plan utilizes asset data based on 2023 year-end

Key Stats

Current Replacement Value (CRV)	Average Condition	Current Maturity Level
$2.8 Billion	Fair	Intermediate
Average Annual Infrastructure Gap – Current LOS $26.0 Million		Average Annual Infrastructure Gap – Proposed LOS Same as Current LOS gap

State of the Infrastructure

Asset Hierarchy

Table 1: Facilities Planning & Development Hierarchy

Asset Class	Asset Type
Corporate	Facilities and Site Infrastructure
Fire	Facilities and Site Infrastructure
Library	Facilities and Site Infrastructure
Parks	Facilities and its corresponding Site Infrastructure
	Site Linear Infrastructure (lighting and paved parking)
Recreation	Facilities and Site Infrastructure
Transit	Facilities and Site Infrastructure
Works	Facilities and Site Infrastructure

In 2023, the Culture facilities portfolio, of 21 assets and mostly consists of Heritage facilities, was redistributed and absorbed amongst three other asset classes - Corporate, Parks and Recreation. Thus, Culture is no longer its own asset class.

Asset Class - Summary

Asset Class	Current Replacement Value (Millions)	Average Condition	Average Annual Infrastructure Gap – Current and Proposed LOS (Millions)
Corporate	$477.9		$4.1
Fire	$166.2		$0
Library	$233.4		$1.2
Parks	$348.2		$8.8
Recreation	$1,136.7		$6.0

Asset Class	Current Replacement Value (Millions)	Average Condition	Average Annual Infrastructure Gap – Current and Proposed LOS (Millions)
Transit	$354.0		$5.1
Works	$46.9		$1.2

Assets Used by Facilities Planning & Development – Managed By Other Service Areas

Assets Used by FPD	Managed By	Quantity	Current Replacement Value (Millions)
Vehicles and Equipment	Corporate Fleet	18 Ea.	$1.0

Asset Management Tools & Systems

The City maintains its inventory information in various systems, with each system serving a specific function and purpose.

Vanderweil Facility Advisors (VFA) is a computerized asset management software that tracks each asset/component and its relevant attributes. The VFA software is used to support budget modeling, requirements forecasting and capital planning for the FPD portfolio. The inventory information contained in VFA has been used to support the development of this plan.

CityWide is the City's Tangible Capital Asset (TCA) System. The system was introduced in 2008 to capture infrastructure valuation information about the City's major assets.

Infor EAM (Enterprise Asset Management) is a maintenance and work order tracking system to manage assets, schedule maintenance activities, and track work orders. The Infor software is used to maintain FPD assets.

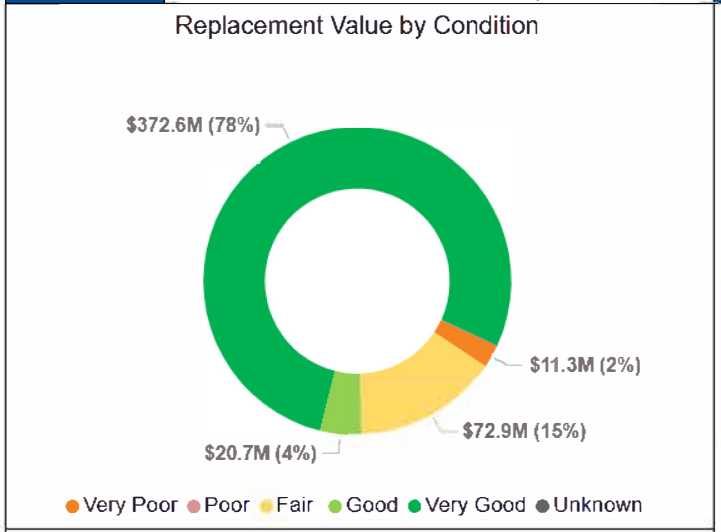
Each of these systems plays an integral role in supporting decision-making about City services and infrastructure. The inventory information contained within each of these systems is comprehensive, reliable, and reasonably accurate and has been used to support the development of this plan.

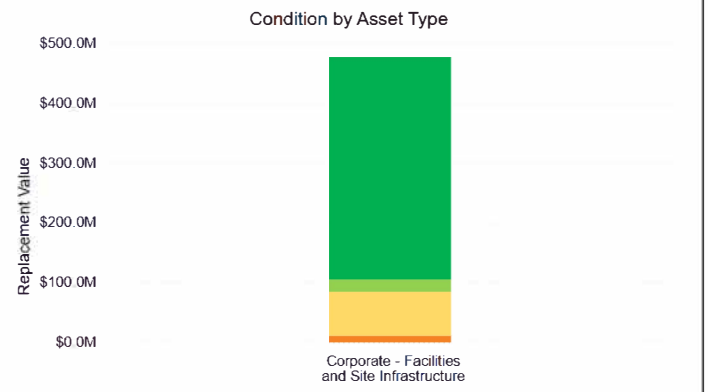
Dashboards

The following dashboards provide a summary of the state of the current infrastructure for each asset class. The information in this plan was prepared using 2023 year-end data in 2023 dollars. In charts, graphs and tables where money is represented in thousands of dollars ($000), figures have been rounded to the nearest thousand. This means that the totals shown may not always balance perfectly, due to rounding.

Asset Class: Corporate

Data Quality:	Asset Inventory	Condition	Replacement Value	Current Replacement Value:	$477.9 Million
	B	C	C		

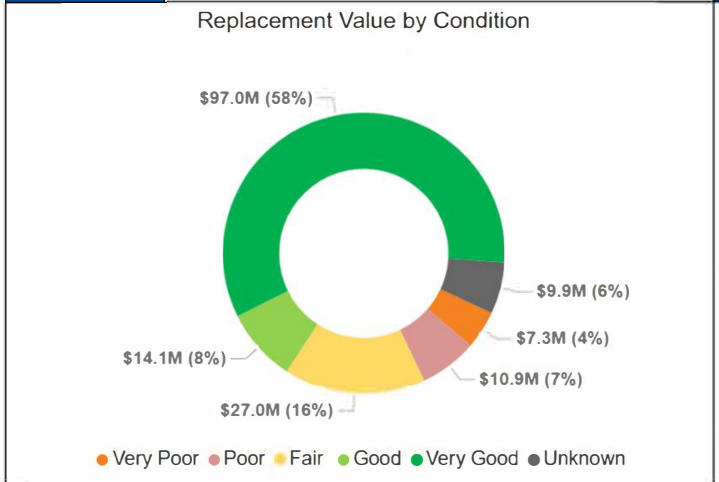


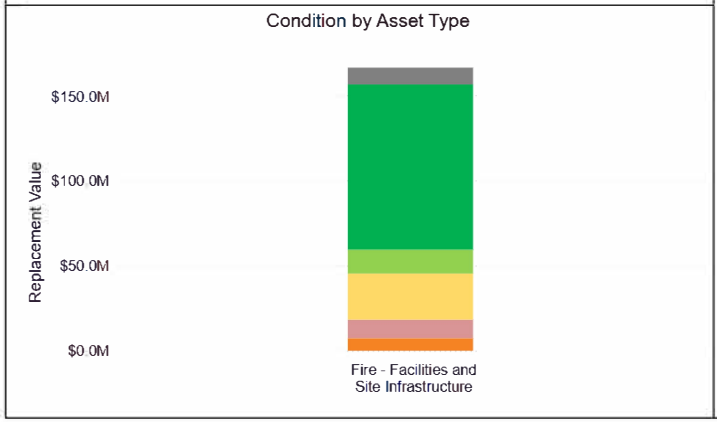


Asset Type	Quantity	Average Age (Years)	Estimated Useful Life (Years)	Current Replacement Value (000s)
Corporate – Facilities and Site Infrastructure	15 Ea.	65.8	75	$477,900

Asset Class: Fire

Data Quality:	Asset Inventory	Condition	Replacement Value	Current Replacement Value:	$166.2 Million
	B	C	C		

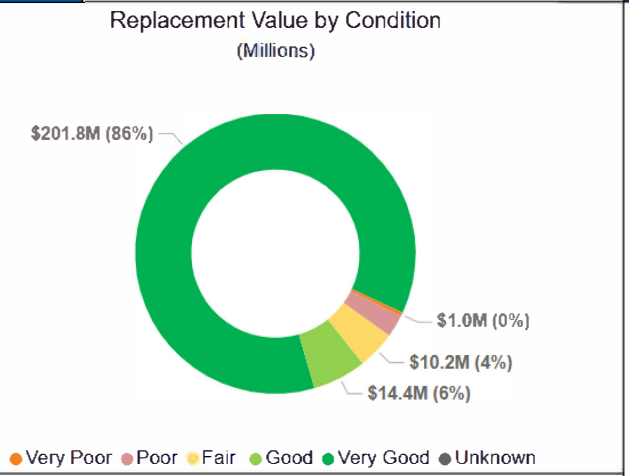


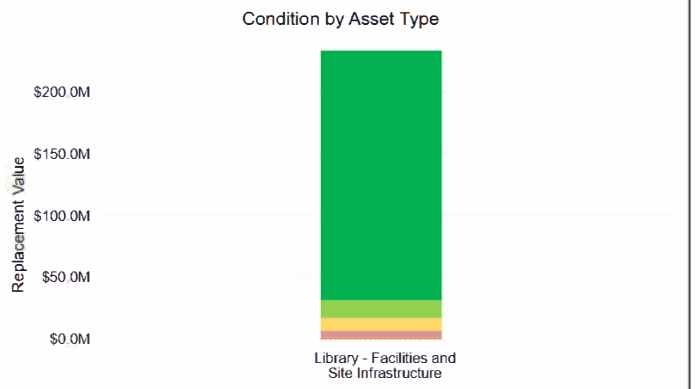


Asset Type	Quantity	Average Age (Years)	Estimated Useful Life (Years)	Current Replacement Value (000s)
Fire – Facilities and Site Infrastructure	32 Ea.	34.4	75	$166,200

Asset Class: Library

Data Quality:	Asset Inventory	Condition	Replacement Value	Current Replacement Value:	$233.4 Million
	B	C	C		



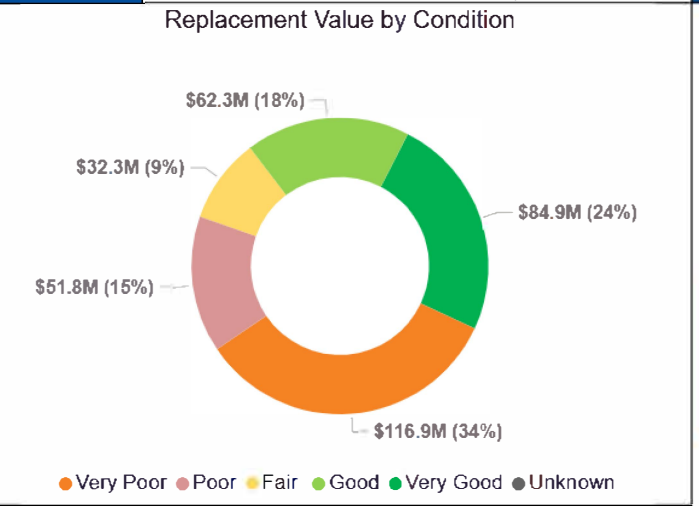


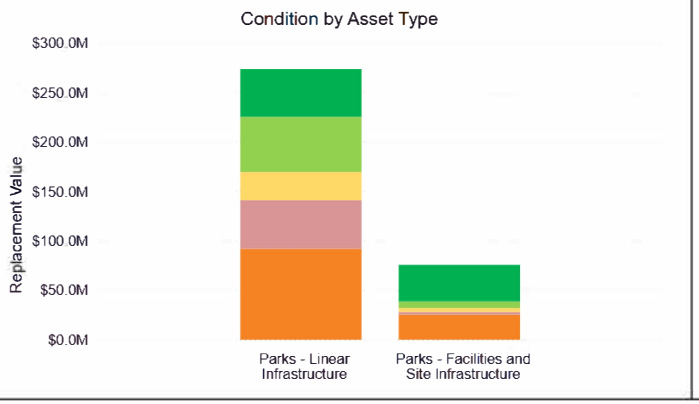
Asset Type	Quantity	Average Age (Years)	Estimated Useful Life (Years)	Current Replacement Value (000s)
Library – Facilities and Site Infrastructure	17 Ea.	37.5	75	$233,400

Asset Class: Parks

Data Quality:	Asset Inventory	Condition	Replacement Value
	B	C	C

Current Replacement Value:	$348.2 Million



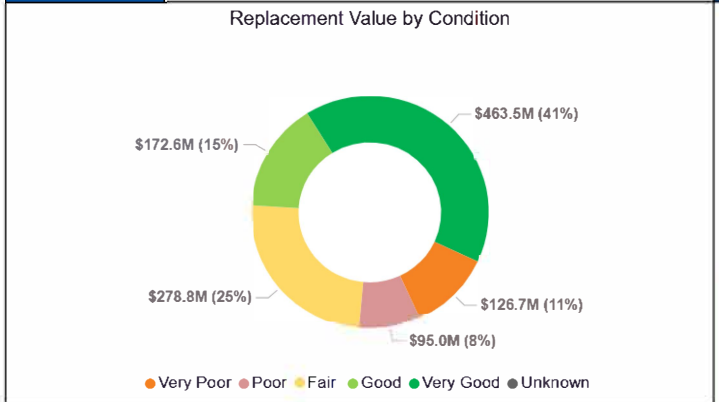


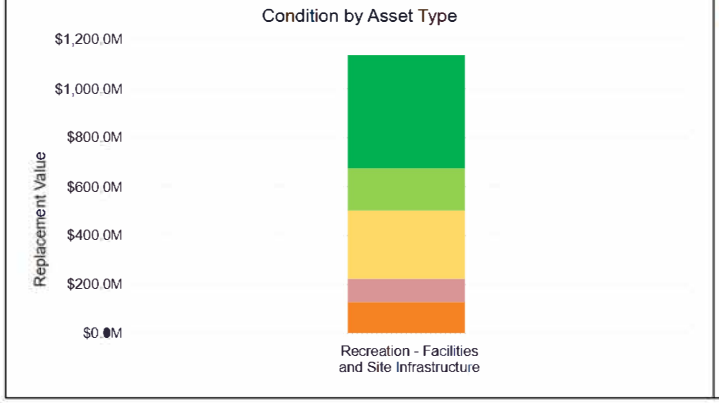
Asset Type	Quantity	Average Age (Years)	Estimated Useful Life (Years)	Current Replacement Value (000s)
Parks – Facilities and Site Infrastructure	78 Ea.	60.5	75	$75,200
Site Infrastructure (lighting and paved parking)	284 Ea.	43.8	20	$273,000

Asset Class: Recreation

Data Quality:	Asset Inventory	Condition	Replacement Value
	B	C	C

Current Replacement Value:	$1,136.7 Million



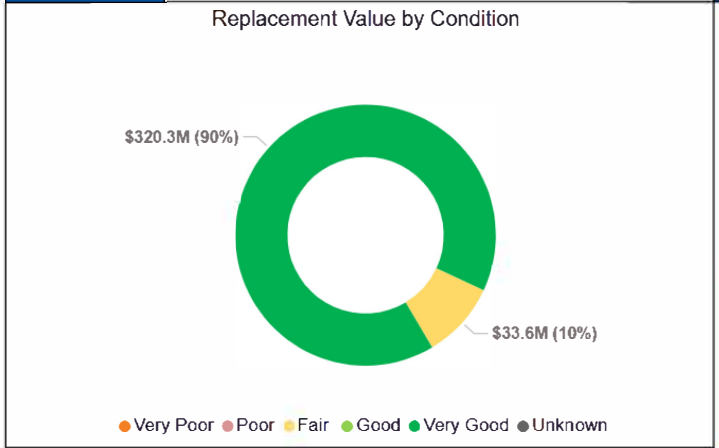


Asset Type	Quantity	Average Age (Years)	Estimated Useful Life (Years)	Current Replacement Value (000s)
Recreation – Facilities and Site Infrastructure	69 Ea.	50.4	75	$1,136,700

Asset Class: Transit

Data Quality:	Asset Inventory	Condition	Replacement Value
	B	C	C

Current Replacement Value:	$354.0 Million

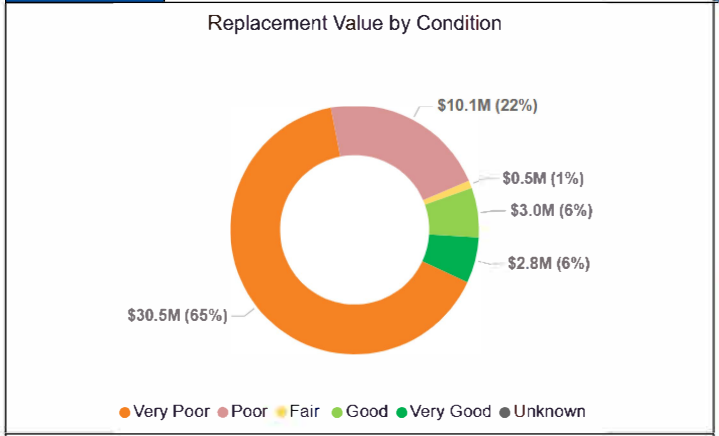


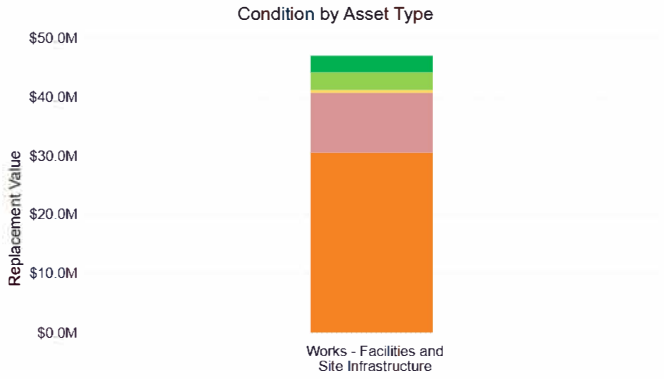
Asset Type	Quantity	Average Age (Years)	Estimated Useful Life (Years)	Current Replacement Value (000s)
Transit – Facilities and Site Infrastructure	27 Ea.	15.1	75	$354,000

Asset Class: Works

Data Quality:	Asset Inventory	Condition	Replacement Value
	B	C	C

Current Replacement Value: $46.9 Million





Asset Type	Quantity	Average Age (Years)	Estimated Useful Life (Years)	Current Replacement Value (000s)
Works – Facilities and Site Infrastructure	12 Ea.	36.6	75	$46,900

Background Information

For all seven asset classes, the assets are managed in the same manner.

Replacement costs are calculated utilizing VFA and is based on the sum of the replacement cost for each system. These costs are compared to the appraised insured replacement values and adjusted for alignment.

Estimated useful life is based on Building Owners and Managers Association (BOMA) standards and applied to each system, with the average lifespan for a facility being 75 years.

Facilities that are owned by the City, the responsibility of FPD, and are defined as conditioned occupied spaces are included in this iteration of the plan. The smaller, non-conditioned structures such as sheds, canopies, domes, shelters are excluded.

Asset components are assessed utilizing facility condition index (FCI) as shown in Table 2. The FCI is an industry-standard benchmark for facility management that objectively evaluates both the current and projected conditions of a facility. It is calculated as the ratio of the total cost of required renewals or repairs to the building's current replacement value. Currently, staff utilize a one-year projection to calculate FCI.

Table 2: Condition Rating Scale

Condition Rating	% Remaining Useful Life	Facility Condition Index (FCI)	Description
Very Good	80-100%	<0.05	Assets have greater than or equal to 80% of its remaining useful life. It is generally in very good condition, typically new or recently rehabilitated.
Good	60-79%	0.05≤FCI<0.1	Assets have less than 80% and greater than or equal to 60% of its remaining service life. It is in good condition.
Fair	40-59%	0.1≤FCI<0.2	Assets have less than 60% and greater than or equal to 40% of its remaining service life. They are in fair condition.
Poor	20-39%	0.2≤FCI≤0.3	Assets are in poor condition and mostly below operable state, with many elements approaching the end of their service life.
Very Poor	0-19%	>0.3	Assets are in very poor, unacceptable condition and should be replaced or rehabilitated in the near future.

Levels of Service

Governing Legislation for Facilities Planning & Development

Legislation	Requirements
Accessibility of Ontarians with Disabilities Act, 2005	Provides accessibility standards to benefit all Ontarians.
Development Charges Act, 1997	Provides municipalities the ability to levy charges to fund growth-related municipal infrastructure, on the principle that growth pays for growth.
Municipal By-Laws	Regulations approved by Council to safeguard and protect persons and properties.
O. Reg. 588/17: Asset Management Planning for Municipal Infrastructure	Provides policies and guidelines for levels of service considerations.
Occupational Health and Safety Act, 1990	Rules governing health and safety in Ontario's workplaces.
Building Code Act, 1992	Legislative framework that governs the construction, renovation and use of buildings.
Conservation Authorities Act, 1990	Provides guidance for the organization and delivery of programs and services that further the conservation, restoration, development and management of natural resources in watersheds in Ontario.
Emergency Management and Civil Protection Act, 1990	Provides requirements for emergency management.
Environmental Protection Act, 1990	Provides for the protection of the natural environment through regulations regarding discharge of contaminates into the natural environment.
Ontario Heritage Act, 1990	Provides guidance for the organization and delivery of programs and services that further the conservation, restoration, development and management of historical buildings and sites in Ontario.
Planning Act, 1990	Provides direction on municipal planning activities.

Community Levels of Service Framework

Core Value	LOS Objective	Asset Class	Performance Measure	Current Performance (2023)
Quality	Reduce energy consumption and greenhouse gas (GHG) emissions across city owned and operated facilities.	All	Reduce the energy consumption and GHG emission across city owned and operated facilities by 1% each year from the period of (2024–2028).	• Energy Consumption: 180,900 mWh • GHG Emissions: 20,146 Tons of CO_2
	Provide electric vehicle charging infrastructure for both fleet and public use to promote the electrification of corporate fleet and personal vehicles.	All	Number of city-owned electric vehicle (EV) charging ports (e.g. stations) and number of locations for either public or fleet use.	To meet the increasing use of electric vehicles, a number of electric vehicle charging stations are being installed for both corporate and community usage at a variety of locations. This includes municipal parking lots, community centers, libraries, municipal yards, and transit depots. • 97 stations for a mix of public and fleet use

Technical Levels of Service Framework

LOS Objective	Asset Class	Performance Measure	Current Performance (2023)	Target Performance (2024-2033)	Background Information
Core Value: Quality					
To ensure efficient and well-maintained infrastructure that supports client groups' services and programs.	All	Average Facility Condition Index (FCI) by Asset Class.	Corporate: 0.06	Corporate: 0.10	Initially based on 10-year targets that were approved in 2009 by Council. The targets were reviewed in 2023 and updated to align with City priorities.
			Fire: 0.08	Fire: 0.10	
			Library: 0.02	Library: 0.15	
			Parks: 0.23	Parks: 0.15	
			Recreation: 0.13	Recreation: 0.15	
			Transit: 0.02	Transit: 0.15	
			Works: 0.41	Works: 0.15	
		% of buildings in fair or better condition (FCI band) – based on area.	65%	65% or higher	
Core Value: Reliability					
To ensure efficient and well-maintained infrastructure that supports service objectives.	All	% of assets with high-very high-risk rating.	21.1%	0-20%	Based on the portfolio replacement value, across all years.

LOS Objective	Asset Class	Performance Measure	Current Performance (2023)	Target Performance (2024-2033)	Background Information
Core Value: Affordability					
To effectively manage lifecycle activities and ensure adequate funding for assets.	All	Actual vs Target Reinvestment Rate (Capital).	1.8%	2.5%	A measure of how much funding is available to meet capital state of good repair lifecycle needs (Actual) versus how much funding is required (Target).

Demand Management

A building typically begins to require higher investment in capital lifecycle renewals at approximately 20 years of age. Approximately 65 per cent of the FPD building area portfolio is currently over 30 years old, which means that the pressure for lifecycle renewals is only going to increase every year. Aging infrastructure requires the systematic allocation of limited resources to maintain City-wide services, and the need to balance service levels with affordability poses significant pressures and challenges for the FPD Service Area.

Drivers affecting demand on the City's building infrastructure can include aging infrastructure, energy efficiency and climate change, a growing portfolio, and changes in legislative requirements.

Maintaining FCI targets – Using the FCI numbers and comparing them against the desired 10-year target allows buildings to be compared analytically and highlights the buildings that are in the greatest need of renewals, repairs or lifecycle replacements. Table 3 provides scenarios related to the 10-year forecast and how the FCI changes based on the funding provided. If the City wants to maintain the current FCI targets and maintain the condition of the City's facilities, additional funding will be required.

Growing portfolio - with the FPD portfolio replacement value currently at $2.8 billion, and as more buildings are added, some that are already in poor condition when acquired by the City, the current funding portfolio needs to consider the additional funding requirements for these assets. There are 34 buildings in this list, valued at $160 million, that do not have budgeted requirements captured in the system. An example of these assets includes, Churchill Meadows Community Center, Mavis West (Alectra site), Dixie Chapel, Hazel McCallion Central Library, and Square One IDEA Hub. These assets, on average, would require approximately $3.2 million per year to maintain, and are not captured in the budget forecast.

Asset retirement obligations –O.Reg. 553/21 is a fairly new legislative requirement that pertains to asset retirement obligations such as asbestos abatement and decommissioning of underground fuel tanks. These future retirement costs pose additional budget pressures.

Efficiencies and improvements – not all new initiatives and improvements are funded through a separate budget request or funding source. Many code compliance and non-requirement renewals are absorbed into the state of good repair lifecycle budget. These have additional costs and impacts which do not address the risk rating or FCIs and could be related to energy, security and accessibility.

Table 3: FCI Scenarios related to 10-year forecast

Scenarios	Current FCI (for facilities assets only)	Total funding over 10 years (based on scenario)	FCI 10-year forecast (based on scenario funding)	Results of each scenario
No change	0.11	$511M	0.24	FCI condition cannot be maintained, and will not continue to meet established targets
Additional funding to meet 2.28% Replacement Value	0.11	$568M	0.13	FCI can remain as status quo, does not meet future demands or growth to portfolio
Additional funding to meet 2.5% Replacement Value	0.11	$574M	0.12	FCI can be maintained and supports future demands and additional requirements from the 29 facilities added to portfolio

Demand Drivers, Projections and Management Plans

Demand Driver	Current Position	Projection	Impact on Services	Demand Management Plan
Aging Infrastructure	More than half (65%) of the building portfolio is 30 years and older, and approximately 17% of the portfolio's building area are currently in Poor and Very Poor condition.	As the City's building and site infrastructure ages, the overall condition will decrease. The overall capital renewal costs are expected to increase as a result.	Aging infrastructure without intervention can lead to more unplanned service disruptions, emergency repairs, and associated budget stresses which impact the services provided at these facilities.	Develop and maintain a comprehensive asset management plan to formalize asset management plans at a system group level and conduct validation activities in order to maximize the useful service life of building assets. In turn this will inform the level of investment required in a more accurate and reliable source.

Demand Driver	Current Position	Projection	Impact on Services	Demand Management Plan
Grandfathered issues (e.g. code compliance for accessibility	The City cannot become accessible without addressing the retrofit of existing buildings and places and many older facilities could benefit from accessibility improvements.	Accessibility must be considered for all capital renewal projects to improve their accessibility and to meet the City's Facility Accessibility Design Standards. This may result in added costs to the overall projects but would keep costs lower if included during the design phase.	Accessibility barriers can prevent residents and visitors from visiting and/or receiving services from certain facilities. Additionally, barriers can make it difficult for staff to perform their duties and lead to unplanned interventions which stresses budgets. Improving accessibility makes it easier for people of all abilities to participate.	Develop an inventory of accessibility issues at facilities and address these issues during proposed condition-driven capital renewal projects wherever practical and include in project scope.

Demand Driver	Current Position	Projection	Impact on Services	Demand Management Plan
Buildings where designated substances are present	Many older buildings were constructed with materials that are now considered designated substances and require special consideration and attention for abatement.	Legislation requires all projects perform an assessment of designated substances prior to commencing construction or renovation work. This requirement will continue to place cost and time pressures for future redevelopment projects.	Where designated substances are found, project timelines and budgets are impacted. Additionally, some cases may require either the full or partial closure of a facility to complete the abatement.	Address these issues during proposed condition-driven capital renewal projects wherever practical and include in project scope.
Prioritizing energy efficiency and climate change actions	The City has developed a 5-year Energy Conservation Plan with a goal of 1% energy reductions annually, declared a climate emergency, and developed a Climate Change Action Plan with a goal of 40% reductions by 2030 and 80% reductions by 2050	Plan and execute cost-intensive energy efficiency projects, facility renovations, and expand renewable energy generation assets. This requires investments in energy efficiency, greenhouse gas emission reductions and building resiliency in the expanding building portfolio.	If energy related initiatives are not incorporated into life cycle projects the City may not be able to meet the targets set out in the Climate Change Action Plan and 5-year Energy Conservation Plan.	Address these issues during proposed condition-driven capital renewal projects wherever practical and include prioritize decarbonisation during lifecycle renewals, facility renovations that maximize greenhouse gas emission reductions.

Demand Driver	Current Position	Projection	Impact on Services	Demand Management Plan
	compared to 1990 levels[1].			
Maintain FCI (Facility Condition Index) targets	FCI targets to highlight the buildings that are in the greatest need of system renewals, repairs or lifecycle replacements.	Improve the quality of data for each program (at system group level), so the FCI analysis can be done at the system level and not just at the asset level. Decisions can be made based on risk rating at the systems level, and not just at the overall condition of the facility.	If FCIs are not maintained for all systems groups, a facility may have an unexpected service interruption.	Conduct validation activities to maximize the useful service life of building assets. In turn this will inform the level of investment required in a more accurate and reliable source and longer plan.

[1] https://www.mississauga.ca/wp-content/uploads/2020/09/20144905/City-of-Mississauga-Climate-Change-Action-Plan.pdf

Risk Management

Asset specific risks are determined by assessing the system's consequence of failure (CoF) and likelihood of failure (LoF). While the loss of some systems may have little impact on service delivery and negligible risk of damage or injury, the loss of other systems such as roofs and life safety systems can severely impact public services and may lead to further damages or even fatalities.

For the purposes of this asset management plan, the remaining useful life of a system is used as a proxy for LoF, and criticality of a system is used as a proxy for CoF. These two factors are multiplied together to calculate the risk rating for each asset system. In subsequent asset management plans, the CoF will also consider other aspects such as disruption, safety, financial, environmental impact, and reputation to the organization.

Criticality criteria has been identified for each asset system group (such as structure, roof, interior finishes, plumbing etc.). CoF is defined by a numerical score assigned to each asset system based on the descriptions in Table 4. The likelihood of an asset system failure for each system/component is based on the remaining useful life as shown in Table 5. Table 6 provides a matrix that summarizes the risk rating results.

Table 4: Asset System Criticality Ranking

Criticality	Description	Score
Very Low	• Easy to replace • Can be non-operational for multiple months without significantly impacting core service delivery to many users	1
Low	• Somewhat difficult to replace • Can be non-operational for multiple weeks without significantly impacting core service delivery to many users • Asset does not perform a safety function or meet regulatory requirements	2
Medium	• Moderately difficult to replace • Outages of more than a couple of days may significantly impact core service delivery to many users • Asset performs a safety function or meet a regulatory requirement	3
High	• Highly mission-sensitive asset with no redundancy • Mission-critical asset with very limited redundancy • Significant community investment	4
Very High	• Mission-critical and unique asset • Significant service disruption from any outage • No redundancy • Significant community investment	5

Table 5: Likelihood of Failure Ranking

Likelihood	Description	Score
Very Low	• Remaining useful life is >75% of the asset lifespan • Systems are generally in very good condition, typically new or recently rehabilitated	1
Low	• Remaining useful life is between 75% and 35% of the asset lifespan • Systems are in good condition	2
Medium	• Remaining useful life is between 35% and 13% of the asset lifespan • Systems are in fair condition and will be subject to mid-life interventions	3
High	• Remaining useful life is between 13% and 3% of the asset lifespan • Systems are in poor condition and mostly below standard, with many elements approaching the end of their service life	4
Very High	• Remaining useful life is less than 3% of the asset lifespan • Systems are in very poor, unacceptable condition and should be replaced or rehabilitated	5

Table 6: Risk Rating Matrix

Risk Rating		Consequence/Criticality				
		Very Low (1)	Low (2)	Medium (3)	High (4)	Very High (5)
Likelihood	Rare (1)	Very Low (1)	Very Low (2)	Very Low (3)	Very Low (4)	Very Low (5)
	Unlikely (2)	Very Low (2)	Low (4)	Low (6)	Medium (8)	Medium (10)
	Possible (3)	Very Low (3)	Low (6)	Medium (9)	High (12)	High (15)
	Likely (4)	Very Low (4)	Medium (8)	High (12)	High (16)	Very High (20)
	Almost Certain (5)	Very Low (5)	Medium (10)	High (15)	Very High (20)	Very High (25)

Lifecycle Management

Lifecycle Strategies

Facilities Planning & Development – Current and Proposed Lifecycle Activities

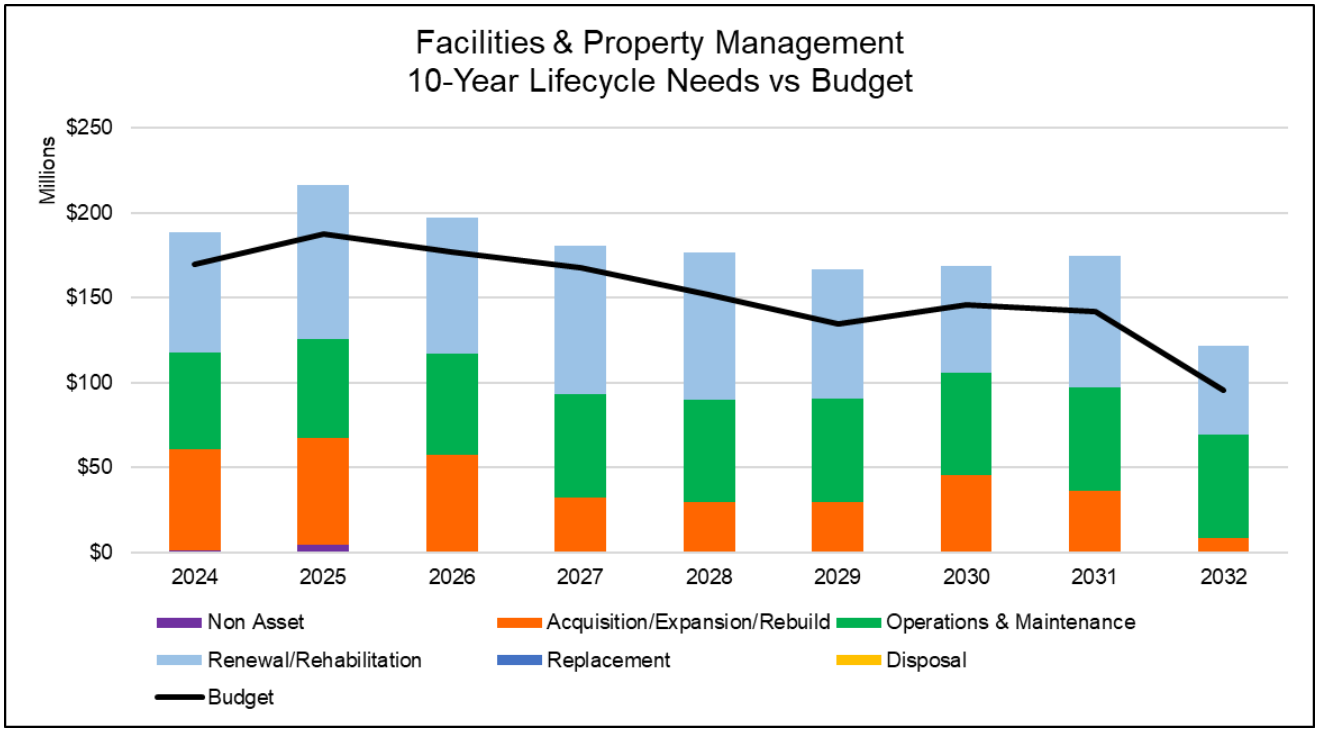
Current and Proposed Lifecycle Activities	Risks associated with Lifecycle Activities
Non-Asset Solutions: Activities that do not alter the condition or performance of assets or services but provide staff with valuable information for their effective management.	
• Annual building condition assessments and studies (approximately 20% of portfolio per year) • Ongoing updates and quality control checks to computerized asset management system (VFA) • Ongoing client group consultation • Ongoing process mapping and developing standard operating procedures and standards • Development of the annual FPD Business Plan	• Inability to identify and record asset condition to inform decision-making for maintenance and capital programs • Incorrect assumptions regarding expected useful life and other factors associated with undefined standards and practices • Strategic planning/budgeting, project prioritization and capital costing is not effective without building condition assessments, other studies and client consultation, of which inform long-term decision making
Operations & Maintenance: Minor activities that preserve the condition or performance of assets and ensures the longevity of assets in line with their design and operational requirements.	
• Complete demand maintenance on all equipment. Some practices include run to failure, the use of metrics to track how long different devices from different manufactures perform and on-site assessments by in-house staff or vendors	• Premature failure for equipment and not able to extend the life of underused equipment • Maintenance issues may persist longer if Security Services does not patrol

Current and Proposed Lifecycle Activities	Risks associated with Lifecycle Activities
• Facilities Maintenance (FM) provides 24-hour service delivery model to address unexpected concerns and ensure the safe and secure use of facilities and sites • In-house and outsource resources to provide preventative and demand maintenance related to structural, electrical and HVAC/mechanical systems including emergency response to major failures • Direct support to City departments that operate the facilities day-to-day for technical expertise and guidance to support City program requirements	• No response from Security Services could result in increased stress or even injury to the public and facility staff • Failing to perform preventative or demand maintenance may result in noncompliance of regulatory requirements, property damage, and/or risk to the public • Deterioration of City property • Complaints from City employees and/or public • Non performed operating and maintenance activities can affect the life of the asset
Renewal/Rehabilitation: Significant activities designed to extend the useful life of assets components.	
• Replacement of systems and equipment based on recommendations from the annual budget process	• Emergency service request funding is required to respond to the failures that were not part of the planned lifecycle capital projects • Facility closures and impacts to programs • Increase in daily operating and maintenance costs
Replacement: Replacement activities occur once an asset reaches the end of its useful life, cannot provide the intended function or performance, and rehabilitation is not a viable option.	
• The buildings and sites with the highest FCI values within the portfolio are analyzed for potential redevelopment. By replacing a building in Poor or Very Poor Condition, the newly constructed asset	• Increased operating and maintenance costs • Emergency breakage which can affect programing

Current and Proposed Lifecycle Activities	Risks associated with Lifecycle Activities
will provide a much greater service to users, and will result in a decrease in the overall portfolio wide FCI profile	• Impact to services and customer experience provided at facility
Disposal/ Demolition: Activities associated with the disposal or decommissioning of an asset.	
• Decommission/demolish at end of life if asset is no longer required • Sell or donate assets	• Safety risk to public • Extra operating cost to maintain the asset
Acquisition/Expansion/Rebuild: These activities expand services to previously non-serviced areas or to accommodate growth; they provide new or enhanced services beyond the current capacity and/or functionality of existing assets.	
• Upgrading or expanding building assets to accommodate growth and to meet the needs of the public	• Increased resources and risk to assess, maintain, renew, demolish newly acquired asset

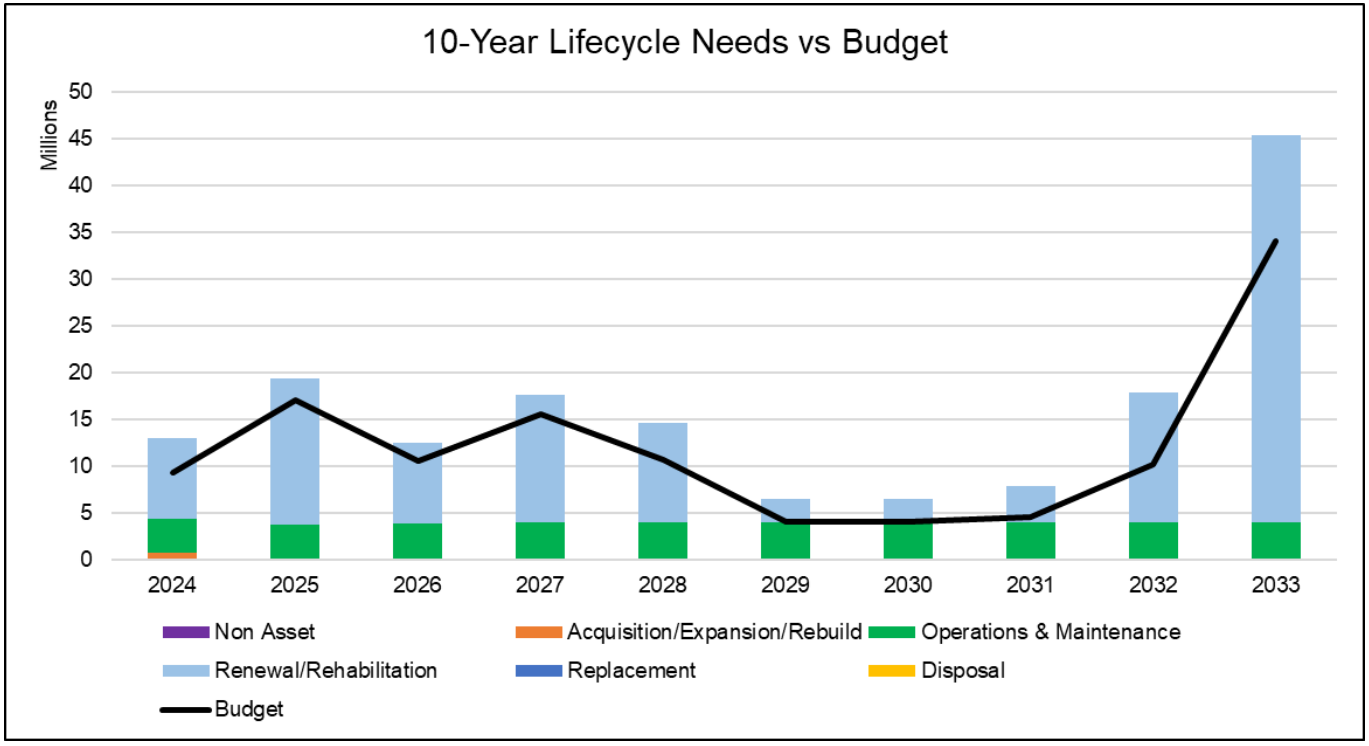
Lifecycle Needs vs. Budget

Facilities Planning & Development



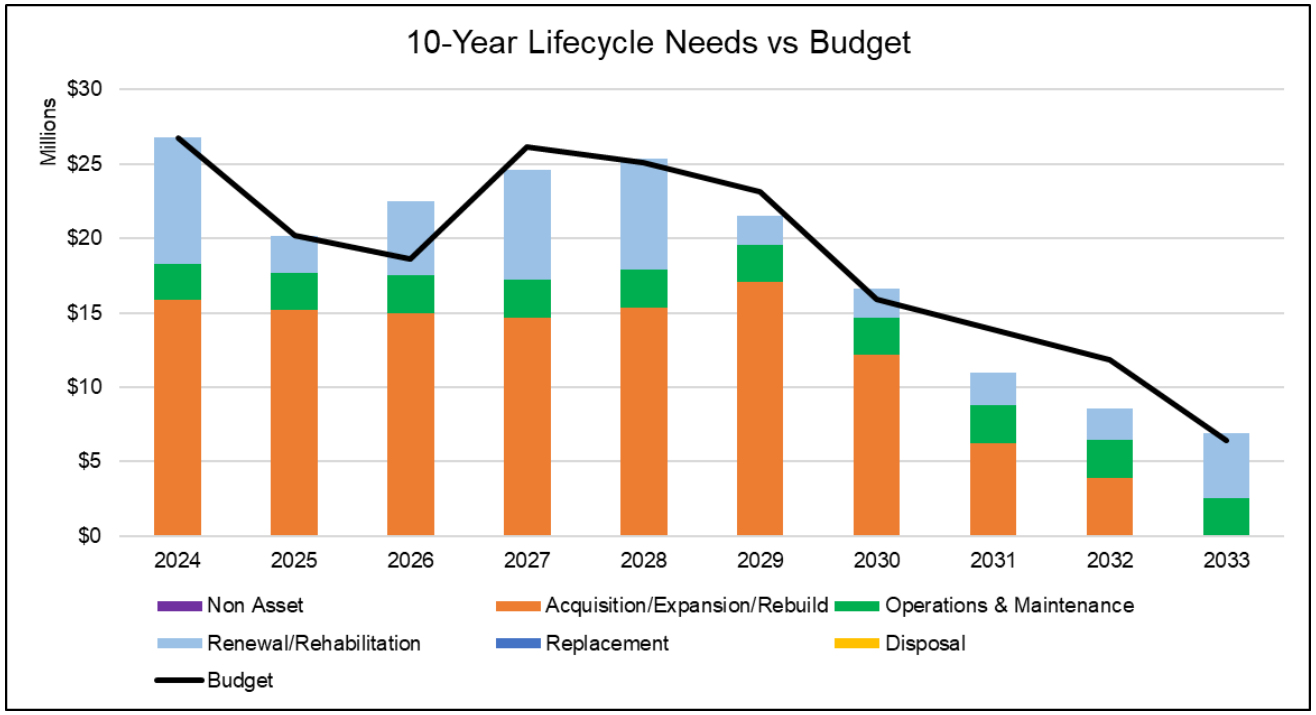
Due to various demand drivers such as aging infrastructure, public expectations and climate change, staff are challenged to maintain their service levels. There is a greater need to proactively address assets that are reaching end of useful life to minimize disruptions of City services by decreasing the infrastructure gap.
As part of continuous improvement, staff will continue to quantify and analyze the lifecycle needs required as they refine their proposed levels of service, where they have been established, along with any resourcing requirements as a result.

Corporate



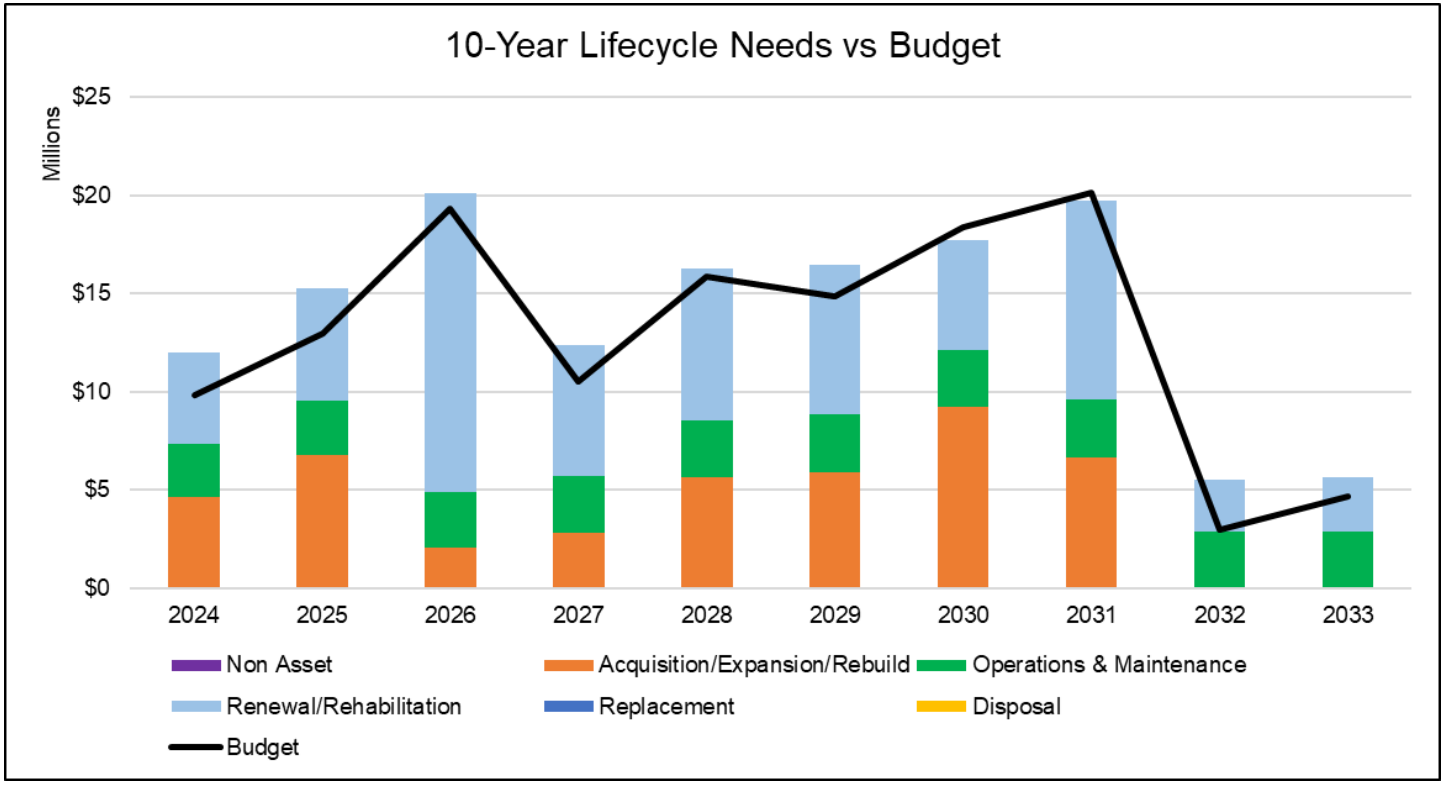
The Corporate portfolio has grown slightly in 2024 due to asset reallocation. The renewal needs are relatively stable except for 2032-2033, as it is projected a number of assets will require rehabilitation and renewal.

Fire



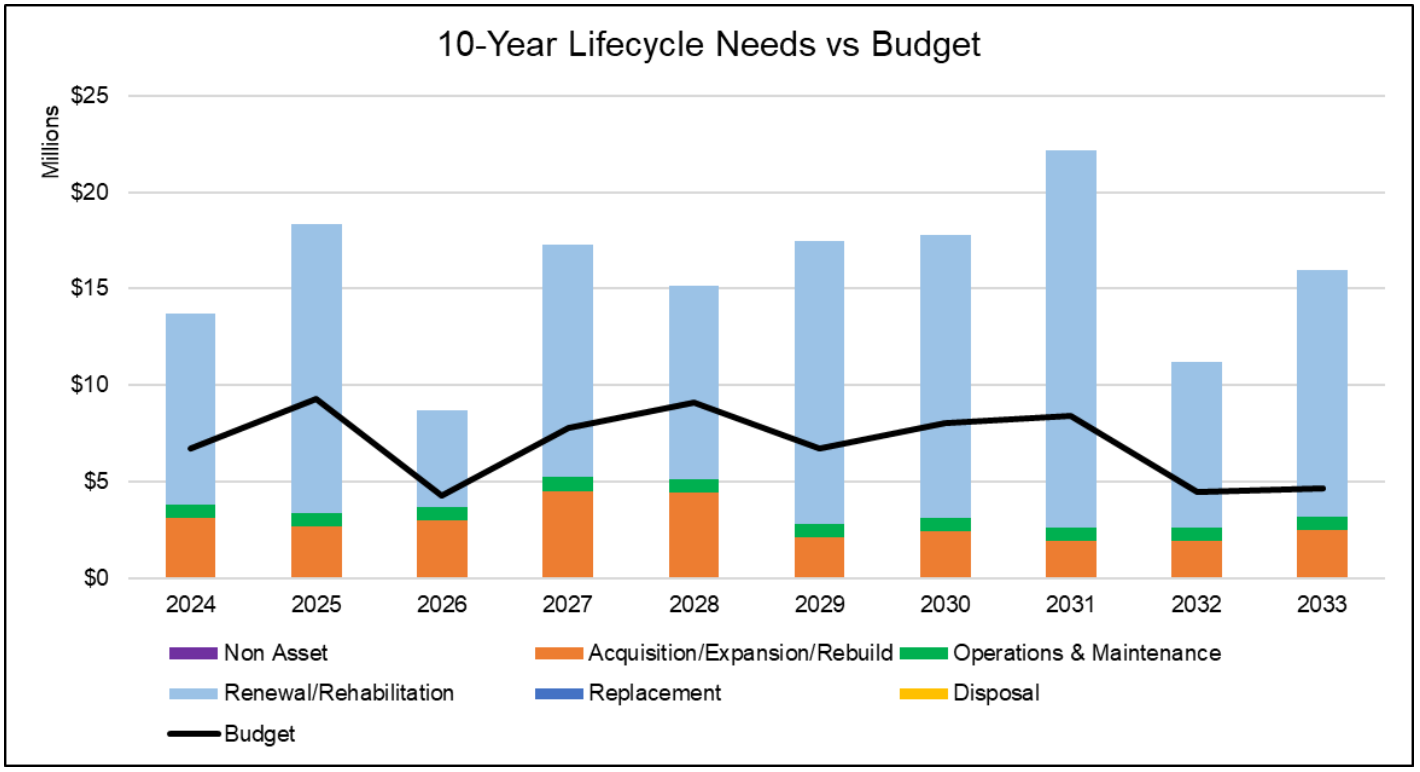
As part of the Fire Master Plan, several newly constructed and renovated fire stations are planned for the 10-year period from 2024 to 2033. These developments are being balanced by the rehabilitation budget illustrated in the graph above. The current condition of the portfolio is Good; however, the new objective is to achieve a status of Good to Very Good by the end of this period. Without adequate funding, the City risks further deterioration of the portfolio to Fair, which would jeopardize staff's ability to meet the service standards for fire emergency response in the City of Mississauga.

Library



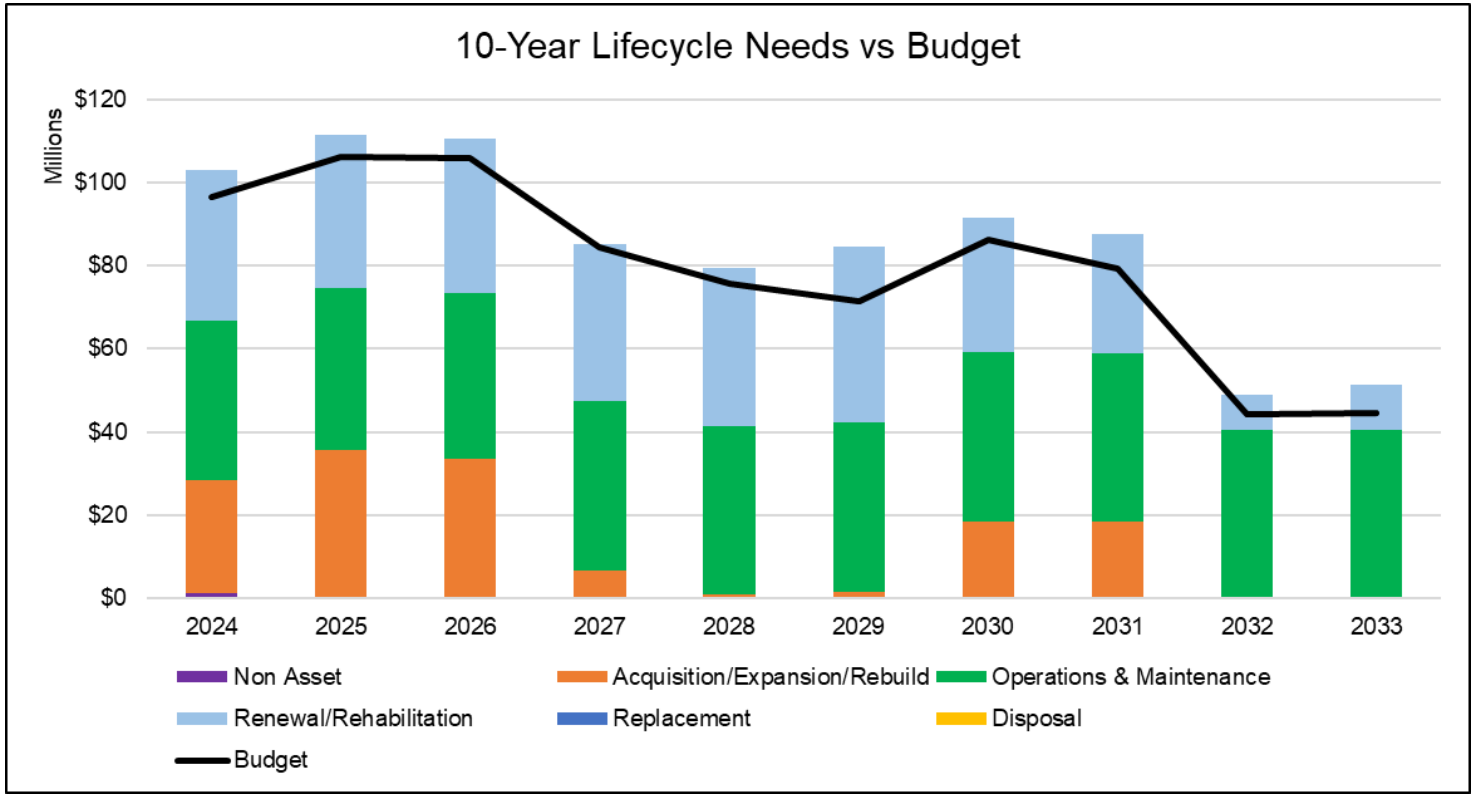
A number of new libraries are projected over the next 10 years. A slight budget gap still exists, with the gap being greater once the new build funding ends in 2032.

Parks



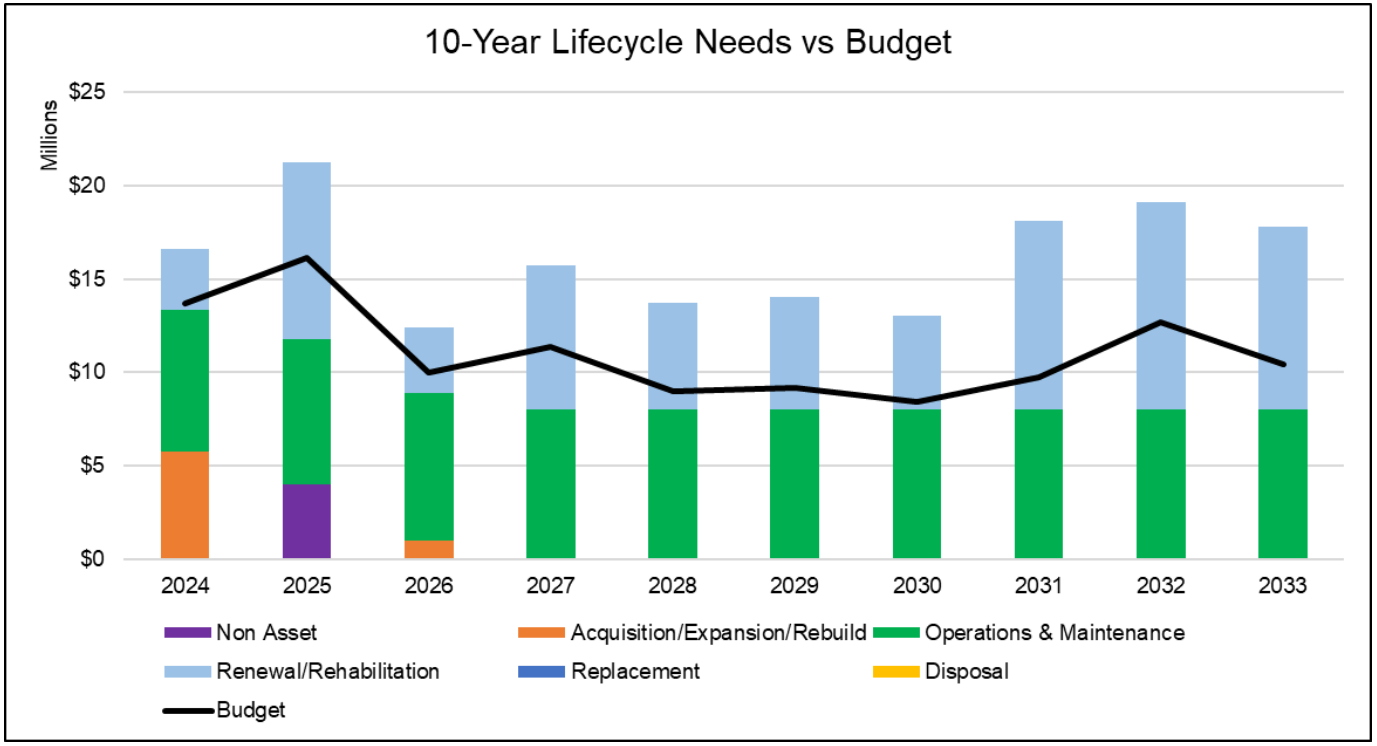
Among the seven asset classes regions, the Parks asset class faces the most significant gap between lifecycle renewal needs and available funding. Additionally, the Parks asset class does not currently meet the Facility Condition Index (FCI) target due to the extensive presence of aging assets throughout the City. To effectively maintain these assets in the coming years, it is imperative to allocate additional funding to this asset class.

Recreation



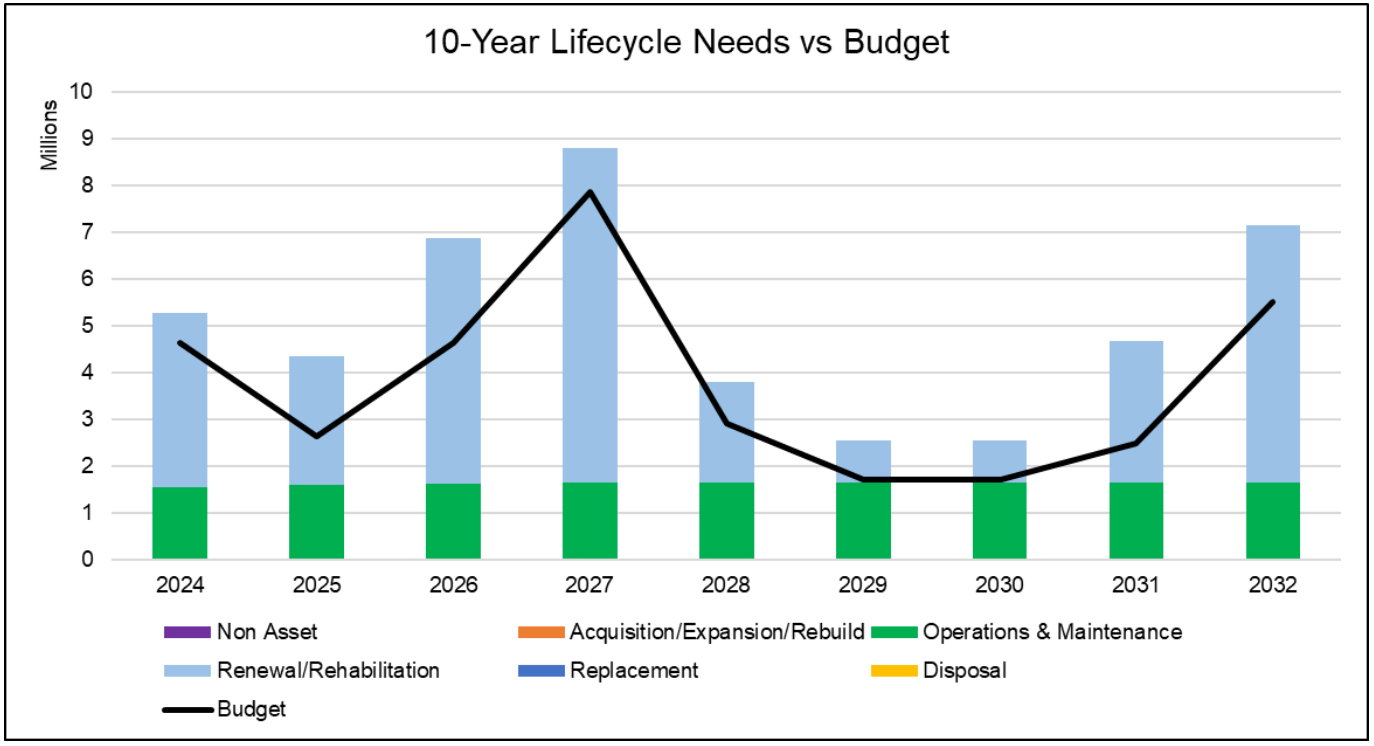
The Recreation asset class possesses the highest current replacement value portfolio, estimated at $1.1 billion. While several new rebuilds are projected and adequately funded, the available rehabilitation funding falls slightly short of the required amount to address ongoing maintenance needs.

Transit



Several newly constructed Bus Rapid Transit (BRT) stations over the past decade have contributed to a lower overall Facility Condition Index (FCI). However, there remains a significant gap, particularly concerning the Edward J. Dowling Transit Facility, the oldest facility in the portfolio (circa 1977) and the largest at 32,000 square meters. This facility requires increased funding to adequately address the maintenance and modernization needs of this aging asset.

Works



The Works asset class is unable to meet the Facility Condition Index (FCI) target primarily due to the Mavis South facility, which is the largest asset in the portfolio, measuring 5,300 square meters and constructed circa 1956. As this facility approaches the end of its useful life, it significantly contributes to a funding gap estimated at $10 million.

Budget Breakdown

Over the next 10 years, Facilities Planning & Development plans to spend an average of $148.4 million annually on facilities and site infrastructure assets, with the majority of the budget being used for rehabilitation activities at 34.4 per cent, operations & maintenance activities at 40.4 per cent, and acquisition/expansion activities at 24.7 per cent.

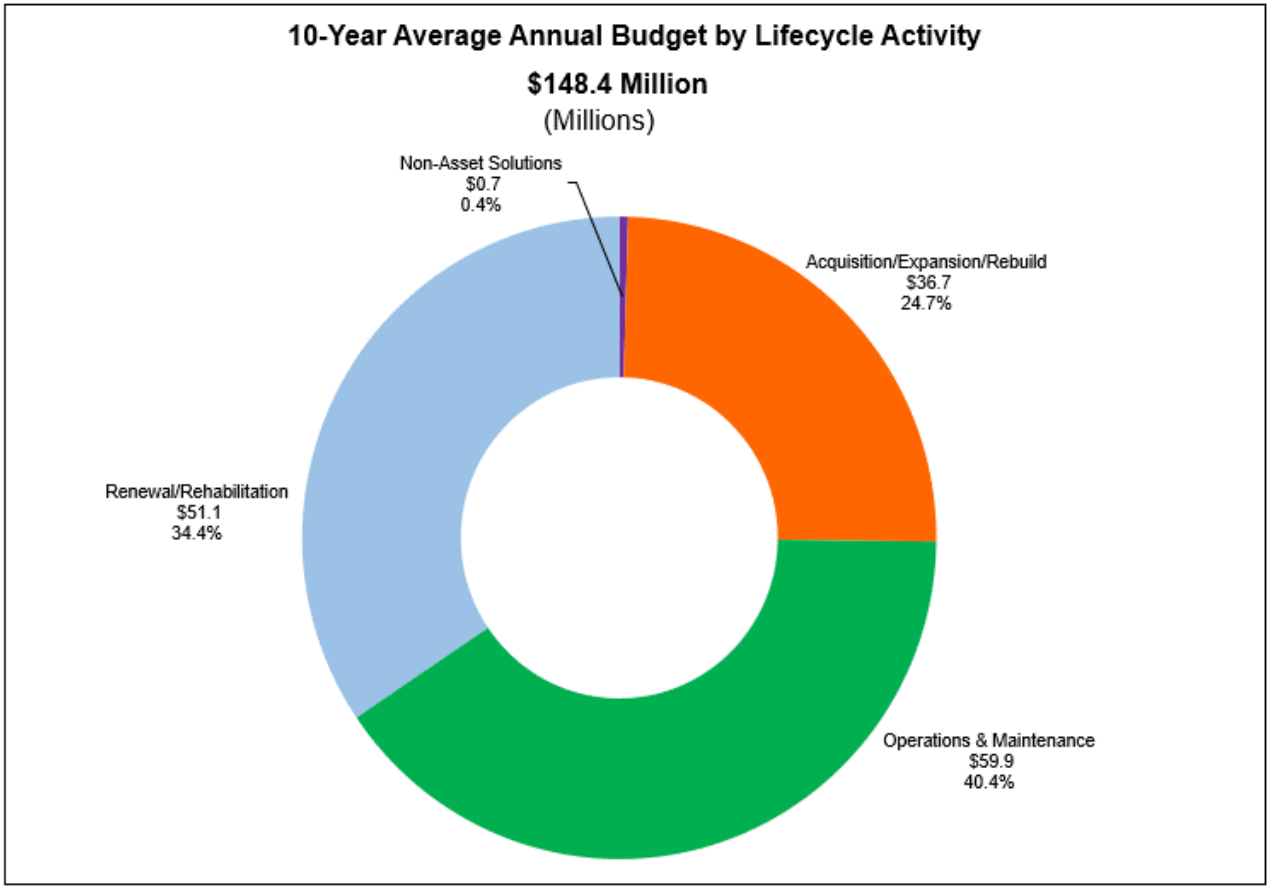


Figure 1: Breakdown of Budget by Lifecycle Activity

Table 7 shows the 10-year annual average budget breakdown by asset class. The majority of the of the operating and capital budget is spent on State of Good Repair (SOGR) of Facilities Planning & Development assets.

Table 7: Budget breakdown by Asset Class

Asset Class	SOGR Budget Type ($ Million)			Growth Capital Budget ($ Million)	Total Budget ($ Million)
	Operating	Capital	Total		
Corporate	3.8	8.1	12.0	-	12.0
Fire	2.5	10.9	13.4	5.4	18.8
Library	2.9	7.0	9.9	3.1	13.0
Parks	0.7	3.4	4.1	2.9	6.9
Recreation	40.0	33.7	73.7	5.7	79.4
Transit	8.0	2.0	10.0	1.1	11.1
Works	1.6	2.2	3.8	-	3.8
Other[2]	-	0.8	0.8	2.5	3.3
Total	**59.5**	**68.1**	**127.6**	**20.7**	**148.4**

[2] "Other" denotes lifecycle activities that span multiple asset classes such as energy enhancements, accessibility improvements, solar PV installation and climate change mitigation studies.

Financing Strategy

Capital Funding Sources and Operating Revenue Sources

The estimated available funding for the next 10-year period (2024-2033) for Facilities Planning & Development is $1.5 billion. The primary sources of funding are operating revenue sources at 40.1 per cent, Tax Reserve Funds at 44.8 per cent which is primarily used to support capital infrastructure renewal needs, Canada Community-Building Reserve Funds 0.8 per cent and Development Charges Reserve Funds at 7.4 per cent, supporting growth projects.

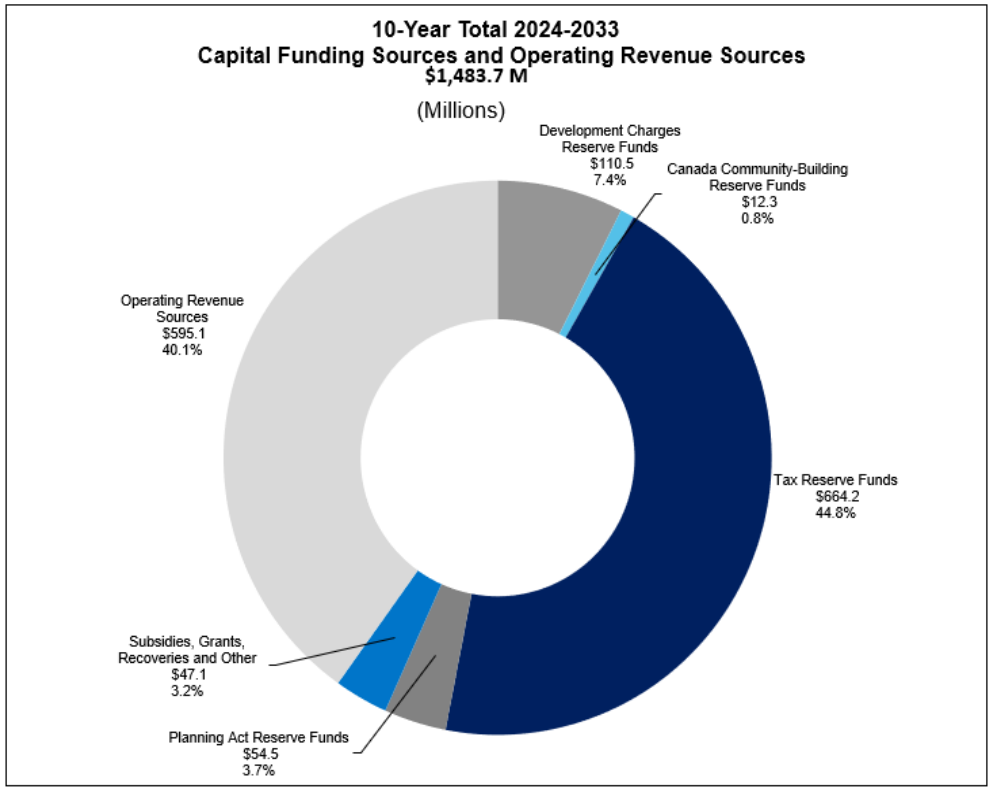
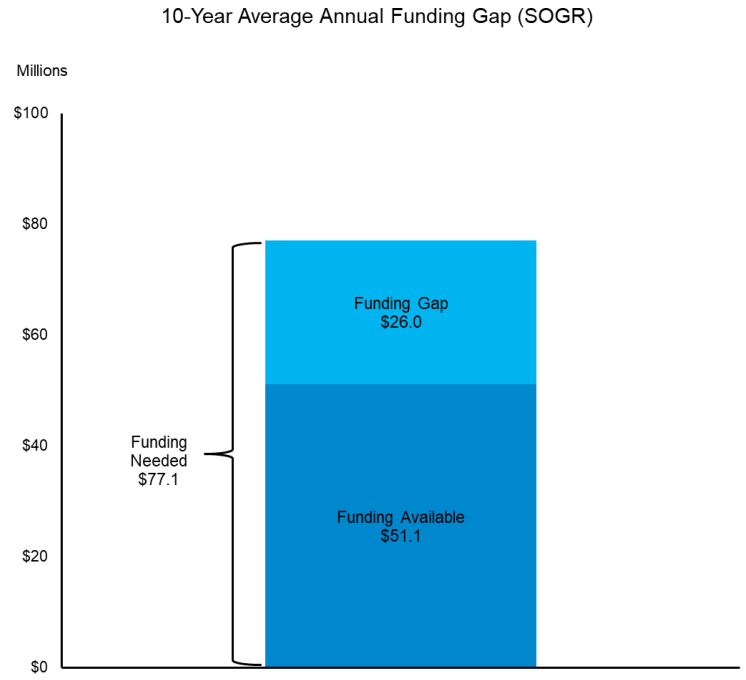


Figure 2: Capital Funding Sources (2024-2033)

Infrastructure Gap

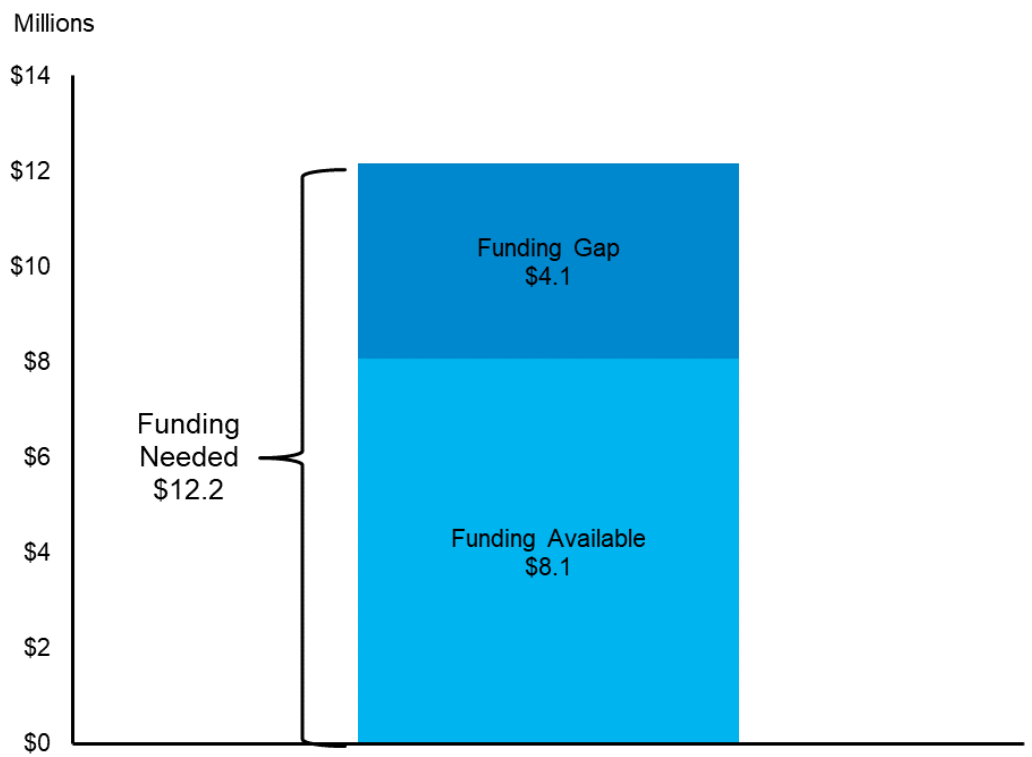
Facilities Planning & Development



The overall 10-year average annual infrastructure gap for Facilities Planning & Development is $26.0 million. Some of the drivers affecting demand on the City's building infrastructure include aging building infrastructure and the gap triggered by the assets with very high to high-risk rating. This high-risk rating supersedes the gap calculated between the current and target FCI numbers since both factors relies on the remaining useful life.

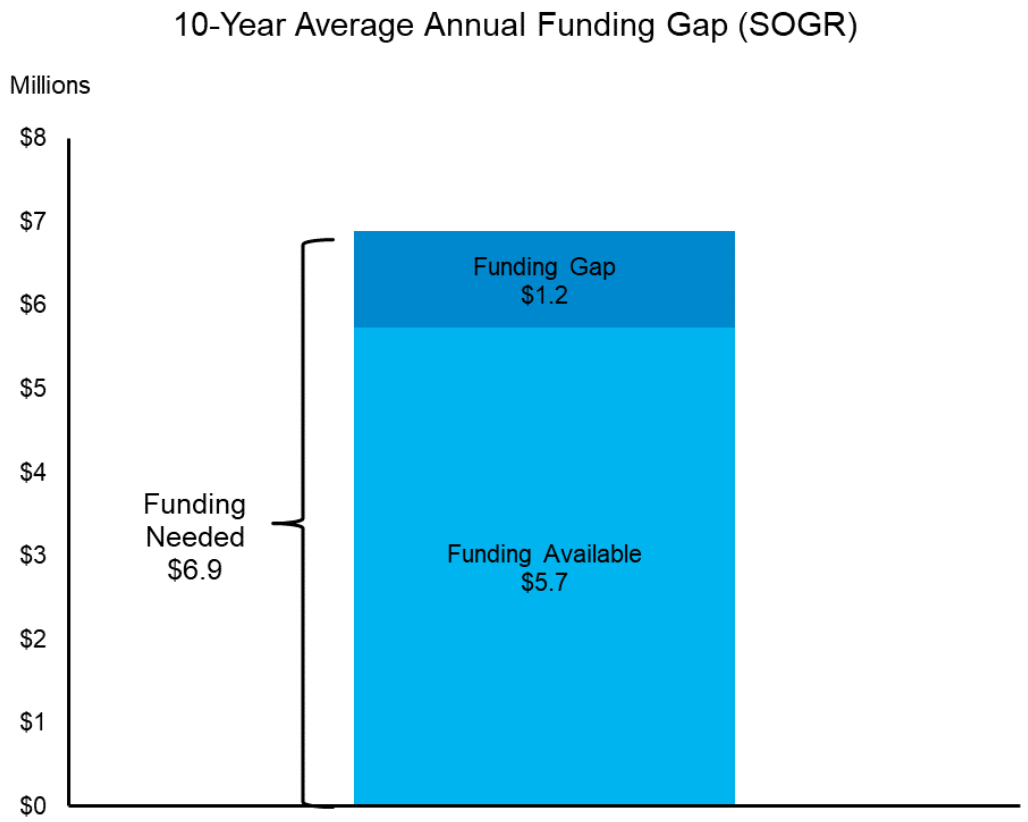
Additional funding will allow the average FCI for all asset classes (except Parks and Works) to be maintained at their target over the next 10 years. Based on the 2023 year-end data, the Fire asset class does not have a funding gap. As part of continuous improvement, staff will continue to evaluate the affordability and sustainability of proposed levels of service, where they have been established, and integrate their asset management program with the annual budgeting process.

Corporate



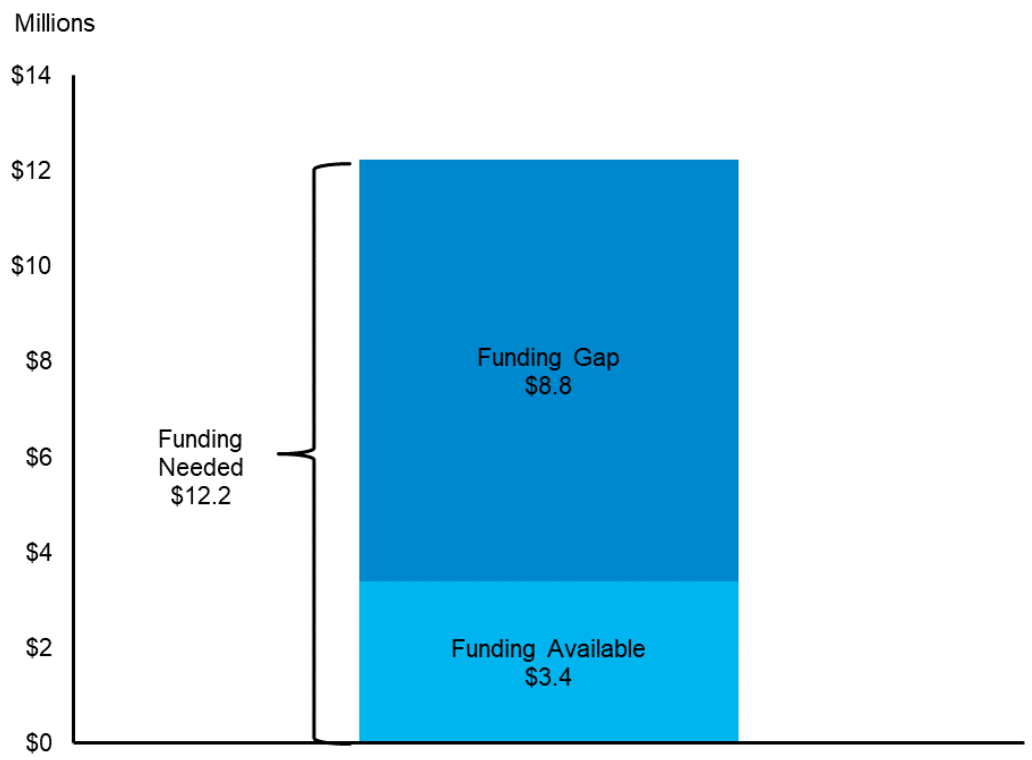
The Corporate asset class has a funding gap of $4.1 million.

Library



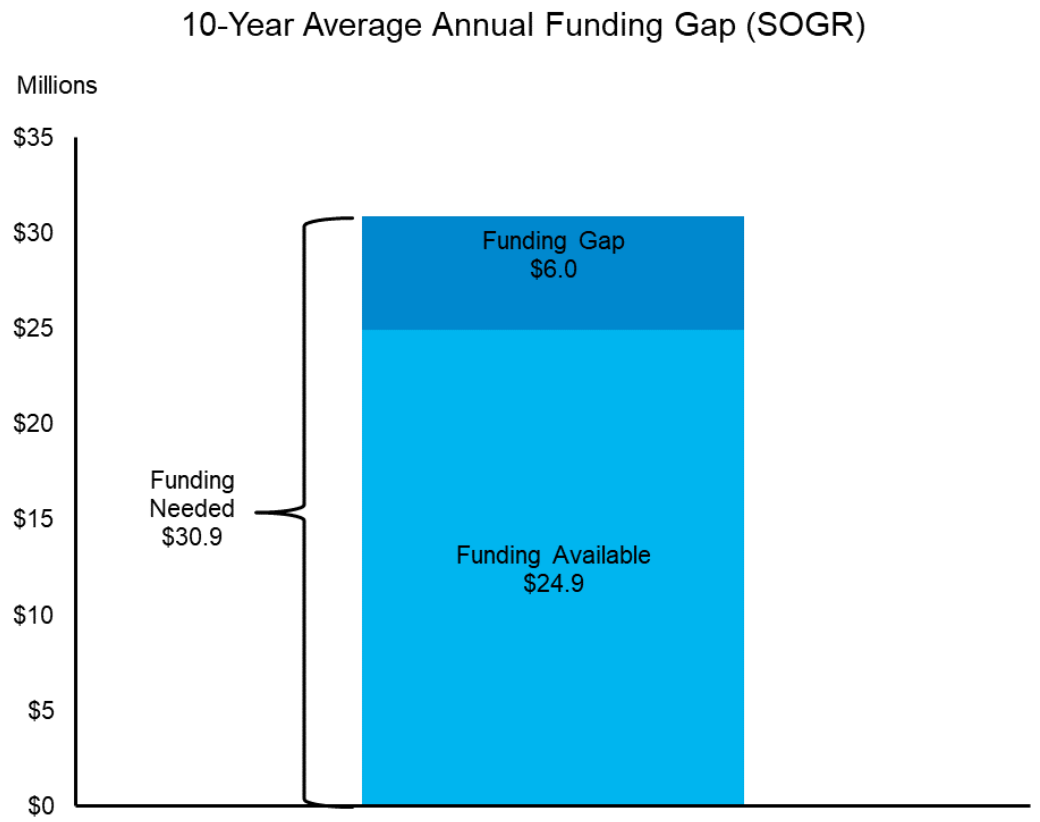
The overall 10-year average annual infrastructure gap for Library is $1.2 million.

Parks



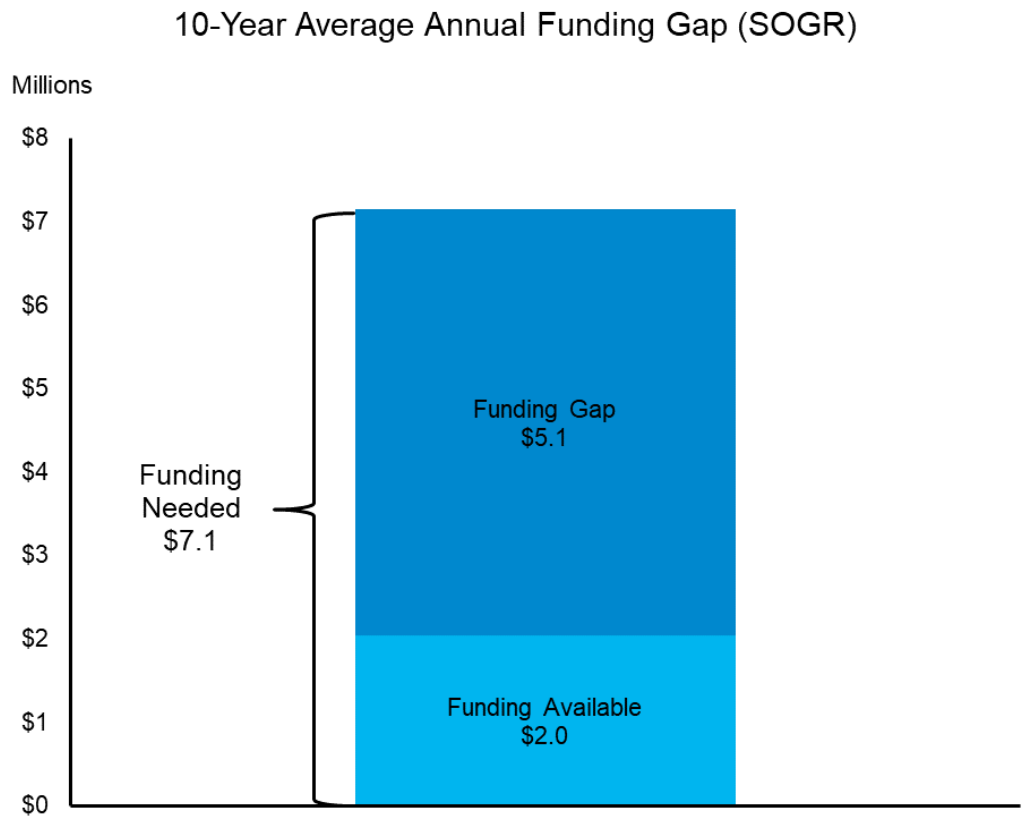
Among the seven asset classes, Parks has the largest overall 10-year average annual infrastructure gap sitting at $8.8 million

Recreation



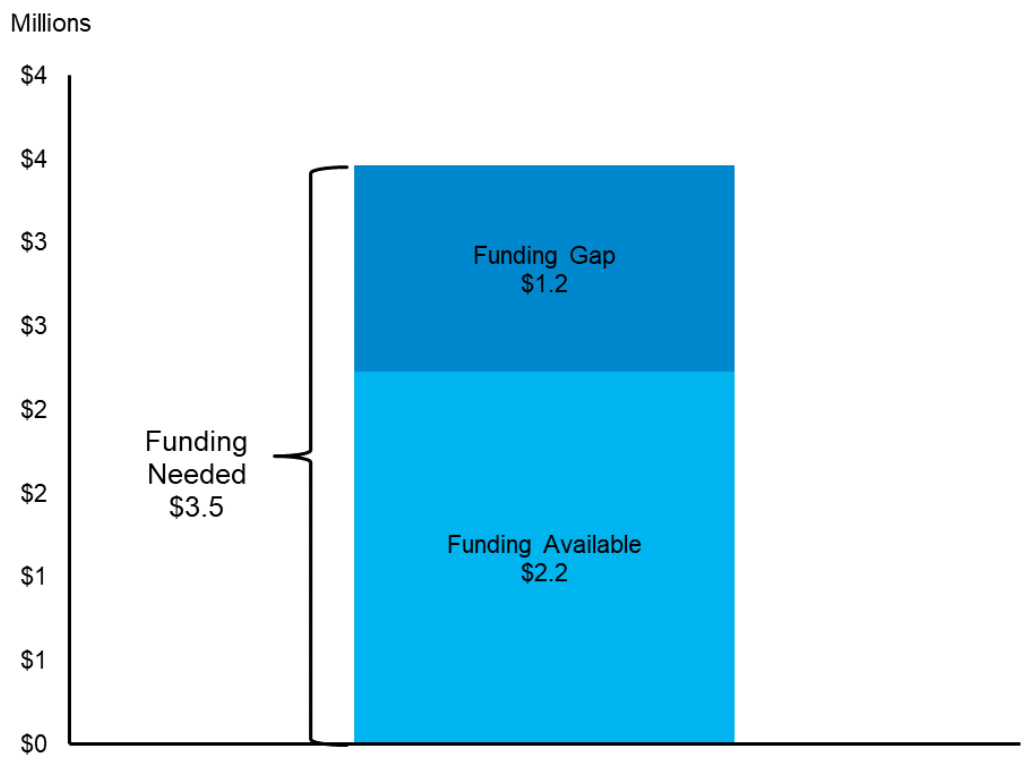
The overall 10-year average annual infrastructure gap for Recreation is $6.0 million.

Transit



The overall 10-year average annual infrastructure gap for Transit is $5.1 million exceeding the available funding budget.

Works



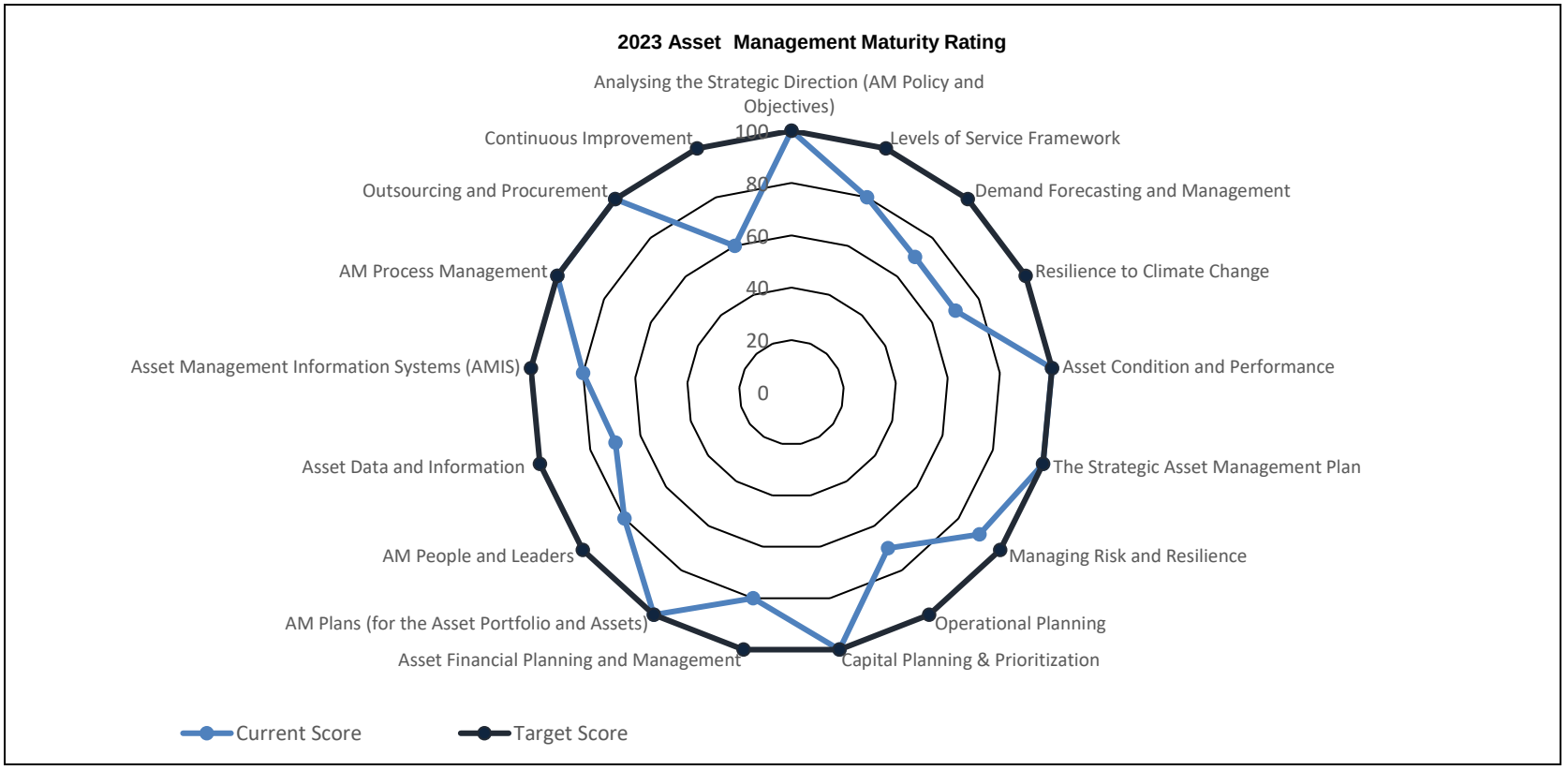
The overall 10-year average annual infrastructure gap for Works is $1.2 million.

Continuous Improvement & Maturity

Maturity Assessments

The radar graph(s) below are based on a 2023 maturity assessment. As the service areas mature in each category, they will expand outwards towards the outer ring (Target).

Facilities Planning & Development



Continuous Improvement Plan

Task No.	Continuous Improvement Task	Asset Class	Estimated Timing	Value/Impact	Required Resources
State of Infrastructure (SOI)					
SOI - 01	Update data inventory by conducting annual condition assessments.	All	2023-2028	Ensures that database is up to date at the conclusion of each annual capital project planning process.	Internal
SOI - 02	Conduct building condition assessments for facilities that are not assessed yet.	All	2023-2026	Improved completeness and accuracy of the information within the database to improve tracking and management of assets and identifying funding requirements for capital renewal and asset management planning.	External
SOI - 03	Conduct desktop appraisals of the facilities and associated site infrastructure within the property lines.	All	2024-2026	Ensure that the appraised insurance value is up to date and inclusive of all building components within the property lines to improve the asset management planning.	External
SOI - 04	Continue to split up and assign the building facilities and systems to the corresponding service areas responsible for lease/shared use	All	2023-2026	Improved tracking/reporting of assets and responsibility to maintain/manage assets, and management of assets and identifying funding requirements.	Internal

Task No.	Continuous Improvement Task	Asset Class	Estimated Timing	Value/Impact	Required Resources
	facilities. Client consultation required.				
SOI - 05	Culture asset class to be divided and assigned to either Recreation or Parks asset class accordingly.	Parks, Recreation	2023-2026	Improved tracking/reporting of assets and responsibility to maintain/manage assets, and management of assets and identifying funding requirements.	Internal
SOI - 06	Clearly define a process for all staff to provide inventory data updates when work has been completed at a City facility or site. Define a communication plan and reporting mechanism to ensure compliance.	All	2023-2026	Improved completeness and accuracy of the information within the database to improve tracking and management of assets and identifying funding requirements for capital renewal and asset management planning.	Internal
SOI - 07	Define framework to integrate linear site infrastructure, EV chargers and climate change initiatives into the inventory.	All	2023-2028	Improved completeness to capture all demand forecasted activities.	Internal

Task No.	Continuous Improvement Task	Asset Class	Estimated Timing	Value/Impact	Required Resources
SOI - 08	Update data inventory for back logged work completed by various asset classes.	All	2023-2028	Ensures that database is up to date at the conclusion of each annual capital project planning process and remove any redundancies.	Internal
SOI - 09	Review robustness of the FCI and risk assessment frameworks.	All	2023-2028	Improved data priorities to help with capital renewal decision making.	Internal
Lifecycle Activities (LCA)					
LCA - 01	Facilitate a discussion to understand the pros/cons of a centralized and decentralized model for capital funding for facilities and the asset portfolio. To be done in collaboration with the other service areas define an approach for moving forward.	All	2023-2026	Improved completeness and accuracy of the information within the database to improve tracking and management of assets and identifying funding requirements for capital renewal and asset management planning.	Internal
LCA - 02	Update the FPD and client group Service Level Agreements to address gaps and	All	2023-2026	Improved completeness and accuracy of the information within the database to improve tracking and management of	Internal

Task No.	Continuous Improvement Task	Asset Class	Estimated Timing	Value/Impact	Required Resources
	define the asset responsibility and asset list.			assets and identifying funding requirements for capital renewal and asset management planning.	
Financing Strategies (FS)					
FS - 01	Define an approach where the demand forecasts will be based on the weighted FCI and not on the facility average.	All	2023-2026	Support decision making and allocating funding for capital renewal and asset management planning based on the risk rating and system groups.	Internal
FS - 02	Create framework that leverages centralized asset data to drive budget from across all the Service Areas.	All	2023-2026	Support decision making and allocating funding for capital renewal and asset management planning across the organization.	Internal

Corporate Asset
Management Plan **2025**

Parks, Forestry & Environment

Table of Contents

Introduction 3
Key Stats 4
State of the Infrastructure 5
- Asset Hierarchy 5
- Asset Class - Summary 7
- Assets Used by Parks, Forestry & Environment - Managed By Other Service Areas 8
- Asset Management Tools & Systems 9
- Dashboards 9

Levels of Service 27
- Governing Legislation for Parks, Forestry & Environment Service Area 27
- Community Levels of Service Framework 28
- Technical Levels of Service Framework 30

Demand Management 33
- Demand Drivers, Projections and Management Plans 34

Risk Management 41
Lifecycle Management 42
- Lifecycle Strategies 42
- Lifecycle Needs vs. Budget 47
- Budget Breakdown 55

Financing Strategy 57
- Capital Funding Sources and Operating Revenue Sources 57
- Infrastructure Gap 58

Continuous Improvement and Maturity 63
- Maturity Assessments 63
- Continuous Improvement Plan 72

Appendix 75

Introduction

Valued at over $1.4 billion, as shown in Key Stats, Mississauga's Parks, Forestry & Environment (PFE) division plans, develops, maintains, expands and renews the parks system, public art and heritage, and urban forest, boulevard landscapes and natural areas. The Parks, Forestry & Environment Asset Management Program includes park amenities, park infrastructure, trees, boulevard landscapes, natural areas and equipment. Parks, Forestry & Environment has a robust inventory of assets, tracked and regularly assessed, to determine accurate budgetary needs.

The public art and heritage assets grow the City as a vibrant arts, culture and heritage hub.

Contemplating Child sculpture

Lakefront Promenade

Key Stats

Current Replacement Value (CRV)	Average Condition	Current Maturity Level
$1.4 Billion	Good	Intermediate
Average Annual Infrastructure Gap – Current LOS		Average Annual Infrastructure Gap – Proposed LOS
$10.4 Million[1]		Ongoing Analysis

[1] Council has approved additional capital funding in order to minimize the existing infrastructure gap starting in 2025.

State of the Infrastructure

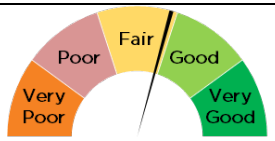
Asset Hierarchy

Table 1: Parks, Forestry & Environment Hierarchy

Asset Class	Asset Type
Amenities	Sports Fields
	Green Space
	Park Structures
	Sports Courts & Multi-Pads
	Play Facilities
Parks Infrastructure	Off-Road Trails
	Pedestrian Bridges
	Docking Systems
Parks Equipment	Power Equipment
	Tools and Specialized Equipment
	Machinery
Trees	Street Trees
	Park Trees
	Trees in Amended Boulevard Treatments
Boulevard Landscapes	Boulevard Grass
	Horticulture Features
	Seasonal Planters

	Amended Boulevard Treatment Areas
Natural Areas	Forested
	Non-Forested
Forestry Equipment	Power Equipment
	Tools and Specialized Equipment
	Machinery
	Information Technology
Public Art and Heritage	Pedestrian Art
	Greenspace Art
	Roadway Art
	Visible Art
	Heritage and Museum Equipment

Asset Class - Summary

Asset Class	Current Replacement Value (Millions)	Average Condition	Average Annual Infrastructure Gap – Current LOS (Millions)
Amenities	$392.8		$4.9
Parks Infrastructure	$120.5		$1.1
Parks Equipment	$1.1		$0.0
Trees	$582.3		$3.4
Boulevard Landscapes	$93.8		$0.0
Natural Areas	$226.8		$0.9
Forestry Equipment	$0.8		$0.0

Public Art and Heritage	$5.1		$0.0

The average annual funding gap to meet proposed levels of service is an ongoing analysis that staff are conducting for all their asset classes.

Assets Used by Parks, Forestry & Environment - Managed By Other Service Areas

Assets Used by Parks, Forestry & Environment	Managed By	Quantity	Current Replacement Value (Millions)
Vehicles and Equipment	Corporate Fleet	564 Ea.	$27.4
Buildings	Facilities Planning & Development	78 Ea.	$75.2

Asset Management Tools & Systems

The City maintains its inventory information in various systems, with each system serving a specific function and purpose.

Infor is the computerized maintenance management system used by Parks, Forestry and Environment staff to track most of their assets and manage service requests, work orders and permits. Requests for service are tracked from two primary channels: the offices of the Mayor and members of Council and the 3-1-1 Citizen Contact Centre.

RoadMatrix is a specialized asset analysis system used to track and manage off-road trails. The system stores condition assessment information and can forecast long-term requirements.

CityWide is the City's Tangible Capital Asset (TCA) System. The system was introduced in 2008 to capture infrastructure valuation information about the City's major assets.

Excel is used to track inventory and relevant attribute information for public art and heritage assets.

Each of these systems plays an integral role in supporting decision-making about City services and infrastructure. The inventory information contained within each of these systems is comprehensive, reliable, and reasonably accurate and has been used to support the development of this plan.

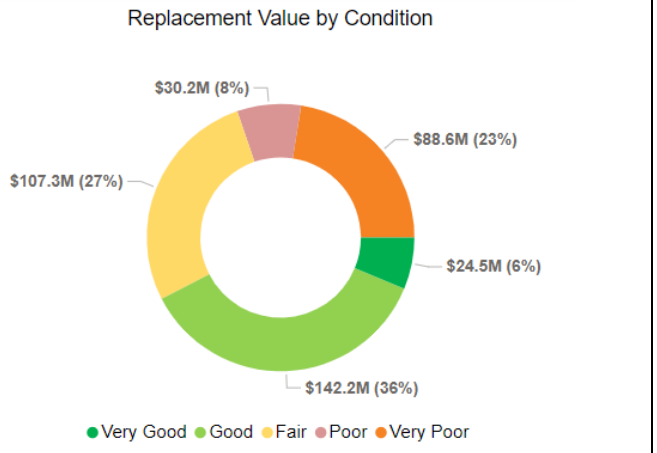
Dashboards

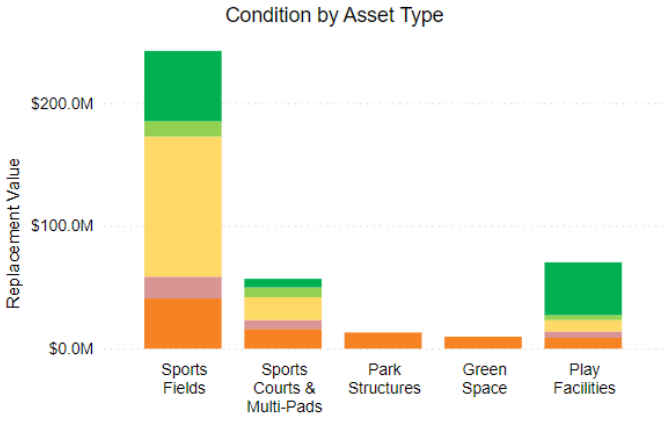
The following dashboards provide a summary of the state of the current infrastructure for each asset class. The information in this plan was prepared using 2023 year-end data in 2023 dollars. In charts, graphs and tables where money is represented in thousands of dollars ($000), figures have been rounded to the nearest thousand. This means that the totals shown may not always balance perfectly, due to rounding.

Asset Class: Amenities

Data Quality:	Asset Inventory	Condition	Replacement Value
	B	B	A

Current Replacement Value: $392.8 Million





Asset Type	Quantity	Average Age (Years)	Estimated Useful Life (Years)	Current Replacement Value (000s)
Sports Fields	398 Ea.	25.6	25	$242,600
Green Space	96 Ea.	5.7	25	$9,900
Park Structures	89 Ea.	17.3	25	$13,150
Sports Courts & Multi-Pads	258 Ea.	14.4	20-25	$56,900
Play Facilities	300 Ea.	14.3	20-25	$70,300

Background Information

Amenities have various asset types within them that serve different functions; they include:

- Sports Fields include Baseball/Softball, Cricket, Football, Soccer and Track & Field fields
- Green Space include Outdoor Fitness and Leash Free Zones
- Park Structures include Picnic and Shade Structures
- Sport Courts & Multi-Pads include Basketball/Multi-Pads, Bocce, BMX, Lacrosse, Lawn Bowling, Multi-Ramp
- Tennis/Pickleball and Volleyball courts
- Play Facilities include Community and All-Inclusive Playgrounds as well as Spray Pads

Playground facilities are inspected on a monthly basis, in accordance with Canadian standard association (CSA) standards, regardless of the size or complexity of the assets; any major deficiencies that affect functionality, use or the safety of users are addressed immediately. Regardless of the condition of the playground facility, once it reaches its estimated useful life of 25 years, it is replaced. Staff will consider new technologies and accessibility requirements at the time of replacement.

An overall condition inspection is conducted annually for playground facilities to determine future capital needs. Spray pads are inspected on a regular basis. Spray pad water does not need to be tested regularly as the water is not recirculated and goes to waste.

Sports fields, courts, and green spaces undergo comprehensive condition assessments every two to three years.

Staff perform regular visual checks on the park structures; with more formal condition assessments being conducted every three years. Park structures are undergoing a condition assessment that will be completed in the spring of 2025.

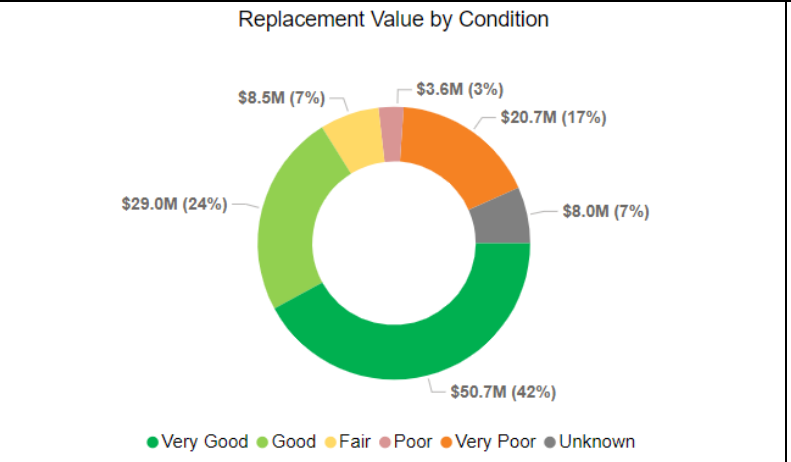
Assets that have been excluded from this iteration include:

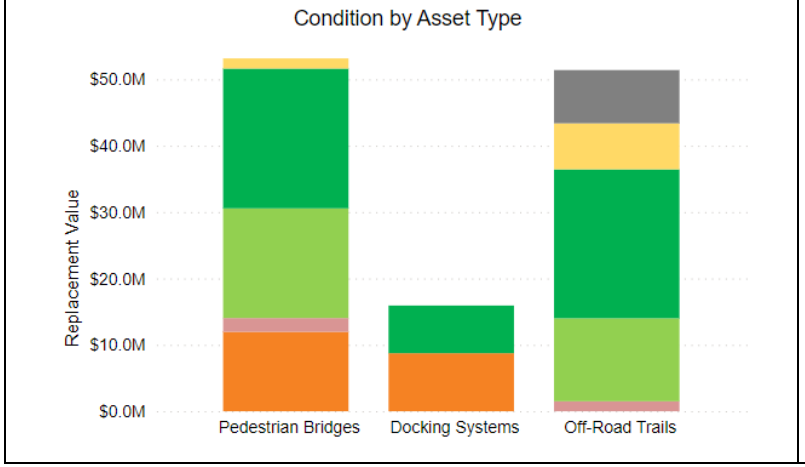
- Natural ice rinks
- Toboggan hills
- Seasonal planters
- Amenities owned by external organizations (e.g. school boards, Region of Peel, etc.)

Asset Class: Parks Infrastructure

Data Quality:	Asset Inventory	Condition	Replacement Value
	A	B	A

Current Replacement Value: $120.5 Million





Asset Type	Quantity	Average Age (Years)	Estimated Useful Life (Years)	Current Replacement Value (000s)
Off-Road Trails	277.8 km	-	15	$53,200
Pedestrian Bridges	131 Ea.	24.9	30	$51,400
Docking Systems	10 Ea.	17.0	20	$15,900

Background Information

Park trails are assessed formally every three years, with the last assessment having been conducted in October 2020. Staff exclude certain trails from the condition assessment if they are under or around major construction at the time of the inspection. A new condition assessment of trails will be conducted in 2025. Trails receive a pavement quality index (PQI) that is in line with how road pavement is assessed. Any trails owned and managed by the Roads group are not included in this plan.

Gravel or dirt trails are visually inspected by staff, on an ad-hoc basis. These assets are in a perpetual cycle of maintenance.

Pedestrian bridges are inspected every two years through the Ontario Structural Inspection Manual (OSIMs) studies and receive a condition rating. Park staff also regularly inspect the bridges to ensure that they are safe, accessible and reliable. Bridges managed by the Roads group are not included in this plan.

Docking systems are informally inspected on an ad-hoc basis and mostly rely on an age-based condition to determine lifecycle intervention.

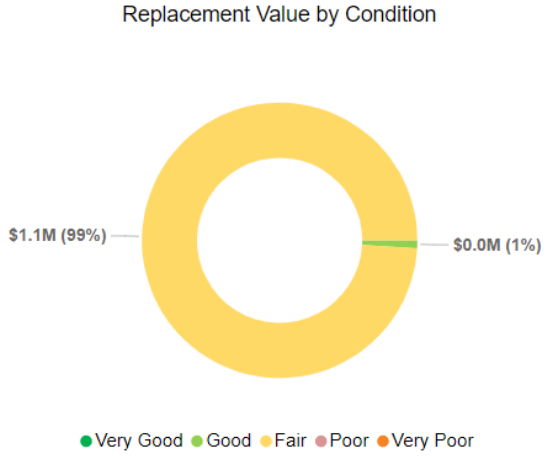
Staff are improving the quality and accuracy of data related to other parks infrastructure assets such as retaining walls, perimeter fencing and shoreline treatments before they are included in asset management plans.

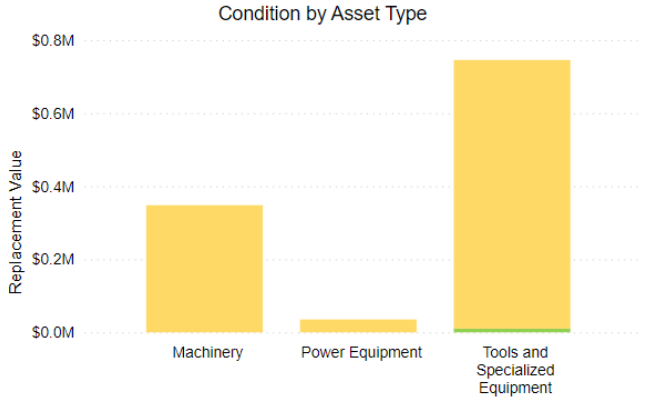
Nine Creeks Trail

Asset Class: Parks Equipment

Data Quality:	Asset Inventory	Condition	Replacement Value
	C	C	B

Current Replacement Value: $1.1 Million





Asset Type	Quantity	Average Age (Years)	Estimated Useful Life (Years)	Current Replacement Value (000s)
Tools & Specialized Equipment	635 Ea.	-	10	$750
Power Equipment	97 Ea.	-	10	$35
Machinery	193 Ea.	-	10	$350

Background Information

Staff primarily utilize age-based condition assessments for the Parks equipment. Some considerations for asset usage, functionality and obsolescence are taken into account when staff are prioritizing replacements, but they are not reflected in the above condition ratings for the assets.

Where in-service date and age are missing, staff made educated estimates on the condition, with most assets being labelled as Fair.

Major fleet and equipment that are owned and managed by Corporate Fleet group are not included in this plan.

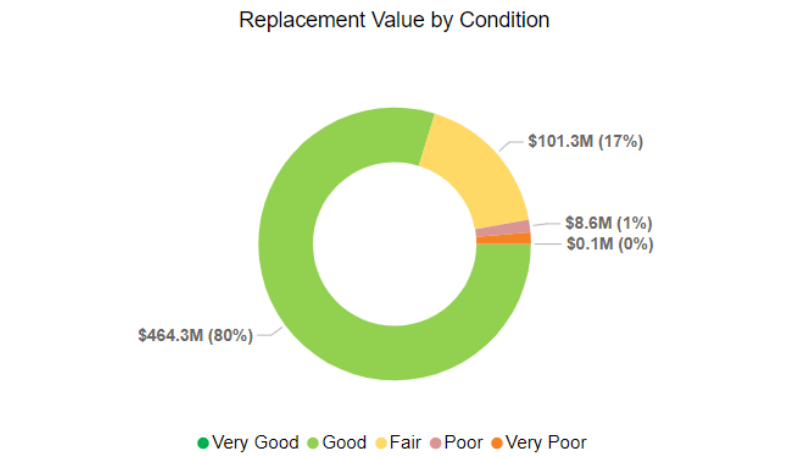
Parks operations staff continue to work on the quality and accuracy of the parks equipment inventory by assessing the condition of assets and appraising their replacement costs.

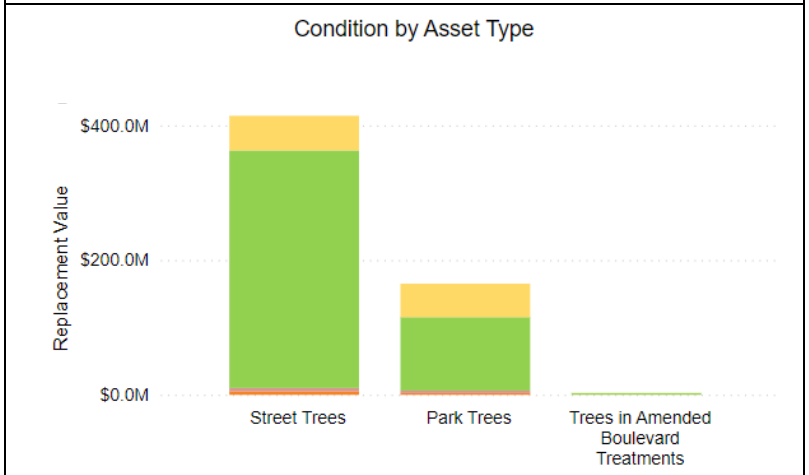
Maintenance at Mississauga Parks

Asset Class: Trees

Data Quality:	Asset Inventory	Condition	Replacement Value
	A	A	A

Current Replacement Value: $582.3 Million





Asset Type	Quantity	Average Age (Years)	Estimated Useful Life (Years)	Current Replacement Value (000s)
Street Trees	192,884 Ea.	18.3	30	$414,300
Park Trees	69,957 Ea.	17.2	60	$165,100
Trees in Amended Boulevard Treatments	548 Ea.	6.6	30	$2,900

Background Information

The tree inventory is updated on a seven-year rotation, and by Forestry staff on an as-needed basis. The tree inventory condition assessment was originally completed on a four-point scale, however, to remain consistent with Corporate Asset Management guidelines, it was converted into a five-point scale. The 2025 inventory cycle utilized the five-point scale as will future updates to the tree inventory.

Age data is largely incomplete as documented installation dates were only reliably available after 2018. A model was developed to approximate age of trees which factored species growth factors using their diameter as a proxy for age.

A Safe Useful Life Expectancy (SULE) model was developed to project the expected number of years that an asset can be expected to provide a desired level of service at an acceptable cost and level of risk.

Monetary replacement cost for living assets is a complex task. To determine an appropriate replacement cost, the Guide for Plant Appraisal (Ninth ed.) by the Council for Tree & Landscape Appraisers (CTLA) was used. Appraisal valuations considered the basic tree cost derived from the cost of the tree and the unit tree cost multiplied by the appraised trunk increase. This value was then multiplied by variables depreciating for species rating, location rating, and condition rating. When the appraised value was below the replacement cost, the value was adjusted to replacement cost to install a new tree, inclusive of costs associated with the removal of the tree in order to plant a new one.

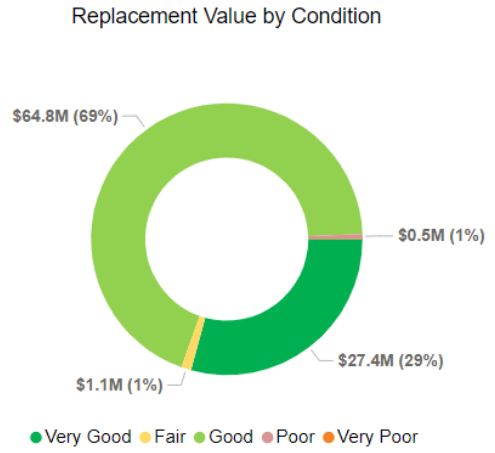
Tree assets where ownership is not conclusive or are currently under warranty (e.g. developer installations) are not included in the inventory. As they become assumed they will be included in future iterations of this plan.

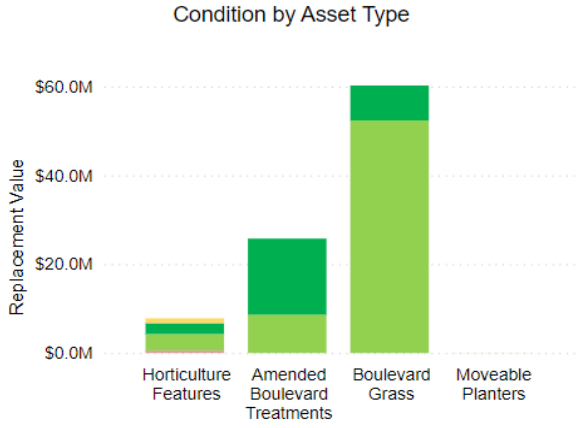
Street tree planting on Barrisdale Drive

Asset Class: Boulevard Landscapes

Data Quality:	Asset Inventory	Condition	Replacement Value
	B	B	A

Current Replacement Value: $93.8 Million





Asset Type	Quantity	Average Age (Years)	Estimated Useful Life (Years)	Current Replacement Value (000s)
Boulevard Grass	215.1 Ea.	-	-	$60,200
Horticulture Features	4.4 Ea.	-	-	$7,800
Moveable Planters	34 Ea.	5.0	15	$30
Amended Boulevard Treatments	varies.	-	30-50	$25,800

Background Information

Boulevard Grass

Staff oversee the maintenance of approximately 215 hectares of grass cutting throughout the City. Areas are added or removed as required based on an established eligibility criteria. These assets are in a perpetual state of maintenance and undergo regular visual inspections aligned with the frequency of service.

To estimate replacement value, staff calculate the costs associated with the removal of the existing grass, introducing new soil, laying the sod, applying initial fertilization, and maintaining consistent watering for a duration of 14 days to establish a healthy turf.

Horticulture Features

Visual inspections are conducted regularly by staff. Similarly to Boulevard Grass, these assets have an annual maintenance requirement. If left unmaintained, these features degrade quickly as weeds and weather elements break down the horticultural display.

Horticulture feature replacement costs are based on obtained quotations and consultation for services. Actual costs are highly variable depending on location constraints and plant material that is being installed.

As the infrastructure that holds the horticulture features, such as concrete containers, is not owned or managed by Forestry, assessment is limited to the soil, plants, and trees.

Seasonal Planters

Staff maintain several seasonal planters used for horticultural displays. These seasonal planters can be transported across various locations City-wide. A majority of them are found along the Bus Rapid Transit (BRT) station network and at various transit facilities.

Staff rely on age-based condition in the absence of physical condition assessments.

Amended Boulevard Treatment Areas

Staff rely on age-based condition in the absence of physical condition assessments. Planning & Building staff provided a detailed price matrix to reflect costs for the installation of amended boulevard treatments.

Amended Boulevard Treatments are upgraded boulevard infrastructure throughout the City. Generally, amended boulevards are installed by developers as part of development there are numerous examples in which Park Development or Transportation & Works (T&W) have installed certain features. They are relatively costly to install and thus require a higher degree of attention.

These asset types are typically unencumbered lands, free of utilities or other infrastructure, and typically feature soil cells, and engineered growing media. Although there may be multiple combinations, the primary installations include:

- Soil Cells: in which an engineered infrastructure is installed into the boulevard and filled with soil. This infrastructure prevents soil compaction, which is common in dense urban areas, however it is the most expensive form of amended boulevard
- Structural Soil: in which an engineered growing mixture, primarily mixed granular, is used which is more resistant to the impacts of compaction. However, without frequent soil amendments, it is the lowest quality for tree growth

Amended soils: existing soils (often compacted or poor quality, i.e., shale) are replaced with a soil growing media suitable for tree growth. Often these environments (although not always) are associated with curbed planters to prevent compaction. This is the optimal environment for tree growth but most susceptible to impacts of tree compaction.

Streetscape installations associated with amended boulevard treatments fall in the purview of Forestry, these include:

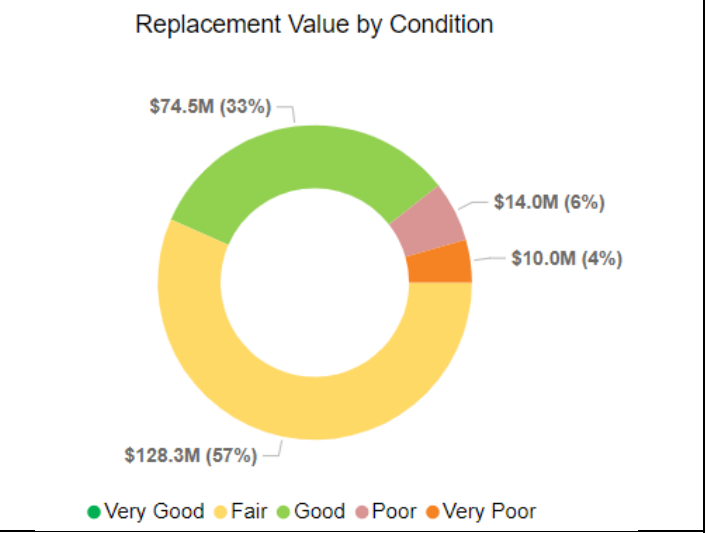
- Tree Guards
- Tree Grates
- Benches
- Garbage Receptacles

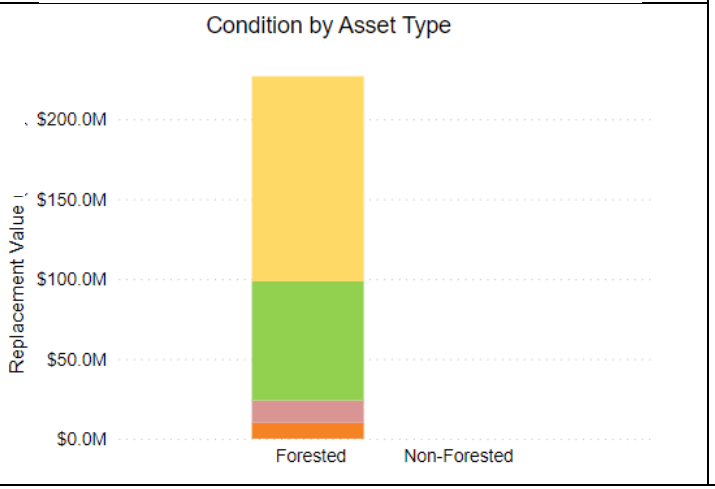
Boulevard grass that is not owned by the City (e.g. tractor-cut areas or with developer installations) is not included in the inventory at this time. Bike Parking/Rings that are within the amended boulevard treatments are owned by the Roads group and excluded from the inventory as well.

Horticultural Feature on Burnhamthorpe Rd W.

Asset Class: Natural Areas

Data Quality:	Asset Inventory	Condition	Replacement Value	Current Replacement Value:	$226.8 Million
	D	D	C		





Asset Type	Quantity	Average Age (Years)	Estimated Useful Life (Years)	Current Replacement Value (000s)
Forested	848 Ha.	-	80-120	$226,800
Non-Forested	Continuous Improvement			

Background Information

Forested Area

Forested areas include those lands that have a predominant land cover vegetated with trees. The underlying data source for this asset management plan is the 2022 forest inventory. Each forest area is provided an age-class, predominant species distribution, average basal area (indicator of density and for the purpose of asset management progress towards maturity). The amount of land area included in this analysis is 207.3 hectares of forested land. For the remaining forested areas an average value is generated using the representative samples from the forest inventory. A limitation of this analysis is that some of these other forested areas have diverse conditions unique from assessed woodlands including often small, limited access, steep slopes, ravine locations, and limited operational abilities. There is no industry standard approach to assess and calculate an overall condition rating, rather the CSA W218:23 Specification for Natural Asset Inventories provide guiding principles by defining minimum requirements for the development and reporting of a natural asset inventory.

To get an accurate picture of the health of a woodland, five key criteria are assessed: overstory quality, dead tree abundance, overstory diversity, abundance of desirable tree regeneration and abundance of invasive plant species. Each criterion is rated on a five-point scale. The overall health of the forest is determined by calculating the average of the criteria scores.

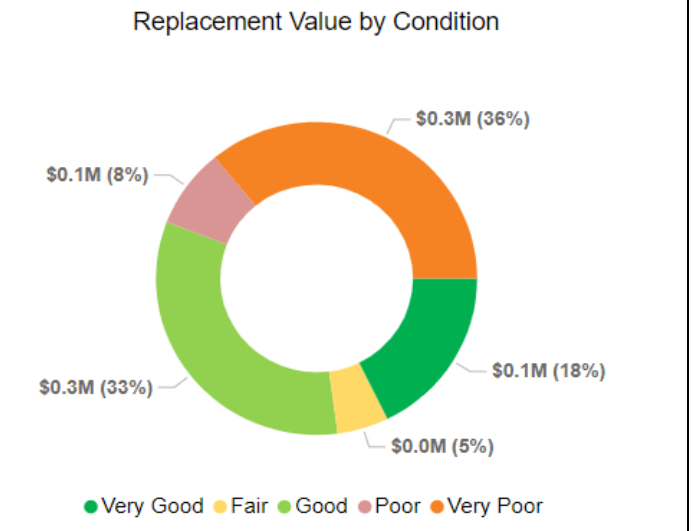
The replacement valuation method is based on the cost to restore each asset including natural/semi-natural forest, and plantation which constitute the forested asset type. The replacement value method estimates the cost of restoring a forest and adjusts it by a factor that reflects the time needed to recover the service levels of older forested areas. The restoration cost for each area is obtained by multiplying its area by the restoration cost per unit area. The adjustment factor is calculated by dividing the basal area of the inventory compartment by 5 m2/ha. The basal area is a measured attribute from Mississauga's forest inventory. The adjustment factor increases the value of older compartments compared to younger ones.

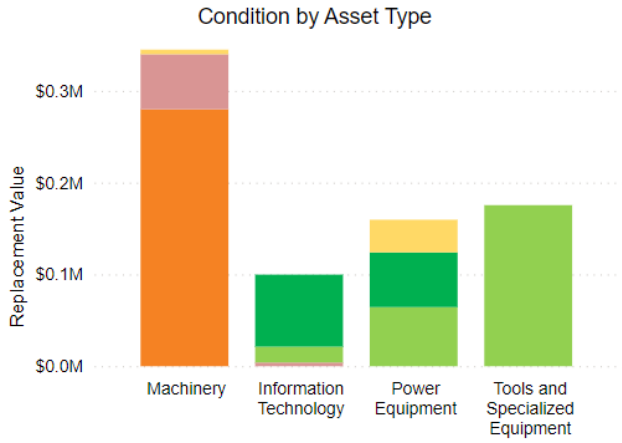
Non-Forested Area

Non-forested areas are ecosystems that are not predominantly treed. They have a diverse array of functions and will be further assessed in future iterations of this plan. These non-forested areas can include, but are not limited to, grasslands and wetlands.

Asset Class: Forestry Equipment

Data Quality:	Asset Inventory	Condition	Replacement Value	Current Replacement Value:	$0.8 Million
	C	C	A		





Asset Type	Quantity	Average Age (Years)	Estimated Useful Life (Years)	Current Replacement Value (000s)
Tools and Specialized Equipment	125 Ea.	7.0	5-10	$180
Power Equipment	100 Ea.	4.0	4	$160
Machinery	7 Ea.	11.0	10	$345
Information Technology	32 Ea.	1.9	4-10	$100

Background Information

Tools and Specialized Equipment

Forestry acquires highly specialized equipment important for completing tree work. Staff are provided with the equipment needed to operate safely in trees and aerial devices. There are manual tools and personal protective equipment (specialized) which are on a frequent replacement cycle due to their safety implications, frequency of use or other factors. These include:

- Arborist Specialized Tools and Equipment
- Manual Tools - Pole Pruners
- Manual Tools - Hand Saws
- Manual Tools - Ladder
- Arborist Personal Protective Equipment (Chain saw pants, Chainsaw boots, gloves, eye protection)

Age-based condition is utilized for these assets.

Power Equipment

These assets include climbing chainsaws, speciality chainsaws, power pole saws, power blowers, string trimmers, and more. Age-based condition is utilized for these assets.

Machinery

Forestry owns several specialized machines outside of Corporate Fleet that enable specific tasks to be completed. These include:

- Mini-skidsteer (S800TX)
- Kubota Loader (B2320HSD w Auger & Tiller attachment)
- Stumper (SC60TX & SG13)
- Brush Mower
- Good Rig Control System

Age-based condition is utilized for these assets.

Information Technology

Forestry owns tablets that are not owned or managed by Information Technology (IT) as they are considered secondary devices. IT provides an asset identification for the tablets, but the purchase, maintenance and replacement fall within the responsibility of Forestry.

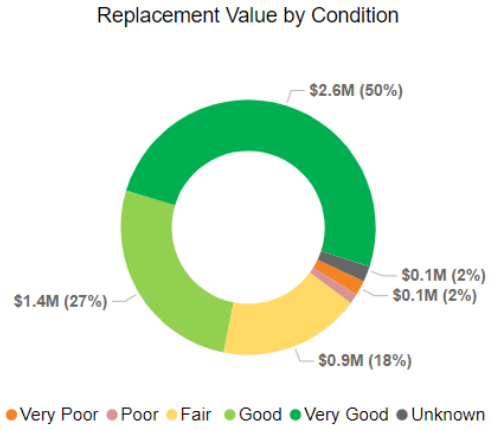
Further, Forestry owns Advanced Diagnostic tools as well as Remotely Piloted Aircraft Systems.

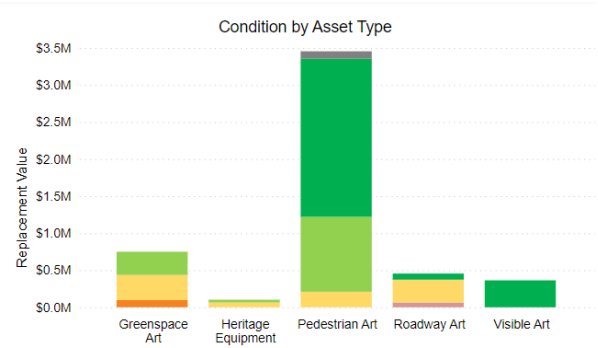
Age-based condition is utilized for these assets.

Asset Class: Public Art & Heritage

Data Quality:	Asset Inventory	Condition	Replacement Value
	B	B	A

Current Replacement Value: $5.1 Million





Asset Type	Quantity	Average Age (Years)	Estimated Useful Life (Years)	Current Replacement Value (000s)
Greenspace Art	5 Ea.	21.0	20-40	$750
Pedestrian Art	21 Ea.	8.9	20-40	$3,460
Roadway Art	3 Ea.	6.3	20-40	$455
Visible Art	4 Ea.	10.3	20	$360
Heritage Equipment	45 Ea.	-	5-10	$100

Background Information

Public Art

Public Art includes 33 permanent public art pieces throughout the City of Mississauga that are well inventoried. Replacement values are based on insurance appraisals that are conducted regularly.

Depending on the material type that the Public Art asset is composed of the estimated useful life will vary greatly.

The condition of these assets is based on a mixture of age-based assessment as well as staff inspections. Depending on the asset, those inspections are conducted quarterly, yearly, or as required based on staff expertise. As a result, the data quality index for Condition is at a “B”.

Temporary and digital public art assets are not included in this iteration.

Heritage Equipment

Heritage equipment only includes mannequins, stands and cases. Although artifacts are also part of this division, they are considered priceless and have not been factored into this asset management plan. Museum collections, which are also held by this division, were not reviewed as part of this assessment as their value and lifecycle are determined through Museum standards and processes.

The condition for all assets was assumed to be “Fair-Good” as no formal condition assessments are conducted at this time, and the majority of assets lacked an in-service date in order to approximate the age. This has been identified as a continuous improvement item as staff advance on their asset management journey. Replacement values were based on current market prices.

Artifacts and museum collections (over 25,000 assets considered invaluable) are not included either.

Levels of Service

Governing Legislation for Parks, Forestry & Environment Service Area

Legislation	Requirements
Accessibility of Ontarians with Disabilities Act, 2005	Provides accessibility standards to benefit all Ontarians.
Conservation Authorities Act, 1990	Provides guidance for the organization and delivery of programs and services that further the conservation, restoration, development and management of natural resources in watersheds in Ontario.
Development Charges Act, 1997	Provides municipalities the ability to levy charges to fund growth-related municipal infrastructure, on the principle that growth pays for growth.
Emergency Management and Civil Protection Act, 1990	Provides requirements for emergency management.
Municipal By-Laws	Regulations approved by Council to safeguard and protect persons and properties.
O. Reg 239/02: Minimum Maintenance Standards	Provides requirements for minimum standards of repair for municipal highways.
O. Reg. 472/10 and O. Reg. 104/97: Standards for Bridges	Defines which bridges must be inspected biennially.
O. Reg. 588/17: Asset Management Planning for Municipal Infrastructure	Provides policies and guidelines for levels of service considerations in stormwater management assets.
Occupational Health and Safety Act, 1990	Rules governing health and safety in Ontario's workplaces.
Ontario Heritage Act, 1990	Provides guidance for the organization and delivery of programs and services that further the conservation, restoration, development and management of natural resources in watersheds in Ontario.
Ontario Water Resources Act, 1990	Provides guidance in the inspection and maintenance frequency of stormwater management facilities (i.e., storm ponds).
Planning Act, 1990	Provides direction on municipal planning activities.

Community Levels of Service Framework

Core Value	LOS Objective	Asset Class	Performance Measure	Current Performance
Scope	To ensure assets support the delivery of Parks services.	Parks Infrastructure	Description of the traffic that is supported by bridges.	Park bridges support pedestrians, cyclists and other users.
		Amenities	Park Facilities – Description of their distribution throughout the city. Following the Future Directions.	Walkability to Parks Play sites (See Figure 3).
	To ensure assets support the delivery of Forestry services and health of the natural environment and the community.	Trees, Boulevard Landscapes	Description of the location and quantity of Forestry assets.	Boulevard Landscapes and Tree Asset Network (See Figure 5 and Figure 6).
Quality	To ensure efficient and well- maintained infrastructure that supports the wellbeing of the community.	Parks Infrastructure	Description of the condition of structures and impact on use.	Bridges undergo biennial condition assessments and receive an overall Bridge Condition Index (BCI) that ranges from 0-100.
		Amenities	Park Facilities – Description of the inspection process and lifecycle activities conducted to ensure state of good repair (SOGR).	Assets undergo inspection on a regular basis, with more critical assets having a greater frequency. Staff strive to maintain, rehabilitate and replace assets proactively, depending on the criticality, age and condition.

Core Value	LOS Objective	Asset Class	Performance Measure	Current Performance
	To ensure well-maintained green infrastructure that supports the health of the natural environment and the community.	Trees	Description of the condition of assets.	Example – Tree Quality Map (See Figure 6).
Affordability	Parks services are maintained cost-effectively and are affordable to users.	Amenities	Park Facilities – Description of Service Level Agreements and standard operating procedures.	Parks staff adhere to established service level agreements and operating procedures.
	Forestry services are delivered in a cost-effective manner.	Trees, Boulevard Landscapes, Natural Areas	Description of Service Level Agreements and standard operating procedures.	Forestry has service level agreements with many groups including the public that specifies the timing of various life cycle activities. Example – Forestry Inspections has 30 business days to complete inspections for non- emergency requests.
Reliability	Forestry services are reliable and available when required.	Trees, Boulevard Landscapes, Natural Areas	Forestry Assets – Description of the lifecycle maintenance activities to ensure assets are in a state of good repair.	Assets are maintained on a scheduled maintenance cycle that adheres to best practices.

Technical Levels of Service Framework

LOS Objective	Asset Class	Performance Measure	Current Performance (2023)	Target Performance (2024-2033)	Background Information
Core Value: Scope					
To ensure assets support the delivery of Parks services.	Parks Infrastructure	Percent of bridges with loading or dimensional restrictions.	0%	Maintain status quo	Mandated metric by O.Reg. 588/17.
To ensure assets support the delivery of Forestry services and health of the natural environment and the community.	Trees	Number of trees as a percentage of total plantable area of municipality.	Future Metric		
	Boulevard Landscapes	Number of hectares of boulevard landscapes as a percentage of total hectares of road allowance in Mississauga.	2.1%	Maintain status quo	N/A
	Natural Areas	Number of hectares of natural areas as a percentage of available parkland in Mississauga.	Future Metric		
Core Value: Quality					
To ensure efficient and well-maintained infrastructure that supports the wellbeing of	Parks Infrastructure	Average bridge condition index (BCI).	70.0	To align with Roads Service Area direction	BCI scores are updated biennially through OSIMs.

LOS Objective	Asset Class	Performance Measure	Current Performance (2023)	Target Performance (2024-2033)	Background Information
the community and the health of the natural environment.	All	Per cent of assets in fair or better condition.	84%	>70%	Inclusive of all Asset Classes in PF&E.
Core Value: Affordability					
Parks & Forestry services are delivered cost-effectively and are affordable to users.	All	Actual vs. Target Reinvestment Rate.	1.6% vs. 2.3%		A measure of how much funding is available to meet capital state of good repair lifecycle needs (Actual) versus how much funding is required (Target).
Core Value: Reliability					
Parks services are reliable and available at all necessary times.	Amenities	Per cent of assets with risk rating of high/very high.	Future Metric		
		Per cent compliance with scheduled preventative maintenance within established SLA timelines.	Future Metric		

LOS Objective	Asset Class	Performance Measure	Current Performance (2023)	Target Performance (2024-2033)	Background Information
		Per cent of Environics survey results with satisfied/very satisfied with park services.	84%	TBD	Survey conducted annually among residents in the City of Mississauga.
Forestry services are reliable and available when required.	Trees, Boulevard Landscapes, Natural Areas	Per cent of emergency maintenance completed within established SLA timelines.	94%	TBD	N/A
		Per cent of routine maintenance completed within established SLA timelines.	84%	TBD	N/A
		Per cent compliance within established SLA timelines.	86%	TBD	N/A
		Number of participants as a percentage of total participant spaces available.	Future Metric		

Demand Management

The City places significant emphasis on assessing the present and future needs of its Park System, Urban Forest & Natural Heritage System, all of which are crucial elements in the City's overall health. They facilitate a wide range of recreational, cultural and leisure activities while embracing vibrant urban spaces, multi-use trail systems and significant natural habitats. The City's Parks, Forestry & Environment Division envisions that these spaces function as integral components that enrich the quality of life for its residents.

To ensure a sustainable future for the City's Parks Systems, Urban Forest & Natural Heritage System, proactive planning for potential challenges posed by a suite of demand drivers are required. These include abiotic forces such as increased stress and damage from extreme weather events, biotic forces such as the spread of invasive non-native species, changes in technology and increased development and population growth.

The City's public art and heritage assets support the creative sector and improve quality of life and public places for residents and visitors.

Urban Canopy Dr. Martin L. Dobkin Community Park

Paul Coffey Park

It Takes a Community to Build the Story by Jay havens

Demand Drivers, Projections and Management Plans

Demand Driver	Current Position	Projection	Impact on Services	Demand Management Plan
Asset Management Planning	Asset Management is a relatively new concept for Ontario Municipalities. Ontario Municipalities are required to develop an asset management plan for non-core infrastructure by 2024.	Effective asset management planning is expected to become standard practice at the City within the next few years.	Effective asset management planning should allow the City to make effective, risk- based decisions. The asset management plan includes inspection programs and maintenance strategies to identify problems and intervene at the right times to fund rehabilitation and replacement works. This will result in cost-effective spending on the right assets at the right time to maximize an asset's useful service life.	Continue to implement asset management principles and procedures and identify/document continuous improvements through updated maturity assessments. Other initiatives for the Parks, Forestry & Environment section include improvements to data, software, training, and asset condition assessments to support effective programs, services and the development of better asset management plans and strategies.

Demand Driver	Current Position	Projection	Impact on Services	Demand Management Plan
Demographic & Population Changes	With the population and demography of the City of Mississauga constantly evolving, so do the demands and service level needs of the public. For example, demand for outdoor sports fields, courts, cricket pitches, and un-programmed spaces are increasing. Demand for the winter use of park amenities and trails is also increasing.	Staff evaluate service level provisions through regular public engagements, service requests, the Parks Plan, and by conducting a Parks, Forestry and Environment Future Directions plan review every four years. Considerations are made for the size, location and usage rate of park amenities when determining the feasibility of service improvements (e.g., expanding the scale of spray pads at destination-type or waterfront park developments, maintaining trails and pedestrian bridges in the winter).	To meet the demands or needs of the public with regards to appropriate and sustainable service level provisions, puts pressure on the City from an operational, economic and regulatory perspective. This is especially the case for growing requests such as maintaining parks and trails during the winter as that will require increased capital and/or operating budget to achieve.	Staff quantify the costs and risks associated with enhancing or modifying the types of services they maintain through their asset management plans, master plans and capital projects. Staff acquire or construct new assets to meet demands; expand the hours of sports courts and other park amenities to accommodate demand; Increase winter maintenance budget to account for off-road trails and pedestrian bridges that remain open in the winter.

Demand Driver	Current Position	Projection	Impact on Services	Demand Management Plan
Technological Advancements	New technologies and techniques are constantly being developed, and staff evaluate and take advantage of these advancements when feasible. Public Art staff are constantly considering new trends that emerge within the artworld, such as digital exhibits or interactive exhibits, and bringing them to the City.	Newer technologies provide more opportunities and competition, thereby allowing staff to diversify their lifecycle interventions. Technology will provide more opportunities for creative and interactive art pieces, such as virtual reality or augmented reality, which will create unique cultural experiences. Technological advancements can potentially provide City staff with more options to diversify their lifecycle interventions in a more efficient and cost-effective manner.	The ever-changing technological landscape puts pressure on Parks & Forestry's limited budget and staff resources. Staff try to adapt and utilize best industry practice, tools, and techniques in order to manage their assets effectively and sustain desired service levels. Using unsupported assets may increase risk of financial consequences and operational delays.	Conduct regular cost benefit analyses of new technology and potential service enhancements. Monitor changes to available renewal technologies and communicate with other municipalities to discuss changes in industry best practice. Staff conduct regular cost-benefit analyses of new technology and potential service enhancements. Staff also regularly investigate new opportunities and technologies to deliver unique cultural experiences at the City.

Demand Driver	Current Position	Projection	Impact on Services	Demand Management Plan
Climate Change & Extreme Weather Changes[2]	With the frequency and intensity of extreme weather changes increasing year after year, staff are challenged to maintain their levels of service and assets adequately. Extreme heat or drought events affect the usage of play facilities and outdoor sports fields, further exacerbated by the urban heat island (UHI) effect[3].	There are numerous changes predicted by mid-century, including, but not limited to, increases in temperature by approximately 3.4°C. The frequency of 1 in 100-year extreme rainfall and overland flooding events is expected to be three times more likely. The frequency of freezing rain events for the typically coldest months could increase in southwestern and south-central Ontario by the 2050s.	An increase in extreme heat can lead to dry-out of the park fields. It can also lead to quicker disintegration of asphalt and/or rubber court surfaces. An increase in extreme heat leads to increased stress on trees leading to reduced growth and vulnerability to pests and disease. Road salt is applied to roadways to mitigate freezing rain events, and as a result, impacts urban trees through salt spray on bark and foliage as well as infiltrating urban boulevards. This affects salinity, ultimately reducing	Staff evaluate different mitigation and adaptation strategies and conduct cost-benefit analyses to determine the best lifecycle interventions during the acquisition, maintenance, rehabilitation, replacement, or even disposal of assets. Staff conducted a climate change vulnerability assessments of municipally-owned assets in 2023 to better understand climate change hazards and their risks to Parks & Forestry services. Staff consider the impacts of climate change on assets during the capital planning process. Public Art

[2] Climate Risk Institute (CRI), Emmons & Olivier Resources Inc. (EOR), Nodelcorp, and Climalogik. 2023. Climate Change Risk and Adaptation Assessment for Asset Management. Prepared for the City of Mississauga, Ontario.
[3] Urban heat island (UHI) is a phenomenon characterized by higher temperatures in urban areas compared to their surrounding areas. This temperature difference is primarily attributed to human activities, such as the extensive use of impervious surfaces, buildings, and heat-generating infrastructure, which absorb and re- radiate solar energy, leading to elevated urban temperatures.

Demand Driver	Current Position	Projection	Impact on Services	Demand Management Plan
	They can also lead to the premature expiration of natural assets. Increased rainfall events can lead to more flooding and shutdown of amenities. Extreme wind events create a health and safety risk for operational staff as well as the Public. Climate change poses various challenges regarding how Public Art is created, maintained, and experienced.	High wind events can cause tree limbs and woody debris to fall, which can accumulate in watercourses, damage infrastructure, property, or people and can reduce vitality of tree.	the expected useful life of urban trees. Decline in overall tree health and vigour impacts the ability of the urban forest to provide essential ecosystem services. An increase in the frequency and severity of storms and precipitation events may affect the longevity of Public Art assets and expedite their deterioration (ex: rusting, corrosion, physical damages), thus affecting service levels. Adapting to increased temperatures and extreme weather events may affect the quality and sustainability of Culture programs and services.	staff work closely with the artists to ensure new exhibits are durable and sustainable. Forestry staff select more resilient species of hardy trees to plant, that are better able to withstand the stressors of growing in urban environments. Strengthen tree maintenance and pruning schedules to ensure health and safety of the urban forest. Increased importance of tree establishment and protection practices to ensure that trees can become self-resilient, structurally developed and protected from damage so that they are best prepared to withstand the impacts of a changing climate.

Demand Driver	Current Position	Projection	Impact on Services	Demand Management Plan
City Growth & Development	With continued population growth and intensification in Mississauga, the city will require additional outdoor recreation facilities to meet demand and service levels. Majority of areas within the city limits have been developed. Continued growth will result in pressures on the Urban Forest & Natural Heritage System.	Park redevelopments and additional parkland will be required to meet the demand created by new growth and additional population. New legislation and changes to the Planning Act further limit the City's ability to provide additional parkland. Future growth will result in more pressures on the Urban Forest & Natural Heritage System. Due to space constraints and overlapping development pressures, more soil cells and engineered growing media are expected to be installed.	New parkland and facilities will require additional staffing, operating resources and future capital rehabilitation and replacement requirements. Forestry assets will require additional staffing, operating resources and future capital rehabilitation and replacement requirements.	New assets will need to be added to the inventory registry and included in condition assessment programs for monitoring and future replacement needs. Targeted expansion of the Urban Forest & Natural Heritage System in high priority areas. The maintenance of trees and the restoration of natural areas will need to be strengthened.

Demand Driver	Current Position	Projection	Impact on Services	Demand Management Plan
Limited supply of available contractors	The City relies on a limited supply of available contractors to complete its work on the Urban Forest & Natural Heritage System.	The City will continue to be reliant on contractors to complete services pertaining to the management of the Urban Forest & Natural Heritage System.	Additional staffing, operating and capital resources will be required to maintain the Urban Forest & Natural Heritage System as costs increase overtime.	The need for, and importance of, the development of strong asset management and lifecycle management strategies to ensure funding and capacity is available when needed.

Risk Management

Park staff has identified risk management as a continuous improvement as they will begin to formalize and develop a framework in 2025. Staff prioritize assets by considering many factors such as the age, condition, location, usage and consequence of failure of the assets. Parks, Forestry & Environment staff will be working with the Corporate Asset Management (CAM) Office to develop comprehensive and reliable risk models so they can prioritize within, and across, various asset classes.

A qualitative risk rating was used for the Tree Asset Class following the methodology outlined in the ANSI A300 (Part 9)-2011 Tree Risk Assessment. The two-part matrix first shows the likelihood of failure with the likelihood of impacting targets as shown in Table 2. The second matrix assesses the likelihood of failure and impact derived from the first matrix against the perceived consequences, to determine a qualitative risk rating as shown in Table 3.

Table 2: Matrix One - Likelihood of Failure & Impacting Service Level

Likelihood of Failure	Likelihood of Impacting Service Level			
	Very Low	Low	Medium	High
Imminent	Unlikely	Somewhat Likely	Likely	Very Likely
Probable	Unlikely	Unlikely	Somewhat Likely	Likely
Possible	Unlikely	Unlikely	Unlikely	Somewhat Likely
Improbable	Unlikely	Unlikely	Unlikely	Unlikely

Table 3: Matrix Two - Likelihood of Failure & Consequence

Likelihood of Failure and Impact	Consequences			
	Negligible	Minor	Significant	Severe
Very Likely	Low	Moderate	High	Extreme
Likely	Very Low	Moderate	High	High
Somewhat Likely	Very Low	Low	Moderate	Moderate
Unlikely	Very Low	Very Low	Low	Low

Lifecycle Management

Lifecycle Strategies

Parks, Forestry and Environment – Current and Proposed Lifecycle Activities

Current and Proposed Lifecycle Activities	Risks associated with Lifecycle Activities
Non-Asset Solutions: Activities that do not alter the condition or performance of assets or services but provide staff with valuable information for their effective management.	
• Parks, Forestry & Environment Standard Operating Procedures are updated annually • Natural Heritage & Urban Forest Strategy • Urban Forestry Management Plan • Invasive Species Management Plan • Training courses to foster cultural change • Parks, Forestry & Environment Service Level Agreements (SLAs) are established and reviewed when needed • City staff are available to respond and attend to customer requests (24/7 on call coverage for emergency forestry requests) • Future Directions Master Plans • Feasibility Studies	• Asset life is not extended or cost of managing an asset increases rather than decreases • Facility closures • Loss of revenue • Not adhering to established service level agreements may results in shorter asset life, worsening quality, public distrust in business unit, exposure to claims • Injury/lawsuit
Operations & Maintenance: Minor activities that preserve the condition or performance of assets and ensures the longevity of assets in line with their design and operational requirements.	
• Playgrounds are inspected monthly in alignment with CSA standards	• Insufficient resources available to complete a series of unplanned, urgent work requests that are submitted in close succession

Current and Proposed Lifecycle Activities	Risks associated with Lifecycle Activities
• Park assets undergo staff visual inspections on a regular basis • Annual playground capital inspections are performed by playground practitioners for condition assessments and replacement timing • Trail condition inspections are done by an external consultant/engineer every three years • Bridges condition inspections are done by an external consultant/engineer every two years • All other play facilities, sports fields, courts have a condition assessment every three years • Litter pickup once a week • In soccer fields, cricket fields and baseball diamonds, grass is cut three times a week • Over seeding, top dressing and sodding is done once a year or as required for soccer fields, cricket fields and baseball diamonds • Annual maintenance filling of potholes and grading of gravel trails • Paved trails are repaved every 15 years • Scheduled tree inspection every seven years	• Unable to complete planned maintenance activities while managing reactive maintenance activities • Premature asset failure due to incorrectly planned maintenance activities • Emergency or unscheduled closures result in much higher replacement costs • Loss of reputation/public perception • Facility closures • Loss of revenues • Injury/lawsuits • If there are no monthly inspection there could be a risk to health and safety • Premature asset failure due to lack of maintenance activities • Impact to service levels due to delayed operations & maintenance, potentially requiring more drastic and costly rehabilitation or replacement intervention

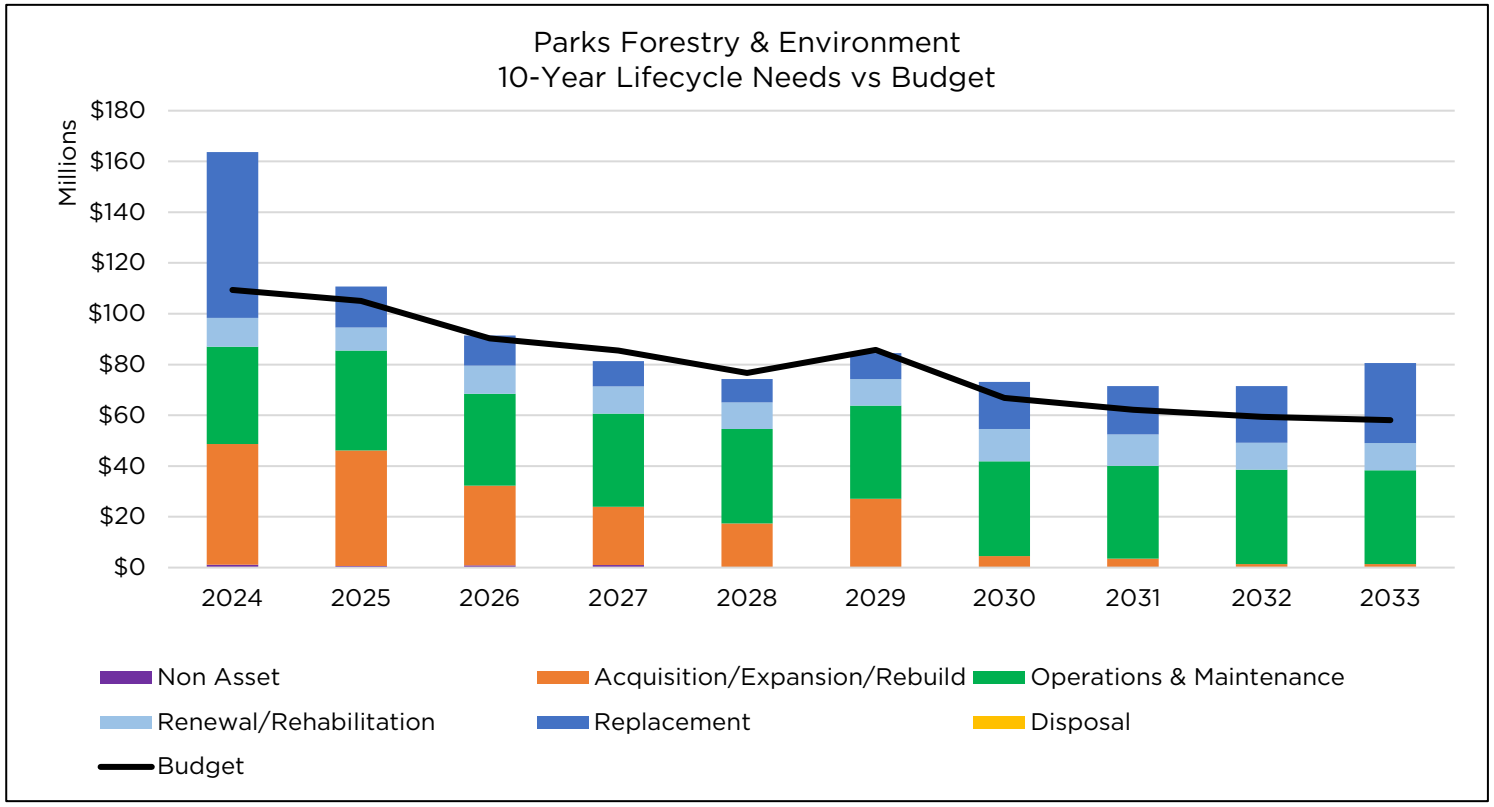
Current and Proposed Lifecycle Activities	Risks associated with Lifecycle Activities
• Scheduled preventative tree pruning every seven years • Seasonal cleanup, aeration, fertilization, mulching, and filling in displays • Annual inspection of streetscape features and maintenance as required • Culture staff develop a contingency plan to operate and maintain art pieces internally if the artists are no longer able to support them • Conservator evaluations and detailed condition assessments by third parties as needed • Public art assets can undergo annual inspections; power washing to clean dirt and debris; anti-graffiti protective coating every five years; bronze waxing every two to three years; sealer/stone enhancer; or other specialized work	
Renewal/Rehabilitation: Significant activities designed to extend the useful life of assets components.	
• Replacing or rehabilitating components of an asset instead of complete replacement • Grinding and capping of an asphalt trail as needed • Replacing carpet on artificial turf fields as needed based on condition assessments	• Incorrect assumptions regarding expected useful life after rehabilitation • Deferral cost of not rehabilitating items on schedule • Degradation of natural asset • Facility closures

<table>
<tr><th>Current and Proposed Lifecycle Activities</th><th>Risks associated with Lifecycle Activities</th></tr>
<tr><td>Structural reinforcement and decking replacement on a bridge
Natural areas are typically renewed through capital projects particularly for invasive species management
Repairing of defective forestry equipment to maintain equipment life</td><td>Loss of revenue
Injury/lawsuits</td></tr>
<tr><td colspan="2">Replacement: Replacement activities occur once an asset reaches the end of its useful life, cannot provide the intended function or performance, and rehabilitation is not a viable option.</td></tr>
<tr><td>Asset condition and age are monitored through the course of its' life, but in general, assets are replaced as follows:
Replace playgrounds every 25 years
Replace full park shelters every 20 years
Replace the entire bridge structure every 30-50 years
Artificial turf fields are replaced every 10-12 years
Synthetic track surface is replaced every seven years
Forestry assets are replaced at scheduled end of service life</td><td>Facility closures
Loss of service
Loss of reputation
Loss of revenue
Injury/lawsuits</td></tr>
</table>

Current and Proposed Lifecycle Activities	Risks associated with Lifecycle Activities
Disposal/ Demolition: Activities associated with the disposal or decommissioning of an asset.	
• N/A	• N/A
Acquisition/Expansion/Rebuild: These activities expand services to previously non-serviced areas or to accommodate growth; they provide new or enhanced services beyond the current capacity and/or functionality of existing assets.	
• New and expanded assets are reviewed and prioritized within master plans and are funded through development charges • New assets are reviewed and selected to best suit the location to achieve success. This can include new trees, boulevard landscapes, natural areas, equipment etc.	• Asset failure as a reflection of incorrect asset size, environmental tolerance, cultural tolerance etc. • Service is prematurely expanded • The ability to afford, operate and maintain any future assets

Lifecycle Needs vs. Budget

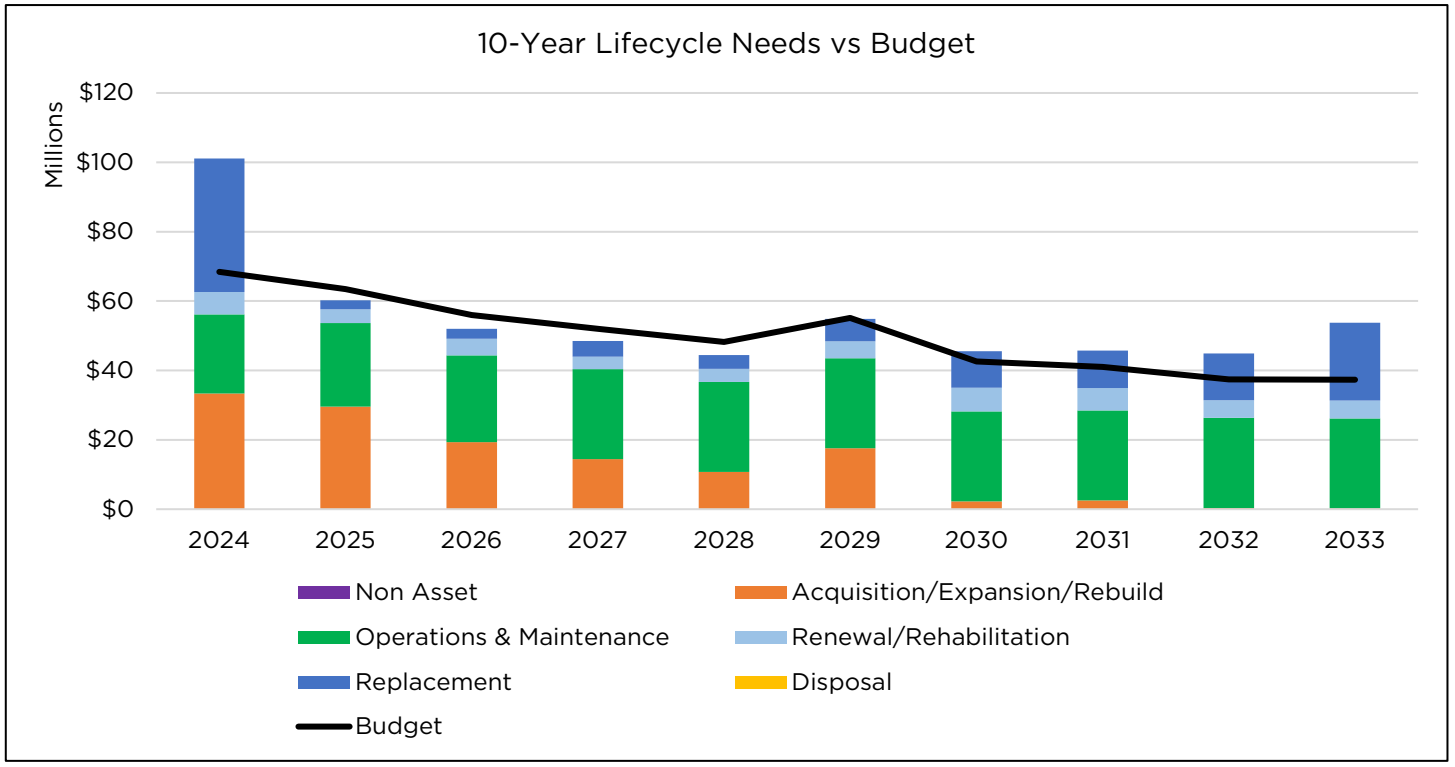
Parks, Forestry & Environment Service Area



On average, PFE assets are in Good condition, with some major rehabilitations and replacements occurring in the next 10 years. There is a backlog of assets, in 2024, that are in very poor condition or have reached the end of their useful life.

As part of continuous improvement, staff will continue to quantify and analyze the lifecycle needs required as they refine their proposed levels of service, where they have been established, along with any resourcing requirements as a result.

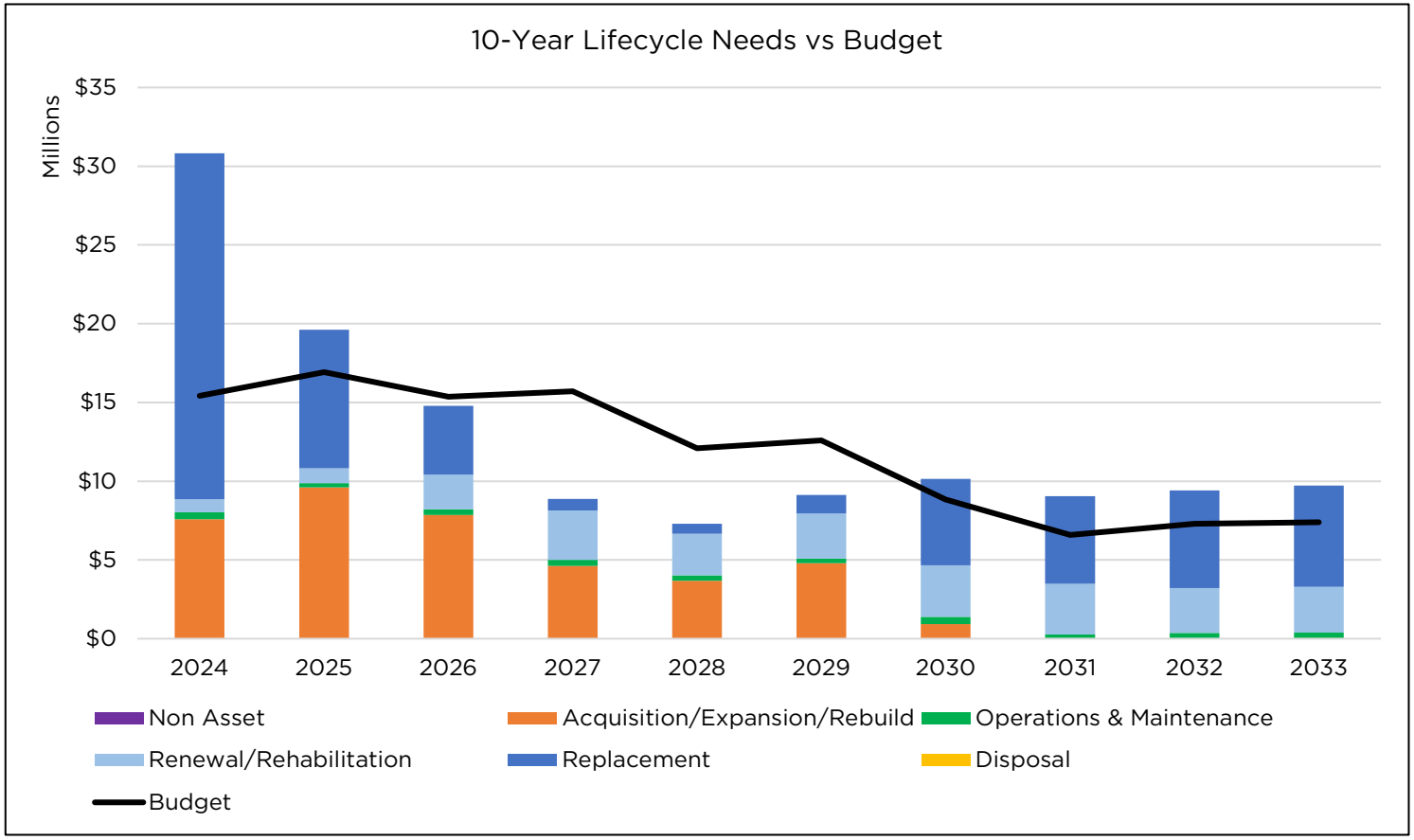
Amenities



Approximately 30 per cent of Amenities assets are in Poor-Very Poor condition, indicated by the spike in 2024. Projects are coordinated with the timing of other asset replacements and interdepartmental initiatives. In some instances, asset replacements are advanced to minimize the disturbance of a park and maximize efficiency/economies of scale.

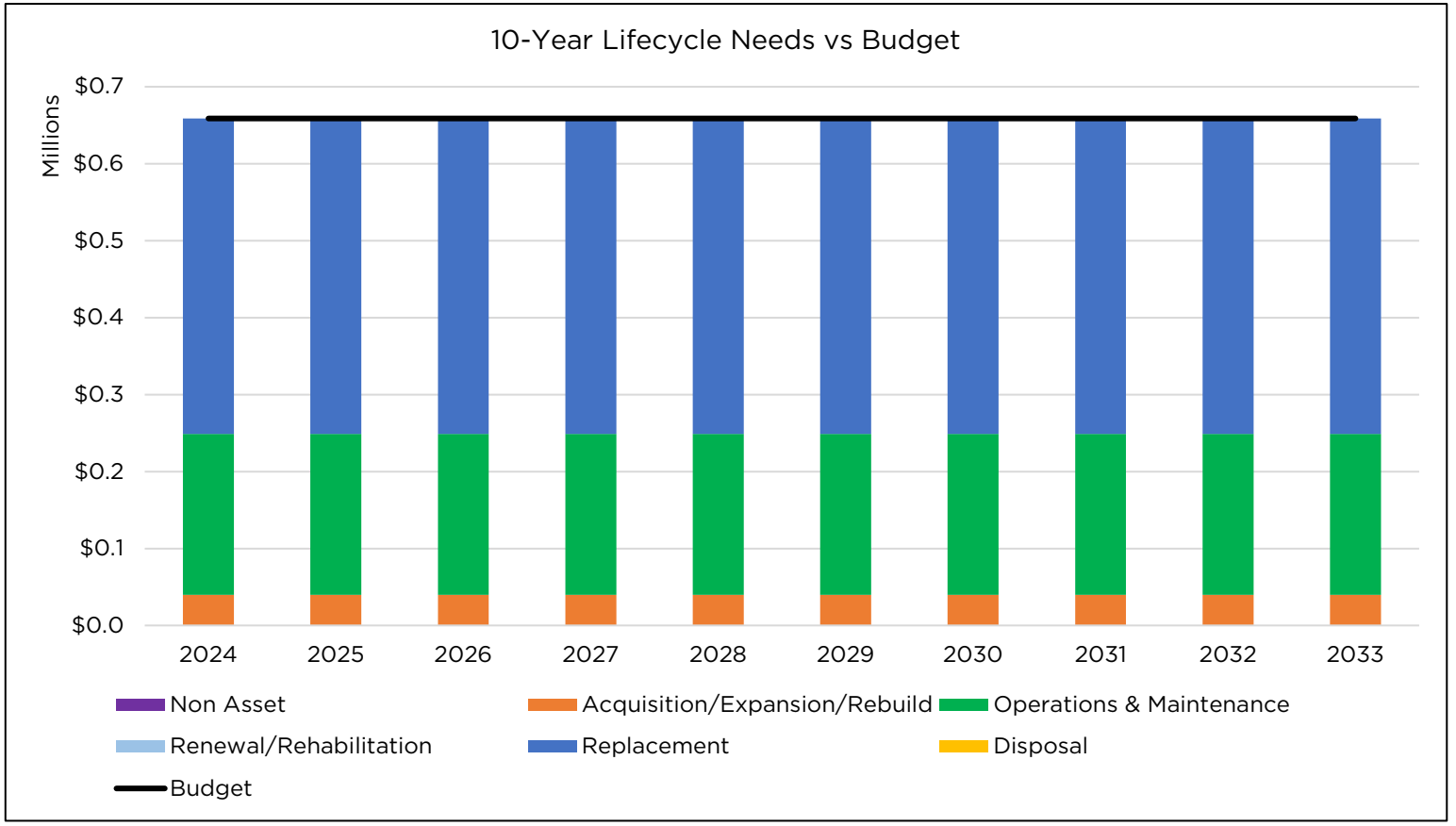
Play facilities are maintained in a Good or Very Good condition throughout their lifespan and are replaced at the 25-year mark to meet current standards and functionality.

Parks Infrastructure



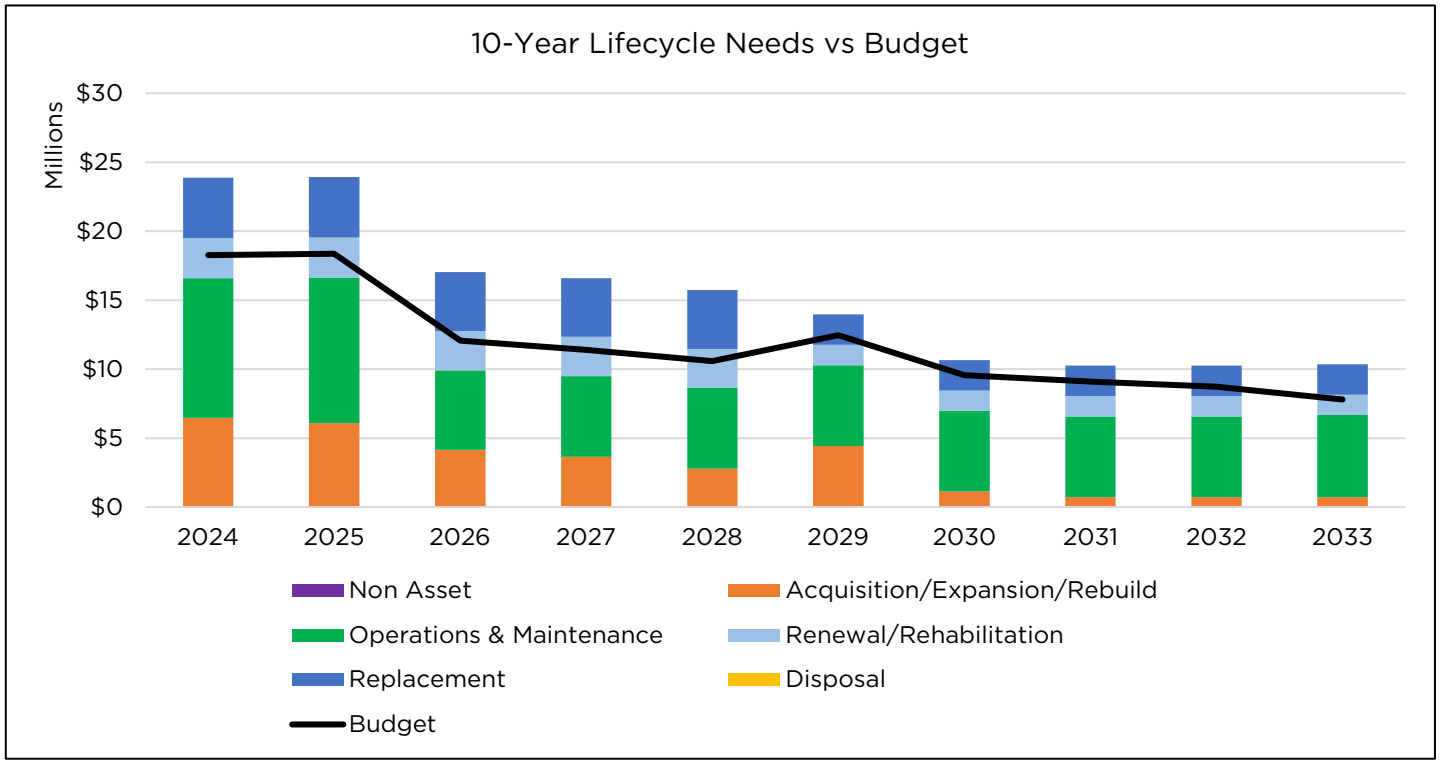
Most Parks Infrastructure assets (Trails, Bridges and Dock Systems) are in fair or better condition, with major rehabilitations and replacements occurring beyond the 10-year timeframe. The 2024 bar indicates a backlog of assets that are in very poor condition and require replacement. Please note that there is $19 million in approved funding for bridge and trail reconstructions in progress.

Equipment (Parks and Forestry)



Equipment is replaced on an as-needed basis when they reach their end of life or no longer meet functional needs.

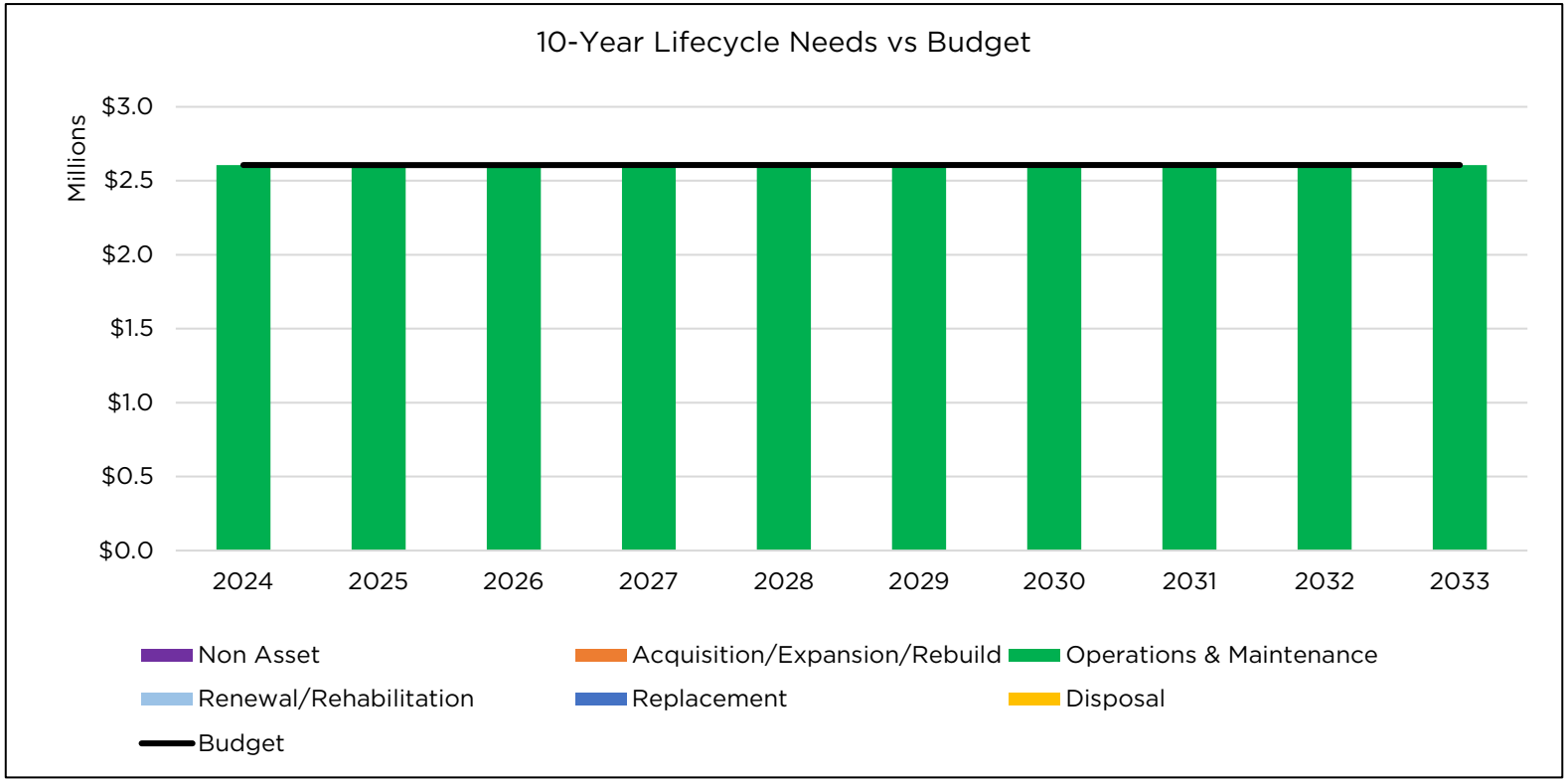
Trees



To forecast the rehabilitation and replacement needs of trees, staff applied the following criteria over the next 10 years:

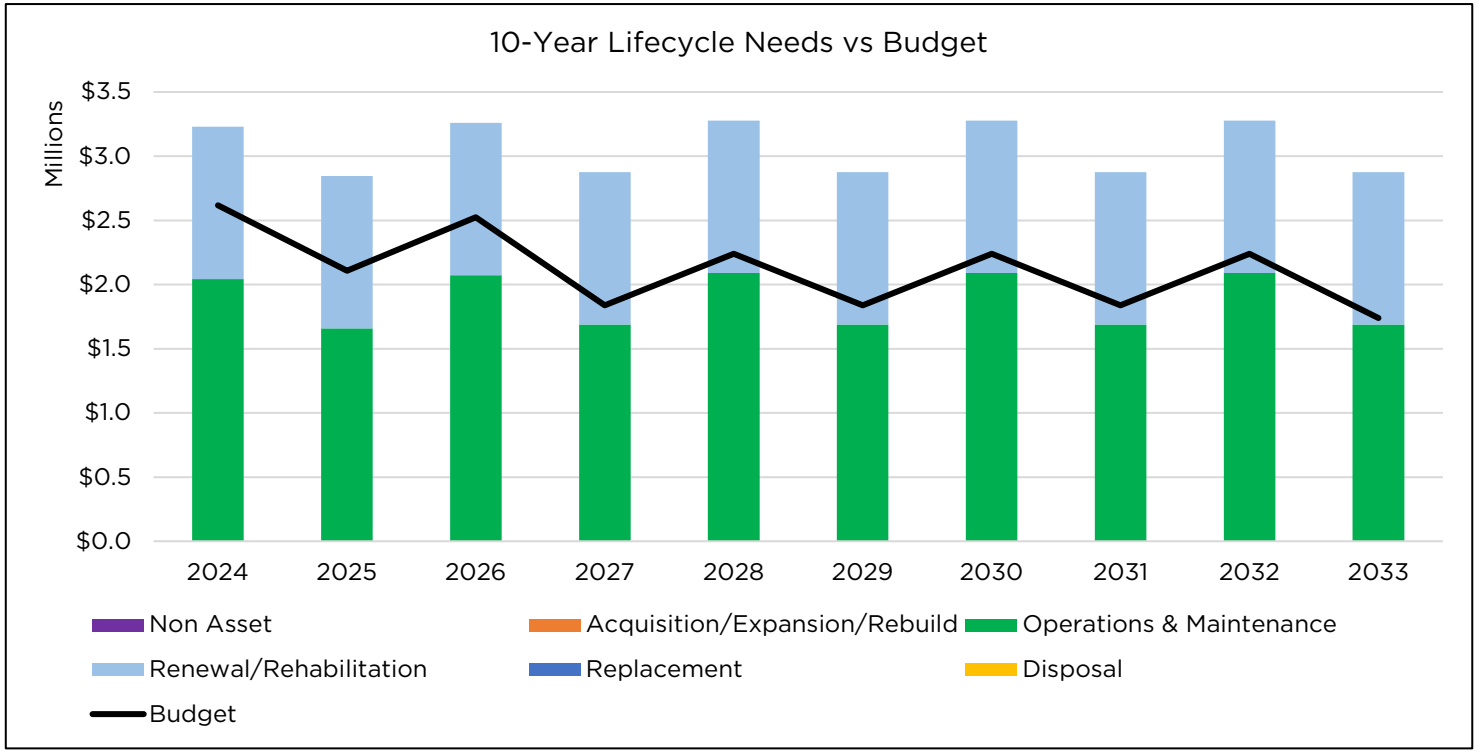
- Based on average planting rates, staff forecasted over 10 years, taking into consideration annual mortality rate of two per cent. Annual mortality is highly variable and subject to many factors such as climate change, pests, or diseases that can affect the rate at which they decline
- There exists a considerable backlog of planting sites reflective of the funding gap for this service. Dead trees and stumps that need to be managed and replaced are also part of the forecast

Boulevard Landscapes



Boulevard grass and horticulture features are under perpetual maintenance and funded adequately. Amended boulevard treatments contain fairly new assets that are not due for renewal or replacement until 2034. However, these assets may be up for replacement much earlier due to damage from various third parties such as utilities, soil shifting/settling etc. The associated streetscape features to amended boulevard treatment areas can experience early renewal needs as well, despite the fact that the earliest end-of-life replacement is not until 2054.

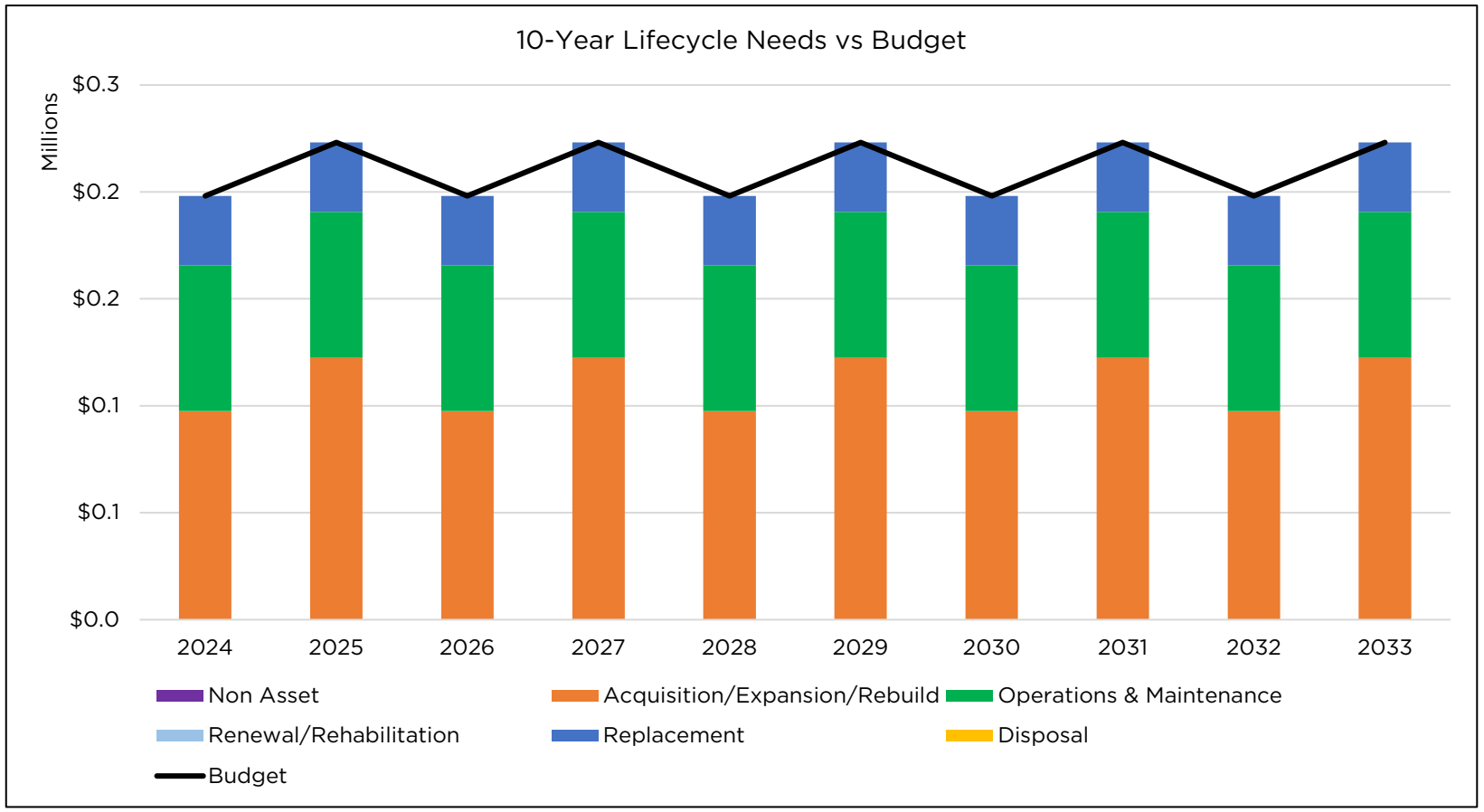
Natural Areas



Staff estimated the lifecycle needs to improve asset condition from Poor/Very Poor to Fair or Better. Roughly 10 per cent of the Natural Areas (Forested) are in Poor-Very Poor condition.

Natural Areas are heavily impacted by invasive species management and understory planting which contribute to 40 per cent of the overall woodland condition and are thus a reasonably large proportion of influence to alter the condition from Poor-Very Poor to at least Fair or better. Staff forecasted the costs of those activities based on a reliable average; however, it should be noted that pricing can vary significantly depending on topography, drainage, vegetation on site, etc.

Public Art and Heritage



Public Art and Heritage equipment are repaired and replaced on an as-needed basis in order to maximize the functional life of the equipment and art pieces.

Budget Breakdown

Over the next 10 years, Parks, Forestry and Environment plans to spend an average of $79.9 million annually on Parks, Forestry and Environment assets, with the majority of the budget being used for operations & maintenance activities at 46.6 per cent and acquisition/expansion activities at 25.3 per cent.

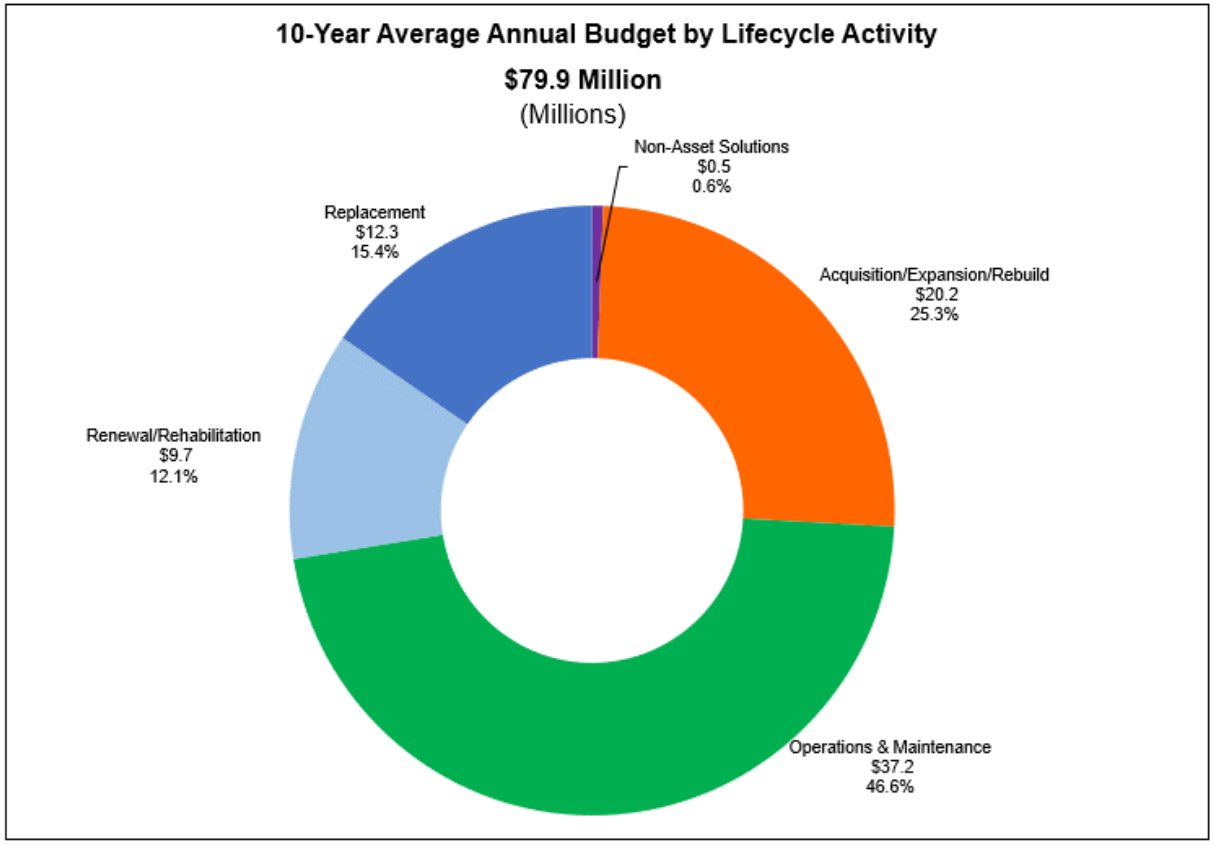


Figure 1: Breakdown of Budget by Lifecycle Activity

Table 4 shows the 10-year annual average budget breakdown by asset class. The majority of the of the operating and capital budget is spent on State of Good Repair (SOGR) of Parks, Forestry & Environment assets.

Table 4: Budget breakdown by Asset Class

Asset Class	SOGR Budget Type ($ Million)			Growth Capital Budget ($ Million)	Total Budget ($ Million)
	Operating	Capital	Total		
Amenities	25.4	11.9	37.3	12.9	50.2
Parks Infrastructure	0.3	7.6	7.9	3.9	11.8
Trees	5.8	3.1	8.9	3.0	11.8
Natural Areas	1.3	0.8	2.1	-	2.1
Boulevard Landscapes	2.6	-	2.6	-	2.6
Equipment (Parks and Forestry)	0.2	0.4	0.6	-	0.7
Public Art and Heritage	0.1	0.1	0.2	-	0.2
Other[4]	-	0.3	0.3	-	0.5
Total	**35.7**	**24.3**	**60.0**	**19.9**	**79.9**

[4] "Other" asset class denotes lifecycle activities that span over multiple asset classes within the service area such as plans, studies, and other non-asset solutions.

Financing Strategy

Capital Funding Sources and Operating Revenue Sources

The estimated available funding for the next 10-year period (2024-2033) for Parks, Forestry and Environment is $799.1 million. The primary sources of funding are operating revenue sources at 44.6 per cent, Tax Reserve Funds at 25.1 per cent which is primarily used to support capital infrastructure renewal needs, and Development Charges Reserve Funds at 23.2 per cent, supporting growth projects.

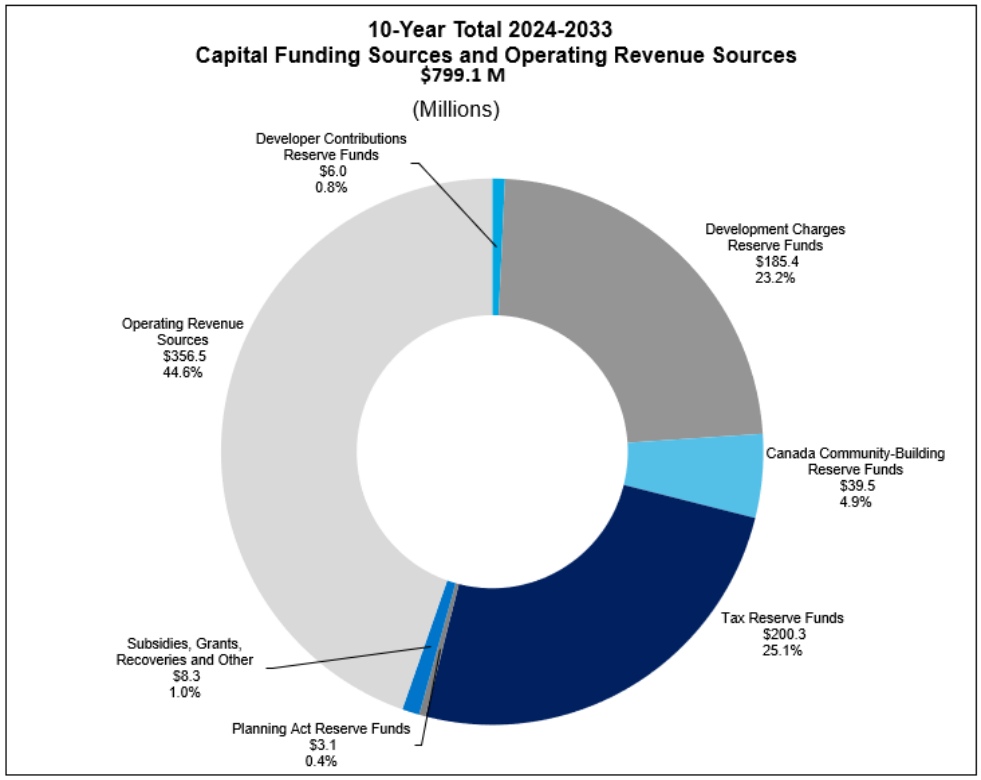
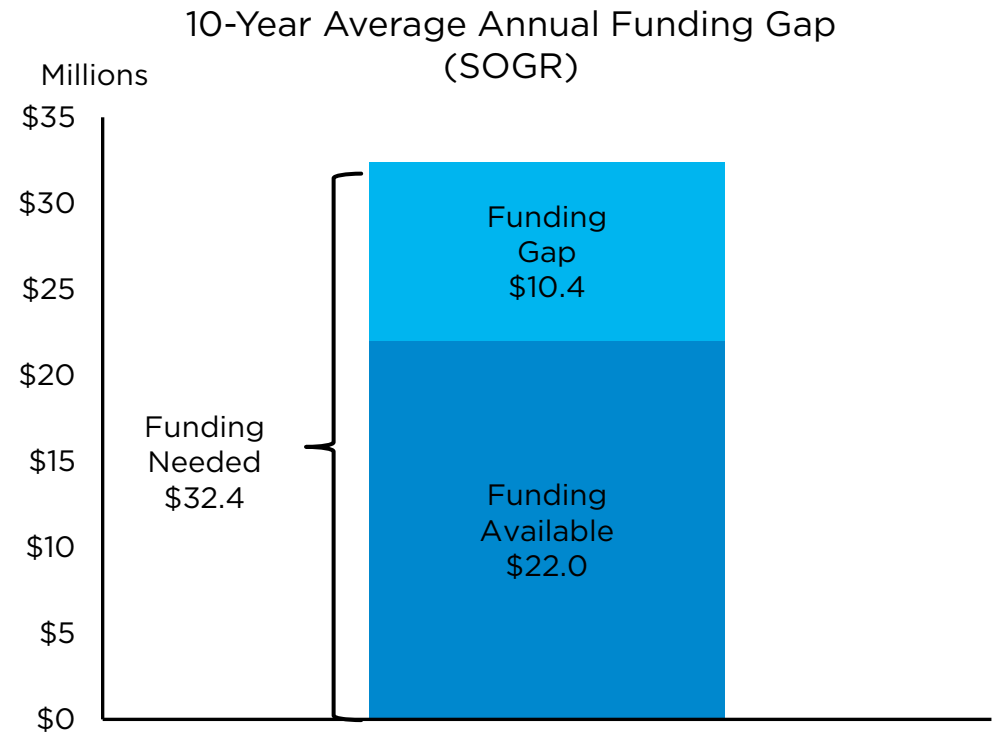


Figure 2: Capital Funding Sources (2024-2033)

Infrastructure Gap

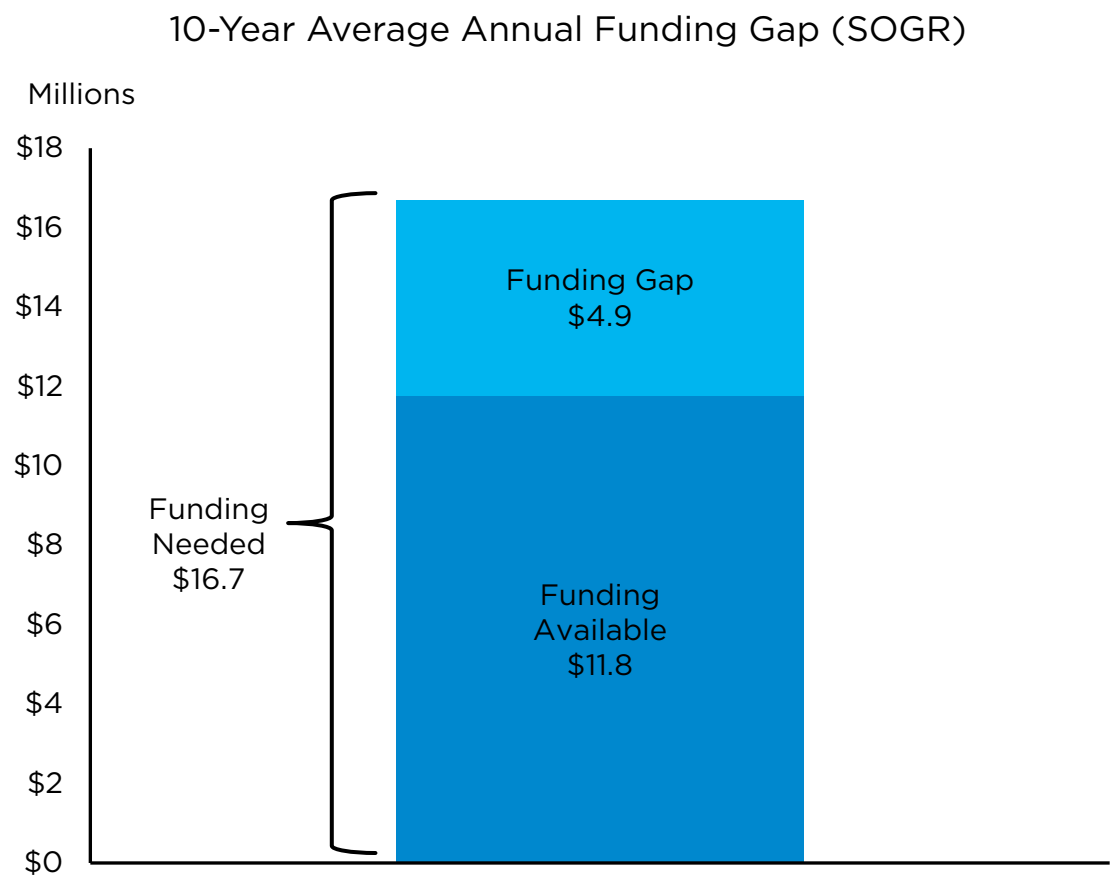
Parks, Forestry and Environment Service Area



The average annual funding gap for Parks, Forestry and Environment is $10.4 million. Some asset classes, such as Boulevard Landscapes and Equipment (Parks and Forestry) have no funding gap at this time and are sufficiently funded to meet service level needs within the next 10-years.

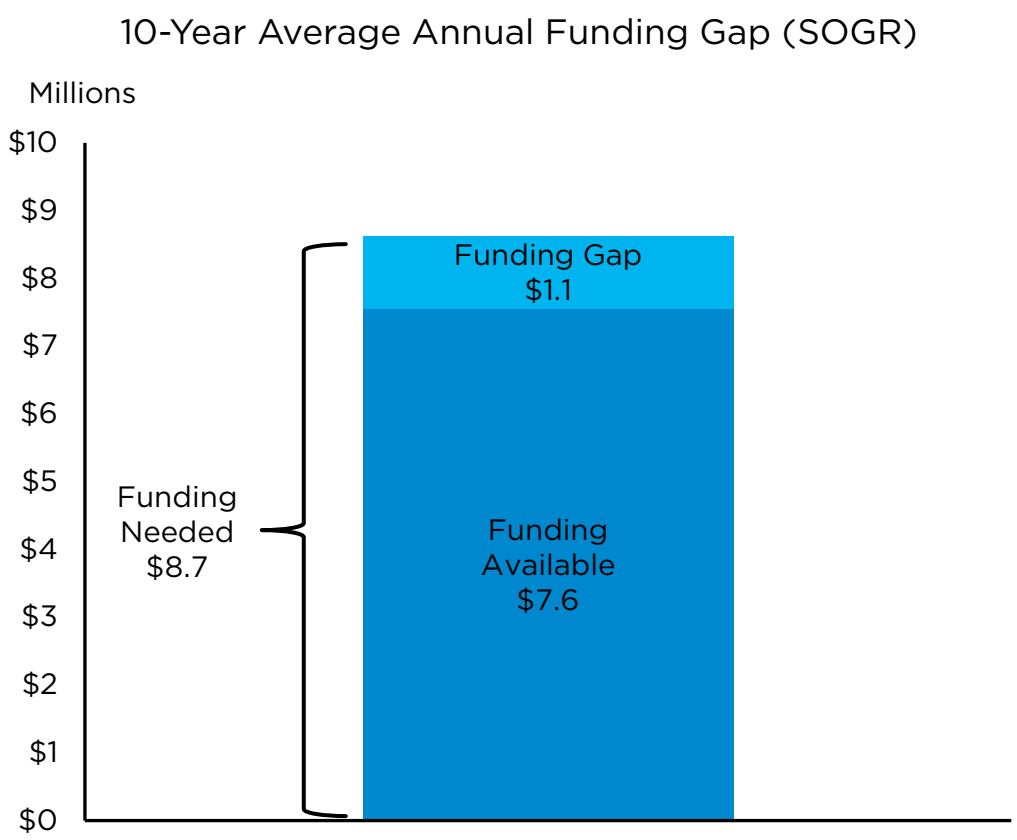
As part of continuous improvement, staff will continue to evaluate the affordability and sustainability of proposed levels of service, where they have been established, and integrate their asset management program with the annual budgeting process.

Amenities



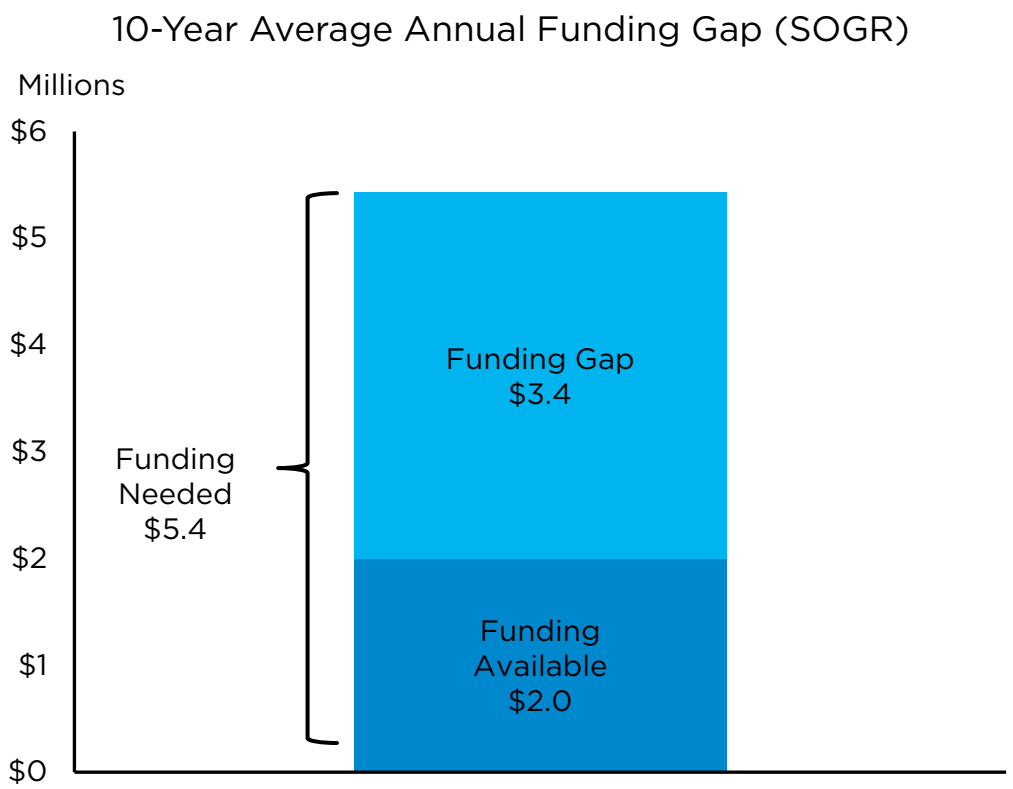
There are a substantial number of assets that are reaching their end of life that make up part of this backlog in order to provide the desired level of service staff need to fund these projects.

Parks Infrastructure



There is a $1.1 million average annual funding gap for assets within Parks Infrastructure.

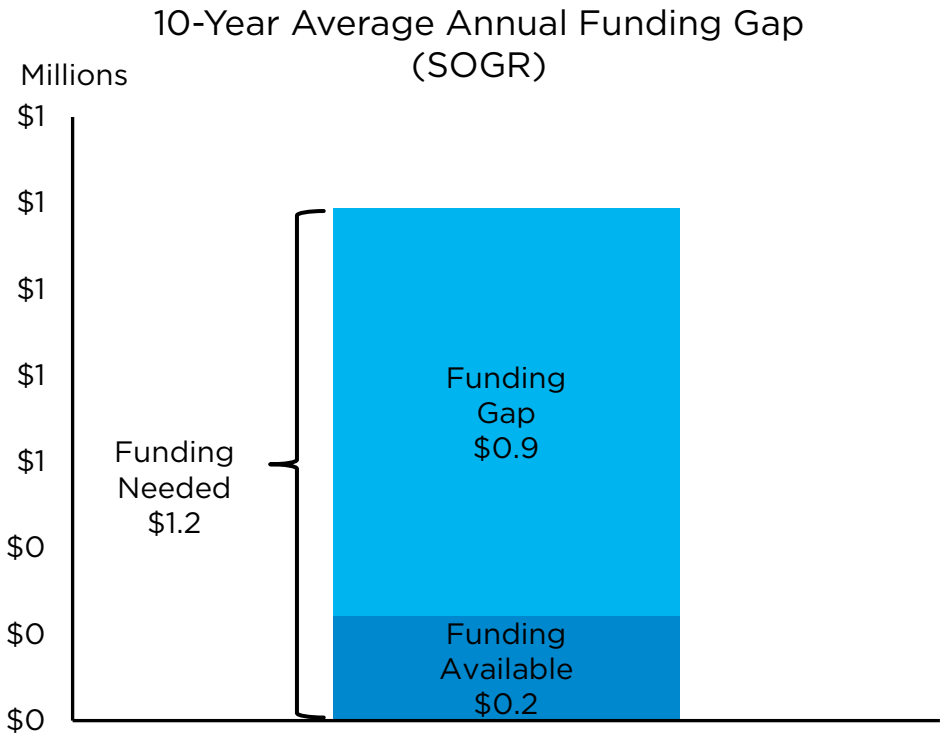
Trees



Replacement of trees is an underfunded service. The rate of mortality exceeds the replacement of new trees annually creating a substantial backlog. Further, the Emerald Ash Borer (EAB) resulted in significant loss to the city's tree population which are, and will continue to be, replaced through funding sources available into 2025.

To deal with the existing backlog which can be scoped out over a five-year period, a funding gap has been identified and required to renew these sites. Failure to do so will result in an increased backlog which will further delay and increase replacement tree timelines.

Natural Areas



The renewal gap for natural areas captures the need to restore natural areas that are in Poor or Very Poor condition to at least Fair condition. Of the 848 hectares of forested areas, approximately 10 per cent are in Poor or Very Poor condition. Invasive species management and understory planting are two actions that can reasonably contribute to the restoration of a woodland and influence the overall condition score.

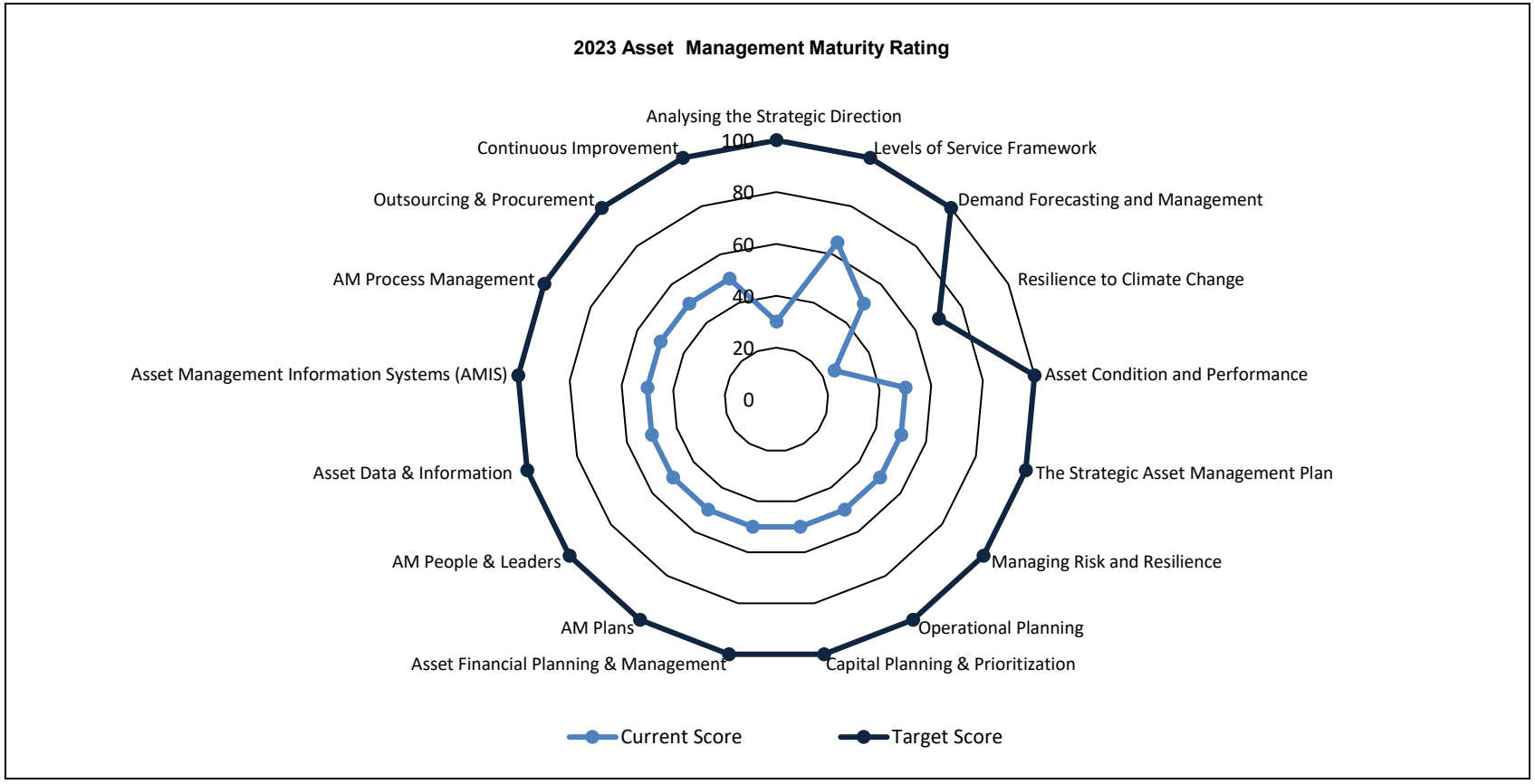
The funding required to renew the 84.8 hectares of natural areas in Poor or Very Poor condition to at least Fair conditions would be $11,900,000. These projects are typically scoped out on a 10-year planning horizon (to account for the time required to conduct the project) and thus their budgeted allocation can be amortized over 10 years.

Continuous Improvement and Maturity

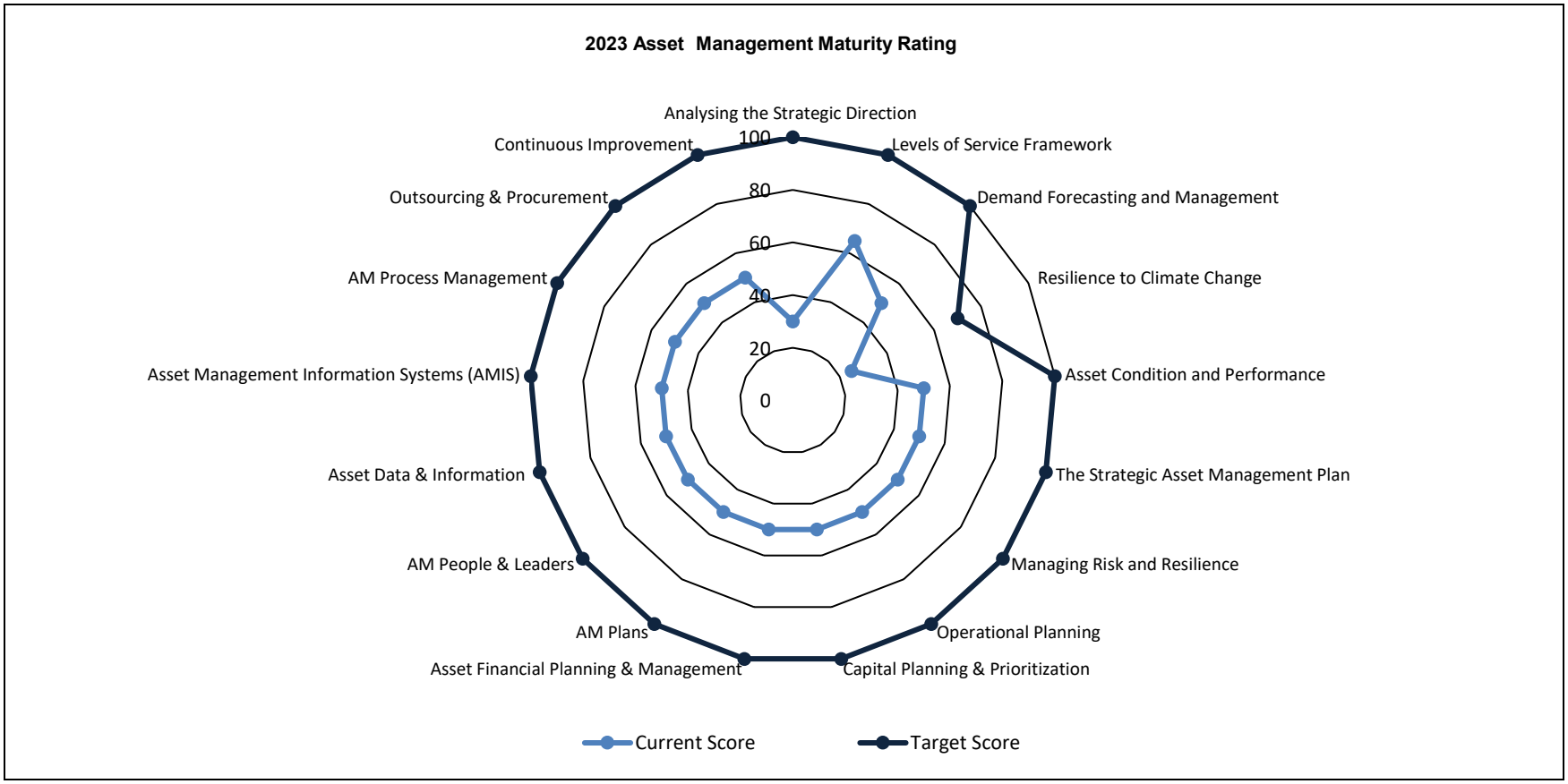
Maturity Assessments

The radar graph(s) below are based on a 2023 maturity assessment. As the service areas mature in each category, they will expand outwards towards the outer ring (Target).

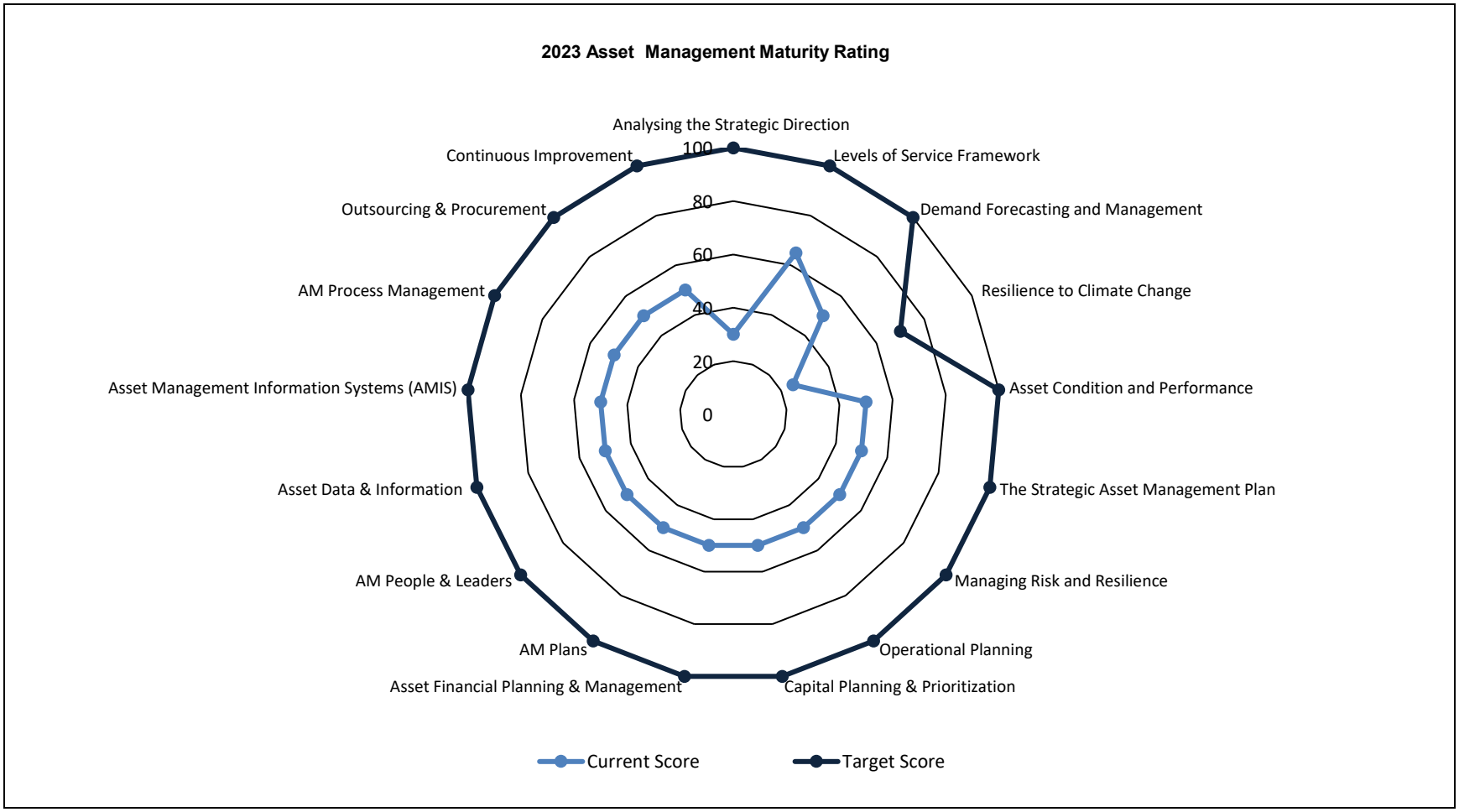
Parks, Forestry and Environment



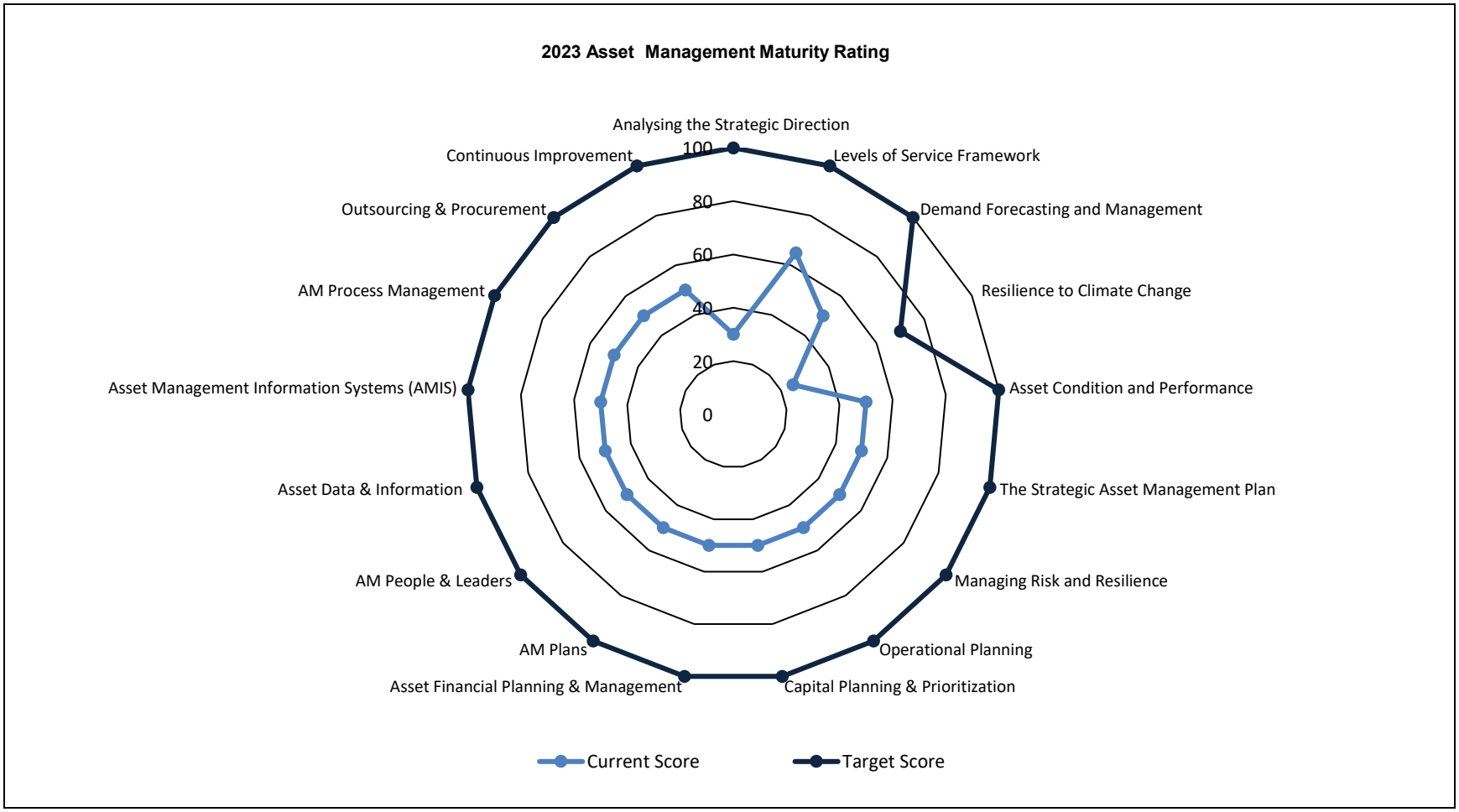
Amenities


2023 Asset Management Maturity Rating
Analysing the Strategic Direction
Levels of Service Framework
Demand Forecasting and Management
Resilience to Climate Change
Asset Condition and Performance
The Strategic Asset Management Plan
Managing Risk and Resilience
Operational Planning
Capital Planning & Prioritization
Asset Financial Planning & Management
AM Plans
AM People & Leaders
Asset Data & Information
Asset Management Information Systems (AMIS)
AM Process Management
Outsourcing & Procurement
Continuous Improvement
100
80
60
40
20
0
Current Score
Target Score

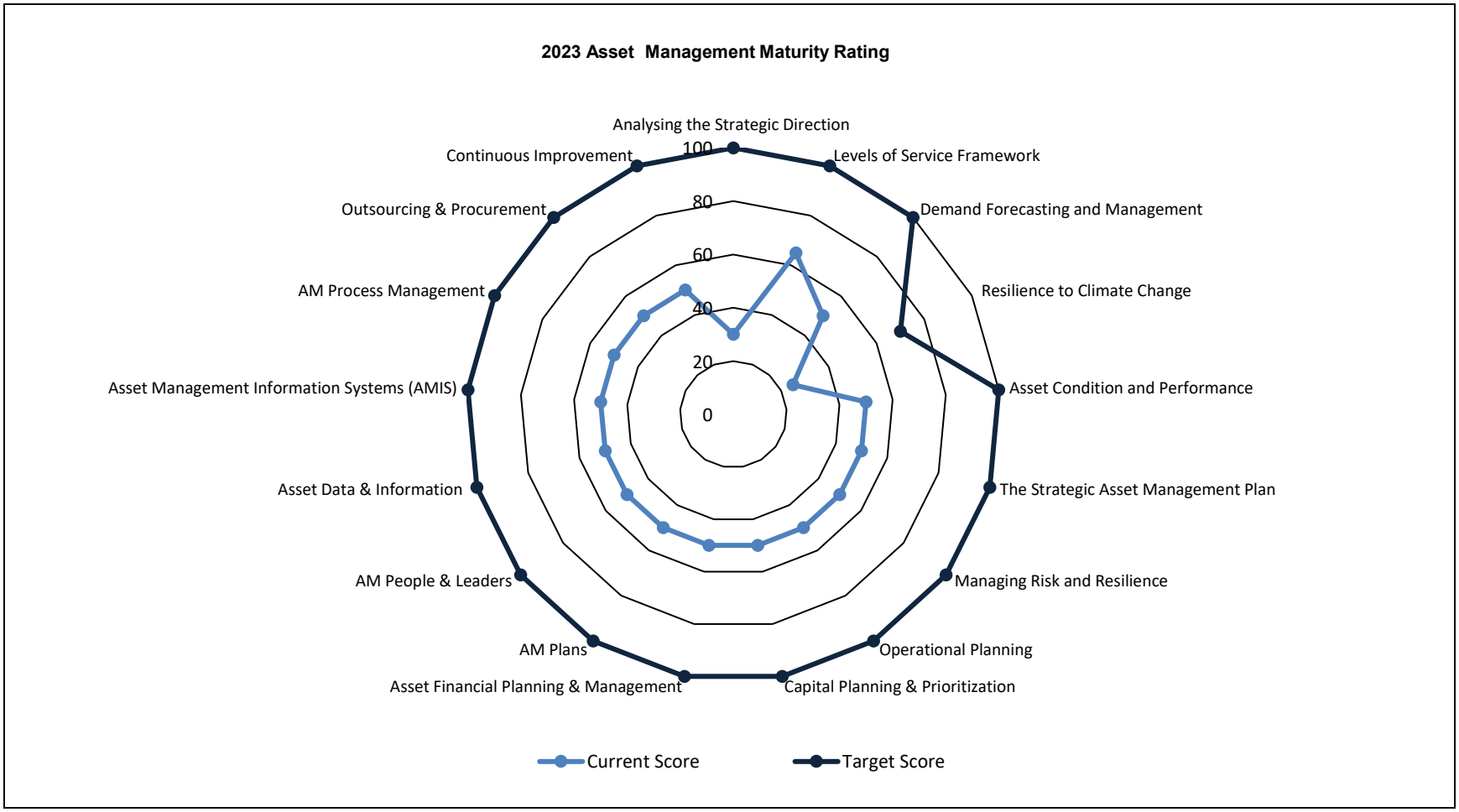
Parks Infrastructure



Parks Equipment



Trees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Asset Data & Information
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Outsourcing & Procurement
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100
80
60
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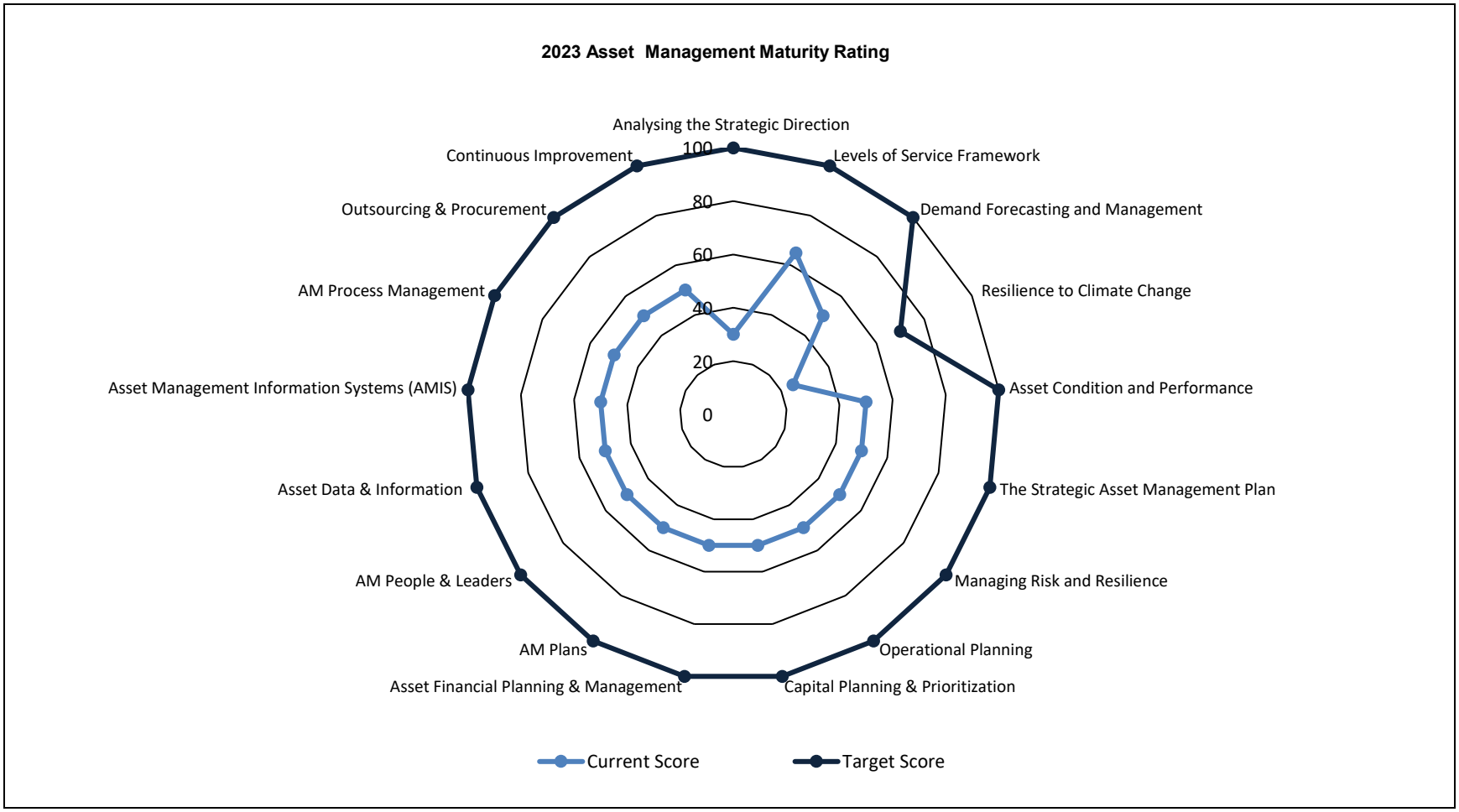
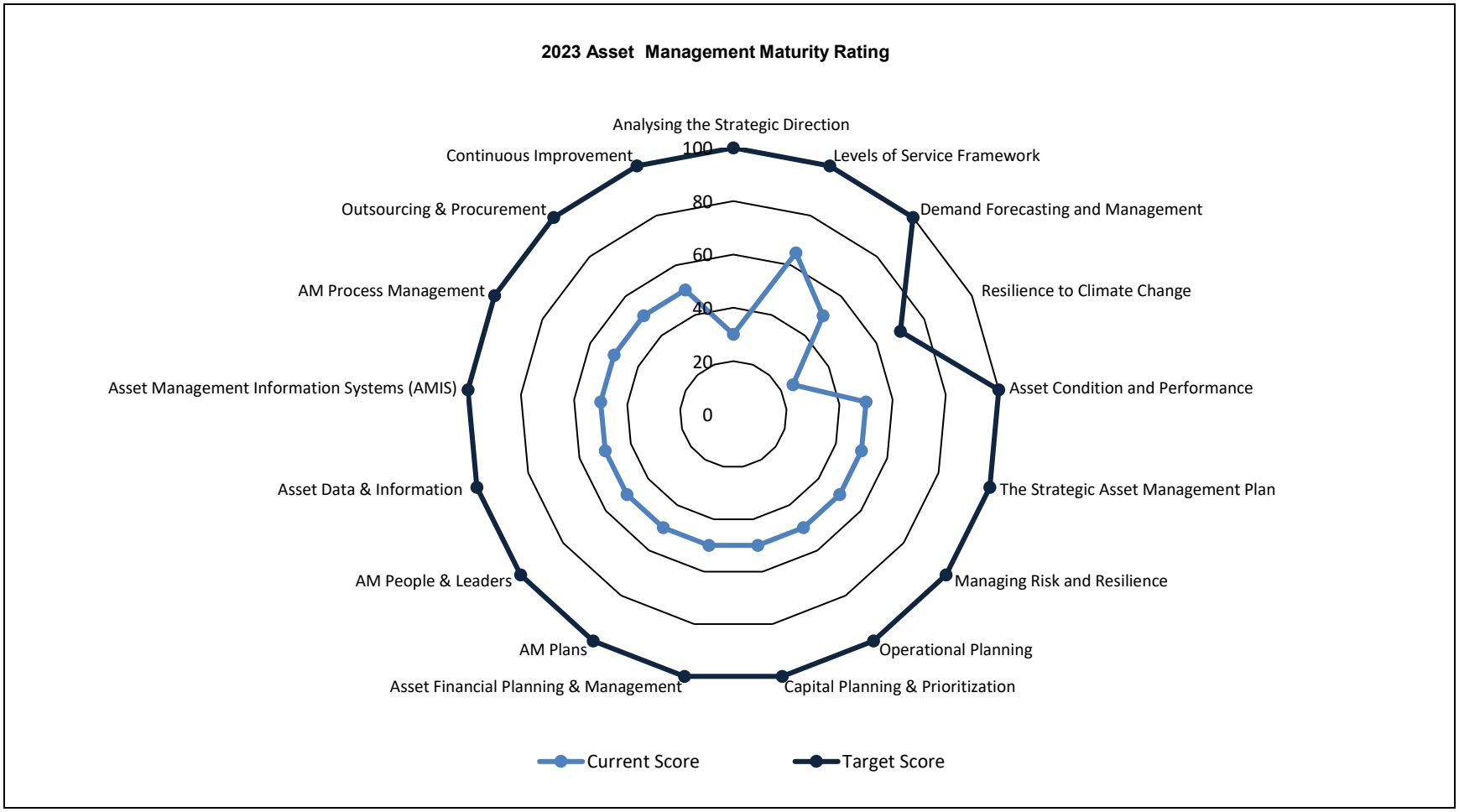
Current Score
Target Score

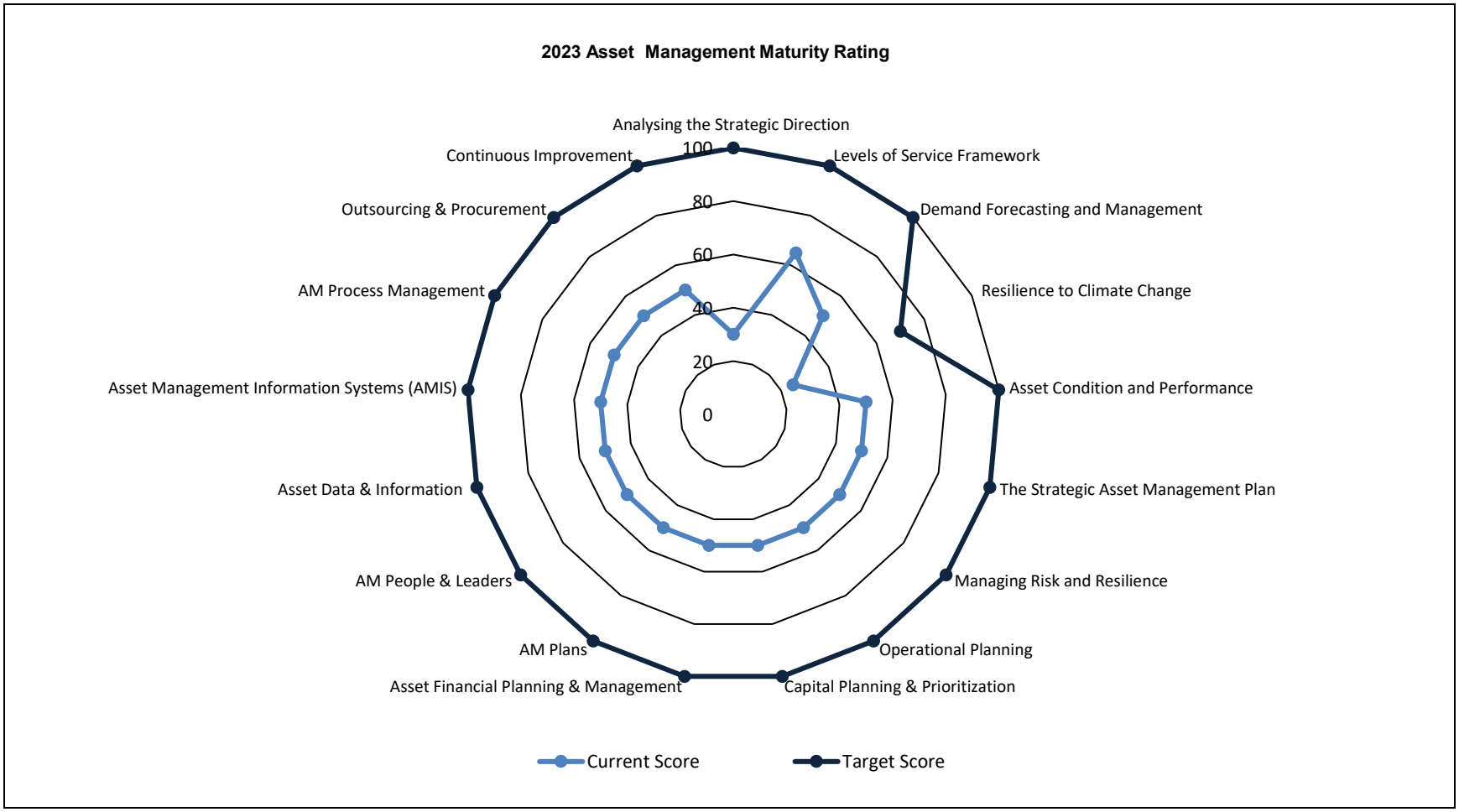
Boulevard Landscapes



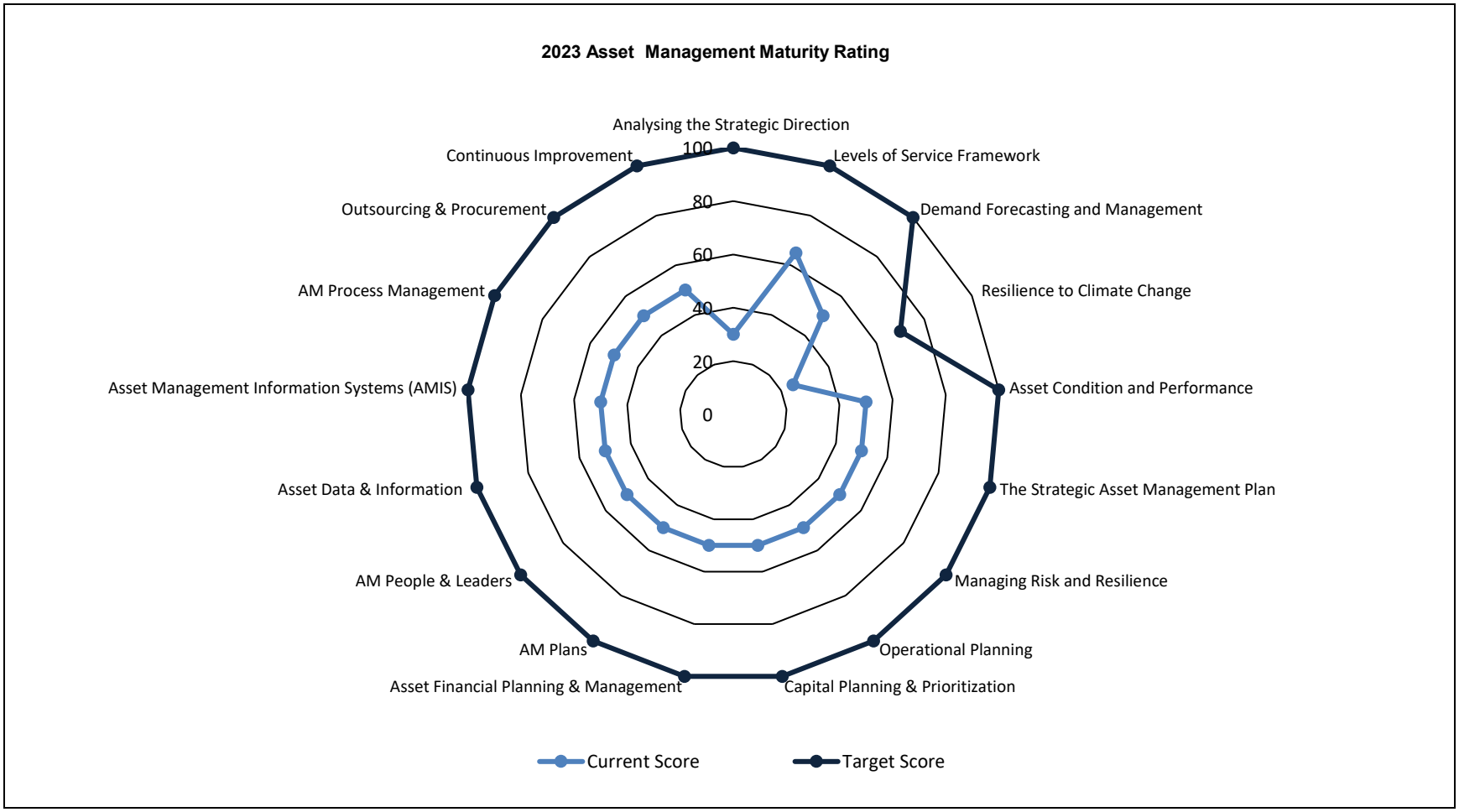
Natural Areas



Forestry Equipment



Public Art and Heritage



Continuous Improvement Plan

Task No	Continuous Improvement Task	Asset Class	Estimated Timing	Value/Impact	Required Resources
State of Infrastructure (SOI)					
SOI-01	Develop a Risk Assessment Framework.	All	2023-2026	Enable the Parks, Forestry & Environment service area to better prioritize funding availability across asset classes.	Internal/External
SOI-02	Compile a Parks & Forestry Equipment Inventory.	Parks Equipment	2023-2025	Compile a comprehensive database of parks non-fleet, powered equipment and handheld tools inventory across all parks areas, complete with critical attribute information. Improve on standard methodology to add new equipment and remove old equipment that will also speak to INFOR.	Internal
SOI-03	Condition assessments on newly acquired, and old park structures.	Amenities	2024-2025	Assess all park structures and provide condition rating and replacement timeline.	Internal/External
SOI-04	Include Infrastructure Assets in AM Plans.	Parks Infrastructure	2024-2026	Compile comprehensive inventory of retaining walls, fencing, irrigation systems, stormwater and shoreline treatments within city parks.	Internal

Task No	Continuous Improvement Task	Asset Class	Estimated Timing	Value/Impact	Required Resources
SOI-05	Implement INFOR for work order management.	All	2024-2025	Enhanced and expanded work order management for parks service requests.	Internal
SOI-06	Update the Maturity Assessment and Continuous Improvement Plan and report back to Leadership Team.	All	2023-Ongoing	Providing Leadership Team and Council with regular updates on the progress made towards asset management planning.	Internal
SOI-07	Consolidate Forestry Assets into Asset Management Software and formalize inventory to assign unique IDs populating missing attribute information.	Boulevard Landscapes, Natural Areas	2024-2025	Integrate all forestry assets into Asset Management System to allow for better management of assets centralized in one source for information.	Internal/External
SOI-08	Expand condition scoring system to a five-point scale.	All	2024-2025	Allows for asset condition to be consistent with corporate asset management best practices.	Internal
SOI–09	Replacement Cost Update and development.	All	2023-Ongoing	Enables precise budgeting required for lifecycle costing and sustainability of the forestry resource. This knowledge aids in making decisions regarding optimal timing for asset replacement,	Internal

Task No	Continuous Improvement Task	Asset Class	Estimated Timing	Value/Impact	Required Resources
				thereby maximizing operation efficiency.	
SOI-10	Estimated useful life: review and update.	Trees	2023-Ongoing	Allows for better Lifecycle Management planning.	Internal
Levels of Service (LOS)					
LOS-01	Ongoing review of LOS metrics and establishment of targets.	All	2023-2025	Level of service targets enable the service area to track progress against established targets.	Internal
Financing Strategies (FS)					
FS-01	Centralize all assets in one asset management system to run asset management scenarios.	All	2025-2026	Develop a predictive performance model to forecast the future condition of assets, based on budget, levels of service and/or lifecycle strategies changes.	Internal/External
FS-02	Work with Corporate Finance to formalize performance targets and sustainable funding.	All	2023-2025	Develop more proactive and reliable short-term and long-term capital planning.	Internal

Appendix

Levels of Service Maps

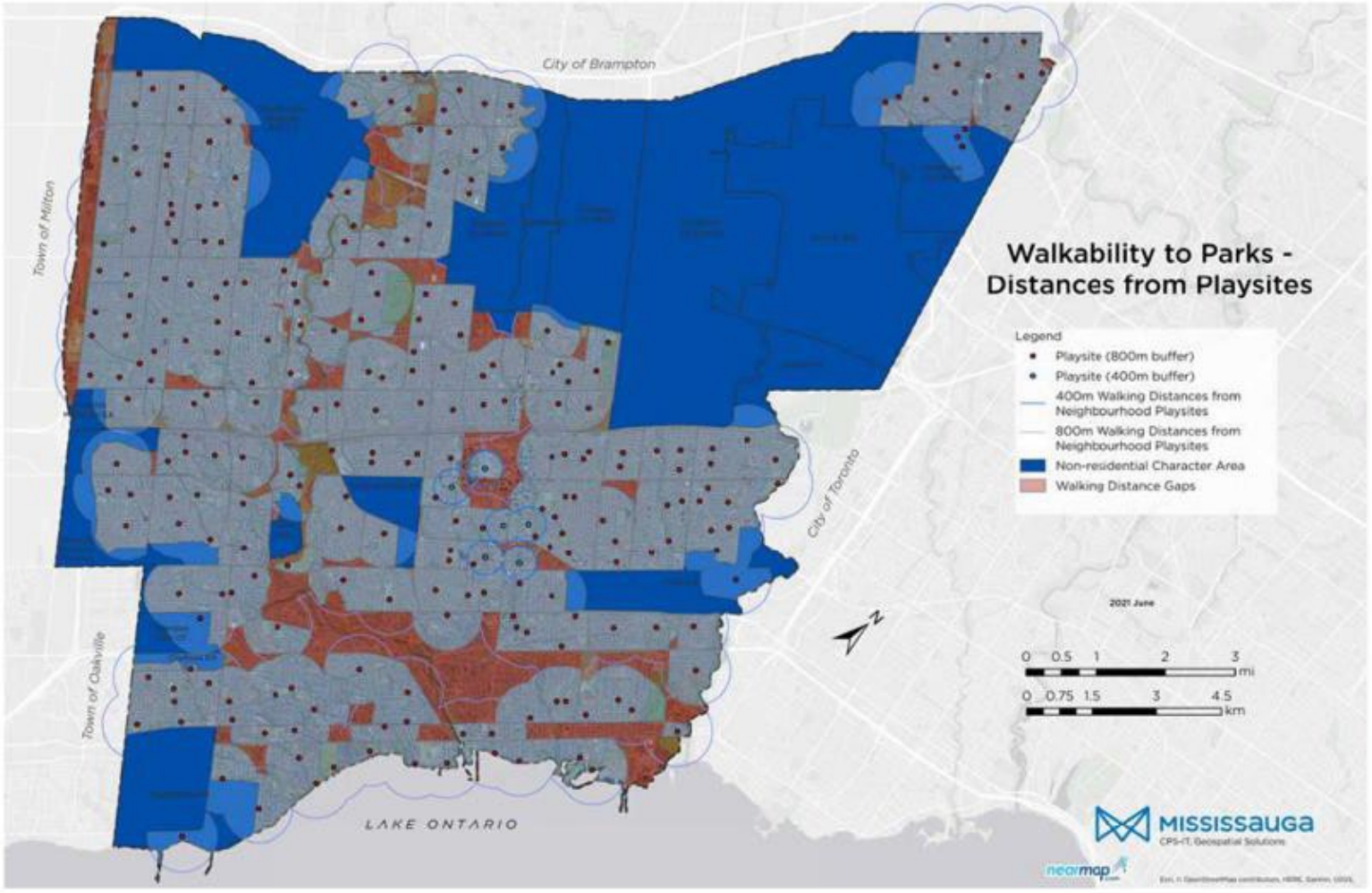


Figure 3: Walkability to Parks – Playsite Distance Map (Future Directions)

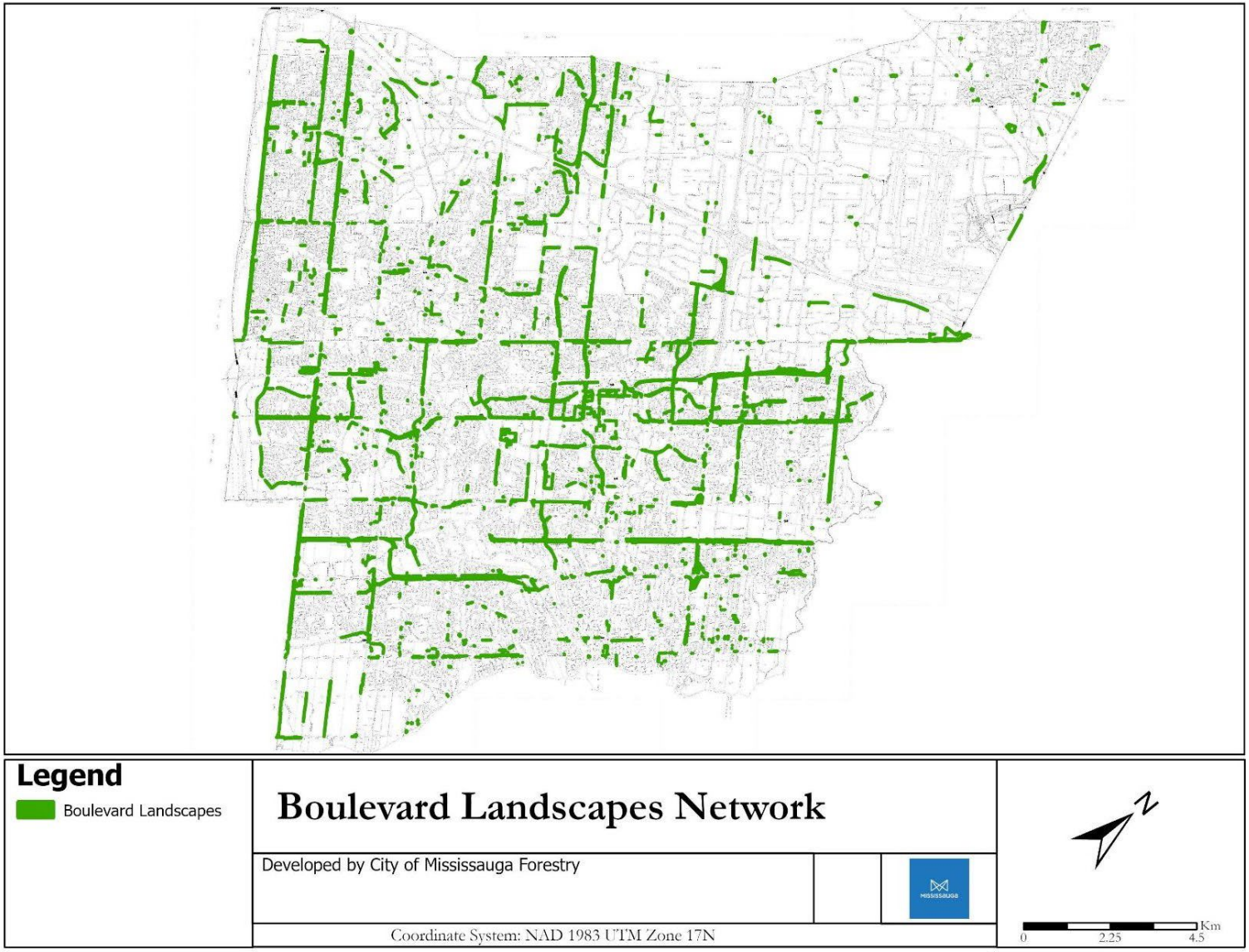


Figure 4: Boulevard Landscapes Network

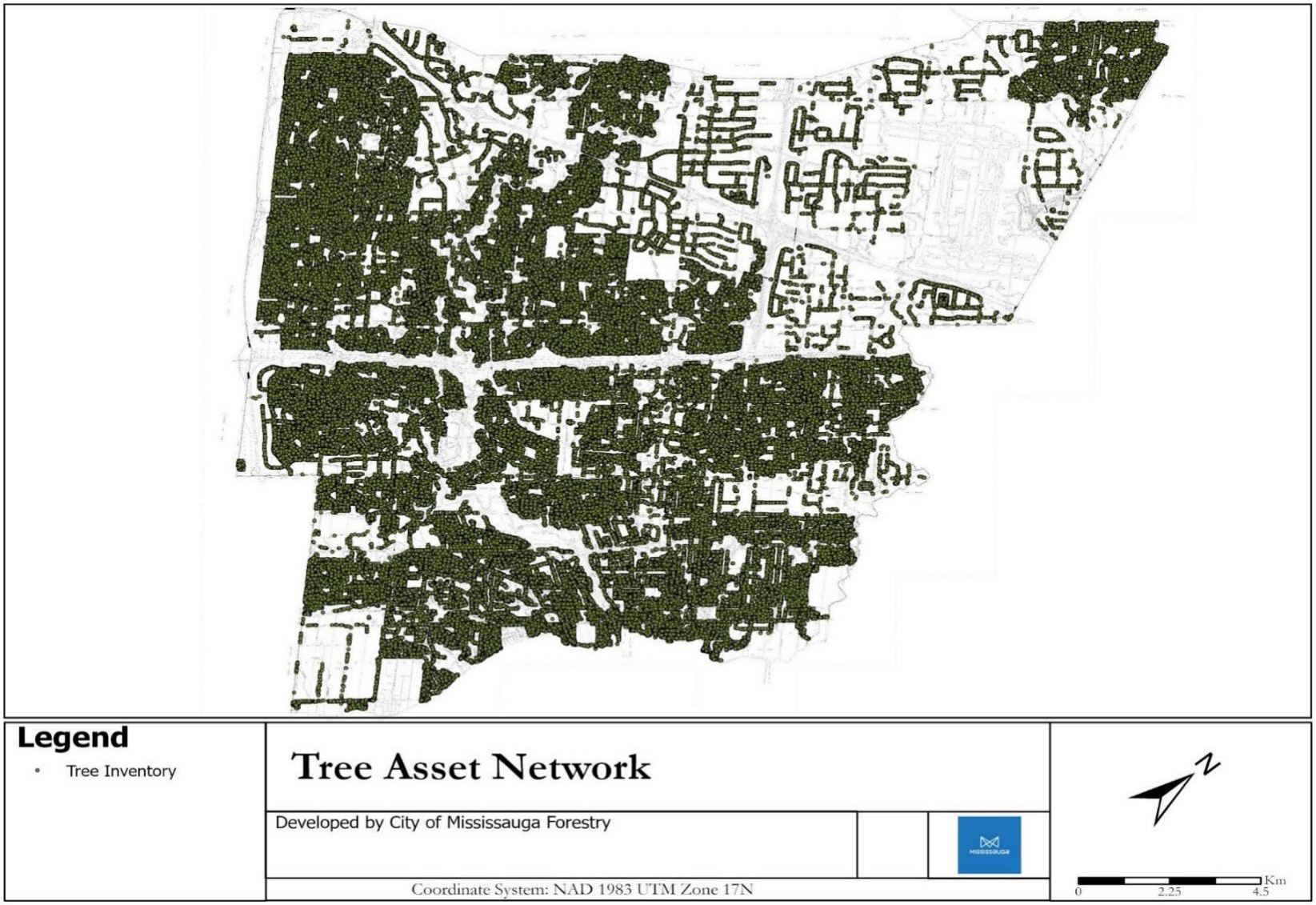


Figure 5: Tree Asset Network

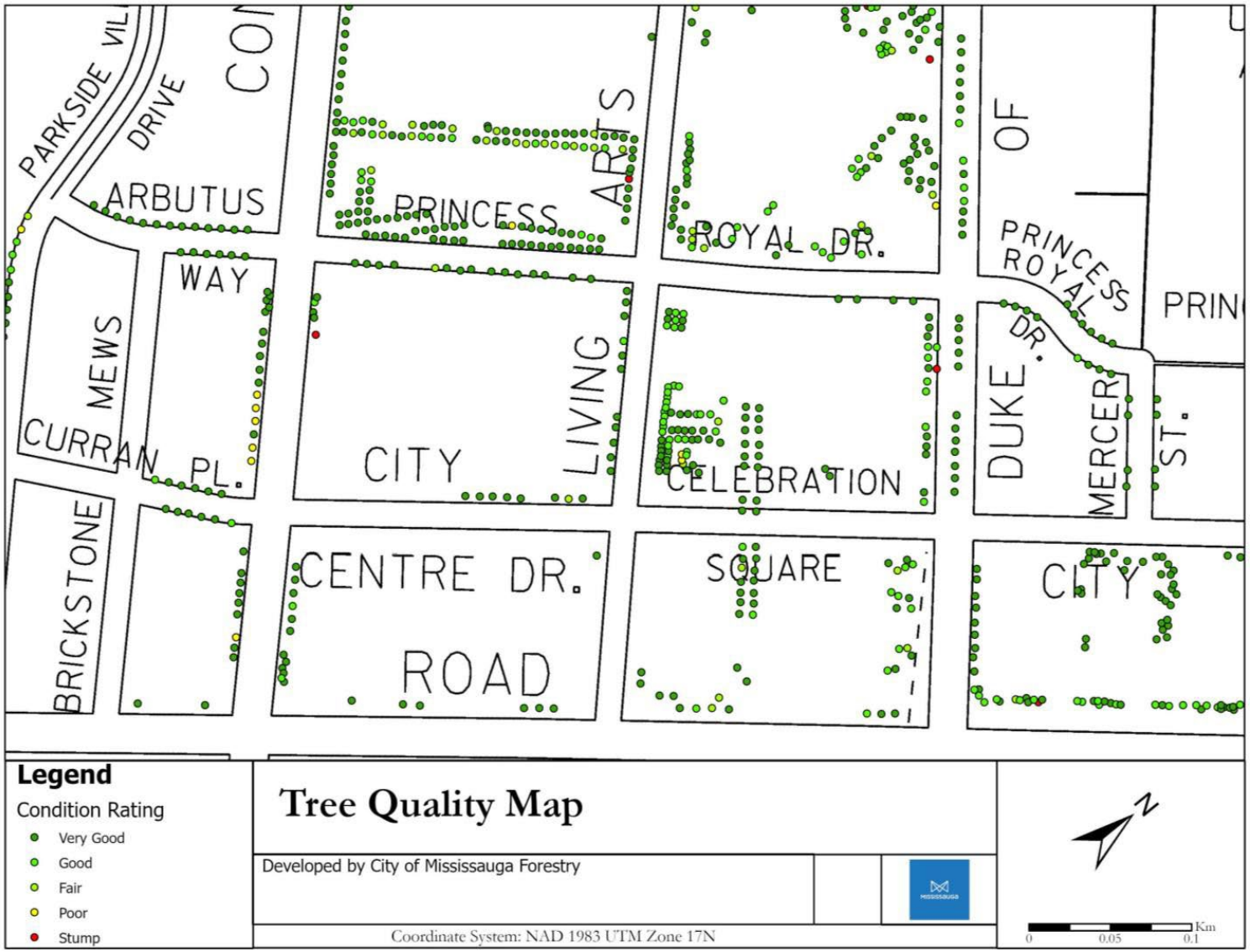


Figure 6: Tree Quality Map

Corporate Asset Management Plan **2025**

Transit (MiWay)

Table of Contents

Introduction 3
Key Stats 4
State of the Infrastructure 5
Asset Hierarchy 5
Asset Class - Summary 6
Assets Used by Transit Services – Managed By Other Service Areas 7
Asset Management Tools & Systems 8
Dashboards 8
Levels of Service 17
Governing Legislation for Transit (MiWay) 17
Community Levels of Service Framework 20
Technical Levels of Service Framework 21
Demand Management 26
Growth Analysis & Transit Ridership 26
Demand Drivers, Projections, and Management Plans 35
Risk Management 42
Asset-Specific Risk Methodology 42
Lifecycle Management 54
Lifecycle Strategies 54
Lifecycle Needs vs Budget 57
Budget Breakdown 61
Financing Strategy 63
Capital Funding Sources and Operating Revenue Sources 63
Cost Analysis: Overview of the Full Lifecycle Model Approach 68
Infrastructure Gap 86
Continuous Improvement & Maturity 89
Maturity Assessments 89
Continuous Improvement Plan 94
Appendix 97

Introduction

As the City of Mississauga continues to develop as a transit-oriented and dynamic urban centre, the City and Transit (MiWay) strive to ensure that transit service levels support customer growth through increasing service frequencies and improvement of infrastructure to enhance the safety, reliability, and efficiency of the transit system. As the ridership increases significantly, the need to add service and infrastructure grows thereby increasing the cost of delivering that service.

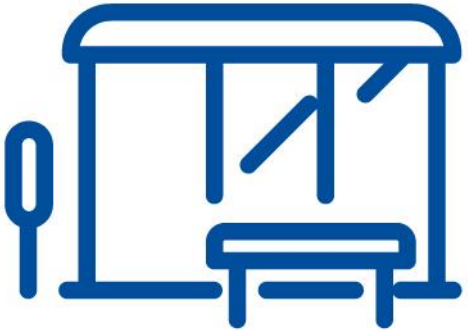
The City's Strategic Plan provides direction for growth and evolution through the identification of five pillars: focus on the customer, move people, support employee success, harness technology and innovation and build business and environmental sustainability. The Transit asset management plan has been developed to ensure that transit assets meet the fast-evolving needs of Transit's customers and stakeholders while aligning with both the City's and Transit's strategic directions. To this end, Transit's assets will be managed based on the following guiding principles:

- **Resilient and customer focussed** with the ability to anticipate and meet customer requirements leading to Transit (MiWay) being the customer's preferred transportation choice
- **Sustainable today and in the future** through the ever-evolving levels of service to ensure the long-term health of its infrastructure
- **Evidence-informed, transparent and collaborative** decision making that will be documented for both internal and external service delivery groups
- **Optimized and aligned** decisions to meet service delivery requirements and outcomes in alignment with corporate reporting requirements
- **Safety driven** for its customers and employees and all others who interact with the service

Transit (MiWay) currently supports a network of 65 routes servicing approximately 3,200 stops and multiple terminals and stations. Transit owns, operates and maintains most of the transit assets required to provide Mississauga with a shared travel choice that is friendly, reliable and respects the environment. Transit's asset portfolio is comprised of five Asset Classes: Revenue-Generating Vehicles, Facilities, Right of Way (ROW) Infrastructure, Stormwater Infrastructure, and Equipment & Systems, valued at approximately at $830 Million as shown in Key Stats.

While transit facilities support the delivery of transit services within the City of Mississauga, these assets are reported under the City's Facilities Asset Management Plan and are not included in Transit's Asset Management Plan; Transit does perform some operations and maintenance duties and undertakes minor facility upgrade projects.

Key Stats

Current Replacement Value (CRV)	Average Condition	Current Maturity Level
$830 Million	Good	Intermediate
Average Annual Infrastructure Gap – Current LOS		Average Annual Infrastructure Gap – Proposed LOS
$3.5 Million		Same as Current LOS

State of the Infrastructure

Asset Hierarchy

Table 1: Transit (MiWay) Service Area Hierarchy

Asset Class	Asset Type	Asset Sub-Types
Vehicles (Revenue-Generating)	Conventional Buses (Standard 40′)	Conventional Buses (Standard 40′)
	Conventional Buses (Articulated 60′)	Conventional Buses (Articulated 60′)
	Hybrid Buses (Standard 40′)	Hybrid Buses (Standard 40′)
	Hybrid Buses (Articulated 60′)	Hybrid Buses (Articulated 60′)
Equipment & Systems	Non- Revenue Vehicles	Administrative Vehicles
	On-Vehicle IT Equipment	Radios
		Geolocation Technology (IBUS); Passenger Count System; Cameras
	Fare Equipment	Fare boxes
	Presto Equipment	Presto equipment
Right of Way (ROW) Infrastructure	Structures	Bridges
		Culverts
		Noise Walls
		Retaining Walls
		Living Walls
	Road Infrastructure	Pavement (Transitway)
		Stops
Stormwater Infrastructure	Stormwater Management Facilities	Cell
		Channel
		Sewer (includes junctions)
		Inlets/Outlets
		Oil Grit Separator (OGS)
		Structures
	Storm Sewers	Sewers
		Culverts
		Inlets/Outlets
		Junctions

Asset Class - Summary

Asset Class	Current Replacement Value (Millions)	Average Condition	Average Annal Infrastructure Gap Current and Proposed LOS (Millions)
Vehicles (Revenue-Generating)	$503.5		$0.0
Equipment & Systems	$28.4		$0.09
Right of Way (ROW) Infrastructure	$273.3		$3.4
Stormwater Infrastructure	$24.8		$0.0

Assets Used by Transit Services – Managed By Other Service Areas

Assets Used by Transit Services	Managed By	Quantity	Current Replacement Value (Millions)
Buildings[1]	Facilities Planning & Development	27 Ea.	$354.0

Transit Buses

[1] While transit buildings support the delivery of transit services within the City, these assets are reported in detail under the Facilities Asset Management Plan. Transit does perform some operations and maintenance duties and undertakes minor facility upgrade projects.

Asset Management Tools & Systems

Transit's asset hierarchy consists of assets that are owned by Transit (MiWay), as well as assets that impact Transit's levels of service. Due to the wide range of assets owned by Transit, some assets are managed by different departments and systems within the City.

Esri's Geographic Information System (GIS) environment is used to map road pavement and right-of-way assets.

Trapeze EMS is an enterprise asset management software that manages assets and work orders. It stores information on transit buses, administrative vehicles and IT equipment.

BridgeTMS is the asset analysis system used to manage the City's bridge, culvert, and retaining wall structures. Not only does the system contain detailed information about each of the City's structures, but it also contains detailed OSIM (Ontario Structural Inspection Manual) information.

Infor is a computerized maintenance management system used to record and manage service requests, work orders and permits related to roadway and right-of-way assets.

CityWide is the City's Tangible Capital Asset (TCA) System. The system was introduced in 2008 to capture infrastructure valuation information about the City's major assets.

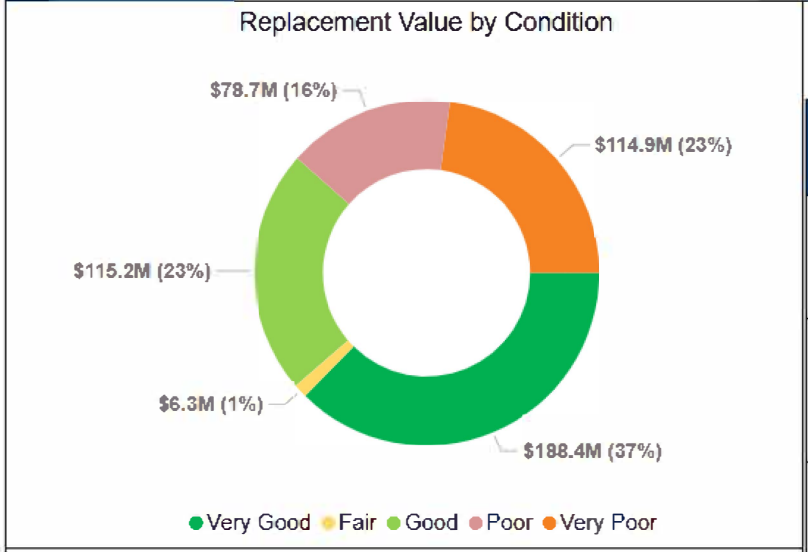
Each of these systems plays an integral role in supporting decision-making. The asset data and information contained within these systems is comprehensive, reliable, and reasonably accurate and has been used to support the development of this plan.

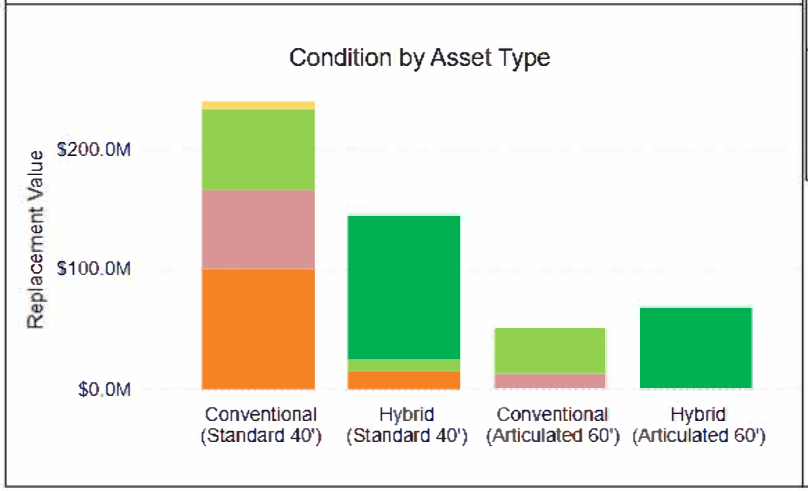
Dashboards

The following dashboards provide a summary of the state of the current infrastructure for each asset class. The information in this plan was prepared using 2023 year-end data and 2023 dollars for current replacement value. In charts, graphs and tables where money is represented in thousands of dollars ($000), figures have been rounded to the nearest thousand. This means that the totals shown may not always balance perfectly, due to rounding.

Dashboard – Vehicles (Revenue-Generating)

Data Quality:	Asset Inventory	Condition	Replacement Value	Current Replacement Value:	$503.5 Million
	A	B	A		





Asset Type	Quantity	Average Age (Years)	Estimated Useful Life (Years)	Current Replacement Value (000s)
Conventional (Standard 40')	266 Ea.	11.0	15	$239,400
Conventional (Articulated 60')	39 Ea.	6.0	12	$50,700
Hybrid (Standard 40')	145 Ea.	2.0	15	$145,000
Hybrid (Articulated 60')	49 Ea.	1.0	12	$68,400

Background Information

Transit's revenue generating vehicles consists of a fleet of 499 buses with a replacement value of $503.5 million. The overall condition of the asset class is Fair, although 210 of the buses fall within a Poor-Very Poor condition rating due to remaining useful life (RUL). The condition of bus assets has seen significant improvements due to the Investing in Canada Infrastructure Program (ICIP), which provided funding to the City that enabled Transit to renew almost 40 per cent of its fleet within one year.

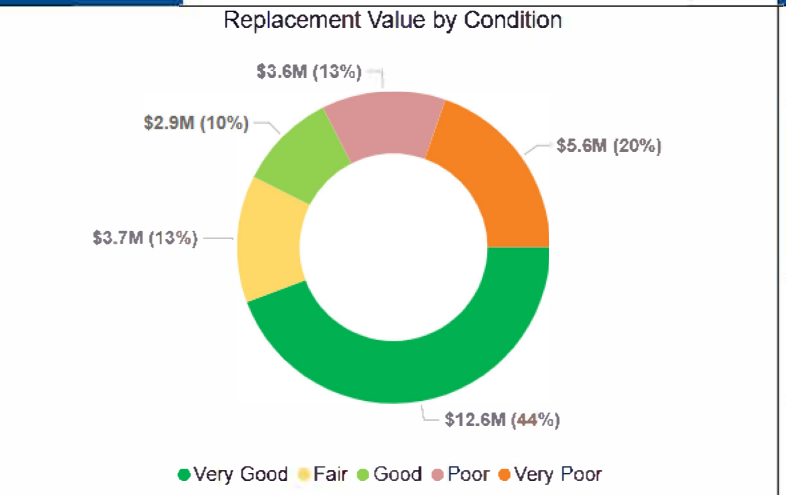
The condition of assets has been calculated on an age-based assessment (Table 10). This approach is commonly used when no formal condition assessment is available, whereby the age of the asset and its estimated useful life (EUL) are used to estimate the current condition. Additionally, staff considered other factors alongside age to determine the condition/performance of assets (i.e., capacity, functionality, compliance, etc.). Staff plan to work towards a "risk-based" approach in the future, which will improve the overall data confidence and accuracy scoring.

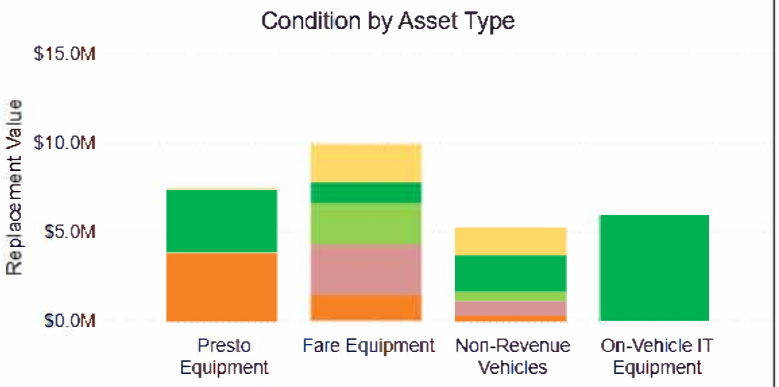
Hybrid Bus (Standard 40')

Dashboard – Equipment & Systems

Data Quality:	Asset Inventory	Condition	Replacement Value
	C	C	B

Current Replacement Value: $28.4 Million





Asset Type	Quantity	Average Age (Years)	Estimated Useful Life (Years)	Current Replacement Value (000s)
Non-Revenue Vehicles	73 Ea.	4.0	10	$5,200
On-Vehicle IT Equipment	538 Ea.*	1.0	10	$5,900
Fare Equipment	499 Ea.	12.0	12-15	$9,900
Presto Equipment	987 Ea.	6.0	10	$7,400

*538 denotes the quantity of radios in service only. The other assets included under On-Vehicle IT Equipment such as geolocation technology, passenger count system and cameras have a one-to-one relationship with the number of buses available and are added/removed when buses are procured/decommissioned.

Background Information

The Equipment & Systems asset class is made up of Non-Revenue Vehicles, On-Vehicle IT Equipment, Fare Equipment, and Presto Equipment with an overall replacement value of $28.4 million.

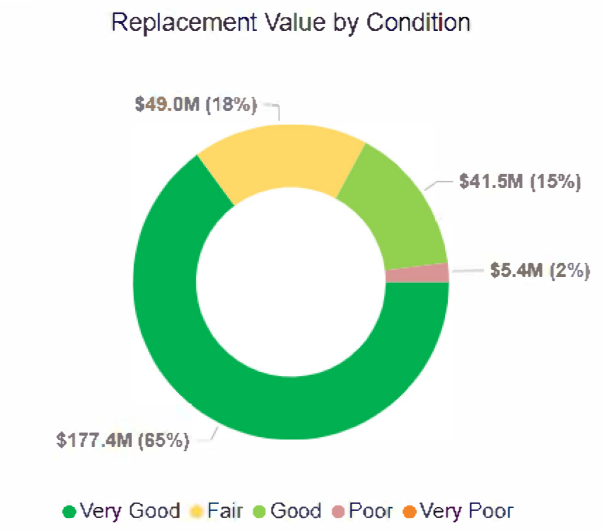
The overall weighted condition of these assets is Fair. The condition of assets has been calculated on an age-based assessment (Table 10) or assumed to be Fair or better where no formal condition assessment data is available. As part of continuous improvement, staff will be developing asset-specific condition assessments to improve the data accuracy and reliability considering other factors alongside age to determine the condition/performance of assets (i.e., capacity, functionality, compliance etc.).

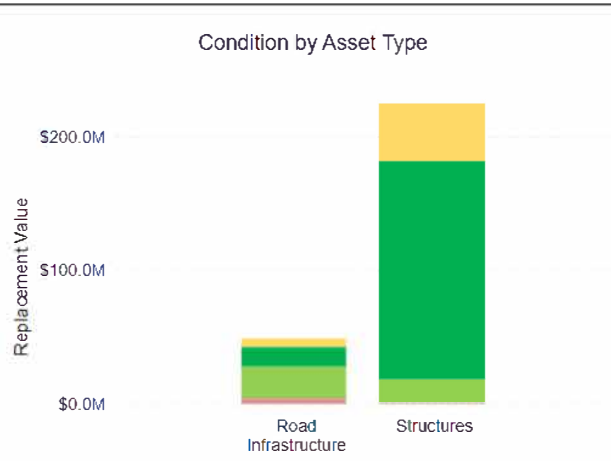
Transit Fare Equipment – On-Vehicle Presto

Dashboard – Right of Way (ROW) Infrastructure

Data Quality	Asset Inventory	Condition	Replacement Value
	C	C	B

Current Replacement Value: $273.3 Million





Asset Type	Asset Sub-Type	Quantity	Average Age (Years)	Estimated Useful Life (Years)	Current Replacement Value (000s)
Road Infrastructure	Pavement	144,033 m^2	9.0	50	$26,500
	Stops*	3,230 Ea.	9.0	20-50	$67,300
Structures	Bridges	28 Ea.	9.0	75-100	$139,700
	Culverts	1 Ea.	9.0	60-70	$955
	Noise walls	1.8 km	6.0	30-50	$5,300
	Retaining walls	1.2 km	8.0	50-60	$1,400
	Living walls	2.1 km	11.0	30-50	$32,100

*Stops can be comprised of shelters, bus bays, pedestrian landing pads and stop markers which have varying useful lives.

Background Information

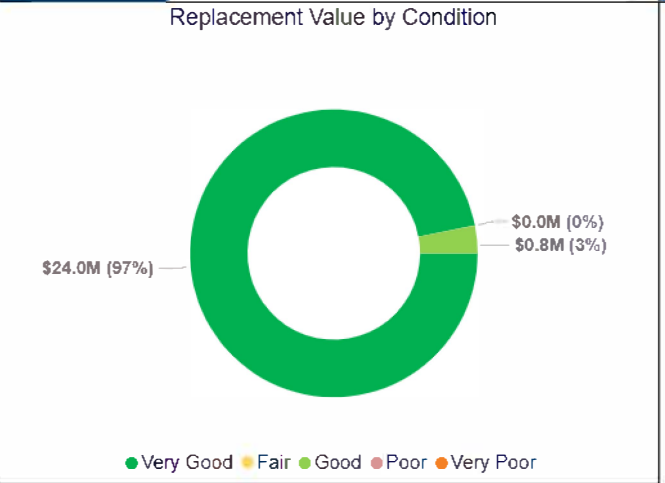
The Right of Way (ROW) Infrastructure asset class is comprised of many assets including dedicated roads, bridges, culverts, noise walls, and bus stops with a total current replacement value of $273.3 million. Condition is assessed based on the criteria identified in Table 11 in the Appendix. Where no condition or age information was available, a “Fair” condition was assumed for those assets.

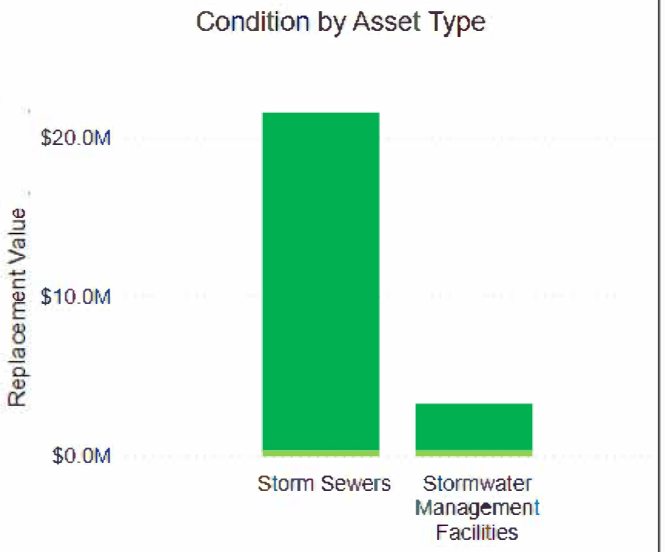
Dedicated Roads - Transitway

Dashboard – Stormwater Infrastructure

Data Quality:	Asset Inventory	Condition	Replacement Value
	B	C	B

Current Replacement Value: $24.8 Million





Asset Type	Asset Sub-Type	Quantity	Average Age (Years)	Estimated Useful Life (Years)	Current Replacement Value (000s)
Storm Sewers	Sewers	336 Ea.	13.0	100	$16,200
	Inlets/ Outlets	11 Ea.	13.0	100	$330
	Manholes/ Catchbasins	330 Ea.	13.0	100	$5,000
Stormwater Management Facilities	Cell/ Channel	10 Ea.	9.0	50-100	$440
	Sewer	40 Ea.	13.0	85-100	$1,600
	Inlets/ Outlets	10 Ea.	19.0	85-100	$260
	Oil Grit Separators	14 Ea.	10.0	100	$900
	Structures	1 Ea.	10.0	50	$30

Background Information

The Stormwater Infrastructure asset class is comprised of stormwater sewers which consists of catch basins, manholes, pipes, culverts, inlets etc. and stormwater management facilities (SWMF) which consists of cells, channels, sewers, outlets, inlets etc. The Stormwater Infrastructure asset class has a current replacement value of $24.8 million. Replacement costs are calculated using a unit cost basis.

The overall condition of the asset class is Very Good indicating that the assets are relatively new. The condition of assets has been calculated on an age-based assessment. This approach is commonly used when no formal condition assessment is available, whereby the age of the asset and its estimated useful life (EUL) are used to estimate the current condition.

As part of continuous improvement, a condition-based approach of CCTV inspections for the stormwater drainage network is tentatively scheduled for 2025+ (based on current asset priorities). Additionally, some assets have yet to be spatially mapped and have not been included in this plan.

Transit Stormwater - Outfall

Levels of Service

Governing Legislation for Transit (MiWay)

Legislation	Requirements
Highway Traffic Act, R.S.O 1990	Act that governs Ontario roadways, vehicles and vehicle operations.
Building Opportunities in the Skilled Trades Act, 2021	Act that defines, qualifies, and ensures compliance for skilled trades employers and workers in Ontario.
Emergency Management and Civil Protection Act, 1990	Act that provides requirements for emergency management.
Municipal By-Laws	Regulations approved by Council to safeguard and protect persons and properties including air quality and idling.
O. Reg 169/22: Vehicle Emissions	Rules governing emissions systems and standards for vehicles in Ontario.
O. Reg 170/22: Vehicle Inspection Centres	Rules governing locations and requirements for authorized technicians.
O. Reg 199/07: Commercial Motor Vehicle Inspections (CMV)	Rules governing inspection schedules, performance and record keeping for CMVs.
O. Reg 424/97: Commercial Motor Vehicle Operators' Information	Rules outlining requirements for CMV Operators (the City).
O. Reg. 588/17: Asset Management Planning for Municipal Infrastructure	Provides policies and guidelines for levels of service considerations in managing municipal infrastructure assets.
R.R.O. 1990, Reg. 611: Safety Inspections	Rules outlining the technical requirements around a safety inspection for technicians.
R.R.O. 1990, Reg. 601: Motor Vehicle Inspection Stations	Rules outlining the classes of stations, licences, registration of technicians, operations and fees for an inspection station.
Occupational Health and Safety Act, 1990	Rules governing health and safety in Ontario workplaces.

Transit's Level of Service (LOS) Goals

The LOS framework helps support and achieve key asset management goals:

- Recommend future asset-related endorsement of the community and technical level of service framework and vision guiding principles, which enables Transit to clearly communicate service level impacts associated with available operating and capital budgets into future years
- Develop and continuously improve the documentation to provide evidence-based level of service linkages between the community and technical levels with integration directly into service-based activities as it relates to both the operational and capital expenditures. This objective is achieved through development of Transit's financial model
- Allow stakeholders, on an ongoing basis, to understand their needs and appropriately update the desired levels of service while balancing future risks
- Develop a clear relationship between the level of service and the costs associated to meeting level of service objectives by integrating into the budget process
- Meet the requirements of O. Reg. 588/17 for 2025 to define the proposed level of service, identify costs to meet the proposed level of service and identify any risks of not meeting targets

Overview of Transit's Current LOS

For the purposes of the 2025 transit asset management plan, the community and technical levels of service measures remain consistent with those established through the 2024 iteration, however, the "current" baseline dataset has been updated with more accurate information. In some instances, there have been some significant shifts in the current performance relative to the 2024 plan. Some of the significant shifts can be attributed to the following:

- Ridership information used in the 2024 plan relied upon data derived during the pandemic (2021). Since then, Transit (MiWay) has seen a significant increase in revenue rides and the revised baseline data reflects more up to date information
- Condition data has been updated with several of the more recent revenue fleet acquisitions replacing the older and out of service fleet. In turn, the updated datasets indicate a more favourable current state for Transit vehicles than the figures reported in the 2024 plan
- The change in on-time performance can be attributed to a change in the methodology. The previous methodology used a range of +1 minutes early to -5 minutes late, whereas the recent methodology uses +2 minutes early to -4 minutes late

Proposed LOS

The current levels of service have been updated as part of this plan which lay the foundation for the proposed LOS.

Overall, the proposed levels of service outlined in this report have been carefully evaluated based on the following criteria:

1. Options & Associated Risk
   Service area staff assess various options for the proposed levels of service and analyze the risks associated with each option to the long-term sustainability of the Transit service. This assessment considers factors such as service quality, operational efficiency, and financial sustainability.
2. Differences from Current Levels of Service
   Transit undertook a comparison of the proposed levels of service with the current levels to identify areas where adjustments or enhancements are necessary. While some proposed levels of service may mirror the current levels outlined in the 2024 plan, adjustments or enhancements to the current procedures may still be necessary to ensure alignment with organization goals.
3. Achievability
   The feasibility of achieving the proposed levels of service considering factors such as available resources, technological capabilities, and operational constraints have been evaluated by Transit. Efforts have been made to ensure that the proposed measures are realistic and attainable within the City's operational capacity. Notwithstanding the City's intended ability to achieve the targets, it is expected that the proposed levels of service continue to be reviewed and monitored.
4. Affordability
   The affordability of the proposed levels of service is conducted in conjunction with the budget process, ensuring alignment with the financial resources and fiscal capacity of the organization. This process inherently involves approval by Council and the organization, with affordability considerations integrated into budgetary decisions.

Community Levels of Service Framework

Core Value	LOS Objective	Asset Class	Performance Measure	Current Performance
Scope	Provide accessible and frequent transit service	All	Description of the extent of the City's transit system	The extent of the Transit system and all its routes is available to all customers here. The Transit system is comprised of (Source): • 3,230 stops (35% sheltered) • 65 transit routes (6 express, 50 local, 9 school routes) • Nearly 500 buses
Quality	Provide Clean Buses and Clean Customer Amenities	All	Description of the opportunities provided by the City for members of the public to provide customer feedback	The City provides customers several ways to provide feedback on the quality of service. Customers can submit feedback through various ways including by phone, online or in person. Information on the various ways to provide feedback is available here.
			Description of the cleaning cycle maintained by staff to ensure continued delivery of levels of service expected by users of the City's transit system.	• Daily cleaning of buses (mopping floors, garbage pick-up) • Basic cleaning of buses on 28-day cycle • Advanced cleaning of buses (including roof, ceiling, lighting) on 180-day cycle • Annual stop inspections • Weekly transitway station inspections

Technical Levels of Service Framework

Core Value	LOS Objective	Performance Measure	Current Performance (2023)	Target Performance (2024-2033)	Background Information
Scope	Provide accessible and frequent transit service	Revenue Passengers per Capita	59.6	67.0	Transit has defined a target of 79.0 revenue passengers per capita by 2049 according to the City's budget. The prorated target by 2033 is 67.0.
Performance	Provide reliable transit service	On-Time Performance Average	64%	Minimum 80%	This target is anticipated to be achieved over the 10-year period through the proposed lifecycle activities identified in this report.
		% of Vehicles that Exceed their Estimated Useful Life			
		Non-Revenue Vehicles	4.6%	0.0%	The City has the funding capacity to replace all vehicles required over the next 10-years based on an age-based assessment. Keeping with this replacement schedule, the target level of service can be achieved over the next 10 years.
		Conventional (Diesel) Buses (Standard 40')	5.6%		
		Conventional (Diesel) Buses (Articulated 60')	0.0%		
		Hybrid Buses (Standard 40')	0.0%		
		Hybrid Buses (Articulated 60')	0.0%		

Core Value	LOS Objective	Performance Measure	Current Performance (2023)	Target Performance (2024-2033)	Background Information
	Provide reliable transit service	% of Assets in Fair or Better Condition			
		Vehicles (Revenue Generating)	63.3%	80.0% or higher	The City has the funding capacity to replace vehicle assets required over the next 10-years based on an age-based assessment. There would be a need to increase funding for equipment & systems as well as right of way infrastructure to achieve the target level of service over the next 10 years.
		Equipment & Systems	67.7%	80.0% or higher	
		Right-of-Way (ROW) Infrastructure (Stops, Bus Bays, Bus Shelters, Transitway Pavement only)	94.3%	70.0% or higher	
		Stormwater Infrastructure	100.0%	Align with Stormwater Service Area direction	
		Labour Hours Attributed to Preventative Maintenance as a % of Total Labour Hours (Vehicles)	52%	70%	Transitioning towards preventative maintenance activities rather than reactive maintenance will reduce unexpected delays, potential loss of revenues, and vehicle downtime. The target was established in consultation with Transit staff.
		Labour Hours Attributed to Reactive Maintenance as a % of Total Labour Hours (Vehicles)	48%	30%	

Core Value	LOS Objective	Performance Measure	Current Performance (2023)	Target Performance (2024-2033)	Background Information
Affordability	Provide affordable transit service	**Actual vs. Target Reinvestment Rate**			
		Vehicles (Revenue Generating)	10.9% vs. 10.9%		A measure of how much funding is available to meet capital state of good repair lifecycle needs (Actual) versus how much funding is required (Target).
		Equipment & Systems	10.0% vs. 10.3%		
		Right of Way (ROW) Infrastructure	0.4% vs. 1.7%		
		Stormwater Infrastructure	Not Applicable		
		Revenue/Cost Ratio (Fare Revenue to Gross Cost)	40.9%	Maintain status quo	Based on municipal comparators as per the Canadian Urban Transit Association (CUTA) factbook.

Current Performance

- Revenue Passengers per Capita: Transit has defined a target of 79 revenue passengers per capita by 2049 which is expected to be met. As the proposed levels of service are required to be projected over a 10-year period to coincide with the regulation, the projected target by 2033 is expected to be 67 revenue passengers per capita (prorated on the overall target). The total anticipated cost to meet this target amounts to about $1.38 billion over 10-years. This cost compared to the existing budget allocation of $1.35 billion represents a cumulative funding gap of $0.03 billion (or $35 million)– this gap would be considered the increased expenditure needed to meet the proposed level of service over the next 10-years. Notably, the gap is minor in the context of Transit's total expenditure requirement, and the proposed level of service is currently funded at a rate of 97.5 per cent and these costs are expected to enable Transit to be well on its way to meeting its long-term target
- On Time Performance Average: Transit has set a target of 80 per cent for on-time performance. Transit has indicated that this value has continued to improve over time and expects that the 80 per cent target will be met by the end of the 10-year period. The total anticipated cost to meet this target amounts to about $1.38 billion over 10-years. This cost compared to the existing budget allocation of $1.35 billion represents a cumulative funding gap of $0.03 billion – this gap would be considered the increased expenditure needed to meet the proposed level of service over the 10 years
- Percentage of Vehicles that Exceed their Estimated Useful Life: In general, Transit aims to ensure vehicles are replaced on a rolling schedule based on the design life of each vehicle. Therefore, the proposed level of service target is such that no vehicles will be operated past their design life. While 4.6 per cent of non-revenue vehicles and 5.6 per cent of conventional (Diesel) Buses (Standard 40′) are considered overdue for replacement, these values are based on the inventory data which generally lags the actual replacement of the vehicles. These vehicles are already considered in the budget and in the process of being replaced
- Percentage of Assets in Fair or Better Condition: While the condition of assets is largely based on the age of assets, Transit aims to ensure that 80 per cent or more of revenue generating vehicles and equipment and systems assets are in fair or better condition. For Right-of-Way infrastructure, this value is 70 per cent or more. As assets are replaced over the next 10-year period Transit expects that the average overall condition of these assets will improve toward the target

- Labour Hours Attributed to Preventative/Reactive Maintenance: Transit has set a target for this split to be 70 per cent/30 per cent. While the current split is 52 per cent/48 per cent, the Transit capital plan includes costs needed to improve towards the target. This target is based on discussions with staff and their expertise, which aligns with best practices
- Actual vs. Target Reinvestment Rate: The reinvestment rate is the ratio between annual capital funding available and replacement value. The current value is about 11 per cent for vehicles, 10 per cent for equipment & systems, while only 0.4 per cent for ROW infrastructure. Transit expects that this ratio is adequate to continue to meet level of service objectives for revenue fleet, however, the reinvestment ratio should be increased to address the funding shortfall in Equipment & Systems and ROW infrastructure
- Revenue Cost Ratio: The ratio is currently around 41 per cent and is expected to be maintained over the 10-year period. Note that this ratio represents one of the highest recoveries compared to other GTA municipal transit systems (see Figure 10: Transit Services Cost Recovery Comparison for Select GTA Municipalities, 2022 CUTA factbook)

Demand Management

The Transit Service Area is planning for the future by recognizing the pressures and challenges ahead resulting from aging transit assets, extreme weather events, climate change and new legislation/regulations among other factors. There is an increasing need to plan and deliver effective and timely transit services and establish sustainable service levels. The table on 35 (Demand Drivers, Projections, and Management Plans) provides a summary of the key demand drivers for transit services.

Growth Analysis & Transit Ridership

As a part of the ongoing development of a Transit Asset Management Plan, an analysis of current and future growth in the City is required to properly plan for future asset management related needs in the most efficient and cost-effective manner. This section aims to provide an overview of historical, current and projected growth in the City, Transit ridership (and the key planning and demographic elements influencing it), and anticipated expansion-related activities planned for as outlined in the most recent Development Charges Background Study.

Historical Population, Household & Employment Growth in the City

A key component to asset management planning is to understand how future changes in a municipality's population and employment base will impact the demand for municipal services. Moreover, consideration must be made for how changes in population and employment can impact ridership for transit systems. This section aims to identify the factors that can influence the demand for the City of Mississauga's Transit-related asset portfolio and their associated levels of service.

The population of the City of Mississauga was approximately 742,600 in 2021, making it the third largest City in Ontario and seventh largest in Canada. For planning purposes, total population, as opposed to Census population, is used as it accounts for the Census net under coverage (i.e. those who were missed or double-counted by the Census). Since 2006, the City's population has increased by nearly 45,000 residents and approximately 62,000 employees. This growth has propelled the acquisition of several new assets and the expansion of City services. These activities ensure that service levels are maintained and the needs of residents, both existing and new, are met. This is particularly relevant for Transit services as the City has continued to acquire new fleet, expand services and improve ridership. Figure 1 below tracks population, households and employment in the City since 1996. As a point of context, as the City's 2021 population figures were lower than those projected in the approved Region of Peel Official Plan for 2021 (795,000 people), the growth which was not achieved (approximately 52,000 people) has been assumed to occur over the remaining planning period to 2051.

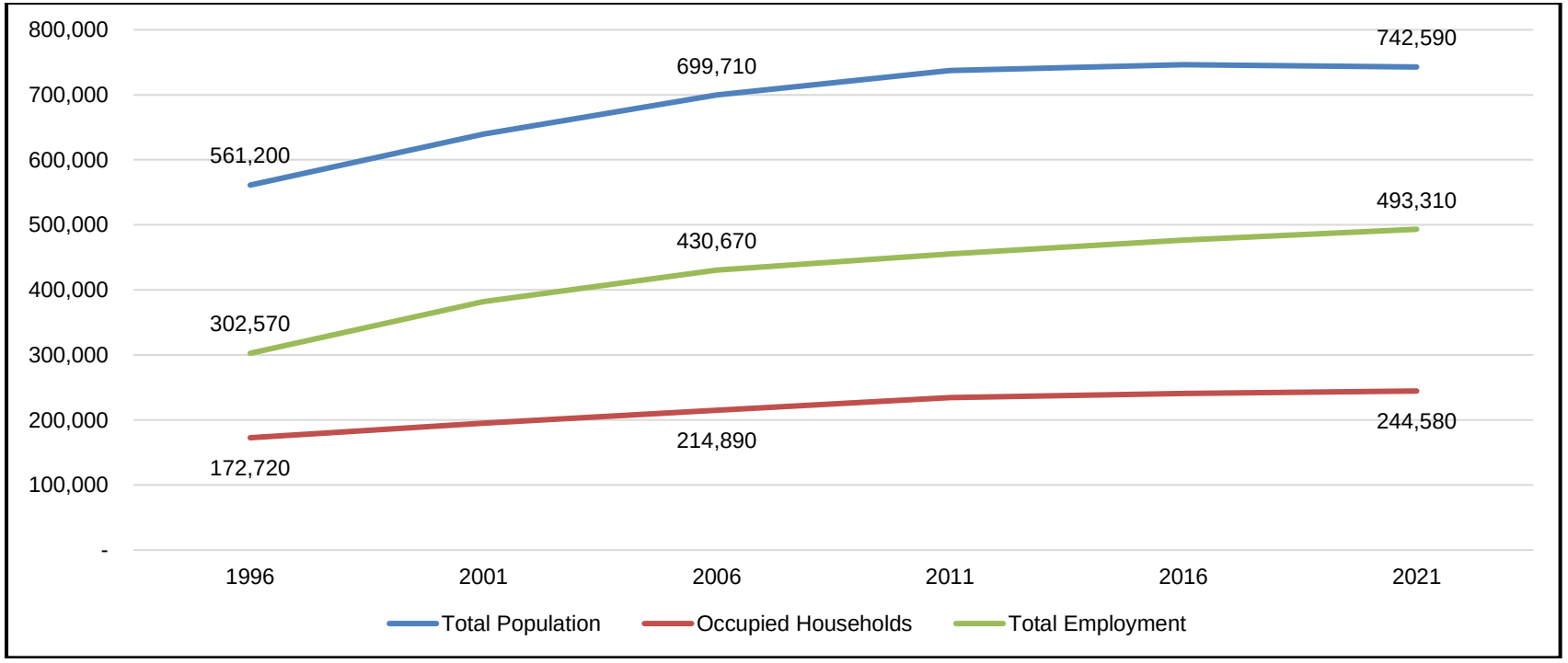


Figure 1: Historical Population, Occupied Households and Employment (1996 – 2021) Statistics Canada Data.

Note: The 2021 population and household figures are based on 2021 Census while employment is based on Peel Region forecast for Mississauga

While there was a slight decline in population over the last Census period from 2016 to 2021, the City is expected to return to steady population and employment growth, and associated development, over the long-term to meet the provincially approved 2051 targets. This level of growth will place demand for additional services, including improved access for all modes of transportation to ensure that quality of life is maintained for the new and existing residents.

Overall, the demand pressures identified will require the City to review and manage existing levels of service. An ongoing evaluation of the need for new services is required to identify works required to expand servicing capacity or address asset-related needs in the City's Transit asset portfolio.

Key Demographic & Planning Elements

Growth

The total population of the City of Mississauga is estimated at approximately 742,600 (2021 Census - adjusted to account for the under-coverage) with a strong residential and non-residential growth forecast over the long-term.

It is projected that the City's population will reach 995,000 and approximately 590,000 employees by 2051 based on the provincially approved Region of Peel Official Plan and the draft City of Mississauga Official Plan (Figure 2Error! Reference source not found. below). The projected increase in residential growth, supplemented by continued economic development, will further create increased demand for municipal infrastructure. These additional infrastructure needs must be planned for to meet the needs of residents.

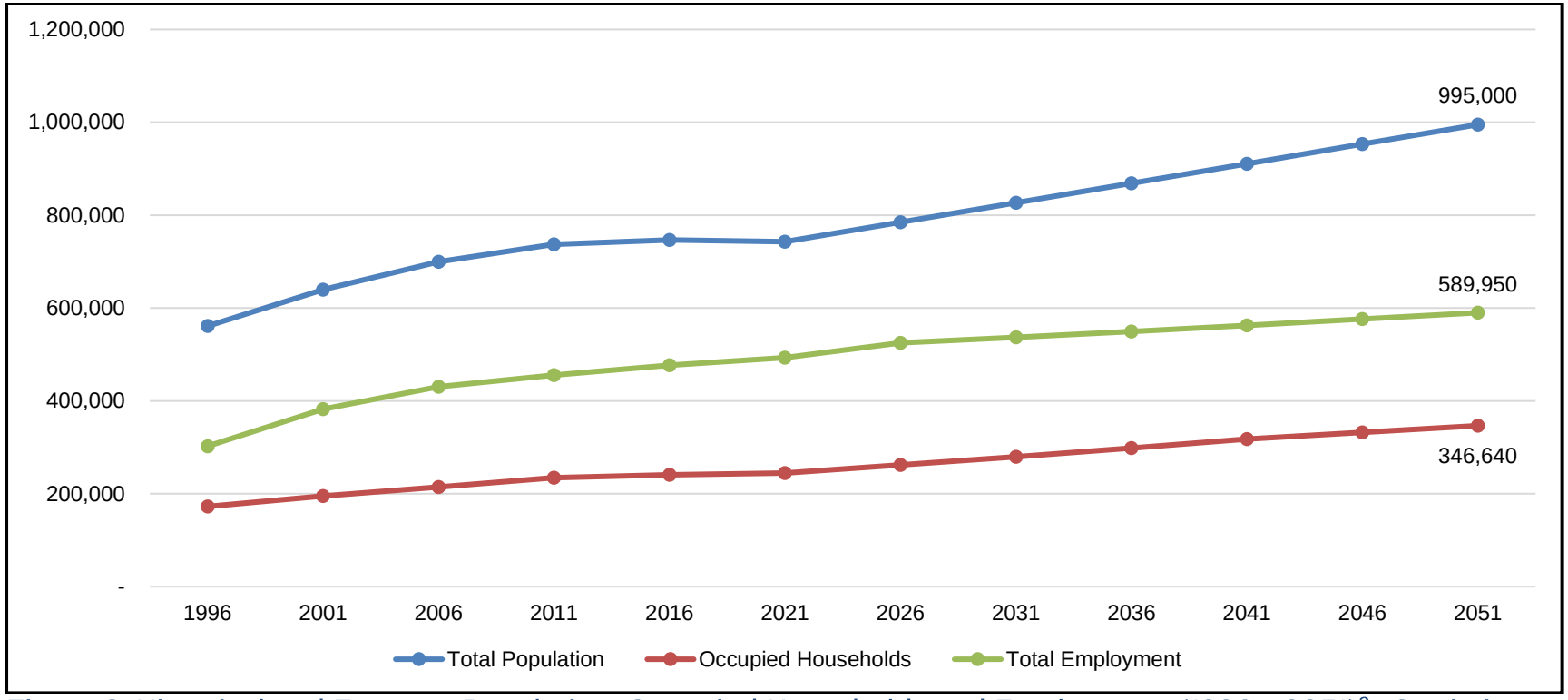


Figure 2: Historical and Forecast Population, Occupied Households and Employment (1996 – 2051)[2] , Statistics Canada and based on the Region of Peel Official Plan

[2] The 2051 targets remain consistent with the Region of Peel approved targets, but the inter-year figures have been adjusted to reflect the 2021 census results.

Housing Pledge

In November 2022, as part of Bill 23, the *More Homes Built Faster Act, 2022* and in support of the Provincial goal to build 1.5 million homes by 2031, the Province assigned housing targets to selected large and fast growing lower and single-tier municipalities in Ontario. Peel's local municipalities subsequently endorsed housing pledges to meet the Provincial targets. These targets total 246,000 units for Peel's local municipalities and are distributed as follows: Brampton – 113,000 units, Caledon – 13,000 units and Mississauga – 120,000 units.

The housing targets are monitored by the Province through housing starts, growth in additional residential units (ARUs) and long-term care beds. Housing targets are measured by housing starts as reported by the municipality or by Canada Mortgage and Housing Corporation (CMHC). The 10-year period for the targets is from January 2022 through to December 2031. Of note, the Region of Peel forecasts are all forecasts of occupied housing units and population. The population forecast is closely tied to the housing forecast, but housing only accommodates population after the units are completed.

The primary method of creating additional housing units to meet the targets is:

- Through increasing the household formation rates formation (e.g. adult children who are living with their parents moving out to form new households)
- A significant further shift towards apartment in the forecast housing unit mix which is particularly evident in Mississauga since there is no potential to expand the greenfield land base

Under this scenario, the Region of Peel reaches a population of just over 2.5 million by 2051 because of the accelerated housing growth required to meet the local municipal housing pledges. Of the total, the City of Mississauga represents about 1.1 million people (or 43 per cent) of the total population by 2051.

While the asset management plan is intended to ensure alignment with the Growth Plan, recent provincial policy changes have evolved, and the municipal planning landscape has changed. On August 20, 2024, the province published the new Provincial Planning Statement, 2024, (PPS, 2024), a province-wide policy instrument that, once in force, will replace both the Provincial Policy Statement, 2020 (PPS, 2020) and A Place to Grow: Growth Plan for the Greater Golden Horseshoe (Growth Plan). The new PPS came into force on October 20, 2024.

The PPS, 2024 fundamentally changes how growth planning occurs throughout the province by simplifying and re-aligning existing policies to ostensibly achieve the province's goal to build at least 1.5 million homes by 2031. As a policy statement under the *Planning Act*, all decisions that affect a planning matter must be consistent with the PPS, 2024.

Figure 3 below summarizes the difference in the population over various planning periods to 2051. By the end of the period, the population achieved under the housing pledge scenario would be considerably higher than what would be achieved under the Regional Official Plan targets.

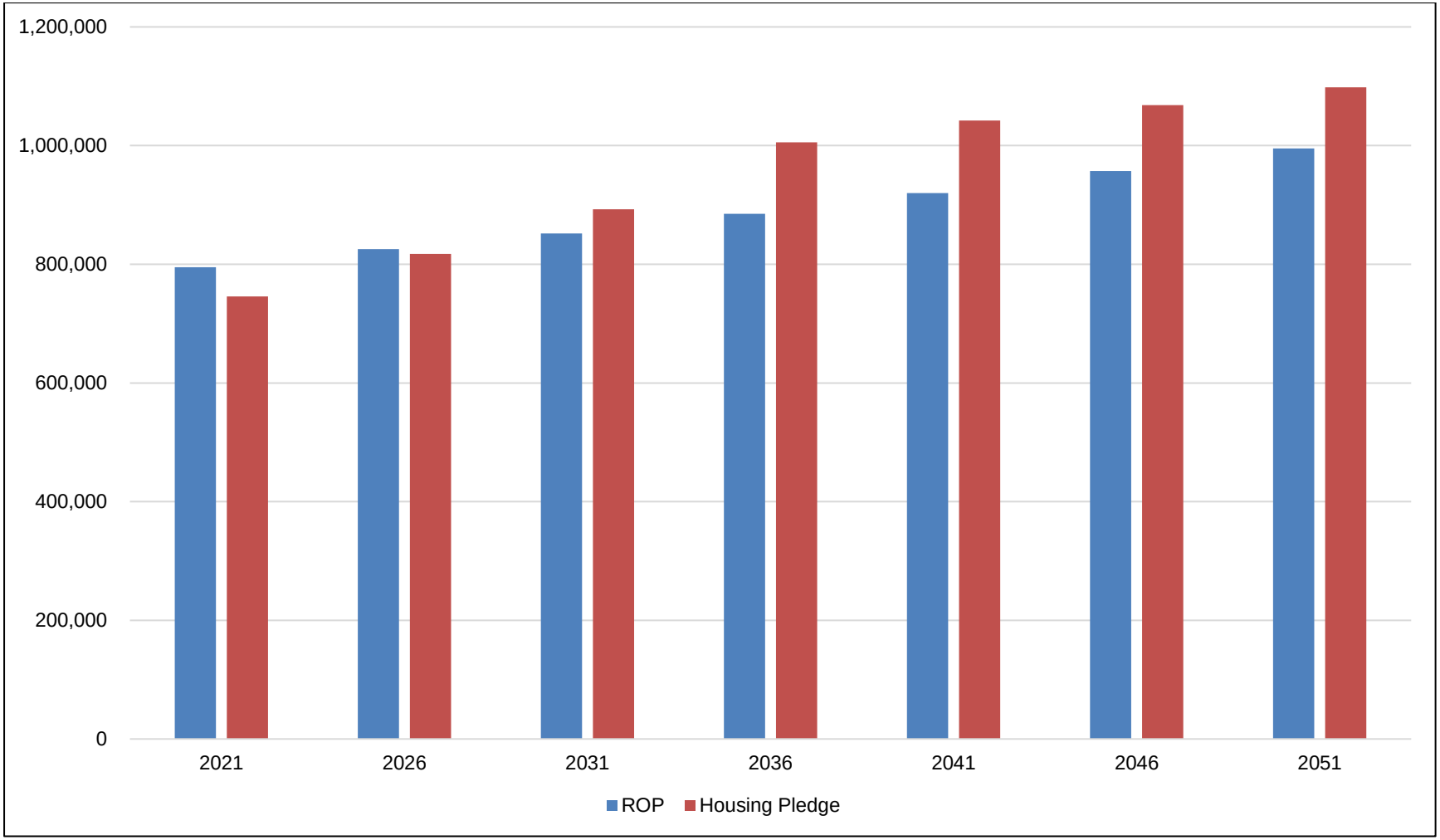


Figure 3: City of Mississauga Population Projection: ROP vs. Housing Pledge

Age Structure

Mississauga's age structure is slightly younger than the Province but notably older than the neighbouring municipality of Brampton. While the City will remain attractive to younger households, Mississauga's age structure is anticipated to shift increasingly towards senior population age groups as shown in Figure 4. As the population ages, the need for a variety of different services will change from the current standards. Of particular importance to Transit services, these demographic patterns can potentially lead to a change in transit use and commuting patterns impacting revenue ridership. Typically, municipalities with a younger age profile would be more akin to utilize transit services.

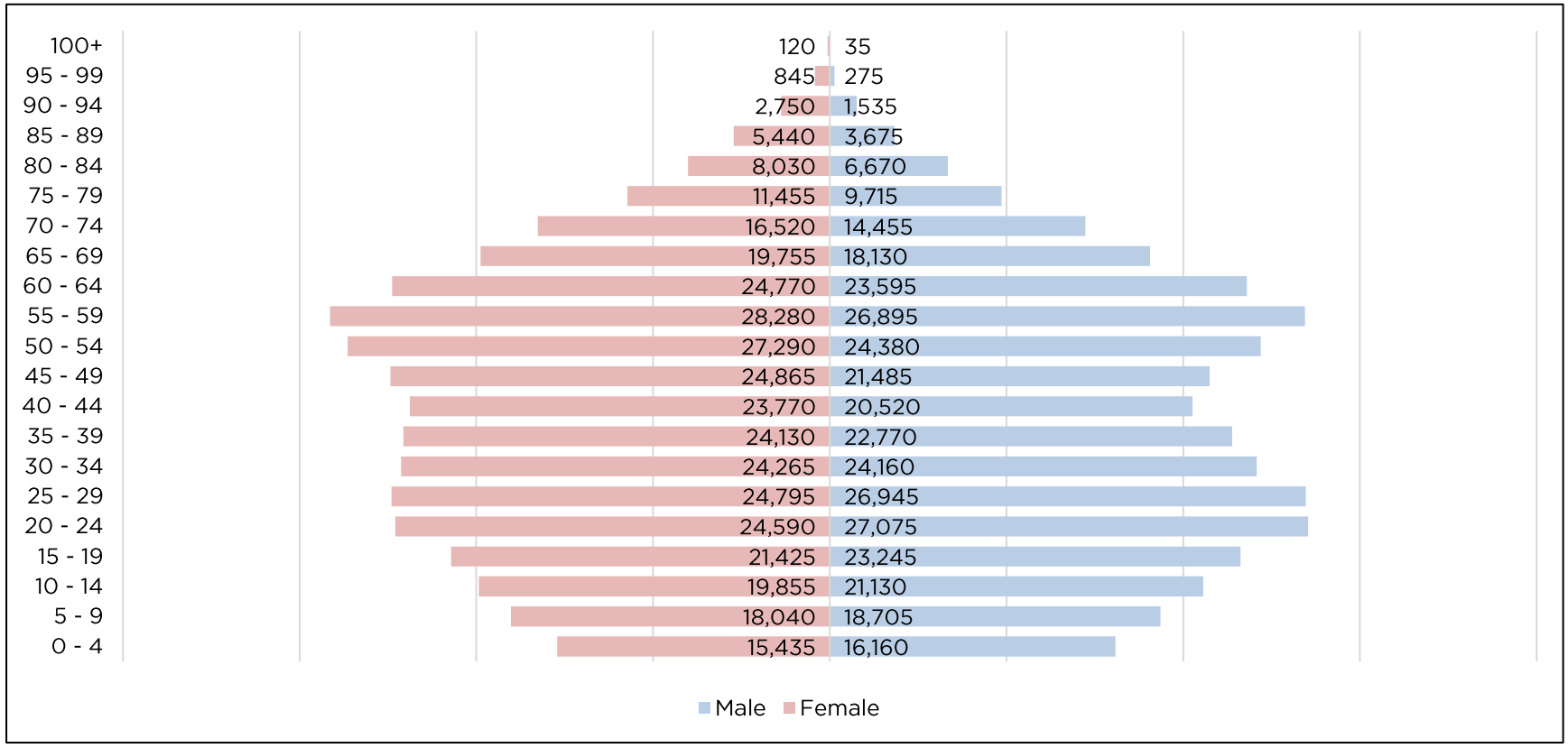


Figure 4: City of Mississauga – 2021 Population Age Structure, Statistics Canada, 2021 Census

Transit Ridership (Revenue Rides)

An assessment of the ridership forecast was completed using the City's business plan and population projections outlined in this plan. As a point of reference, the City of Mississauga has targeted a short-term goal of 54 revenue rides per capita with that amount increasing to 79 rides per capita by 2049. For the purposes of this analysis, the transit ridership forecast maintains the City's methodology to measure annual revenue ridership, which is the sum of all linked trips on the transit system for which a fare has been received. Figure 5 below outlines the change in ridership from 2015 through to 2033. The City's transit system has experienced steady growth in ridership in the pre-pandemic era from 2015 to 2019.

Like many transit agencies across the country, the COVID-19 pandemic impacted the use of the transit system as a primary mode of transportation ultimately impacting revenue ridership. Furthermore, the figure illustrates a reduction in revenue rides of about 50 per cent in 2020 and 2021 with a strong rebound in ridership in 2022 to a more normalized pre-pandemic level. For 2023, there were an estimated 46.1 million rides equating to about 60 rides per capita, which has exceeded the short-term target set by Transit – 2024 rides are projected to increase by about two per cent from 2023 levels. Following this period, continued growth in ridership is expected which revenue rides will reach about 58 million by 2033 which equates to about 67 rides per capita on an estimated population of 865,000.

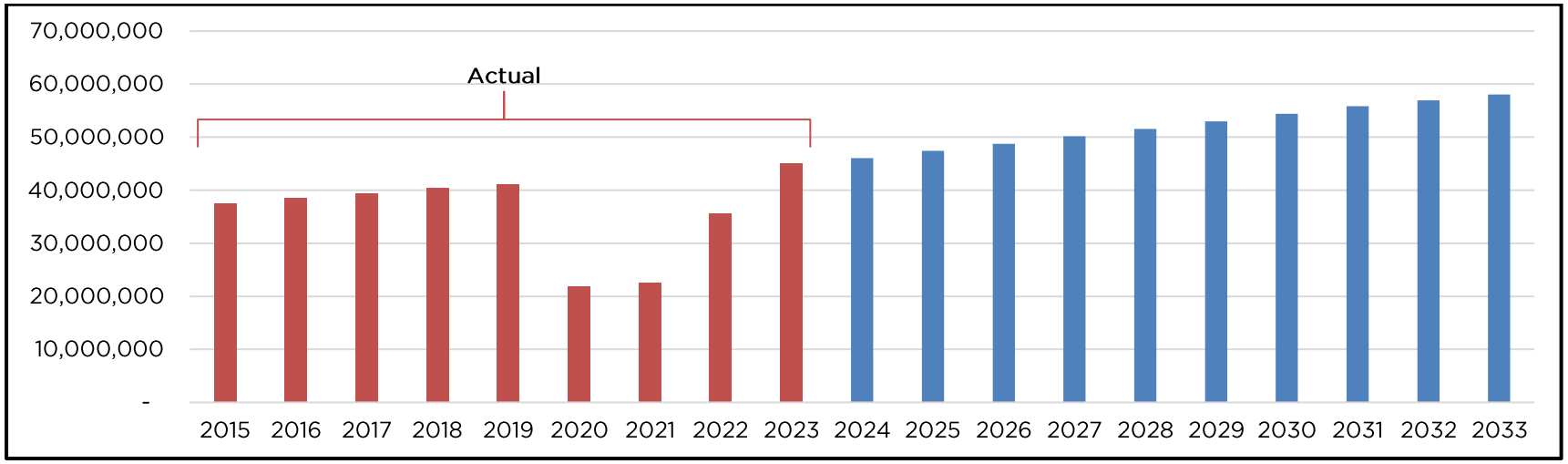


Figure 5: City of Mississauga Transit Revenue Ride Projections (Source: 2022 Transit (MiWay) Business Plan, Canadian Urban Transit Association (CUTA) 2015-2023, and Hemson projections post 2023)

Expansion Activities

As a result of increased population and employment, which is an attributing factor in the ridership projections outlined, new capital assets would be required to accommodate this growth. The City historically has used development charges, to the fullest extent allowed for, under the provisions of the *Development Charges Act (DCA)* to ensure that growth pays for growth. The City's DC Background Study illustrates a capital requirement of $455 million for new transit infrastructure over the 2022-2031 period, of which, $262 million is growth related and can be recovered from development charges (DCs) over this period. The remaining amount would be recovered from grants and subsidies ($91 million), and $102 million to be funded through taxes[3].

From a technical perspective, not all net new assets can be recovered from DCs as there are limitations to what can be considered growth-related. For the purposes of the 2022 DC Background Study, the City's travel demand model was used to forecast future transit ridership as an indicator of the planned levels of service based on future land use (population and employment) and future network[4]. This methodology helped determine the share of net new assets which could be funded from DCs, while the remaining share of costs would have to be funded from non-DC sources (i.e. taxes). In addition, the DC Study, the analysis below includes consideration for budgeted acquisitions over the 10-year period.

Of particular importance from an asset management perspective, although a significant share of this infrastructure will attract funding from development charges, the assets will become the responsibility of the City to operate, maintain, repair and ultimately replace in the future. This requires careful asset management planning to ensure levels of service can be maintained. A proper understanding of the relationship between the assets required to support the demand identified and the long-term asset management implications is critical.

[3] The figures represented here reflect the DC Study amounts in $2022

[4] Note, the ridership model used for the purposes of the DC study is different than the revenue rides projected in **Figure 8**. The DC Study projects AM (morning) peak period transit demand for 2016 (2016 network), 2016 (2031 network) and 2041 (2031 network). By applying the proposed 2031 transit network to the anticipated population and employment in 2041, the total AM peak period trips are projected.

Demand Drivers, Projections, and Management Plans

Demand Driver	Current Position	Projection	Impact on Services	Demand Management Plan
Knowledge Retention (Staff Attrition)	Transit, like many other similar organizations, will inevitably be experiencing both an aging workforce and staff attrition due to many uncontrollable factors. This potential knowledge management risk may result in either inefficient working as staff will take additional time to conduct tasks initially or this can result in lower LOS, as asset failures may not be prevented or the response to an asset failure may not be dealt with as promptly as it had previously.	Staff retention is an ongoing concern for Transit. As a trend, this may become more difficult to attract and retain talented staff which has the potential to impact on Transit's ability to continue to deliver its LOS.	Delays to processes due to learning curve. Delays to implementing improvements due to learning curve. Workforce has limited experience and therefore delivers lower quality work.	Develop, review and update Standard Operating Procedures. Review and update training curriculum. Formalized succession planning.
Demographic Changes & Diversity	Demographic shifts impact Transit's customer demands for enhanced asset-related information transparency and a broader spectrum of communication	As the demographics continue to adjust, the change may put additional pressure on the City to ensure the transit services meet the demands of an evolving user base. Addressing these	Low customer satisfaction. Low employee satisfaction.	Equity, diversity and inclusion training for all City staff. Updates to the City's Facility Accessibility Design Standards.

Demand Driver	Current Position	Projection	Impact on Services	Demand Management Plan
	methods, including social media. The diversity that exists in Mississauga in terms of persons from different social, cultural, economic, and religious backgrounds, and persons with disabilities should be important trends to consider, when identifying priorities and building new infrastructure. For reference, according to 2021 census, the City had the 5th largest visible minority population in Ontario with nearly 62% of the population reported as being a visible minority.	changes involves developing innovative strategies to cater to diverse customer needs amid rapid demographic modification.		Improved coordination between City teams for projects and decisions that involve various members of the public including transit users.

Demand Driver	Current Position	Projection	Impact on Services	Demand Management Plan
Technology Changes	Embracing new technology within Transit is crucial for improved service delivery and reduced dependence on hard infrastructure assets.	As technology advances, Transit will need to be able to adapt to change and endorse new technologies to improve LOS.	Obsolete technology and/or parts. Unreliable data. Lack of training for new technology.	Implementing comprehensive Data Governance Strategies to ensure uninterrupted service delivery. Stay up to date with changing technologies. Review and update training curriculum. Advancements in technology can influence the trajectory of climate change.
Climate Change	The impacts of climate change are posing a variety of challenges to maintaining service levels across the organization which is expected to increase pressures and changes in demand in the future.	There is clear direction from Council and leadership that climate change is a priority with the adoption of the Climate Change Action Plan in 2019. The City continues to feel the impacts of climate change with observable changes in temperature, precipitation, and the frequency and intensity of extreme weather	Potential to impact the performance of assets, particularly those aging assets that were likely never designed with such conditions being a possibility. Possibility for higher short term snow management needs and increased importance or capacity of stormwater supporting assets	Assessing climate change scenarios to develop a robust Risk Management Strategy and continue to update detailed Service Asset Management Plan. Develop a comprehensive assessment of service and infrastructure demand changes in alignment with the City of Mississauga's Climate Change Action Plan.

Demand Driver	Current Position	Projection	Impact on Services	Demand Management Plan
		events. Into the future, Mississauga can expect a greater number of hot days (over 30 degrees Celsius), more frequent and extreme rainfall events leading to flooding, and changing freeze-thaw cycles.[5]	(bridge and culverts). Potential to adversely affect asset durability and performance.	The City must continue its efforts to reduce its contribution to climate change as well as mitigate and adapt to its impacts. Transit can play an important role in reducing greenhouse gas emissions by transitioning to low and zero emissions technologies.

[5] Climate Risk Institute (CRI), Emmons & Olivier Resources Inc. (EOR), Nodelcorp, and Climalogik. 2023. *Climate Change Risk and Adaptation Assessment for Asset Management.* Prepared for the City of Mississauga, Ontario.

Demand Driver	Current Position	Projection	Impact on Services	Demand Management Plan
Employment Trends	Employment trends can be influenced by various factors, including economic conditions, industry growth, and regional development, among others. As with most communities in Ontario, the COVID-19 pandemic resulted in a disruption to the local economy, the effects of which are still being felt. At the time of the 2021 Census business closures and stay-at-home orders were still in effect. As such, a large portion of the labour force was unemployed and many others were working from home on a full-time basis, and often outside the City.	Employees continue to gradually return to their usual place of work, either full-time or under hybrid arrangements, it is evident that some shifts in work-at-home patterns will be long-lasting. Therefore, impacting both Transit staff and Transit's ridership demand. As Transit continues to develop the asset management program, identification of gaps in resources to effectively managing assets. Additional staff support will be required to improve asset management maturity, meet growing ridership demands and effectively assets.	Potential to impact future ridership and infrastructure demands. Need for additional resources to improve asset management maturity, meet growing ridership demands and effectively manage assets.	Continue to seek grant funding for growth, replacement and rehabilitation of assets. Submit budget requests for additional staff.

Demand Driver	Current Position	Projection	Impact on Services	Demand Management Plan
Population Density & Urbanization	Intensification is development that allows for more people to connect, work, and play within the existing urban boundary by re-developing, expanding and/or re-purposing existing areas, buildings or vacant lands. The City needs to ensure development in these built-up areas and planned intensification occurs in a sustainable and coordinated fashion. Developments needs to consider provisions for transit infrastructure that will support demand generated from the intensified areas.	Mississauga will continue to grow through intensification as its greenfield lands are nearly entirely built out. Mississauga is planning for growth through intensification based on a City structure and urban hierarchy with the highest intensity of development in the Downtown Urban Grow Centre, followed by Major Transit Station Areas, Major Nodes, Community Nodes and Neighbourhoods.	Increased transit service demand in intensified areas. Need for upgraded on-street infrastructure such as shelters to support service growth. Need for property for additional terminals and garages to support service growth.	Prioritize transit service and infrastructure in the City's master plans and strategic studies. Provision for transit infrastructure though development applications. Partner with provincial and federal authorities for opportunities for new and upgraded transit terminals/infrastructure including high-order transit projects. Continue to seek grant funding for growth, replacement and rehabilitation of assets.

Demand Driver	Current Position	Projection	Impact on Services	Demand Management Plan
Regulatory Pressure	Transit services are typically regulated at different levels of government, including municipal, provincial, and federal authorities. Municipalities in Ontario are responsible for local transit services, while provincial and federal authorities may be involved in broader transportation policies and regulations. Involvement by the various tiers and current legislation may impact Transit's ability to meet desired levels of service.	Transit strives to be in compliance with applicable regulations. As regulations continue to evolve, Transit must have a forward-thinking approach to sourcing managing, and commissioning assets in order to minimize throwaway costs of replacing assets. Furthermore, as Transit works collaboratively to implement higher-order transit projects, the regulations and standards per project may differ depending on the asset owner.	Existing assets not meeting updated codes and standards. Transit is not the asset owner (or is partial owner) and therefore the asset performance is subject to different LOS and lifecycle practices. Lag time between new legislation implementation project completion may result is inability to comply with up-to-date regulations. Contracts for on-going projects would reference relevant regulations and standards at the time the project was tendered.	Continuous monitoring of impending legislation is necessary to future-proof assets and ensure compliance. Continue to benchmark best practices and consult with other agencies for alignment.

Risk Management

Asset-Specific Risk Methodology

Currently, risk management and prioritization for Transit is undertaken through the budget development process. Transit prioritizes lifecycle needs as needed, and projects future needs based on different approaches (see Lifecycle Management Section). This said, a standardized framework to assess and monitor asset specific risk has not been formally developed. For this reason, Transit, through this asset management plan has developed a framework to assess asset specific risk. This approach will enable a standardized approach to prioritizing assets and monitoring risks over the longer-term period.

Risk Analysis

The risk management framework (RMF) assumes that asset risk is result of the likelihood and consequence of risk related events[6]. The framework acknowledges that implementation of this standard, and development of a cohesive set of risk categories and associated risk criteria for measurement purposes are required. Table 2 illustrates a risk matrix which provides a high-level guide on the extent of the actions required to manage asset risk. Note that the lower left portion of the table represents a low-risk scenario while the upper right of the table represents a high-risk scenario.

Likelihood of Failure

The likelihood of an asset risk event refers to how likely it is for a risk event to occur. It may be determined and measured using either a qualitative or quantitative approach. Alternatively, it can also be determined as the probability or frequency over a given period. The likelihood of failure is be determined on an asset-by-asset basis based on a qualitative score from 1 to 5 where 5 represents the highest likelihood of failure. Table 3 summarizes the definition of likelihood.

Table 2: Risk Management Framework

		Consequence		
		Minor	Moderate	Significant
Likelihood	High	Risk Management and Monitoring Required	High Management Required	Extensive Management Required
	Medium	Moderately Acceptable Risk but Monitoring Needed	Risk Management and Monitoring Required	High Management Required
	Low	Acceptable Risk	Moderately Acceptable Risk but Monitoring Needed	Risk Management Required

Note: Likelihood and consequence are defined in the following sections.

[6] Based on frameworks provided by ISO55000 and MFOA

Table 3: Likelihood of Failure Definitions

Score	Description
Rare (1)	Expected to occur once within a greater than 25-year period <5% chance of occurring
Unlikely (2)	Expected to occur once within a 15 to 25-year period 5% to 34% chance of occurring
Likely (3)	Expected to occur once within a greater than 5 to 15-year period 35% to 64% chance of occurring
Very Likely (4)	Expected to occur once within a greater than 1 to 5-year period 65% to 90% chance of occurring
Almost Certain (5)	Expected to occur at least once a year or less >90% chance of occurring

Note: Chance of occurrence is determined on an order of magnitude basis and does not represent a sample probability.

It is important to note that the likelihood of failure represents a qualitative assessment of the perceived potential of an asset failing to provide desired levels of service. The higher the value assigned to an asset (i.e. closer to P5) the more likely that asset has the potential to no longer provide the level of service expected. Assets with a higher likelihood of failure would be prioritized for lifecycle activities to address the issues driving the high score. Conversely, an asset that is likely to continue to provide the desired level of service, would have a lower likelihood of failure (i.e. closer to P1).

Consequence of Failure

An outcome of an event affecting the levels of service is described by the consequence. The consequence can be expressed from both a qualitative and quantitative perspective. The consequence of failure is determined based on the degree to which a risk event would impact levels of service based on the following criteria:

- Financial: refers to the financial impact if an asset does not provide the desired level of service. Factors such as current economic/market conditions or funding levels are drivers of the consequence
- Legal & Regulatory: refers to the consequence to levels of service of not meeting legislative requirements or contractual agreements
- Community Factors: consequences that can impact the local community, neighbourhood or businesses if level of service objectives are not met
- Services & Operations considers the level of service disruption if an asset does not provide the desired level of service. Service and operational consequence could be largely driven by policy decisions by the City
- Assets & Infrastructure: Refers to consequences or impacts to the condition of assets, confidence in asset data and availability of data
- Environmental: considers the impact to the natural environment, and the timeframe in which the impact can be reversed. This is related to both legal and regulatory compliance as well with climate change as a key driver
- Health, Safety & Workforce: associated to physical/psychological health and safety of staff, the magnitude or seriousness of injuries that can occur under a certain risk event and the impact to stakeholders of such events
- Public Trust: refers to the perception of the public and stakeholders of the service being provided by assets

Similar to likelihood of failure, the consequence is determined on an asset-by-asset basis. An asset is assigned a consequence based on a 1 to 5 scale where 5 represents the highest consequence if an asset is considered to fail to provide the desired level of service. The consequence framework is expected to provide a standardized method to assess the consequence of assets' failure.

Table 4: Consequence of Failure Criteria

Consequence Criteria	Consequence of Failure				
	Minor	Moderate	Significant	Severe	Critical
Financial	• <1% impact to relevant annual expenditures/revenues	• 1-5% impact to the relevant annual expenditures/ revenues	• >5-10% impact to the relevant annual expenditures/ revenues	• >10-15% impact to the relevant annual expenditures/ revenues	• >15% impact to the relevant annual expenditures/ revenues
Legal & Regulatory	• Breach in requirement, no threat of penalties, sanctions or lawsuits	• Breach in requirement, leading to inconsequential penalties, sanctions or lawsuits	• Breach in requirements leading to significant penalties, sanctions, or lawsuits	• Breach in requirements, leading to severe penalties, sanctions, or lawsuits	• Breach in requirements, leading to critical penalties, sanctions, or lawsuits
Community Factors	• Nominal or no impact to community factors	• Short-term, localized impact to community factors	• Long-term, localized impact to community factors	• Short-term, widespread impact to community factors	• Long-term, widespread impact to community factors
Services & Operations	• No real pressure on current services or operations	• Some areas in which the business is unable to maintain its current services or operations	• Isolated but noticeable examples of decline/disruption or improvement in services or operations	• Widespread and severe decline/disruption or improvement in services or operations	• Permanent disruption or improvement in services or operations

Consequence Criteria	Consequence of Failure				
	Minor	Moderate	Significant	Severe	Critical
Assets & Infrastructure	• No impact to the condition/ availability • No impact to confidence in data • No loss (gain) of data	• Short-term, localized impact to the condition/ availability • Short-term, localized impact to confidence in data • Inconsequential loss/gain of data	• Long-term, localized impact to the condition/ availability • Long-term, localized impact to confidence in data • Significant loss (gain) of data	• Short-Term, widespread impact to the condition/ availability • Short-Term, Widespread impact to confidence in data • Severe loss (gain) of data	• Long-term, widespread impact to the condition/ availability • Long-term, widespread impact to confidence in data • Critical loss/gain of data
Environmental	• No environmental damage or improvement	• Localized but reversable environmental damage or improvement	• Localized but irreversible environmental damage or improvement	• Widespread but reversable environmental damage or improvements	• Widespread but irreversible environmental damage or improvement

Consequence Criteria	Consequence of Failure				
	Minor	Moderate	Significant	Severe	Critical
Health, Safety & Workforce	• No impact to physical and/or psychological health & safety • Potential for minor injury that does not result in lost time • Nominal or no impact to staff satisfaction and/or competencies	• Localized but reversible impact to physical and/or psychological health & safety • Potential for limited lost time incident • Short-term, localized impact to staff satisfaction and/or competencies	• Localized but irreversible impact to physical and/or psychological health & safety • Potential for short term disability • Long-term, localized impact to staff satisfaction and/or competencies	• Widespread but reversible impact to physical and/or psychological health & safety • Potential for long term disability • Short-term, widespread impact to staff satisfaction and/or competencies	• Widespread but irreversible impact to physical and/or psychological health & safety • Potential for fatalities • Long-term, widespread impact to staff satisfaction and/or competencies
Public Trust	• Minimal reputational impact • Nominal or no impact to stakeholder confidence	• Moderate, short-term reputational impact • Short-term, localized impact to stakeholder confidence	• Moderate, long-term reputational impact • Long-term, localized impact to stakeholder confidence	• Major, short-term reputational impact • Short-term, widespread impact to stakeholder confidence	• Major, long-term reputational impact • Long-term, widespread impact to stakeholder confidence

Risk Relationship to Community Levels of Service

Certain factors affect the levels of service provided by each asset. The RMF considers defining likelihood and consequence factors for each of the three customer levels of service categories, which would result in an evaluation of risk in all three areas:

- Capacity & Use: Describes the assets capacity to provide service to meet demand. It also describes whether the asset is available at all times that service is demanded. Within Transit's context, this typically relates to whether assets have enough capacity to meet the demands for service from a growing population
- Functionality: Describes to what extent the asset complies with regulations, perform their intended function and are safe, secure and sustainable
- Quality: Describes the physical condition of assets, the level they are maintained at and satisfaction of customers. The quality of an asset tends to change over time as the asset ages

The tool therefore allows for the recognition of asset failure not just in the traditional sense (an asset breaking down) but also in terms of an asset failing to provide desired levels of service. Asset failure is often referred within the context of an asset removed from service; however, this framework will help identify assets which are considered to have failed in either their capacity/use, functionality or quality.

Risk Evaluation

After establishing the parameters associated to likelihood and consequence, the information can be used to generate a quantitative assessment based on the following formula:

The RMF is expanded to incorporate the customer levels of service for both the likelihood and consequence of failure. Therefore, a more detailed evaluation of the likelihood and consequence of failure are clearly defined as resulting from the customer levels of service. This provides a clearer relationship between the services provided and the linkage to the perceived risks. The more advanced likelihood and consequence formula is as follows:

max Likelihood = max (Capacity & Use, Functionality, Quality) and

max Consequence = max (Capacity & Use, Functionality, Quality)

where Capacity & Use = {1,2,3,4 or 5}, Functionality = {1,2,3,4 or 5}, Quality = {1,2,3,4 or 5}

The resulting quantitative risk assessment in this expanded risk framework is therefore determined as follows:

max Likelihood X max Consequence = Risk Rating

summarizes the risk rating categories in a risk assessment matrix. Assets identified to be closer to the bottom left of the matrix are considered lower risk to the City with assets identified to be closer to the top right of the matrix considered higher risk. The risk

categories, and associated colour coding, are defined as follows:

- Insignificant (Green) – Accept risk, no risk treatment required
- Low (Light Green) – May be acceptable but monitoring of assets may be required
- Medium (Yellow) – Requires some consideration by management with necessary risk management and monitoring adopted as needed
- High (Orange) – Requires considerations by management, risk management and monitoring are required
- Extreme (Red) – Requires extensive management input, risk mitigation to reduce to an acceptable level is essential

Table 5: Risk Assessment Matrix

		Consequence				
		C1	C2	C3	C4	C5
Likelihood	P5	Medium	Medium	High	Extreme	Extreme
	P4	Low	Medium	High	High	Extreme
	P3	Low	Medium	Medium	High	High
	P2	Insignificant	Low	Medium	Medium	Medium
	P1	Insignificant	Insignificant	Low	Low	Medium

Based on the criteria in Table 5 above, despite the obvious risk associated with the "extreme" classification, assets in a "high" risk category should garner equal attention as these assets could disrupt Transit's level of service and could transition to an extreme classification without proper intervention. For example, the max score method allows the driver of the risk to be identified by looking at the likelihood and consequence scores of an asset - the highest value from the capacity and use, functionality and quality category would be the main driver of risk. This would therefore help inform the lifecycle activities that would need to be undertaken to address the risk.

It is important to note that the evaluation of assets utilizing the risk management framework are intended to be used as a complimentary process to annual capital budgeting exercises. The evaluation can help inform a list of prioritized works which would include the set of lifecycle activities needed to address high risk assets.

Cumulative Results of the Risk Analysis

Figure 6 summarizes the cumulative results of the Risk Analysis undertaken for all applicable Transit assets[7]. In total, about $610.4 million in assets have been assessed using the RMF. Of the $610.4 million, about $107.7 million (18 per cent) have been assessed to be in medium risk, a further $401.3 million (66 per cent) in high risk with the remaining $101.4 million (16 per cent) representing the share in extreme risk.

The results of the risk analysis are a direct result of the review and consultation of likelihood and consequence parameters by Transit's subject matter experts. As a result, it reflects the on-the-ground knowledge of staff who work closely with those assets they are responsible for. However, staff intend to continue to make improvements to the risk assessment in subsequent asset management plans to better align with proposed levels of service, lifecycle costs and to help inform the decision-making process.

The assets assessed in high and extreme risk simply suggest the assets which Transit should prioritize for repair and replacement to manage the service and limit the risk of assets not meeting desired levels of service. Transit infrastructure is deemed safe for operations.

[7] Assets such as Structures and Stormwater infrastructure have been excluded from the Transit risk analysis as they are managed by other service areas.

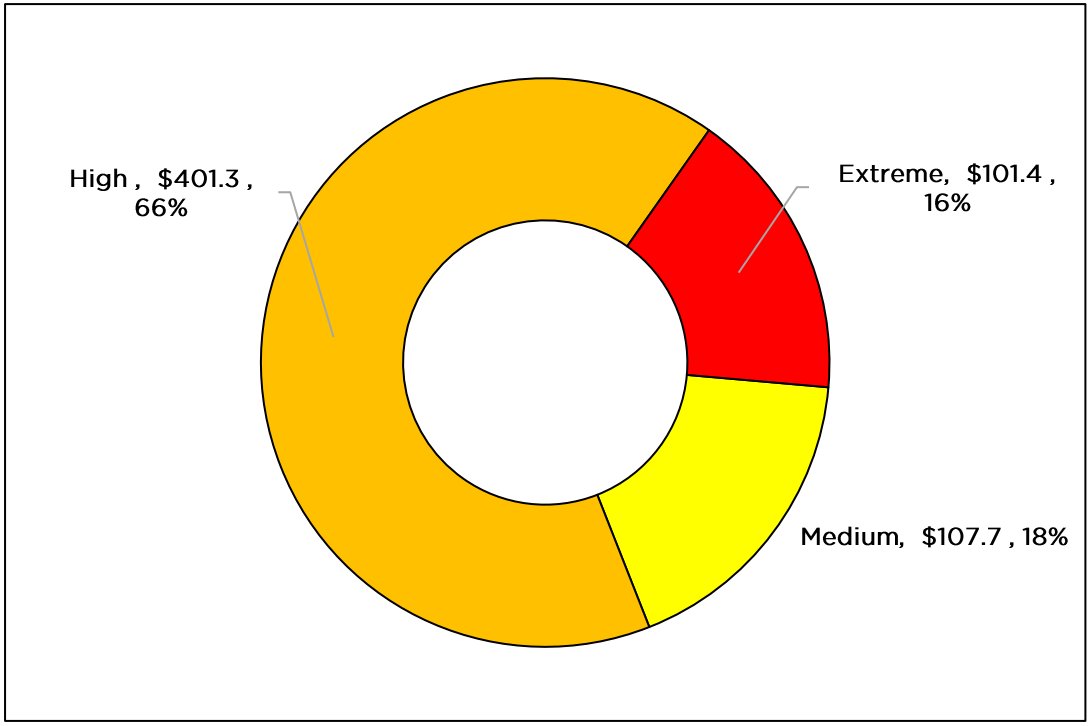


Figure 6: Summary of Risk Assessment by Risk Category ($Millions)

The pie graph below provides a further breakdown of the asset specific risk assessment results. Of the total, the extreme assets can be attributed entirely to the City's revenue fleet which is directly related to those assets in Very Poor condition. Note that the Very Poor condition reflect assets that are scheduled to be replaced soon based on their design life but are operated safely right up to their point of replacement. The revenue vehicles also represent a significant share of the high-risk asset category at 63 per cent of the total $610 million. Applicable Right of Way (ROW) infrastructure as well as Equipment and Systems represent about 17 per cent of the total and represent the totality of the medium risk-based assets.

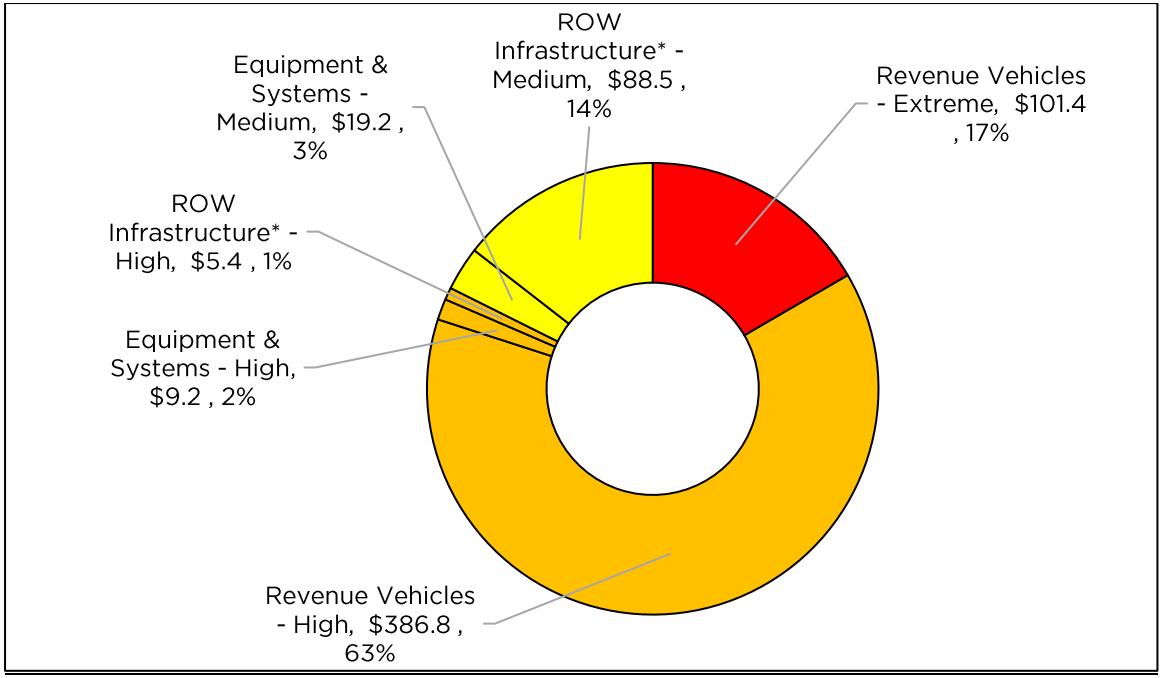


Figure 7: Summary of Risk Assessment by Asset Class ($Millions)

Risk Treatment

The core function of the risk analysis is to provide Transit with a risk profile of assets. Another component is to develop a guideline of risk treatments to manage or reduce asset risks. Of particular importance is identifying what risk treatments are required to manage/reduce the risk of assets failing to provide desired levels of service. Different risk treatments will have varying effect on levels of service, and it is important to ensure that the optimal risk treatments are utilized.

Risk treatments suggest approaches to address these risk factors which can include increasing the capacity of the existing fleet through the expansion of services as well as prioritizing assets identified to be in Very Poor condition for consideration in the capital program.

It is noted that most of the assets within the Transit portfolio utilize an age-based approach to determine condition. In reference to revenue fleet, with a value of about $488.2 million, a portion of these assets are classified as either “High” or “Extreme” risk because of the condition of some specific buses at, or near, the end of their useful life.

This is despite the revenue fleet asset category being in Fair condition on average. The reason for the assessed risk rating can also be attributed to the consequence of failure for these assets assessed as “high” given the priority of this infrastructure to deliver services and the fallout if the service fails.

Staff are strategically planning to mitigate the capacity and quality issues of the high-risk assets. A few key treatment activities are listed below:

- A continued replacement of the assets that are beyond their useful lives and timely replacement of the fleet upon its regular schedule will reduce the likelihood of failure for the high-risk assets. Transit currently replaces revenue vehicle at the end of their useful life. Due to the general procurement process timing and availability of vehicles, the timing of vehicle delivery can sometimes impact the in-service date of a new asset requiring some vehicles to remain in service beyond the design life. Furthermore, due to the frequency of asset replacement on assets with a shorter-useful life, there will always be vehicles that are considered poor or very poor by virtue of design life until the new asset comes into service.
- Expand the servicing capacity of the Transit system to continue to align with continued growth pressures increasing the use of the City’s public transit service
- Upgrade the existing fleet as part of Transit’s overall replacement strategy: existing 40-foot conventional buses are planned to be replaced with 40-foot hybrid busses. While there are increased upgrade costs to change the propulsion of the existing fleet, this would better tie into the City’s overall corporate goals, service level and risk mitigation framework
- Particularly for bus stops and shelters within the Right of Way asset category, Transit is moving towards implementing an inspection plan for shelters that are nearing the end of useful life to identify those requiring replacement

Finally, risk should be monitored quite closely going forward to ensure the funds allocated to Transit are sufficient to manage the capital asset management needs of the service area to achieve the service levels ensuring high and extreme risk assets are properly managed. This approach will provide the additional advantage of being able to calculate residual risk as part of the overall RMF.

Lifecycle Management

Lifecycle Strategies

As some Transit assets are maintained by other groups within the City, the lifecycle activities for ROW assets, such as roads, bridges, culverts, noise walls, retaining walls, and Stormwater Infrastructure can be found in the Road and Stormwater asset management plans. For Equipment & Systems, there are no lifecycle activities noted as only end-of-life replacement is currently being conducted.

Vehicles (Revenue-Generating) – Current and Proposed Lifecycle Activities

Current and Proposed Lifecycle Activities	Risks associated with Lifecycle Activities
Non-Asset Solutions: Activities that do not alter the condition or performance of assets or services but provide staff with valuable information for their effective management.	
• Updates to training program/curriculum as needed for new bus technologies for Maintenance and Operations staff Proposed • Procurement process for buses initiated 12 to 18 months before end-of-life replacement to ensure new vehicles in service to meet proposed level of service	• Strategic planning/budgeting, project prioritization and capital costing is not effective without Master Plans and other studies to inform long-term decision making
Operations & Maintenance: Minor activities that preserve the condition or performance of assets and ensures the longevity of assets in line with their design and operational requirements.	
• Semi-annual inspection process as prescribed by Ministry of Transportation Ontario (MTO) • Visual inspections are conducted to make sure asset components are functioning as required (ex: Look for missing body parts, damaged or cracked frame etc.) • Check for cleanliness regularly • Maintenance based on Original Equipment Manufacturer (OEM) recommendations	• Premature asset failure due to incorrectly planned maintenance activities • Emergency or unscheduled maintenance can result in much higher replacement costs • On-time performance affected • Loss of revenues • Injury/lawsuits

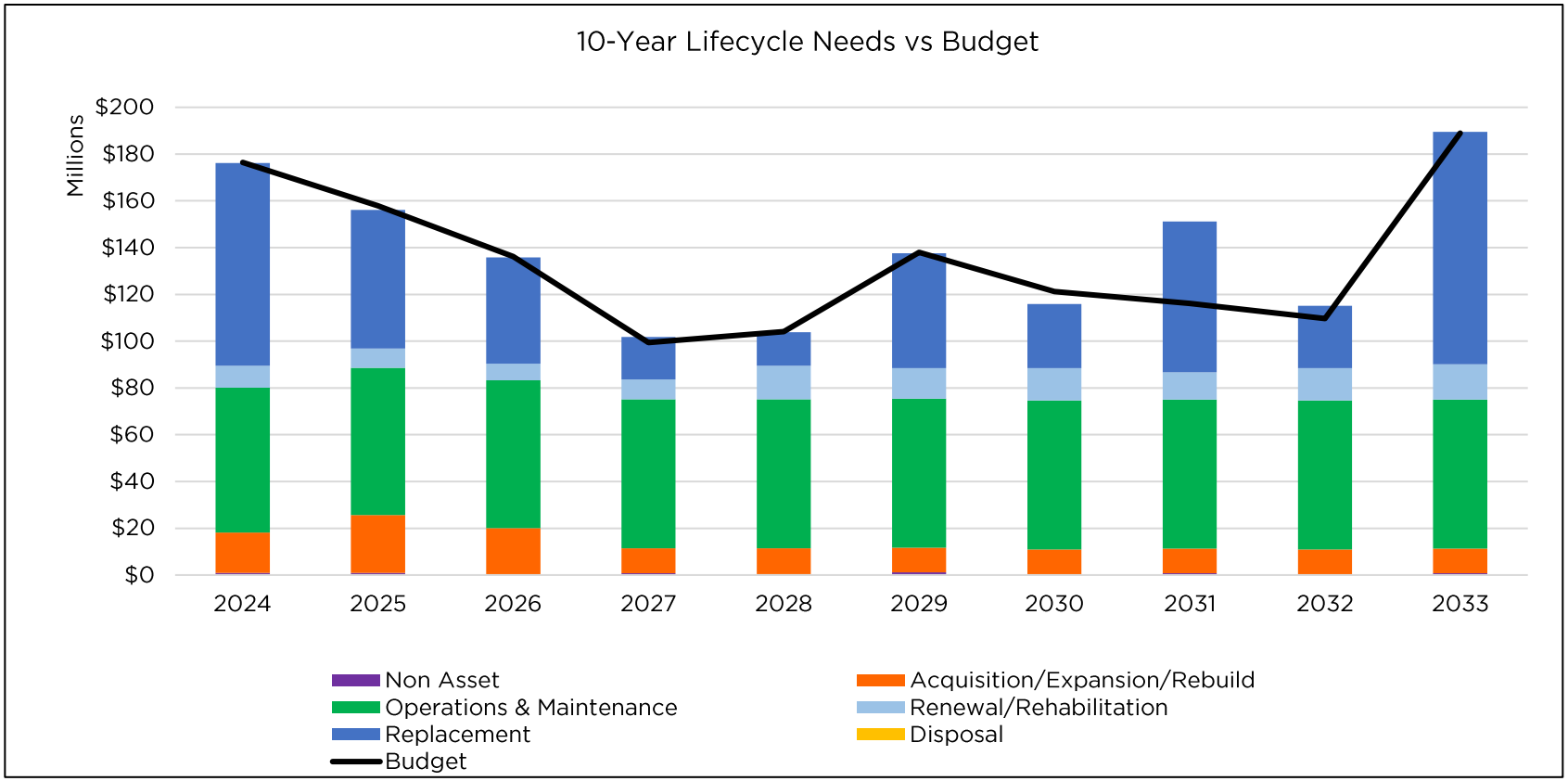
Current and Proposed Lifecycle Activities	Risks associated with Lifecycle Activities
Renewal/Rehabilitation: Significant activities designed to extend the useful life of assets component.	
• N/A	• Deferral cost of not rehabilitating items on schedule • On-time performance affected • Loss of revenues • Injury/lawsuits
Replacement: Replacement activities occur once an asset reaches the end of its useful life, cannot provide the intended function or performance, and rehabilitation is not a viable option.	
• Full replacement of vehicles at the end of their useful life	• Inadequate planning and implementation of infrastructure to manage existing and potential growth pressures • On-time performance affected
Disposal/Demolition: Activities associated with the disposal or decommissioning of an asset.	
• Selling or scrapping vehicles at the end of their useful life	• N/A
Acquisition/Expansion/Rebuild: These activities expand services to previously non-serviced areas or to accommodate growth; they provide new or enhanced services beyond the current capacity and/or functionality of existing assets.	
• Purchasing growth buses to increase service hours, while also introducing zero-emission vehicles to Transit fleet	• Service is prematurely expanded • The ability to fund, operate and maintain any future assets

Facilities – Current and Proposed Lifecycle Activities

Current and Proposed Lifecycle Activities	Risks associated with Lifecycle Activities
Operations & Maintenance: Minor activities that preserve the condition or performance of assets and ensures the longevity of assets in line with their design and operational requirements.	
• Manage projects related to minor repairs, replacements, and upgrades of transit facilities • Fire drills and monthly Joint Health and Safety Inspections • Miscellaneous stocking of supplies • Daily walk-around by each Maintenance Shift Supervisor to identify safety concerns and ensure proper storage of tools and materials	• Premature asset failure due to incorrectly planned maintenance activities • Emergency or Unscheduled closure result in much higher replacement costs • Facility closures • Loss of revenues • Injury/lawsuits
Acquisition/Expansion/Rebuild: These activities expand services to previously non-serviced areas or to accommodate growth; they provide new or enhanced services beyond the current capacity and/or functionality of existing assets.	
• New construction of transit terminals, stations, and garages with support from Facilities Planning & Development	• Service is prematurely expanded • The ability to fund, operate and maintain any future assets

Lifecycle Needs vs Budget

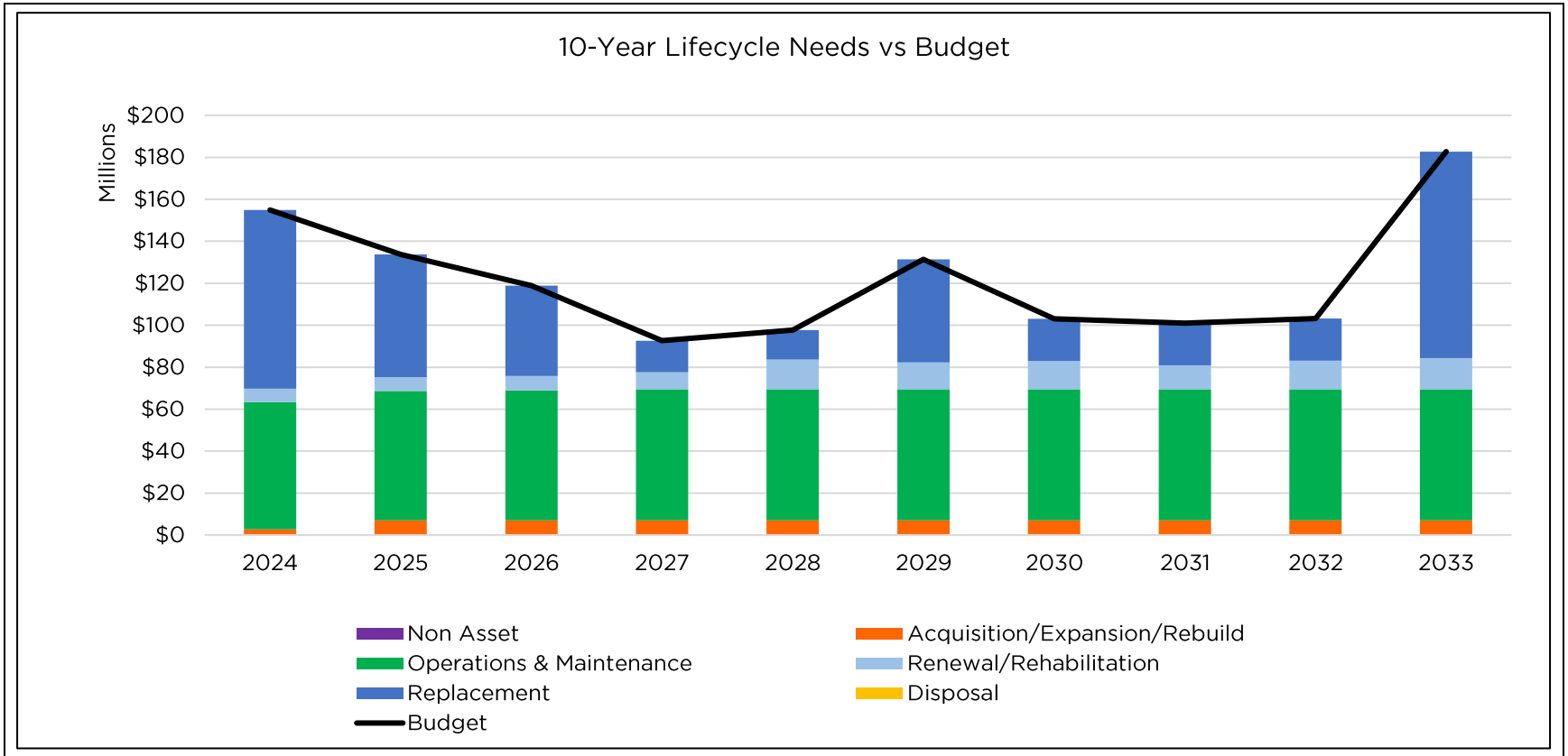
Transit (MiWay)



The graphs depicted here illustrate the total lifecycle needs relative to Transit's budget. Overall, Transit assets are in Good condition, with some major replacements occurring in the next 10 years.

As part of continuous improvement, staff will continue to quantify and analyze the lifecycle needs required as they refine their proposed levels of service, where they have been established, along with any resourcing requirements as a result.

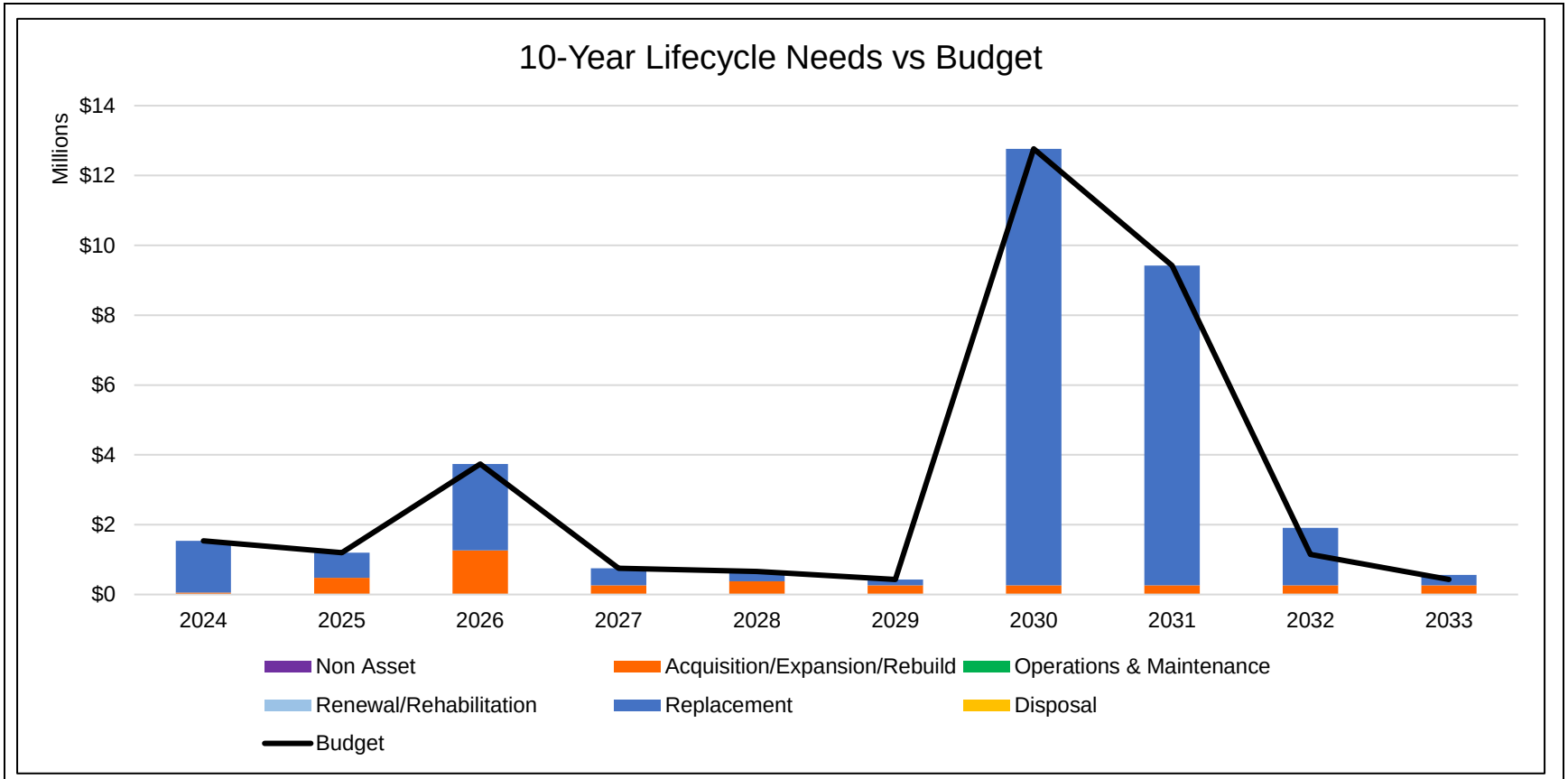
Vehicles (Revenue-Generating)



Approximately 39 per cent of the revenue generating vehicle inventory is in Poor to Very Poor condition, meaning their replacement is imminent within the next few years as shown from 2024-2026.

For the 2024-2033 forecast, the planned budget is sufficient to meet lifecycle demands for revenue generating vehicles. As part of the City's overall replacement strategy, existing 40-foot conventional buses are planned to be replaced with 40-foot hybrid busses. While there are increased upgrade costs to change the propulsion of the existing fleet, this would better tie into the City's overall corporate goals, service levels and risk mitigation framework.

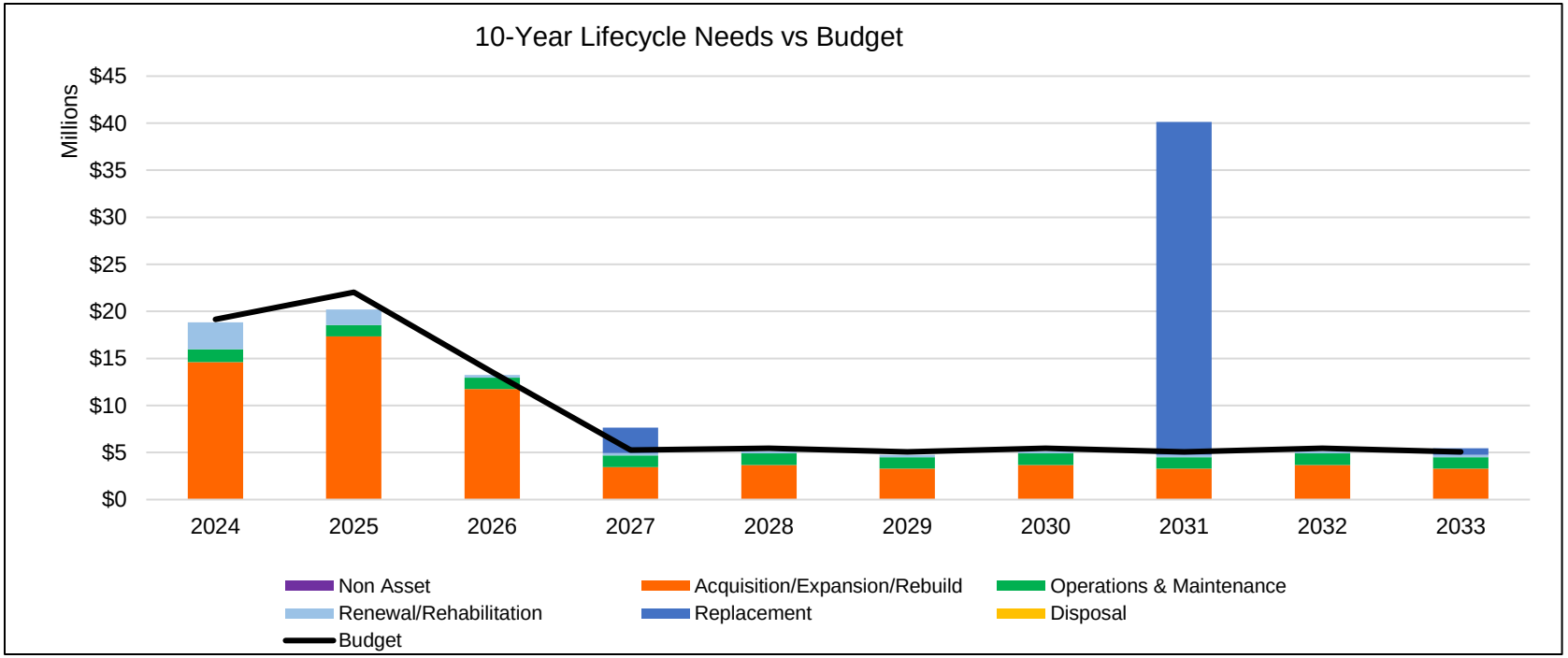
Equipment & Systems



Nearly 70 per cent of the Equipment & Systems assets are in fair or better condition. The assets in Poor or Very Poor condition are estimated to reach their end-of-life replacement within the next three years. The planned budget is mostly sufficient to meet the lifecycle needs of these assets as shown by the Budget line; however, for the fare equipment asset type, there is a moderate infrastructure gap.

The needs from 2030-2032 are related to future On Vehicle IT Equipment replacement and refurbishment needs, specifically as it relates to replacing PRESTO equipment, fare equipment and radios.

Right of Way (ROW) Infrastructure



Only two per cent of the Right of Way assets are in Poor condition, which primarily relates to stops, bus bays and pavement (Transitway) that will be replaced over the 10-year period.

The first few years of the forecast see a spike in acquisitions related to enhanced shelters, enhanced stop amenities, and transit priority measures. The primary driver of the funding gap for ROW assets is identified in 2031, which relates to the replacement of several bus shelters that will reach the end of their useful life.

The remaining assets, including noise walls, retaining walls, living walls, and bridges and culverts are relatively young and are in Good to Very Good condition. As these assets have a longer useful life, there are no identified replacement needs within the 10-year period. Staff will continue to validate and assess asset condition and performance to more accurately and reliably inform their lifecycle forecasts and planned budgets.

Budget Breakdown

Over the next 10 years, Transit plans to spend an average of $134.8 million annually on transit assets, with the majority of the budget being used for operations and maintenance activities at 47 per cent and replacement activities at 34 per cent as shown in Figure 8.

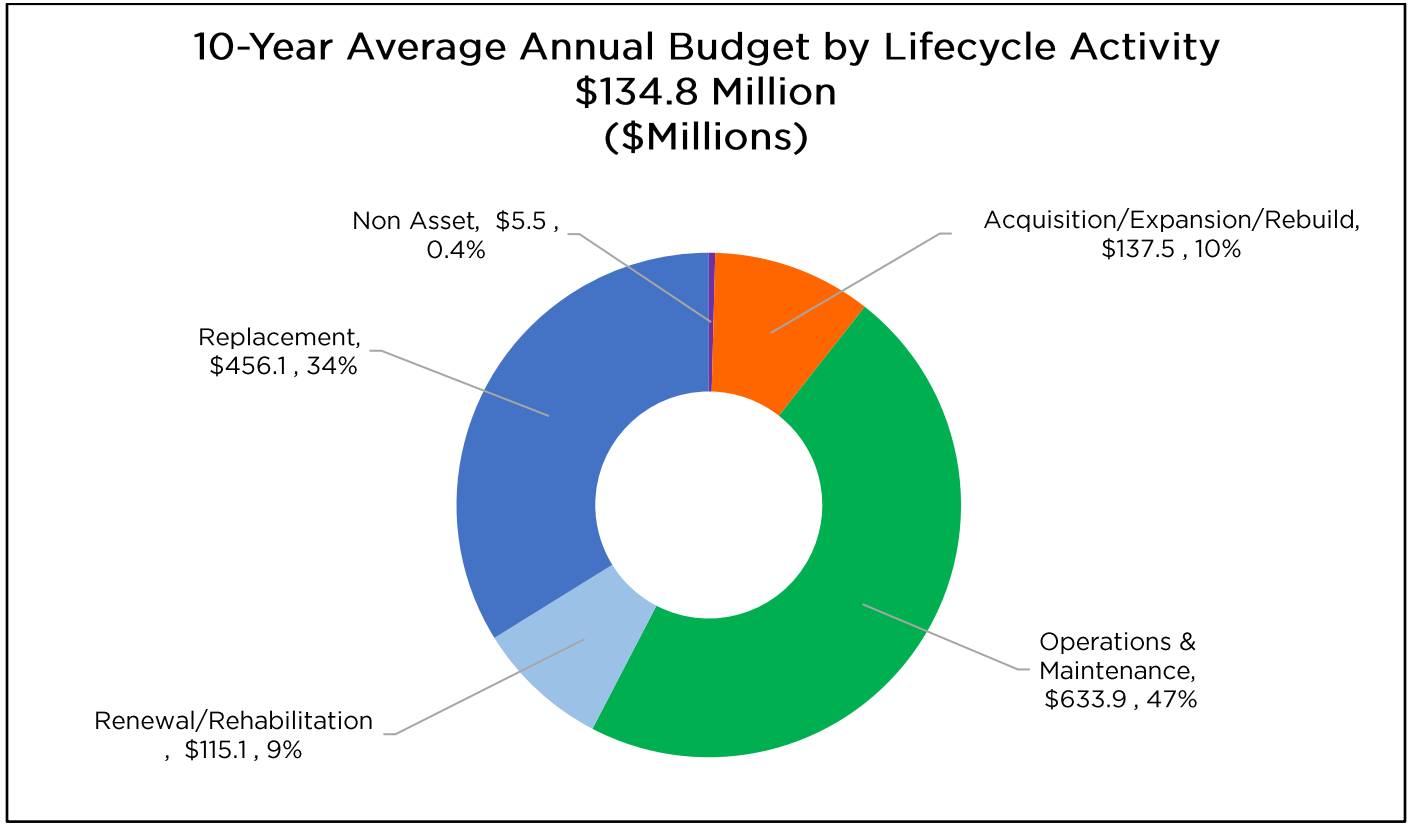


Figure 8: Breakdown of Budget by Lifecycle Activity

Table 6: Budget Breakdown by Asset Class ($Millions)

Asset Class	SOGR Budget		Growth Capital Budget	Total Budget
	Operating	Capital		
Vehicles (Revenue Generating)	$62.2	$53.2	$6.6	$121.9
Equipment & Systems	-	$2.9	$0.3	$3.2
Right of Way (ROW) Infrastructure	$1.2	$1.1	$6.8	$9.2
Other[8]	-	$0.2	$0.3	$0.6
Total	**$63.4**	**$57.4**	**$14.0**	**$134.8**

[8] The "Other" asset class denotes lifecycle activities that span over multiple asset classes within the Service Area such as plans, studies, and other non-asset solutions.

Financing Strategy

Capital Funding Sources and Operating Revenue Sources

As illustrated in Figure 9, the estimated available funding for the next 10-year period (2024-2033) for Transit $134.8 million. The primary sources of funding are Operating Revenue sources at 47 per cent and Tax Reserve Funds at 28 per cent.

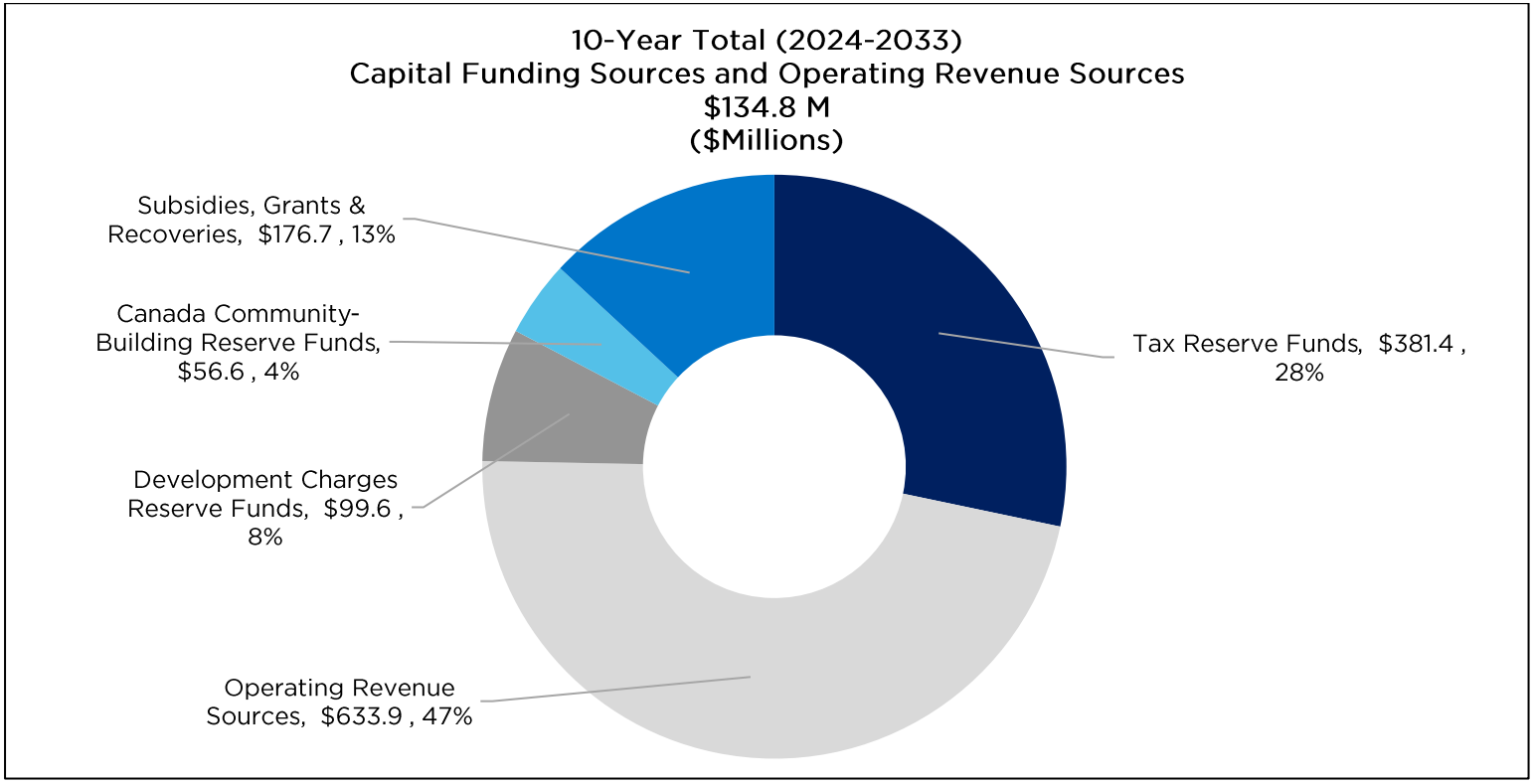


Figure 9: Capital Funding Sources & Operating Revenue Sources

Overview of Revenues

Transit (MiWay) uses a wide range of funding and financing tools to address the identified capital requirements while the Transit operating costs are funded through a combination of user fees and taxes.

From a capital funding perspective, the type of capital project typically aligns to its funding source. In this regard, growth-related projects receive funding through development charges; replacement projects are predominantly funded through tax-based contributions. Provincial and Federal subsidies are also commonly used to fund transit services and the Investing in Canada Infrastructure Program (ICIP) will be used to facilitate the replacement and renewal of the City's fleet in addition to funding on-street transit appurtenances and transit amenities (e.g. shelters, queue jump lanes, glass partitions, etc.).

Federal and Provincial Grants

The Federal and Provincial governments provide grants to municipalities to assist in funding necessary capital infrastructure. Senior grants are generally separated into two categories: ongoing and one-time.

The Canada Community-Building Fund (CCBF) provides stable funding to municipalities across Canada on an annual basis. It is a major source of capital funding for the City of Mississauga, with $43.7 million in these funds received in 2024 (as per the 2024-2027 Business Plan & 2024 Budget). These contributions, which are distributed to municipalities based on population, are now indexed annually for inflation. Unlike Provincial Gas Tax funds, Federal Gas Tax funds may be applied to most services. The City of Mississauga has typically used Federal Gas Tax funds for transit, facilities, roads and bridges.

According to the 2024 Budget, the City also received $19.7 million in transit-focused Provincial Gas Tax funding - the City primarily uses these funds for transit operating expenditures. Provincial Gas Tax funds are distributed to municipalities across Ontario based on a formula considering population and ridership.

The City has secured funding from 2022 to 2027 for the construction, rehabilitation and replacement of Transit assets, through the Investing in Canada Infrastructure Program (ICIP), of approximately $472.4 million. The amount is comprised of Federal funding, Provincial Funding and a portion funded by the City of Mississauga.

User Fee Supported Funding Tools

User fees are representative of the principle of economic efficiency, as the consumer of the service has direct control over the extent to which the service is used. In Mississauga, user fees related to transit are significant sources of operating budget revenue.

Using the data obtained from the 2022 Canadian Urban Transit Association (CUTA) factbook, the City of Mississauga collected about $78 million in transit user fees, which accounts for approximately 36 per cent of the total operating expenses associated with providing the service. This cost recovery ratio is slightly higher than the cost recovery average (31 per cent) compared to other GTA municipalities with transit services (Figure 10). Considering size and density, Mississauga's transit service cost recovery is lower than the City of Toronto's TTC operation and the City of Brampton's transit service. It is recognized that the TTC operation

is quite different as the level of intensification along transit routes is much higher and the service delivery model which is highly dependent on a network of subways and streetcars which influenced the ridership per transit vehicle. Also, GTA municipalities are often required to provide transit on routes before adjacent subdivisions are fully built-out which could impact the timing of revenue collections relative to the costs incurred.

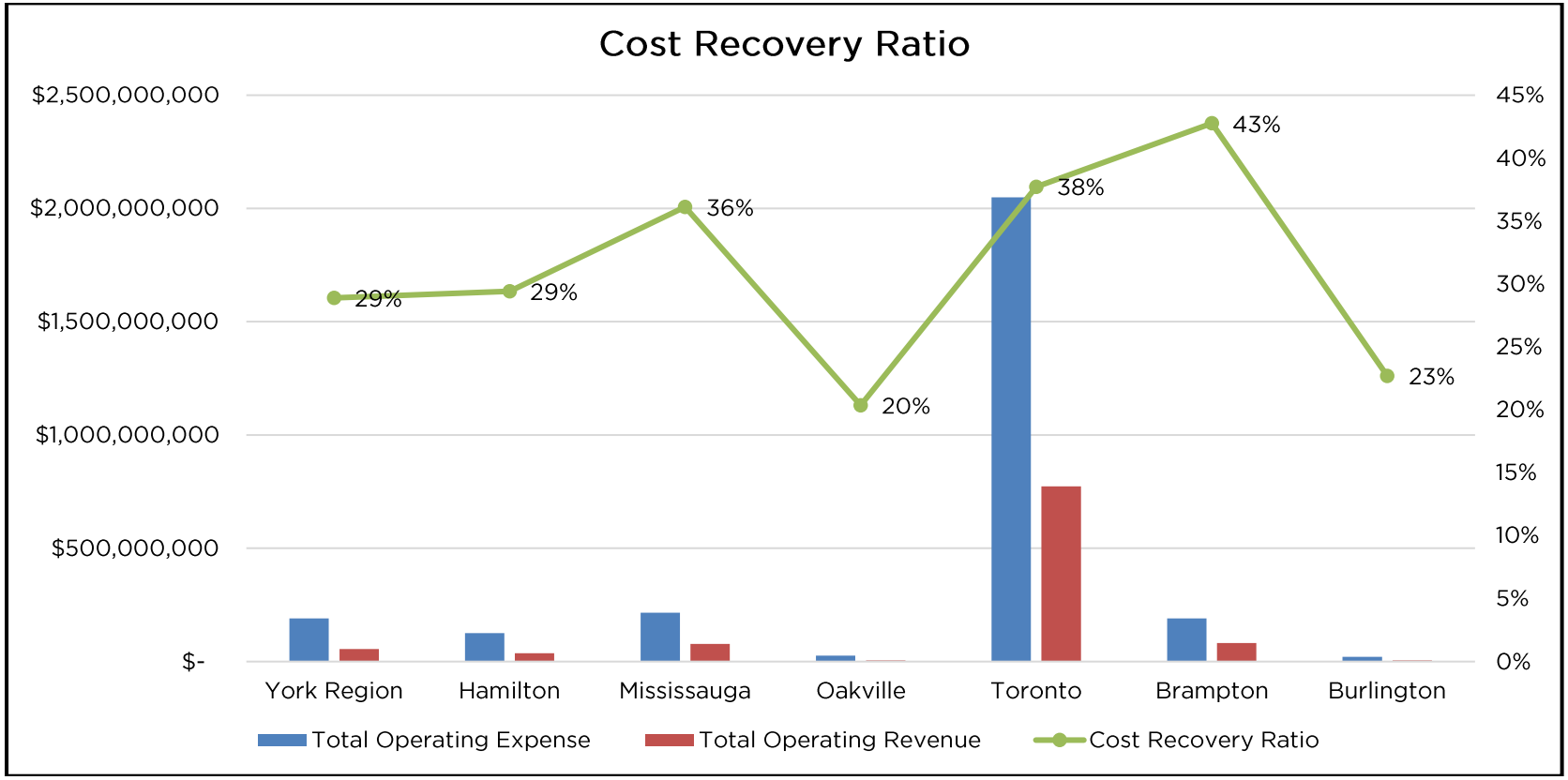


Figure 10: Transit Services Cost Recovery Comparison for Select GTA Municipalities, 2022 CUTA factbook

Development Supported Funding Tools

Developer-funded mechanisms are available to municipalities to cover the costs of transit capital infrastructure that is associated with growth and development. Most municipalities in Ontario impose development charges to pay for off-site, development-related infrastructure. The *Development Charges Act (DCA)* provides the authority to impose these charges and provides strict limitations on their calculation. Development charges are generally based on the benefits principle, as increases in need for services necessitated by development are estimated and all or a portion of the net capital cost (gross cost less other contributions such as grants or subsidies) of providing the services are recovered through the levy paid by the benefiting development.

The City of Mississauga currently collects development charges on a City-wide basis to cover growth-related costs associated with transit operations. Development charges cannot be used for replacement projects; however, they can pay for the expansion share of certain projects. Amongst the 2016 amendments to the DCA, the legislation requires municipalities to complete an asset management plan for the growth-related assets considered in the background study. Furthermore, the changes to the Act allow for the calculation of the transit development charge to be based on the use of the "planned level of service" rather than the more restrictive "10-year historical average level of service". These changes formed an integral component to how the DC rate was calculated during the 2022 DC Study update.

Revenue History

As shown in Figure 11 below, over the past number of years, Provincial and Federal grants and subsidies continually represent the largest share of capital funding sources for transit services. It should be noted that growth-related projects are generally funded through the City's development charge reserve funds as well as grants and subsidies available.

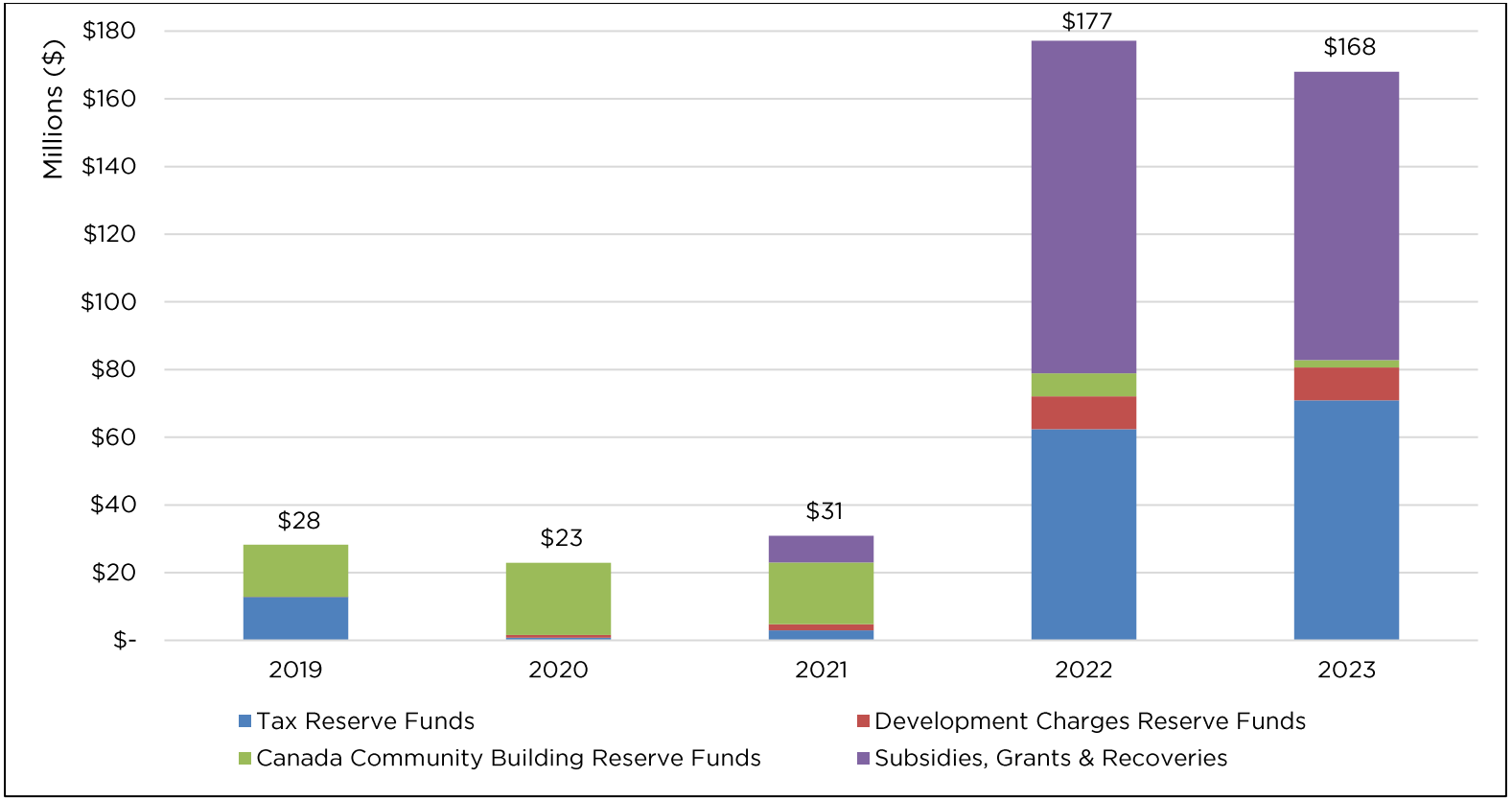


Figure 11: Historical Transit Capital Budget by Funding Source

The following provides a snapshot of the most prominent capital funding sources for Transit based on the 2019-2023 period.

- Subsidies, Grants & Recoveries represent the largest share of total transit funding, representing approximately 45 per cent of the total funding over the 2019-2023 period. It is assumed a significant share of these grants in 2022 and 2023 are related to the ICIP funding secured by the City. Transit is different from other City services as federal and provincial funding has historically been more readily available to fund asset repair and replacement activities than other City services
- Canada Community Building Reserve Funds represent an additional 15 per cent of the total funding. Overall, this allocation of funds would need to be considered and incorporated into the funding plan moving forward
- About five per cent of the funding is from development charges, used as a source of funds for growth-related projects outlined in the City's DC Study
- The Tax Reserve Funds capital contributions represented roughly 35 per cent of the City's capital funding sources for Transit Services. These funds are used to address the annual deterioration of existing Transit assets

On average from 2019-2023, about $81 million (unadjusted for inflation) per annum has been spent on transit infrastructure for non-DC related infrastructure.

Cost Analysis: Overview of the Full Lifecycle Model Approach

As part of this analysis, the total full lifecycle costs of an asset that correspond to the requirements of the regulation. This would entail a cost estimation throughout the asset's life including planning, design, construction, acquisition, operation, maintenance, renewal (and disposal). In addition, the analysis also takes into consideration the inclusion of expansion-related infrastructure into the lifecycle management strategy. This approach ensures that the additional lifecycle costs associated with newly constructed/acquired assets are accounted for in the long-term forecast. The initial first-round capital to acquire the asset is not considered in the asset management provision.

While this plan looks to address the various cost elements, it is important to recognize that as the maturity level increases, the costs associated with each lifecycle activity will strengthen and improve the expenditure outlook. Table 7 below provides the specific approach used to forecast expenditures in this Transit Asset Management Plan.

It is important to recognize that there are some limitations with the cost analysis, and primarily, the contributions for asset replacement includes the replacement of assets of a similar function and style. This limitation is particularly relevant for transit services as the infrastructure that supports these services are very dynamic and the capital lifecycle requirements of

these assets are continuing to evolve. Therefore, this expenditure analysis does not include for the consideration of electrification of the City's fleet (or supporting infrastructure) to upgrade existing technologies. In this context, achieving greenhouse gas (GHG) reductions and targets may require additional funding beyond what has been identified herein.

The cost analysis is intended to be used for information purposes outlining a level of optimal investment to support the existing asset base and future lifecycle needs of the City.

Table 7: Overview of the Full Lifecycle Cost Activities and the Approach Employed

Category	Approach
Non-Asset Solutions	• Based on a review of the 2022 Transit Business plan and budget documents, certain solutions have been documented. A minor provision of $552,490 per annum has been included in the forecast
Operations & Maintenance	• Review of 2019-2023 historical expenditures for Transit as it relates to average maintenance activities by asset class • The City's forecast is used as the basis for the 10-year projection of O&M expenditures under existing assets. New O&M costs for expansion related activities is also calculated for the early years reaching $62.5 million in 2027 and maintaining at that level over the period. The total spending need over the 10-year period included for in the funding gap calculation amounts to $621.5 million. • Does not include employee overhead-related operating costs (example: transit operators associated to delivering the service) • Note, a more robust O&M expenditure outlook is provided for consideration and shown under a distinct "scenario analysis.
Renewal/ Rehabilitation	• A more robust renewal expenditure forecast has been estimated for the City's revenue fleet (buses). The figures are based on similar assumptions used in other municipalities • The renewal activities are shown under a distinct "scenario analysis" • The total lifecycle costs include an annual provision of $11.5 million to account for asset renewal needs. Of this annual amount, over 94% is related to the revenue fleet

Category	Approach
Replacement	• The total lifecycle cost is based only on the sum of the total replacement needs required over the first 10-years of the plan based on evaluation of each asset accounted for in this plan. Note, replacement needs for Vehicles (Revenue Generating) and Equipment & Systems were supplemented by information in the City's budget in which some fleet replacement activities were advanced to align with available funding • The average annual investment required to replace assets when they reach the end of their useful life (age/condition replacement schedule) was also calculated
Disposal/ Demolition	• Analysis assumes any costs associated with "disposal" is included in the replacement value and captured in the capital replacement requirements
Acquisition/ Expansion/ Rebuild	• New first-round capital expenditures are excluded from the calculation as the cost is funded through development charges or other sources • Only asset management requirements associated with expansion activities are considered • The City's 2022 DC Background Study was used to inform new acquisitions to base the Asset Management requirements moving forward. Note, the growth needs associated with Transit facilities and BRT stations outlined in the background study have been removed as the responsibility of managing those assets rests outside of Transit. This figure was then supplemented using an assumed acquisition need over the 10-years based on internal estimates • For new acquisitions, O&M costs are maintained at the relationship of average expenditures relative to replacement value of Transit assets (but adjusted to exclude certain ROW assets and Stormwater infrastructure) • For the purposes of the financing strategy, the first-round growth-related acquisitions are assumed to be funded from DCs. The asset management requirements to replace these assets are calculated for illustration purposes but are not included in the funding gap.

The section below details a more robust cost and expenditure outlook for different lifecycle activities of operation and maintenance, rehabilitation and expansion requirements which are not included to the extent outlined in the existing cost analysis at this stage but will be reviewed and considered in future iterations.

Non-Asset Solutions

Ridership levels in 2020 and 2021 saw a significant drop as a result of the COVID-19 pandemic. The recent Transit (MiWay) Business Plans presented several solutions to increase ridership to return to pre-pandemic levels while also keeping a sustainable operation over the long-term. Some of the strategies included the following:

- Freezing of fares throughout 2021 and 2022
- Review of fare products and consideration of options to strategically increase ridership to pre-COVID-19 levels
- Focusing on building a responsive service by monitoring customer needs and ridership trends to adjust routes and timing with the goal of minimizing overcrowding
- Identifying strategies to align Transit with the Transportation Master Plan's Action Plan through several non-asset initiatives to increase levels of service
- Performing cost/benefit analysis to evaluate opportunities for on-demand transit including an overnight service and first-mile/last-mile connections
- Providing information regarding new transit services to existing and potential customers at transit stations and terminals
- Integration of services and fares between Transit (MiWay) and TTC

Non-asset solutions represent a minor share of the total 10-year lifecycle activity - a provision of about $552,500 per annum has been included in the forecast.

Operations and Maintenance (O&M)

Figure 12 shows the City's anticipated transit maintenance expenditures over a 10-year planning period to 2033. This figure illustrates the capital asset related maintenance expenditures identified in the Transit operating budget. Figure 12 below includes the projected added maintenance costs associated with acquisition of new capital assets.

New transit investments coming into service are expected to cause the City's maintenance expenditures to increase steadily over the 10-year period through to 2033. Over time, assessment growth will be available to help offset the projected increases to maintenance costs. Furthermore, the timing of additional operating costs can vary relative to ridership trends and when the capital assets become in-service.

To help understand the relationship of costs relative to rides, the maintenance expenditures are correlated to projected revenue rides. The growth in expenditures is tied to the annual increase in capital assets the City is planning to acquire over the period to 2033 (excluding Transit facilities) – the transit maintenance costs by 2033 are calculated at $76.3 million which is an increase on the $61.9 million expenditure associated

with the existing infrastructure (based on 2024 budget). Cumulatively, this would equate to a spending need of $633.9 million over the next 10 years at existing levels to maintain the existing asset base plus an additional $62.8 million to capture the maintenance activities for new non-facility related transit assets. It is expected that these additional costs be revisited and benchmarked against the City's service level considerations moving forward.

The O&M spending need included for in the funding gap analysis is consistent with the budget spending of $621.5 million over the 10-year period which is moderately lower than the calculated needs outlined in Figure 12 below. The figure below considers additional expenditure needs arising from new growth over the 10-year period.

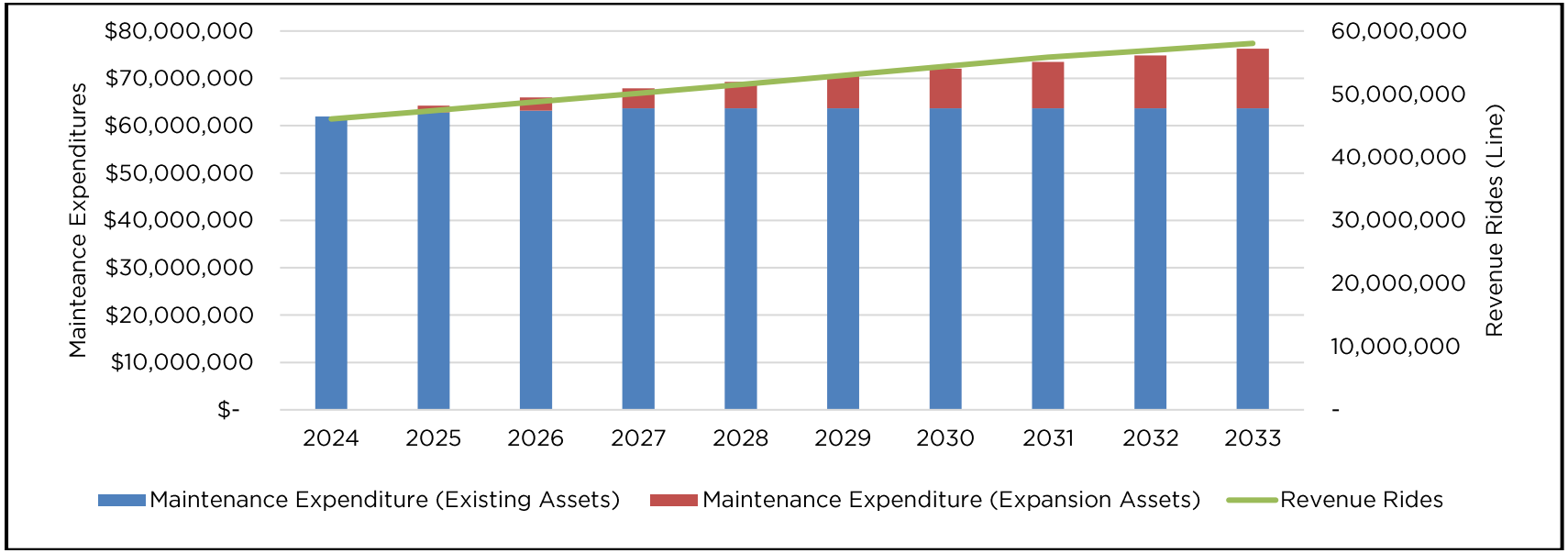


Figure 12: Forecast of Transit Maintenance Expenditures vs. Ridership (Revenue Rides)

Rehabilitation and Replacement Requirements

An analysis to understand the impacts if the City were to schedule fleet overhauls, refurbishments in addition to traditional replacement activities to extend the life of the City's revenue fleet assets was prepared. In this regard, three scenarios have been considered, with each scenario resulting in different replacement timing and lifecycle costs.

The first scenario which does not include any mid life-cycle intervention activities is consistent with the current Transit fleet capital asset management approach. Table 8 below outlines the fleet replacement, refurbishment, and overhaul schedules under each scenario.

Table 8: Schedule of Fleet Overhauls, Refurbishments, and Replacements

Level of Mid-lifecycle Intervention	First Scenario: No Mid-Lifecycle Interventions	Second Scenario: Limited Mid-Lifecycle Intervention	Third Scenario: Extensive Mid-Lifecycle Intervention
Expected Useful Life of Buses	12 or 15 Years (depending on bus)	Extend Life by 3 Years	Extend Life by 6 Years
Mid-Lifecycle Activities	None	Body and Interior Refurbishments	Mechanical Components, Body and Interior Refurbishments
Mid-Lifecycle Activity Timing	None	General Refurbishment: 9 Years	Engine After-Treatment: 6 and 12 Years Transmission & Hybrid Drive Unit: 9 Years Battery Refurbishment: 12 Years
Risk of Unplanned Maintenance Events	High	Medium	Low

Figure 13, Figure 14 and Figure 15 indicate the long-term revenue fleet needs, including mid-lifecycle renewal needs under each of the scenarios detailed above. The figures indicate that significant capital asset replacement requirements are needed immediately as many of the buses currently in-service are beyond their useful lives and scheduled for replacement. This requirement only relates to those vehicles currently in-service and as Transit continues to acquire new vehicles to meet demand additional replacement requirements would be warranted (see expansion activities).

All costs for mid-lifecycle activities have been assumed to be proportionate to the replacement value of each asset type. The cost assumptions for all mid-lifecycle activities are laid out in Table 9 below. Additional costs related to an increased need for staff to carry out the capital activities may be required under Scenario's 2 and 3, while Scenario 1 poses an increased risk of vehicle down-time due to unplanned maintenance events.These increased costs and risks are difficult to quantify and have therefore been left out of the scenario analysis at this time. The three scenarios have been calculated over a 36-year period to represent the timing associated with the replacement schedule of two buses that have had mid-lifecycle intervention activities.

Table 9: Rehabilitation & Refurbishment Cost Assumptions for Revenue Vehicles

Asset Type	Activity Type	Activity Cost Assumption
Conventional (Diesel) Buses – Standard 40'	Engine After-Treatment	$65,000
	Transmission	$55,000
	General Refurbishment	$205,000
Hybrid Buses – Standard 40'	Engine After-Treatment	$65,000
	Hybrid Drive Unit	$55,000
	Battery Refurbishment	$80,000
	General Refurbishment	$33,000
Conventional (Diesel) Buses – Articulating 60'	Engine After-Treatment	$65,000
	Transmission	$55,000
	General Refurbishment	$395,000
Hybrid Buses – Articulating 60'	Engine After-Treatment	$65,000
	Hybrid Drive Unit	$55,000
	Battery Refurbishment	$80,000
	General Refurbishment	$395,000

SCENARIO 1 – NO MID-LIFECYCLE REFURBISHMENTS

The lifecycle of revenue fleet expects the service life of each asset to be 12 or 15 years (depending on the type of bus) when no mid-lifecycle activities are performed. Figure 13 below shows the timing of expected replacement costs based on the service life of each asset. Over the period from 2024 to 2059, it is expected that an average of $39.3 million will be spent on fleet replacement each year totaling $1.4 billion by 2059.

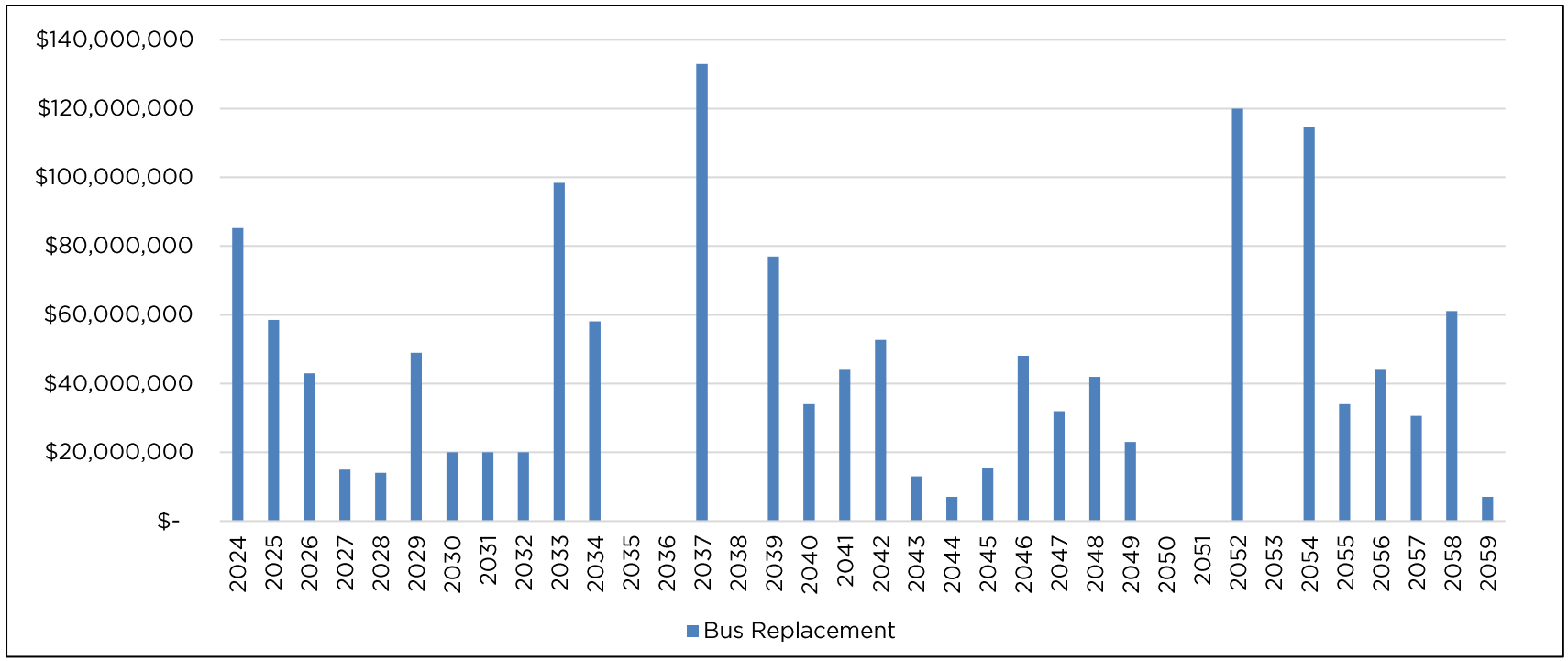


Figure 13: Scenario 1 (Fleet Replacement Schedule)

SCENARIO 2: LIMITED MID-LIFECYCLE REFURBISHMENTS

The lifecycle of revenue fleet expects the service life of each asset be extended by three years when one mid-lifecycle general refurbishment is performed at in each asset's life. Figure 14 below shows the timing and amount of expected refurbishment and replacement costs over the next 36 years. Over the period from 2024 to 2059, it is expected that an average of $28.5 million will be spent on fleet replacement and mid-lifecycle refurbishments each year. On average the capital spend of $28.5 million is calculated totaling nearly $1.0 billion by 2059.

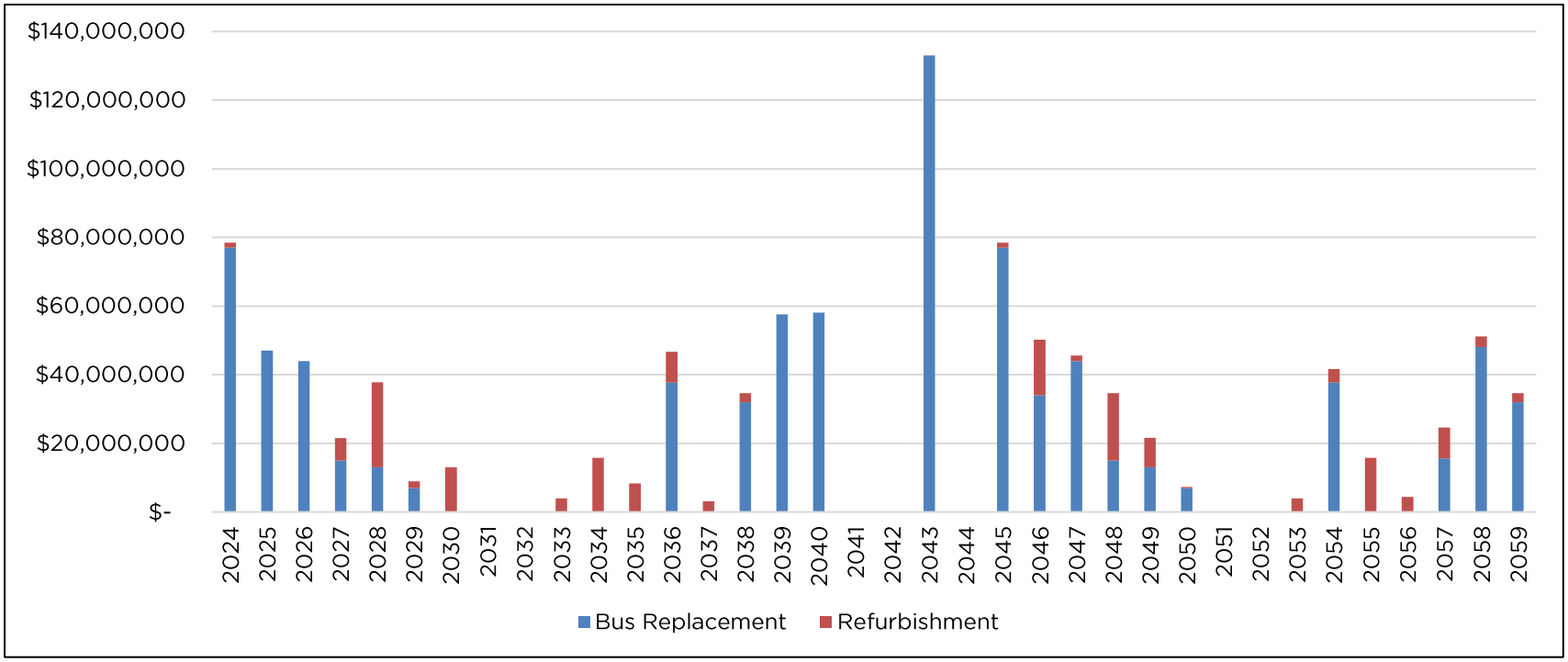


Figure 14: Scenario 2 (Fleet Replacement and Refurbishment Schedule

SCENARIO 3: EXTENSIVE MID-LIFECYCLE REFURBISHMENTS AND OVERHAULS

The lifecycle of revenue fleet expects the service life of each asset to be extended by six years if all identified mid-lifecycle activities are performed in each asset's life. For example, on a 60-foot bus, Engine After-Treatments will be performed twice before the bus is required to be replaced on the 18th year of service. Activities including transmission replacement in a conventional bus and battery refurbishments and hybrid drive unit replacements in a hybrid bus, for example, will be replaced once throughout the full lifecycle of the vehicle. Figure 15 below shows the timing and amount of expected refurbishment, overhaul, and replacement costs over the next 36 years. Over the period from 2024 to 2059, it is expected that an average of $35.2 million will be spent on fleet replacement and renewals each year and totaling $1.3 billion by 2059.

Although the graphs illustrate the replacement needs to 2059, the annual provision requirement when considering the needs of repair and replacement outside the 2059 planning period, the scenarios start to align more closely.

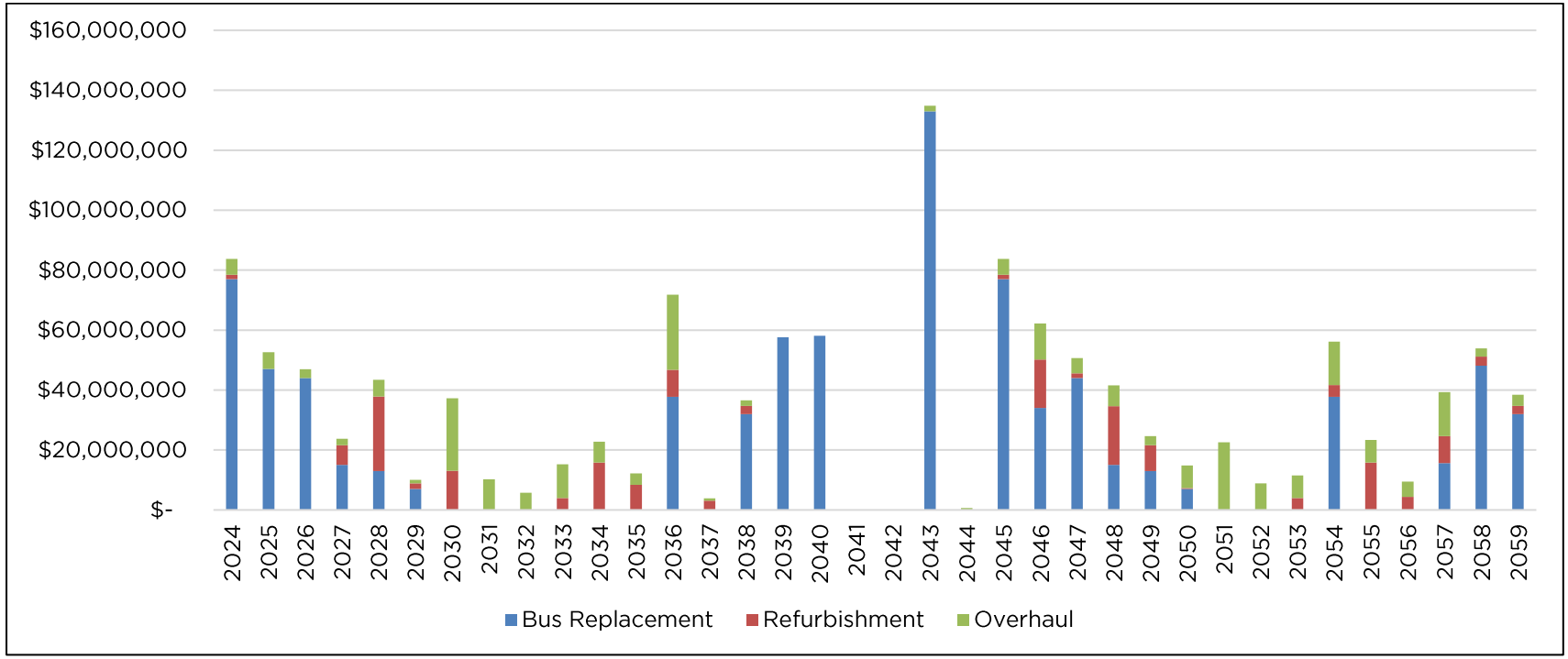


Figure 15: Scenario 3 (Fleet Replacement, Refurbishment, and Overhaul Schedule

Total 10-Year Asset Replacement Needs

A key component of the lifecycle model is to identify the asset replacement requirements for each asset based on the timing of when the asset came into service, the asset age, and the condition of the asset. Over the 10-year period, it is calculated that approximately $491.1 million in asset replacements is required. A few key considerations are noted below:

- Of the total 10-year asset replacement requirements, about $423.1 million (86 per cent) is related to revenue generating vehicles
- Approximately 18 per cent of the replacement needs have been identified in the first year of the analysis (2024) as any asset that is "overdue" is identified for replacement in the first year. Notably most of these assets in the first year also relate to revenue generating vehicles

The replacement needs over the 10-year period does not capture any savings for the replacement of assets which would occur outside the 10-year planning horizon. To supplement the replacement analysis outlined in this plan, an annual provision schedule for replacement is calculated for each asset based on its remaining useful life and the anticipated cost of replacement in constant dollars. The aggregate of all individual provisions forms an annual capital contribution requirement for the purpose of asset replacement. The annual provision represents the average annual investment required to replace assets when they reach the end of their useful life. This average annual expenditure over the same 10-year period is calculated at $61.6 million. Also note, the calculations summarized in Figure 16 and Figure 17 exclude the renewal needs identified in the additional scenarios above as this is intended to illustrate the City's status quo practice to replace buses at the end of their useful life.

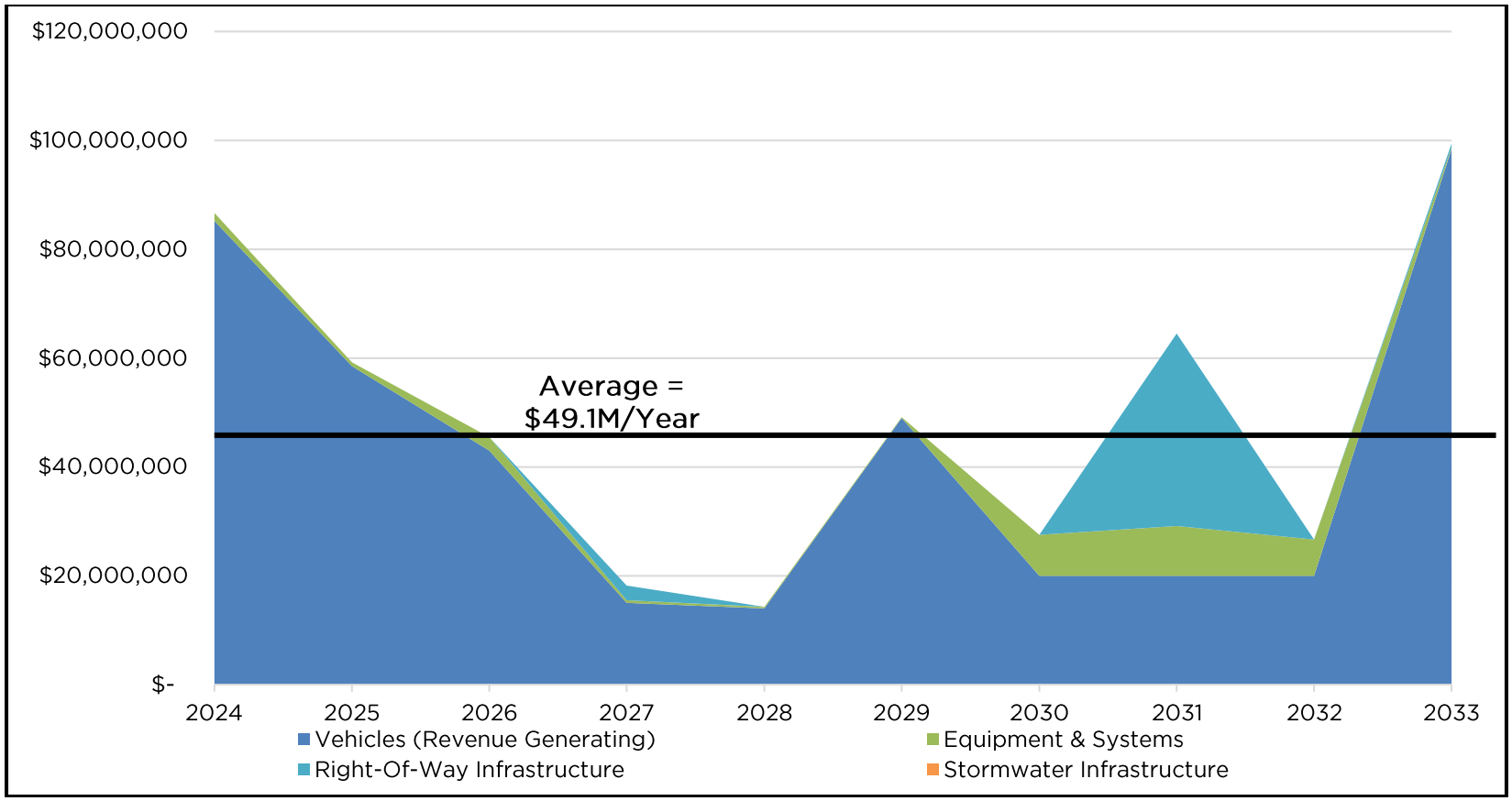


Figure 16: Capital Asset Replacement Requirements over the Next 10-Years

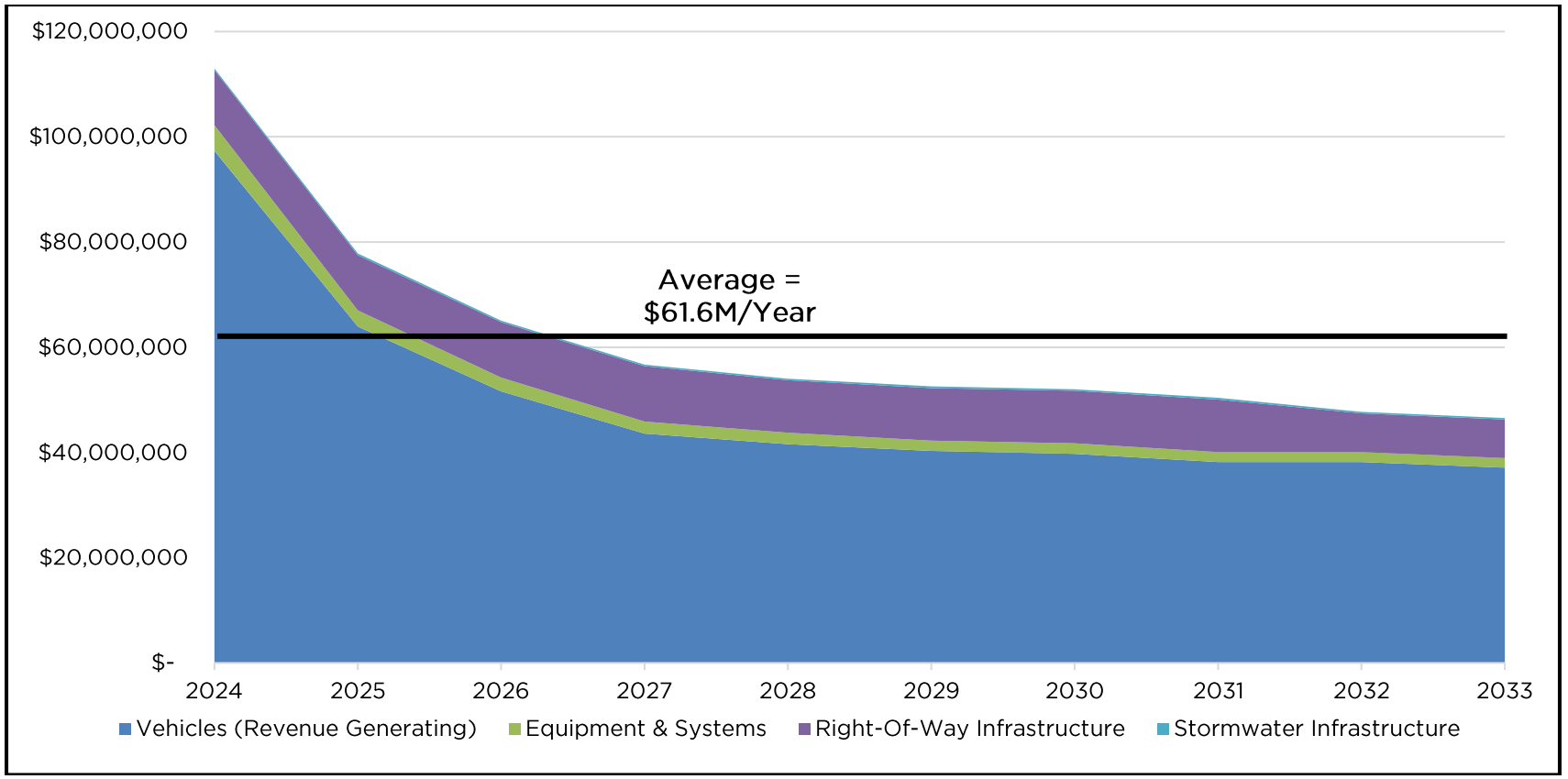


Figure 17: Annual Contribution Requirement (Scenario 1)

Acquisition/Expansion/Rebuild Activities

The City has historically used development charges, to the fullest extent allowed for, under the provisions of the DCA to pay for expansion related activities. This section aims to explore the first-round capital costs included in the DC Study as well as the annual needs required to maintain these assets over the course of their useful life.

First-Round Capital Costs

The City's DC Background Study illustrates a capital requirement of $455 million for new transit assets over the 2022-2031 period, of which, $262 million is growth related and can be recovered from development charges over this period. The remaining amount would be recovered from grants and subsidies ($91 million), and $102 million to be funded through taxes. The capital works included in the City's DC Study are identified, by funding source, in Figure 18 below. Not all new assets can be recovered from DCs as there are limitations to what can be considered growth-related. For the purposes of the 2022 DC Background Study, the City's travel demand model was used to forecast future transit ridership as an indicator of the planned levels of service based on future land use (population and employment) and future network. This methodology helped determine the share of net new assets which could be funded from DCs, while the remaining share of costs would have to be funded from non-DC sources (taxes or user fees).

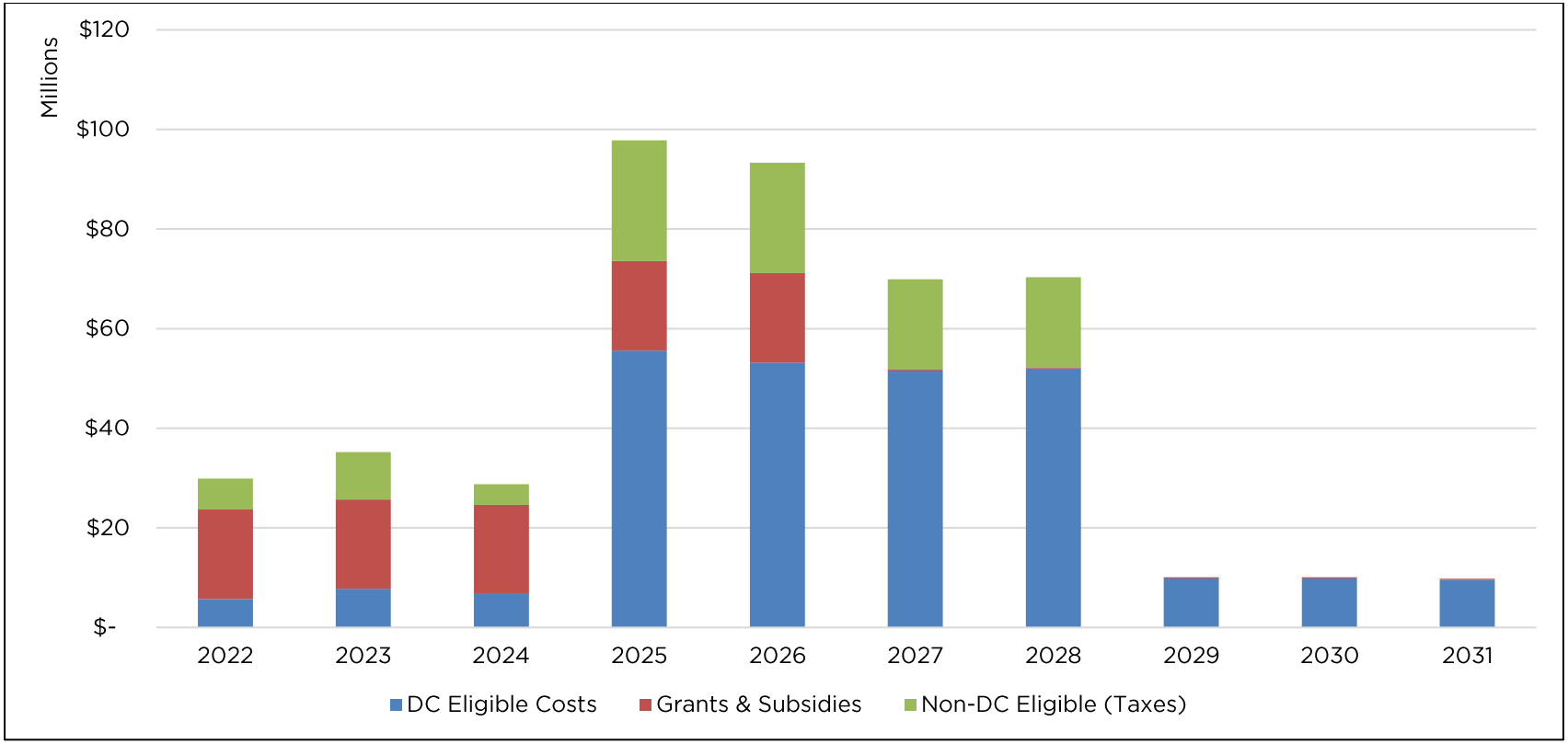


Figure 18: Development Charges Study Transit Capital Program (2022-2031)

Source: City of Mississauga Development Charges Background Study

Notably, an additional $49.1 million in expansion-related capital expenditures have been identified from the City's 10-year plan. These additional expenses have been included in the following section to calculate the annual asset management related requirements associated with the planned acquisitions over the 10-year period.

Annual Asset Management Related to New Expansion Related Capital

Although a significant share of these assets will attract funding from development charges, the assets will become the responsibility of the City to operate, maintain, repair and ultimately replace in the future. This requires careful asset management planning to ensure levels of service can be maintained. A proper understanding of the relationship between the assets required to support the demand identified and the long-term asset management implications is critical.

Based on the capital program included in the DC Study (including timing of the works, cost, and useful life of the capital asset but adjusted to net out facilities) plus the additional capital expenses identified through the more recent budgeting exercise, a provision for asset replacement has been calculated for transit services. The aggregate of all the individual capital project provisions form the required annual capital provision.

Figure 19 provides the annual calculated asset management contribution for non-facility related transit assets included in the DC Study[9]. By 2034, the total annual provision requirement reaches $19.7 million. On average, over the 10-year planning period considered, this amounts to an annual provision to replace these assets of $6.8 million (total of $67.6 million over 10-years) the average is lower than the total reached in 2034 as the average better represents the timing of capital acquisitions and the City will be able to plan for the replacement only when the asset is acquired.

[9] The DC Study 10-year capital program has been used as cost proxy to be included in this analysis. Therefore, the capital program timeline has been adjusted to 2024-2033 to match the timeframe in this study.

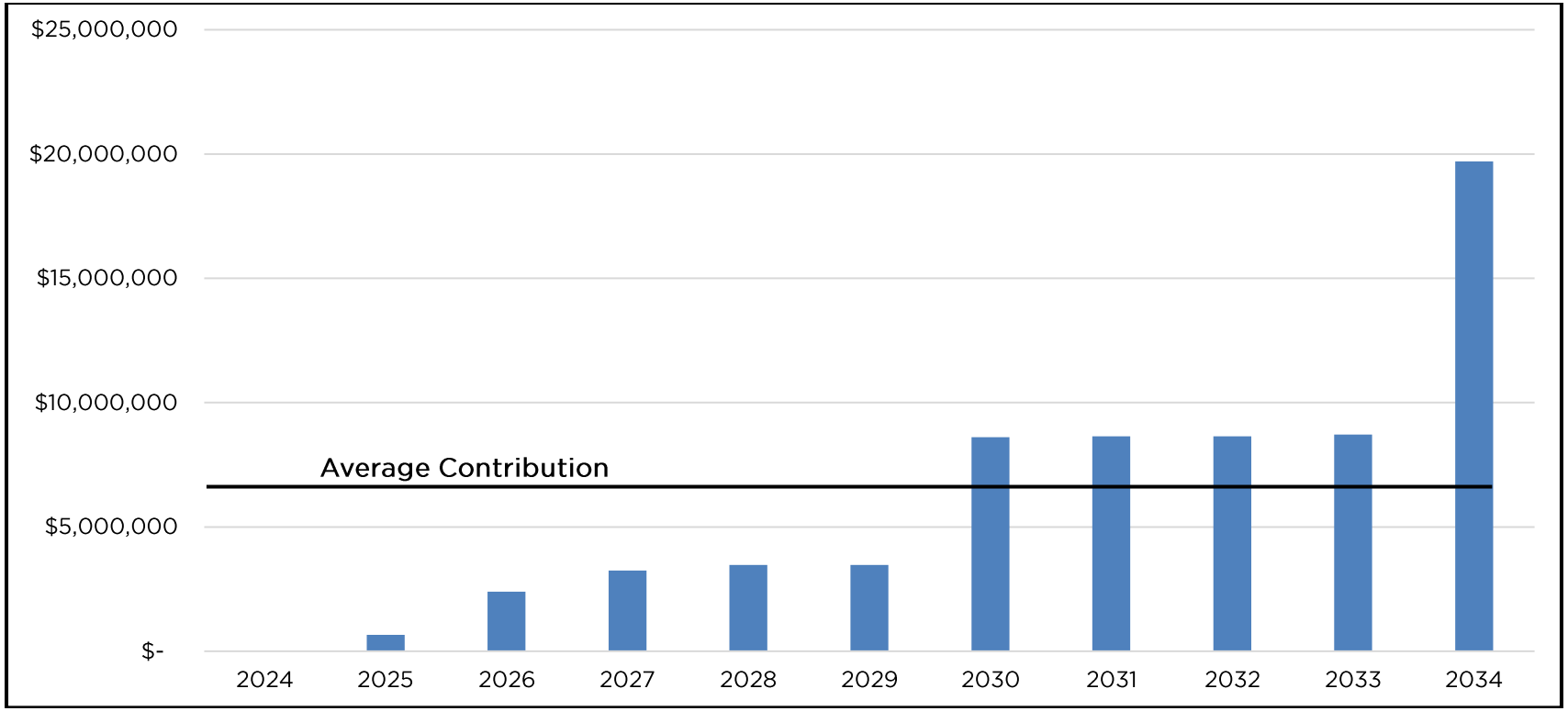


Figure 19: Annual Capital Provision to Replace Assets Outlined in the DC Capital Project List[10]

[10] Excludes Facilities and BRT station related capital replacement needs identified in the DC Study as this set of assets would be managed by the Facilities Planning & Development division, with modifications to match the City's budgeted acquisitions over the 10-year period. The gross cost of facilities omitted is $366.8 million (as per 2022 DC Study: Projects 1.3.1, 1.3.2, 1.3.3, 1.4.11 and 1.4.12)

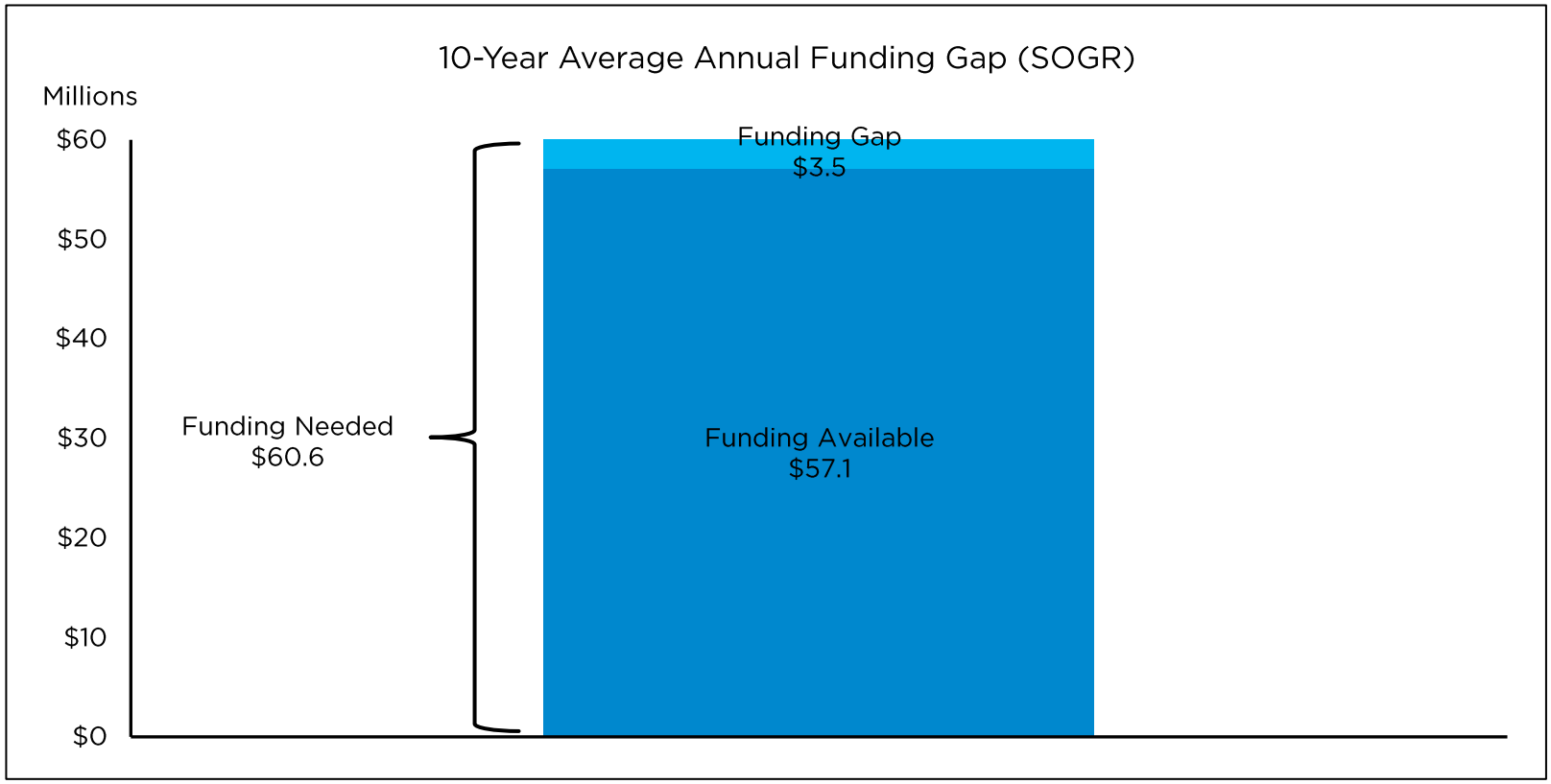
For the purposes of the financing strategy, the first-round growth-related acquisitions are assumed to be funded from DCs. The additional annual asset management requirements ($6.8 million per annum) associated with the new assets which may be needed are calculated for illustration purposes but not included in the funding gap calculations in the following tables.

Disposal Activities

The analysis assumes any costs associated with "disposal" are accounted for in the replacement value and captured in the capital replacement requirements.

Infrastructure Gap

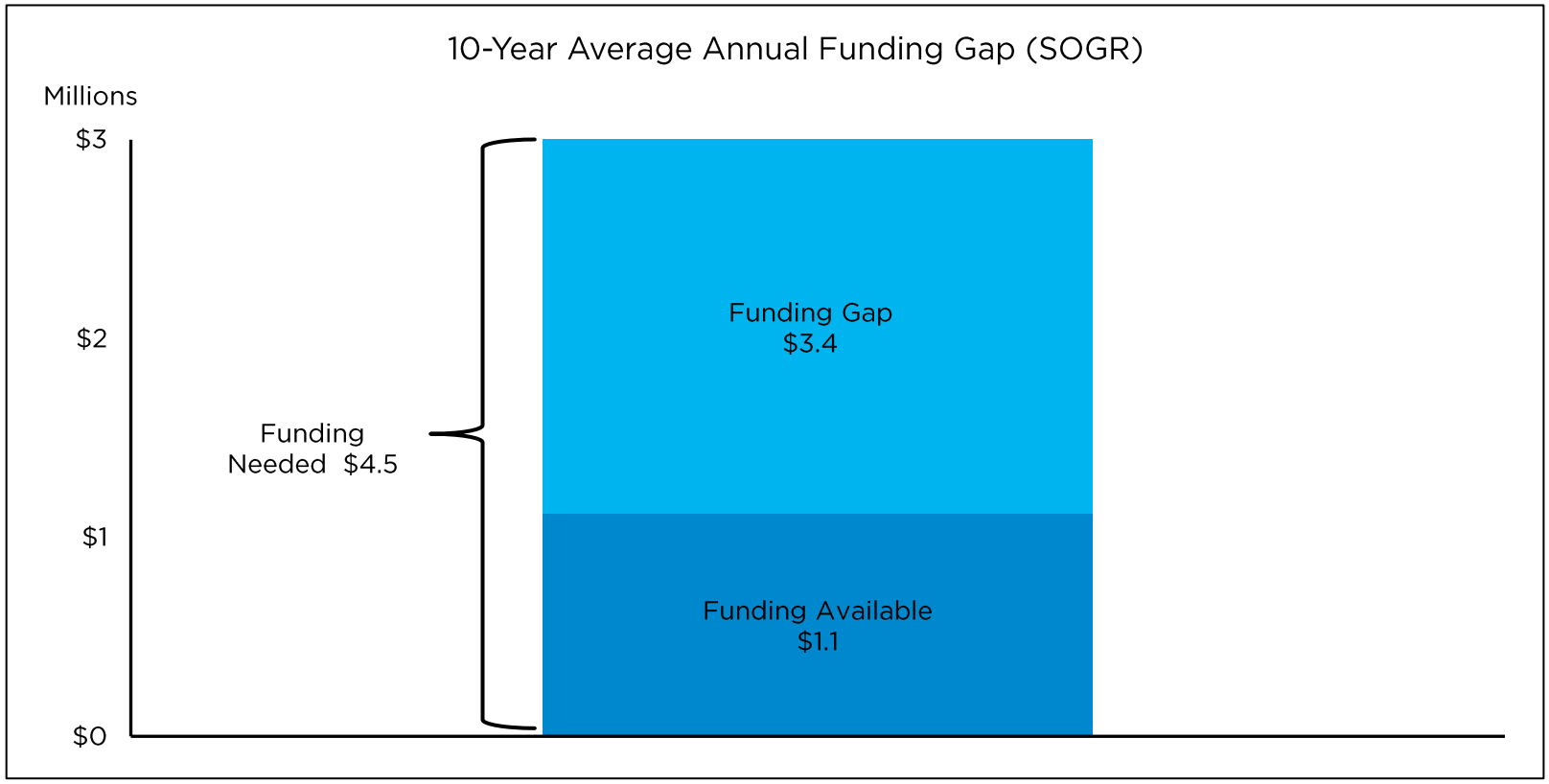
Transit (MiWay)



As of this iteration of the Transit asset management plan, an infrastructure gap of $3.5 million per annum is identified over the 10-year period. Vehicles (Revenue Generating) and Stormwater Infrastructure have not contributed to this gap due to sufficient funding for their lifecycle needs.

Staff will also look to minimize the infrastructure gap by improving databases to achieve a proper assessment of the condition of assets.

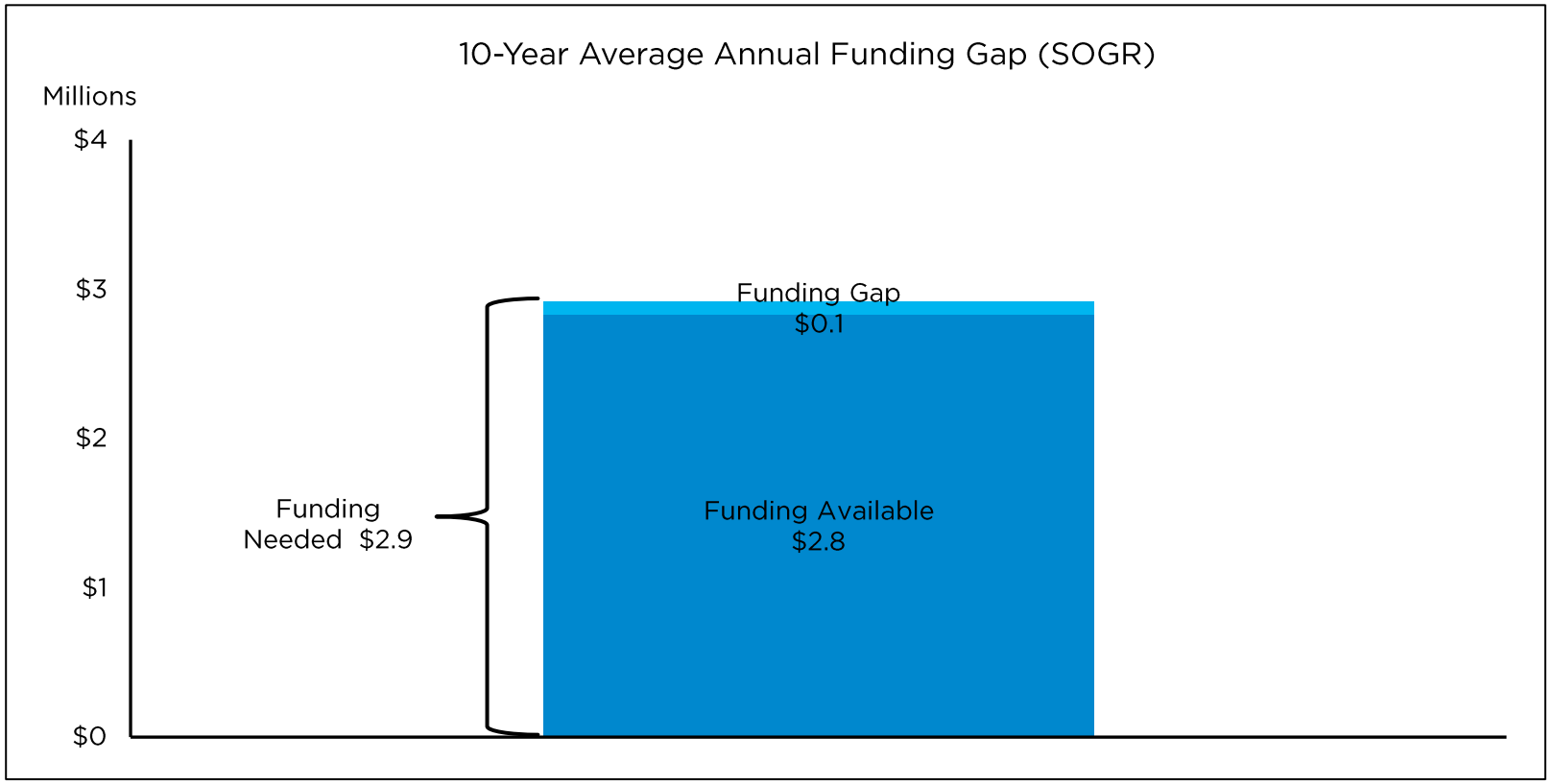
Right of Way (ROW) Infrastructure



Transit (MiWay) currently has limited funding for assets such as bus shelters, however the average annual funding gap is $3.4 million over the 10-year period to 2033.

The primary driver of this infrastructure gap relates to the replacement of a significant portion of the City's bus shelters towards the end of the 10-year period. Additional replacement needs have been identified for stops and bus bays throughout the period.

Equipment & Systems

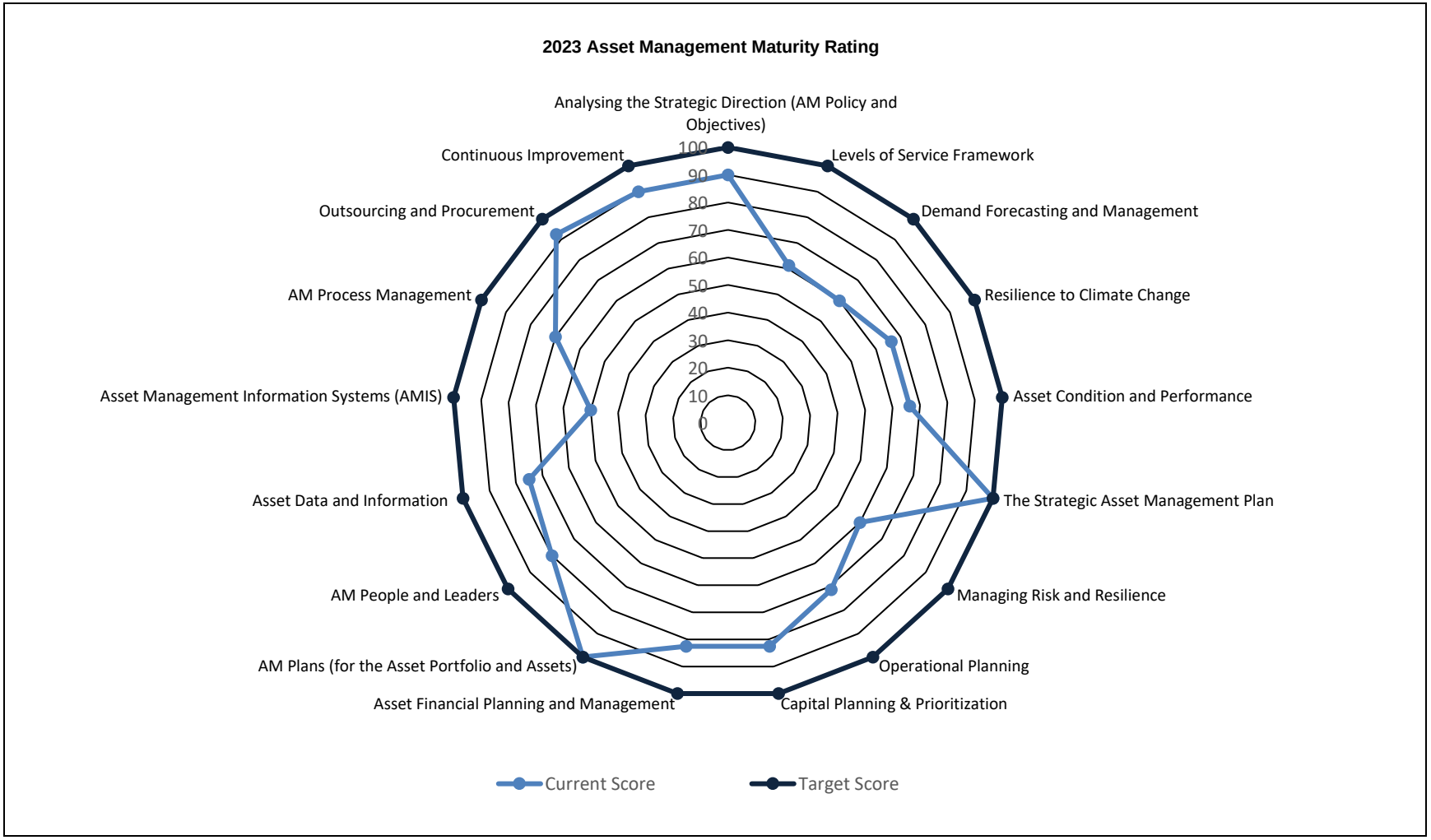


Equipment & Systems have a marginal average annual funding gap of $89,600 over the 10-year period. The slight gap relates to the replacement of radios towards the end of the period as they reach the end of their useful life.

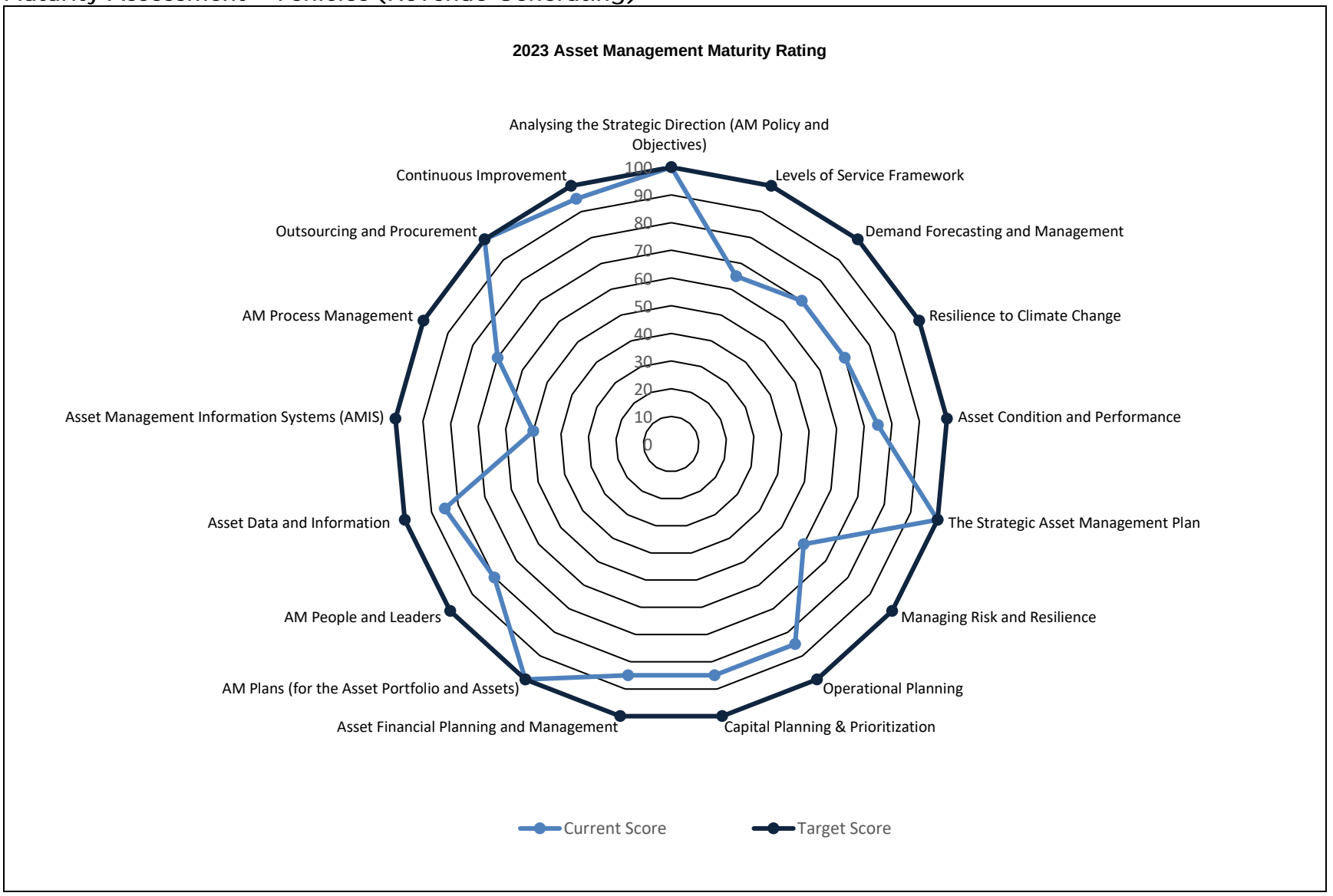
Continuous Improvement & Maturity

Maturity Assessments

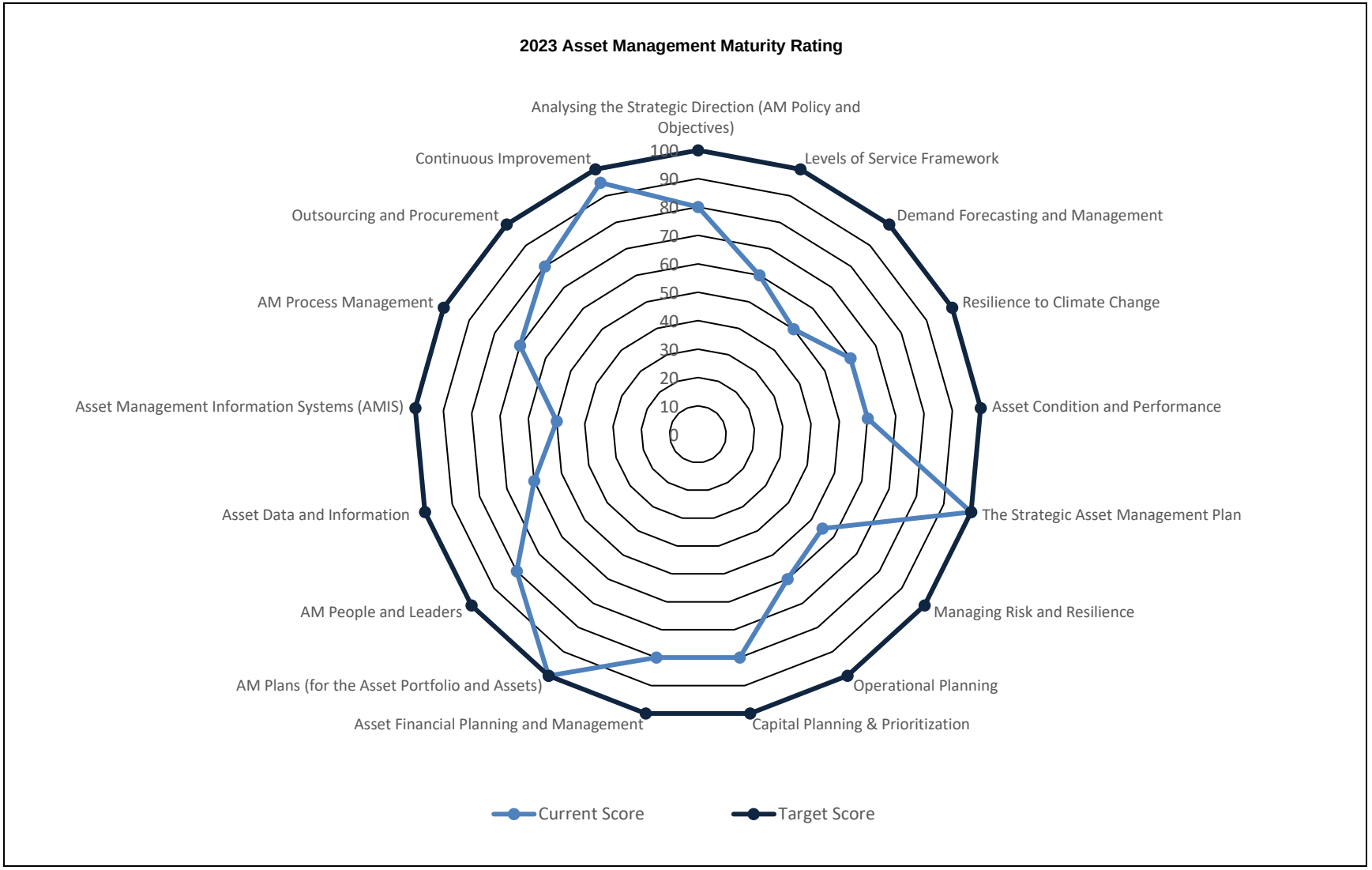
Maturity Assessment – Transit (MiWay)



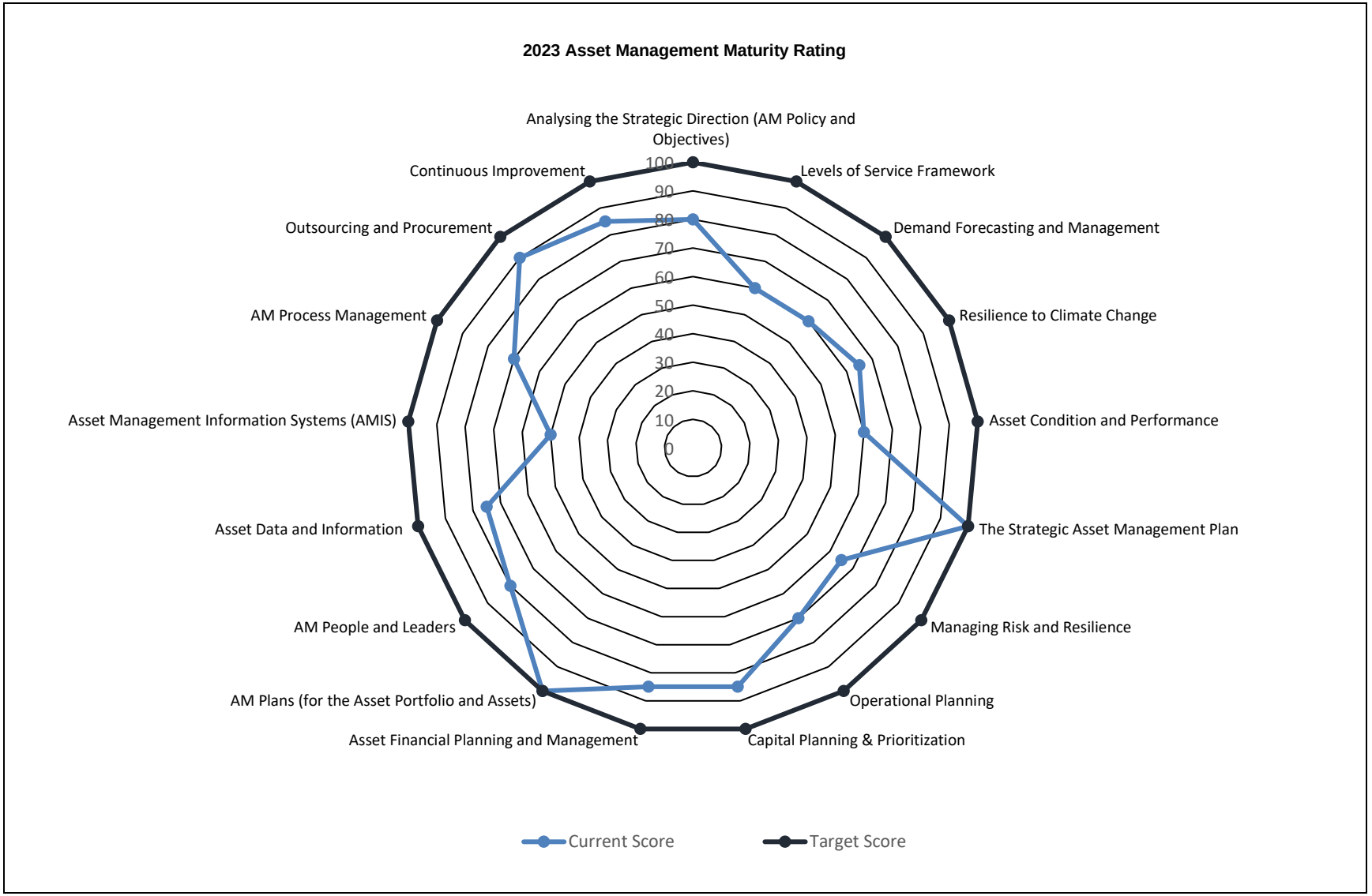
Maturity Assessment – Vehicles (Revenue-Generating)



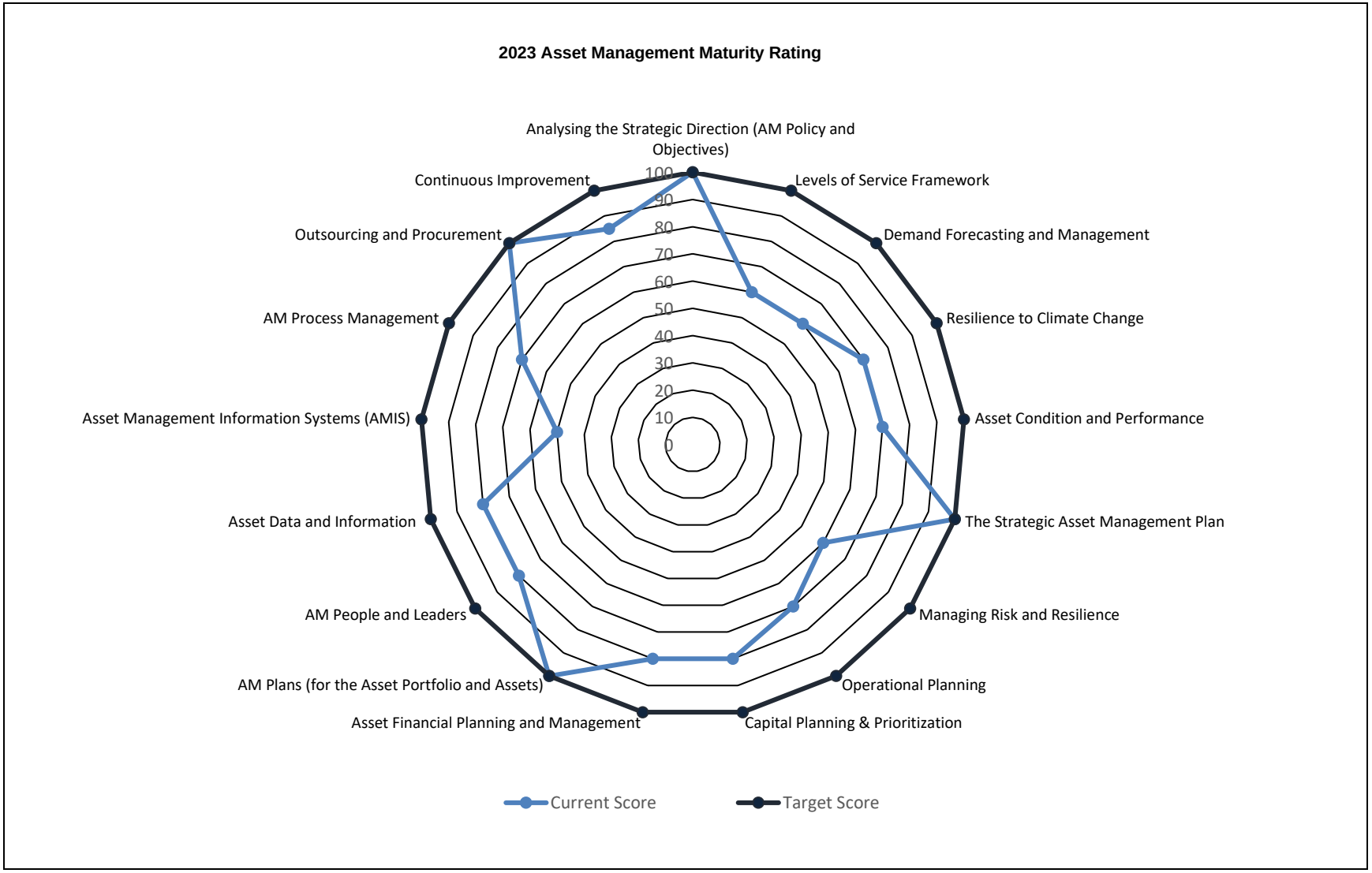
Maturity Assessment – Equipment & Systems



Maturity Assessment – Right-of-Way (ROW) Infrastructure



Maturity Assessment – Stormwater Infrastructure



Continuous Improvement Plan

Task No.	Continuous Improvement Task	Estimated Timing	Value/Impact	Required Resources
State of Infrastructure (SOI)				
SOI-01	Formalization of Asset Management governance model.	2023-Ongoing	Supports and sustains asset management plan development and the future of the overall Transit asset management program.	Internal
SOI-02	Additional review of data management systems and feasibility of system integration.	2023-Ongoing	Ensures consistency and accuracy of data to inform future asset management planning initiatives.	Internal
SOI-03	Improved data collection processes and development of data guidelines and governance strategies.	2023-Ongoing	Improves data accuracy, confidence and reliability as well as consistency in reporting and data collection.	Internal
SOI-04	Expand asset hierarchy to component and sub-component level.	2023-Ongoing	Identification of assets at the sub-component level allows for closer monitoring of asset replacement and renewal needs.	Internal
SOI-05	Ongoing updates to replacement costs.	2023-Ongoing	Ensures accurate reporting of assets as well as planning for replacement.	Internal
SOI-06	Holistic and integrated condition assessment program for all asset classes.	2023-Ongoing	Condition assessments allow for a more accurate reporting and planning for lifecycle activities.	Internal

Task No.	Continuous Improvement Task	Estimated Timing	Value/Impact	Required Resources
Levels of Service (LOS)				
LOS-01	Ongoing data collection to support LOS metrics	2023-2029	Allows for tracking of progress towards meeting targets.	Internal
LOS-02	Administer Willingness to Pay surveys to customers.	2023-2027	Gain an understanding of the opinions of Transit users and their expected levels of service.	Internal
Lifecycle Management Strategy (LMS)				
LMS-01	Consideration of lifecycle costs when evaluating asset-related projects.	2023-Ongoing	Alignment of budget activities with lifecycle activities.	Internal
LMS-02	Climate change and decarbonization strategy.	2023-Ongoing	Aligns with the acquisition of new zero emissions fleet moving forward.	External
LMS-03	Mid-life overhaul or suitable replacement and rehabilitation strategies.	2023-Ongoing	Potential to extend the useful life of assets and maximize asset investment.	Internal
LMS-04	Improving lifecycle analysis tools through automation and use of technologies.	2023-Ongoing	Ensure consistency in lifecycle analysis.	Internal
Demand Management (DM)				
DM-01	Further develop understanding of the relationship between the assets required to support demand drivers.	2023-Ongoing	Ensures that assets are available to meet demand.	Internal

Task No.	Continuous Improvement Task	Estimated Timing	Value/Impact	Required Resources
Risk Management Strategy (RMS)				
RMS-01	Further development of ongoing mitigation actions.	2023-Ongoing	Continued mitigation of asset risk.	Internal
RMS-02	Development of a full Reliability, Availability, Maintainability, Safety (RAMS) model.	2023-Ongoing	Provides a more rigorous risk management framework to inform decision making.	Internal
RMS-03	Adopt structured approach for continual assessment and enhancement of risk management practices.	2023-Ongoing	Ensures that Transit's practices align with industry best practices and improve upon existing frameworks.	Internal
RMS-04	Develop prioritization of lifecycle activities and costs through risk analysis.	2023-Ongoing	Improves decision-making process.	Internal
Financing Strategy (FS)				
FS-01	Activity-based tracking of costs.	2023-Ongoing	Informs LOS metrics.	Internal
FS-02	Further understanding of renewal needs.	2023-Ongoing	Could alter design life of assets and enhance overall services.	Internal
FS-03	Identify costs associated with electrification of Transit fleet.	2023-Ongoing	Improved asset management planning and budgeting.	Internal
FS-05	Monitoring and bridging of infrastructure gap and benchmarking with similar agencies.	2023-Ongoing	Improve financial sustainability in the long term.	Internal

Appendix

Table 10: Asset Condition Rating based on Remaining Useful Life

Condition Rating	Methodology	Definition
Very Good	80-100% remaining useful life	The asset is fit for the future. It is well maintained, in good condition, new or recently rehabilitated.
Good	60-79% remaining useful life	The asset is adequate. It is acceptable and generally within the mid-stage of its expected service life.
Fair	40-59% remaining useful life	The asset requires attention. The asset shows signs of deterioration, and some elements exhibit deficiencies.
Poor	20-39% remaining useful life	There is an increasing potential for its condition to affect the service it provides. The asset is approaching the end of its service life, the condition is below the standard and a large portion of the system exhibits significant deterioration.
Very Poor	0-19% remaining useful life	The asset is unfit for sustained service. It is near or beyond its expected service life and shows widespread signs of advanced deterioration. Some assets may be unusable.

Table 11: Asset Condition Rating Scale for ROW Assets

Condition Rating			Very Good	Good	Fair	Poor	Very Poor
Physical Condition Definitions			**Fit for the Future** - The asset is generally in very good condition, typically new, or recently rehabilitated	**Adequate for Now** -- The asset is in good condition and performing as intended. Some elements show minimal signs of deterioration.	**Requires Attention** - The asset shows general signs of deterioration and requires attention with some elements exhibiting significant deficiencies	**Approaching End of Life** - The asset is in poor condition and typically below established standards, with many elements approaching the end of their life	**Requires Renewal** - The asset is below established standard conditions with widespread signs of advanced deterioration.
Asset Class	Asset Type	Condition Rating Scale					
Right of Way (ROW)	Road Infrastructure (Pavement Only)	PQI (Pavement Quality Index)	80 - 100	70 - 79	55 - 69	20 - 54	0 - 19
	Structures (Bridges and Culverts)	Bridge Condition Index (BCI)	100	80 - 99.9	40 - 79.9	20 - 39.9	0 – 19
	Structures (Retaining Walls)	10-point scale	9 - 10	7 - 8	5 - 6	3 - 4	1 – 2

Corporate Asset
Management Plan **2025**

Fire & Emergency Services

Table of Contents

Introduction 3
Key Stats 4
State of the Infrastructure 5
Asset Hierarchy 5
Asset Class - Summary 6
Assets Used by MFES – Managed By Other Service Areas 6
Asset Management Tools and Systems 7
Dashboards 7
Levels of Service 17
Governing Legislation for Fire and Emergency Services 17
Community Levels of Service Framework 18
Technical Levels of Service Framework 24
Demand Management 26
Demand Drivers, Projections and Management Plans 27
Risk Management 30
Lifecycle Management 32
Lifecycle Strategies 32
Lifecycle Needs vs. Budget 34
Budget Breakdown 39
Financing Strategy 41
Capital Funding Sources and Operating Revenue Sources 41
Infrastructure Gap 42
Continuous Improvement & Maturity 43
Maturity Assessments 43
Continuous Improvement Plan 48
Appendix 50

Introduction

Mississauga Fire and Emergency Services (MFES) has a clear mission statement: to protect life, property, and the environment in Mississauga from all risks through education, enforcement, engineering, emergency response and economic incentive. MFES strives to be a global leader in Fire Service and Life Safety excellence. The provision of infrastructure in a financially sustainable manner will help to support this vision. As of 2023-year end, MFES assets have a combined replacement value of $120.2 million[1], with an overall average condition of Fair, as shown in Key Stats.

The MFES Asset Management (AM) Plan details information about infrastructure assets including actions required to provide an agreed level of service (LOS) in the most cost-effective manner while outlining associated risks. The Fire and Emergency Services Asset Management (AM) Plan defines the services to be provided, how the services are provided, and what funds are required to provide the services over a 10-year planning period.

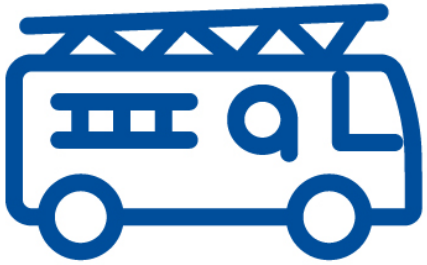
The MFES AM Plan also supports and is line with several legislative requirements in place which support the delivery of Fire Services including:

- National Fire Protection Association (NFPA) - NFPA 1, Fire Code, advances fire and life safety for the public and first responders as well as property protection by providing a comprehensive, integrated approach to fire code regulation and hazard management
- Occupational Health and Safety Act (OHSA) - The OHSA is the main piece of legislation governing health and safety in the workplace in Ontario. It sets out the legal rights and responsibilities of employers, employees, and other stakeholders in relation to health and safety

Under OHSA, employers are required to take all reasonable precautions to protect the health and safety of their employees. This includes protecting employees from the risks of fire and ensuring that they have the knowledge and resources they need to stay safe in the event of a fire.

[1] The overall replacement value for MFES does not include the City's Fire Facilities.

Key Stats

Current Replacement Value (CRV)	Average Condition	Current Maturity Level
$120.2 Million	Fair	Intermediate
Average Annual Infrastructure Gap – Current LOS		Average Annual Infrastructure Gap – Proposed LOS
$0.3 Million		Ongoing Analysis

State of the Infrastructure

Asset Hierarchy

Table 1: MFES Hierarchy

Asset Class	Asset Type
Fire Fleet	Front Line Vehicles
	Support Vehicles and Equipment
	Mechanical Shop Equipment
Specialized Tools and Equipment	Fire Fighting Tools and Equipment
	Professional Development and Accreditation Equipment
	Personal Protective Equipment
Information Technology	In-Vehicle Laptops
	Portable Radios
	Vehicle Communications (VCOM) Infrastructure
Facility Fixtures, Furniture and Equipment	Furnishing and Equipment
	Fitness Equipment

Asset Class - Summary

Asset Class	Current Replacement Value (Millions)	Average Condition	Average Annual Infrastructure Gap – Current LOS (Millions)
Fire Fleet	$97.8		$0.3
Specialized Tools and Equipment	$13.8		
Information Technology	$3.0		
Facility Fixtures, Furniture and Equipment	$5.6		

The average annual funding gap to meet proposed levels of service is an ongoing analysis that staff are conducting for all their asset classes.

Assets Used by MFES – Managed By Other Service Areas

Assets Used by MFES	Managed By	Quantity	Current Replacement Value (Millions)
Buildings	Facilities Planning & Development	32 Ea.	$166.2

Asset Management Tools & Systems

The City maintains its inventory information in various systems, with each system serving a specific function and purpose.

FASTER is the computerized management system used by Fire staff to manage asset inventory, condition and performance, and work order management.

WinFuel is a monitoring system that tracks fueling and fluid information for fleet assets, and automatically integrates with the FASTER system.

Excel is used to track the inventory for smaller fire equipment.

CityWide is the City's Tangible Capital Asset (TCA) System. The system was introduced in 2008 to capture infrastructure valuation information about the City's major assets.

Each of these systems plays an integral role in supporting decision-making about City services and infrastructure. The inventory information contained within each of these systems is comprehensive, reliable, and reasonably accurate and has been used to support the development of this plan.

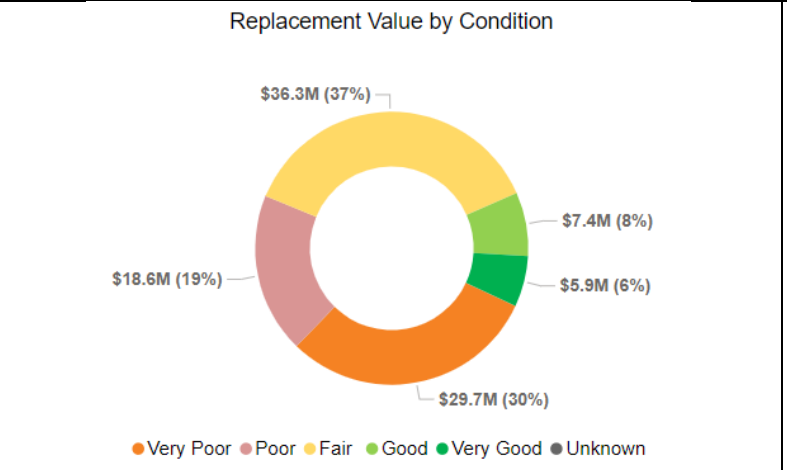
Dashboards

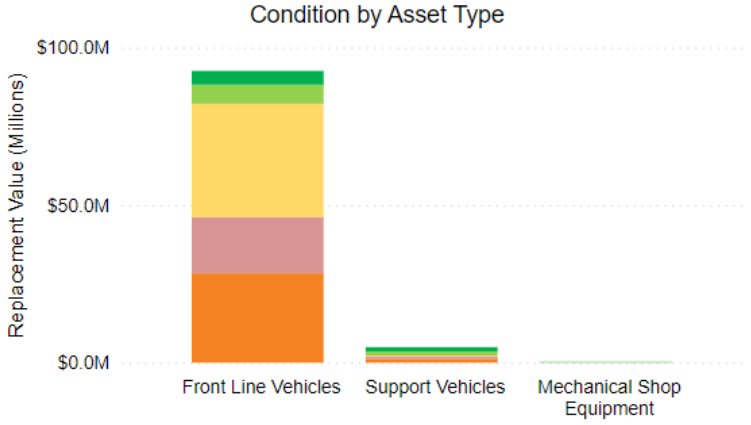
The following dashboards provide a summary of the state of the current infrastructure for each asset class. The information in this plan was prepared using 2023 year-end data. In charts, graphs and tables where money is represented in thousands of dollars ($000), figures have been rounded to the nearest thousand. This means that the totals shown may not always balance perfectly, due to rounding.

Asset Class: Fire Fleet

Data Quality:	Asset Inventory	Condition	Replacement Value
	A	A	B

Current Replacement Value: $97.8 Million





Asset Type	Quantity	Average Age (Years)	Estimated Useful Life (Years)	Current Replacement Value (000s)
Front Line Vehicles	47 Ea.	8.4	15	$92,650
Support Vehicles and Equipment	134 Ea.	6.5	8-20	$4,930
Mechanical Shop Equipment	42 Ea.	4.0	15-25	$225

Background Information

Front Line Vehicles

This asset type includes assets such as pumpers, aerials, squad vehicles and heavy duty five tonne vehicles. These are mission critical assets that are stored in the FASTER system. Condition is assessed annually using a 15-point scale as shown in Table 2.

Support Vehicles and Equipment

Support vehicles and equipment include small front line response vehicles, light and medium duty vehicles and small engine equipment. These assets are also tracked on a 15-point scale as shown in Table 2, and tracked in the FASTER system.

Mechanical Shop Equipment

Hoists, lifts, jacks, ground ladders and other mechanical equipment make up this asset type. These assets are currently tracked in Excel and pooled/grouped together for many assets. Staff have identified this as a continuous improvement item to refine the quality and reliability of the data. Remaining useful life (RUL) is used as a proxy of condition as shown in Table 2.

Front Line Vehicle - Ladder Truck

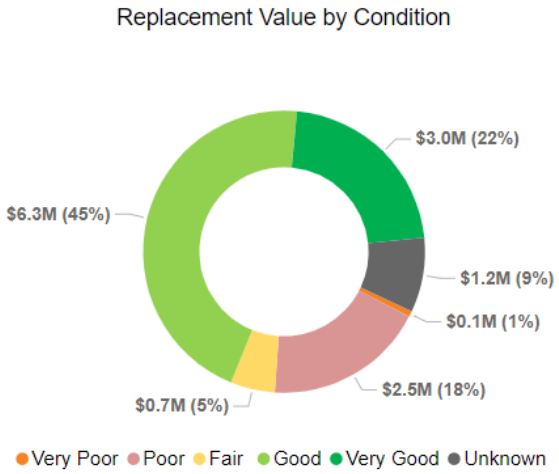
Table 2: Condition Rating Scale

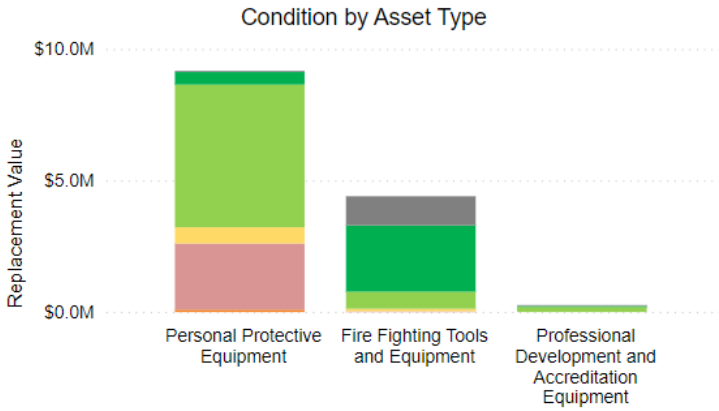
Condition Rating	% of Remaining Useful Life (RUL)	Fleet Condition Rating	Description
Very Good: Fit for the Future	RUL ≥ 75%	0-3	Asset is physically sound and is performing its function as originally intended. Required maintenance costs are well within standards and norms. Typically, asset is new or recently rehabilitated.
Good: Adequate for Now	75% > RUL ≥50%	4-6	Asset is physically sound and is performing its function as originally intended. Required maintenance costs are within acceptable standards and norms but are increasing. Typically, asset has been used for some time but is within mid-stage of its expected life.
Fair: Requires Attention	50 > RUL ≥25%	7-9	Asset is showing signs of deterioration and is performing at a lower level than originally intended. Some components of the asset are becoming physically deficient. Required maintenance costs exceed acceptable standards and norms and are increasing. Typically, asset has been used for a long time and is within the later stage of its expected life.
Poor: Approaching End of Life	25% > RUL >0%	10-12	Asset is showing significant signs of deterioration and is performing to a much lower level than originally intended. A major portion of the asset is physically deficient. Required maintenance costs significantly exceed acceptable standards and norms. Typically, asset is approaching the end of its expected life.
Very Poor (End of Life): Requires Renewal	RUL ≤ 0%	13-15	Asset is physically unsound and/or not performing as originally intended. Asset has higher probability of failure or failure is imminent. Maintenance costs are unacceptable, and rehabilitation is not cost effective. Replacement/major refurbishment is required.

Asset Class: Specialized Tools and Equipment

Data Quality:	Asset Inventory	Condition	Replacement Value
	C	C	B

Current Replacement Value: $13.8 Million





Asset Type	Quantity	Average Age (Years)	Estimated Useful Life (Years)	Current Replacement Value (000s)
Fire Fighting Tools and Equipment	1,883 Ea.	2.0	5-10	$4,400
Professional Development and Accreditation Equipment	203 Ea.	-	5-15	$260
Personal Protective Equipment	2,640 Ea.	6.0	10-15	$9,170

Background Information

Specialized Tools and Equipment include assets such as:

- Rescue Equipment
- Medical Equipment
- Fire Suppression hose
- Breathing Air Packs and Air Cylinders
- Specialized personal protective equipment

These assets are tracked on Excel at a high level. Asset data requires clean-up to improve decision-making. Staff continue to collect and refine attribute information such as in-service dates, quantity, and replacement values.

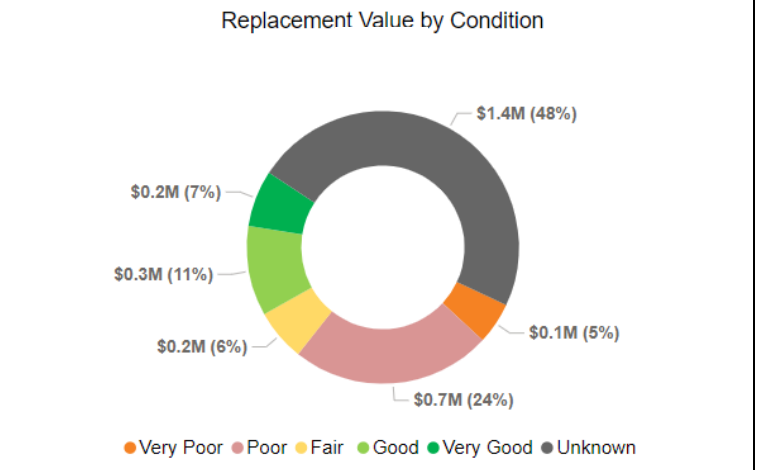
Staff utilize age and remaining useful life as a proxy for condition as shown in Table 2. Ten per cent of the assets are missing in-service date and are marked as Unknown condition.

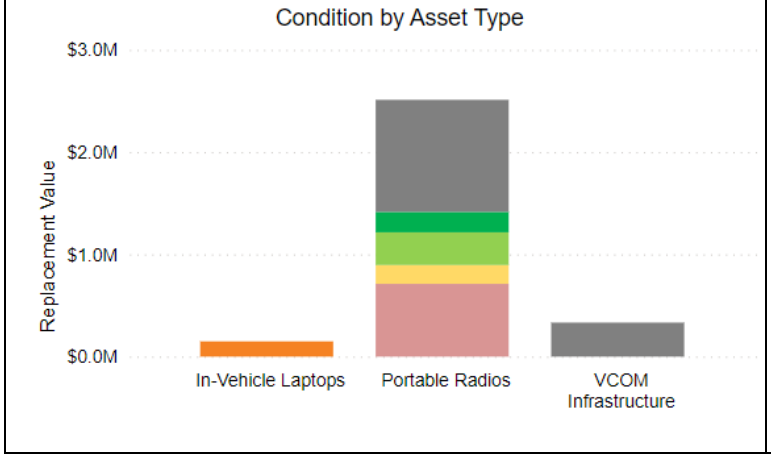
PPA - MSA Air Pack and Cylinder

Asset Class: Information Technology

Data Quality:	Asset Inventory	Condition	Replacement Value
	C	C	B

Current Replacement Value: $3.0 Million





Asset Type	Quantity	Average Age (Years)	Estimated Useful Life (Years)	Current Replacement Value (000s)
In-Vehicle Laptops	37 Ea.	-	5	$150
Portable Radios	314 Ea.	-	10	$2,510
VCOM Infrastructure	1 Ea.	-	50	$333

Background Information

Information technology allows Fire staff to communicate effectively and track critical information in real time.

In-Vehicle Laptops are laptops that are mounted in emergency vehicles and equipped with global positioning system (GPS), computer aided dispatch (CAD) and automatic vehicle location (AVL).

Portable Radios are comprised of handheld and mounted radios that are used for emergency response communications.

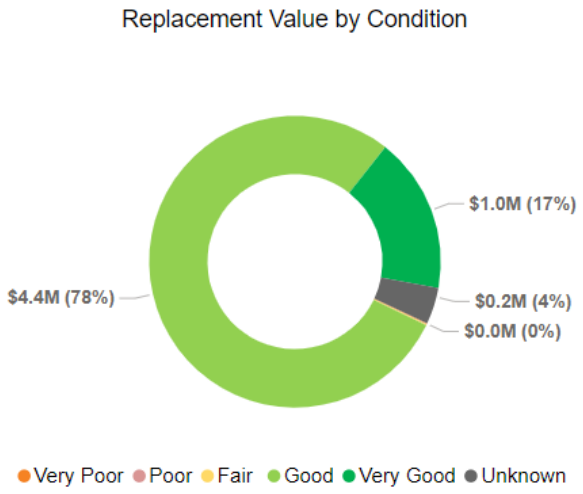
VCOM Infrastructure is a network of assets used by regional emergency services to support radio transmission. It is a shared system that includes the Region of Peel, Brampton, Caledon Fire, Alectra and the Canadian Border Services Agency. It collects and tracks information such as GPS data, maps, pictures, video and real time analytics. The replacement value included in this plan accounts of the City of Mississauga's portion only.

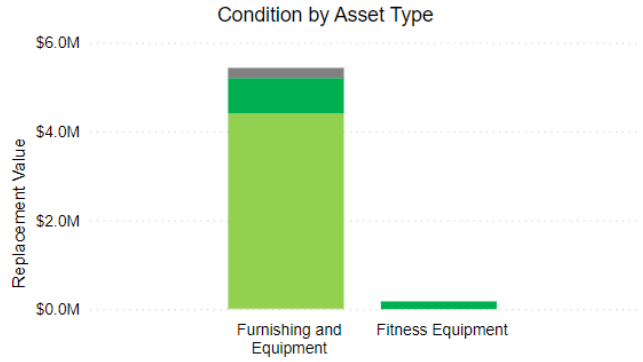
These assets are currently tracked on Excel, with much of the attribute information being limited. Age is used as a proxy for condition, where available. Staff will continue to collect and refine this asset class in future iterations of the asset management plans.

VCOM Infrastructure

Asset Class: Facility Fixtures, Furniture and Equipment

Data Quality:	Asset Inventory	Condition	Replacement Value	Current Replacement Value:	$5.6 Million
	C	C	B		





Asset Type	Quantity	Average Age (Years)	Estimated Useful Life (Years)	Current Replacement Value (000s)
Furnishing and Equipment	949 Ea.	-	10-15	$5,430
Fitness Equipment	293 Ea.	-	5-10	$180

Background Information

Facility fixtures, furniture and equipment includes all of the assets found within the fire stations and training centre that are the ownership and responsibility of MFES to lifecycle and replace. This includes assets such as tables, chairs, cabinets, small appliances, gym equipment, and more.

These assets are currently tracked on Excel and rely entirely on age as a proxy for condition. Because of the nature of these smaller assets, some are pooled/group together and do not have accurate attribute information tagged against them. Staff have identified this as a continuous improvement item to work on in upcoming years.

Furnishing and Equipment

Levels of Service

Governing Legislation for Fire and Emergency Services

Legislation	Requirements
Accessibility for Ontarians with Disabilities Act (AODA)	Developing, implementing, and enforcing accessibility standards to achieve accessibility for Ontarians with disabilities with respect to goods, services, facilities, accommodation, employment, buildings, structures, and premises on or before January 1, 2025.
Fire Protection and Prevention Act, 1997 (FPPA)	This Act consists of a set of minimum requirements for fire safety within and around existing buildings and facilities.
Fire Protection and Prevention Act, 2022-O. Reg 343/22	Firefighter Certification requires all Ontario municipalities to ensure that their staff are certified to the applicable National Fire Protection Association (NFPA) Professional Qualifications standards identified within the regulation. This new regulation comes into effect in two stages beginning on July 1, 2026, and July 1, 2028.
Ontario Regulation 378/18 Community Risk Assessments	Requires that every municipality and every fire department in a territory without municipal organization complete a community risk assessment and use it to inform decisions on the provision of fire protection services.
Highway Traffic Act	Also known as Section 159 (2,3) of Canada's Highway Traffic Act, the Move Over Law in Ontario states that drivers are required to slow down and move over to another lane when they approach emergency vehicles with flashing lights.
Occupational Health and Safety Act (OHSA)	OHSA sets out the legal rights and responsibilities of employers, employees, and other stakeholders in relation to health and safety.
O. Reg. 199/07: Commercial Motor Vehicle Inspections	All commercial motor vehicles and their drivers must meet strict safety standards and follow all commercial vehicle-related regulations in the Highway Traffic Act.
National Fire Protection Association (NFPA)	NFPA 1, Fire Code, advances fire and life safety for the public and first responders as well as property protection by providing a comprehensive, integrated approach to fire code regulation and hazard management.

Community Levels of Service Framework

Core Value	LOS Objective	Asset Class	Performance Measure	Current Performance
Capacity	MFES provides effective and timely emergency response.	All	City map, illustrating strategic location of fire stations and response area.	See Figure 3: Existing and Planned Future Fire Stations.
Function	MFES facilities meet functional requirements.	All	Description of applicable requirements for MFES facilities.	See Current Performance – Function.
Reliability	MFES keeps assets in a state of good repair (SOGR).	All	Description of inspection process and lifecycle activities MFES staff perform to ensure assets are at SOGR.	See Current Performance – Reliability.
	MFES provides effective and targeted public fire education.	All	Description of public education and outreach goals.	See Current Performance – Reliability.
	MFES provides fire safety standards and enforcement.	All	Descriptions of relevant standards.	See Governing Legislation for Fire and Emergency Services.
Financial	MFES services are financially sustainable.	All	Description of impact to underfunding assets to MFES services.	See Current Performance – Capacity.

Current Performance – Capacity

Capacity and use service attributes assess whether services have enough capacity and are available and accessible to customers. Deficiencies in these levels of service would indicate a need for expansion of the asset portfolio (e.g., to increase capacity or areas served).

Response Times

The National Fire Protection Association (NFPA) identifies a target of 240 seconds of travel time for the initial arriving fire apparatus, aiming to achieve this target 90 per cent of the time. MFES has more recently targeted a 75th per centile travel time.

MFES identifies the following concentration (depth of response) targets:

- 610 seconds or less travel time for seven apparatus to a fire in a confirmed high rise (90th percentile)
- 480 seconds or less travel time for five apparatus to a fire in a defined high-risk occupancy (90th percentile)

As the City continues to grow, MFES has been unable to achieve travel time targets. As a result, MFES has identified the need for six new fire stations over the next 12 years. The goal is to have stations located so that the response time for the first arriving vehicle from a station to an incident will occur in four minutes (240 seconds) or less, 75 per cent of the time.

MFES uses a targeted approach to public education and enforcement to augment emergency response in order to accept the risk differential between 75 per cent and the NFPA target of 90 per cent. These include:

- The expansion of targeted public education and proactive fire safety inspections
- The use of operational staff more effectively to deliver public education
- The reinforcement and consistent application of all available enforcement strategies to ensure compliance with the Ontario Building Code, Fire Code and other legislative requirements
- Leverage provincial residential fire safety strategies to target neighbourhoods with low smoke alarm compliance
- Complete an annual evaluation of City building stock and update proactive inspection records to ensure inspection frequency aligns with the assigned risk

Current Performance – Function

The service attribute related to function assesses whether services meet customer needs while limiting health, safety, security, natural and other impacts. Deficiencies in these levels of service would indicate a need for upgrades (e.g., to improve energy efficiency, or to meet latest technological standards).

Legislation

The City identified the following needs and is currently renovating 17 out of its existing 21 stations to meet the following:

- Accessibility - All 17 of the identified stations require upgrade work to be compliant with the 2015 City of Mississauga Facility accessibility Design Standards
- Staffing Composition - There are currently eight stations that do not have provisions for female washroom and change room facilities. As the staffing composition continues to change, stations must be modified to accommodate all employees
- Health and Safety Requirements (Occupational Health and Safety) - Cancer rates among firefighters, both active and retired, are much higher than rates in the general public. Front-line operations staff are at a high risk of exposure to contaminants, carcinogens and other hazardous substances. As a result, design standards for fire stations now include provisions for containment and avoidance of cross-contamination as well as proper storage for personal protective equipment. Specific asset upgrade activities performed on the facilities include ventilated bunker gear rooms, clean zone gym facilities, enhanced laundry facilities, among others

Energy Efficiency

In line with the City's Climate Action Plan, MFES is embarking on a number of initiatives to assist in reducing greenhouse gas emissions. These include:

Equipment

- Electric auto extrication equipment purchased and implemented in 2021/22 – previous equipment required the fire truck to be running to hydraulically power the tools
- All new lawn maintenance equipment purchased since 2021 is electric – no more gas-powered lawn equipment will be purchased
- Positive Pressure Ventilation (PPV) fans – trial has started in 2023 to evaluate the efficiency and effectiveness of Battery Electric PPV fans. The current fans are gas powered and emit very high levels of pollution
- All small hand tools and lights will be battery electric – old units were 120V and required the apparatus to be running to power

Vehicles

- 2022 – purchased six hybrid vehicles for the Command team
- 2023 – The City is currently in the delivery/commissioning stage for two electric transit vans, one electric and one hybrid pick-up truck, and one hybrid Compact SUV

- 2023 – MFES is exploring the electrification of front-line apparatus and as such has ordered its first electric vehicle (EV) fire truck (with an estimated delivery year of 2024)

Facilities

- New fire stations will be designed to achieve Net Zero Energy (FS125 opening in 2024, FS123 opening in 2025/26, FS124 opening in 2026, and FS126, FS127 and FS128 are in the planning stage)
- New Fire stations and renovated stations will be equipped with electric vehicle charging stations, and have the infrastructure for future electric fire apparatus available
- All new Fire Stations will be designed with the goal of achieving Net Zero Energy
- All new Fire Stations will be built with the necessary infrastructure to accommodate electric vehicle charging

Current Performance – Reliability

The service attribute related to reliability assesses the physical condition and age of the assets. Deficiencies in these levels of service would indicate a need for renewal (rehabilitation or replacement) or repair of assets, or changes to operations and maintenance strategies.

State of Good Repair

After a thorough review of appropriate lifecycle replacement models for front-line fire apparatus, MFES has implemented a comprehensive method of prioritizing and evaluating the lowest lifecycle cost of these assets through the Fleet Management Information System (FMIS). Each asset's eligibility and priority for replacement is determined using a point system, with points allocated on four criteria: age, meter (KMs/Hours), maintenance and repair cost, and a condition assessment. A combination of these criteria is used to determine both capital planning and replacement priority:

- Current Age – Every asset subject to the Fleet Asset Replacement Cycle has a pre-determined lifecycle, based on factors inherent to the type of equipment, use of equipment, and frequency of use. This was developed using industry best practices and benchmarked against similar municipalities. The further along in the assets anticipated lifecycle, the higher the point total for lifecycle
- Current Meter – Expected end of life meter: Every asset has a pre-determined lifecycle based on usage, recorded as mileage or hours. Every asset is tracked for usage. The higher the meter, the higher the point total for meter
- Maintenance and repair cost – Every maintenance and repair dollar spent is tracked in the FMIS. This

data is used to ensure that the total lifecycle cost of each asset is tracked. The greater the ratio of maintenance and repair cost to the original acquisition cost of the asset, the higher the point total for maintenance and repair cost. This category is double weighted

- Mechanical condition assessment – Every asset receives, at a minimum, an annual condition assessment as part of the comprehensive preventative maintenance program. Technicians evaluate the overall condition of the asset and assign a point value to condition

This comprehensive method of empirically validating and evaluating asset replacement allows multiple inputs to contribute to the replacement decision-making and establishing priorities, while maximizing the useful life of the assets, at the lowest possible cost. The most important factor is that this approach moves replacement cycle decision-making into a data-centered model.

This process is ongoing with the purchase of several new, front-line vehicles to replace those which are beyond their reasonable lifecycle. A fleet preventative maintenance program has been executed, which is expected to reduce the time a vehicle is out of service for demand maintenance. As part of an overall review of capital assets, MFES will undertake a full lifecycle review of all major equipment. This will assist in the development of a more rigorous lifecycle replacement plan that will inform the 10-year Capital budget process.

Public Education

Proactive public fire safety education is the primary strategy to improve community safety. Promoting fire safety awareness among community residents has been demonstrated as an effective strategy in reducing the occurrence of fires. MFES delivers a variety of public education programs for everyone, from young children to seniors. These programs are delivered by both public education officers who specialize in developing and delivering fire safety programs, as well as fire suppression crews who interact with the community daily. The overall objective of these programs is to educate the public on the dangers of fire and provide information on how to prevent fires.

Staff Training

On April 14, 2022, the Province imposed Ontario Regulation 343/22 – Firefighter Certification, under the FPPA, which requires all municipalities in Ontario to ensure that their staff are certified to the applicable National Fire Protection Association (NFPA) Pro-Qual standards identified within the regulation. This new regulation comes into effect in two stages beginning on July 1, 2026, and July 1, 2028. The seven technical rescue services outlined in the regulation include:

- Surface Water Rescue
- Swift Water Rescue
- Ice Rescue
- Rope Rescue
- Trench Rescue
- Confined Space Rescue
- Structural Collapse Rescue

The Professional Development and Accreditation Section of MFES will be responsible for overseeing certification efforts to meet the requirements of this new legislation and manage the challenges of delivery/implementation.

Inspections

The frequency of inspections is an important issue and impacts the ongoing level of fire safety and code compliance of properties. Routine inspections should be conducted at a frequency that conveys and reinforces to property owners the importance of their properties being maintained in a code-compliant condition. The inspection frequency will be based on the risk identified in the Community Risk Assessment (CRA) and the application of NFPA 1730 which defines minimum inspection frequency for fire safety inspections, based on occupancy risk. MFES completes an annual evaluation of City building stock and updates proactive inspection records to ensure inspection frequency aligns with the assigned risk. To ensure inspection cycles commensurate with the level of risk, the fire safety inspection program will be expanded to include on-duty fire operations staff to greatly increase the number of inspections that can be completed.

Technical Levels of Service Framework

LOS Objective	Performance Measure	Current Performance (2023)	Target Performance (2024-2033)	Background Information
Core Value: Capacity				
MFES emergency response performance.	First Arriving Apparatus - Travel Time (seconds) (75th percentile) - ALL calls.	336	240	N/A
	First Arriving Apparatus - Travel Time (seconds) (75th percentile) - FIRE calls.	320	240	N/A
	Travel time for seven apparatus to a fire in a confirmed high rise (90th percentile).	956	610	N/A
	Travel time for five apparatus to a fire in a defined high-risk occupancy (90th percentile).	792	480	N/A
Core Value: Function				
MFES meets functional requirements.	% fire facilities that meet AODA and other legislative compliance.	90%	90%	N/A
	Annual reduction in tonne carbon dioxide equivalent (tCO2e) for Fire Fleet.	65 tCO2e or 7%	TBD	N/A
Core Value: Reliability				
MFES keeps assets in a state of good repair (SOGR).	% fire assets with high or very high criticality rating in fair or better condition.	TBD	TBD	N/A
	% fire assets with moderate, low or very low criticality rating in fair or better condition.	TBD	TBD	N/A

LOS Objective	Performance Measure	Current Performance (2023)	Target Performance (2024-2033)	Background Information
	% assets in very poor condition.	24.9%	TBD	N/A
	% fire fleet that meet MTO inspection schedules.	100%	100%	N/A
	% fire fleet that meet MFES planned inspection schedules (on-time).	100%	100%	N/A
	Preventative Maintenance Ratio.	35%	60%	N/A
MFES provides public fire education.	% of population receiving public fire safety education.	5%	TBD	N/A
MFES provides fire safety standards and enforcement.	% of staff trained to NFPA 1031 (Fire Inspector) Standards – captains.	24%	TBD	N/A
	% of staff trained to NFPA 1035 (Public Educator) Standards - suppression staff.	54%	TBD	N/A
	% of fire inspections completed on high-risk properties.	96%	TBD	N/A
Core Value: Affordability				
MFES services are financially sustainable.	Actual vs. Target Reinvestment Rate.	0.64% vs. 0.67%		N/A

Demand Management

Drivers affecting demand for Fire and Emergency Services include changes to development form and density, regulations and legislation, technological changes, economic factors, environmental awareness and the direct impact of climate change on MFES' assets.

Demand for new services will be managed through a combination of managing existing assets, upgrading of existing assets, providing new assets to meet demand, and demand management. Demand management practices include non-asset solutions such as public education, insuring against risks and managing failures.

Non-asset solutions focus on providing the required service without the need for asset ownership and management actions including reducing demand for the service, reducing the level of service (allowing some assets to deteriorate beyond current service levels) or educating customers to accept appropriate asset failures.

Asset Programs to meet Demand

Growth New Fire Stations (represented in the FPM AM Plan):

- Fire Station 123 – 3050 The Collegeway
- Fire Station 124 – 2524 Cawthra Road
- Fire Station 125 – 6627 Tenth Line
- Fire Station 126 – Land to be acquired in the Mavis and Dundas area
- Fire Station 127 – Land to be acquired in the Lorne Park area
- Fire Station 128 – Land to be acquired in the QEW and Dixie

MFES Growth to Support New Fire Stations:

- New Fire Apparatus
- New Fire Apparatus Tools and Equipment
- New Fire Station Furniture, Fixtures, and Equipment
- Personal Protective Equipment for new staff for new fire stations
- Replacement of Emergency Response Tools and Equipment (partial growth-related purchases)
- Technical Rescue Equipment Replacement (partial growth-related purchases)
- VCOM Infrastructure Upgrades

The cumulative asset inventory is expected to grow by $22.7 million over the next 10 years, irrespective of the facilities the City is acquiring and/or improving through significant renovation. MFES also plans to spend a total of $0.5 million over the next 10 years in upgrade-related purchases.

Demand Drivers, Projections and Management Plans

Current Situation	Projection	Impact on Services	Demand Management Plan
Demand Driver: Demographics			
Children aged 14 and under, represent 15.2 per cent of the city's total population Seniors (age 65 and older) represent 16.37 per cent of the city's total population.	Seniors are at an increased risk of fire fatality in residential occupancies when compared to other age groups. Seniors account for a much higher percentage of fire fatalities than their proportion of the population. Most reported fire-related civilian injuries occurred in residential occupancies.	Youth represent an important demographic for the purposes of public education. There is value in targeted public education and prevention programs to this demographic. Structured education programs for children and youth can promote fire and life safety awareness for future generations which helps mitigate fire-related risks.	Develop and provide public education programming that targets: • Residents aged 65 and above • School-age children ages six to 14 • Unregistered daycares and community group homes
Demand Driver: Building Stock			
Residential Occupancies represent 93.24 per cent of the city's existing property stock, and 66.9	The majority of civilian injuries occurred in residential occupancies.	Potential for vulnerable individuals including seniors and youth residing in residential occupancies.	Assess infrastructure, equipment and deployment needs in community development nodes including Port Credit and Lakeview to

Current Situation	Projection	Impact on Services	Demand Management Plan
per cent of the city's fire loss. The city currently has 2,343 buildings defined by the Ontario Building Code (OBC) as high-rise buildings with a floor level 18 metres (59 feet) above grade, or five storeys.	Of the fire loss incidents in Residential occupancies 29 per cent of incidents did not have a smoke alarm present and 14 per cent of incidents had a smoke alarm present but was not operational.	Potential for exposure risk depending on dwelling type and building age. As the city continues to grow, construction may include increased numbers of multifamily dwellings and high-rise occupancies.	ensure future population growth and provincially accelerated growth targets are addressed. Monitor development and trends along transit corridors and adjust operational programming to meet needs and circumstances. Develop and deliver a risk reduction strategy for high-rise and high-risk building stock. Complete the Fire Station Infrastructure Plan including the construction of new fire stations and renovation of existing stations. Deliver a pre-incident planning program based on the National Fire Protection Association (NFPA) 1620 standard.

Current Situation	Projection	Impact on Services	Demand Management Plan
Demand Driver: Fire Loss			
Industrial occupancies represent 2.29 per cent of the city's property stock and 11.6 per cent of the city's fire loss.	Many industrial properties with potential fuel load concerns include heavy manufacturing (non- automotive), truck terminals, mini-warehousing, distribution centres, petro-chemical plants and food processing plants.	Understanding building use – large buildings such as industrial plants and warehouses, department stores and big box stores can contain large volumes of combustible materials. Building areas can cause comparable challenges. Horizontal travel distances can also mean extended response times by firefighters. Many industrial properties with potential fuel-load concerns. There are a number of warehousing units in the City to support the economic hub around the airport and the local goods movement network.	Implement a pre-incident planning program based on the National Fire Protection Association (NFPA) 1620 standard. Complete an annual evaluation of city building stock and update proactive inspection records to ensure inspection frequency aligns with the assigned risk. Reinforce and consistently apply all available enforcement strategies to ensure compliance with the Ontario Building Code, Fire Code and other legislative requirements. Develop and deliver a risk reduction strategy for high-rise and high-risk building stock.

Risk Management

Asset Risk Framework

For this AM Plan, risks are defined as adverse impacts on MFES's ability to meet Customer LOS expectations, as measured by the Technical LOS Indicators outlined in the following chapter.

Criticality Assessment

Risks are identified as the failure to meet target or assumed target Technical LOS. The risk grading scales to quantify asset criticality are outlined in Table 3. The risk assessment for the MFES AM Plan excludes full asset risk profiles (which include likelihood of failure), and instead focuses on asset criticality.

Table 3: Consequence of Failure Scale

Consequence	Description	Score
Very Low	• Easy to replace • Can be non-operational for multiple months without significantly impacting core service delivery to many users	1
Low	• Somewhat difficult to replace • Can be non-operational for multiple weeks without significantly impacting core service delivery to many users • Asset does not perform a safety function or meet a regulatory requirement	2
Medium	• Moderately difficult to replace • Outages of more than a couple of days may significantly impact core service delivery to many users • Asset may perform a safety function or meet a regulatory requirement	3
High	• Highly mission-sensitive asset with no redundancy • Mission-critical asset with very limited redundancy • Significant community investment	4
Very High	• Mission-critical and unique asset • Significant service disruption from any outage • No redundancy • Significant community investment	5

Asset Criticality Assessment

The potential consequence of not keeping assets in a state of good repair was assessed, by Asset Class and Asset Type, using the frameworks above. The rationale for the assessment and the resulting asset criticality were provided by MFES staff and are detailed in Table 4 below. Based on the criticality assessment, the Current Risk profiles were evaluated using a Risk Rating Matrix. Critical risks are those assessed with ratings of 'Very High' (requiring immediate corrective action) and 'High' (requiring corrective action).

Table 4: Asset Criticality Rating

Asset Class	Asset Type	Criticality	Rationale/Notes
Fire Fleet	Front Line Vehicles	3-4	Highly mission sensitive, little redundancy.
	Support Vehicles and Equipment	1-3	Small front line response vehicles are specialty equipped and not easily replaced compared to other vehicles and small engine equipment.
	Mechanical Shop Equipment	1-3	Some assets like hoists and lifts are more critical as they pose safety concerns if they fail. Ground ladders are not easy to replace.
Specialized Tools and Equipment	Fire Fighting Tools and Equipment	2-4	Rescue equipment are highly mission sensitive, long lead time replacement. Other tools are on specialty order.
	Professional Development and Accreditation Equipment	1-2	N/A
	Personal Protective Equipment	1-2	Short lead time, have redundancy or ability to rent.
Information Technology	In Vehicle Laptops	3	No spares, redundancy with phones and other maps.
	Portable Radios	4	Hard to replace (current market conditions).
	VCOM Infrastructure	4	Shared, inter-related with Portable Radios.
Facility Fixtures, Furniture and Equipment	Furnishing and Amenities	1	N/A
	Fitness Equipment		

Lifecycle Management

Lifecycle Strategies

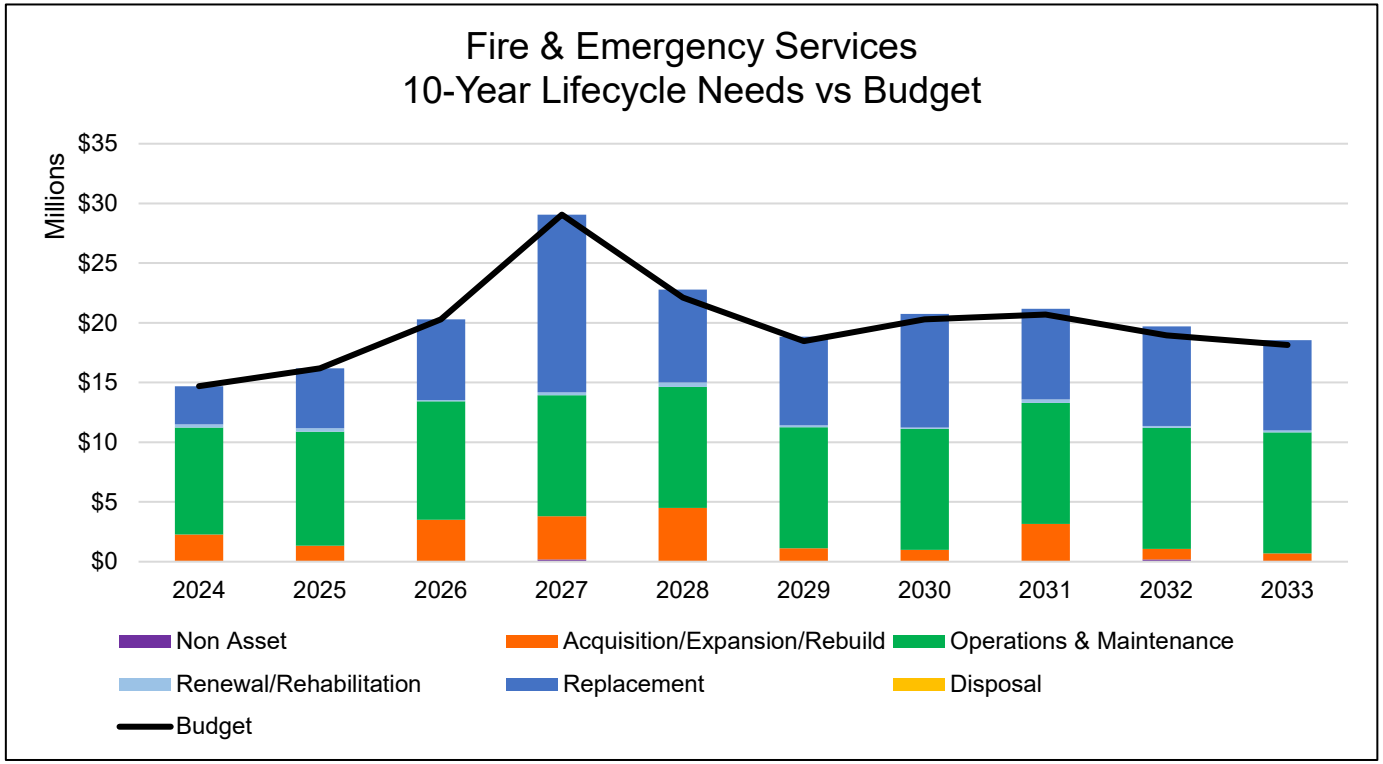
Fire and Emergency Services – Current and Proposed Lifecycle Activities

Current and Proposed Lifecycle Activities	Risks associated with Lifecycle Activities
Non-Asset Solutions: Activities that do not alter the condition or performance of assets or services but provide staff with valuable information for their effective management.	
• Standard Operating Procedures • Service Level Agreements with user groups • Driver training for vehicles and equipment • Annual Asset Utilization Reports • Green Vehicle and Equipment Policy	• Impacts to service delivery • Health and safety risks to City staff and Public • Potential non-compliance with legislation
Operations & Maintenance: Minor activities that preserve the condition or performance of assets and ensures the longevity of assets in line with their design and operational requirements.	
• Routine condition inspections for fleet and specialized equipment • Legislated inspections for fleet and specialized equipment • Reactive maintenance – as and when required	• Failure to complete condition inspections can lead to unexpected operational issues • Failure to complete legislated inspections can lead to fines by the Province • Failure to maintain assets can lead to increased costs over the lifecycle of the asset
Renewal/Rehabilitation: Significant activities designed to extend the useful life of assets components.	
• Refurbishment of front-line vehicles on adhoc basis • No early, mid, or later life rehabilitation activities for other asset classes	• Failure to refurbish front-line vehicles can lead to increased costs over the entire lifecycle of the asset

Current and Proposed Lifecycle Activities	Risks associated with Lifecycle Activities
Replacement: Replacement activities occur once an asset reaches the end of its useful life, cannot provide the intended function or performance, and rehabilitation is not a viable option.	
• Assets are replaced when they reach their end-of-life or no longer meet functional requirements	• Failure to replace some assets within planned service life may result in decrease reliability, increased downtime, increased operating costs and failure to meet legislative requirement associated with industry standard best practices such as NFPA
Disposal/ Demolition: Activities associated with the disposal or decommissioning of an asset.	
• Optimal lifecycle analysis is completed for each asset prior to replacement. Salvage value can vary but an average of 10-15 per cent of replacement value is consistently achieved • Auction planning ensures that similar assets are staggered and targets seasonal demands for assets to maximize return	• Improper disposal can lead to environmental damages, lost recovery from salvage and increased repair costs for assets that have already been replaced
Acquisition/Expansion/Rebuild: These activities expand services to previously non-serviced areas or to accommodate growth; they provide new or enhanced services beyond the current capacity and/or functionality of existing assets.	
• Low- or zero-emissions fleet assets being acquired • Proactive planning for charging infrastructure	• Unsustainable fleet inventory and compromise in state of good repair of assets • Inability to mitigate climate change impacts and other demand factors • Growth activities may be delayed and impact the quality of asset services provided

Lifecycle Needs vs. Budget

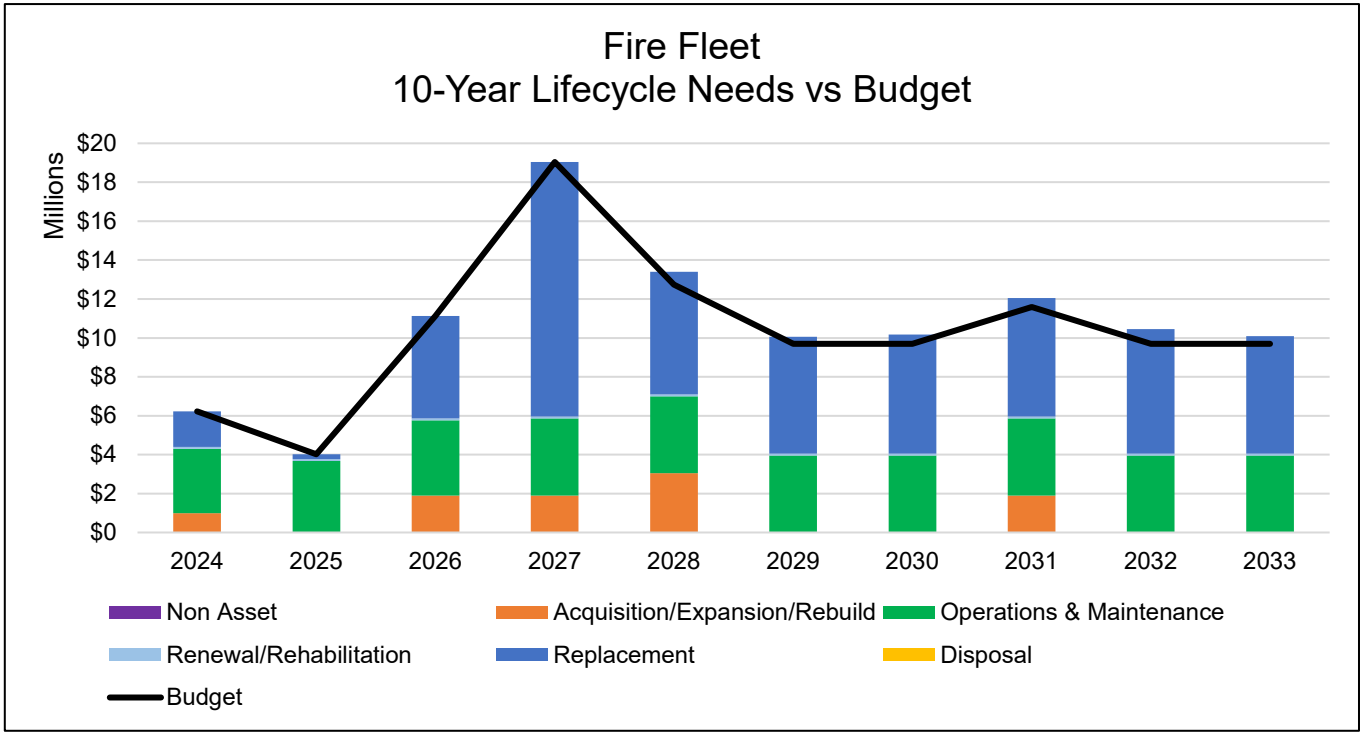
Fire and Emergency Services



Approximately 40 per cent of the Fire and Emergency Services assets are in Very Poor – Poor condition, indicating that a moderate portion of the inventory will be replaced within the next 10 years. Staff will also be acquiring several new personal protective equipment and fire fleet assets in order to improve service delivery.

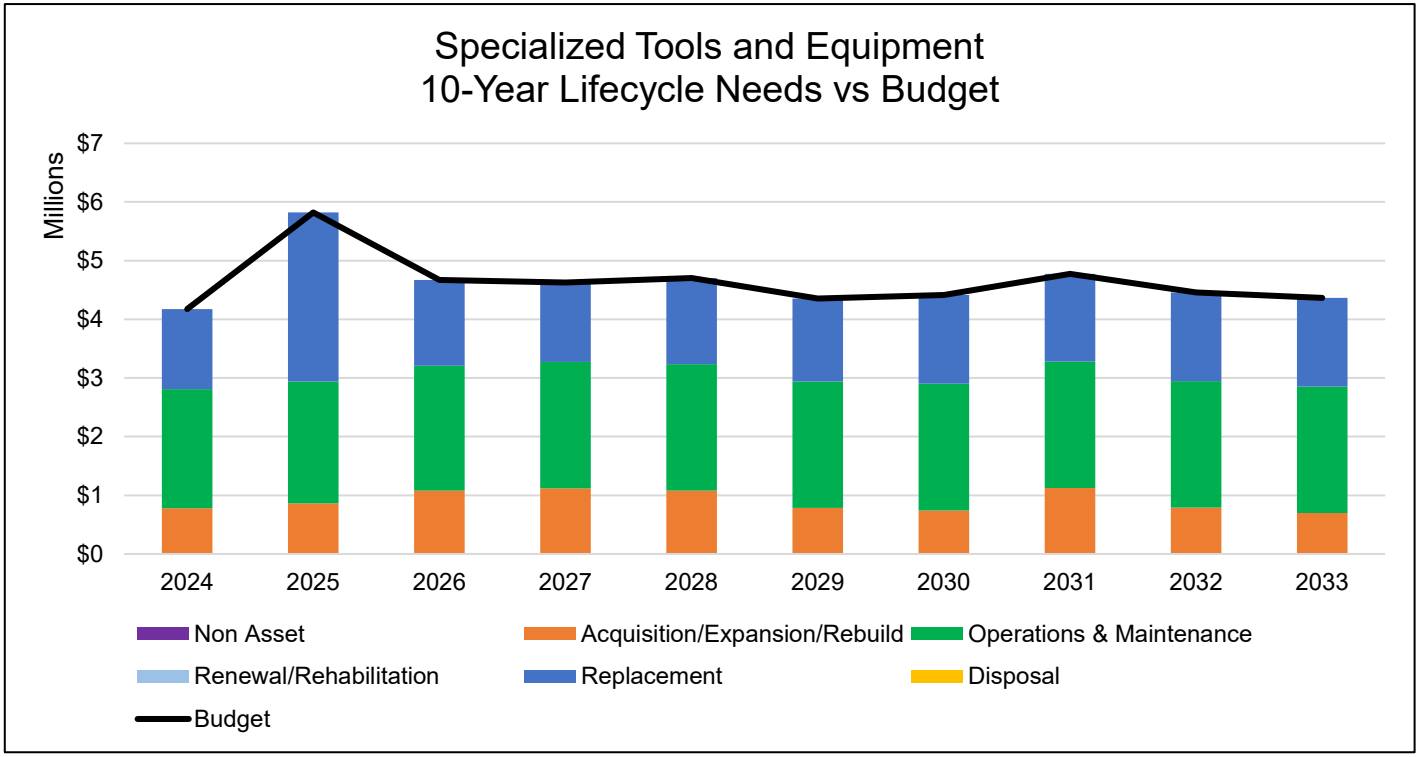
As part of continuous improvement, staff will continue to quantify and analyze the lifecycle needs required as they refine their proposed levels of service, where they have been established, along with any resourcing requirements as a result.

Fire Fleet



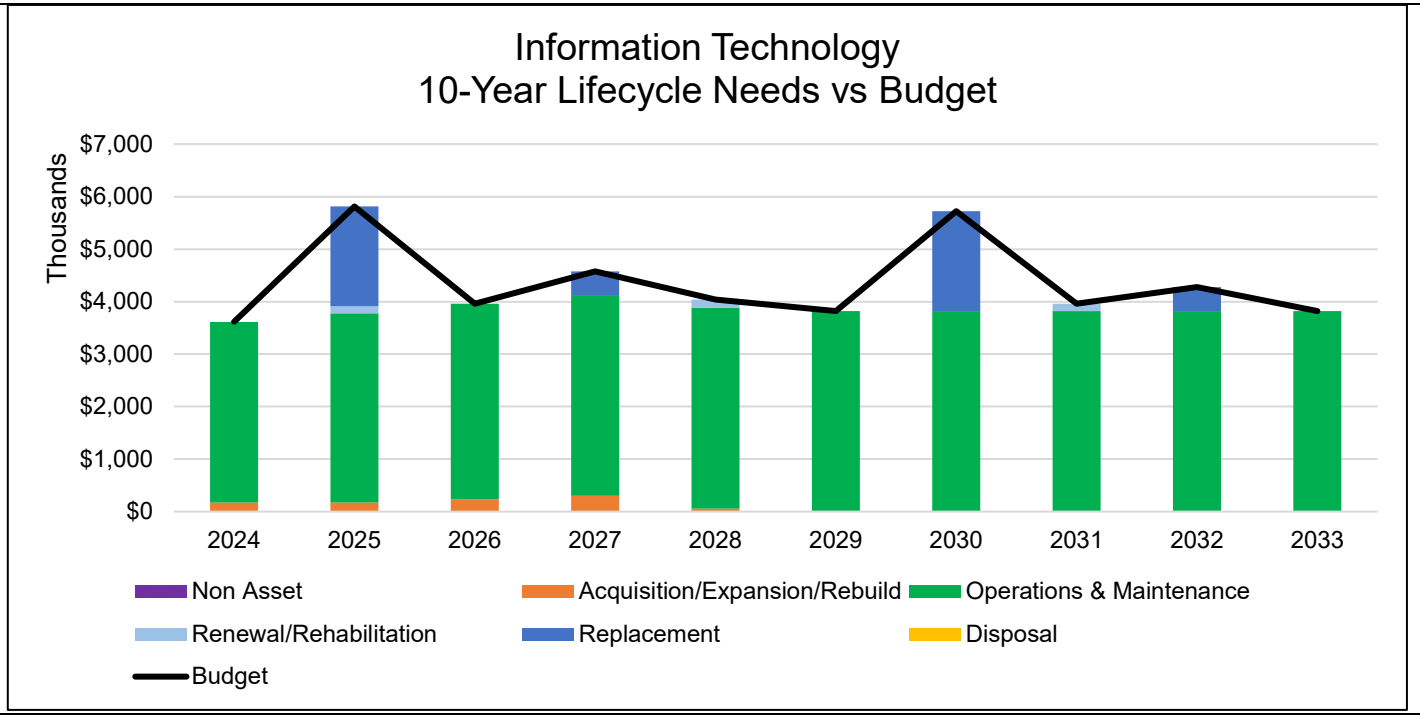
Almost 50 per cent of the fire fleet assets are in Very Poor-Poor condition, indicating some major replacements in the next 10 years. A constant challenge for staff to forecast replacements proactively is the long lead times between ordering a fleet asset and receiving it.

Specialized Tools and Equipment



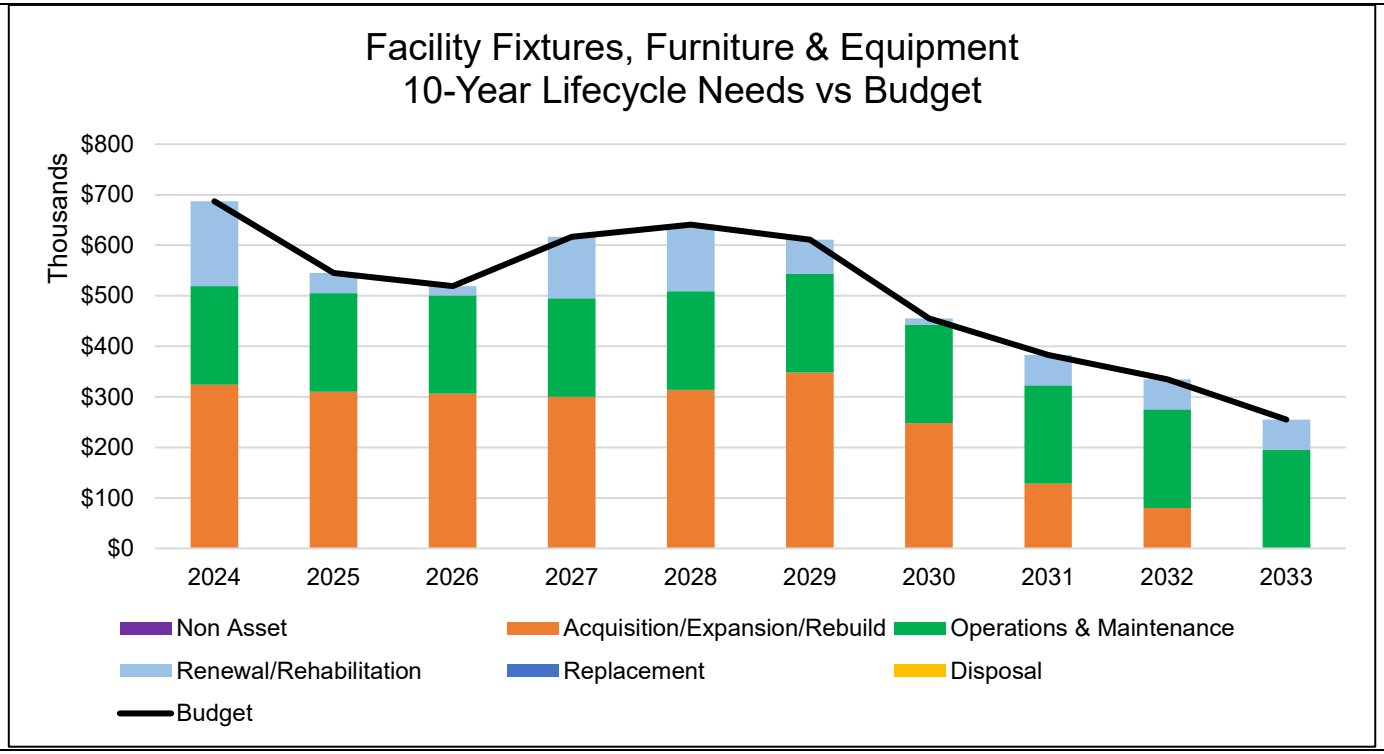
Many of the specialized tools and equipment are at the beginning of their estimated useful life and will typically be replaced on a cyclical basis when they no longer function as intended.

Information Technology



Information technology assets are largely maintained through Operations & Maintenance and replaced when they reach their end of useful life or become obsolete. A large portion of these assets are unknown condition rating which may increase rehabilitation, or replacement needs if they are found to be in poor condition upon inspection.

Facility Fixtures, Furniture and Equipment



Most of the assets in facility fixtures, furniture and equipment are in fair or better condition meaning only a small subset will require renewal or replacement in the next 10 years.

Budget Breakdown

Over the next 10 years, MFES plans to spend an average of $19.9 million annually, with the majority of the budget being used for operations and maintenance activities at 49.9 pr cent and replacement activities at 37.7 per cent.

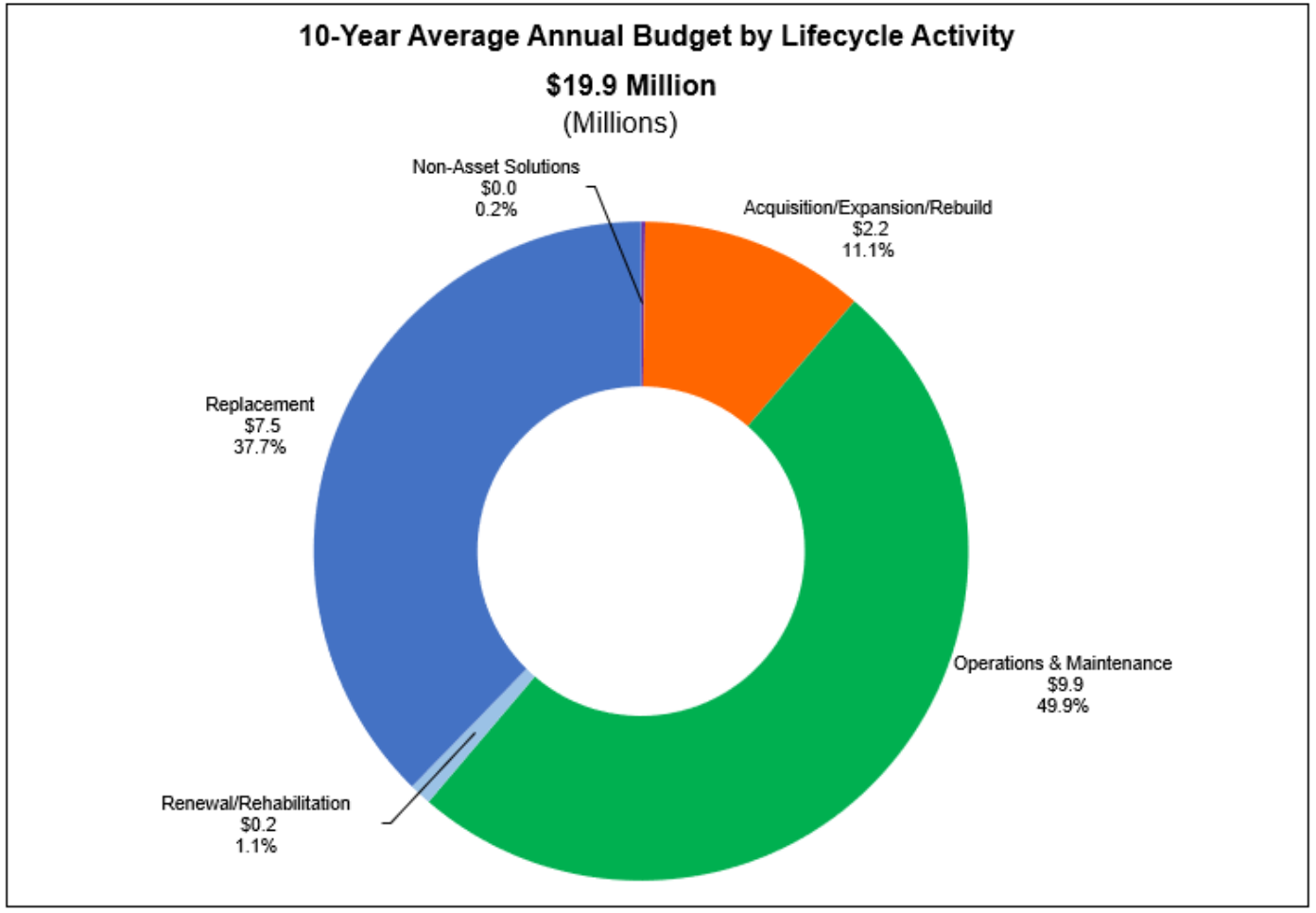


Figure 1: Breakdown of Budget by Lifecycle Activity

Table 5 shows the 10-year annual average budget breakdown by asset class. The majority of the of the operating and capital budget is spent on State of Good Repair (SOGR) of Fire & Emergency assets.

Table 5: Budget breakdown by Asset Class

Asset Class	SOGR Budget Type ($ Million)			Growth Capital Budget ($ Million)	Total Budget ($ Million)
	Operating	Capital	Total		
Fire Fleet	3.9	5.7	9.6	0.8	10.4
Specialized Tools & Equipment	2.1	2.3	4.4	0.2	4.6
Information Technology	3.8	0.6	4.4	-	4.4
Facility Fixtures, Furniture & Equipment	0.2	0.2	0.4	0.1	0.5
Other[2]	-	-	-	0.04	0.0
Total	**9.9**	**8.8**	**18.8**	**1.1**	**19.9**

[2] "Other" asset class denotes lifecycle activities that span over multiple asset classes within the service area such as plans, studies, and other non-asset solutions.

Financing Strategy

Capital Funding Sources and Operating Revenue Sources

The estimated available funding for the next 10-year period (2024-2033) for MFES is $198.9 million. The primary sources of funding are operating revenue sources at 49.9 per cent, Tax Reserve Funds at 46.1 per cent which is primarily used to support capital infrastructure renewal needs, and Development Charges Reserve Funds at 4.0 per cent, supporting growth projects.

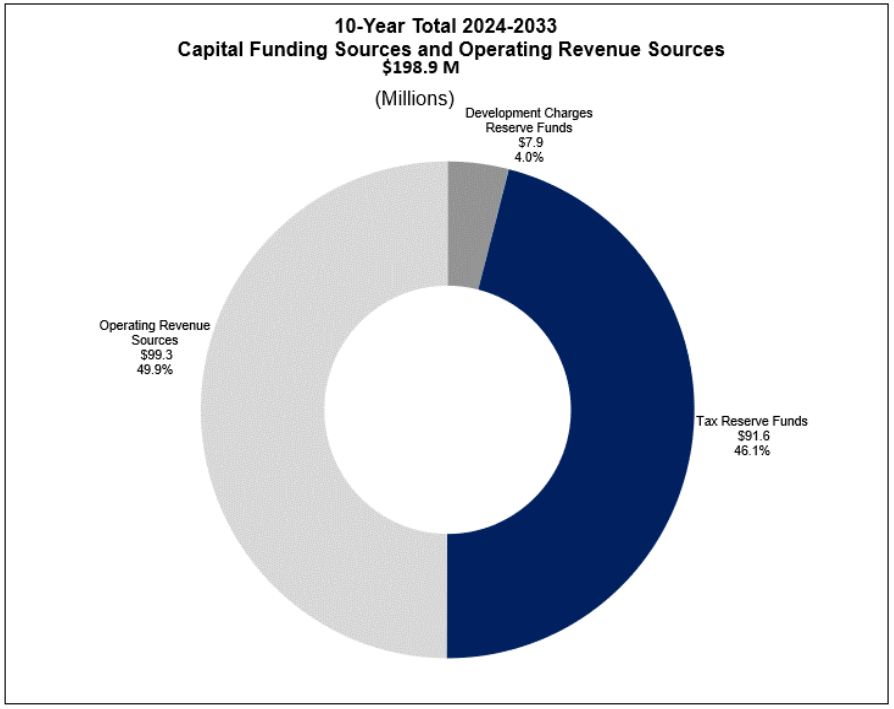
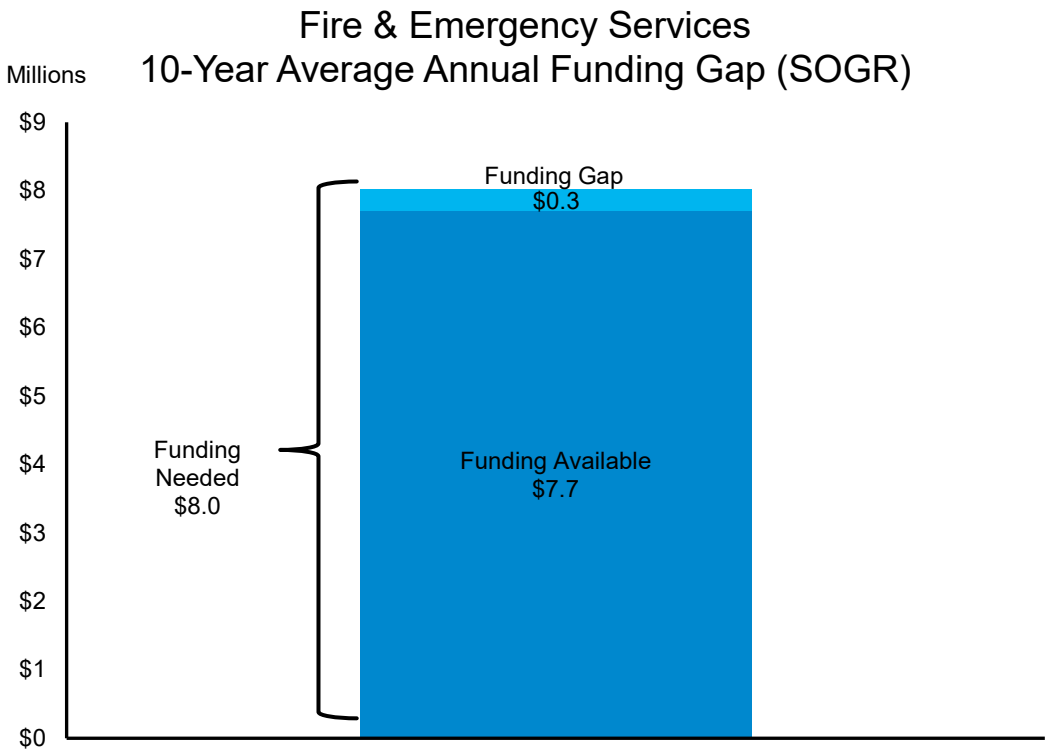


Figure 2: Capital Funding Sources (2024-2033)

Infrastructure Gap

Fire and Emergency Services



Overall, the average annual funding available is approximately $7.7 million and the average annual needs to maintain the current LOS are $8 million, resulting in an average annual funding gap of $0.3 million.

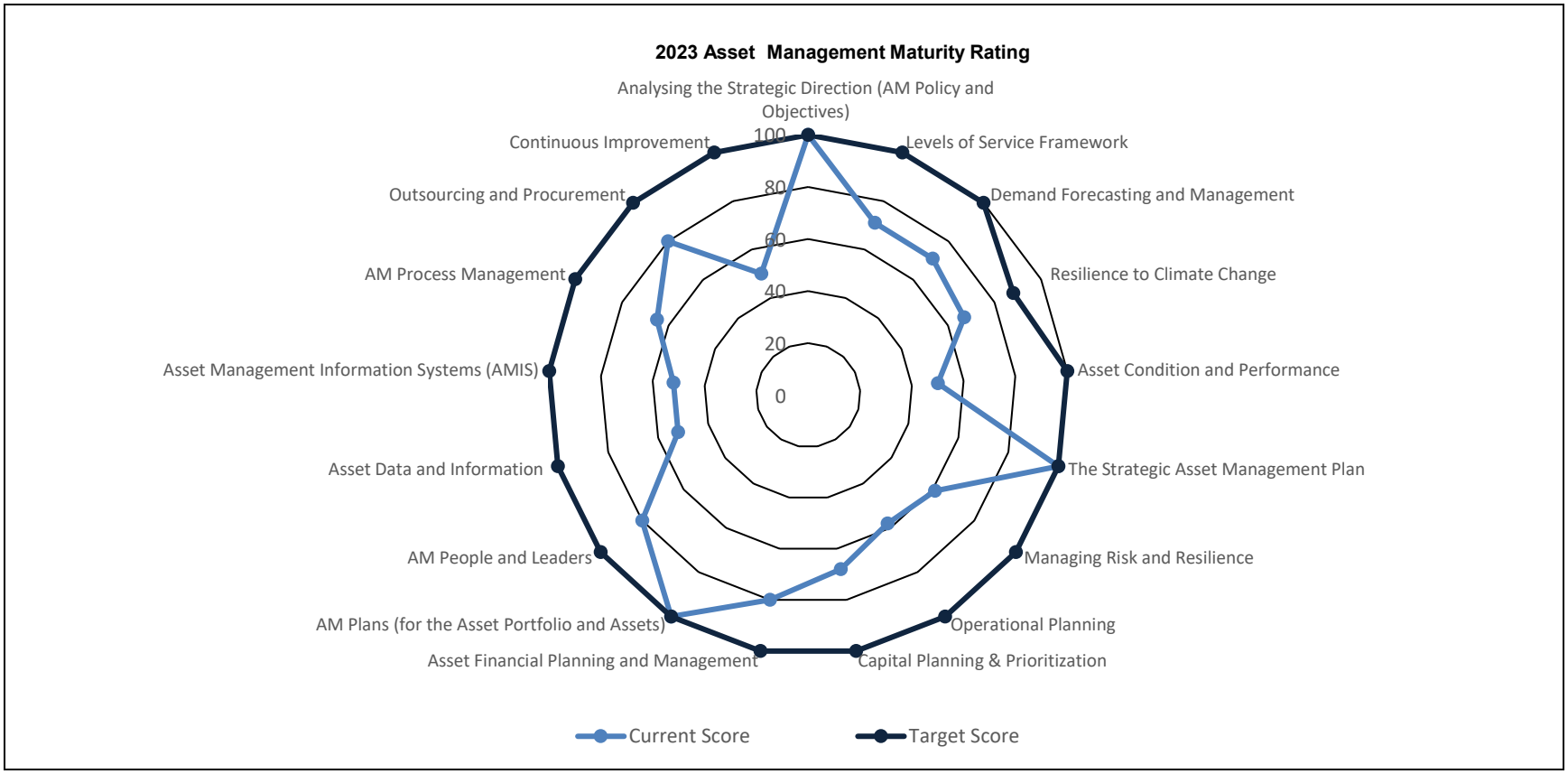
For this iteration, only the fire fleet asset class is shown to have a funding gap. Specialized equipment, IT and Facility Fixtures asset classes are sufficiently funded to meet current service level demands. As part of continuous improvement, staff will continue to evaluate the affordability and sustainability of proposed levels of service, where they have been established, and integrate their asset management program with the annual budgeting process.

Continuous Improvement & Maturity

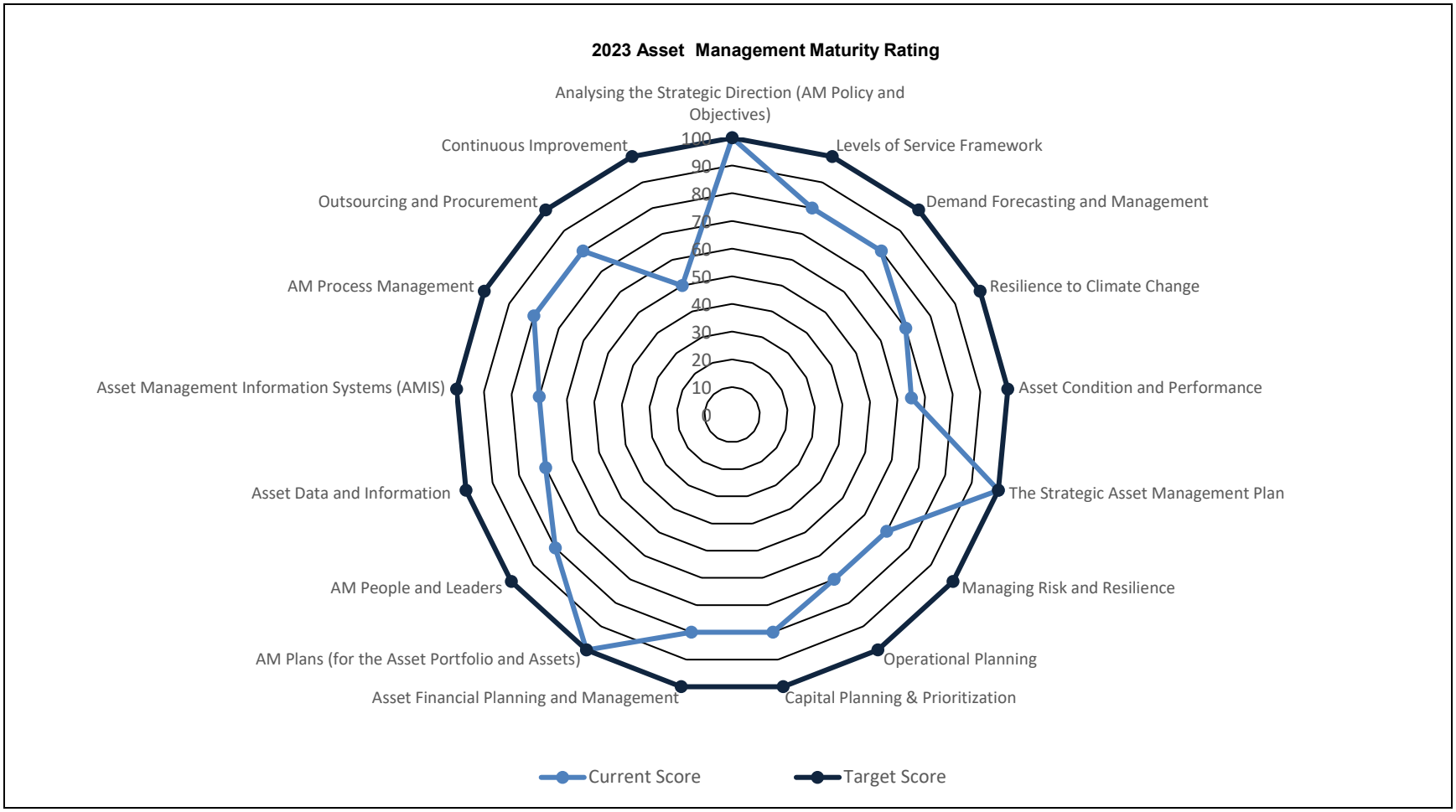
Maturity Assessments

The radar graph(s) below are based on a 2023 maturity assessment. As the service areas mature in each category, they will expand outwards towards the outer ring (Target).

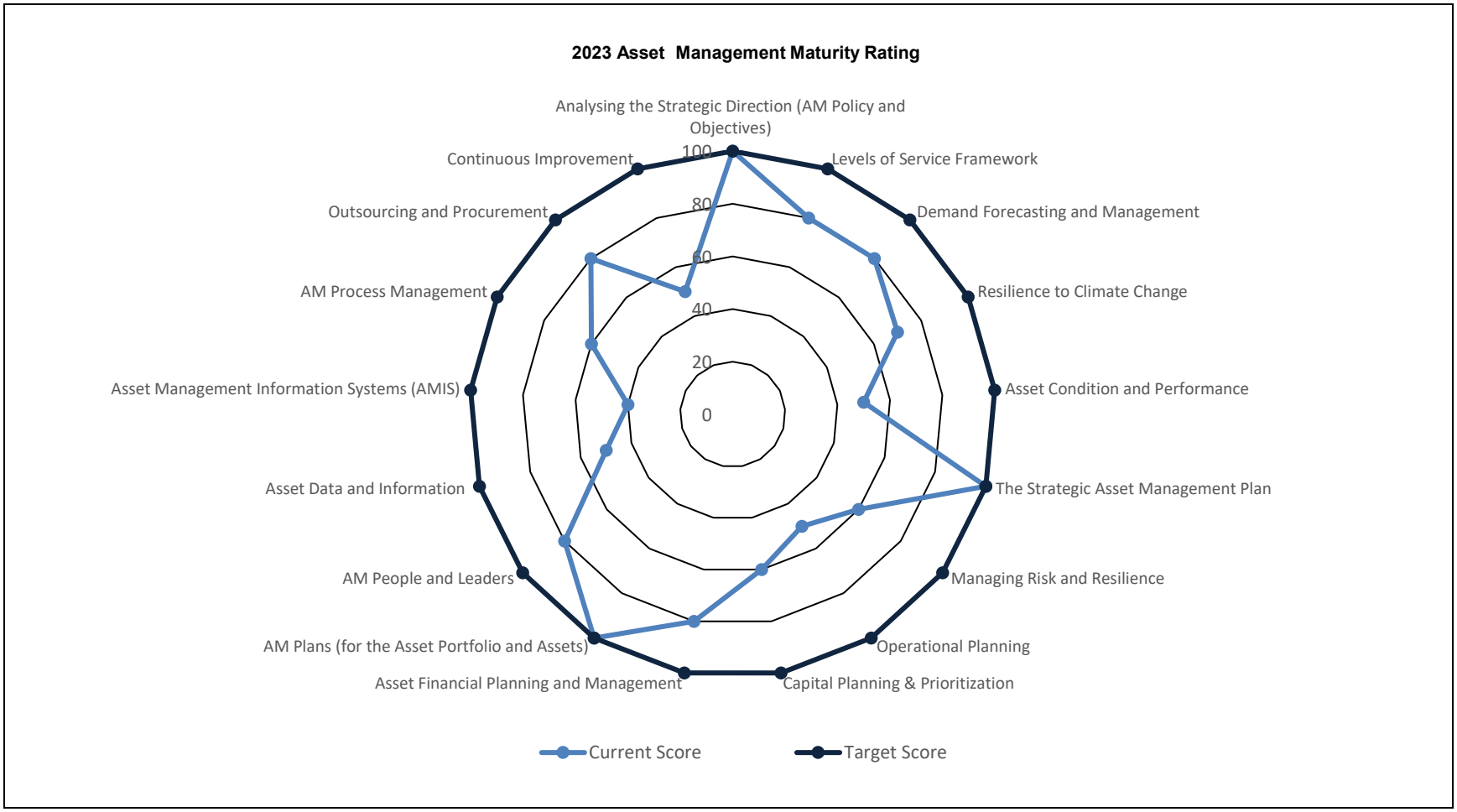
Maturity Assessment– Fire and Emergency Services



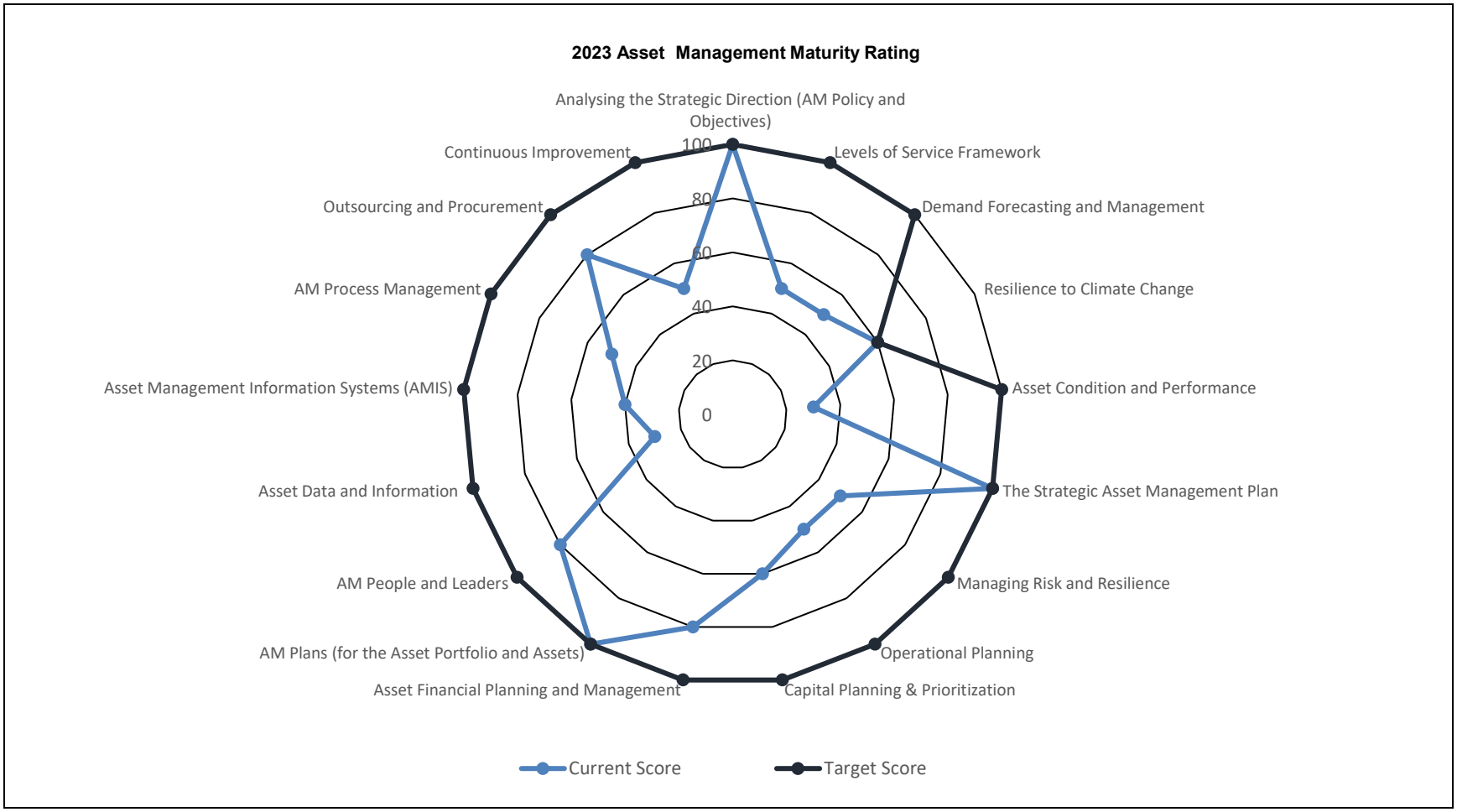
Maturity Assessment – Fire Fleet



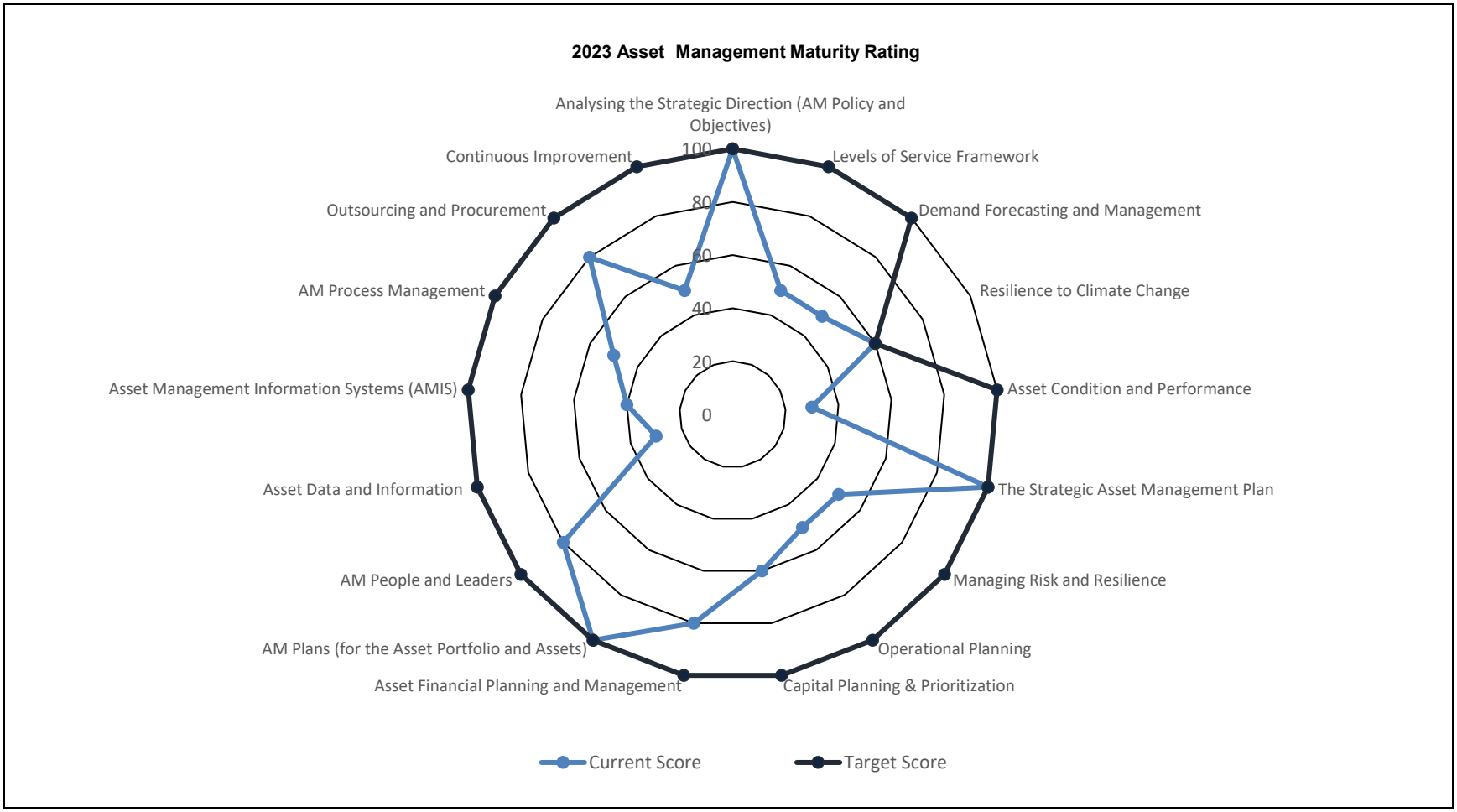
Maturity Assessment – Specialized Tools and Equipment



Maturity Assessment – Information Technology



Maturity Assessment – Facility Fixtures, Furniture and Equipment



Continuous Improvement Plan

Task No	Continuous Improvement Task	Asset Class	Estimated Timing	Value/Impact	Required Resources
State of Infrastructure (SOI)					
SOI-01	Continue to develop comprehensive asset registries for inventory of operational assets. Work with City's Finance team to determine clear delineation between capital and operating assets and associated funding sources.	All	2024-2025	Ability to delineate appropriate funding sources and amounts for all assets.	Internal
SOI-02	Develop standards for required fields within the asset registry. Develop data standards for all assets, particularly for condition, performance, and utilization.	All	2024-Ongoing	Improved data quality for future reporting within the AM Plan.	Internal
SOI-03	Work with City staff to determine ownership of VCOM infrastructure.	Information Technology	2024 (Completed)	Improved data quality for future reporting within the AM Plan.	Internal
SOI-04	Continue updating risk assessment based on emerging threats to the organization. Continue to drill deeper in the risk assessment and capture risk information at the asset level to support maintenance program.	All	2024-2025	Sound risk analysis assists with infrastructure decision-making through means such as justifying capital prioritization or optimizing maintenance tasks and activities.	External/Internal

Task No	Continuous Improvement Task	Asset Class	Estimated Timing	Value/Impact	Required Resources
Levels of Service (LOS)					
LOS-01	Continue to develop and collect updated information on technical LOS for all service attributes.	All	2024-Ongoing	Collection of LOS current performance and targets enable the service area to track progress against established targets.	Internal
Lifecycle Activities (LCA)					
LCA-01	Ongoing data collection and reporting to help support fleet decision-making.	Fire Fleet	2024-Ongoing	Better asset lifecycle tracking ensures the right infrastructure decisions are made at the right time and for the right costs.	Internal
LCA-02	Continue to report any disposals for all asset classes.	All			
Financing Strategies (FS)					
FS-01	Review coding of projects to lifecycle and asset categories with Finance to improve confidence in gap analysis by lifecycle and asset category.	All	2024-Ongoing	Improved accuracy of the funding gap estimation.	Internal
FS-02	Work with Corporate Finance to review performance targets and sustainable funding for all assets on a routine basis.			O. Reg. 588/17 requires the establishment of Service Level Targets by 2025.	

Appendix

Existing and Planned Future Fire Stations

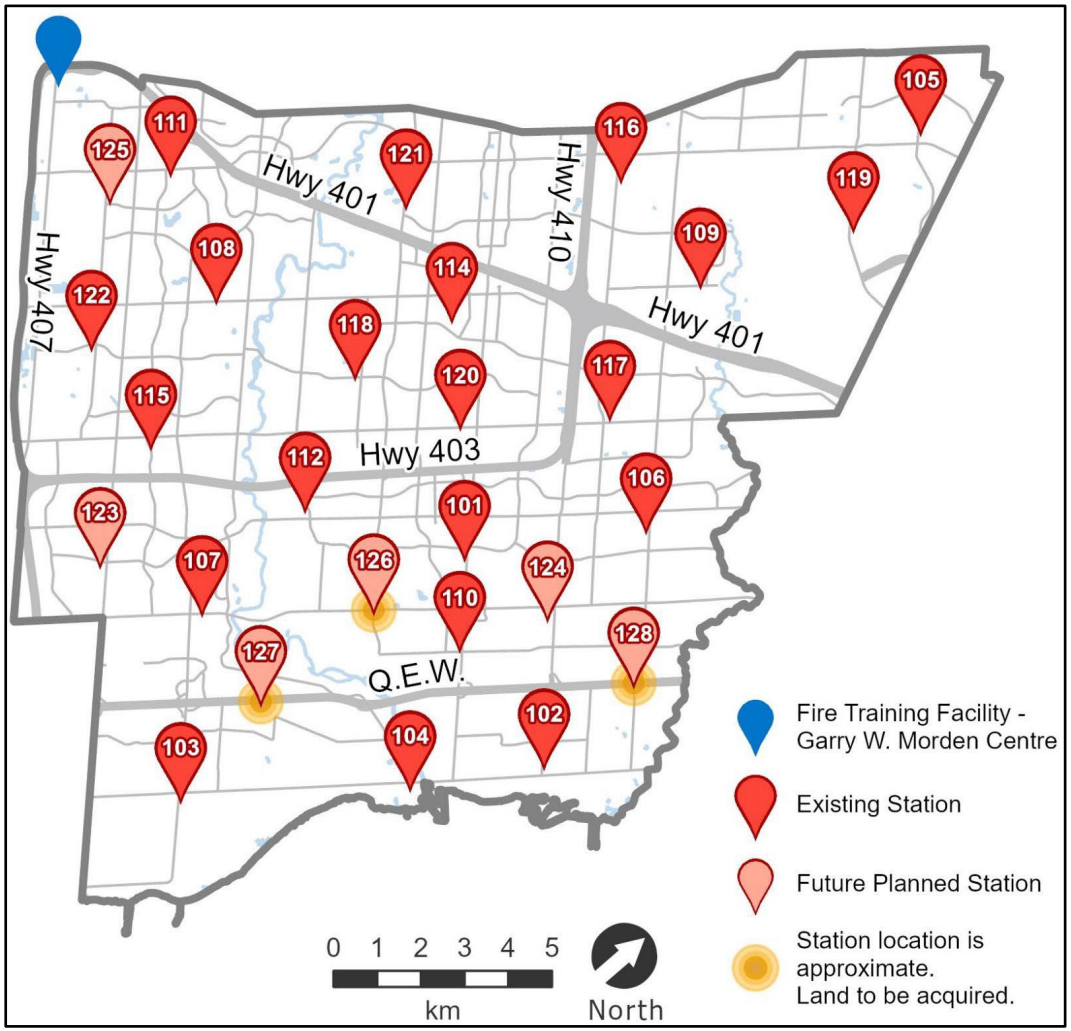


Figure 3: Existing and Planned Future Fire Stations

Corporate Asset Management Plan **2025**

Information Technology (IT)

Table of Contents

Introduction 3
Key Stats 4
State of the Infrastructure 5
- Asset Hierarchy 5
- Asset Class - Summary 6
- Asset Management Tools & Systems 7
- Dashboards 7

Levels of Service 16
- Governing Legislation for Information Technology 16
- Community Levels of Service Framework 17
- Technical Levels of Service Framework 17

Demand Management 18
Risk Management 22
- Asset-Specific Risk Methodology 22

Lifecycle Management 23
- Lifecycle Strategies 23
- Lifecycle Needs vs. Budget 25
- Budget Breakdown 30

Financing Strategy 32
- Capital Funding Sources and Operating Revenue Sources 32
- Infrastructure Gap 33

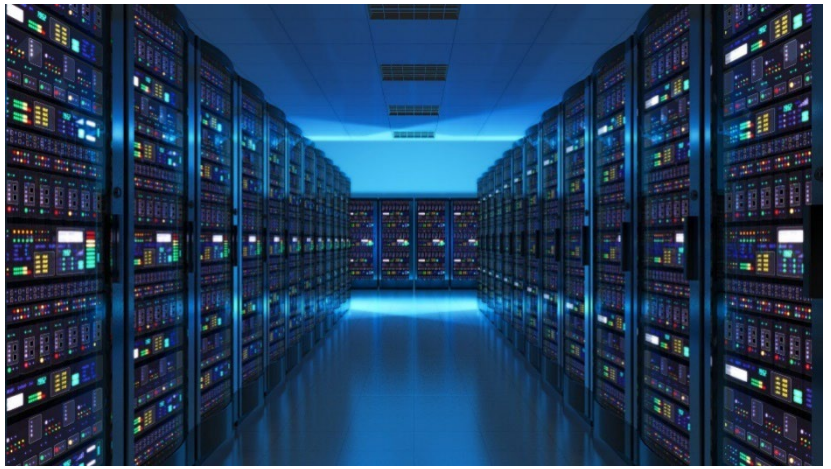
Continuous Improvement and Maturity 34
- Maturity Assessments 34
- Continuous Improvement Plan 38

Introduction

This asset management plan includes assets that are owned and managed by Information Technology (IT) Services. Only tangible/physical assets have been accounted for due to their high level of data confidence; non-tangible assets such as software and licencing will be considered in future iterations as their data quality and reliability improves.

IT Services plans, acquires, installs, maintains and replaces technology infrastructure as part of the City's electronic information system. IT staff support various types of assets such as computers, printers, servers, phones, and much more that are critical to the delivery of IT services. IT works directly with many other service areas to sustain their technological needs and achieve the desired service levels. IT has six areas that support the City's technological needs; they are:

- Strategy and Innovation
- City Services
- Infrastructure Planning and Operations
- Digital Services and Mobility
- Enterprise Business Solutions
- Service Management



Server Room

Key Stats

Current Replacement Value (CRV) $73.2 Million	Average Condition Fair	Current Maturity Level Intermediate
Average Annual Infrastructure Gap- Current LOS $0.0 Million		Average Annual Infrastructure Gap- Proposed LOS Ongoing Analysis

State of the Infrastructure

Asset Hierarchy

Table 1: Information Technology Service Area Hierarchy

Asset Class	Asset Type
End-User Devices	Computers
	Monitors
	Plotters
	Printers
	AV Equipment
	Docking Stations
	Radios
Network Services	Network Security Infrastructure
	Network Services UPS Business Continuity
	Network Wireless Infrastructure
	Switches and Routers
	VoIP Systems and Phones
Platform Services	Physical Servers
	Server Racks
	Power Distribution Units (PDUs)
	Storage Area Networks (SANs)
	Backup Systems
	Mail Gateways
Public Sector Network (PSN) Fibre	Network Fibre

Asset Class - Summary

Asset Class	Current Replacement Value (Millions)	Average Condition	Average Annual Infrastructure Gap – Current LOS (Millions)
End-User Devices	$19.1		$0.0
Network Services	$17.3		
Platform Services	$8.6		
PSN Fibre	$28.2		

The average annual funding gap to meet proposed levels of service is an ongoing analysis that staff are conducting for all their asset classes.

Asset Management Tools & Systems

The City maintains its inventory information in various systems, with each system serving a specific function and purpose.

SharePoint is used by Information Technology staff to store, retrieve, search, archive, track, manage, and reporting all IT assets.

ServiceNow is a new software solution that IT acquired to store, manage, track and report on the IT inventory. As it is a new solution, IT will be understanding how to best utilize the software to its full capacity.

Esri GIS is utilized to map the public network fibre assets and store relevant attribute information.

CityWide is the City's Tangible Capital Asset (TCA) System. The system was introduced in 2008 to capture infrastructure valuation information about the City's major assets.

Each of these systems plays an integral role in supporting decision-making about City services and infrastructure. The inventory information contained within each of these systems is comprehensive, reliable, and reasonably accurate and has been used to support the development of this plan.

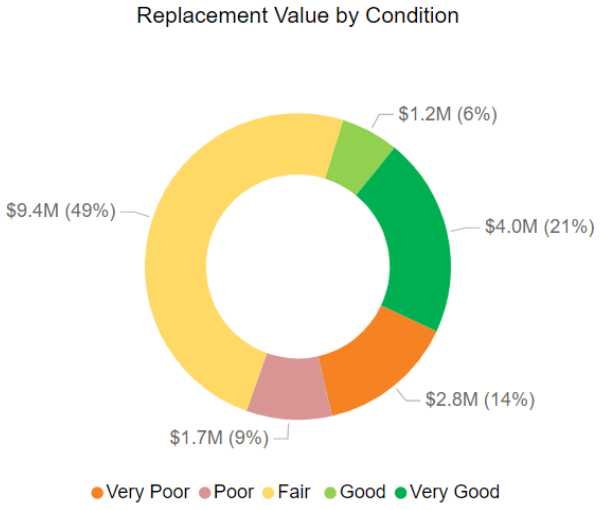
Dashboards

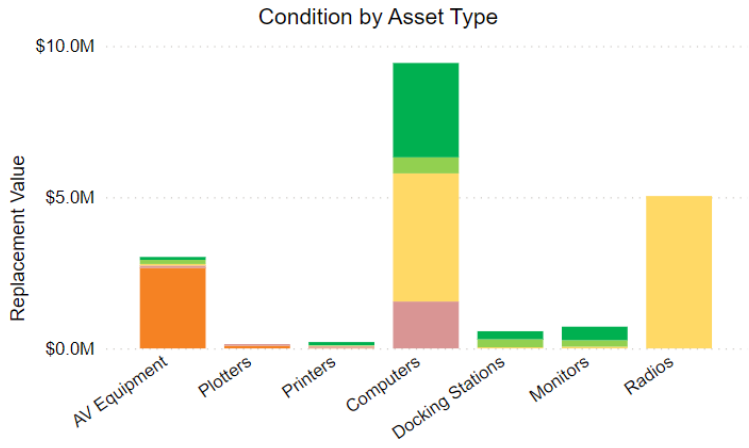
The following dashboards provide a summary of the state of the current infrastructure for each asset class. The information in this plan was prepared using 2023 year-end data. In charts, graphs and tables where money is represented in thousands of dollars ($000), figures have been rounded to the nearest thousand. This means that the totals shown may not always balance perfectly, due to rounding.

Dashboard – End-User Devices

Data Quality:	Asset Inventory	Condition	Replacement Value
	B	C	B

Current Replacement Value: $19.1 Million





Asset Type	Quantity	Average Age (Years)	Estimated Useful Life (Years)	Current Replacement Value (000s)
Computers	6,743 Ea.	2.5	5-7	$9,440
Monitors	2,877 Ea.	2.0	10	$720
Plotters	3 Ea.	8.3	7-10	$140
Printers	348Ea.	2.0	3-5	$210
AV Equipment	2,846 Ea.	18.1	5-100	$3,030
Docking Stations	2,276 Ea.	2.6	7-10	$570
Radios	1,953 Ea.	-	7-10	$5,000

Background Information

End-User Devices support audio-visual services, photo and video production services, and the deployment and management of desktop environments.

Age-based condition is primarily utilized to determine asset replacement, and any assets that are kept beyond their estimated useful life are used for secondary/redundancy purposes. For radios, the condition is assumed to be fair based on staff expertise. In-service date/age for Radios have not been accurately tracked in the past, but it is a continuous improvement item that staff have begun tracking as assets are replaced.

As shown by the data quality scoring, the inventory, condition and replacement value information are at a moderate level of confidence/quality. This is largely due to older assets having less attribute information tagged against them; however, over the last few years, staff have assigned attribute information much more consistently against assets in order to improve data reliability.

IT staff completed a comprehensive inventory cleanup and 714 obsolete or inactive printers have been removed.

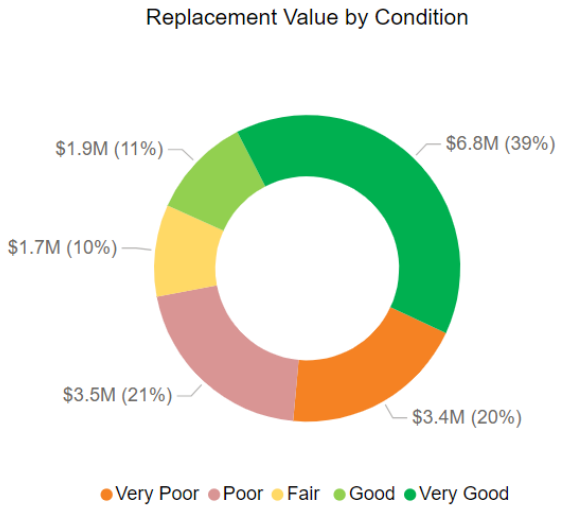
As of 2024, two of the three plotters have been replaced, thus, bringing the average age down.

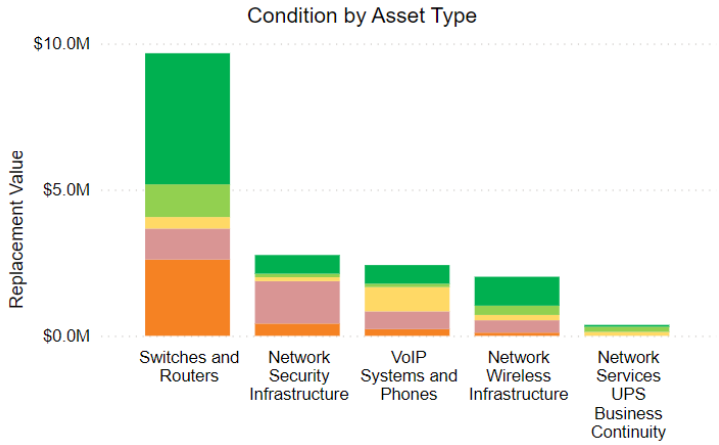
T14 Laptop and Targus docking station

Dashboard – Network Services

Data Quality:	Asset Inventory	Condition	Replacement Value
	B	C	B

Current Replacement Value: $17.3 Million





Asset Type	Quantity	Average Age (Years)	Estimated Useful Life (Years)	Current Replacement Value (000s)
Network Security Infrastructure	59 Ea.	3.6	5-8	$2,800
Network Services UPS Business Continuity	354 Ea.	3.0	5-8	$370
Network Wireless Infrastructure	2,952 Ea.	2.9	5-8	$2,000
Switches and Routers	2,927 Ea.	3.7	5-8	$9,700
VoIP Systems and Phones	3,305 Ea.	4.4	5-8	$2,400

Background Information

The City's Network Services assets include Network Security Infrastructure, Network Services UPS Business Continuity, Network Wireless Infrastructure, Switches and Routers and VoIP Systems and Phones.

Network Services support both wired and wireless data communications for over 120 City facilities. They include assets such as switches, routers, Wi-Fi controllers, firewalls, access points, teleconference phones, collaboration endpoints and much more.

These assets utilize age and remaining useful life as proxies for condition; although staff also consider other factors such as performance, demand and vendor agreements when it comes to their replacement cycle.

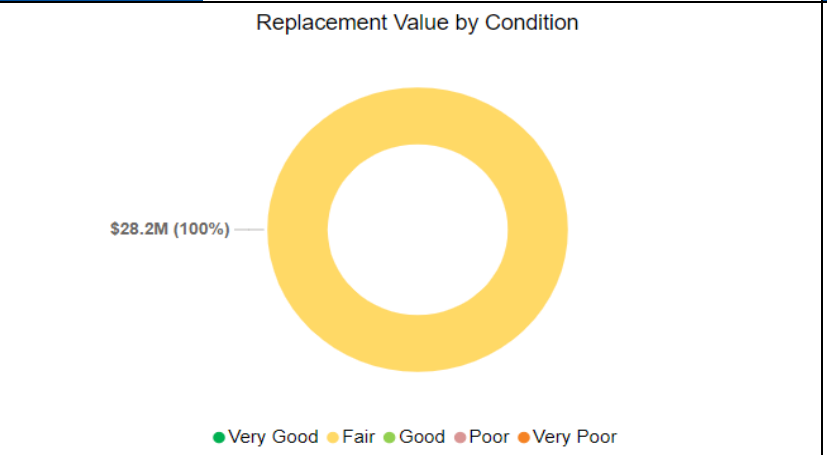
As shown by the data quality scoring, the inventory, condition and replacement value information are at a moderate level of confidence/quality. This is largely due to older assets having less attribute information tagged against them; however, over the last few years, staff have assigned attribute information much more consistently against assets to improve data reliability.

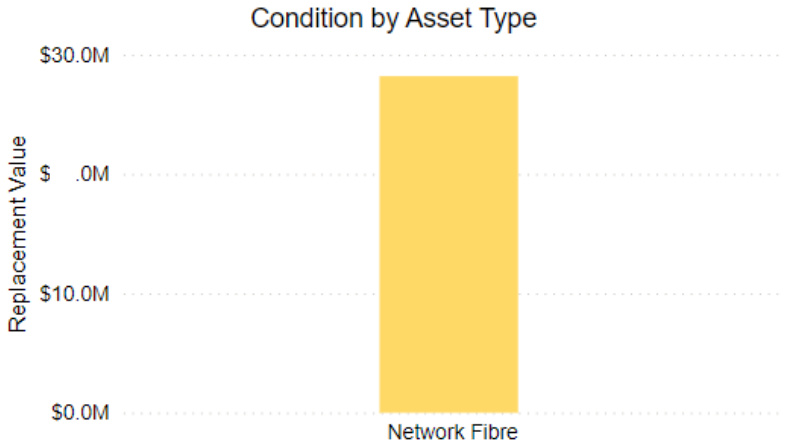
48P Switch and 40 Wireless Controller

Dashboard – Public Sector Network (PSN) Fibre

Data Quality:	Asset Inventory	Condition	Replacement Value
	B	C	B

Current Replacement Value: $28.2 Million





Asset Type	Quantity	Average Age (Years)	Estimated Useful Life (Years)	Current Replacement Value (000s)
Network Fibre	225.6 km	-	30-50	$28,200

Background Information

The City of Mississauga owns and manages approximately 26 per cent of the overall public sector network (PSN) which is a shared broadband infrastructure network with the neighbouring municipalities of Region of Peel, Brampton and Caledon.

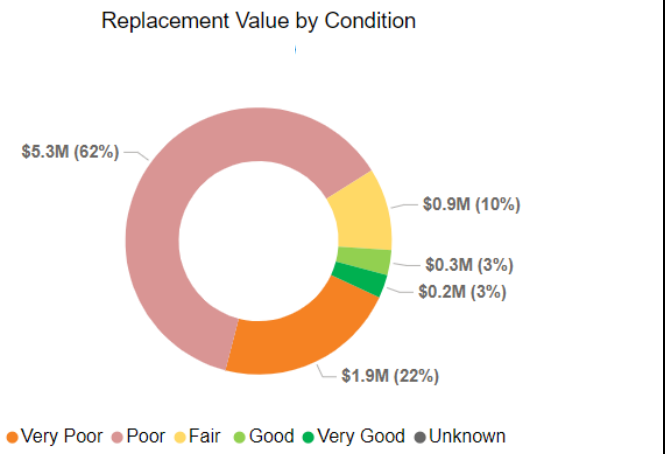
The PSN is comprised of assets such as nodes, connections and cables. The PSN provides high-speed telecommunications between municipal facilities and public sector agencies.

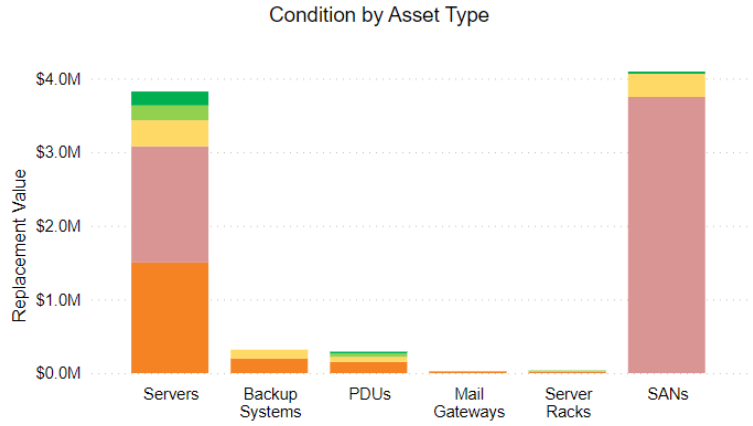
Age is used as a proxy for condition; however, staff contract out inspections to regularly assess the integrity of the network and identify any deficiencies or defects that need to be addressed. Assets are replaced and/or upgraded based on their performance, criticality and available budget.

Dashboard – Platform Services

Data Quality:	Asset Inventory	Condition	Replacement Value
	B	B	B

Current Replacement Value: $8.6 Million





Asset Type	Quantity	Average Age (Years)	Estimated Useful Life (Years)	Current Replacement Value (000s)
Physical Servers	126 Ea.	6.0	5-10	$3,800
Server Racks	15 Ea.	8.0	5-10	$40
PDUs	54 Ea.	5.0	5-10	$290
SANs	26 Ea.	4.0	5-10	$4,100
Backup Systems	8 Ea.	11.0	5-10	$320
Mail Gateways	4 Ea.	-	5-10	$25

Background Information

Platform Services support data operations for email delivery, user security and enterprise backups.

Condition is based on a mixture of age, remaining useful life, and vendor agreements as it relates to asset replacement. Many of the assets in Poor-Very Poor condition have already been replaced as of 2024 so the Platform Services portfolio is actually in fair or better health overall.

As shown by the data quality scoring, the inventory, condition and replacement value information are at a moderate level of confidence/quality. Although some assets have surpassed their estimated useful life, their performance may be sufficient to meet current service level needs.

Over the last few years, staff have assigned attribute information much more consistently against assets to improve data reliability.

Server Equipment

Levels of Service

Governing Legislation for Information Technology

Legislation	Requirements
Municipal Government Act, 2001	• Practices and procedures • Accountability and transparency • Finance
O. Reg. 588/17: Asset Management Planning for Municipal Infrastructure	Provides policies and guidelines for levels of service considerations in stormwater management assets.
Municipal Freedom of Information and Protection of Privacy Act	Governs the collection, use and disclosure of information by the City.
Occupational Health and Safety Act, 1990	Governing health and safety requirements in the workplace. (e.g. sets out mandatory working-at-heights training requirements).
Municipal By-Laws	Regulations approved by Council to address local City issues (e.g. by-law between the City and various telecommunication companies to comply with the requirements of the Canadian Radio-Television and Telecommunications Commission).

Community Levels of Service Framework

Core Value	LOS Objective	Asset Class	Performance Measure	Current Performance
Performance	IT Services assets are maintained in a state of good repair and meet service delivery needs.	All	Description of the lifecycle activities staff undertake to maintain assets in a state of good repair.	Staff repair and/or replace assets on a proactive basis, when possible, in alignment with manufacturer recommendations, vendor service-level agreements, or staff expertise.

Technical Levels of Service Framework

Core Value	LOS Objective	Asset Class	Performance Measure	Current Performance (2023)	Target Performance (2024-2033)	Background Information
Performance	IT Services assets are maintained in a state of good repair and meet service delivery needs.	All	% of assets in fair or better condition (by replacement value).	End-User Devices: 76%	To Be Determined	As staff continue to improve the quality and reliability of their data, target levels of service will be determined for this performance metric. However, staff typically replace assets before they reach the end of their useful life and no longer meet functional needs.
				Network Services: 60%		
				Platform Services: 17%		
				PSN Fibre: 100%		

Demand Management

The City's IT Services is committed to delivering services in an efficient and cost-effective manner. In the ever-evolving world of technology, there are many demand drivers that challenge staff's ability to maintain desired service levels. Some of these challenges include:

- Cyber-security and data privacy requirements
- Technological advancements and modernization
- Increased demand for more cloud-based services and infrastructure
- Aging infrastructure
- Limited resources
- Supply chain issues
- Artificial Intelligence

There is an increasing need to plan and deliver innovative, reliable, responsive and secure services, and establish sustainable service levels for IT Services. Strategies to meet these demands include keeping up with new technologies, reprioritizing of work for business continuity and disaster preparedness, and the effective delivery of capital projects and studies. These actions also align with the City's vision and strategic plan.

Demand Drivers, Projections and Management Plans

Demand Driver	Current Situation	Projection	Impact on Services	Demand Management Plan
Changing Technology	Technology is constantly evolving, and in many cases, vendors will stop supporting assets that have become obsolete or no longer meet new technological requirements.	Technology will continue to change as the demand for more cloud-based applications and online services increases, thus putting more pressure on staff to meet service levels and customer expectations.	Inability to meet customer expectations and demands for state-of-the-art technology. Using unsupported assets may increase risk of financial consequences and operational delays.	Staff remain up to date on technological enhancements that may affect the assets and services they manage. Technology is renewed in line with both industry and operational standards. Staff communicate with vendors regularly to stay apprised on upcoming major changes and adapt accordingly.
Resource Challenges	The City has recently seen many changes in staffing as a result of retirements and staff turnover. Current staffing issues focus on being able to assign the right resources to critical initiatives while maintaining an adequate level of capacity for day-to-day operations.	As IT Services move toward more cloud-based and online services, staffing requirements and roles will need to adapt to manage the workload more effectively and ensure that the City's strategic goals are being met.	Without sufficient staffing in place, the quality and reliability of the City's IT services and assets will be adversely affected. Maintaining IT assets in a state of good repair and advancing key IT system enhancements will be more difficult as a result of limited resourcing.	The City employs a combination of permanent, contract and part-time staff in order to deliver on key projects, meet service level enhancements, and achieve operational requirements. IT, alongside the Human Resources department, created a pre-qualified roster for IT services so that unique skill sets

Demand Driver	Current Situation	Projection	Impact on Services	Demand Management Plan
				can be acquired as needed; thus, providing more agility to respond to increasing workloads.
Adapting to New Business Requirements and Growth	Staff must constantly adapt to changes in stakeholder expectations or new business requirements, while also maintaining their current existing service levels. This includes managing growth and the migration of staff and/or assets from one system or service level to another.	There are constantly new and different business requirements that IT needs to adapt to and factor into their capital and operating plans. For example, newly acquired assets or programs such as the Smart City initiative, pose a pressure on the sustainability and performance of the IT portfolio. Depending on the complexity of the business requirements, staff may have to keep using and paying for older systems/assets during the transition period into the new system/asset.	Adapting to new business requirements while trying to maintain current service levels for existing assets is a challenge and can affect the quality of the overall asset portfolio. There may be trade-offs or delays in the timing of lifecycle interventions to accommodate the new initiatives. Staff consider many factors when adapting to new business requests and growth such as additional costs, delays in procurement, longer migration times and logistical issues. All	Staff maintain direct and constant communication with their key stakeholders to minimize unexpected or unplanned business requests. Staff utilize a project-prioritization technique in order to organize available resources and meet their strategic objectives.

Demand Driver	Current Situation	Projection	Impact on Services	Demand Management Plan
			while striving to maintain acceptable service levels.	
Environmental Stewardship	For IT Services, there are more demands for digital upgrades and a more environmentally friendly service delivery that challenges the status quo.	The City is committed to decreasing its carbon footprint with clear goals to achieve within the next 30+ years. As IT Services evolve, there will be more consideration for the type of assets acquired and their replacement and disposal requirements.	There are many consequences to climate change that will affect staff's ability to deliver their desired service levels in an efficient, cost-effective and reliable manner.	Staff work with Procurement Services to establish clear wording within vendor contracts regarding asset disposals in environmentally conscious ways.

Risk Management

Asset-Specific Risk Methodology

Asset-specific risks are determined by assessing the asset's 'consequence of failure' (CoF) and 'likelihood of failure' (LoF). While the loss of some assets or components may have little impact on service delivery and negligible risk of damage or injury, the loss of other assets such as roads and bridges can severely impact public services and may lead to private property damages or even fatalities. The criticality of an asset is therefore linked to the inherent consequence of the loss of its function, including related impacts on the function of a system or network of assets.

For the purposes of this asset management plan, the overall condition of an asset is used as a proxy for determining risk; in particular, its likelihood of failure. In subsequent updates to this asset management plan, a formal risk assessment tool will be developed to inform decision-making and prioritization for a variety of asset classes and their components.

Information Technology Risk

The IT Service Area addresses risk information in a number of ways, including:

- Professional judgement is used in decision-making throughout all lifecycle activities and takes into consideration aspects of criticality, such as disruption to users, public safety, financial impact, environmental impact, and reputation to the organization
- The City's capital prioritization methodology includes an assessment of each project's importance by taking into consideration the risks associated with not undertaking the project, should funding not be approved

Lifecycle Management

Lifecycle Strategies

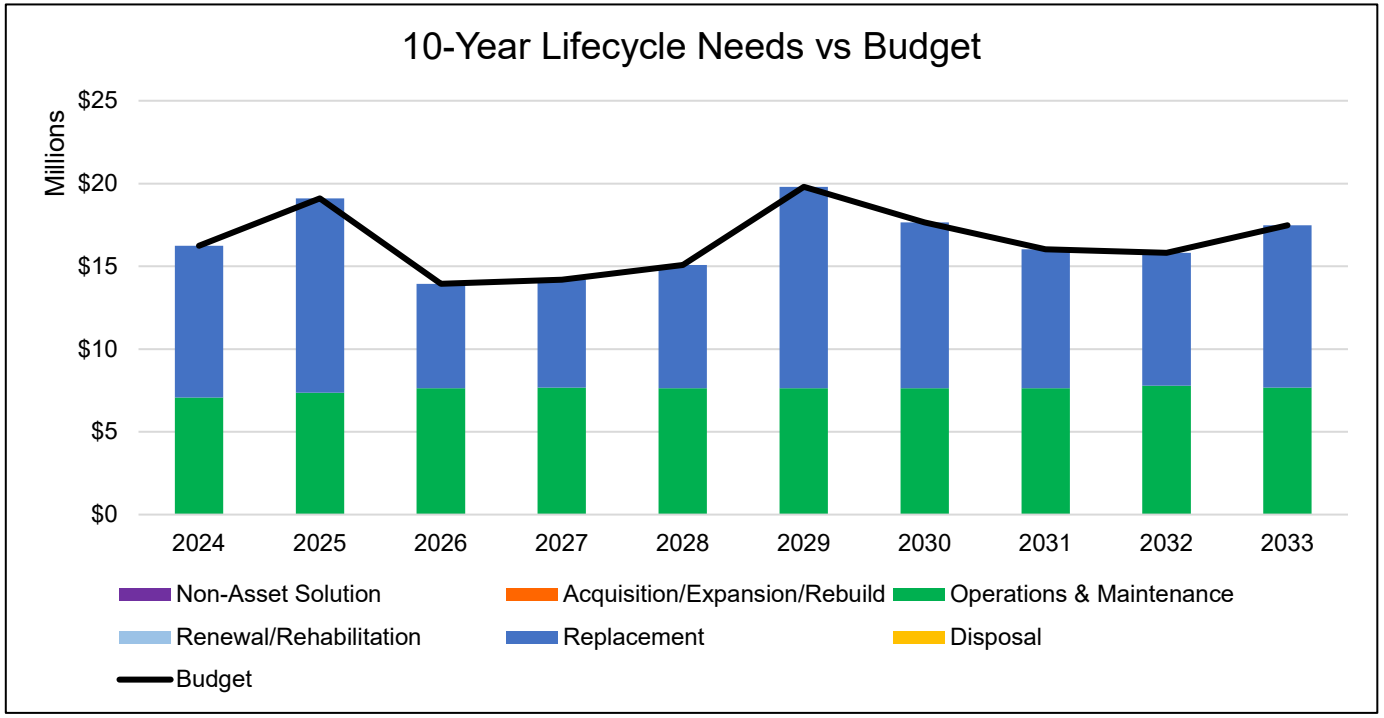
Information Technology – Current and Proposed Lifecycle Activities

Current and Proposed Lifecycle Activities	Risks associated with Lifecycle Activities
Non-Asset Solutions: Activities that do not alter the condition or performance of assets or services but provide staff with valuable information for their effective management.	
• IT Standards for standard hardware are reviewed annually and reported to Council • IT Master Plans are completed every 4–5 years • Annual review of budget needs for platform services (capital and operating)	• IT solutions are used to plan for growth effectively and to align the City with best industry practice. There are financial, reputational and operational risks associated with conducting these IT master plans and standards
Operations and Maintenance: Minor activities that preserve the condition or performance of assets and ensures the longevity of assets in line with their design and operational requirements.	
• Assets are maintained per manufacturer warranty recommendations • Minor repairs of asset components (e.g., monitor screen repairs and sensor repairs) are completed on an as-needed basis • Assets are inspected on a daily, monthly or annual basis depending on their criticality and complexity • Preventative maintenance program is established for network fibre assets	• Regular maintenance and inspections allow staff to maintain the performance and functionality of assets, and by extension, the desired service levels by mitigating hazards or premature failures

Current and Proposed Lifecycle Activities	Risks associated with Lifecycle Activities
Renewal/Rehabilitation: Significant activities designed to extend the useful life of assets components.	
• N/A	• N/A
Replacement: Replacement activities occur once an asset reaches the end of its useful life, cannot provide the intended function or performance, and rehabilitation is not a viable option.	
• Assets are replaced at end of life on a cyclical basis, when they no longer meet capacity/technological needs, or if they are no longer covered by vendor agreements. Where feasible, staff use those assets in a supplemental or secondary manner, as a form of redundancy	• The timely replacement of assets ensures that day-to-day operations are not impacted, and that the most cost-effective interventions are applied to the IT asset portfolio
Disposal/Demolition: Activities associated with the disposal or decommissioning of an asset.	
• Staff return disposed assets to vendors to dispose of in an environmentally conscious way	• N/A
Acquisition/Expansion/Rebuild: These activities expand services to previously non-serviced areas or to accommodate growth; they provide new or enhanced services beyond the current capacity and/or functionality of existing assets.	
• Upgrading or expanding assets to handle more capacity (e.g., adding another shelf to the storage array, adding more switches, acquiring a larger printer) • Adapting to technological changes as a result of renovations or replacements of facilities	• Technological obsolescence or redundancy as a result of changes to the business needs • Cybersecurity risks

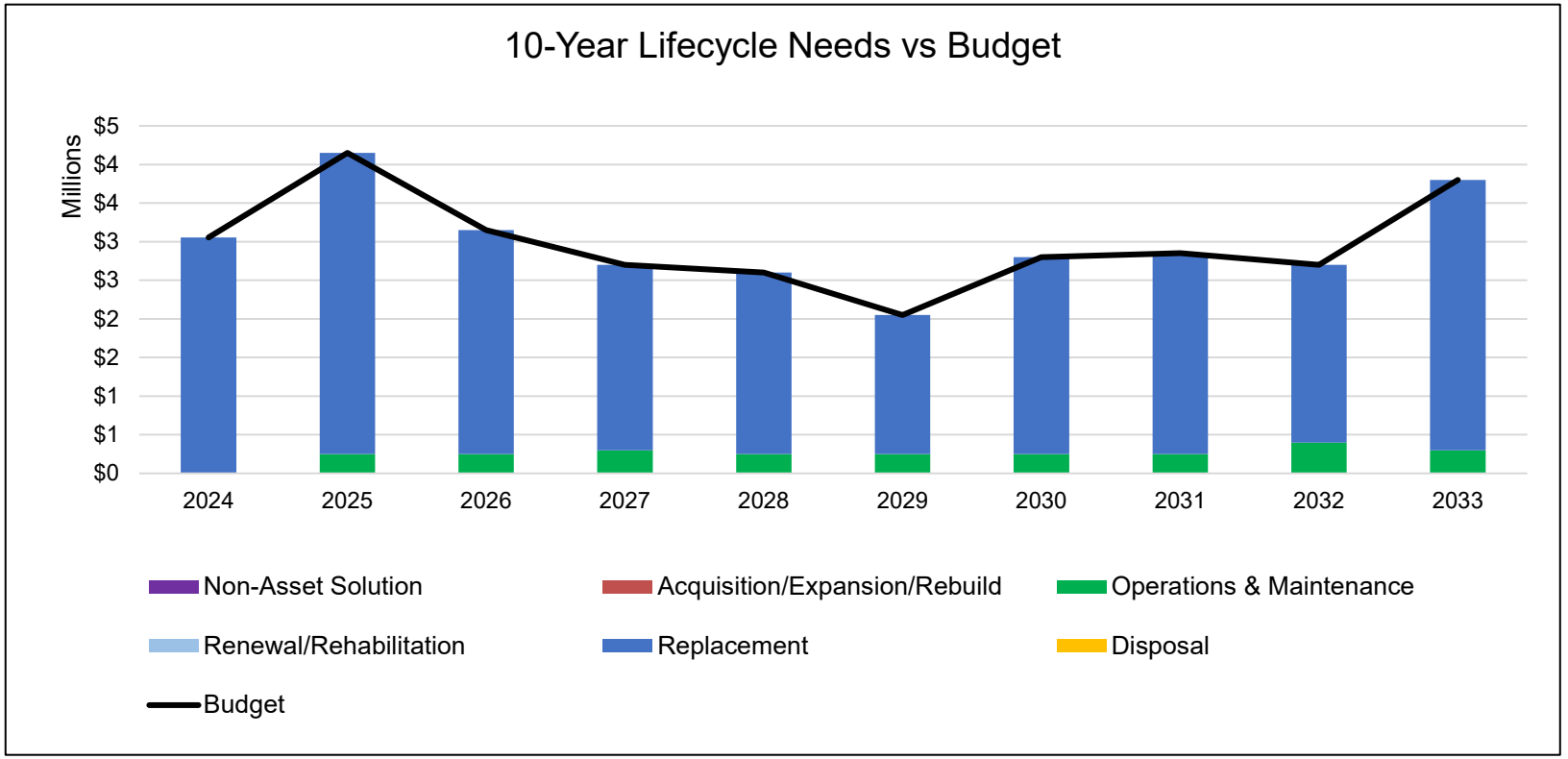
Lifecycle Needs vs. Budget

Information Technology



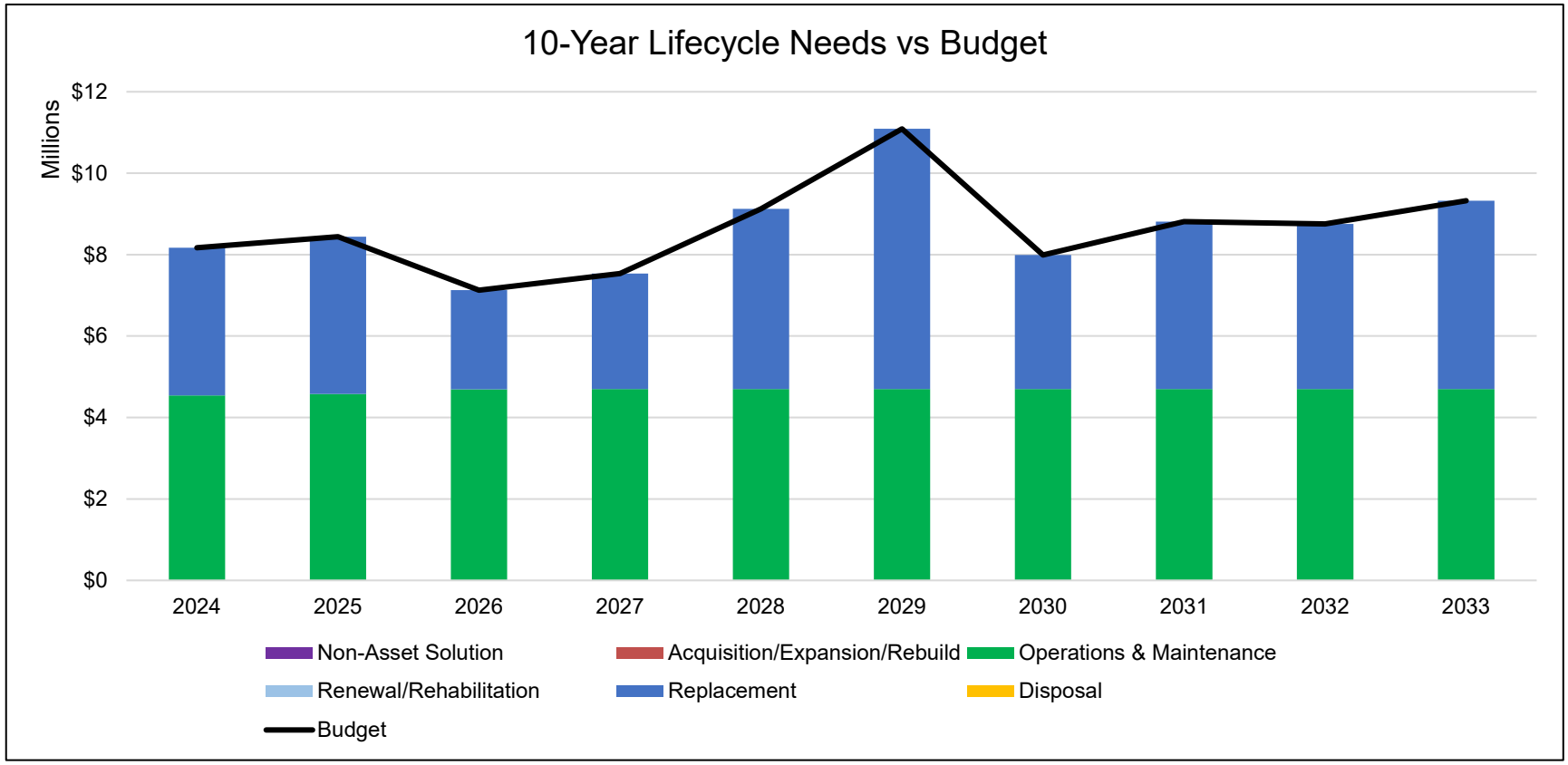
For the 2024 to 2033 forecast, IT assets are sufficiently funded to meet their lifecycle needs. As part of continuous improvement, staff will continue to quantify and analyze the lifecycle needs required as they refine their proposed levels of service, where they have been established, along with any resourcing requirements as a result.

End-User Devices



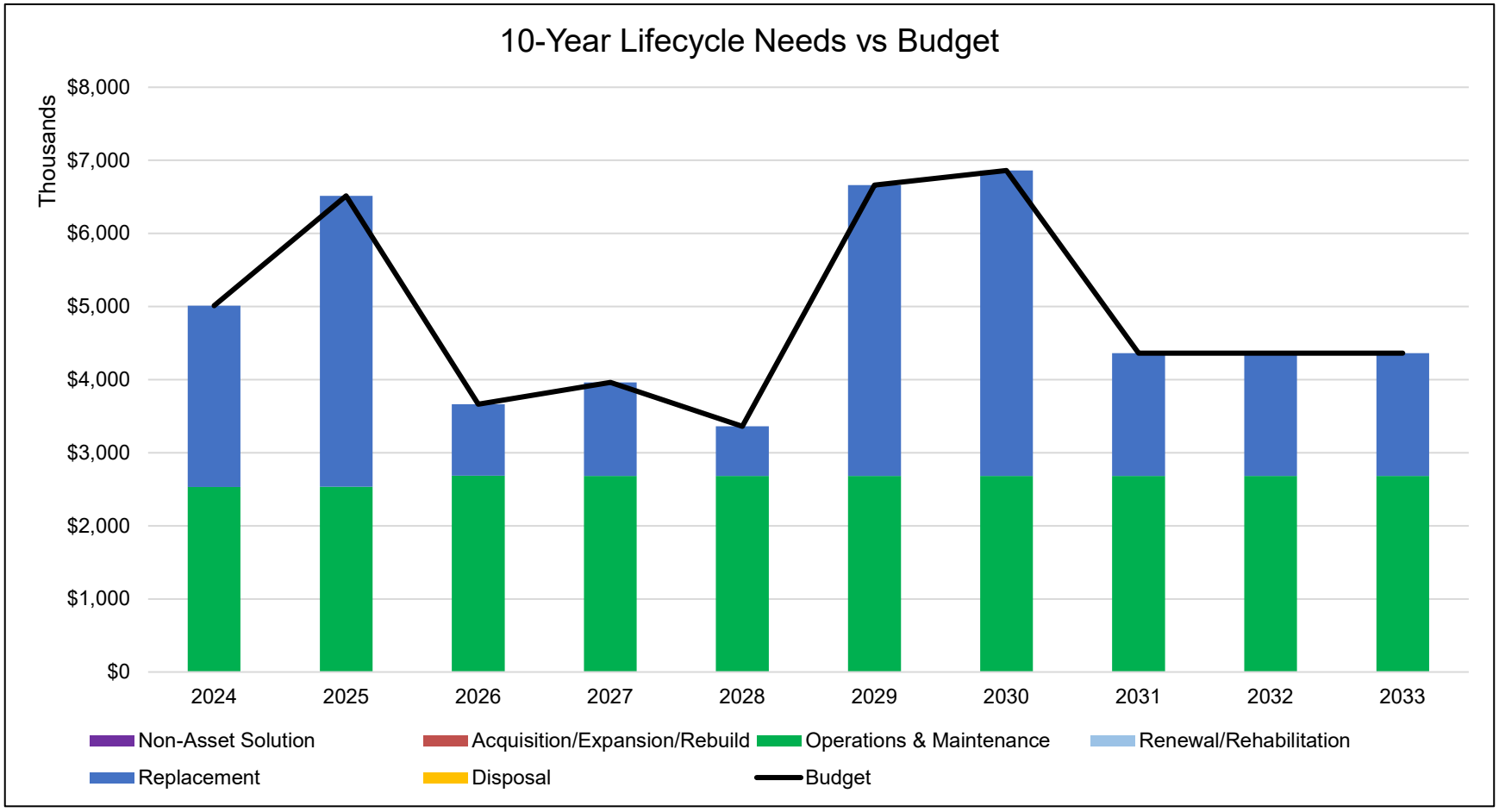
Major replacements are expected in the next 10 years owing to assets reaching their end of useful life. Twenty-three per cent of end-user devices are in Poor to Very Poor condition, while the majority, 49 per cent, are in Fair condition requiring replacement in the later stages of the 10-year forecast.

Network Services



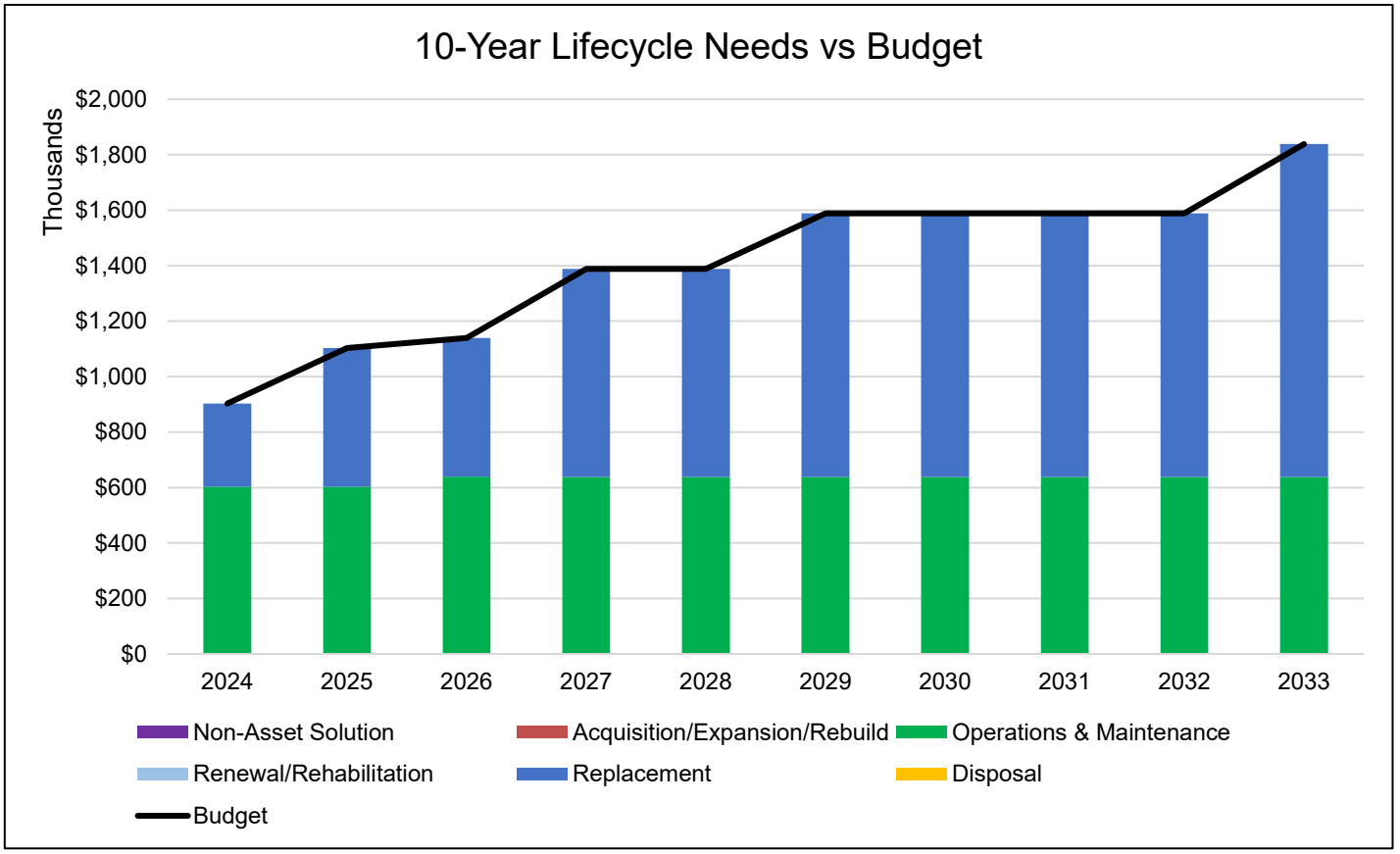
Fourty-one per cent of network services assets is in Poor to Very Poor condition, requiring replacement in the next 10-years. Equipment maintenance accounts for the majority of the Operations and Maintenance needs (green portion of bar graphs).

Platform Services



The majority of platform services assets are reaching their end of useful life within the next 10 years and will require full replacement, which staff have budgeted for proactively.

PSN Fibre



The steady incline in replacement is based on a mixture of age and staff expertise/decisions. Over time the fibre cables may start to degrade and therefore segments may require replacement as areas start to fail. Unfortunately, the replacement timeline is not predictable so there is a yearly budget for replacement as necessary. In addition, Operations & Maintenance activities are consistent year to year.

Budget Breakdown

Over the next 10 years, Information Technology plans to spend an average of $16.5 million annually on IT hardware assets, with the majority of the budget being used for replacement activities at 54.2 per cent and operations and maintenance at 45.8 per cent.

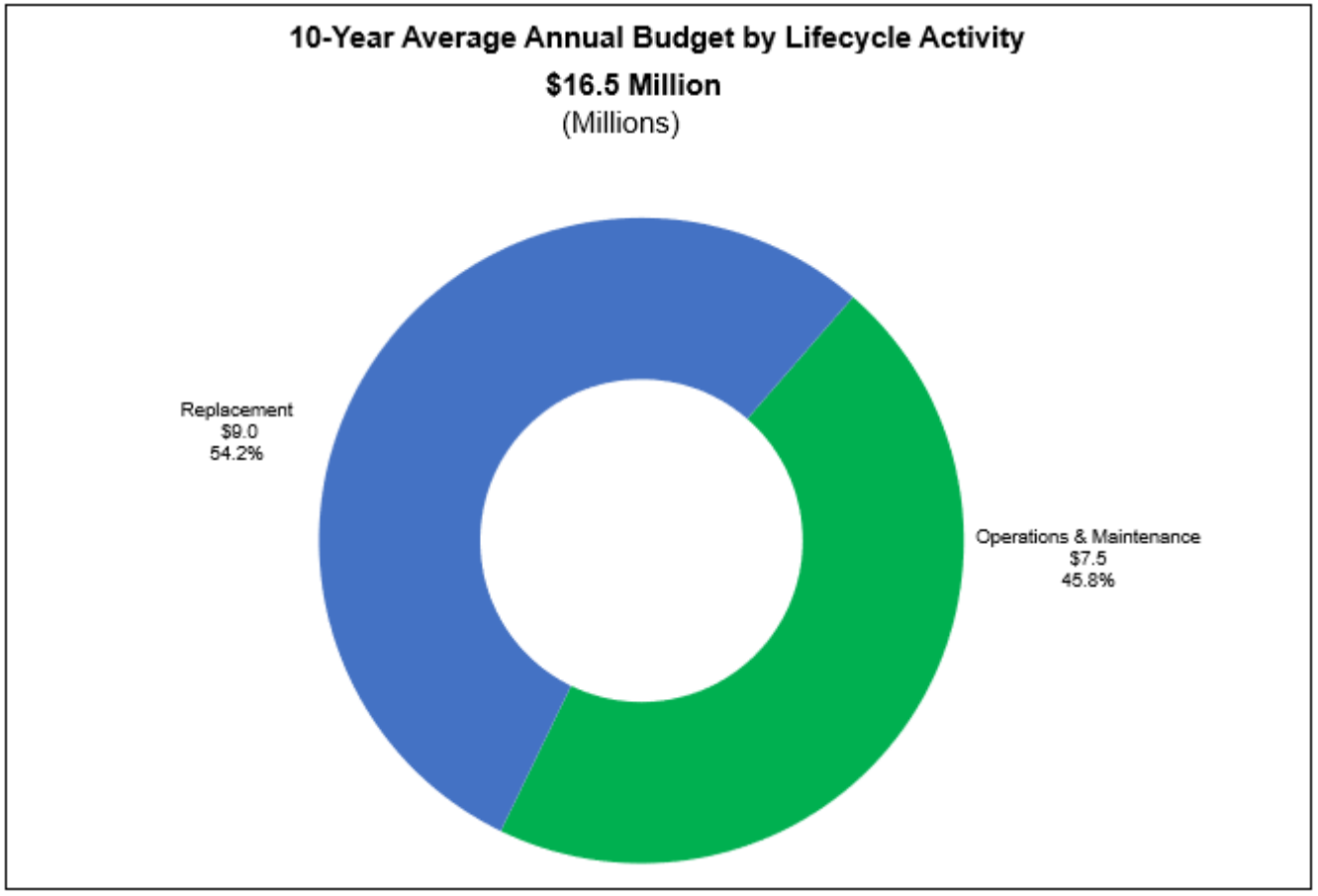


Figure 1: Breakdown of Budget by Lifecycle Activity

Table 2 shows the 10-year annual average budget breakdown by asset class. The majority of the of the operating and capital budget is spent on State of Good Repair (SOGR) of Information Technology assets.

Table 2: Budget breakdown by Asset Class

Asset Class	SOGR Budget Type ($ Million)			Growth Capital Budget ($ Million)	Total Budget ($ Million)
	Operating	Capital	Total		
End User Devices	-	3.0	3.0	-	3.0
Network Services	4.0	3.2	7.2	-	7.2
Platform Services	2.7	2.3	5.0	-	5.0
PSN Fibre	0.6	0.8	1.4		1.4
Total	**7.3**	**9.3**	**16.6**	**-**	**16.6**

Financing Strategy

Capital Funding Sources and Operating Revenue Sources

The estimated available funding for the next 10-year period (2024-2033) for Information Technology is $165.3 million. The primary sources of funding are Tax Reserve Funds at 55.7 per cent which is primarily used to support capital infrastructure renewal needs and operating revenue sources at 44.3 per cent.

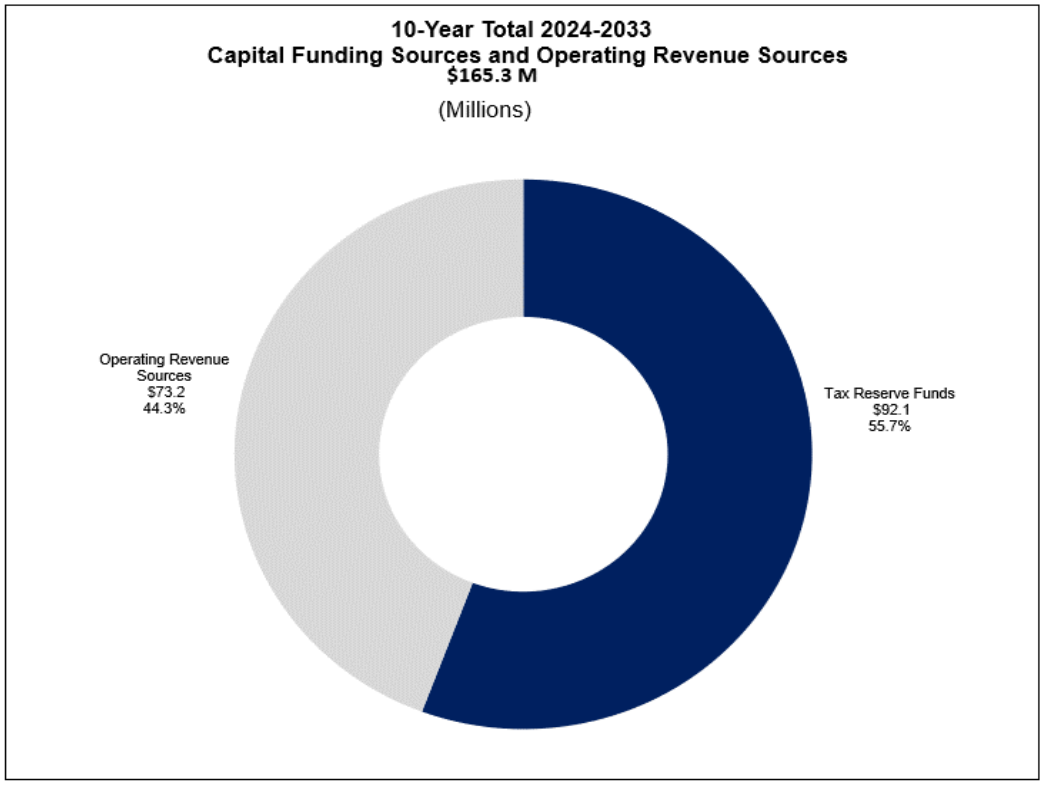
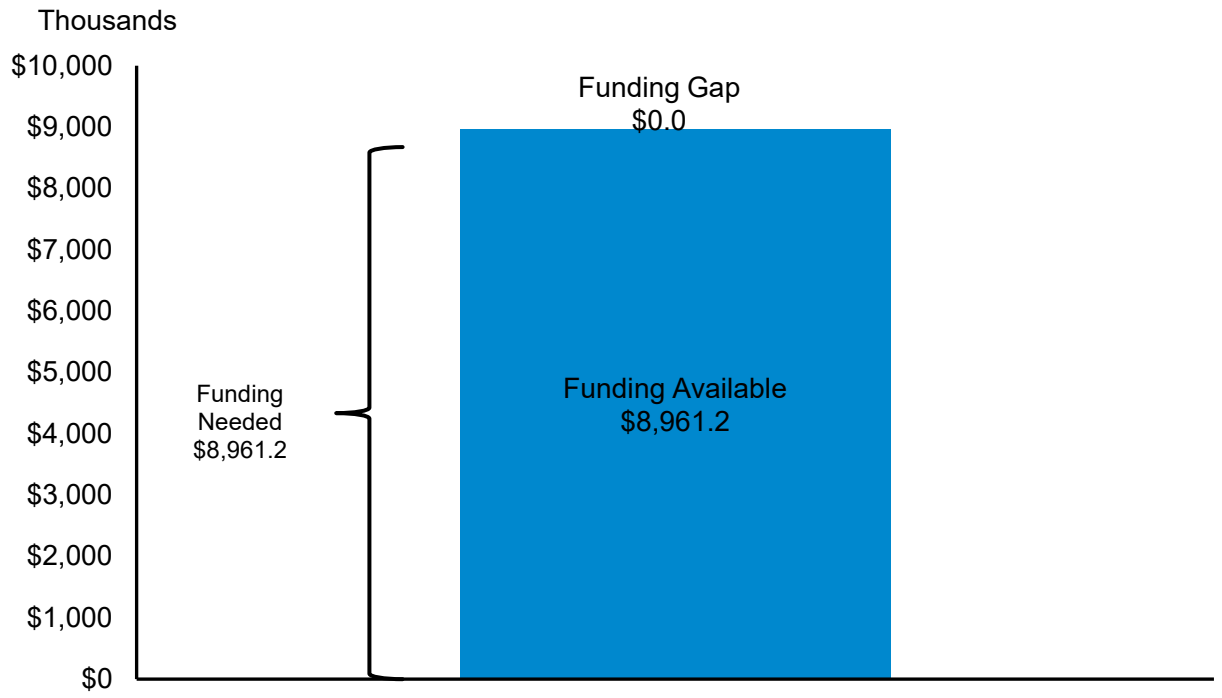


Figure 2: Capital Funding Sources (2024-2033)

Infrastructure Gap

Information Technology



As of this plan iteration, IT is deemed to have sufficient budget to address its lifecycle needs to meet current levels of service for all asset classes.

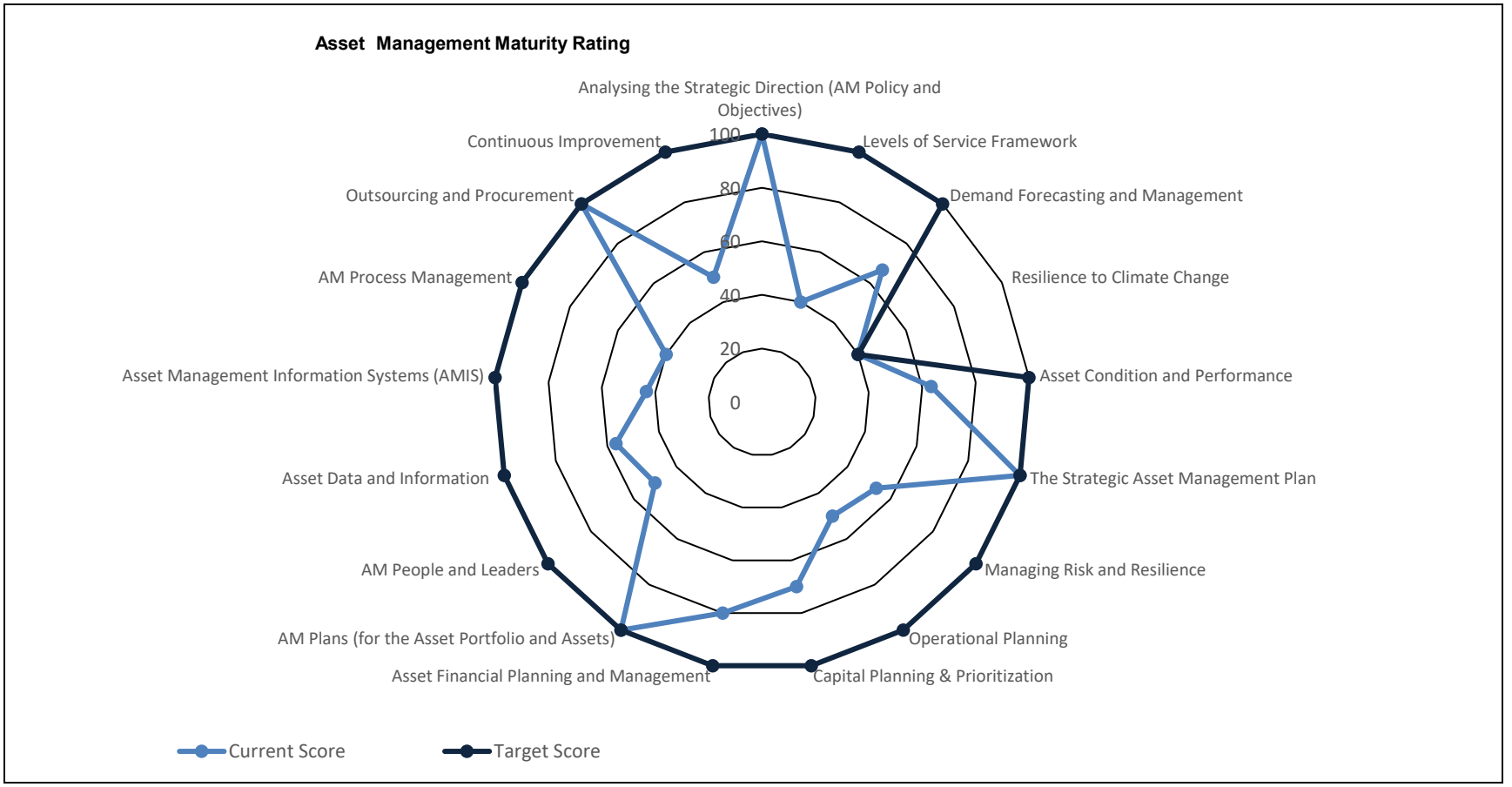
As part of continuous improvement, staff will continue to evaluate the affordability and sustainability of proposed levels of service, where they have been established, and integrate their asset management program with the annual budgeting process.

Continuous Improvement and Maturity

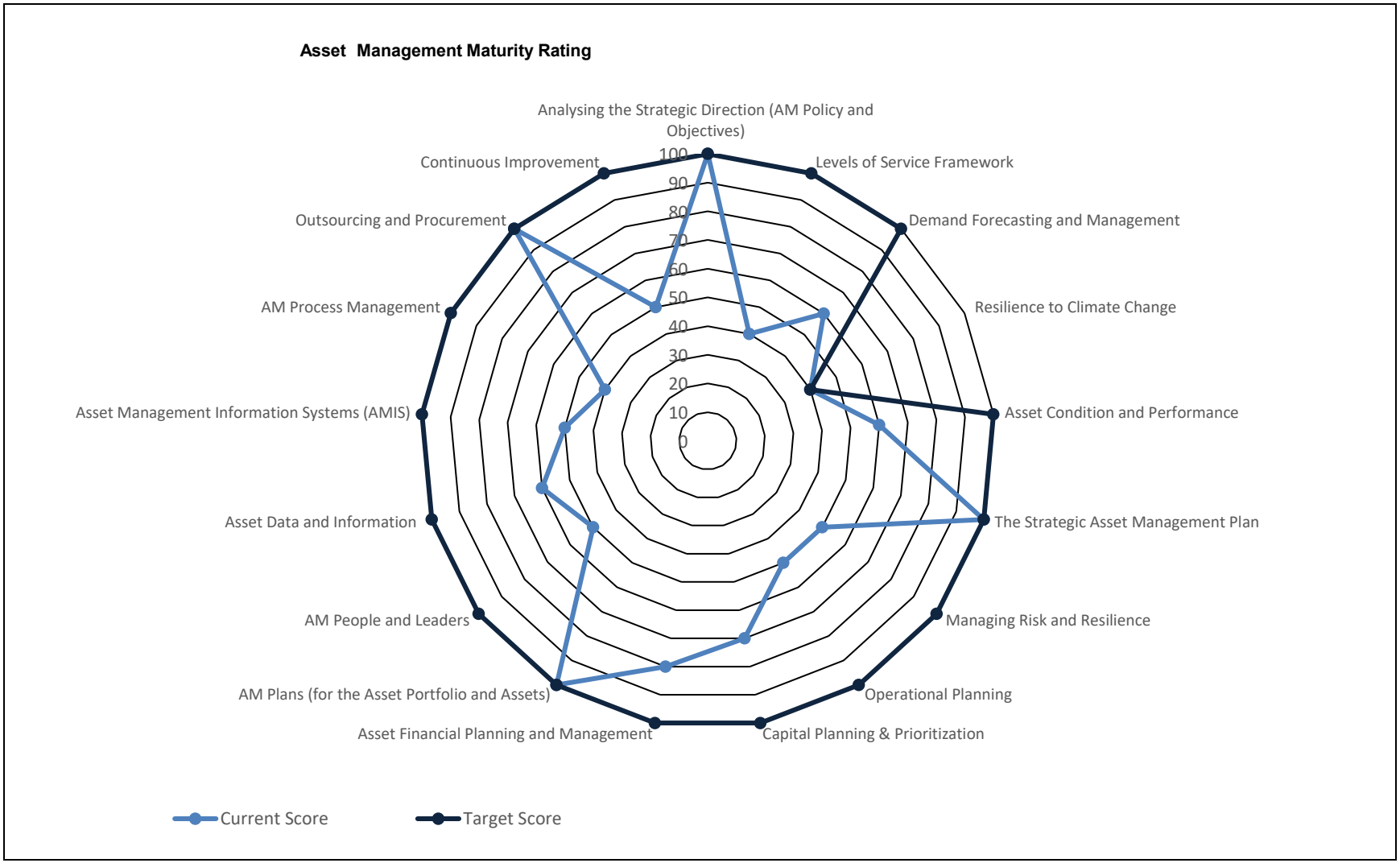
Maturity Assessments

The radar graph(s) below are based on a 2023 maturity assessment. As the service areas mature in each category, they will expand outwards towards the outer ring (Target).

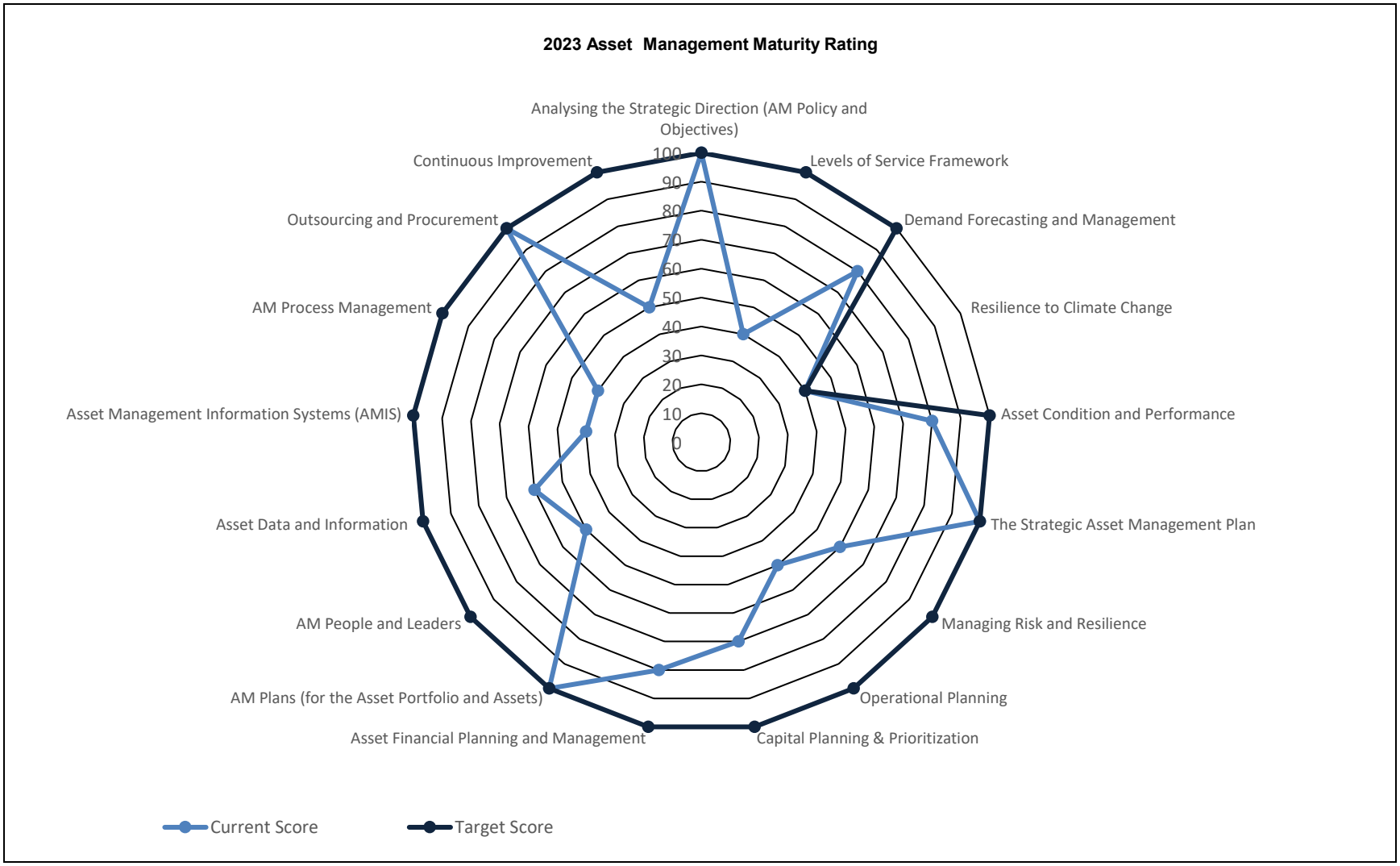
Maturity Assessment – Information Technology



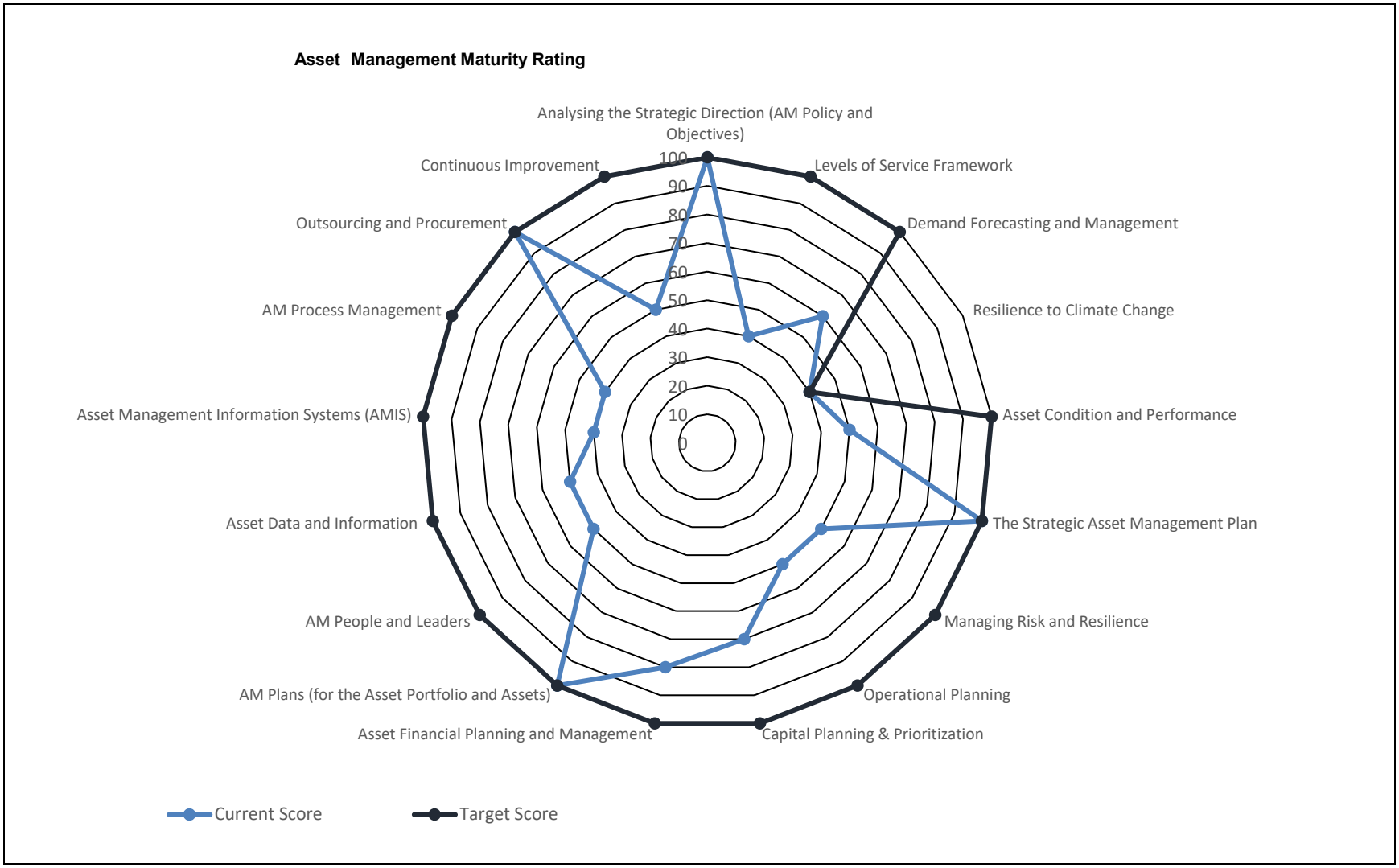
Maturity Assessment – End User Devices



Maturity Assessment –Network Services

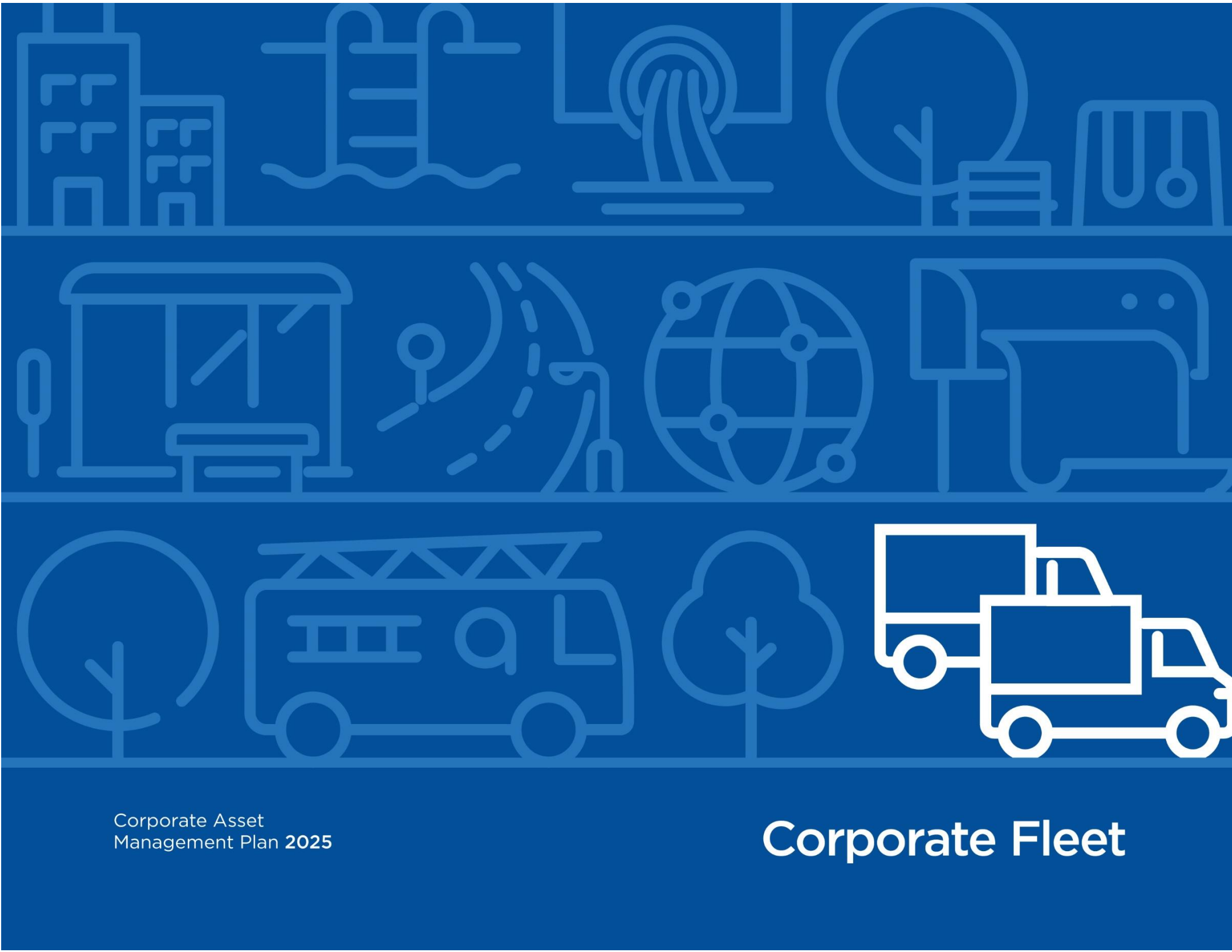


Maturity Assessment – Platform Services



Continuous Improvement Plan

Task No	Continuous Improvement Task	Asset Class	Estimated Timing	Value/Impact	Required Resources
State of Infrastructure (SOI)					
SOI-01	Review asset inventories and populate missing information.	All	2023-Onwards	Ensures accurate asset information to help make informed decisions.	External
SOI-02	Expand asset hierarchy to include additional assets.	All	2024 Completed	Includes all asset types within asset class, ensuring a complete asset class.	Internal/External
SOI-03	Develop maturity assessment of Network Fibre asset class.	Public Sector Network	2025-2026	Identifies areas of improvement for the asset management program.	Internal
Levels of Service (LOS)					
LOS-01	Establish more levels of service metrics.	All	2024-2025	In addition to being required to meet O. Reg. 588/17, LOS targets enable the service area to track progress against established targets.	External
Financing Strategies (FS)					
FS-01	Review lifecycle costing and infrastructure gap calculations.	All	2024-Onwards	Ensuring the correct allocations and lifecycle costing assumptions are used will lead to more detailed forecasts for operating and capital budgets.	Internal
FS-02	Centralize all assets in one asset management system to run asset management scenarios.	All	2024-Onwards	Develop a predictive performance model to forecast assets future condition based on budget, levels of service and/or lifecycle strategies changes.	Internal/External



Corporate Asset
Management Plan **2025**

Corporate Fleet

Table of Contents

Introduction 3
Key Stats 4
State of the Infrastructure 5
- Asset Hierarchy 5
- Asset Class - Summary 6
- Assets Used by Corporate Fleet – Managed By Other Service Areas 6
- Asset Management Tools & Systems 7
- Dashboards 7

Levels of Service 12
- Governing Legislation for Corporate Fleet 12
- Community Levels of Service Framework 13
- Technical Levels of Service Framework 14

Demand Management 15
- Demand Drivers, Projections and Management Plans 16

Risk Management 19
- Asset-Specific Risk Methodology 19

Lifecycle Management 20
- Lifecycle Strategies 20
- Lifecycle Needs vs. Budget 23
- Budget Breakdown 24

Financing Strategy 26
- Capital Funding Sources and Operating Revenue Sources 26
- Infrastructure Gap 27

Continuous Improvement & Maturity 28
- Maturity Assessments 28
- Continuous Improvement Plan – Corporate Fleet 29

Appendix 30

Introduction

The City of Mississauga is committed to providing corporate vehicle and equipment maintenance, replacement and operator training in a safe, reliable and environmentally sustainable manner. The management of City-owned fleet vehicles and equipment spans across Fire and Emergency Services, Transit, and Corporate Fleet. This detailed asset management plan (AMP) focuses on the vehicles and equipment within Corporate Fleet only, which are managed by Works Operation & Maintenance (WOM). Corporate Fleet maintains 444 vehicles and 626 equipment assets on behalf of 18 user groups across the organization.

A Corporate Fleet Asset is defined as any City-owned vehicle or equipment, with the exception of vehicles and equipment of Mississauga Fire and Emergency Services and Transit, that is used by employees and/or contractors to deliver City programs and/or services and that is:

- Licensed under the Highway Traffic Act and/or licensed under the City's CVOR certificate, and/or
- Self-propelled by an engine that produces at least 15HP or 11kW (e.g. mowers, loaders, tractors and attachments)

The current Corporate Fleet portfolio is valued at approximately $69.5 million as shown in Key Stats. These user groups are responsible for the planning and budgeting of new assets, while acquisition, ownership and lifecycle management of these assets are transferred to Corporate Fleet's responsibility. This decentralized approach for the procurement of fleet assets poses significant sustainability and service-delivery challenges for Corporate Fleet. As a result, through the Fleet Management Policy, approved in November 2024, procurement of Corporate Fleet Assets has been centralized through Fleet Services.

Corporate Fleet supports the planning, acquisition, maintenance, replacement and disposal of Corporate Fleet Assets.

Key Stats

Current Replacement Value (CRV)	Average Condition	Current Maturity Level
$69.5 Million	Fair	Intermediate
Average Annual Infrastructure Gap – Current LOS		Average Annual Infrastructure Gap – Proposed LOS
$2.3 Million[1]		Ongoing Analysis

[1] Council has approved additional capital funding in order to eliminate the existing infrastructure gap starting in 2025.

State of the Infrastructure

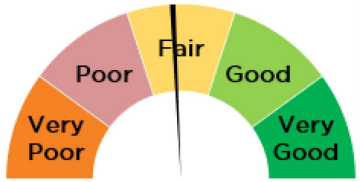
Asset Hierarchy

Table 1: Corporate Fleet Hierarchy

Asset Class	Asset Type
Vehicles	Light Vehicles (up to 4,499 kilograms)
	Heavy Vehicles (4,500 kilograms and over)
Equipment	Light Equipment (on-road)
	Light Equipment (off-road)
	Medium Equipment (off-road)
	Heavy Equipment (off-road)

Only Corporate Fleet Assets, as defined under the Fleet Management Policy, are considered under this asset management plan.

Asset Class - Summary

Asset Class	Current Replacement Value (Millions)	Average Condition	Average Annual Infrastructure Gap – Current LOS (Millions)
Vehicles	$35.1		$2.3
Equipment	$34.4		

The average annual funding gap to meet proposed levels of service is an ongoing analysis that staff are conducting for all their asset classes.

Assets Used by Corporate Fleet – Managed By Other Service Areas

Assets Used by Corporate Fleet	Managed By	Quantity	Current Replacement Value (Millions)
Buildings	Facilities Planning & Development	5 Ea.	$1.8

Asset Management Tools & Systems

The City maintains its inventory information in various systems, with each system serving a specific function and purpose.

FASTER is the computerized management system used by the Corporate Fleet staff to manage asset inventory, condition and performance, and work order management.

WinFuel is a monitoring system that tracks fuelling and fluid information for fleet assets, and automatically integrates with the FASTER system.

CityWide is the City's Tangible Capital Asset (TCA) System. The system was introduced in 2008 to capture infrastructure valuation information about the City's major assets.

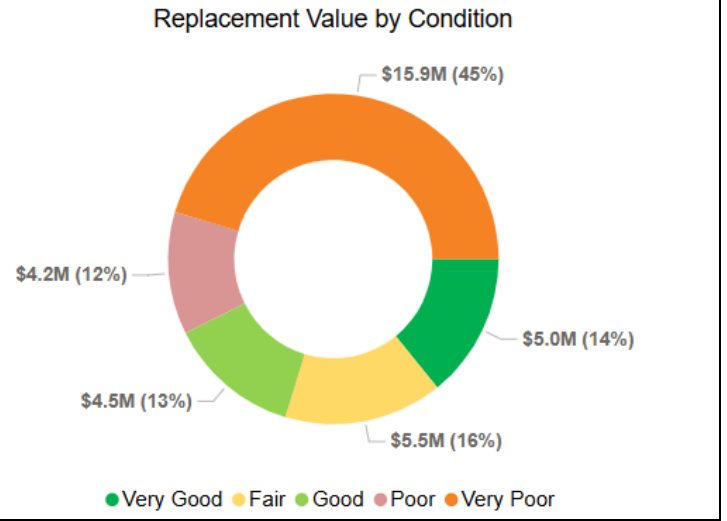
Each of these systems plays an integral role in supporting decision-making about City services and infrastructure. The asset data and information contained within these systems is comprehensive, reliable, and reasonably accurate and has been used to support the development of this plan.

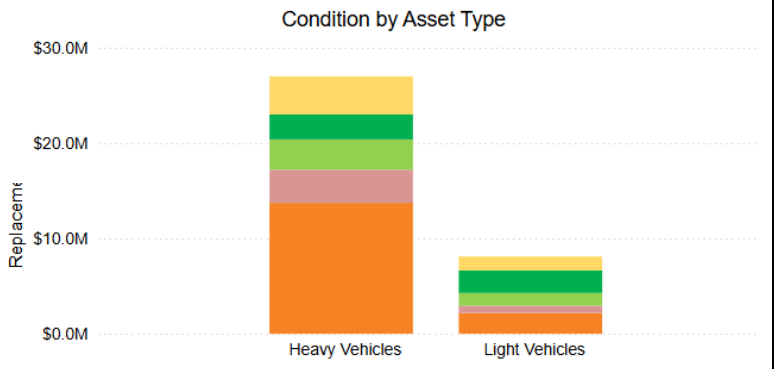
Dashboards

The following dashboards provide a summary of the state of the current infrastructure for each asset class. The information in this plan was prepared using 2023 year-end data and 2023 dollars for current replacement value. In charts, graphs and tables where money is represented in thousands of dollars ($000), figures have been rounded to the nearest thousand. This means that the totals shown may not always balance perfectly, due to rounding.

Dashboard – Vehicles

Data Quality:	Asset Inventory	Condition	Replacement Value	Current Replacement Value:	$35.1 Million
	A	A	B		





Asset Type	Quantity	Average Age (Years)	Estimated Useful Life (Years)	Current Replacement Value (000s)
Light Vehicles	171 Ea.	6.1	4-10	$8,100
Heavy Vehicles	273 Ea.	7.3	8-14	$26,980

Background Information

Corporate Fleet assets include light and heavy vehicles that perform a variety of services from earth-moving to snow removal. Light vehicles are smaller assets, like passenger cars, SUVs and small pick-up trucks, that weigh under 4,500 kilograms whereas heavy vehicles denote assets that weigh 4,500 kilograms or over, such as heavy pick-ups, dump trucks, and aerial trucks.

Corporate Fleet Assets are inspected based on Original Equipment Manufacturer (OEM) preventative maintenance schedules. Each asset, depending on the class and manufacturer, is setup for this regular preventative maintenance in FASTER. Once the trigger criteria is met, the inspection is scheduled. Any deficiencies that affect asset functionality, use or the safety of users are addressed immediately. Once the vehicle reaches its estimated useful life, it should be replaced. Often, assets are maintained past their useful life based on the City's current level of capital replacement funding for Corporate Fleet. Staff will consider new technology, green technology and any changes for user group requirements at the time of replacement.

At a minimum, an overall condition inspection is conducted annually for every Corporate Fleet Asset to ensure the asset is in a state of good repair and safe to use. Table 3 in the Appendix provides a summary of the condition framework.

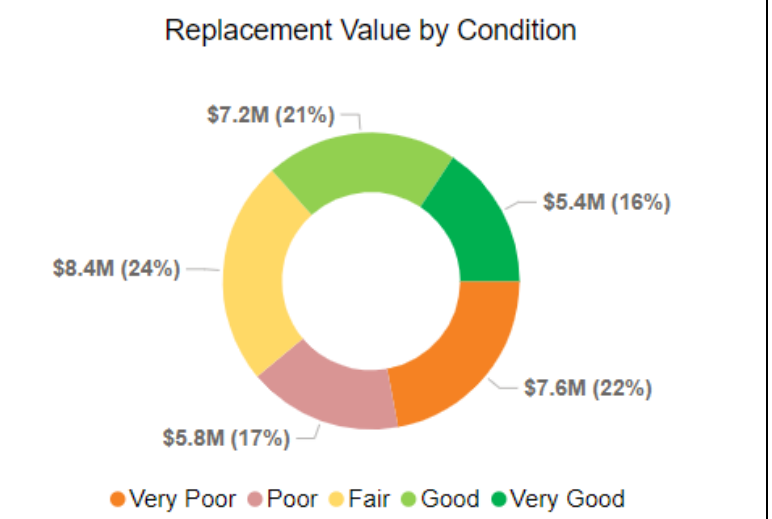
Heavy vehicles over 4,500 kilograms require an annual safety inspection that is legislated by the Ministry of Transportation (MTO) to meet a strict set of standards. These inspections are performed annually, regardless of asset use, and vehicles and drivers may be subject to inspection by the MTO roadside team at anytime. It is critical that the vehicle has the required maintenance records available, and that the driver has the required training to complete their paperwork.

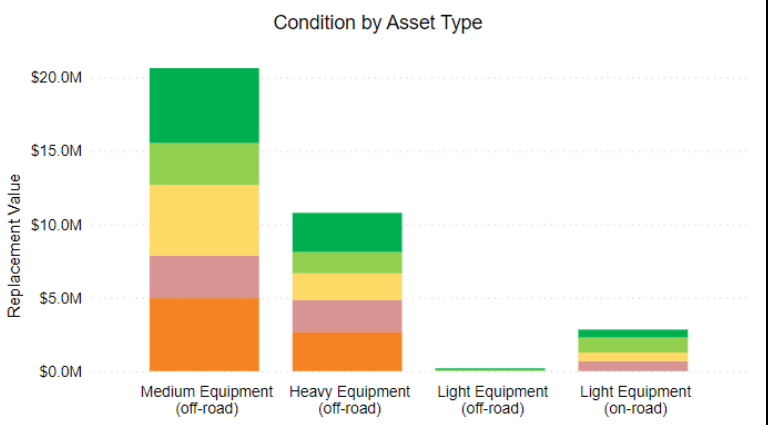
Demand maintenance is performed as required. Fleet Services relies on user groups to report required maintenance demand items or through maintenance triggers as flagged by the City's telematics solution.

Signs and Pavement Markings Vehicle

Dashboard – Equipment

Data Quality:	Asset Inventory	Condition	Replacement Value	Current Replacement Value:	$34.4 Million
	B	A	B		





Asset Type	Quantity	Average Age (Years)	Estimated Useful Life (Years)	Current Replacement Value (000s)
Light Equipment (on-road)	144 Ea.	6.3	6-15	$2,830
Light Equipment (off-road)	5 Ea.	8.6	6-15	$190
Medium Equipment (off-road)	392 Ea.	7.0	7-15	$20,640
Heavy Equipment (off-road)	85 Ea.	5.2	8-12	$10,780

Background Information

Corporate Fleet equipment includes on-road and off-road light, medium and heavy equipment, ranging from trailers to ice resurfacers, to tractors. On-road equipment, as the name suggests, are assets that are licensed and can be legally driven on roads.

Corporate Fleet Assets are inspected based on Original Equipment Manufacturer (OEM) preventative maintenance schedules. Each asset, depending on the class and manufacturer, is setup for this regular preventative maintenance in FASTER. Once the trigger criteria is met, the inspection is scheduled. Any deficiencies that affect asset functionality, use or the safety of users are addressed immediately. Once the equipment reaches its estimated useful life, it should be replaced. Based on the City's current level of capital replacement funding for Corporate Fleet Assets, many are often maintained past their useful life. Staff consider new technology, green technology and any changes for user group requirements at the time of replacement.

At minimum, an overall condition inspection is conducted annually for every Corporate Fleet asset to ensure the asset is in a state of good repair and safe to use. Table 3 in the Appendix provides a summary of the condition framework.

A review of current practices and available data has been completed and one major gap has been identified. Due to the City's decentralized fleet planning and acquisition process, there may be a number of equipment assets missing from the Corporate Fleet inventory. Having a decentralized system, where the user groups may purchase fleet assets without Corporate Fleet's knowledge, poses sustainability challenges for Corporate Fleet maintenance, replacement, and overall service delivery performance.

These challenges are reflected in the Corporate Fleet's current asset condition and expanding funding gap. The City annually budgets for approximately $500,000 in additional net new assets but does not add funding for the subsequent replacement of these assets in the 10-year capital plan, nor for any operating costs. This has been addressed through the Fleet Management Policy, approved in November 2024, which centralizes the acquisition of all Corporate Fleet Assets through Fleet Services.

Zero-turn Mower

Levels of Service

Governing Legislation for Corporate Fleet

Legislation	Requirements
Highway Traffic Act, R.S.O 1990	Act that governs Ontario roadways, vehicles and vehicle operations.
Building Opportunities in the Skilled Trades Act, 2021	Act that defines, qualifies, and ensures compliance for skilled trades employers and workers in Ontario.
Emergency Management and Civil Protection Act, 1990	Act that provides requirements for emergency management.
Municipal By-Laws	Regulations approved by Council to safeguard and protect persons and properties including air quality and idling.
O. Reg 169/22: Vehicle Emissions	Rules governing emissions systems and standards for vehicles in Ontario.
O. Reg 170/22: Vehicle Inspection Centres	Rules governing locations and requirements for authorized technicians.
O. Reg 199/07: Commercial Motor Vehicle Inspections (CMV)	Rules governing inspection schedules, performance and record keeping for CMVs.
O. Reg 424/97: Commercial Motor Vehicle Operators' Information	Rules outlining requirements for CMV Operators (the City).
O. Reg. 588/17: Asset Management Planning for Municipal Infrastructure	Provides policies and guidelines for levels of service considerations in managing municipal infrastructure assets.
R.R.O. 1990, Reg. 611: Safety Inspections	Rules outlining the technical requirements around a safety inspection for technicians.
R.R.O. 1990, Reg. 601: Motor Vehicle Inspection Stations	Rules outlining the classes of stations, licences, registration of technicians, operations and fees for an inspection station.
Occupational Health and Safety Act, 1990	Rules governing health and safety in Ontario workplaces.

Community Levels of Service Framework

Core Value	LOS Objective	Performance Measure	Current Performance
Scope	To ensure asset capacity is sufficient to support the delivery of corporate fleet services for client groups.	List of client groups and fleet inventory that corporate fleet supports.	Corporate Fleet provides services to 18 unique user areas: • Animal Services • Survey & Inspections • Facilities Operations, Energy and Maintenance • Library • Municipal Parking • Corporate Security • MiWay Transit Security • Recreation • Culture • Works Operations • Parks • Signs & Pavement Markings • Traffic Management • Courier • Fleet Services • Operations Planning Coordination • Forestry • Parking Enforcement

Technical Levels of Service Framework

Core Value	LOS Objective	Performance Measure	Current Performance (2023)	Target Performance (2024-2033)	Background Information
Reliability	To ensure asset capacity is sufficient to support the delivery of corporate fleet services for client groups.	Percentage of fleet availability.	86%	90% within the first 5 years	This metric considers demand maintenance, preventative maintenance and parts downtime.
Quality	To ensure efficient and well-maintained infrastructure that supports service delivery.	Percentage of assets that are in fair or better condition.	52%	>60%	Staff plan to replace all critical Very Poor assets within the next 2 years.
		Percentage compliance with scheduled preventative maintenance.	N/A	80%	Staff were unable to calculate current performance for this metric due to system limitations. It is a continuous improvement item.
Affordability	To effectively manage corporate fleet assets to maximize usage and minimize risk and costs.	Actual vs Target Reinvestment Rate.	0.62% vs 0.95%		A measure of how much funding is available to meet capital state of good repair lifecycle needs (Actual) versus how much funding is required (Target).
Regulatory	To meet legislative requirements.	Percentage of fleet that meet and/or exceed compliance with Ministry of Transportation (MTO) standards.	N/A	100%	Staff were unable to calculate current performance for this metric due to system limitations. It is a continuous improvement item.
		Average satisfactory safety rating (SSR) for Commercial Vehicles Operators Registration.	11.0 SSR	<35.0 SSR	Satisfactory safety rating (SSR) includes all corporate fleet and MiWay commercial Motor Vehicles.

Demand Management

Corporate Fleet is an internal service that provides life cycle management services to 18 unique user groups across the corporation. Lifecycle management services include procurement, maintenance and asset retirement. Corporate Fleet is responsible for all Corporate Fleet Assets (with the exception of Fire and Emergency Services and Transit assets) as well as the provision of fuel at four fuelling sites across the City. Corporate Fleet Assets are critical to support service delivery across the organization.

Corporate Fleet is planning for the future through both mitigation and adaptation to climate change. In 2020, the City of Mississauga updated the Corporate Green Fleet and Equipment Policy. This policy outlines priority investment in low-and zero-emissions fleet, equipment and infrastructure. A series of actions to support greening of the corporate fleet is underway, including transitioning to hybrid technology; adoption of alternative, cleaner fuels; electric vehicles and electric vehicle infrastructure planning; improved vehicle maintenance; and driver training.

Additionally, future proactive monitoring of driver behaviours through telematics will support these actions, which contribute towards mitigating climate change and support the City's Climate Change Action Plan. The success of these actions is highly dependant on strong collaboration with Corporate Fleet user groups.

As the City grows and City services are enhanced, often the fleet grows in size requiring additional fleet support to manage and maintain these assets. The recently approved Fleet Management Policy ensures that alternatives to fleet growth are evaluated thoroughly.

Mississauga Van

Demand Drivers, Projections and Management Plans

Demand Driver	Current Situation	Projection	Impact on Services	Demand Management Plan
Aging Assets	Half (50 per cent) of Corporate Fleet Assets are currently in Poor or Very Poor condition. As such, the maintenance and inspection needs are significant at this time. Capital needs consistently outpace funding allocated.	As the City's Corporate Fleet ages, the overall condition will decrease. The operating and maintenance costs have risen as we are maintaining an older fleet and will continue to increase as assets are kept beyond their useful life due to capital funding challenges.	An aging fleet in Poor or Very Poor condition without intervention can lead to more unplanned downtime; emergency repairs; rental and contracting costs and service level disruptions.	Develop and adhere to a comprehensive asset management plan and fleet management policy to formalize asset inventory, replacement activities and maximize the useful service life of Corporate Fleet Assets. In turn, this will inform the level of capital investment required.
New Legislation & Regulations	There are a number of existing laws and regulations which dictate how the City provides corporate fleet services.	In general, environmental awareness is strong and regulations are becoming stricter. Asset management regulations have recently been established and are expected to become more prescriptive. Legislation is subject to change based on changing governments.	New legislation may increase operating and capital pressures. Examples include continuously evolving emissions and commercial motor vehicle inspection legislation. This could increase asset service life but also potentially increase capital and operating costs.	Remain informed of changes to legislation and adjust maintenance, operating programs and budget accordingly.

Demand Driver	Current Situation	Projection	Impact on Services	Demand Management Plan
City Growth & Net New Fleet Acquisition	Annual and additional growth fleet funding is provided to various services in the organization for net new additional fleet assets.	With capital funding challenges to replace the City's existing aging fleet, funding additional net new assets enhances the funding pressure.	Additional net new assets will add new stresses to the existing Corporate Fleet management system and must be met with a commitment to increase the capital fleet replacement budget as net new assets are added to the fleet.	Maintain a comprehensive asset management plan and fleet management policy to formalize asset inventory, net new process requests and maximize the use of existing corporate fleet assets. In turn, this will inform the level of operating and capital investment required to be funded at the time of growth acquisition.
Technology	New technologies such as low- and zero-emissions vehicles and equipment have limited availability in Ontario at this time. Market availability across all assets classes is either relatively new or non-existent. There is a high demand for these assets and production is increasing. Telematics technology at the City has expanded.	The cost to replace aging Corporate Fleet assets should become more affordable in the future if the federal government continues to mandate sales for green vehicles and the number of suppliers and availability increases. In the short term, telematics technology can be used to reduce the City's fleet size, and	Corporate Fleet replacement with low-or zero-emission alternatives may become more affordable in the future as the technology becomes more available and competitive as the marketplace increases.	Monitor changes to available technologies. Research, fund and invest in charging infrastructure accordingly. Communicate with other municipalities to discuss pilot replacements and industry best practice.

Demand Driver	Current Situation	Projection	Impact on Services	Demand Management Plan
		greenhouse gas emissions through proactive monitoring and analysis.		
Climate Change & Extreme Weather Changes	With the frequency and intensity of extreme weather events increasing year after year, demand maintenance will increase on assets due to accelerated deterioration of vehicles and equipment caused by the elements. Most assets are stored outdoors, and the weather has an impact on the deterioration and maintenance requirements which can also lead to the premature end of useful life.	As temperatures increase globally, especially those in urban environments, asset maintenance and deterioration will increase. Additional funding may be required to replace assets prematurely.	Vehicle and equipment requirements for service delivery may change with extreme weather changes.	Monitor changes to available technologies. Consider indoor or covered storage requirements for fleet assets for new and existing storage sites. Communicate with other municipalities to discuss evolving industry best practice.

Risk Management

Asset-Specific Risk Methodology

Corporate Fleet staff have identified risk management as a continuous improvement item as they begin to formalize and standardize a framework in 2024. Currently, staff prioritize assets by considering many factors such as the age, condition, location, usage and criticality of the asset. Corporate Fleet will be working with the Corporate Asset Management (CAM) Office to develop comprehensive and reliable risk models to effectively prioritize within, and across, various asset classes.

In subsequent updates to this asset management plan, a formal risk assessment tool will be developed to inform decision-making and prioritization for a variety of asset classes and their components.

Lifecycle Management

Lifecycle Strategies

Corporate Fleet – Current and Proposed Lifecycle Activities

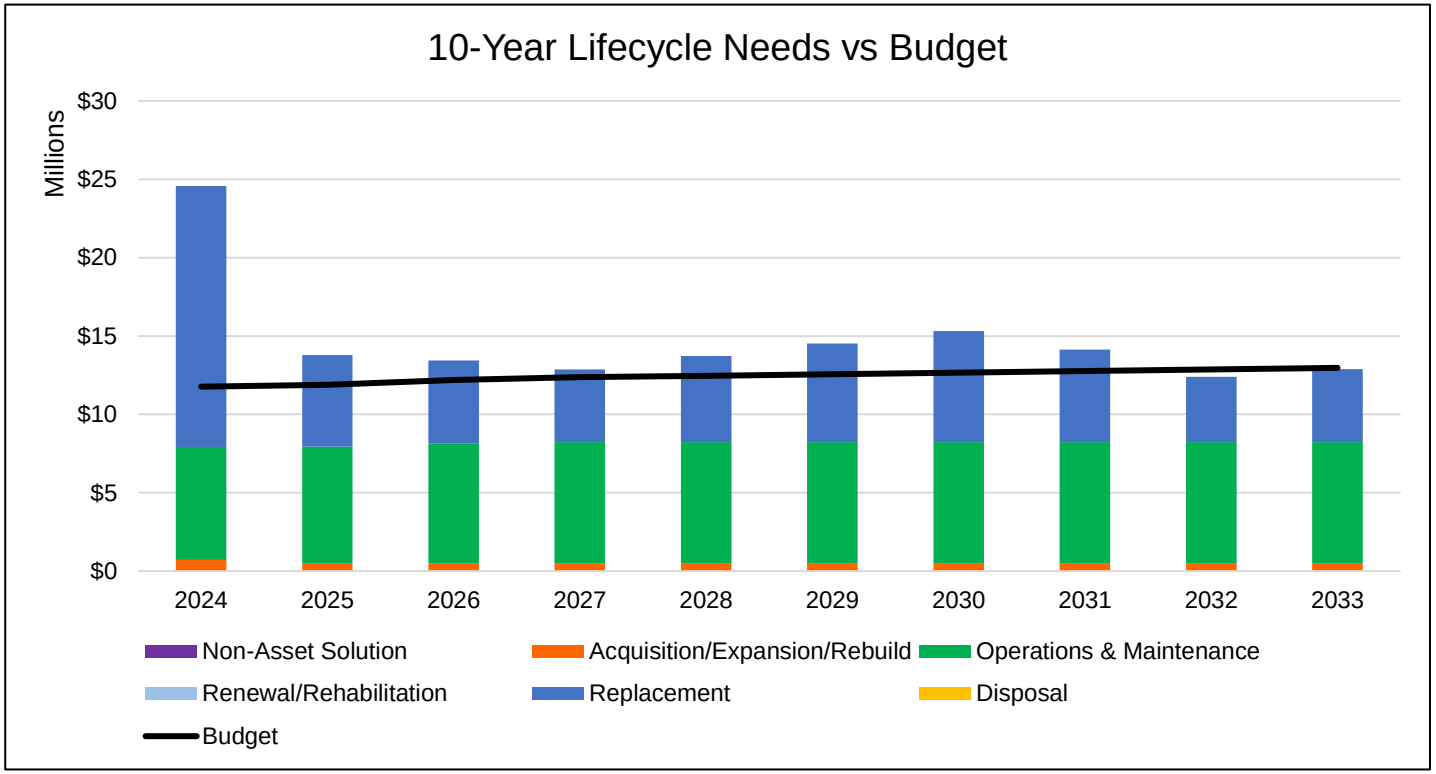
Current and Proposed Lifecycle Activities	Risks associated with Lifecycle Activities
Non-Asset Solutions: Activities that do not alter the condition or performance of assets or services but provide staff with valuable information for their effective management.	
• Standard Operating Procedures • Service Level Agreements with user groups • Driver training for vehicles and equipment • Annual Asset Utilization Reports • Green Vehicle and Equipment Policy • Proactive monitoring requirements for leaders of fleet assets to ensure safe driving practices that align with asset management requirements Proposed •Self-booking tool for user groups to schedule preventative maintenance, within required timelines, and demand maintenance as required (planned for future)	• Health & Safety risk for staff and Public • Lawsuits • Service level disruptions due to non-compliance
Operations & Maintenance: Minor activities that preserve the condition or performance of assets and ensures the longevity of assets in line with their design and operational requirements.	
• Maintenance and inspections according to manufacturers' recommendation and legislative standards • Drivers complete and document a daily pre-trip inspection of each asset they use. Any deficiencies are reported and documented	• Maintenance costs increase • Service level disruptions may occur if the asset is down or not available • Safety and legal risk due to limited proactive monitoring and coaching • Reputational risk

Current and Proposed Lifecycle Activities	Risks associated with Lifecycle Activities
• Annual condition assessments are conducted on Corporate Fleet Assets • For services not available in-house like body work, oil spraying and tire replacement, supervisors coordinate sublet repairs • Parts Team maintains a parts inventory of the most frequently used parts to reduce downtime to user groups and speed up repair time • Periodic inspection of driver paperwork internally	
Renewal/Rehabilitation: Significant activities designed to extend the useful life of assets components.	
• Regular renewals/rehabilitation based on condition and performance • Review add-on equipment, attachments, and outfitting past the lifecycle of the parent asset	• Delayed renewals or rehabilitation may result in unscheduled downtime due to repairs or asset failure
Replacement: Replacement activities occur once an asset reaches the end of its useful life, cannot provide the intended function or performance, and rehabilitation is not a viable option.	
• Optimal asset lifecycle is assessed on an ongoing basis to determine the replacement that minimizes maintenance costs and maximizes salvage value • Communications with staff at end of useful life to help with service and repair decisions to mitigate non-value-added expenditures Proposed • Replace critical assets in Poor-Very Poor condition (14.1-15.0 pt condition rating) within next two years	• Delayed replacement due to funding challenges/deferral may result in unscheduled downtime and increased operating costs • Service disruptions may result due to asset failure, and additional costs for rental (if available) and/or contracting services

Current and Proposed Lifecycle Activities	Risks associated with Lifecycle Activities
Disposal/ Demolition: Activities associated with the disposal or decommissioning of an asset.	
• Optimal lifecycle analysis is completed for each asset prior to replacement. Salvage value can vary but an average of 10-15 per cent of replacement value is consistently achieved • Auction planning ensures that similar assets are staggered and targets seasonal demands for assets to maximize return	• Improper disposal can lead to environmental damages, lost recovery from salvage and increased repair costs for assets that have already been replaced
Acquisition/Expansion/Rebuild: These activities expand services to previously non-serviced areas or to accommodate growth; they provide new or enhanced services beyond the current capacity and/or functionality of existing assets.	
• Low- or zero-emissions fleet assets being acquired • Proactive planning for charging infrastructure	• Unsustainable fleet inventory and compromise in state of good repair of assets • Inability to mitigate climate change impacts and other demand factors • Growth activities may be delayed and impact the quality of asset services provided

Lifecycle Needs vs. Budget

Corporate Fleet



Funding is provided annually for new acquisitions, but the replacement funding is not increasing at the same rate plus inflation. This causes significant pressure on the replacement budget and forces the City to incur additional operating costs to maintain assets past the end of their useful life.

As part of continuous improvement, staff will continue to quantify and analyze the lifecycle needs required as they refine their proposed levels of service, where they have been established, along with any resourcing requirements as a result.

Budget Breakdown

Over the next 10 years, Corporate Fleet plans to spend an average of $12.5 million annually on vehicles and equipment, with the majority of the budget being used for operations and maintenance activities at 61.3 per cent, and replacement activities at 34.5 per cent.

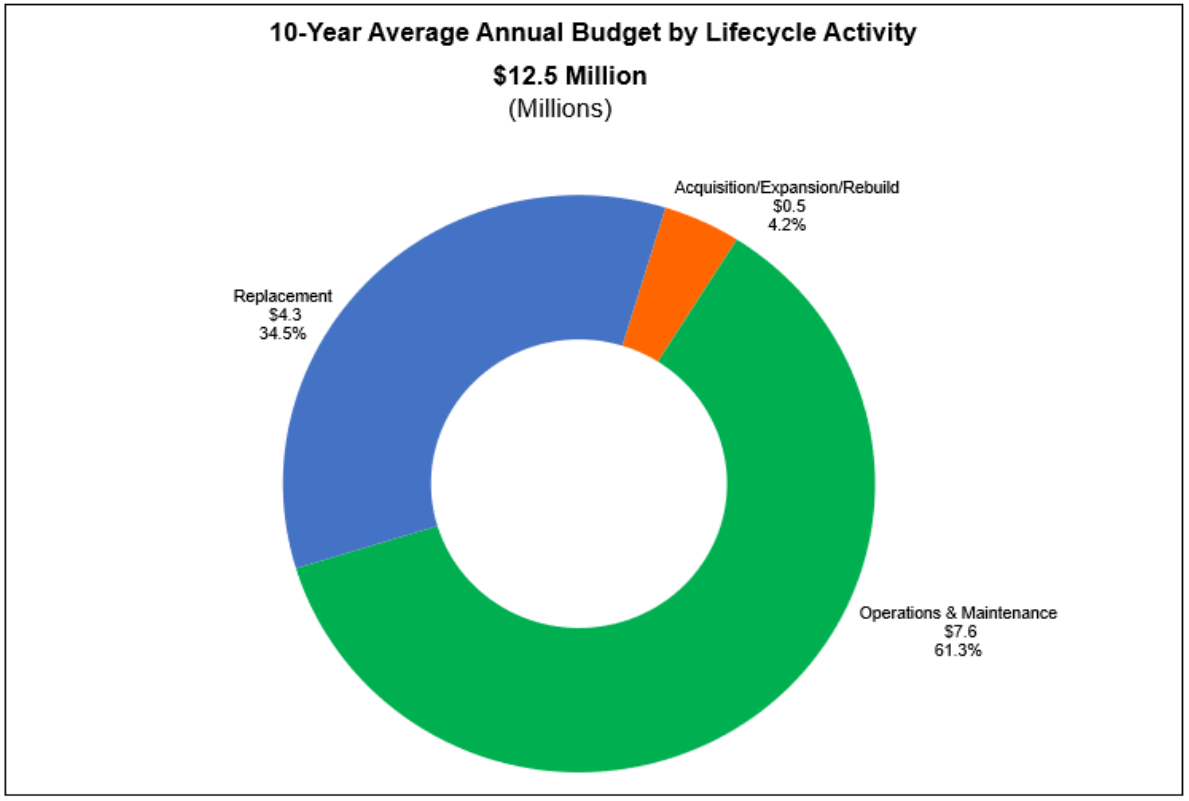


Figure 1: Breakdown of Budget by Lifecycle Activity

Table 2 shows the 10-year annual average budget breakdown by asset class. The majority of the of the operating and capital budget is spent on State of Good Repair (SOGR) of Corporate Fleet assets.

Table 2: Budget breakdown by Asset Class

Asset Class	SOGR Budget Type ($ Million)			Growth Capital Budget ($ Million)	Total Budget ($ Million)
	Operating	Capital	Total		
Vehicles and Equipment	7.6	4.3	11.9	0.5	12.5
Total	**7.6**	**4.3**	**11.9**	**0.5**	**12.5**

Financing Strategy

Capital Funding Sources and Operating Revenue Sources

The estimated available funding for the next 10-year period (2024-2033) for Corporate Fleet is $124.5 million. The primary sources of funding are operating revenue sources at 61.3 per cent and Tax Reserve Funds at 34.6 per cent which is primarily used to support capital infrastructure renewal needs.

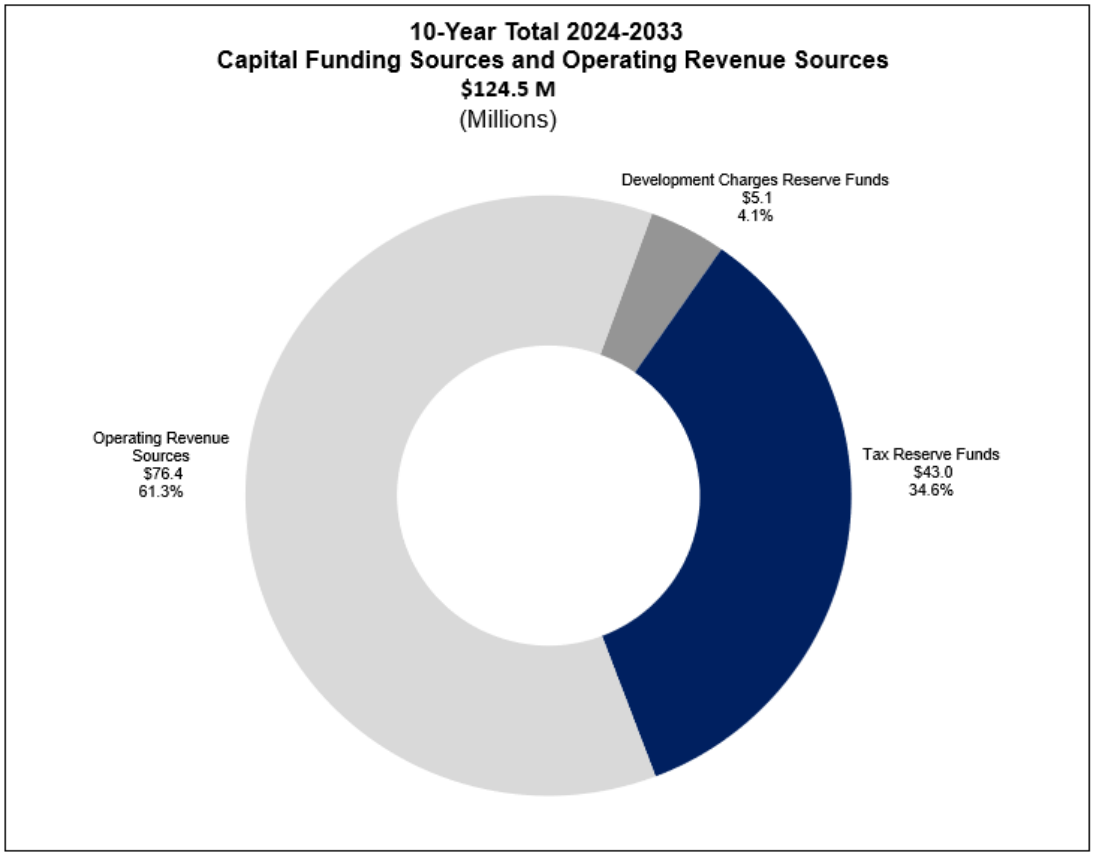
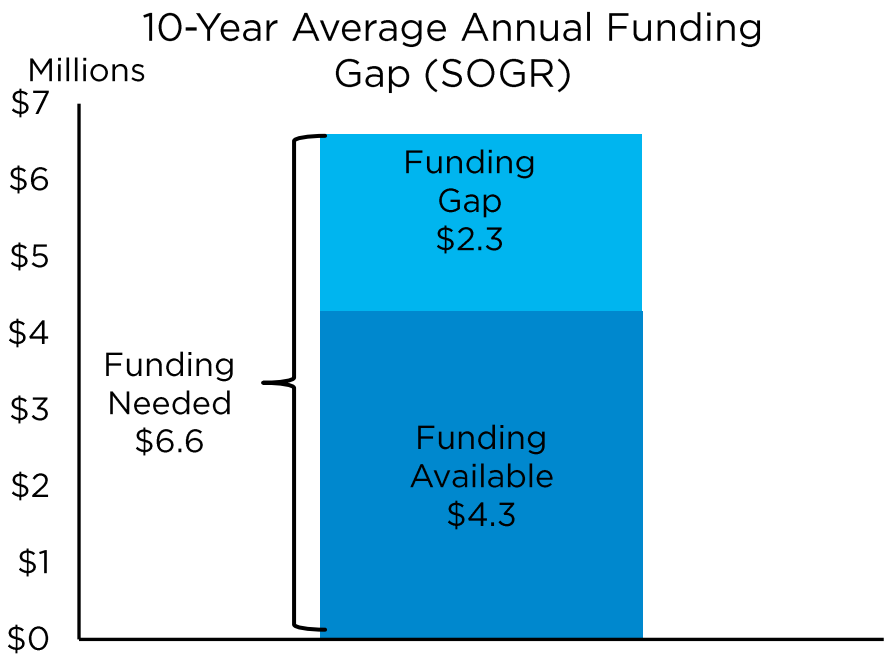


Figure 2: Capital Funding Sources (2024-2033)

Infrastructure Gap

Corporate Fleet



The average annual funding gap to meet current levels of service is approximately $2.3 million. Staff have determined that to achieve and sustain the proposed levels of service, no additional funding needs or resourcing are required beyond the gap identified for current levels of service. Council recently approved additional capital funding in order to eliminate the existing funding gap starting in 2025 onwards. The proposed service levels are achievable within the next 10 years with ongoing process and system improvements with existing staff.

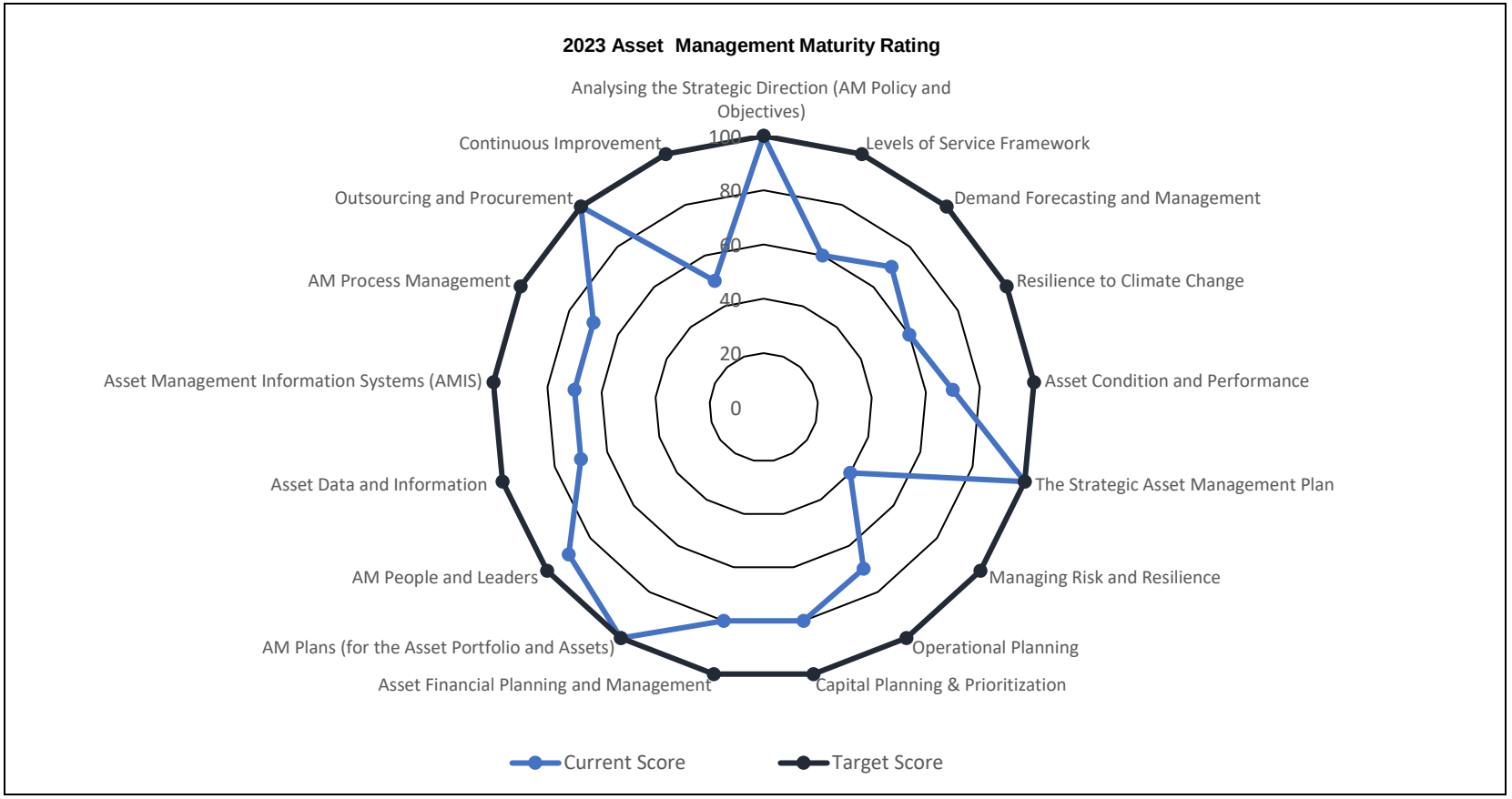
As part of continuous improvement, staff will continue to evaluate the affordability and sustainability of proposed levels of service, where they have been established, and integrate their asset management program with the annual budgeting process.

Continuous Improvement & Maturity

Maturity Assessments

The radar graph(s) below are based on a 2023 maturity assessment. As the service areas mature in each category, they will expand outwards towards the outer ring (Target).

Maturity Assessment – Corporate Fleet



Continuous Improvement Plan – Corporate Fleet

Task No.	Continuous Improvement Task	Estimated Timing	Value/Impact	Required Resources
State of Infrastructure (SOI)				
SOI-01	Review MTO Inspection Schedules.	2024-Ongoing	Ensure customer impact is minimized and is achievable for fleet staff.	Internal
SOI-02	Develop a risk assessment framework for fleet assets.	2024-2025	Enable staff to better prioritize asset lifecycle intervention.	Internal
SOI-03	Develop and implement the Fleet Management Policy.	2023 – 2024 (Completed)	Establish planning and acquisition processes for corporate fleet assets to enhance fleet sustainability.	Internal
SOI-04	Develop and implement bi-annual FASTER data audit.	2024-2026	To ensure data sets are clean and accurate at all times.	Internal
Financing Strategy (FS)				
FS-01	Utilize asset investment planning tool to run scenarios and forecast lifecycle needs.	2025 – 2026	Develop a predictive performance model to forecast asset condition based on budget, levels of service and changes in lifecycle strategies.	Internal
FS-02	Work with Finance to formalize performance targets and sustainable funding.	2023 – 2025	Develop more proactive and reliable short-term and long-term capital planning.	Internal
FS-03	Work with Corporate Finance to address golf asset funding.	2024-Ongoing	Ensure that asset management plan structure and capital funding structure for golf assets align.	Internal
Levels of Service (LOS)				
LOS-01	Ongoing review of LOS metrics and establishment of targets.	2023 – 2025	To refine service demands for long-term sustainability.	Internal
LOS-02	Develop and conduct user group customer service survey.	2024	To obtain feedback on service levels, user group priorities and challenges	Internal

Appendix

Table 3: Condition Scale for Corporate Fleet assets

Condition Rating	Corporate Fleet Rating (15 pt)	Description
Very Good: Fit for the Future	0-2.9	The Corporate Fleet asset has greater than or equal to 80 per cent of its remaining useful life. It is generally in very good condition, typically new or recently rehabilitated.
Good: Adequate for Now	3-5.9	The Corporate Fleet asset has less than 79 per cent (and greater than or equal to 60 per cent) of its remaining service life. It is in good condition.
Fair: Requires Attention	6-8.9	The Corporate Fleet asset has less than 59 per cent (and greater than or equal to 40 per cent) of its remaining service life. Maintenance requirements generally begin to increase; but the asset is in fair condition.
Poor: Approaching End of Life	9-11.9	The Corporate Fleet asset has less than 39 per cent (and greater than or equal to 21 per cent) of its remaining service life. It is operable, but condition is deteriorating, asset components may need replacement as approaching the end of service life, and maintenance requirements and asset downtime may increase. Levels of Service may be impacted.
Very Poor: Requires Renewal	12-15	The Corporate Fleet asset has less than 20 per cent of its remaining service life. It is in poor condition and should be replaced or rehabilitated as the optimal service life reaches the end and minimum cost of ownership is reached. Any extension beyond this period will result in significant investment in asset maintenance and reduce reliability impacting levels of service.

Corporate Asset
Management Plan **2025**

Recreation & Culture

Table of Contents

Introduction 3
Key Stats 4
State of the Infrastructure 5
Asset Hierarchy 5
Asset Class - Summary 7
Assets Used by Recreation & Culture – Managed By Other Service Areas 7
Asset Management Tools & Systems 8
Dashboards 8
Levels of Service 17
Governing Legislation for Recreation & Culture Service Area 17
Community Levels of Service Framework 18
Technical Levels of Service Framework 19
Demand Management 20
Demand Drivers, Projections and Management Plans 22
Risk Management 28
Asset-Specific Risk Methodology 28
Lifecycle Management 29
Lifecycle Strategies 29
Lifecycle Needs vs. Budget 33
Budget Breakdown 38
Financing Strategy 40
Capital Funding Sources and Operating Revenue Sources 40
Infrastructure Gap 41
Continuous Improvement & Maturity 42
Maturity Assessments 42
Continuous Improvement Plan 47
Appendix 50

Introduction

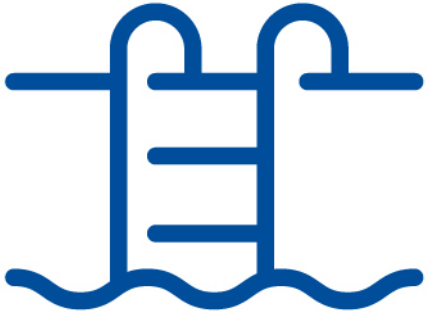
The City's Recreation & Culture Service Area focuses on keeping Mississauga residents healthy and active, and to grow the City as a vibrant arts and cultural hub connected in partnership with the community. Recreation staff continuously strives to deliver responsive and effective services that satisfy the diverse needs of residents within all Mississauga communities. Recreation operates and maintains 12 major and 12 minor recreational facilities across the City including: eight equipment-based fitness centres, 12 indoor swimming pools, seven outdoor pools and 13 arenas. These various recreational facilities are outfitted with a variety of equipment to support the effective delivery of recreational services for City residents. Recreation staff focus on the equipment assets and programs within these facilities whereas Facilities Planning & Development is responsible for the building structure itself.

For Culture, there are three sections divided between Recreation & Culture and Parks, Forestry & Environment Divisions that are responsible for Culture Services; they are: Culture Programs, Events & Media Production, and Venue & Event Services.

Weights on Rack at Fitness Facility

Hammerson Hall stage at the Living Arts Centre

Key Stats

Current Replacement Value (CRV)	Average Condition	Current Maturity Level
$29.2 Million	Good	Intermediate
Average Annual Infrastructure Gap – Current LOS		Average Annual Infrastructure Gap – Proposed LOS
$0.0 Million		Ongoing Analysis

State of the Infrastructure

Asset Hierarchy

Table 1: Recreation & Culture Service Area Hierarchy

Asset Class	Asset Type
Recreation Equipment	Aquatics
	Arenas
	Community Programs
	Fitness
	Food Services
	Golf
	Meeting Rooms
	Operations
Culture Programs	Ceramic Studio Equipment
	Flame-working and Sculpture Studio Equipment
	Glass Studio Equipment
	IT Equipment
	Photography Equipment
	Wood Studio Equipment
	Textile Studio Equipment
	General Visual Arts Equipment

Asset Class	Asset Type
Events & Media Production	Lighting Equipment
	Rigging Equipment
	Audio Equipment
	Video Equipment
	Production Equipment
	Staging Equipment
Venue and Events Services	Small Arms Inspection Building
	Paramount Fine Foods
	Meadowvale Theatre
	Living Arts
	Celebration Square

Asset Class - Summary

Asset Class	Current Replacement Value (Millions)	Average Condition	Average Annual Infrastructure Gap – Current LOS (Millions)
Recreation Equipment	$25.2		$0.0
Culture Programs	$1.0		
Events & Media Production	$1.8		
Venue and Events Services	$1.2		

The average annual funding gap to meet proposed levels of service is an ongoing analysis that staff are conducting for all their asset classes.

Assets Used by Recreation & Culture – Managed By Other Service Areas

Assets Used by Recreation & Culture	Managed By	Quantity	Current Replacement Value (Millions)
Vehicles and Equipment	Corporate Fleet	57 Ea.	$3.0
Buildings	Facilities Planning & Development	69 Ea.	$1,136.7

Asset Management Tools & Systems

The City maintains its inventory information in various systems, with each system serving a specific function and purpose.

Excel is used to track inventory and relevant attribute information for all Recreation & Culture assets.

CityWide is the City's Tangible Capital Asset (TCA) System. The system was introduced in 2008 to capture infrastructure valuation information about the City's major assets.

ACTIVENet is a software solution that manages facility, registration and memberships. It is also used as a reporting tool for some culture assets.

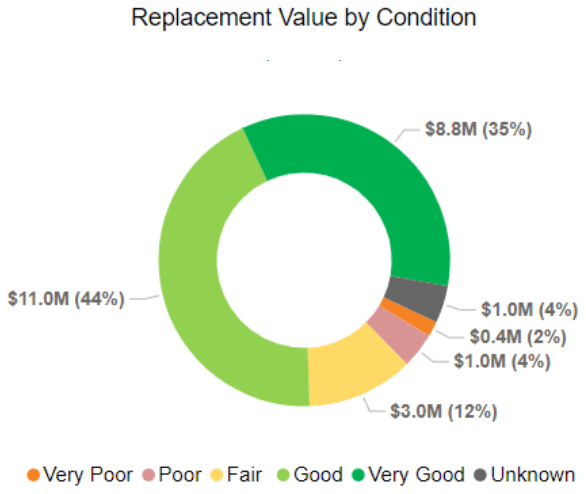
Each of these systems plays an integral role in supporting decision-making about City services and infrastructure. The inventory information contained within each of these systems is comprehensive, reliable, and reasonably accurate and has been used to support the development of this plan.

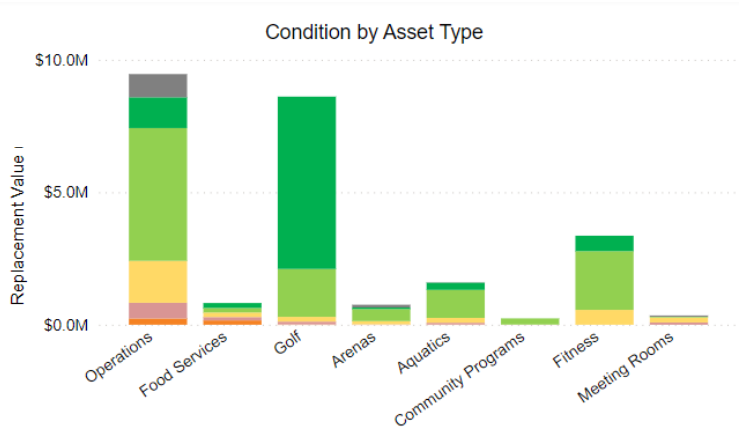
Dashboards

The following dashboards provide a summary of the state of the current infrastructure for each asset class. The information in this plan was prepared using 2023 year-end data. In charts, graphs and tables where money is represented in thousands of dollars ($000), figures have been rounded to the nearest thousand. This means that the totals shown may not always balance perfectly, due to rounding.

Asset Class: Recreation Equipment

Data Quality:	Asset Inventory: C	Condition: C	Replacement Value: B	Current Replacement Value:	$25.2 Million





Asset Type	Quantity	Average Age (Years)	Estimated Useful Life (Years)	Current Replacement Value (000s)
Aquatics	480 Ea.	6.1	10-20	$1,600
Arenas	186 Ea.	9.9	10-20	$750
Community Programs	361 Ea.	6.3	10-20	$240
Fitness	421 Ea.	5.2	10-20	$3,360
Food Services	68 Ea.	17.4	10-20	$820
Golf	186 Ea.	9.3	10-20	$8,600
Meeting Rooms	66 Ea.	16.8	10-20	$350
Operations	4,111 Ea.	9.9	10-20	$9,460

Background Information

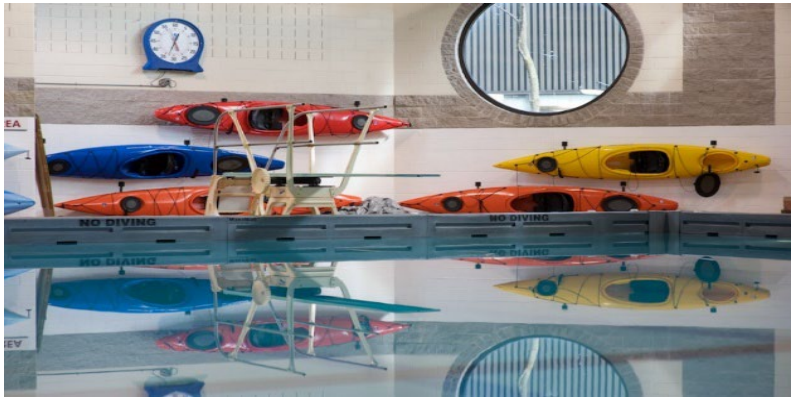
Recreation equipment includes over 5,000 active assets that support various recreation programs and services.

Staff are in the process of updating and refining their inventory to ensure that all recreation equipment assets are being captured and that the critical attribute information tagged against the assets (i.e. in-service date, replacement value, etc) is accurate and reliable.

For this iteration, staff have excluded any recreation equipment assets that are considered consumables/expendables and assets that have insufficient data.

Staff primarily utilize age-based condition for Recreation equipment. Staff make considerations for asset usage, functionality and obsolesce are considered when staff are prioritizing replacements.

Where in-service date and therefore age are unavailable, staff made educated estimates on the condition, with assets being mostly labelled as Good.

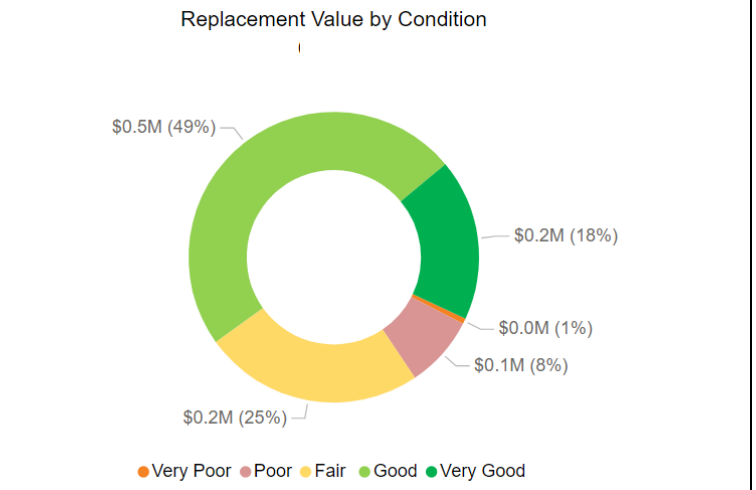


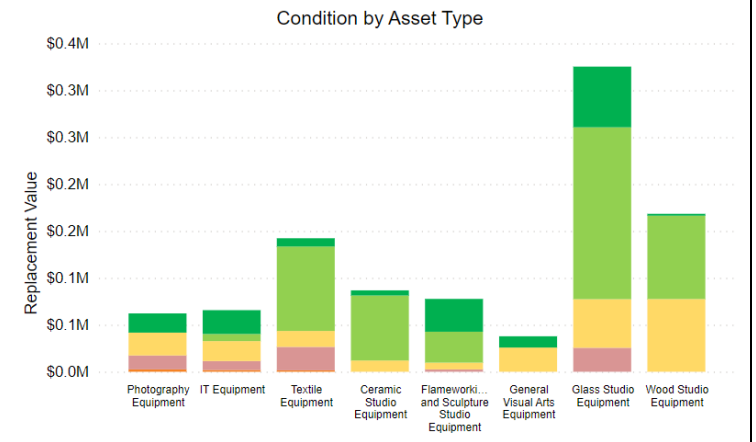
Mississauga Valley's Pool – Kayaking Equipment

Asset Class: Culture Programs

Data Quality:	Asset Inventory	Condition	Replacement Value
	B	B	B

Current Replacement Value: $1.0 Million





Asset Type	Quantity	Average Age (Years)	Estimated Useful Life (Years)	Current Replacement Value (000s)
Ceramic Studio Equipment	25 Ea.	14.5	10-20	$90
Flameworking and Sculpture Studio Equipment	29 Ea.	15.0	10-40	$80
Glass Studio Equipment	86 Ea.	12.7	5-30	$325
IT Equipment	74 Ea.	4.3	5-8	$70
Photography Equipment	91 Ea.	10.6	5-20	$60
Wood Studio Equipment	32 Ea.	15.6	5-30	$170
Textile Equipment	108 Ea.	10.0	5-20	$140
General Visual Arts Equipment	57 Ea.	5.5	10-20	$40

Background Information

The City provides registered and school programs across various art forms. The Culture Programs Service Area consists of 502 assets that residents can access for their programming needs.

These assets are currently inventoried in an excel spreadsheet with critical attribute information, such as in-service date, description, quantity and replacement value, tagged against them. Replacement values were based on a mixture of inflated historical costs and current market prices, as available.

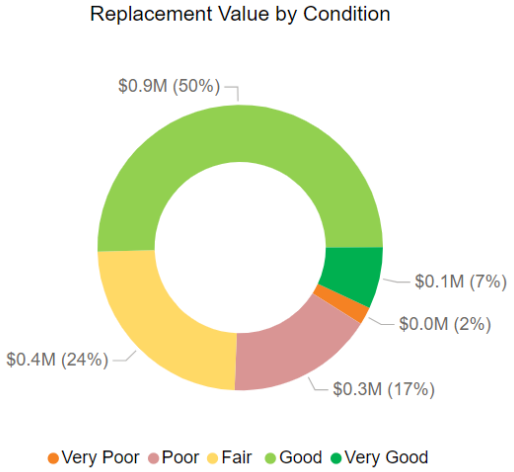
The condition of assets was primarily based on age and remaining useful life, with some exceptions based on staff knowledge of asset performance/condition.

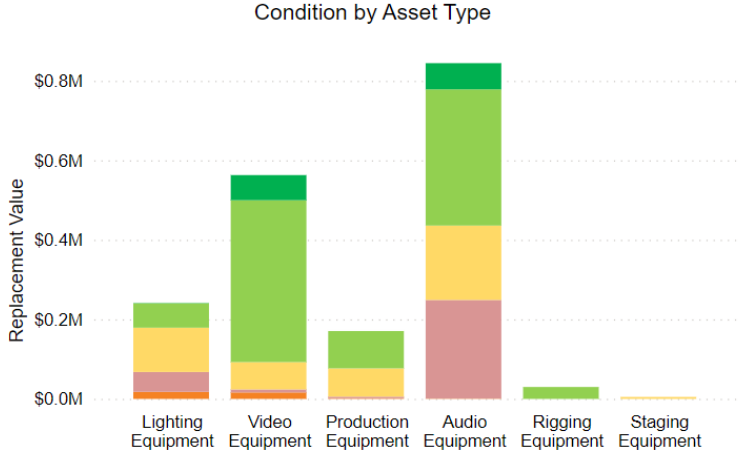
As a continuous improvement item, staff will be refining their data to ensure that assets are captured and updated regularly and that replacement values are more accurate.

Glass studio at the Living Arts Centre

Asset Class: Events & Media Production

Data Quality:	Asset Inventory: C	Condition: C	Replacement Value: B	Current Replacement Value:	$1.8 Million





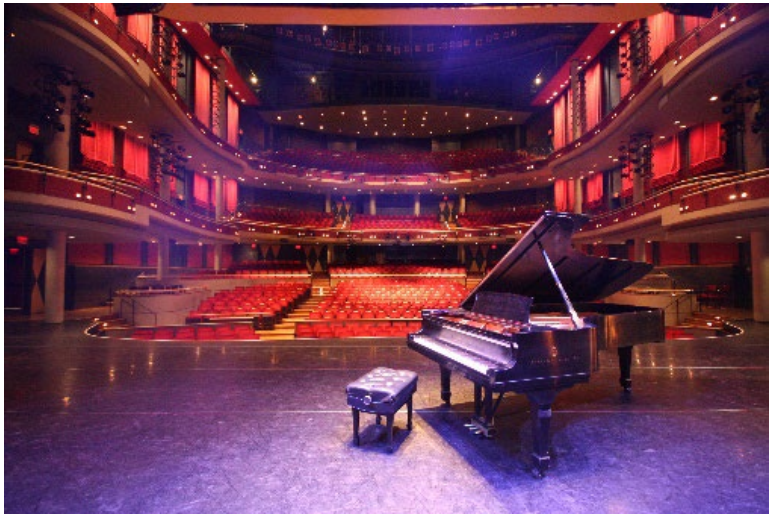
Asset Type	Quantity	Average Age (Years)	Estimated Useful Life (Years)	Current Replacement Value (000s)
Lighting Equipment	1,576 Ea.	12.8	5-25	$240
Rigging Equipment	4 Ea.	10.0	30	$30
Audio Equipment	828 Ea.	11.4	5-25	$840
Video Equipment	184 Ea.	9.5	5-20	$560
Staging Equipment	1 Ea.	5.0	-	$5
Production Equipment	131 Ea.	10.2	5-20	$170

Background Information

The Events & Media Production Service Area is an integral part of providing technical support for live event productions for small to large scale venues throughout the City. The Events & Media Production Service Area has 2,724 assets that are used to assist staff in perfecting each performance.

The asset inventory is stored in an excel spreadsheet that tracks the location, age, quantity and purchase cost of the assets. Staff will continue to refine the inventory to ensure that all active assets are captured accurately and that the replacement values are wholly based on current market prices as opposed to inflated historical/purchase costs.

Condition was approximated solely based on age and remaining useful life. For assets where the in-service date was missing or deemed inaccurate, a condition of "Good" was assumed.

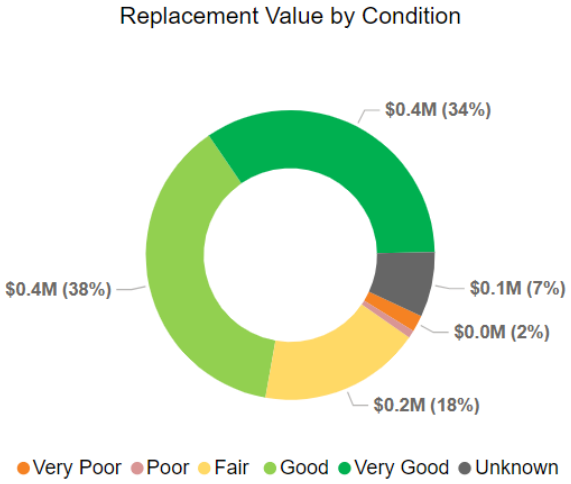


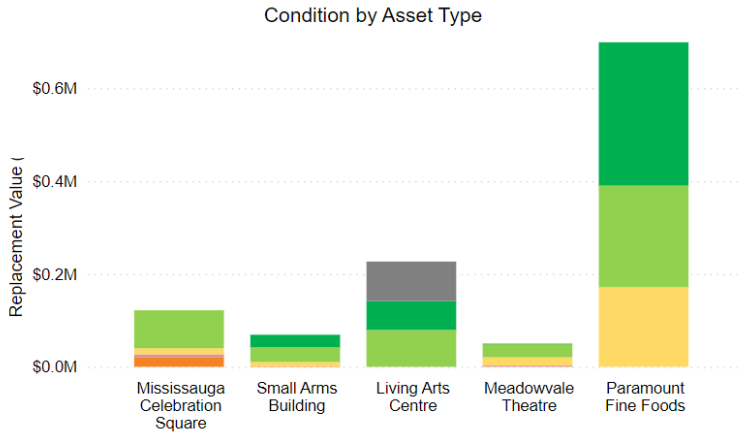
Main stage at the Living Arts Centre

Asset Class: Venue & Events Services

Data Quality:	Asset Inventory	Condition	Replacement Value
	D	D	B

Current Replacement Value:	$1.2 Million





Asset Type	Quantity	Average Age (Years)	Estimated Useful Life (Years)	Current Replacement Value (000s)
Small Arms Inspection Building Equipment	134 Ea.	-	5-10	$70
Paramount Fine Foods Equipment	48 Ea.	-	5-10	$700
Meadowvale Theatre Equipment	193 Ea.	-	5-20	$50
Living Arts Equipment	121 Ea.	-	5-10	$230
Celebration Square Equipment	67 Ea.	-	5-20	$120

Background Information

Venue & Event Services manage various asset types within five main Cultural facilities in Mississauga; they are: Celebration Square, Living Arts Centre, Paramount Fine Foods Centre, Small Arms Inspection Building and Meadowvale Theatre.

Assets vary depending on the facilities they are within and the functions they serve. They can include:

- Garbage cans
- Window blinds
- Skate container
- Electric heaters
- Basketball equipment (i.e. portable basketball floor, Spalding Stanchions, Spalding shotclock)
- Daktronic equipment (i.e. shotclock controller, game clock controller, score displays, red light on backboards, hockey goal lights)
- Stageright equipment (i.e. stage decks and bases, handrails, stage drape, blow through stage barricade)
- Kitchen equipment (i.e. fridges, freezer and utensils)
- Office equipment (i.e. coat racks, podiums, portable display walls, portable sign stands)

For this iteration, staff have excluded assets that are considered consumables/expendables and assets that have insufficient data.

The condition for all assets was assumed to be "Good-Very Good". No formal condition assessments are conducted at this time, and the majority of assets lacked an in-service date in order to approximate the age. This has been identified as a continuous improvement item as staff advance on their asset management journey.

Replacement values were based on a mixture of historical inflation and available current market prices.

Servery in the Small Arms Inspection Building

Levels of Service

Governing Legislation for Recreation & Culture Service Area

Legislation	Requirements
Accessibility of Ontarians with Disabilities Act, 2005	Provides accessibility standards to benefit all Ontarians.
Development Charges Act, 1997	Provides municipalities the ability to levy charges to fund growth-related municipal infrastructure, on the principle that growth pays for growth.
Environmental Protection Act, 1990	Provides for the protection of the natural environment through regulations regarding discharge of contaminates into the natural environment.
Municipal By-Laws	Regulations approved by Council to safeguard and protect persons and properties.
Municipal Government Act, 2001	• Practices and procedures • Accountability and transparency • Finance
O. Reg. 588/17: Asset Management Planning for Municipal Infrastructure	Provides policies and guidelines for levels of service considerations in managing Recreation & Culture assets.
Occupational Health and Safety Act, 1990	• Rules governing health and safety in Ontario's workplaces • Includes *R.R.O. 1990, Reg. 851: Industrial Establishments*
Planning Act, 1990	Provides direction on municipal planning activities.

Community Levels of Service Framework

Core Value	LOS Objective	Asset Class	Performance Measure	Current Performance
Capacity	Providing an appropriate number of recreation facilities and amenities to ensure facilities have capacity to meet demand.	Recreation	• Wait lists for programs • # of programs offered • Number of facilities within the City which provide readily available equipment	• Request for Program Spaces (not individuals) -17.6K • Programs Offered – 14,185 • Number of Facilities - 12 major and 12 minor recreational facilities across the City including: 8 equipment-based fitness centres, 12 indoor swimming pools, 7 outdoor pools and 13 arenas
Performance	To ensure efficient and well-maintained infrastructure that supports the wellbeing of the community.	Recreation	• Average corporate rating of Recreation facilities	• Overall Customer Satisfaction -91%
			• Description of the lifecycle activities staff undertake to maintain assets in a state of good repair	• Culture Services staff undertake maintenance, rehabilitation and replacement activities based on the criticality of the assets, their condition and available resources

Technical Levels of Service Framework

Core Value	LOS Objective	Asset Class	Performance Measure	Current Performance (2023)	Target Performance (2024-2033)	Background Information
Capacity	Providing an appropriate number of recreation facilities and amenities to ensure facilities have capacity to meet demand.	Recreation	• Average Program Fill Rate for Recreation programs • Service level provisions (# of recreation facilities per 81,000 residents)	• Program Fill Rate – 81% • Service Level Provision – 1:81,200	TBD	N/A
Performance	To ensure efficient and well-maintained infrastructure that supports the wellbeing of the community.	All	• % of assets in fair or better condition (by Asset Class)	• Recreation: 93% • Culture Programs: 92% • Events & Media Production: 81% • Venue & Events Services: 90%	TBD	N/A
Affordability	Services are maintained cost-effectively and are affordable to users.	All	• Actual vs Target Capital Reinvestment Rate	6.9% vs. 6.9%	A measure of how much funding is available to meet capital state of good repair lifecycle needs (Actual) versus how much funding is required (Target).	

Demand Management

The City of Mississauga has an estimated population of about 718,000 residents (Census, 2021) and is projected to continue to grow in the coming years. The continuous growth of the City will impact the performance and sustainability of Recreation & Culture services. Staff consider population changes and other demand drivers when determining the appropriate service level provisions for indoor and outdoor recreational assets. Table 2 provides an example of the desired service level provisions, by Service Area (zones), for equipment-based fitness centres. Figure 3 in the Appendix provides a map to illustrate those desired service level provisions.

These service level analyses are completed for all the user groups within each line of business to better inform asset infrastructure needs. For example, in Service Area (zone) 1–1 community centre will be required for a population of 182,000 estimated people in 2028 based on growth and community need.

Table 2: 2019 Future Directions Service Area Provision

Service Area	Supply	2019 Provision Level	2028 Provision Level
1	1	1: 172,000	1: 182,000
2	2	1: 75,500	1: 79,000
3	1	1: 32,000	1: 33,000
4	2	1: 51,000	1: 53,000
5	3[1]	1: 99,000	1: 72,300
6	11[1]	0	1: 116,000
City-Wide	**10**[1]	**1: 94,875**	**1: 81,200**

Note: Table only includes equipment-based fitness centres

[1] Reflects 2028 supply and service level with recommended club-format fitness centre additions at the Burnhamthorpe and Carmen Corbasson Community Centres

Factors affecting demand include population and demographic changes, ongoing work on truth and reconciliation, technological advancements, and climate change. Understanding these demand drivers enables staff to strategically manage services and adapt to changing circumstances. A summary of some of the major internal and external drivers that affect Recreation & Culture services is shown in the following table.

Demand Drivers, Projections and Management Plans

Demand Driver	Current Situation	Projection	Impact on Services	Demand Management Plan
Demographic & Population Changes	With the population and demography of the City of Mississauga constantly evolving so do the demands and service level needs of the public. For example, an increase in the youth or senior population can drive demand for specific recreational programs and equipment tailored to these demographics' preferences and needs. Changing demographics and increased diversity in many communities and neighbourhoods will affect Culture Services. There has been growing recognition in Canada of the lack of diversity in mainstream	Staff evaluate service level provisions through regular public engagements, service requests, annual business plan, as well as the Future Directions Plan review every four years. Considerations are made for the size, location, and usage rate of recreational facilities when determining the feasibility of service improvements (e.g. adding additional fitness equipment at high usage fitness centres). Future growth will result in more pressures where space is limited.	To meet the demands or needs of the public with regards to appropriate and sustainable service level provisions put pressure on the City from an operational, economic and regulatory perspective. For example, building and equipping a new hub for youth is an increased pressure on City budget but one that was required to meet community need. Changes in demographics and population may affect the scope, quantity and type of	Staff quantify the costs and risks associated with enhancing or modifying the types of services they maintain through their asset management plans, master plans and capital projects. Staff evaluate service level provisions through regular public engagements, annual business plan and the Culture Plan (which is reviewed every four years). Staff quantify the costs and risks associated with enhancing or modifying the types of services they provide.

Demand Driver	Current Situation	Projection	Impact on Services	Demand Management Plan
	arts, culture and heritage experiences and also in the make-up of administrations, instructors, presenters and creators of arts, culture and heritage.	Changing demographics and increased diversity in many communities and neighbourhoods will influence how Culture Services responds and delivers to diverse perspectives and populations when building an inclusive community that is open to all.	cultural services provided by the City, with limited funding and resources.	
Cultural and Lifestyle Shifts	Changes in cultural norms and lifestyle preferences can drive demand for specific recreational activities. For example, growing awareness of health and wellness leads to increased demand for fitness related programs and equipment.	Staff evaluate service level provisions through regular public engagements, service requests, annual business plan, as well as the Future Directions Plan review every four years.	There is additional pressure on the City from an operational, economic, and regulatory perspective to meet the evolving needs of the residents. For example, COVID brought on the pressure of providing virtual fitness programming	Staff quantify the costs and risks associated with enhancing or modifying the types of services they maintain through their asset management plans, master plans and capital projects.

Demand Driver	Current Situation	Projection	Impact on Services	Demand Management Plan
			which required additional technical equipment.	
Environmental Awareness	Growing environmental consciousness encourages the development of eco-friendly recreation programs and equipment. This might involve utilizing sustainable materials for equipment or promoting outdoor activities.	Procuring equipment from vendors who provide more eco-friendly options with sustainable materials.	Anticipated increased environmental awareness in future generations could lead to increased demand for a higher service level (e.g., greater expectations that the City make additional investment) for environmentally friendly equipment.	Monitor changes in public satisfaction (e.g., survey, Business Plan) of recreation services and consider adjusting investment accordingly to meet desired level of service.
Government Initiatives	Supportive government policies and incentives can influence the expansion or enhancement of recreation services. For example, subsidies for specific programs	Annual review of the various grants and subsidies available for Recreation and its residents.	Collaboration with government initiatives strengthens services, potentially expanding the reach of recreational programs and equipment to	Regularly assess the impact of government initiatives on recreation programs by implementing tracking mechanisms, conducting surveys, and analyzing participation data. In

Demand Driver	Current Situation	Projection	Impact on Services	Demand Management Plan
	might lead to increased accessibility and participation.		broader audience. It relieves economical pressure from Recreation's operating and capital budgets.	addition, fostering collaboration with government agencies and community partners can be of great benefit in receiving grants/subsidies.
Technological Advancements	Embracing technology in recreation program and equipment not only benefits the residents but also City of Mississauga in reducing operational costs and better asset management. For example, integration of technology into recreation equipment such as smart fitness trackers or more accessibility features can attract participants who are drawn to	Technological advancements can potentially provide City staff with more options to diversify their lifecycle interventions in a more efficient and cost-effective manner.	The ever-changing technological landscape puts pressure on Recreation's limited budget and staff resources. Staff try to adapt and utilize best industry practice, tools, and techniques in order to manage their assets effectively and sustain desired service levels. The ever-changing technological landscape puts	Conduct regular cost benefit analysis of new technology and potential service enhancements. Staff conduct regular cost-benefit analyses of new technology and potential service enhancements. Staff also regularly investigate new opportunities and technologies to deliver unique cultural experiences at the City.

Demand Driver	Current Situation	Projection	Impact on Services	Demand Management Plan
	modern and innovative experience. Events & Media Production staff track changes in technology when it comes to audio, video, lighting equipment and more to optimize service delivery.		pressure on Culture Service's limited budget and staff resources. Inability to meet customer expectations and demands for state-of-the-art technology. Using unsupported assets may increase risk of financial consequences and operational delays.	
Climate Change	Increased temperatures may also lead to an increased demand for indoor spaces for cultural activities including registered educational programs and outdoor day camps. It may also increase the demand	Climate change continues to impact and challenge municipal service delivery. Increases in temperature by approximately 3.4°C. The frequency of 100-year extreme rainfall and overland flooding	Adapting to increased temperatures and extreme weather events may affect the quality and sustainability of Recreation & Culture	Staff consider the impacts of climate change on assets during the capital planning process. Staff also consider the procurement of environmentally

Demand Driver	Current Situation	Projection	Impact on Services	Demand Management Plan
	for a longer programming season in the summer and shoulder seasons.	events is expected to be three times more likely. The frequency of freezing rain events for the typically coldest months could increase in southwestern and south-central Ontario by the 2050s.	programs and services.	friendly assets or more sustainable materials.

Risk Management

Asset-Specific Risk Methodology

Asset-specific risks are determined by assessing the asset's 'consequence of failure' (CoF) and 'likelihood of failure' (LoF). While the loss of some assets or components may have little impact on service delivery and negligible risk of damage or injury, the loss of other assets such as roads and bridges can severely impact public services and may lead to private property damages or even fatalities. The criticality of an asset is therefore linked to the inherent consequence of the loss of its function, including related impacts on the function of a system or network of assets.

For the purposes of this asset management plan, the overall condition of an asset is used as a proxy for determining risk; in particular, its likelihood of failure. In subsequent updates to this asset management plan, a formal risk assessment tool will be developed to inform decision-making and prioritization for a variety of asset classes and their components.

Lifecycle Management

Lifecycle Strategies

Recreation & Culture Services – Current and Proposed Lifecycle Activities

Current and Proposed Lifecycle Activities	Risks associated with Lifecycle Activities
Non-Asset Solutions: Activities that do not alter the condition or performance of assets or services but provide staff with valuable information for their effective management.	
• Future Directions Master Plan • Recreation Business Plan • Development Charge (DC) Studies • Feasibility Studies	• Inability to identify and record asset condition to inform decision-making for maintenance and capital programs • Inability to track service requests and works orders, to understand capital/maintenance work has been completed and that customer needs have been addressed • Strategic planning/budgeting, project prioritization and capital costing is not effective without Master Plans and other studies to inform long-term decision making • Without DC studies the City cannot collect funding for growth-related projects and satisfy legislated requirements
Operations & Maintenance: Minor activities that preserve the condition or performance of assets and ensures the longevity of assets in line with their design and operational requirements.	
• Ensuring front line and operational staff are trained and qualified in how each equipment functions to be of assistance to customers • Ensuring equipment and facility is well maintained i.e. proper cleanliness	• Damage to equipment due to improper use resulting in excess repair costs and premature asset failure • Potential loss of customers and revenues due to poorly maintained equipment/facility • Health and safety costs going over budget

Current and Proposed Lifecycle Activities	Risks associated with Lifecycle Activities
• Maintaining safety of users by minimizing on site incidents that threaten the safety of our customers and staff • Current practice is to conduct preventative and routine maintenance to prolong the life of assets • Preventative checks on equipment are done at minimum once a year • Routine maintenance is based on manufacturer specifications • Demand maintenance is also conducted when required to bring asset back to its functional state in case of unexpected failures • Condition assessments are conducted every two years on all cardio equipment • Assets are inspected on a regular basis depending on their criticality and performance demands • Annual maintenance on Glass Melting Furnaces by City staff • Preventative Maintenance is conducted twice a year on Living Arts Centre equipment. City staff conduct some of the work while the rest is allocated to third party technicians	• Loss of reputation • Potential injury/lawsuit • Insufficient resources available to complete a series of unplanned, urgent work requests that are submitted in close succession • Unable to complete planned maintenance activities while managing reactive maintenance activities • Premature asset failure due to incorrectly planned maintenance activities • Emergency or unscheduled closures resulting in excessive replacement costs • Service disruption due to asset failures • Premature asset failure due to lack of maintenance activities • Impact to service levels due to delayed operations & maintenance, potentially requiring more drastic and costly rehabilitation or replacement intervention

Current and Proposed Lifecycle Activities	Risks associated with Lifecycle Activities
Renewal/Rehabilitation: Significant activities designed to extend the useful life of assets components.	
• Replacing equipment parts such as treadmill belt or motor • Various facility improvements such as maintenance of gymnasium floors, shower tiles, pool filters	• Incorrect assumptions regarding expected useful life after rehabilitation • Deferral cost of not rehabilitating items on schedule • Degradation of natural asset • Facility closures • Loss of revenues • Injury/lawsuits
Replacement: Replacement activities occur once an asset reaches the end of its useful life, cannot provide the intended function or performance, and rehabilitation is not a viable option.	
• Replace assets based on asset performance and staff experience, as required • Replace cardio equipment every five years based on actual asset usage and run life of asset • Replace strength training equipment every 10 years • Assets are replaced when they reach their end of useful life or when their performance/condition no longer meets service requirements (functionality or capacity issues) • Assets may be replaced proactively if newer or more efficient options are available that optimize cost and performance or if vendors no longer support older asset models	• Service disruption/loss of service • Loss of reputation • Loss of revenues • Increased budget impact • Injury/lawsuits

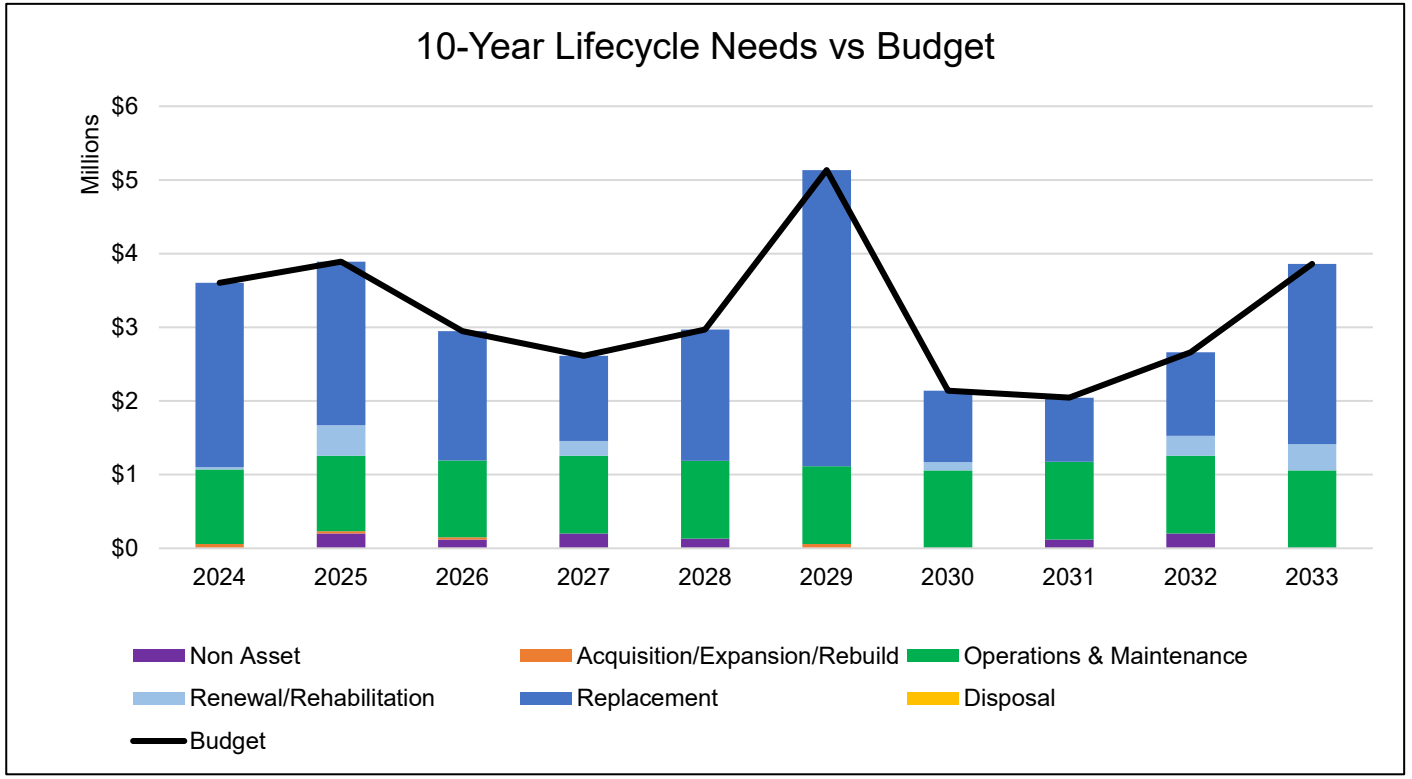
Current and Proposed Lifecycle Activities	Risks associated with Lifecycle Activities
Disposal/ Demolition: Activities associated with the disposal or decommissioning of an asset.	

• Decommission at End of Life if asset is no longer required
• Sell or donate assets
• With fitness equipment, the goal is to get maximum salvage value of the decommissioned assets to reduce the total lifecycle cost of the asset. This is done through a trade in program where the original vendor of purchase allows the City to trade in old equipment for its current day value
	• Failure to decommission assets properly can lead to:
	  • Higher capital budget costs
	  • Challenges the City's "Green" strategic pillar that supports commitment to the environment

Acquisition/Expansion/Rebuild: These activities expand services to previously non-serviced areas or to accommodate growth; they provide new or enhanced services beyond the current capacity and/or functionality of existing assets.	
• New and expanded assets are prioritized within master plans. New assets are selected to best suit locational needs and service level targets • New and expanded assets are reviewed and prioritized within the Culture Master plan	• Asset failure as a reflection of incorrect asset size, environmental tolerance, cultural tolerance etc. • Service is prematurely expanded • The ability to afford, operate and maintain any future assets

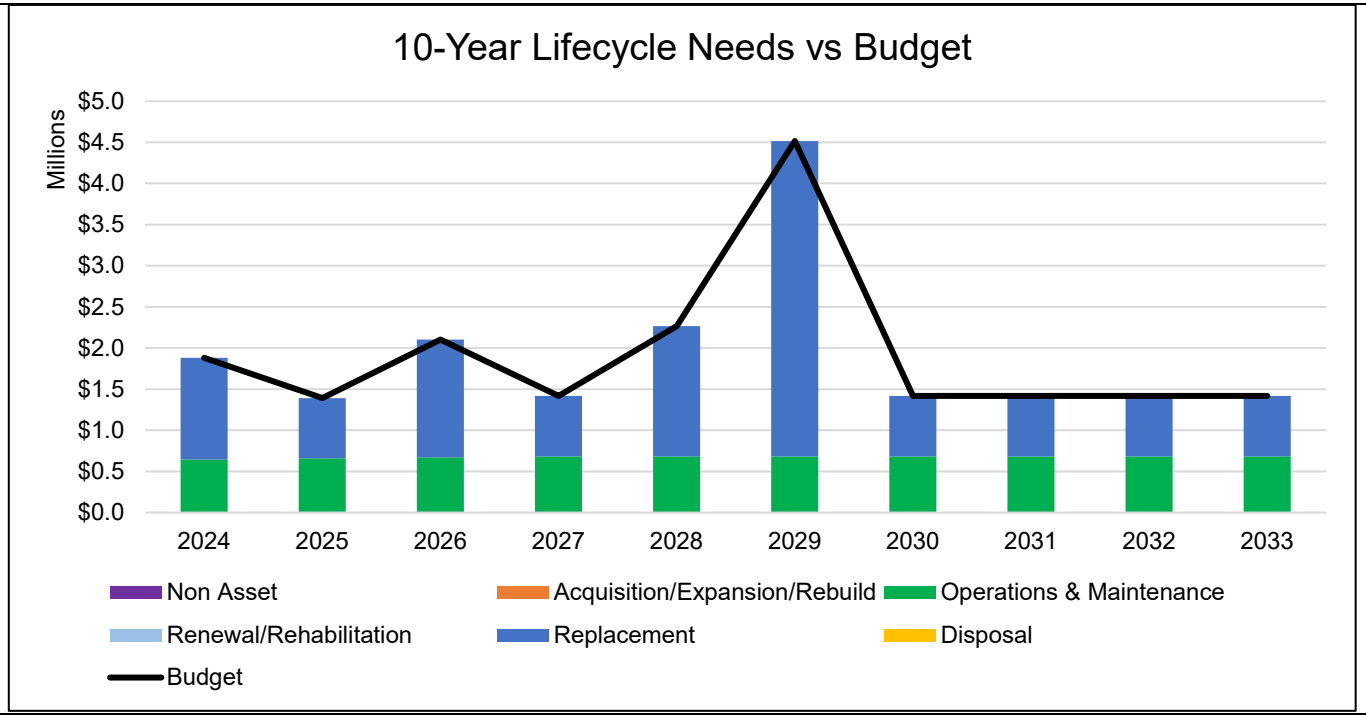
Lifecycle Needs vs. Budget

Recreation & Culture Service Area



Overall, the Recreation and Culture Service Area is sufficiently funded to meet its asset needs and service level requirements. As data quality is improved and staff advance in their asset management programs, a more detailed analysis between lifecycle needs and budget will be conducted.

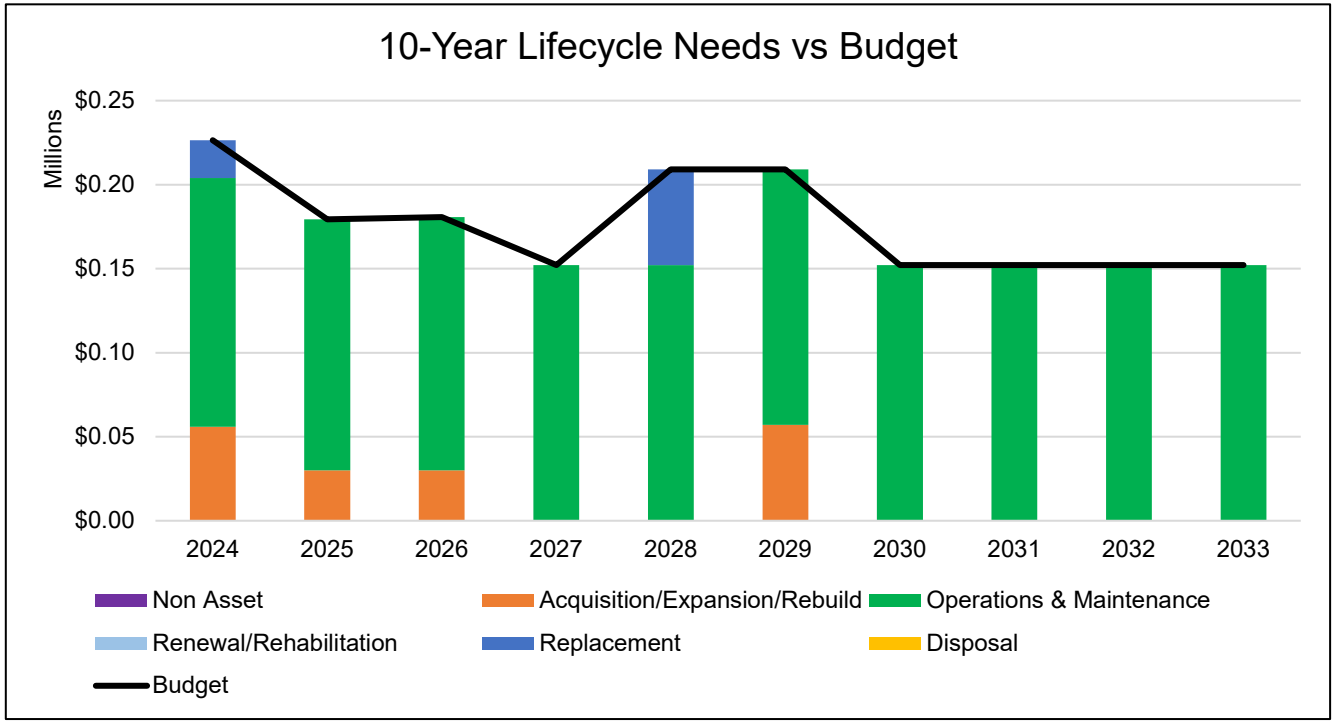
Recreation Equipment



Although most recreation equipment assets are in fair or better condition, some are coming up for replacement at the end of the next 10-year cycle, including the replacement of the Paramount Fine Foods Centre (PFFC) dome and Sportsplex artificial turf replacement.

As staff continue to refine their asset inventory and collect up-to-date condition information, the lifecycle needs analysis will mature, and more detailed and appropriate budget requests will be determined.

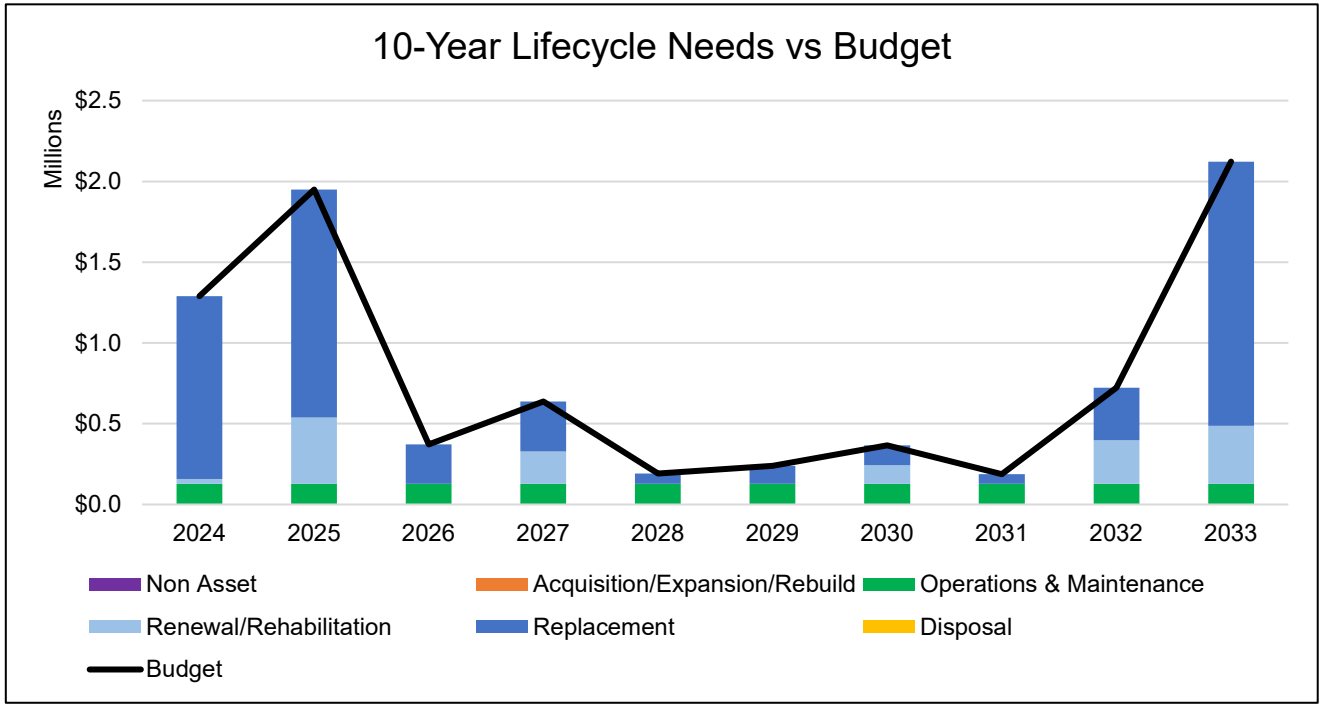
Culture Programs



Many of the Culture Program assets are in fair or better condition, but some will need to be replaced within the next 10 years as they reach their end of useful life. Typically, staff conduct regular operations and maintenance to extend the life of their assets.

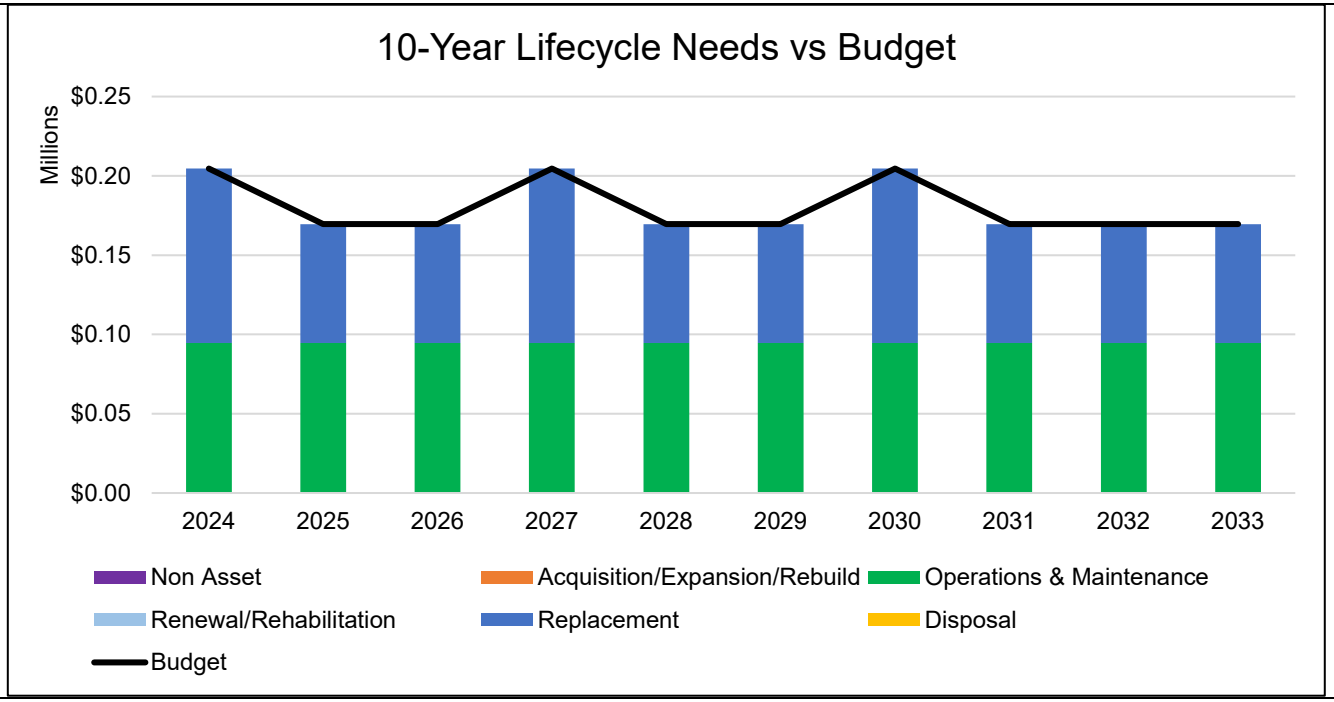
Staff are planning for some computer and equipment upgrades/expansions in 2024-2026.

Events & Media Production



About 19 per cent of the Events & Media Production assets are in Poor-Very Poor condition meaning they will require replacement within the next two years. Assets that are in Good condition, with an estimated useful life of 10 years, are up for replacement at the end of the forecast in 2033.

Venue & Events Services



Assets within the Venue & Events Services have a longer estimated useful life (up to 20 years), with the majority of them being in Fair condition. Some replacements are scheduled throughout the next 10 years.

Budget Breakdown

Over the next 10 years, Recreation & Culture plans to spend an average of $3.2 million annually on assets, with the majority of the budget being used for replacement activities at 59.2 per cent and operations & maintenance activities at 32.9 per cent.

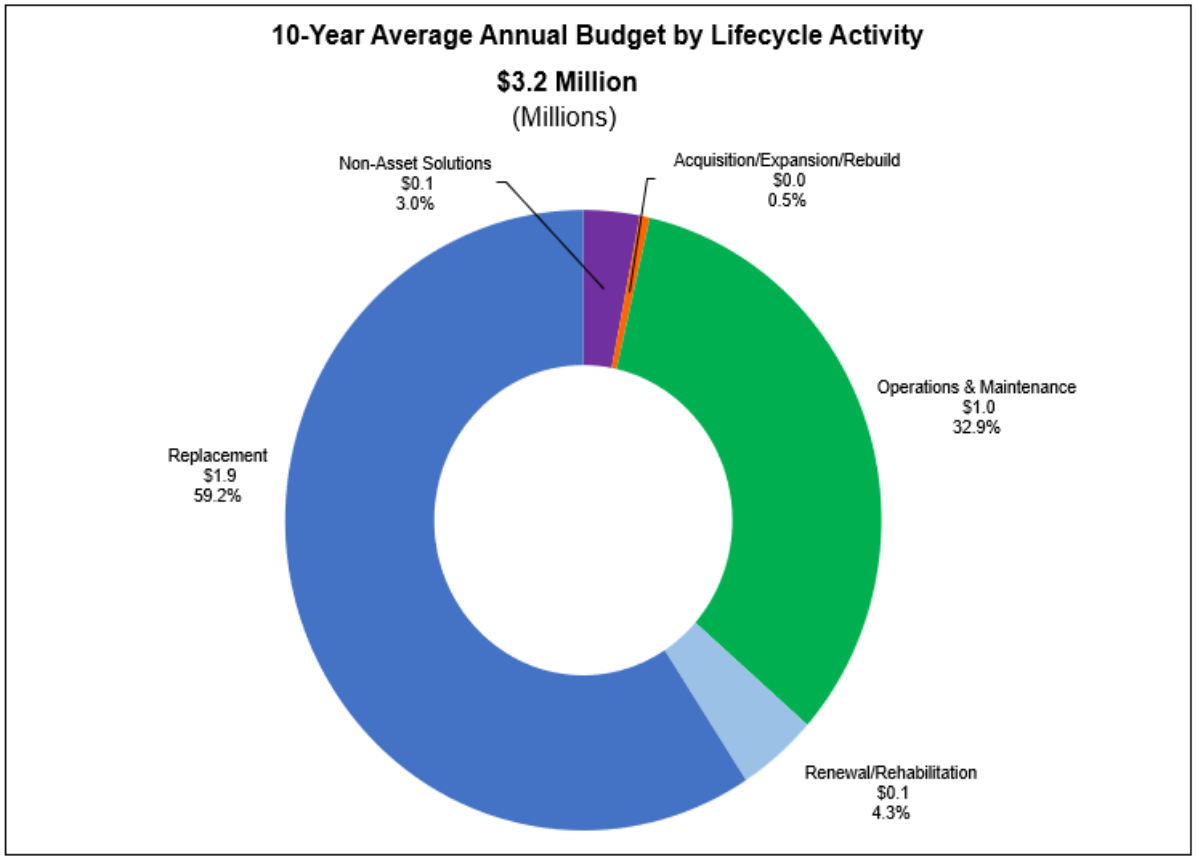


Figure 1: Breakdown of Budget by Lifecycle Activity

Table 3 shows the 10-year annual average budget breakdown by asset class. The majority of the of the operating and capital budget is spent on State of Good Repair (SOGR) of Recreation & Culture assets.

Table 3: Budget breakdown by Asset Class

Asset Class	SOGR Budget Type ($ Million)			Growth Capital Budget ($ Million)	Total Budget ($ Million)
	Operating	Capital	Total		
Recreation	0.7	1.2	1.9	-	1.9
Culture Programs	0.2	0.0	0.2	0.0	0.2
Events & Media Production	0.1	0.7	0.8	-	0.8
Venue & Event Services	0.1	0.1	0.2	-	0.2
Other[2]	-	0.0	0.0	0.1	0.1
Total	**1.1**	**2.1**	**3.2**	**0.1**	**3.2**

[2] The "Other" asset class denotes lifecycle activities that span over multiple asset classes within the Service Area such as plans, studies, and other non-asset solutions.

Financing Strategy

Capital Funding Sources and Operating Revenue Sources

The estimated available funding for the next 10-year period (2024-2033) for Recreation & Culture is $31.9 million. The primary sources of funding are tax reserve funds at 54.0 per cent and operating revenue sources at 32.9 per cent.

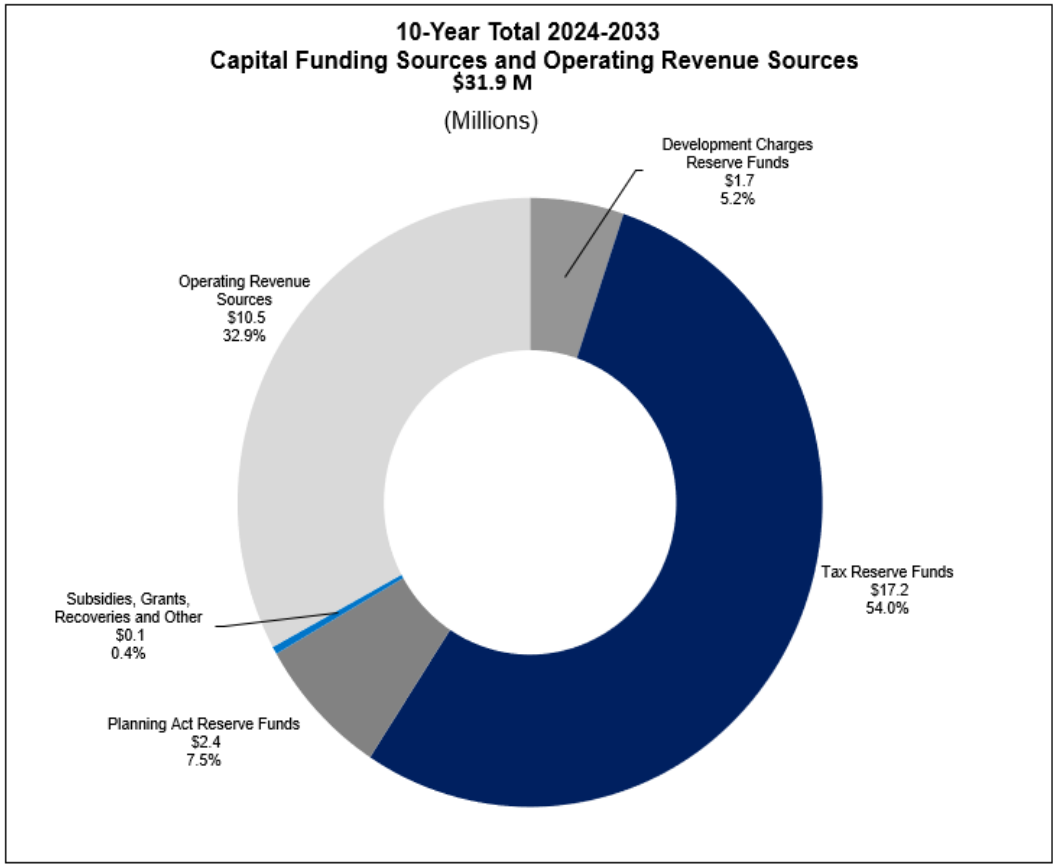


Figure 2: Capital Funding Sources (2024-2033)

Infrastructure Gap

As of this iteration of the plan, Recreation & Culture is deemed to have sufficient budget to address its lifecycle needs to meet current levels of service for all asset classes. As part of continuous improvement, staff will continue to evaluate the affordability and sustainability of proposed levels of service, where they have been established, and integrate their asset management program with the annual budgeting process.

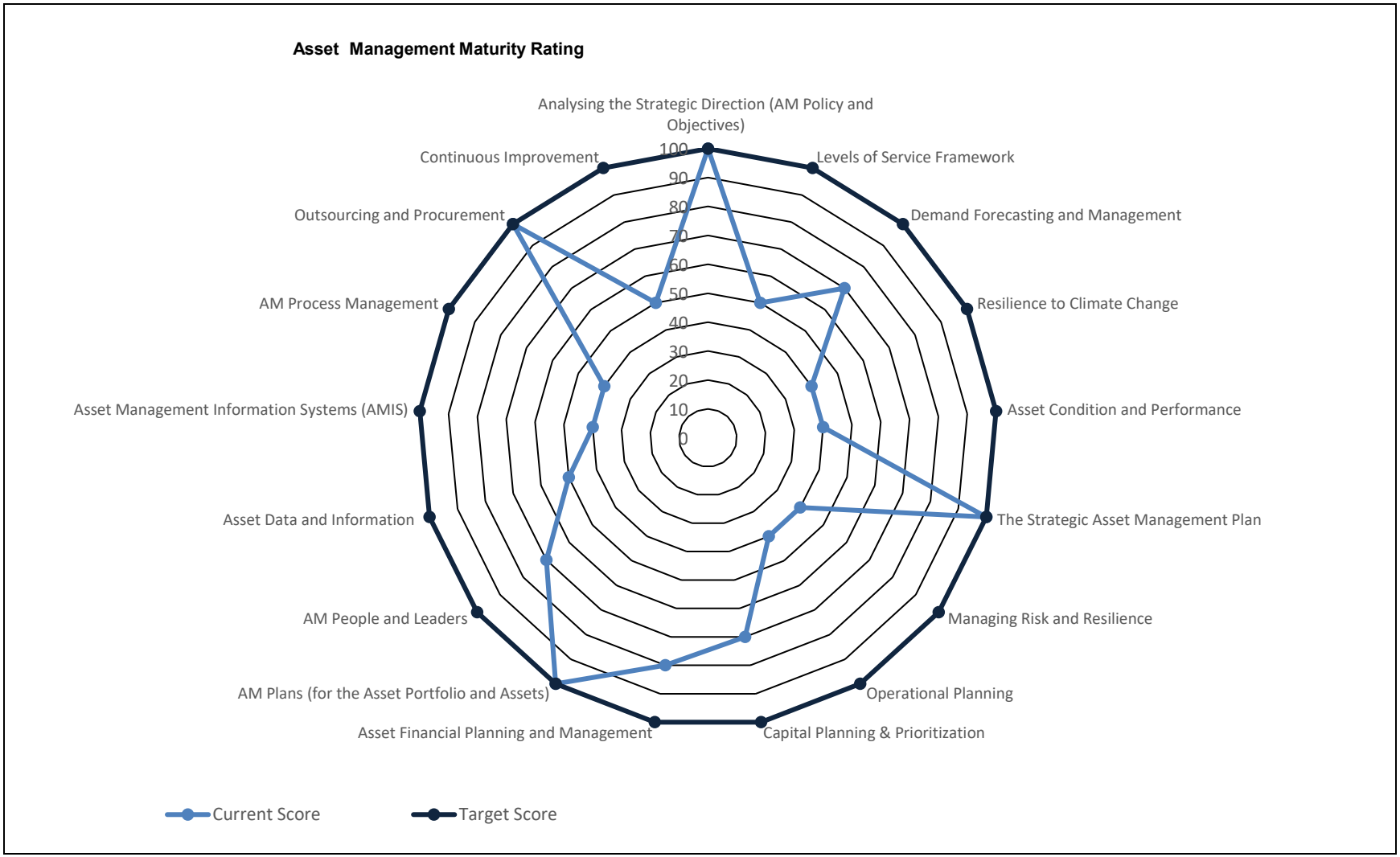
Continuous Improvement & Maturity

Maturity Assessments

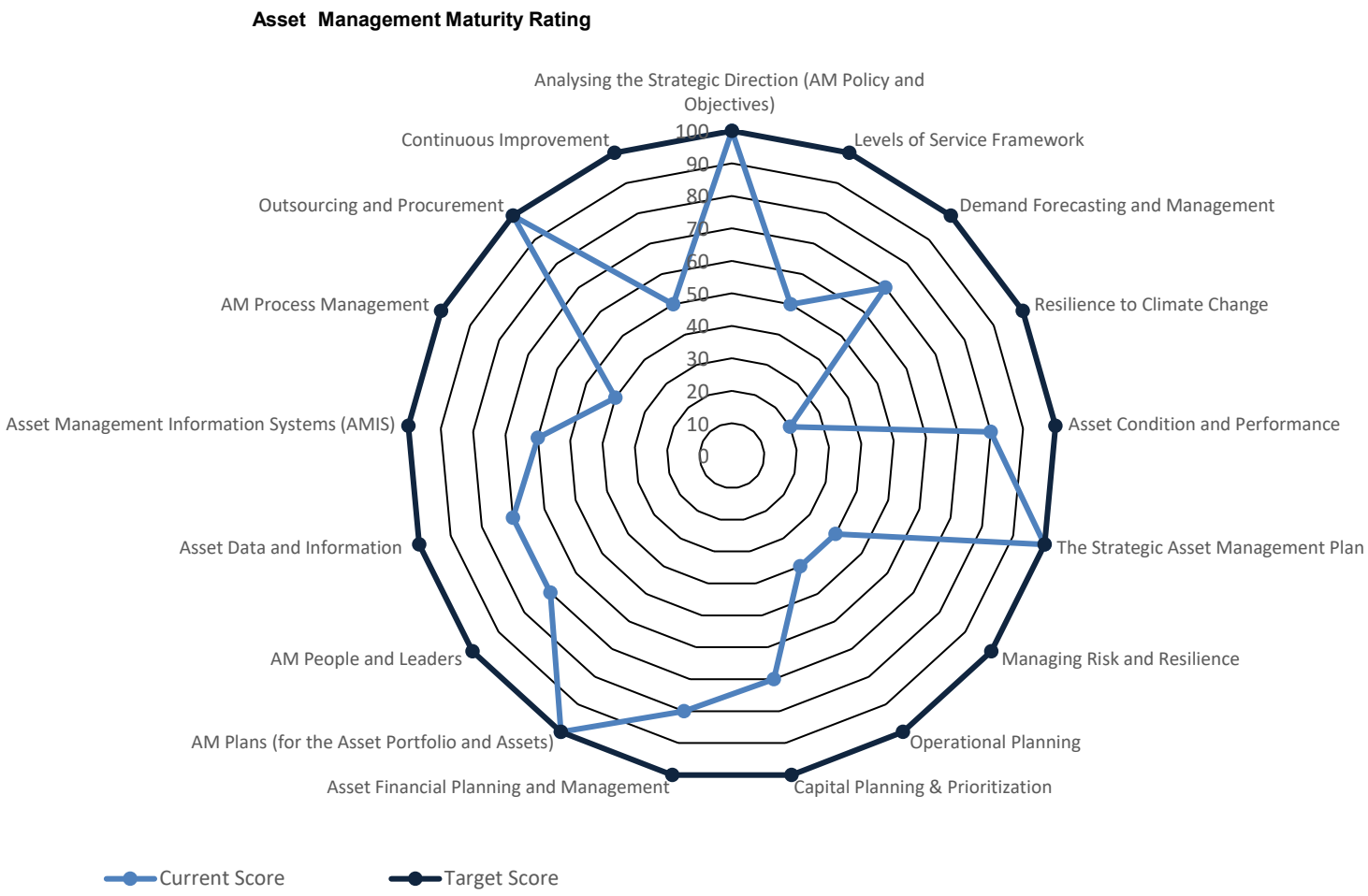
The radar graph(s) below are based on a 2023 maturity assessment. As the service areas mature in each category, they will expand outwards towards the outer ring (Target).

Maturity Assessment– Recreation & Culture

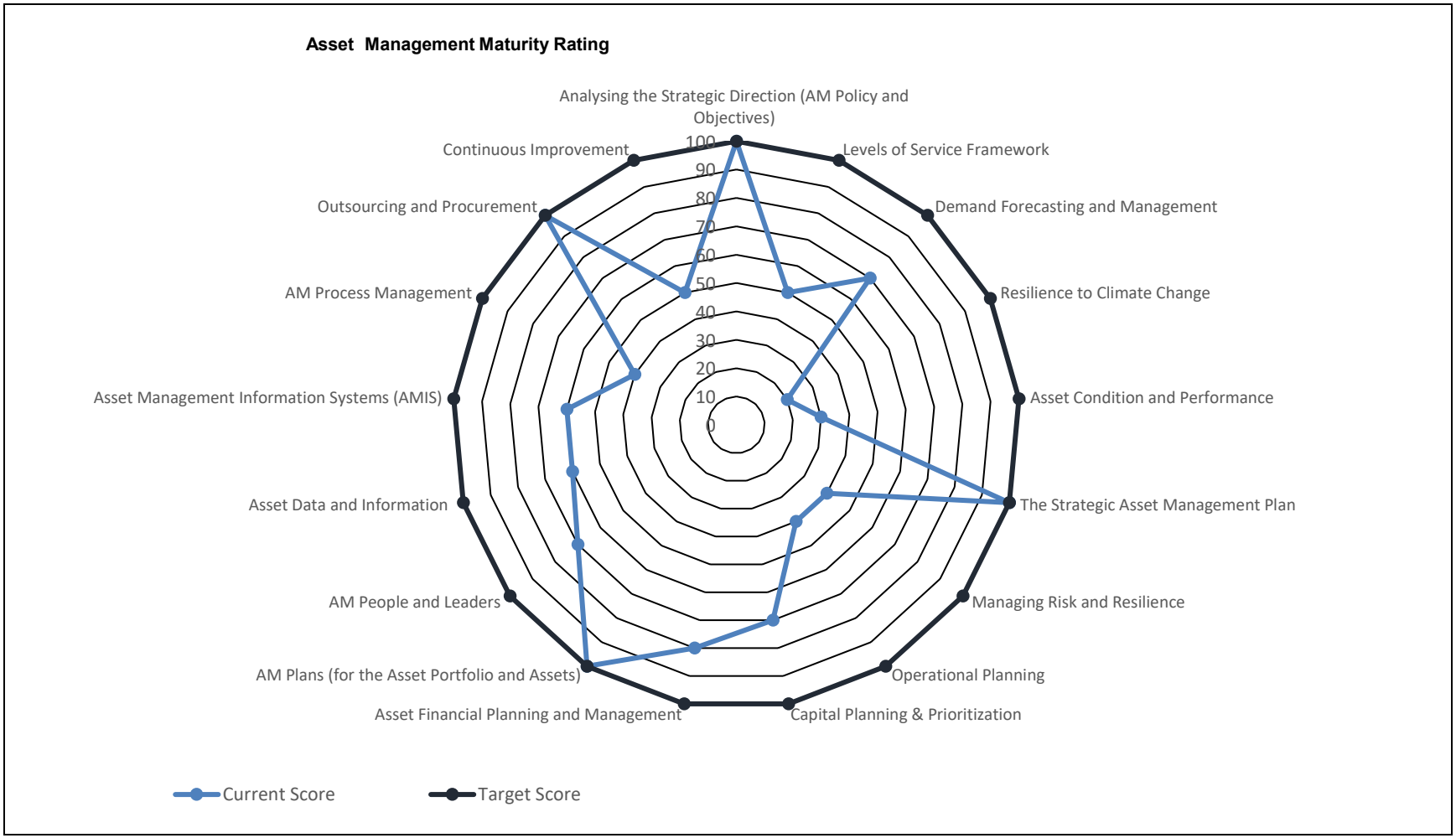
Maturity Assessment – Recreation



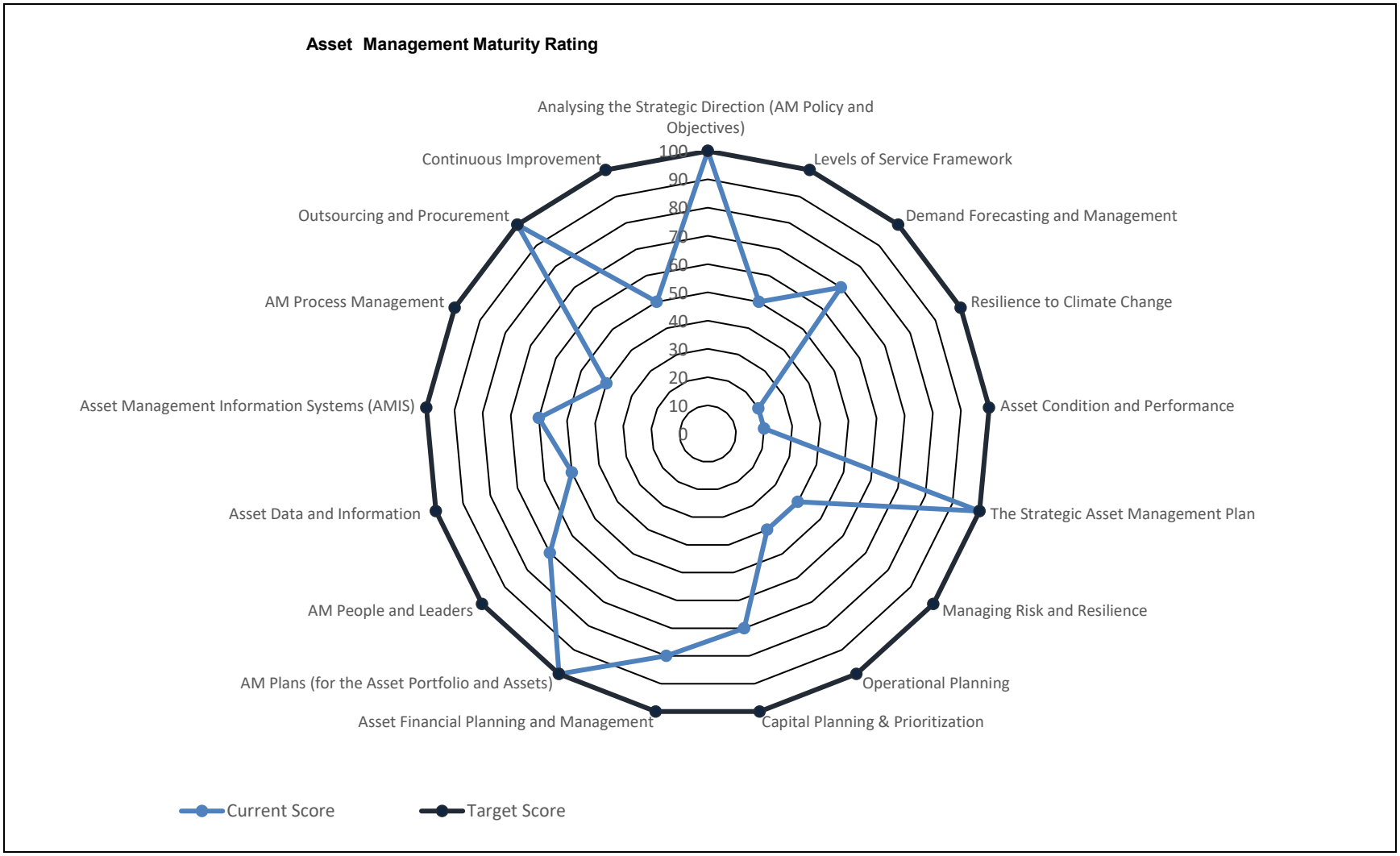
Maturity Assessment – Culture Programs



Maturity Assessment – Events & Media Production



Maturity Assessment – Venue & Events Services



Continuous Improvement Plan

Task No	Continuous Improvement Task	Asset Class	Estimated Timing	Value/Impact	Required Resources
State of Infrastructure (SOI)					
SOI-01	Develop a formalized Risk Assessment Framework for Recreation & Culture.	All	2023-Ongoing	Enable the Recreation division to better prioritize funding availability across asset classes.	Internal/External
SOI-02	Develop a centralized asset register which is regularly updated (ideally automated) when new assets are added.	All	2023-Ongoing	Allows for better asset management when database is up to date. Potential cost saving through better management of lifecycle activities.	Internal
SOI-03	Formalize inventory, assign unique IDs and create assets/features by asset component.	All	2023-2025	Improved completeness and accuracy of the information within the database to improve tracking and management of assets and identifying funding requirements.	Internal
SOI-04	Condition assessments on newly acquired and old assets.	All	2024-2025	Assess all equipment and provide condition rating and replacement timeline.	Internal/External
SOI-05	Utilize Infor for work order management.	Recreation; Culture Programs	2023-Ongoing	Enhanced and expanded work order management for Recreation service requests.	Internal

Task No	Continuous Improvement Task	Asset Class	Estimated Timing	Value/Impact	Required Resources
SOI-06	Update the Maturity Assessment and Continuous Improvement Plan and report back to Leadership Team.	All	2024-2025	Providing Leadership Team and Council with regular updates on the progress made towards asset management planning will ensure that we continue to mature in our asset management practices.	Internal
SOI-07	Replacement Cost Update and Development.	All	2024-2025	Enables precise budgeting required for lifecycle costing and sustainability of the Recreation resource. This knowledge aids in making decisions regarding optimal timing for asset replacement, maximizing operation efficiency.	Internal
SOI-08	Estimated Useful life: Review and Update.	All	2024-2025	Allows for better lifecycle management planning.	Internal
SOI-09	Data Governance Strategy.	All	2023-Ongoing	Develop a data governance strategy to collect and track asset information effectively and in a standardized manner. Review asset attribute information on an annual basis, at a minimum, to ensure quality and reliability.	Internal

Task No	Continuous Improvement Task	Asset Class	Estimated Timing	Value/Impact	Required Resources
Levels of Service (LOS)					
LOS-01	Ongoing review of LOS metrics and establishment of targets.	All	2023-Ongoing	Level of service targets enable the service area to track progress against established targets.	Internal
Financing Strategies (FS)					
FS-01	Centralize all assets in one asset management system to run asset management scenarios.	All	2025-2026	Develop a predictive performance model to forecast assets future condition based on budget, levels of service and/or lifecycle strategies changes.	Internal/External
FS-02	Work with Corporate Finance to formalize performance targets and sustainable funding.	All	2024-2025	Develop more proactive and reliable short-term and long-term capital planning.	Internal

Appendix

2019 Future Directions Service Area Provisions Map

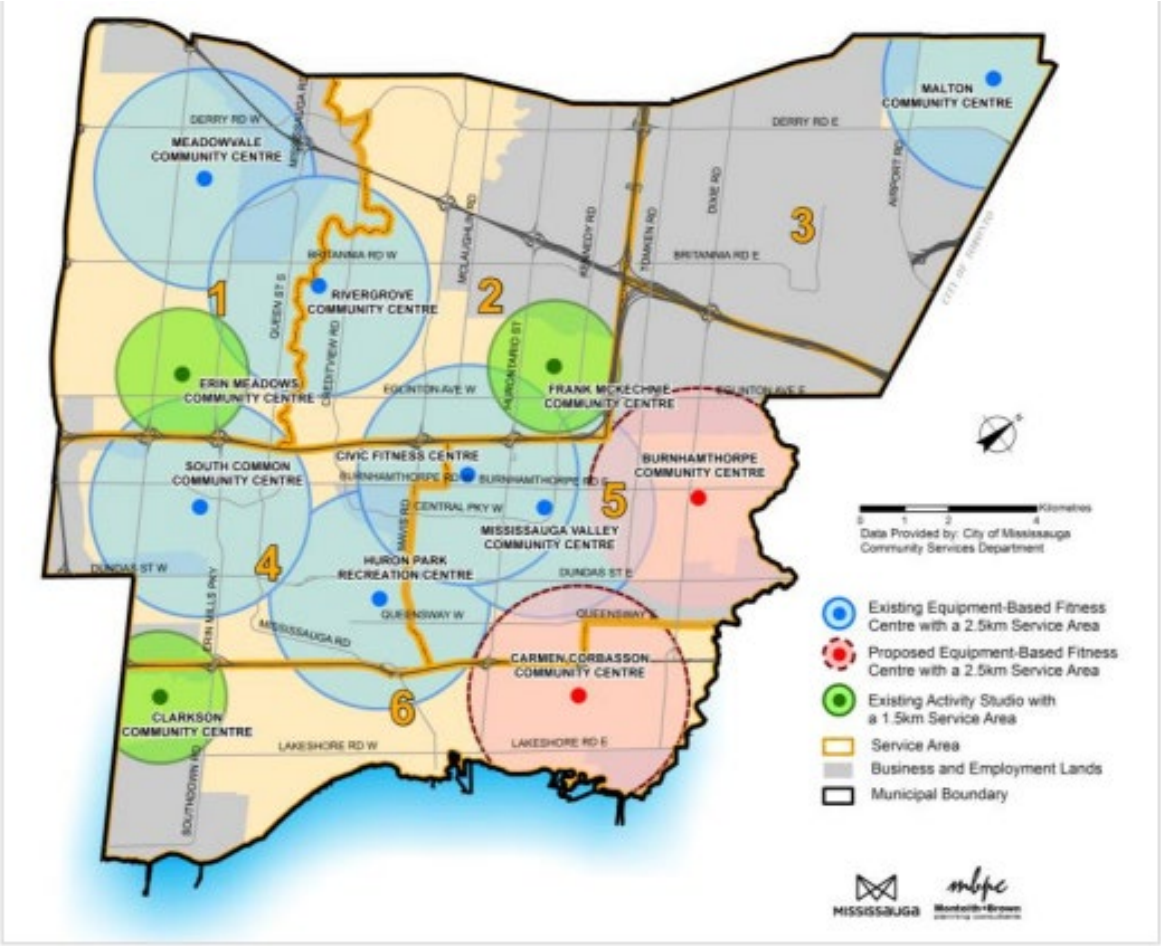
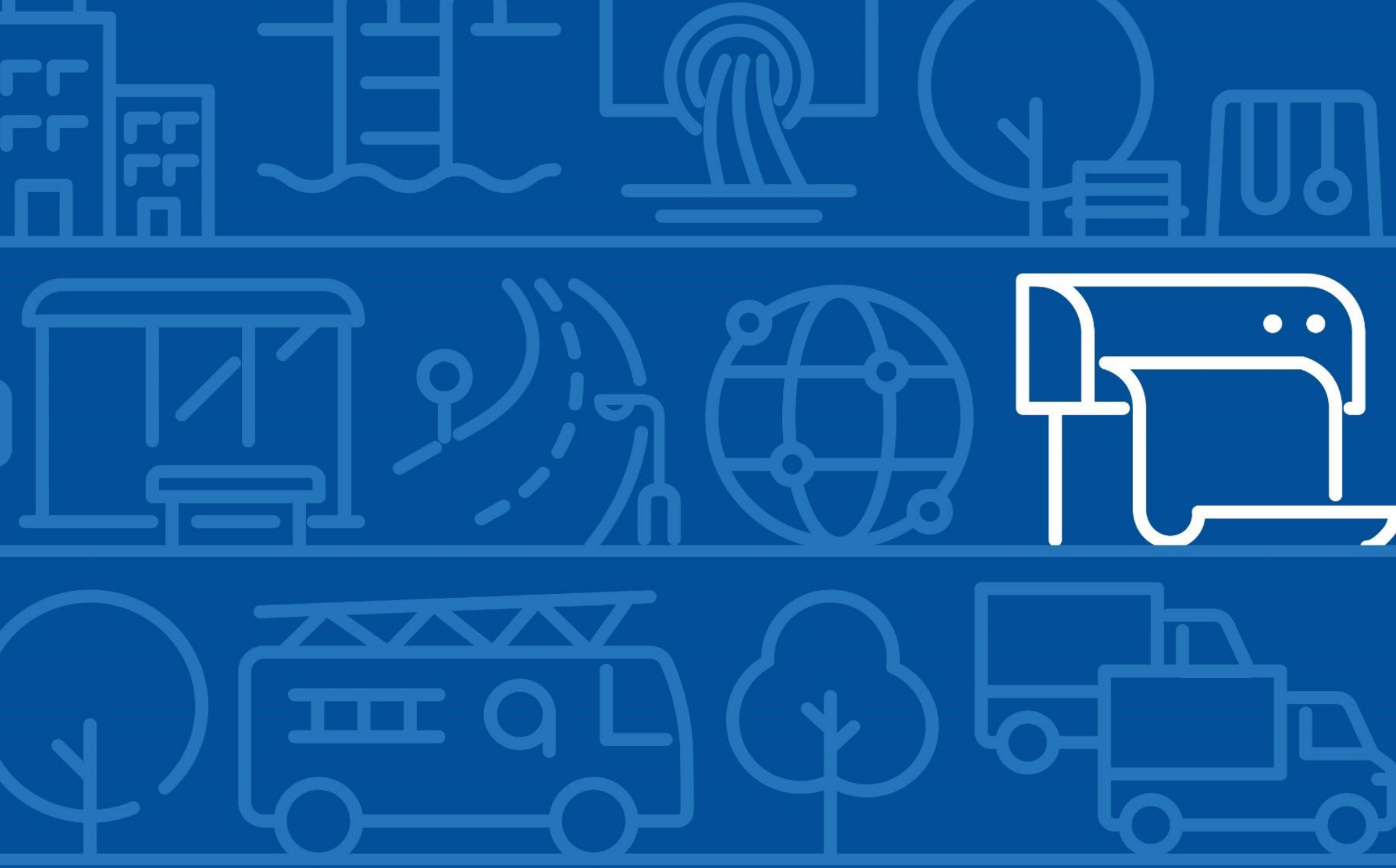


Figure 3: 2019 Future Directions Service Area Provisions Map



Corporate Asset
Management Plan **2025**

General Government

(Print & Mail Services)

Table of Contents

Introduction 3
Key Stats 4
State of the Infrastructure 5
- Asset Hierarchy 5
- Asset Class - Summary 6
- Asset Management Tools & Systems 7
- Dashboards 7

Levels of Service 10
- Governing Legislation for General Government Service Area 10
- Community Levels of Service Framework 11
- Technical Levels of Service Framework 11

Demand Management 12
- Demand Drivers, Projections and Management Plans 13

Risk Management 16
- Asset-Specific Risk Methodology 16

Lifecycle Management 17
- Lifecycle Strategies 17
- Lifecycle Needs vs. Budget 19
- Budget Breakdown 20

Financing Strategy 22
- Capital Funding Sources and Operating Revenue Sources 22
- Infrastructure Gap 23

Continuous Improvement & Maturity 24
- Maturity Assessments 24
- Continuous Improvement Plan 25

Introduction

Print & Mail Services supports the delivery of quality, cost-effective, timely and environmentally friendly printing, signage, and related finishing and mailing (whether in-house or through third-party contracts). Services include:

- City printed document requirements (e.g., tax bills, business cards, public notification letters, newsletters, courthouse notices, training manuals, etc.)
- Large-format signage requirements, posters, vinyl banners
- Scanning and digitizing of City documents
- Bindery and finishing
- Letter Shop services (addressing, inserting, labelling, sealing, sorting)
- Processing registered mail

Print & Mail Services 3 Hole Punch Machine

Key Stats

Current Replacement Value (CRV)	Average Condition	Current Maturity Level
$1.0 Million	Fair	Core
Current Average Annual Infrastructure Gap		**Proposed Average Annual Infrastructure Gap**
$0.0 Million		Same as Current

State of the Infrastructure

Asset Hierarchy

Table 1: General Government Service Area Hierarchy

Asset Class
Document Scanning Equipment
Mailing Equipment
Packaging Equipment
Paper Handling Equipment
Print Finishing Equipment
Printing Equipment

Asset Class - Summary

Asset Class	Current Replacement Value (000)	Average Condition	Average Annual Infrastructure Gap – Current LOS (Millions)	Average Annual Infrastructure Gap – Proposed LOS (Millions)
Document Scanning Equipment	$52		$0.0	Same as Current
Mailing Equipment	$256			
Packaging Equipment	$11			
Paper Handling Equipment	$20			
Print Finishing Equipment	$384			
Printing Equipment	$326			

Asset Management Tools & Systems

The City maintains its inventory information in various systems, with each system serving a specific function and purpose.

Excel is used to track inventory and relevant attribute information for all Print and Mail Services assets.

CityWide is the City's Tangible Capital Asset (TCA) System. The system was introduced in 2008 to capture infrastructure valuation information about the City's major assets.

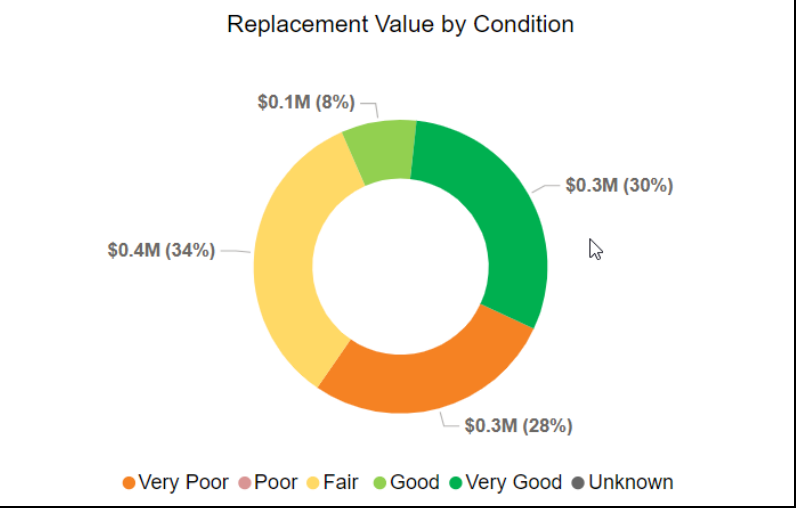
Dashboards

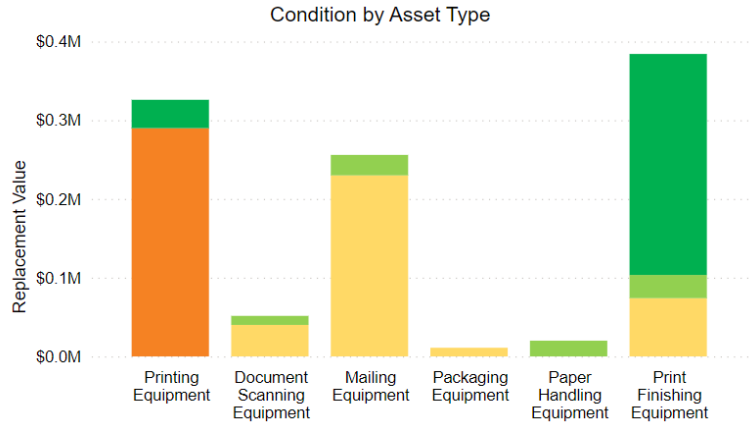
The following dashboards provide a summary of the state of the current infrastructure for each asset class. The information in this plan was prepared using 2023 year-end data. In charts, graphs and tables where money is represented in thousands of dollars ($000), figures have been rounded to the nearest thousand. This means that the totals shown may not always balance perfectly, due to rounding.

Dashboard – General Government (Print & Mail Services)

Data Quality:	Asset Inventory	Condition	Replacement Value
	B	B	A

Current Replacement Value: $1.0 Million





Asset Type	Quantity	Average Age (Years)	Estimated Useful Life (Years)	Current Replacement Value (000s)
Document Scanning Equipment	2 Ea.	13.5	8-15	$52
Mailing Equipment	2 Ea.	13.5	5-20	$256
Packaging Equipment	1 Ea.	10.0	7	$11
Paper Handling Equipment	1 Ea.	9.0	5	$20
Print Finishing Equipment	24 Ea.	6.0	8	$384
Printing Equipment	2 Ea.	6.5	10	$326

Background Information

The City's General Government includes 32 assets comprising of Document Scanning Equipment, Mailing Equipment, Packaging Equipment, Paper Handling Equipment, Print and Signage Finishing Equipment and Printing Equipment.

Most of Print and Mail Equipment assets are in fair or better condition. Although some assets have far surpassed their estimated useful life, their performance remains sufficient to meet current service level needs. Staff rely on age and regular visual assessments to determine the condition of assets.

Print & Mail Services Large Format Laminator

Levels of Service

Governing Legislation for General Government Service Area

Legislation	Requirements
Accessibility of Ontarians with Disabilities Act, 2005	Provides accessibility standards to benefit all Ontarians.
Municipal Government Act, 2001	• Practices and procedures • Accountability and transparency • Finance
O. Reg. 588/17: Asset Management Planning for Municipal Infrastructure	Provides policies and guidelines for levels of service considerations.

Community Levels of Service Framework

Core Value	LOS Objective	Asset Class	Performance Measure	Current Performance
Performance	Print & Mail Services assets are maintained in a state of good repair and meet service delivery needs.	All	Description of the lifecycle activities staff undertake to maintain assets in a state of good repair.	Staff repair and/or replace assets on a proactive basis, when possible, in alignment with manufacturer recommendations, vendor service-level agreements, or staff expertise.

Technical Levels of Service Framework

Core Value	LOS Objective	Asset Class	Performance Measure	Current Performance (2023)	Target Performance (2024-2033)	Background Information
Performance	Print & Mail Services assets are maintained in a state of good repair and meet service delivery needs.	All	Actual vs. Target Capital Reinvestment Rate	4.8% vs. 4.8%		A measure of how much funding is available to meet capital state of good repair lifecycle needs (Actual) versus how much funding is required (Target).
			% of assets in fair or better condition	99%	Maintain status quo	Condition is based on a mixture of remaining useful life and staff expertise

Demand Management

The City's Print & Mail Services is designed to support City staff in providing internal and external communication from Mayor and Members of Council to residents. There are various demand drivers that impact the service delivery such as changing technology, evolving stakeholder values and climate limitations and challenges.

There is an increasing need to plan and deliver innovative, reliable, responsive and secure services, and establish sustainable service levels for Print & Mail Services. Strategies to meet these demands include keeping up with new technologies, reprioritizing of work for business continuity and disaster preparedness, and the effective delivery of capital projects and studies. These actions also align with the City's vision and strategic plan.

Print & Mail Services Challenge Cutter

Demand Drivers, Projections and Management Plans

Demand Driver	Current Situation	Projection	Impact on Services	Demand Management Plan
Changing Technology	Technology is constantly evolving, and in many cases, vendors will stop supporting assets that have become obsolete or no longer meet new technological requirements.	Technology will continue to change as the demand for more cloud-based applications and online services increases, thus putting more pressure on staff to meet service levels and customer expectations.	Inability to meet customer expectations and demands for state-of-the-art technology. Using unsupported assets may increase risk of financial consequences and operational delays.	Staff remain up to date on technological enhancements that may affect the assets and services they manage. Technology is renewed in line with both industry and operational standards. Staff communicate with vendors regularly to stay apprised on upcoming major changes and adapt accordingly.
Resource Challenges	The City has recently seen many changes in staffing as a result of retirements and staff turnover. Current staffing issues focus on being able to assign the right resources to critical initiatives while maintaining an adequate level of capacity for day-to-day operations.	As IT Services move toward more cloud-based and online services, staffing requirements and roles will need to adapt to manage the workload more effectively and ensure that the City's strategic goals are being met.	Without sufficient staffing in place, the quality and reliability of the City's IT services and assets will be adversely affected. Maintaining IT assets in a state of good repair and advancing key IT system enhancements will be more difficult as a result of limited resourcing.	The City employs a combination of permanent, contract and part-time staff in order to deliver on key projects, meet service level enhancements, and achieve operational requirements. Print & Mail Services, alongside the Human Resources department, created a pre-qualified roster for IT services so that unique skill sets can be acquired as needed; thus, providing more agility to respond to increasing workloads.

Demand Driver	Current Situation	Projection	Impact on Services	Demand Management Plan
Adapting to New Business Requirements	Staff must constantly adapt to changes in stakeholder expectations or new business requirements, while also maintaining their current existing service levels.	There are constantly new and different business requirements that IT needs to adapt to and factor into their capital and operating plans. For example, newly acquired assets as a result of the Region of Peel dissolution, or programs such as the Smart City initiative, pose a pressure on the sustainability and performance of the IT portfolio.	Adapting to new business requirements while trying to maintain current service levels for existing assets is a challenge and can affect the quality of the overall asset portfolio. There may be trade-offs or delays in the timing of lifecycle interventions to accommodate the new initiatives.	Staff maintain direct and constant communication with their key stakeholders to minimize unexpected or unplanned business requests. Staff utilize a project-prioritization technique in order to organize available resources and meet their strategic objectives. Print & Mail Services are in the process of implementing a digital storefront and information management system in order to streamline and improve service delivery for printing. Staff are proactive in acquiring specialized tools in order to improve efficiency and reduce the need for outsourcing.
Environmental Stewardship	There are more demands for digital upgrades and a more environmentally friendly service delivery that	The City is committed to decreasing its carbon footprint with clear goals to achieve within the next 30+ years. As Print & Mail	There are many consequences to climate change that will affect staff's ability to deliver their desired service levels in an efficient, cost-	Staff work with material management to establish clear wording within vendor contracts regarding asset disposals in environmentally conscious ways. Staff have reduced their usage of plastic

Demand Driver	Current Situation	Projection	Impact on Services	Demand Management Plan
	challenges the status quo.	Services evolve, there will be more consideration for the type of assets acquired and their replacement and disposal requirements.	effective and reliable manner.	shrink-wrap packaging in order to reduce the City's carbon footprint, and 90 per cent of the paper used comes from sustainable sources. The City also works toward meeting the Forest Stewardship Council (FSC) requirements for sustainable sourcing and FSC-certified finished and labelled goods.

Risk Management

Asset-Specific Risk Methodology

Asset-specific risks are determined by assessing the asset's 'consequence of failure' (CoF) and 'likelihood of failure' (LoF). While the loss of some assets or components may have little impact on service delivery and negligible risk of damage or injury, the loss of other assets such as roads and bridges can severely impact public services and may lead to private property damages or even fatalities. The criticality of an asset is therefore linked to the inherent consequence of the loss of its function, including related impacts on the function of a system or network of assets.

For the purposes of this asset management plan, the overall condition of an asset is used as a proxy for determining risk; in particular, its likelihood of failure. In subsequent updates to this asset management plan, a formal risk assessment tool will be developed to inform decision-making and prioritization for a variety of asset classes and their components.

Lifecycle Management

Lifecycle Strategies

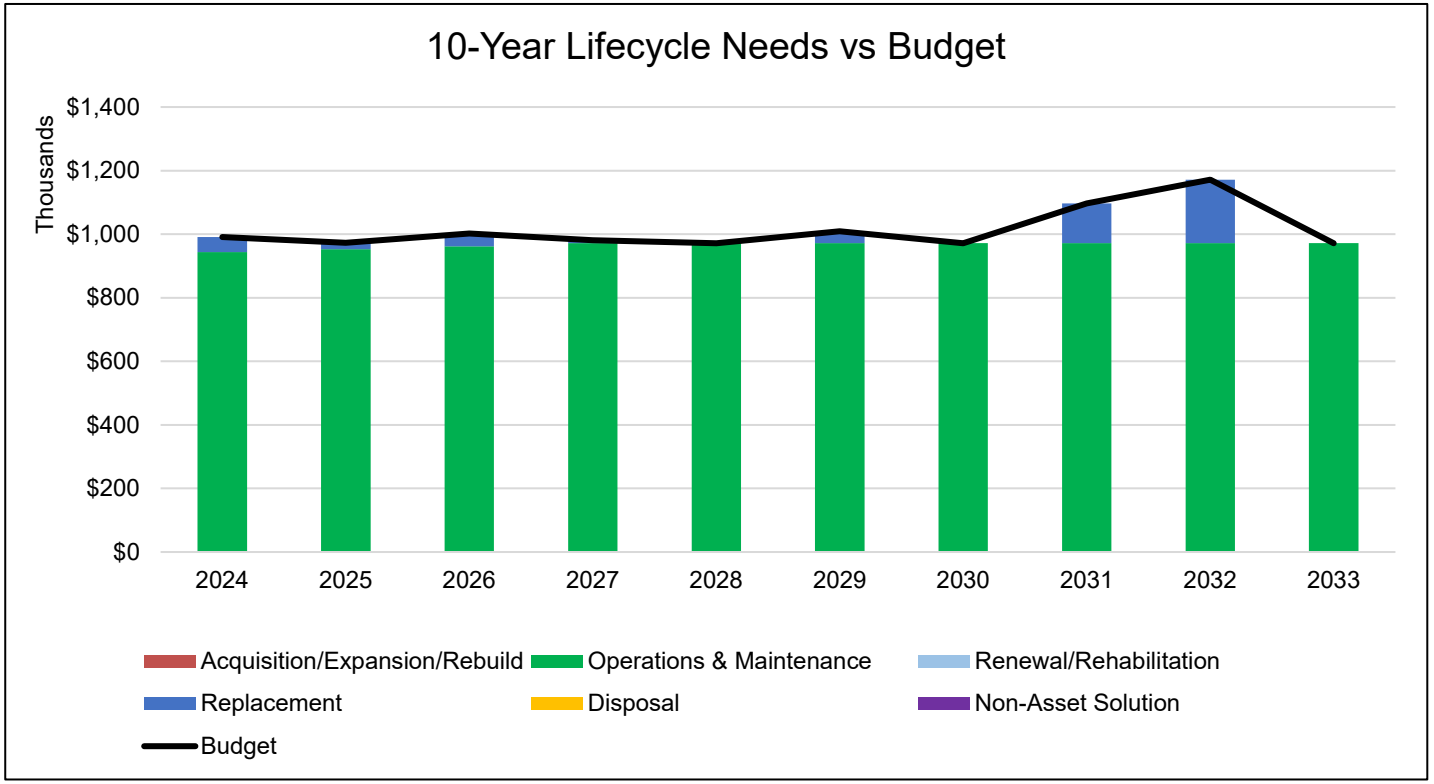
Printing & Mail Services – Current and Proposed Lifecycle Activities

Current and Proposed Lifecycle Activities	Risks associated with Lifecycle Activities
Non-Asset Solutions: Activities that do not alter the condition or performance of assets or services but provide staff with valuable information for their effective management.	
• Annual review of budget needs for (capital and operating)	• These non-asset IT solutions are used to plan for growth effectively and to align the City with best industry practice. There are financial, reputational and operational risks associated with conducting these IT master plans and standards
Operations & Maintenance: Minor activities that preserve the condition or performance of assets and ensures the longevity of assets in line with their design and operational requirements.	
• Assets are maintained per manufacturer warranty recommendations • Minor repairs of asset components (e.g., monitor screen repairs and sensor repairs) are completed on an as-needed basis • Assets are inspected on a daily, monthly or annual basis depending on their criticality and complexity	• Regular maintenance and inspections allow staff to maintain the performance and functionality of assets, and by extension, the desired service levels by mitigating hazards or premature failures
Renewal/Rehabilitation: Significant activities designed to extend the useful life of assets components.	
• N/A	• N/A

Current and Proposed Lifecycle Activities	Risks associated with Lifecycle Activities
Replacement: Replacement activities occur once an asset reaches the end of its useful life, cannot provide the intended function or performance, and rehabilitation is not a viable option.	
• Assets are replaced at end of life on a cyclical basis, when they no longer meet capacity/technological needs, or if they are no longer covered by vendor agreements. Where feasible, staff use those assets in a supplemental or secondary manner, as a form of redundancy	• The timely replacement of assets ensures that day-to-day operations are not impacted, and that the most cost-effective interventions are applied to the Print & Mail asset portfolio
Disposal/ Demolition: Activities associated with the disposal or decommissioning of an asset.	
• N/A	• N/A
Acquisition/Expansion/Rebuild: These activities expand services to previously non-serviced areas or to accommodate growth; they provide new or enhanced services beyond the current capacity and/or functionality of existing assets.	
• Upgrading or expanding assets to handle more capacity (e.g., adding another shelf to the storage array, adding more switches, acquiring a larger printer) • Adapting to technological changes as a result of renovations or replacements of facilities	• Technological obsolescence or redundancy as a result of changes to the business needs

Lifecycle Needs vs. Budget

Printing & Mail Service Area



Many of Print & Mail Services' assets are in fair condition and therefore the assets go beyond the 10-year forecast. Typically, staff conduct regular operations and maintenance to extend the life of their assets.

Budget Breakdown

Over the next 10 years, Print & Mail Services plans to spend an average of $1.0 million annually on its assets, with the majority of the budget being used for Operations & Maintenance activities.

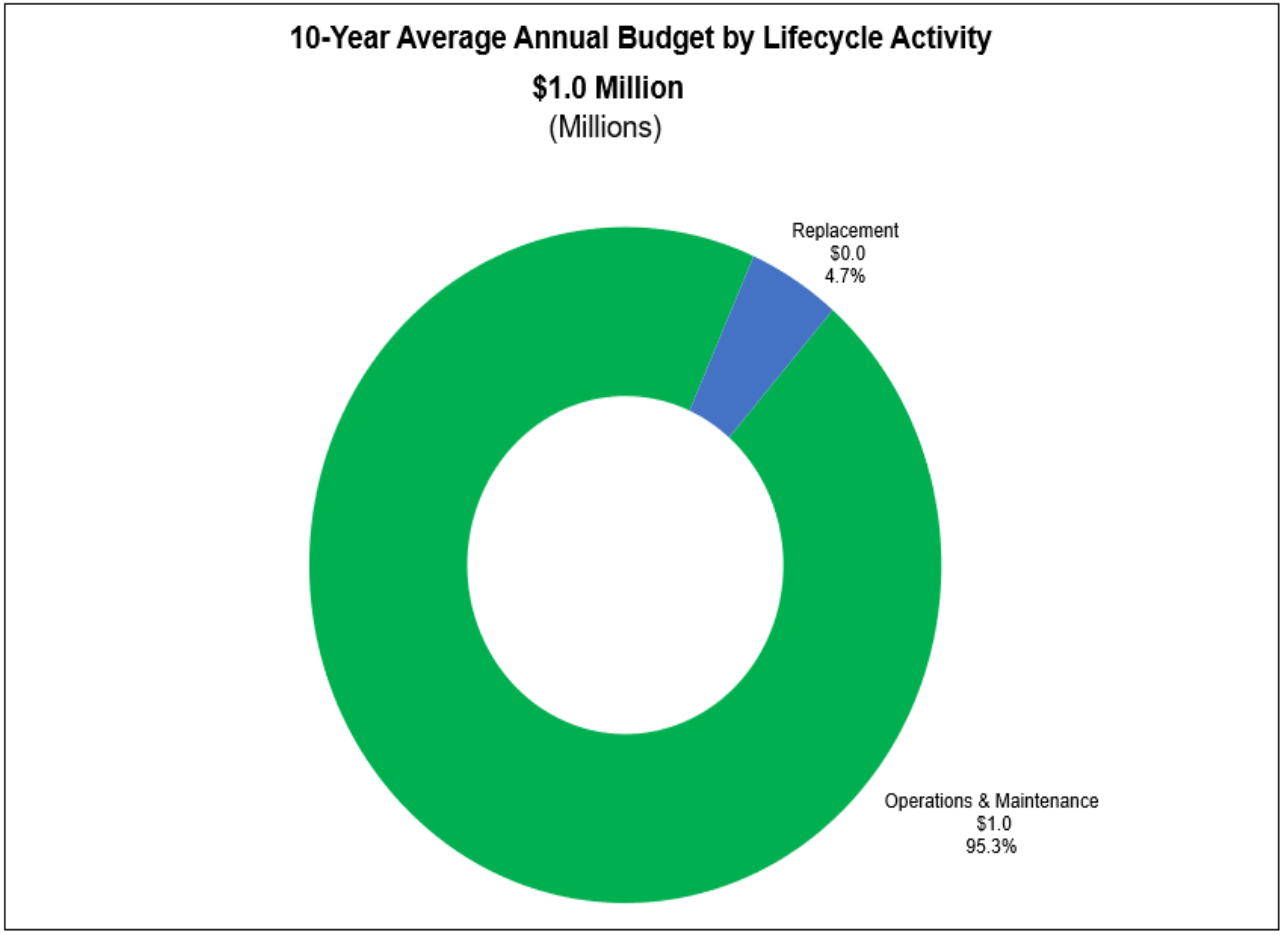


Figure 1: Breakdown of Budget by Lifecycle Activity

Table 2 shows the 10-year annual average budget breakdown by asset class. The majority of the of the operating and capital budget is spent on State of Good Repair (SOGR) of Print & Mail assets.

Table 2: Budget breakdown by Asset Class

Asset Class	SOGR Budget Type ($ Million)			Growth Capital Budget ($ Million)	Total Budget ($ Million)
	Operating	Capital	Total		
Print & Mail Services	0.97	0.05	1.01	-	1.01
Total	**0.97**	**0.05**	**1.01**	**-**	**1.01**

Financing Strategy

Capital Funding Sources and Operating Revenue Sources

The estimated available funding for the next 10-year period (2023-2032) for Print & Mail Services is $10.1 million. The sources of funding are Operating Revenue Sources at 95.3 per cent and Tax Reserve Funds at 4.7 per cent.

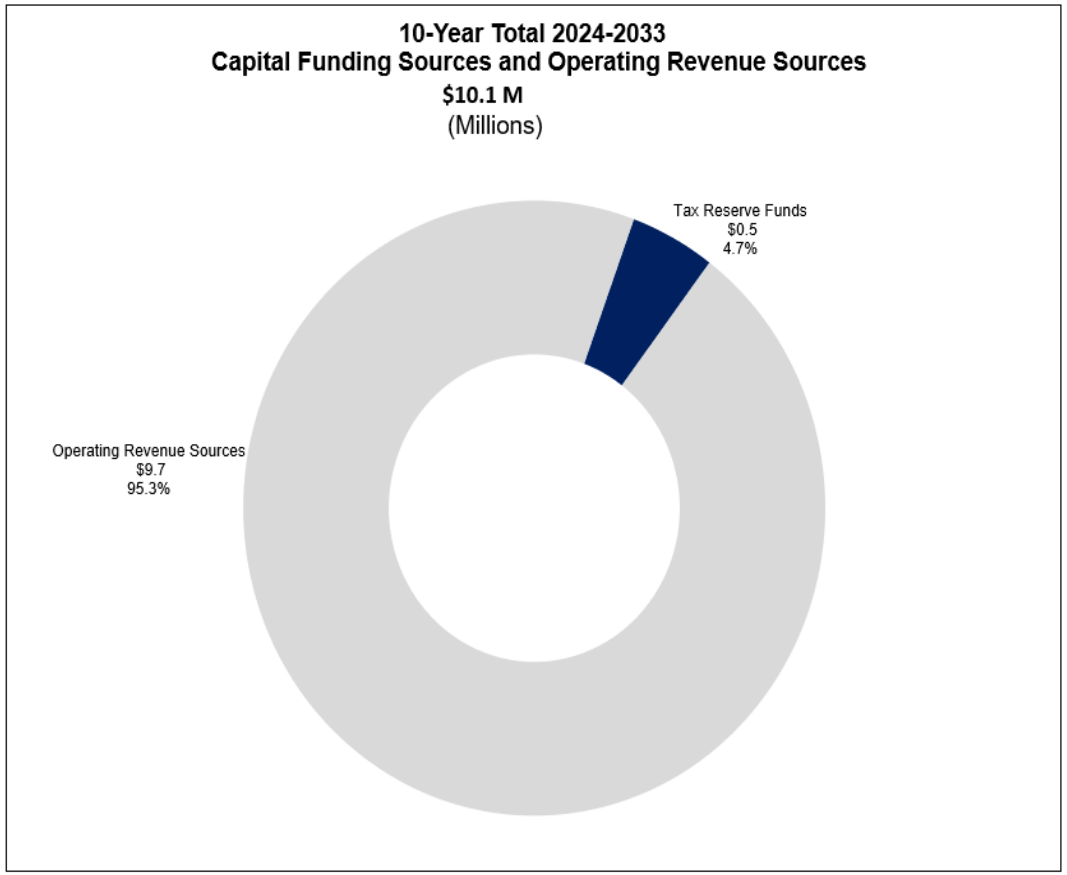
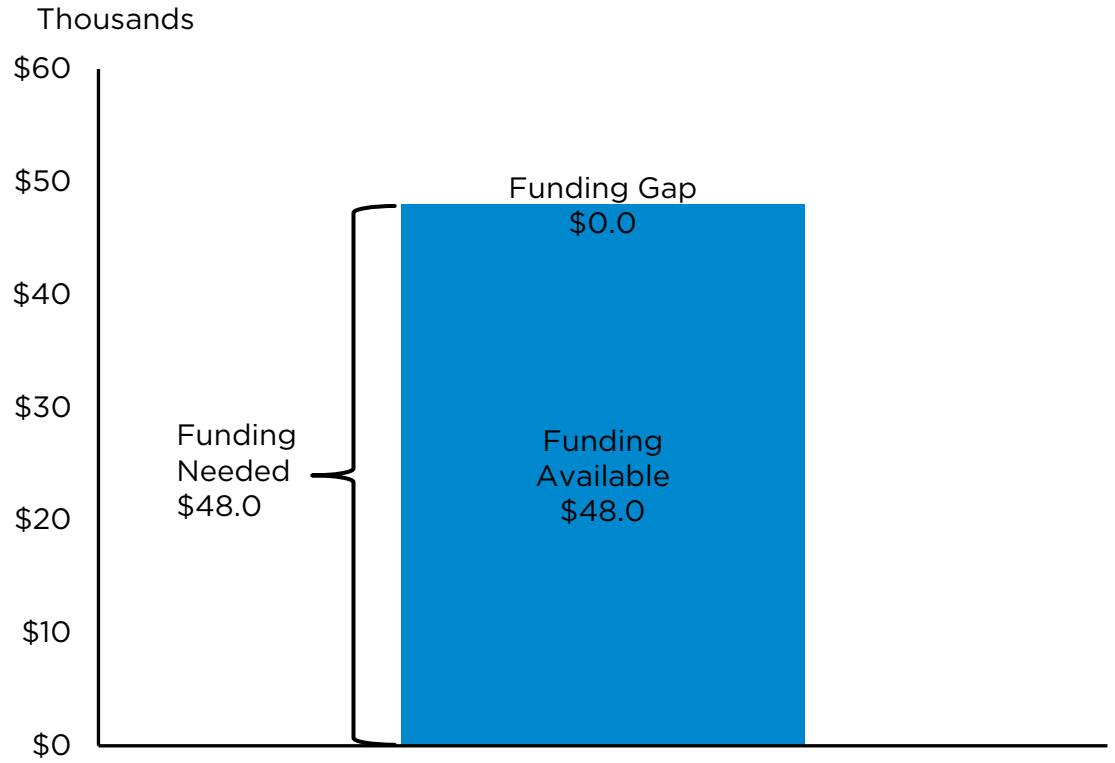


Figure 2: Capital Funding Sources (2024-2033)

Infrastructure Gap

Print & Mail Services



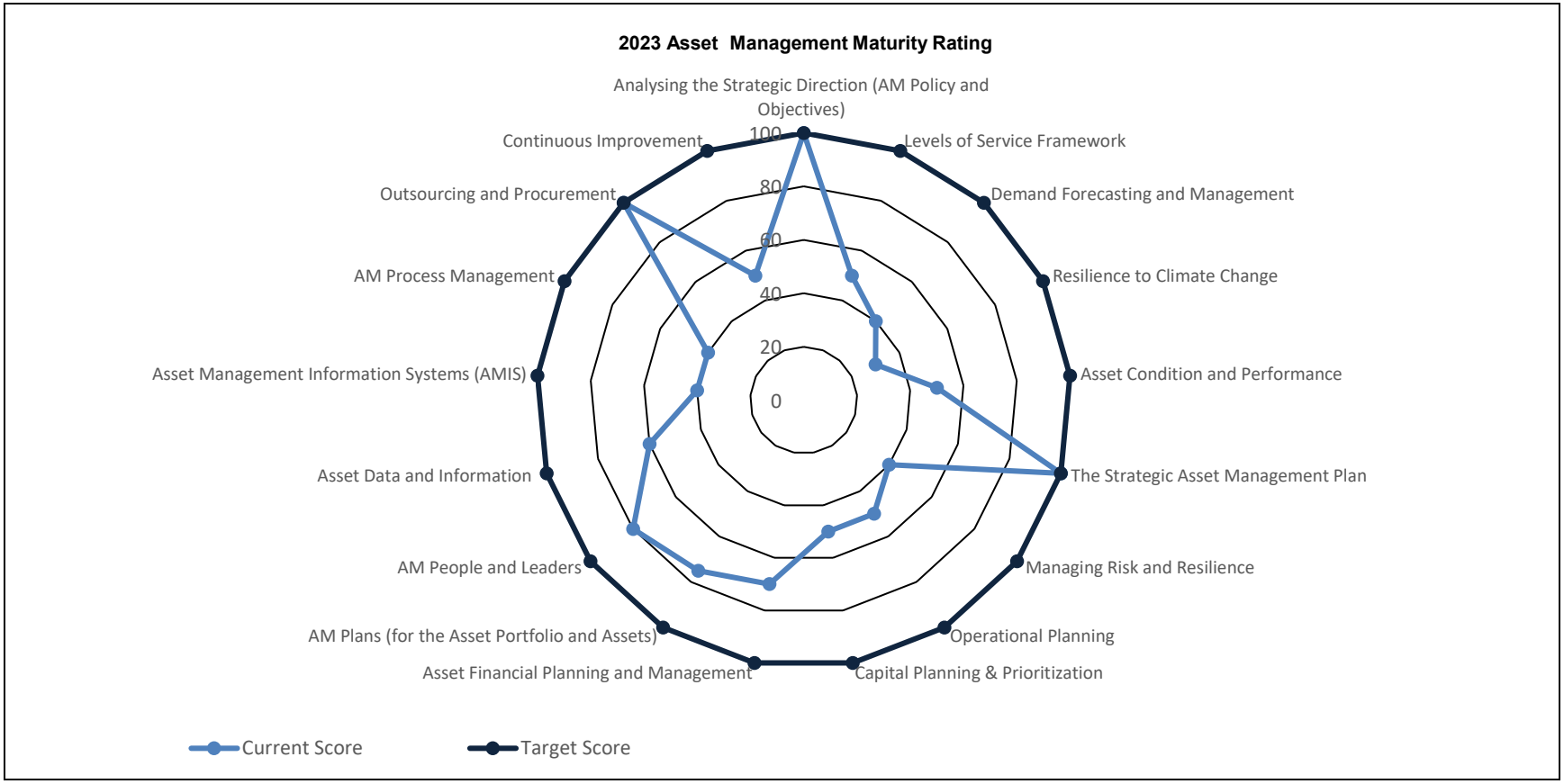
As of this plan iteration, Print & Mail Services is deemed to have sufficient budget to address its lifecycle needs to meet current and proposed service levels.

Continuous Improvement & Maturity

Maturity Assessments

The radar graph below is based on a 2023 maturity assessment. As the service areas mature in each category, they will expand outwards towards the outer ring (Target).

Print and Mail Services



Continuous Improvement Plan

Task No	Continuous Improvement Task	Asset Class	Estimated Timing	Value/Impact	Required Resources
State of Infrastructure (SOI)					
SOI-01	Review asset inventories and populate missing information	All	2022-Ongoing	Ensures accurate asset information to help make informed decisions.	External
SOI-02	Expand asset hierarchy to include additional assets.	All	2022-2024 (Completed)	Includes all asset types within asset class, ensuring a complete asset class.	Internal/External
Levels of Service (LOS)					
LOS-01	Review levels of service metrics.	All	2022-2025	In addition to being required to meet O. Reg. 588/17, LOS targets enable the service area to track progress against established service levels.	External
Financing Strategies (FS)					
FS-01	Review lifecycle costing and infrastructure gap calculations.	All	2022-Ongoing	Ensuring the correct allocations and lifecycle costing assumptions are used will lead to more detailed forecasts for operating and capital budgets.	Internal