



**City of Kingston  
Report to Council  
Report Number 24-207**

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**To:** Mayor and Members of Council  
**From:** Neil Carbone, Commissioner, Corporate Services  
**Resource Staff:** Brent Fowler, Director, Corporate Asset Management & Fleet  
**Date of Meeting:** November 19, 2024  
**Subject:** Asset Management Plans for Multiple Service Areas to meet Ontario Regulation 588/17 Requirements

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**Council Strategic Plan Alignment:**

Theme: Regulatory & compliance

Goal: See above

**Executive Summary:**

The City of Kingston has made considerable progress in formalizing asset management practices that align with provincial requirements and emerging best practices in the municipal sector, particularly with the implementation of its Asset Management Framework. The framework follows the provincial guidance and requirements outlined in O. Reg 588/17 allowing for a consistent deployment across all assets and standardized training content for staff. These efforts enhance decision-making capabilities and promote sustainable financial practices, essential for managing municipal infrastructure.

In 2019, the Canadian Infrastructure Report Card (CIRC) revealed that a significant portion of municipal infrastructure in Canada was in poor or very poor condition, requiring immediate rehabilitation and replacement over the next 5-10 years to sustain service levels that meet community expectations while also over-coming climate change and balancing the needs of net new infrastructure being brought on-line. It is crucial to have consistent, high-quality data across the organization to enable senior leadership to plan and prioritize renewal projects based on evidence, adopt best practices for cost efficiency, and take advantage of funding opportunities from provincial and federal governments.

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This report presents the City of Kingston's Asset Management plans (AMP) for all infrastructure assets that were not included in the 2022 approved Core Asset Management Plan in accordance with *Ontario Regulation 588/17: Asset Management Planning for Municipal Infrastructure (the "Regulation")* under the *infrastructure for Jobs and Prosperity Act*. The next phase, due by July 1, 2025, as required by the legislation, will be to complete the AMP by consolidating all City owned assets and identify proposed Levels of Service (LOS) and required investments to achieve those levels of service over the next 10 years.

Upon completion of all phases of this work, the City will have an enterprise-wide integrated asset management plan that will inform the priority and scope of investment in capital assets required to support Council's approved levels of service as well as a roadmap that will inform the prioritization and rationale of long-term capital investment and funding resources going forward.

The City's professional services partner on this project, Dillon Consulting, will join staff in presenting this information to Council.

**Recommendation:**

**That** Council adopt the 2024 Asset Management Plan as set out in Exhibit A through Exhibit F to Report Number 24-207 and authorize the Director of Corporate Asset Management & Fleet to make any required non-material amendments; and

**That** Council adopt the 2023 Facilities Asset Management Plan as set out in Exhibit G to Report Number 24-207 and authorize the Director of Corporate Asset Management & Fleet to make any required non-material amendments; and

**That** Council direct staff to make available the final approved 2024 Asset Management Plan and 2023 Facilities Asset Management Plan, to the public via the City's website.

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**Authorizing Signatures:**

ORIGINAL SIGNED BY COMMISSIONER

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**Neil Carbone, Commissioner,  
Corporate Services**

ORIGINAL SIGNED BY CHIEF

ADMINISTRATIVE OFFICER

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**Lanie Hurdle, Chief  
Administrative Officer**

**Consultation with the following Members of the Corporate Management Team:**

Paige Agnew, Commissioner, Growth & Development Services

Jennifer Campbell, Commissioner, Community Services

David Fell, President & CEO, Utilities Kingston Not required

Peter Huigenbos, Commissioner, Major Projects & Strategic Initiatives Not required

Brad Joyce, Commissioner, Infrastructure, Transportation  
& Emergency Services

Desirée Kennedy, Chief Financial Officer & City Treasurer

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**Options/Discussion:****Background**

In 2016, the Province of Ontario enacted the Infrastructure for Jobs Prosperity Act 2015 that included an authority for the Province to regulate municipal asset management planning. In 2017, the Province released a draft regulation illustrating various best practices, while outlining requirements for municipalities in undertaking asset management. In late December 2017, Ontario Regulation 588/17 was passed. The regulations were subsequently amended in March of 2021 under Ontario Regulation 193/21, to change the timing of reporting requirements under the Act.

Additionally, the Regulation requires that the strategic asset management policy and asset management plans be approved by a resolution passed by Council and made available to the public via the City's website and to persons who request a copy.

Under this regulation, the Province has mandated phased requirements to ensure that municipalities develop Asset Management Plans. Following the adoption of an Asset Management Policy, Asset Management Plan for Core Assets, the next milestone required was the development and approval of an Asset Management Plan for all other assets. An outline of the milestones and deadlines from the Province are as follows:

**2019** – A strategic Asset Management Policy.

**2022** – All Core Assets to be covered in the Asset Management Plan with current level of service (LOS). Core assets include water, wastewater, stormwater, roads and bridges/culverts.

**2024** – All Other Assets owned by the municipality to be covered in the Asset Management Plan with current LOS. All other assets include buildings, fleet and equipment as well as green infrastructure assets.

**2025** – Proposed LOS and the lifecycle management and financial strategy for 10-year period to achieve the proposed LOS.

\*Core Assets as defined by the regulation are roads, bridges and culverts, stormwater management systems (i.e., pipes, ponds, etc.), water, and wastewater. Water and wastewater asset management documents and plans are the responsibility of Utilities Kingston.

\*Other Assets include assets related to Infrastructure, Transportation, Transit, Emergency Services, Corporate Services, Parking, Community Services, Parks, Parkland, Trails, Police, Libraries, City Real Estate and Environment.

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The scale and criticality of the City's asset portfolio demands an integrated asset management approach that requires collaboration from multiple departments and operations to ensure that value from assets is realized, risks reduced and expected community levels of service maintained.

The City of Kingston's commitment to develop asset management plans goes well beyond simply meeting the provincial regulatory requirements and treating it as a one-off project. The City recognizes the value and benefits of an integrated, holistic approach to asset management planning. The project objectives included:

- Ensure that the City is well-positioned for current and future grant programs by meeting the requirements of O. Reg 588/17.
- Enhance service delivery to our customers by developing a framework for corporate infrastructure planning and asset lifecycle management for all departments to adopt that reduces risk exposure and enables evidence-based decision making.
- Raise awareness of asset management as a business model, its purpose and how it can enhance decision making and assist with meeting strategic objectives.
- Meet provincial regulatory requirements for asset management planning.
- Enhance interdepartmental communication and collaboration on projects that involve asset management.
- Create a consistent management process and protocol for all corporate assets.
- Support and foster the development of improved asset management practices that clarify and justify funding requirements.
- Support - internally and to the public - the prioritization and rationale of capital plans and capital funding resources.
- Demonstrate long-term asset stewardship and sustainability.

### Current Status

In April 2019, Council adopted the City of Kingston Asset Management Policy which is attached to this report as Exhibit H. This was the first step in a series of actions required under Ontario Regulation 588/17, "Asset Management Planning for Municipal Infrastructure" (O.Reg. 588/17) and it is used to guide the development of the Asset Management Plans outlined in Appendix A through G presented in this report.

On June 21, 2022 ([Report Number EITP-22-006](#)) the Core Asset Management Plan was approved which included the Transportation & Stormwater infrastructure elements as required by the regulation including roads, bridges, culverts, and stormwater systems.

The following Asset Management Plans, as prepared by Utilities Kingston for city-owned assets were approved and adopted as follows; the Water and Wastewater Asset Management Plan, on October 19, 2021 ([Report Number 21-234](#)) and the Natural Gas Distribution System & Water Heater Asset Management Plans on June 18, 2024 ([Report Number 24-171](#))

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In 2023 staff issued a Request for Proposal (RFP) F18-TPW-CAMF-2023-01 - Professional Services to Develop Specific Non-Core Asset Management Plans for all other infrastructure assets.

### 2024 Asset Management Plans (Exhibit A through Exhibit F)

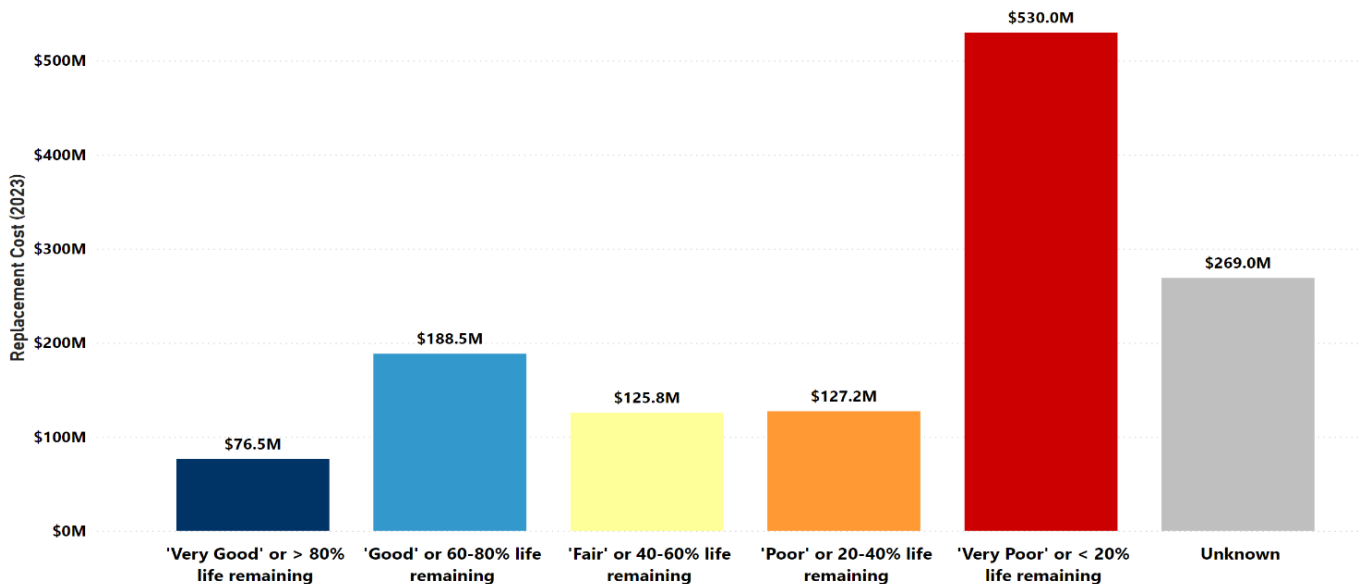
The project is now completed, and this report is the third of four requirements under O. Reg 588/17 requiring every Ontario municipality to submit an approved Asset Management plan for all other infrastructure assets. Of note, the 2023 Corporate Facilities Asset Management Plan was developed separately and is also being submitted for approval at this time.

The AMP also ensures that required agencies and corporations (e.g.: Kingston Frontenac Public Library, Kingston Police) are included along with the City Departments with infrastructure assets, as defined by O. Reg 588./17.

The City of Kingston’s complex and diverse asset portfolio delivers essential services to the community. This portfolio includes over 661,000 unique assets, representing **\$1.3 billion** in replacement value that supports 21 different service areas

The summary figure below illustrating the Asset Condition Summary (by replacement cost) excludes Corporate Facility assets associated with Kingston Fire & Rescue, Police Services, Kingston Frontenac Public Library, Rideaucrest Long-Term Care Centre and Airport Operations.

**Figure 1: Condition Summary by Replacement Cost**



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Based on the condition assessment of all assets above, assets in 'Very Poor' condition have an estimated replacement cost of \$530M, representing approximately 40% of the overall asset portfolio.

It is important to note however, that the condition ranking of approximately 92% of all assets were established based on their age and expected useful life – a reasonable approach in the absence of current condition information. This estimation can overstate the need to replace assets, may not reflect maintenance and renewal efforts implemented to extend the useful life of the assets, and may not identify those assets still fit for purpose to meet current service levels.

This is the case for a large portion of the assets in the 'Very Poor' category above, whose remaining useful life is based on an 'average life consumed' measure due to the absence of more detailed condition assessment information. These assets include streetlights, traffic signals, sidewalks, minor culverts, pathways, multi-use trails, information & technology assets and fleet. As a result, many of these assets are anticipated to exceed the average estimated useful life for that particular asset class.

In the absence of current condition assessment information, the above is a common practice employed by municipal organizations to inform asset management planning and is illustrated as such in publicly available Asset Management plans. This method is also commonly used where for financial, practical, and other reasons it is not feasible to complete condition-specific assessments of particular assets.

A critical take-away will be evaluating the useful life assumptions over time. The City will continue working to increase the percentage of assets with available industry standard condition assessment data as outlined in several continuous improvement initiatives presented in the plans.

The estimated replacement costs for assets whose condition is identified as "unknown" due to gaps in asset age records and condition assessment history is \$269M. Key asset classes that this has impacted include minor culverts (<3m), streetlights, multi-use recreational trails, parkland and library collections. The City's planned efforts to refine age and condition data will enhance the accuracy of forecasted expenditures and future asset management planning.

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**Table 1: Overall Summary of Key Results**

(For the purpose of reporting, the numbers have been rounded off to the nearest million)

<b>Volume – Chapter</b>	<b>Service Area</b>	<b>Total Replacement Cost (2023)</b>	<b>Average Condition</b>	<b>10-Year Annual Average Investment to maintain Current LOS</b>
1-4	Transportation - Structures	\$482.8M	Poor	\$39.5M <sup>5</sup>
4-2	Parks Linear	\$232.4M	Poor	\$3.3M
2-2	Corporate Fleet	\$185.1M	Fair	\$15.4M
1-3	Traffic Control & Safety	\$119.4M	Poor	\$4.4M
1-6	Kingston Fire & Rescue	\$118.1M <sup>1</sup>	Poor	\$4.3M
4-3	Park Amenities	\$97.7M	Good	\$0.6M
5-2	Police Services	\$91.4M <sup>1</sup>	Poor	\$1.0M
5-3	Library Services	\$85.1M <sup>1</sup>	Very Good	\$0.6M
3-4	Residential Long-Term Care	\$76.4M <sup>1</sup>	Good	\$0.1M
1-8	Airport Operations	\$58.8M <sup>1</sup>	Fair	\$1.3M
1-5	Urban Forestry	\$24.6M	Fair	\$0.1M
3-5	Indoor Recreation & Marinas	\$14.7M	Fair	\$0.6M
2-4	Parking Equipment, Lots, & Structures	\$14.1M	Fair	\$0.6M
2-3	Information Systems & Technology (IS&T)	\$13.2M	Poor	\$5.2M
1-2	Transit	\$7.9M	Good	\$0.5M



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Volume – Chapter	Service Area	Total Replacement Cost (2023)	Average Condition	10-Year Annual Average Investment to maintain Current LOS
5-4	City Real Estate & Environment	\$4.2M	Good	6
1-7	Solid Waste	\$2.9M	Good	6
4-5	Cemeteries	\$0.1M <sup>2</sup>	Good	\$0.0M
3-2	Heritage Services	Unknown <sup>3</sup>	Unknown	6
3-3	Arts & Culture Services	Unknown <sup>3</sup>	Poor	6
4-4	Park Facilities	4	4	4
		<b>\$1,630M<sup>1</sup></b>		<b>\$77.6M</b>

**Table Notes**

<sup>1</sup> These service areas include **\$308.0M** in replacement cost of associated facilities, as listed in the Facilities AMP (2023).

<sup>2</sup> Only one cemetery remains in active operation (Pine Grove Cemetery), the remaining five are inactive.

<sup>3</sup> There is no available replacement cost or valuation data for these assets as they are irreplaceable assets.

<sup>4</sup> Refer to the City’s Facilities AMP (2023).

<sup>5</sup> At the time of preparing this AMP, no condition assessment data could be leveraged for Sidewalks and Minor Culverts (< 3 m), and forecasted reinvestment has been derived primarily based on age and expected useful life. Many of these assets are documented to pre-date 1950 which hints at potential inaccuracies within the age data. It is recommended that the City further refines their data for Sidewalks and Minor Culverts (< 3 m) including the collection of condition assessment data to be considered in subsequent iterations of the AMP. Refinement of age and condition data by the City will assist at refining forecasted expenditures in the years to come.

<sup>6</sup> Asset replacement forecasts could not be developed for this service area at this time due to gaps in available information.

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The Asset Management Plans that are found in Exhibit A through Exhibit F (2024 Asset Management Plan) and Exhibit G (Facilities Asset Management Plan) provide the foundation that will support an integrated approach as asset management practices are developed to ensure the sustainability of assets and related services.

2024 Asset Management Plan comprises 21 service areas, organized into five service groups, and are presented in the following five volumes of the AMP:

**1) Infrastructure, Transportation, Transit and Emergency Services**

- Transit
- Traffic Control and Safety
- Structures
- Urban Forestry
- Fire & Emergency Services
- Solid Waste
- Airport Operations

**2) Corporate Services and Parking Operations**

- Corporate Fleet
- Information Systems and Technology
- Parking Equipment, Lots and Structures

**3) Community Services**

- Heritage Services
- Arts and Culture Services
- Residential Long-Term Care
- Indoor Recreation and Marinas

**4) Parks, Parkland and Trails**

- Park Linear
- Park Amenities
- Park Facilities
- Cemeteries

**5) Police, Libraries, City Real Estate and Environment**

- Police Services
- Library Services
- City Real Estate and Environment

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This report informs Council and residents of the current condition of all other infrastructure assets, the current service levels provided by those assets, identifies the average estimated useful life of assets, and quantifies current replacement values.

The **2024 Asset Management Plan** found in Exhibit A through Exhibit F is aligned to meet specific regulatory requirements and includes the following sections:

1. Introduction – Overview including asset information, definition, and basic history.
2. Volume 1 to 5 (under each category)
  - a. Asset Inventory – Categorization of assets in further detail.
  - b. Asset Valuations – Valuation of assets based upon current replacement cost.
  - c. Asset Age – Average asset age information by category.
  - d. Asset Condition – Based on current available information with explanation and details of condition assessments by asset category.
  - e. Levels of Service – Qualitative description in terms of scope, reliability, and quality of current community levels of service as well as metrics to support current technical levels of service by asset category.
  - f. Lifecycle Activities – Description of asset lifecycle activities and an outlook of the costs in maintaining the current levels of service over a 10-year timeframe.
  - g. Lifecycle Cost and Risk – Outline of lifecycle costs for activities that can be completed to maintain the assets at the current levels of service over a 10-year timeframe while highlighting any risks associated with assets failing to meet current levels of service.
3. Improvement & Monitoring – Overview of continuous improvement strategies to be implemented over time to strengthen and improve the City's Asset Management Plan.

The asset categories related to Corporate Facilities are presented in the Facilities Asset Management Plan developed separately in 2023 with assistance from GM Blue Plan and attached as Exhibit G.

The facilities assets consist of 147 buildings, structures, and electric vehicle (EV) charging stations as of the 2023 asset management plan. The Total Replacement cost for all facilities assets is \$1.3 Billion with 79% having an overall condition of Fair to Good. The 10-year annual average to maintain the current LOS is forecasted at \$25 Million.

The **Facilities Asset Management Plan** includes all municipal facilities which support a wide range of services that are provided to the Kingston community within the following categories:

#### **Facilities Asset Portfolio**

- Administration & Offices
- Airport
- Ambulance Services

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- Aquatic Centres
- Arenas
- Arts and Culture
- Community Centres
- Fire and Emergency Services
- Fleet Services
- Housing and Social Services
- Large Venue Entertainment Centre
- Leased
- Libraries
- Long Term Care
- Marinas
- Parks
- Police Services
- Public Works & Solid Waste
- Transit
- Utilities
- Other

The **Facilities Asset Management Plan** is aligned to meet specific regulatory requirements and includes the following sections:

- a. Introduction – Overview including asset information, definition, and basic history.
- b. Overview of Facilities Management & Construction Services
- c. State of Local Infrastructure
- d. Levels of Service
- e. Asset Lifecycle Management Strategy
- f. Improvement and Monitoring

### **Future Tasks and Initiatives (Next Steps)**

The City is currently reviewing and prioritizing multiple continuous improvement and best practices that were recommended when developing the 2024 Asset Management Plan and the Facilities Asset Management Plan.

These include the following:

- **Data Maturity of Asset Inventory:** Ensuring continuous updates for new assets, capturing missing assets and removing outdated ones. Regular asset inventory updates to increase data maturity.
- **Condition Assessment Planning:** Establishing a structured framework for assessing asset conditions with appropriate review cycles and processes for updating condition information.

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- **Level of Service (LOS) Optimization:** Exploring ways to improve the current LOS framework for better infrastructure management.
- **Performance Monitoring:** Implementing regular performance tracking with dashboards for transparent reporting.
- **Risk Framework Enhancement:** Refining the risk assessment process, integrating it with asset performance, incorporating climate change impacts and leveraging for project prioritization.
- **Integration of Asset Management Plans with Capital Prioritization Framework and Budgeting:** Enhancing the existing capital prioritization processes used in strategic decision-making; Ensuring full lifecycle and renewal requirements are considered through a framework that emphasizes evidence-based decision-making.
- **Technology Utilization;** Leverage existing systems available to the City to streamline asset register data capture while exploring methods to integrate field inspection results.
- **Data Governance Model:** Establish and implement a framework for data management and governance as it relates to asset management critical components and performance measures.
- **Review of Current Asset Estimated Useful Life Assumptions:** Multiple recommendations were made by (Subject Matter Experts) SME's concerning re-evaluating current (Estimated Useful Life) EUL's for certain assets because of new technologies, life cycle management lessons learned and benchmarks from other municipalities.

#### **Upcoming Key Milestones and Future Asset Management Reporting to Council:**

- Outcomes and recommendations from engagement & consultation with an Internal Focus Group of SME's and the community on proposed levels of service.

#### **July 1, 2025**

- It is expected that all City Programs and Agencies will be able to also identify the proposed service levels and asset performance resulting from asset investments.

#### **Q4 2025**

- Asset Management Policy update to be completed.

#### **Annually**

- As required by O. Reg. 588/17, municipalities will report to their Councils at least once per year on the current progress of asset management in the Municipality and any barriers to aligning operations with the AMP.

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**Fiscal Year 2030**

- A full update of the AMP will be required within 5 years.

**Conclusion**

The 2024 Corporate Asset Management Plan (AMP) helps to establish a crucial baseline that will align with the work and outcomes required to meet the 2025 O. Reg 588/17 requirements, creating a structured and holistic foundation for ongoing improvement in data maturity, lifecycle management, and capital planning across the City of Kingston. These enhancements along with community input on Levels of Service (LOS) derived from the upcoming community engagement project, will serve as essential tools for City staff as they refine the prioritization framework for the 2025 planning process and beyond.

This will ensure that asset sustainability, prioritization, and financial planning collectively support long-term community prosperity. Moving forward, this foundational work will guide reliable, data-driven decisions in service delivery and infrastructure funding, positioning Kingston for adaptive, resilient growth.

**Existing Policy / By-Law:**

City of Kingston - Asset Management Policy, Version 1.0, April 2019

**Financial Considerations:**

Adoption of the recommended 2024 Asset Management Plans will not have immediate financial implications. Additional funding will be considered as part of the 2025 capital and operating budgets in order to meet the next compliance deadline of July 1, 2025, to identify proposed levels of service, lifecycle management and adoption of a financial strategy to achieve those LOS within a 10-year timeframe.

Looking ahead, like most municipalities, the City has an infrastructure funding gap and would need to make significant additional investment in its assets to maintain the current levels of service identified in the attached reports. Similar to the few municipalities that have already incorporated asset management planning into their financial plans ahead of the July 2025 deadline, staff are expecting that levels of service will need to be modified and/or additional revenues raised in order to achieve proposed levels of service within the 10-year timeframe required under O.Reg 588/17.

Lastly, an approved Asset Management Plan is also an eligibility requirement for certain government grant programs. Examples would include Municipal Asset Management program grants administered through the Federation of Canadian Municipalities (FCM) as well as Federal Gas Tax reporting requirements.

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Laura Carter, Chief Librarian and Chief Executive Officer, Kingston Frontenac Public Library

**Exhibits Attached:**

Exhibit A - Executive Summary and Introduction

Exhibit B - Volume 1 - Infrastructure, Transportation, Transit, & Emergency Services

Exhibit C - Volume 2 - Corporate Services & Parking Operations

Exhibit D - Volume 3 - Community Services

Exhibit E - Volume 4 - Parks, Parkland, & Trails

Exhibit F - Volume 5 - Police, Libraries, City Real Estate & Environment

Exhibit G - 2023 Facilities Asset Management Plan

Exhibit H - Asset Management Policy



# City of Kingston 2024 Asset Management Plan

Executive  
Summary and  
Introduction

Volume 1  
Infrastructure,  
Transportation,  
Transit, &  
Emergency  
Services

Volume 2  
Corporate  
Services &  
Parking  
Operations

Volume 3  
Community  
Services

Volume 4  
Parks, Parkland,  
& Trails

Volume 5  
Police, Libraries,  
City Real Estate  
& Environment



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## Acronyms and Abbreviations

### Acronyms and Abbreviations

An abbreviation and an acronym are both shortened versions of something else. Both can often be represented as a series of letters.

AEC	Age Equivalent Correction
AMP	Asset Management Plan
AODA	Accessibility for Ontarians with Disabilities Act
CLP	Climate Leadership Plan
DC	Development Charges
EUL	Expected Useful Life
IIDEA	Indigenization, Inclusion, Diversity, Equity and Accessibility
IS&T	Information Systems and Technology
ISO	International Standards Organization
LOS	Level of Service
OCM	Organizational Change Management
SOLI	State of Local Infrastructure

## Executive Summary

### Executive Summary

The City of Kingston (City) was amalgamated in 1998 and today serves a total population of approximately 154,100 persons, including the permanent population and post-secondary student population not captured by the Census. It is uniquely situated between Toronto, Ottawa, and Montreal with easy access to all three by Highway 401 which runs through the City. With its location along the shores of Lake Ontario, at the mouth of the Cataraqui River, and the start end of the St. Lawrence River, Kingston is surrounded by natural beauty that enhances life for its residents.

Over time, the City has established asset management practices for the management of its infrastructure assets; however, more recent efforts have been made to formalize those practices within an Asset Management Framework. These improvements will result in improved decision-making abilities and sustainable financial practices.

In 2022, the City completed an Asset Management Plan (AMP) for Transportation and Stormwater assets, and in early 2024, one was also completed for Corporate Facilities. Moreover, Utilities Kingston generated the **Water and Wastewater Utilities Asset Management Plans**, which were approved by council in October 2021 (Report Number 21-234), and two additional AMPs, the **Natural Gas Distribution System Asset Management Plan**, and the **Water Heater Asset Management Plan**, in early 2024 (Report Number 24-171).

Moving beyond core assets, this project includes the other infrastructure assets owned by the City to meet Phase 3 of the **Ontario Regulation 588/17: Asset Management Planning for Municipal Infrastructure**. The asset categories included in the scope of this AMP represent 21 service areas, which were organized into five service groups presented in the following five volumes of the AMP:

- Volume 1 – Infrastructure, Transportation, Transit, & Emergency Services;
- Volume 2 – Corporate Services & Parking Operations;
- Volume 3 – Community Services;
- Volume 4 – Parks, Parkland, & Trails; and,

## Executive Summary

- Volume 5 – Police, Libraries, City Real Estate & Environment.

The Executive Summary and Introduction has been published as a separate and overarching document for this project. The five volumes of the AMP outline the City’s assets and strategies based on the information available at the time of writing the report. Assets will continue to deteriorate over time, requiring additional investments aimed at improving their conditions and extending their useful lives. These measures are essential to ensuring that the infrastructure remains "fit for purpose" in delivering the services.

## Regulatory Alignment

Asset management for municipalities is defined in a regulation: **O. Reg. 588/17: Asset Management Planning for Municipal Infrastructure**. This regulation builds on an earlier document called “Building Together: Guide for Municipal Asset Management Plans (2012)” and aligns with the international standard ISO55000. The regulation establishes the following four phases of compliance:

### Phase 1 - 2019

- A strategic asset management policy.

### Phase 2 - 2022

- All core assets to be covered in the asset management plan with current Level of Service (LOS). Core assets include water, wastewater, stormwater, roads and bridges/culverts.

### Phase 3 - 2024

- All assets owned by the municipality to be covered in the AMP with current LOS. Non-core assets include buildings, fleet and equipment as well as green infrastructure assets.

### Phase 4 - 2025

- Proposed LOS and the lifecycle management and financial strategy for 10-year period to achieve the proposed LOS.



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The series of AMPs (Volumes 1 through 5) plus the Facilities AMP address the Phase 3 requirements for all other asset categories except for natural assets. This is the first iteration of an AMP for these service areas. Future updates will need to include green infrastructure assets (i.e., natural assets) owned by the City and further assessment on infrastructure vulnerability to the impacts of climate change.

In the following sub-sections of the Executive Summary the combined highlights from each of the service areas are presented. For more details on each service area, refer to the volume and section of the AMP.

## Scope of Assets

The service areas and associated asset classes within the scope of each AMP volume are presented in **Table E-1**.

**Table E-1: The Service Area and Asset Classes included in the Scope**

Volume – Section	Service Area	Asset Classes
1-2	Transit	On-Street Infrastructure, Concrete Pads, IT & Other Support Equipment, and Benches
1-3	Traffic Control & Safety	Guide Rails, Signs, Streetlights, and Traffic Signals
1-4	Structures	Sidewalks, Wildlife Mitigation Infrastructure, and Minor Culverts (< 3 metre)
1-5	Urban Forestry	Tree Canopy
1-6	Fire & Emergency Services	Facilities, Fleet, and Equipment
1-7	Solid Waste	Disposal, Diversion, and Environmental Control Systems
1-8	Airport Operations	Facilities, Airport Site, Runway, Runway Lighting, IT Software, and Other Equipment
2-2	Corporate Fleet	Vehicles and Fleet Equipment
2-3	Information Systems & Technology (IS&T)	IT Infrastructure, End User Devices, Applications & Software, and Video Camera Systems

## Executive Summary

<b>Volume – Section</b>	<b>Service Area</b>	<b>Asset Classes</b>
2-4	Parking Equipment, Lots, & Structures	Surface Lots, Parking Structures, Equipment, and Information & Technology
3-2	Heritage Services	Outdoor Collection, Civic Collection, General Heritage Collection, Memorandum of Understanding Collection, Pumphouse Collection, and MacLachlan Woodworking Museum Collection
3-3	Arts & Culture Services	Grand Theatre (Functional Capital) and Tett Centre (Functional Capital)
3-4	Residential Long-Term Care	Facility Equipment, Information Technology (IT), and Resident Direct Care Equipment
3-5	Indoor Recreation & Marinas	Aquatics – Pool & Equipment, Arenas & Equipment, Boat Launches, Community Centre, Crawford Wharf, Fitness Centre & Equipment, and Marinas
4-2	Parks Linear	Fencing, Multi-Use Recreational Trails, Park Land, Pathways, and Shoreline Protection & Seawalls
4-3	Park Amenities	Community Gardens, Multi-Use Courts, Off-Leash Dog Parks, Playgrounds & Equipment, Skateparks, Splash Pads, Sports Fields, and Tennis, Pickleball Courts
4-4	Park Facilities	Maintenance Buildings, Parks (site) Lighting, Picnic Shelters, Plumbing Systems, and Washrooms
4-5	Cemeteries	Land and Structures
5-2	Police Services	Facilities, Fleet Assets, Specialized Equipment, and Information Technology & Telecommunications
5-3	Library Services	Facilities, Fleet Assets, Collections, Custodial Equipment, Other Equipment, Automated Materials Handling, Furniture, Shelving, and Information Technology
5-4	City Real Estate & Environment	Housing & Social Services, Other City-Owned Land Assets, and Environmental Remediation Infrastructure

## Executive Summary



### State of Local Infrastructure

The State of the Local Infrastructure (SOLI) presents the current condition of assets owned and maintained by the City. These assets enable the delivery of various services to residents, community visitors, and staff.

### Asset Inventory and Valuation

**Table E-2** combines the count and total replacement cost per service area. The estimated total replacement cost (2023) for the 21 service areas is **\$1.629 billion** with a total asset count of **661,420**.

## Executive Summary

### Table E-2 Notes

<sup>1</sup> The total replacement cost (2023) for these service areas includes the replacement cost of associated facilities, as listed in the Facilities AMP (2023).

<sup>2</sup> Only one cemetery remains in active operation (Pine Grove Cemetery), the remaining five are inactive.

<sup>3</sup> Inflated from the City of Kingston Parks Asset Management Plan (GHD, 2009).

<sup>4</sup> There is no available replacement cost or valuation data for these assets.

<sup>5</sup> Refer to the City's Facilities AMP (2023).

**Table E-2: Asset Inventory Summary Organized by Largest to Smallest Replacement Cost (2023)**

<b>Volume – Chapter</b>	<b>Service Area</b>	<b>Asset Count</b>	<b>Total Replacement Cost (2023)</b>
1-4	Structures	11,218	\$482.8 M
4-2	Parks Linear	623	\$232.4 M
2-2	Corporate Fleet	946	\$185.1 M
1-3	Traffic Control & Safety	43,946	\$119.4 M
1-6	Kingston Fire & Rescue	168	\$118.1 M <sup>1</sup>
4-3	Park Amenities	304	\$97.74 M
5-2	Police Services	133	\$91.35 M <sup>1</sup>
5-3	Library Services	338,422	\$85.07 M <sup>1</sup>
3-4	Residential Long-Term Care	1,057	\$76.36 M <sup>1</sup>
1-8	Airport Operations	41	\$58.79 M <sup>1</sup>
1-5	Urban Forestry	40,972	\$24.58 M
3-5	Indoor Recreation & Marinas	500	\$14.56 M
2-4	Parking Equipment, Lots, & Structures	470	\$14.09 M
2-3	Information Systems & Technology (IS&T)	2,799	\$13.23 M

## Executive Summary

Volume – Chapter	Service Area	Asset Count	Total Replacement Cost (2023)
1-2	Transit	756	\$7.910 M
5-4	City Real Estate & Environment	40	\$4.174 M
1-7	Solid Waste	203,833	\$2.857 M
4-5	Cemeteries	6 <sup>2</sup>	\$0.112 M <sup>3</sup>
3-2	Heritage Services	13,195	Unknown <sup>4</sup>
3-3	Arts & Culture Services	1,991	Unknown <sup>4</sup>
4-4	Park Facilities	5	5
<b>Not Applicable (N/A)</b>	<b>N/A</b>	<b>661,420</b>	<b>\$1.629 B</b>

## Asset Age and Condition Summary

Based on the condition assessment of all assets in this AMP, assets in Very Poor condition have an estimated replacement cost of **\$530 million**, representing approximately 40% of the overall asset portfolio. The condition ranking of approximately 92% of the assets in the AMP was established based on their age and expected useful life, a reasonable approach in the absence of current condition information. However, this estimation can overstate the need to replace assets and not reflect the maintenance efforts to extend useful life of assets.

The estimated replacement cost for assets whose condition is identified as “unknown” due to gaps in age records and condition assessment history is **\$269 million**. Key asset classes that this has impacted include minor culverts (< 3 metres [m]), streetlights, multi-use recreational trails, parkland, and library collections. The City’s planned efforts to refine age and condition data will enhance the accuracy of forecasted expenditures and future asset management planning.

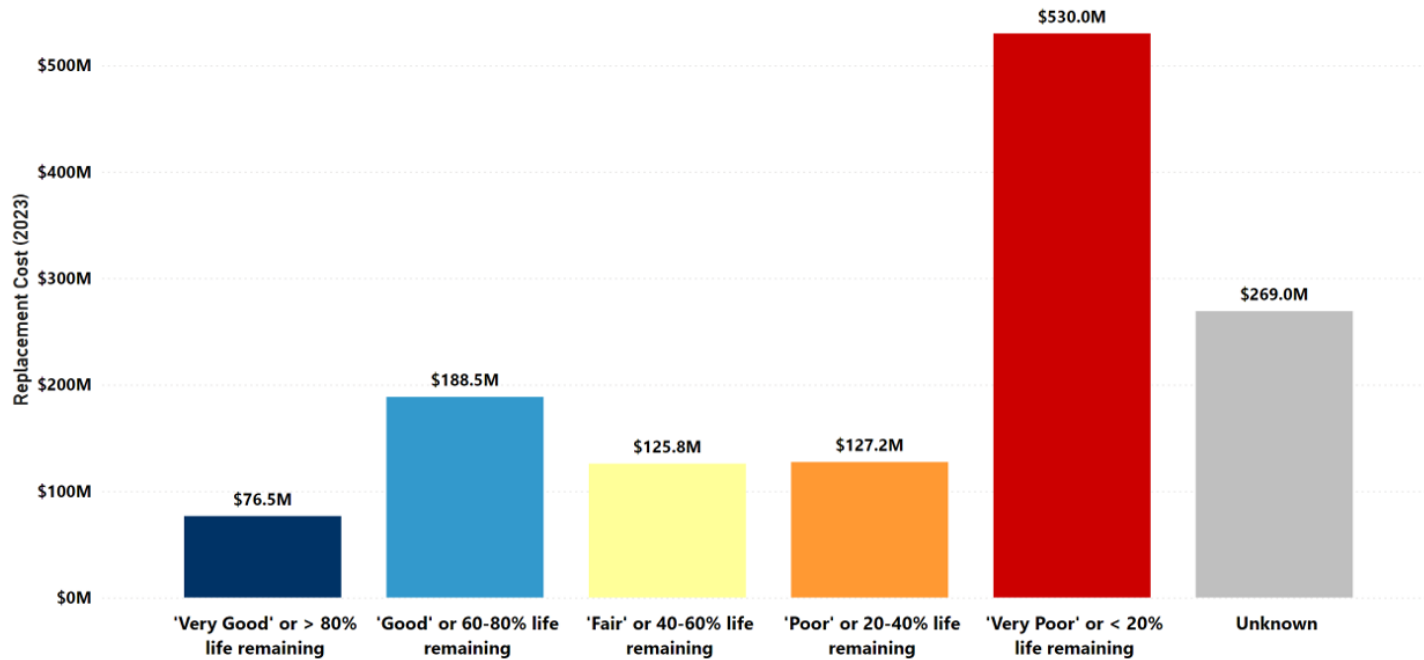
An overall condition summary for all assets by replacement cost (in 2023 dollars) is shown in **Figure E-1**.

## Executive Summary

### Figure E-1 Notes

<sup>1</sup> This summary figure excludes replacement costs attributed to facilities associated with Kingston Fire & Rescue, Police Services, Library Services, Residential Long-Term Care, and Airport Operations.

**Figure E-1: Condition Summary for All Assets by 2023 Replacement Cost**



The expected useful life range, average remaining useful life, and the average condition per service area is summarized in **Table E-3**.

### Table E-3 Notes

<sup>1</sup> Refer to the City's Facilities AMP (2023)

## Executive Summary

**Table E-3: Expected Useful Life, Remaining Useful Life, and Average Condition**

<b>Volume – Chapter</b>	<b>Service Area</b>	<b>Expected Useful Life (Years)</b>	<b>Average Remaining Useful Life (Years)</b>	<b>Average Condition</b>
1-2	Transit	10 to 25	10	Good
1-3	Traffic Control & Safety	12 to 50	7	Poor
1-4	Structures	15 to 50	6	Poor
1-5	Urban Forestry	50	27	Fair
1-6	Kingston Fire & Rescue	10 to 20	4	Poor
1-7	Solid Waste	5 to 15	5	Good
1-8	Airport Operations	10 to 25	8	Fair
2-2	Corporate Fleet	10 to 15	7	Fair
2-3	Information Systems & Technology (IS&T)	5 to 10	2	Poor
2-4	Parking Equipment, Lots, & Structures	3 to 50	13	Fair
3-2	Heritage Services	Indefinite	Indefinite	Unknown
3-3	Arts & Culture Services	10	3	Poor
3-4	Residential Long-Term Care	10 to 15	8	Good
3-5	Indoor Recreation & Marinas	10 to 50	8	Fair
4-2	Parks Linear	20 to 200	5	Poor
4-3	Park Amenities	10 to 30	14	Good
4-4	Park Facilities	1	1	1
4-5	Cemeteries	1000	665	Good
5-2	Police Services	10 to 15	3	Poor
5-3	Library Services	7 to 15	12	Very Good
5-4	City Real Estate & Environment	20 to 30	13	Good

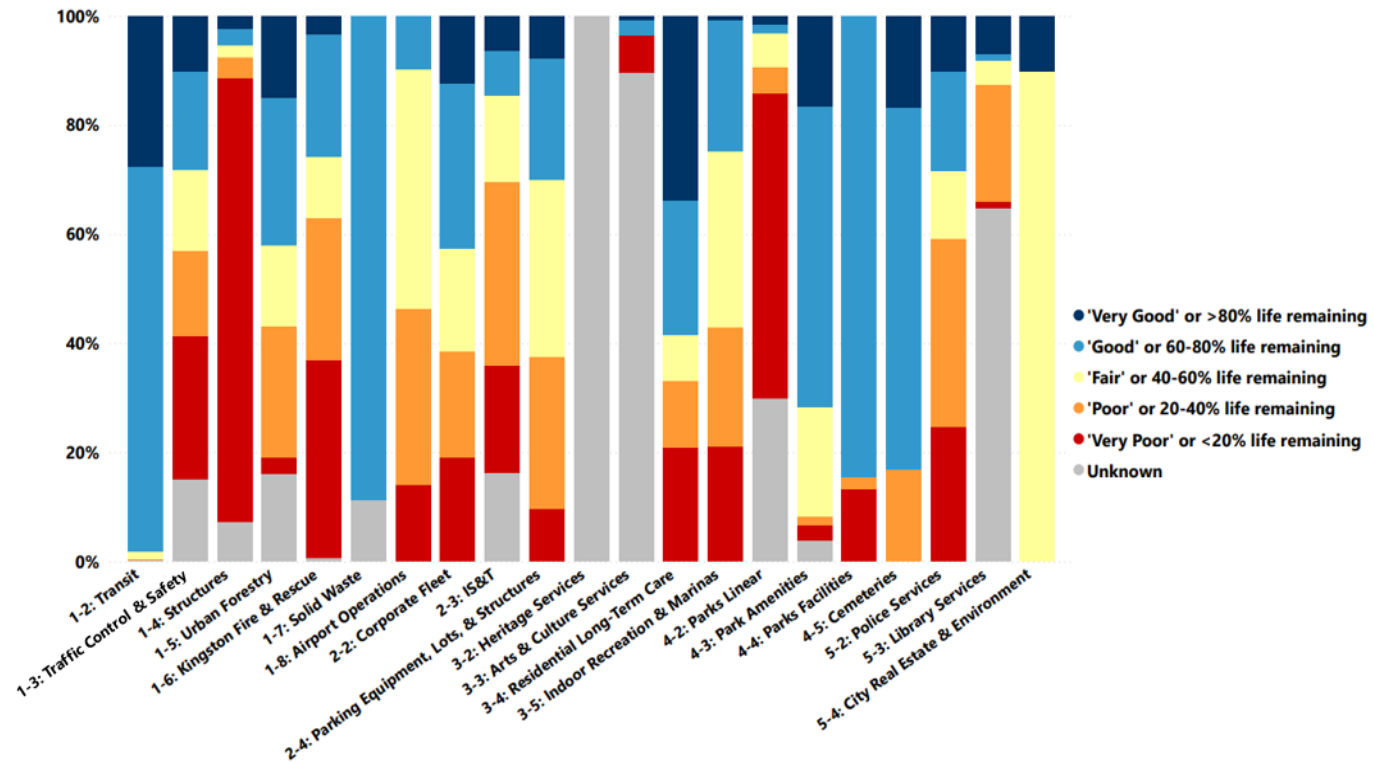
## Executive Summary

A condition summary by 2023 replacement cost is presented by service area in **Figure E-2**. Assets in Very Poor condition, or less than 20% remaining service life, are presented at the bottom of the stacked bar graph.

### Figure E-2 Notes

<sup>1</sup> The replacement costs for assets pertaining to Arts and Culture Services could not be determined at the time of the AMP. As a result, the condition summary for Arts and Culture Services is shown by count.

**Figure E-2: Condition Summary by Service Area and 2023 Replacement Cost**





## Executive Summary

### Data Sources and Confidence

Data confidence can be estimated based on the confidence level of various qualifiers and can be presented on a scale from 0% (low) to 100% (high), as shown in **Table E-4**. The qualifiers chosen for evaluation are specifically targeted for estimating overall confidence of condition reporting within the SOLI.

**Table E-4: Data Confidence Scale**

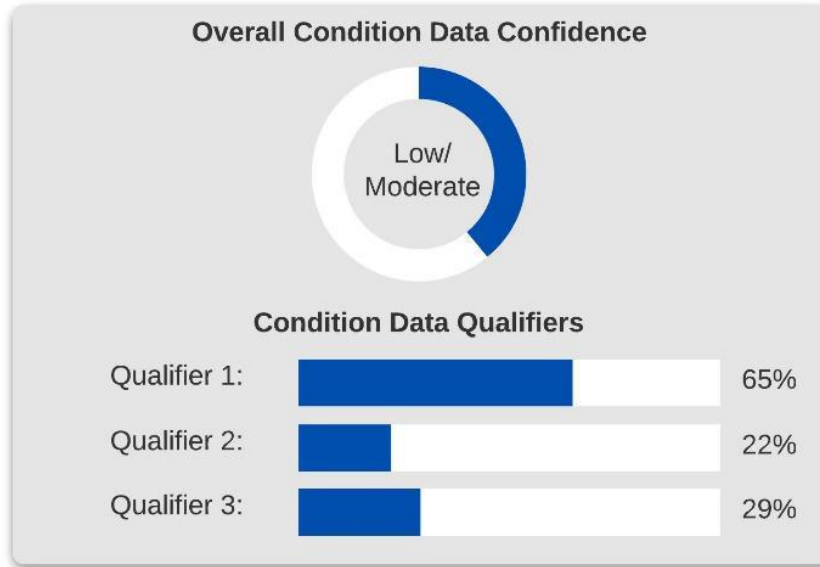
Confidence Level	Low	Low/ Moderate	Moderate	Moderate/ High	High
Average of Qualifiers	0% to 29%	20% to 39%	40% to 59%	60% to 79%	80% to 100%

Assuming the data source is reliable, the following qualifiers were considered to estimate data confidence regarding the data utilized in the creation of this SOLI report:

- **Qualifier 1:** The percentage of assets in the asset inventory where construction, installation, or acquisition years are documented (65%);
- **Qualifier 2:** The percentage of assets in the asset inventory that have condition assessment data documented (22%); and,
- **Qualifier 3:** The percentage of the estimated overall replacement value, in 2023 dollars, attributed to assets in the asset inventory with documented condition assessment data (i.e., condition is not solely age-based) (29%).

Executive Summary

Figure E-3: SOLI Report Data Confidence - All Assets



As summarized in **Figure E-3**, the overall asset condition data confidence for all assets is estimated as Low/Moderate. A summary of the overall data sources and confidence for all service areas is shown in **Table E-5**.

**Table E-5 Notes**

<sup>1</sup> Refer to the City’s Facilities AMP (2023).

**Executive Summary**

**Table E-5: Summary of SOLI Report Data Confidence**

<b>Report (Volume – Chapter)</b>	<b>Service Area</b>	<b>Qualifier 1</b>	<b>Qualifier 2</b>	<b>Qualifier 3</b>	<b>Condition Data Confidence</b>
1-8	Airport Operations	78%	86%	99%	High
4-3	Park Amenities	66%	96%	99%	High
3-5	Indoor Recreation & Marinas	58%	90%	97%	High
1-5	Urban Forestry	55%	79%	79%	Moderate/High
1-2	Transit	99%	32%	43%	Moderate
2-4	Parking Equipment, Lots, & Structures	61%	20%	73%	Moderate
2-3	Information Systems & Technology (IS&T)	80%	11%	40%	Moderate
3-4	Residential Long-Term Care	100%	2%	3%	Low/Moderate
4-5	Cemeteries	100%	0%	0%	Low/Moderate
5-2	Police Services	100%	0%	0%	Low/Moderate
2-2	Corporate Fleet	99%	0%	0%	Low/Moderate
5-4	City Real Estate & Environment	95%	0%	0%	Low/Moderate
1-4	Structures	93%	0%	0%	Low/Moderate
1-3	Traffic Control & Safety	50%	29%	9%	Low/Moderate
1-6	Kingston Fire & Rescue	87%	0%	0%	Low/Moderate
4-2	Parks Linear	57%	0%	0%	Low
5-3	Library Services	1%	1%	31%	Low
3-2	Heritage Services	12%	0%	0%	Low
3-3	Arts & Culture Services	10%	0%	0%	Low
1-7	Solid Waste	<1%	0%	0%	Low
4-4	Park Facilities	1	1	1	1

## Executive Summary

### Levels of Service

Asset management is about the services that the City provides to its end-user or customer. The questions typically asked when assessing Levels of Service (LOS) include: What services do you provide to residents? Are these services meeting their needs, falling below expectations, or exceeding expectations?

LOS is the combination of indicators that reflect the social and economic goals of the City and link an asset's performance to its target performance goals. For this AMP, LOS was described in two perspectives:

- Community Level of Service: intended to be customer-focused, provide a qualitative description (what service do residents receive and care about); and
- Technical Level of Service: based on the physical characteristics of an asset (what the asset can deliver and what is required to meet regulations) and how the asset is currently performing.

LOS is the combination of parameters that reflect the social, political, environmental, and economic outcomes that the municipality delivers (FCM, 2018). The LOS Framework includes one or more parameters that are most relevant for the service area.

**Table E-6** summarizes the City's current community and technical Level of Service parameters for each service area.

#### Table E-6 Notes

<sup>1</sup>There are no current Level of Service performance measures for this service.

<sup>2</sup>Refer to the City's Facilities AMP (2023) for Level of Service information pertaining to this service area.

Executive Summary

Table E-6: Summary of Community and Technical LOS Parameters per Service Area

Report (Volume – Chapter)	Service Area	Community LOS	Technical LOS
1-2	Transit	<ul style="list-style-type: none"> <li>• Accessibility</li> <li>• Availability</li> </ul>	<ul style="list-style-type: none"> <li>• Quality</li> </ul>
1-3	Traffic Control & Safety	<ul style="list-style-type: none"> <li>• Safety</li> </ul>	<ul style="list-style-type: none"> <li>• Quality</li> <li>• Safety</li> </ul>
1-4	Structures	<ul style="list-style-type: none"> <li>• Environmental Acceptability</li> </ul>	<ul style="list-style-type: none"> <li>• Quality</li> </ul>
1-5	Urban Forestry	<ul style="list-style-type: none"> <li>• Capacity</li> </ul>	<ul style="list-style-type: none"> <li>• Quality</li> </ul>
1-6	Kingston Fire & Rescue	<ul style="list-style-type: none"> <li>• Capacity</li> </ul>	<ul style="list-style-type: none"> <li>• Quality</li> </ul>
1-7	Solid Waste <sup>1</sup>		
1-8	Airport Operations	<ul style="list-style-type: none"> <li>• Reliability</li> <li>• Suitability</li> </ul>	<ul style="list-style-type: none"> <li>• Quality</li> </ul>
2-2	Corporate Fleet	<ul style="list-style-type: none"> <li>• Quality</li> <li>• Environmental Acceptability</li> </ul>	<ul style="list-style-type: none"> <li>• Quality</li> </ul>
2-3	Information Systems & Technology (IS&T)	<ul style="list-style-type: none"> <li>• Reliability</li> </ul>	<ul style="list-style-type: none"> <li>• Quality</li> </ul>
2-4	Parking Equipment, Lots, & Structures	<ul style="list-style-type: none"> <li>• Availability</li> </ul>	<ul style="list-style-type: none"> <li>• Quality</li> </ul>
3-2	Heritage Services	<ul style="list-style-type: none"> <li>• Community Satisfaction</li> </ul>	<ul style="list-style-type: none"> <li>• Quality</li> </ul>
3-3	Arts & Culture Services	<ul style="list-style-type: none"> <li>• Customer Satisfaction</li> </ul>	<ul style="list-style-type: none"> <li>• Quality</li> </ul>
3-4	Residential Long-Term Care	<ul style="list-style-type: none"> <li>• Capacity</li> </ul>	<ul style="list-style-type: none"> <li>• Quality</li> </ul>
3-5	Indoor Recreation & Marinas	<ul style="list-style-type: none"> <li>• Customer Satisfaction</li> </ul>	<ul style="list-style-type: none"> <li>• Quality</li> </ul>
4-2	Parks Linear	<ul style="list-style-type: none"> <li>• Quality</li> </ul>	<ul style="list-style-type: none"> <li>• Capacity</li> </ul>
4-3	Park Amenities	<ul style="list-style-type: none"> <li>• Quality</li> </ul>	<ul style="list-style-type: none"> <li>• Safety</li> </ul>

## Executive Summary

Report (Volume – Chapter)	Service Area	Community LOS	Technical LOS
4-4	Park Facilities <sup>2</sup>		
4-5	Cemeteries	<ul style="list-style-type: none"> <li>• Availability</li> <li>• Quality</li> </ul>	<ul style="list-style-type: none"> <li>• Availability</li> <li>• Quality</li> </ul>
5-2	Police Services	<ul style="list-style-type: none"> <li>• Quality</li> <li>• Reliability</li> </ul>	
5-3	Library Services	<ul style="list-style-type: none"> <li>• Capacity</li> <li>• Availability</li> </ul>	<ul style="list-style-type: none"> <li>• Quality</li> </ul>
5-4	City Real Estate & Environment		<ul style="list-style-type: none"> <li>• Environmental Acceptability</li> </ul>

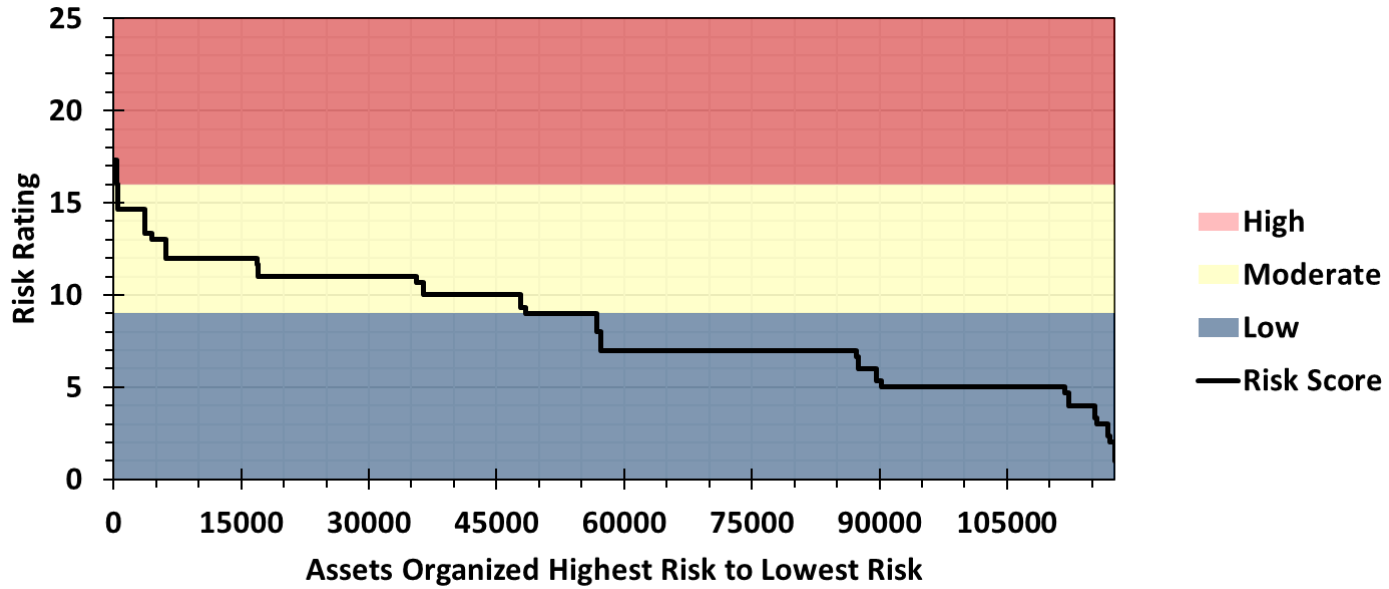
## Risk Assessment

Risk in asset management is a key component to assist in making informed decisions on assets. Although risk often focuses on the performance of the infrastructure itself, it is important to also consider how the overall system operates and identify potential barriers to achieving the LOS.

The Risk profile of all service areas is displayed in **Figure E-4**. Of the assets tracked within the asset inventory, approximately 0.5% are classified as High risk, 41% are classified as Moderate risk, and the remaining 58.5% of assets are Low risk.

## Executive Summary

Figure E-4: Risk Profile - All Assets



For further information on the risk approach, methodology, and analysis, refer to **Section 1.6.3** of the Introduction.

## Executive Summary

### Asset Management Strategy

A core objective in asset management is to proactively extend the useful life of assets where possible, by ensuring existing deterioration is well understood and properly addressed through timely maintenance, rehabilitation, and replacement activities. The provision of reliable infrastructure is crucial for ensuring that the City can continue to deliver reliable services to its current residents. As the City's existing assets age, significant reinvestment will be required for the replacement of deteriorated assets to ensure service delivery. It is important to note that forecasting in most of the lifecycle models within this AMP rely heavily on age and expected useful life (EUL) to determine renewal or replacement needs in the absence of asset condition data.

A summary of the 10-year annual average capital reinvestment needs per service area is shown in **Table E-7** and **Figure E-5**. The project average annual capital reinvestment required for all assets within the AMP over the next decade is estimated to be **\$77.56 million** per year.

#### Table E-7 Notes

<sup>1</sup> At the time of preparing this AMP, no condition assessment data could be leveraged for Sidewalks and Minor Culverts (< 3 m) and forecasted reinvestment has been derived primarily based on age and expected useful life. Many of these assets are documented to pre-date 1950 which hints at potential inaccuracies within the age data. It is recommended that the City further refines their data for Sidewalks and Minor Culverts (< 3 m) including the collection of condition assessment data to be considered in subsequent iterations of the AMP. Refinement of age and condition data by the City will assist at refining forecasted expenditures in the years to come.

<sup>2</sup> Asset replacement forecasts could not be developed for this service area at this time due to significant asset data gaps.

<sup>3</sup> Refer to the City's Facilities AMP (2023).



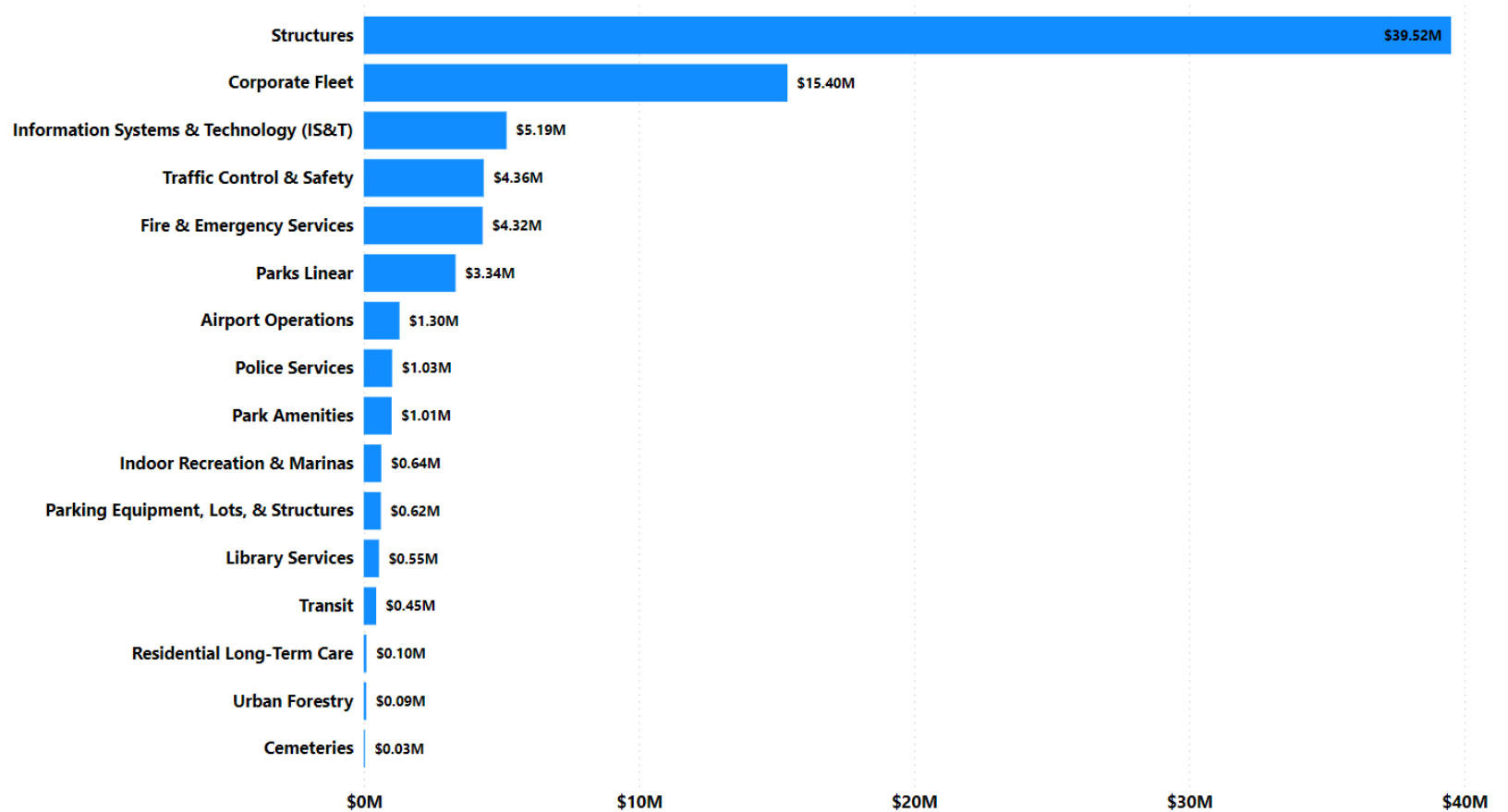
## Executive Summary

**Table E-7: Summary of 10-Year Capital Reinvestment Needs per Service Area**

Volume – Chapter	Service Area	10-Year Annual Average
1-4	Structures	\$39.52 M <sup>1</sup>
2-2	Corporate Fleet	\$15.40 M
2-3	Information Systems & Technology (IS&T)	\$5.190 M
1-3	Traffic Control & Safety	\$4.360 M
1-6	Kingston Fire & Rescue	\$4.320 M
4-2	Parks Linear	\$3.340 M
1-8	Airport Operations	\$1.300 M
5-2	Police Services	\$1.030 M
3-5	Indoor Recreation & Marinas	\$0.636 M
4-3	Park Amenities	\$0.632 M
2-4	Parking Equipment, Lots, & Structures	\$0.620 M
5-3	Library Services	\$0.552 M
1-2	Transit	\$0.450 M
3-4	Residential Long-Term Care	\$0.095 M
1-5	Urban Forestry	\$0.087 M
4-5	Cemeteries	\$0.030 M
1-7	Solid Waste	2
3-2	Heritage Services	2
3-3	Arts & Culture Services	2
4-4	Park Facilities	3
5-4	City Real Estate & Environment	2
<b>N/A</b>	<b>N/A</b>	<b>\$77.56 M</b>

## Executive Summary

Figure E-5: Summary of 10-Year Capital Reinvestment Needs per Service Area



**Note:** The 10-year annual average reinvestment needs for Solid Waste, Heritage Services, Arts & Culture Services, and City Real Estate & Environment could not be developed at this time due to significant data gaps. Reinvestment for Parks Facilities is detailed in the City’s Facilities AMP (2023). Consequently, these service areas have been excluded from the figure.

## Executive Summary

### Roadmap with Next Steps

Asset management is a continuous improvement activity and completion of this AMP is a first iteration of documentation of the assets within the 21 service areas. The City will continue to regularly review and update asset data and asset management documentation. O. Reg. 588/17 requires that all municipalities update their asset management plans for July 1, 2025, to include proposed levels of service and financing strategies to achieve the proposed levels of service.

The final section in the Introduction presents the Roadmap with Next Steps. This section presents the upcoming regulatory requirements and recommendations to prepare for future updates, with 12 general recommendations, and specific recommendations for each volume.



## Acknowledgements

### Acknowledgements

A project of this breadth and scope could not be completed without significant contributions from a large team of individuals from across the organization. The project team would like to express appreciation to City staff and Council for their cooperation and input to this AMP. We acknowledge their commitment and flexibility to contribute to this important document representing 21 service areas and the infrastructure assets that deliver those important services to the community.

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- Shruti Patil, Corporate Asset Management and Fleet, Corporate Asset Management Analyst

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## About this Report

Dillon Consulting Limited (Dillon) was retained by the City of Kingston (City) to help generate their first Asset Management Plan for 21 service areas to meet the requirements of **O. Reg. 588/17: Asset Management Planning for Municipal Infrastructure**, as amended by O. Reg. 193/21. The core consulting team for the project is presented below.

### Consulting Team

- Darla Campbell, Project Manager
- Liza Guilbeau, Project Coordinator
- Taylor McNeill, Asset Management Coordinator
- Austen Underhill, Data Lead
- Megan Gallie, Asset Analyst

## Introduction



### 1.0 Introduction

The City of Kingston (City) was amalgamated in 1998 and today serves a total population of approximately 154,100 persons, including the permanent population and post-secondary student population not captured by the Census. It is uniquely situated between Toronto, Ottawa, and Montreal with easy access to all three by Highway 401 which runs through the City. With its location along the shores of Lake Ontario, at the mouth of the Cataraqui River, and the start end of the St. Lawrence River, Kingston is surrounded by natural beauty that enhances life for its residents.



## Introduction

Kingston's economy is centered on public institutions and establishments including Queens University, the Royal Military College of Canada, St. Lawrence College, as well as healthcare, correctional, and military facilities. The City has played a unique role in the history of Canada, including a brief stint as the Nation's first capital. Today you can see this reflected in its historical downtown and monuments.

Over time, the City has established asset management practices for the management of its infrastructure assets; however, more recent efforts have been made to formalize those practices within an Asset Management Framework. These improvements will result in improved decision-making abilities and sustainable financial practices.

Kingston's Asset Management Framework already includes the Strategic Asset Management Policy, accepted by Council in 2019, Report #19-091. This policy is intended to define the City's expectations, key principles, and governance framework for the practice of asset management at the City. The policy, along with other documents related to asset management are all developed to be in alignment with the City's Strategic Plan, as well as other important planning documents.

As per the most recent strategic plan, the City has established priorities for the current term, up until 2026. All these priorities are in some way supported by the City's infrastructure, thus improvements to the management of that infrastructure will support the achievement of these priorities.

In 2022, the City completed an Asset Management Plan (AMP) for Transportation and Stormwater assets, and in early 2024, one was also completed for Corporate Facilities. Moreover, Utilities Kingston generated the **Water and Wastewater Utilities Asset Management Plans**, which were approved by council in October 2021 (Report Number 21-234), and two additional AMPs, the **Natural Gas Distribution System Asset Management Plan**, and the **Water Heater Asset Management Plan**, in early 2024 (Report Number 24-171).

Moving beyond core assets, this project includes the other infrastructure assets owned by the City to meet Phase 3 of the **Ontario Regulation 588/17: Asset Management Planning for Municipal Infrastructure**. The 21 service areas, were organized into five service groups, and are presented in the following five volumes of the AMP:

## Introduction

- Volume 1 – Infrastructure, Transportation, Transit, & Emergency Services;
- Volume 2 – Corporate Services & Parking Operations;
- Volume 3 – Community Services;
- Volume 4 – Parks, Parkland, & Trails; and
- Volume 5 – Police, Libraries, City Real Estate & Environment.

The five volumes of the AMP outline the City's assets and strategies based on the information available at the time of writing the volumes. Assets will continue to deteriorate over time, requiring additional investments aimed at improving their conditions and extending their useful lives. These measures are essential to ensuring that the infrastructure remains "fit for purpose" in delivering critical municipal services.

The introduction presents key asset management concepts including alignment with strategic plan, policy, and regulation. It identifies the scope of assets included in the volumes and provides an overview of the sections for each service area which include: the State of the Local Infrastructure, Levels of Service, Risk Assessment, and the Asset Management Strategy. The introduction also presents a section on Growth and a Roadmap with Next Steps outlined.

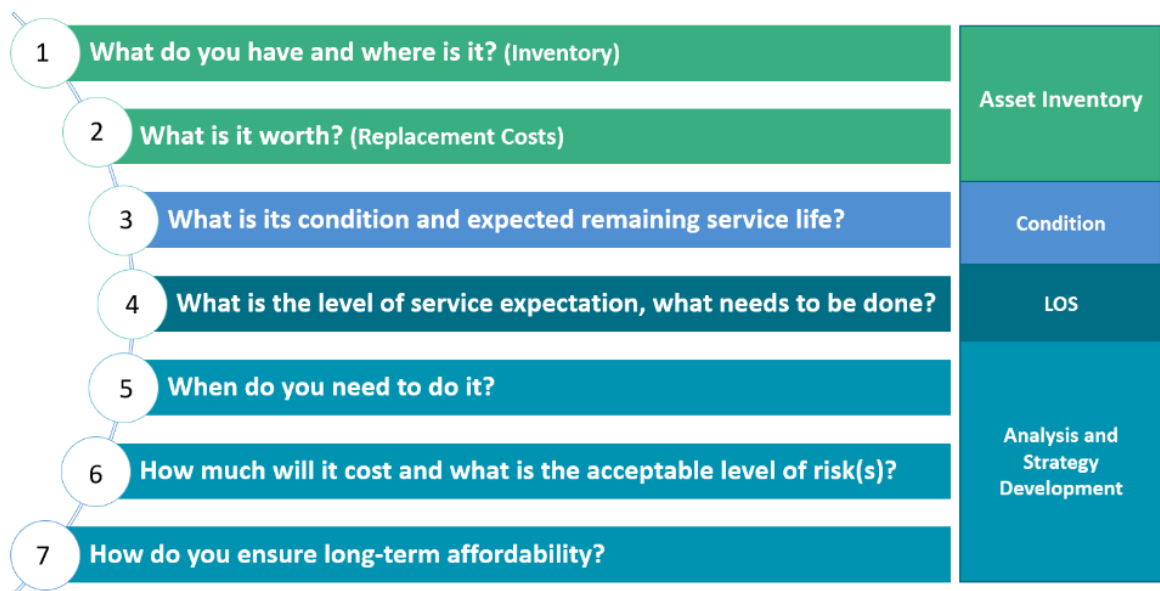
### 1.1 Asset Management

Asset management is a coordinated activity of an organization to realize value from assets, where the realization of value normally involves balancing costs, risks, opportunities, and performance benefits (as defined in ISO 55000). Asset management is a process used in decision-making. It helps us care for the infrastructure that delivers valuable services to our community in a way that considers the service needs of our community, manages risks and opportunities, and uses resources wisely (as defined by the Federation of Canadian Municipalities).

Value from services is delivered to the community through the performance of the assets. It is the performance that delivers value which requires a balancing of cost and risk. The essential questions in asset management, as presented in **Figure 1-1**, demonstrate the overall process of asset management from establishing the asset inventory, to asset condition, to levels of service, and the strategies to deliver the service.

## Introduction

**Figure 1-1: Essential Questions in Asset Management**



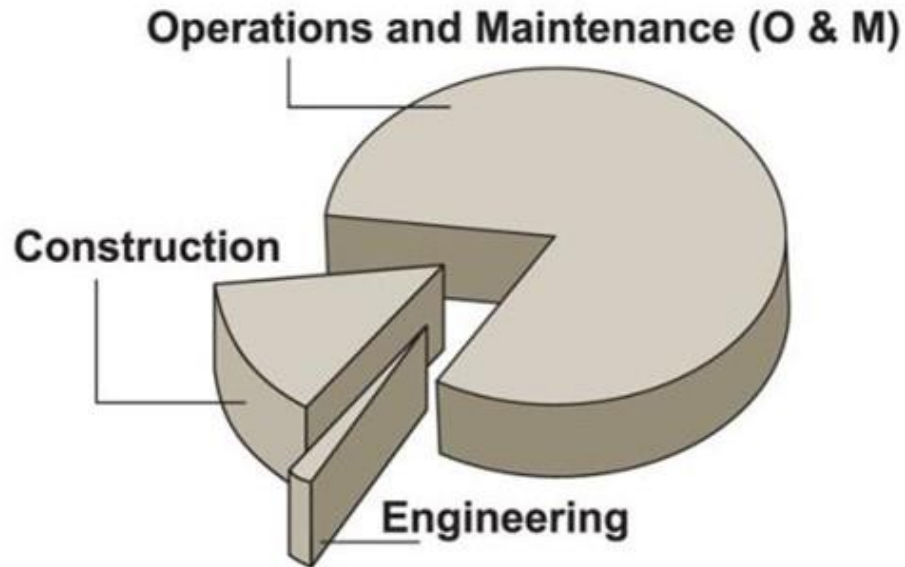
This AMP, the City’s first-generation AMP for all other assets (i.e., outside core assets), helps to establish an asset inventory (Questions 1 and 2), estimate asset condition and estimate asset expected remaining useful life (Question 3), document current levels of service (Question 4), and inform when assets are expected to be due for replacement along with the estimated cost (Questions 5 and Part of Question 6).

Asset management is a process of deriving the best possible decisions regarding the creation, maintenance, renewal, rehabilitation, disposal, expansion, and procurement of infrastructure assets. The objective of asset management is to maximize the benefits of the assets, minimize risk and provide satisfactory levels of service to the public in a sustainable manner. It considers risks related to the lifecycle of the assets and requires a multi-disciplinary team of planning, finance, engineering, technology, maintenance, and operations.

## Introduction

Asset management considers the full lifecycle of the infrastructure, not just the initial cost for designing and constructing the asset (20%), but the ongoing operations and maintenance costs (80%), see **Figure 1-2**.

**Figure 1-2: Lifecycle Costs (InfraGuide 2005)**



The provision of reliable infrastructure is essential to deliver services to the community and accommodate growth in an environmentally, socially, and economically sustainable manner.

To ensure that the City can provide reliable infrastructure to meet the needs of residents both now and in the future, it has developed and implemented an AMP. The purpose of the plan is to identify the technical and financial needs of assets well in advance of a major asset renewal or replacement, enabling the City to strategically plan for these major projects and investments should the timing of the needs coincide.

Introduction

1.2 Scope of Assets

The service areas within the scope of each AMP volume are presented in **Table 1-1**.

**Table 1-1: Assets within the Scope of the AMP**

Volume	Service Areas
1 - Infrastructure, Transportation, Transit, & Emergency Services	<ul style="list-style-type: none"> <li>• Transit</li> <li>• Traffic Control &amp; Safety</li> <li>• Structures</li> <li>• Urban Forestry</li> <li>• Kingston Fire &amp; Rescue</li> <li>• Solid Waste</li> <li>• Airport Operations</li> </ul>
2 - Corporate Services & Parking Operations	<ul style="list-style-type: none"> <li>• Corporate Fleet</li> <li>• Information Systems &amp; Technology</li> <li>• Parking Equipment, Lots &amp; Structures</li> </ul>
3 - Community Services	<ul style="list-style-type: none"> <li>• Heritage Services</li> <li>• Arts &amp; Culture Services</li> <li>• Residential Long-Term Care</li> <li>• Indoor Recreation &amp; Marinas</li> </ul>
4 - Parks, Parkland, & Trails	<ul style="list-style-type: none"> <li>• Park Linear</li> <li>• Park Amenities</li> <li>• Park Facilities</li> <li>• Cemeteries</li> </ul>
5 - Police, Libraries, City Real Estate & Environment	<ul style="list-style-type: none"> <li>• Library Services</li> <li>• Police Services</li> <li>• City Real Estate &amp; Environment</li> </ul>

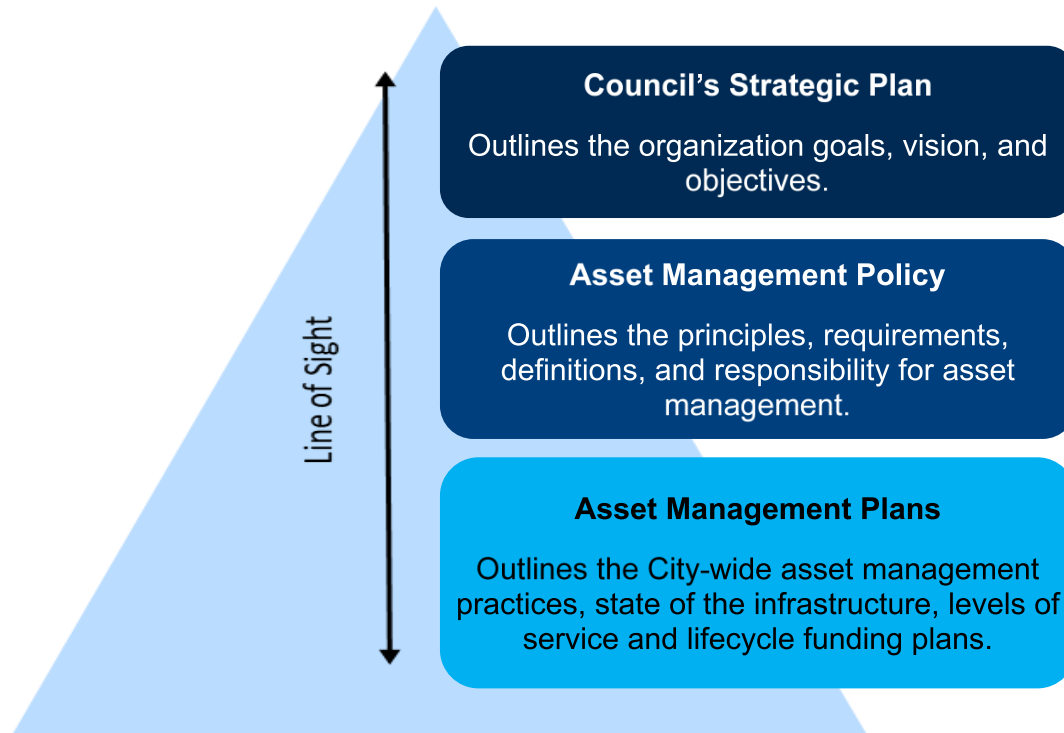
Introduction

1.3 Alignment with Strategic Plan, Policy, and Regulation

1.3.1 Alignment with the City’s Vision, Mission, Values and Strategic Priorities

A fundamental concept of asset management is to provide a clear line of sight between the organizational objectives, asset management objectives and any related asset management activities. When determining the purpose and desired outcomes of asset management for the City, it is crucial to consider the City's broad goals and overall strategic direction. See **Figure 1-3** for line of sight from the Strategic Plan through Policy to Asset Management Plans.

**Figure 1-3: Line of Sight between Strategic Objectives and Asset Management Plans**



## Introduction

The City's Vision, Mission, and Values statements define what the City strives to provide for its citizens and the methods it intends to utilize. In June of 2024, these statements were recently updated after feedback and collaboration from Council and City employees from across the corporation. The City redefined its path with a clear Vision, inspiring Mission, and updated core Values as outlined below.

- **Vision:** Vibrant. Sustainable. Inclusive. Elevating our communities, together.
- **Mission:** We embrace innovation, foster collaboration, respect the environment, and provide exceptional services that reflect the needs of a diverse community.
- **Values:**
  - **Belonging:** We create an accessible and inclusive environment where every individual is accepted and valued for their diverse perspectives and identities.
  - **Collaboration:** We build strong relationships with each other, residents, businesses, community organizations and other partners to achieve our shared goals.
  - **Accountability:** We work with integrity to ensure transparency and responsiveness in meeting the needs and concerns of the community.
  - **Innovation:** We strive to find creative solutions and new opportunities to improve our services and operations.

In May of 2023, Council approved the **2023 to 2026 Strategic Plan** with the following five pillars:

1. Support Housing Affordability
2. Lead Environmental Stewardship and Climate Action
3. Build an Active and Connected Community
4. Foster a Caring and Inclusive Community
5. Drive Inclusive Economic Growth

## Introduction

In addition, Council has identified Foundational Principles that will help to build the City’s organizational resilience, capacity, and culture to deliver on the City’s Strategic priorities. These include:

- Invest in the organization's capacity.
- Invest in the process improvement.
- Maintain financial sustainability.
- Advance Indigenization, Inclusion, Diversity, Equity and Accessibility (IIDEA) in the corporation.
- Continue to advance community partnerships and advocacy with other levels of government.

### 1.3.2 Alignment with the Asset Management Policy

The City’s Asset Management Policy (19-091) has defined key principles and a governance framework to be used in support of the City’s organizational goals as they apply to the asset management system. These are presented in **Table 1-2**.

**Table 1-2: Key Asset Management Principles**

Principle	Definition
Holistic	Take a comprehensive approach that looks at the “big picture” (i.e. the combined implications of managing all aspects rather than a compartmental approach). This includes the functional interdependencies and contributions of assets within asset systems and the different management of assets across all lifecycle phases.
Systematic	Take a methodical approach (i.e. formal, repeatable, and consistent) to the management of assets.
Systemic	Make asset investment decisions in an asset system context, not just to optimize the individual asset itself.
Risk-based	Manage asset risk associated with attaining levels of service and focusing resources, expenditures, and priorities based on risk and associated cost/benefit.
Optimal	Make asset investment decisions based on trade-offs between competing factors of service levels (including asset performance), risk and cost.



## Introduction

Principle	Definition
Sustainable	Take a long-term, lifecycle-based approach in estimating asset investment and activities, thus developing effective asset management strategies for the long term.
Integrated	Coordinate the above principles to ensure the delivery of justified services and well-defined outcomes.
Aligned	Ensure that the asset management system complements the strategic objectives of the City, as well as other key business systems, legislation, and regulation.

The policy, along with other documents related to asset management are all developed to be in alignment with the City’s Strategic Plan, as well as other important planning documents.

### 1.3.3 Regulatory Alignment

Asset management for municipalities is defined in a regulation: **O. Reg. 588/17: Asset Management Planning for Municipal Infrastructure**. This regulation builds on an earlier document called “Building Together: Guide for Municipal Asset Management Plans (2012)” and aligns with the international standard ISO55000. The regulation establishes the following four phases of compliance:

## Introduction

### Phase 1 - 2019

- A strategic asset management policy.

### Phase 2 - 2022

- All core assets to be covered in the asset management plan with current Level of Service (LOS). Core assets include water, wastewater, stormwater, roads and bridges/culverts.

### Phase 3 - 2024

- All assets owned by the municipality to be covered in the AMP with current LOS. Non-core assets include buildings, fleet and equipment as well as green infrastructure assets.

### Phase 4 - 2025

- Proposed LOS and the lifecycle management and financial strategy for 10-year period to achieve the proposed LOS.

The series of AMPs (Volumes 1 through 5) plus the Facilities AMP address the Phase 3 requirements for all other asset categories except for natural assets. This is the first iteration of an AMP for these service areas. Future updates will need to include green infrastructure assets (i.e., natural assets) owned by the City and further assessment on infrastructure vulnerability to the impacts of climate change.

Inclusive of all other assets owned by the City, the AMP volumes identify the required investments to maintain service delivery for the next 10 years. The plan should be updated on an ongoing basis with the availability of new information, and the regulation requires annual reporting to Council on the progress (and barriers) to implementing the AMP.

## Introduction

### 1.4 Governance and Relationship to Other Planning Documents

In support of aligning asset management with other planning initiatives at the City, it is necessary to integrate this plan and any future iterations with other planning documents. **Table 1-3** summarizes some of these key planning documents.

**Table 1-3: Key Planning Documents**

Key Planning Document	Purpose
Kingston's Strategic Plan	The document sets the strategic vision and priorities for the current Council term.
Official Plan	This plan outlines the land-use planning goals and policies for physical development, protection of natural and cultural heritage, resource management, and necessary supporting infrastructure.
Climate Leadership Plan (CLP)	Updated in 2021, this plan is an integrated corporate and community change management strategy which outlines the impacts of ongoing initiatives, objectives, and actions to chart a path of achieving the City's target of carbon neutrality by 2040.
Emergency Management Plan	The plan assigns responsibilities and guides the actions of key officials in the event of an emergency.
Utilities Kingston Asset Management Plans	Provides an overview of the state of the infrastructure, levels of service, lifecycle management strategies and financial strategies for water, wastewater assets, as well as other assets operated by Utilities Kingston.
Multi-year Accessibility Plan	Outlines the strategies in place to prevent and remove barriers and meet the requirements under the Accessibility for Ontarians with Disabilities Act (AODA) and the Integrated Accessibility Standards Regulation. Applies to Customer Service, Employment, Transportation, Information and Communication and Design of Public Spaces.

## Introduction

Key Planning Document	Purpose
Multi-year Capital Plan	The plan outlines and guides the 15-year capital expenditures for infrastructure replacement and renewal (including other capital priorities).
Multi-year Financial Plan	The plan shows the 4-year operating budget to fund day-to-day operations.
Development Charges Study	The DC Study identifies the growth driven infrastructure investments that will be required to accommodate a larger population served.
Corporate Plans	The Corporate plans recommend the preferred long-term strategies for the infrastructure or programs. The City currently has plans for and incorporates updates as required in the following: Integrated Mobility Plan (formally Transportation Master Plan), Transit Service Plan, Waterfront Master Plan, Parks and Recreation Master Plan, Urban Forest Management Plan, 10-Year Municipal Housing and Homelessness Plan, Community Safety and Well-being Plan, Public Art Master Plan.

### 1.5 Growth

In 2023, the City completed a “Population, Housing & Employment Projections” study. The study was conducted to provide a basis for the City’s long-range land use, transportation, infrastructure, and capital expenditure planning. The study is completed every five years based on updated Statistics Canada Census data. Within this study, the City identified three growth scenarios (low, medium and high) spanning a period of 30 years (up to the year 2051, using 2021 Census data).

The growth scenarios for population, housing, and employment are summarized in **Table 1-4** below.

Introduction

Table 1-4: Growth Scenarios (Low, Medium, High)

Scenario	Permanent Population	Total Population (permanent & students)	Permanent Housing (number of units)	Total households (permanent & students)	Employment (number of jobs)
Existing (2021)	136,600	154,100	57,800	62,900	71,900
Low Growth (2051)	186,600	210,500	80,800	88,200	107,800
Medium Growth (2051)	197,000	220,900	84,800	92,200	113,900
High Growth (2051)	207,400	231,300	88,500	95,900	119,900

In December 2023, the medium growth scenario was adopted by Council and therefore the recommended growth forecast scenario to be used by the City. The forecasted growth in 5-year intervals is shown in **Table 1-5**.

## Introduction

**Table 1-5: Forecasted Growth in 5-Year intervals for Medium Growth Scenario**

Year	Permanent Population	Total Population (permanent & students)	Permanent Housing (number of units)	Total households (permanent & students)	Employment (number of jobs)
2021	136,300	154,100	57,800	62,900	71,900
2026	148,000	166,800	63,000	68,600	85,900
2031	158,900	178,400	67,800	73,600	92,700
2036	169,900	189,500	72,600	78,500	98,800
2041	179,600	200,700	77,000	83,300	104,500
2046	188,800	211,200	80,900	87,800	109,300

As a community grows, so does the need for infrastructure assets to deliver services to the expanding community. New assets and assets that require expanded capacity to serve a growing population will be identified in Master Plans and reflected in the Development Charges study.

Asset management focuses on maintaining assets already owned by the City. From that perspective, the impact of growth is addressed in the AMP for each of the service categories. For example, from higher usage of assets and more wear and tear that could reduce the useful life of assets.

As the City continues to grow, it is imperative to strike a balance between addressing the maintenance and enhancement of existing infrastructure and strategically planning for the development of new infrastructure. This approach ensures sustainable growth while meeting the evolving needs of the community.

## 1.6 Overview of the AMP

For each service area, the information is presented in a consistent manner in the following sub-sections:

- State of the Local Infrastructure;
- Levels of Service;

## Introduction

- Risk Assessment; and
- Asset Management Strategy.

The methodology and approach for each of these sub-sections are described below.

### 1.6.1 State of the Local Infrastructure

The State of the Local Infrastructure (SOLI) presents the current condition of assets owned and maintained by the City. These assets enable the delivery of various services to residents, community visitors and staff. The SOLI sets out the following information as established in the regulation:

- A summary of the assets in the service category;
- The estimated replacement cost in 2023 dollars of the assets in the service category;
- The average age of the assets in the service category;
- The information available on the condition of the assets in the service category;
- The available expected useful life and remaining useful life for all assets; and
- A description of the City's approach to assessing the condition of the assets in the service category, based on recognized and generally accepted practices where appropriate.

#### 1.6.1.1 Asset Hierarchy

Asset management relies on asset data to make informed decisions. For the City, assets encompass a variety of services and organizing asset information requires as a first step, the development of an asset hierarchy. The asset hierarchy provides a **line of sight** for which asset classes and sub-classes belong to each service before identifying each individual asset.

Asset data serves as the foundation of the asset hierarchy and ultimately allows the City to make informed evidence-based decisions about their assets. By implementing robust asset data management practices, the City will be able to understand both the current and future needs of their assets through the intentional collection of meaningful attributes such as age, condition, construction material, and replacement value. The levels for the City's asset hierarchy are presented in **Table 1-6**.

## Introduction

**Table 1-6: Asset Hierarchy Overview with an Example**

Level	Level Name	Description	Example
1	Asset Group	Assets have been divided into five (5) groups.	Group 2: Corporate Services & Parking Operations
2	Service Area	Service provided to City staff or the community.	Corporate Fleet
3	Asset Class	Individual functional units within the Service Area.	Vehicles
4	Asset Sub-Class	Additional classification of assets within each asset class as applicable	Light Duty

### 1.6.1.2 Asset Condition

To standardize the methodology for evaluating and reporting on the condition of the assets, a condition rating for each asset was organized and assigned using a 5-scale rating system which is based on the Canadian Infrastructure Report Card (2019) produced by the Canadian Network of Asset Managers and several other Canadian Associations. **Table 1-7** outlines the rating system which ranges from 1 (Very Good) to 5 (Very Poor).



Introduction

Table 1-7: Condition Rating System

Condition Rating	Condition Grade	Remaining Useful Life	Description
1	Very Good	more than 80%	Physically sound, performing as intended and resembles “like-new” condition.
2	Good	60% - 80%	Physically sound and performing as intended. Needs to be re-inspected in the medium term.
3	Fair	40% - 60%	Showing deterioration, with some elements physically deficient. Early stages of decay are becoming evident.
4	Poor	20% - 40%	Major portion of asset is physically deficient. It is not functioning properly due to significant deterioration and is a candidate for replacement in the short term.
5	Very Poor	less than 20%	Asset is physically unsound. There is a high probability it will fail, or it already has. Immediate replacement is required.
N/A	Unknown	N/A	No or limited data to estimate the condition of the asset.

Where the condition is reported as “unknown”, this indicates a data gap that the City will focus on filling in subsequent iterations of the AMPs.

The asset information was compiled into the asset inventory, which was used to report on the condition ratings for the assets. A hybrid approach was used, considering: 1) the age of the asset; 2) expected useful life (EUL); and 3) the last known condition rating assigned to the asset. **It is important to note that if condition assessment information was not available, a straight-line asset deterioration was assumed to calculate the condition ratings based on remaining useful life, as outlined in Table 1-7. Due to existing data gaps, this method was employed to evaluate the condition of approximately 92% of the assets in this AMP.**

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Straight-line deterioration is a concept derived from the more commonly known accounting calculation referred to as “Straight-Line Depreciation”. This principle assumes a uniform rate of reduction in an asset’s value from the asset’s purchase price down to its value at the end of its useful life. In this case, the concept is applied to an asset’s physical condition deteriorating over time. Straight-line deterioration is a common practice in asset management used to forecast asset replacement schedules based on historical information, in the absence of a recent visual condition assessment.

For assets where a last-known condition was recorded, age-equivalent corrections were used to determine an appropriate condition rating assuming straight-line deterioration, but also considering the last known condition. As part of this calculation, each asset or asset element’s EUL was extrapolated along the condition rating scale and an upper limit, lower limit, and mid-point were generated for each condition grade centered on the remaining useful life of the asset and in alignment with **Table 1-7** above. To establish the age equivalent correction (AEC) for an asset considering last known condition, the following equation was applied:

$$\text{AEC} = \text{Mid Point of the Last Known Condition Rating (Years)} - \text{Years Since Last Known Condition}$$

### 1.6.2 Levels of Service

Asset management focuses on the critical municipal services that the City provides to its end-user or customer. The questions typically asked when assessing Levels of Service (LOS) include: What services do you provide to residents? Are these services meeting their needs, falling below expectations, or exceeding expectations?

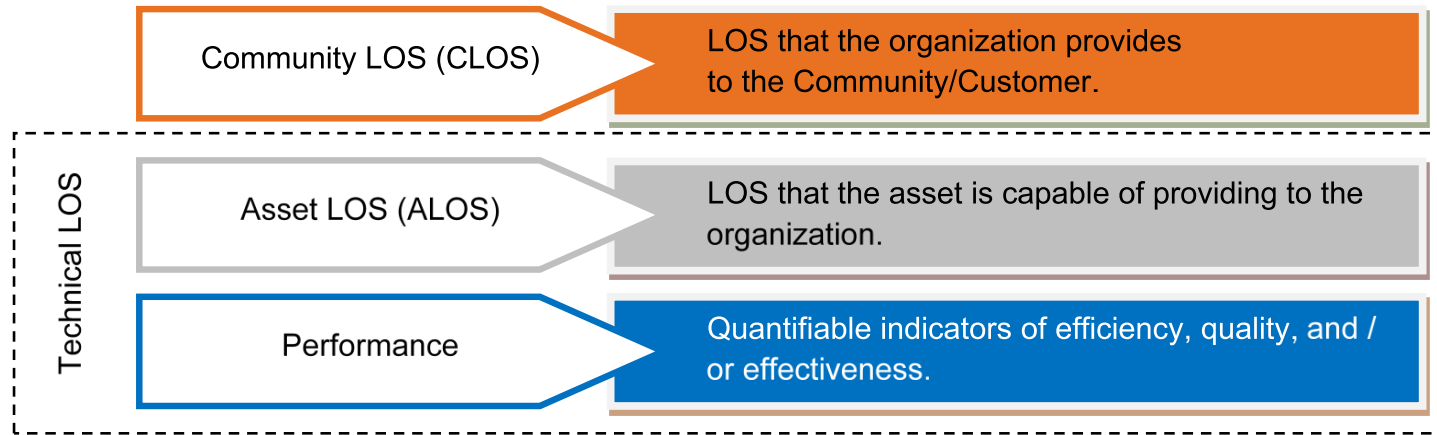
LOS is the combination of indicators that reflect the social and economic goals of the City and link an asset’s performance to its target performance goals. For this AMP, LOS was described in two perspectives:

- **Community Level of Service:** intended to be customer-focused, provide a qualitative description (what service do residents receive and care about); and
- **Technical Level of Service:** based on the physical characteristics of an asset (what the asset can deliver and what is required to meet regulations) and how the asset is currently performing.

Introduction

Figure 1-4 presents the Community and Technical LOS definitions.

Figure 1-4: Levels of Service Definitions



1.6.2.1 Developing the LOS Framework

LOS is the combination of parameters that reflect the social, political, environmental, and economic outcomes that the municipality delivers (FCM, 2018). The ten LOS parameters established in ISO55000 to define service levels are shown in Figure 1-5. The LOS Framework includes one or more parameter that is most relevant for the service area.

## Introduction

**Figure 1-5: LOS Parameters (ISO 55000)**



The LOS Framework was developed through a series of workshops with City staff.

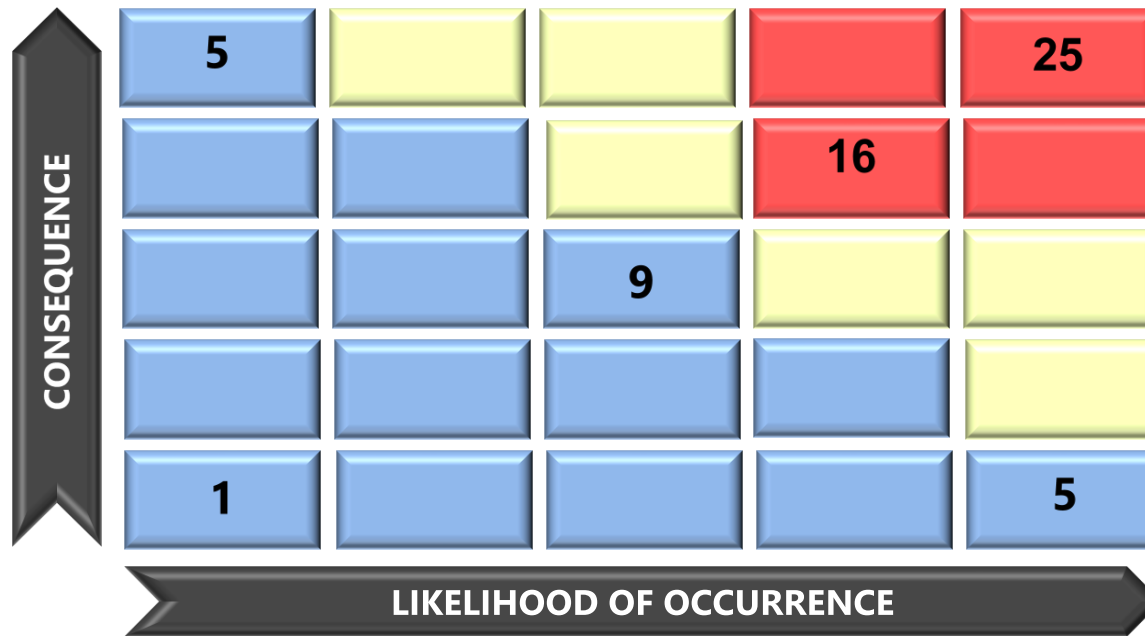
### 1.6.3 Risk Assessment

Risk in asset management is a key component to assist in making informed decisions on assets. Although risk often focuses on the performance of the infrastructure itself, it is important to also consider how the overall system operates and identify potential barriers to achieving the LOS.

The assets with the highest risk rating help identify the priorities for the City. As part of assessing risk, this methodology considers the factors that increase the likelihood of a hazard occurring (or non-delivery of service) and the consequence. **Figure 1-6** presents a risk “heat map” plotting likelihood and consequence in a 5 by 5 matrix with a maximum risk score of 25.

Introduction

Figure 1-6: Risk Matrix



High risks are shown in the red zone (risk rating 16 to 25), moderate risks are shown in the yellow zone (risk ratings of 10 to 15) and low risks are in blue zone (risk ratings of 1 to 9).

The approach and methodology to risk assessment is presented in the following sections. A risk profile organizing the assets from the highest risk to the lowest risk is presented in the corresponding section for each asset service area.

1.6.3.1 Risk Methodology & Approach

Risk is the likelihood and magnitude of a negative scenario (hazard) occurring that limits the ability of the asset to deliver the service. Risk is the consideration of asset failure and the consequence of the failure.

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### RISK = LIKELIHOOD OF OCCURRENCE x CONSEQUENCE

The consequence considers the severity of the impact, vulnerability of the asset, and exposure to the negative scenario. Applying the methodology of a score of 1 to 5 for the likelihood of occurrence and the consequence, the maximum risk rating is 25 (high).

### Calculation of Likelihood

The factors that contribute to the likelihood of occurrence (failure) include:

- A – Condition of the asset;
- B – Performance (reliability); and
- C – Vulnerability to climate change.

Table 1-8 provides a description of these factors.

**Table 1-8: Likelihood Factors**

Factors	Low (1)	Low/ Moderate (2)	Moderate (3)	Moderate/ High (4)	High (5)
<b>A – Condition</b>	Very Good	Good	Fair	Poor	Very Poor
<b>B – Performance</b>	Always Reliable	N/A	Usually Reliable	N/A	Not Reliable
<b>C – Climate Change</b>	No or limited impact, quick recovery, or mitigation in place  0-1 Interactions	Limited impact, or mitigation in place  2 Interactions	Limited impact with slower recovery; mitigation plan not in place  3 Interactions	Moderate impact; no or limited mitigation plan  4 Interactions	High impact; no or limited mitigation plan  5-6 Interactions

## Introduction

By separating condition and performance as two separate factors, there is an opportunity to consider assets in poor condition that may still be performing well, compared to those that are not performing, as well as good condition assets that may not be reliable. The climate change factor brings into consideration assets that are vulnerable to climate change scenarios such as intense rainfall, increased temperatures, extreme weather, and drought.

Therefore, the likelihood of failure is  $(A + B + C)/3$ . This is the average of the factors, assuming they are equally weighted.

## Calculation of Consequence

The question to consider when calculating consequence is: What increases the impact of non-delivery of services (or failure of the asset)?

The factors that contribute to the consequence rating include:

- D – Impact or severity; and
- E – Importance of the asset in delivering service.

Both impact and importance contribute to the consequence and will be multiplied by the likelihood of occurrence. The two ratings are added together for a maximum consequence score of 5. Consequence will be  $D + E$ . See **Table 1-9** for the description of consequence factors.

**Table 1-9: Consequence Factors**

<b>Factors</b>	<b>Low</b>	<b>Moderate</b>	<b>High</b>
<b>D – Impact</b>	Low or no impact (0)	Moderate impact (1)	High impact (2)
<b>E – Importance of the asset in delivering service</b>	Low importance (1)	Moderate importance (2)	High importance (3)

## Introduction

The impact and importance ratings were established in consultation with city staff. The most important assets for delivering service were identified, as well as moderate and low importance. How the importance rankings were applied in each asset category is presented for each asset category.

## Calculation of Risk

The risk calculation for each of the assets is determined as follows.

**RISK = LIKELIHOOD OF OCCURRENCE X CONSEQUENCE**

**RISK = (A + B + C)/3 X (D + E)**

Where:

A = Condition

B = Performance

C = Climate Change

D = Impact

E = Importance of the Asset

## Climate Change

Climate change is one of the most complex challenges facing municipalities. Ontario has experienced a significant number of recent extreme weather events and its adverse impacts such as flooding, ice storms, power outages, and infrastructure damage. It is expected that patterns such as rising average temperatures, shifting historical precipitation patterns with increased intensity, duration and frequency of storm events and periods of drought, increasing windstorms, and fluctuations in lake levels are anticipated to continue and AMPs must consider the impact of climate change on delivering services in the City.



## Introduction

In the Risk workshop, staff considered the following climate hazards and identified low, moderate, or high vulnerability for each asset category:

- Mean Annual Temperature;
- Number of Hot Days (> 25 Celsius [C]);
- Heavy Snow Events;
- Heavy Rain Events;
- Extreme Weather Events; and
- Occurrence and Magnitude of Flooding.

This information was applied to the “C” factor in the likelihood of failure calculation.

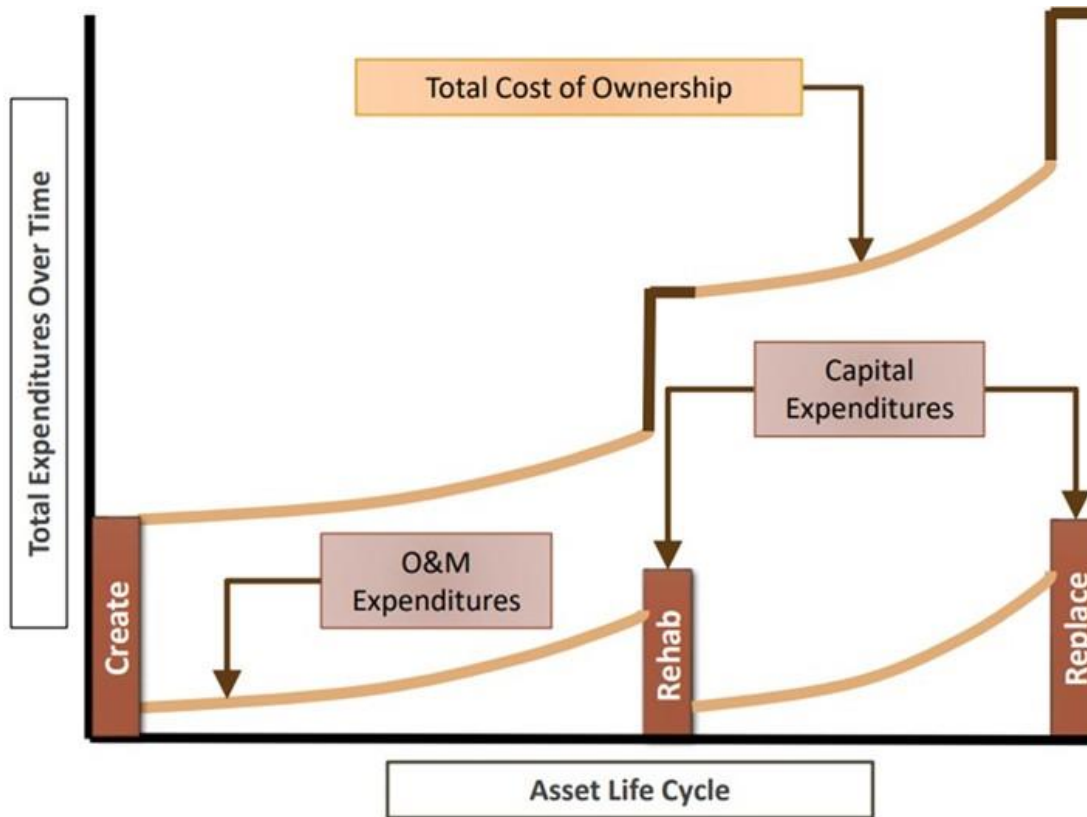
### 1.6.4 Asset Management Strategy

A core objective in asset management is to proactively extend the useful life of assets where possible, by ensuring existing deterioration is well understood and properly addressed through timely maintenance, rehabilitation, and replacement activities. The provision of reliable infrastructure is crucial for ensuring that the City can continue to deliver reliable services to the community. As the City’s existing assets age, significant reinvestment will be required for the replacement of deteriorated assets to ensure appropriate service delivery.

**Figure 1-7** depicts the full lifecycle of an infrastructure asset and demonstrates the cumulative cost of ownership which increases throughout the asset’s service life and amounts to far more than the initial investment. An infrastructure asset’s lifecycle begins in the planning and design phase, where the need for the new asset is identified and a strategic plan is created. This is followed by the first asset-related expenditure which is the initial investment to construct or create the asset. Once the asset has been created, the asset enters the operational phase, requiring regular maintenance to keep it functional. Over time, as deterioration increases, capital reinvestment is required to extend the useful life of the asset and prolong service delivery through rehabilitation. After rehabilitation, the asset re-enters the operational phase, accumulating additional costs associated with operations and maintenance before reaching the end of its useful life and requiring replacement.

Introduction

Figure 1-7: Cumulative Cost of Asset Ownership (AMONTario)



## Introduction

The lifecycle activities include activities that can be undertaken over an asset’s useful life. These activities, under O. Reg. 588/17, are defined to include constructing, maintaining, renewing, operating, and decommissioning of assets and all engineering and design work associated with these activities. Further, the **Building Together – Guide for Municipal Asset Management Plans (Municipality of Infrastructure)** categorizes lifecycle activities into the following categories: non-infrastructure solutions, maintenance, renewal/rehabilitation, replacement, disposal, and expansion activities. Lifecycle activities have been identified for each of the asset categories within this AMP.

Lifecycle modeling allows the City to understand the future reinvestment needs of existing assets by generating a theoretical asset replacement forecast that considers available asset inventory data. The age, EUL, replacement cost, condition, and risk score of each asset can be leveraged within the lifecycle model to proactively plan for reinvestment over a period of interest to maintain or increase LOS. Asset replacement forecasts within this AMP estimate the required 10-year reinvestment for assets within each asset class, based on available asset inventory data.

The Asset Management Strategy is presented in two parts, first, on lifecycle activities and second on funding those lifecycle activities.

### 1.6.5 Roadmap with Next Steps

#### 1.6.5.1 Next Steps – Regulatory Compliance

**Proposed Levels of Service:** Establish proposed Levels of Service and a financing strategy to deliver the proposed Levels of Service, as described in section 6 of the regulation, required by July 1, 2025.

**Green Infrastructure Assets and Climate:** The inclusion of green infrastructure assets (e.g., natural assets) owned by the City and consideration of vulnerabilities caused by climate change on the performance of all infrastructure.

**Strategic Asset Management Policy:** Review and, if necessary, update the Strategic Asset Management Policy every five years.

## Introduction

**Annual Review of Progress:** As required by O. Reg. 588/17, municipalities will conduct an annual review and report to their Councils at least once per year on the current progress of asset management in the Municipality and any barriers to aligning operations with the AMP and a strategy to address any barriers.

**Full Update of AMP:** A full update of the AMP will be required at least every 5 years after the plan is completed under section 6.

### 1.6.5.2 Next Steps – Recommendations to Prepare for Future Update

This section focuses on recommendations identified through the development of the AMP volumes. These recommendations are based on experience with limited or outdated data, gaps or barriers to reporting on levels of service and performance, or the desire to apply global best practices to advance asset management at the City. The recommendations have been summarized in tables by general recommendation and specific recommendations for each of the volumes.



**Introduction**

**Table 1-10: General Recommendations**

<b>Item</b>	<b>Type</b>	<b>Recommendation</b>
GR - 1	Asset Data	Continue to update the asset inventory on a regular basis as new assets are added and end-of-life assets are disposed of.
GR - 2	Asset Data	Develop an overall plan for condition assessments, including a standardized process for updating condition information, the appropriate frequency for gathering new condition information and a review of software platform(s) used to store and consolidate that data (technology review).
GR - 3	Asset Data	Update risk scores as new condition information becomes available and as other changes in the inventory or performance occur (e.g., new climate hazards).
GR - 4	Asset Data	Incorporate risk in the prioritization of capital projects and adjust the risk score when the capital project is completed.
GR - 5	Performance	Review the Level of Service framework and seek opportunities to improve.
GR - 6	Performance	Monitor the performance of assets on a regular basis and generate a dashboard for regular reporting.
GR - 7	Performance	Review the Risk framework and look for opportunities to improve it.
GR - 8	Organizational Development	Incorporate asset management training and awareness into staff professional development and training programs.
GR - 9	Organizational Development	Expand Asset Management Steering Committee to include additional representatives and establish “Terms of Reference”.
GR - 10	Organizational Development	Develop and implement a Change Management and Communication Plan with consideration of the governance of the asset management program.
GR-11	Organizational Development	Conduct a review of technology and business practices that support asset management at the City. Develop a roadmap for implementation.
GR -12	Organizational Development	Network and share ideas and best practices with other municipal peers on asset management processes and data governance.

Introduction

**Table 1-11: Volume 1 – Infrastructure, Transportation, Transit, & Emergency Services**

Item	Type	Recommendation
V1 - 1	Asset Data	No data was available for concrete pads and benches associated with transit shelters and transit stations, or assets associated with transit locations administered through service agreements between the City and third-party property owners, including a park and ride location and bus terminals.
V1 - 2	Asset Data	Significant data gaps were present in the available data for Minor Culverts (< 3 m), impacting the ability to estimate replacement costing. The City should further refine their data for culverts, including the collection of construction materials and sizing attributes.
V1 - 3	Asset Data	No condition assessment data could be leveraged for Sidewalks and Minor Culverts (< 3 m) and forecasted reinvestment has been derived primarily based on age and expected useful life.
V1 - 4	Asset Data	Develop a formal asset inventory of Solid Waste assets to better inform future AMP iterations.
V1 - 5	Asset Data	At the time of the report, no data was available for certain Information & Technology assets. This is currently being compiled to be updated in the 2025 update.
V1 - 6	Asset Data	Complete updates to Kingston Fire & Rescue fleet and maintenance data including setting up appropriate class codes within M5 system and incorporating maintenance data on light duty fleet assets.
V1 - 7	Asset Data	Integrate Traffic Signal, Streetlight, and Transit Shelter asset information in Cartegraph Asset Management System.
V1 - 8	Performance	Increase transit services to rural areas throughout Kingston and expand the services to more evenings and holidays.
V1 - 9	Performance	Continuous upgrades at transfer points and bus stop infrastructure to ensure users have a safe and comfortable waiting location.

**Introduction**

<b>Item</b>	<b>Type</b>	<b>Recommendation</b>
V1 - 10	Performance	Include additional park and ride lots to allow users to park their vehicles and use public transportation.
V1 - 11	Performance	Incorporate transit priority measures to improve transit travel time.
V1 - 12	Performance	Enhance transit technology to allow for real-time bus arrival, automatic passenger counting, automatic vehicle location, etc.
V1 - 13	Performance	Segregate streetlight and traffic signal service calls to split out those during extreme weather events.

**Table 1-12: Volume 2 – Corporate Services & Parking Operations**

<b>Item</b>	<b>Type</b>	<b>Recommendation</b>
V2 - 1	Asset Data	Further develop the asset inventories for Video Camera Systems (Information Systems and Technology Service Category) and Information and Technology assets (Parking Equipment) as there was currently no data available for these asset classes. This is currently being compiled to be updated in the 2025 update.
V2 - 2	Asset Data	Develop an overarching data management plan for Information System Technology to track costing for maintaining and managing the data the City currently owns.
V2 - 3	Asset Data	Develop a strategy for software management for each asset service area to ensure that all software being used by the City can be effectively observed and the full extent of the software assets and costs associated with each asset category can be tracked under one central system.
V2 - 4	Asset Data	Continue the migration of all Corporate Wide-Fleet assets to the Asset Works (Fleet Focus M5) Enterprise Fleet Management Information System. This will allow the timely tracking of maintenance activities and ensure replacement and maintenance schedules are being met.

## Introduction

Item	Type	Recommendation
V2 - 5	Asset Data	All fleet asset Expected Useful Lives (EUL) should be re-examined over the course of the next 5-year update period, especially as new fleet technologies evolve, including advancements in zero-emission vehicles.
V2 - 6	Asset Data	To increase the fleet asset condition data confidence rating and to supplement existing mandatory provincial safety and preventative maintenance inspections, an additional condition matrix is recommended to be implemented.
V2 - 7	Asset Data	Establish and develop an Asset Data Management Strategy to help standardize the collection and reporting of asset and condition information.
V2 - 8	Performance	Expand the collection of performance data to be able to track and report how the assets are performing and to assist the City in establishing targets for proposed LOS.

**Table 1-13: Volume 3 – Community Services**

Item	Type	Recommendation
V3 - 1	Asset Data	Investigate whether Proficio can be configured to summarize asset condition data for all assets (Civic collection and Public Art) within an asset class in tabular format to better inform future AMPs.
V3 - 2	Asset Data	No data was available at the time of this report for Crawford Wharf assets. The City should further develop an inventory of assets comprising the asset class to be considered in subsequent iterations of this AMP.
V3 - 3	Asset Data	Integration of ice plant condition assessment results into future capital planning.
V3 - 4	Asset Data	Complete Marina Infrastructure Assessment for the Portsmouth Olympic Harbour.



**Introduction**

**Table 1-14: Volume 4 – Parks, Parkland, & Trails**

<b>Item</b>	<b>Type</b>	<b>Recommendation</b>
V4 - 1	Asset Data	No data was available for the Fencing asset class.
V4 - 2	Asset Data	It is recommended that a condition assessment is completed for Park Land and Shoreline Protection & Seawalls assets.
V4 - 3	Asset Data	No data was available for the Community Gardens asset class. This asset class is not included in this AMP. It is recommended that the City further develops an inventory of these asset classes to be considered in subsequent iterations of this AMP.
V4 - 4	Asset Data	No data was available for Structures located at cemeteries. The City should further develop an inventory of these asset classes to be considered in subsequent iterations of this AMP.

**Table 1-15: Volume 5 – Police, Libraries, City Real Estate & Environment**

<b>Item</b>	<b>Type</b>	<b>Recommendation</b>
V5 - 1	Asset Data	No data was available for two asset classes for Kingston Police: Specialized Equipment and Information Technology & Telecommunications. The City should further develop an inventory of these asset classes to be considered in subsequent iterations of this AMP.
V5 - 2	Asset Data	For Kingston Police, continue the migration of Fleet asset registry and maintenance-related work order data to the Asset Works (Fleet Focus M5) Enterprise Fleet Management Information System. This will allow the timely tracking of maintenance activities and ensure replacement and maintenance schedules are being met.

Introduction

Item	Type	Recommendation
V5 - 3	Asset Data	Data for Library Collections assets was limited to high-level summaries of pooled assets. As a result, the condition of these assets and the required reinvestment could not be determined. In the 2025 update, the team at KFPL will work to provide additional reporting from the Integrated Library System (ILS) used to track collection assets.
V5 - 4	Asset Data	Adopt asset register tool to track other equipment and information technology assets for KFPL.

# City of Kingston 2024 Asset Management Plan

Executive  
Summary and  
Introduction

**Volume 1**  
Infrastructure,  
Transportation,  
Transit, &  
Emergency  
Services

Volume 2  
Corporate  
Services &  
Parking  
Operations

Volume 3  
Community  
Services

Volume 4  
Parks, Parkland,  
& Trails

Volume 5  
Police, Libraries,  
City Real Estate  
& Environment



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## Appendices (Provided in Separate Document)

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A - Expected Useful Life

B - Risk Variables

Acronyms

# Acronyms

Acronym	Definition
AMP	Asset Management Plan
CPSE	Centre for Public Service Excellence
EUL	Expected Useful Life
FMCS	Facilities Management & Construction Services
IPS	Intersection Pedestrian Signal
IT	Information Technology
KTMP	Kingston Transportation Master Plan
LOS	Levels of Service
NFPA	National Fire Protection Association
SOLI	State of the Local Infrastructure



## 1.0 Overview

The asset management project includes 21 service areas, covering all assets owned by the City of Kingston (City) that are not already included in other Asset Management Plans (AMP). This is the first iteration of an AMP for these service areas. Given the extensive range of assets included in the project, the plan is presented in the following six documents:

- Executive Summary and Introduction
- Volume 1: Infrastructure, Transportation, Transit, & Emergency Services
- Volume 2: Corporate Services & Parking Operations
- Volume 3: Community Services
- Volume 4: Parks, Parkland, & Trails
- Volume 5: Police, Libraries, City Real Estate & Environment

## Overview

The Introduction document presents key asset management principles and an overview of how each service area will be presented in its own chapter with the following sections: State of the Local Infrastructure (SOLI); Levels of Service (LOS); Risk Assessment; and Asset Management Strategy. The Introduction also includes a section on Growth and a Roadmap with Next Steps. The following sections are included in the Introduction document:

- Section 1.1 Asset Management
- Section 1.2 Scope of Assets
- Section 1.3 Alignment with Strategic Plan, Policy, and Regulation
- Section 1.4 Governance and Relationship to Other Planning Documents
- Section 1.5 Growth
- Section 1.6 Overview of the AMP
  - State of the Local Infrastructure
  - Levels of Service
  - Risk Assessment
  - Asset Management Strategy
- Section 1.7 Roadmap with Next Steps



Overview

1.1 Scope of Assets in Volume 1

The service areas included in **Volume 1: Infrastructure, Transportation, Transit, & Emergency Services** are: Transit; Traffic Control & Safety; Structures; Urban Forestry; Kingston Fire & Rescue; Solid Waste; and Airport Operations. See **Table 1-1** for the respective asset classes for each service area and the relevant chapter.

**Table 1-1: Service Areas included in Infrastructure, Transportation, Transit, & Emergency Services**

Service Area	Asset Classes	Report Chapter
Transit	<ul style="list-style-type: none"> <li>• On-Street Infrastructure</li> <li>• Concrete Pads</li> <li>• IT &amp; Other Support Equipment</li> <li>• Benches</li> </ul>	Chapter 2.0
Traffic Control & Safety	<ul style="list-style-type: none"> <li>• Guide Rails</li> <li>• Signs (Traffic Control, Bus Stop Signage, Other)</li> <li>• Streetlights</li> <li>• Traffic Signals</li> </ul>	Chapter 3.0
Structures	<ul style="list-style-type: none"> <li>• Sidewalks</li> <li>• Wildlife Mitigation Infrastructure</li> <li>• Minor Culverts, &lt; 3 metre (m) (Driveway, Cross, Other)</li> </ul>	Chapter 4.0
Urban Forestry	<ul style="list-style-type: none"> <li>• Tree Canopy (Urban Street, Rural, Park/Open, Woodland, Other)</li> </ul>	Chapter 5.0

Overview

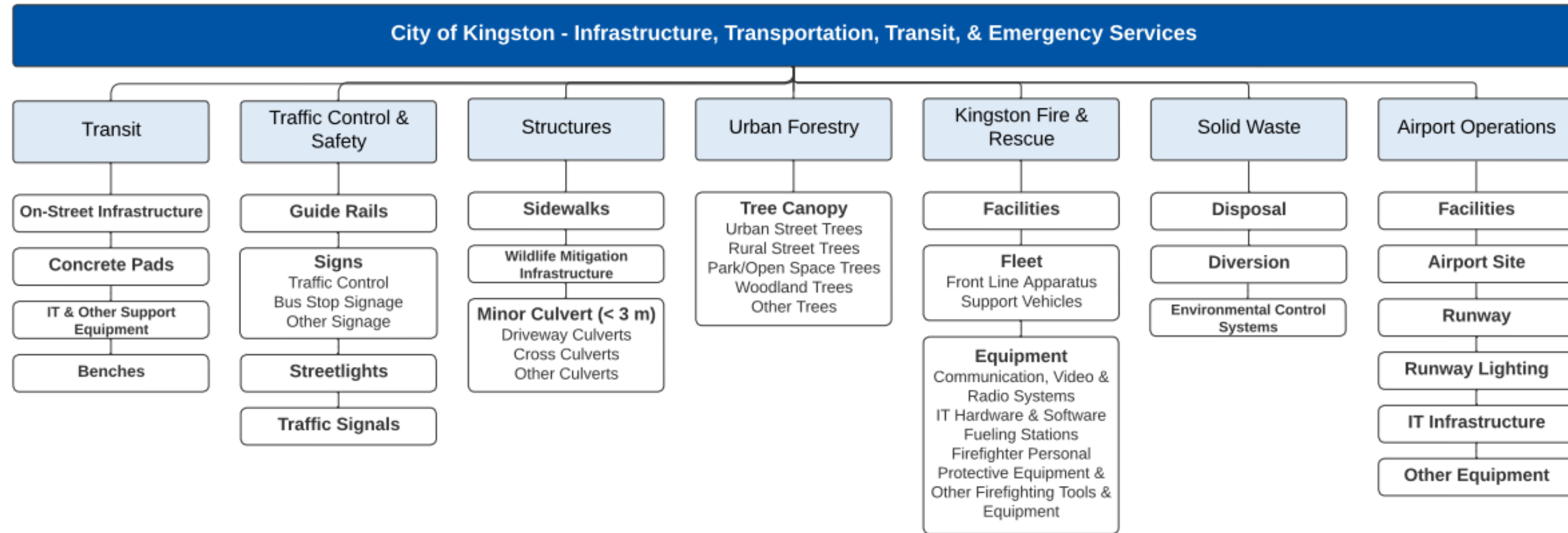
Service Area	Asset Classes	Report Chapter
Kingston Fire & Rescue	<ul style="list-style-type: none"> <li>• Facilities</li> <li>• Fleet (Front Line Apparatus, Support Vehicles)</li> <li>• Equipment (Communications, Radio, Video, Fuelling Stations, IT, Firefighter Personal Protective Equipment &amp; Other Firefighting Tools &amp; Equipment)</li> </ul>	Chapter 6.0
Solid Waste	<ul style="list-style-type: none"> <li>• Disposal</li> <li>• Diversion</li> <li>• Environmental Control Systems</li> </ul>	Chapter 7.0
Airport Operations	<ul style="list-style-type: none"> <li>• Facilities</li> <li>• Airport Site</li> <li>• Runway</li> <li>• Runway Lighting</li> <li>• IT Software</li> <li>• Other Equipment</li> </ul>	Chapter 8.0

1.2 Asset Hierarchy

The asset hierarchy that was generated and used for the City’s assets is shown in **Figure 1-1**. The asset group (level 1) is shown in the blue box, the seven service areas (level 2) are shown in the light blue boxes, the asset classes are shown in bold (level 3), and where applicable, the asset sub-classes are shown in regular text (level 4).

Overview

Figure 1-1: Asset Hierarchy for Infrastructure, Transportation, Transit, & Emergency Services



## Overview

### 1.3 Asset Inventory and Replacement Costs

An asset inventory was generated for all assets included in this AMP using Microsoft Excel. The inventory organizes assets using the various levels of the asset hierarchy and acts as a central repository for the asset data that can be used to inform asset management planning. It is recommended that the City continually updates the asset information stored within the asset inventory to facilitate asset management planning based on reliable data.

Where replacement costs were provided, the values were inflated based on the Bank of Canada Consumer Price Index (CPI) to estimate the replacement cost in 2023 dollars. If replacement costs were not provided, Dillon leveraged a unit cost model to assign replacement costs based on unit cost estimated for 2023. It is recommended that unit prices should be reviewed annually by the City based on costs observed from local suppliers and contractors.

### 1.4 Establishing Levels of Service

There were four LOS workshops that were held with staff. The service categories for this volume were covered in Workshop 1 and 2.

- Workshop 1 was held on November 7, 2023, and included the stakeholders for Transit, Traffic Control & Safety, Urban Forestry and Solid Waste service areas.
- Workshop 2 was held on November 10, 2023, and included the stakeholders for Police, Information Systems & Technology and Parking Equipment, Lots, and Structures service areas.

There were City staff from each service area that attended the workshop. The list of attendees is summarized in **Table 1-2**.

Overview

**Table 1-2: Workshop Attendees - Infrastructure, Transportation, Transit, & Emergency Services**

<b>Service</b>	<b>Name</b>	<b>Role</b>
Corporate Asset Management and Fleet Services	Brent Fowler	Director, Corporate Asset Management and Fleet
Corporate Asset Management and Fleet Services	Mike Montgomery	Systems and Technology Support Specialist
Transit	Ian Semple	Director, Transportation and Transit
Transit	Andrew Morton	Transit Service Project Manager
Traffic Control and Safety	Mark Dickson	Manager, Transportation Infrastructure
Traffic Control and Safety	Joel Melburn	Project Manager, Transportation
Structures/Urban Forestry/Solid Waste	Karen Santucci	Director, Public Works and Solid Waste
Structures/Urban Forestry/Solid Waste	Troy Stubinski	Manager, Operations, Public Works Services
Structures	Adam McDonald	Operations Manager
Structures	Luke Follwell	Director, Engineering
Structures	John Piraino	Asset Management Coordinator/Cartegraph Administrator

Overview

Service	Name	Role
Urban Forestry	Marty Mayberry	Supervisor, Forestry
Kingston Fire & Rescue	Monique Belair	Fire Chief and Director of Kingston Fire & Rescue
Kingston Fire & Rescue	Kevin Donaldson	Deputy Fire Chief, Kingston Fire & Rescue
Kingston Fire & Rescue	Don Carter	Deputy Chief of Operations and Training
Kingston Fire & Rescue	Tara Perry	Administrative Assistant Fire and Rescue
Kingston Fire & Rescue	Brandi Timpson	Manager, Administration and Emergency Preparedness
Kingston Fire & Rescue /IS&T	Wayne Rice	Manager, Distributed Computing Services
Solid Waste	Jason Hollett	Manager, Solid Waste Operations
Solid Waste	Adam Mueller	Supervisor, Solid Waste Operations
Airport Operations	Craig Desjardins	Director, Strategy, Innovation & Partnerships
Airport Operations	Aron Winterstein	Airport Manager
Facilities Management and Construction Services	Dan Korneluk	Manager, Energy & Asset Management

Overview

1.5 Growth Related Impacts on Lifecycle of Assets

As the City continues to expand, there are impacts to existing service levels and assets based on these future needs. The growth-related assumptions and potential impact on the lifecycle of the assets is shown in Table 1-3.

Table 1-3: Growth Related Impacts on Lifecycle of Assets

Service Category	Growth Impact Assumptions	How Assumptions Relate to Lifecycle of Assets
Transit	<ul style="list-style-type: none"> <li>• Increase in service demands due to increased operating hours, or capacity covering greater distances</li> <li>• Increases to internal capacity (staffing) required to maintain equipment</li> </ul>	<ul style="list-style-type: none"> <li>• Potential increase in capital expenditures for the purchase of additional assets to meet service needs</li> <li>• Potential increase in operational costs to maintain fleet assets</li> </ul>
Traffic Control and Safety	<ul style="list-style-type: none"> <li>• Increase in service demands to operation or capacity of the services</li> <li>• Higher risk of cyberattacks due to increased number of assets required to provide service</li> </ul>	<ul style="list-style-type: none"> <li>• Potential increase in capital expenditures for facility services and maintenance</li> <li>• Potential increased operational costs due to increase in collection and network size</li> </ul>
Structures	<ul style="list-style-type: none"> <li>• Increase in service demands due to increased operating hours, or capacity covering greater distances</li> <li>• Increased development will occur as a result of continued growth</li> </ul>	<ul style="list-style-type: none"> <li>• Potential increase in capital expenditures for the purchase of additional assets to meet service needs</li> </ul>

Overview

Service Category	Growth Impact Assumptions	How Assumptions Relate to Lifecycle of Assets
		<ul style="list-style-type: none"> <li>Potential increase in operational costs due to an increase in the overall asset portfolio</li> </ul>
Urban Forestry	<ul style="list-style-type: none"> <li>Increase in service demands in operations and maintenance due to increased assets (canopy cover)</li> </ul>	<ul style="list-style-type: none"> <li>Potential increase in capital expenditures for services and maintenance</li> </ul>
Kingston Fire & Rescue	<ul style="list-style-type: none"> <li>Increase in service demands-requiring increased operation or capacity at greater distances</li> <li>Increases to internal capacity (staffing) required to maintain equipment</li> </ul>	<ul style="list-style-type: none"> <li>Potential increase in capital expenditures for the purchase of additional assets to meet service and facilities services needs</li> <li>Potential increase in operational costs to maintain fleet assets</li> </ul>
Airport Operations	<ul style="list-style-type: none"> <li>Increase in service demands-requiring increased operation or capacity at greater distances</li> </ul>	<ul style="list-style-type: none"> <li>Potential increase in capital expenditures for the purchase of additional assets to meet service and facilities services needs</li> </ul>





## 2.0 Transit

The City of Kingston provides scheduled transit service throughout the urban area of the City, and under contract into neighbouring Amherstview in Loyalist Township. Operated as Kingston Transit, the transit network connects residents and visitors to destinations across the City, be it for work, school, or recreation. Over 270,000 revenue hours are operated on scheduled service with a fleet of transit buses. The specialized transit operation is managed through Kingston Access Bus, a separate agency, on behalf of the City. The operation and maintenance of a variety of transit assets, in addition to the fleet of buses, is managed by the City. The following section of the AMP includes assets that are under the Transit service, excluding the fleet of transit buses and non-revenue vehicles which have been inventoried under Corporate Fleet Service which is included in Volume 2 of the AMP.

**Note on Scope:** At the time of preparing this AMP no data was available for concrete pads and benches associated with transit shelters and transit stations, or assets associated with transit locations administered through service agreements between the City and third-party property owners including a park and ride location and bus terminals at the Cataraqui Centre and the Kingston Centre. As a result, those assets are not included in this AMP. It is recommended that the City further develops an inventory of these assets to be considered in subsequent iterations of the AMP.

## Transit

### 2.1 State of the Local Infrastructure

#### 2.1.1 Asset Inventory and Valuation

For inventory purposes, Transit assets have been summarized into asset classes and further divided into applicable asset types. **Table 2-1** summarizes the asset inventory for Transit services by asset class, asset type, asset count, total replacement cost (in 2023 dollars). The total replacement cost (2023 dollars) is estimated at **\$7.9 million** for the **756 assets** included in the inventory.

**Table 2-1: Inventory Summary by Asset Type - Transit**

Asset Class	Asset Type	Asset Count	Total Replacement Cost (2023)
On-Street Infrastructure	Transit Shelters	241	\$2,830,120
On-Street Infrastructure	Transit Stations	2	\$539,500
Information Technology (IT) & Other Support Equipment	Transit Equipment	513	\$4,539,900
<b>Overall</b>	<b>Not Applicable (N/A)</b>	<b>756</b>	<b>\$7,909,520</b>

#### 2.1.2 Asset Age Summary

**Table 2-2** summarizes the average age, average condition, expected useful life (EUL), and the average remaining useful life of assets pertaining to Transit services. The overall average age of Transit assets is five years, and the average remaining useful life is 10 years.

Transit

**Table 2-2: Average Age, Average Condition, Expected Useful Life, and Average Remaining Useful Life – Transit**

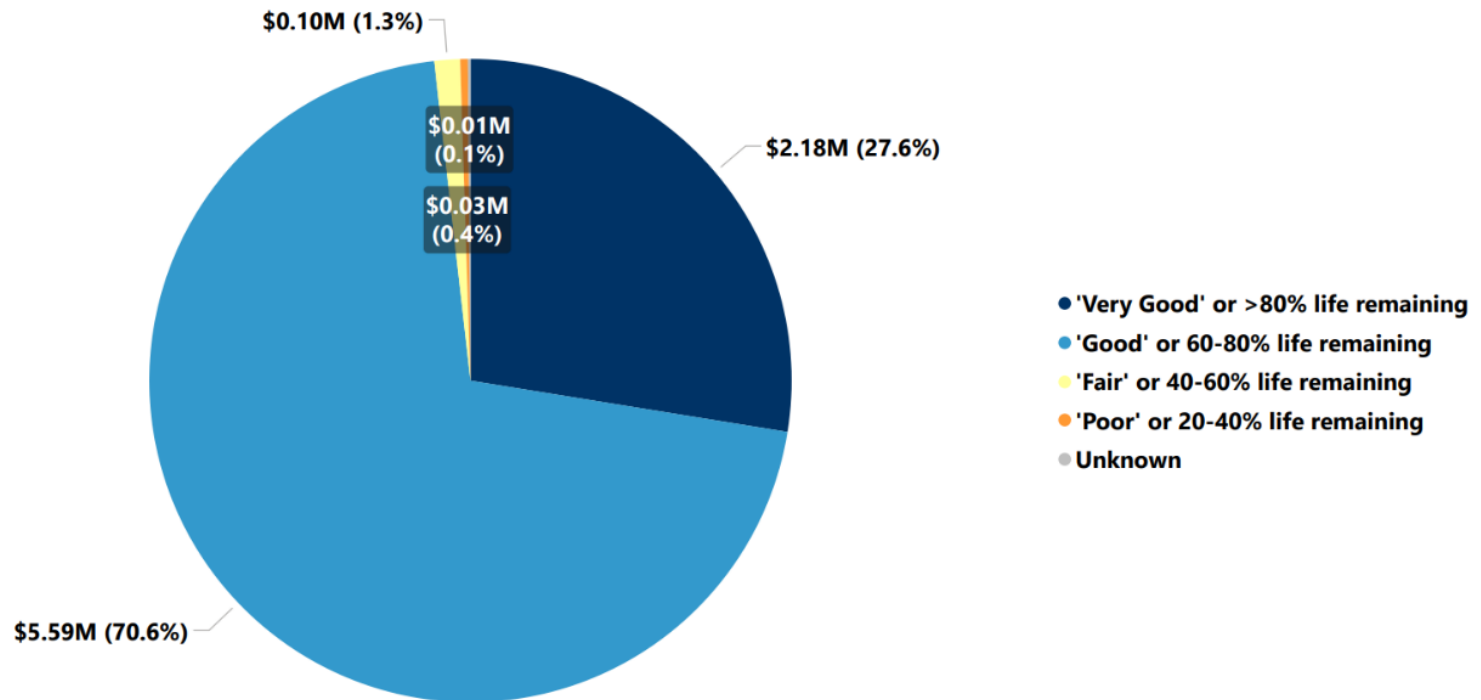
<b>Asset Class</b>	<b>Asset Type</b>	<b>Average Age (Years)</b>	<b>Average Condition Grade</b>	<b>Expected Useful Life (Years)</b>	<b>Average Remaining Useful Life (Years)</b>
On-Street Infrastructure	Transit Shelters	10	Good	25	17
On-Street Infrastructure	Transit Stations	1	Very Good	25	22
IT & Other Support Equipment	Transit Equipment	3	Good	10	7
<b>Overall</b>	<b>N/A</b>	<b>5</b>	<b>Good</b>	<b>10 to 25</b>	<b>10</b>

Transit

2.1.3 Asset Condition

An overall condition summary for Transit assets by replacement cost (in 2023 dollars) is shown in **Figure 2-1**. About 99.5% of the assets are in very good to fair condition, with 0.4% of the assets with unknown condition.

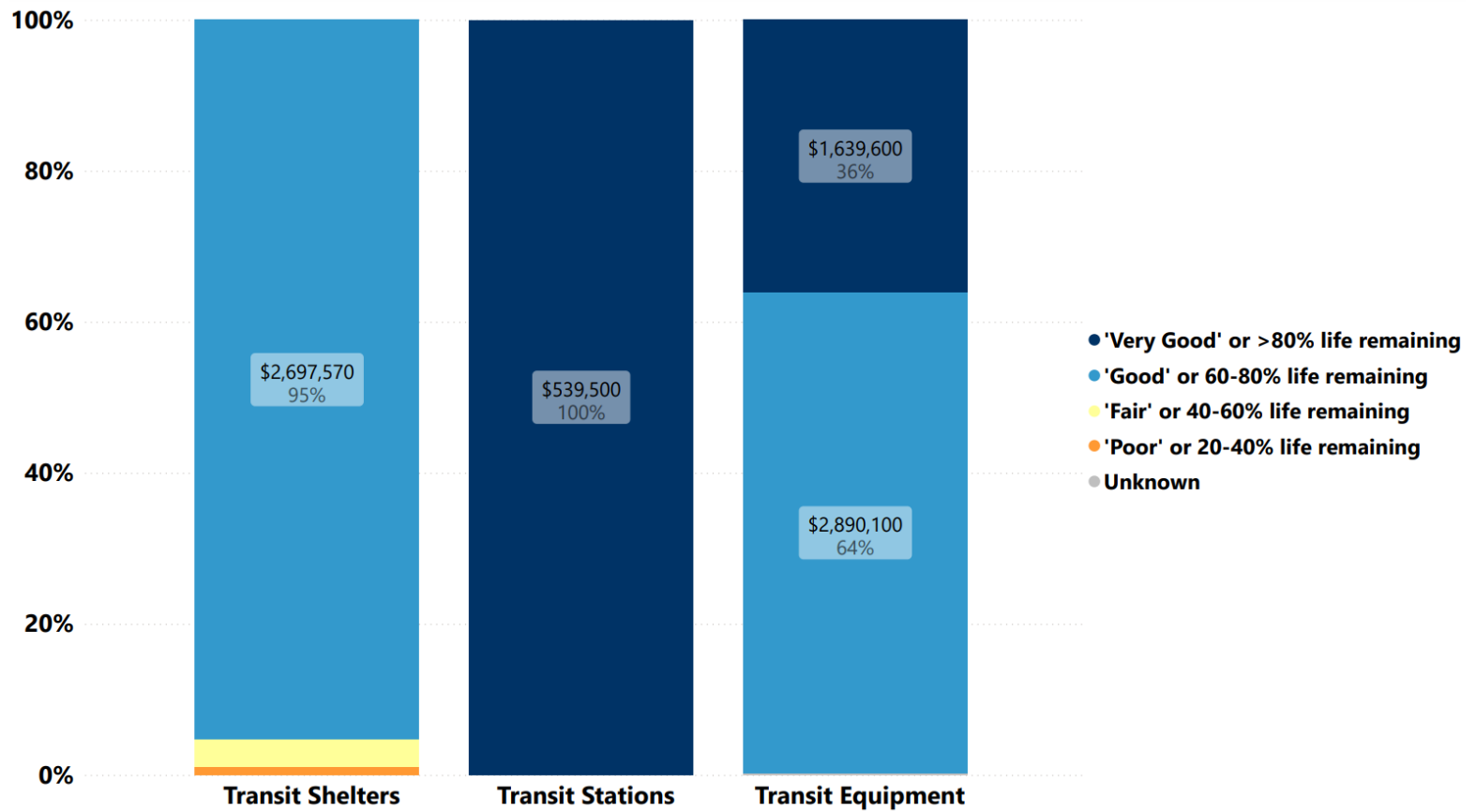
**Figure 2-1: Condition Summary by 2023 Replacement Cost - Transit**



## Transit

A condition summary is provided in **Figure 2-2** by asset class and replacement cost (in 2023 dollars). Condition data for On-Street Infrastructure is maintained by City staff within an Excel-based inventory sheet. In the absence of condition assessment data, the condition of IT & Other Support Equipment has been primarily determined based on age and EUL.

**Figure 2-2: Condition Summary by Asset Type and 2023 Replacement Cost - Transit (On-Street Infrastructure and IT & Other Support Equipment)**



Transit

2.1.4 Data Sources and Confidence

The asset data for Transit assets is maintained by the City between two main data repositories. The transit equipment data is maintained by the City in a Enterprise-wide fleet and equipment asset and work order management application from AssetWorks Inc. called FleetFocus (also known as M5) and the transit shelter data is stored in a Microsoft Excel-based inventory spreadsheet. The City has staff who regularly update the inventory data for Transit assets hosted within FleetFocus and the spreadsheet. This suggests that the data source can be assumed to be reliable.

Data confidence can be estimated based on the confidence level of various qualifiers and can be presented on a scale from 0% (low) to 100% (high), as shown in **Table 2-3**. The qualifiers chosen for evaluation are specifically targeted for estimating overall confidence of condition reporting within the SOLI.

**Table 2-3: Data Confidence Scale**

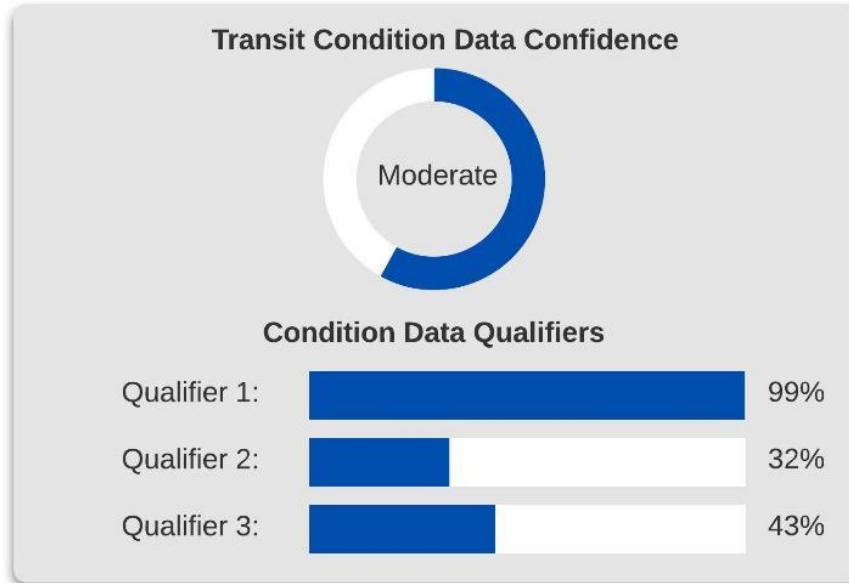
Confidence Level	Low	Low/Moderate	Moderate	Moderate/High	High
Average of Qualifiers	0% to 19%	20% to 39%	40% to 59%	60% to 79%	80% to 100%

Assuming the data source is reliable, the following qualifiers were considered to estimate data confidence regarding the data utilized in the creation of this SOLI report:

- **Qualifier 1:** The percentage of assets in the asset inventory where construction, installation, or acquisition years are documented (99%);
- **Qualifier 2:** The percentage of assets in the asset inventory that have condition assessment data documented (32%); and,
- **Qualifier 3:** The percentage of the estimated overall replacement value, in 2023 dollars, attributed to assets in the asset inventory with documented condition assessment data (i.e., condition is not solely age-based) (43%).

Transit

Figure 2-3: SOLI Report Data Confidence - Transit



As summarized in **Figure 2-3**, the overall asset condition data confidence for Transit assets is estimated as Moderate. Presently, condition assessment data is available for all On-Street Infrastructure which significantly increases the overall condition data confidence for Transit assets. For IT & Other Support Equipment, no condition assessment data was available. However, all installation years for IT & Other Support Equipment are documented allowing for age-based condition to be evaluated.

## Transit

### 2.2 Levels of Service

In 2015, the City developed the Kingston Transportation Master Plan (KTMP) which aimed at providing a long-term direction for the development of the transportation networks and supporting policies, programs, and service. The KTMP included active transportation, public transit, transportation demand management, transportation systems management, and the City's Road network. Additionally, Kingston generated a draft Active Transportation Master Plan (ATMP) in 2018.

For public transit, a key objective was to increase transit mode share and decrease single-occupancy vehicle (SOV) use. The target for the transit mode share is 15% by 2034. To achieve this target, it was recommended that transit service be expanded and investments in infrastructure and technology be accelerated to improve access and comfort.

In June 2024, an updated presentation to Council outlined Options for Transit Improvements which included planned Transit Stop, Terminals and updated Station Guidelines to outline and inform infrastructure requirements, including new and future customer amenity requirements. A new Kingston Transit Service Strategy is currently being developed for implementation in 2027 based on the following service principles; Accessible, Frequent, Available, and Reliable.

As the master plan provides a long-term vision for the system, the City has developed community and technical Levels of Service (LOS), for their existing assets within the network. These LOS were developed based on contributions from the municipal staff and in the review of the 2015 KTMP. **Table 2-4** and **Table 2-5** outline the City's current community and technical LOS for Transit.



Transit

Table 2-4: Community LOS - Transit

LOS Parameter	LOS Statement	Performance Measure	Current LOS (2023)
<b>Accessibility</b>	Compliance with Ontario Regulation (O. Reg.) 191/11, s. 78 for accessible transit stops.	Percent of transit stops that are accessible	65%
<b>Accessibility</b>	Compliance with O. Reg. 191/11, s. 78 for accessible shelters.	Percent of transit shelters that are accessible	To be included in the 2025 AMP
<b>Accessibility</b>	Compliance with O. Reg. 191/11, s. 51 and 52 for pre-boarding and on-board announcements.	Percent availability of pre-boarding and on-board announcements.	100%
<b>Availability</b>	All transit stops will be connected to the pedestrian network.	Percent of transit stops connected to the pedestrian network	To be included in the 2025 AMP

Transit

Table 2-5: Technical LOS - Transit

LOS Parameter	LOS Statement	Performance Measure	Current LOS (2023)
Quality	Transit Hard Surfacing without heaving or cracking.	Percentage of assets that are in poor or better condition.	100%
Quality	Transit shelters in good structural condition	Percentage of assets that are in poor or better condition.	100%
Quality	Transit stations in good structural condition	Percentage of assets that are in poor or better condition.	100%

2.3 Risk Assessment

The risk ratings for Transit assets included On-Street Infrastructure and IT & Other Support Equipment. The risk scores were calculated using the risk methodology and approach outlined in the Introduction document. **Table 2-6** summarizes the risk factors for the Transit assets.

Transit

Table 2-6: Risk Factors - Transit

Factors	Risk Ratings
<b>A - Condition</b>	The condition of the assets was determined either by visual or age-based and can be found in the SOLI section of the AMP.
<b>B - Performance</b>	The performance of the On-Street Infrastructure assets was identified as being “always reliable” and assigned a rating of 1 for calculating risk score. IT & Other Support Equipment assets was assigned a rating of 3 for calculating risk score and deemed as “usually reliable”.
<b>C - Climate Change</b>	The climate change ratings were determined at the asset class level by identifying climate change hazard interactions. The On-Street Infrastructure assets were identified as a “high” risk and assigned a rating of 5 for calculating the risk score. IT & Other Support Equipment assets were identified as a “low” risk and assigned a rating of 1 for calculating the risk score.
<b>D - Impact</b>	The impact of the On-Street Infrastructure and IT & Other Support Equipment assets was identified as "low" impact and assigned a rating of 0 for calculating risk score.
<b>E - Importance</b>	A “moderate” importance rating was applied to On-Street Infrastructure and IT & Other Support Equipment assets and a rating of 2 was assigned for calculating risk score.

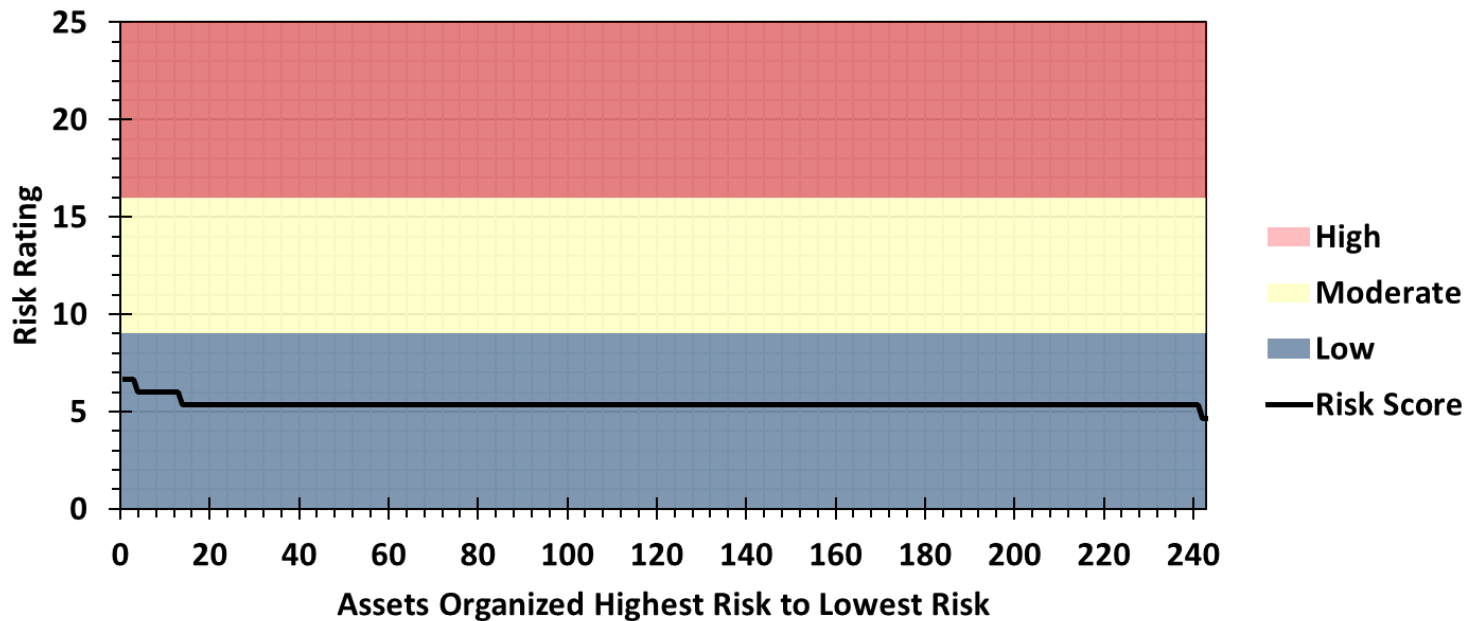
The individual risk ratings were used in calculating the risk score for each of the assets.

Transit

2.3.1 Risk Profile

The Risk profile of the On-Street Infrastructure assets is displayed in **Figure 2-4**. All of the 243 On-Street Infrastructure tracked within the asset inventory are classified as Low risk.

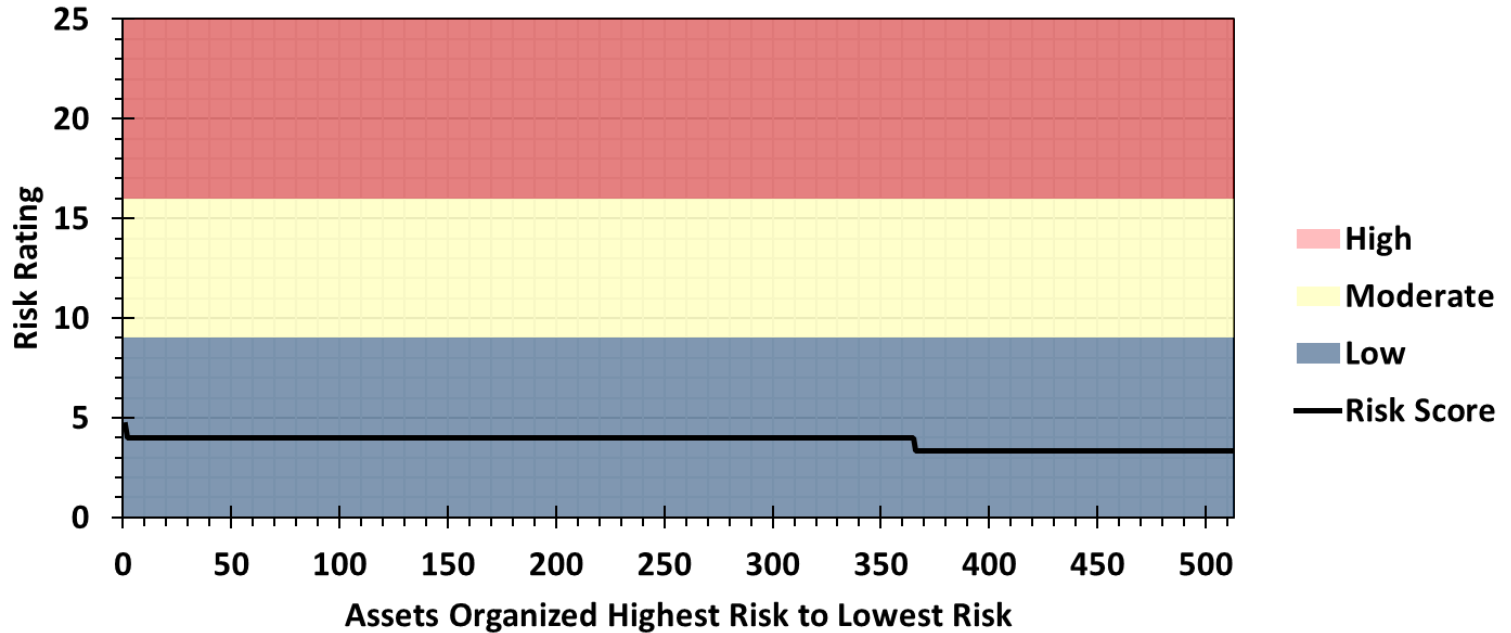
**Figure 2-4: Risk Profile - Transit (On-Street Infrastructure)**



The Risk profile of the IT & Other Support Equipment assets is displayed in **Figure 2-5**. All 513 assets tracked in the asset inventory are considered as Low risk.

Transit

Figure 2-5: Risk Profile – Transit (IT & Other Support Equipment)



## 2.4 Asset Management Strategy

### 2.4.1 Lifecycle Activities - Transit

The lifecycle activities considered include:

- **Non-Infrastructure Solutions:** Actions or policies that can lower costs and extend useful lives.
- **Maintenance Activities:** Regularly scheduled inspection and maintenance, or more significant repair and activities associated with unexpected events.
- **Renewal / Rehabilitation Activities:** Significant repairs designed to extend the life of the asset.

## Transit

- **Replacement / Construction Activities:** Activities that are expected to occur once an asset has reached the end of its useful life and renewal/rehabilitation is no longer an option.
- **Disposal Activities:** Activities associated with disposing of an asset once it has reached the end of its useful life or is otherwise no longer needed.
- **Expansion / Growth / Service Improvement Activities:** Planned activities required to extend services to previously unserved areas or expand services to meet growth demands.

**Table 2-7** describes the lifecycle activities that can be implemented within the asset management strategy for Transit assets. The lifecycle activities presented below are existing activities performed by the City, identified during a workshop with City staff in January 2024.

**Table 2-7: Lifecycle Activities - Transit**

Lifecycle Activity Type	Description of Activity	Frequency / Timing
Non-Infrastructure Solutions	Zero Emission Electric Bus Feasibility Study.	Based on service provider's needs
Non-Infrastructure Solutions	Annual Service Plan, 5-Year Service Strategy and 10-year Outlook	Every 5 years
Non-Infrastructure Solutions	Multi-year plan for asset growth and replacement	As needed
Maintenance Activities	Preventative maintenance of transit shelters and stations	Bi-annually
Maintenance Activities	Replacement of shelters due to significant damage/collisions.	As needed

Transit

Lifecycle Activity Type	Description of Activity	Frequency / Timing
Maintenance Activities	Condition assessment of transit stops, shelters, and stations.	Annually
Renewal / Rehabilitation Activities	Replace equipment and benches.	Equipment: As identified by periodic servicing Shelters/Benches: As needed
Replacement / Construction Activities	Replacement at end of service life, incorporate modernization where feasible, disposal of previous asset.	As needed
Expansion / Growth / Service Improvement Activities	Watson Development Charges Background Study	Currently in development
Expansion / Growth / Service Improvement Activities	Campus Planning, Facility & Space Needs Review	Currently in development
Expansion / Growth / Service Improvement Activities	Annual Service Plan, Transit Stop, Terminals and Station Guidelines, 5-Year Service Strategy, and 10-Year Outlook	Based on service provider's needs



#### 2.4.2 Funding the Lifecycle Activities - Transit

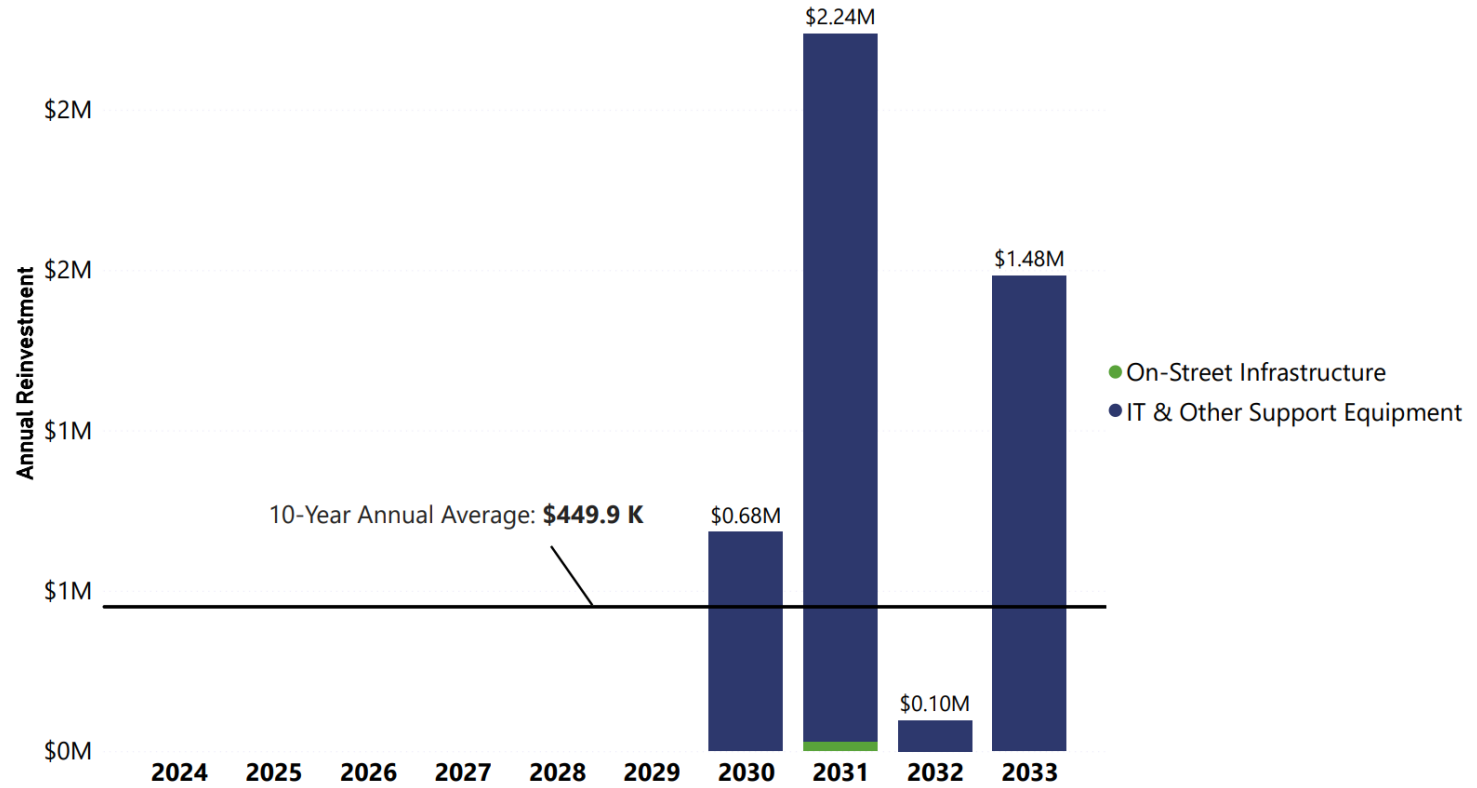
Lifecycle modeling allows for the City to understand the future reinvestment needs of their existing assets by generating a theoretical asset replacement forecast that considers available asset inventory data. The age, Expected Useful Life (EUL), replacement cost, condition, and risk score of each asset can be leveraged within the lifecycle model to proactively plan for reinvestment over a period of time. Asset replacement forecasts within this subsection estimate the required reinvestment for Transit assets over the next 10 years based on available asset inventory data.

There is a total of approximately **\$4.5 million** to be reinvested into the Transit assets owned by the City in the next 10 years, **excluding** reinvestment associated with transit buses, the transit facility and maintenance garage. This translates to a 10-year annual average of approximately **\$449.9 thousand**, as presented in **Figure 2-6**. For details regarding transit buses and facilities, refer to the Corporate Fleet section in Volume 2 of this AMP and the Facilities 2023 Corporate AMP.



Transit

Figure 2-6: 10-Year Capital Reinvestment Needs - Transit



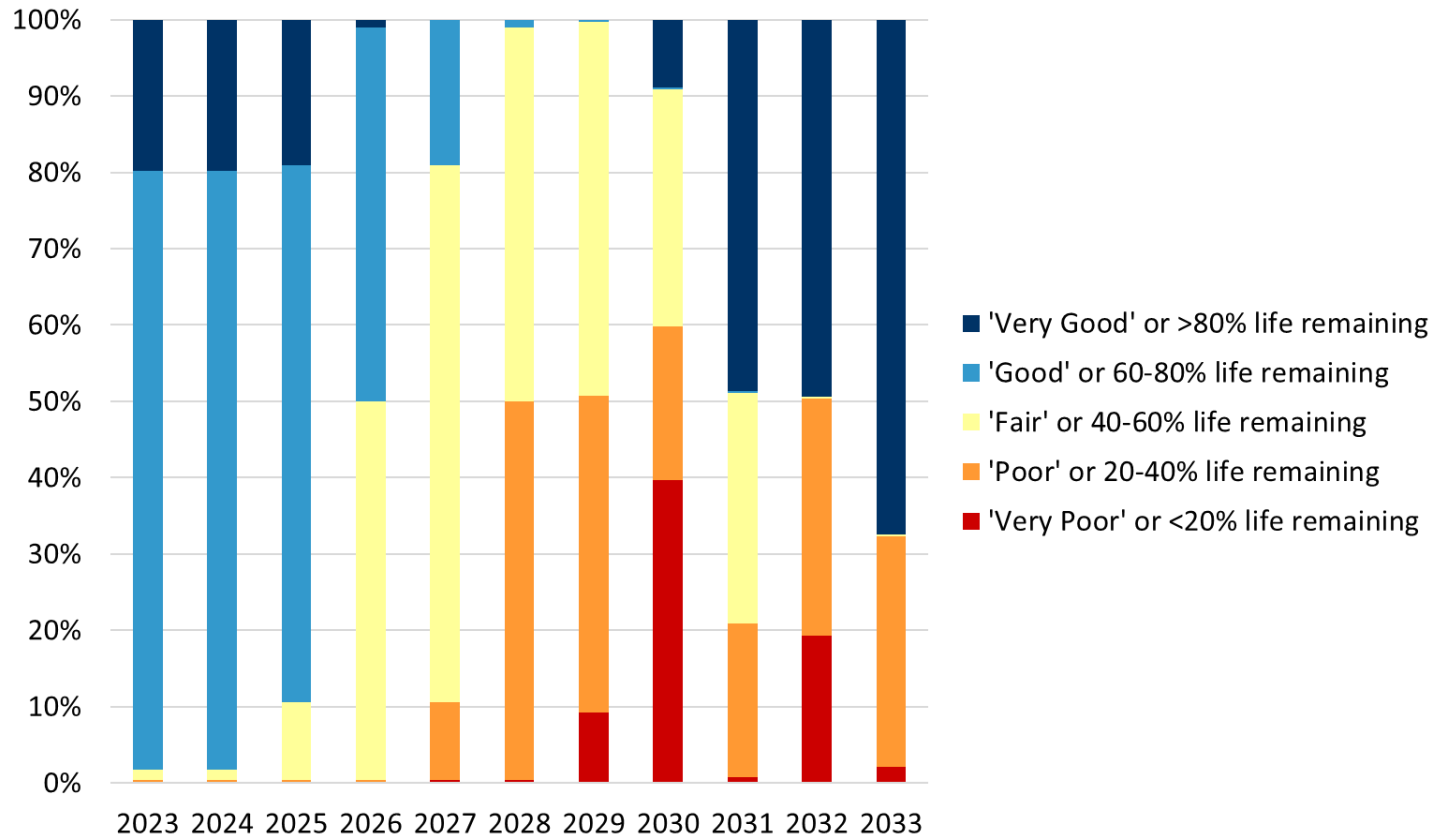
## Transit

The distribution of reinvestment needs for IT and Other Equipment is skewed due to the significant 2021 and 2023 investments made in driver protection systems (barriers), upgraded fareboxes and the Quantum wheelchair restraint systems. It is important to note that forecasting in this lifecycle model relies heavily on age and EUL to determine renewal or replacement needs and that tracking of condition data for Transit assets by the City will assist at refining forecasted expenditures in the decades to come. The LOS includes maintaining the current assets in poor or better condition (100%). From the lifecycle model, the percentage of Transit assets in poor or better condition fluctuates throughout the next 10-years due to the EUL of the assets. Based on the EUL and age of the Transit assets, the forecasted portion of Transit assets in poor or better condition remains at 100% until 2027, eventually finishing at 98% in 2033.

**Figure 2-7** shows an overview of the condition of Transit over the next 10 years based on the lifecycle model.

Transit

Figure 2-7: Condition Overview by Year Based on Lifecycle Model - Transit





### 3.0 Traffic Control & Safety

The City places significant emphasis on traffic control and safety, doing its utmost to ensure all roads, pedestrian pathways, and cycle lanes are safe and well-maintained for both residents and visitors. Traffic control initiatives include a robust system of traffic signals, signage, road markings, roundabouts, and traffic calming measures, all aimed to allow for smooth and efficient flow of traffic. The City is committed to enhancing pedestrian and cyclist safety, with features like designated bicycle lanes, pedestrian crossovers, and crosswalk signals. In providing the Traffic Control & Safety service, the City manages a wide range of assets including Guide Rails, Signs, Streetlights, and Traffic Signals. The following section of the AMP includes assets that are under the Traffic Control & Safety service areas.

## Traffic Control & Safety

### 3.1 State of the Local Infrastructure

#### 3.1.1 Asset Inventory and Valuation

For inventory purposes, Traffic Control & Safety assets have been summarized into asset classes and further divided into applicable asset types. **Table 3-1** summarizes the asset inventory for Traffic Control & Safety by asset class, asset type, asset count, total replacement cost (in 2023 dollars). The 335 Guide Rails recorded in the asset inventory have a total length of 25.3 kilometres (km). The total replacement cost (2023 dollars) is estimated at **\$119.4 million** for the **43,946 assets** included in the inventory.

**Table 3-1: Inventory Summary by Asset Type - Traffic Control & Safety**

Asset Class	Asset Type	Count	Total Replacement Cost (2023)
Guide Rails	Guide Rail	335	\$2,301,650
Signs	Traffic Sign	18,256	\$11,866,400
Streetlights	Street Lighting – Lights	14,888	\$7,444,000
Streetlights	Street Lighting – Pole – Concrete	5,914	\$59,140,000
Streetlights	Street Lighting – Pole – Other	2,401	\$16,807,000
Streetlights	Traffic Signal – Pole – Concrete	287	\$2,870,000
Streetlights	Traffic Signal – Pole – Other	1,337	\$9,359,000
Traffic Signals	Traffic Signal – Cabinet	192	\$4,876,800
Traffic Signals	Traffic Signal – Controller	195	\$819,000
Traffic Signals	Traffic Signal – Intersection Pedestrian Signal (IPS)	12	\$3,300,000
Traffic Signals	Traffic Signal – Opticom/Video/Vehicle Detection	129	\$645,000

Traffic Control & Safety

Asset Class	Asset Type	Count	Total Replacement Cost (2023)
Overall	N/A	43,946	\$119,428,850

3.1.2 Asset Age Summary

**Table 3-2** summarizes the average age, average condition, expected useful life, and the average remaining useful life of assets pertaining to Traffic Control & Safety. The overall average age of Traffic Control & Safety assets is 21 years, and the average remaining useful life is seven years.

**Table 3-2: Average Age, Average Condition, Expected Useful Life, and Average Remaining Useful Life - Traffic Control & Safety**

Asset Class	Asset Type	Average Age (Years)	Average Condition Grade	Expected Useful Life (Years)	Average Remaining Useful Life (Years)
Guide Rails	Guide Rail	93	Poor	30	8
Signs	Traffic Sign	7	Fair	10	5
Streetlights	Street Lighting – Lights	15	Very Poor	12	1
Streetlights	Street Lighting – Pole – Concrete	32	Fair	50	19
Streetlights	Street Lighting – Pole – Other	19	Fair	35	18
Streetlights	Traffic Signal – Pole – Concrete	45	Poor	50	11
Streetlights	Traffic Signal – Pole – Other	17	Fair	35	21

Traffic Control & Safety

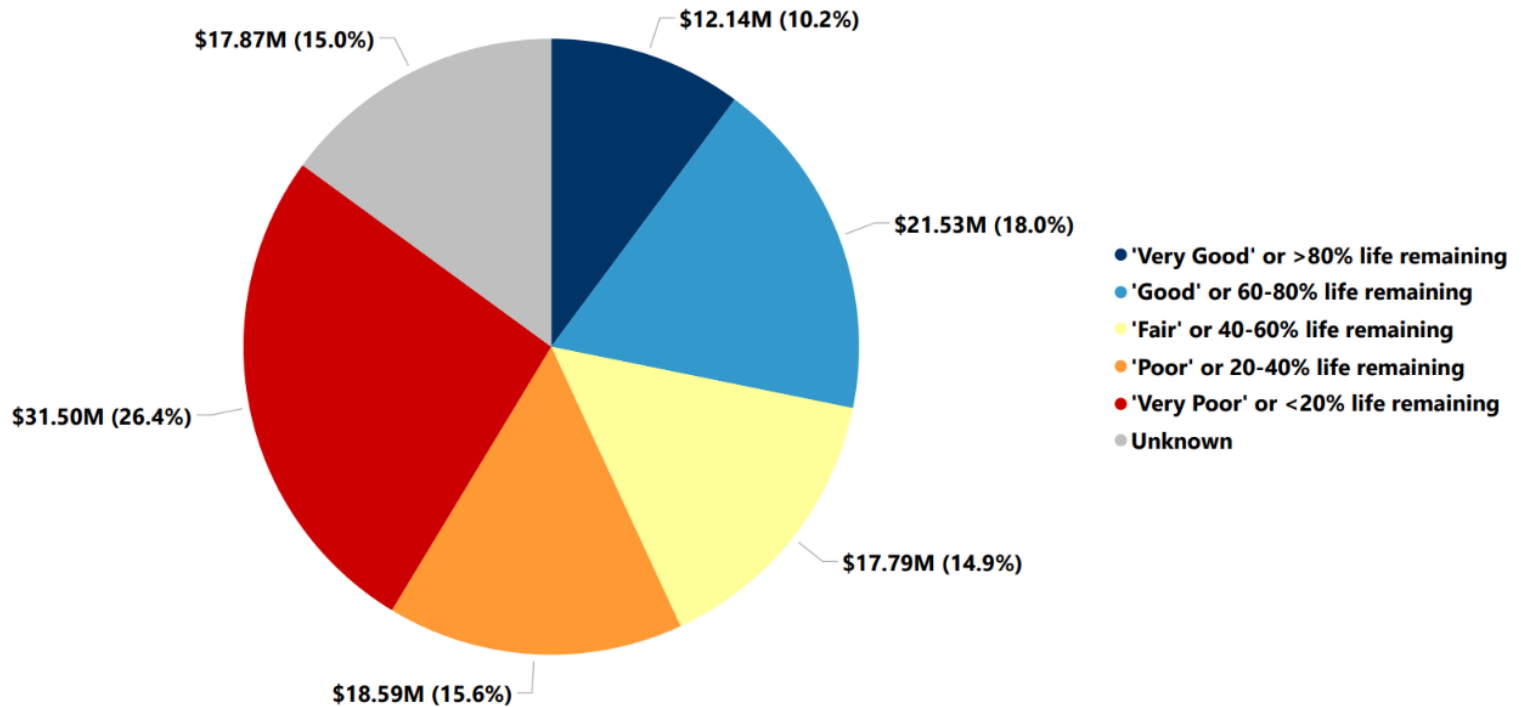
Asset Class	Asset Type	Average Age (Years)	Average Condition Grade	Expected Useful Life (Years)	Average Remaining Useful Life (Years)
Traffic Signals	Traffic Signal – Cabinet	17	Fair	35	18
Traffic Signals	Traffic Signal – Controller	14	Poor	15	4
Traffic Signals	Traffic Signal – IPS	6	Good	15	9
Traffic Signals	Traffic Signal – Opticom/Video/Vehicle Detection	18	Poor	20	4
<b>Overall</b>	<b>N/A</b>	<b>21</b>	<b>Poor</b>	<b>12 to 50</b>	<b>7</b>

Traffic Control & Safety

3.1.3 Asset Condition

An overall condition summary for Traffic Control & Safety assets by replacement cost (in 2023 dollars) is shown in **Figure 3-1**. About 43.1% of the assets are in very good to fair condition, with 15% of the assets with unknown condition.

**Figure 3-1: Condition Summary by 2023 Replacement Cost - Traffic Control & Safety**

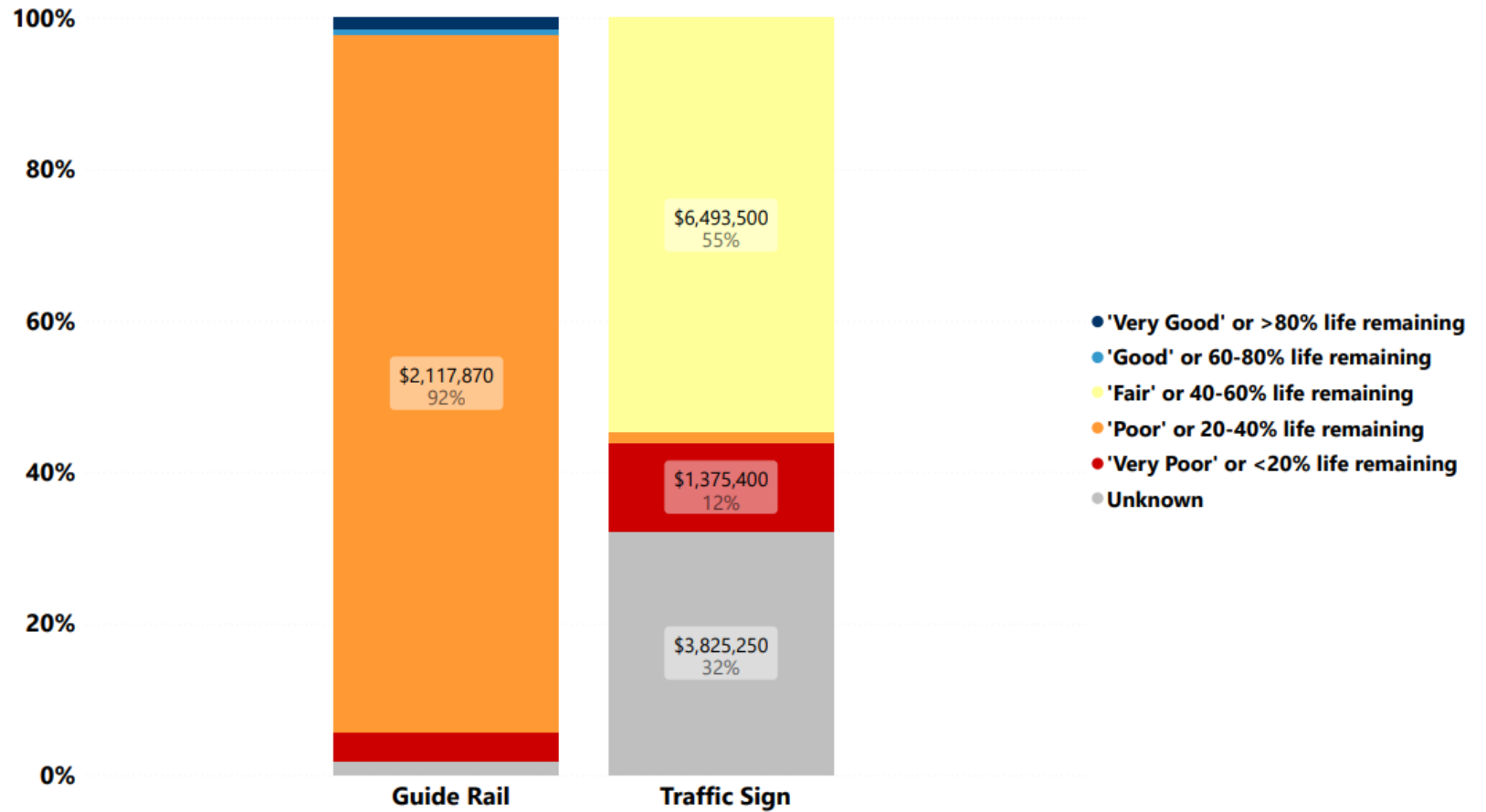


A condition summary for Guide Rails and Sign assets is provided in **Figure 3-2** by asset type and replacement cost (in 2023 dollars). Condition has been determined utilizing a combination of available asset condition data and age-based condition methods.



Traffic Control & Safety

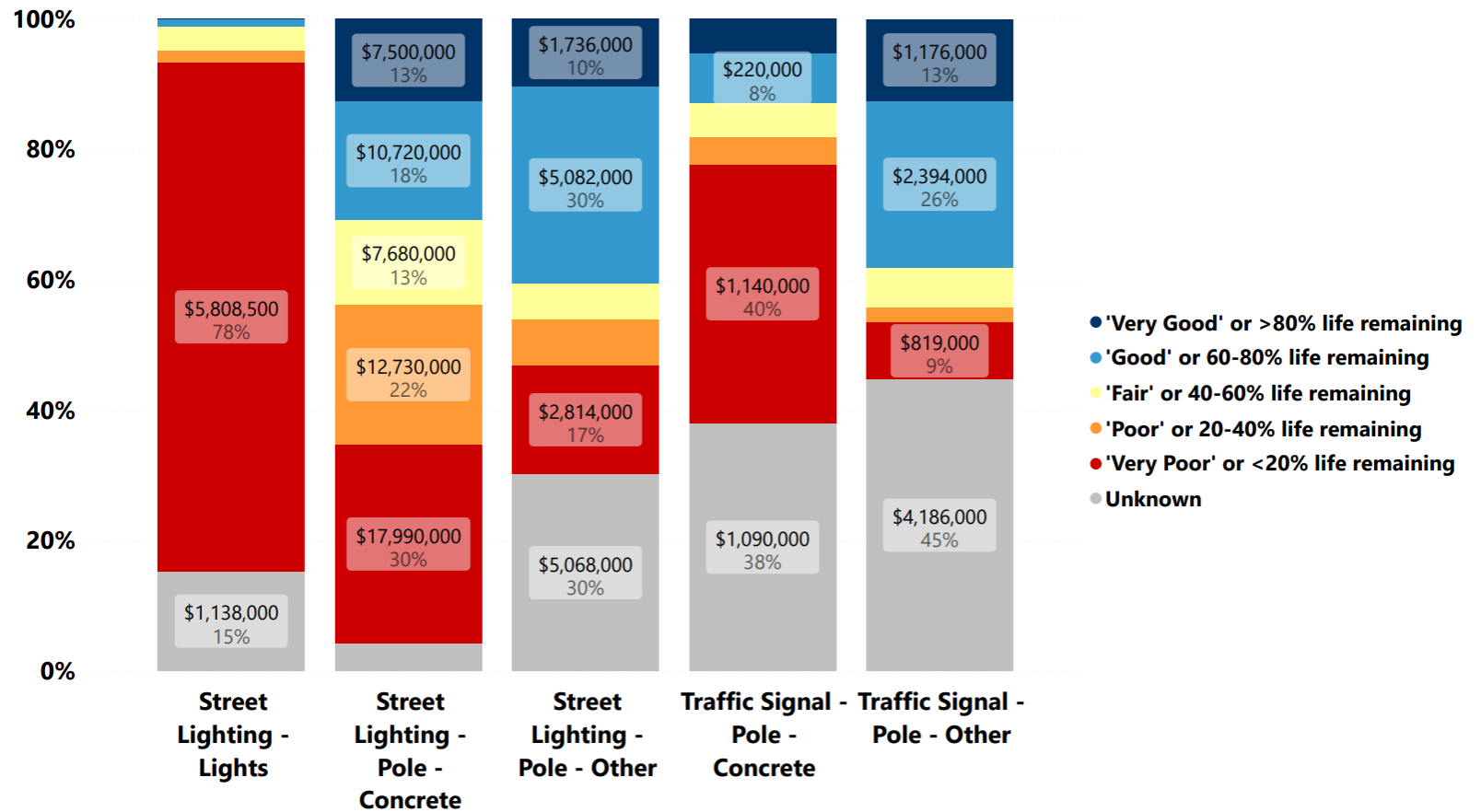
Figure 3-2: Condition Summary by Asset Type and 2023 Replacement Cost - Traffic Control & Safety (Guide Rails and Signs)



**Traffic Control & Safety**

A condition summary for Streetlights assets is provided in **Figure 3-3** by asset type and replacement cost (in 2023 dollars). In the absence of condition assessment data, the condition of Streetlight assets has been primarily determined based on age and expected useful life.

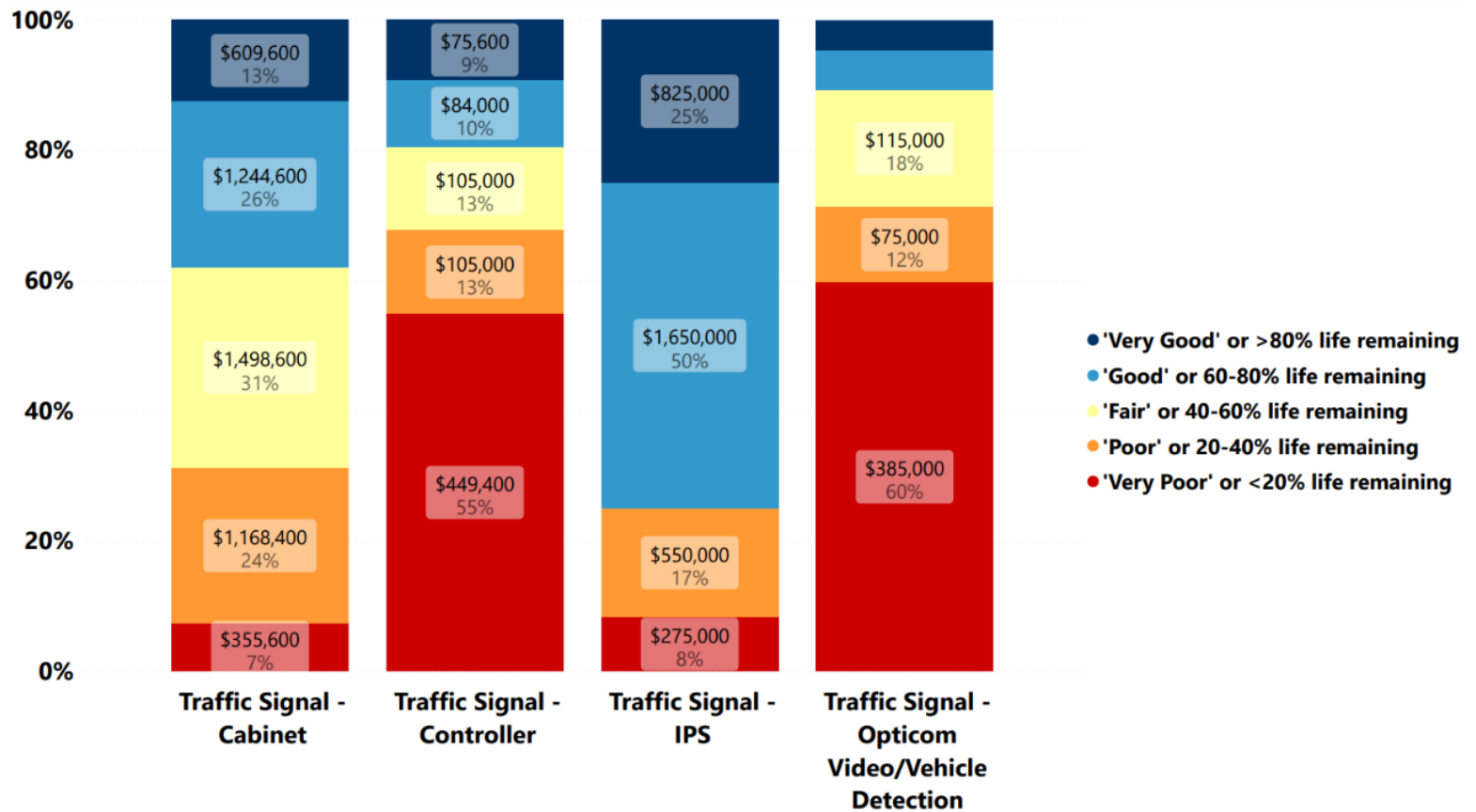
**Figure 3-3: Condition Summary by Asset Type and 2023 Replacement Cost - Traffic Control & Safety (Streetlights)**



### Traffic Control & Safety

A condition summary for Traffic Signal assets is provided in **Figure 3-4** by asset type and replacement cost (in 2023 dollars). In the absence of condition assessment data, the condition of Traffic Signal assets has been primarily determined based on age and expected useful life.

**Figure 3-4: Condition Summary by Asset Type and 2023 Replacement Cost - Traffic Control & Safety (Traffic Signals)**



## Traffic Control & Safety

### 3.1.4 Data Sources and Confidence

The asset data for Traffic Control & Safety assets is maintained by the City between two main data repositories. Data for Guide Rails, Traffic Signs, and Streetlights is maintained in a Geographic Information System (GIS)-based repository and data for Traffic Signals is currently stored in a Microsoft Excel-based inventory spreadsheet with a plan to transition to GIS and Cartegraph in the next year. The City has staff who regularly update the inventory data for Traffic Control & Safety assets hosted within the GIS-based repository and Excel-based inventory sheet. This suggests that the data source can be assumed to be reliable.

Data confidence can be estimated based on the confidence level of various qualifiers and can be presented on a scale from 0% (low) to 100% (high), as shown in **Table 3-3**. The qualifiers chosen for evaluation are specifically targeted for estimating overall confidence of condition reporting within the SOLI.

**Table 3-3: Data Confidence Scale**

Confidence Level	Low	Low/ Moderate	Moderate	Moderate/ High	High
Average of Qualifiers	0% to 19%	20% to 39%	40% to 59%	60% to 79%	80% to 100%

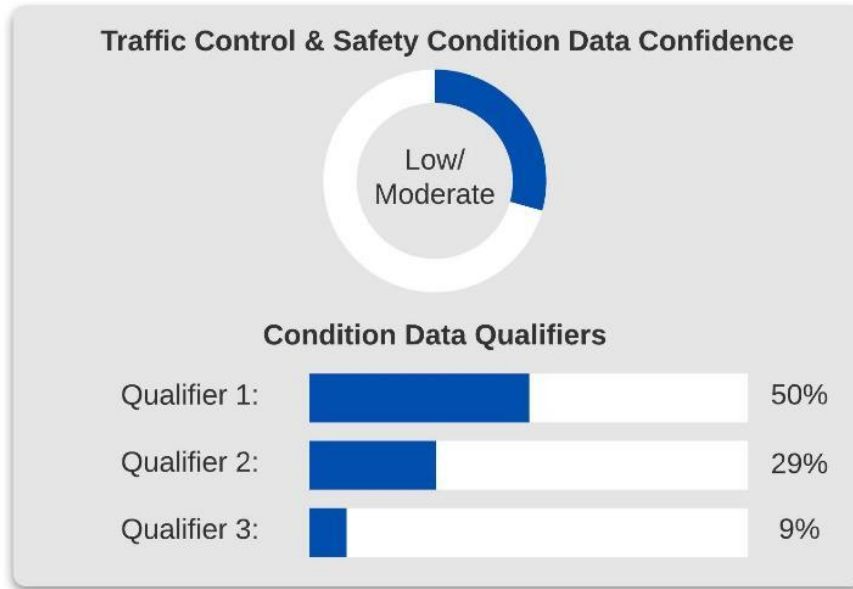
Assuming the data sources are reliable, the following qualifiers were considered to estimate data confidence regarding the data utilized in the creation of this SOLI report:

- **Qualifier 1:** The percentage of assets in the asset inventory where construction, installation, or acquisition years are documented (50%);
- **Qualifier 2:** The percentage of assets in the asset inventory that have condition assessment data documented (29%); and,

### Traffic Control & Safety

- **Qualifier 3:** The percentage of the estimated overall replacement value, in 2023 dollars, attributed to assets in the asset inventory with documented condition assessment data (i.e., condition is not solely age-based) (9%).

**Figure 3-5: SOLI Report Data Confidence – Traffic Control & Safety**



As summarized in **Figure 3-5**, the overall asset condition data confidence for Traffic Control & Safety assets is estimated as Low/Moderate. Presently, condition assessment data is available for most guiderails and traffic signs, but none of the other asset classes. Additionally, the installation years are only known for 50% of the asset inventory which represents a significant data gap. Data confidence can be increased by improving the quality of the data and/or filling data gaps.

Traffic Control & Safety

3.2 Levels of Service

The City has developed the community and technical Levels of Service (LOS), based on contributions from the municipal staff. It was decided that Safety and Quality were key attributes in gauging the performance of the assets. **Table 3-4** and **Table 3-5** outline the City’s current community and technical levels of service for Traffic Control & Safety.

**Table 3-4: Community LOS - Traffic Control & Safety**

LOS Parameter	LOS Statement	Performance Measure	Current LOS (2023)
<b>Safety</b>	Provide a traffic network that is safe for all end-users (drivers, pedestrians, and cyclists).	Number of non-scheduled service issues per year (including weather related)	374

**Table 3-5: Technical LOS - Traffic Control & Safety**

LOS Parameter	LOS Statement	Performance Measure	Current LOS (2023)
<b>Quality</b>	Assets are kept in good working condition.	Percentage of assets that are in poor or better condition.	52%

### Traffic Control & Safety

LOS Parameter	LOS Statement	Performance Measure	Current LOS (2023)
Safety	Providing an operational road network that is safe for drivers, pedestrians and cyclists and meets legislative requirements.	Percentage of regulated Signs that meet retro reflectivity targets.	97.58%

### 3.3 Risk Assessment

The risk ratings for physical Traffic Control & Safety assets included Guide Rails, Signs, Streetlights, and Traffic Signals. The risk scores were calculated using the risk methodology and approach outlined in Section 1.4 of the Introduction. **Table 3-6** summarizes the risk factors for the Traffic Control & Safety assets.

**Table 3-6: Risk Factors - Traffic Control & Safety**

Factors	Risk Ratings
A - Condition	The condition of the assets was determined either by visual or age-based and can be found in the SOLI section of the AMP.
B - Performance	The performance of Signs and Streetlights assets are both assigned a rating of 1, representing that the assets are “always reliable”. The performance of the Guide Rail and Traffic Signal assets was identified as "usually reliable" and assigned a rating of 3 for calculating risk score.

Traffic Control & Safety

Factors	Risk Ratings
<b>C - Climate Change</b>	The climate change ratings were determined at the asset class level by identifying climate change hazard interactions. The Signs and Streetlights assets were identified as a “low” risk and assigned a rating of 1 for calculating the risk score. The Guide Rails and Traffic Signals were identified as a “high” risk and assigned a rating of 5 for calculating the risk score.
<b>D - Impact</b>	The impact of all asset classes was identified as "moderate" impact and assigned a rating of 1 for calculating risk score.
<b>E - Importance</b>	The Guide Rails, Signs, and Streetlights asset classes was identified as “moderate” importance and assigned a rating of 2 when calculating risk. A “high” importance rating was applied to the Traffic Signal assets and a rating of 3 was assigned for calculating risk score.

The individual risk ratings were used in calculating the risk score for each of the assets.

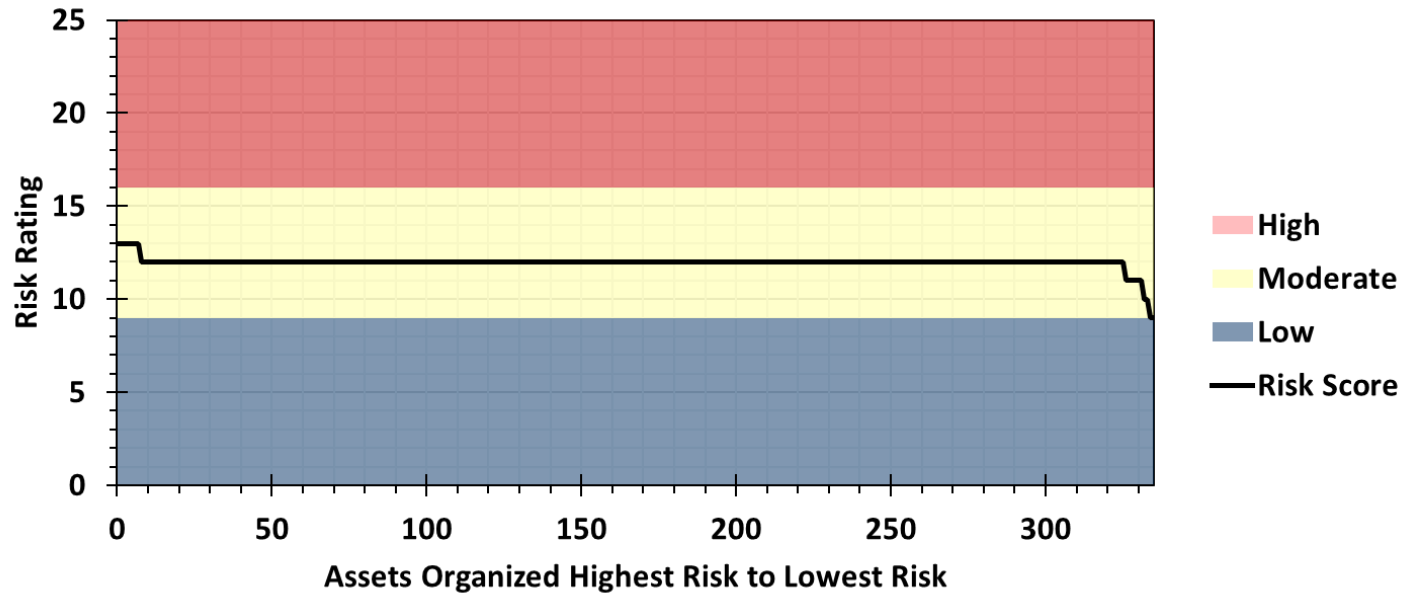
**3.3.1 Risk Profile**

The Risk profile of the Guide Rail assets is displayed in **Figure 3-6**. Of the 335 Guide Rail assets tracked in the asset inventory, approximately 99.5% (333) are considered as Moderate risk and the remaining 0.5% (2) assets are Low risk.



Traffic Control & Safety

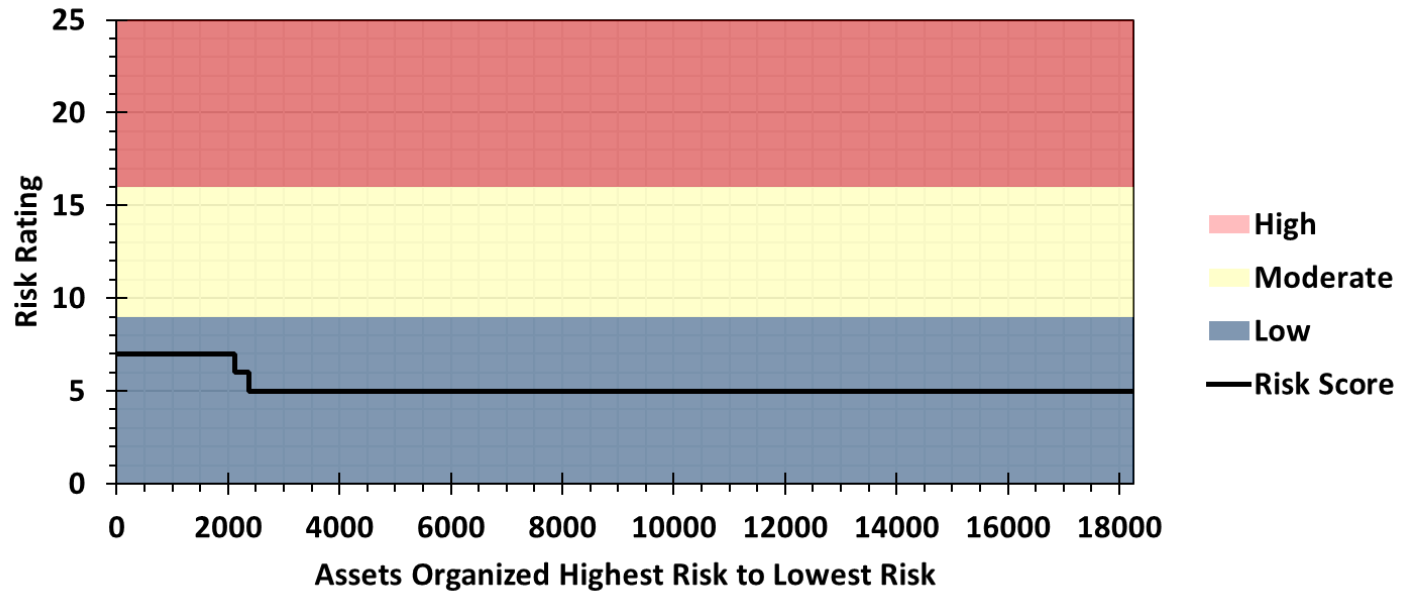
Figure 3-6: Risk Profile - Traffic Control & Safety (Guide Rails)



The Risk profile for Traffic Signs assets is displayed in **Figure 3-7**. All 18,256 Sign assets tracked in the asset inventory are considered as Low risk.

Traffic Control & Safety

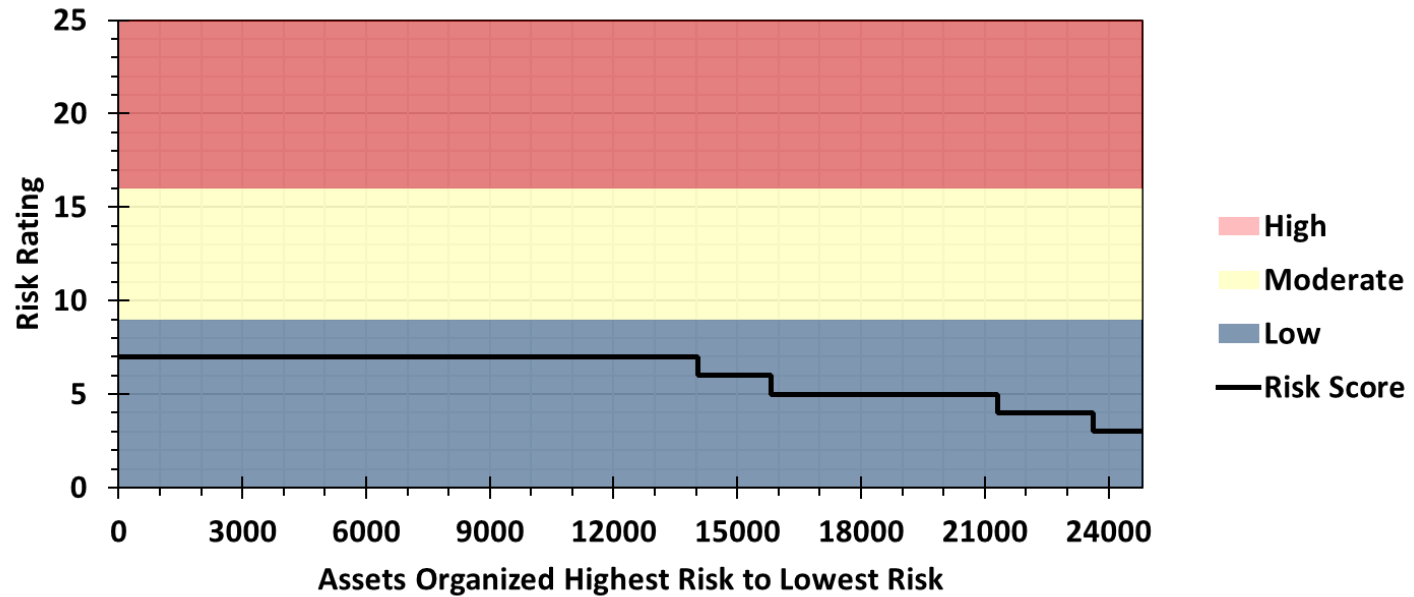
Figure 3-7: Risk Profile - Traffic Control & Safety (Signs)



The Risk profile for Streetlight assets is displayed in **Figure 3-8**. All 24,827 Streetlight assets tracked in the asset inventory are considered as Low risk.

Traffic Control & Safety

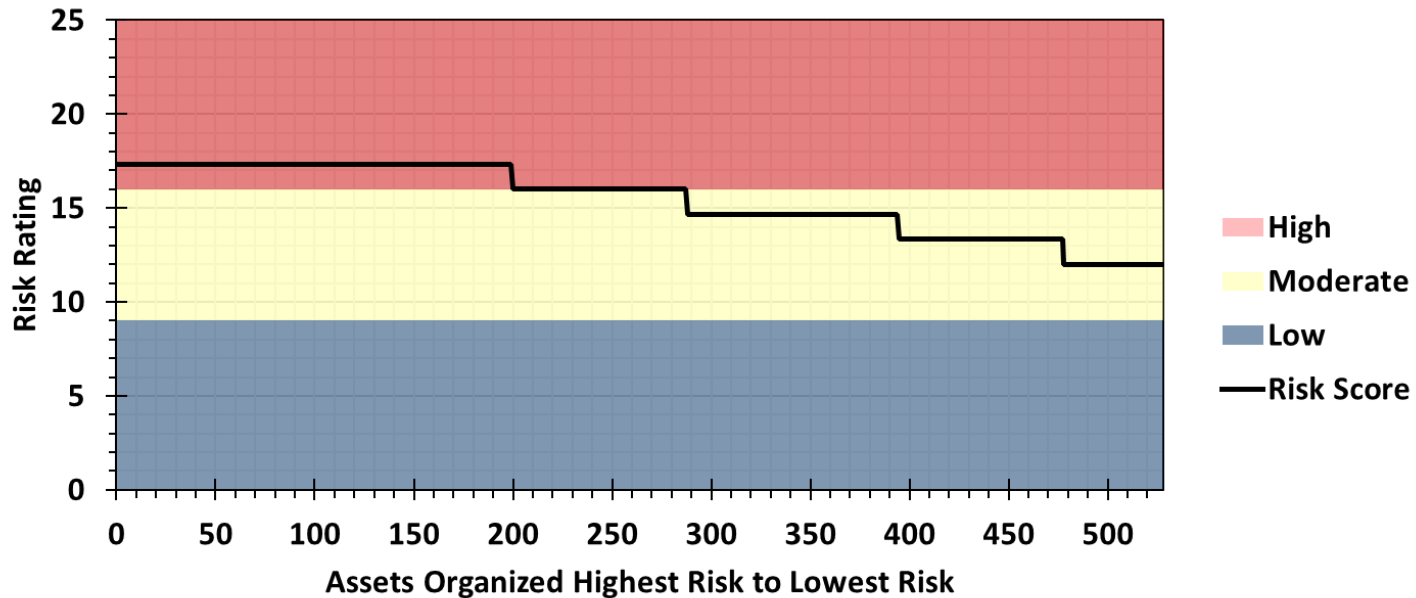
Figure 3-8: Risk Profile - Traffic Control & Safety (Streetlights)



The Risk profile for Traffic Signal assets is displayed in **Figure 3-9**. Of the 528 Traffic Signal assets tracked within the asset inventory, about 37.7% (199) are classified as High risk and the remaining 62.3% (329) are Moderate risk.

## Traffic Control & Safety

Figure 3-9: Risk Profile - Traffic Control & Safety (Traffic Signals)



## 3.4 Asset Management Strategy

### 3.4.1 Lifecycle Activities – Traffic Control & Safety

The lifecycle activities considered include:

- **Non-Infrastructure Solutions:** Actions or policies that can lower costs and extend useful lives.
- **Maintenance Activities:** Regularly scheduled inspection and maintenance, or more significant repair and activities associated with unexpected events.
- **Renewal / Rehabilitation Activities:** Significant repairs designed to extend the life of the asset.
- **Replacement / Construction Activities:** Activities that are expected to occur once an asset has reached the end of its useful life and renewal/rehabilitation is no longer an option.

### Traffic Control & Safety

- **Disposal Activities:** Activities associated with disposing of an asset once it has reached the end of its useful life or is otherwise no longer needed.
- **Expansion / Growth / Service Improvement Activities:** Planned activities required to extend services to previously unserved areas or expand services to meet growth demands.

**Table 3-7** describes the lifecycle activities that can be implemented within the asset management strategy for Traffic Control & Safety assets. The lifecycle activities presented below are existing activities performed by the City, identified during a workshop with City staff in January 2024.

**Table 3-7: Lifecycle Activities – Traffic Control & Safety**

Lifecycle Type	Description of Activity	Frequency / Timing
Non-Infrastructure Solutions	Sign contracts for pricing and warranty of products.	Ongoing
Non-Infrastructure Solutions	General policy to reduce inventory variety to streamline maintenance.	Ongoing
Non-Infrastructure Solutions	Tying replacements and repairs to other capital projects to optimize investments.	Ongoing
Maintenance Activities	Regular Guide Rail inspections and rehabilitation.	Bi-annually
Maintenance Activities	Regular Sign inventory and reflectivity inspections.	Annually

**Traffic Control & Safety**

<b>Lifecycle Type</b>	<b>Description of Activity</b>	<b>Frequency / Timing</b>
Maintenance Activities	Reuse parts from failed/replaced equipment, if possible.	As needed
Maintenance Activities	Regular scheduled inspection of traffic signal cabinets.	Annually
Maintenance Activities	Regular repair of poles and signals as needed due to collisions, extreme weather, or complaints.	Ongoing
Renewal / Rehabilitation Activities	Replacement of specific components as required.	As needed
Replacement / Construction Activities	Replace Streetlights when damaged, utility relocation or part of reconstruction.	As needed
Replacement / Construction Activities	Replacement of streetlight poles/lights at end of EUL	End of EUL
Replacement / Construction Activities	Full reconstruction of Traffic Signals at end of EUL	End of EUL
Disposal Activities	Recover costs with metal recycling (i.e., copper wire).	End of EUL

**Traffic Control & Safety**

<b>Lifecycle Type</b>	<b>Description of Activity</b>	<b>Frequency / Timing</b>
Expansion / Growth / Service Improvement Activities	Centralized signals program, transit signal priority, communications based on studies or new development.	Ongoing
Expansion / Growth / Service Improvement Activities	Active transportation improvements as per ATMP such as dedicated bike & pedestrian signalization.	Ongoing
Expansion / Growth / Service Improvement Activities	Integrated Mobility Plan (IMP)	As needed
Expansion / Growth / Service Improvement Activities	Retrofit streetlight lamps with LED fixtures.	As needed
Expansion / Growth / Service Improvement Activities	Review of other infrastructure around intersection to ensure new features are incorporated (audible pedestrian signals, bike facilities, proper detection, centralized signals software).	During replacement/construction activities

## Traffic Control & Safety

### 3.4.2 Funding the Lifecycle Activities – Traffic Control & Safety

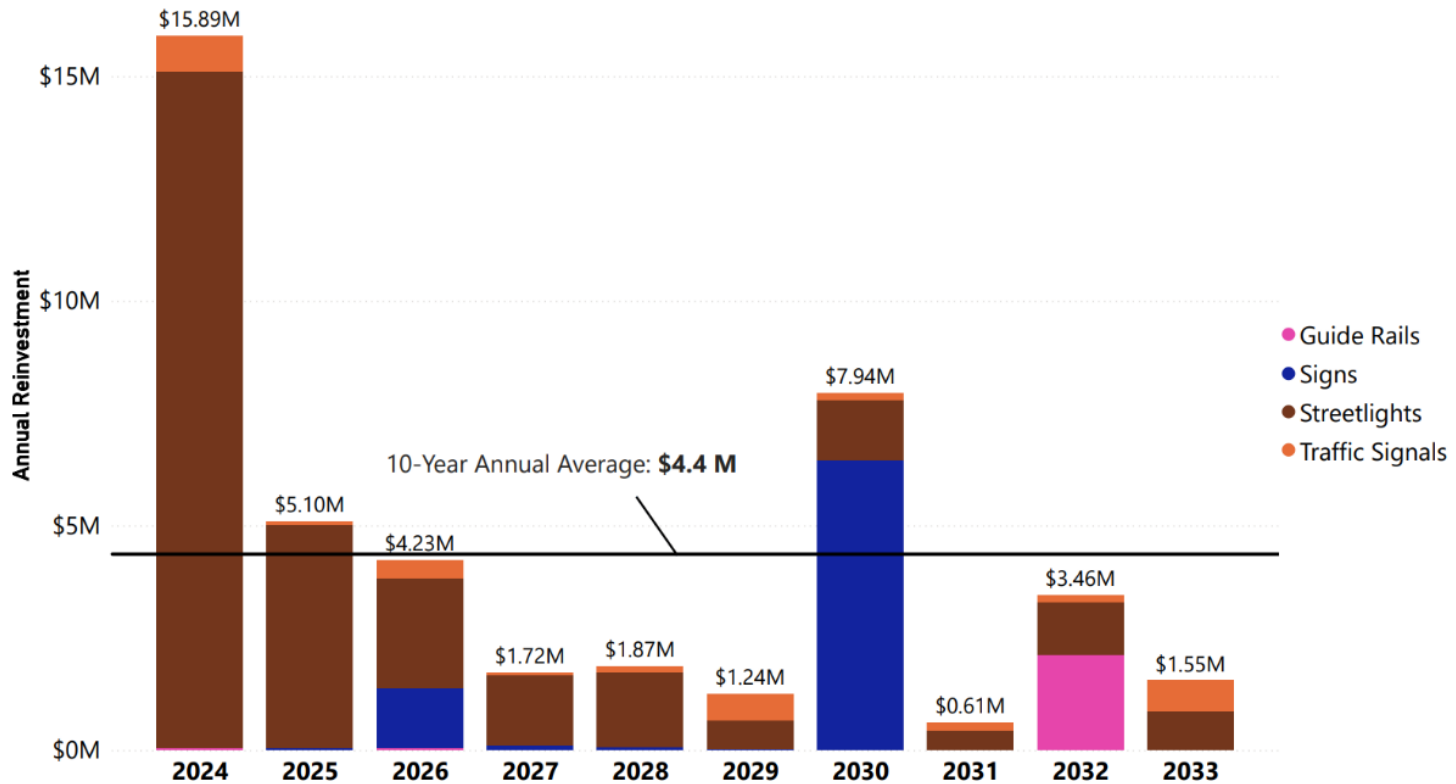
Lifecycle modeling allows for the City to understand the future reinvestment needs of their existing assets by generating a theoretical asset replacement forecast that considers available asset inventory data. The age, EUL, replacement cost, condition, and risk score of each asset can be leveraged within the lifecycle model to proactively plan for reinvestment over a period of interest. Asset replacement forecasts within this subsection estimate the required reinvestment for Traffic Control & Safety assets over the next 10 years based on available asset inventory data.

There is a total of approximately **\$43.6 million** to be reinvested into the Traffic Control & Safety assets owned by the City in the next 10 years. This translates to a 10-year annual average of approximately **\$4.4 million**, as presented in **Figure 3-10**.



Traffic Control & Safety

Figure 3-10: 10-Year Capital Reinvestment Needs – Traffic Control & Safety

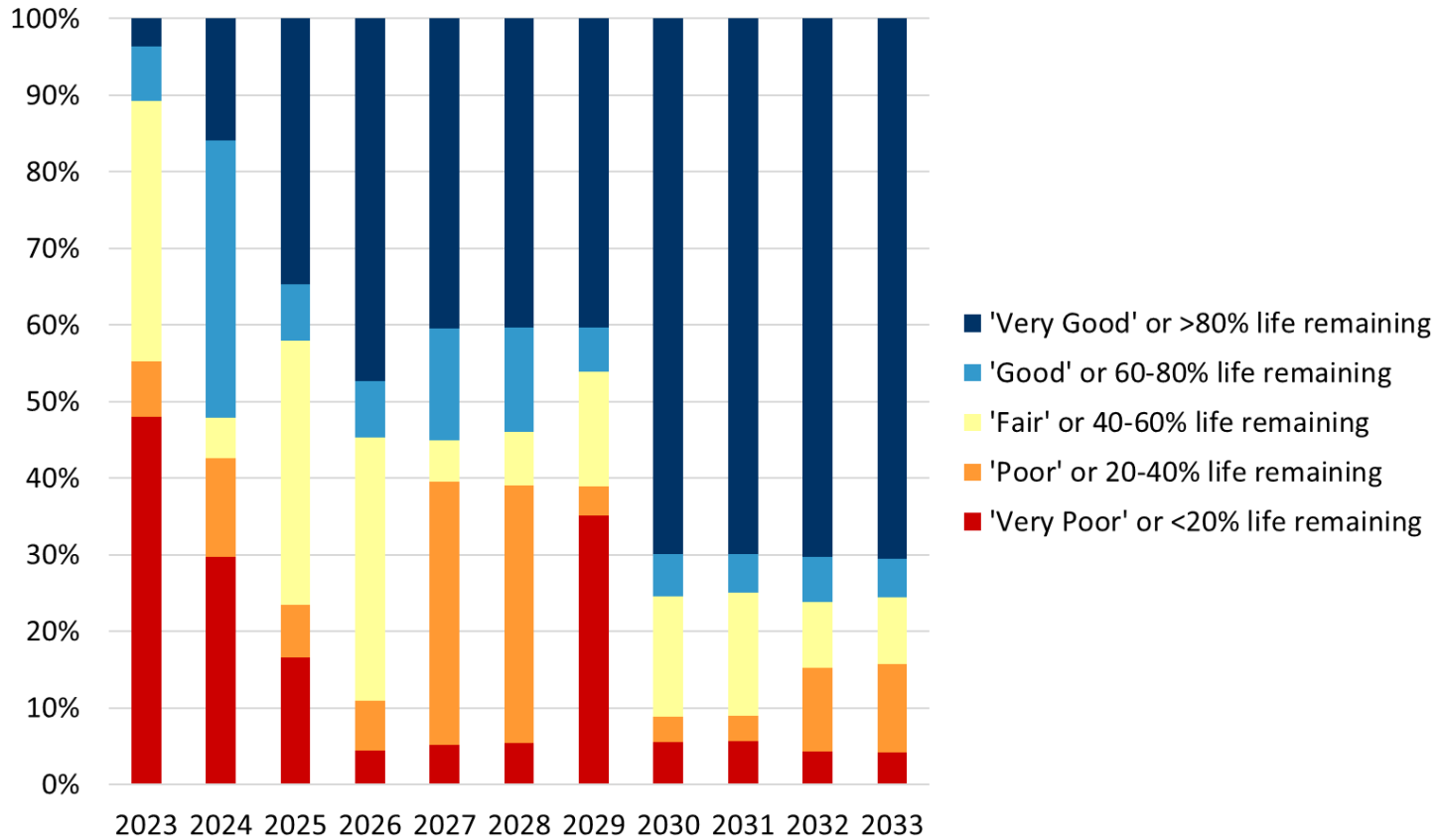


It is important to note that forecasting in this lifecycle model relies heavily on age and EUL to determine renewal or replacement needs and that tracking of condition data for Traffic Control & Safety assets by the City will assist at refining forecasted expenditures in the decades to come. The LOS includes maintaining the current assets in poor or better condition (52%). From the lifecycle model, the percentage of Traffic Control & Safety assets in poor or better condition fluctuates throughout the next 10-years, reaching 96% in 2033.

Traffic Control & Safety

Figure 3-11 shows an overview of the condition of Traffic Control & Safety over the next 10 years based on the lifecycle model.

Figure 3-11: Condition Overview by Year Based on Lifecycle Model – Traffic Control & Safety





## 4.0 Structures

The City's Structures assets include Sidewalks, Wildlife Mitigation Infrastructure, and Minor Culverts (< 3 m). The following section of the AMP includes assets that are under the Structures area.

**Note:** At the time of preparing this AMP, significant data gaps were present in the available data for Minor Culverts (< 3 m) impacting the ability to estimate replacement costing. More specifically, the construction material and size of most culverts (approximately 99%) was unknown and all assets without this information were assigned an “Unspecified” asset type. For estimating replacement costing of unspecified culverts, the average per metre unit cost estimated for culverts with known material and size was assumed. It is recommended that the City further refines their data for culverts including the collection of construction materials and sizing attributes to be considered in subsequent iterations of the AMP.

## Structures

### 4.1 State of the Local Infrastructure

#### 4.1.1 Asset Inventory and Valuation

For inventory purposes, Structures assets are summarized into asset classes, and further divided into applicable asset types. The asset classes, asset types, a count of assets therein, and the total replacement cost (in 2023 dollars) are show in **Table 4-1**. The total replacement cost (2023 dollars) is estimated at **\$482.8 million** for the **11,218 assets** included in the inventory.

**Table 4-1: Inventory Summary by Asset Type - Structures**

Asset Class	Asset Type	Count	Length (km)	Total Replacement Cost (2023)
Sidewalks	Sidewalk – Asphalt	594	74.56	\$7,980,700
Sidewalks	Sidewalk – Concrete/Brick	4,557	508.01	\$97,856,320
Wildlife Mitigation Infrastructure	Wildlife Fencing	6	7.16	\$1,302,420
Minor Culverts (< 3 m)	Minor Culvert – Concrete	4	0.08	\$637,010
Minor Culverts (< 3 m)	Minor Culvert – Unspecified	6,017	69.71	\$373,112,800
Minor Culverts (< 3 m)	Minor Culvert – Steel	40	0.55	\$1,878,050
<b>Overall</b>	<b>N/A</b>	<b>11,218</b>	<b>660.06</b>	<b>\$482,767,300</b>

## Structures

### 4.1.2 Asset Age Summary

**Table 4-2** summarizes the average age, average condition, expected useful life, and the average remaining useful life of assets pertaining to Structures. The overall average age of Structures assets is 74 years, and the average remaining useful life is six years.

**Table 4-2: Average Age, Average Condition, Expected Useful Life, and Remaining Useful Life - Structures**

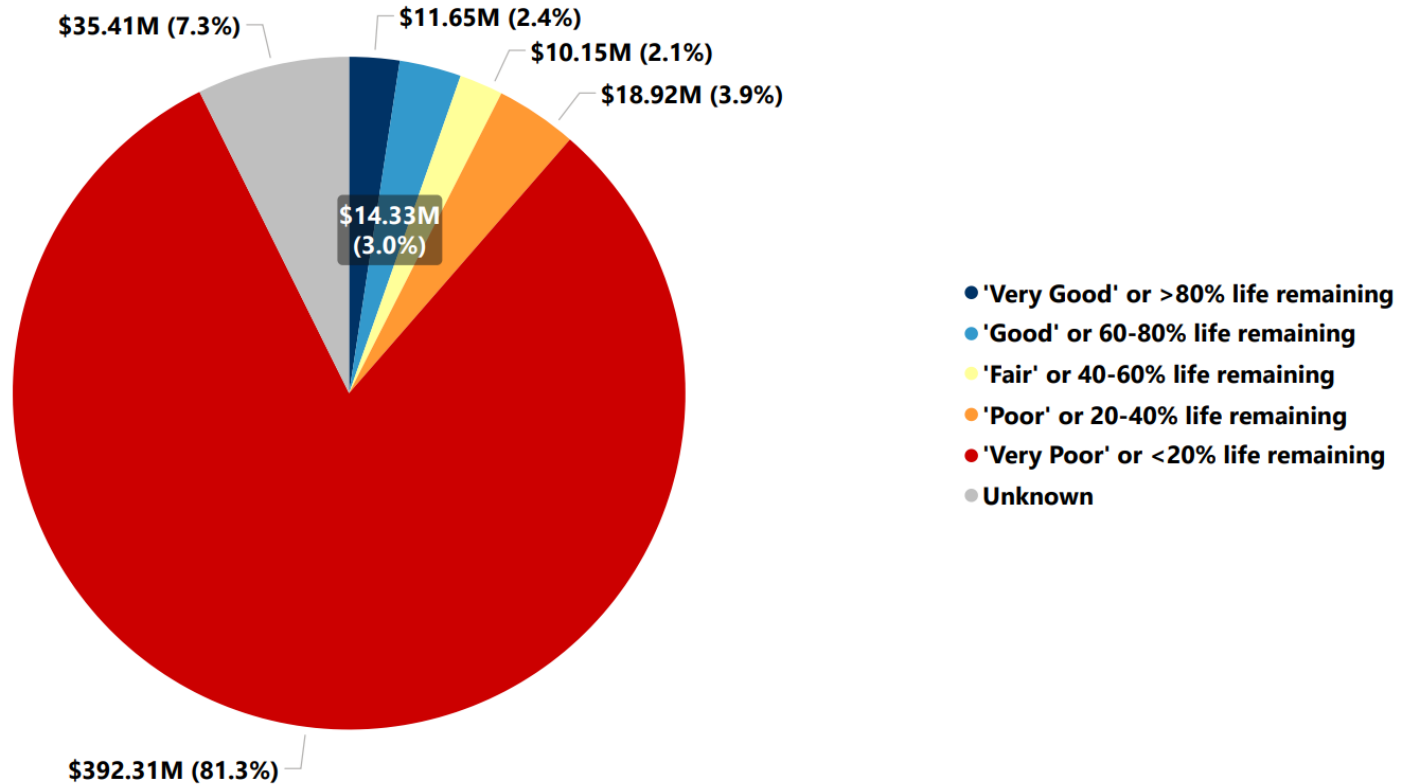
Asset Class	Asset Type	Average Age (Years)	Average Condition Rating	Expected Useful Life (Years)	Average Remaining Useful Life (Years)
Sidewalks	Sidewalk – Asphalt	33	Poor	30	9
Sidewalks	Sidewalk – Concrete/Brick	57	Poor	50	13
Wildlife Mitigation Infrastructure	Wildlife Fencing	4	Very Good	15 to 25	19
Minor Culverts (< 3 m)	Minor Culvert – Concrete	76	Very Poor	50	6
Minor Culverts (< 3 m)	Minor Culvert – Steel	62	Very Poor	30	0
Minor Culverts (< 3 m)	Minor Culvert – Unspecified	93	Very Poor	40	0
<b>Overall</b>	<b>N/A</b>	<b>74</b>	<b>Poor</b>	<b>15 to 50</b>	<b>6</b>

## Structures

### 4.1.3 Asset Condition

An overall condition summary for Structures assets by replacement cost (in 2023 dollars) is shown in **Figure 4-1**. About 7.5% of the assets are in very good to fair condition, with 7.3% of the assets with unknown condition.

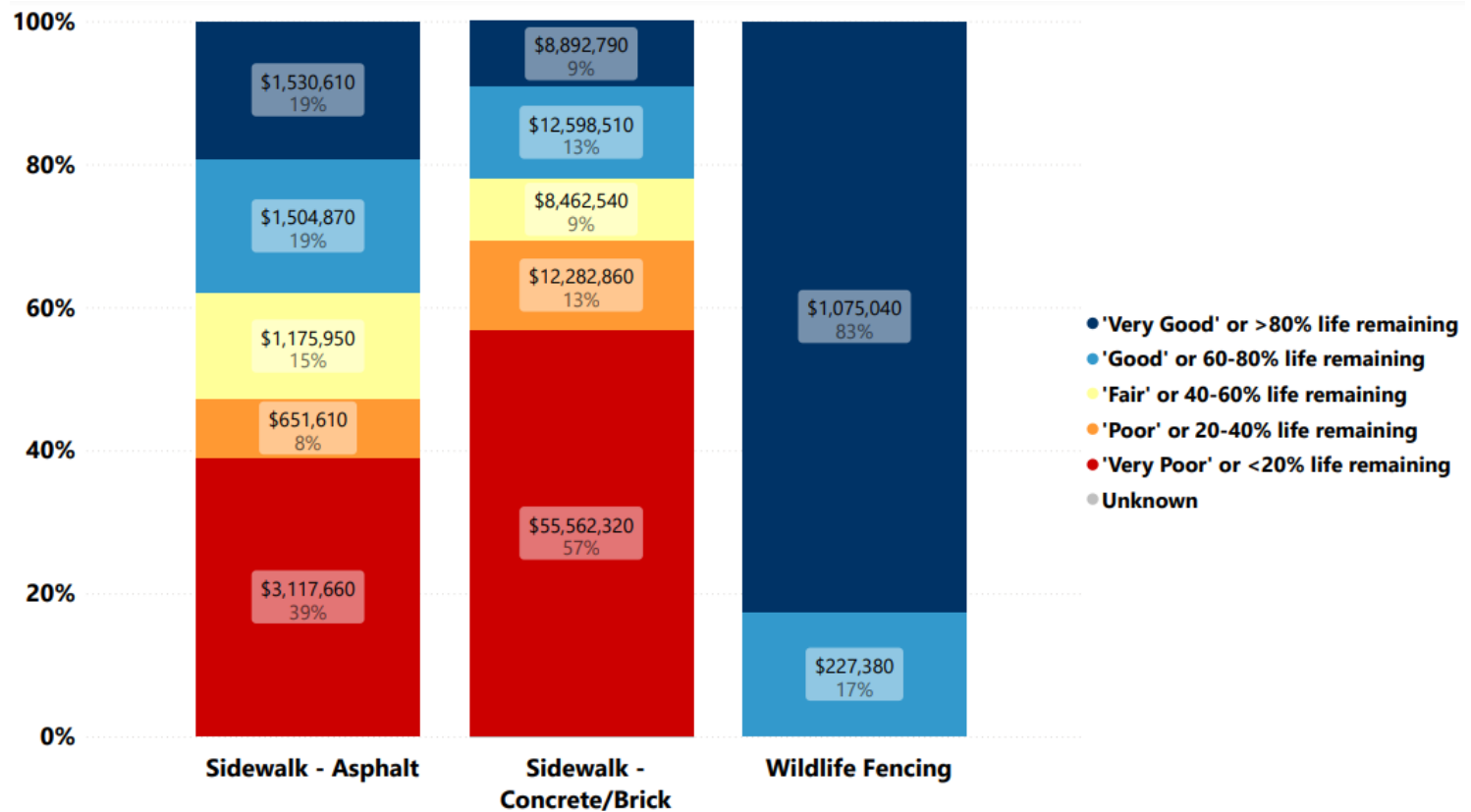
**Figure 4-1: Condition Summary and 2023 Replacement Cost - Structures**



## Structures

A condition summary for Sidewalks and Wildlife Mitigation Infrastructure assets is provided in **Figure 4-2** by asset type and replacement cost (in 2023 dollars). In the absence of condition assessment data, the condition of the assets has been primarily determined based on age and expected useful life.

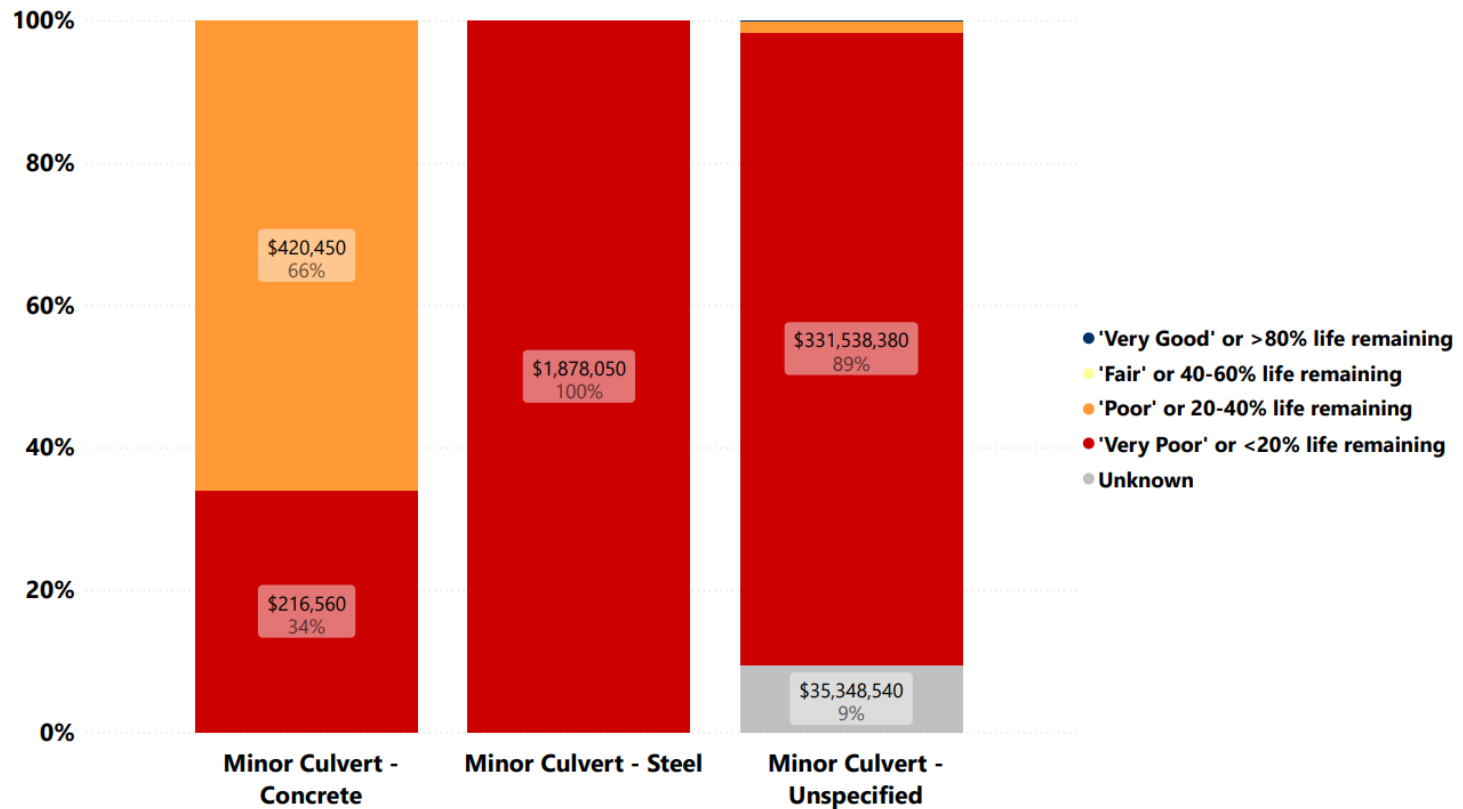
**Figure 4-2: Condition Summary by Asset Type and 2023 Replacement Cost - Structures (Sidewalks and Wildlife Mitigation Infrastructure)**



## Structures

A condition summary for Minor Culverts is provided in **Figure 4-3** by asset type and replacement cost (in 2023 dollars). In the absence of condition assessment data, the condition of Minor Culverts has been primarily determined based on age and expected useful life. It is important to note that a significant portion of the minor culvert inventory pre-dates 1950 based on existing asset data resulting in many assets believed to be in very poor condition.

**Figure 4-3: Condition Summary by Asset Type and 2023 Replacement Cost - Structures (Minor Culverts (< 3 m))**





## Structures

### 4.1.4 Data Sources and Confidence

The asset data for Structures assets is maintained by the City between two main data sources, data for Sidewalks and Minor Culverts (< 3 m) is maintained in a GIS-based repository and data for Wildlife Mitigation Infrastructure is stored in a Microsoft Excel-based inventory spreadsheet.

Data confidence can be estimated based on the confidence level of various qualifiers and can be presented on a scale from 0% (low) to 100% (high), as shown in **Table 4-3**. The qualifiers chosen for evaluation are specifically targeted for estimating overall confidence of condition reporting within the SOLI.

**Table 4-3: Data Confidence Scale**

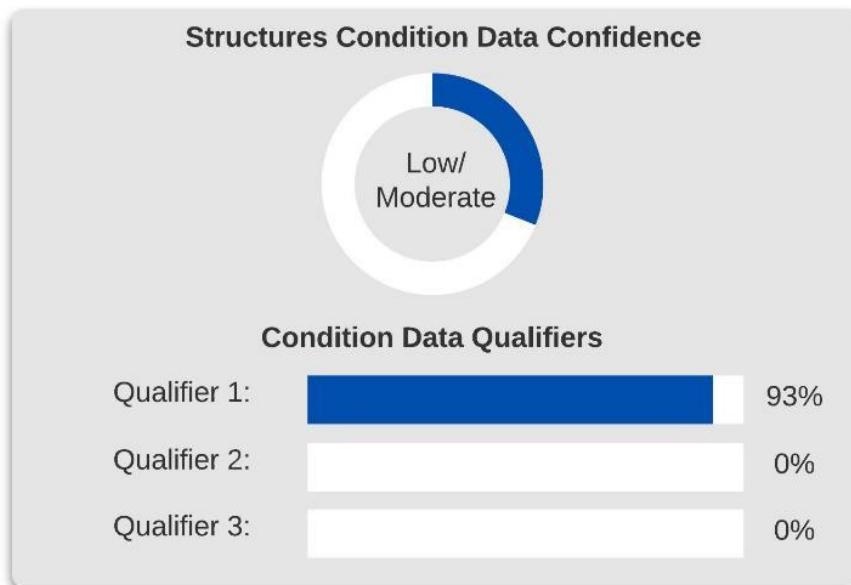
Confidence Level	Low	Low/ Moderate	Moderate	Moderate/ High	High
Average of Qualifiers	0% to 19%	20% to 39%	40% to 59%	60% to 79%	80% to 100%

Assuming the data source is reliable, the following qualifiers were considered to estimate data confidence regarding the data utilized in the creation of this SOLI report:

- **Qualifier 1:** The percentage of assets in the asset inventory where construction, installation, or acquisition years are documented (93%);
- **Qualifier 2:** The percentage of assets in the asset inventory that have condition assessment data documented (0%); and,
- **Qualifier 3:** The percentage of the estimated overall Structures replacement value, in 2023 dollars, attributed to assets in the asset inventory where condition can be assessed using available data (i.e., based on condition assessment history and/or age-based condition) (0%).

## Structures

Figure 4-4: SOLI Report Data Confidence – Structures



As summarized in **Figure 4-4**, the overall asset condition data confidence for Structures assets is estimated as Low/Moderate. Presently, all asset conditions for Structures assets are age-based. Data confidence can be increased by improving the documentation of condition assessment data as a result of a formal condition assessment program. Additionally, asset data for Structures assets should be refined to better inform asset management planning including addressing data gaps such as missing diameters for Minor Culverts (< 3 m).

### 4.2 Levels of Service

The City has developed the community and technical Levels of Service (LOS), based on contributions from the municipal staff. It was decided that Quality and Environmental Acceptability were key attributes in gauging the performance of the assets. **Table 4-4** and **Table 4-5** outline the City’s community and technical levels of service for Structures.

Structures

Table 4-4: Community LOS - Structures

LOS Parameter	LOS Statement	Performance Measure	Current LOS (2023)
<b>Environmental Acceptability</b>	Providing stormwater services that protect and benefit the environment	Percentage of community with stormwater quality control	To be determined

Table 4-5: Technical LOS - Structures

LOS Parameter	LOS Statement	Performance Measure	Current LOS (2023)
<b>Quality</b>	Providing a transportation network that is reliable	Percentage of sidewalk assets in poor or better condition.	44%
<b>Quality</b>	Minor stormwater culverts (<3 m) are in good working condition.	Percentage of stormwater assets that are in poor or better condition.	22%

4.3 Risk Assessment

The risk ratings for Structures assets included Sidewalks, Wildlife Mitigation Infrastructure, and Minor Culverts. The risk scores were calculated using the risk methodology and approach outlined in the Introduction document. **Table 4-6** summarizes the risk factors for the Structures assets.

Structures

Table 4-6: Risk Factors - Structures

Factors	Risk Ratings
<b>A - Condition</b>	The condition of the assets was determined either by visual or age-based and can be found in the SOLI section of the AMP.
<b>B - Performance</b>	The performance of the Sidewalks assets was identified as "usually reliable" and assigned a score of 3 for calculating risk score. The Wildlife Mitigation Infrastructure and Minor Culvert assets was identified as "always reliable" and assigned a risk score of 1.
<b>C - Climate Change</b>	The climate change ratings were determined at the service category level by identifying climate change hazard interactions. The Sidewalks assets were identified as a "moderate" risk and assigned a rating of 3 for calculating the risk score. The Wildlife Mitigation Infrastructure and Minor Culvert assets were identified as a "high" risk and assigned a rating of 5 for calculating the risk score.
<b>D - Impact</b>	The Sidewalk and Minor Culvert assets was recognized as "moderate" impact and assigned a score of 1 for calculating risk score. The impact of the Wildlife Mitigation Infrastructure was identified as "low" impact and assigned a score of 0 for calculating risk score.
<b>E - Importance</b>	The Sidewalk assets was assigned a "high" importance and a score of 3 when calculating risk. A "moderate" importance rating was given to the Minor Culvert assets and a score of 2 was assigned for calculating risk score. The Wildlife Mitigation Infrastructure assets was assigned a "low" importance and score of 1 when calculating risk.

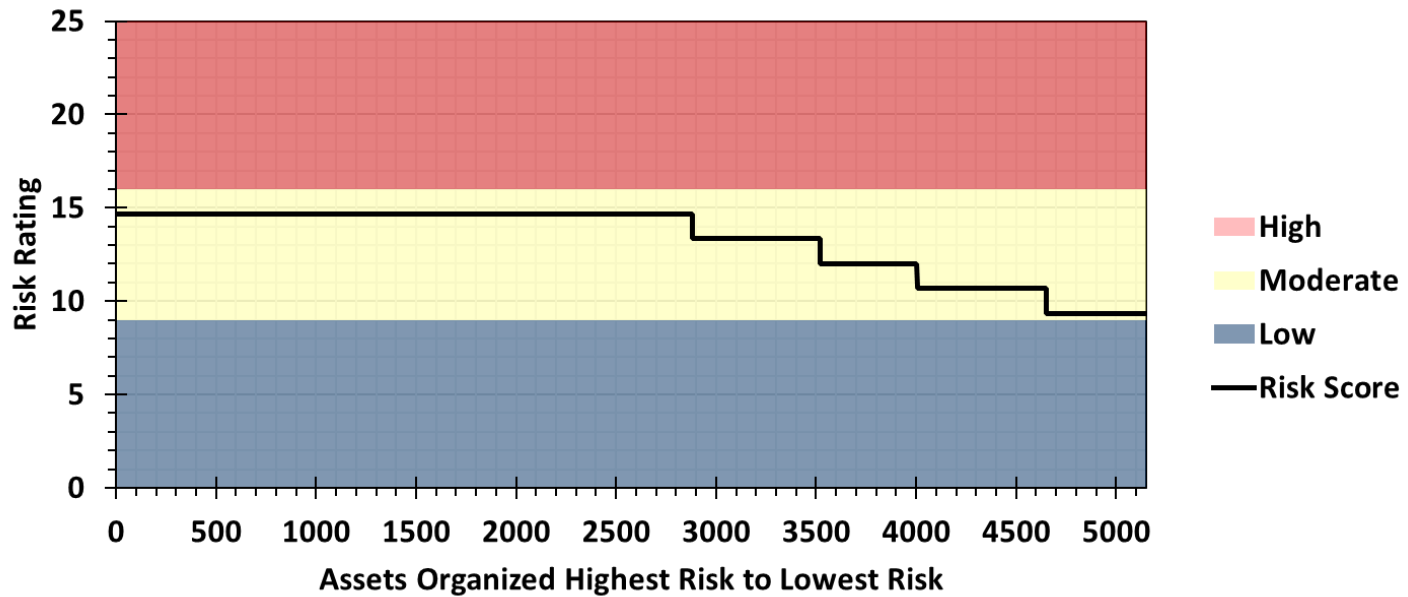
The individual risk ratings were used in calculating the risk score for each of the assets.

## Structures

### 4.3.1 Risk Profile

The Risk profile for the Sidewalk assets is displayed in **Figure 4-5**. All 5,151 Sidewalk assets tracked in the asset inventory are considered as Moderate risk.

**Figure 4-5: Risk Profile - Structures (Sidewalks)**

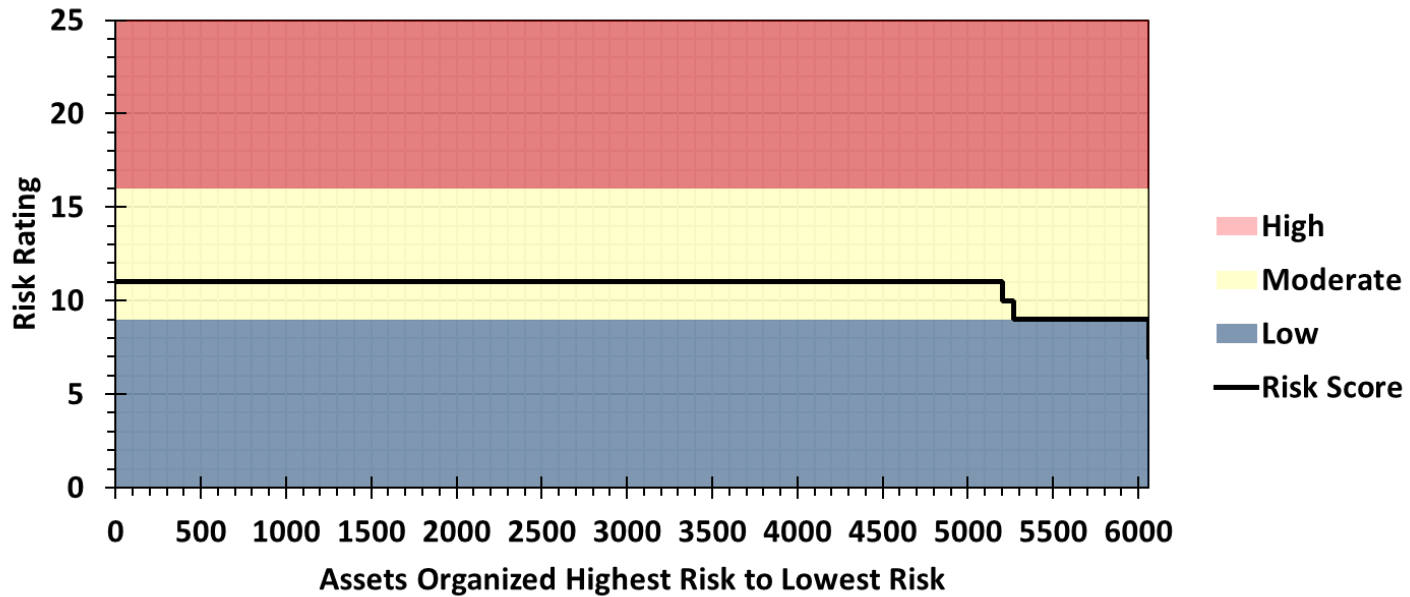


All six (6) Wildlife Mitigation Infrastructure assets tracked in the asset inventory are considered as Low risk.

The Risk profile of the Minor Culvert assets is displayed in **Figure 4-6**. Of the 6,061 Minor Culvert assets tracked in the asset inventory, approximately 86.8% (5,267) assets are considered as Moderate risk. The remaining 13.1% (794) assets are considered Low risk.

## Structures

Figure 4-6: Risk Profile - Structures (Minor Culverts (< 3 m))



## 4.4 Asset Management Strategy

### 4.4.1 Lifecycle Activities - Structures

The lifecycle activities considered include:

- **Non-Infrastructure Solutions:** Actions or policies that can lower costs and extend useful lives.
- **Maintenance Activities:** Regularly scheduled inspection and maintenance, or more significant repair and activities associated with unexpected events.
- **Renewal / Rehabilitation Activities:** Significant repairs designed to extend the life of the asset.
- **Replacement / Construction Activities:** Activities that are expected to occur once an asset has reached the end of its useful life and renewal/rehabilitation is no longer an option.

## Structures

- **Disposal Activities:** Activities associated with disposing of an asset once it has reached the end of its useful life or is otherwise no longer needed.
- **Expansion / Growth / Service Improvement Activities:** Planned activities required to extend services to previously unserved areas or expand services to meet growth demands.

**Table 4-7** describes the lifecycle activities that can be implemented within the asset management strategy for Structures assets. The lifecycle activities presented below are existing activities performed by the City, identified during a workshop with City staff in January 2024.

**Table 4-7: Lifecycle Activities - Structures**

Lifecycle Type	Description of Activity	Frequency / Timing
Non-Infrastructure Solutions	Visual inspections by road patrol	Ongoing
Non-Infrastructure Solutions	Traffic counting program.	Ongoing
Maintenance Activities	Sidewalk inspections and hazard removals.	Annually
Renewal / Rehabilitation Activities	Localized rehabilitation of sidewalk sections.	As needed
Replacement / Construction Activities	Full reconstruction of sidewalks.	End of EUL
Replacement / Construction Activities	Replacement of minor culverts.	Prior to adjacent road resurfacing
Disposal Activities	Recycling of steel culverts.	End of EUL

Structures

Lifecycle Type	Description of Activity	Frequency / Timing
Expansion / Growth / Service Improvement Activities	Expansion of asset inventory based on community masterplans (i.e., Integrated Mobility Plan).	Based on masterplan

4.4.2 Funding the Lifecycle Activities - Structures

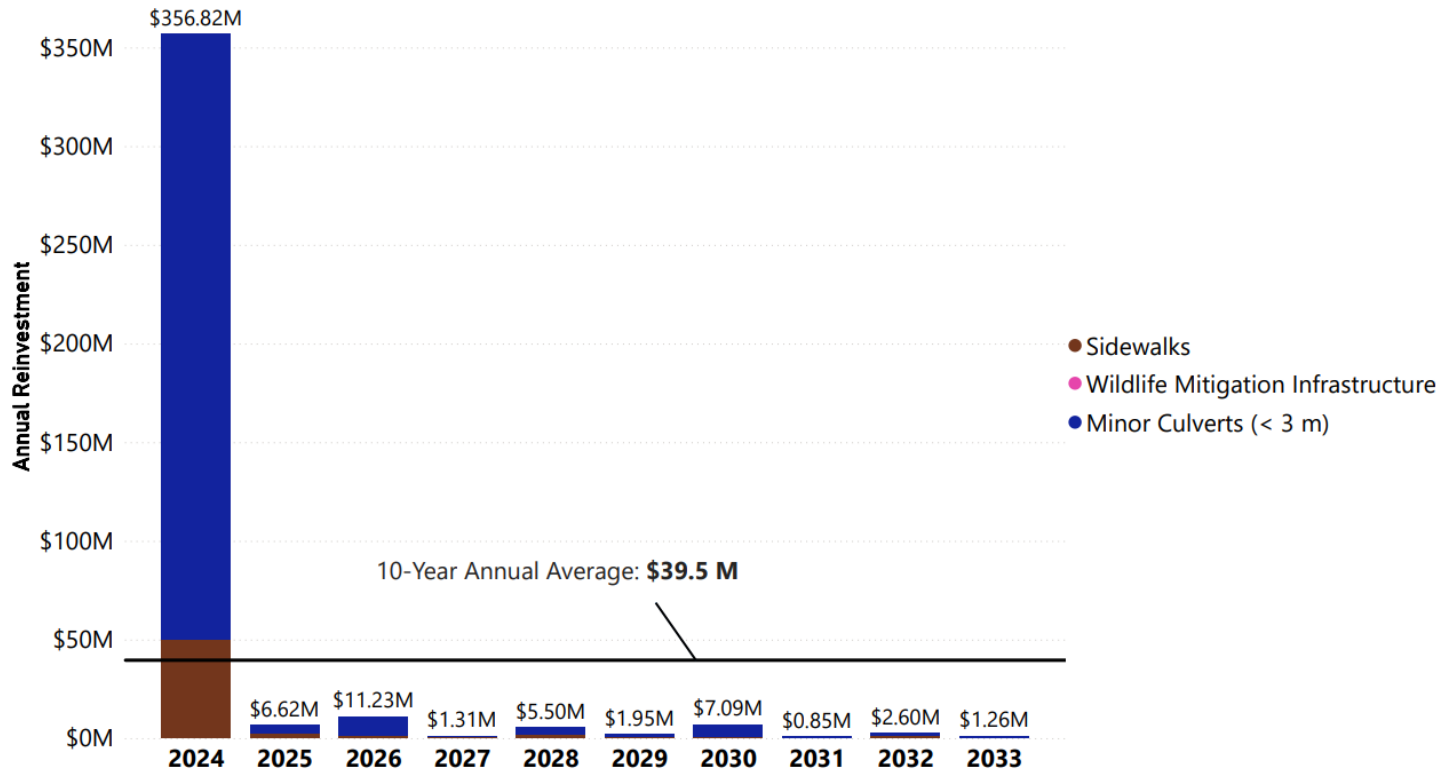
Lifecycle modeling allows for the City to understand the future reinvestment needs of their existing assets by generating a theoretical asset replacement forecast that considers available asset inventory data. The age, EUL, replacement cost, condition, and risk score of each asset can be leveraged within the lifecycle model to proactively plan for reinvestment over a period of interest. Asset replacement forecasts within this subsection estimate the required reinvestment for Structures assets over the next 10 years based on available asset inventory data. It is important to note that a significant portion of the Minor Culvert (< 3 m) inventory includes culverts documented to be over 100 years old resulting in significant backlog forecasted for 2024.

There is a total of approximately **\$395.2 million** to be reinvested into the Structures assets owned by the City in the next 10 years. This translates to a 10-year annual average of approximately **\$39.5 million**, as presented in **Figure 4-7**.



Structures

Figure 4-7: Condition Overview by Year Based on Lifecycle Model – Structures



**Note:** At the time of preparing this AMP, no condition assessment data could be leveraged for Sidewalks and Minor Culverts (< 3 m) and forecasted reinvestment has been derived primarily based on age and expected useful life. Many of these assets are documented to pre-date 1950 which hints at potential inaccuracies within the age data. It is recommended that the City further refines their data for Sidewalks and Minor Culverts (< 3 m) including the collection of condition assessment data to be considered in subsequent iterations of the AMP.

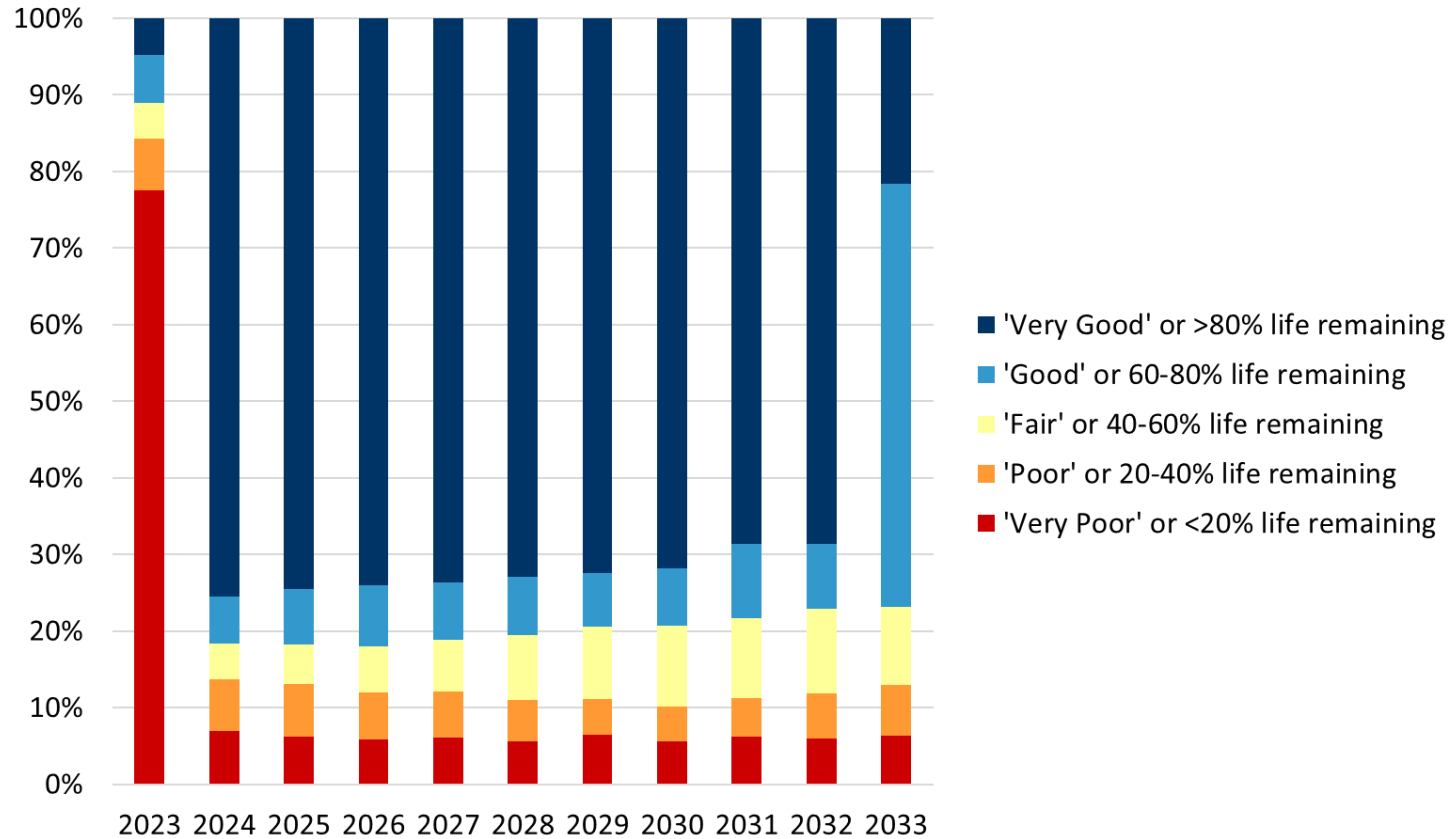
## Structures

It is important to note that forecasting in this lifecycle model relies heavily on age and EUL to determine renewal or replacement needs and that tracking of condition data for Structures assets by the City will assist at refining forecasted expenditures in the decades to come. The LOS includes maintaining the current assets in poor or better condition (22%). From the lifecycle model, the percentage of Structures assets in poor or better condition fluctuates throughout the next 10-years, reaching a high of 94% in 2025 and maintaining 94% through to 2033.

**Figure 4-8** shows an overview of the condition of Structures over the next 10 years based on the lifecycle model.

Structures

Figure 4-8: Condition Overview by Year Based on Lifecycle Model - Structures





## 5.0 Urban Forestry

The City's Urban Forestry includes the City's wealth of diverse tree species that contribute significantly to the overall health and aesthetics of the City's urban environment. Public Works manages and maintains all public trees and related vegetation on City streets, parks, and other communal spaces, as well as implementing strategic tree planting programs. Regular tree health assessments are conducted with an emphasis on sustainable practices, balancing urban development with preservation of natural habitats. The City is committed to enhancing the urban canopy and biodiversity, contributing to its reputation as a sustainable, green City. The following section of the AMP includes assets that are under Forestry, particularly the trees comprising the City's Tree Canopy. This AMP does not include any forestry on private property.

## Urban Forestry

### 5.1 State of the Local Infrastructure

#### 5.1.1 Asset Inventory and Valuation

The Urban Forestry section covers the City’s Tree Canopy including many individual trees spread out over different geographical areas. The asset class, a count of assets therein, and the total replacement cost (in 2023 dollars) are show in **Table 5-1**. The total replacement cost (2023 dollars) is estimated at **\$24.6 million** for the **40,972 assets** included in the inventory.

**Table 5-1: Inventory Summary by Asset Type – Urban Forestry**

Asset Class	Asset Type	Count	Total Replacement Cost (2023)
Tree Canopy	Trees	40,972	\$24,583,200

#### 5.1.2 Asset Age Summary

**Table 5-2** summarizes the average age, average condition, expected useful life, and the average remaining useful life of assets pertaining to Urban Forestry. The overall average age of Urban Forestry assets is 74 years, and the average remaining useful life is 27 years.

**Table 5-2: Average Age, Average Condition, Expected Useful Life, and Remaining Useful Life – Urban Forestry**

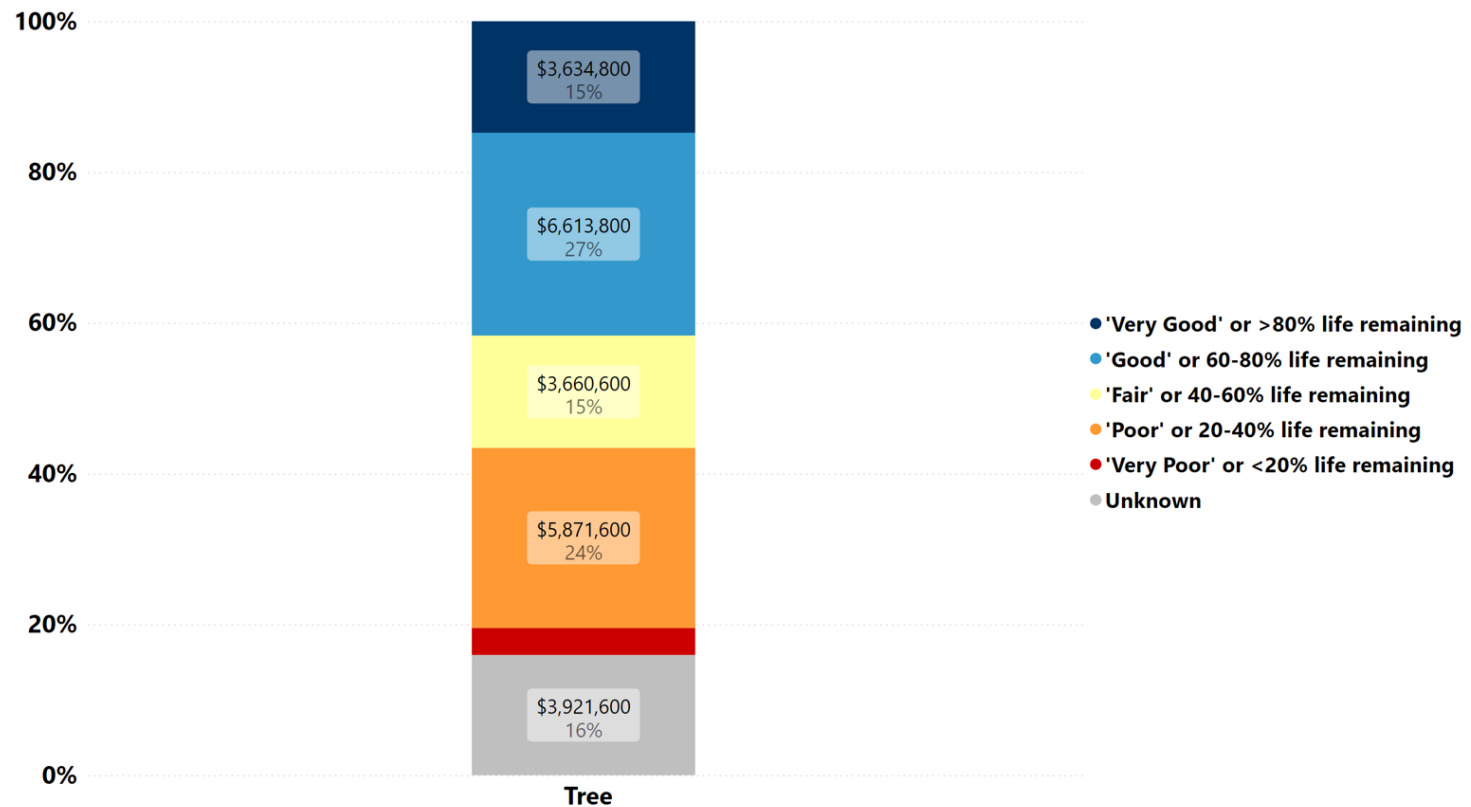
Asset Class	Asset Type	Average Age (Years)	Average Condition Rating	Expected Useful Life (Years)	Average Remaining Useful Life (Years)
Tree Canopy	Tree	74	Fair	50	27

## Urban Forestry

### 5.1.3 Asset Condition

A condition summary for the Tree Canopy is provided in **Figure 5-1** by asset type. Condition has been determined primarily based on the resulting overall condition index for each tree based on tree health assessments completed by the City's forestry staff. About 57% of the assets are in very good to fair condition, with 16% of the assets with unknown condition.

**Figure 5-1: Condition Summary by Asset Type – Urban Forestry (Tree Canopy)**



## Urban Forestry

### 5.1.4 Data Sources and Confidence

The asset data for trees is maintained by the City in a tree registry hosted in Cartegraph which served as the main data source for this AMP. The City has staff who regularly update the inventory data for trees once tree health assessments are completed. This suggests that the data source within this AMP can be assumed to be reliable.

Data confidence can be estimated based on the confidence level of various qualifiers and can be presented on a scale from 0% (low) to 100% (high), as shown in **Table 5-3**. The qualifiers chosen for evaluation are specifically targeted for estimating overall confidence of condition reporting within the SOLI.

**Table 5-3: Data Confidence Scale**

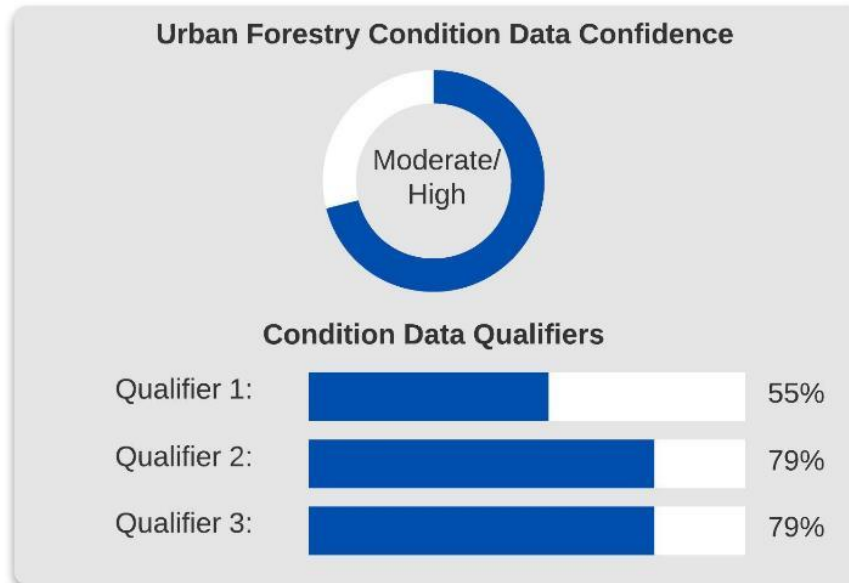
Confidence Level	Low	Low/ Moderate	Moderate	Moderate/ High	High
Average of Qualifiers	0% to 19%	20% to 39%	40% to 59%	60% to 79%	80% to 100%

Assuming the data source is reliable, the following qualifiers were considered to estimate data confidence regarding the data utilized in the creation of this SOLI report:

- **Qualifier 1:** The percentage of assets in the asset inventory where construction, installation, or acquisition years are documented (55%);
- **Qualifier 2:** The percentage of assets in the asset inventory that have condition assessment data documented (79%); and,
- **Qualifier 3:** The percentage of the estimated overall replacement value, in 2023 dollars, attributed to assets in the asset inventory with documented condition assessment data (i.e., condition is not solely age-based) (79%).

## Urban Forestry

Figure 5-2: SOLI Report Data Confidence – Urban Forestry



As summarized in **Figure 5-2**, the overall asset condition data confidence for Urban Forestry assets is estimated to be Moderate/High. Data confidence can be increased by improving the quality of the data and/or filling in data gaps.

### 5.2 Levels of Service

The City has developed the community and technical Levels of Service (LOS), based on contributions from the municipal staff. It was decided that Capacity and Quality were key attributes in gauging the performance of the assets. **Table 5-4** and **Table 5-5** outline the City’s current community and technical levels of service for Urban Forestry.



## Urban Forestry

**Table 5-4: Community LOS – Urban Forestry**

LOS Parameter	LOS Statement	Performance Measure	Current LOS (2023)
<b>Capacity</b>	Provide a sufficient Tree Canopy around the City.	Percent Tree Canopy coverage.	30%

**Table 5-5: Technical LOS – Urban Forestry**

LOS Parameter	LOS Statement	Performance Measure	Current LOS (2023)
<b>Quality</b>	Providing quality Urban Forestry services and healthy urban trees.	Percentage of trees that are in poor or better condition.	96%

### 5.3 Risk Assessment

The risk ratings for Urban Forestry assets include the Tree Canopy. The risk scores were calculated using the risk methodology and approach outlined in the Introduction document. **Table 5-6** summarizes the risk factors for the Urban Forestry assets.

Urban Forestry

Table 5-6: Risk Factors – Urban Forestry

Factors	Risk Ratings
<b>A - Condition</b>	The condition of the assets was determined either by visual or age-based and can be found in the SOLI section of the AMP.
<b>B - Performance</b>	The performance of the asset class was identified as "usually reliable" and assigned a rating of 3 for calculating risk score.
<b>C - Climate Change</b>	The climate change ratings were determined at the asset class level by identifying climate change hazard interactions. The Tree Canopy assets were identified as a "high" risk and assigned a rating of 5 for calculating the risk score.
<b>D - Impact</b>	The Tree Canopy assets were recognized as "low" impact and assigned a rating of 0 for calculating risk score.
<b>E - Importance</b>	The Tree Canopy asset class was identified as "high" importance and assigned a rating of 3 when calculating risk.

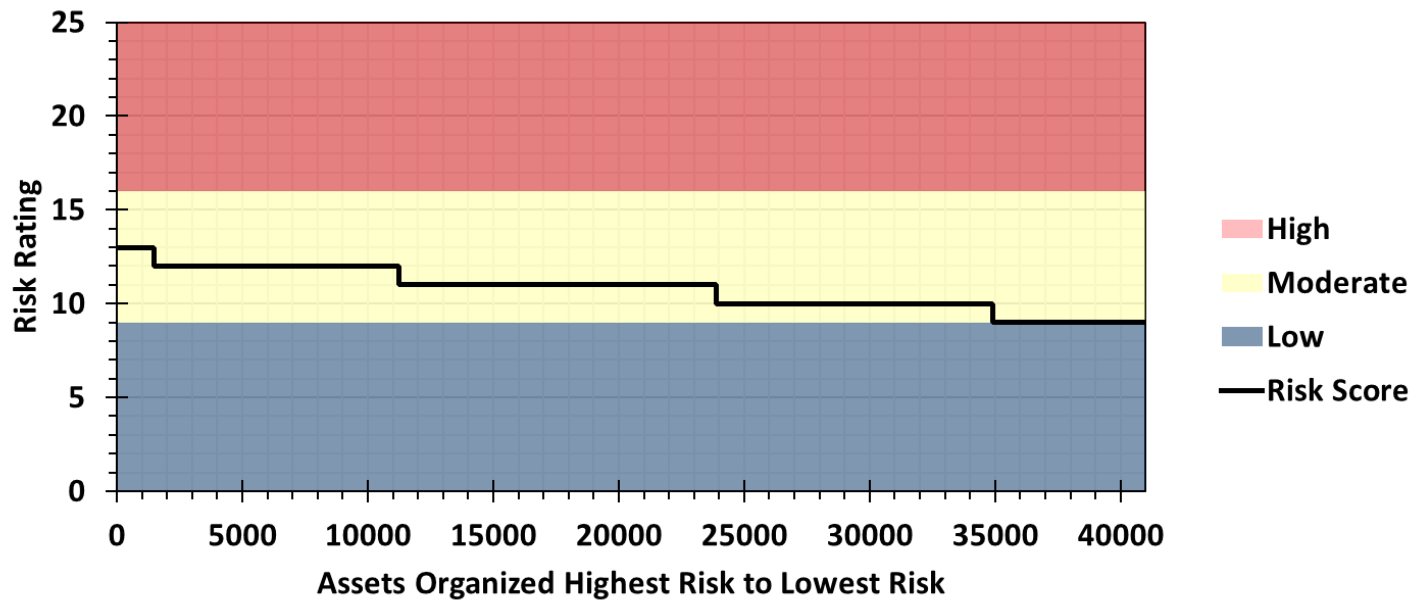
The individual risk ratings were used in calculating the risk score for each of the assets.

## Urban Forestry

### Risk Profile

The Risk profile of the Tree Canopy assets is displayed in **Figure 5-3**. Of the 40,972 Trees tracked within the asset inventory, approximately 85.2% (34,914) are classified as Moderate risk and the remaining 14.7% (6,058) are Low risk.

**Figure 5-3: Risk Profile – Urban Forestry (Tree Canopy)**



## 5.4 Asset Management Strategy

### 5.4.1 Lifecycle Activities – Urban Forestry

The lifecycle activities considered include:

## Urban Forestry

- **Non-Infrastructure Solutions:** Actions or policies that can lower costs and extend useful lives.
- **Maintenance Activities:** Regularly scheduled inspection and maintenance, or more significant repair and activities associated with unexpected events.
- **Renewal / Rehabilitation Activities:** Significant repairs designed to extend the life of the asset.
- **Replacement / Construction Activities:** Activities that are expected to occur once an asset has reached the end of its useful life and renewal/rehabilitation is no longer an option.
- **Disposal Activities:** Activities associated with disposing of an asset once it has reached the end of its useful life or is otherwise no longer needed.
- **Expansion / Growth / Service Improvement Activities:** Planned activities required to extend services to previously unserved areas or expand services to meet growth demands.

**Table 5-7** describes the lifecycle activities that can be implemented within the asset management strategy for Urban Forestry assets. The lifecycle activities presented below are existing activities performed by the City, identified during a workshop with City staff in January 2024.

**Table 5-7: Lifecycle Activities – Urban Forestry**

Lifecycle Type	Description of Activity	Frequency / Timing
Non-Infrastructure Solutions	Tree by-law and Forestry Management Plan	Ongoing
Non-Infrastructure Solutions	Neighbourhood Tree Planting Program	Ongoing
Maintenance Activities	Mitigation maintenance pruning program.	Ongoing
Maintenance Activities	Routine inspection for all trees	High-Risk Trees: Annually Other Trees: Every 3 to 5 years

Urban Forestry

Lifecycle Type	Description of Activity	Frequency / Timing
Maintenance Activities	Ash Tree Preventative Treatment Program (part of annual tree inspections)	Annual program for remaining ash trees in inventory
Renewal / Rehabilitation Activities	Silva cells in new construction in areas with high percentages of hardscapes.	As needed
Replacement / Construction Activities	Where possible replace every tree removed with a new tree in the same spot or in another area.	End of EUL
Disposal Activities	Utilizing the mulch generated from removed trees for young tree protections.	End of EUL
Expansion / Growth / Service Improvement Activities	Goal to increase Tree Canopy to 30%, as per section 2.3.3. of the City of Kingston’s Strategic Plan 2023-2026, by planting additional trees on public land in any area determined feasible. Also, support the planting of trees on private property without the City taking ownership of the tree.	Ongoing

## Urban Forestry

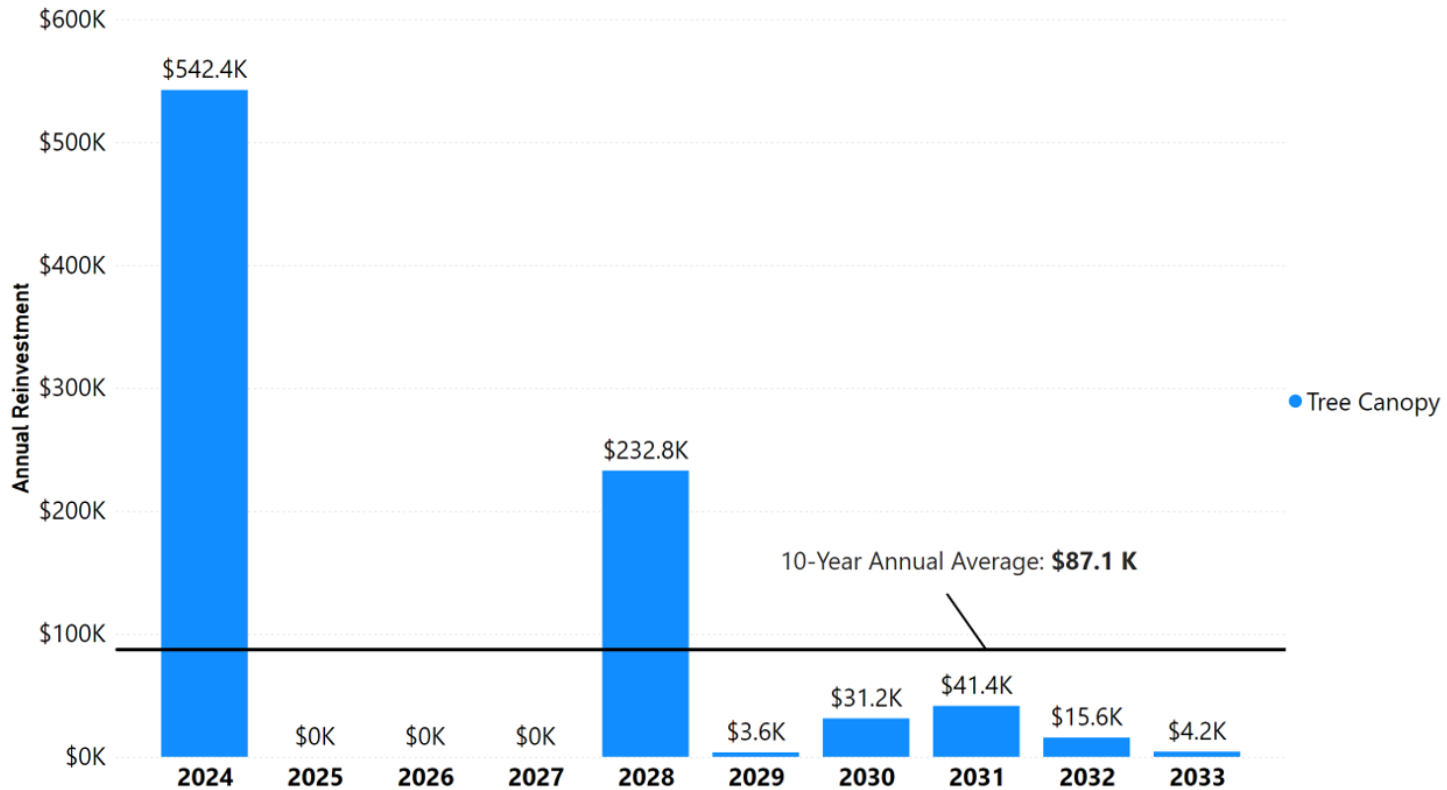
### 5.4.2 Funding the Lifecycle Activities - Urban Forestry

Lifecycle modeling allows for the City to understand the future reinvestment needs of their existing assets by generating a theoretical asset replacement forecast that considers available asset inventory data. The age, EUL, replacement cost, condition, and risk score of each asset can be leveraged within the lifecycle model to proactively plan for reinvestment over a period of interest. Asset replacement forecasts within this subsection estimate the required reinvestment for Urban Forestry assets over the next 10 years based on available asset inventory data.

There is a total of approximately **\$871.2 thousand** to be reinvested into the Urban Forestry assets owned by the City in the next 10 years. This translates to a 10-year annual average of approximately **\$87.1 thousand**, as presented in **Figure 5-4**.

## Urban Forestry

Figure 5-4: 10-Year Capital Reinvestment Needs - Urban Forestry

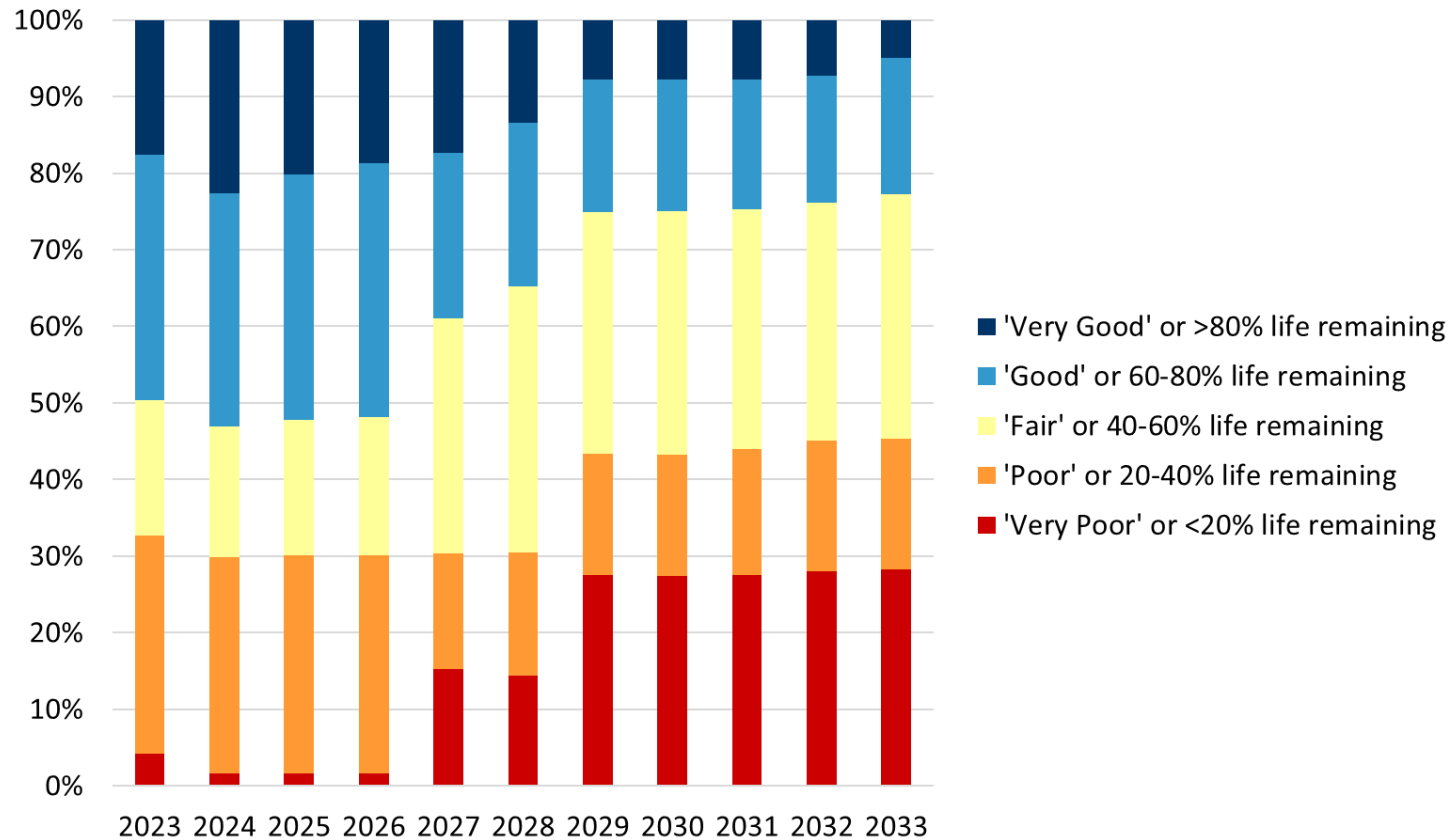


It is important to note that forecasting in this lifecycle model relies heavily on age and EUL to determine renewal or replacement needs and that tracking of condition data for tree assets by the City will assist at refining forecasted expenditures in the decades to come. The LOS includes maintaining the current assets in poor or better condition (96%). From the lifecycle model, the percentage of Urban Forestry assets in poor or better condition fluctuates throughout the next 10-years, reaching a high of 98% from 2024 to 2026 and eventually finishing at 72% in 2033.

## Urban Forestry

**Figure 5-5** shows an overview of the condition of Urban Forestry over the next 10 years based on the lifecycle model.

**Figure 5-5: Condition Overview by Year Based on Lifecycle Model – Urban Forestry**







## 6.0 Kingston Fire & Rescue

Kingston's Fire & Rescue manages and oversees the operation and maintenance of Facilities, Vehicles, and required equipment that support everyday operations. The following section of the AMP includes assets that are utilized by Kingston Fire & Rescue.

It is important to note that Kingston Fire & Rescue Facilities were included in the dedicated 2023 Facilities AMP developed by the City's Facilities Management & Construction Services (FMCS) department in consultation with GM BluePlan Engineering Limited. As a result, the details on these facilities in this AMP are limited to basic inventory information. For further detail on the facilities including data confidence and lifecycle modeling, please refer to the 2023 Facilities AMP.

Kingston Fire & Rescue

6.1 State of the Local Infrastructure

6.1.1 Asset Inventory and Valuation

Kingston Fire & Rescue oversees many Fleet, Equipment, and Facility assets. For inventory purposes, these have been summarized into asset classes and further divided into applicable asset types. The asset classes, asset types, a count of assets therein, and the total replacement cost (in 2023 dollars) are show in **Table 6-1**. The total replacement cost (2023 dollars) is estimated at **\$118.1 million** for the **168 assets** included in the inventory.

**Table 6-1 Notes**

<sup>1</sup> As reported in Facilities AMP (2023).

<sup>2</sup> To be updated in the 2025 AMP.

**Table 6-1: Inventory Summary by Asset Type – Kingston Fire & Rescue**

Asset Class	Asset Type	Count	Total Replacement Cost (2023)
Facilities <sup>1</sup>	Fire Stations, Towers, and Storage Buildings	25	\$55,000,000 <sup>1</sup>
Fleet	Light Vehicle	31	\$2,170,000
Fleet	Heavy Vehicle	33	\$50,832,720
Fleet	Boat	1	\$1,898,840
Fleet	Trailer	1 <sup>2</sup>	\$6,500
Equipment	Equipment	77	\$8,647,750
<b>Overall</b>	<b>N/A</b>	<b>168</b>	<b>\$118,105,810</b>

## Kingston Fire & Rescue

### 6.1.2 Asset Age Summary

**Table 6-2** summarizes the average age, average condition, expected useful life, and the average remaining useful life of assets pertaining to Kingston Fire & Rescue. For details regarding facilities, please refer to the Facilities AMP (2023). The overall average age of Kingston Fire & Rescue assets is 12 years, and the average remaining useful life is four years.

**Table 6-2: Average Age, Average Condition, Expected Useful Life, and Remaining Useful Life - Kingston Fire & Rescue**

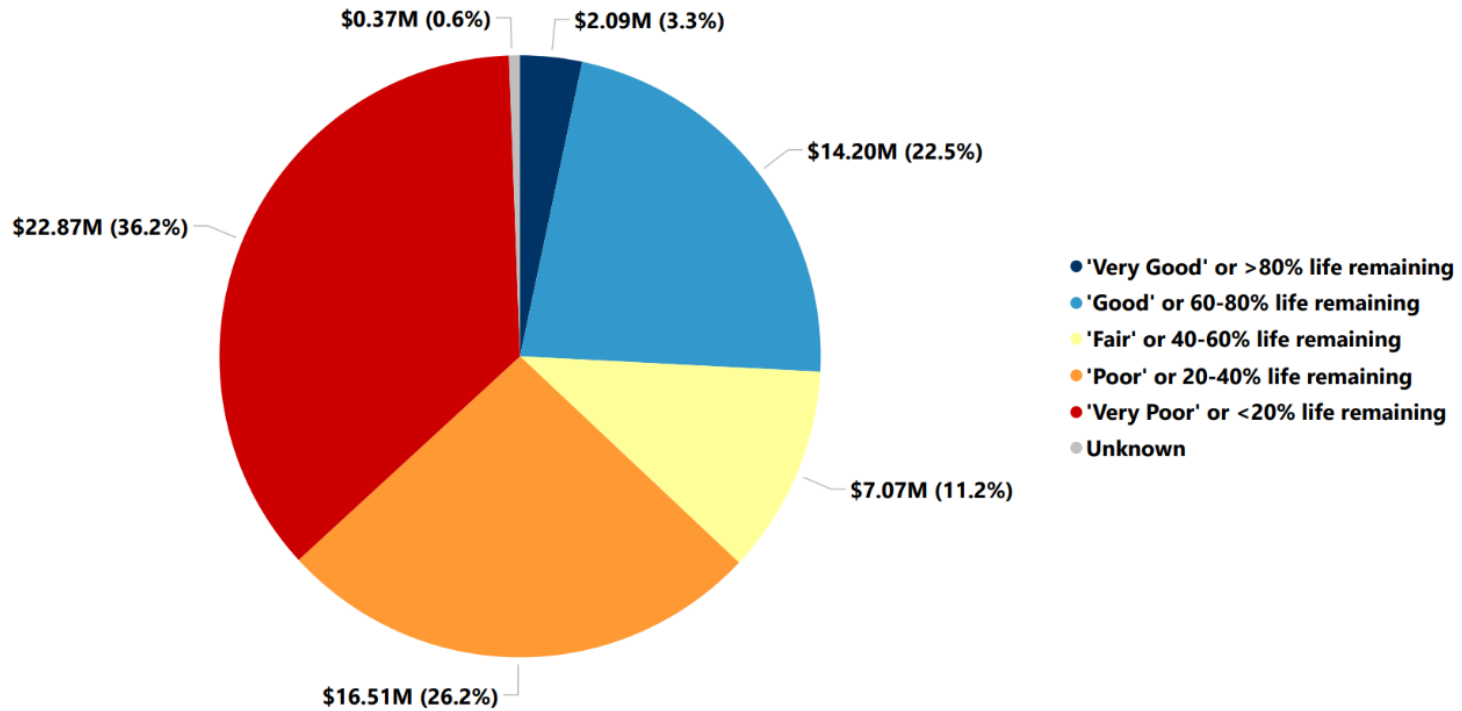
Asset Class	Asset Type	Average Age (Years)	Average Condition Rating	Expected Useful Life (Years)	Average Remaining Useful Life (Years)
Fleet	Light Vehicle	10	Poor	10	2
Fleet	Heavy Vehicle	15	Poor	20	6
Fleet	Boat	5	Good	20	15
Fleet	Trailer	15	Very Poor	15	0
Equipment	Equipment	11	Poor	15	4
<b>Overall</b>	<b>N/A</b>	<b>12</b>	<b>Poor</b>	<b>10 to 20</b>	<b>4</b>

### 6.1.3 Asset Condition

An overall condition summary for Kingston Fire & Rescue assets by replacement cost (in 2023 dollars) is shown in **Figure 6-1**. About 37% of the assets are in very good to fair condition, with 0.6% of the assets with unknown condition.

Kingston Fire & Rescue

Figure 6-1: Condition Summary and 2023 Replacement Cost – Kingston Fire & Rescue

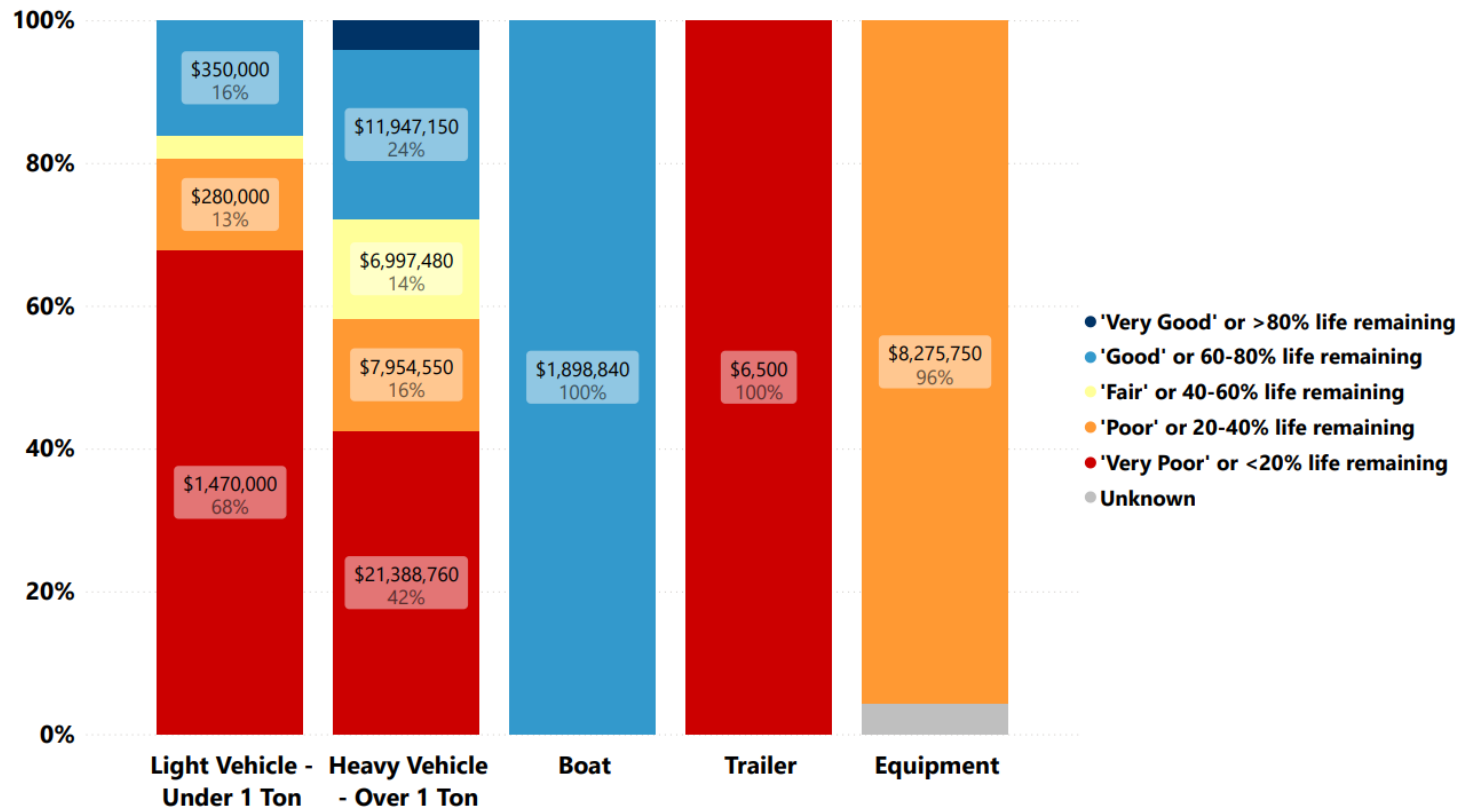


Based on Figure 14 of the Facilities AMP (2023), building and site elements that represent approximately 3% of the total replacement value of Kingston Fire & Rescue Facilities are in very poor condition; 25% are in poor condition, 32% are in fair condition, and 40% are in good condition. For further details regarding Kingston Fire & Rescue facilities, please refer to the Facilities AMP (2023).

### Kingston Fire & Rescue

A condition summary for Fleet and Equipment assets is provided in **Figure 6-2** by asset type and replacement cost (in 2023 dollars). In the absence of condition assessment data, the condition of Fleet and Equipment assets has been primarily determined based on age and expected useful life.

**Figure 6-2: Condition Summary by Asset Type and 2023 Replacement Cost - Kingston Fire & Rescue (Fleet and Equipment)**



## Kingston Fire & Rescue

### 6.1.4 Data Sources and Confidence

The asset data for Kingston Fire & Rescue Fleet assets is maintained by the City in a web-based fleet and equipment management solution from AssetWorks Inc. called FleetFocus M5 and served as the main data source of Fleet and Equipment assets for this AMP. The City has staff who regularly update the inventory data for Kingston Fire & Rescue assets hosted within the City’s Enterprise Fleet Management Information System. This suggests that the data source within this AMP can be assumed to be reliable.

Data confidence can be estimated based on the confidence level of various qualifiers and can be presented on a scale from 0% (low) to 100% (high), as shown in **Table 6-3**. The qualifiers chosen for evaluation are specifically targeted for estimating overall confidence of condition reporting within the SOLI.

For discussion on data confidence related to Kingston Fire & Rescue Facilities, please refer to the Facilities AMP (2023).

**Table 6-3: Data Confidence Scale**

Confidence Level	Low	Low/ Moderate	Moderate	Moderate/ High	High
Average of Qualifiers	0% to 19%	20% to 39%	40% to 59%	60% to 79%	80% to 100%

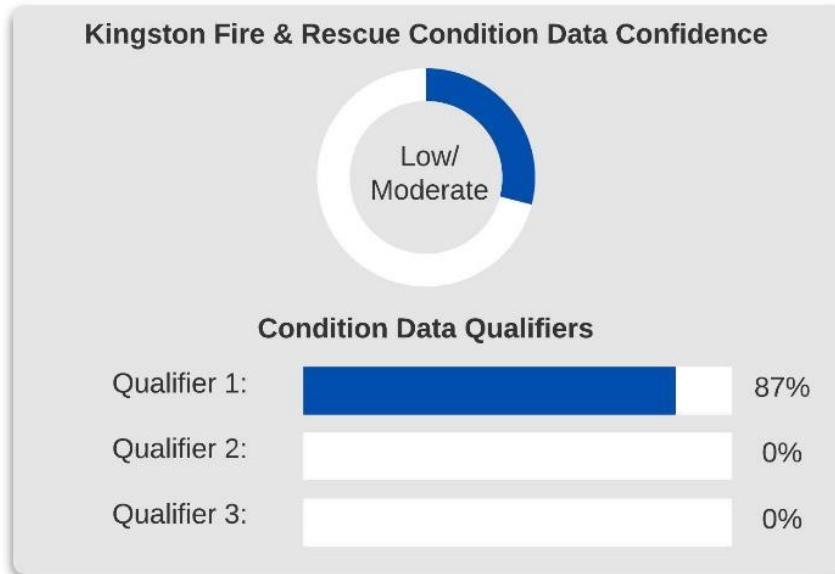
Assuming the data source is reliable, the following qualifiers were considered to estimate data confidence regarding the data utilized in the creation of this SOLI report:

- **Qualifier 1:** The percentage of assets in the asset inventory where construction, installation, or acquisition years are documented (87%);
- **Qualifier 2:** The percentage of assets in the asset inventory that have condition assessment data documented (0%); and,

### Kingston Fire & Rescue

- **Qualifier 3:** The percentage of the estimated overall replacement value, in 2023 dollars, attributed to assets in the asset inventory with documented condition assessment data (i.e., condition is not solely age-based) (0%).

**Figure 6-3: SOLI Report Data Confidence – Kingston Fire & Rescue**



As summarized in **Figure 6-3**, the overall asset condition data confidence for Kingston Fire & Rescue assets is estimated to be Low/Moderate. Presently, all asset conditions for Kingston Fire & Rescue assets are age-based. Data confidence can be increased by improving the documentation of condition assessment data. For Fleet assets, this may include adding an additional attribute within FleetFocus M5 to track assigned asset condition ratings which can be assigned or updated when City staff perform regularly scheduled maintenance.

## Kingston Fire & Rescue

### 6.2 Levels of Service

Kingston Fire & Rescue developed a strategic plan in 2021 for a 5-year planning period. The plan was created to determine the current capabilities and the opportunities to improve the services to meet the Centre for Public Service Excellence (CPSE) standards. Within the strategic plan, there are five strategic goals which include:

1. Training program for both volunteer and professional firefighters, that includes evaluating current training methods, resources, and the composite service model;
2. Establish an internal communication plan and culture;
3. Create a CPSE accreditation with a focus on continuous improvement;
4. Implement a substantial public education and community outreach platform and programs; and,
5. Create the most optimal dispatch and apparatus management practices and protocols.

Each of these goals have their own objectives, timeframes, and critical tasks. These goals are for the overall services being provided by Kingston Fire & Rescue and were considered when reviewing the community Levels of Service (LOS) for the assets.

The City has developed the community and technical Levels of Service (LOS), based on input from municipal staff. It was decided that Quality and Environmental Acceptability were key attributes in gauging the performance of the assets **Table 6-4** and **Table 6-5** outline the City's current community and technical levels of service for Kingston Fire & Rescue.



Kingston Fire & Rescue

Table 6-4: Community LOS – Kingston Fire & Rescue

LOS Parameter	LOS Statement	Performance Measure	Current LOS (2023)
Capacity	Provide adequate response time.	Average response time (mins)	5.1

Table 6-5: Technical LOS - Kingston Fire & Rescue

LOS Parameter	LOS Statement	Performance Measure	Current LOS (2023)
Quality	Fleet and Equipment are kept in good working condition.	Percentage of assets that are in poor or better condition.	63%

6.3 Risk Assessment

The risk ratings for Kingston Fire & Rescue assets included Fleet and Equipment. The risk scores were calculated using the risk methodology and approach outlined in Section 1.4 of the Introduction. **Table 6-6** summarizes the risk factors for the Kingston Fire & Rescue assets.

Table 6-6: Risk Factors - Kingston Fire & Rescue

Factors	Risk Ratings
A - Condition	The condition of the assets was determined either by visual or age-based and can be found in the SOLI section of the AMP.

Kingston Fire & Rescue

Factors	Risk Ratings
<b>B - Performance</b>	The performance of the Fleet assets was identified as "always reliable" and assigned a rating of 1 for calculating risk score. The Equipment assets was identified as "usually reliable" and assigned a rating of 3 for calculating risk score.
<b>C - Climate Change</b>	The climate change ratings were determined at the asset class level by identifying climate change hazard interactions. The Fleet and Equipment assets were identified as a "low" risk and assigned a rating of 1 for calculating the risk score.
<b>D - Impact</b>	The Fleet and Equipment assets were recognized as "high" impact and assigned a rating of 2 for calculating risk score.
<b>E - Importance</b>	The Fleet and Equipment assets were identified as "high" importance and assigned a rating of 3 when calculating risk.

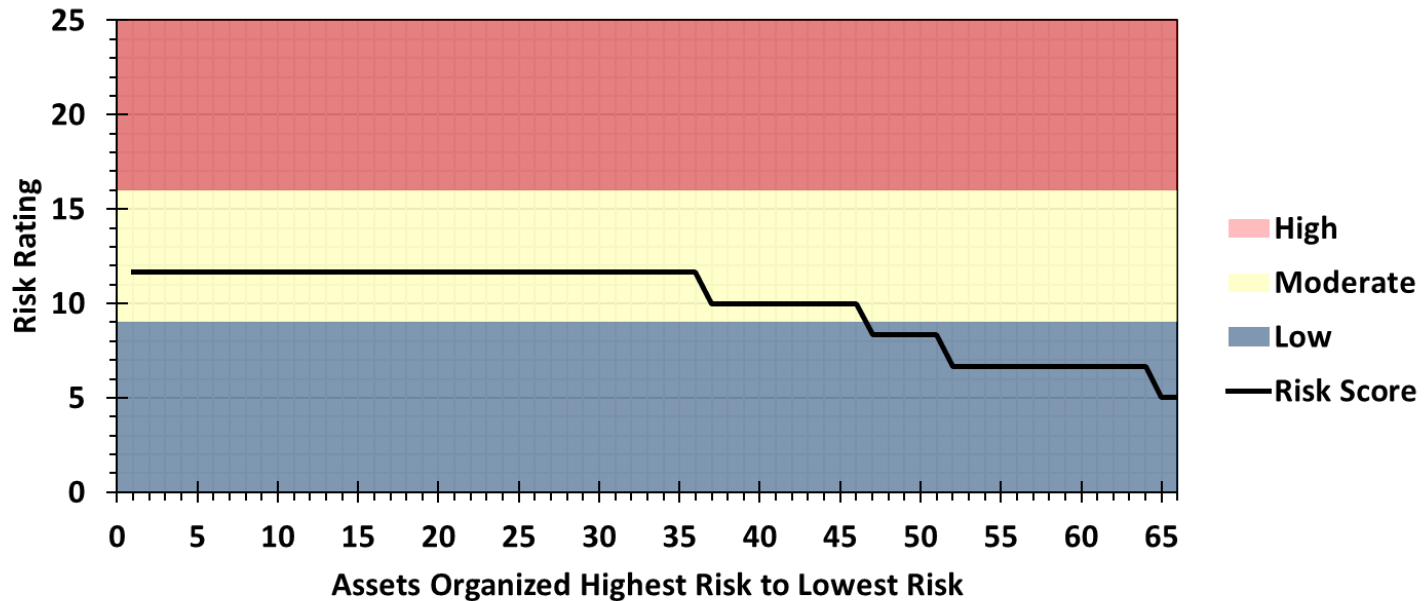
The individual risk ratings were used in calculating the risk score for each of the assets.

## Kingston Fire & Rescue

### 6.3.1 Risk Profile

The Risk profile of the Fleet assets is displayed in **Figure 6-4**. Of the 66 Fleet tracked within the asset inventory, approximately 69.7% (46) are classified as Moderate risk and the remaining 30.3% (20) are Low risk.

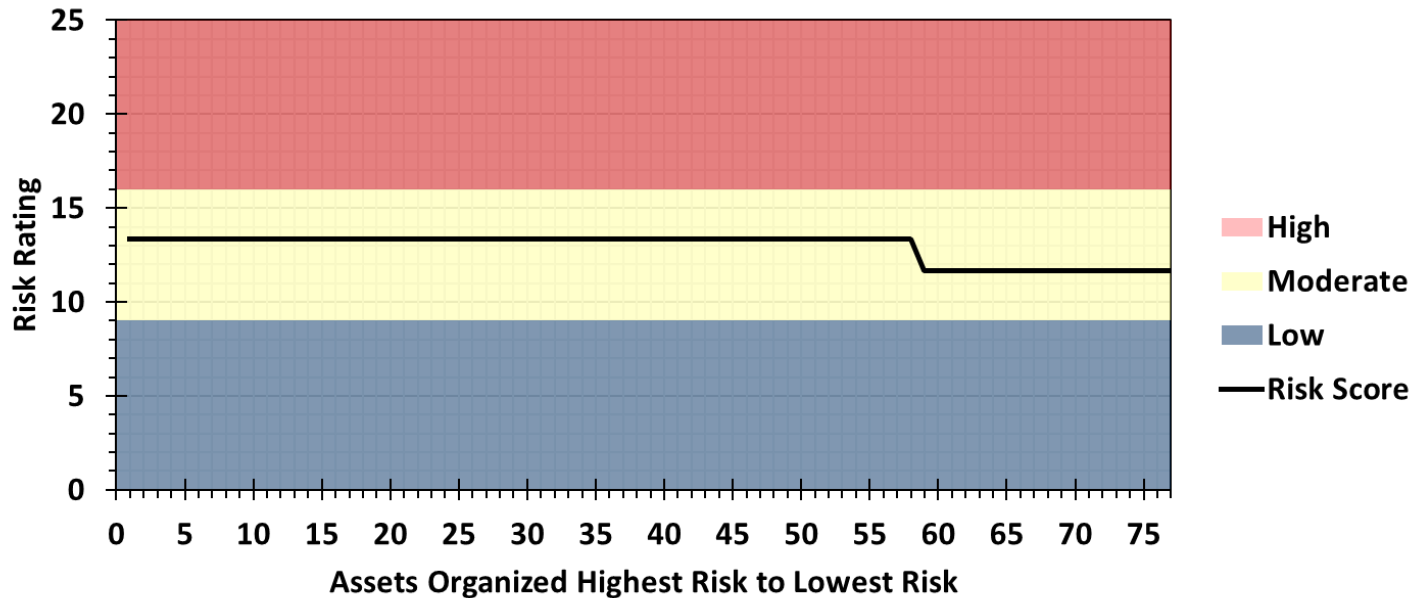
**Figure 6-4: Risk Profile - Kingston Fire & Rescue (Fleet)**



The Risk profile of the Equipment assets is displayed in **Figure 6-5**. All 77 Equipment assets tracked in the asset inventory are considered as Moderate risk.

## Kingston Fire & Rescue

Figure 6-5: Risk Profile - Kingston Fire & Rescue (Equipment)



## 6.4 Asset Management Strategy

### 6.4.1 Lifecycle Activities – Kingston Fire & Rescue

The lifecycle activities considered include:

- **Non-Infrastructure Solutions:** Actions or policies that can lower costs and extend useful lives.
- **Maintenance Activities:** Regularly scheduled inspection and maintenance, or more significant repair and activities associated with unexpected events.
- **Renewal / Rehabilitation Activities:** Significant repairs designed to extend the life of the asset.
- **Replacement / Construction Activities:** Activities that are expected to occur once an asset has reached the end of its useful life and renewal/rehabilitation is no longer an option.

### Kingston Fire & Rescue

- **Disposal Activities:** Activities associated with disposing of an asset once it has reached the end of its useful life or is otherwise no longer needed.
- **Expansion / Growth / Service Improvement Activities:** Planned activities required to extend services to previously unserved areas or expand services to meet growth demands.

**Table 6-7** describes the lifecycle activities that can be implemented within the asset management strategy for Kingston Fire & Rescue. The lifecycle activities presented below are existing activities performed by the City, identified during a workshop with City staff in January 2024.

**Table 6-7: Lifecycle Activities - Kingston Fire & Rescue**

Lifecycle Type	Description of Activity	Frequency / Timing
Non-Infrastructure Solutions	Policies and procedures for all Fleet and Equipment.	Based on applicable standards (including NFPA 1911)
Maintenance Activities	Regular scheduled inspection and maintenance as per all applicable legislation, standards, and manufacturer recommendations.	Based on applicable standards (including NFPA 1911)
Maintenance Activities	Preventative maintenance program for communications towers.	Annually, monthly, and as needed
Renewal / Rehabilitation Activities	Repairs/rehabilitation of communications towers.	As needed
Replacement / Construction Activities	Replacement of Fleet and Equipment	End of EUL (based on NFPA 1911)

**Kingston Fire & Rescue**

<b>Lifecycle Type</b>	<b>Description of Activity</b>	<b>Frequency / Timing</b>
Disposal Activities	At the end of estimated service life, Kingston Fire & Rescue Fleet and Equipment assets are sold or disposed of following City policy, applicable regulations and environmental standards.	End of EUL
Expansion / Growth / Service Improvement Activities	As an Accredited fire service, we follow our Standards of Cover and Community Risk Assessment/Performance Gaps.	Ongoing
Expansion / Growth / Service Improvement Activities	Compliance report submitted CPSE for approval.	Annually

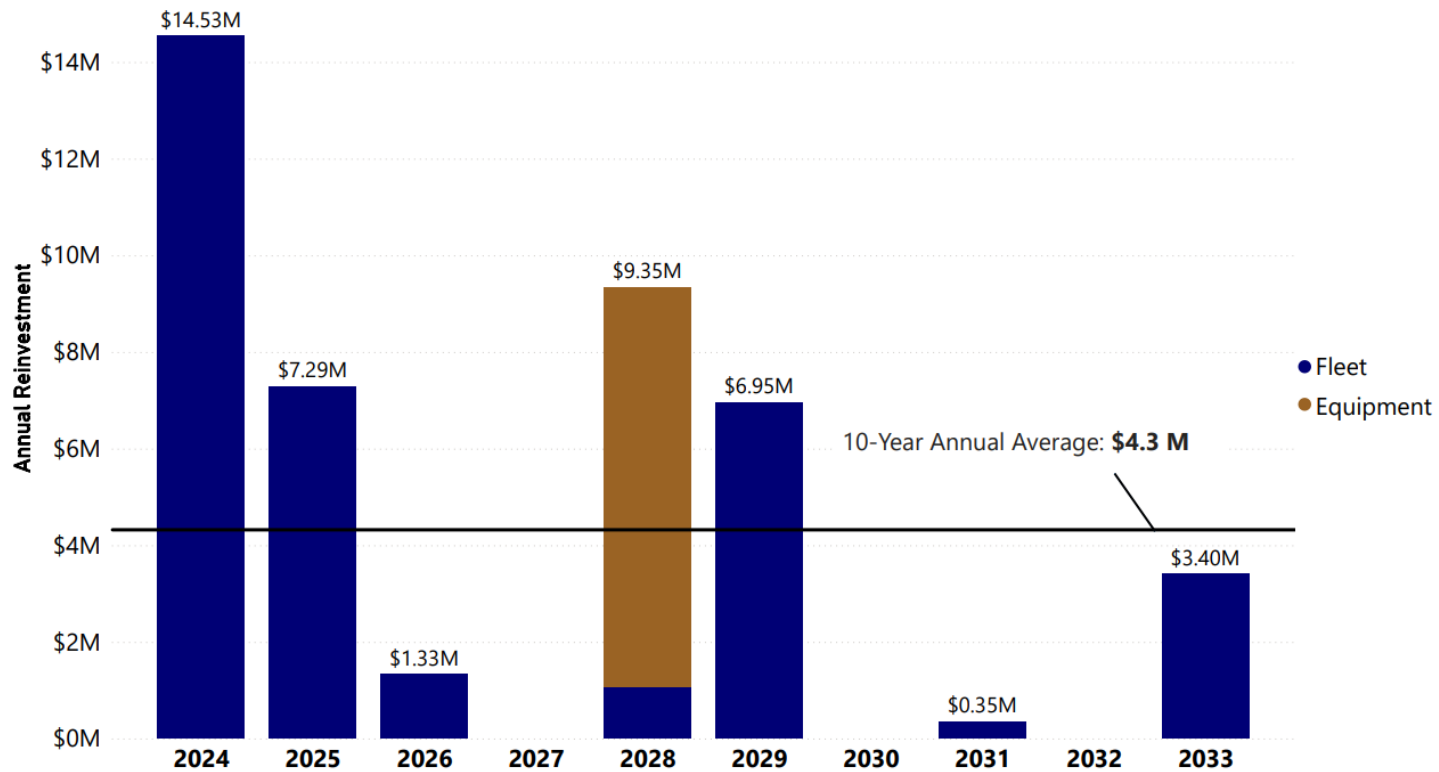
**6.4.2 Funding the Lifecycle Activities - Kingston Fire & Rescue**

Lifecycle modeling allows for the City to understand the future reinvestment needs of their existing assets by generating a theoretical asset replacement forecast that considers available asset inventory data. The age, EUL, replacement cost, condition, and risk score of each asset can be leveraged within the lifecycle model to proactively plan for reinvestment over a period of interest. Asset replacement forecasts within this subsection estimate the required reinvestment for Kingston Fire & Rescue assets over the next 10 years based on available asset inventory data. It is important to note that reinvestment for Facilities is not included in this AMP, please refer to the Facilities AMP (2023).

### Kingston Fire & Rescue

There is a total of approximately **\$43.2 million** to be reinvested into the Kingston Fire & Rescue assets owned by the City in the next 10 years. This translates to a 10-year annual average of approximately **\$4.3 million**, as presented in **Figure 6-6**. The \$8.28 million reinvestment needs for equipment in 2028 is due to the 15-year expected useful life for all communication, video, & radio system assets.

**Figure 6-6: 10-Year Capital Reinvestment Needs - Kingston Fire & Rescue**



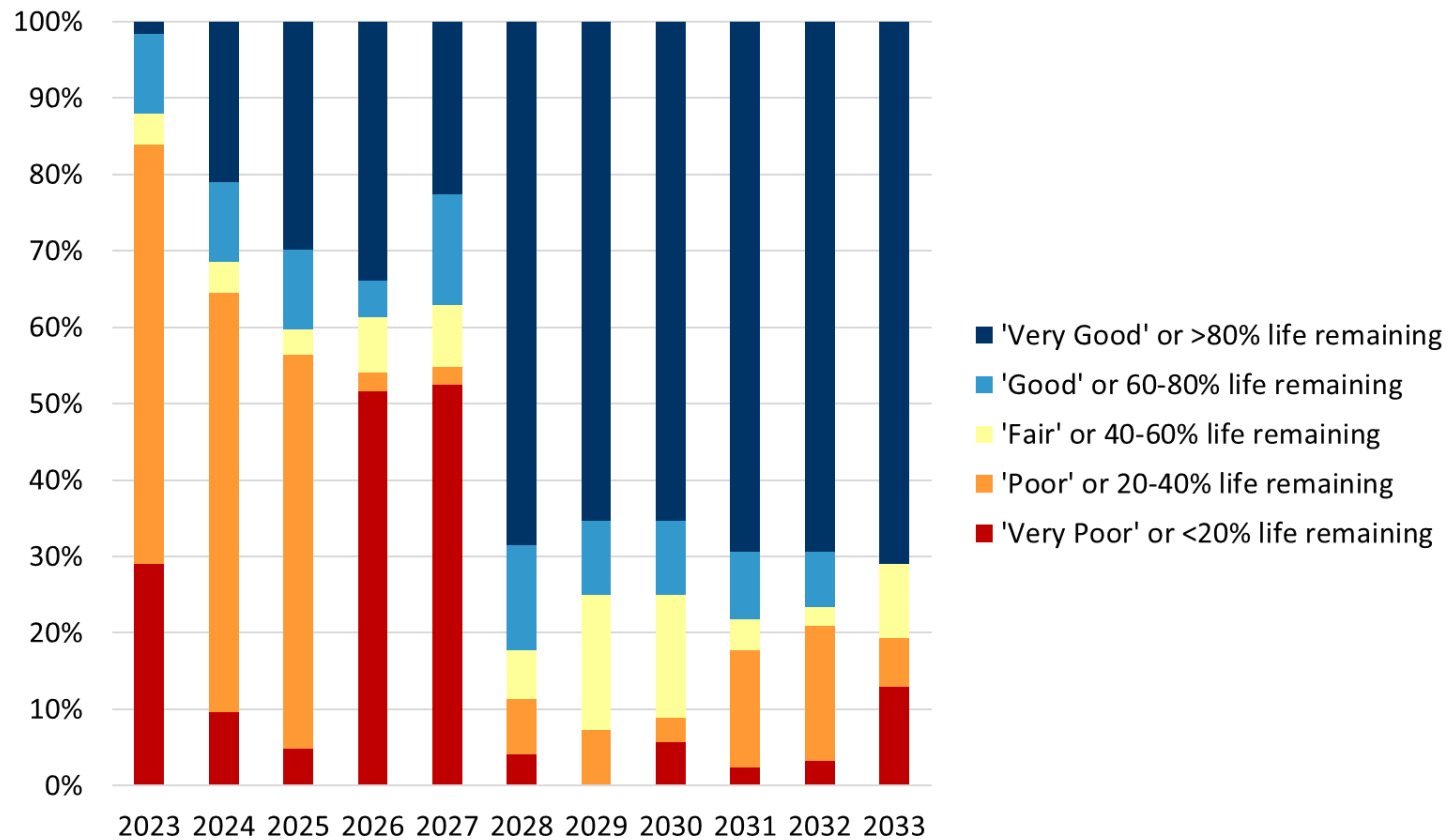
It is important to note that forecasting in this lifecycle model relies heavily on age and EUL to determine renewal or replacement needs and that tracking of condition data for Kingston Fire & Rescue assets by the City will assist at refining forecasted expenditures in future updates.

### Kingston Fire & Rescue

The LOS includes maintaining the current assets in poor or better condition (63%). From the lifecycle model, the percentage of Kingston Fire & Rescue assets in poor or better condition fluctuates throughout the next 10-years, reaching a high of 100% in 2029, eventually finishing at 87% in 2033.

**Figure 6-7** shows an overview of the condition of Kingston Fire & Rescue over the next 10 years based on the lifecycle model.

**Figure 6-7: Condition Overview by Year Based on Lifecycle Model – Kingston Fire & Rescue**







## 7.0 Solid Waste

The City's Solid Waste Service, managed under the Public Works & Solid Waste Department, is responsible for the efficient and responsible collection, Disposal, and Diversion of Solid Waste to keep the City clean and sustainable. An array of services are included, such as regular curbside pickup of residential waste, recycling, and organic materials, seasonal collections of leaf and yard waste. To provide the Solid Waste service, the City manages and oversees the operation and maintenance of a variety of Solid Waste assets in addition to the fleet of collection trucks. The following section of the AMP includes assets that are under the Solid Waste service, **excluding** fleet and facility assets which are inventoried under Corporate Fleet in Volume 2 of this AMP and the Corporate Facilities 2023 AMP.

**Note on Scope:** At the time of preparing this AMP no data was available for one asset class, Diversion. As a result, this asset class is not included in this AMP. It is recommended that the City further develops an inventory of this asset class to be considered in subsequent iterations of the AMP.

## Solid Waste

### 7.1 State of the Local Infrastructure

#### 7.1.1 Asset Inventory and Valuation

**Table 7-1** summarizes the asset inventory for Solid Waste by asset class, asset type, asset count, total replacement cost (in 2023 dollars). All inventory counts and replacement costs of the assets are estimated based on service collection points. The total replacement cost (2023 dollars) is estimated at **\$2.9 million** for the **203,833 assets** included in the inventory.

**Table 7-1: Inventory Summary by Asset Type – Solid Waste**

Asset Class	Asset Type	Count	Total Replacement Cost (2023)
Disposal	Solid Waste Blue/Grey Bins	150,750	\$1,160,780
Disposal	Solid Waste Carts	2,826	\$322,170
Disposal	Solid Waste Depot Bins	7	\$30,100
Disposal	Solid Waste Green Bins	50,250	\$1,344,190
<b>Overall</b>	<b>N/A</b>	<b>203,833</b>	<b>\$2,857,240</b>

#### 7.1.2 Asset Age Summary

**Table 7-2** summarizes the average age, average condition, expected useful life, and the average remaining useful life of assets pertaining to Solid Waste. The overall average age of Solid Waste assets is two years, and the average remaining useful life is five years.

Solid Waste

Table 7-2: Average Age, Average Condition, Expected Useful Life, and Remaining Useful Life – Solid Waste

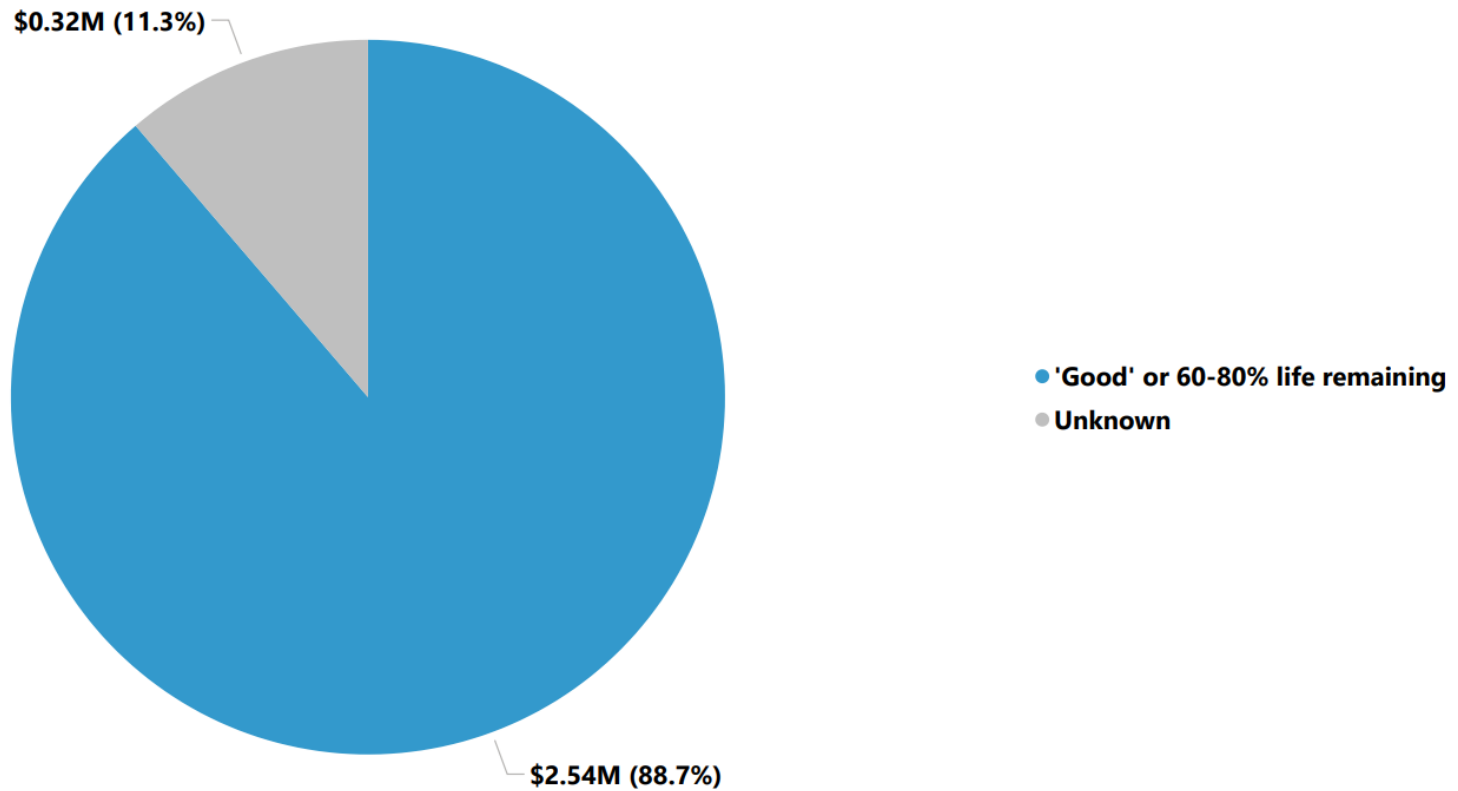
Asset Class	Asset Type	Average Age (Years)	Average Condition Rating	Expected Useful Life (Years)	Average Remaining Useful Life (Years)
Disposal	Solid Waste Blue/Grey Bins	2	Good	8	6
Disposal	Solid Waste Carts	Unknown	Unknown	15	Unknown
Disposal	Solid Waste Depot Bins	3	Good	10	7
Disposal	Solid Waste Green Bins	2	Good	5	3
<b>Overall</b>	<b>N/A</b>	<b>2</b>	<b>Good</b>	<b>5 to 15</b>	<b>5</b>

Solid Waste

7.1.3 Asset Condition

An overall condition summary for Solid Waste assets by replacement cost (in 2023 dollars) is shown in **Figure 7-1**. About 88.7% of the assets are in good, with 11.3% of the assets with unknown condition.

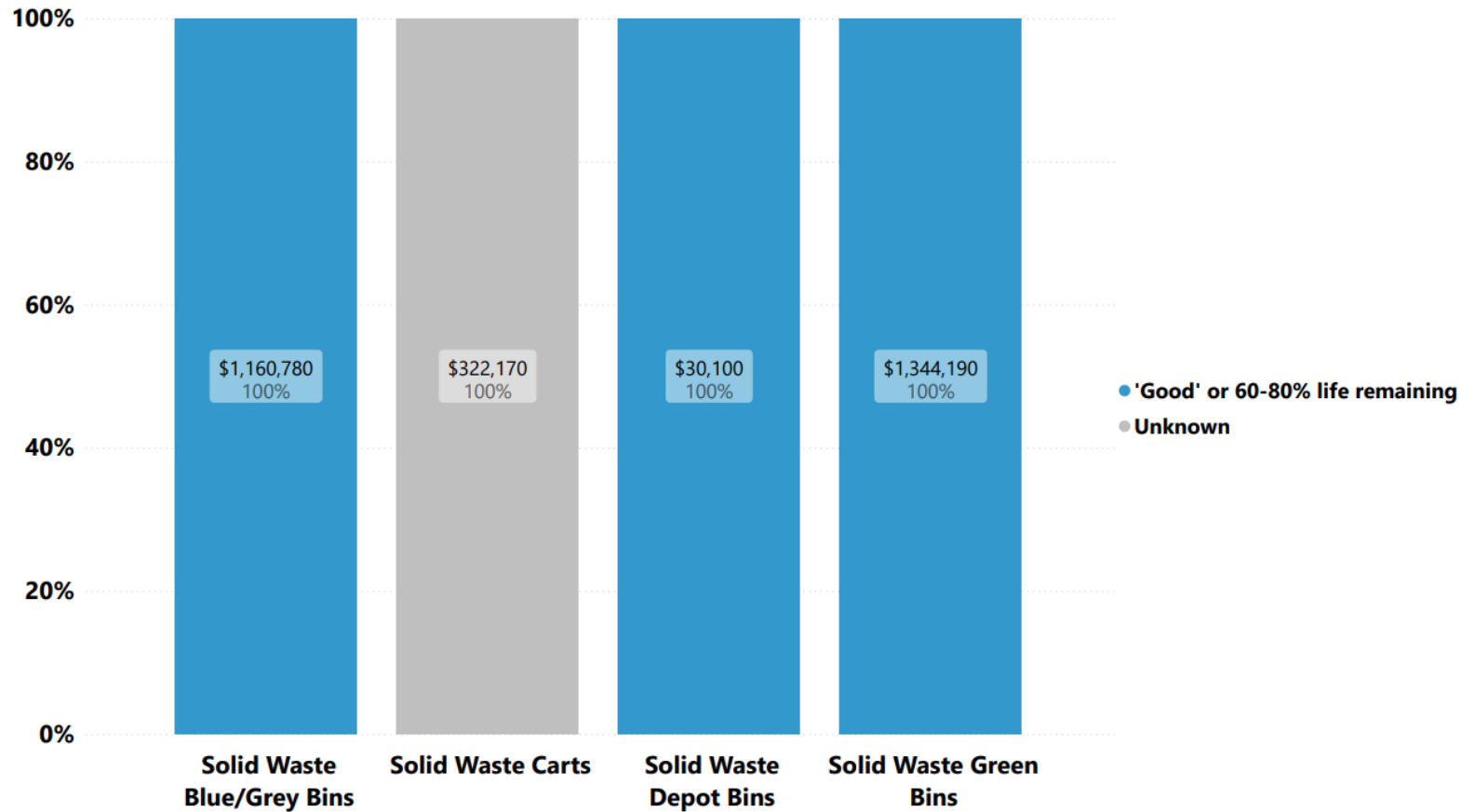
**Figure 7-1: Condition Summary and 2023 Replacement Cost – Solid Waste**



A condition summary for Disposal assets is provided in **Figure 7-2** by asset type and replacement cost (in 2023 dollars). In the absence of condition and age data, the condition of the assets has been primarily determined based on input from City staff.

Solid Waste

Figure 7-2: Condition Summary by Asset Type and Replacement Cost – Solid Waste (Disposal)



7.1.4 Data Sources and Confidence

Asset data for Solid Waste assets was assembled in Microsoft Excel and at this time there is no centralized repository for Solid Waste asset information.

**Solid Waste**

Data confidence can be estimated based on the confidence level of various qualifiers and can be presented on a scale from 0% (low) to 100% (high), as shown in **Table 7-3**. The qualifiers chosen for evaluation are specifically targeted for estimating overall confidence of condition reporting within the SOLI.

**Table 7-3: Data Confidence Scale**

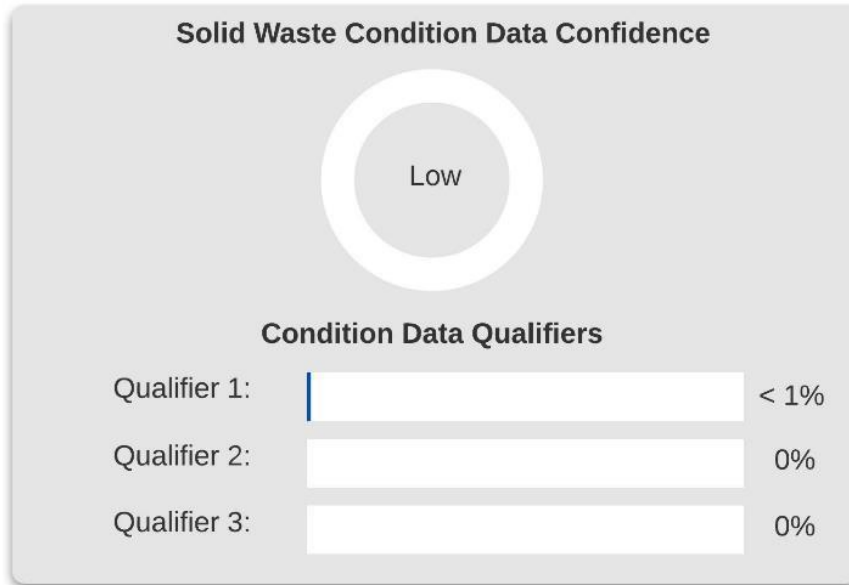
<b>Confidence Level</b>	<b>Low</b>	<b>Low/Moderate</b>	<b>Moderate</b>	<b>Moderate/High</b>	<b>High</b>
Average of Qualifiers	0% to 19%	20% to 39%	40% to 59%	60% to 79%	80% to 100%

Assuming the data source is reliable, the following qualifiers were considered to estimate data confidence regarding the data utilized in the creation of this SOLI report:

- **Qualifier 1:** The percentage of assets in the asset inventory where construction, installation, or acquisition years are documented (< 1%);
- **Qualifier 2:** The percentage of assets in the asset inventory that have condition assessment data documented (0%); and,
- **Qualifier 3:** The percentage of the estimated overall replacement value, in 2023 dollars, attributed to assets in the asset inventory with documented condition assessment data (i.e., condition is not solely age-based) (0%).

Solid Waste

Figure 7-3: SOLI Report Data Confidence – Solid Waste



As summarized in **Figure 7-3**, the overall asset condition data confidence for Solid Waste assets is estimated to be Low. Data confidence can be increased by improving the quality of the data and/or filling in data gaps. Currently, significant data gaps exist for Solid Waste assets including the unknown condition and age data. It is recommended that the City develops a formal asset inventory of Solid Waste assets to better inform future AMP iterations.

## Solid Waste

### 7.2 Levels of Service

The City has Solid Waste assets that provide service which will be undergoing changes in July of 2025 due to legislative impacts. Blue and grey boxes will no longer be municipal assets as of July 1, 2025 and green bins will be replaced over a 5-year period with new larger green bins. Due to these impacts, the City will not be collecting and providing recycling services. Therefore, there are no current level of service performance measure for this service.

As the City transitions to a cart-based waste collection program (2025 to 2030), asset management of the newly delivered Carts (garbage and green bin) will be built into the system. This will allow the City to track average life spans and replacement costs more effectively than is currently manageable.

### 7.3 Risk Assessment

The risk ratings for Solid Waste assets include all assets under the asset class of Disposal. The risk scores were calculated using the risk methodology and approach outlined in the Introduction document. **Table 7-4** summarizes the risk factors for the Solid Waste assets.

**Table 7-4: Risk Factors – Solid Waste**

Factors	Risk Ratings
<b>A - Condition</b>	The condition of the assets was determined either by visual or age-based and can be found in the SOLI section of the AMP.
<b>B - Performance</b>	The performance of the Disposal assets was identified as "usually reliable" and assigned a rating of 3 for calculating risk score.



**Solid Waste**

Factors	Risk Ratings
<b>C - Climate Change</b>	The climate change ratings were determined at the asset class level by identifying climate change hazard interactions. The Disposal assets were identified as a “low” risk and assigned a rating of 1 for calculating the risk score.
<b>D - Impact</b>	The Disposal assets was recognized as "moderate" impact and assigned a rating of 1 for calculating risk score.
<b>E - Importance</b>	The Disposal asset class was identified as “low” importance and assigned a rating of 1 when calculating risk.

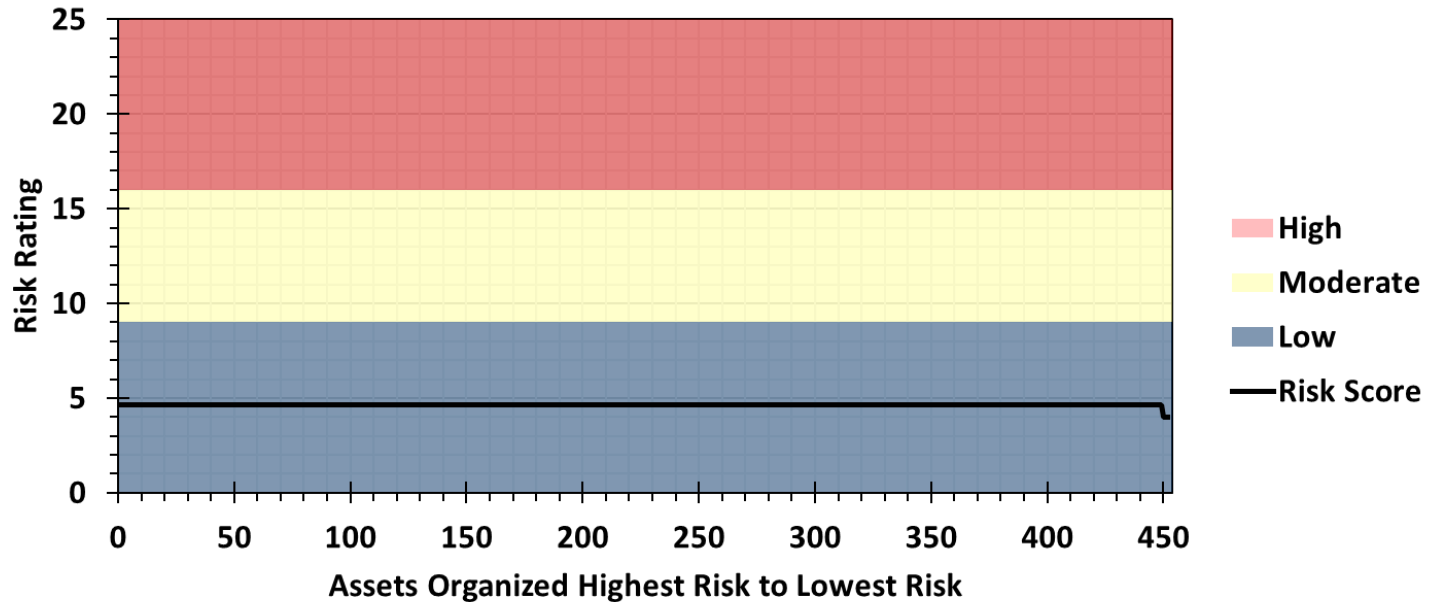
The individual risk ratings were used in calculating the risk score for each of the assets.

**7.3.1 Risk Profile**

The Risk profile of the Disposal assets is displayed in **Figure 7-4**. It is important to note that inventory data for Disposal assets includes pooled assets. All of the 452 Disposal assets tracked within the asset inventory are of Low risk.

## Solid Waste

Figure 7-4: Risk Profile – Solid Waste (Disposal)



## 7.4 Asset Management Strategy

### 7.4.1 Lifecycle Activities – Solid Waste

The lifecycle activities considered include:

- **Non-Infrastructure Solutions:** Actions or policies that can lower costs and extend useful lives.
- **Maintenance Activities:** Regularly scheduled inspection and maintenance, or more significant repair and activities associated with unexpected events.
- **Renewal / Rehabilitation Activities:** Significant repairs designed to extend the life of the asset.

## Solid Waste

- **Replacement / Construction Activities:** Activities that are expected to occur once an asset has reached the end of its useful life and renewal/rehabilitation is no longer an option.
- **Disposal Activities:** Activities associated with disposing of an asset once it has reached the end of its useful life or is otherwise no longer needed.
- **Expansion / Growth / Service Improvement Activities:** Planned activities required to extend services to previously unserved areas or expand services to meet growth demands.

**Table 7-5** describes the lifecycle activities that can be implemented within the asset management strategy for Solid Waste. The lifecycle activities presented below are existing activities performed by the City, identified during a workshop with City staff in February 2024.

**Table 7-5: Lifecycle Activities – Solid Waste**

Lifecycle Type	Description of Activity	Frequency / Timing
Maintenance Activities	Inspections & Diagnostics	Daily, weekly, monthly, and annually
Renewal / Rehabilitation Activities	Baler rebuilds (hydraulics, rams, flooring/walls).	Every 3 to 5 years
Renewal / Rehabilitation Activities	Conveyor belt repairs and rehabilitation.	Every 1 to 3 years

### 7.4.2 Funding the Lifecycle Activities – Solid Waste

Lifecycle modeling allows for the City to understand the future reinvestment needs of their existing assets by generating a theoretical asset replacement forecast that considers available asset inventory data. The age, EUL, replacement cost, condition, and risk score of each asset can be leveraged within the lifecycle model to proactively plan for reinvestment over a period of interest. Asset replacement forecasts could not be developed for Solid Waste assets at the time of preparing this AMP due to significant data gaps.



## 8.0 Airport Operations

The City's Airport, named Kingston Norman Rogers Airport, provides essential air traffic service for its residents, visitors, and businesses in the Kingston area. The airport, which is owned and operated by the City, features a modern terminal, that in the past has served commercial airlines that offer regular scheduled flights to various domestic destinations. Since the pandemic, work is underway to reattract commercial air services. The airport also supports the local economy through general aviation services which include hangar rentals, cargo operations, charter services, and flight school operations. It is equipped with an instrument landing system, providing year-round accessibility. Its recent expansion included new passenger terminal building and runway extension, which has increased its capacity and made it more convenient for both leisure and business travellers. To provide Airport Operations, the City manages a wide range of assets, including Facilities, Site, Runway Pavement, Runway Lighting, and Other Equipment.

## Airport Operations

It is important to note that the Airport Facilities were included in the dedicated 2023 Facilities AMP developed by the City's Facilities Management & Construction Services (FMCS) department in consultation with GM BluePlan Engineering Limited. As a result, the details on Airport Facilities in this AMP are limited to basic inventory information. For further detail on the facilities including data confidence and lifecycle modeling, please refer to the 2023 Facilities AMP. Fleet assets required to support Airport Operations are also included in the Corporate Fleet AMP in Volume 2 of this AMP.

**Note on Scope:** At the time of preparing this AMP, no data was available for some Information & Technology assets related to Airport Operations. Those supported by the City's IS&T department would be included in Volume 2 of this AMP. As a result, the asset class is not included in this AMP. It is recommended that the City further develops an inventory of assets comprising the asset class to be considered in subsequent iterations of the AMP.

## 8.1 State of the Local Infrastructure

### 8.1.1 Asset Inventory and Valuation

**Table 8-1** summarizes the asset inventory for Airport Operations by asset class, asset type, asset count, total replacement cost (in 2023 dollars). The total replacement cost (2023 dollars) is estimated at **\$58.8 million** for the **41 assets** included in the inventory.

## Airport Operations

### Table 8-1 Notes

<sup>1</sup> As reported in Facilities AMP (2023).

**Table 8-1: Inventory Summary by Asset Type – Airport Operations**

Asset Class	Asset Type	Count	Total Replacement Cost (2023)
Facilities <sup>1</sup>	Airport Buildings	4	\$30,900,000 <sup>1</sup>
Airport Site	Roadways – Asphalt	6	\$1,368,250
Airport Site	Parking Lots – Asphalt	2	\$728,000
Runway	Roadways – Asphalt	7	\$16,146,000
Runway	Parking Lots – Asphalt	2	\$6,968,000
Runway Lighting	Site Lighting	15	\$2,620,000
Other Equipment	Video Wall	5	\$57,310
<b>Overall</b>	<b>N/A</b>	<b>41</b>	<b>\$58,787,560</b>

### 8.1.2 Asset Age Summary

**Table 8-2** summarizes the average age, the average condition, the expected useful life, and the average remaining useful life of assets pertaining to Airport Operations. For details regarding Airport Operations facilities, please refer to the Facilities AMP (2023). The overall average age of Airport Operations assets is 18 years, and the average remaining useful life is eight years.

## Airport Operations

**Table 8-2: Average Age, Average Condition, Expected Useful Life, and Remaining Useful Life – Airport Operations**

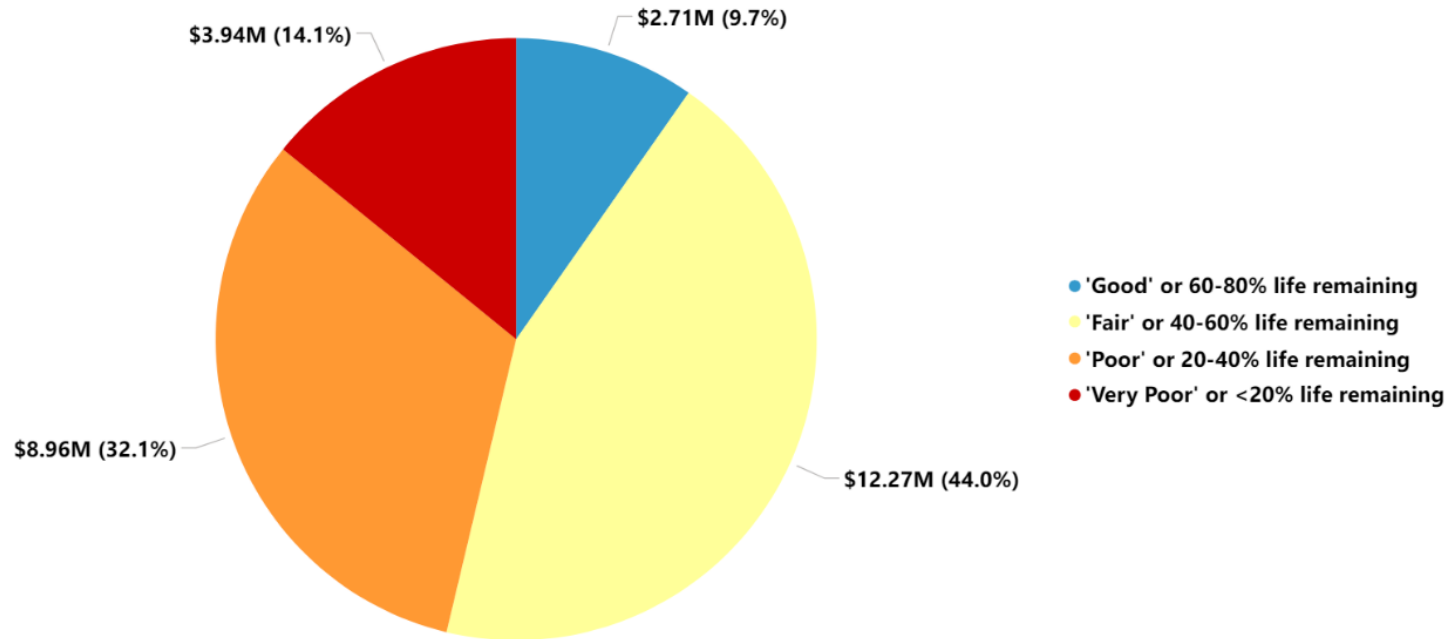
Asset Class	Asset Type	Average Age (Years)	Average Condition Rating	Expected Useful Life (Years)	Average Remaining Useful Life (Years)
Airport Site	Roadways – Asphalt	Unknown	Poor	25	9
Airport Site	Parking Lots – Asphalt	Unknown	Poor	25	9
Runway	Roadways – Asphalt	25	Fair	25	9
Runway	Parking Lots – Asphalt	26	Poor	25	6
Runway Lighting	Site Lighting	18	Poor	20	10
Other Equipment	Video Wall	5	Fair	10	5
<b>Overall</b>	<b>N/A</b>	<b>18</b>	<b>Fair</b>	<b>10 to 25</b>	<b>8</b>

### 8.1.3 Asset Condition

An overall condition summary for Airport Operations assets by replacement cost (in 2023 dollars) is shown in **Figure 8-1**. About 53.7% of the assets are in good to fair condition.

Airport Operations

Figure 8-1: Condition Summary and 2023 Replacement Cost – Airport Operations



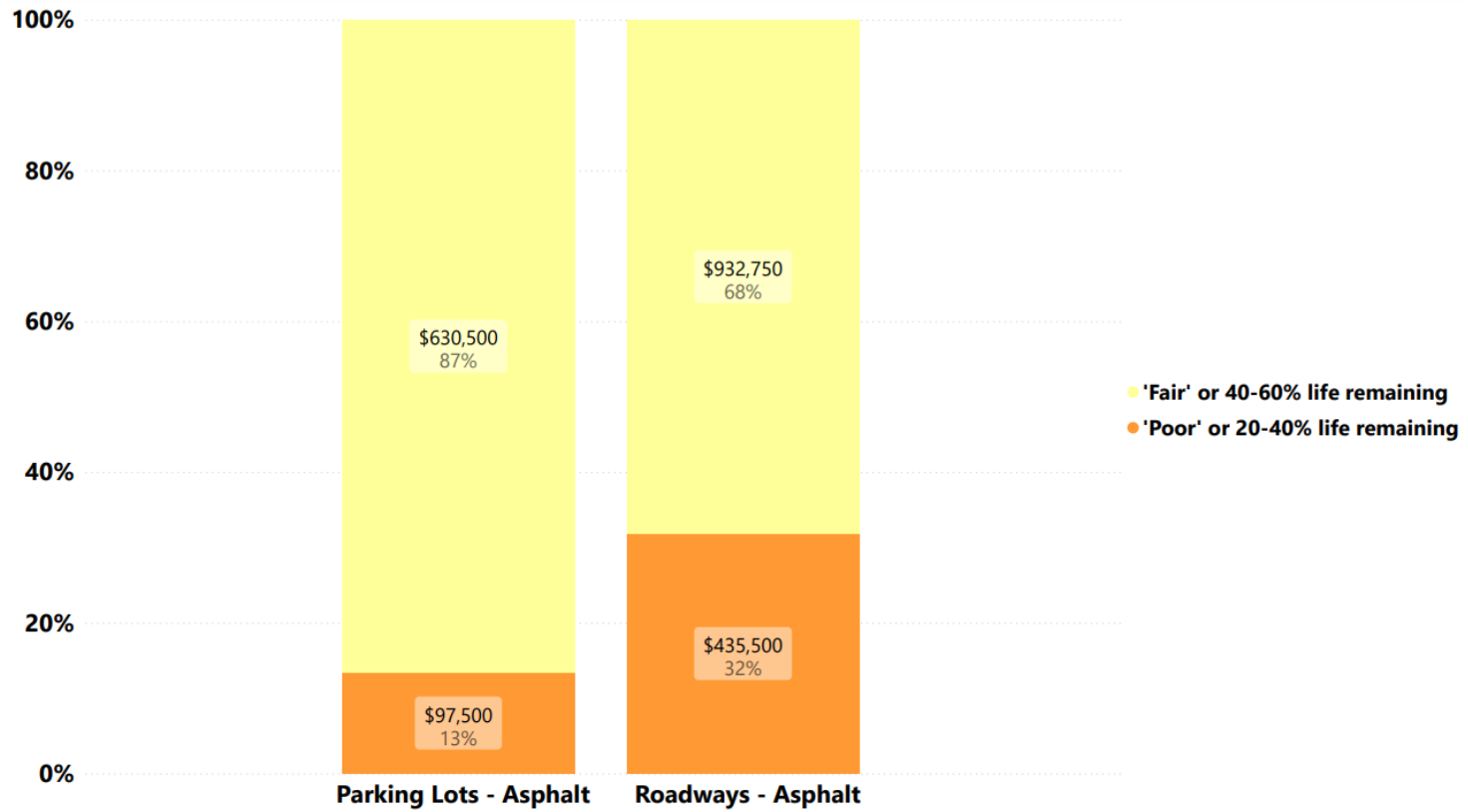
Based on Figure 14 of the Facilities AMP (2023), building and site elements that represent approximately 1% of the total replacement value of Airport facilities are in very poor condition; 32% are in poor condition, 29% are in fair condition, and 38% are in good condition. For details regarding airport facilities, please refer to the Facilities AMP (2023).

A condition summary for Airport Site assets is provided in **Figure 8-2** by asset type and replacement cost (in 2023 dollars). In the absence of condition assessment data, the condition of Airport Site assets has been primarily determined based on age and expected useful life.



Airport Operations

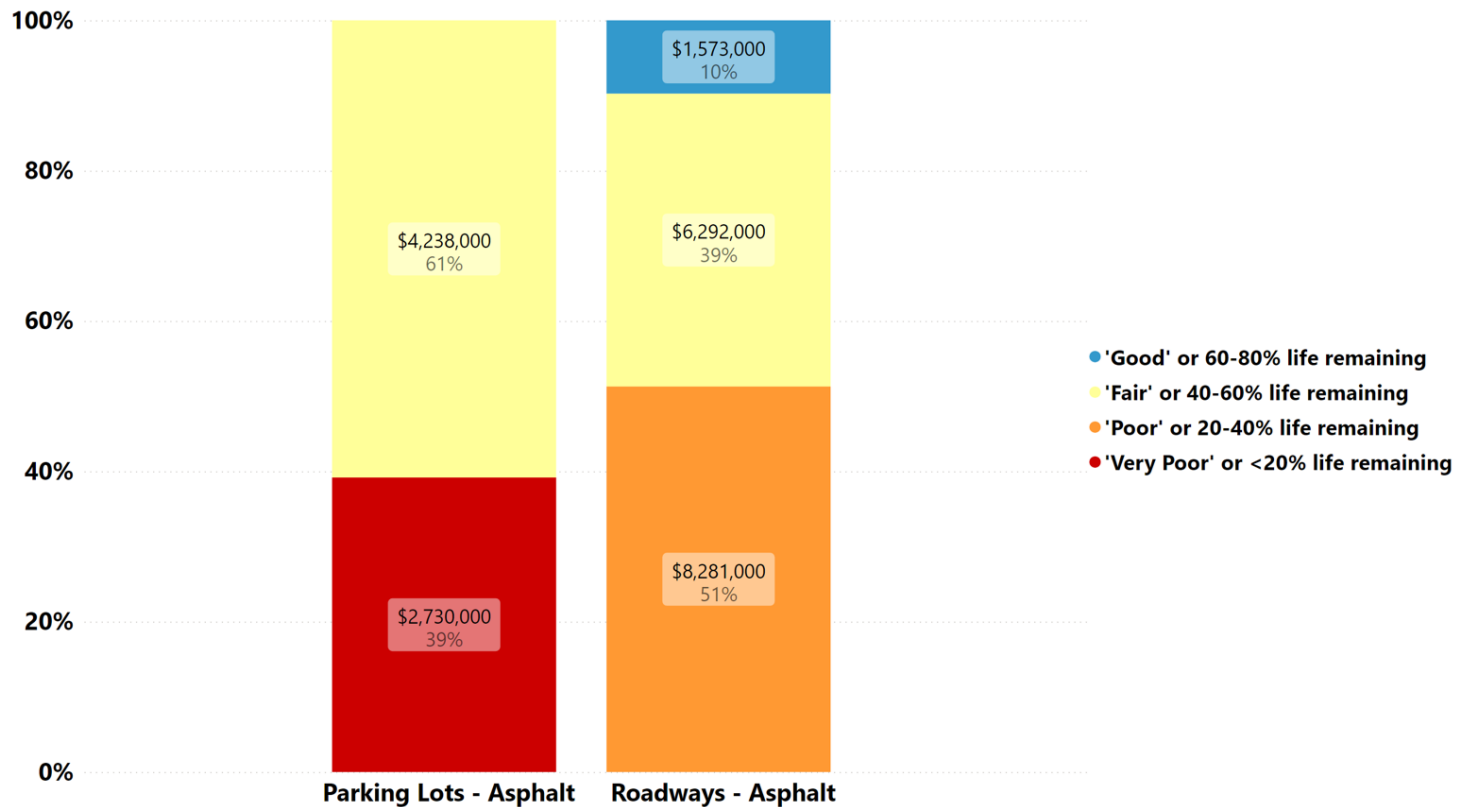
Figure 8-2: Condition Summary by Asset Type and 2023 Replacement Cost - Airport Operations (Airport Site)



## Airport Operations

A condition summary for Runway assets is provided in **Figure 8-3**, by asset type and replacement cost (in 2023 dollars). In the absence of condition assessment data, the condition of Vehicle assets has been primarily determined based on age and expected useful life.

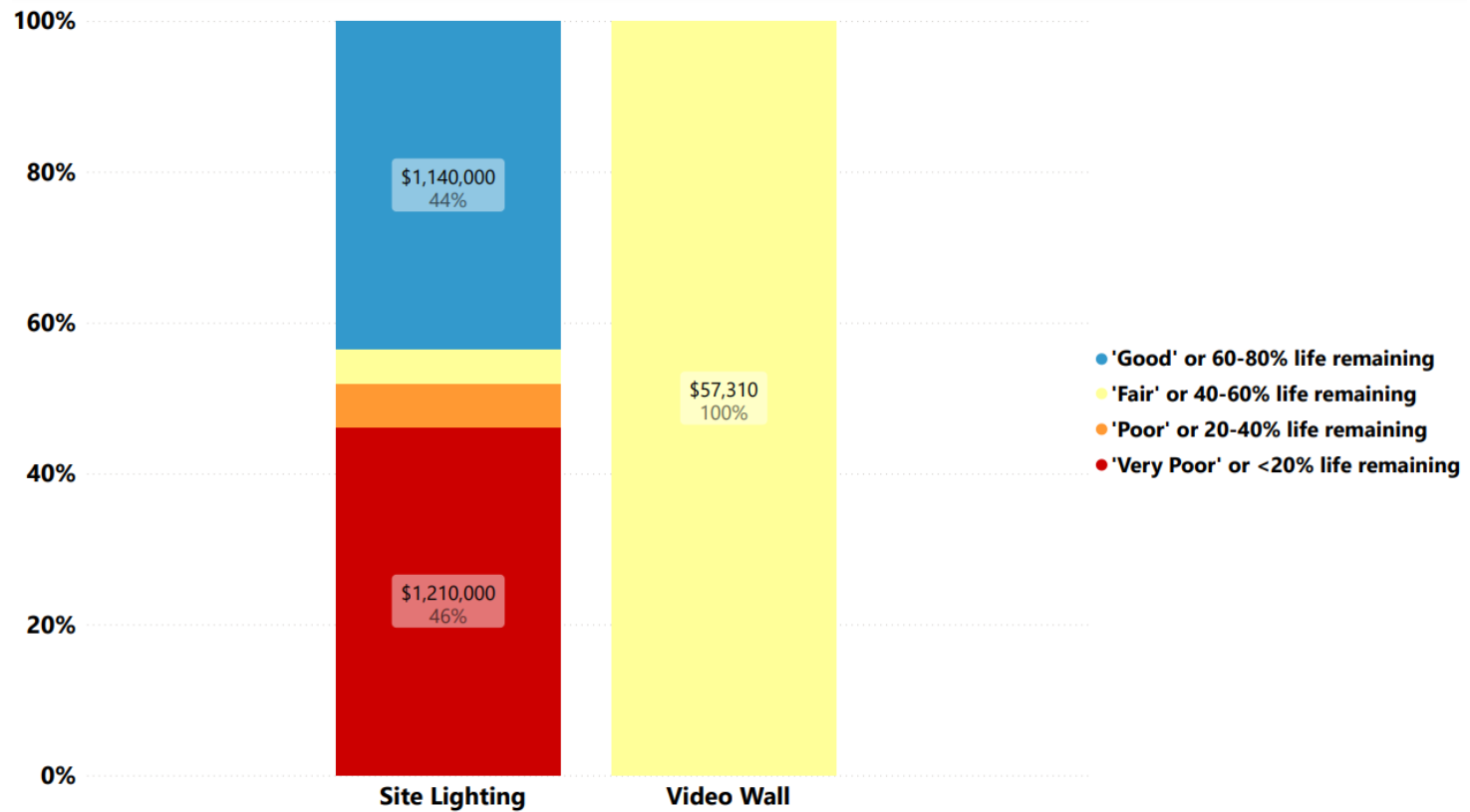
**Figure 8-3: Condition Summary by Asset Type and 2023 Replacement Cost - Airport Operations (Runway)**



## Airport Operations

A condition summary for Runway Lighting and Other Equipment assets is provided in **Figure 8-4** by asset type and replacement cost (in 2023 dollars). In the absence of condition assessment data, the condition of the assets has been primarily determined based on age and expected useful life.

**Figure 8-4: Condition Summary by Asset Type and 2023 Replacement Cost - Airport Operations – (Runway Lighting and Other Equipment)**



## Airport Operations

### 8.1.4 Data Sources and Confidence

Asset data for Airport Operations assets, outside airport facilities, is not maintained in a developed inventory. City staff provided a facility inventory assessment report (in Portable Document Format [PDF]) that was completed in 2022 to inform inventories in 2023, translating to the assumption within this AMP that the data source can be seen as reliable.

Data confidence can be estimated based on the confidence level of various qualifiers and can be presented on a scale from 0% (low) to 100% (high), as shown in **Table 8-3**. The qualifiers chosen for evaluation are specifically targeted for estimating overall confidence of condition reporting within the SOLI.

For discussion on data confidence related to Airport Operations facilities, please refer to the Facilities AMP (2023).

**Table 8-3: Data Confidence Scale**

Confidence Level	Low	Low/ Moderate	Moderate	Moderate/ High	High
Average of Qualifiers	0% to 19%	20% to 39%	40% to 59%	60% to 79%	80% to 100%

Assuming the data source is reliable, the following qualifiers were considered to estimate data confidence regarding the data utilized in the creation of this SOLI report:

- **Qualifier 1:** The percentage of assets in the asset inventory where construction, installation, or acquisition years are documented (78%);
- **Qualifier 2:** The percentage of assets in the asset inventory that have condition assessment data documented (86%); and,

## Airport Operations

- **Qualifier 3:** The percentage of the estimated overall replacement value, in 2023 dollars, attributed to assets in the asset inventory with documented condition assessment data (i.e., condition is not solely age-based) (99%).

**Figure 8-5: SOLI Report Data Confidence**



As summarized in **Figure 8-5**, the overall asset condition data confidence for Airport Operations assets is estimated to be High. Most inventoried assets including runways, taxiways, aprons, and associated exterior lighting were assessed in 2022 resulting in recent asset condition assessment data that could be utilized in this AMP.

## Airport Operations

### 8.2 Levels of Service

The City is in the process of updating the 2007 Airport Master Plan to provide the overall vision for the airport with a systematic manner of development for the airport’s infrastructure. In addition to the Master Plan, the City generated a Business Case in 2012 which was used for the expansion of the airport and conducted a Highest and Best Land Use plan in 2018. These plans were developed for growth and long-term planning.

For the existing airport assets, the City has developed community and technical Levels of Service (LOS), based on input from municipal staff. **Table 8-4** and **Table 8-5** outline the City’s current community and technical levels of service for Airport Operations.

**Table 8-4: Community LOS – Airport Operations**

LOS Parameter	LOS Statement	Performance Measure	Current LOS (2023)
<b>Reliability</b>	Provide reliable service as volume and movement increases	Aircraft movements per year	29,243 – increase of 29.5% from 2022
<b>Suitability</b>	Provide infrastructure to support airlines and airport land development	Runway Infrastructure able to support unrestricted operations by B737-900 aircraft and percentage of available lands serviced.	Q400-restricted operations, 1% vacant serviced land

## Airport Operations

**Table 8-5: Technical LOS – Airport Operations**

LOS Parameter	LOS Statement	Performance Measure	Current LOS (2023)
Quality	Roadways, Parking Lots, Site Lighting, Video Wall are kept in good working condition.	Percentage of assets that are in poor or better condition.	81%

### 8.3 Risk Assessment

The risk ratings for Airport Operations assets included Airport Site, Runway, Runway Lighting, and Other Equipment. The risk scores were calculated using the risk methodology and approach outlined in Section 1.4 of the Introduction. **Table 8-6** summarizes the risk factors for the Airport Operations assets.

**Table 8-6: Risk Factors – Airport Operations**

Factors	Risk Ratings
A - Condition	The condition of the assets was determined either by visual or age-based and can be found in the SOLI section of the AMP.
B - Performance	The performance of the Airport Site, Runway Lighting, and Other Equipment assets was identified as "always reliable" and assigned a rating of 1 for calculating risk score. The Runway assets were assigned a rating of 5 and identified as "not reliable" due to their current conditions limiting the allowable aircraft size.

**Airport Operations**

Factors	Risk Ratings
<b>C - Climate Change</b>	The climate change ratings were determined at the asset class level by identifying climate change hazard interactions. The Airport Site, Runway, and Runway Lighting were identified as a “moderate” risk and assigned a rating of 3 for calculating the risk score. The Other Equipment assets were identified as a “low” risk and assigned a rating of 1 for calculating the risk score.
<b>D - Impact</b>	The Airport Site, Runway, and Other Equipment assets was recognized as "low" impact and assigned a rating of 0 for calculating risk score. The impact of the Runway Lighting was identified as "moderate" impact and assigned a rating of 1 for calculating risk score.
<b>E - Importance</b>	The Airport Site, Runway, and Runway Lighting asset class was identified as “high” importance and assigned a rating of 3 when calculating risk. A “moderate” importance rating was given to the Other Equipment assets and a rating of 2 was assigned for calculating risk score.

The individual risk ratings were used in calculating the risk score for each of the assets.

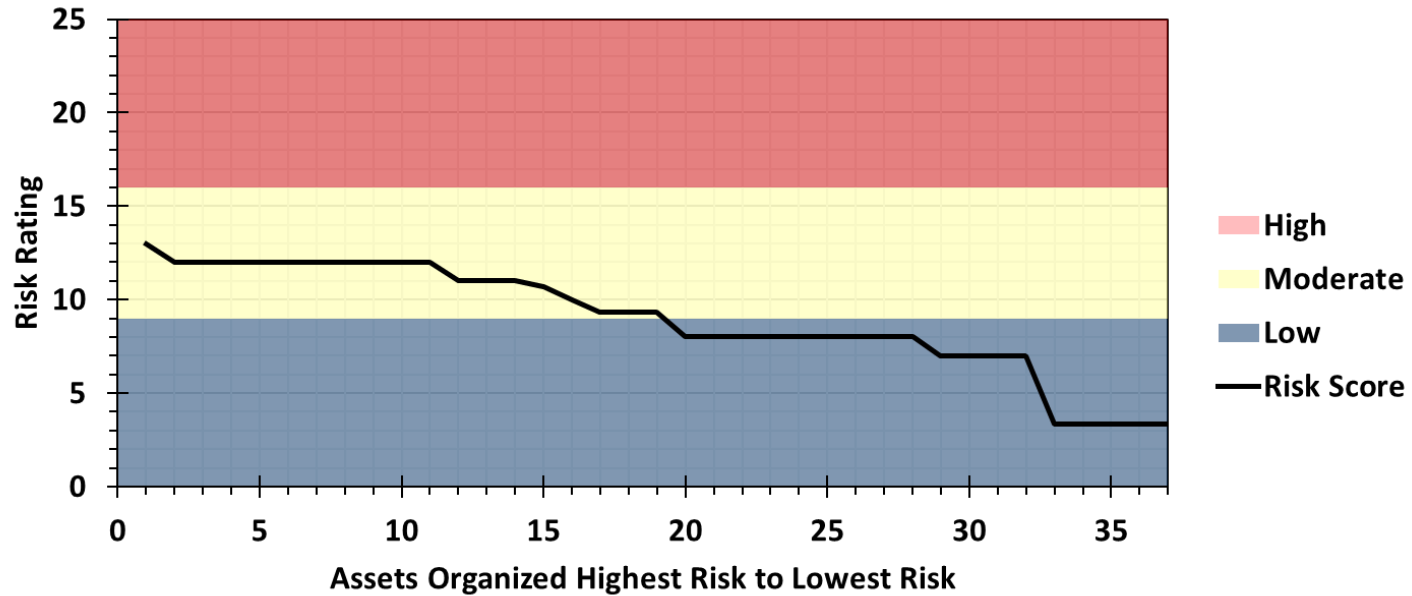
**8.3.1 Risk Profile**

The Risk profile for the eight Airport Site assets tracked within the asset inventory are classified as Low risk, while the nine Runway pavement assets tracked were classified as Moderate risk. Of the 15 Runway Lighting assets, ten were classified as Moderate risk and the remaining five were classified as Low risk. The five Other Equipment assets were classified as Low risk. The Risk profile for all 37 Airport Operation assets is displayed in **Figure 8-6**.



## Airport Operations

Figure 8-6: Risk Profile - Airport Operations (All Asset Classes)



## 8.4 Asset Management Strategy

### 8.4.1 Lifecycle Activities – Airport Operations

The lifecycle activities considered include:

- **Non-Infrastructure Solutions:** Actions or policies that can lower costs and extend useful lives.
- **Maintenance Activities:** Regularly scheduled inspection and maintenance, or more significant repair and activities associated with unexpected events.
- **Renewal / Rehabilitation Activities:** Significant repairs designed to extend the life of the asset.
- **Replacement / Construction Activities:** Activities that are expected to occur once an asset has reached the end of its useful life and renewal/rehabilitation is no longer an option.

## Airport Operations

- **Disposal Activities:** Activities associated with disposing of an asset once it has reached the end of its useful life or is otherwise no longer needed.
- **Expansion / Growth / Service Improvement Activities:** Planned activities required to extend services to previously unserved areas or expand services to meet growth demands.

**Table 8-7** describes the lifecycle activities that can be implemented within the asset management strategy for Airport Operations. The lifecycle activities presented below are existing activities performed by the City, identified during a workshop with City staff in January 2024.

**Table 8-7: Lifecycle Activities – Airport Operations**

Lifecycle Type	Description of Activity	Frequency / Timing
Non-Infrastructure Solutions	Pavement Condition Assessments	Every 3 years
Non-Infrastructure Solutions	Runway Friction Testing	Every 2 years (based on Transport Canada recommendations)
Non-Infrastructure Solutions	Aviation Regulatory Assessment	Annually
Maintenance Activities	Preventative maintenance and general upkeep including crack sealing, line painting, drainage control, snow clearing/runway de-icing, and wildlife control.	As needed
Replacement / Construction Activities	Replacement of Assets	End of EUL

## Airport Operations

Lifecycle Type	Description of Activity	Frequency / Timing
Disposal Activities	Demolition of Hangers	As needed
Expansion / Growth / Service Improvement Activities	Runway 01-19 Widening and Increasing of Bearing Strength	Ongoing
Expansion / Growth / Service Improvement Activities	Terminal Expansion	Ongoing
Expansion / Growth / Service Improvement Activities	Airport Masterplan	Every 10 years
Expansion / Growth / Service Improvement Activities	Air Service Plan	Every 5 years

### 8.4.2 Funding the Lifecycle Activities – Airport Operations

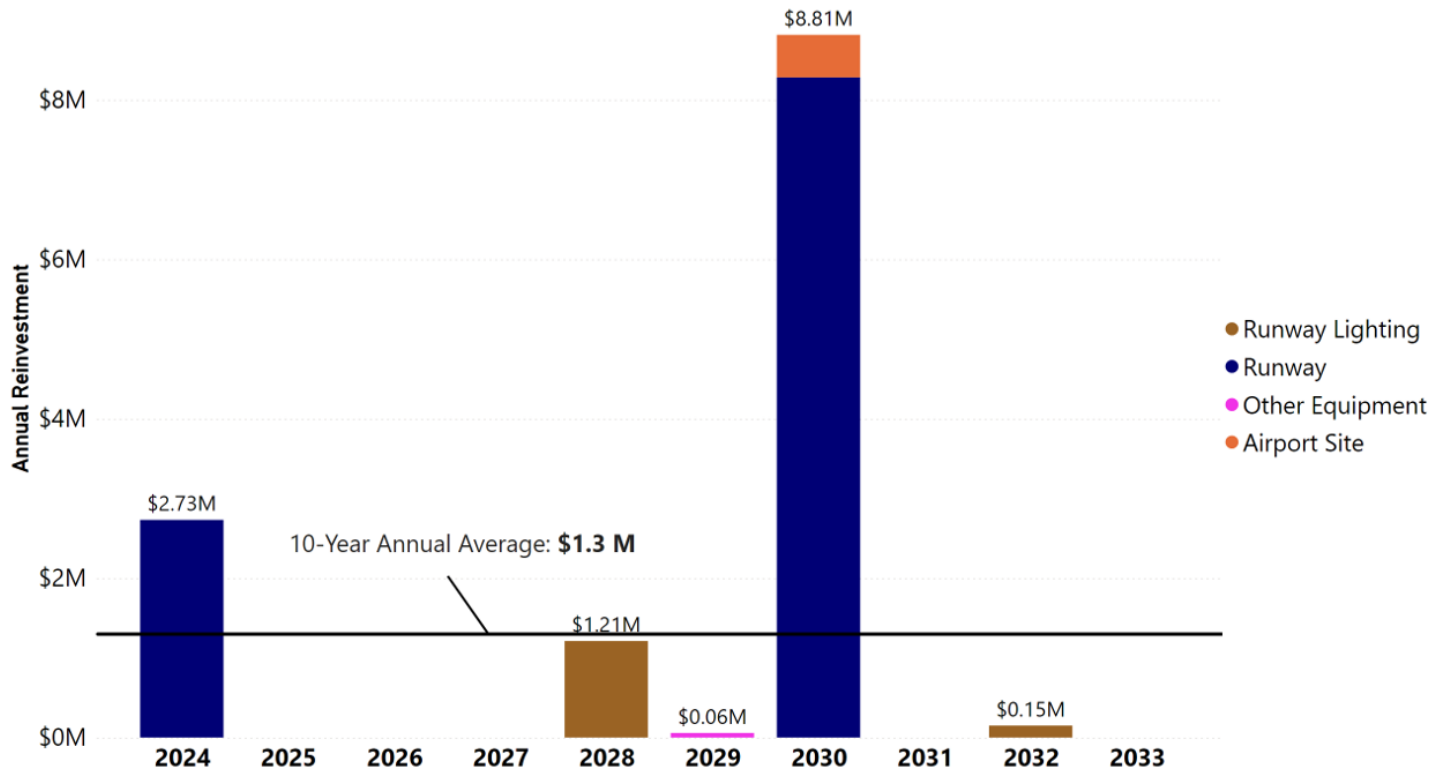
Lifecycle modeling allows for the City to understand the future reinvestment needs of their existing assets by generating a theoretical asset replacement forecast that considers available asset inventory data. The age, EUL, replacement cost, condition, and risk score of each asset can be leveraged within the lifecycle model to proactively plan for reinvestment over a period of interest. Asset replacement forecasts within this subsection estimate the required reinvestment for Airport Operations assets over the next 10 years based on available asset inventory data.

There is a total of approximately **\$13 million** to be reinvested into the Airport Operations assets owned by the City in the next 10 years. This translates to a 10-year annual average of approximately **\$1.3 million**, as presented in **Figure 8-7**.

### Airport Operations

**Note:** At the time of preparing this AMP, there is currently a runway, taxiway, and apron surface assessment underway to identify what pavement upgrades would be required to support sustainable airline traffic. The results of this assessment were not available for this AMP and may impact the airport’s capital investment requirement as outlined below.

**Figure 8-7: 10-Year Capital Reinvestment Needs - Airport Operations**



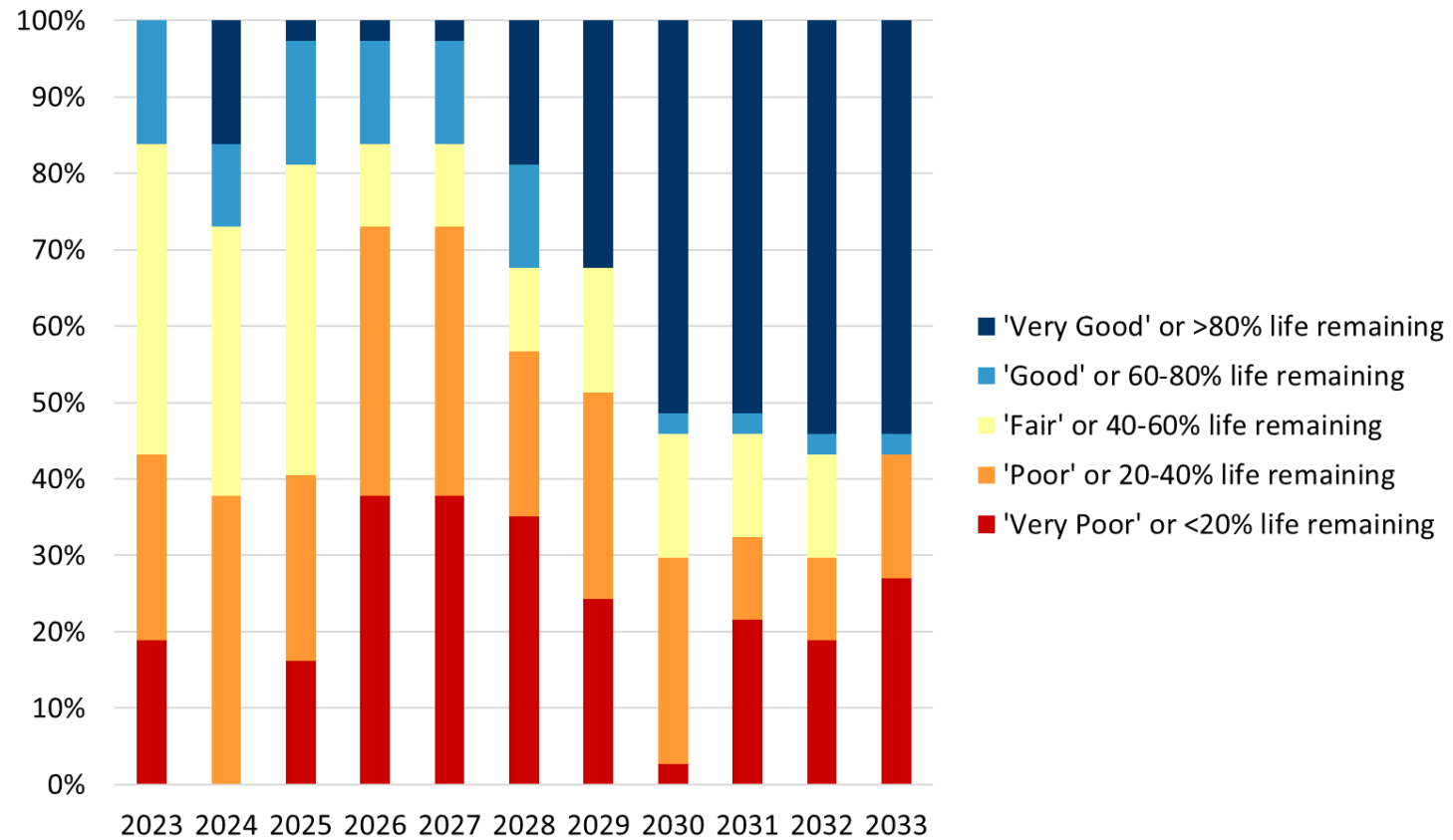
## Airport Operations

It is important to note that forecasting in this lifecycle model relies heavily on age and EUL to determine renewal or replacement needs and that tracking of condition data for Airport Operations assets by the City will assist at refining forecasted expenditures in the decades to come. The LOS includes maintaining the current assets in poor or better condition (81%). From the lifecycle model, the percentage of Airport Operations assets in poor or better condition fluctuates throughout the next 10-years, reaching a high of 100% in 2024 and eventually finishing at 73% in 2033.

**Figure 8-8** shows an overview of the condition of Airport Operations over the next 10 years based on the lifecycle model.

Airport Operations

Figure 8-8: Condition Overview by Year Based on Lifecycle Model – Airport Operations



# City of Kingston 2024 Asset Management Plan

Executive  
Summary and  
Introduction

Volume 1  
Infrastructure,  
Transportation,  
Transit, &  
Emergency  
Services

Volume 2  
Corporate  
Services &  
Parking  
Operations

Volume 3  
Community  
Services

Volume 4  
Parks, Parkland,  
& Trails

Volume 5  
Police, Libraries,  
City Real Estate  
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**Appendices (Provided in a Separate Document)**

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- B – Risk Variables

Acronyms

# Acronyms

Acronym	Definition
AMP	Asset Management Plan
BCA	Building Condition Assessment
CO <sub>2</sub> e	Carbon Dioxide Equivalent
CPI	Consumer Price Index
EUL	Expected Useful Life
EV	Electric Vehicle
FMCS	Facilities Management & Construction Services
FMIS	Fleet Management Information System
GIS	Geographic Information System
GHG	Greenhouse Gas
IS&T	Information Systems & Technology
IT	Information Technology
KFPL	Kingston Frontenac Public Library
KM	Kilometre
LOS	Levels of Service
PDU	Power Distribution Unit
SOLI	State of the Local Infrastructure
UK	Utilities Kingston
UPS	Uninterruptible Power Supply



## 1.0 Overview

The asset management project includes 21 service areas, covering all assets owned by the City of Kingston (City) that are not already included in other Asset Management Plans (AMP). This is the first iteration of an AMP for these service areas. Given the extensive range of assets included in the project, the plan is presented in the following six documents:

- Executive Summary and Introduction
- Volume 1: Infrastructure, Transportation, Transit, & Emergency Services
- Volume 2: Corporate Services & Parking Operations
- Volume 3: Community Services
- Volume 4: Parks, Parkland, & Trails
- Volume 5: Police, Libraries, City Real Estate & Environment

## Overview

The Introduction document presents key asset management principles and an overview of how each service area will be presented in its own chapter with the following sections: State of the Local Infrastructure (SOLI); Levels of Service (LOS); Risk Assessment; and Asset Management Strategy. The Introduction also includes a section on Growth and a Roadmap with Next Steps. The following sections are included in the Introduction document:

- Section 1.1 Asset Management
- Section 1.2 Scope of Assets
- Section 1.3 Alignment with Strategic Plan, Policy, and Regulation
- Section 1.4 Governance and Relationship to Other Planning Documents
- Section 1.5 Growth
- Section 1.6 Overview of the AMP
  - State of the Local Infrastructure
  - Levels of Service
  - Risk Assessment
  - Asset Management Strategy
- Section 1.7 Roadmap with Next Steps

Overview

1.1 Scope of Assets in Volume 2

The service areas included in **Volume 2: Corporate Services & Parking Operations** are: Corporate Fleet; Information Systems and Technology (IS&T); and Parking Equipment, Lots and Structures. See **Table 1-1** for the respective asset classes for each service area and the relevant chapter.

**Table 1-1: Service Areas included in Corporate Services & Parking Operations**

Service Area	Asset Classes	Report Chapter
Corporate Fleet	<ul style="list-style-type: none"> <li>• Vehicles</li> <li>• Fleet Equipment</li> </ul>	Chapter 2.0
Information Systems & Technology (IS&T)	<ul style="list-style-type: none"> <li>• IT Infrastructure</li> <li>• End User Devices</li> <li>• Applications &amp; Software</li> <li>• Video Camera Systems</li> </ul>	Chapter 3.0
Parking Equipment, Lots, & Structures	<ul style="list-style-type: none"> <li>• Surface Lots</li> <li>• Parking Structures</li> <li>• Equipment</li> <li>• Information &amp; Technology</li> </ul>	Chapter 4.0

**Note:** Condition assessments are not included for the assets in Applications & Software (IS&T) as these are not physical assets. Additionally, at the time of writing this AMP there was no data available for the following asset classes: Video Camera Systems (IS&T); and Information & Technology (Parking Equipment, Lots, & Structures).

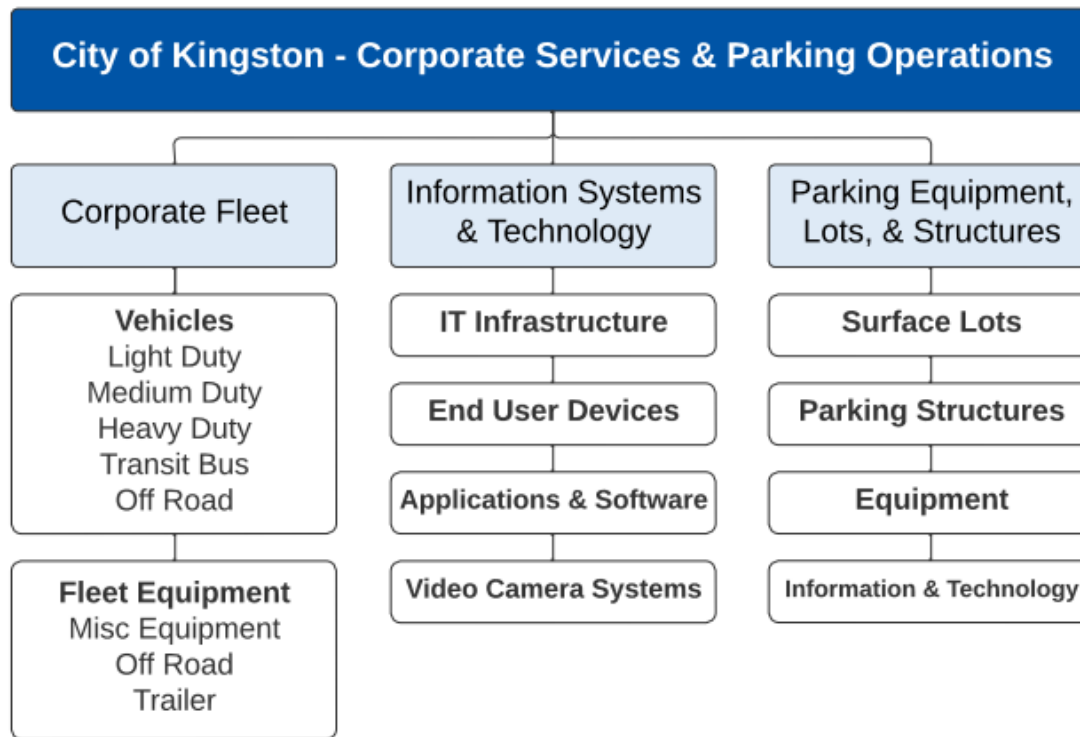


Overview

1.2 Asset Hierarchy

The asset hierarchy that was generated and used for the City’s assets is shown in **Figure 1-1**. The asset group (level 1) is shown in the blue box, the three service areas (level 2) are shown in the light blue boxes, the asset classes are shown in bold (level 3), and where applicable, the asset sub-classes are shown in regular text (level 4).

**Figure 1-1: Asset Hierarchy for Corporate Services & Parking Operations**



## Overview

### 1.3 Asset Inventory and Replacement Costs

An asset inventory was generated for all assets included in this AMP using Microsoft Excel. The inventory organizes assets using the various levels of the asset hierarchy and acts as a central repository for the asset data that can be used to inform asset management planning. It is recommended that the City continually updates the asset information stored within the asset inventory to facilitate asset management planning based on reliable data.

Where replacement costs were provided, the values were inflated based on the Bank of Canada Consumer Price Index (CPI) to estimate the replacement cost in 2023 dollars. If replacement costs were not provided, Dillon leveraged a unit cost model to assign replacement costs based on unit cost estimated for 2023. It is recommended that unit prices should be reviewed annually by the City based on costs observed from local suppliers and contractors.

Replacement costs for Applications & Software depend on contracts administered between the City and applicable vendors and for the purposes of this AMP documented costs associated with annual software support and maintenance are captured in addition to any known or predicted contract increases provided by the City.

### 1.4 Establishing Levels of Service

There were four LOS workshops that were held with staff. The service categories for this volume were covered in Workshop 2 and 3.

- Workshop 2 was held on November 10, 2023, and included the stakeholders for Information Systems & Technology and Parking Equipment, Lots, and Structures service categories.
- Workshop 3 was held on November 21, 2023, and included the stakeholders for Corporate Fleet.

There were City staff from each service area that attended the workshop. The list of attendees is summarized in **Table 1-2**.

Overview

**Table 1-2: Workshop Attendees - Corporate Services & Parking Operations**

Service	Name	Role
Corporate Fleet	Brent Fowler	Director Corp Asset Management & Fleet
Corporate Fleet	Gord Warner	Manager Fleet Services
IS&T	Jeff Bumstead	Chief Information Officer/ IS&T Admin.
IS&T	Jordan Rogers	Manager of GIS
IS&T	Scott Tulk	Manager of Digital Transformation
Parking Structures and Services	Laird Leggo	Manager Licensing Parking Operations & Policy

**1.5 Growth Related Impacts on Lifecycle of Assets**

As the City continues to expand, there are impacts to existing service levels and assets based on these future needs. The growth-related assumptions and potential impact on the lifecycle of the assets is shown in **Table 1-3**.

**Table 1-3: Growth Related Impacts on Lifecycle of Assets**

Service Category	Growth Impact Assumptions	How Assumptions Relate to Lifecycle of Assets
Corporate Fleet	<ul style="list-style-type: none"> <li>Increase in service demands due to increased operating hours, or capacity covering greater distances.</li> </ul>	<ul style="list-style-type: none"> <li>Potential increase in capital expenditures for the purchase of additional assets to meet service needs</li> </ul>

Overview

Service Category	Growth Impact Assumptions	How Assumptions Relate to Lifecycle of Assets
	<ul style="list-style-type: none"> <li>Increases to internal capacity (staffing) required to maintain equipment</li> </ul>	<ul style="list-style-type: none"> <li>Potential increase in operational costs to maintain fleet assets</li> </ul>
Information Systems & Technology	<ul style="list-style-type: none"> <li>Increase in service demands to operation or capacity of the services</li> <li>Higher risk of cybersecurity due to increased number of assets required to provide service</li> </ul>	<ul style="list-style-type: none"> <li>Potential increased operational costs due to increase network size</li> </ul>
Parking Equipment, Lots, & Structures	<ul style="list-style-type: none"> <li>Increase in service demands by the number of assets required to provide a reliable service without impacting growth opportunities</li> <li>Increase service needs for additional lots or structures to service a growing community</li> </ul>	<ul style="list-style-type: none"> <li>Potential increased capital costs to address increased need of more assets to meet service</li> <li>Potential increase in operational costs due to an increase in the overall network size</li> </ul>



## 2.0 Corporate Fleet

The City's Corporate Asset Management & Fleet Services Department manages and oversees the procurement, operation, maintenance, and re-marketing of over 1,000 owned and leased fleet vehicles and equipment operated by the organization. This includes a wide range of vehicles and equipment such as public transit buses, construction vehicles, plow trucks, trailers, and utility vehicles. The following section of the AMP includes assets that are managed by this department that are utilized to support critical municipal operations.

It is important to note that fleet and equipment assets related to Kingston Fire & Rescue, Police, and Library Services are inventoried under their respective service areas, and as a result, are not included in this volume; however, Fleet Assets deployed at Utilities Kingston are included.

## Corporate Fleet

### 2.1 State of the Local Infrastructure

#### 2.1.1 Asset Inventory and Valuation

Corporate Fleet represents a diverse portfolio of municipal fleet and equipment assets that span numerous City departments. The City develops current replacement values by using historical cost, inflation professional judgement, industry trends, and updated estimates from major suppliers. For inventory purposes, Corporate Fleet asset classes have been further divided into applicable asset sub-classes. The asset classes, asset sub-classes, a count of assets therein, and the total replacement cost (in 2023 dollars) are show in **Table 2-1**. The total replacement cost (2023 dollars) is estimated at **\$185.1 million** for the **946 assets** included in the inventory.

**Table 2-1: Inventory Summary by Asset Type - Corporate Fleet**

Asset Class	Asset Sub-Class	Count	Total Replacement Cost (2023)
Vehicles	Light Duty	210	\$8,193,600
Vehicles	Medium Duty	57	\$4,628,200
Vehicles	Heavy Duty	80	\$22,264,600
Vehicles	Transit Bus	81	\$128,514,600
Vehicles	Off Road	52	\$8,174,800
Fleet Equipment	Misc. Equipment	285	\$1,963,500
Fleet Equipment	Off Road	102	\$8,705,100
Fleet Equipment	Trailer	79	\$2,471,900
<b>Overall</b>	<b>Not Applicable (N/A)</b>	<b>946</b>	<b>\$185,105,200</b>

## Corporate Fleet

### 2.1.2 Asset Age Summary

The average age, average condition, expected useful life, and average remaining useful life of the assets in the Vehicles and Fleet Equipment asset classes are summarized in **Table 2-2**. The overall average age of Corporate Fleet assets is seven years and the average remaining useful life is seven years.

**Table 2-2: Average Age, Average Condition, Expected Useful Life, and Average Remaining Useful Life - Corporate Fleet**

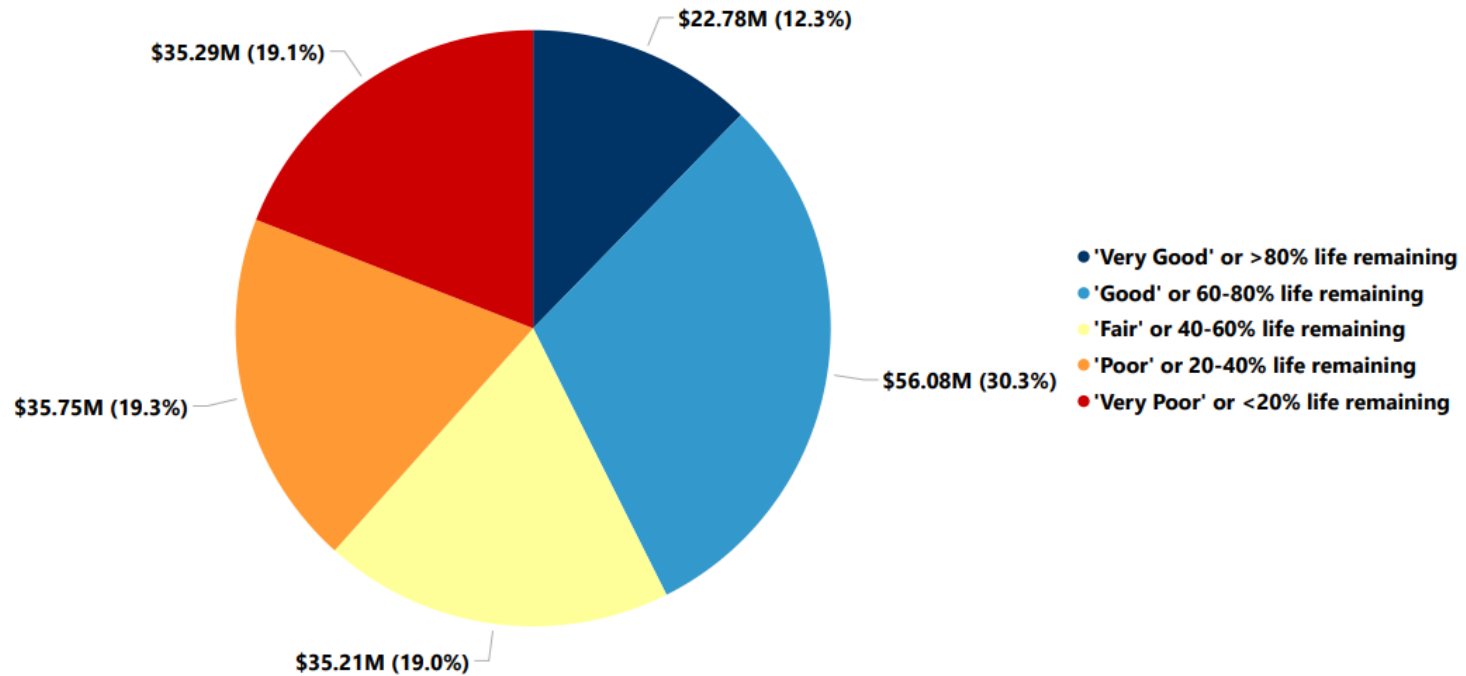
Asset Class	Asset Sub-Class	Average Age (Years)	Average Condition Grade	Expected Useful Life (Years)	Average Remaining Useful Life (Years)
Vehicles	Light Duty	7	Fair	10	4
Vehicles	Medium Duty	8	Poor	10	3
Vehicles	Heavy Duty	11	Poor	10	2
Vehicles	Transit Bus	8	Fair	15	7
Vehicles	Off Road	8	Fair	10	5
Fleet Equipment	Misc. Equipment	4	Very Good	15	12
Fleet Equipment	Off Road	9	Fair	15	7
Fleet Equipment	Trailer	14	Poor	15	4
<b>Overall</b>	<b>N/A</b>	<b>7</b>	<b>Fair</b>	<b>10 to 15</b>	<b>7</b>

## Corporate Fleet

### 2.1.3 Asset Condition

An overall condition summary for the assets within the Corporate Fleet service area by replacement cost (in 2023 dollars) is shown in **Figure 2-1**. About 62% of the assets are in very good to fair condition.

**Figure 2-1: Condition Summary and 2023 Replacement Cost – Corporate Fleet**





## Corporate Fleet

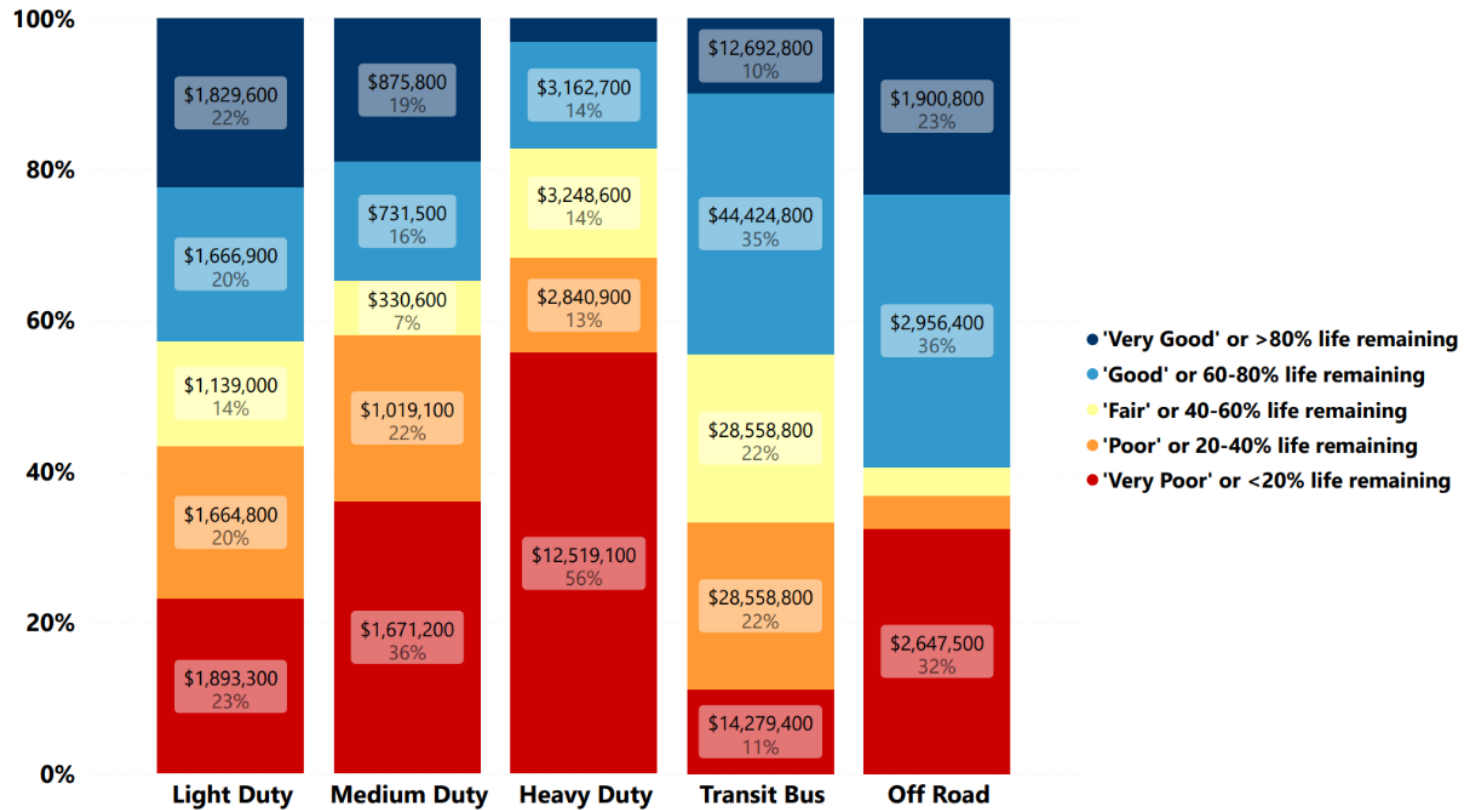
A condition summary for Vehicle assets is provided in **Figure 2-2** by asset type and replacement cost (in 2023 dollars). In the absence of condition assessment data, the condition of the assets has primarily been determined based on age and EUL (the percentage of remaining useful life) or Life-To-Date usage (operating hours and /or mileage).

However, for Corporate Fleet assets, procedures are in place to verify their condition through various methods. These include visual inspections, legislative requirements (e.g., safety inspections), feedback from operators, supervisors, and driver trainers, engine fault code alerts from the telematics system, and preventative maintenance performed by mechanics during regularly scheduled maintenance.



Corporate Fleet

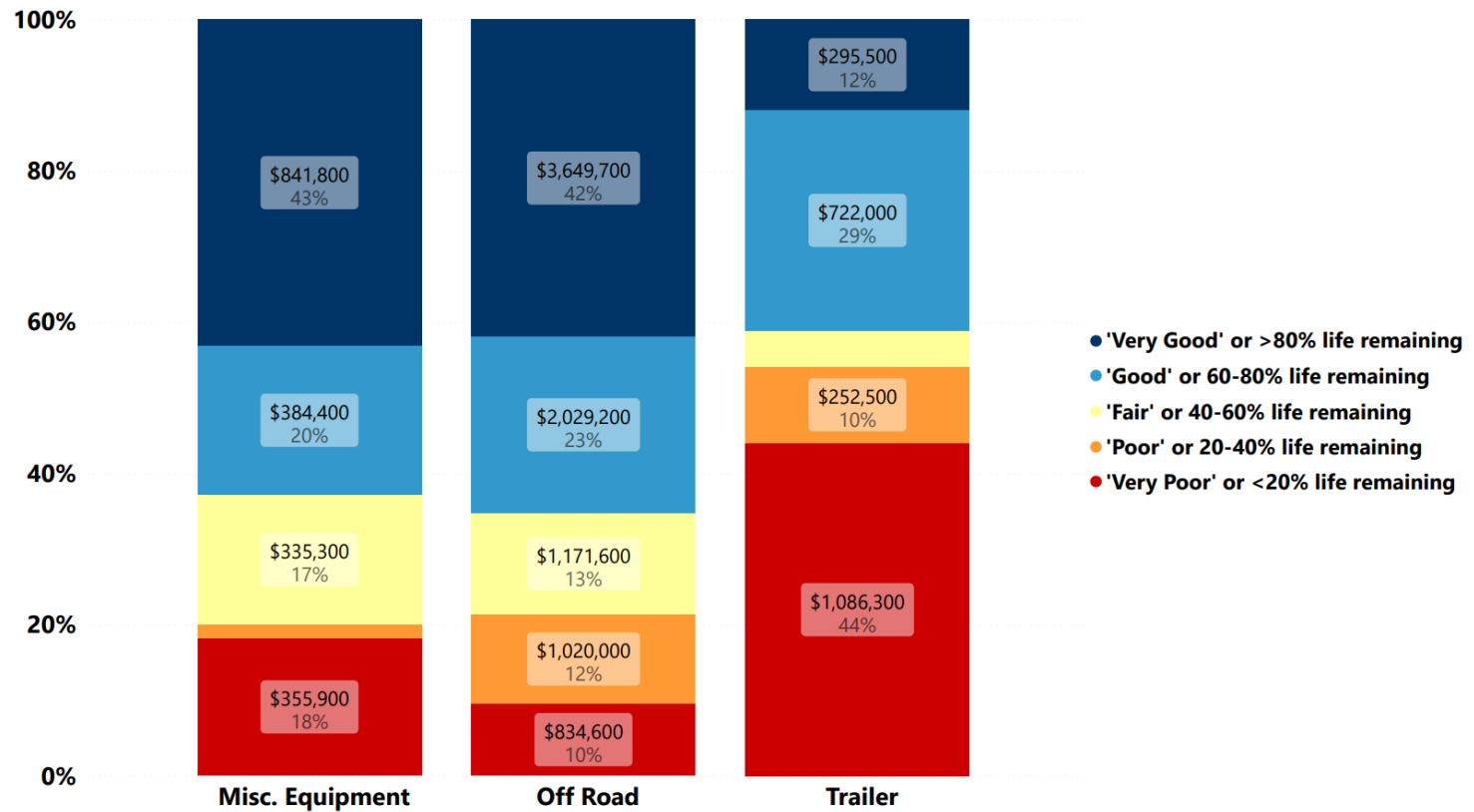
Figure 2-2: Condition Summary by Asset Type and 2023 Replacement Cost - Corporate Fleet (Vehicles)



A condition summary for Fleet Equipment assets is provided in **Figure 2-3** by asset type and replacement cost (in 2023 dollars). In the absence of condition assessment data, the condition of the assets has primarily been determined based on age and EUL.

Corporate Fleet

Figure 2-3: Condition Summary by Asset Type and 2023 Replacement Cost - Corporate Fleet (Fleet Equipment)



## Corporate Fleet

### 2.1.4 Data Sources and Confidence

The asset data for Corporate Fleet is maintained by the City in a Enterprise-wide fleet and equipment asset and work order management application from AssetWorks Inc. called FleetFocus (also known as M5). This application served as the main data source for this AMP. The City has dedicated staff who update the inventory data for Corporate Fleet in real-time while also supporting Kingston Fire & Rescue, Kingston Police, and the Kingston Frontenac Public Library Board (KFPL) with hosting their fleet data in the City's Fleet Management Information System (FMIS). This suggests that the data source is reliable.

Data confidence can be estimated based on the confidence level of various qualifiers and can be presented on a scale from 0% (low) to 100% (high), as shown in **Table 2-3**. The qualifiers chosen for evaluation are specifically targeted for estimating overall confidence of condition reporting within the SOLI.

**Table 2-3: Data Confidence Scale**

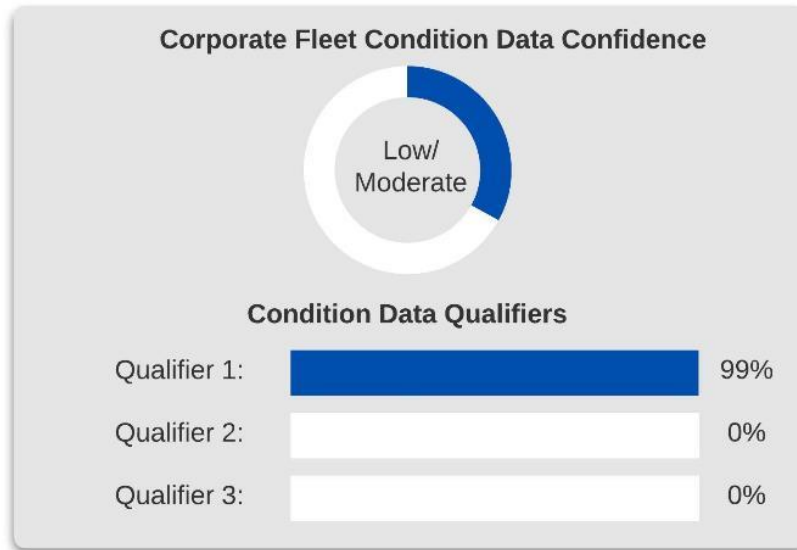
Confidence Level	Low	Low/ Moderate	Moderate	Moderate/ High	High
Average of Qualifiers	0% - 19%	20% - 39%	40% - 59%	60% - 79%	80% - 100%

Assuming the data source is reliable, the following qualifiers were considered to estimate data confidence regarding the data utilized in the creation of this SOLI report:

- **Qualifier 1:** The percentage of assets in the asset inventory where construction, installation, or acquisition years are documented (99%);
- **Qualifier 2:** The percentage of assets in the asset inventory that have condition assessment data documented (0%); and,
- **Qualifier 3:** The percentage of the estimated overall Corporate Fleet replacement value, in 2023 dollars, attributed to assets in the asset inventory where condition can be assessed using available data (i.e., based on condition assessment history and/or age-based condition) (0%).

## Corporate Fleet

**Figure 2-4: SOLI Report Data Confidence - Corporate Fleet**



As summarized in **Figure 2-4**, the overall data confidence for the condition of Corporate Fleet assets is estimated as Low to Moderate. Currently, the asset conditions for Corporate Fleet assets are based on age. Data confidence can be increased by improving the documentation of condition assessment data. For Corporate Fleet assets, this could include adding an additional attribute within FleetFocus to track assigned asset condition ratings, which can be assigned or updated when staff perform regularly scheduled maintenance.

## 2.2 Levels of Service

The City has developed the customer and technical LOS, based on contributions from staff. It was decided that Quality and Environmental Acceptability were key attributes in gauging the performance of the assets. **Table 2-4** and **Table 2-5** outline the City’s current community and technical LOS for Corporate Fleet.

## Corporate Fleet

**Table 2-4: Community LOS - Corporate Fleet**

LOS Parameter	LOS Statement	Performance Measure	Current LOS (2023)
<b>Quality</b>	Fleet and equipment are kept in good working condition	Percentage of assets that are meeting condition performance objectives.	75%
<b>Environmental Acceptability</b>	Corporate fleet assets are environmentally sustainable by reducing GHG emissions and fuel economy.	Annual GHG Emissions and Fuel Consumption	12,432 t CO <sub>2</sub> e (based on 2022 data)

**Table 2-5: Technical LOS - Corporate Fleet**

LOS Parameter	LOS Statement	Performance Measure	Current LOS (2023)
<b>Quality</b>	Corporate fleet is maintained based on fleet best practices	The cost of maintaining the fleet asset per operating hour or km	Currently not available

## 2.3 Risk Assessment

The risk ratings for Corporate Fleet includes Vehicles and Fleet Equipment. The risk scores were calculated using the risk methodology and approach outlined in the Introduction materials which were provided under a separate document. **Table 2-6** summarizes the risk factors for the Corporate Fleet assets.

Corporate Fleet

Table 2-6: Risk Factors - Corporate Fleet

Factors	Risk Ratings
<b>A - Condition</b>	The condition of the assets was determined either by visual or age-based and can be found in the SOLI section of this AMP.
<b>B - Performance</b>	The performance of the Vehicles was identified as being "usually reliable" and assigned a rating of 3 for calculating risk score. The Fleet Equipment was identified as "always reliable" and assigned a rating of 1 for calculating risk.
<b>C - Climate Change</b>	The climate change ratings were determined at the asset class level by identifying climate change hazard interactions. The Vehicles were identified as a "high" risk and assigned a rating of 5 when calculating the risk score, while the Fleet Equipment was identified as a "low" climate risk and given a 1 for calculating risk.
<b>D - Impact</b>	The impact of the Vehicles was identified as "moderate" impact and given a rating of 1 for calculating risk. The Fleet Equipment was recognized as "low" impact and assigned a rating of 0 for calculating risk score.
<b>E - Importance</b>	A "high" importance rating was given to Vehicles and a rating of 3 was assigned for calculating risk score. The Fleet Equipment asset class was identified as "moderate" importance and assigned a rating of 2 when calculating risk.

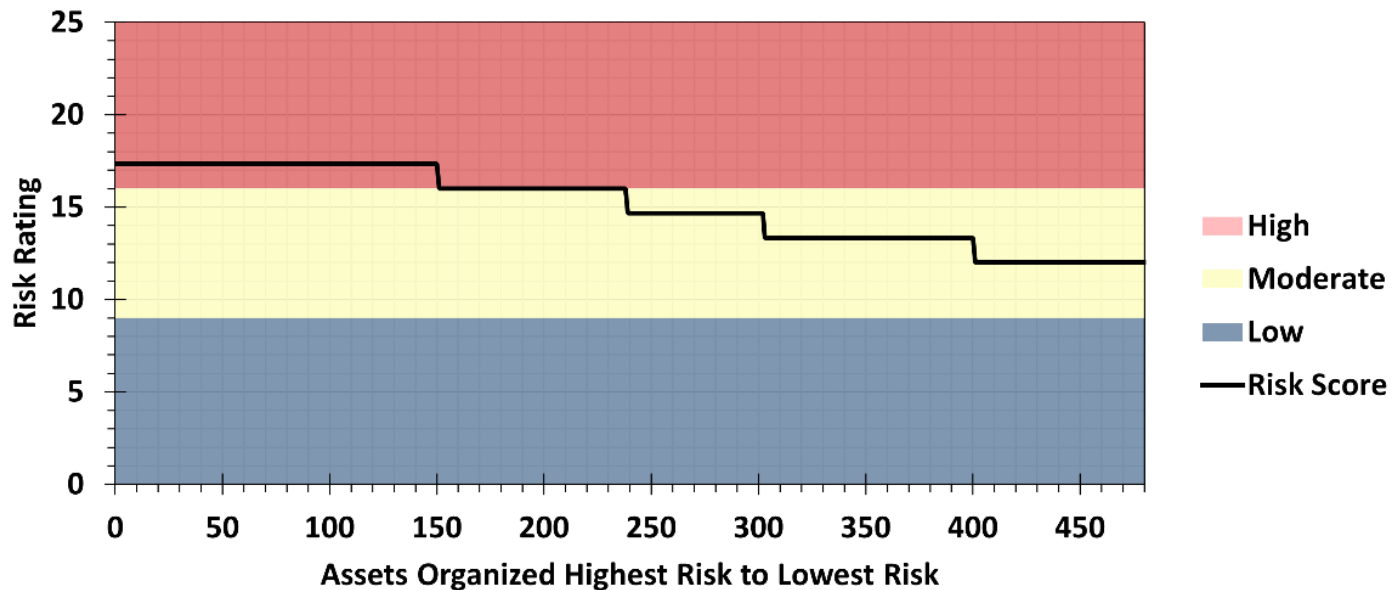
The individual risk ratings were used in calculating the risk score for each of the assets.

## Corporate Fleet

### 2.3.1 Risk Profile

The Risk profile of the Vehicles assets is displayed in **Figure 2-5**. Of the 480 Vehicles tracked within the asset inventory, approximately 50% (238) are classified as High risk and the remaining 242 as Moderate risk. These assets are considered high and moderate priorities for the implementation of lifecycle activities and possible replacement.

**Figure 2-5: Risk Profile - Corporate Fleet (Vehicles)**

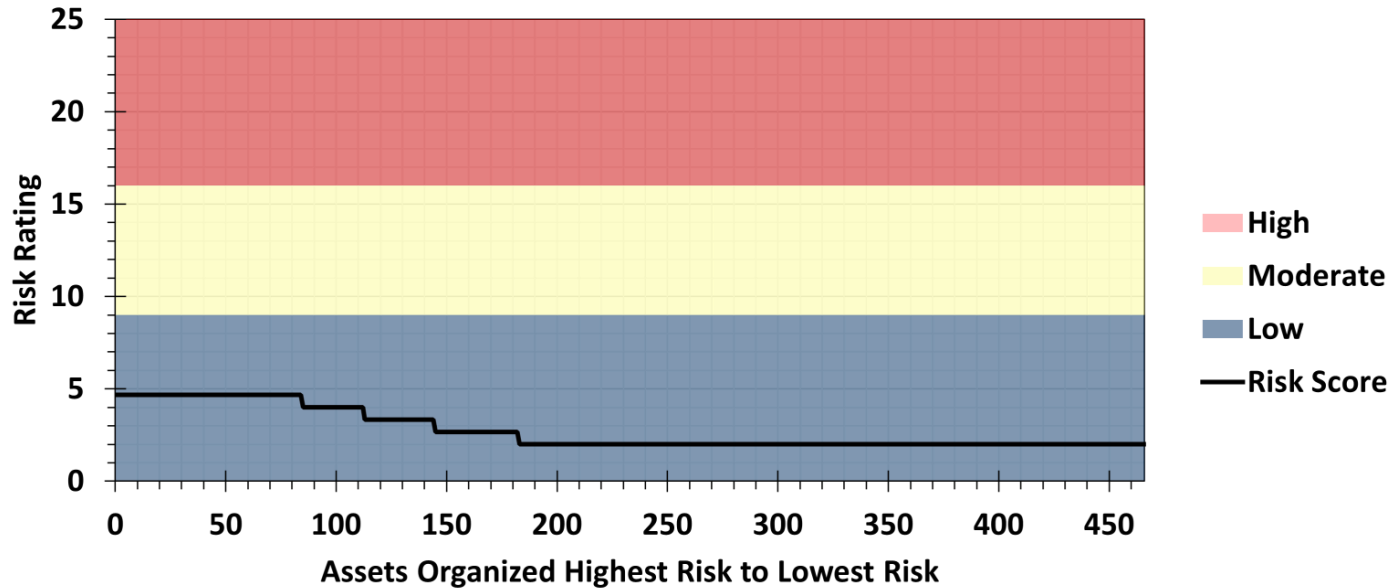


The Risk profile of the Fleet Equipment assets is displayed in **Figure 2-6**. All 466 Fleet Equipment assets tracked in the asset inventory are considered as Low risk.



## Corporate Fleet

Figure 2-6: Risk Profile - Corporate Fleet (Fleet Equipment)



## 2.4 Asset Management Strategy

### 2.4.1 Lifecycle Activities – Corporate Fleet

The lifecycle activities considered include:

- **Non-Infrastructure Solutions:** Actions or policies that can lower costs and extend useful lives.
- **Maintenance Activities:** Regularly scheduled inspection and maintenance, or more significant repair and activities associated with unexpected events.
- **Renewal / Rehabilitation Activities:** Significant repairs designed to extend the life of the asset.
- **Replacement / Construction Activities:** Activities that are expected to occur once an asset has reached the end of its useful life and renewal/rehabilitation is no longer an option.

## Corporate Fleet

- **Disposal Activities:** Activities associated with disposing of an asset once it has reached the end of its useful life or is otherwise no longer needed.
- **Expansion / Growth / Service Improvement Activities:** Planned activities required to extend services to previously unserved areas or expand services to meet growth demands.

**Table 2-7** describes the lifecycle activities that can be implemented within the asset management strategy for Corporate Fleet assets. The lifecycle activities presented below are existing activities performed by the City, identified during a workshop with City staff in February of 2024.

**Table 2-7: Lifecycle Activities - Corporate Fleet**

Lifecycle Activity Type	Description of Activity	Frequency / Timing
Non-Infrastructure Solutions	Zero-Emission Vehicle Transition Studies	As required
Non-Infrastructure Solutions	Review / Benchmarking of Lifecycles	As required
Non-Infrastructure Solutions	Evaluate and explore with equipment manufacturers new technologies and design improvements to improve reliability and longevity	As required (annual meetings with major suppliers)
Non-Infrastructure Solutions	Lifecycle Management Review – Condition Assessment	Annually
Non-Infrastructure Solutions	Green Fleet Policy	As required
Non-Infrastructure Solutions	Solid Waste Cart-Based Transition Plan	Project-based

Corporate Fleet

Lifecycle Activity Type	Description of Activity	Frequency / Timing
Non-Infrastructure Solutions	Optimal asset lifecycles are continually assessed in determining timing of replacements leveraging maintenance data from FMIS	As required
Maintenance Activities	Regular Scheduled Maintenance and Inspections	Based on manufacturer's recommendations
Renewal / Rehabilitation Activities	Transit Buses – Refurbishment	At 30,000 hours or approximately 7 years
Renewal / Rehabilitation Activities	Fleet - Corrosion Prevention Program	Annual rustproofing/ undercoating program for specific fleet asset categories
Renewal / Rehabilitation Activities	Snowplow Trucks - Refurbishment	As required for snowplow truck (review at year 7 for year 8 budgeting if required)
Renewal / Rehabilitation Activities	Street Sweepers - Refurbishment	At 3500 hours or approximately 5 years
Replacement / Construction Activities	Replacement at End of Useful Life (EUL)	End of EUL
Disposal Activities	Public Auction of Fleet Assets administered by a Third Party	End of EUL

Corporate Fleet

Lifecycle Activity Type	Description of Activity	Frequency / Timing
	<p>Plan with auction to target seasonal disposal of assets to maximize return when demand is higher</p> <p>Optimize lifecycle analysis on light duty fleet assets through leveraging leasing program with Enterprise Fleet Management <i>(also assists with minimizing obsolescence of EV battery capacity and technology)</i></p>	
Disposal Activities	Review opportunities to re-purpose vehicle outfitting and attachments past the lifecycle of the original asset it was installed on	End of EUL
Expansion / Growth / Service Improvement Activities	<p>Business Cases to support the addition of Fleet Assets. Guided by:</p> <ul style="list-style-type: none"> <li>• City of Kingston Strategic Plan (2023-2026)</li> <li>• Green Fleet Strategy</li> <li>• Watson Population Growth Study &amp; Council Adoption</li> </ul>	Based on service provider's needs
Expansion / Growth / Service Improvement Activities	Zero-Emission Fleet Transition	Based on service provider's needs

## Corporate Fleet

### 2.4.2 Funding the Lifecycle Activities – Corporate Fleet

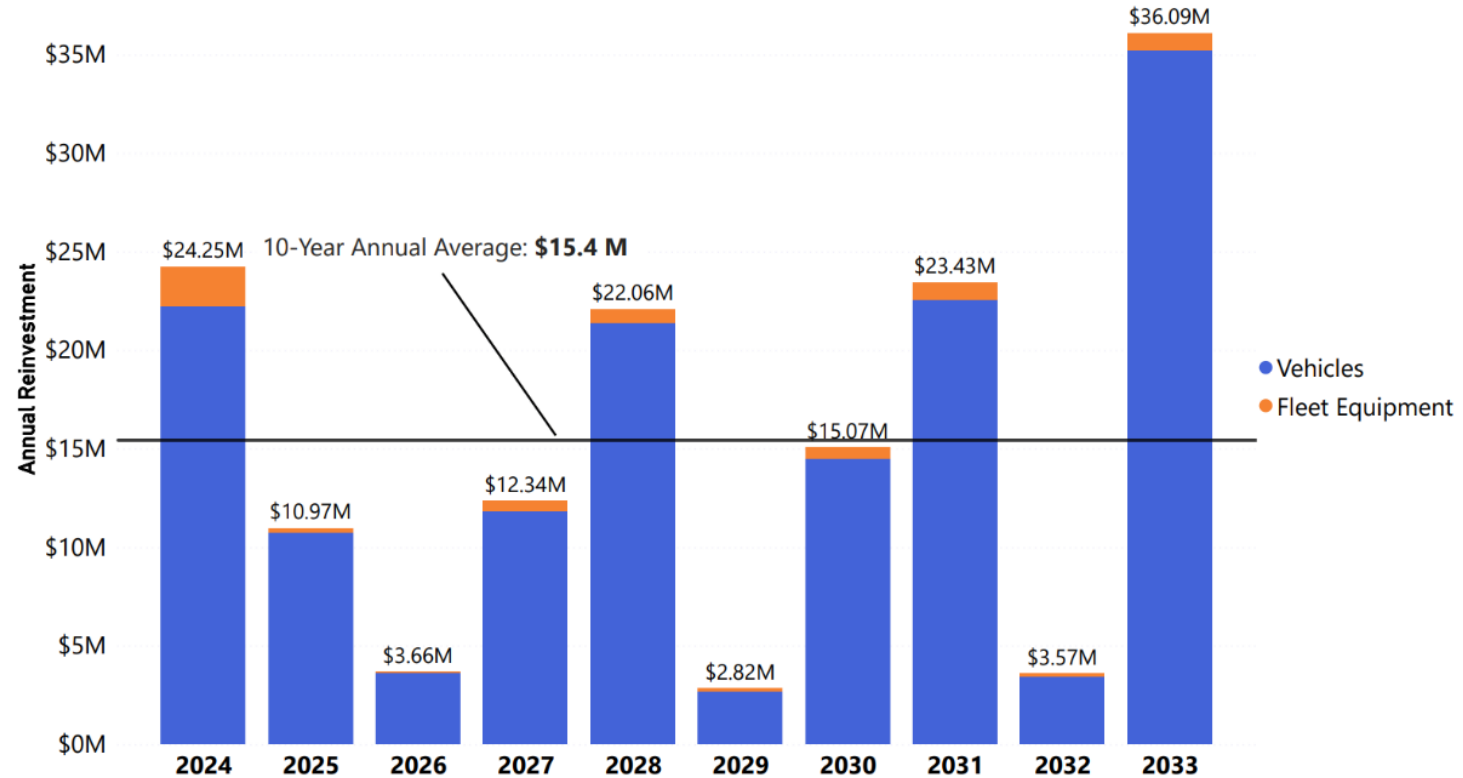
Lifecycle modeling allows for the City to understand the future reinvestment needs of their existing assets by generating a theoretical asset replacement forecast that considers available asset inventory data. The age, EUL, replacement cost, condition, and risk score of each asset can be leveraged within the lifecycle model to proactively plan for reinvestment over a period of time. Asset replacement forecasts within this subsection estimate the required reinvestment for assets over the next 10 years based on available asset inventory data.

There is a total of approximately **\$154 million** to be reinvested into the Corporate Fleet assets owned by the City in the next 10 years. This translates an annual average of approximately **\$15.4 million** over a 10-year period, as presented in **Figure 2-7**.



Corporate Fleet

Figure 2-7: 10-Year Capital Reinvestment Needs - Corporate Fleet

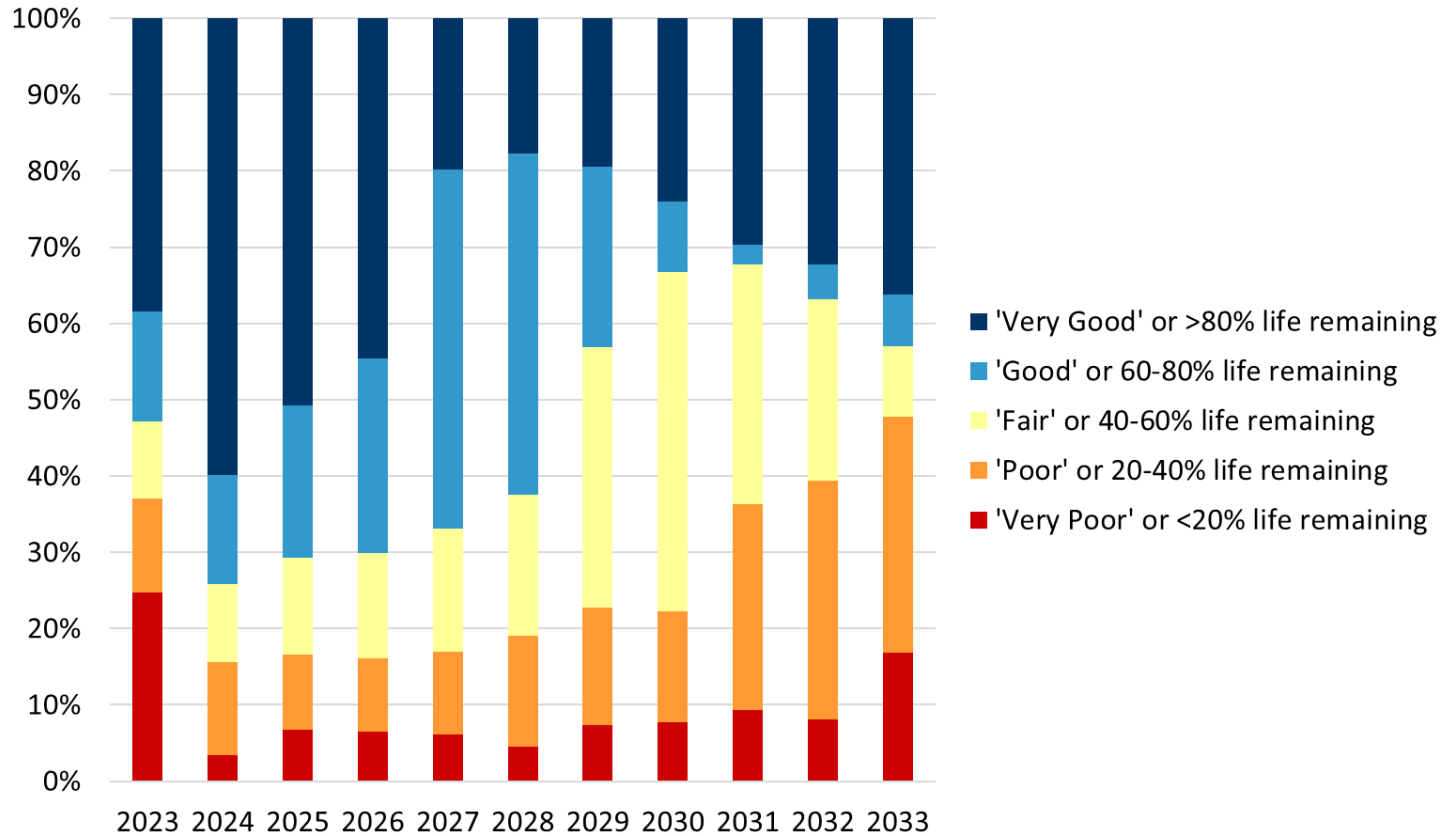


It is important to note that forecasting in this lifecycle model relies heavily on age and EUL to determine renewal or replacement needs and that tracking of condition data for Corporate Fleet assets by the City will assist at refining forecasted expenditures in the decades to come. The LOS includes maintaining the current assets in poor or better condition (75%). From the lifecycle model, the percentage of Corporate Fleet assets in poor or better condition fluctuates throughout the next 10-years, reaching a high of 97% in 2024 and eventually finishing at 83% in 2033.

## Corporate Fleet

**Figure 2-8** shows an overview of the condition of Corporate Fleet over the next 10 years based on the lifecycle model.

**Figure 2-8: Condition Overview by Year Based on Lifecycle Model - Corporate Fleet**





### 3.0 Information Systems & Technology

The Corporate Services – Information Systems & Technology (IS&T) department oversees all activities related to technology, including managing software applications, network infrastructure, computer systems, database systems, and security systems. The team works closely with other departments to understand their technology requirements and create solutions that help the organization achieve its goals effectively and efficiently. IT Services staff through their deployment of a centralized service desk responded to 12,781 service requests in 2023. This chapter includes assets that are managed under the IS&T department.

**Note on Scope:** At the time of preparing this AMP no data was readily available for the Video Camera Systems asset class, and as a result, the asset class has been excluded. It is recommended that the City develops an inventory of Video Camera Systems to be considered in subsequent iterations of the AMP.

The Applications & Software asset class includes digital assets that do not exhibit a physical condition. These assets have been included in the AMP for inventory purpose only.



## Information Systems & Technology

### 3.1 State of the Local Infrastructure

#### 3.1.1 Asset Inventory and Valuation

The assets maintained by the IS&T service support various departments at the City. The asset classes, asset types, a count of assets therein, and the total replacement cost (in 2023 dollars) are show in **Table 3-1**. The total replacement cost (2023 dollars) is estimated at **\$13.2 million** for the **2,799 assets** included in the inventory.

#### Table 3-1 Notes

<sup>1</sup> At this time of this AMP, costs associated with approximately 47% of inventoried software assets were unknown. Costs associated with software assets will be further refined in future iterations of this AMP.

**Table 3-1: Inventory Summary by Asset Type - IS&T**

Asset Class	Asset Type	Count	Total Replacement Cost (2023)
IT Infrastructure	Access Switch Device	171	\$427,500
IT Infrastructure	General IT Infrastructure	140	\$4,302,100
IT Infrastructure	Wireless Access Point	225	\$1,800,000
End User Devices	Computer – Desktop	488	\$976,000
End User Devices	Computer – Laptop	880	\$1,320,000
End User Devices	Phones/Tablets	546	\$546,000
End User Devices	Printers	187	\$187,000
Applications & Software	Software Subscription	16	\$1,241,900 <sup>1</sup>
Applications & Software	Software Support & Maintenance – Annual	146	\$2,431,500 <sup>1</sup>
<b>Overall</b>	<b>N/A</b>	<b>2,799</b>	<b>\$13,232,000</b>

## Information Systems & Technology

### 3.1.2 Asset Age Summary

The average age, average condition, expected useful life, and average remaining useful life of the asset types in the IS&T service area are summarized in **Table 3-2**. The overall average age of IS&T assets is four years, and the average remaining useful life is two years.

**Table 3-2: Average Age, Average Condition, Expected Useful Life, and Average Remaining Useful Life – IS&T**

Asset Class	Asset Type	Average Age (Years)	Average Condition Grade	Expected Useful Life (Years)	Average Remaining Useful Life (Years)
IT Infrastructure	Access Switch Device	Unknown	Unknown	5	Unknown
IT Infrastructure	General IT Infrastructure	6	Fair	10	5
IT Infrastructure	Wireless Access Point	9	Very Poor	10	1
End User Devices	Computer – Desktop	4	Poor	5	1
End User Devices	Computer – Laptop	3	Fair	5	2
End User Devices	Phones/ Tablets	Unknown	Unknown	5	Unknown
End User Devices	Printers	4	Fair	7	3
<b>Overall</b>	<b>N/A</b>	<b>4</b>	<b>Poor</b>	<b>5 to 10</b>	<b>2</b>

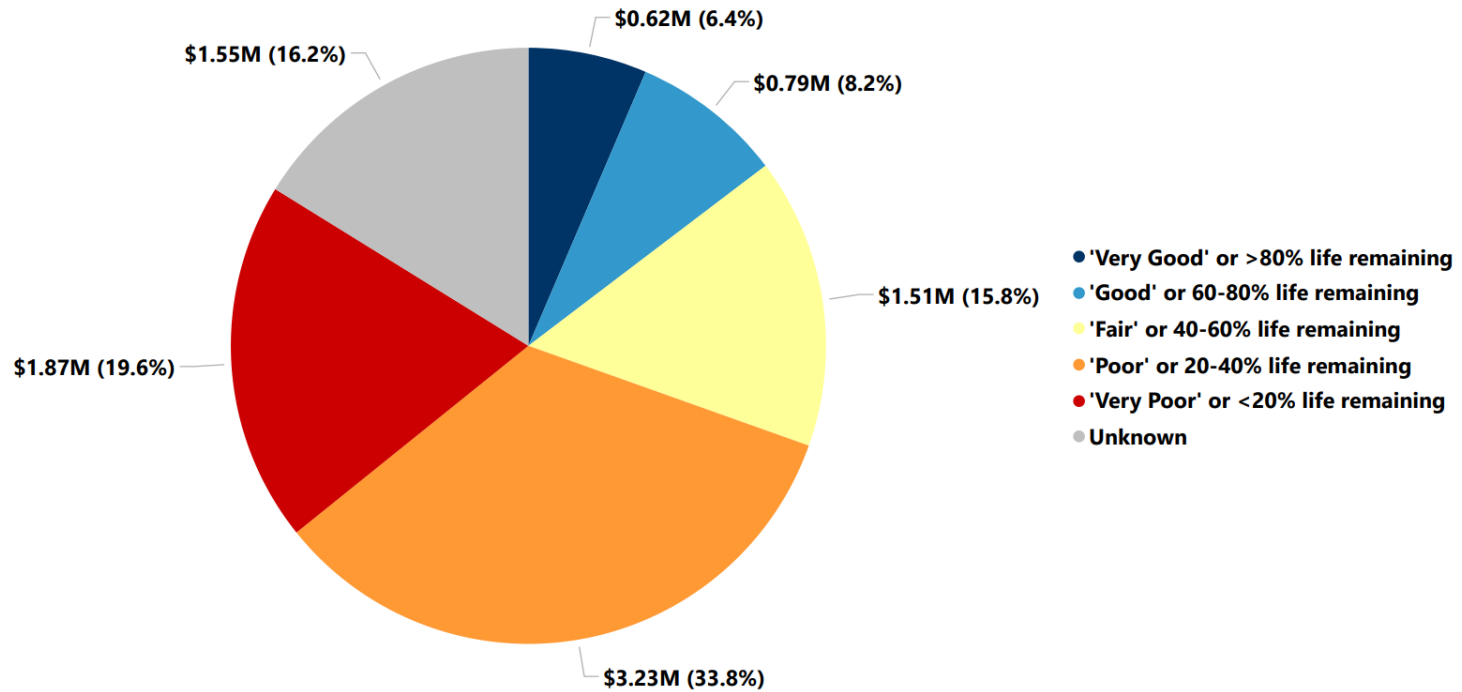
## Information Systems & Technology

Applications & Software assets have been excluded as they are digital assets. Additionally, at the time of preparing the AMP, the age of access switch devices and phones/tablets is not well documented in the asset data. This will be further refined in future updates of the AMP.

### 3.1.3 Asset Condition

An overall condition summary for assets under the IS&T service area by replacement cost (in 2023 dollars) is shown in **Figure 3-1**. There is approximately 30% of the assets that are in very good to fair condition, while 16.2% of the assets with an unknown condition.

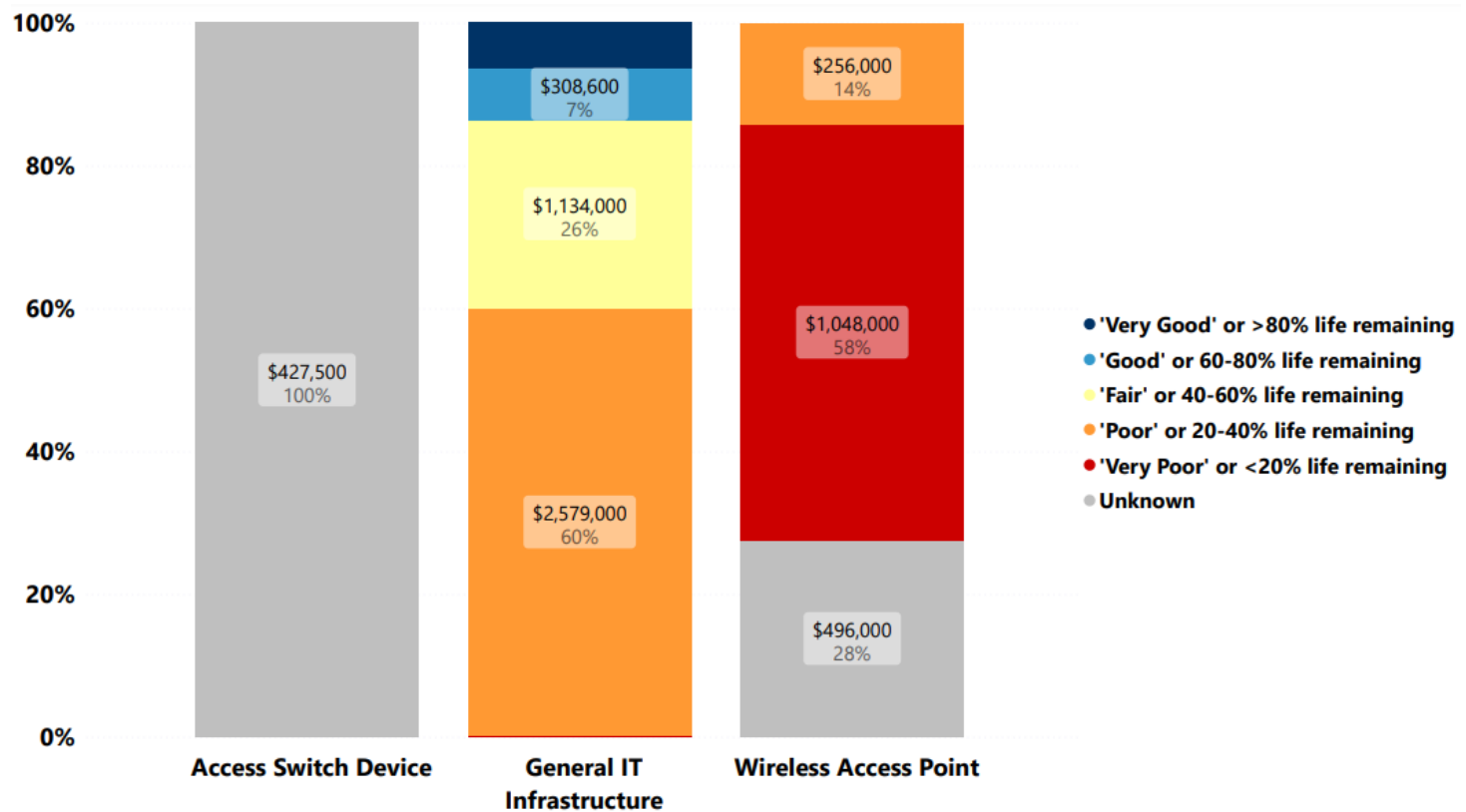
**Figure 3-1: Condition Summary and 2023 Replacement Cost - IS&T**



### Information Systems & Technology

A condition summary for IT Infrastructure assets is provided in **Figure 3-2** by asset type and replacement cost (in 2023 dollars). The condition of general IT infrastructure has been determined utilizing a combination of available asset condition data assigned by the IS&T managers during the generation of this AMP and age-based condition methods. In the absence of condition assessment data, the condition of access switch devices, servers, and wireless access points have been primarily determined based on age and EUL.

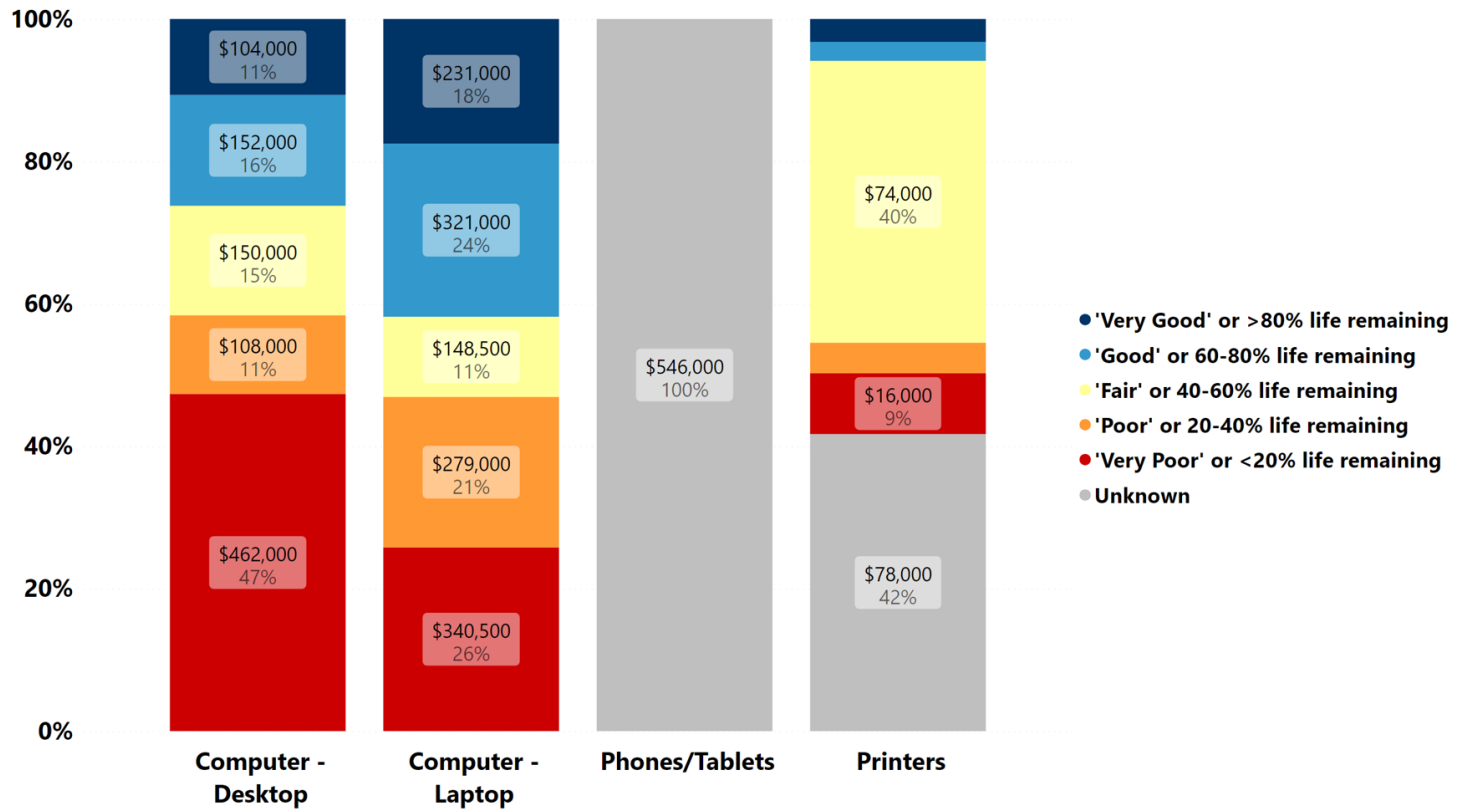
**Figure 3-2: Condition Summary by Asset Type and Replacement Cost - IS&T (IT Infrastructure)**



### Information Systems & Technology

A condition summary for End User Devices is provided in **Figure 3-3** by asset type and replacement cost (in 2023 dollars). In the absence of condition assessment data, the condition of the assets have primarily been determined based on age and EUL.

**Figure 3-3: Condition Summary by Asset Type and Replacement Cost - IS&T (End User Devices)**



## Information Systems & Technology

### 3.1.4 Data Sources and Confidence

Asset data for IS&T assets is maintained by City staff within various Microsoft Excel spreadsheets, often dedicated to specific asset types, and at this time there is no centralized repository for asset information. City staff compiled the various Excel-based inventories in 2023, translating to the assumption that the data source can be seen as reliable.

Data confidence can be estimated based on the confidence level of various qualifiers and can be presented on a scale from 0% (low) to 100% (high), as shown in **Table 3-3**. The qualifiers chosen for evaluation are specifically targeted for estimating overall confidence of condition reporting within the SOLI. Applications and software assets are digital in nature and therefore have been excluded from consideration in the following data confidence estimation.

**Table 3-3: Data Confidence Scale**

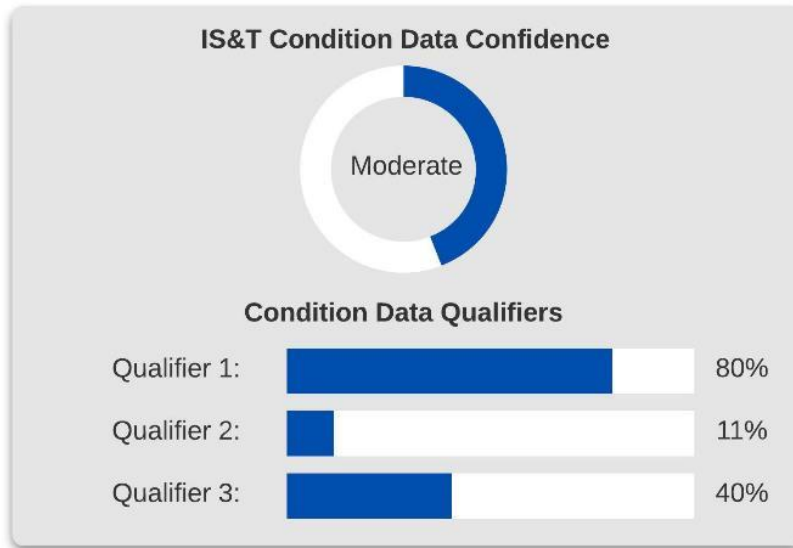
Confidence Level	Low	Low/ M	Moderate	Moderate/ High	High
Average of Qualifiers	0% - 19%	20% - 39%	40% - 59%	60% - 79%	80% - 100%

Assuming the data sources are reliable, the following qualifiers were considered to estimate data confidence regarding the data utilized in the creation of this SOLI report:

- **Qualifier 1:** The percentage of assets in the asset inventory where construction, installation, or acquisition years are documented (80%);
- **Qualifier 2:** The percentage of assets in the asset inventory that have condition assessment data documented (11%); and,
- **Qualifier 3:** The percentage of the estimated overall IS&T replacement value (excluding applications and software), in 2023 dollars, attributed to assets in the asset inventory with documented condition assessment data (i.e., condition is not solely age-based) (40%).

Information Systems & Technology

Figure 3-4: SOLI Report Data Confidence - IS&T



As summarized in **Figure 3-4**, the overall asset condition data confidence for IS&T assets is estimated as Moderate. Currently, the majority of the conditions for these assets are solely age-based except for some IT Infrastructure assets where a condition rating was assigned directly by IS&T staff. This includes local area network cabling, cooling devices, PDUs, transfer switches, UPS units, servers, and network connection appliances. The data confidence can be increased by improving the quality of the data and/or filling data gaps.

## Information Systems & Technology

### 3.2 Levels of Service

The City developed and established the community and technical LOS based on input from municipal staff. It was determined that the key attributes for the performance of the assets were based on Quality and Reliability. **Table 3-4** and **Table 3-5** outline the City’s current community and technical levels of service for IS&T.

#### Table 3-4 and Table 3-5 Notes

<sup>1</sup> Variance due to security and maintenance activities. Additional skew due to inclusion of partner organizations like Kingston Frontenac Public Library (KFPL) and Utilities Kingston (UK). Partner production systems are sometimes in development state outside of City standard maintenance windows.

<sup>2</sup> IT asset conditions for this AMP are primarily based on age and EUL. In general, the EUL of IT assets is quite short, with most assets expected to last between 5 and 7 years. As such, the proportion of IT assets in poor or better condition will fluctuate significantly each year. In future iterations of this AMP, the City may consider additional factors to determine IT asset conditions and associated lifecycle implications such as available capacity for future growth, integration, vendor support, and security updates. In some cases, although a device may be operational with adequate performance parameters, it is no longer fit for purpose given vulnerabilities, integration obsolescence, or available capacity for service expansion.

**Table 3-4: Community LOS - IS&T**

LOS Parameter	LOS Statement	Performance Measure	Current LOS (2023)
<b>Reliability</b>	Provide efficient and reliable services for end-users	% of uptime is greater than 95%	99.6% <sup>1</sup>



## Information Systems & Technology

**Table 3-5: Technical LOS - IS&T**

LOS Parameter	LOS Statement	Performance Measure	Current LOS (2023)
Quality	Equipment and assets are kept in good working condition	Percentage of assets that are meeting condition performance objectives.	52% <sup>2</sup>

### 3.3 Risk Assessment

The risk ratings for physical IS&T assets included IT Infrastructure and End User Devices. The risk scores were calculated using the risk methodology and approach outlined in the Introduction. **Table 3-6** summarizes the risk factors for the IS&T assets.

**Table 3-6: Risk Factors - IS&T**

Factors	Risk Ratings
<b>A - Condition</b>	The condition of the assets was determined either by visual or age-based and can be found in the SOLI section of the AMP.
<b>B - Performance</b>	The performance of all IS&T assets was identified as "usually reliable" and assets were assigned a rating of 3 for calculating risk score.
<b>C - Climate Change</b>	The climate change ratings were determined at the asset class level by identifying climate change hazard interactions. The IT Infrastructure and End User Devices were identified as a "moderate" risk and assigned a rating of 3 for calculating the risk score.

## Information Systems & Technology

Factors	Risk Ratings
<b>D - Impact</b>	The impact of all IS&T asset classes was identified as "moderate" impact and assets were assigned a rating of 1 for calculating risk score.
<b>E - Importance</b>	A "high" importance rating was applied to the IT Infrastructure assets and a rating of 3 was assigned for calculating risk score. The End User Devices asset class was identified as "moderate" importance and assigned a rating of 2 when calculating risk.

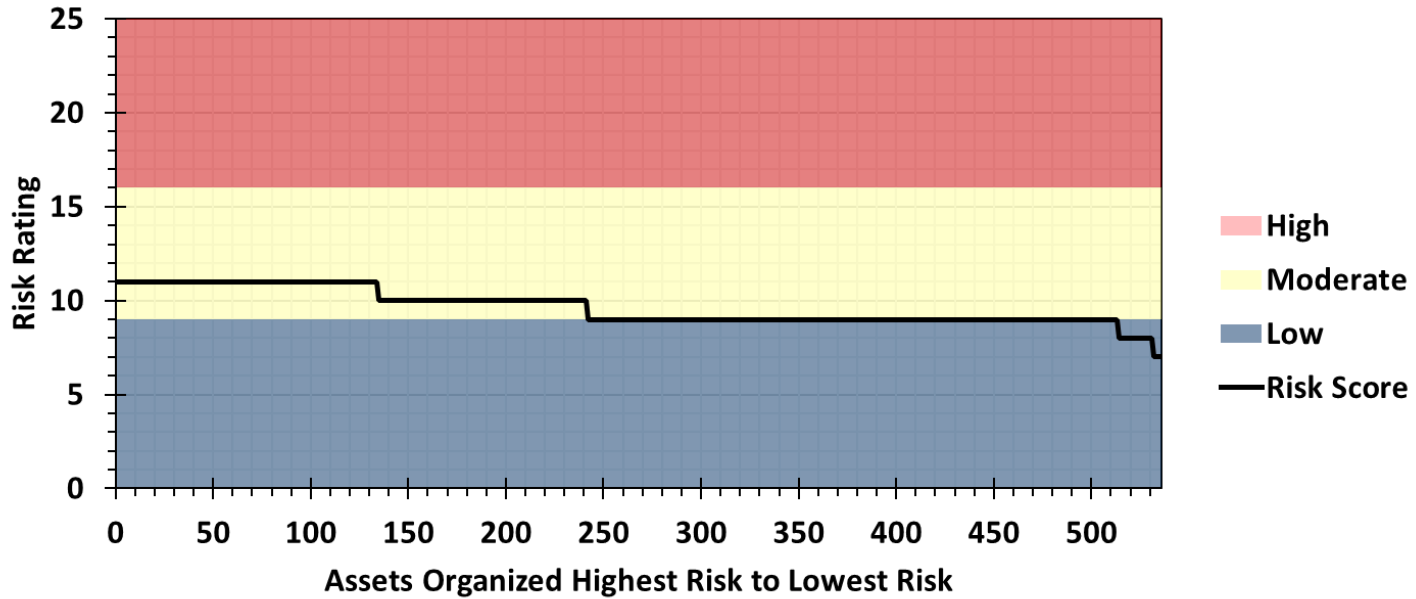
The individual risk ratings were used in calculating the risk score for each of the assets.

### 3.3.1 Risk Profile

The Risk profile of the IT Infrastructure assets is displayed in **Figure 3-5**. Of the 536 IT Infrastructure assets tracked within the asset inventory, approximately 95% (513) are classified as Moderate risk. These assets are considered moderate priorities for the implementation of lifecycle activities and possible replacement. The remaining assets are considered Low risk.

Information Systems & Technology

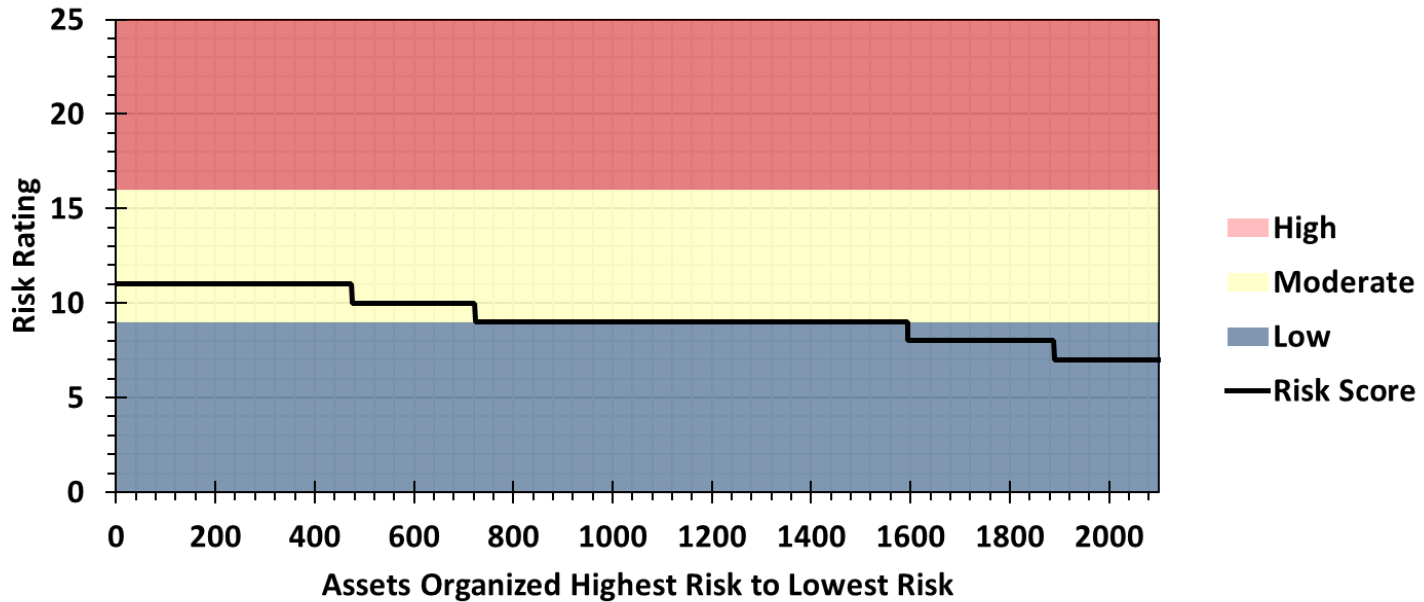
Figure 3-5: Risk Profile - IS&T (IT Infrastructure)



The Risk profile of the End User Devices assets is displayed in **Figure 3-6**. Of the 2,101 End User Devices tracked within the asset inventory, about 76% (1,594) are classified as Moderate risk. These assets are considered moderate priorities for implementation of lifecycle activities and possible replacement. The remaining assets are considered Low risk.

## Information Systems & Technology

Figure 3-6: Risk Profile - IS&T (End User Devices)



### 3.4 Asset Management Strategy

#### 3.4.1 Lifecycle Activities – IS&T

The lifecycle activities considered include:

- **Non-Infrastructure Solutions:** Actions or policies that can lower costs and extend useful lives.
- **Maintenance Activities:** Regularly scheduled inspection and maintenance, or more significant repair and activities associated with unexpected events.
- **Renewal / Rehabilitation Activities:** Significant repairs designed to extend the life of the asset.

## Information Systems & Technology

- **Replacement / Construction Activities:** Activities that are expected to occur once an asset has reached the end of its useful life and renewal/rehabilitation is no longer an option.
- **Disposal Activities:** Activities associated with disposing of an asset once it has reached the end of its useful life or is otherwise no longer needed.
- **Expansion / Growth / Service Improvement Activities:** Planned activities required to extend services to previously unserved areas or expand services to meet growth demands.

**Table 3-7** describes the lifecycle activities that can be implemented within the asset management strategy for IS&T assets. The lifecycle activities presented below are existing activities performed by the City, identified during a workshop with City staff in January 2024.

**Table 3-7: Lifecycle Activities- IS&T**

Lifecycle Type	Description of Activity	Frequency / Timing
Maintenance Activities	Software – In Place Version Lifts	Annually or bi-annually
Maintenance Activities	Software – Firmware, Maintenance and Updates	Weekly or monthly
Renewal / Rehabilitation Activities	Software – Support Contract Renewals	Annually (unless multi-year contract in place)
Renewal / Rehabilitation Activities	Replacement of Parts/Components	As required
Replacement / Construction Activities	Replacement of IS&T Assets	End of EUL

### Information Systems & Technology

Lifecycle Type	Description of Activity	Frequency / Timing
Disposal Activities	Software – Termination of Contracts and Migration of Data to New Software Solution or Data Exportation	As required (rare occurrence)
Disposal Activities	Hardware – Assets to be Disposed of are Sent to Disposal Service	End of EUL
Expansion / Growth / Service Improvement Activities	Platform Architecture Review	Every 5 years
Expansion / Growth / Service Improvement Activities	Network Expansion (New Buildings, Service Expansion)	As required
Expansion / Growth / Service Improvement Activities	New Hardware Technology Assessment – Evaluation of Hardware Inventory to Replace Obsolete Hardware Equipment for Better Performance/Longevity	Every 5 years

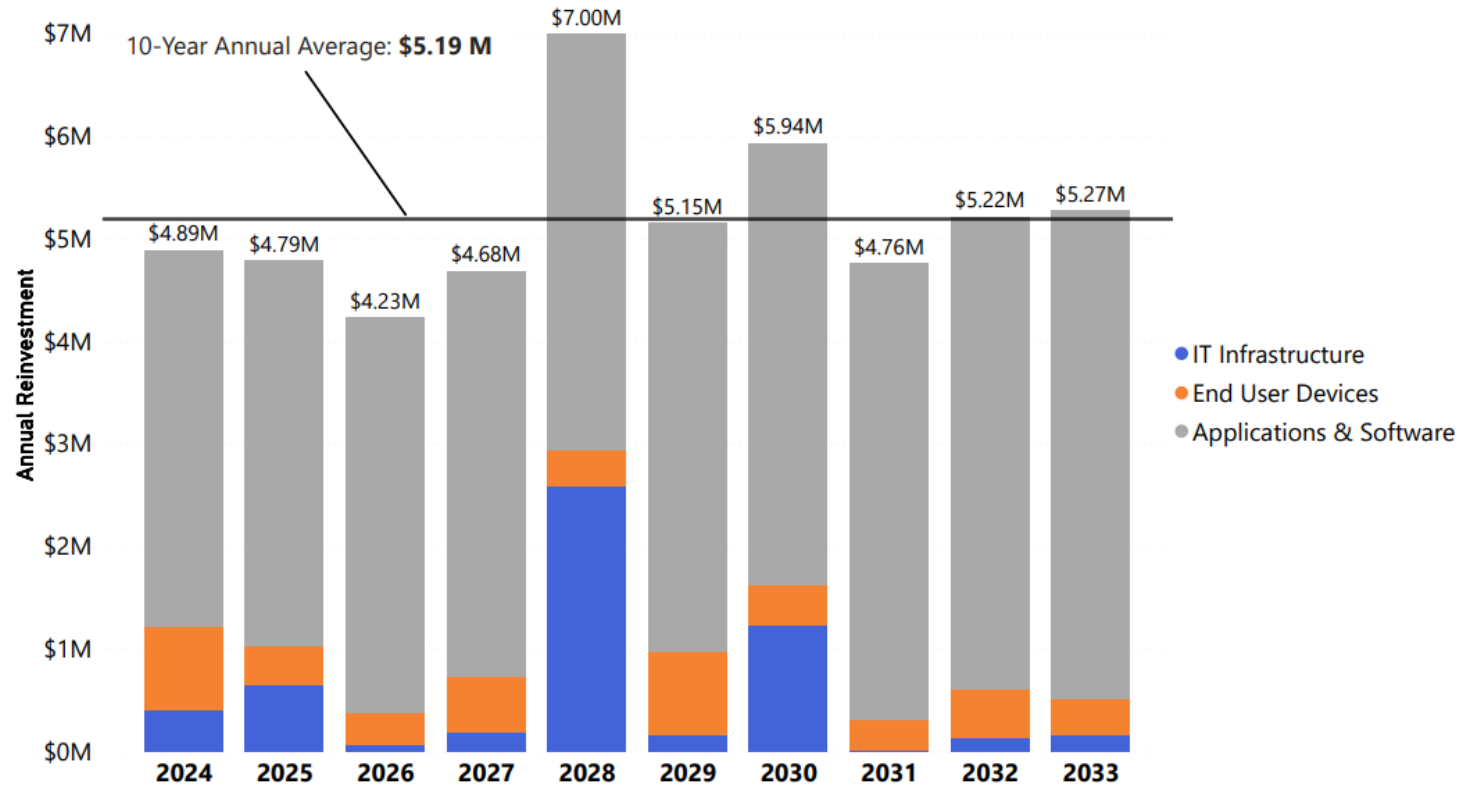
#### 3.4.2 Funding the Lifecycle Activities

Lifecycle modeling allows for the City to understand the future reinvestment needs of their existing assets by generating a theoretical asset replacement forecast that considers available asset inventory data. The age, EUL, replacement cost, condition, and risk score of each asset can be leveraged within the lifecycle model to proactively plan for reinvestment over a period of time. Asset replacement forecasts within this subsection estimate the required reinvestment for assets over the next 10 years based on available asset inventory data.

### Information Systems & Technology

There is an approximate total of **\$51.9 million** to be reinvested into the IS&T assets owned by the City over the next 10 years. This translates to a 10-year annual average of approximately **\$5.19 million per year**, as presented in **Figure 3-7**.

**Figure 3-7: 10-Year Capital Reinvestment Needs - IS&T**



It is important to note that forecasting in this lifecycle model relies heavily on age and EUL to determine renewal or replacement needs. Applications & Software carry the most significant lifecycle costs, which is attributed to annual costs of purchasing, licensing, maintenance, and updates.

## Information Systems & Technology

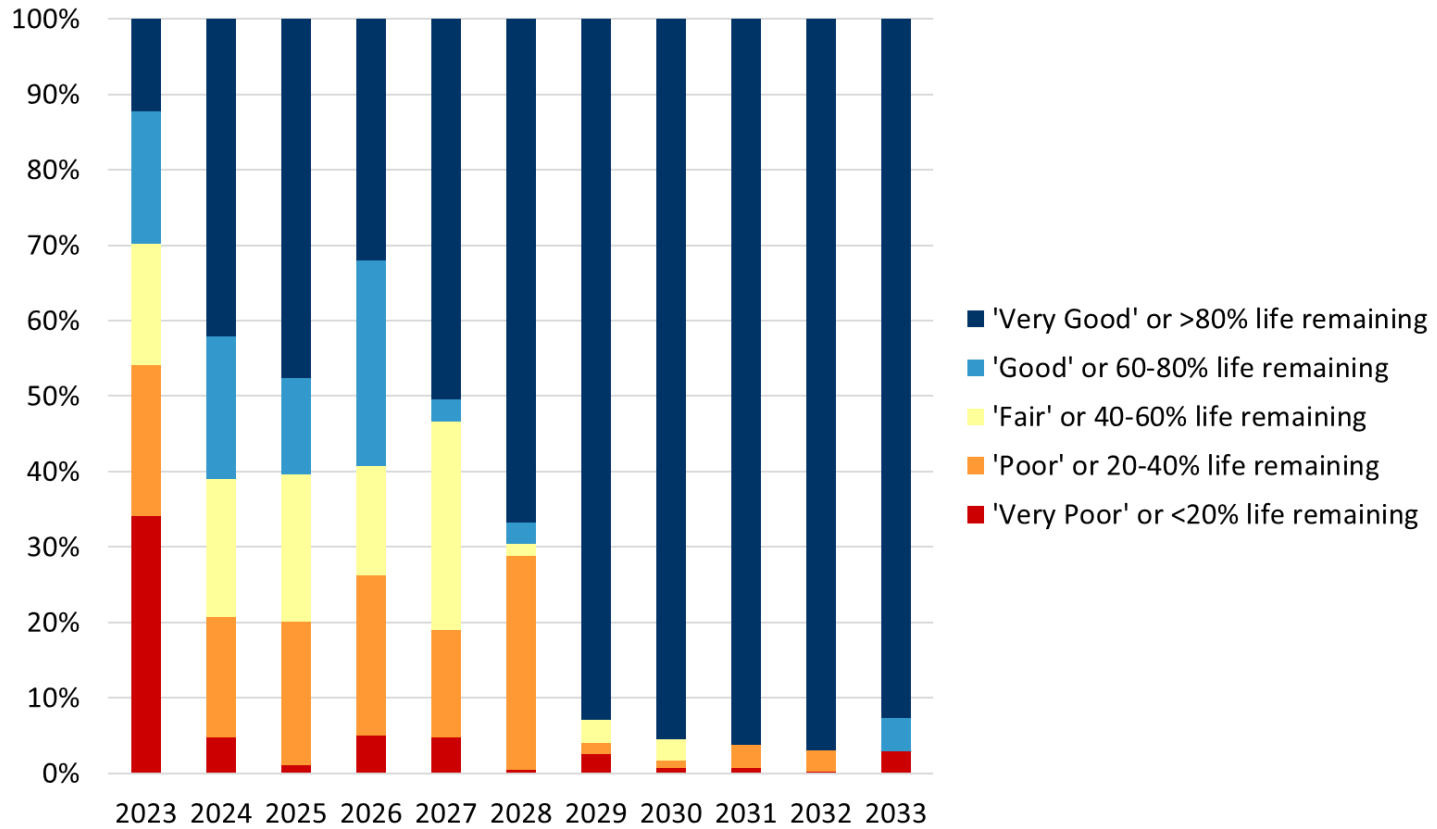
The LOS defined in the AMP includes maintaining assets in poor or better condition (52%). This LOS definition does not apply to digital applications and software assets that do not exhibit a physical condition. From the lifecycle model, the percentage of physical IS&T assets in poor or better condition fluctuates throughout the next 10-years, reaching 100% in 2028 and 2032. For IS&T assets, 97% of assets are expected to be in poor or better condition as of 2033.

**Figure 3-8** shows an overview of physical IS&T asset conditions (i.e., excluding digital Applications & Software assets) throughout the next 10 years based on the lifecycle model.



Information Systems & Technology

Figure 3-8: Condition Overview by Year Based on Lifecycle Model - IS&T





## 4.0 Parking Equipment, Lots, & Structures

The City's Parking Operations team manages and oversees the operation of street parking and City-owned parking lots and structures throughout the City. This includes a network of single space parking meters, multi-space pay stations, and a portfolio of surface lots and parking garages. The following chapter of the AMP includes assets that are under the Parking Equipment, Lots, & Structures area.

It is important to note that two parking garages, the Hanson Parking Garage and the Chown Parking Garage, are not included in the AMP as they are featured in the Facilities AMP. However, the only parking structure asset included in this AMP is the structural concrete of the Robert Bruce Parking Garage, a single level parking garage owned by the City. For 2025 reporting, all parking garages will be reported together.

The City's Facilities Management & Construction Services (FMCS) department is comprised of three divisions: Facilities Management, Energy & Asset Management, and Facilities Construction. FMCS maintains the City's diverse portfolio of municipal buildings, thereby supporting departments such as Parking Operations in providing extensive front-line services to the community. This centralized, shared services collaborative approach has allowed the integration of energy management and sustainability considerations along with other aspects of facilities maintenance, asset management, space planning, design, construction, and demolition across all areas of the city.

## Parking Equipment, Lots, & Structures

**Note on Scope:** At the time of preparing this AMP, no data was available for specific Information & Technology assets related to Parking Equipment, Lots, & Structures including payment transaction software and associated IT infrastructure. Information is now available and will be present in subsequent reports.

### 4.1 State of the Local Infrastructure

#### 4.1.1 Asset Inventory and Valuation

Parking Equipment, Lots, & Structures assets provide designated parking for residents and visitors. The asset classes, asset types, a count of assets therein, and the total replacement cost (in 2023 dollars) are shown in **Table 4-1**. The overall replacement cost (2023 dollars) is **\$14.1 million** for **470 assets** included in the inventory.

**Table 4-1: Inventory Summary by Asset Type - Parking Equipment, Lots, & Structures**

Asset Class	Asset Type	Count	Total Replacement Cost (2023)
Surface Lots	Asphalt Paved Surfaces	17	\$7,038,400
Surface Lots	Gravel Surfaces	2	\$92,800
Surface Lots	Concrete Curb and Sidewalk	1	\$34,800
Surface Lots	Asphalt Walkway	1	\$15,300
Surface Lots	Exterior Site Stairs – Concrete	2	\$26,200
Surface Lots	Guardrails and Barriers	9	\$255,200
Surface Lots	Line Marking and Sealants	17	\$50,300
Surface Lots	Miscellaneous Structures and Equipment	9	\$1,004,100
Surface Lots	Parking Stops	16	\$450,900
Surface Lots	Planters – Concrete	1	\$2,200

### Parking Equipment, Lots, & Structures

Asset Class	Asset Type	Count	Total Replacement Cost (2023)
Surface Lots	Pole Light Fixtures	10	\$495,700
Surface Lots	Storm Sewer	4	\$98,800
Surface Lots	Vehicle Bollard (Limiting Device)	6	\$82,500
Parking Structures	Structural Concrete	1	\$1,305,000
Equipment	Pay and Display Station	242	\$2,904,000
Equipment	Single Space Parking Meter	132	\$237,600
<b>Overall</b>	<b>N/A</b>	<b>470</b>	<b>\$14,093,800</b>

#### 4.1.2 Asset Age Summary

The average age, average condition, expected useful life, and average remaining useful life of the assets in the Surface Lots, Parking Structures, and Equipment asset classes are summarized in **Table 4-2**. The overall average age is 15 years, with average remaining useful life of five years.

**Parking Equipment, Lots, & Structures**

**Table 4-2: Average Age, Average Condition, Expected Useful Life, and Average Remaining Useful Life - Parking Equipment, Lots, & Structures**

<b>Asset Class</b>	<b>Asset Type</b>	<b>Average Age (Years)</b>	<b>Average Condition Grade</b>	<b>Expected Useful Life (Years)</b>	<b>Average Remaining Useful Life (Years)</b>
Surface Lots	Asphalt Paved Surfaces	65	Fair	25	11
Surface Lots	Gravel Surfaces	Unknown	Very Poor	15	3
Surface Lots	Concrete Curb and Sidewalk	54	Poor	50	13
Surface Lots	Asphalt Walkway	Unknown	Poor	25	6
Surface Lots	Exterior Site Stairs – Concrete	104	Fair	50	28
Surface Lots	Guardrails and Barriers	58	Poor	20	7
Surface Lots	Line Marking and Sealants	71	Very Poor	3	0
Surface Lots	Miscellaneous Structures and Equipment	104	Fair	40	15
Surface Lots	Parking Stops	77	Poor	20	9
Surface Lots	Planters – Concrete	Unknown	Fair	50	23
Surface Lots	Pole Light Fixtures	90	Good	25	15
Surface Lots	Storm Sewer	83	Good	50	38
Surface Lots	Vehicle Bollard (Limiting Device)	71	Good	30	18

Parking Equipment, Lots, & Structures

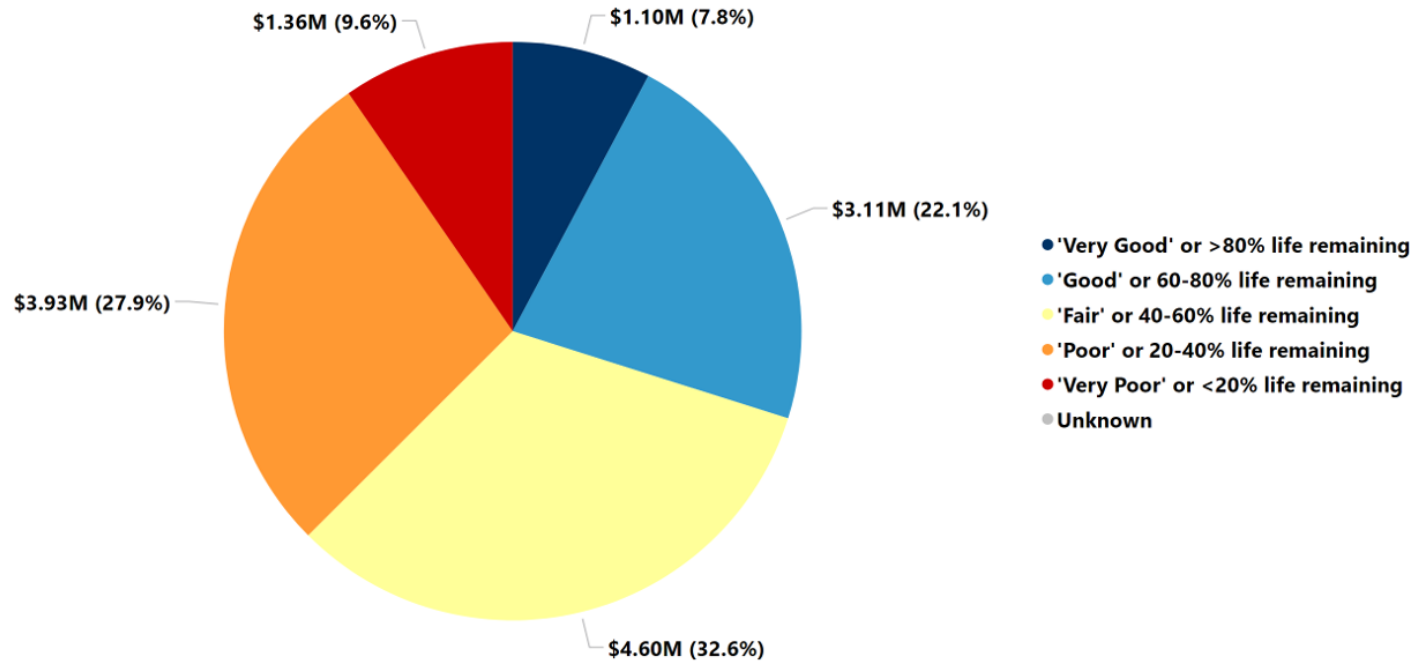
Asset Class	Asset Type	Average Age (Years)	Average Condition Grade	Expected Useful Life (Years)	Average Remaining Useful Life (Years)
Parking Structures	Structural Concrete	54	Very Poor	50	13
Equipment	Pay and Display Station	3	Fair	8	5
Equipment	Single Space Parking Meter	18	Very Poor	10	0
<b>Overall</b>	<b>N/A</b>	<b>14</b>	<b>Fair</b>	<b>3 to 50</b>	<b>13</b>

## Parking Equipment, Lots, & Structures

### 4.1.3 Asset Condition

An overall condition summary for assets under the Parking Equipment, Lots, & Structures service area by replacement cost (in 2023 dollars) is shown in **Figure 4-1**. Over half of the asset are in fair to very good condition (63%) with less than 10% in very poor condition.

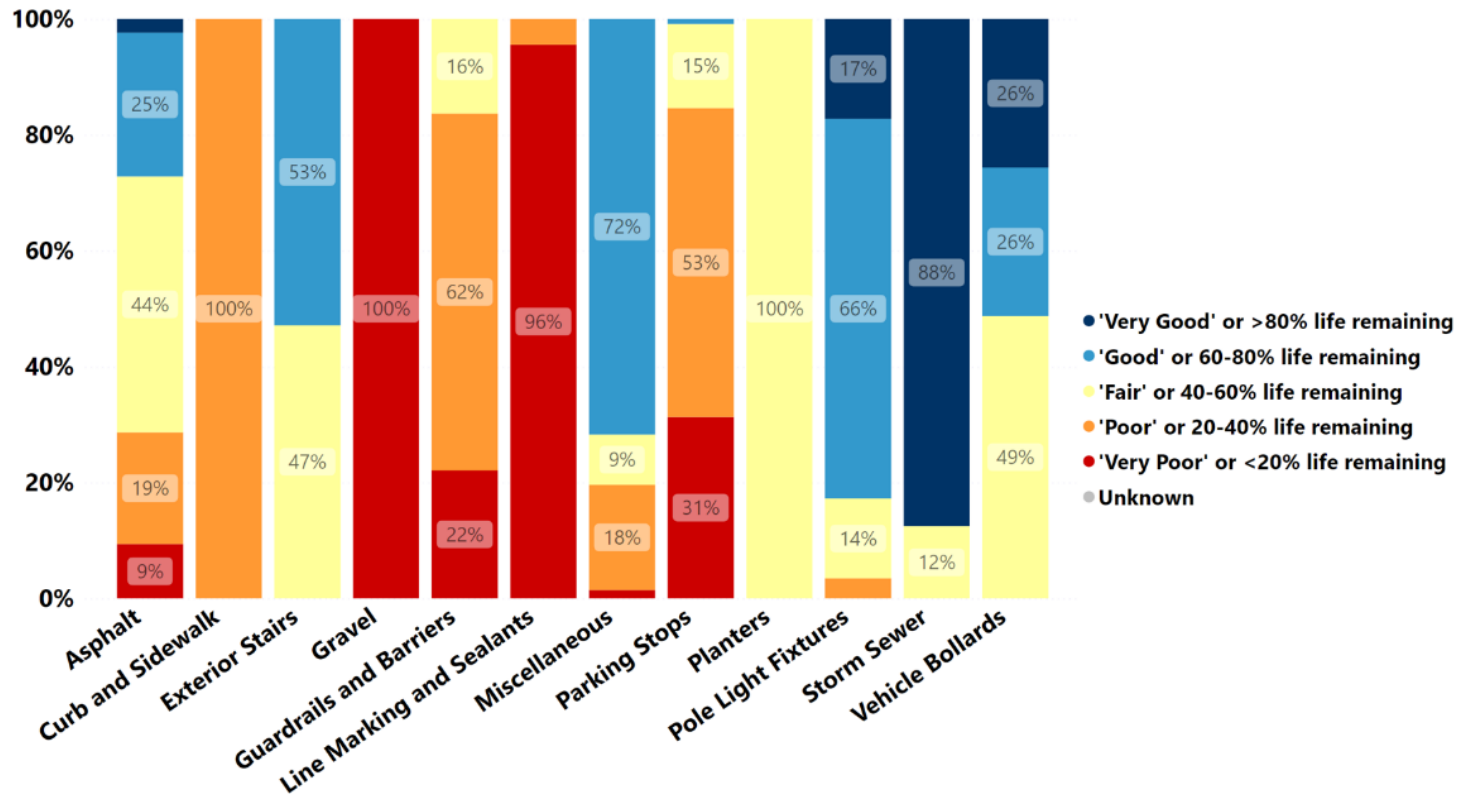
**Figure 4-1: Condition Summary and 2023 Replacement Cost - Parking Equipment, Lots, & Structures**



### Parking Equipment, Lots, & Structures

A condition summary for Surface Lots is provided in **Figure 4-2** by asset type and replacement cost (in 2023 dollars). The condition of Surface Lots has been informed by the 2022 Building Condition Assessments (BCA) completed by Art Engineering, with conditions projected as of 2023 utilizing the methodology outlined in the Introduction document.

**Figure 4-2: Condition Summary by Asset Type and Replacement Cost - Parking Equipment, Lots, & Structures (Surface Lots)**





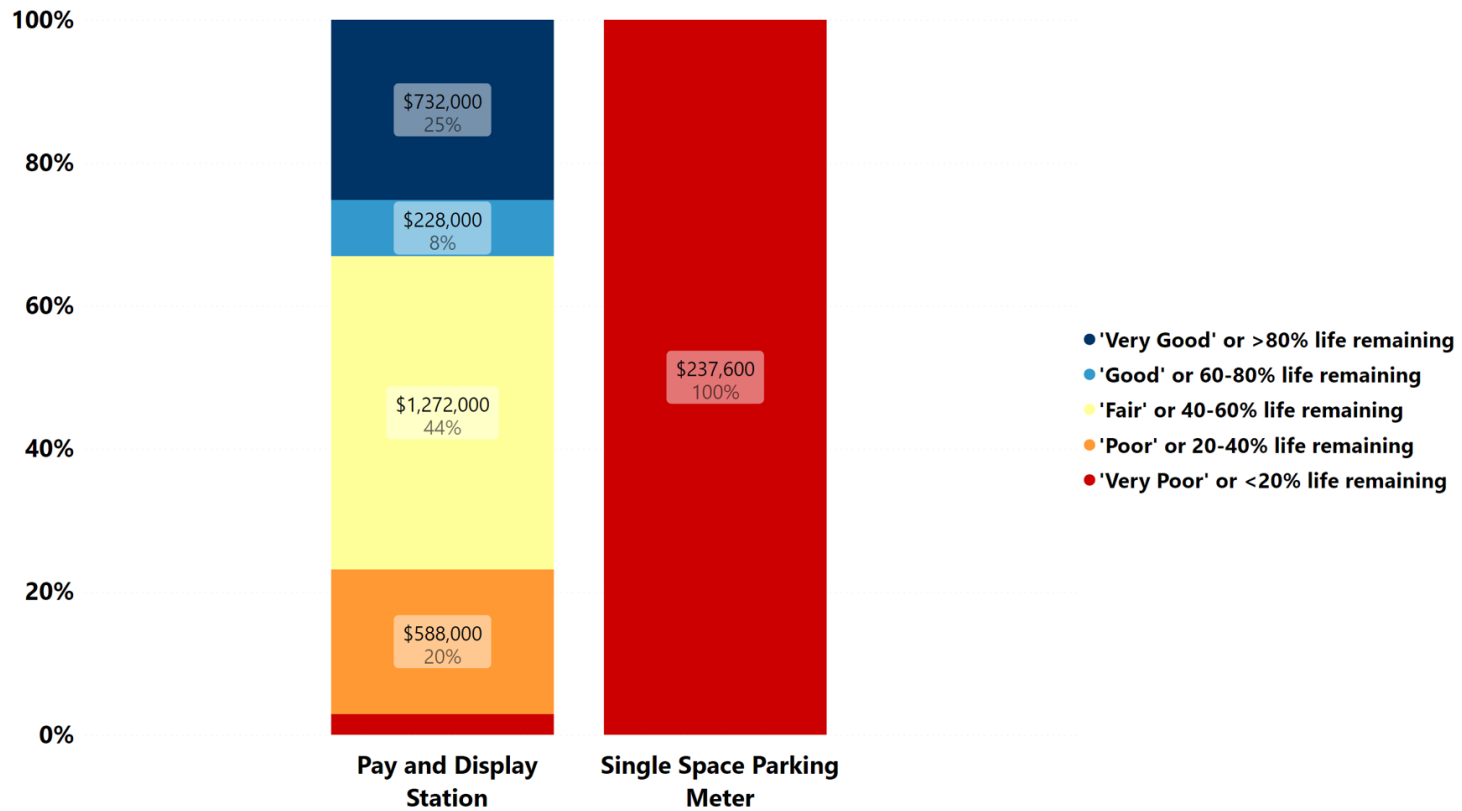
## Parking Equipment, Lots, & Structures

The condition of the sole Parking Structure asset, specifically the structural concrete of the Robert Bruce Parking Garage, is considered Poor. The determined condition rating was informed by the 2022 BCAs completed by Art Engineering, adjusted to 2023 utilizing the methodology outlined in the Introduction materials which were provided under a separate document. In 2022 to 2023 after this assessment the parking garage was significantly refurbished based on the results of the BCA, the condition would now be assessed higher. The 2022 BCAs were utilized to develop a 5 year asset management plan to address asset deficiencies, with some of the projects under way and some additional maintenance activities completed which are not reflected at this time. These updates will occur in the 2025 update.

A condition summary for Equipment is provided in **Figure 4-3** by asset type and replacement cost (in 2023 dollars). In the absence of condition assessment data, the condition of equipment has been determined based on age and expected useful life. The single space meters are being replaced with smart meters in 2024.

## Parking Equipment, Lots, & Structures

**Figure 4-3: Condition Summary by Asset Type and Replacement Cost - Parking Equipment, Lots, & Structures (Equipment)**



### 4.1.4 Data Sources and Confidence

Asset data for Equipment assets is maintained by the City within ArcGIS, a web-based geographical mapping solution that served as the data source for these assets in this AMP. The data source for Surface Lots and Parking Structures was the BCAs completed by Art Engineering in 2022 which included the development of an asset inventory.

### Parking Equipment, Lots, & Structures

Data confidence can be estimated based on the confidence level of various qualifiers and can be presented on a scale from 0% (low) to 100% (high), as shown in **Table 4-3**. The qualifiers chosen for evaluation are specifically targeted for estimating overall confidence of condition reporting within the SOLI.

**Table 4-3: Data Confidence Scale**

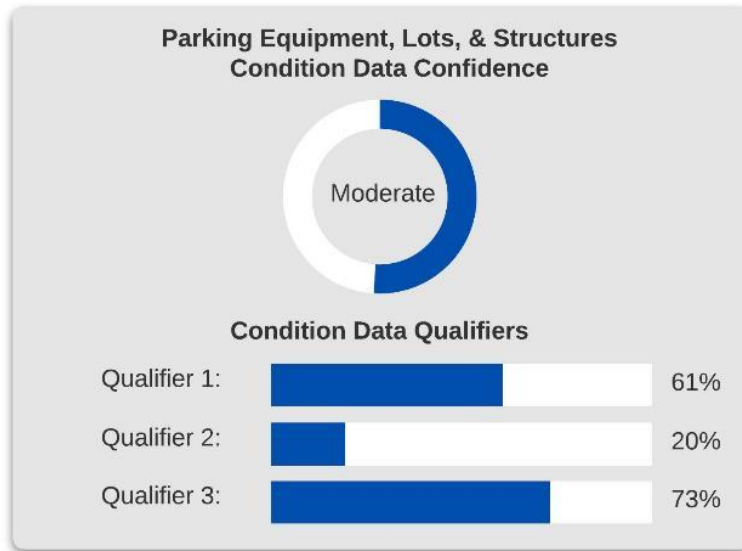
Confidence Level	Low	Low/ Moderate	Moderate	Moderate/ High	High
Average of Qualifiers	0% - 19%	20% - 39%	40% - 59%	60% - 79%	80% - 100%

Assuming the data source is reliable, the following qualifiers were considered to estimate data confidence regarding the data utilized in the creation of this SOLI report:

- **Qualifier 1:** The percentage of assets in the asset inventory where construction, installation, or acquisition years are documented (61%);
- **Qualifier 2:** The percentage of assets in the asset inventory that have condition assessment data documented (20%); and,
- **Qualifier 3:** The percentage of the estimated overall Parking Equipment, Lots, & Structures replacement value, in 2023 dollars, attributed to assets in the asset inventory with documented condition assessment data (i.e., condition is not solely age-based) (73%).

## Parking Equipment, Lots, & Structures

Figure 4-4: SOLI Report Data Confidence – Parking Equipment, Lots, & Structures



As summarized in **Figure 4-4**, the overall asset condition data confidence for Parking Equipment, Lots, & Structures assets are Moderate. Data confidence can be increased by improving the quality of the data and/or filling in data gaps. The largest data gap at the time of this AMP pertains to single space parking meters, where the installation dates are unknown, and no condition assessment history is documented limiting the condition reporting for the SOLI report.

### 4.2 Levels of Service

The City has developed the community and technical LOS, based on input from staff. It was decided that Availability and Quality were key attributes in gauging the performance of the assets. **Table 4-4** and **Table 4-5** outline the City’s current community and technical levels of service for Parking Equipment, Lots, and Structures.

Parking Equipment, Lots, & Structures

Table 4-4: Community LOS - Parking Equipment, Lots, & Structures

LOS Parameter	LOS Statement	Performance Measure	Current LOS (2023)
<b>Availability</b>	Adequate parking for short-term parking	Number of hourly/daily metered on-street spaces	On-street metered spaces – 1,872
		Number of hourly/daily spaces in garages/lots	Off-street metered spaces – 1,496
<b>Availability</b>	Adequate parking for long-term parking	Number monthly permit spaces available in garages/lots	Permit spaces – 860
		Number of monthly permit spaces available on-street	Spaces Available - 106 Permit spaces on-street – 1,642 Spaces Available – 1,142

Table 4-5: Technical LOS - Parking Equipment, Lots, & Structures

LOS Parameter	LOS Statement	Performance Measure	Current LOS (2023)
<b>Quality</b>	Equipment and assets are kept in good working condition	Percentage of assets that are meeting condition performance objectives	94%

Parking Equipment, Lots, & Structures

4.3 Risk Assessment

The risk ratings for Parking Equipment, Lots, & Structures assets included Surface Lots, Parking Structures and Equipment. The risk scores were calculated using the risk methodology and approach outlined in the Introduction. **Table 4-6** summarizes the risk factors for Parking, Equipment, Lots & Structure assets.

**Table 4-6: Risk Factors - Parking Equipment, Lots, & Structures**

Factors	Risk Ratings
<b>A - Condition</b>	The condition of the assets was determined either by visual or age-based and can be found in the SOLI section of the AMP.
<b>B - Performance</b>	The performance of all the asset classes was determined to be "always reliable" and assets were assigned a rating of 1 for calculating risk score.
<b>C - Climate Change</b>	The climate change ratings were determined at the asset class level by identifying climate change hazard interactions. The Surface Lots were identified as a "high" risk and assigned a rating of 5 when calculating the risk score, while both the Parking Structures and Equipment were identified as a "low" climate risk and assigned a rating of 1 for calculating risk.
<b>D - Impact</b>	The impact of all the asset classes was identified as "moderate" impact and assets were assigned a rating of 1 for calculating risk.
<b>E - Importance</b>	A "high" importance rating was given to the Parking Structures assets and a rating of 3 was assigned for calculating risk score. The Surface Lots and Equipment asset classes were identified as "moderate" importance and assigned a rating of 2 when calculating risk.

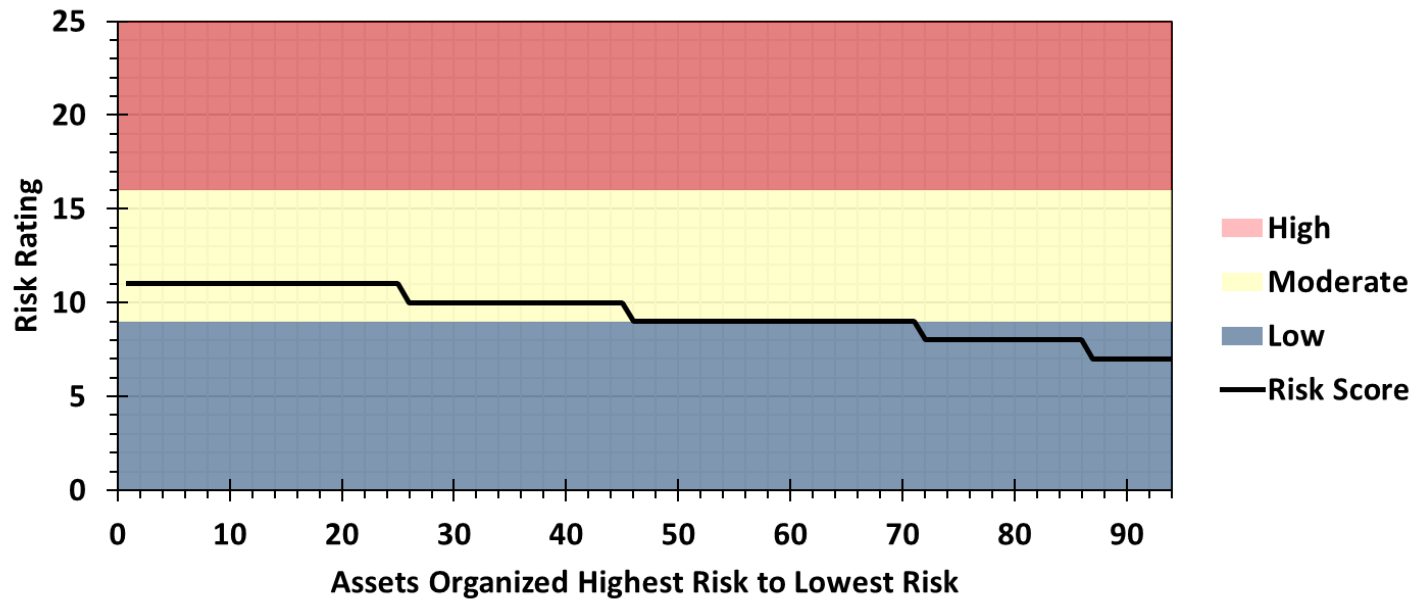
The individual risk ratings were used in calculating the risk score for each of the assets.

## Parking Equipment, Lots, & Structures

### 4.3.1 Risk Profile

The Risk profile of the Surface Lots assets is displayed in **Figure 4-5**. Of the 93 Surface Lots tracked within the asset inventory, approximately 75% (71) are classified as Moderate risk. These assets are considered moderate priorities for the implementation of lifecycle activities and possible replacement. The remaining assets are considered Low risk.

**Figure 4-5: Risk Profile - Parking Equipment, Lots, & Structures – (Surface Lots)**

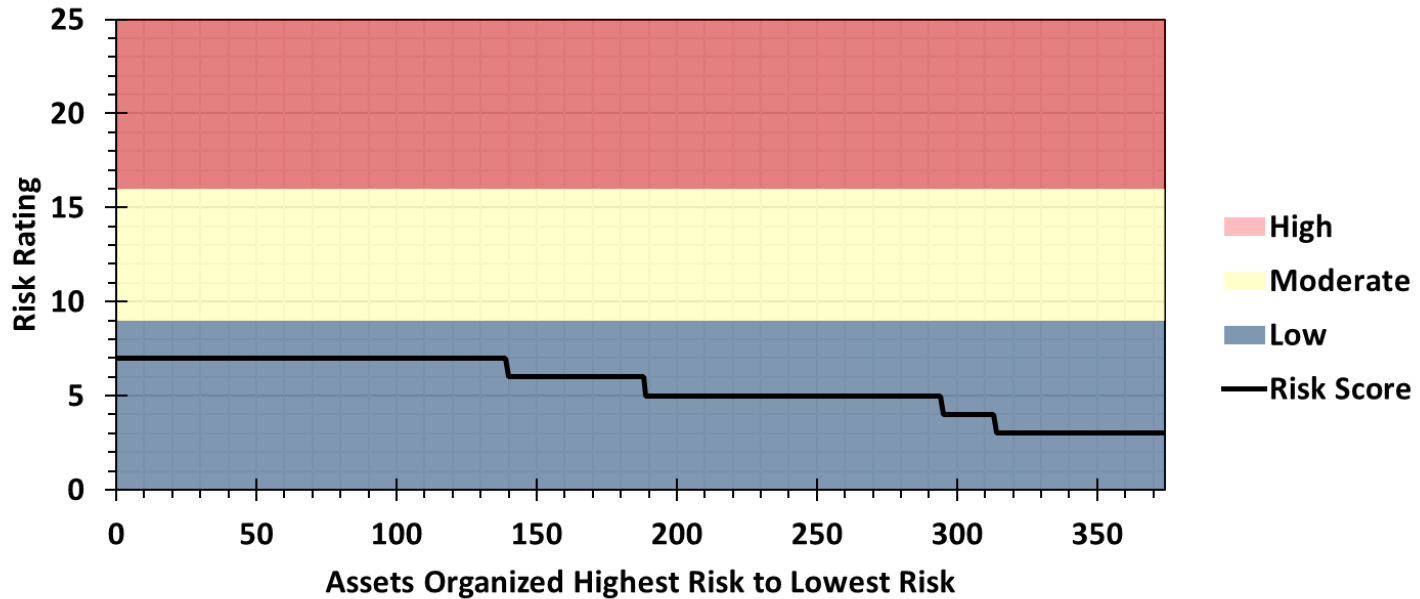


The Parking Structures asset has a risk score of 8, resulting in a Low risk.

The Risk profile of the Equipment assets is displayed in **Figure 4-6**. All 374 Equipment assets tracked in the asset inventory are considered as Low risk.

## Parking Equipment, Lots, & Structures

Figure 4-6: Risk Profile - Parking Equipment, Lots, & Structures (Equipment)



## 4.4 Asset Management Strategy

### 4.4.1 Lifecycle Activities – Parking Equipment, Lots & Structures

The lifecycle activities considered include:

- **Non-Infrastructure Solutions:** Actions or policies that can lower costs and extend useful lives.
- **Maintenance Activities:** Regularly scheduled inspection and maintenance, or more significant repair and activities associated with unexpected events.
- **Renewal / Rehabilitation Activities:** Significant repairs designed to extend the life of the asset.



### Parking Equipment, Lots, & Structures

- **Replacement / Construction Activities:** Activities that are expected to occur once an asset has reached the end of its useful life and renewal/rehabilitation is no longer an option.
- **Disposal Activities:** Activities associated with disposing of an asset once it has reached the end of its useful life or is otherwise no longer needed.
- **Expansion / Growth / Service Improvement Activities:** Planned activities required to extend services to previously unserved areas or expand services to meet growth demands.

**Table 4-7** describes the lifecycle activities that can be implemented within the asset management strategy for Parking Equipment, Lots, & Structures. The lifecycle activities presented below are existing activities performed by the city and were identified during a workshop with City staff in January 2024.

**Table 4-7: Lifecycle Activities - Parking Equipment, Lots, & Structures**

Lifecycle Type	Description of Activity	Frequency / Timing
Non-Infrastructure Activities	Parking Lot Assessments	Every 5 years
Non-Infrastructure Activities	Parking Studies & Review (ie: Hospital spots)	Every 5 to 7 years
Non-Infrastructure Activities	Accessibility parking space needs	As requested by public
Maintenance Activities	Inspections and Maintenance of Garages and Lots	Daily
Maintenance Activities	Scheduled Maintenance of Elevators in Garages	Monthly
Maintenance Activities	Routine Maintenance of Parking Meters and Garage Equipment	Semi-annually

### Parking Equipment, Lots, & Structures

Lifecycle Type	Description of Activity	Frequency / Timing
Renewal / Rehabilitation Activities	Garages – Proactive Sealant Replacement and Waterproofing	Every 8 to 10 years
Renewal / Rehabilitation Activities	Lots – Proactive Inspections for Potholes and Asphalt Repairs, Grading done on gravel lots	Every spring
Replacement / Construction Activities	Replacement of Assets	End of EUL
Disposal Activities	Recycling of Equipment	End of EUL
Expansion / Growth / Service Improvement Activities	Review of Parking Rates and Services	Every 5 to 7 years
Expansion / Growth / Service Improvement Activities	Expansion of Mobile Payment Technology to All Metered Areas in the City	2024

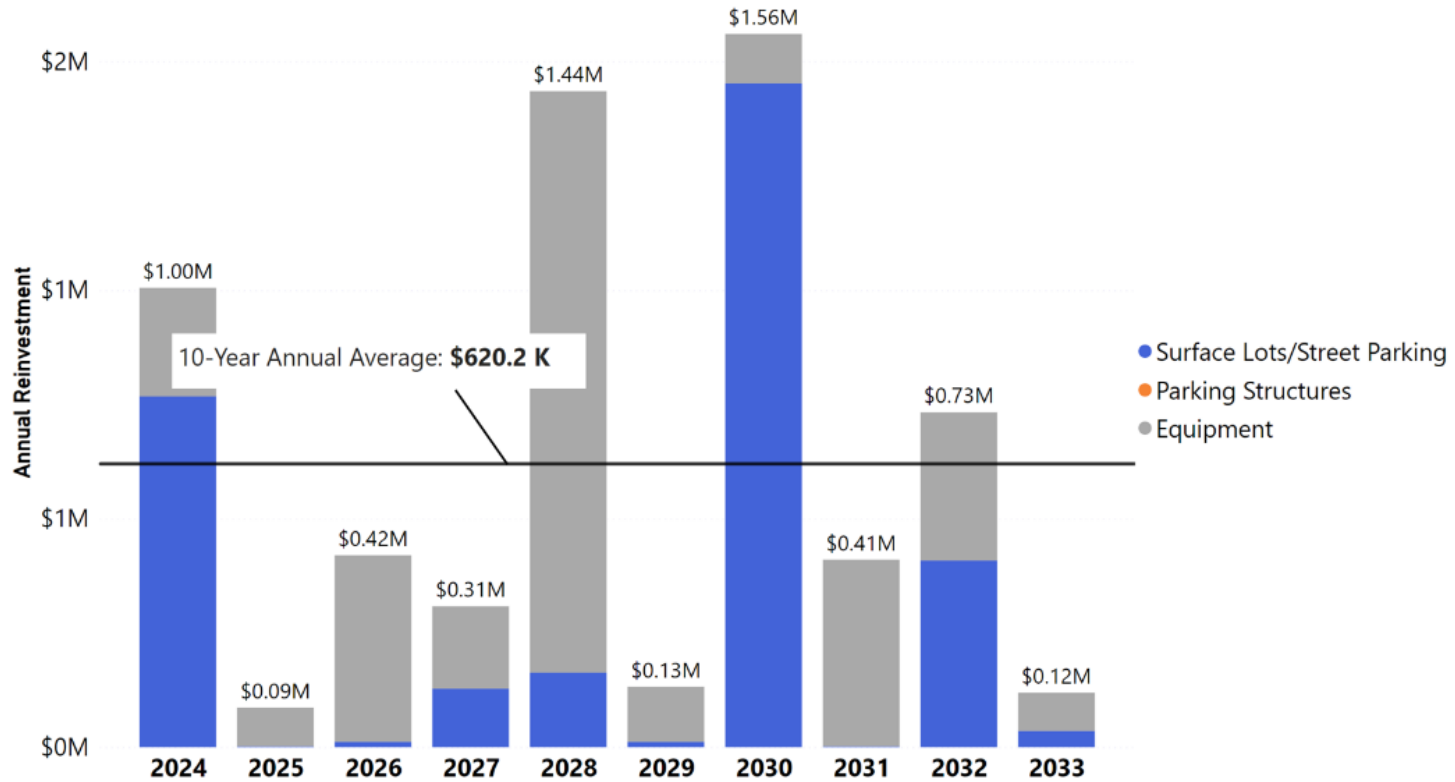
#### 4.4.2 Funding the Lifecycle Activities

Lifecycle modeling allows for the City to understand the future reinvestment needs of their existing assets by generating a theoretical asset replacement forecast that considers available asset inventory data. The age, EUL, replacement cost, condition, and risk score of each asset can be leveraged within the lifecycle model to proactively plan for reinvestment over a period of time. Asset replacement forecasts within this subsection estimate the required reinvestment for assets over the next 10 years based on available asset inventory data.

There is an approximate total of **\$6.2 million** to be reinvested into the Parking Equipment, Lots, & Structures assets owned by the City in the next 10 years. This translates to a 10-year annual average of approximately **\$620.2 thousand**, as presented in **Figure 4-7**.

Parking Equipment, Lots, & Structures

Figure 4-7: 10-Year Capital Reinvestment Needs- Parking Equipment, Lots, & Structures



## Parking Equipment, Lots, & Structures

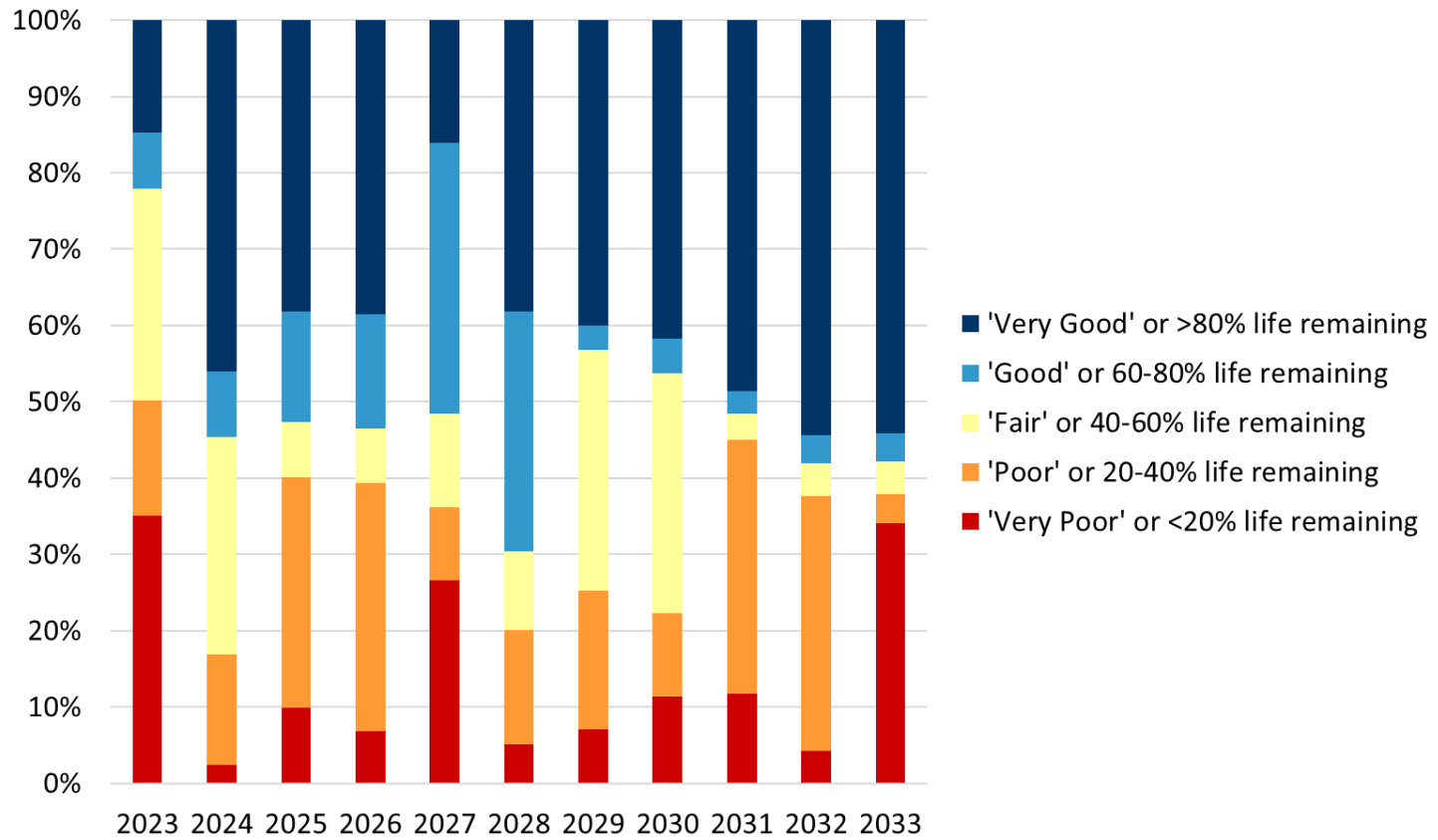
It is important to note that forecasting in this lifecycle model relies heavily on age and EUL to determine renewal or replacement needs and that further tracking of condition data for Parking Equipment, Lots, & Structures assets will assist at refining forecasted expenditures in the decades to come. Currently, the condition of 132 single space parking meters is not known with great certainty without age or condition data. However, the single space parking meters are planned to be replaced with smart meters in early 2024 as they are at the end of their useful life resulting in their exclusion from the lifecycle model.

The LOS defined in this AMP includes maintaining the current portion of assets in poor or better condition (92%). From the lifecycle model, the percentage of Parking Equipment, Lots, & Structures in poor or better condition fluctuates throughout the next 10 years, reaching a high of 98% in 2024 and concluding at 66% in 2033.

**Figure 4-8** shows a condition overview of Parking Equipment, Lots, & Structures throughout the next 10 years based on the lifecycle model.

### Parking Equipment, Lots, & Structures

Figure 4-8: Condition Overview by Year Based on Lifecycle Model - Parking Equipment, Lots, & Structures



# City of Kingston 2024 Asset Management Plan

Executive  
Summary and  
Introduction

Volume 1  
Infrastructure,  
Transportation,  
Transit, &  
Emergency  
Services

Volume 2  
Corporate  
Services &  
Parking  
Operations

Volume 3  
Community  
Services

Volume 4  
Parks, Parkland,  
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Police, Libraries,  
City Real Estate  
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**Appendices (Provided in a separate document)**

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A – Expected Useful Life

B – Risk Variables

Acronyms

# Acronyms

Acronym	Definition
AMP	Asset Management Plan
CPI	Consumer Price Index
EUL	Expected Useful Life
FMCS	Facilities Management & Construction Services
IATSE	International Alliance of Theatrical Stage Employees
IPM	Integrated Pest Management
IT	Information Technology
KCP	Kingston Cultural Plan
LOS	Levels of Service
rH	Relative Humidity
SOLI	State of the Local Infrastructure



## 1.0 Overview

The asset management project includes 21 service areas, covering all assets owned by the City of Kingston (City) that are not already included in other Asset Management Plans (AMP). This is the first iteration of an AMP for these service areas. Given the extensive range of assets included in the project, the plan is presented in the following six documents:

- Executive Summary and Introduction
- Volume 1: Infrastructure, Transportation, Transit, & Emergency Services
- Volume 2: Corporate Services & Parking Operations
- Volume 3: Community Services
- Volume 4: Parks, Parkland, & Trails
- Volume 5: Police, Libraries, City Real Estate & Environment

## Overview

The Introduction document presents key asset management principles and an overview of how each service area will be presented in its own chapter with the following sections: State of the Local Infrastructure (SOLI); Levels of Service (LOS); Risk Assessment; and Asset Management Strategy. The Introduction also includes a section on Growth and a Roadmap with Next Steps. The following sections are included in the Introduction document:

- Section 1.1 Asset Management
- Section 1.2 Scope of Assets
- Section 1.3 Alignment with Strategic Plan, Policy, and Regulation
- Section 1.4 Governance and Relationship to Other Planning Documents
- Section 1.5 Growth
- Section 1.6 Overview of the AMP
  - State of the Local Infrastructure
  - Levels of Service
  - Risk Assessment
  - Asset Management Strategy
- Section 1.7 Roadmap with Next Steps

### 1.1 Scope of Assets in Volume 3

The service areas included in **Volume 3: Community Services** are: Heritage Services; Arts & Culture Services; Residential Long-Term Care; and Indoor Recreation & Marinas. See **Table 1-1** for the respective asset classes for each service area and the relevant chapter.

**Table 1-1: Service Areas included in Volume 3: Community Services**

Service Area	Asset Classes	Report Chapter
Heritage Services	<ul style="list-style-type: none"> <li>• Outdoor Collection</li> <li>• Civic Collection</li> <li>• General Heritage Collection</li> </ul>	Chapter 2.0

## Overview

Service Area	Asset Classes	Report Chapter
	<ul style="list-style-type: none"> <li>• Memorandum of Understanding Collection</li> <li>• PumpHouse Collection</li> <li>• MacLachlan Woodworking Museum Collection</li> </ul>	
Arts & Culture Services	<ul style="list-style-type: none"> <li>• Grand Theatre (Functional Capital)</li> <li>• Tett Centre (Functional Capital)</li> </ul>	Chapter 3.0
Residential Long-Term Care	<ul style="list-style-type: none"> <li>• Facility Equipment</li> <li>• Information Technology (IT)</li> <li>• Resident Direct Care Equipment</li> </ul>	Chapter 4.0
Indoor Recreation & Marinas	<ul style="list-style-type: none"> <li>• Aquatics – Pool &amp; Equipment</li> <li>• Arenas &amp; Equipment</li> <li>• Boat Launches</li> <li>• Community Centres</li> <li>• Crawford Wharf</li> <li>• Fitness Centre &amp; Equipment</li> <li>• Marinas</li> </ul>	Chapter 5.0

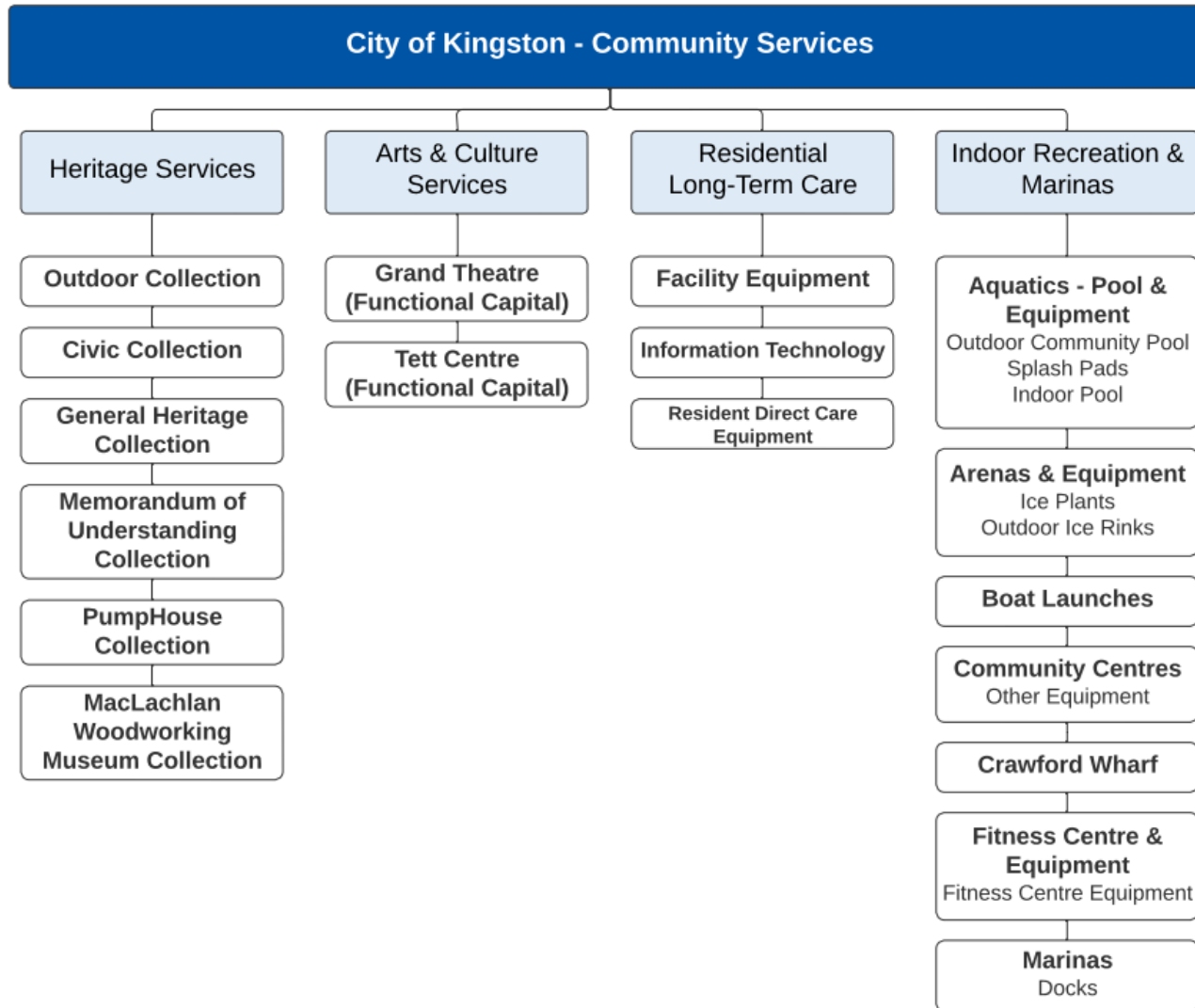
## 1.2 Asset Hierarchy

The asset hierarchy that was generated and used for the City's assets is shown in **Figure 1-1**. The asset group (level 1) is shown in the blue box, the four service areas (level 2) are shown in the light blue boxes, the asset classes are shown in bold (level 3), and where applicable, the asset sub-classes are shown in regular text (level 4).



Overview

Figure 1-1: Asset Hierarchy for Community Services



## Overview

### 1.3 Asset Inventory and Replacement Costs

An asset inventory was generated for all assets included in this AMP using Microsoft Excel. The inventory organizes assets using the various levels of the asset hierarchy and acts as a central repository for the asset data that can be used to inform asset management planning. It is recommended that the City continually updates the asset information stored within the asset inventory to facilitate asset management planning based on reliable data.

Where replacement costs were provided, the values were inflated based on the Bank of Canada Consumer Price Index (CPI) to estimate the replacement cost in 2023 dollars. If replacement costs were not provided, Dillon leveraged a unit cost model to assign replacement costs based on unit cost estimated for 2023. It is recommended that unit prices should be reviewed annually by the City based on costs observed from local suppliers and contractors.

### 1.4 Establishing Levels of Service

There were four LOS workshops that were held with staff. The service categories for this volume were covered in Workshop 3 and 4.

- Workshop 3 was held on November 21st, 2023, and included the stakeholders for Heritage, Arts & Culture, and Rideaucrest Long-term Care service categories.
- Workshop 4 was held on November 27, 2023, and included the stakeholders for Indoor Recreation & Marinas.

There were City staff from each service area that attended the workshop. The list of attendees is summarized in **Table 1-2**.

Overview

Table 1-2: Workshop Attendees – Community Services

Service	Name	Role
Heritage Services	Kevin Gibbs	Director Heritage Services
Heritage Services	Melanie Banks	Manager Heritage Programming
Arts & Culture Services	Danika Lochhead	Director, Arts & Culture Services
Arts & Culture Services	Diane Zemba	Grand Theatre Manager/Performing Arts
Residential Long-Term Care	Casie Keyes	Administrator Rideaucrest
Residential Long-Term Care	Laura Rabbie	Administration Manager Rideaucrest
Indoor Recreation & Marinas	Luke Follwell	Director of Engineering
Indoor Recreation & Marinas	Neal Unsworth	Manager Parks & Shoreline
Indoor Recreation & Marinas	Amy Elgersma	Director Recreation & Leisure Services

1.5 Growth Related Impacts on Lifecycle of Assets

As the City continues to expand, there are impacts to existing service levels and assets based on these future needs. The growth-related assumptions and potential impact on the lifecycle of the assets is shown in **Table 1-3**.

Overview

Table 1-3: Growth Related Impacts on Lifecycle of Assets

Service Category	Growth Impact Assumptions	How Assumptions Relate to Lifecycle of Assets
Heritage Services	<ul style="list-style-type: none"> <li>Changing service demands based on population growth and demographic</li> </ul>	<ul style="list-style-type: none"> <li>Potential increase in capital expenditures to maintain the state of collections</li> </ul>
Arts & Culture Services	<ul style="list-style-type: none"> <li>Increase needs for service based on demands</li> </ul>	<ul style="list-style-type: none"> <li>Potential increase in capital and maintenance costs for facility services</li> <li>Potential increased operational costs due to number of assets</li> </ul>
Residential Long-Term Care	<ul style="list-style-type: none"> <li>Increased needs to meet the continued growth and changing population age</li> <li>Increases to internal capacity (staffing) required to maintain equipment</li> </ul>	<ul style="list-style-type: none"> <li>Potential increase in operational costs due to an increase in the overall asset portfolio</li> <li>Potential increase in capital expenditures for the purchase of additional assets to meet service needs for residents</li> </ul>
Indoor Recreation & Marinas	<ul style="list-style-type: none"> <li>Increase in service demands due to increased operating hours</li> <li>Increased development will occur as a result of continued growth</li> </ul>	<ul style="list-style-type: none"> <li>Potential increase in capital expenditures for the purchase of additional assets to meet service needs for residents</li> <li>Potential increase in operational costs due to an increase in the overall use of assets</li> </ul>



## 2.0 Heritage Services

The City's Heritage Services is dedicated to preserving and celebrating the rich historical and cultural legacy of the City, with a particular emphasis on its diverse art collections. These collections, housed in various municipal facilities and public spaces, include an impressive array of artworks ranging from historical pieces to contemporary creations. The City Hall, for instance, features an extensive collection of portraits and artifacts that reflect Kingston's storied past. Additionally, the PumpHouse Museum and the MacLachlan Woodworking Museum showcase unique collections that highlight the City's industrial and craft heritage. Heritage Services also manages outdoor art installations throughout the City, enhancing urban spaces with sculptures, murals, and other artistic expressions. Through exhibitions, educational programs, and community events, Heritage Services ensures that these art collections are accessible and engaging, fostering a deeper appreciation for the City's cultural and artistic heritage among residents and visitors. This chapter includes assets that are managed under Heritage Services.

## Heritage Services

### 2.1 State of the Local Infrastructure

#### 2.1.1 Asset Inventory and Valuation

For inventory purposes, Heritage Services assets have been summarized into asset classes and further divided into applicable asset types. **Table 2-1** summarizes the asset inventory for Heritage Services by asset class, asset type and asset count. At the time of the AMP, there was no replacement cost data available for these assets as they are irreplaceable assets.

It should be noted that the City has an extensive civic collection of historical pieces. These priceless pieces of art and history will not have a specified replacement value or service life and are not subject to depreciation or depletion. City staff ensure these items are treated as unique and prioritize preservation techniques so they can be conserved and enjoyed by generations.

#### Table 2-1 Notes

<sup>1</sup> There is no available replacement cost or valuation data for these assets.

**Table 2-1: Inventory Summary by Asset Type – Heritage Services**

Asset Class	Asset Count	Total Replacement Cost (2023)
Outdoor Collection	94	Unknown
Civic Collection	2,313	Unknown
General Heritage Collection	76	Unknown
Memorandum of Understanding Collection	111	Unknown
PumpHouse Collection	1,339	Unknown
MacLachlan Woodworking Museum Collection	9,262	Unknown

## Heritage Services

Asset Class	Asset Count	Total Replacement Cost (2023)
Overall	13,195	Unknown <sup>1</sup>

### 2.1.2 Asset Age Summary

**Table 2-2** summarizes the average age and average condition of assets pertaining to Heritage Services. Unlike the other assets included in the AMP, these assets are intended to be preserved indefinitely. As such, their service life is different from those assets that are meant to be replaced over time. They have no defined service life or replacement schedule. **Table 2-2** does not include an expected useful life or average remaining useful life.

#### Table 2-2 Notes

<sup>1</sup> No condition data was available for Heritage Services assets at the time of preparing this AMP. Age data was only available for 1,592 of the 13,195 Heritage Services assets. The overall average age of Heritage Services assets is 74 years based on the available age data.

**Table 2-2: Average Age and Average Condition – Heritage Services**

Asset Class	Average Age (Years)	Average Condition Grade
Outdoor Collection	Unknown	Unknown
Civic Collection	67	Unknown
General Heritage Collection	69	Unknown
Memorandum of Understanding Collection	86	Unknown
PumpHouse Collection	90	Unknown
MacLachlan Woodworking Museum Collection	174	Unknown

## Heritage Services

Asset Class	Average Age (Years)	Average Condition Grade
Overall	74	Unknown

### 2.1.3 Asset Condition

Since these assets are intended for perpetual preservation, traditional methods of determining the remaining service life are not applicable. Currently, City staff monitor the condition of Heritage Services assets through visual inspections. Inspection data was unavailable at the time of the AMP, and the current condition of these assets is unknown. However, with regular maintenance and inspections, it is anticipated that they will remain in good condition.

### 2.1.4 Data Sources and Confidence

The asset data for Heritage Services assets was provided in 2023 by City staff in the format of various Excel report files exported from a collections management software from Re:discovery Inc. called Proficio. Currently, this critical subscription-based software platform serves as the central repository for asset & condition data related to the assets.

Data confidence can be estimated based on the confidence level of various qualifiers and can be presented on a scale from 0% (low) to 100% (high), as shown in **Table 2-3**. The qualifiers chosen for evaluation are specifically targeted for estimating overall confidence of condition reporting within the SOLI.

**Table 2-3: Data Confidence Scale**

Confidence Level	Low	Low/Moderate	Moderate	Moderate/High	High
Average of Qualifiers	0% to 19%	20% to 39%	40% to 59%	60% to 79%	80% to 100%

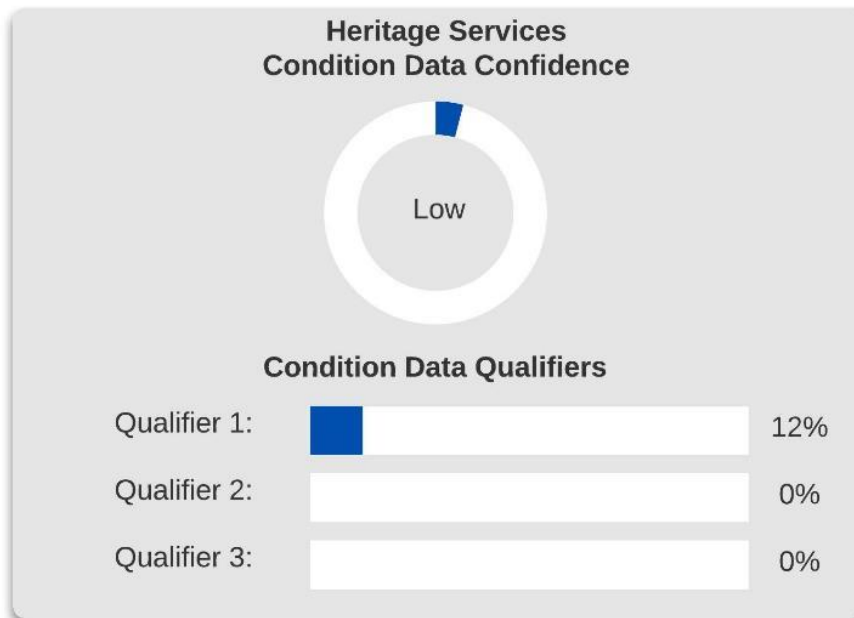


## Heritage Services

Assuming the data source is reliable, the following qualifiers were considered to estimate data confidence regarding the data utilized in the creation of this SOLI report:

- **Qualifier 1:** The percentage of assets in the asset inventory where construction, installation, or acquisition years are documented (12%);
- **Qualifier 2:** The percentage of assets in the asset inventory that have condition assessment data documented (0%); and,
- **Qualifier 3:** The percentage of the estimated overall replacement value, in 2023 dollars, attributed to assets in the asset inventory with documented condition assessment data (i.e., condition is not solely age-based) (0%).

**Figure 2-1: SOLI Report Data Confidence – Heritage Services**



## Heritage Services

As summarized in **Figure 2-1**, the overall asset condition data confidence for Heritage Services assets is estimated as Low. Currently, the City's Proficio software stores asset condition assessment reports completed by City staff for individual assets but does not allow for tabular asset condition data to be summarized and exported for individual assets within each asset class (i.e., asset condition data is only accessed by opening individual asset condition assessment reports). As a result, asset condition data could not be utilized for this AMP. For asset management planning purposes, it is recommended that the City investigates whether Proficio can be configured to summarize asset condition data for all assets within an asset class in tabular format to better inform future AMPs.

### 2.2 Levels of Service

In 2014, the City developed the Kingston Public Art Master Plan, a strategic document designed to enhance the cultural and aesthetic richness of the City through public art. The plan aims to outline the vision, goals, and actions needed to integrate public art into the urban fabric of Kingston, promoting community engagement, cultural expression, and placemaking. The master plan emphasizes the importance of diversity and inclusion, ensuring public art reflects the City's varied cultural heritage and contemporary society.

Key goals of the master plan include:

- Fostering a sense of identity and pride among Kingston residents.
- Creating vibrant and attractive public spaces.
- Supporting local and regional artists.

As the plan provides a long-term vision for public art included as part of the Civic Collection, the City has developed community and technical Levels of Service (LOS), for their existing assets within the collection. These LOS were developed based on contributions from the municipal staff. It was decided that Community Satisfaction and Quality were key attributes in gauging the performance of the assets. **Table 2-4** and **Table 2-5** outline the City's current community and technical LOS for Heritage Services.

Heritage Services

Table 2-4: Community LOS – Heritage Services

LOS Parameter	LOS Statement	Performance Measure	Current LOS (2023)
<b>Community Satisfaction</b>	Curate vibrant collections that meet community expectations relating to cultural equity, diversity, and the City’s geography.	Percentage of respondents that are satisfied with the City’s existing collections, as informed by public survey.	Currently Unknown

Table 2-5: Technical LOS – Heritage Services

LOS Parameter	LOS Statement	Performance Measure	Current LOS (2023)
<b>Quality</b>	Preserve Heritage Services assets in a good state of repair.	Percentage of assets that are meeting condition performance objectives.	Currently Unknown

Heritage Services

2.3 Risk Assessment

The risk scores were calculated using the risk methodology and approach outlined in the Introduction document. **Table 2-6** summarizes the risk factors for the Heritage Services assets.

**Table 2-6: Risk Factors – Heritage Services**

Factors	Risk Ratings
<b>A - Condition</b>	As the condition of the assets is unknown, a condition rating of 3 was assumed for all assets and a rating of 3 for calculating the risk scores.
<b>B - Performance</b>	The performance of all assets was identified as being “usually reliable” and assigned a rating of 3 for calculating risk scores.
<b>C - Climate Change</b>	The climate change ratings were determined at the asset class level by identifying climate change hazard interactions. Outdoor Collection assets were identified as a “high” risk and assigned a rating of 5 for calculating the risk scores. All other asset classes were assigned a rating of 1.
<b>D - Impact</b>	The impact of the assets was identified as "low" impact and assigned a rating of 0 for calculating risk scores.
<b>E - Importance</b>	The importance of the assets was identified as "high" importance and assigned a rating of 3 for calculating risk score, except for the General Heritage Collection. The General Heritage Collection was identified as “low” importance and assigned a rating of 1 for calculating risk scores.

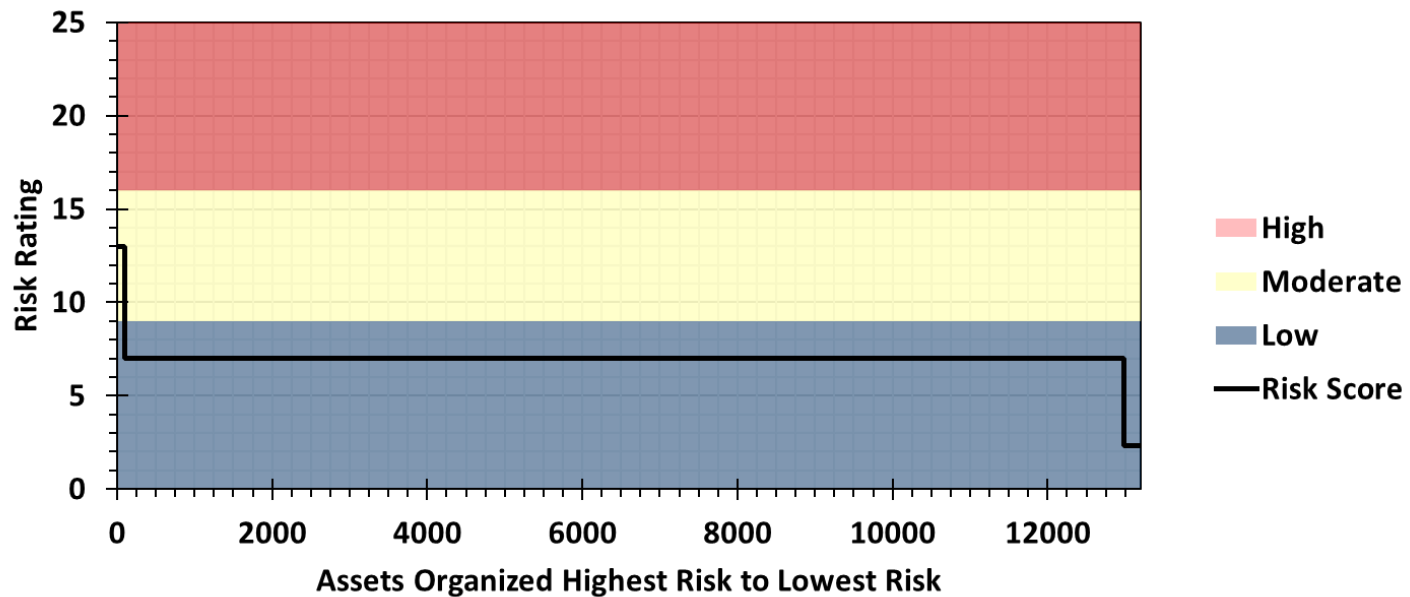
The individual risk ratings were used in calculating the risk score for each of the assets.

## Heritage Services

### 2.3.1 Risk Profile

The Risk profile of the Heritage Services assets is displayed in **Figure 2-2**. Of the 13,195 assets tracked within the asset inventory, 104 assets are classified as Moderate risk and the remaining 13,091 assets as Low risk. Moderate risk assets primarily include Outdoor Collection assets subject to climate change impacts.

**Figure 2-2: Risk Profile – Heritage Services (All Collections)**



## 2.4 Asset Management Strategy

### 2.4.1 Lifecycle Activities – Heritage Services

The lifecycle activities considered in this AMP include:

## Heritage Services

- **Non-Infrastructure Solutions:** Actions or policies that can lower costs and extend useful lives.
- **Maintenance Activities:** Regularly scheduled inspection and maintenance, or more significant repair and activities associated with unexpected events.
- **Renewal / Rehabilitation Activities:** Significant repairs designed to extend the life of the asset.
- **Replacement / Construction Activities:** Activities that are expected to occur once an asset has reached the end of its useful life and renewal/rehabilitation is no longer an option.
- **Disposal Activities:** Activities associated with disposing of an asset once it has reached the end of its useful life or is otherwise no longer needed.
- **Expansion / Growth / Service Improvement Activities:** Planned activities required to extend services to previously unserved areas or expand services to meet growth demands.

**Table 2-7** describes the lifecycle activities that can be implemented within the asset management strategy for Heritage Services assets. The lifecycle activities presented below are existing activities performed by the City, identified during a workshop with City staff in January 2024.

**Table 2-7: Lifecycle Activities – Heritage Services**

Lifecycle Activity Type	Description of Activity	Frequency / Timing
Non-Infrastructure Solutions	Public Art Master Plan	Every 5 years
Maintenance Activities	Environment Controls - Temperature and relative humidity (rH) monitoring	Daily
Maintenance Activities	General Cleaning of Collections	Weekly
Maintenance Activities	Integrated Pest Management (IPM)	Monthly
Maintenance Activities	Deep Cleaning of Outdoor Assets	Bi-annually (spring and fall)
Renewal / Rehabilitation Activities	Rehabilitation of assets as needed, informed by condition reporting and larger assessments.	Ongoing

## Heritage Services

Lifecycle Activity Type	Description of Activity	Frequency / Timing
Renewal / Rehabilitation Activities	Conservation Work	Annually or bi-annually
Replacement / Construction Activities	Replacement of Assets in Critical Condition	As needed
Disposal Activities	Deaccessioning Process	As determined during quarterly Heritage Programs Committee meetings
Expansion / Growth / Service Improvement Activities	Review of City Policies. Creation of new policies as needed.	Bi-annually

### 2.4.2 Funding the Lifecycle Activities – Heritage Services

Lifecycle modeling allows for the City to understand the future reinvestment needs of their existing assets by generating a theoretical asset replacement forecast that considers available asset inventory data. For Heritage Services assets, however, the replacement values are highly subjective and influenced by factors like the artist's reputation, provenance, and market trends. This differs from traditional lifecycle approaches for other built infrastructure.

The primary goal of Heritage Services lifecycle management is preservation, not long-term operational performance. Historical data on maintenance and operation costs would aid in estimating future funding requirements for lifecycle activities. While this data was unavailable for this AMP, it should be considered in future iterations.



### 3.0 Arts & Culture Services

The City's Arts & Culture Services department is dedicated to enriching the community through a robust offering of arts and cultural programs. This includes the operation of key cultural facilities such as the Kingston Grand Theatre and Tett Centre for Creativity and Learning. The Kingston Grand Theatre, a historic and iconic venue, hosts a diverse array of performances including music, theatre, dance, and comedy, serving as a central hub for entertainment in the City. Meanwhile, the Tett Centre, located on the waterfront, offers dynamic spaces for arts education, studios, and galleries, fostering creativity and collaboration among community members. This section of the AMP summarizes asset inventories for Arts & Culture Services.

The City's Facilities Management & Construction Services (FMCS) department is comprised of three divisions: Facilities Management, Energy & Asset Management, and Facilities Construction. FMCS maintains the City's diverse portfolio of municipal buildings, thereby supporting departments and agencies in providing extensive front-line services to the community. This centralized, shared services collaborative approach has allowed the integration of energy management and sustainability considerations along with other aspects of facilities maintenance, asset management, space planning, design, construction, and demolition across all areas of the City.



## Arts & Culture Services

It is important to note that the Arts & Culture Services facilities were included in the dedicated 2023 Facilities AMP developed by the City’s FMCS department in consultation with GM BluePlan Engineering Limited. The assets in this AMP are considered functional capital assets within the facilities, which are managed separately through Arts & Culture Services in consultation with the Tett Centre, and as outlined in the Service Level Agreement within the Tett Centre Master Lease. For details on the facilities including data confidence and lifecycle modeling, please refer to the 2023 Facilities AMP.

### 3.1 State of the Local Infrastructure

#### 3.1.1 Asset Inventory and Valuation

For inventory purposes, Arts & Culture Services assets are summarized into asset classes. The asset class and asset count are shown in **Table 3-1**. At the time of the AMP, there were no replacement cost data available for these assets.

**Table 3-1: Inventory Summary by Asset Type – Arts & Culture Services**

Asset Class	Count	Total Replacement Cost (2023)
Kingston Grand Theatre (Functional Capital)	1,454	Unknown
Tett Centre (Functional Capital)	537	Unknown
<b>Overall</b>	<b>1,991</b>	<b>Unknown</b>

#### 3.1.2 Asset Age Summary

**Table 3-2** summarizes the average age, average condition, expected useful life, and the average remaining useful life of assets pertaining to Arts & Culture Services. The overall average age of Arts & Culture Services assets is 13 years, and the average remaining useful life is three years.

Arts & Culture Services

Table 3-2: Average Age, Average Condition, Expected Useful Life, and Remaining Useful Life – Arts & Culture Services

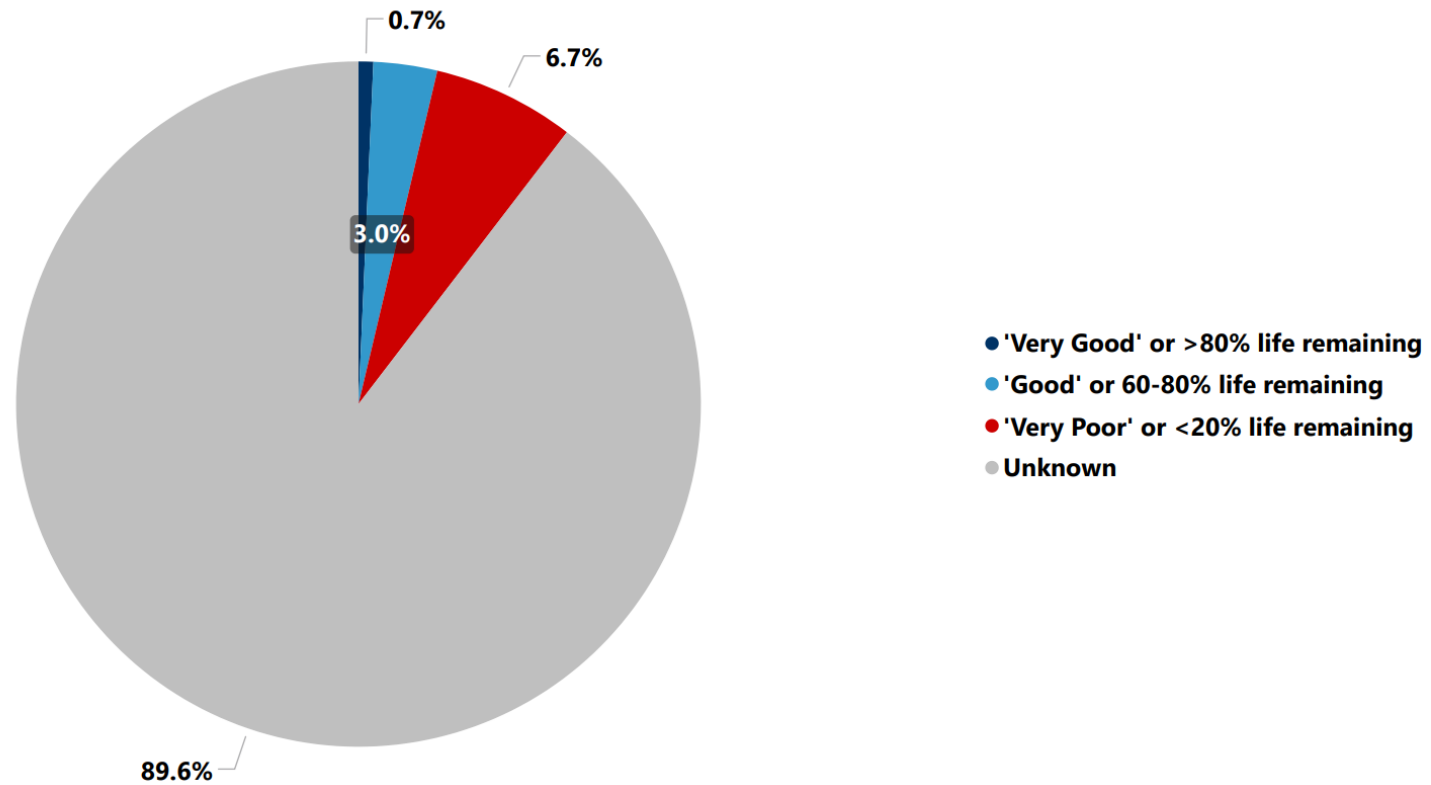
Asset Class	Average Age (Years)	Average Condition Rating	Expected Useful Life (Years)	Average Remaining Useful Life (Years)
Kingston Grand Theatre (Functional Capital)	13	Poor	10	3
Tett Centre (Functional Capital)	Unknown	Unknown	10	Unknown
<b>Overall</b>	<b>13</b>	<b>Poor</b>	<b>10</b>	<b>3</b>

## Arts & Culture Services

### 3.1.3 Asset Condition

An overall condition summary for Arts & Culture Services assets is shown in **Figure 3-1**. Approximately 90% of the assets lack condition data. There is approximately 3.7% of the assets that are in very good to fair condition, while 89.6% of the assets with an unknown condition.

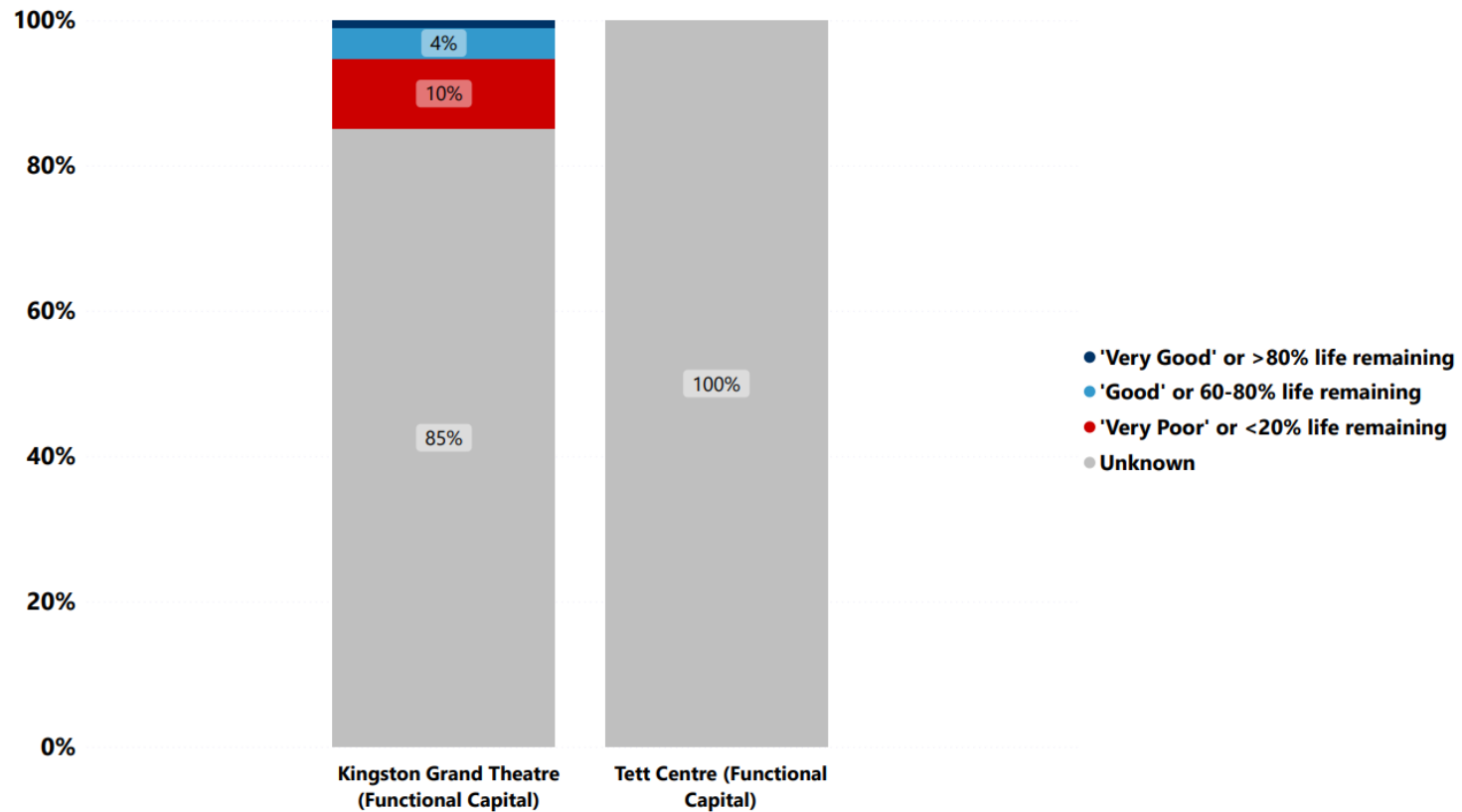
**Figure 3-1: Condition Summary – Arts & Culture Services**



### Arts & Culture Services

A condition summary for Kingston Grand Theatre (Functional Capital) and Tett Centre (Functional Capital) is provided in **Figure 3-2** by asset type. In the absence of condition assessment data, the condition of the assets has been primarily determined based on age and expected useful life (if available).

**Figure 3-2: Condition Summary by Asset Class – Arts & Culture Services (Kingston Grand Theatre (Functional Capital) and Tett Centre (Functional Capital))**



## Arts & Culture Services

### 3.1.4 Data Sources and Confidence

The asset data for assets pertaining to Arts & Culture Services was provided by City staff in the format of various Excel inventory files. Currently, there is no central repository for this asset data.

Data confidence can be estimated based on the confidence level of various qualifiers and can be presented on a scale from 0% (low) to 100% (high), as shown in **Table 3-3**. The qualifiers chosen for evaluation are specifically targeted for estimating overall confidence of condition reporting within the SOLI.

**Table 3-3: Data Confidence Scale**

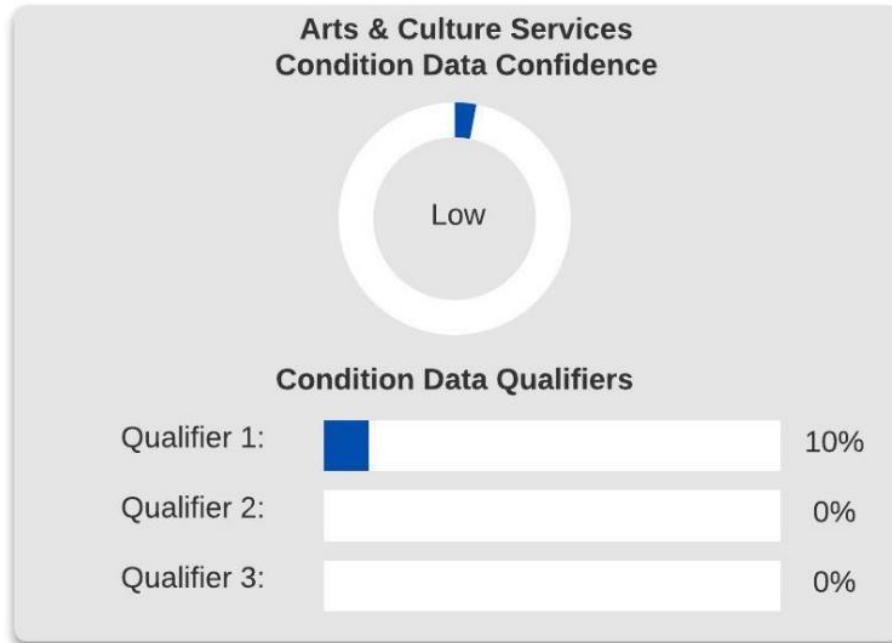
Confidence Level	Low	Low/Moderate	Moderate	Moderate/High	High
Average of Qualifiers	0% to 19%	20% to 39%	40% to 59%	60% to 79%	80% to 100%

Assuming the data source is reliable, the following qualifiers were considered to estimate data confidence regarding the data utilized in the creation of this SOLI report:

- **Qualifier 1:** The percentage of assets in the asset inventory where construction, installation, or acquisition years are documented (10%);
- **Qualifier 2:** The percentage of assets in the asset inventory that have condition assessment data documented (0%); and,
- **Qualifier 3:** The percentage of the estimated overall Structures replacement value, in 2023 dollars, attributed to assets in the asset inventory where condition can be assessed using available data (i.e., based on condition assessment history and/or age-based condition) (0%).

## Arts & Culture Services

Figure 3-3: SOLI Report Data Confidence – Arts & Culture Services



As summarized in **Figure 3-3**, the overall asset condition data confidence for Arts & Culture Services assets is estimated as Low. In the absence of a centralized repository for functional capital assets related to Arts & Culture Services, key attributes that inform asset management planning remain unknown including most asset ages, conditions, and replacement costs. Data confidence can be increased by improving the quality of the data and/or filling in data gaps.

### 3.2 Levels of Service

In 2010, the City published the Kingston Cultural Plan (KCP) which provided a comprehensive plan which focused on the following objectives:

### Arts & Culture Services

- **Long-term vision:** Outlined a sustainable, authentic future for Kingston's cultural scene.
- **Collaboration:** Identified opportunities for partnerships between cultural organizations, other stakeholders, and City departments.
- **Strategic goals:** Developing a roadmap with specific actions, initiatives, and a timeline to achieve Kingston's cultural and municipal objectives.

The KCP outlines how the City can improve its residents' cultural experiences and strengthen its identity through cultural investment. It also defines the Arts & Culture Services department's role as a cultural development agency and identifies its required resources. To support the needs of cultural services, the City has developed the community and technical Levels of Service (LOS), based on contributions from the municipal staff. It was decided that Customer Satisfaction and Quality were key attributes in gauging the performance of the assets. **Table 3-4** and **Table 3-5** outline the City's current community and technical levels of service for Arts & Culture Services.

**Table 3-4: Community LOS – Arts & Culture Services**

LOS Parameter	LOS Statement	Performance Measure	Current LOS (2023)
<b>Customer Satisfaction</b>	Provide cultural enrichment services that promotes and supports the development of cultural experiences.	Percentage of respondents that are satisfied with the City's existing cultural services by public survey.	Currently Unknown

## Arts & Culture Services

**Table 3-5: Technical LOS – Arts & Culture Services**

LOS Parameter	LOS Statement	Performance Measure	Current LOS (2023)
<b>Quality</b>	Provide Arts & Culture Services that meet the needs of the community.	Percentage of assets that are in poor or better condition.	Currently Unknown

### 3.3 Risk Assessment

The risk ratings for Arts & Culture Services assets included Kingston Grand Theatre (Functional Capital) and Tett Centre (Functional Capital). The risk scores were calculated using the risk methodology and approach outlined in the Introduction document. **Table 3-6** summarizes the risk factors for the Arts & Culture Services assets.

**Table 3-6: Risk Factors - Arts & Culture Services**

Factors	Risk Ratings
<b>A - Condition</b>	The condition of the assets was determined either by visual or age-based and can be found in the SOLI section of the AMP.
<b>B - Performance</b>	The performance of the Kingston Grand Theatre (Functional Capital) and Tett Centre (Functional Capital) assets was identified as "usually reliable" and assigned a rating of 3 for calculating risk score.



Arts & Culture Services

Factors	Risk Ratings
<b>C - Climate Change</b>	The climate change ratings were determined at the asset class level by identifying climate change hazard interactions. The Kingston Grand Theatre (Functional Capital) and Tett Centre (Functional Capital) assets were identified as a “low” risk and assigned a rating of 1 for calculating the risk score.
<b>D - Impact</b>	The Kingston Grand Theatre (Functional Capital) and Tett Centre (Functional Capital) assets was recognized as "moderate" impact and assigned a rating of 1 for calculating risk score.
<b>E - Importance</b>	The Kingston Grand Theatre (Functional Capital) and Tett Centre (Functional Capital) assets was assigned a “moderate” importance and a rating of 2 when calculating risk.

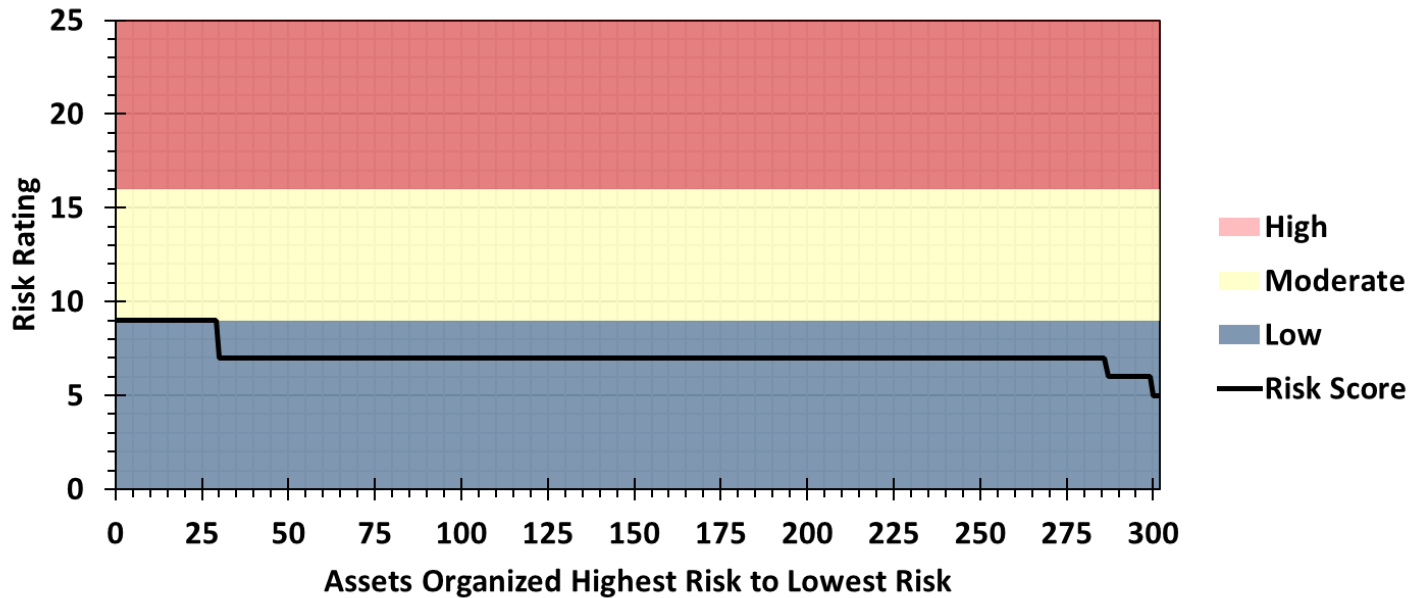
The individual risk ratings were used in calculating the risk score for each of the assets.

**3.3.1 Risk Profile**

The Risk profile for the Kingston Grand Theatre (Functional Capital) assets is displayed in **Figure 3-4**. All 302 assets tracked in the asset inventory are considered as Low risk.

Arts & Culture Services

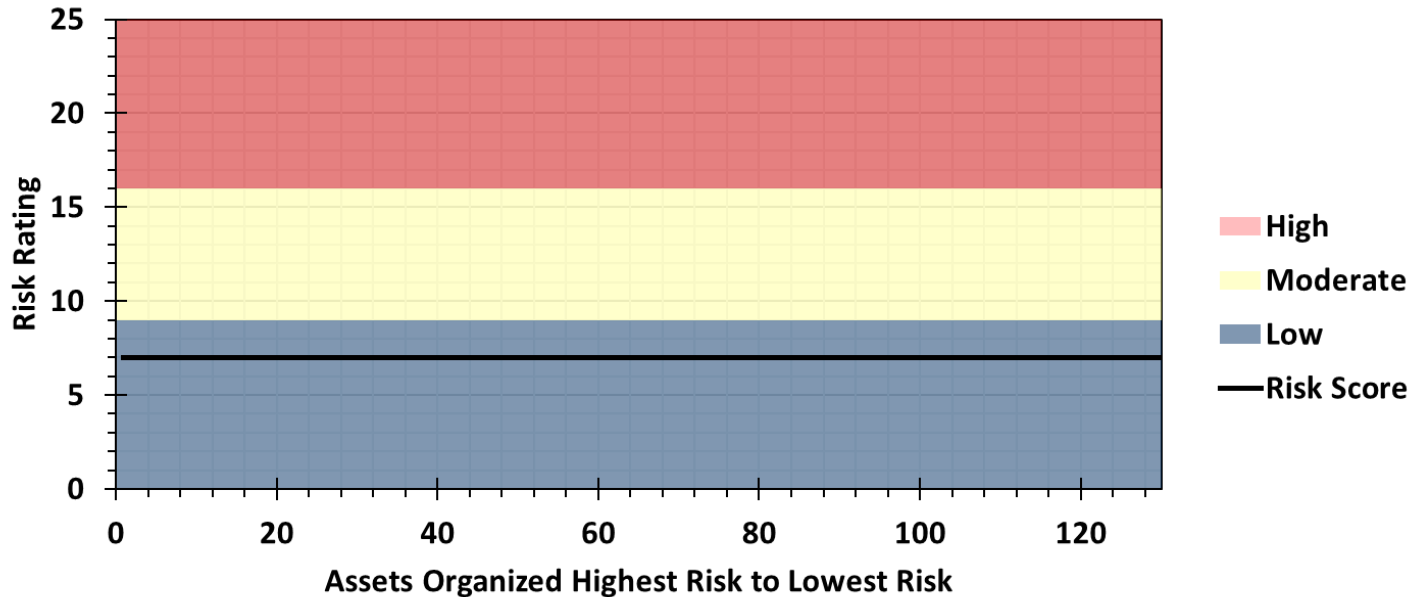
Figure 3-4: Risk Profile - Arts & Culture Services (Kingston Grand Theatre (Functional Capital))



The Risk profile for the Tett Centre (Functional Capital) assets is displayed in **Figure 3-5**. All 130 assets tracked in the asset inventory are considered as Low risk.

## Arts & Culture Services

Figure 3-5: Risk Profile - Arts & Culture Services (Tett Centre (Functional Capital))



### 3.4 Asset Management Strategy

#### 3.4.1 Lifecycle Activities – Arts & Culture Services

The lifecycle activities considered in this AMP include:

- **Non-Infrastructure Solutions:** Actions or policies that can lower costs and extend useful lives.
- **Maintenance Activities:** Regularly scheduled inspection and maintenance, or more significant repair and activities associated with unexpected events.
- **Renewal / Rehabilitation Activities:** Significant repairs designed to extend the life of the asset.
- **Replacement / Construction Activities:** Activities that are expected to occur once an asset has reached the end of its useful life and renewal/rehabilitation is no longer an option.

## Arts & Culture Services

- **Disposal Activities:** Activities associated with disposing of an asset once it has reached the end of its useful life or is otherwise no longer needed.
- **Expansion / Growth / Service Improvement Activities:** Planned activities required to extend services to previously unserved areas or expand services to meet growth demands.

**Table 3-7** describes the lifecycle activities that can be implemented within the asset management strategy for Arts & Culture Services assets. The lifecycle activities presented below are existing activities performed by the City, identified during a workshop with City staff in January 2024.

**Table 3-7: Lifecycle Activities – Arts & Culture Services**

Lifecycle Type	Description of Activity	Frequency / Timing
Non-Infrastructure Solutions	IATSE Collective Agreement (Union)	Ongoing
Non-Infrastructure Solutions	Kingston Grand Theatre Business Plan	Every 10 years
Non-Infrastructure Solutions	Kingston Culture Plan	Every 5 years
Maintenance Activities	Maintenance Plan	Annually
Renewal / Rehabilitation Activities	15-year Capital Plan for The Kingston Grand Theatre and Tett Centre	Annually
Replacement / Construction Activities	Replacement at End of EUL	End of EUL
Disposal Activities	Decommissioning and disposal of assets in collaboration with the FCMS department	As needed

**Arts & Culture Services**

Lifecycle Type	Description of Activity	Frequency / Timing
Expansion / Growth / Service Improvement Activities	Accessibility Plan	Every 10 years

**3.4.2 Funding the Lifecycle Activities – Arts & Culture Services**

Lifecycle modeling allows for the City to understand the future reinvestment needs of their existing assets by generating a theoretical asset replacement forecast that considers available asset inventory data. The age, EUL, replacement cost, condition, and risk score of each asset can be leveraged within the lifecycle model to proactively plan for reinvestment over a period of interest.

The forecasted asset replacement for Arts & Culture Services assets could not be assessed at the time of preparing this AMP due to significant data gaps.



#### 4.0 Residential Long-Term Care

The City's Residential Long-Term Care Service is dedicated to providing high-quality, compassionate care for its senior residents. Rideaucrest is a municipally operated long-term care facility that offers a safe and supportive environment for its residents, with tailored services designed to meet individual health and wellness needs. This section of the AMP summarizes asset inventories for this Residential Long-Term Care Centre.

It is important to note that the Rideaucrest Home was included in the dedicated 2023 Facilities AMP developed by the City's FMCS department in consultation with GM BluePlan Engineering Limited. As a result, the details on the facility in this AMP are limited to basic inventory information. The assets in this AMP are considered functional capital assets within the facility which are managed separately from facility components. For further detail on the facility including data confidence and lifecycle modeling, please refer to the 2023 Facilities AMP.

## Residential Long-Term Care

### 4.1 State of the Local Infrastructure

#### 4.1.1 Asset Inventory and Valuation

The Residential Long-Term Care service oversees the City’s Rideaucrest Home including facility equipment, information technology assets, and resident direct care equipment. **Table 4-1** summarizes the asset inventory by asset class, asset type, asset count, total replacement cost (in 2023 dollars). The total replacement cost (2023 dollars) is estimated at **\$76.4 million** for the **1,057 assets** included in the inventory.

#### Table 4 -1 Notes

<sup>1</sup> As reported in Facilities AMP (2023)

**Table 4-1: Inventory Summary by Asset Type – Residential Long-Term Care**

Asset Class	Asset Type	Count	Total Replacement Cost (2023)
Facilities	Buildings	1	\$74,900,000 <sup>1</sup>
Facility Equipment	Appliances	54	\$398,700
Facility Equipment	Furniture	270	\$234,300
Information Technology	Telephone Systems	1	\$178,200
Resident Direct Care Equipment	Appliances	194	\$355,300
Resident Direct Care Equipment	Furniture	522	\$142,900
Resident Direct Care Equipment	Patient Lifts	15	\$150,000
<b>Overall</b>	<b>N/A</b>	<b>1,057</b>	<b>\$76,359,400</b>

## Residential Long-Term Care

### 4.1.2 Asset Age Summary

**Table 4-2** summarizes the average age, average condition, expected useful life, and the average remaining useful life of functional capital assets pertaining to Residential Long-Term Care. Refer to the 2023 Facilities AMP for details on the facility itself. The overall average age of Residential Long-Term Care assets is seven years, and the average remaining useful life is eight years.

**Table 4-2: Average Age, Average Condition, Expected Useful Life, and Remaining Useful Life – Residential Long-Term Care**

Asset Class	Asset Type	Average Age (Years)	Average Condition Rating	Expected Useful Life (Years)	Average Remaining Useful Life (Years)
Facility Equipment	Appliances	11	Poor	10	3
Facility Equipment	Furniture	2	Very Good	15	13
Information Technology	Telephone Systems	7	Poor	10	3
Resident Direct Care Equipment	Appliances	3	Good	10	6
Resident Direct Care Equipment	Furniture	3	Very Good	15	12
Resident Direct Care Equipment	Patient Lifts	3	Very Good	15	12
<b>Overall</b>	<b>N/A</b>	<b>7</b>	<b>Good</b>	<b>10 to 15</b>	<b>8</b>

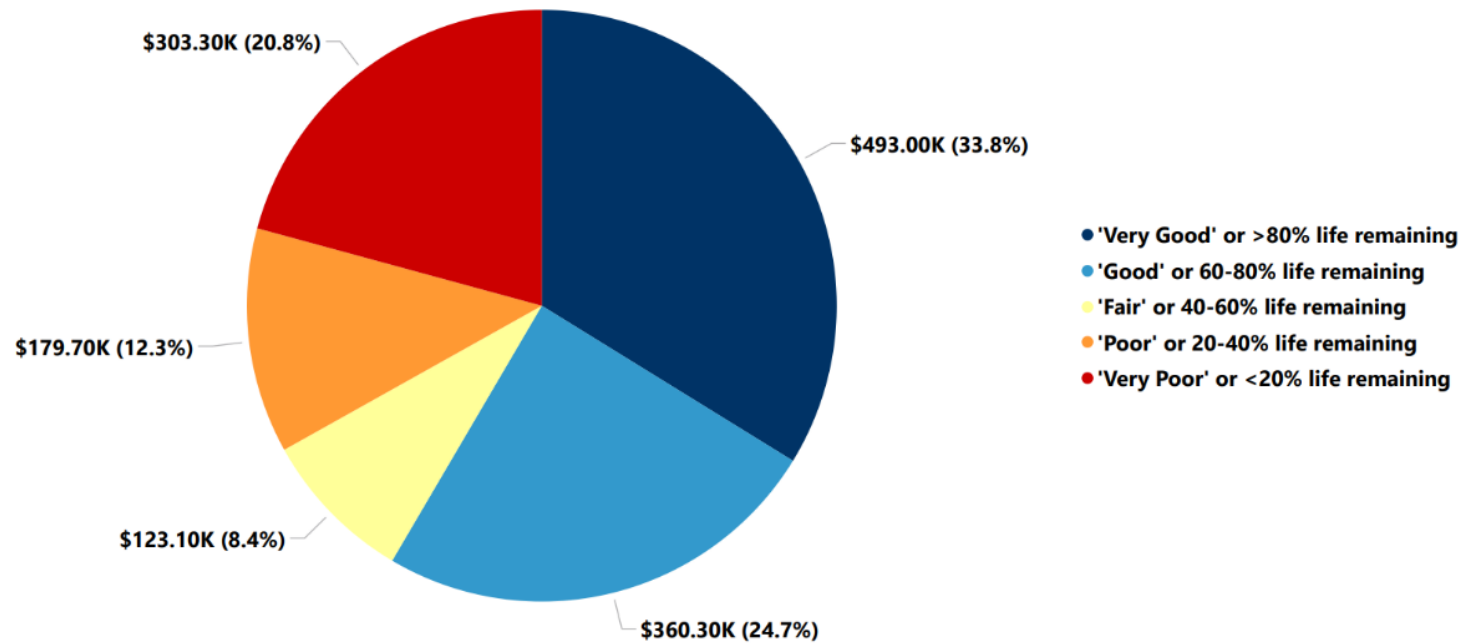


## Residential Long-Term Care

### 4.1.3 Asset Condition

An overall condition summary for Residential Long-Term Care assets by replacement cost (in 2023 dollars) is shown in **Figure 4-1**. There is approximately 66.9% of the assets that are in very good to fair condition.

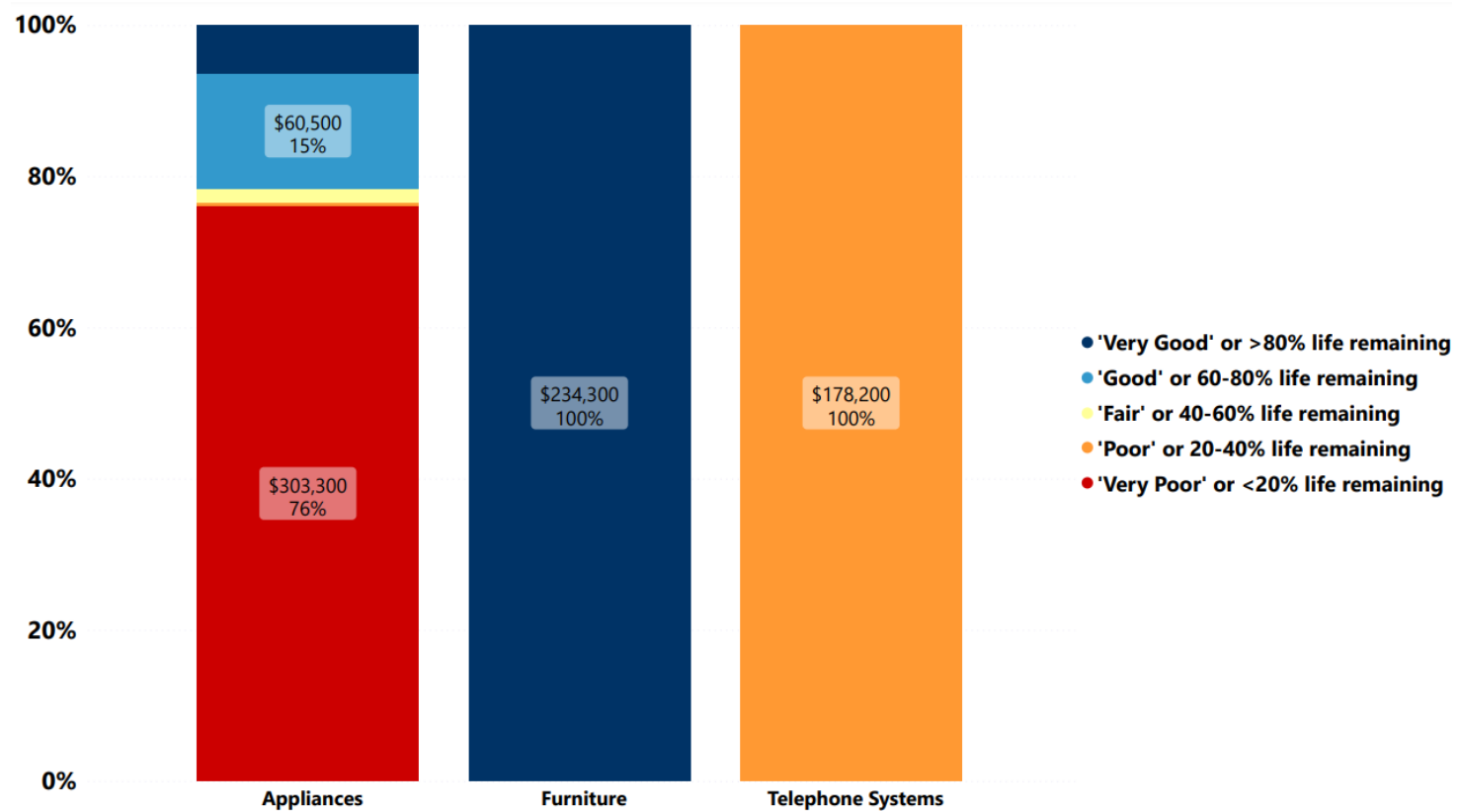
**Figure 4-1: Condition Summary and 2023 Replacement Cost – Residential Long-Term Care**



### Residential Long-Term Care

A condition summary for the Residential Long-Term Care is provided in **Figure 4-2** by asset type. Condition has been determined primarily by an age-based linear deterioration approach.

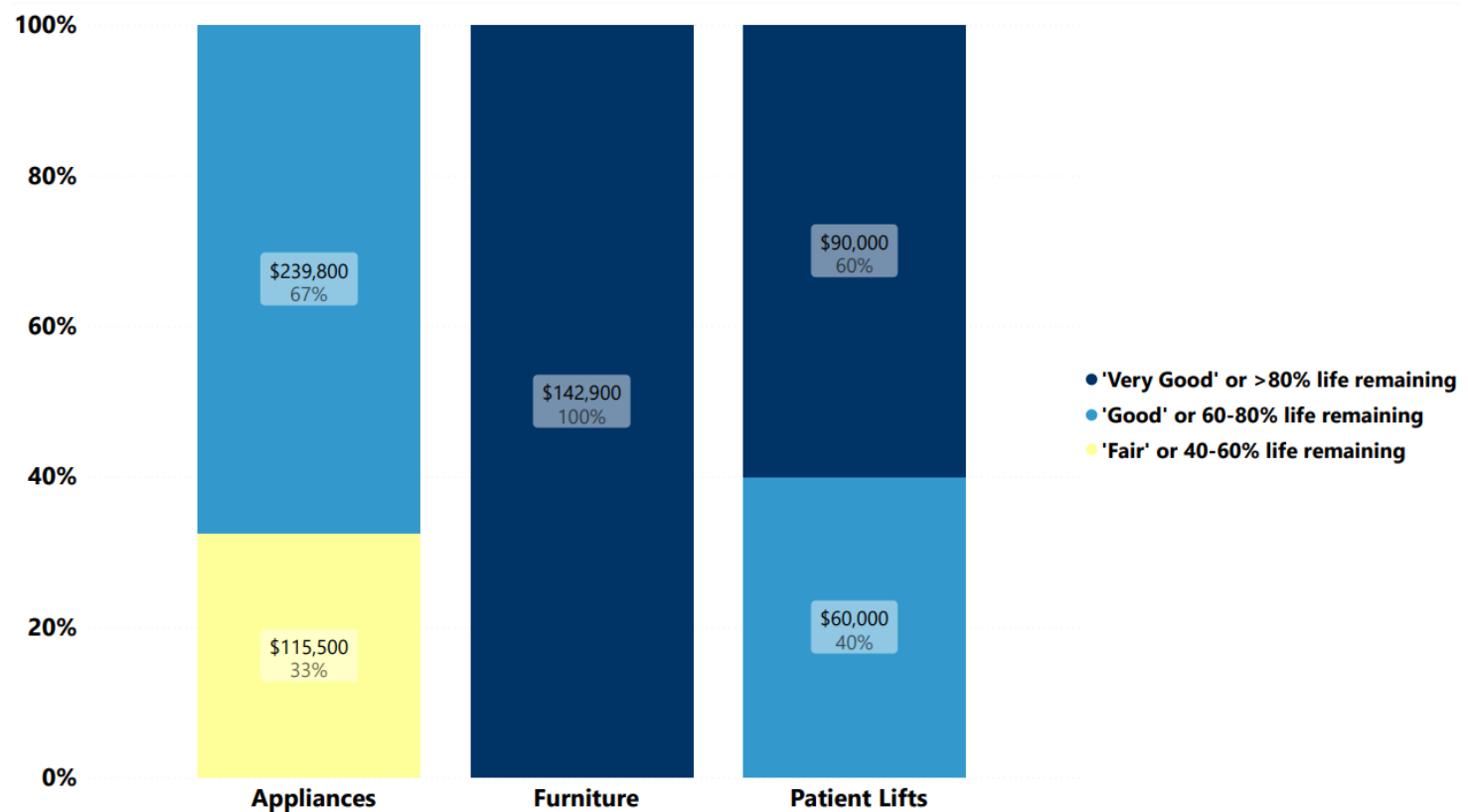
**Figure 4-2: Condition Summary by Asset Type – Residential Long-Term Care (Facility Equipment and Information Technology)**



### Residential Long-Term Care

A condition summary for the Residential Long-Term Care assets is provided in **Figure 4-3** by asset type. Condition has been determined primarily by an age-based linear deterioration approach.

**Figure 4-3: Condition Summary by Asset Type – Residential Long-Term Care (Resident Direct Care Equipment)**



## Residential Long-Term Care

Based on Figure 14 in the 2023 Facilities AMP, approximately 96% of the total replacement cost of the facility is attributed to building and site elements that are in good condition and the remaining 4% of the total replacement cost of the facility attributed to building and site elements that are in very poor condition. Further details are included in the 2023 Facilities AMP.

### 4.1.4 Data Sources and Confidence

Asset data for functional capital assets supporting the Rideaucrest Home was provided by City staff in the format of various Excel files. Currently, there is no central repository for this asset data.

Data confidence can be estimated based on the confidence level of various qualifiers and can be presented on a scale from 0% (low) to 100% (high), as shown in **Table 4-3**. The qualifiers chosen for evaluation are specifically targeted for estimating overall confidence of condition reporting within the SOLI.

**Table 4-3: Data Confidence Scale**

Confidence Level	Low	Low/ Moderate	Moderate	Moderate/ High	High
Average of Qualifiers	0% to 19%	20% to 39%	40% to 59%	60% to 79%	80% to 100%

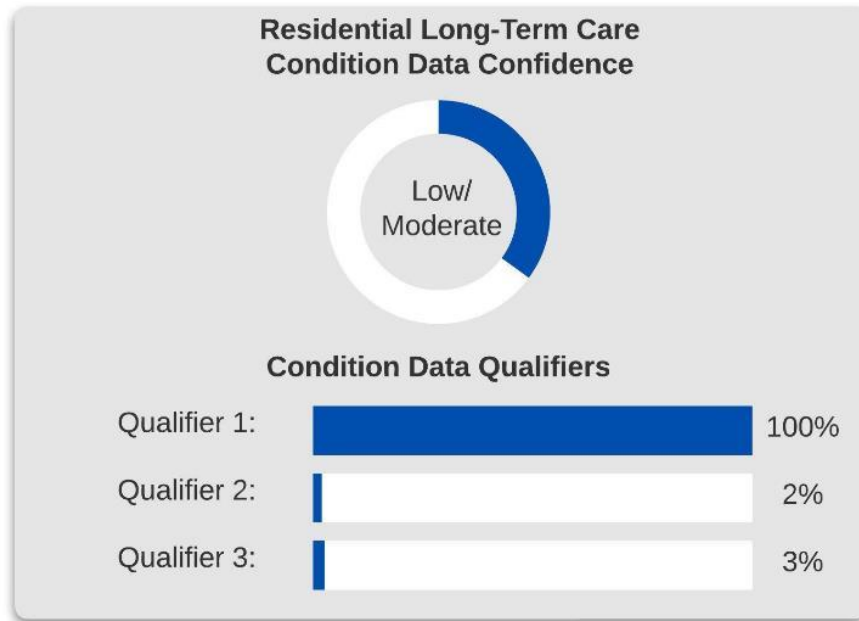
Assuming the data source is reliable, the following qualifiers were considered to estimate data confidence regarding the data utilized in the creation of this SOLI report:

- **Qualifier 1:** The percentage of assets in the asset inventory where construction, installation, or acquisition years are documented (100%);
- **Qualifier 2:** The percentage of assets in the asset inventory that have condition assessment data documented (2%); and

### Residential Long-Term Care

- **Qualifier 3:** The percentage of the estimated overall replacement value, in 2023 dollars, attributed to assets in the asset inventory with documented condition assessment data (i.e., condition is not solely age-based) (3%).

**Figure 4-4: SOLI Report Data Confidence – Residential Long-Term Care**



As summarized in **Figure 4-4**, the overall asset condition data confidence for Residential Long-Term Care assets is estimated to be Low/Moderate. Data confidence can be increased by improving the quality of the data and/or filling in data gaps.

## Residential Long-Term Care

### 4.2 Levels of Service

The City has developed the community and technical Levels of Service (LOS), based on contributions from the municipal staff. It was decided that Capacity and Quality were key attributes in gauging the performance of the assets. **Table 4-4** and **Table 4-5** outline the City’s current community and technical levels of service for Residential Long-Term Care.

**Table 4-4: Community LOS – Residential Long-Term Care**

LOS Parameter	LOS Statement	Performance Measure	Current LOS (2023)
<b>Capacity</b>	Services are available to City residents when required.	Occupancy rate of home	97.27%

**Table 4-5: Technical LOS – Residential Long-Term Care**

LOS Parameter	LOS Statement	Performance Measure	Current LOS (2023)
<b>Quality</b>	Provide care that that meet the residents’ needs.	Percentage of assets that are in poor or better condition.	76%

Residential Long-Term Care

4.3 Risk Assessment

The risk ratings for Residential Long-Term Care assets include Facility Equipment-Appliances, Facility Equipment-Furniture, Information Technology-Telephone Systems, Resident Direct Care Equipment-Appliances, Resident Direct Care Equipment-Patient Lifts, and Resident Direct Care Equipment-Furniture. The risk scores were calculated using the risk methodology and approach outlined in the Introduction document. **Table 4-6** summarizes the risk factors for the Residential Long-Term Care assets.

**Table 4-6: Risk Factors – Residential Long-Term Care**

Factors	Risk Ratings
<b>A - Condition</b>	The condition of the assets was determined either by visual or age-based and can be found in the SOLI section of the AMP.
<b>B - Performance</b>	The performance of the Information Technology asset class was identified as "usually reliable" and assigned a rating of 3 for calculating risk score. Facility Equipment and Resident Direct Care Equipment asset classes was identified as "always reliable" and assigned a rating of 1 for calculating risk score.
<b>C - Climate Change</b>	The climate change of the Information Technology asset class was identified as "moderate" and assigned a rating of 3 for calculating risk score. Facility Equipment and Resident Direct Care Equipment asset classes was identified as "low" and assigned a rating of 1 for calculating risk score.

Residential Long-Term Care

Factors	Risk Ratings
<b>D - Impact</b>	The impact of the Information Technology asset class and Facility Equipment-Appliances, Resident Direct Care Equipment-Appliances, and Resident Direct Care Equipment-Patient Lifts assets was identified as "moderate" impact and assigned a rating of 1 for calculating risk score. Facility Equipment-Furniture and Resident Direct Care Equipment-Furniture was identified as "low" impact and assigned a rating of 0 for calculating risk score.
<b>E - Importance</b>	The importance of the Information Technology asset class was identified as "moderate" importance and assigned a rating of 2 for calculating risk score. Facility Equipment and Resident Direct Care Equipment asset classes was identified as "low" importance and assigned a rating of 1 for calculating risk score.

The individual risk ratings were used in calculating the risk score for each of the assets.

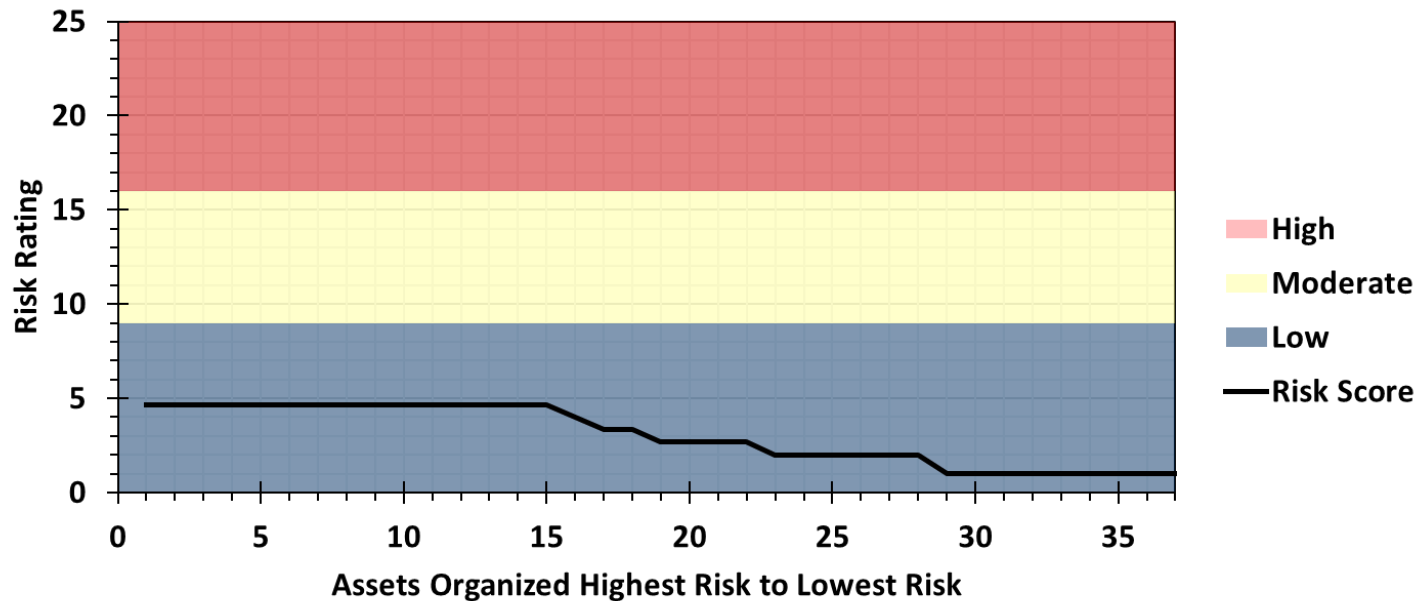


## Residential Long-Term Care

### 4.3.1 Risk Profile

The Risk profile of the Facility Equipment assets is displayed in **Figure 4-5**. All of the 37 Facility Equipment assets tracked within the asset inventory are classified as Low risk.

**Figure 4-5: Risk Profile – Residential Long-Term Care (Facility Equipment)**

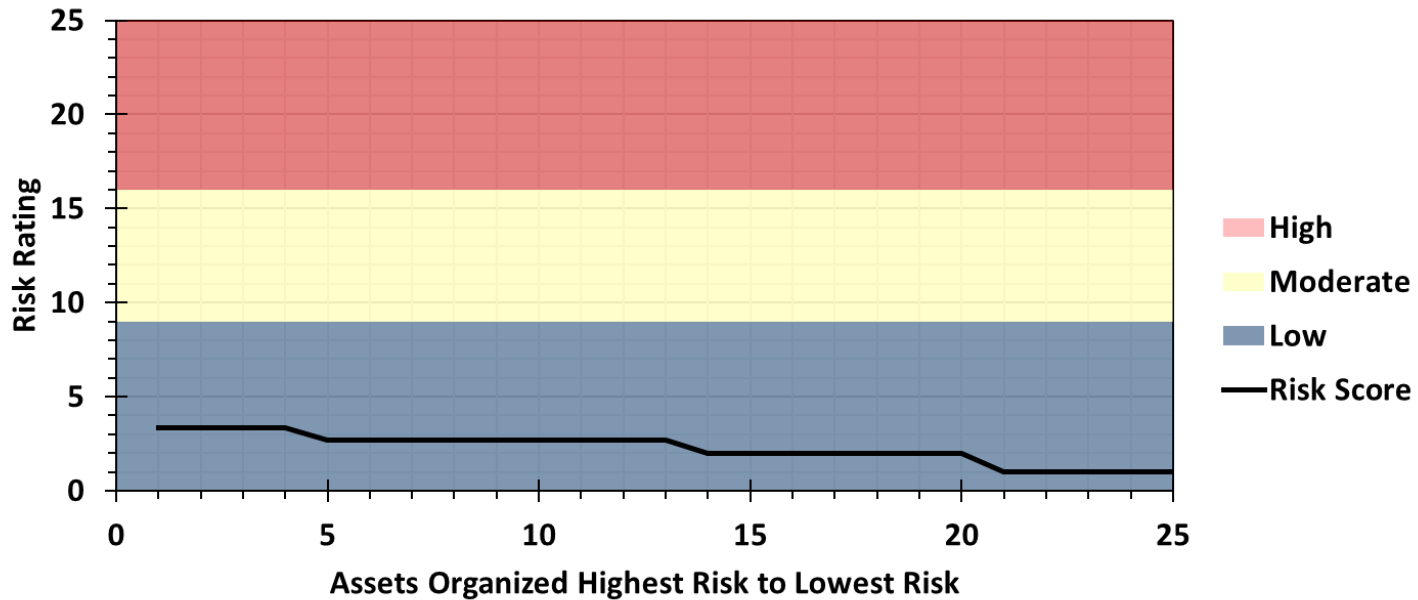


The Risk assessment of the one Information Technology asset is classified as Low risk.

## Residential Long-Term Care

The Risk profile of the Resident Direct Care Equipment assets is displayed in **Figure 4-6**. All of the 25 Resident Direct Care Equipment assets tracked within the asset inventory are classified as Low risk.

**Figure 4-6: Risk Profile – Residential Long-Term Care (Resident Direct Care Equipment)**



## 4.4 Asset Management Strategy

### 4.4.1 Lifecycle Activities – Residential Long-Term Care

The lifecycle activities considered in this AMP include:

- **Non-Infrastructure Solutions:** Actions or policies that can lower costs and extend useful lives.
- **Maintenance Activities:** Regularly scheduled inspection and maintenance, or more significant repair and activities associated with unexpected events.

### Residential Long-Term Care

- **Renewal / Rehabilitation Activities:** Significant repairs designed to extend the life of the asset.
- **Replacement / Construction Activities:** Activities that are expected to occur once an asset has reached the end of its useful life and renewal/rehabilitation is no longer an option.
- **Disposal Activities:** Activities associated with disposing of an asset once it has reached the end of its useful life or is otherwise no longer needed.
- **Expansion / Growth / Service Improvement Activities:** Planned activities required to extend services to previously unserved areas or expand services to meet growth demands.

**Table 4-7** describes the lifecycle activities that can be implemented within the asset management strategy for Residential Long-Term Care assets. The lifecycle activities presented below are existing activities performed by the City, identified during a workshop with City staff in January of 2024.

**Table 4-7: Lifecycle Activities – Residential Long-Term Care**

Lifecycle Type	Description of Activity	Frequency / Timing
Maintenance Activities	Floor & Ceiling Lift Load Testing	Annually
Maintenance Activities	Routine IT System Maintenance & Updates	Ongoing
Maintenance Activities	Preventative Maintenance of Dietary Equipment	As needed
Maintenance Activities	Kingston Fire & Rescue Site Inspection	Annually
Renewal / Rehabilitation Activities	Renewal of Assets in Poor Condition	As able, without compromising resident safety (i.e., bed repair)

### Residential Long-Term Care

Lifecycle Type	Description of Activity	Frequency / Timing
Replacement / Construction Activities	Replacement at End of EUL	End of EUL
Disposal Activities	Metal & Electronic Recycling	As needed
Expansion / Growth / Service Improvement Activities	Trials of new equipment with preferred vendors	As needed
Expansion / Growth / Service Improvement Activities	Renovations led by FMCS (resident bathrooms, dining rooms, serveries, centre lounge areas)	Ongoing

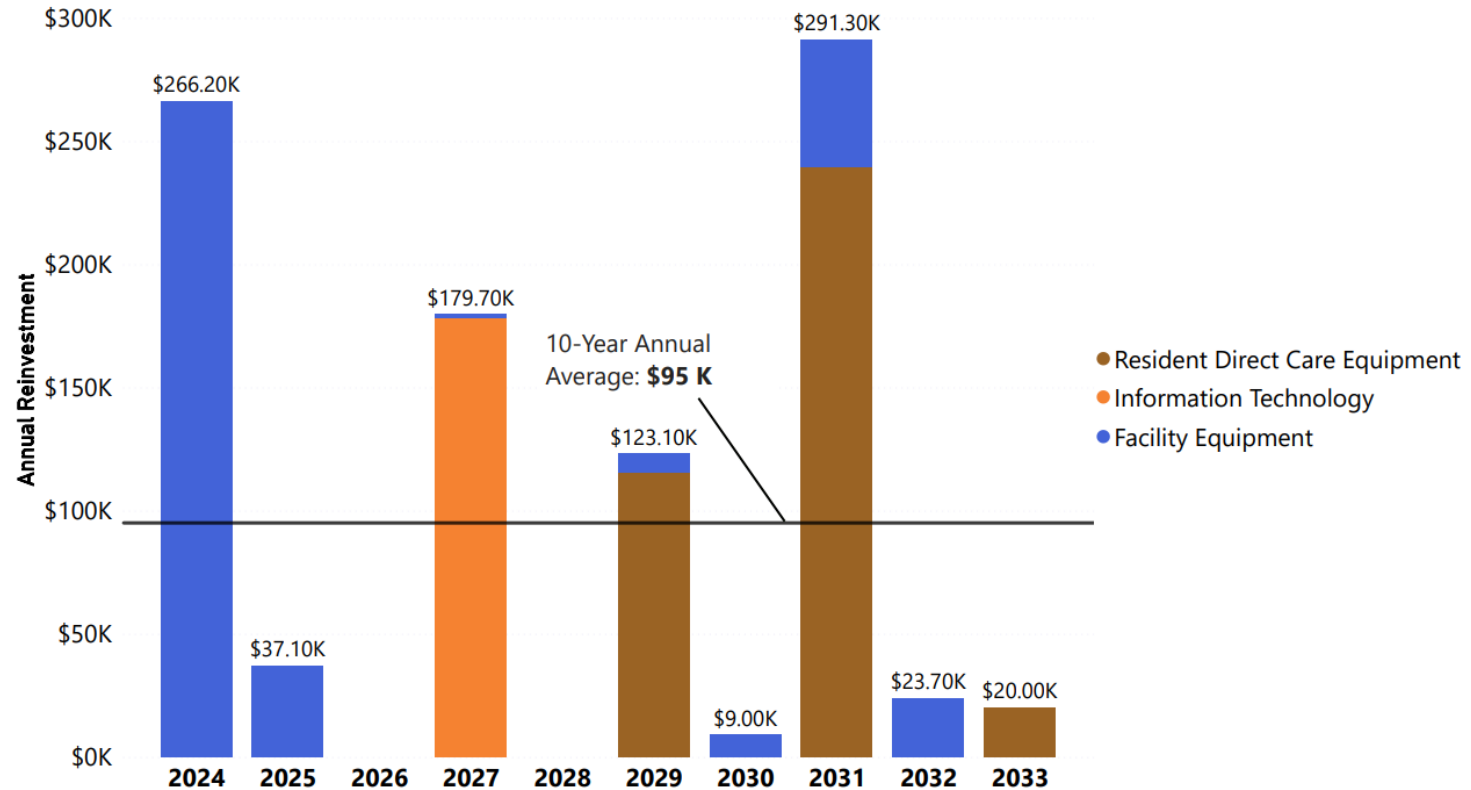
#### 4.4.2 Funding the Lifecycle Activities – Residential Long-Term Care

Lifecycle modeling allows for the City to understand the future reinvestment needs of their existing assets by generating a theoretical asset replacement forecast that considers available asset inventory data. The age, EUL, replacement cost, condition, and risk score of each asset can be leveraged within the lifecycle model to proactively plan for reinvestment over a period of interest. Asset replacement forecasts within this subsection estimate the required reinvestment for Residential Long-Term Care assets over the next 10 years based on available asset inventory data.

There is a total of approximately **\$950.0 thousand** to be reinvested into the Residential Long-Term Care assets owned by the City in the next 10 years. This translates to a 10-year annual average of approximately **\$95.0 thousand**, as presented in **Figure 4-7**.

### Residential Long-Term Care

Figure 4-7: 10-Year Capital Reinvestment Needs - Residential Long-Term Care

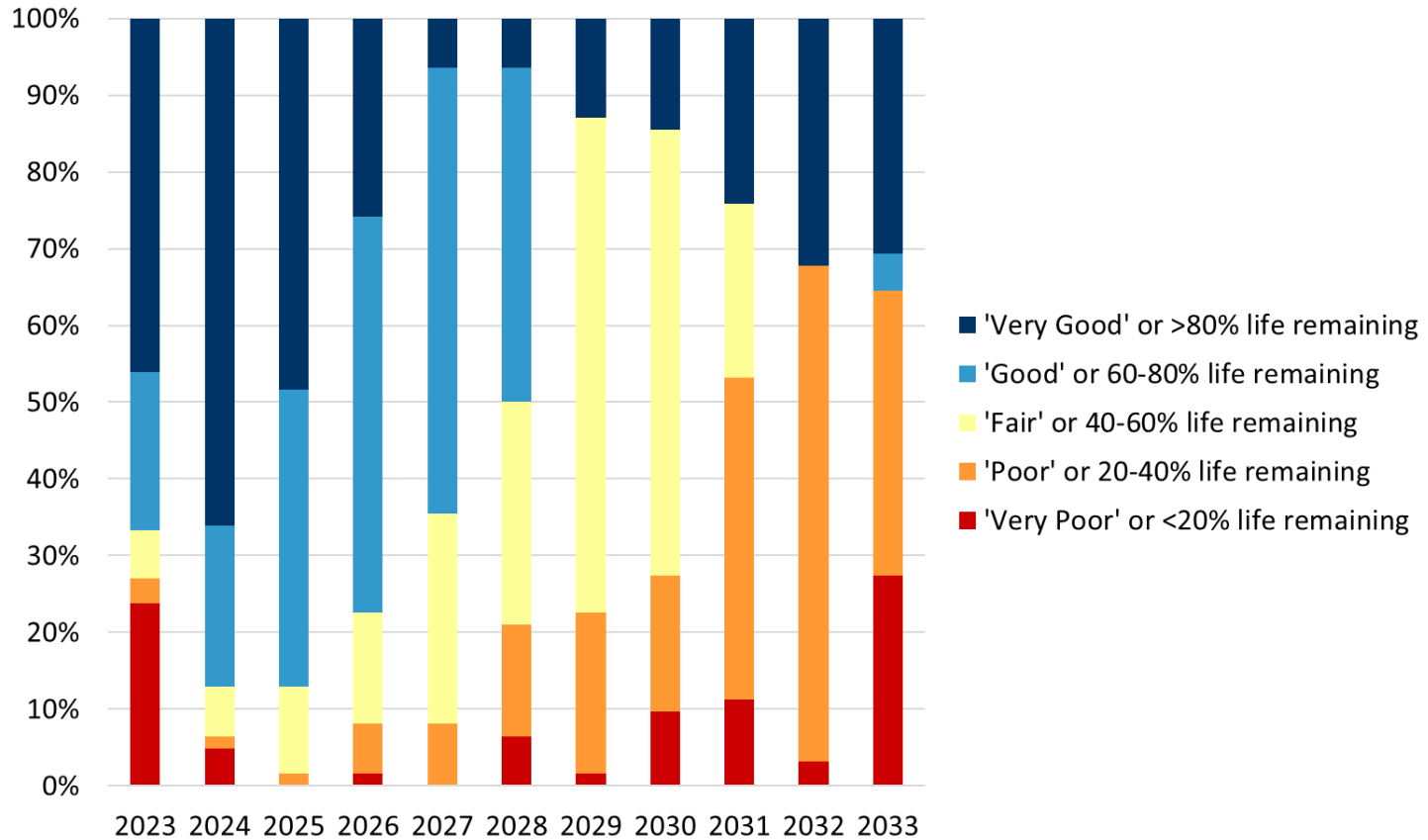


It is important to note that forecasting in this lifecycle model relies heavily on age and EUL to determine renewal or replacement needs and that tracking of condition data for residential long-term care assets by the City will assist at refining forecasted expenditures in the decades to come. The LOS includes maintaining assets in poor or better condition (76%). From the lifecycle model, the percentage of Residential Long-Term Care assets in poor or better condition fluctuates throughout the next 10-years, reaching a high of 100% in 2025 and 2027 and eventually finishing at 73% in 2033.

### Residential Long-Term Care

**Figure 4-8** shows an overview of the condition of Residential Long-Term Care over the next 10 years based on the lifecycle model.

**Figure 4-8: Condition Overview by Year Based on Lifecycle Model – Residential Long-Term Care**





## 5.0 Indoor Recreation & Marinas

The City's Indoor Recreation & Marinas Service manages and oversees the operation and maintenance of Aquatics – Pool & Equipment, Arenas & Equipment, Boat Launches, Crawford Wharf, Fitness Centre & Equipment, and Marina assets. The following section of the AMP includes assets that support Indoor Recreation & Marina services.

**Note on Scope:** At the time of this AMP, no data was available for Crawford Wharf assets. As a result, the asset class is not included in this AMP. It is recommended that the City further develops an inventory of assets comprising the asset class to be considered in subsequent iterations of this AMP.

## Indoor Recreation & Marinas

### 5.1 State of the Local Infrastructure

#### 5.1.1 Asset Inventory and Valuation

The Indoor Recreation & Marinas service oversees many Aquatics, Marinas, and Outdoor Recreation assets. For inventory purposes, Indoor Recreation & Marinas have been summarized into asset classes and further divided into applicable asset types. The asset classes, asset types, a count of assets therein, and the total replacement cost (in 2023 dollars) are show in **Table 5-1**. The total replacement cost (2023 dollars) is estimated at **\$14.9 million** for the **500 assets** included in the inventory.

**Table 5-1: Inventory Summary by Asset Type – Indoor Recreation & Marinas**

Asset Class	Asset Type	Count	Total Replacement Cost (2023)
Aquatics – Pool & Equipment	Outdoor Aquatics	3	\$90,400
Aquatics – Pool & Equipment	Pool Equipment	38	Unknown
Arenas & Equipment	Ice Rink Equipment	89	\$4,998,000
Arenas & Equipment	Ice Rink Pumps	17	\$337,000
Arenas & Equipment	Outdoor Ice Rinks	9	\$637,900
Boat Launches	Boat Launches	6	Unknown
Fitness Centre & Equipment	Fitness Equipment	122	\$454,900
Marinas	Dock – Steel Floats	170	\$3,430,400
Marinas	Dock – Stone Filled Timber Crib	4	\$3,445,000
Marinas	Dock – Styrofoam Floats	34	\$1,047,700
Marinas	Gangway – Aluminium/Steel	8	\$120,000



Indoor Recreation & Marinas

Asset Class	Asset Type	Count	Total Replacement Cost (2023)
Overall	N/A	500	\$14,561,300

5.1.2 Asset Age Summary

**Table 5-2** summarizes the average age, average condition, expected useful life, and the average remaining useful life of assets pertaining to Indoor Recreation & Marinas. Condition assessments for the Cataraqui and Kinsmen ice plants were completed in 2023. The overall average age of Indoor Recreation and Marinas assets is 22 years, and the average remaining useful life is eight years.

**Table 5-2: Average Age, Average Condition, Expected Useful Life, and Remaining Useful Life - Indoor Recreation & Marinas**

Asset Class	Asset Type	Average Age (Years)	Average Condition Rating	Expected Useful Life (Years)	Average Remaining Useful Life (Years)
Aquatics – Pool & Equipment	Outdoor Aquatics	Unknown	Good	20	14
Aquatics – Pool & Equipment	Pool Equipment	Unknown	Unknown	20	Unknown
Arenas & Equipment	Ice Rink Equipment	14	Fair	10 to 40	10
Arenas & Equipment	Ice Rink Pumps	16	Good	25	16

### Indoor Recreation & Marinas

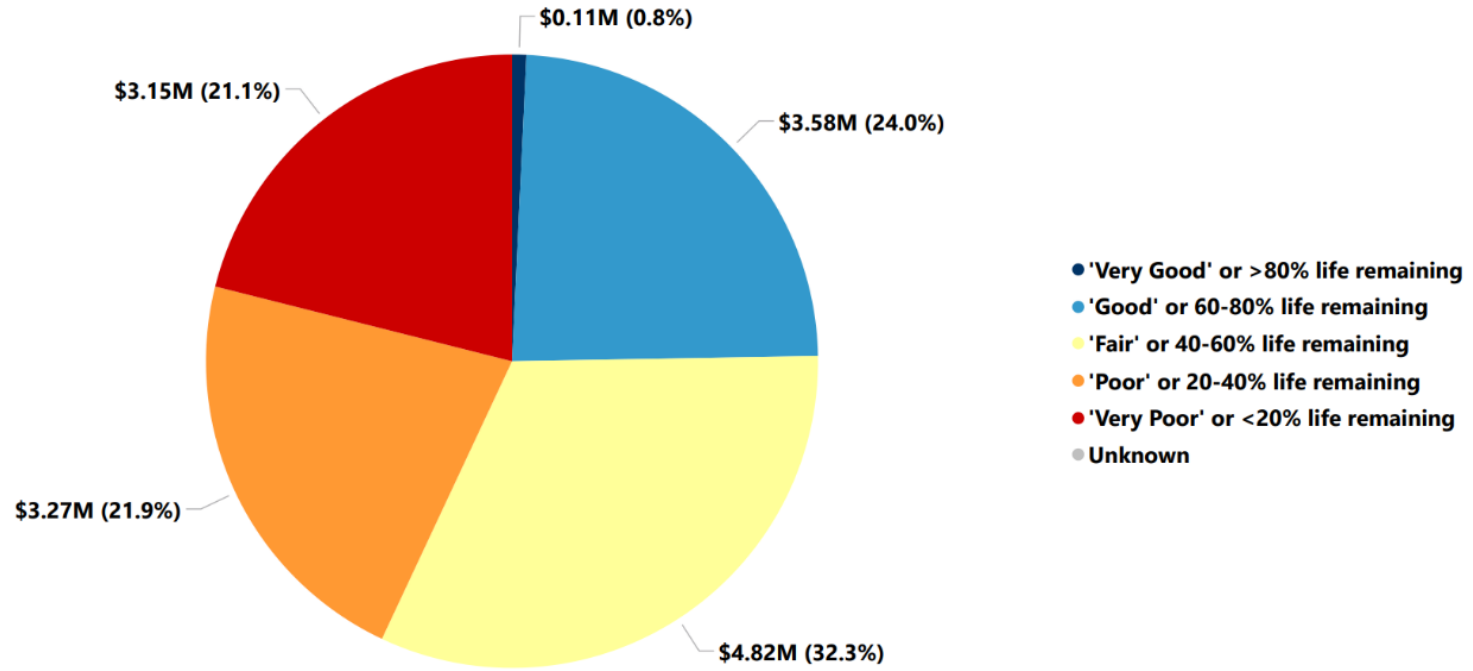
Asset Class	Asset Type	Average Age (Years)	Average Condition Rating	Expected Useful Life (Years)	Average Remaining Useful Life (Years)
Arenas & Equipment	Outdoor Ice Rinks	Unknown	Good	20	13
Boat Launches	Boat Launches	24	Poor	20	5
Fitness Centre & Equipment	Fitness Equipment	11	Good	10 to 15	9
Marinas	Dock – Steel Floats	35	Poor	30	6
Marinas	Dock – Stone Filled Timber Crib	57	Poor	50	15
Marinas	Dock – Styrofoam Floats	14	Very Poor	15	2
Marinas	Gangway – Aluminium/Steel	24	Fair	50	24
<b>Overall</b>	<b>N/A</b>	<b>22</b>	<b>Fair</b>	<b>10 to 50</b>	<b>8</b>

#### 5.1.3 Asset Condition

An overall condition summary for Indoor Recreation & Marinas assets by replacement cost (in 2023 dollars) is shown in **Figure 5-1**. There is approximately 57.1% of the assets that are in very good to fair condition.

Indoor Recreation & Marinas

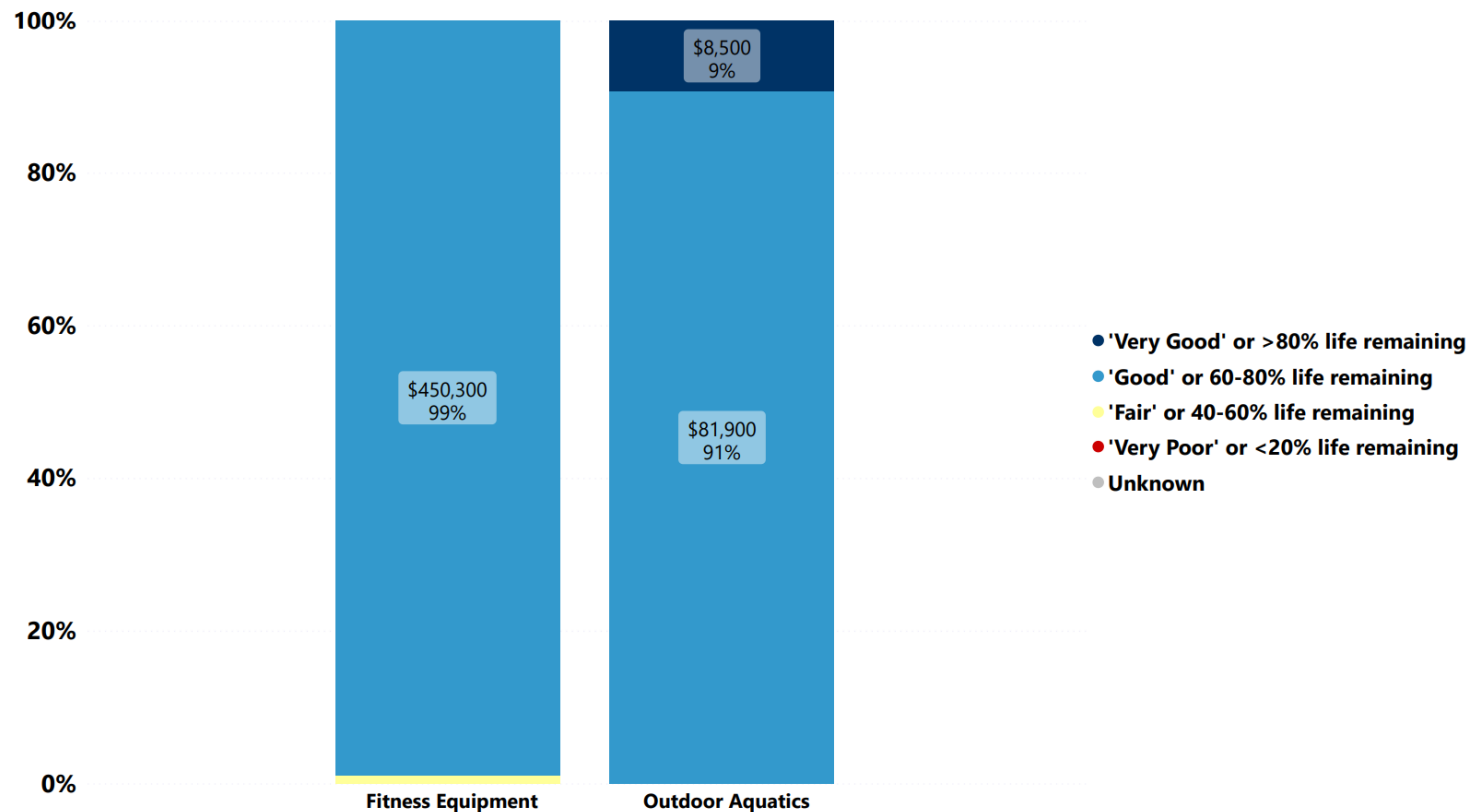
Figure 5-1: Condition Summary and 2023 Replacement Cost – Indoor Recreation & Marinas



### Indoor Recreation & Marinas

A condition summary for Aquatics – Pool & Equipment and Fitness Centre & Equipment assets is provided in **Figure 5-2** by asset type and replacement cost (in 2023 dollars). In the absence of condition assessment data, the condition of Aquatics – Pool & Equipment and Fitness Centre & Equipment assets has been primarily determined based on age and expected useful life. The Pool Equipment assets have been excluded from the figure, due to unknown condition and replacement costs.

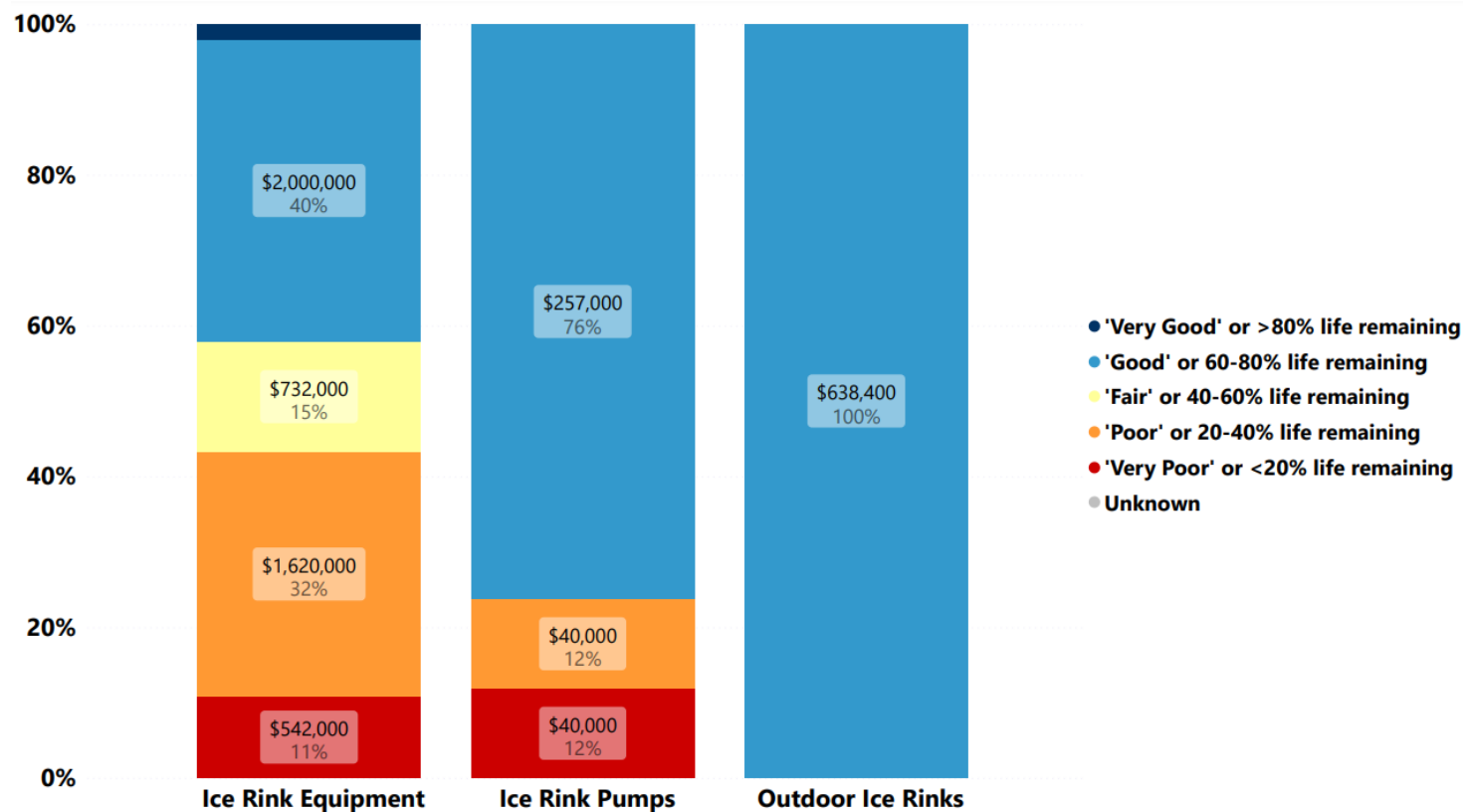
**Figure 5-2: Condition Summary by Asset Type and 2023 Replacement Cost - Indoor Recreation & Marinas (Aquatics – Pool & Equipment and Fitness Centre & Equipment)**



### Indoor Recreation & Marinas

A condition summary for Arenas & Equipment assets is provided in **Figure 5-3** by asset type and replacement cost (in 2023 dollars). In the absence of condition assessment data, the condition of Arenas & Equipment assets has been primarily determined based on age and expected useful life.

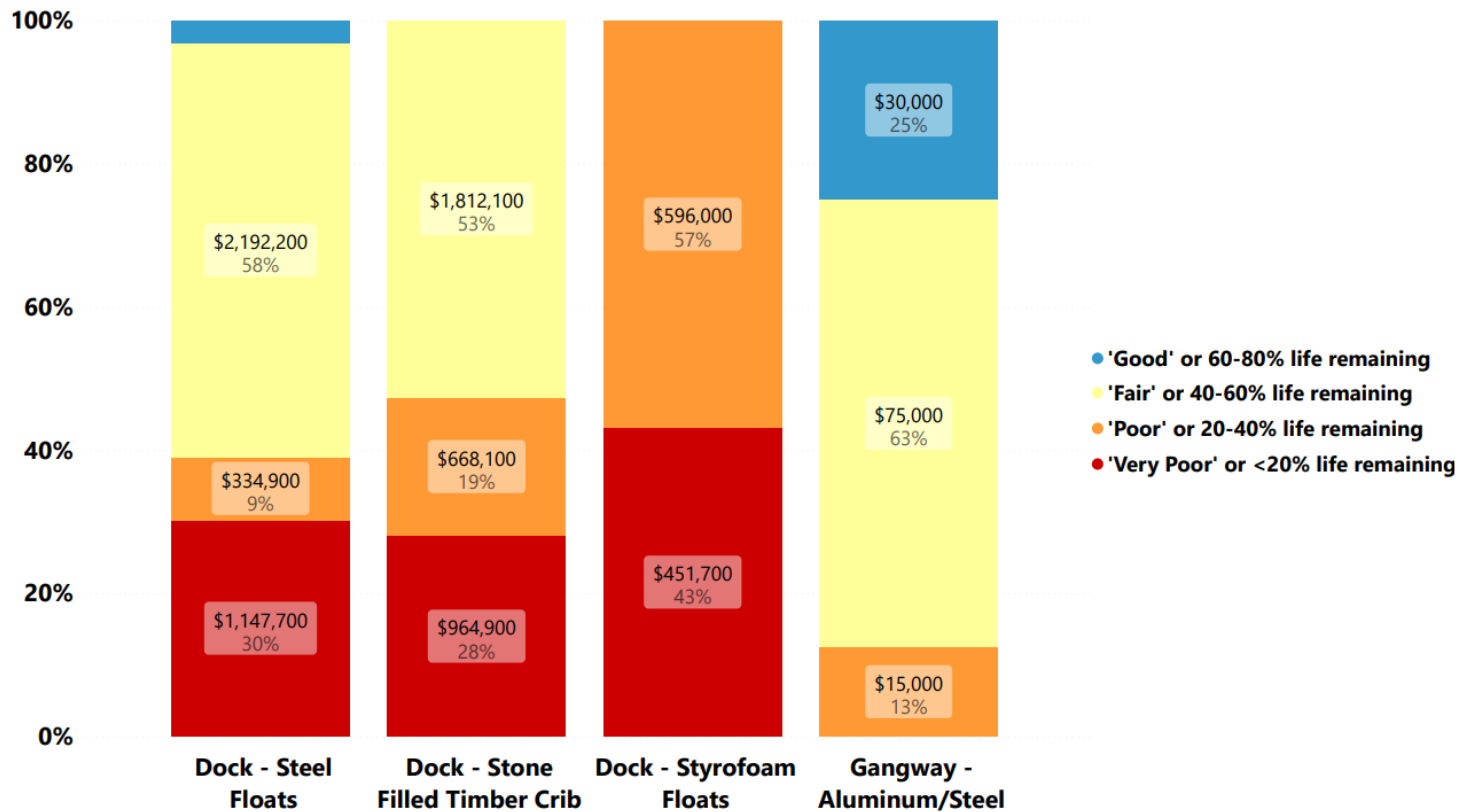
**Figure 5-3: Condition Summary by Asset Type and 2023 Replacement Cost - Indoor Recreation & Marinas (Arenas & Equipment)**



Indoor Recreation & Marinas

A condition summary for Marina assets is provided in **Figure 5-4** by asset type and replacement cost (in 2023 dollars). In the absence of condition assessment data, the condition of Marina assets has been primarily determined based on age and expected useful life.

**Figure 5-4: Condition Summary by Asset Type and 2023 Replacement Cost - Indoor Recreation & Marinas (Marinas)**



## Indoor Recreation & Marinas

### 5.1.4 Data Sources and Confidence

Asset data for assets pertaining to Indoor Recreation & Marinas was provided by City staff in the format of various Excel inventory files. Currently, there is no central repository for the asset data.

Data confidence can be estimated based on the confidence level of various qualifiers and can be presented on a scale from 0% (low) to 100% (high), as shown in **Table 5-3**. The qualifiers chosen for evaluation are specifically targeted for estimating overall confidence of condition reporting within the SOLI.

**Table 5-3: Data Confidence Scale**

Confidence Level	Low	Low/Moderate	Moderate	Moderate/High	High
Average of Qualifiers	0% to 19%	20% to 39%	40% to 59%	60% to 79%	80% to 100%

Assuming the data source is reliable, the following qualifiers were considered to estimate data confidence regarding the data utilized in the creation of this SOLI report:

- **Qualifier 1:** The percentage of assets in the asset inventory where construction, installation, or acquisition years are documented (58%);
- **Qualifier 2:** The percentage of assets in the asset inventory that have condition assessment data documented (90%); and,
- **Qualifier 3:** The percentage of the estimated overall replacement value, in 2023 dollars, attributed to assets in the asset inventory with documented condition assessment data (i.e., condition is not solely age-based) (97%).

## Indoor Recreation & Marinas

Figure 5-5: SOLI Report Data Confidence – Indoor Recreation & Marinas



As summarized in **Figure 5-5**, the overall asset condition data confidence for Indoor Recreation & Marinas assets is estimated to be High.

### 5.2 Levels of Service

In 2021, the City approved the Parks and Recreation Master Plan. The master plan outlines a long-term vision and a strategic implementation approach guided by the City's values, priorities, and needs for enhancing parks and recreation services. Over the next 15 years, the master plan will help managing the development of parks and open spaces, as well as the provision of recreation and leisure services, programs, events, facilities, marinas, and other recreational amenities.



## Indoor Recreation & Marinas

The master plan has since been updated in January 2023 to include an implementation strategy. The master plan has outlined 13 service areas for parks within the City boundaries. A summary of key items that could influence the current LOS are outlined below.

- Current Planning: Plan for future growth through facility renewal and investment, assessing the feasibility to reinvest in aging recreation facilities.
- Prioritization: Prioritize accessibility, security, safety, and sustainability in all new designs.
- Accessibility: All staff must complete training in accessibility, enhanced inclusive services, and American Sign Language interpretation. Development and renovations have been carried out in line with Kingston's Facility Accessibility Design Standards to ensure inclusivity for all residents.
- Service Standards: The current service standard aims to promote health and wellbeing while encouraging an active lifestyle for all residents.

In addition, in 2023 there has been a Marina infrastructure assessment completed for Confederation Basin and plans to complete a similar assessment for Portsmouth Olympic Harbour.

**Table 5-4** and **Table 5-5** outline the City's current community and technical levels of service for Indoor Recreation & Marinas.

## Indoor Recreation & Marinas

**Table 5-4: Community LOS – Indoor Recreation & Marinas**

LOS Parameter	LOS Statement	Performance Measure	Current LOS (2023)
Customer Satisfaction	Marina customers are satisfied with the available marina services, infrastructure condition and can safely enjoy recreational amenities without restriction.	Percentage of marina customers that are satisfied with the service by means of public survey respondents or complaints.	To be determined (note: survey results to be consolidated for 2025 report)

**Table 5-5: Technical LOS - Indoor Recreation & Marinas**

LOS Parameter	LOS Statement	Performance Measure	Current LOS (2023)
<b>Quality</b>	Indoor recreation and marinas assets are kept in good working condition.	Percentage of assets that are in poor or better condition.	72%

### 5.3 Risk Assessment

The risk ratings for Indoor Recreation & Marinas assets included Aquatics – Pool & Equipment, Arenas & Equipment, Boat Launches, Fitness Centre & Equipment, and Marinas asset classes. The risk scores were

## Indoor Recreation & Marinas

calculated using the risk methodology and approach outlined in Section 1.4 of the Introduction. **Table 5-6** summarizes the risk factors for the Indoor Recreation & Marinas assets.

**Table 5-6: Risk Factors - Indoor Recreation & Marinas**

Factors	Risk Ratings
<b>A - Condition</b>	The condition of the assets was determined either by visual or age-based and can be found in the SOLI section of the AMP.
<b>B - Performance</b>	The performance of the Aquatics – Pool & Equipment, Arenas & Equipment, and Fitness Centre & Equipment assets was identified as "always reliable" and assigned a rating of 1 for calculating risk score. The Boat Launches and Marinas assets was identified as "usually reliable" and assigned a rating of 3 for calculating risk score.
<b>C - Climate Change</b>	The Aquatics – Pool & Equipment, Arenas & Equipment, Fitness Centre & Equipment, and Marina assets were identified as a "low" risk and assigned a rating of 1 for calculating the risk score. The Boat Launches assets were identified as "high" risk and assigned a risk rating of 5.
<b>D - Impact</b>	The Aquatics – Pool & Equipment, Arenas & Equipment, Boat Launches, Fitness Centre & Equipment, and Marina assets were recognized as "moderate" impact and assigned a rating of 1 for calculating risk score.
<b>E - Importance</b>	The Aquatics – Pool & Equipment, Arenas & Equipment, and Fitness Centre & Equipment assets were identified as "high" importance and assigned a rating of 3 when calculating risk. Boat Launches and Marinas was identified as "moderate" importance and assigned a rating of 2 when calculating risk.

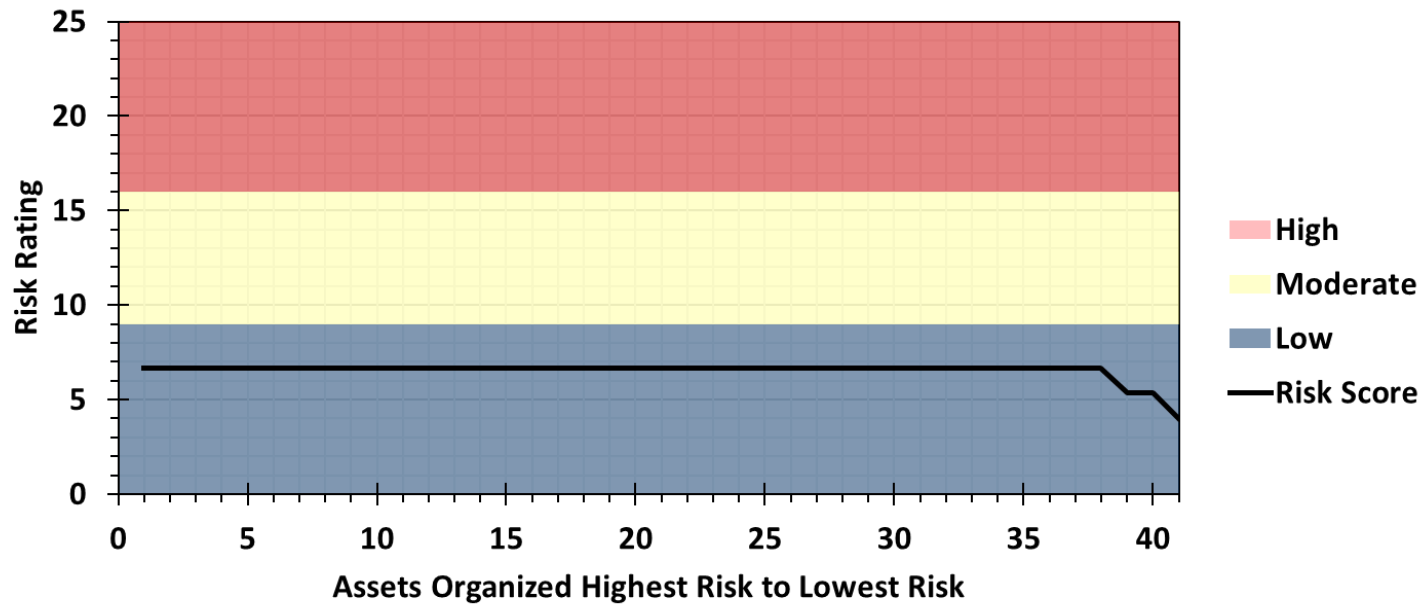
The individual risk ratings were used in calculating the risk score for each of the assets.

## Indoor Recreation & Marinas

### 5.3.1 Risk Profile

The Risk profile of the Aquatics – Pool & Equipment assets is displayed in **Figure 5-6**. All of the 41 assets tracked within the asset inventory are classified as Low risk.

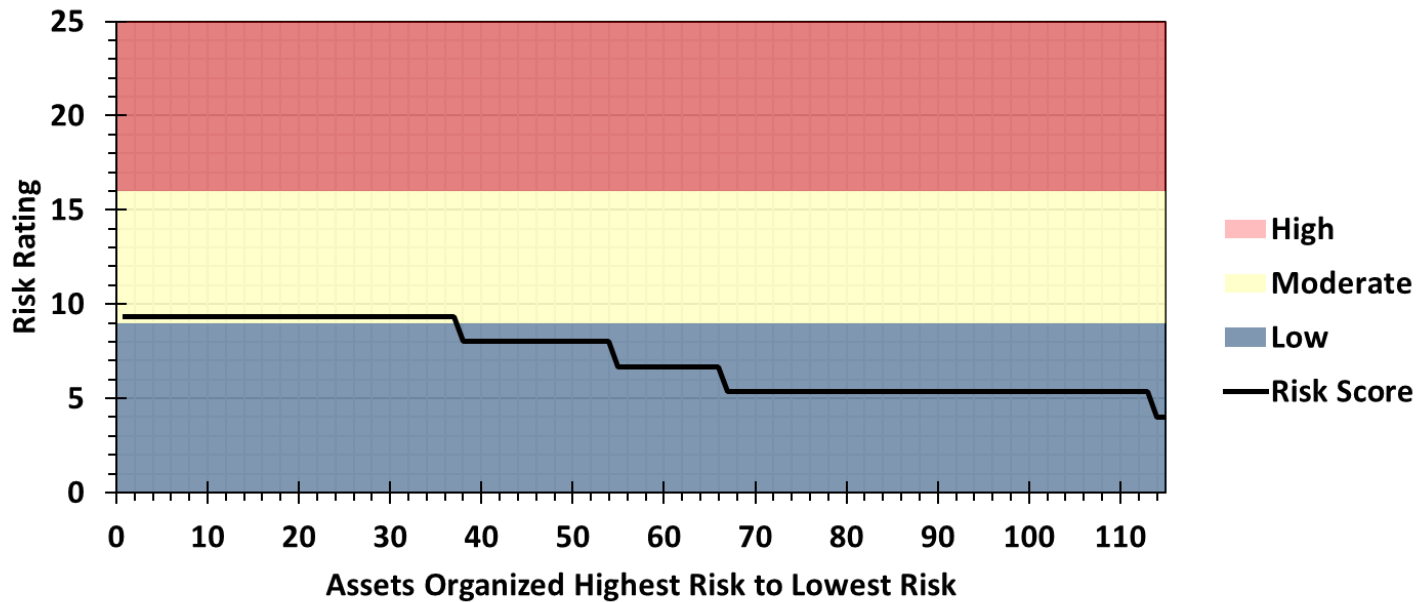
**Figure 5-6: Risk Profile – Indoor Recreation & Marinas (Aquatics – Pool & Equipment)**



### Indoor Recreation & Marinas

The Risk profile of the Arenas & Equipment assets is displayed in **Figure 5-7**. Of the 115 assets tracked within the asset inventory, approximately 32.2% (37) are classified as Moderate risk., the remaining 67.8% (78) assets are classified as low risk.

**Figure 5-7: Risk Profile – Indoor Recreation & Marinas (Arenas & Equipment)**

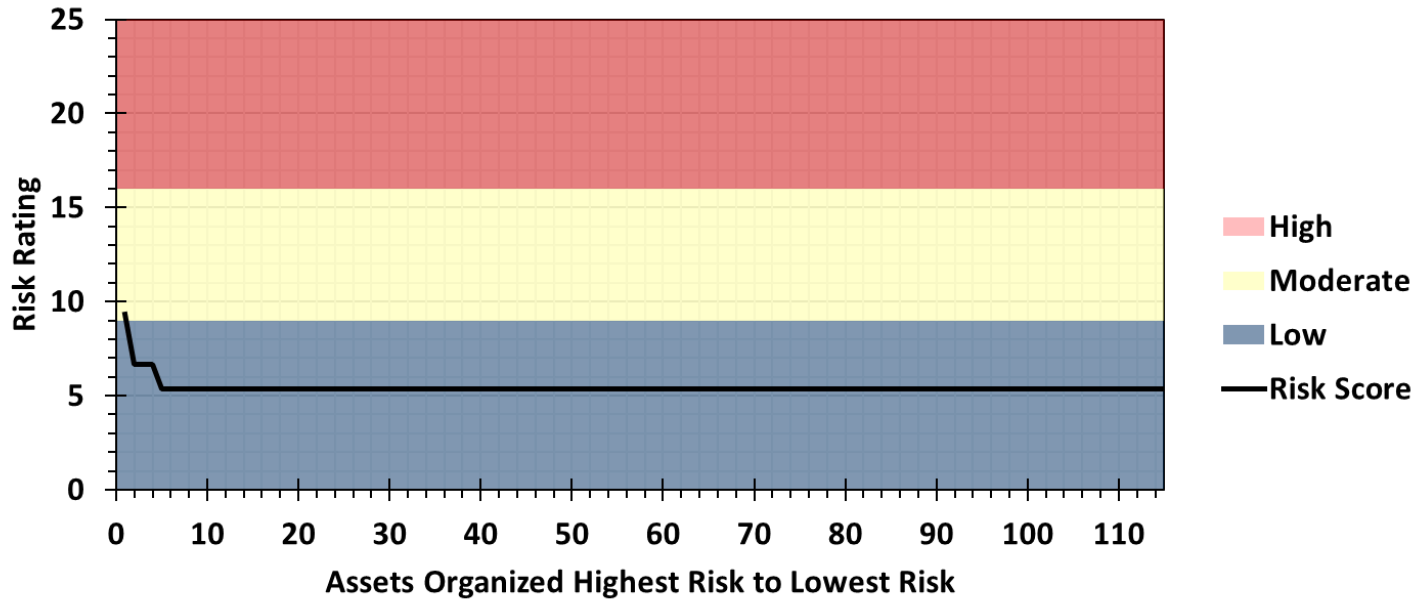


The Risk assessment of the six Boat Launches assets are classified as Moderate risk.

The Risk profile of the Fitness Centre & Equipment assets is displayed in **Figure 5-8**. All of the 122 assets tracked within the asset inventory are classified as Low risk, except for one asset that is classified as Moderate risk.

Indoor Recreation & Marinas

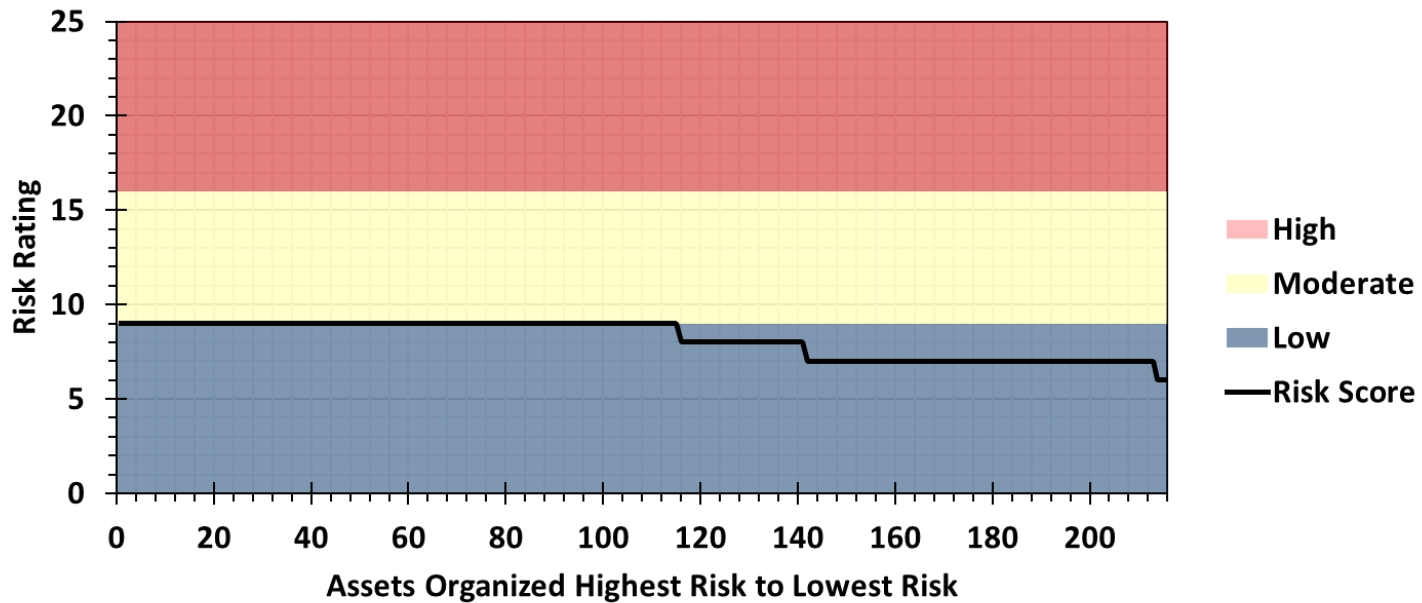
Figure 5-8: Risk Profile – Indoor Recreation & Marinas (Fitness Centre & Equipment)



## Indoor Recreation & Marinas

The Risk profile of the Marina assets is displayed in **Figure 5-9**. All of the 216 assets tracked within the asset inventory are classified as Low risk.

**Figure 5-9: Risk Profile – Indoor Recreation & Marinas (Marinas)**



## 5.4 Asset Management Strategy

### 5.4.1 Lifecycle Activities - Indoor Recreation & Marinas

The lifecycle activities considered in this AMP include:

- **Non-Infrastructure Solutions:** Actions or policies that can lower costs and extend useful lives.
- **Maintenance Activities:** Regularly scheduled inspection and maintenance, or more significant repair and activities associated with unexpected events.

## Indoor Recreation & Marinas

- **Renewal / Rehabilitation Activities:** Significant repairs designed to extend the life of the asset.
- **Replacement / Construction Activities:** Activities that are expected to occur once an asset has reached the end of its useful life and renewal/rehabilitation is no longer an option.
- **Disposal Activities:** Activities associated with disposing of an asset once it has reached the end of its useful life or is otherwise no longer needed.
- **Expansion / Growth / Service Improvement Activities:** Planned activities required to extend services to previously unserved areas or expand services to meet growth demands.

**Table 5-7** describes the lifecycle activities that can be implemented within the asset management strategy for Indoor Recreation & Marinas. The lifecycle activities presented below are existing activities performed by the City, identified during a workshop with City staff in February of 2024.

**Table 5-7: Lifecycle Activities - Indoor Recreation & Marinas**

Lifecycle Type	Description of Activity	Frequency / Timing
Non-Infrastructure Solutions	Parks and Recreation Master Plan	Every 10 years
Non-Infrastructure Solutions	Operating Guidelines – Energy Reduction Strategies	Ongoing
Maintenance Activities	Ice Plant Preventative and Predictive Maintenance Plans	Every 5 to 10 years
Renewal / Rehabilitation Activities	Renewal / rehabilitation of assets	As needed
Replacement / Construction Activities	Marine Infrastructure Capital Replacement Plan	Annually
Replacement / Construction Activities	Ice Plant Capital Asset Replacement Program	Every 15 years



## Indoor Recreation & Marinas

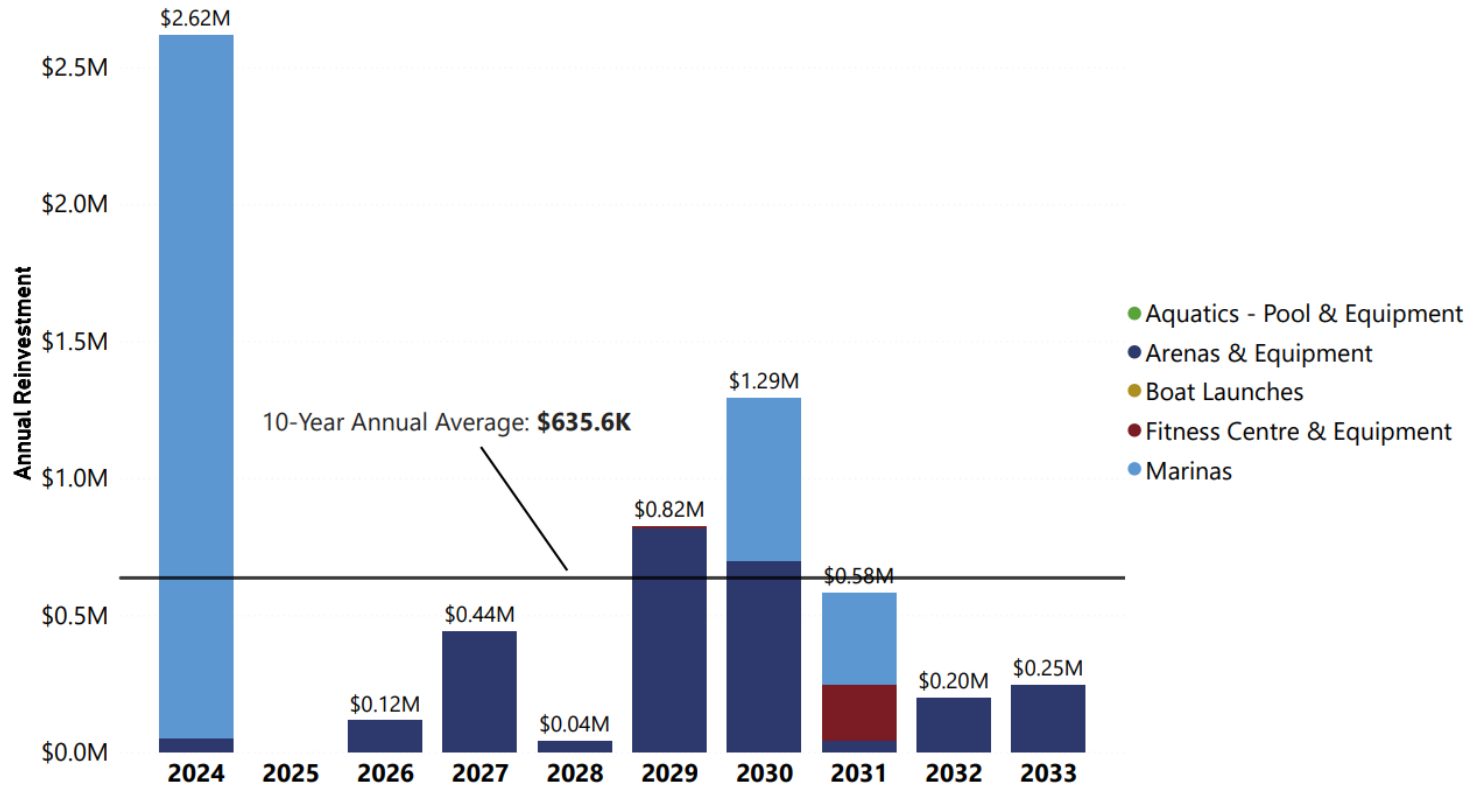
### 5.4.2 Funding the Lifecycle Activities - Indoor Recreation & Marinas

Lifecycle modeling allows for the City to understand the future reinvestment needs of their existing assets by generating a theoretical asset replacement forecast that considers available asset inventory data. The age, EUL, replacement cost, condition, and risk score of each asset can be leveraged within the lifecycle model to proactively plan for reinvestment over a period of interest. Asset replacement forecasts within this subsection estimate the required reinvestment for Indoor Recreation & Marinas assets over the next 10 years based on available asset inventory data.

There is a total of approximately **\$6.35 million** to be reinvested into the Indoor Recreation & Marinas assets owned by the City in the next 10 years. This translates to a 10-year annual average of approximately **\$635.6 thousand**, as presented in **Figure 5-10**. The Marinas docks have a large reinvestment need in 2024, due to six main docks and an extension crib that were assessed in very poor condition in 2022.

Indoor Recreation & Marinas

Figure 5-10: 10-Year Capital Reinvestment Needs - Indoor Recreation & Marinas



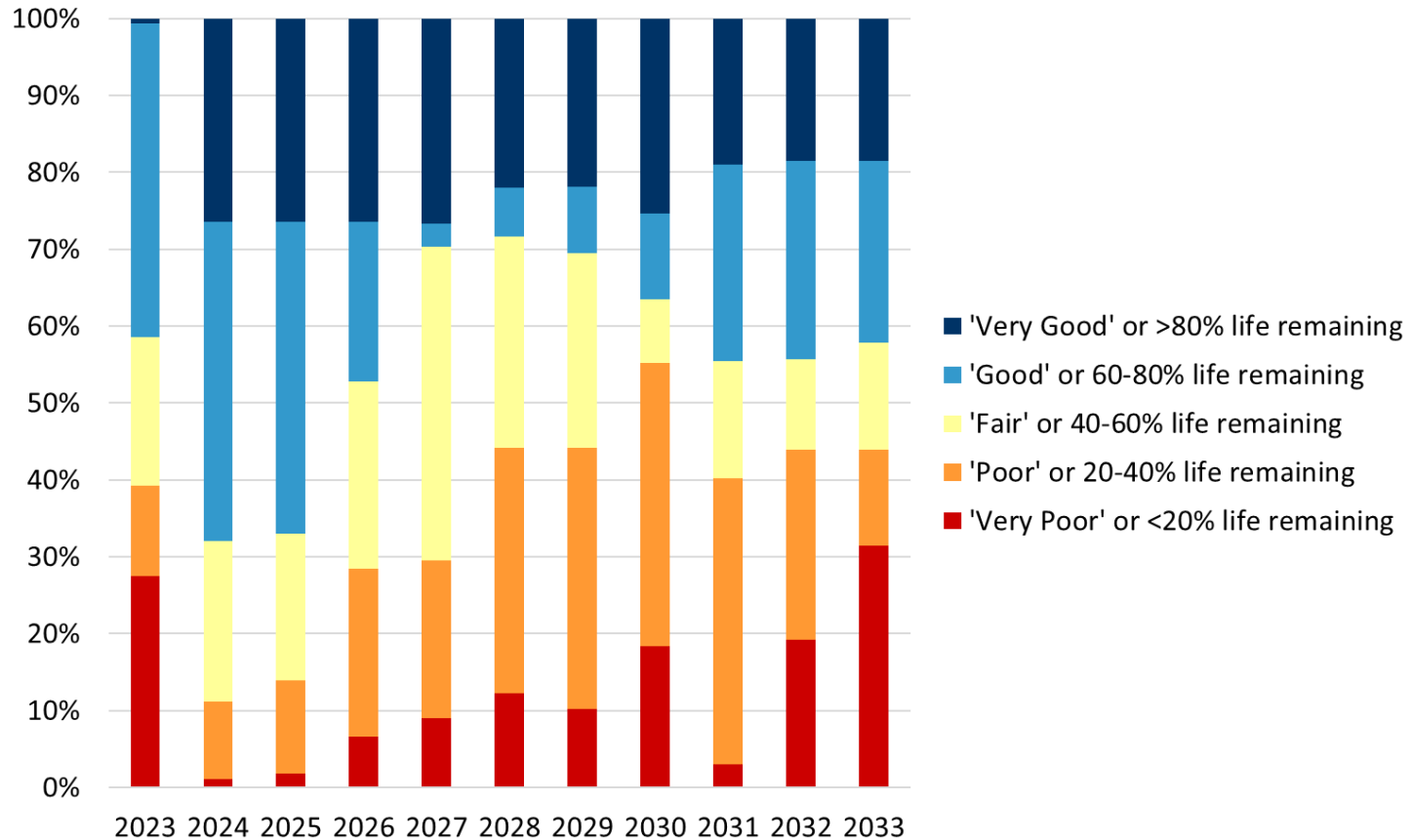
It is important to note that forecasting in this lifecycle model relies heavily on age and EUL to determine renewal or replacement needs and that tracking of condition data for Indoor Recreation & Marinas assets by the City will assist at refining forecasted expenditures in the decades to come.

The LOS includes maintaining assets in poor or better condition (72%). From the lifecycle model, the percentage of Indoor Recreation & Marinas assets in poor or better condition fluctuates throughout the next 10-years, reaching a high of 99% in 2025, eventually finishing at 69% in 2033.

### Indoor Recreation & Marinas

**Figure 5-11** shows a condition overview of the condition of Indoor Recreation & Marinas over the next 10 years based on the lifecycle model.

**Figure 5-11: Condition Overview by Year Based on Lifecycle Model – Indoor Recreation & Marinas**



# City of Kingston 2024 Asset Management Plan

Executive  
Summary and  
Introduction

Volume 1  
Infrastructure,  
Transportation,  
Transit, &  
Emergency  
Services

Volume 2  
Corporate  
Services &  
Parking  
Operations

Volume 3  
Community  
Services

Volume 4  
Parks, Parkland,  
& Trails

Volume 5  
Police, Libraries,  
City Real Estate  
& Environment



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## Appendices (Provided in a Separate Document)

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A – Expected Useful Life

B – Risk Variables

Acronyms

# Acronyms

Acronym	Definition
AODA	<i>Accessibility for Ontarians with Disabilities Act</i>
AMP	Asset Management Plan
BAO	Bereavement Association of Ontario
BCA	Building Condition Assessment
CPI	Consumer Price Index
EUL	Expected Useful Life
GHG	Greenhouse Gas
IS&T	Information Systems & Technology
IT	Information Technology
KM	Kilometre
LOS	Levels of Service
O&M	Operations and Maintenance
PDU	Power Distribution Unit
RUL	Remaining Useful Life
SOLI	State of the Local Infrastructure
UPS	Uninterruptible Power Supply



## 1.0 Overview

The asset management project includes 21 service areas, covering all assets owned by the City of Kingston (City) that are not already included in other Asset Management Plans (AMP). This is the first iteration of an AMP for these service areas. Given the extensive range of assets included in the project, the plan is presented in the following six documents:

- Executive Summary and Introduction
- Volume 1: Infrastructure, Transportation, Transit, & Emergency Services
- Volume 2: Corporate Services & Parking Operations
- Volume 3: Community Services
- Volume 4: Parks, Parkland, & Trails
- Volume 5: Police, Libraries, City Real Estate & Environment

## Overview

The Introduction document presents key asset management principles and an overview of how each service area will be presented in its own chapter with the following sections: State of the Local Infrastructure (SOLI); Levels of Service (LOS); Risk Assessment; and Asset Management Strategy. The Introduction also includes a section on Growth and a Roadmap with Next Steps. The following sections are included in the Introduction document:

- Section 1.1 Asset Management
- Section 1.2 Scope of Assets
- Section 1.3 Alignment with Strategic Plan, Policy and Regulation
- Section 1.4 Governance and Relationship to Other Planning Documents
- Section 1.5 Growth
- Section 1.6 Overview of the AMP
  - State of the Local Infrastructure
  - Levels of Service
  - Risk Assessment
  - Asset Management Strategy
- Section 1.7 Roadmap with Next Steps

### 1.1 Scope of Assets in Volume 4

The service areas included in **Volume 4: Parks, Parkland and Trails** are: Parks Linear; Park Amenities; Park Facilities; and Cemeteries. See **Table 1-1** for the respective asset classes for each service area and the relevant chapter.

Overview

Table 1-1: Service Areas included in Parks, Parkland, & Trails

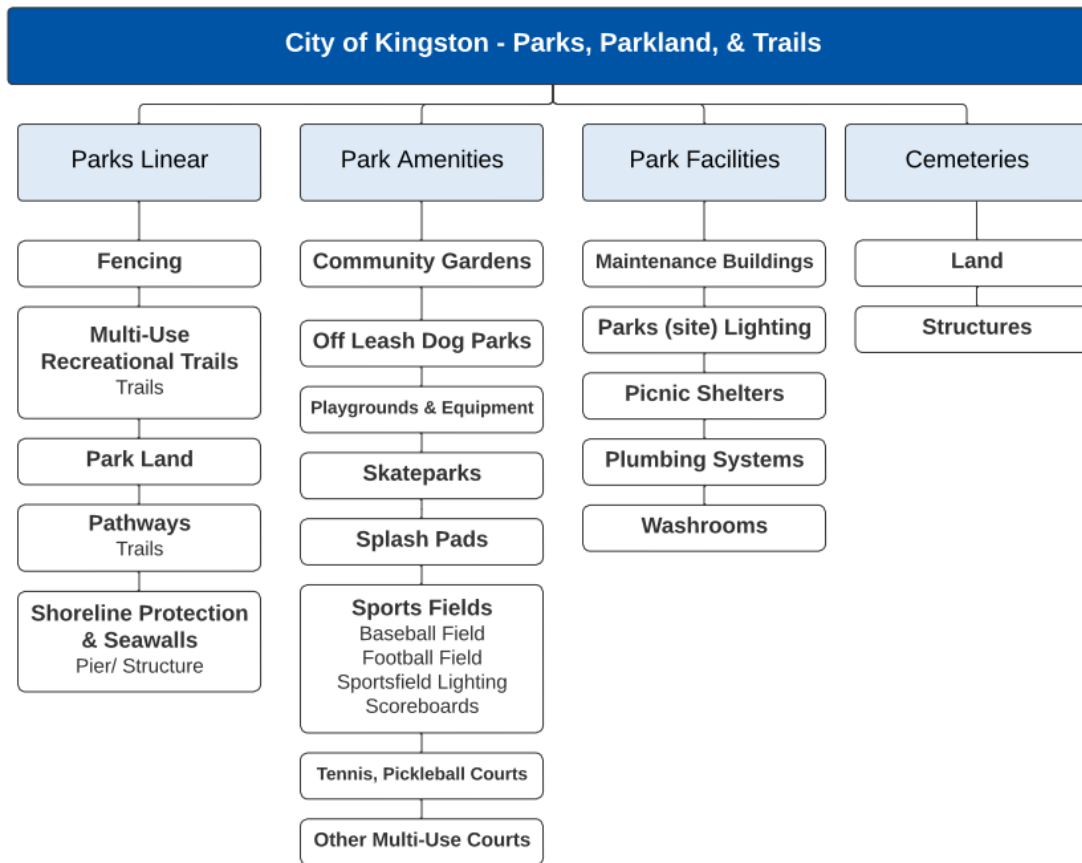
Service Area	Asset Classes	Report Chapter
Parks Linear	<ul style="list-style-type: none"> <li>• Fencing</li> <li>• Multi-Use Recreational Trails</li> <li>• Park Land</li> <li>• Pathways</li> <li>• Shoreline Protection &amp; Seawalls</li> </ul>	Chapter 2.0
Park Amenities	<ul style="list-style-type: none"> <li>• Community Gardens</li> <li>• Off-Leash Dog Parks</li> <li>• Playgrounds &amp; Equipment</li> <li>• Skateparks</li> <li>• Splash Pads</li> <li>• Sports Fields</li> <li>• Tennis, Pickleball Courts</li> <li>• Other Multi-Use Courts</li> </ul>	Chapter 3.0
Park Facilities	<ul style="list-style-type: none"> <li>• Maintenance Buildings</li> <li>• Parks (site) Lighting</li> <li>• Picnic Shelters</li> <li>• Plumbing Systems</li> <li>• Washrooms</li> </ul>	Chapter 4.0
Cemeteries	<ul style="list-style-type: none"> <li>• Land</li> <li>• Structures</li> </ul>	Chapter 5.0

Overview

1.2 Asset Hierarchy

The asset hierarchy that was generated and used for the City’s assets is shown in **Figure 1-1**. The asset group (level 1) is shown in the blue box, the four service areas (level 2) are shown in the light blue boxes, the asset classes are shown in bold (level 3), and where applicable, the asset sub-classes are shown in regular text (level 4).

**Figure 1-1: Asset Hierarchy for Parks, Parkland, & Trails**



## Overview

### 1.3 Asset Inventory and Replacement Costs

An asset inventory was generated for all assets included in this AMP using Microsoft Excel. The inventory organizes assets using the various levels of the asset hierarchy and acts as a central repository for the asset data that can be used to inform asset management planning. It is recommended that the City continually updates the asset information stored within the asset inventory to facilitate asset management planning based on reliable data.

Where replacement costs were provided, the values were inflated based on the Bank of Canada Consumer Price Index (CPI) to estimate the replacement cost in 2023 dollars. If replacement costs were not provided, Dillon leveraged a unit cost model to assign replacement costs based on unit cost estimated for 2023. It is recommended that unit prices should be reviewed annually by the City based on costs observed from local contractors.

### 1.4 Establishing Levels of Service

There were four LOS workshops that were held with staff. The service areas in this volume were covered in Workshop 4.

- Workshop 4 was held on November 27, 2023, and included the stakeholders for Outdoor Recreation & Parks and Shoreline.

There were City staff from each service area that attended the workshop. The list of attendees is summarized in **Table 1-2**.



Overview

**Table 1-2: Workshop Attendees – Community Services**

<b>Service</b>	<b>Name</b>	<b>Role</b>
Parks Linear	Luke Follwell	Director of Engineering
Parks Linear	Neal Unsworth	Manger Parks & Shoreline
Parks Linear	John Piraino	Asset Management Coordinator
Park Amenities	Amy Elgersma	Director of Recreation & Leisure Services
Park Amenities	Troy Stubinski	Operations Manager Public Works
Park Facilities	Amy Elgersma	Director of Recreation & Leisure Services
Park Facilities	Dan Korneluk	Manager of Energy and Asset Management
Cemeteries	Karen Santucci	Director of Public Works & Solid Waste

**1.5 Growth Related Impacts on Lifecycle of Assets**

As the City continues to expand, there are impacts to existing service levels and assets based on these future needs. The growth-related assumptions and potential impact on the lifecycle of the assets is shown in **Table 1-3**.

Overview

Table 1-3: Growth Related Impacts on Lifecycle of Assets

Service Category	Growth Impact Assumptions	How Assumptions Relate to Lifecycle of Assets
Parks Linear	<ul style="list-style-type: none"> <li>• Increase in service demands in operations and maintenance due to increased number of assets</li> </ul>	<ul style="list-style-type: none"> <li>• Potential increase in capital expenditures for the purchase of additional assets to meet service needs</li> </ul>
Park Amenities	<ul style="list-style-type: none"> <li>• Increase needs for service based on demands</li> <li>• Increases to internal capacity (staffing) required to maintain amenities</li> </ul>	<ul style="list-style-type: none"> <li>• Potential increase in capital expenditures for the purchase of additional assets to meet service needs</li> <li>• Potential increased operational costs due to increasing the number of assets</li> </ul>
Park Facilities	<ul style="list-style-type: none"> <li>• Increase in service demands due to increased operating hours, or capacity to meet service needs</li> <li>• Increases to internal capacity (staffing) required to maintain facilities</li> </ul>	<ul style="list-style-type: none"> <li>• Potential increase in capital and maintenance costs for facility services</li> <li>• Potential increase in operational costs to maintain fleet assets</li> </ul>
Cemeteries	<ul style="list-style-type: none"> <li>• Changing service demands based on population growth and demographic</li> </ul>	<ul style="list-style-type: none"> <li>• Potential increase in capital expenditures to acquire new assets or maintain existing cemeteries</li> </ul>



## 2.0 Parks Linear

The City of Kingston's parks infrastructure covers over 606 hectares and plays a critical role in contributing to several key objectives in the City's 2023-2026 Strategic Plan. The Parks Linear assets provide services to all community members and visitors to allow for an enjoyable experience exploring the City of Kingston. The City manages the maintenance and operation of a network of Fencing, Multi-Use Recreational Trails, Park Land, Pathways, and Shoreline Protection & Seawalls.

The City's investment in operating and maintaining these assets helps to support families and improve community health and physical activity levels while enhancing the overall quality of life of Kingston's residents and visitors.

The following section of the AMP includes assets that are under the Parks Linear service.

**Note on Scope:** At the time of this AMP no data was available for the Fencing asset class, and as a result, the asset class is not included in this AMP. It is recommended that the City further develops an inventory of these asset classes to be considered in subsequent iterations of this AMP.

Parks Linear

2.1 State of the Local Infrastructure

2.1.1 Asset Inventory and Valuation

For inventory purposes, the Parks Linear asset classes have been further divided into applicable asset types. It should be noted that a distinction has been made between Multi-Use Recreation Trails and Pathways. Multi-Use Recreational Trails are designed to accommodate a variety of activities such as walking, running, and cycling. Pathways are generally designed for pedestrian use, including walking and jogging. **Table 2-1** summarizes the asset inventory for Parks Linear by asset class, asset type, asset count, and total replacement cost (in 2023 dollars). The total replacement cost (2023 dollars) is estimated at **\$232.4 million** for the **623 assets** included in the inventory.

**Table 2-1: Inventory Summary by Asset Type – Parks Linear**

Asset Class	Asset Type	Asset Count	Quantity	Total Replacement Cost (2023)
Multi-Use Recreational Trails	Trail – Asphalt	3	6.23 km	\$4,736,000
Multi-Use Recreational Trails	Trail – Concrete	2	0.82 km	\$621,700
Multi-Use Recreational Trails	Trail – General	3	0.80 km	\$456,200
Multi-Use Recreational Trails	Trail – Granular	11	31.76 km	\$12,069,100
Park Land	Parkland & Open Space	214	521.22 ha	\$187,546,600
Pathways	Trail – Asphalt	206	24.70 km	\$18,773,200
Pathways	Trail – Brick	3	0.36 km	\$71,400
Pathways	Trail – Concrete	34	1.73 km	\$1,317,500

**Parks Linear**

<b>Asset Class</b>	<b>Asset Type</b>	<b>Asset Count</b>	<b>Quantity</b>	<b>Total Replacement Cost (2023)</b>
Pathways	Trail – General	67	7.59 km	\$4,325,600
Pathways	Trail – Granular	38	6.58 km	\$2,498,500
Shoreline Protection & Seawalls	Pier/ Structure	42	N/A	Unknown
<b>Overall</b>	<b>Not Applicable (N/A)</b>	<b>623</b>	<b>N/A</b>	<b>\$232,415,800</b>

**2.1.2 Asset Age Summary**

**Table 2-2** summarizes the average age, the average condition, the expected useful life, and the average remaining useful life of assets pertaining to the Parks Linear service category. The overall average age of Parks Linear assets is 34 years, and the average remaining useful life is five years.

**Table 2-2: Average Age, Average Condition, Expected Useful Life, and Average Remaining Useful Life – Parks Linear**

<b>Asset Class</b>	<b>Asset Type</b>	<b>Average Age (Years)</b>	<b>Average Condition Grade</b>	<b>Expected Useful Life (Years)</b>	<b>Average Remaining Useful Life (Years)</b>
Multi-Use Recreational Trails	Trail – Asphalt	15	Poor	25	10
Multi-Use Recreational Trails	Trail – Concrete	8	Very Good	50	42

Parks Linear

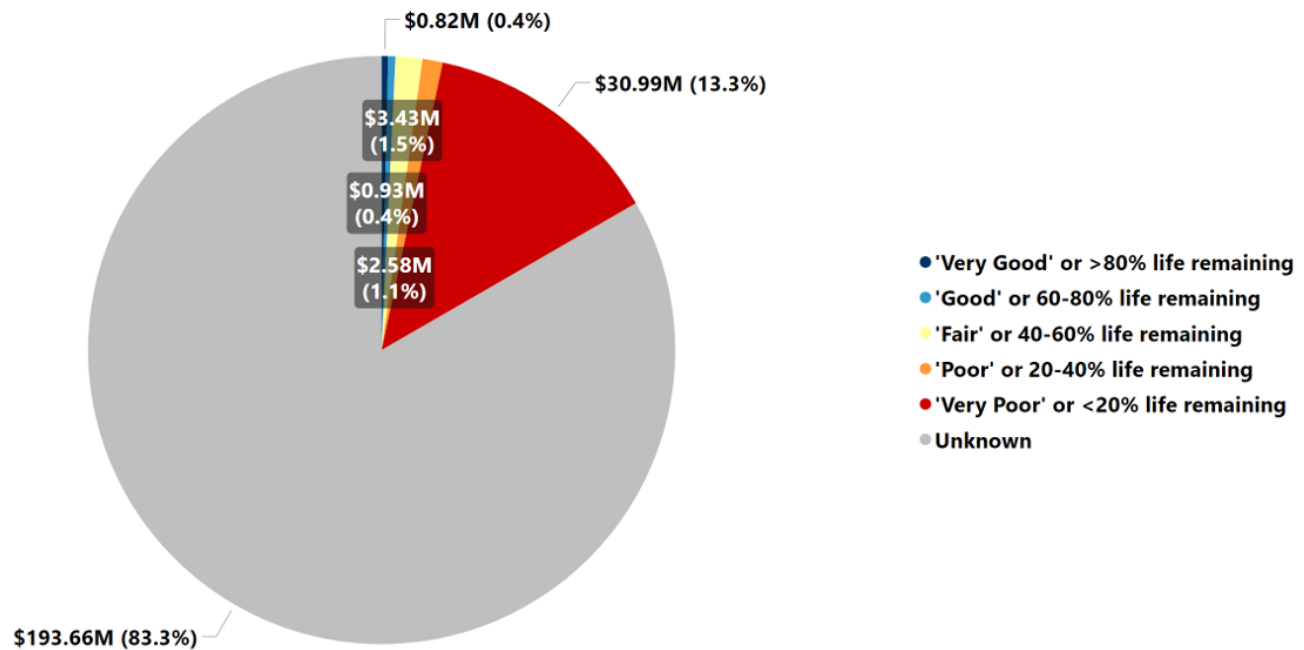
Asset Class	Asset Type	Average Age (Years)	Average Condition Grade	Expected Useful Life (Years)	Average Remaining Useful Life (Years)
Multi-Use Recreational Trails	Trail – General	35	Poor	20	4
Multi-Use Recreational Trails	Trail – Granular	26	Very Poor	20	0
Park Land	Parkland & Open Space	Unknown	Unknown	200	Unknown
Pathways	Trail – Asphalt	36	Poor	25	5
Pathways	Trail – Brick	36	Very Poor	30	0
Pathways	Trail – Concrete	45	Fair	50	17
Pathways	Trail – General	29	Very Poor	20	1
Pathways	Trail – Granular	25	Very Poor	20	2
Shoreline Protection & Seawalls	Pier/ Structure	Unknown	Unknown	20	Unknown
<b>Overall</b>	<b>N/A</b>	<b>34</b>	<b>Poor</b>	<b>20 to 200</b>	<b>5</b>

Parks Linear

2.1.3 Asset Condition

The overall condition summary for Parks Linear assets by replacement cost (in 2023 dollars) is shown in **Figure 2-1**. Due to existing data gaps at the time of preparing the AMP, the condition of Park Land and Shoreline Protection & Seawalls is currently unknown. It is recommended that a condition assessment is completed for Park Land and Shoreline Protection & Seawalls assets.

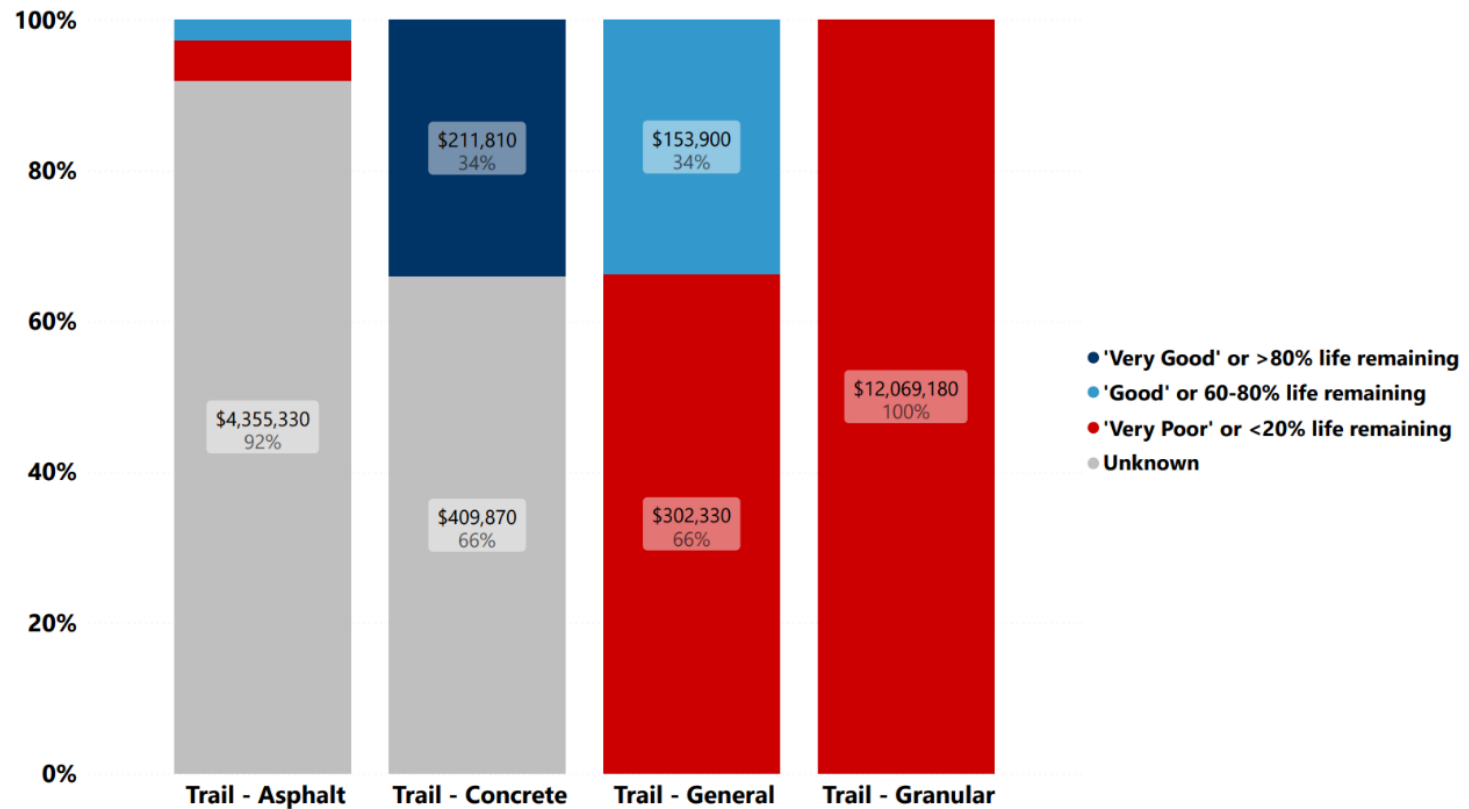
**Figure 2-1: Condition Summary by 2023 Replacement Cost – Parks Linear**



### Parks Linear

A condition summary for the Multi-Use Recreational Trails assets is provided in **Figure 2-2** by asset type and replacement cost (in 2023 dollars). In the absence of condition assessment data, the condition of the Multi-Use Recreational Trails assets has been determined based on age and expected useful life.

**Figure 2-2: Condition Summary by Asset Type and 2023 Replacement Cost – Parks Linear (Multi-Use Recreational Trails)**

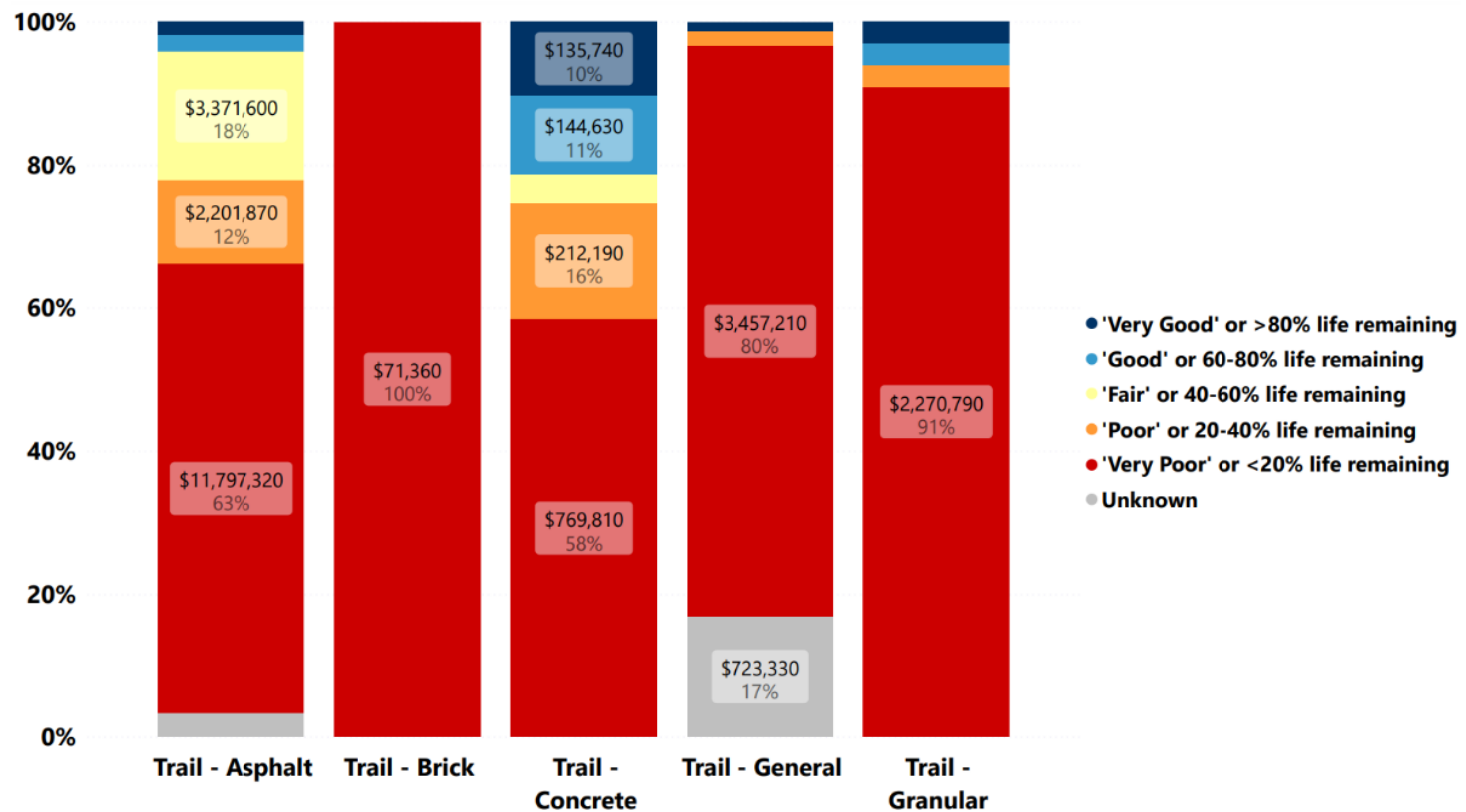




**Parks Linear**

A condition summary for the Pathways assets is provided in **Figure 2-3** by asset type and replacement cost (in 2023 dollars). In the absence of condition assessment data, the condition of the Pathways assets has been determined based on age and expected useful life.

**Figure 2-3: Condition Summary by Asset Type and 2023 Replacement Cost – Parks Linear (Pathways)**



**Parks Linear**

**2.1.4 Data Sources and Confidence**

Asset data for Parks Linear assets is maintained by the City within ArcGIS, a web-based geographical mapping solution, and the Cartegraph asset management software which served as the data source for this AMP.

Data confidence can be estimated based on the confidence level of various qualifiers and can be presented on a scale from 0% (low) to 100% (high), as shown in **Table 2-3**. The qualifiers chosen for evaluation are specifically targeted for estimating overall confidence of condition reporting within the SOLI.

**Table 2-3: Data Confidence Scale**

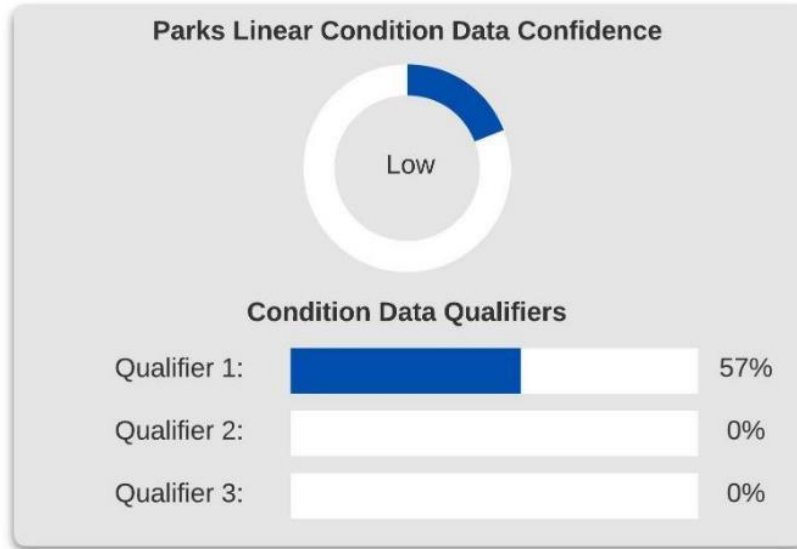
<b>Confidence Level</b>	<b>Low</b>	<b>Low/ Moderate</b>	<b>Moderate</b>	<b>Moderate/ High</b>	<b>High</b>
Average of Qualifiers	0% to 19%	20% to 39%	40% to 59%	60% to 79%	80% to 100%

Assuming the data source is reliable, the following qualifiers were considered to estimate data confidence regarding the data utilized in the creation of this SOLI report:

- **Qualifier 1:** The percentage of assets in the asset inventory where construction, installation, or acquisition years are documented (57%);
- **Qualifier 2:** The percentage of assets in the asset inventory that have condition assessment data documented (0%); and,
- **Qualifier 3:** The percentage of the estimated overall replacement value, in 2023 dollars, attributed to assets in the asset inventory with documented condition assessment data (i.e., condition is not solely age-based) (0%).

## Parks Linear

Figure 2-4: SOLI Report Data Confidence – Parks Linear



As summarized in **Figure 2-4**, the overall asset condition data confidence for Parks Linear assets is estimated as Low. Presently, all asset conditions for Parks Linear assets are age-based and there are many assets where age is currently unknown. Data confidence can be increased by improving the documentation of the asset data (i.e., addressing data gaps such as missing installation years and replacement costing) and/or by formalizing a condition assessment program to assess the current conditions of this infrastructure.

## 2.2 Levels of Service

In 2021, the City approved its Parks and Recreation Master Plan. This plan outlines a long-term vision and a strategic implementation approach guided by the City's values, priorities, and needs for enhancing parks and recreation services. Over the next 15 years, the master plan will help manage the development of parks and open spaces, as well as the provision of recreation and leisure services, programs, events, facilities, marinas, and other recreational amenities.

## Parks Linear

The plan was updated in January 2023 to include an implementation strategy. The plan outlines 13 service areas for parks within the City boundaries. A summary of the key items that will influence the current LOS are outlined below.

- Current Planning: Parkland is planned on 13 park service areas. The areas are used to help prioritize parkland service distribution across the City.
- Prioritization: Service areas with lower parkland service levels should be prioritized for new parkland to ensure equitable distribution.
- Urban Accessibility: In urban areas, parkland should be within an 800-meter (10-minute walk) distance from residential areas to maximize accessibility.
- Service Standards: The current service standard for active parkland is 3.5 hectares of usable parkland per 1,000 residents, with an overall parkland service level of 5.1 hectares per 1,000 residents, including natural lands.

**Table 2-4** and **Table 2-5** outline the City’s current community and technical levels of service for Parks Linear assets.

**Table 2-4: Community LOS – Parks Linear**

LOS Parameter	LOS Statement	Performance Measure	Current LOS (2023)
Quality	Trails, parkland, and structures assets are kept in a good state of repair.	Percentage of assets that are meeting condition performance objectives.	34%

Parks Linear

Table 2-5: Technical LOS - Parks Linear

LOS Parameter	LOS Statement	Performance Measure	Current LOS (2023)
Capacity	Adequate and sufficient parkland is provided for end-users.	Total hectares of useable parkland per 1,000 residents	3.5

2.3 Risk Assessment

The risk ratings for Parks Linear assets included Multi-Use Recreational Trails, Park Land, Pathway, and Shoreline Protection & Seawalls. The risk scores were calculated using the risk methodology and approach outlined in the Introduction materials which were provided under a separate document. **Table 2-6** summarizes the risk factors for the Parks Linear assets.

Table 2-6: Risk Factors – Parks Linear

Factors	Risk Ratings
A - Condition	The condition of the assets was determined either by visual or age-based and can be found in the SOLI section of the AMP.
B - Performance	The performance of Multi-Use Recreational Trails, Park Land, and Pathway assets was identified as being “always reliable” and assigned a rating of 1 for calculating risk score. Shoreline Protection & Seawall assets was identified as being “usually reliable” and assigned a rating of 3 for calculating risk score.

**Parks Linear**

Factors	Risk Ratings
<b>C - Climate Change</b>	The climate change ratings were determined at the asset class level by identifying climate change hazard interactions. The Multi-Use Recreational Trails and Pathways assets were identified as a “low” risk and assigned a rating of 1 for calculating the risk score. The Park Land and Shoreline Protection & Seawall assets were identified as a “high” risk and assigned a rating of 5 for calculating the risk score.
<b>D - Impact</b>	The impact of the Shoreline Protection & Seawall assets was identified as "moderate" impact and assigned a rating of 1 for calculating risk score. The Multi-Use Recreational Trails, Park Land, and Pathway assets was identified as having “low” impact and assigned a rating of 0 for calculating risk score.
<b>E - Importance</b>	The Shoreline Protection & Seawall asset class was identified as “moderate” importance and assigned a rating of 2 when calculating risk. A “high” importance rating was applied to the Multi-Use Recreational Trails, Park Land, and Pathway assets and a rating of 3 was assigned for calculating risk score.

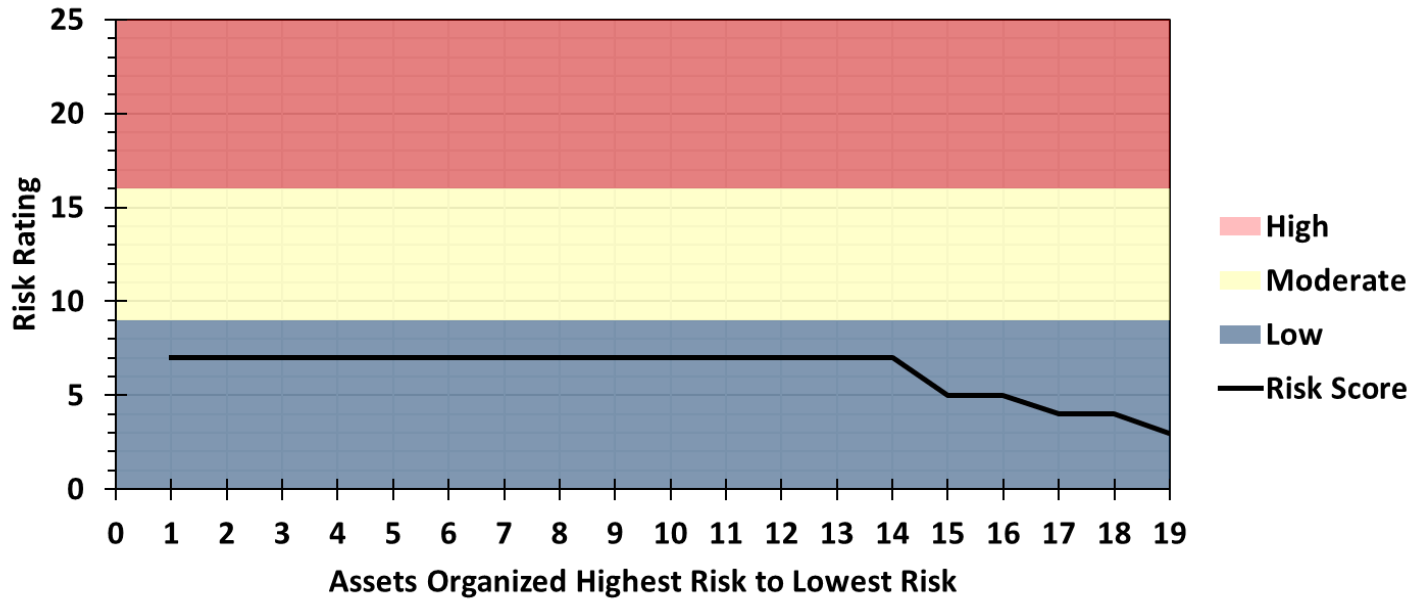
The individual risk ratings were used in calculating the risk score for each of the assets.

**2.3.1 Risk Profile**

The Risk profile of the Multi-Use Recreational Trails assets is displayed in **Figure 2-5**. All 19 assets tracked in the asset inventory are considered as Low risk.

Parks Linear

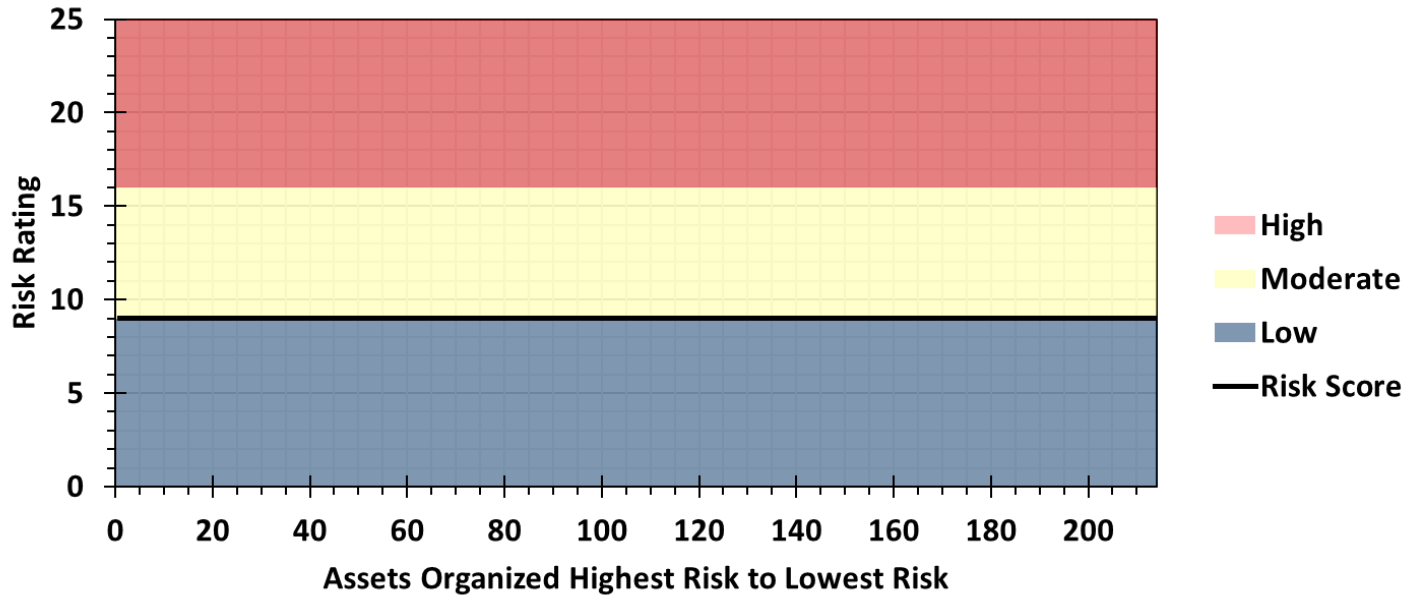
Figure 2-5: Risk Profile – Parks Linear (Multi-Use Recreational Trails)



The Risk profile of the Park Land assets is displayed in **Figure 2-6**. All 214 assets tracked in the asset inventory are considered as Low risk.

Parks Linear

Figure 2-6: Risk Profile - Parks Linear (Park Land)

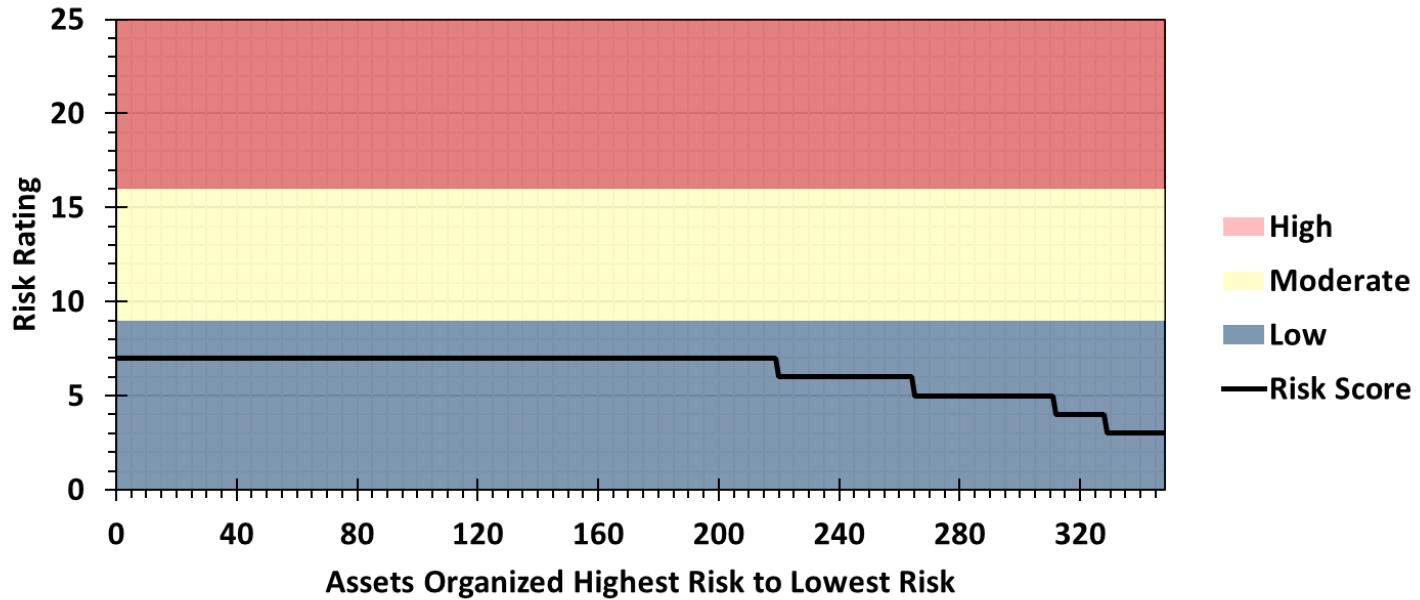


The Risk profile of the Pathways assets is displayed in **Figure 2-7**. All 348 assets tracked in the asset inventory are considered as Low risk.



Parks Linear

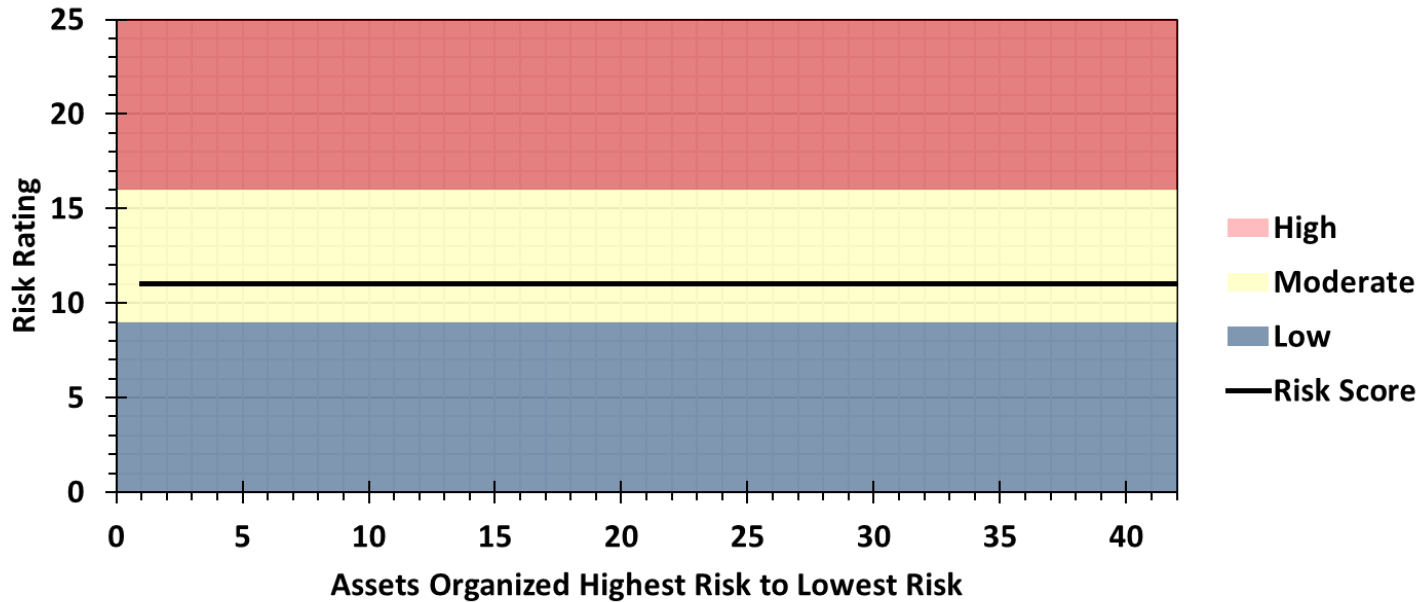
Figure 2-7: Risk Profile - Parks Linear (Pathways)



The Risk profile of the Shoreline Protection & Seawall assets is displayed in **Figure 2-8**. All 42 assets tracked in the asset inventory are considered as Moderate risk.

Parks Linear

Figure 2-8: Risk Profile - Parks Linear (Shoreline Protection & Seawalls)



## 2.4 Asset Management Strategy

### 2.4.1 Lifecycle Activities – Parks Linear

The lifecycle activities considered include:

- **Non-Infrastructure Solutions:** Actions or policies that can lower costs and extend useful lives.
- **Maintenance Activities:** Regularly scheduled inspection and maintenance, or more significant repair and activities associated with unexpected events.
- **Renewal / Rehabilitation Activities:** Significant repairs designed to extend the life of the asset.

**Parks Linear**

- **Replacement / Construction Activities:** Activities that are expected to occur once an asset has reached the end of its useful life and renewal/rehabilitation is no longer an option.
- **Disposal Activities:** Activities associated with disposing of an asset once it has reached the end of its useful life or is otherwise no longer needed.
- **Expansion / Growth / Service Improvement Activities:** Planned activities required to extend services to previously unserved areas or expand services to meet growth demands.

**Table 2-7** describes the lifecycle activities that can be implemented within the asset management strategy for Parks Linear assets. The lifecycle activities presented below are existing activities performed by the City, identified during a workshop with City staff in February 2024.

**Table 2-7: Lifecycle Activities – Parks Linear**

<b>Lifecycle Activity Type</b>	<b>Description of Activity</b>	<b>Frequency / Timing</b>
Non-Infrastructure Solutions	Community Outreach/Public Engagement	Annually
Non-Infrastructure Solutions	Playground Inspections	Annually
Non-Infrastructure Solutions	Pedestrian Bridge Inspections	Every 2 years
Non-Infrastructure Solutions	Shoreline Inspections	Every 3 years
Maintenance Activities	Erosion Control	Annually
Maintenance Activities	Specific maintenance as documented in the public works park maintenance plan	Ongoing
Renewal / Rehabilitation Activities	15-Year Capital Plan	Annually

**Parks Linear**

<b>Lifecycle Activity Type</b>	<b>Description of Activity</b>	<b>Frequency / Timing</b>
Replacement / Construction Activities	15-Year Capital Plan	Annually
Disposal Activities	At time of asset renewal, but never land	Annually
Expansion / Growth / Service Improvement Activities	Development Charges Study	Every 5 to 10 years
Expansion / Growth / Service Improvement Activities	Parks and Recreation Master Plan	Every 15 years
Expansion / Growth / Service Improvement Activities	Waterfront Master Plan	Every 30 years
Expansion / Growth / Service Improvement Activities	Review of Council Approved Population Growth Projections	As needed

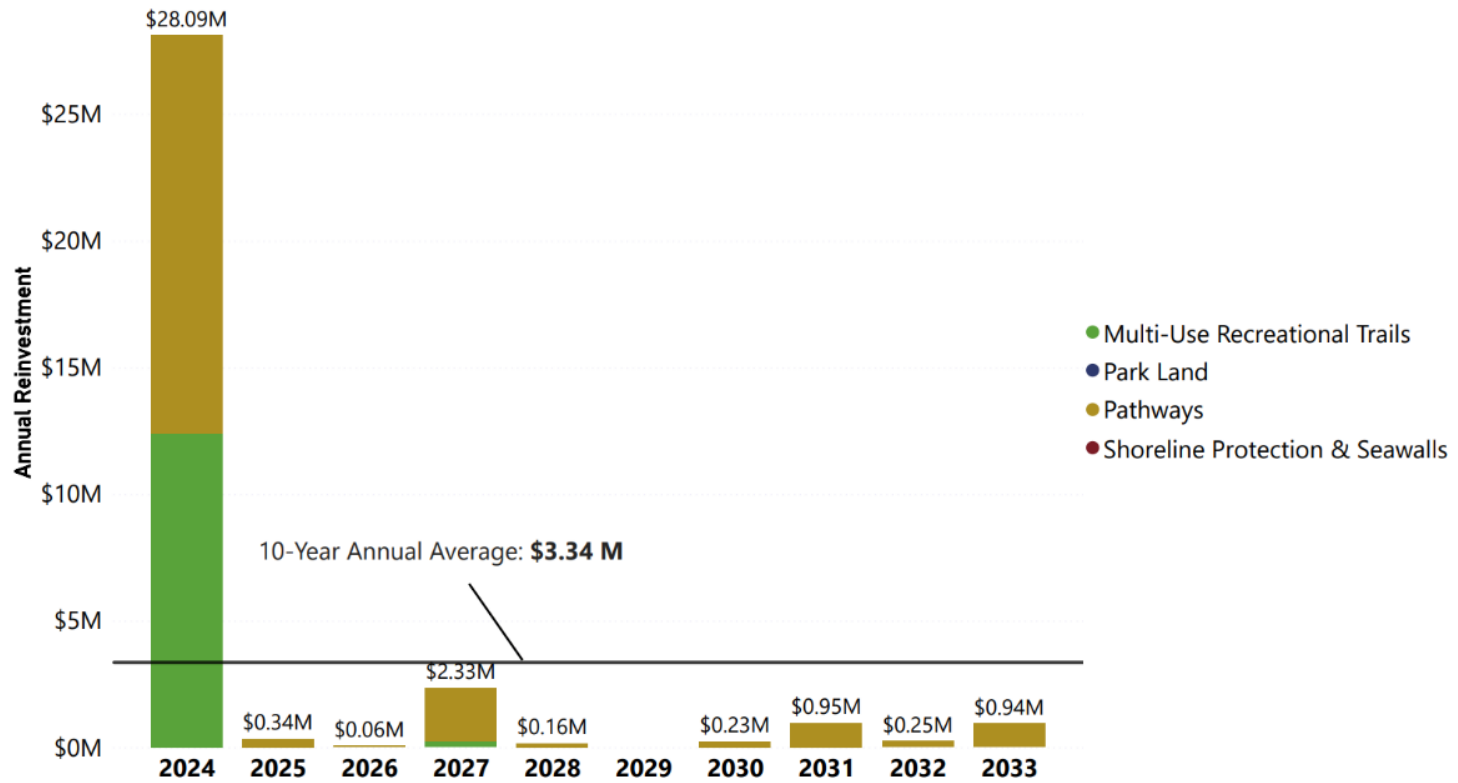
**2.4.2 Funding the Lifecycle Activities – Parks Linear**

Lifecycle modeling allows for the City to understand the future reinvestment needs of their existing assets by generating a theoretical asset replacement forecast that considers available asset inventory data. The age, EUL, replacement cost, condition, and risk score of each asset can be leveraged within the lifecycle model to proactively plan for reinvestment over a period of time. Asset replacement forecasts within this subsection estimate the required reinvestment for Parks Linear assets over the next 10 years based on available asset inventory data.

### Parks Linear

There is a total of approximately **\$33.36 million** to be reinvested into the Parks Linear assets owned by the City in the next 10 years. This translates to a 10-year annual average of approximately **\$3.34 million**, as presented in **Figure 2-9**. Due to the age of the trail assets under Multi-Use Recreational Trails and Pathway asset classes, there are over 200 assets in very poor condition requiring a large reinvestment need in 2024.

**Figure 2-9: 10-Year Capital Reinvestment Needs – Parks Linear**



It is important to note that forecasting in this lifecycle model relies heavily on age and EUL to determine renewal or replacement needs.

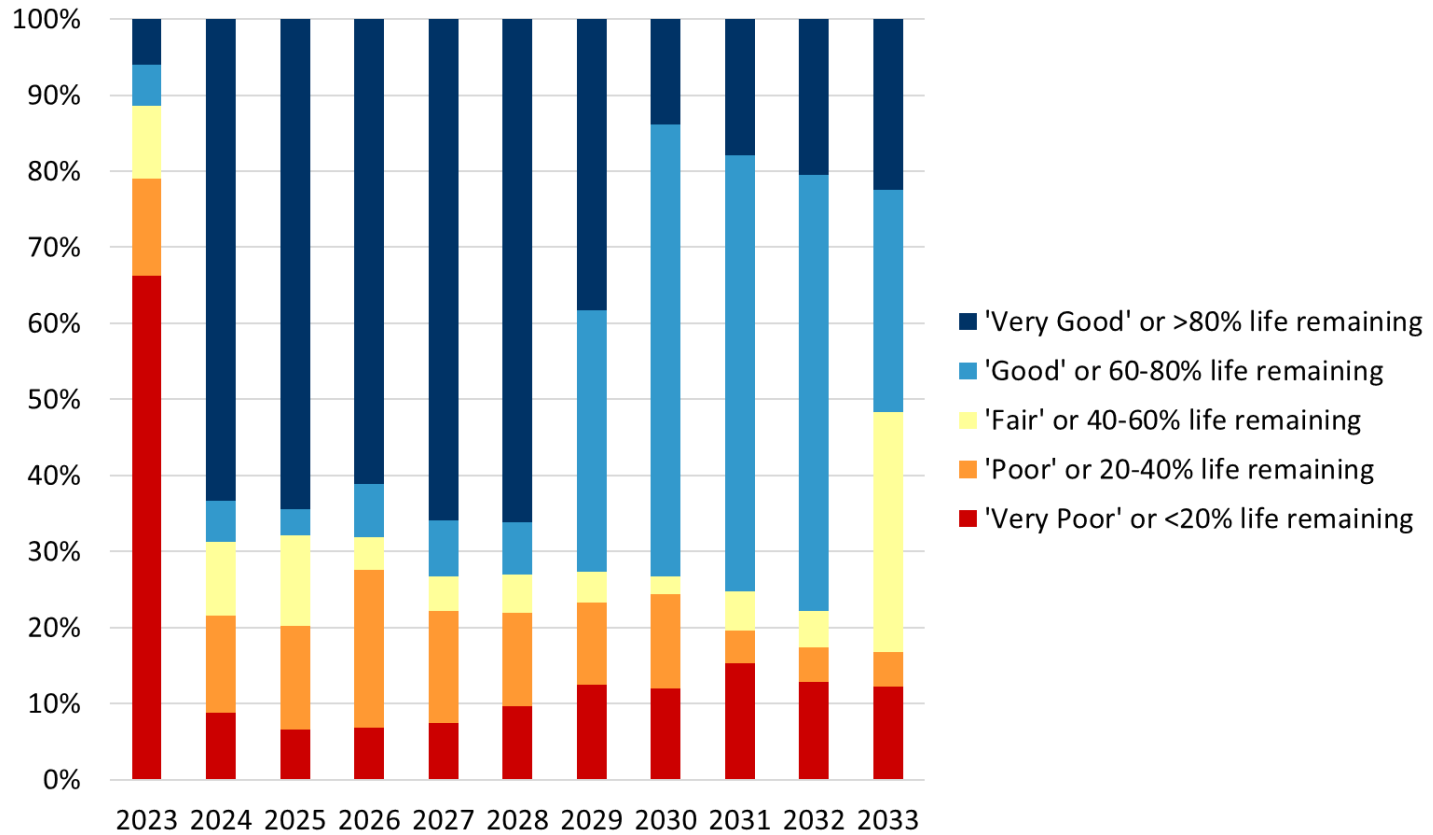
## Parks Linear

The LOS includes maintaining the current assets in poor or better condition (34%). From the lifecycle model, the percentage of Parks Linear assets in poor or better condition fluctuates throughout the next 10-years due to the EUL of the assets. Based on the EUL (20, 25, 30, 50, and 200 years) and age of the assets, the forecasted condition of the Parks Linear assets reaches a high of 93% in 2025 to 2027 and eventually finishing at 88% in 2033.

**Figure 2-10** shows an overview of the condition of Parks Linear over the next 10 years based on the lifecycle model.

Parks Linear

Figure 2-10: Condition Overview by Year Based on Lifecycle Model – Parks Linear





### 3.0 Park Amenities

The City's Park Amenities service manages and oversees Community Gardens, Off Leash Dog Parks, Playground & Equipment, Skateparks, Splash Pads, Sports Fields, Tennis, Pickleball Courts, and Other Multi-Use Courts. The following section of the AMP includes assets that are under the Park Amenities service. The Park and Recreation Master Plan outlines the service level standards for Park Amenities growth needed for the City over 15 years. Although there are needs for additional Park Amenities, renewal to optimize capacity of existing amenities prior to building new is a key direction. Clustering like amenities and repurposing and optimizing existing amenities will help with future maintenance and management of the amenities.

**Note on Scope:** At the time of preparing this AMP no data was available for an asset class (i.e., Community Gardens) and as a result, this asset class has been excluded. It is recommended that the City further develops an inventory of this asset class to be considered in subsequent iterations of the AMP.



Park Amenities

3.1 State of the Local Infrastructure

3.1.1 Asset Inventory and Valuation

For inventory purposes, Park Amenities assets have been summarized into asset classes and further divided into applicable asset types. **Table 3-1** summarizes the asset inventory for Park Amenities by asset class, asset type, asset count, and total replacement cost (in 2023 dollars). The total replacement cost (2023 dollars) is estimated at **\$97.7 million** for the **304 assets** included in the inventory.

Table 3-1: Inventory Summary by Asset Type – Park Amenities

Asset Class	Asset Type	Count	Total Replacement Cost (2023)
Off Leash Dog Park	Off Leash Dog Park	5	\$1,750,000
Playgrounds & Equipment	Playground Large	11	\$5,339,000
Playgrounds & Equipment	Playground Small	102	\$33,454,100
Skateparks	Skate Park Large	1	\$1,020,600
Skateparks	Skate Park Small	3	\$870,900
Splash Pads	Splash Pad/ Wading Pool Small	9	\$2,196,900
Splash Pads	Splash Pad Larger	3	\$1,762,500
Sports Fields	Artificial Turf Field (lit)	2	\$4,818,600
Sports Fields	Ball Diamonds (lit)	14	\$13,209,000
Sports Fields	Ball Diamonds (unlit, including informal)	25	\$8,507,500
Sports Fields	Running Track (rubber)	1	\$1,900,000
Sports Fields	Soccer Field (unlit, natural, full size)	29	\$10,753,200
Sports Fields	Soccer Field (unlit, natural, minor)	25	\$4,045,000
Sports Fields	Throwing/ Jumping Field	1	\$50,000
Tennis, Pickleball Courts	Pickleball Court (dedicated, unlit)	8	\$496,000

Park Amenities

Asset Class	Asset Type	Count	Total Replacement Cost (2023)
Tennis, Pickleball Courts	Tennis Court (unlit)	26	\$5,080,400
Other Multi-Use Courts	Basketball (hoop only)	2	\$10,000
Other Multi-Use Courts	Basketball (separate court only)	30	\$2,280,000
Other Multi-Use Courts	Beach Volleyball Court (unlit)	6	\$150,000
Other Multi-Use Courts	Shuffleboard Court	1	\$50,000
<b>Overall</b>	<b>N/A</b>	<b>304</b>	<b>\$97,743,700</b>

3.1.2 Asset Age Summary

Table 3-2 summarizes the average age, the average condition, the expected useful life, and the average remaining useful life of assets pertaining to the Park Amenities.

Table 3-2: Average Age, Average Condition, Expected Useful Life, and Average Remaining Useful Life – Park Amenities

Asset Class	Asset Type	Average Age (Years)	Average Condition Grade	Expected Useful Life (Years)	Average Remaining Useful Life (Years)
Off Leash Dog Park	Off Leash Dog Park	15	Fair	30	14
Playgrounds & Equipment	Playground Large	14	Good	25	17
Playgrounds & Equipment	Playground Small	17	Good	25	15
Skateparks	Skate Park Large	Unknown	Good	15	10
Skateparks	Skate Park Small	Unknown	Good	15	10

Park Amenities

Asset Class	Asset Type	Average Age (Years)	Average Condition Grade	Expected Useful Life (Years)	Average Remaining Useful Life (Years)
Splash Pads	Splash Pad/ Wading Pool Small	Unknown	Good	20	12
Splash Pads	Splash Pad Larger	Unknown	Good	20	13
Sports Fields	Artificial Turf Field (lit)	Unknown	Good	20	13
Sports Fields	Ball Diamonds (lit)	Unknown	Good	30	20
Sports Fields	Ball Diamonds (unlit, including informal)	Unknown	Good	30	19
Sports Fields	Running Track (rubber)	Unknown	Good	20	13
Sports Fields	Soccer Field (unlit, natural, full size)	Unknown	Good	30	19
Sports Fields	Soccer Field (unlit, natural, minor)	Unknown	Good	30	18
Sports Fields	Throwing/ Jumping Field	Unknown	Good	20	13
Tennis, Pickleball Courts	Pickleball Court (dedicated, unlit)	Unknown	Good	20	13
Tennis, Pickleball Courts	Tennis Court (unlit)	Unknown	Good	20	11
Other Multi-Use Courts	Basketball (hoop only)	Unknown	Good	25	17
Other Multi-Use Courts	Basketball (separate court only)	Unknown	Good	25	15
Other Multi-Use Courts	Beach Volleyball Court (unlit)	Unknown	Fair	10	6

Park Amenities

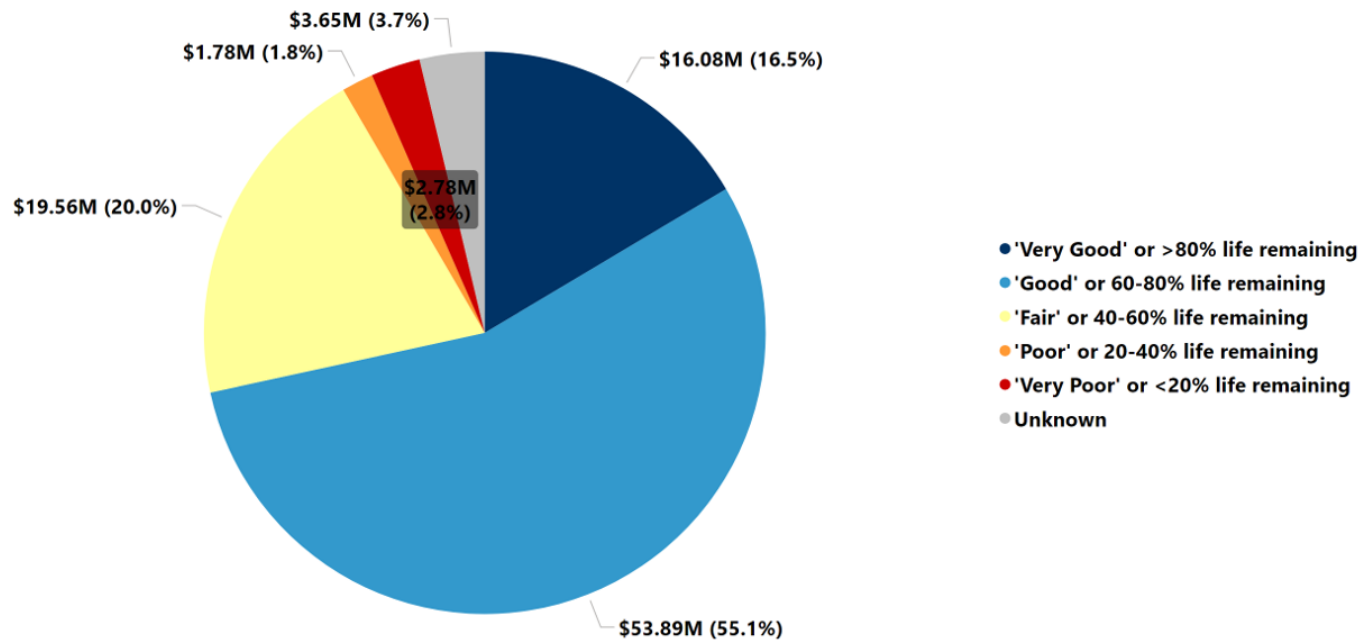
Asset Class	Asset Type	Average Age (Years)	Average Condition Grade	Expected Useful Life (Years)	Average Remaining Useful Life (Years)
Other Multi-Use Courts	Shuffleboard Court	Unknown	Good	20	13
<b>Overall</b>	<b>N/A</b>	<b>15</b>	<b>Good</b>	<b>10 to 30</b>	<b>14</b>

Park Amenities

3.1.3 Asset Condition

The overall condition summary for Park Amenities assets by replacement cost (in 2023 dollars) is shown in **Figure 3-1**. There is approximately 92.5% of the assets that are in very good to fair condition.

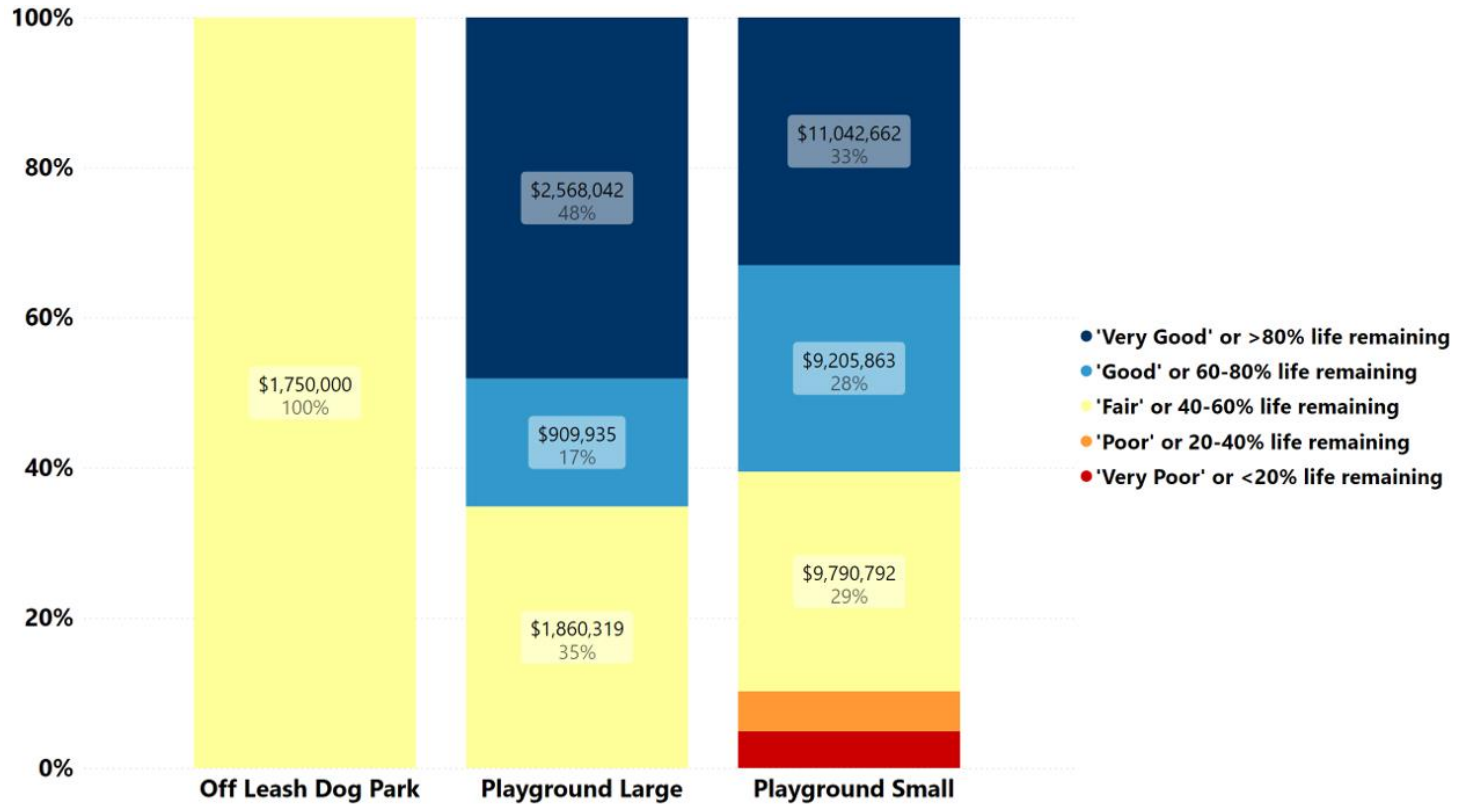
**Figure 3-1: Condition Summary by 2023 Replacement Cost – Park Amenities**



A condition summary for Off Leash Dog Park and Playgrounds & Equipment is provided in **Figure 3-2** by asset type and replacement cost (in 2023 dollars).

Park Amenities

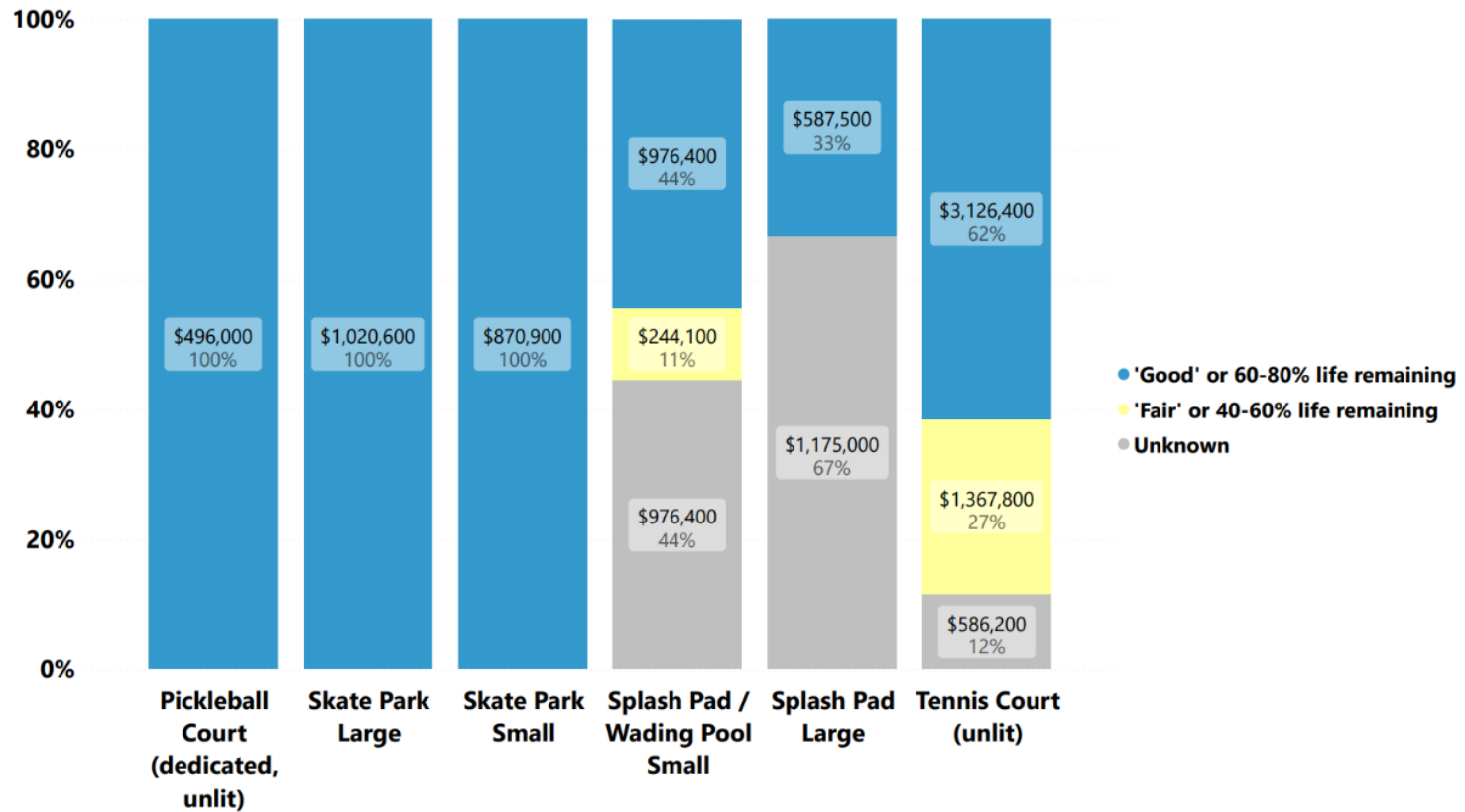
Figure 3-2: Condition Summary by Asset Type and Replacement Cost – Park Amenities (Off Leash Dog Park and Playgrounds & Equipment)



A condition summary for Skateparks, Splash Pads, and Tennis, Pickleball Courts is provided in **Figure 3-3** by asset type and replacement cost (in 2023 dollars).

Park Amenities

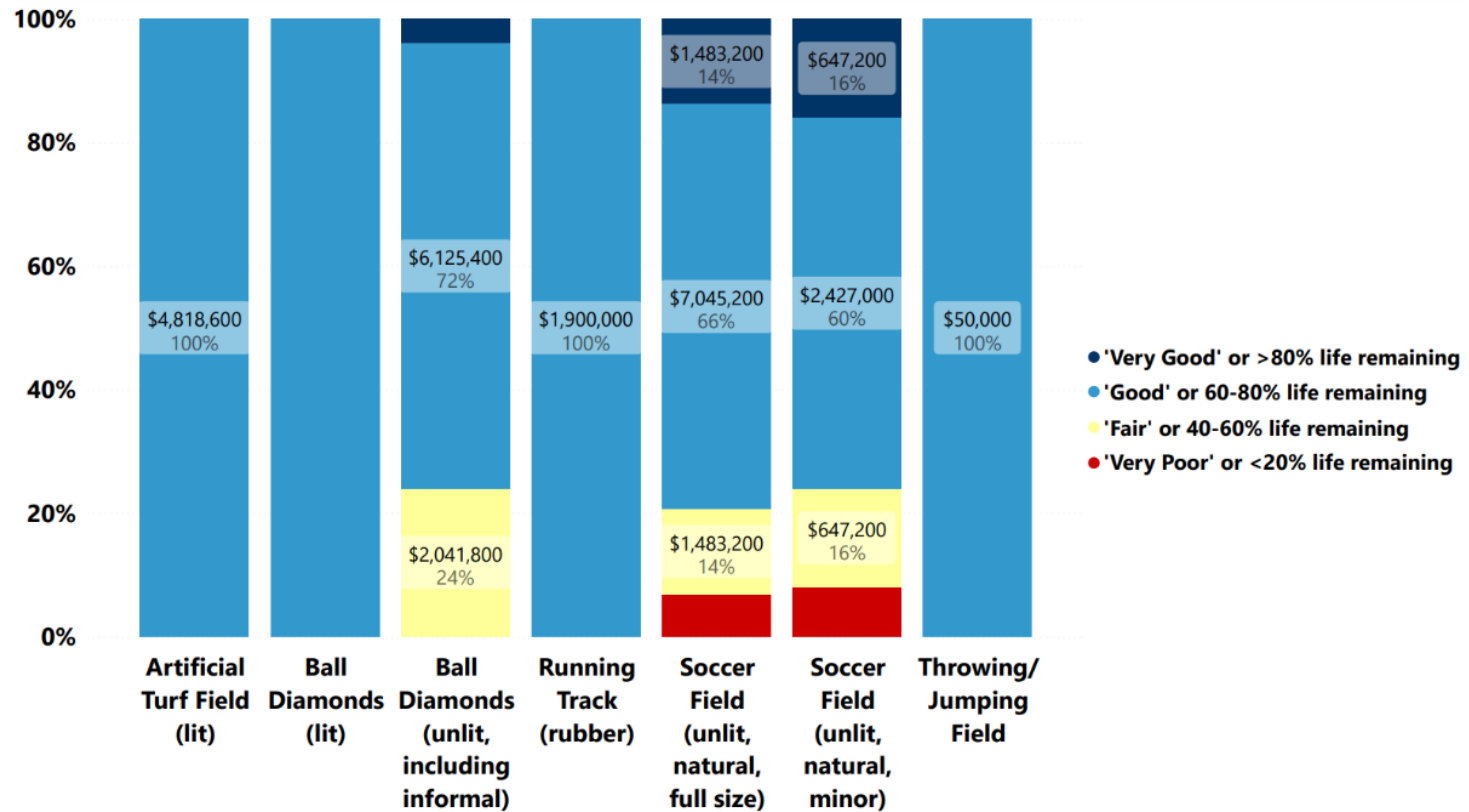
Figure 3-3: Condition Summary by Asset Type and Replacement Cost – Park Amenities (Skateparks, Splash Pads, and Tennis, Pickleball Courts)



A condition summary for Sports Fields is provided in **Figure 3-4** by asset type and replacement cost (in 2023 dollars).

Park Amenities

Figure 3-4: Condition Summary by Asset Type and Replacement Cost - Park Amenities (Sports Fields)

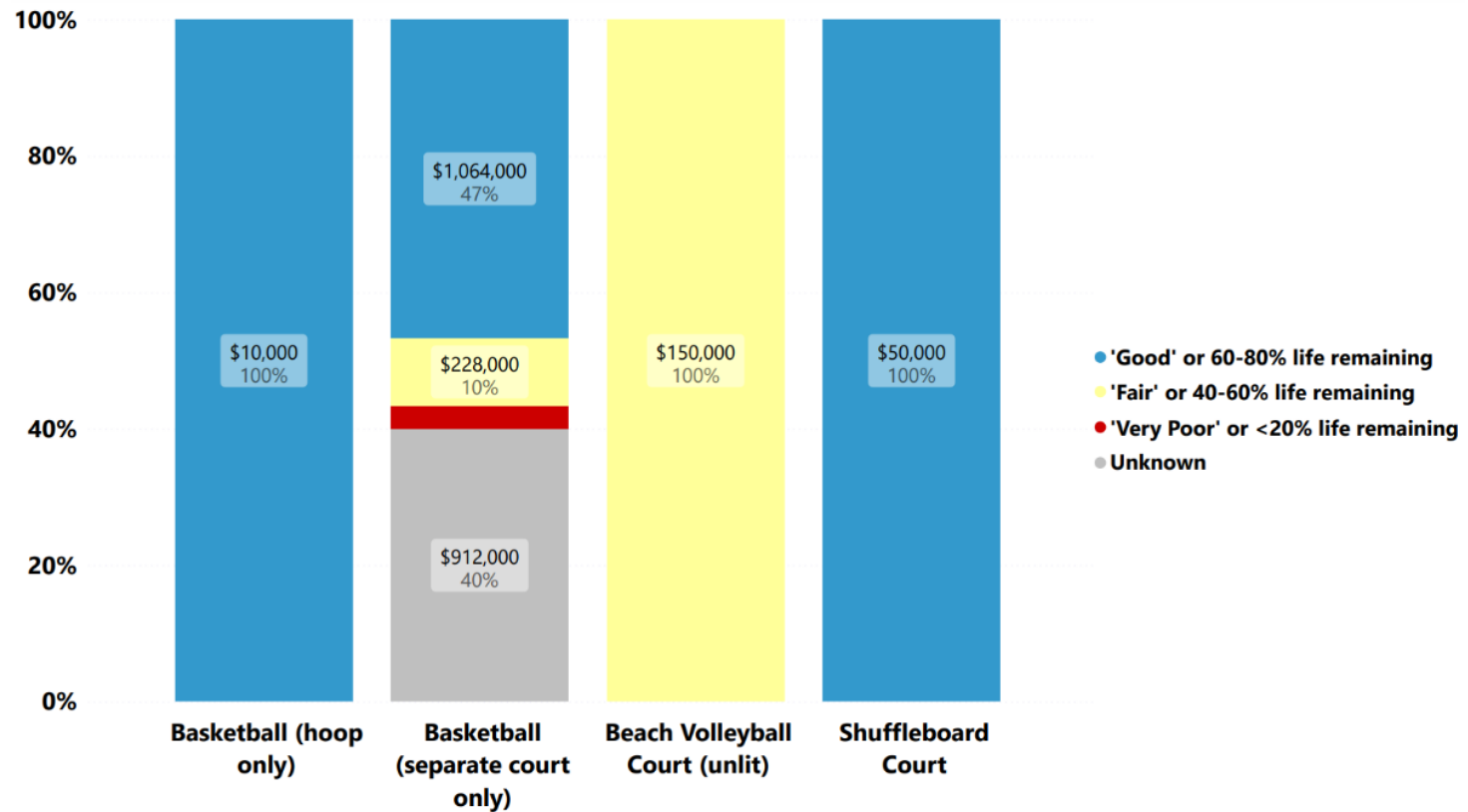


A condition summary for Other Multi-Use Courts is provided in **Figure 3-5** by asset type and replacement cost (in 2023 dollars).



Park Amenities

Figure 3-5: Condition Summary by Asset Type and Replacement Cost - Park Amenities (Other Multi-Use Courts)



3.1.4 Data Sources and Confidence

Asset data for Park Amenities is maintained by City staff. Currently, there is no centralized repository for Park Amenities asset information. The City has some asset data within ArcGIS, a web-based geographical mapping solution, and additional asset data within various Excel spreadsheets including a 2022 Playground Replacement Assessment Summary.

**Park Amenities**

Data confidence can be estimated based on the confidence level of various qualifiers and can be presented on a scale from 0% (low) to 100% (high), as shown in **Table 3-3**. The qualifiers chosen for evaluation are specifically targeted for estimating overall confidence of condition reporting within the SOLI.

**Table 3-3: Data Confidence Scale**

<b>Confidence Level</b>	<b>Low</b>	<b>Low/ Moderate</b>	<b>Moderate</b>	<b>Moderate/ High</b>	<b>High</b>
Average of Qualifiers	0% to 19%	20% to 39%	40% to 59%	60% to 79%	80% to 100%

Assuming the data sources are reliable, the following qualifiers were considered to estimate data confidence regarding the data utilized in the creation of this SOLI report:

- **Qualifier 1:** The percentage of assets in the asset inventory where construction, installation, or acquisition years are documented (66%);
- **Qualifier 2:** The percentage of assets in the asset inventory that have condition assessment data documented (96%); and,
- **Qualifier 3:** The percentage of the estimated overall replacement value, in 2023 dollars, attributed to assets in the asset inventory with documented condition assessment data (i.e., condition is not solely age-based) (99%).

Park Amenities

Figure 3-6: SOLI Report Data Confidence – Park Amenities



As summarized in **Figure 3-6**, the overall asset condition data confidence for Park Amenities assets is estimated as High. Presently, most asset conditions for Park Amenities assets are based on condition ratings assigned in 2023 by City staff, as documented within ArcGIS. Data confidence can be increased by improving the quality of the data and/or filling data gaps, such as documentation of the construction years for assets where construction years are currently unknown.

Park Amenities

3.2 Levels of Service

As mentioned in the **Section 2.2**, the City generated and approved the Parks and Recreation Master Plan in 2021. **Table 3-4** outlines the overall current parkland service level for Park Amenities. Park levels of service is influenced by growth and demand of amenities. Numerous legislative and regulatory requirements such as the Ontario Building Code, the Accessibility for Ontarians Disabilities Act (AODA) standards for customer service, and playground safety requirements apply to Park Amenities. Additionally, community expectations may impact the scale and complexity of renewal of existing amenities.

Table 3-4: Community LOS – Park Amenities

LOS Parameter	LOS Statement	Performance Measure	Current LOS (2023)
Quality	Park Amenities assets are kept in a good state of repair.	Percentage of assets that are meeting condition performance objectives.	92.5%

In the Master Plan, it summarizes the current supply of outdoor recreation amenities and specifies the additional number of each type needed by the end of the planning period (2036) to achieve the service level. The proposed performance measures for the facilities are outlined in **Table 3-5**. The classification of the facilities slightly differs from the AMP.

Park Amenities

Table 3-5: Community LOS – Facility Service Level

Facility	Service Level	Current LOS (2023)
Rectangular Fields	1: 120-130 registered participants	1:126
Ball Diamonds	1: 90-100 registered participants	1:92
Tennis Court (includes multi-use)	1: 4,000 residents	1:6249
Pickleball Court (includes multi-use)	1: 4,000 residents	1:6818
Basketball Court (full, half courts and multi-use)	1 basketball court per 600-700 youth (ages 10-19)	1:7142
Playgrounds	1 playground within 800m of major residential areas	1:1250
Skate Parks	1 skate park per 5,000 youth (ages 10-19)	1:4597
Splash Pads	1 splash pad per 1,500 children (ages 0-9)	1:1010

## Park Amenities

Table 3-6 outline the technical levels of service for Park Amenities.

**Table 3-6: Technical LOS – Park Amenities**

LOS Parameter	LOS Statement	Performance Measure	Current LOS (2023)
Safety	Playgrounds are safe and meet regulatory requirements.	Percentage of playgrounds that meet the Canadian Standards Association (CSA).	100%

### 3.3 Risk Assessment

The risk ratings for physical Park Amenities assets included Off Leash Dog Park, Playgrounds & Equipment, Skateparks, Splash Pads, Sports Fields, Tennis, Pickleball Courts, and Other Multi-Use Courts. The risk scores were calculated using the risk methodology and approach outlined in Section 1.4 of the Introduction.

Table 3-7 summarizes the risk factors for the Park Amenities assets.

**Table 3-7: Risk Factors – Park Amenities**

Factors	Risk Ratings
A - Condition	The condition of the assets was determined either by visual or age-based and can be found in the SOLI section of the AMP.
B - Performance	The performance of all the asset classes, except Playgrounds & Equipment assets was identified as "always reliable" and assigned a rating of 1 for calculating risk score. Playgrounds & Equipment assets was assigned a rating of 3 for being "Usually reliable".

Park Amenities

Factors	Risk Ratings
<b>C - Climate Change</b>	The climate change ratings were determined at the asset class level by identifying climate change hazard interactions. The Off Leash Dog Park and Sports Fields assets were identified as a “high” risk and assigned a rating of 5 for calculating the risk score. The Playgrounds & Equipment, Skatepark, Splash Pad, Tennis, Pickleball Court, and Other Multi-Use Courts assets were identified as a “low” risk and assigned a rating of 1 for calculating the risk score.
<b>D - Impact</b>	The impact of the Playgrounds & Equipment assets was identified as "moderate" impact and assigned a rating of 1 for calculating risk score. The impact of the Off Leash Dog Park, Skatepark, Splash Pad, Sports Field, Tennis, Pickleball Court, and Other Multi-Use Courts assets was identified as "low" impact and assigned a rating of 0 for calculating risk score.
<b>E - Importance</b>	The Off Leash Dog Park, Skatepark, Splash Pad, Sports Field, Tennis, Pickleball Court Other, and Other Multi-Use Courts asset classes was identified as “moderate” importance and assigned a rating of 2 when calculating risk. A “high” importance rating was applied to the Playgrounds & Equipment assets and a rating of 3 was assigned for calculating risk score.

The individual risk ratings were used in calculating the risk score for each of the assets.

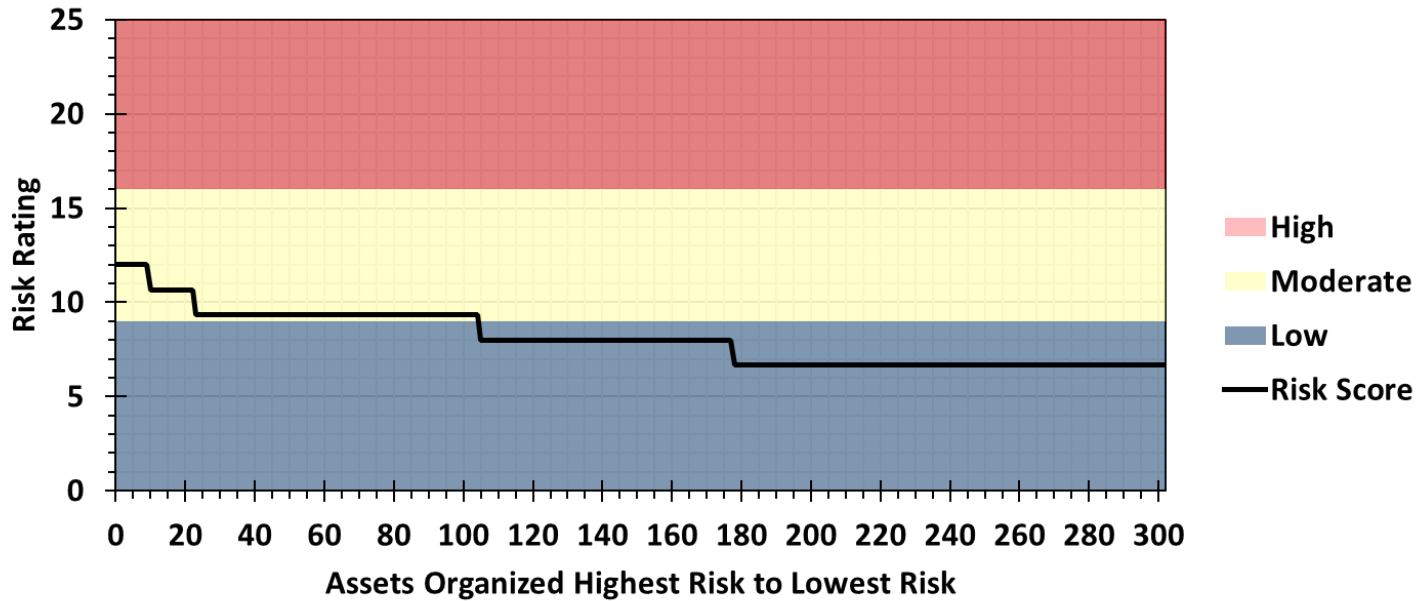
**3.3.1 Risk Profile**

The Risk profile for the five Off Leash Dog Park, four Skateparks, 12 Splash Pads, and 14 Tennis, Pickleball Courts assets tracked within the asset inventory are all classified as Low risk.

The Risk profile of the Playground & Equipment assets is displayed in **Figure 3-7**. There are 34% (104) of the 302 assets tracked in the asset inventory that are considered as Moderate risk, the remaining 66% (198) asset are considered in Low risk.

Park Amenities

Figure 3-7: Risk Profile - Park Amenities (Playground & Equipment)

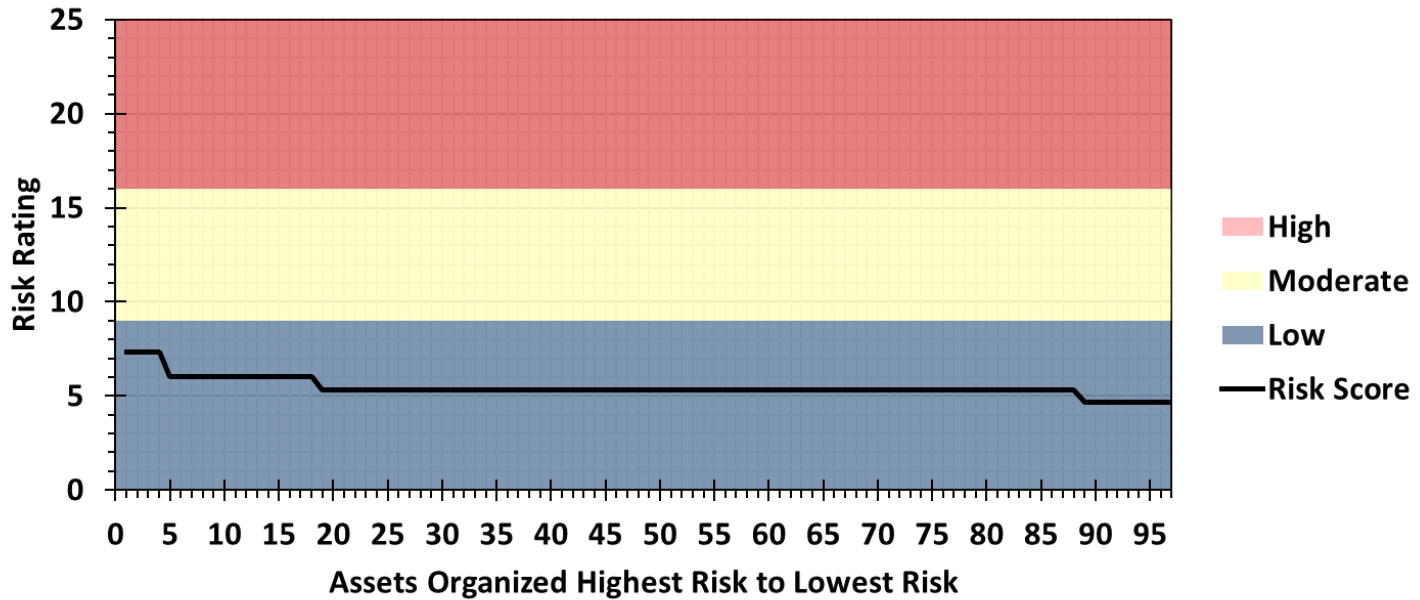


The Risk profile of the Sports Fields assets is displayed in **Figure 3-8**. All 97 assets tracked in the asset inventory are considered as Low risk.



Park Amenities

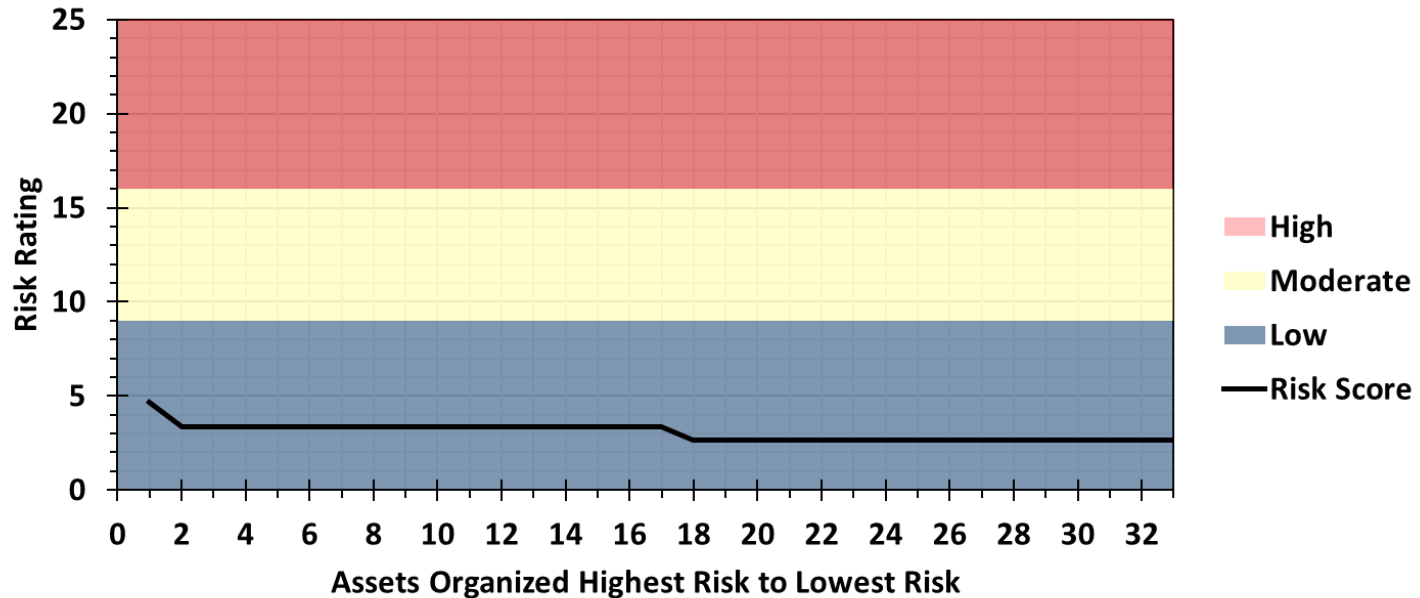
Figure 3-8: Risk Profile - Park Amenities (Sports Fields)



The Risk profile of the Other Multi-Use Courts assets is displayed in **Figure 3-9**. All 33 assets tracked in the asset inventory are considered as Low risk.

## Park Amenities

Figure 3-9: Risk Profile – Park Amenities (Other Multi-Use Courts)



### 3.4 Asset Management Strategy

#### 3.4.1 Lifecycle Activities – Park Amenities

The lifecycle activities considered include:

- **Non-Infrastructure Solutions:** Actions or policies that can lower costs and extend useful lives.
- **Maintenance Activities:** Regularly scheduled inspection and maintenance, or more significant repair and activities associated with unexpected events.
- **Renewal / Rehabilitation Activities:** Significant repairs designed to extend the life of the asset.
- **Replacement / Construction Activities:** Activities that are expected to occur once an asset has reached the end of its useful life and renewal or rehabilitation is no longer an option.

**Park Amenities**

- **Disposal Activities:** Activities associated with disposing of an asset once it has reached the end of its useful life or is otherwise no longer needed.
- **Expansion / Growth / Service Improvement Activities:** Planned activities required to extend services to previously unserved areas or expand services to meet growth demands.

**Table 3-8** describes the lifecycle activities that can be implemented within the asset management strategy for Park Amenities assets. The lifecycle activities presented below are existing activities performed by the City, identified during a workshop with City staff in February 2024.

**Table 3-8: Lifecycle Activities – Park Amenities**

<b>Lifecycle Activity Type</b>	<b>Description of Activity</b>	<b>Frequency / Timing</b>
Maintenance Activities	Turf Care Management Plan	Annually
Maintenance Activities	Turf Maintenance	Daily (during summer season)
Maintenance Activities	Park Amenities assets monitored and repaired based on reporting of deficiencies, supplemented by field inspections completed by Public Works Staff for playgrounds and Splash Pads	Ongoing
Renewal / Rehabilitation Activities	Renewal of assets based on needs identified by City staff in 15-Year Capital Plan	Ongoing
Renewal / Rehabilitation Activities	Court Resurfacing	Approximately every 5 years

**Park Amenities**

<b>Lifecycle Activity Type</b>	<b>Description of Activity</b>	<b>Frequency / Timing</b>
Replacement / Construction Activities	Replacement at Expected Useful Life (EUL)	End of EUL
Replacement / Construction Activities	Utilize approach where possible to bundle assets required for replacement into one construction contract to minimize service disruption and increase cost effectiveness	End of EUL
Expansion / Growth / Service Improvement Activities	Parks and Recreation Master Plan	Every 15 years
Expansion / Growth / Service Improvement Activities	Council Strategic Plan (2023-2026)	Every 4 years
Expansion / Growth / Service Improvement Activities	Development Charges Study or Public Outreach	Every 5 to 10 years

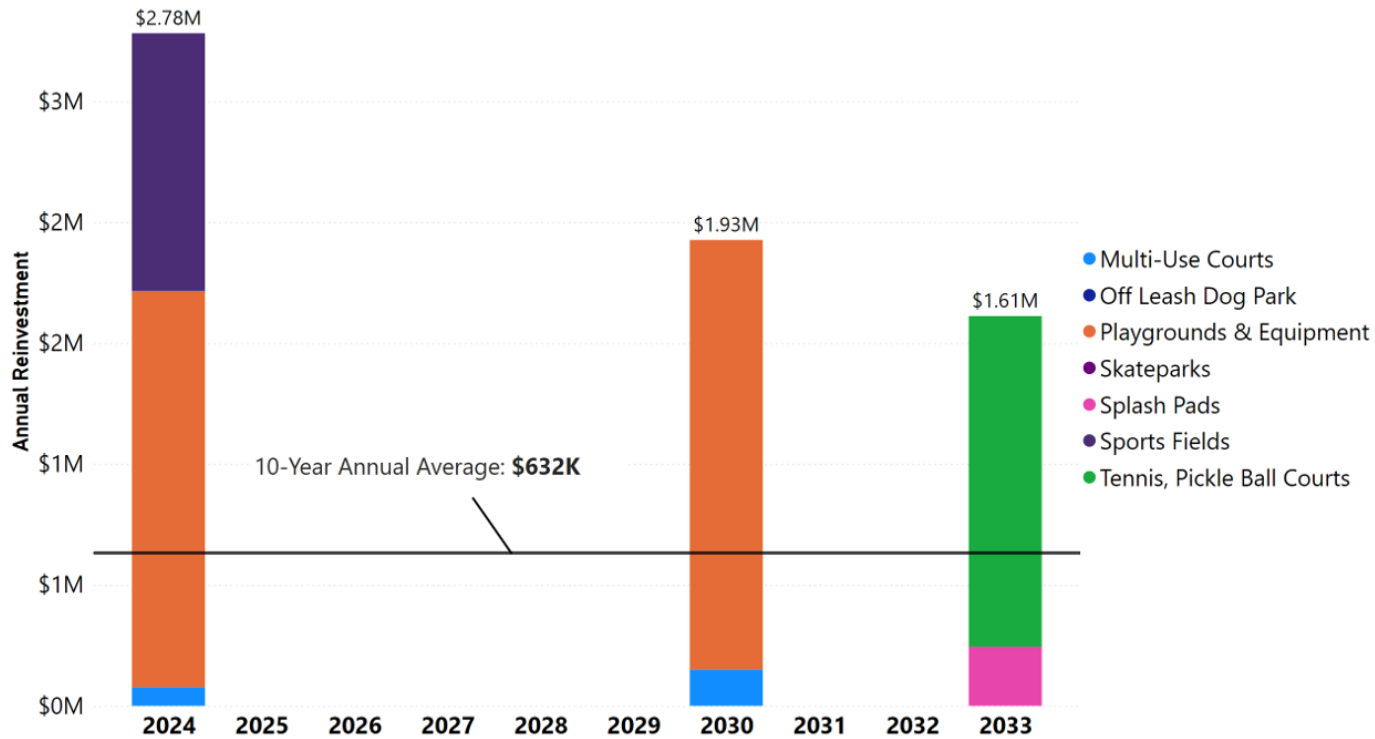
**3.4.2 Funding the Lifecycle Activities – Parks Amenities**

Lifecycle modeling allows for the City to understand the future reinvestment needs of their existing assets by generating a theoretical asset replacement forecast that considers available asset inventory data. The age, EUL, replacement cost, condition, and risk score of each asset can be leveraged within the lifecycle model to proactively plan for reinvestment over a period of interest. Asset replacement forecasts within this subsection estimate the required reinvestment for Park Amenities over the next 10 years based on available asset inventory data.

### Park Amenities

There is a total of approximately **\$6.32 million** to be reinvested into the Park Amenities assets owned by the City in the next 10 years, excluding reinvestment associated with facilities. This translates to a 10-year annual average of approximately **\$632 thousand**, as presented in **Figure 3-10**.

**Figure 3-10: 10-Year Capital Reinvestment Needs – Park Amenities**



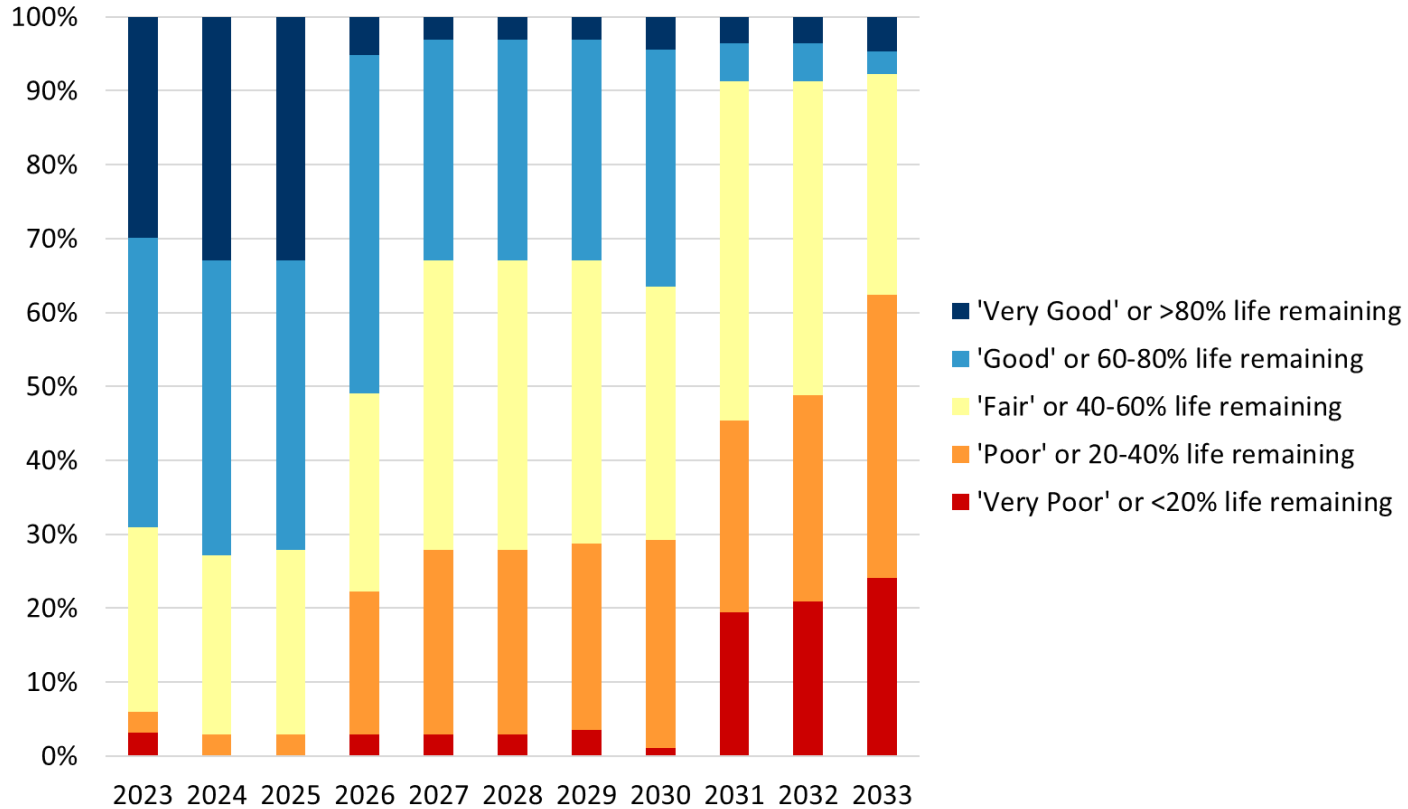
It is important to note that forecasting in this lifecycle model relies heavily on age and EUL to determine renewal or replacement needs.

### Park Amenities

The LOS includes maintaining the current assets in poor or better condition (97%). From the lifecycle model, the percentage of Park Amenities assets in poor or better condition is fluctuates throughout the next 10-years due to the EUL of the assets. With an EUL of 10, 15, 20, 25, and 30 years the assets reach a high of 100% in 2024 to 2025 and finish at 76% in 2033.

**Figure 3-11** shows an overview of the condition of Park Amenities over the next 10 years based on the lifecycle model.

**Figure 3-11: Condition Overview by Year Based on Lifecycle Model – Park Amenities**





#### 4.0 Park Facilities

The City's Park Facilities consists of Maintenance Buildings, Parks (site) Lighting, Picnic Shelters located within parks, start up and winterize Plumbing Systems in park such as splash pads or irrigation lines, and Washrooms. It is important to note that assets within this service category are not included in this volume as they have been previously featured in the City's Facilities AMP (2023) that was developed by GM BluePlan in collaboration with the City's Facilities Management & Construction Services (FMCS) department.

The City's FMCS department is comprised of three divisions: Facilities Management, Energy & Asset Management, and Facilities Construction. FMCS maintains the City's diverse portfolio of municipal buildings, thereby supporting departments such as Parks in providing extensive front-line services to the community. This centralized, shared services collaborative approach has allowed the integration of energy management and sustainability considerations along with other aspects of facilities maintenance, asset management, space planning, design, construction, and demolition across all areas of the City.



## 5.0 Cemeteries

The City's Cemeteries asset portfolio includes six sites with only the Pine Grove Cemetery remaining in active operation. The remainder are historic sites. The service is responsible for the maintenance and administration of several historic and contemporary Cemeteries throughout the City, providing respectful and dignified final resting places for its residents while meeting all legislative requirements including those found under the Funeral, Burial and Cremations Services Act (2002). Sites are well-maintained, with meticulous landscaping and continuous upkeep of monuments and paths, preserving their serene and respectful atmosphere. The service is dedicated to compassionate customer service, helping bereaved families navigate end-of-life arrangements with care and sensitivity. The following section of the AMP includes assets that are under the Cemeteries service.

**Note on Scope:** At the time of preparing this AMP no data was available for Structures located at Cemeteries and as a result this asset class has been excluded. It is also important to note that asset data for Cemeteries was limited to basic inventory information for this AMP. It is recommended that the City further develops an inventory of these assets to be considered in subsequent iterations of the AMP.



Cemeteries

5.1 State of the Local Infrastructure

5.1.1 Asset Inventory and Valuation

**Table 5-1** summarizes the asset inventory for Cemeteries by asset class, asset type, asset count, and total replacement cost (in 2023 dollars). The total replacement cost (2023 dollars) is estimated at **\$111,900** for the **6 assets** included in the inventory.

**Table 5-1 Notes**

<sup>1</sup> Only one cemetery remains in active operation (Pine Grove Cemetery), the remaining five are inactive.

<sup>2</sup> Inflated from the City of Kingston Parks Asset Management Plan (GHD, 2009)

**Table 5-1: Inventory Summary by Asset Type - Cemeteries**

Asset Class	Asset Type	Count	Total Replacement Cost (2023)
Land	Cemetery	6 <sup>1</sup>	\$111,900 <sup>2</sup>

5.1.2 Asset Age Summary

**Table 5-2** summarizes the average age, the average condition, the expected useful life, and the average remaining useful life of assets pertaining to Cemeteries. The overall average age of Cemeteries assets is 356 years and the average remaining useful life is 665 years.

**Cemeteries**

**Table 5-2 Notes**

<sup>1</sup> As Provided in the City of Kingston Parks Asset Management Plan (GHD, 2009)

**Table 5-2: Average Age, Average Condition, Expected Useful Life, and Remaining Useful Life - Cemeteries**

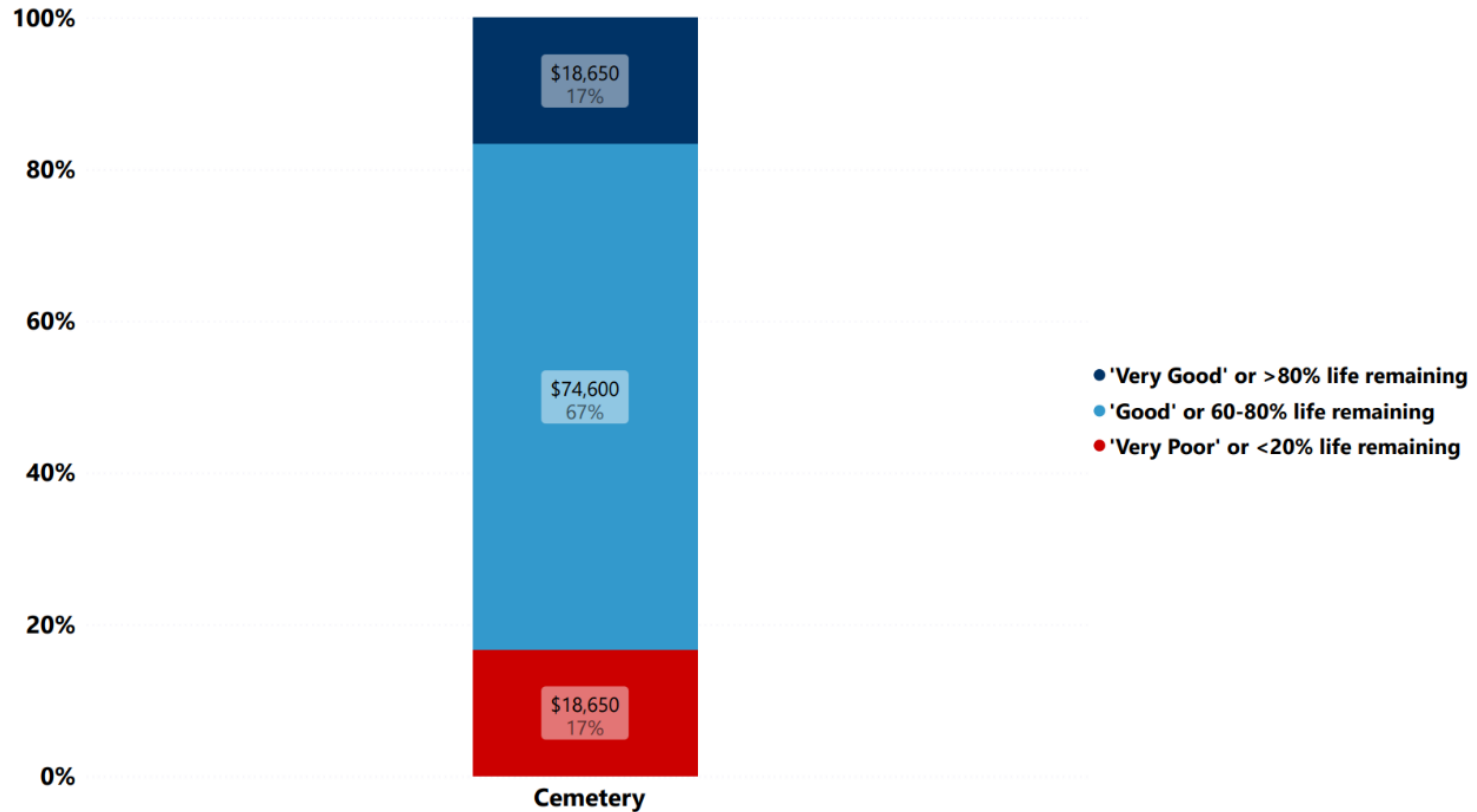
<b>Asset Class</b>	<b>Asset Type</b>	<b>Average Age (Years)</b>	<b>Average Condition Rating</b>	<b>Expected Useful Life (Years)</b>	<b>Average Remaining Useful Life (Years)</b>
Land	Cemetery	356	Good	1000 <sup>1</sup>	665

**5.1.3 Asset Condition**

A condition summary for Land assets is provided in **Figure 5-1** by asset class and replacement cost (in 2023 dollars). There is approximately 84% of the assets that are in very good to fair condition.

## Cemeteries

Figure 5-1: Condition Summary by Asset Class and 2023 Replacement Cost - Cemeteries (Land)



### 5.1.4 Data Sources and Confidence

Asset data for Cemeteries was provided by City staff in the format of a list. Currently, there is no central repository for asset data related to Cemeteries.

## Cemeteries

Data confidence can be estimated based on the confidence level of various qualifiers and can be presented on a scale from 0% (low) to 100% (high), as shown in **Table 5-3**. The qualifiers chosen for evaluation are specifically targeted for estimating overall confidence of condition reporting within the SOLI.

**Table 5-3: Data Confidence Scale**

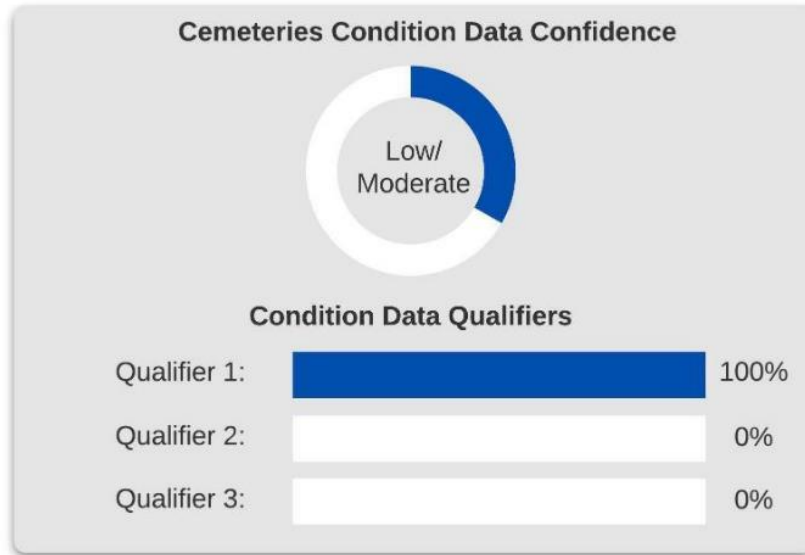
Confidence Level	Low	Low/ Moderate	Moderate	Moderate/ High	High
Average of Qualifiers	0% to 19%	20% to 39%	40% to 59%	60% to 79%	80% to 100%

Assuming the data source is reliable, the following qualifiers were considered to estimate data confidence regarding the data utilized in the creation of this SOLI report:

- **Qualifier 1:** The percentage of assets in the asset inventory where construction, installation, or acquisition years are documented (100%);
- **Qualifier 2:** The percentage of assets in the asset inventory that have condition assessment data documented (0%); and,
- **Qualifier 3:** The percentage of the estimated overall replacement value, in 2023 dollars, attributed to assets in the asset inventory with documented condition assessment data (i.e., condition is not solely age-based) (0%).

## Cemeteries

**Figure 5-2: SOLI Report Data Confidence – Cemeteries**



As summarized in **Figure 5-2**, the overall asset condition data confidence for Cemeteries assets is estimated to be Low and Moderate. Data confidence can be increased by improving the quality of the data and/ or filling in data gaps, such as completing condition assessments.

### 5.2 Levels of Service

The City has developed the community and technical Levels of Service (LOS), based on input from municipal staff. Of note, only one cemetery is in active use – that being Pinegrove. It was decided that Quantity and Quality were key attributes in gauging the performance of the assets. **Table 5-4** and **Table 5-5** outline the City’s current community and technical levels of service for Cemeteries.

Cemeteries

Table 5-4: Community LOS – Cemeteries

LOS Parameter	LOS Statement	Performance Measure	Current LOS (2023)
<b>Availability</b>	Cemetery assets should not endanger people, property, or the integrity of remains.	Active cemeteries are fully compliant with Bereavement Authority of Ontario (BAO) regulations.	70% in compliance with BAO regulations
<b>Quality</b>	Cemetery assets should deliver their intended services at a certain quality. Requests for repair or access to cemetery assets should be completed as quickly as safely practical.	Number of work orders and timeliness of response.	Currently unknown

Table 5-5: Technical LOS – Cemeteries

LOS Parameter	LOS Statement	Performance Measure	Current LOS (2023)
<b>Availability</b>	Assets comply with regulations, perform their intended function and are safe, secure, and sustainable.	Percentage of active cemeteries that are AODA compliant.	100% AODA compliant

**Cemeteries**

<b>LOS Parameter</b>	<b>LOS Statement</b>	<b>Performance Measure</b>	<b>Current LOS (2023)</b>
<b>Quality</b>	Assets are in adequate condition, are maintained as required and respond to customer needs.	Number of work orders and timeliness of response.	Currently Unknown

**5.3 Risk Assessment**

The risk ratings for Cemeteries assets included Land assets. The risk scores were calculated using the risk methodology and approach outlined in Section 1.4 of the Introduction. **Table 5-6** summarizes the risk factors for the Cemeteries assets.

**Table 5-6: Risk Factors - Cemeteries**

<b>Factors</b>	<b>Risk Ratings</b>
<b>A - Condition</b>	The condition of the assets was determined either by visual or age-based and can be found in the SOLI section of the AMP.
<b>B - Performance</b>	The performance of the asset class was identified as "always reliable" and assigned a rating of 1 for calculating risk score.
<b>C - Climate Change</b>	The climate change ratings were determined at the asset class level by identifying climate change hazard interactions. The Land assets were identified as a "low" risk and assigned a rating of 1 for calculating the risk score.

## Cemeteries

Factors	Risk Ratings
<b>D - Impact</b>	The Land assets was recognized as "low" impact and assigned a rating of 0 for calculating risk score.
<b>E - Importance</b>	The Land asset class was identified as "low" importance and assigned a rating of 1 when calculating risk.

The individual risk ratings were used in calculating the risk score for each of the assets.

### 5.3.1 Risk Profile

All six Land assets tracked in the asset inventory are considered as Low risk.

## 5.4 Asset Management Strategy

### 5.4.1 Lifecycle Activities - Cemeteries

The lifecycle activities considered include:

- **Non-Infrastructure Solutions:** Actions or policies that can lower costs and extend useful lives.
- **Maintenance Activities:** Regularly scheduled inspection and maintenance, or more significant repair and activities associated with unexpected events.
- **Renewal / Rehabilitation Activities:** Significant repairs designed to extend the life of the asset.
- **Replacement / Construction Activities:** Activities that are expected to occur once an asset has reached the end of its useful life and renewal or rehabilitation is no longer an option.
- **Disposal Activities:** Activities associated with disposing of an asset once it has reached the end of its useful life or is otherwise no longer needed.
- **Expansion / Growth / Service Improvement Activities:** Planned activities required to extend services to previously unserved areas or expand services to meet growth demands.



## Cemeteries

**Table 5-7** describes the lifecycle activities that can be implemented within the asset management strategy for Cemeteries. The lifecycle activities presented below are existing activities performed by the City, identified during a workshop with City staff in February 2024.

**Table 5-7: Lifecycle Activities - Cemeteries**

Lifecycle Type	Description of Activity	Frequency / Timing
Maintenance Activities	Grass Maintenance	Ongoing
Maintenance Activities	Tree Trimming	Ongoing
Expansion / Growth / Service Improvement Activities	Evaluate option to have a Third-Party Cemetery management company operate administration and ongoing maintenance needs of operating Cemeteries	Ongoing
Expansion / Growth / Service Improvement Activities	Review of plans to expand the City's cemetery assets.	Annually

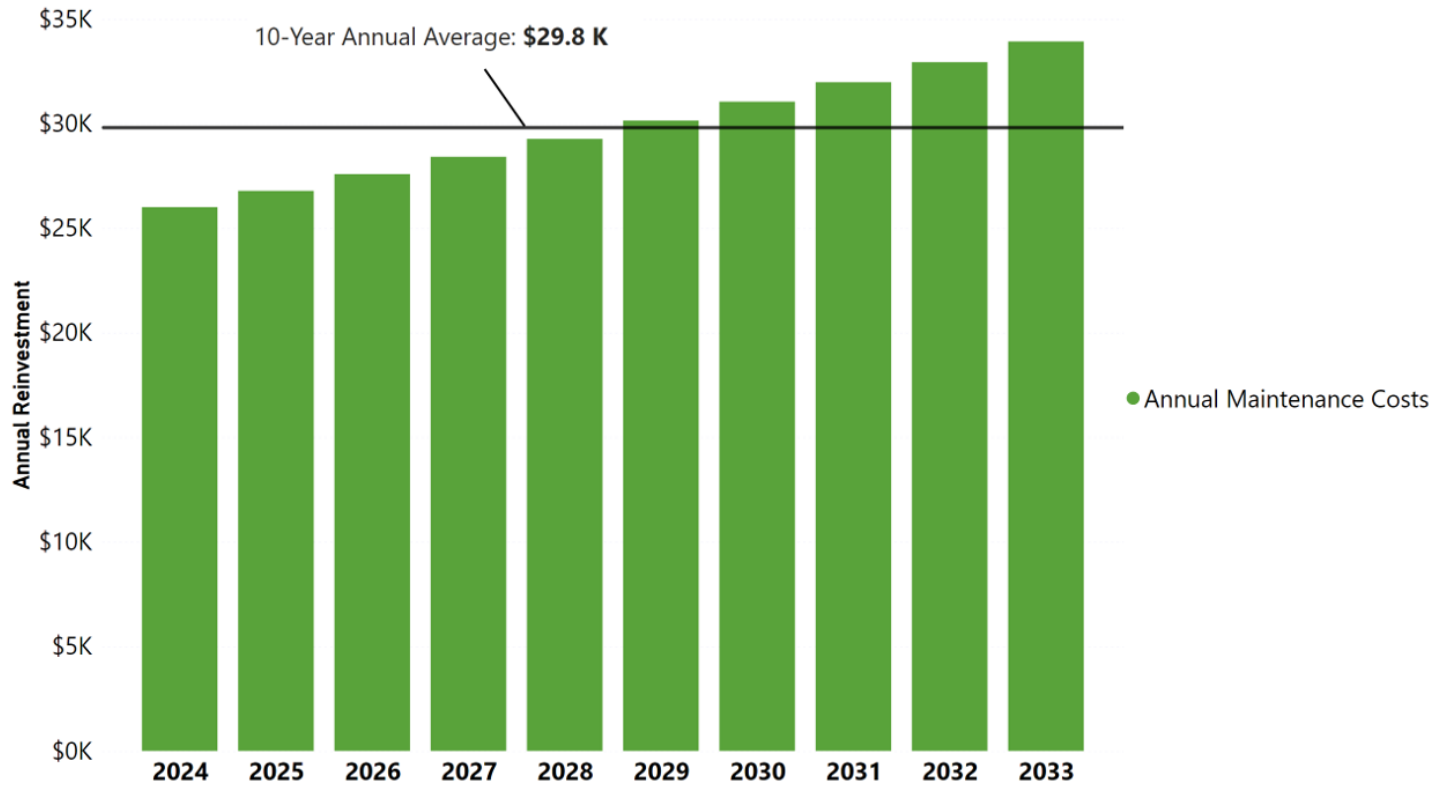
### 5.4.2 Funding the Lifecycle Activities - Cemeteries

Lifecycle modeling allows for the City to understand the future reinvestment needs of their existing assets. For Cemeteries, lifecycle costs are predominantly associated with operations and maintenance (O&M). Asset O&M costs forecasted within this subsection estimate the required reinvestment for Cemeteries assets over the next 10 years based on 2023 maintenance costs.

There is a total of approximately **\$947.9 thousand** to be reinvested into Cemeteries operations and maintenance (O&M) in the next 10 years, excluding reinvestment associated with facilities. This translates to a 10-year annual average of approximately **\$29.8 thousand**, as presented in **Figure 5-3**.

Cemeteries

Figure 5-3: 10-Year O&M Reinvestment Needs - Cemeteries



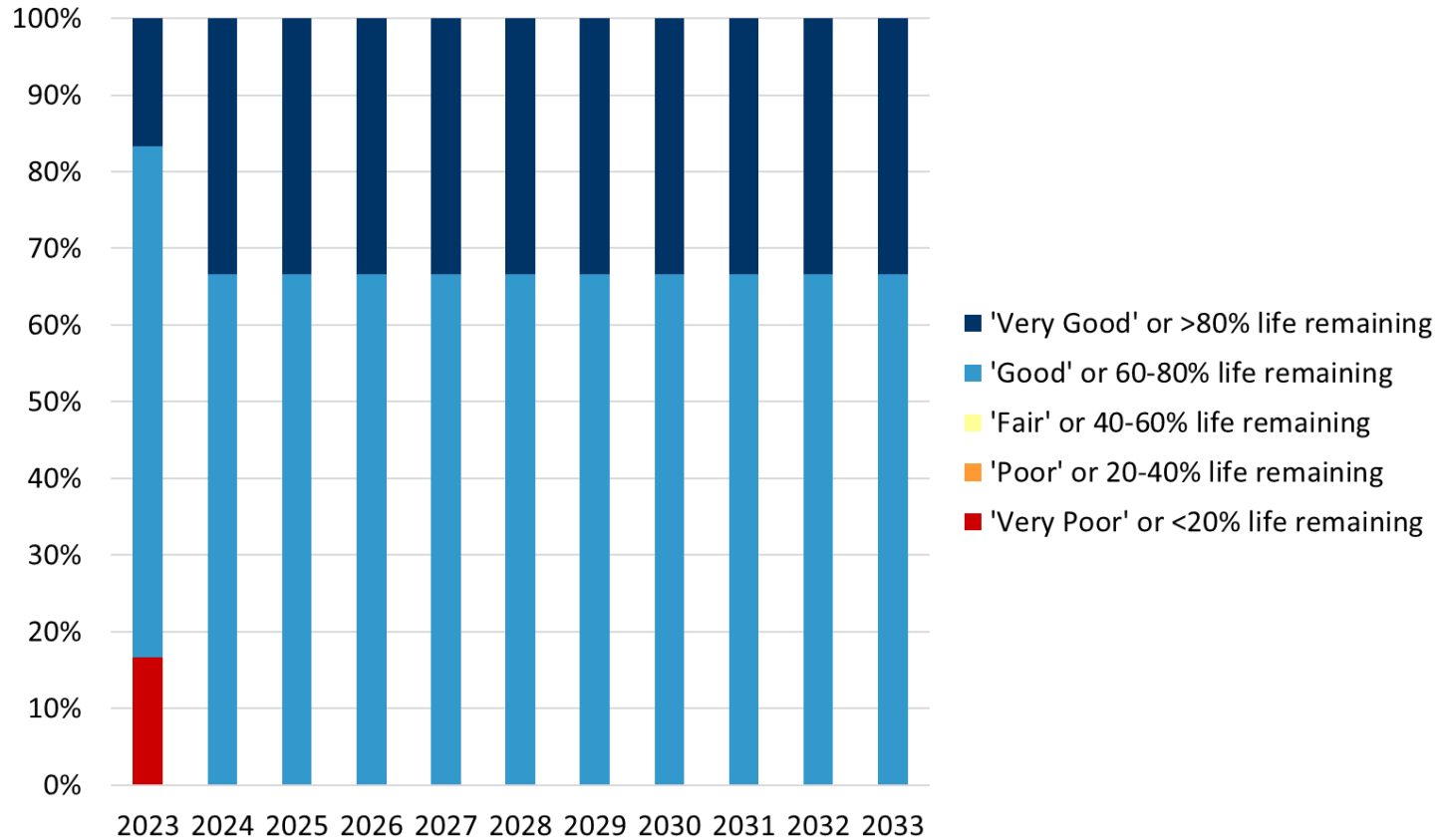
It is important to note that forecasting in this lifecycle model assumes the City only performs maintenance on the Pine Grove Cemetery. O&M costs for 2023 were identified for Pine Grove Cemetery and have been inflated with an assumed average annual inflation rate of 3%.

The technical LOS includes maintaining the current assets in poor or better condition (83%). From the lifecycle model, the percentage of Cemeteries assets in poor or better condition is consistently 100% throughout the next 10-years due to the EUL of the assets.

## Cemeteries

**Figure 5-4** shows an overview of the condition of Cemeteries over the next 10 years based on the lifecycle model.

**Figure 5-4: Condition Overview by Year Based on Lifecycle Model – Cemeteries**



# City of Kingston 2024 Asset Management Plan

Executive  
Summary and  
Introduction

Volume 1  
Infrastructure,  
Transportation,  
Transit, &  
Emergency  
Services

Volume 2  
Corporate  
Services &  
Parking  
Operations

Volume 3  
Community  
Services

Volume 4  
Parks, Parkland,  
& Trails

Volume 5  
Police,  
Libraries, City  
Real Estate &  
Environment



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**Appendices (Provided in Separate Document)**

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- A - Expected Useful Life and Replacement Cost Sources
- B - Risk Variables

Acronyms

# Acronyms

Acronym	Definition
AMP	Asset Management Plan
BCA	Building Condition Assessment
EUL	Expected Useful Life
FCMS	Facilities Management & Construction Services
GHG	Greenhouse Gas
IS&T	Information Technology
IT	Information Systems & Technology
KFPL	Kingston Frontenac Public Library Board
KM	Kilometre
KP	Kingston Police
LOS	Levels of Service
OLS	Our Livable Solutions
PDU	Power Distribution Unit
PSD	Public Sector Digest
RUL	Remaining Useful Life
SOLI	State of the Local Infrastructure
UPS	Uninterruptible Power Supply



## 1.0 Overview

The asset management project includes 21 service areas, covering all assets owned by the City of Kingston (City) that are not already included in other Asset Management Plans (AMP). This is the first iteration of an AMP for these service areas. Given the extensive range of assets included in the project, the plan is presented in the following six documents:

- Executive Summary and Introduction
- Volume 1: Infrastructure, Transportation, Transit, & Emergency Services
- Volume 2: Corporate Services & Parking Operations
- Volume 3: Community Services
- Volume 4: Parks, Parkland, & Trails
- Volume 5: Police, Libraries, City Real Estate & Environment

## Overview

The Introduction document presents key asset management principles and an overview of how each service area will be presented in its own chapter with the following sections: State of the Local Infrastructure (SOLI); Levels of Service (LOS); Risk Assessment; and Asset Management Strategy. The Introduction also includes a section on Growth and a Roadmap with Next Steps. The following sections are included in the Introduction document:

- Section 1.1 Asset Management
- Section 1.2 Scope of Assets
- Section 1.3 Alignment with Strategic Plan, Policy, and Regulation
- Section 1.4 Governance and Relationship to Other Planning Documents
- Section 1.5 Growth
- Section 1.6 Overview of the AMP
  - State of the Local Infrastructure
  - Levels of Service
  - Risk Assessment
  - Asset Management Strategy
- Section 1.7 Roadmap with Next Steps

Overview

1.1 Scope of Assets in Volume 5

The service areas included in **Volume 5: Police, Libraries, City Real Estate & Environment** are: Police Services; Library Services; and City Real Estate & Environment. See **Table 1-1** for the respective asset classes for each service area and the relevant chapter.

**Table 1-1: Service Areas included in Police, Libraries, City Real Estate & Environment**

Service Area	Asset Classes	Report Chapter
Police Services	<ul style="list-style-type: none"> <li>• Facilities</li> <li>• Fleet Assets</li> <li>• Specialized Equipment</li> <li>• Information Technology &amp; Telecommunications</li> </ul>	Chapter 2.0
Library Services	<ul style="list-style-type: none"> <li>• Facilities</li> <li>• Fleet Assets</li> <li>• Collections</li> <li>• Other Equipment</li> <li>• Information Technology</li> </ul>	Chapter 3.0
City Real Estate & Environment	<ul style="list-style-type: none"> <li>• Sleeping Cabins</li> <li>• Other City-Owned Land Assets</li> <li>• Environmental Remediation Infrastructure</li> </ul>	Chapter 4.0

**Note:** Facilities were included in the 2023 Facilities AMP developed by the City’s Facilities Management & Construction Services (FMCS) department in consultation with GM BluePlan Engineering Limited. As a result, the details on the facilities documented for service areas in this AMP are limited to basic inventory information as reported in the 2023 Facilities AMP.

Overview

1.2 Asset Hierarchy

The asset hierarchy that was generated and used for the City’s assets is shown in **Figure 1-1**. The asset group (level 1) is shown in the blue box, the three service areas (level 2) are shown in the light blue boxes, the asset classes are shown in bold (level 3), and where applicable, the asset sub-classes are shown in regular text (level 4).

**Figure 1-1: Asset Hierarchy for Police, Libraries, City Real Estate & Environment**



## Overview

### 1.3 Asset Inventory and Replacement Costs

An asset inventory was generated for all assets included in this AMP using Microsoft Excel. The inventory organizes assets using the various levels of the asset hierarchy and acts as a central repository for the asset data that can be used to inform asset management planning. It is recommended that the City continually updates the asset information stored within the asset inventory to facilitate asset management planning based on reliable data.

Where replacement costs were provided, the values were inflated based on the Bank of Canada Consumer Price Index (CPI) to estimate the replacement cost in 2023 dollars. If replacement costs were not provided, Dillon leveraged a unit cost model to assign replacement costs based on unit cost estimated for 2023. It is recommended that unit prices should be reviewed annually by the city based on costs observed from local suppliers and contractors.

### 1.4 Establishing Levels of Service

There were four LOS workshops that were held with staff. The service categories for this volume were covered in Workshop 2 and 3.

- Workshop 2 was held on November 10, 2023, and included the stakeholders for Police, Information Systems & Technology and Parking Equipment, Lots, and Structures service categories.
- Workshop 3 was held on November 21, 2023, and included the stakeholders for Public Art and Heritage, Fire and Rescue, Rideaucrest, Library Services, Real Estate and City-Owned Land Assets.

There were City staff from each service area that attended the workshop. The list of attendees is summarized in **Table 1-2**.

Overview

**Table 1-2: Workshop Attendees - Police, Libraries, City Real Estate & Environment**

Service	Name	Role
Police Services	Scott Fraser	Chief of Police
Police Services	Greg Sands	Inspector, Patrol and Communications
Police Services	Scarlet Eyles	Director of Finance and Procurement
Library Services	Nicole Charles	Director, Facilities and Technology
Library Services	Laura Carter	Chief Librarian/ Chief Executive Officer
Library Services	Tim Stranak	Manager of Facilities
Real Estate	Brandon Forest	Director of Business, Real Estate, and Environment
Community Housing	Rachel Mcgeachie	Project Manager Housing and Homelessness

**1.5 Growth Related Impacts on Lifecycle of Assets**

As the City continues to expand, there are impacts to existing service levels and assets based on these future needs. The growth-related assumptions and potential impact on the lifecycle of the assets is shown in **Table 1-3**.



Overview

Table 1-3: Growth Related Impacts on Lifecycle of Assets

Service Category	Growth Impact Assumptions	How Assumptions Relate to Lifecycle of Assets
Police Services	<ul style="list-style-type: none"> <li>• Increase in service demands due to increased operating hours, or capacity covering greater distances</li> <li>• Increases to internal capacity (staffing) required to maintain equipment</li> </ul>	<ul style="list-style-type: none"> <li>• Potential increase in capital expenditures for the purchase of additional assets to meet service needs</li> <li>• Potential increase in operational costs to maintain fleet assets</li> </ul>
Library Services	<ul style="list-style-type: none"> <li>• Increase in service demands to operation or capacity of the services</li> <li>• Higher risk of cyberattacks due to increased number of assets required to provide service</li> </ul>	<ul style="list-style-type: none"> <li>• Potential increase in capital expenditures for facility services and maintenance</li> <li>• Potential increased operational costs due to increase in collection and network size</li> </ul>
City Real Estate and Environment	<ul style="list-style-type: none"> <li>• Increased development will occur as a result of continued growth</li> </ul>	<ul style="list-style-type: none"> <li>• Potential increase in operational costs due to an increase in the overall real estate portfolio</li> </ul>



## 2.0 Police Services

From humble beginnings and representing one of the oldest Canadian police forces in existence, members of the Kingston Police (KP) have established a long and proud tradition of serving the Kingston community since 1841. As outlined in their Strategic Plan 2023 to 2026 they serve to support and protect the safety of everyone in the community. To carry out their services, the Kingston Police operates a diverse range of assets including facilities, vehicles, specialized equipment, and information technology. The following section of the AMP summarizes assets inventoried for the Police Services and applies key asset management principles in accordance with the requirements of O. Reg. 588/17: Asset Management Planning for Municipal Infrastructure.

## Police Services

It is important to note that the KP facilities were included in the 2023 Facilities AMP developed by the City's Facilities Management & Construction Services (FMCS) department in consultation with GM BluePlan Engineering Limited. As a result, the details on the police facilities in this AMP are limited to basic inventory information. The City's FMCS department is comprised of three divisions: Facilities Management, Energy & Asset Management, and Facilities Construction. FMCS maintains the City's diverse portfolio of municipal buildings, thereby supporting departments and agencies such as Kingston Police in providing extensive front-line services to the community. This centralized, shared services collaborative approach has allowed the integration of energy management and sustainability considerations along with other aspects of facilities maintenance, asset management, space planning, design, construction, and demolition across all areas of the City.

For further detail on the facilities including data confidence and lifecycle modeling, please refer to the 2023 Facilities AMP.

**Note on Scope:** At the time of this AMP, no data was available for two asset classes (i.e., Specialized Equipment and Information Technology & Telecommunications), and as a result, these asset classes are not included in this AMP. It is recommended that the City further develops an inventory of these asset classes to be considered in subsequent iterations of this AMP. These discussions have already started with the Director of Finance for Police Services and planning is underway to be able to provide an updated asset registry in 2025.

## 2.1 State of the Local Infrastructure

### 2.1.1 Asset Inventory and Valuation

Kingston Police oversees many vehicles and fleet equipment assets in addition to their facilities and specialized technology. For inventory purposes, the KP asset classes have been further divided into applicable asset types. The asset classes, asset type, a count of assets therein, and the total replacement cost (in 2023 dollars) are show in **Table 2-1**.The total replacement cost (2023 dollars) is estimated at approximately **\$91.3 million** for the **133 assets** included in the inventory.

Police Services

Table 2-1 Notes

<sup>1</sup> As reported in Facilities AMP (2023)

Table 2-1: Inventory Summary by Asset Type - Police Services

Asset Class	Asset Type	Asset Count	Total Replacement Cost (2023)
Facilities <sup>1</sup>	Buildings	2	\$81,000,000
Fleet Assets	Light Vehicle – Under 1 Ton	122	\$9,172,500
Fleet Assets	Mobile Response Unit	1	\$972,500
Fleet Assets	Motorcycle	2	\$64,300
Fleet Assets	Trailer	4	\$100,000
Fleet Assets	Utility Vehicle/All-Terrain Vehicle (ATV)	2	\$39,600
<b>Overall</b>	<b>Not Applicable (N/A)</b>	<b>133</b>	<b>\$91,348,900</b>

2.1.2 Asset Age Summary

The average age, average condition, expected useful life, and average remaining useful life of the assets pertaining to Police Services are summarized in **Table 2-2**. The overall average age of KP assets is seven years and the average remaining useful life is three years. Refer to the 2023 Facilities AMP for details on the Police Services facilities.

**Note:** In a future update of the AMP, a distinction will be made within the Light Vehicle asset type between front-line patrol vehicles and other support and administrative Fleet Assets deployed in operation.

Police Services

**Table 2-2: Average Age, Average Condition, Expected Useful Life, and Average Remaining Useful Life - Police Services**

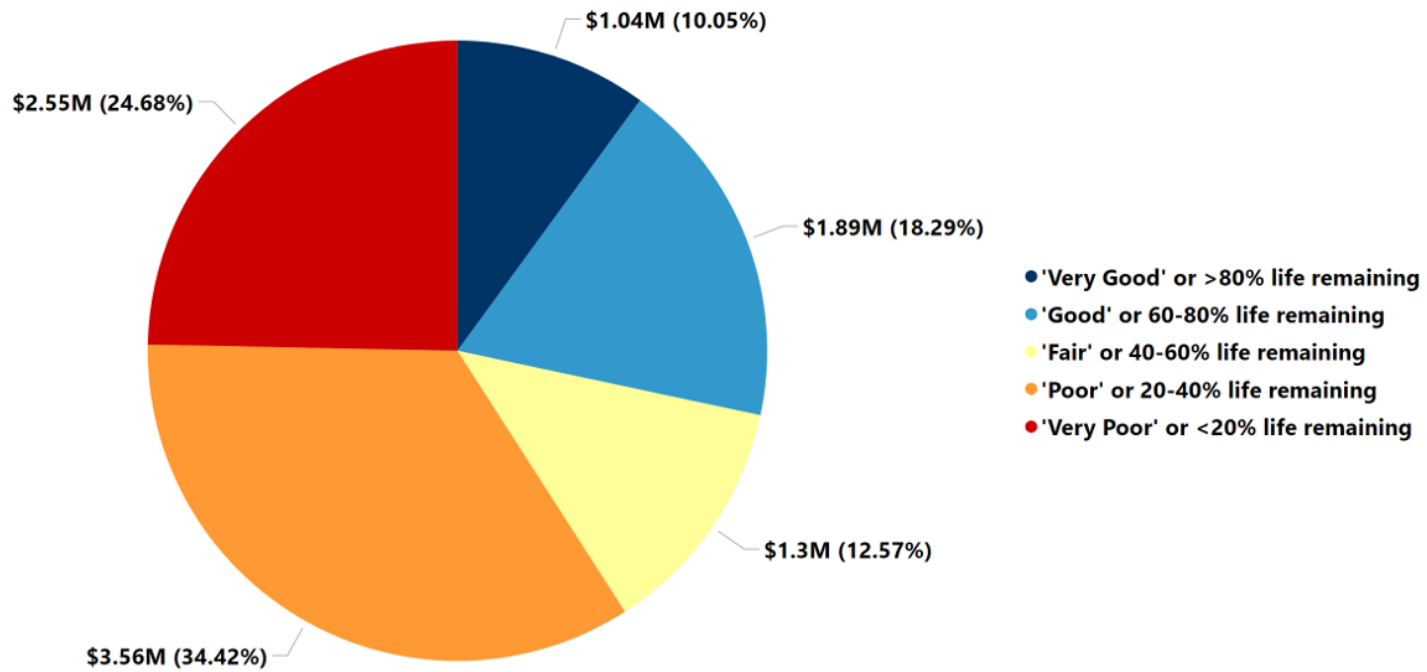
Asset Class	Asset Type	Average Age (Years)	Average Condition Grade	Expected Useful Life (Years)	Average Remaining Useful Life (Years)
Fleet Assets	Light Vehicle	7	Fair	10	3
Fleet Assets	Mobile Response Unit	10	Poor	15	5
Fleet Assets	Motorcycle	10	Very Poor	10	1
Fleet Assets	Trailer	9	Fair	15	6
Fleet Assets	Utility Vehicle/ATV	12	Very Poor	10	0
<b>Overall</b>	<b>N/A</b>	<b>7</b>	<b>Poor</b>	<b>10 to 15</b>	<b>3</b>

**2.1.3 Asset Condition**

An overall condition summary for KP assets by replacement cost (in 2023 dollars) is shown in **Figure 2-1**. About 40.9% of the assets are in very good to fair condition.

Police Services

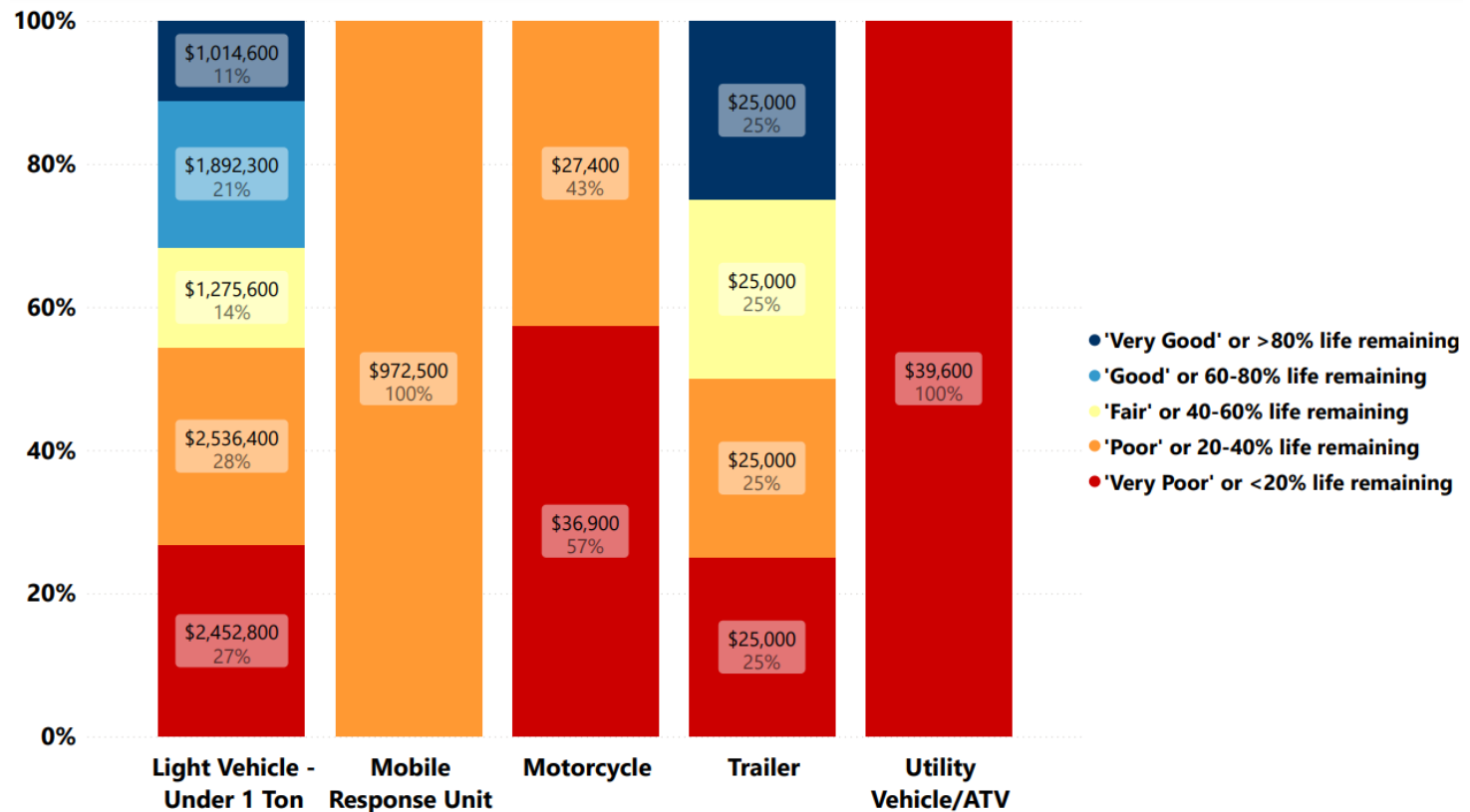
Figure 2-1: Condition Summary by 2023 Replacement Cost - Police Services



A condition summary for the Fleet Assets is provided in **Figure 2-2** by asset type and replacement cost (in 2023 dollars). In the absence of condition assessment data, the condition of the assets has been primarily determined based on age and EUL.

Police Services

Figure 2-2: Condition Summary by Asset Type and 2023 Replacement Cost - Police Services (Fleet Assets)



Based on Figure 14 in the 2023 Facilities AMP, approximately 100% of the total replacement cost of KP facilities is attributed to building and site elements that are in good condition. Further details are included in the Facilities AMP.

## Police Services

### 2.1.4 Data Sources and Confidence

The asset data for KP (Fleet Assets) is maintained by the City in a web-based fleet and equipment management solution from AssetWorks called FleetFocus M5 and served as the main data source of Fleet Assets and Equipment for this AMP. The City has dedicated staff who regularly update the inventory data for Police Services assets hosted within the City’s Enterprise Fleet Management Information System (FMIS). This suggests that the data source can be assumed to be reliable.

Data confidence can be estimated based on the confidence level of various qualifiers and can be presented on a scale from 0% (low) to 100% (high), as shown in **Table 2-3**. The qualifiers chosen for evaluation are specifically targeted for estimating overall confidence of condition reporting within the SOLI.

For discussion on data confidence related to police facilities, please refer to the Facilities AMP (2023).

**Table 2-3: Data Confidence Scale**

Confidence Level	Low	Low/ Moderate	Moderate	Moderate/ High	High
Average of Qualifiers	0% to 19%	20% to 39%	40% to 59%	60% to 79%	80% to 100%

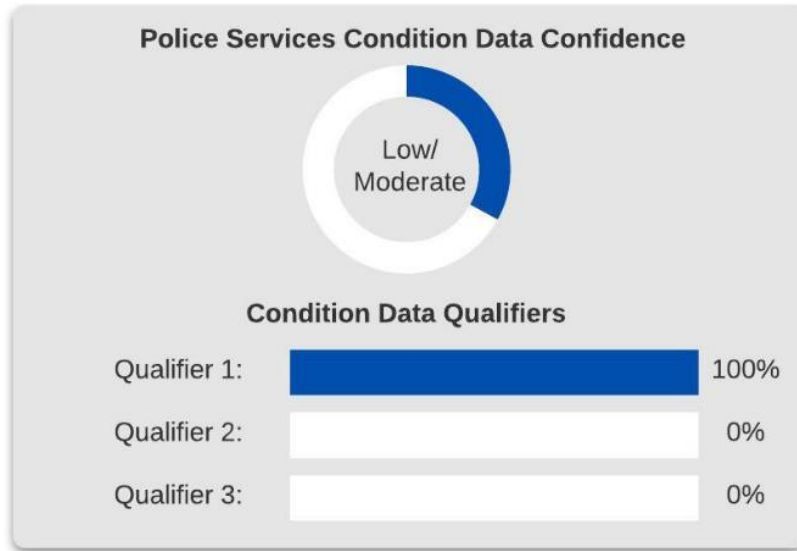
Assuming the data source is reliable, the following qualifiers were considered to estimate data confidence regarding the data utilized in the creation of this SOLI report:

- **Qualifier 1:** The percentage of assets in the asset inventory where construction, installation, or acquisition years are documented (100%);
- **Qualifier 2:** The percentage of assets in the asset inventory that have condition assessment data documented (0%); and,
- **Qualifier 3:** The percentage of the estimated overall replacement value, in 2023 dollars, attributed to assets in the asset inventory with documented condition assessment data (i.e., condition is not solely age-based) (0%).



Police Services

Figure 2-3: SOLI Report Data Confidence - Police Services



As summarized in **Figure 2-3**, the overall asset condition data confidence for KP assets is estimated as Low/Moderate. Presently, all asset conditions for KP Fleet Assets are age-based. Data confidence can be increased by improving the documentation of condition assessment data. For Fleet Assets, this may include adding an additional attribute within FleetFocus to track assigned asset condition ratings which can be assigned or updated when staff perform regularly scheduled maintenance.

## Police Services

### 2.2 Levels of Service

The KP Services Board has developed the Kingston Police Strategic Plan 2023 to 2026 which helps direct the goals of the KP Service. Within the strategic plan, there are five prioritized strategic objectives:

1. Reduce the weighted crime rate by 10 percent, particularly in the downtown core.
2. Improve the KP Service's clearance rate for criminal investigations.
3. Enhance relationships and trust with the Kingston community, with a particular focus on marginalized communities.
4. Improve the morale and retention of members of the KP Service.
5. Increase the efficiency and effectiveness of the KP Service by implementing new technologies and streamlining processes.

Each of these objectives have their own action plans, community safety and statistical drivers, and key performance indicators. These objectives are for the overall services being provided by KP and were considered when reviewing the community Levels of Service (LOS) for the assets in this AMP.

During the workshop, it was decided that Quality and Responsiveness were the key attributes in gauging the performance of fleet, specialized equipment, and information technology assets while the facilities were included under the 2023 Facilities AMP (under a separate cover). **Table 2-4** outlines the current community LOS for KP Services.

Police Services

Table 2-4: Community LOS - Police Services

LOS Parameter	LOS Statement	Performance Measure	Current LOS (2023)
Quality	Fleet, specialized equipment, and information technology assets are kept in good working condition.	Percentage of assets that are in Poor or better condition.	68%
Reliability	Providing professional and responsive services to all residents, businesses, and visitors.	Average response time in minutes.	10 minutes and 34 seconds

The Kingston Police operates under legislative requirements set by multiple governing bodies. This means they must follow several laws and regulations which guide their technical LOS provided to the community. Below are some key requirements that influence the daily operations:

- **Community Safety and Policing Act (CSPA):** This provincial law sets the standards for how police services in Ontario are structured, governed, and operate.
- **Criminal Code of Canada:** This federal law defines criminal offences and sets out the procedures for investigating and prosecuting them.
- **Highway Traffic Act (HTA):** This provincial law outlines the rules of the road and the enforcement powers of police officers in relation to traffic violations.
- **Provincial Offences Act (POA):** This provincial law covers minor offences that are not considered criminal but still carry penalties.
- **Workplace Health and Safety Act (WHSa):** This provincial law ensures a safe work environment for police officers and staff.

## Police Services

- **Accessibility for Ontarians with Disabilities Act (AODA):** This provincial law requires the police service to provide services in a way that is accessible to people with disabilities.
- **Canadian Charter of Rights and Freedoms:** This federal document guarantees certain fundamental rights and freedoms that police officers must respect in their interactions with the public.
- **Youth Criminal Justice Act (YCJA):** This federal law outlines the unique principles and processes that apply when dealing with young people who have committed crimes.

### 2.3 Risk Assessment

The risk scores were calculated using the risk methodology and approach outlined in the Introduction materials which were provided under a separate document. **Table 2-5** summarizes the risk factors for the Police Services assets.

**Table 2-5: Risk Factors - Police Services**

Factors	Risk Ratings
<b>A - Condition</b>	The condition of the assets was determined either by visual or age-based and can be found in the SOLI section of the AMP.
<b>B - Performance</b>	The performance of the Fleet Assets was identified as being “usually reliable” and assigned a score of 3 for calculating risk score.
<b>C - Climate Change</b>	The climate change ratings were determined at the service category level by identifying climate change hazard interactions. The Fleet Assets were identified as a “high” risk and assigned a rating of 5 for calculating the risk score.
<b>D - Impact</b>	The impact of the asset classes was identified as "moderate" impact and assigned a score of 1 for calculating risk score.
<b>E - Importance</b>	The Fleet Asset class was identified as “high” importance and assigned a score of 3 when calculating risk.

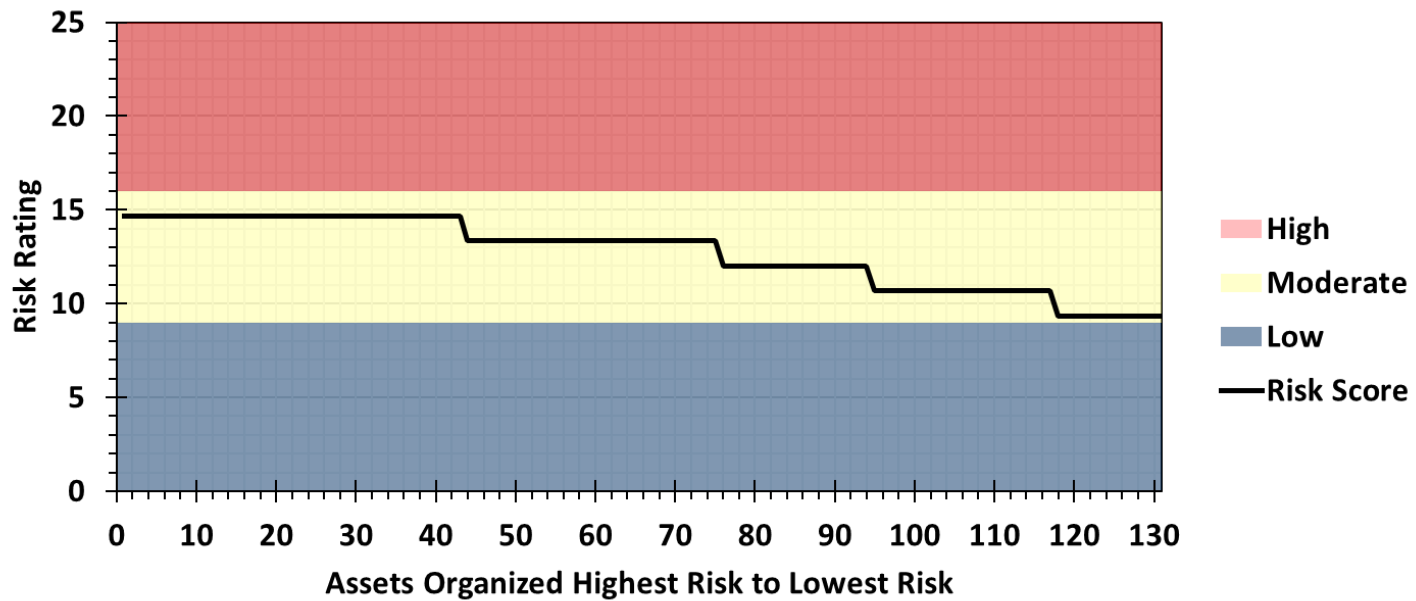
## Police Services

The individual risk ratings were used in calculating the risk score for each of the assets.

### 2.3.1 Risk Profile

The Risk profile of the Fleet Assets is displayed in **Figure 2-4**. All 131 assets tracked in the asset inventory are considered as Moderate risk.

**Figure 2-4: Risk Profile - Police Services (Fleet Assets)**



Police Services

2.4 Asset Management Strategy

2.4.1 Lifecycle Activities

The lifecycle activities considered include:

- **Non-Infrastructure Solutions:** Actions or policies that can lower costs and extend useful lives.
- **Maintenance Activities:** Regularly scheduled inspection and maintenance, or more significant repair and activities associated with unexpected events.
- **Renewal / Rehabilitation Activities:** Significant repairs designed to extend the life of the asset.
- **Replacement / Construction Activities:** Activities that are expected to occur once an asset has reached the end of its useful life and renewal/rehabilitation is no longer an option.
- **Disposal Activities:** Activities associated with disposing of an asset once it has reached the end of its useful life or is otherwise no longer needed.
- **Expansion / Growth / Service Improvement Activities:** Planned activities required to extend services to previously unserved areas or expand services to meet growth demands.

**Table 2-6** describes the lifecycle activities that can be implemented within the asset management strategy for Kingston Police assets. The lifecycle activities presented below are existing activities performed by the City, identified during a workshop with City staff held in February 2024.

**Table 2-6: Lifecycle Activities - Police Services**

Lifecycle Activity Type	Description of Activity	Frequency / Timing
Maintenance Activities	Regular scheduled maintenance and inspections of fleet	Based on manufacturer's recommendations
Maintenance Activities	Regular maintenance and inspections of buildings	Ongoing

**Police Services**

<b>Lifecycle Activity Type</b>	<b>Description of Activity</b>	<b>Frequency / Timing</b>
Renewal / Rehabilitation Activities	Fleet engine and/or transmission replacements	As Needed
Renewal / Rehabilitation Activities	Review opportunities to re-purpose vehicle outfitting and attachments past the lifecycle of the original asset it was installed on	As Needed
Replacement / Construction Activities	Replacement at Expected Useful Life (EUL)	End of EUL or at pre-defined usage limit (kilometres)
Replacement / Construction Activities	Re-deploy fleet based on mileage travelled to other service areas within the department to optimize lifecycle planning (where applicable)	At pre-defined mileage or age
Disposal Activities	Public auction of fleet administered by a Third-Party	At pre-defined mileage or age
Expansion / Growth / Service Improvement Activities	Business Cases to support the addition of Fleet Assets. Guided by: <ul style="list-style-type: none"> <li>• Kingston Police Strategic Plan (2023 to 2026)</li> <li>• Green Fleet Strategy</li> <li>• Watson Population Growth Study &amp; Council Adoption</li> </ul>	As required
Expansion / Growth / Service Improvement Activities	Electrification of fleet vehicles	Planned trials / feasibility studies as required



#### 2.4.2 Funding the Lifecycle Activities-Police Services

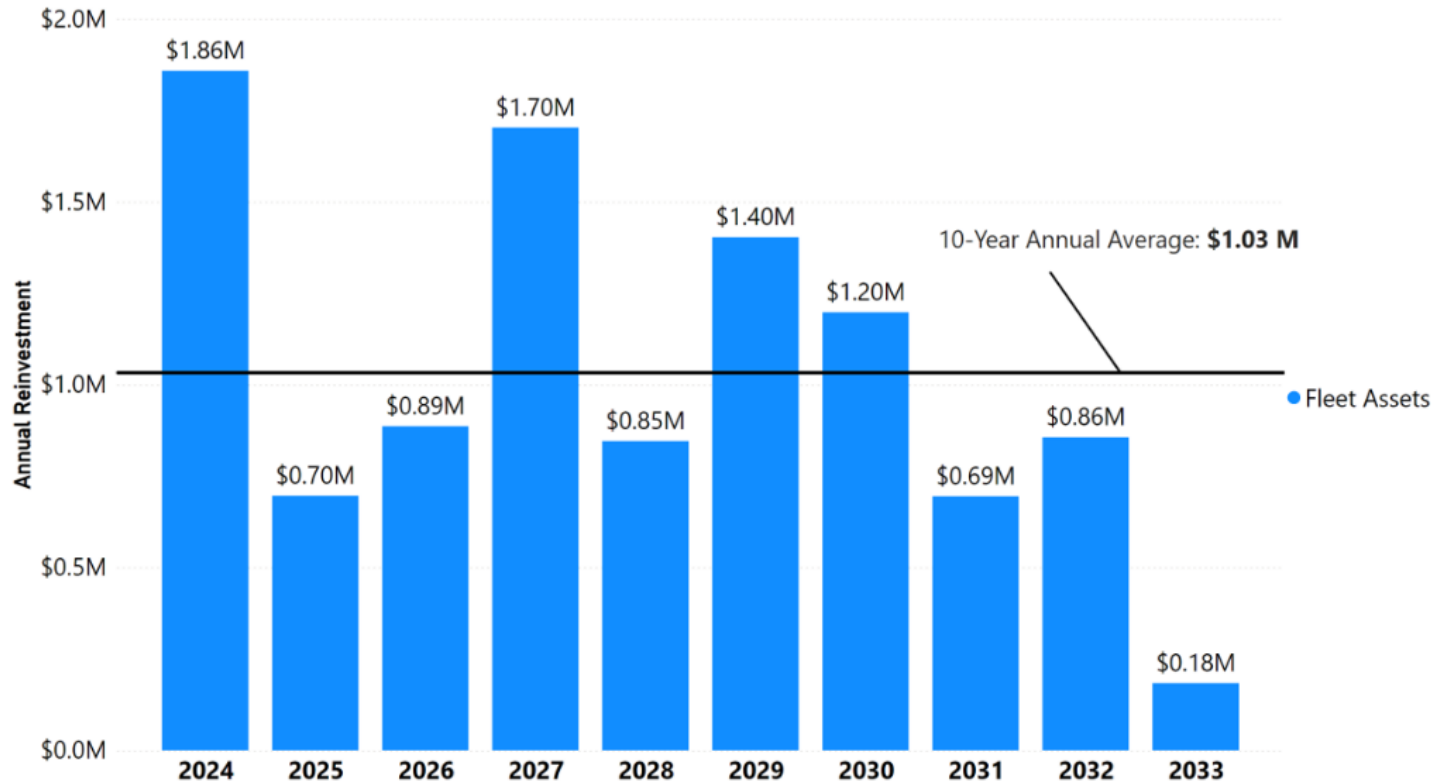
Lifecycle modeling allows for the City to understand the future reinvestment needs of their existing assets by generating a theoretical asset replacement forecast that considers available asset inventory data. The age, EUL, replacement cost, condition, and risk score of each asset can be leveraged within the lifecycle model to proactively plan for reinvestment over a period of time. Asset replacement forecasts within this subsection estimate the required reinvestment for Police Services assets over the next 10 years based on available asset inventory data.

There is a total of approximately **\$10.3 million** to be reinvested into the KP Fleet Assets over the next 10 years. This amount excludes reinvestment associated with facilities and specialized equipment. This translates an annual average of approximately **\$1.03 million** per year over the 10-year period, as shown in **Figure 2-5**. For details regarding police facilities, refer to the Facilities AMP (2023).



Police Services

Figure 2-5: 10-Year Capital Reinvestment Needs - Police Services (Fleet Assets)

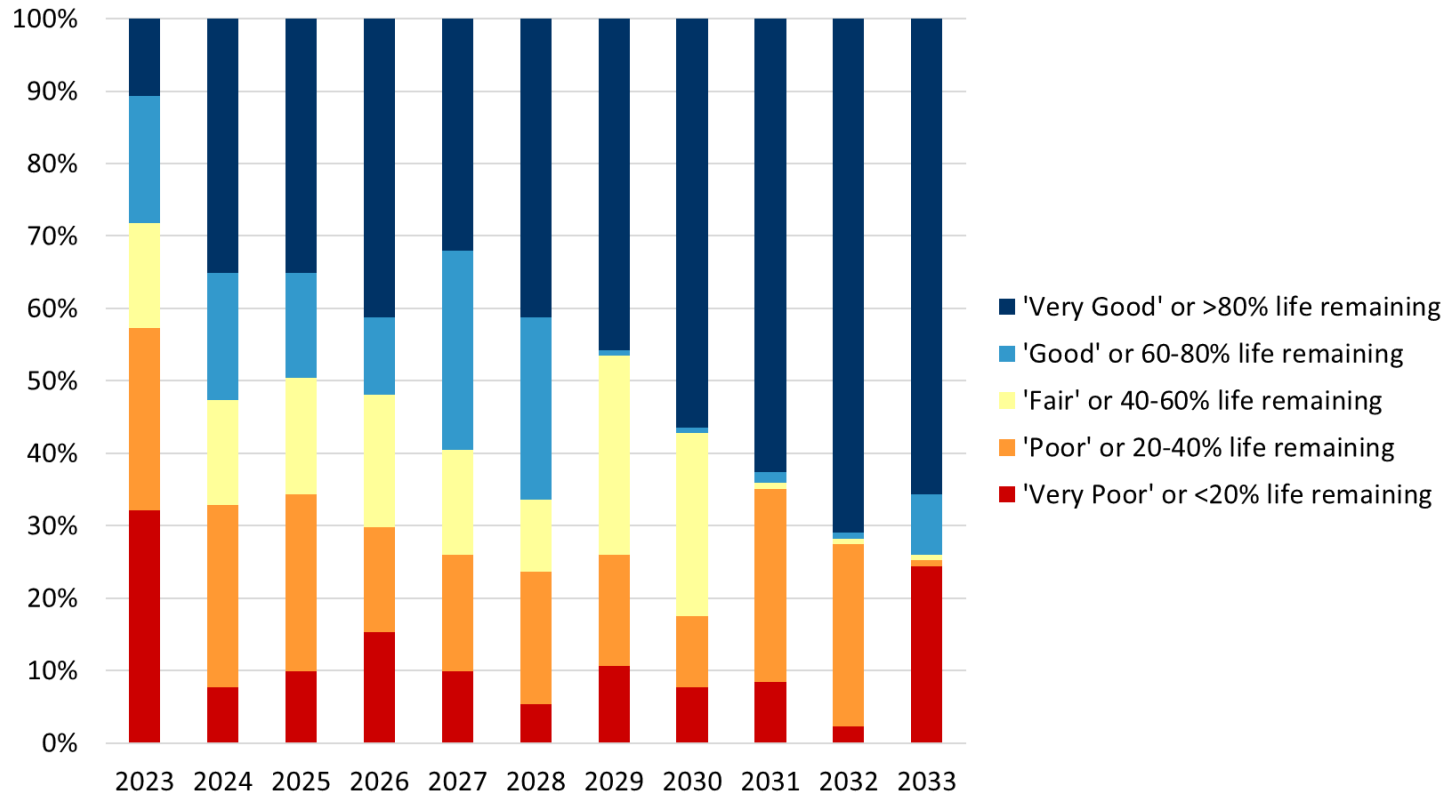


It is important to note that forecasting in this lifecycle model relies heavily on age and EUL to determine renewal or replacement needs. Tracking of condition data for Fleet Assets by staff will be essential for refining forecasted expenditures in the future. The LOS includes maintaining the current percentage of assets in poor or better condition (68%). From the lifecycle model, the percentage of Police Services assets in poor or better condition fluctuates throughout the next 10 years due to the EUL of the assets. Based on the EUL (10 and 15 years) and the age of the Fleet Assets, the forecasted percentage of assets in poor or better condition reaches a high of 98% in 2032 and eventually finishes at 76% in 2033.

Police Services

Figure 2-6 shows an overview of the condition of Police over the next 10 years based on the lifecycle model.

Figure 2-6: Condition Overview by Year Based on Lifecycle Model - Police Services (Fleet Assets)





### 3.0 Library Services

Kingston Frontenac Public Library (KFPL) is a progressive, innovative, sixteen branch library system with a mission to provide exceptional customer service within the context of a warm and welcoming environment. To carryout services to the community, guided by the Public Libraries Act, KFPL owns and/or operates a range of assets including Facilities, Fleet Vehicles, Equipment, Collections, and Information Technology hardware and software. This section of the AMP summarizes assets inventoried for KFPL and applies key asset management principles in accordance with the requirements of O. Reg. 588/17: Asset Management Planning for Municipal Infrastructure.

The City's FMCS department maintains the City's diverse portfolio of municipal buildings, thereby supporting departments and agencies such as KFPL in providing extensive services to the community. This collaborative approach allows the integration of energy management and sustainability considerations along with other aspects of facilities maintenance such as asset management, space planning, design, construction, and demolition.

## Library Services

It is important to note that the library facilities were included in the dedicated 2023 Facilities AMP developed by the City's FMCS department in consultation with GM BluePlan Engineering Limited. As a result, the details on library facilities in this AMP are limited to basic inventory information. For further detail on the facilities including data confidence and lifecycle modeling, please refer to the 2023 Facilities AMP.

**Note on Scope:** At the time of preparing this AMP, data for Collections assets was limited to high-level summaries of pooled assets. As a result, the condition of these assets and the required reinvestment could not be determined. It is recommended that the City further develops an inventory for this asset class to be included in subsequent iterations of the AMP.

### 3.1 State of the Local Infrastructure

#### 3.1.1 Asset Inventory and Valuation

The assets maintained by Library Services support services to the community. **Table 3-1** summarizes the asset inventory for Library Services by asset class, asset type, asset count, and total replacement cost (in 2023 dollars). It is important to note assets in the Collections, Furniture, Shelving, Information Technology, and Other Equipment asset classes have been pooled within the existing inventory data and counts in the table below reflect total asset quantities. The total replacement cost (2023 dollars) is estimated at **\$85.1 million** for the **338,422 assets** included in the inventory.

## Library Services

### Table 3-1 Notes

<sup>1</sup> As reported in Facilities AMP (2023)

**Table 3-1: Inventory Summary by Asset Class - Library Services**

Asset Class	Count	Total Replacement Cost (2023)
Facilities <sup>1</sup>	5	\$66,200,000
Fleet Assets	3	\$151,000
Collections	336,265	\$12,086,800
Custodial Equipment	21	\$84,900
Other Equipment	3	\$153,900
Automated Materials Handling	11	\$606,700
Furniture	1,205	\$1,707,200
Shelving	4	\$3,350,600
Information Technology	905	\$731,600
<b>Overall</b>	<b>338,422</b>	<b>\$85,072,700</b>

### 3.1.2 Asset Age Summary

**Table 3-2** summarizes the average age, the average condition, the expected useful life, and the average remaining useful life of KFPL assets. Details for the library facilities are included in the Facilities AMP (2023). The overall average age of KFPL assets is seven years and the average remaining useful life is 12 years.

## Library Services

**Table 3-2: Average Age, Average Condition, Expected Useful Life, and Average Remaining Useful Life - Library Services**

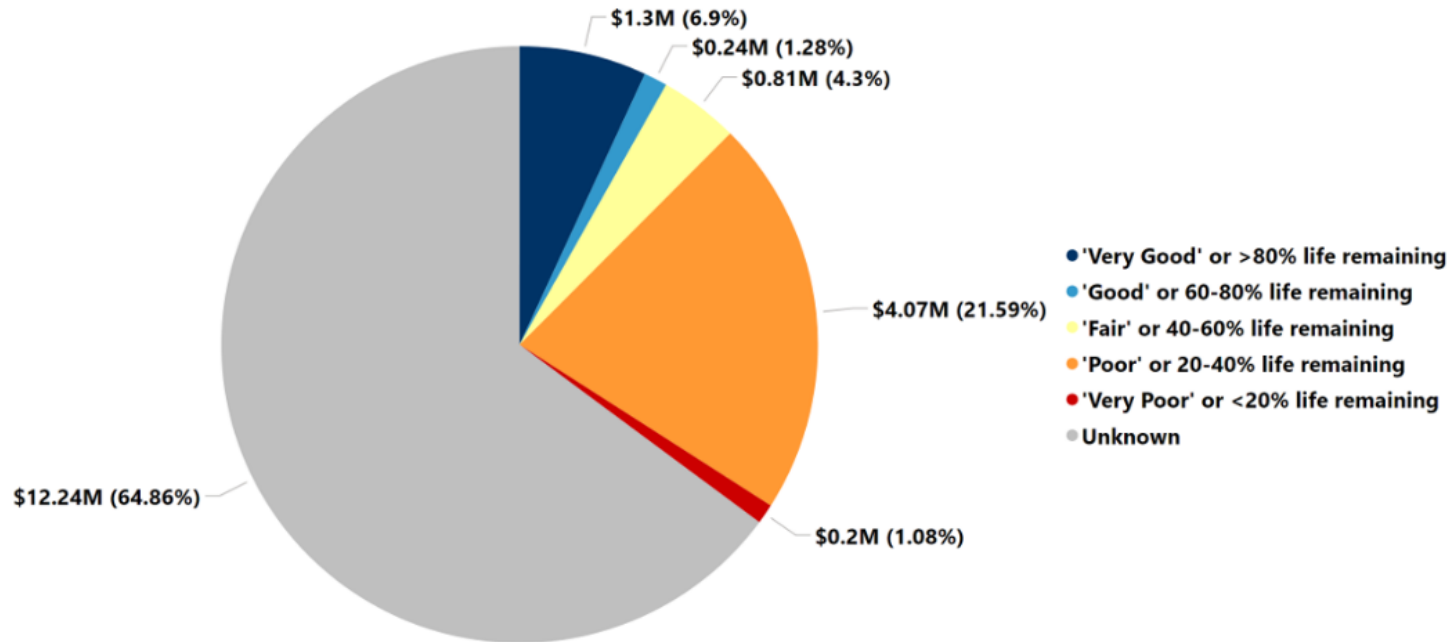
Asset Class	Average Age (Years)	Average Condition Grade	Expected Useful Life (Years)	Average Remaining Useful Life (Years)
Fleet Assets	8	Poor	10	3
Collections	Unknown	Unknown	7	Unknown
Custodial Equipment	8	Good	15	11
Other Equipment	Unknown	Unknown	15	Unknown
Automated Materials Handling	8	Good	10 to 15	7
Furniture	7	Very Good	15	13
Shelving	18	Fair	15	10
Information Technology	4	Fair	7	3
<b>Overall</b>	<b>7</b>	<b>Very Good</b>	<b>7 to 15</b>	<b>12</b>

### 3.1.3 Asset Condition

An overall condition summary for KFPL assets by replacement cost (in 2023 dollars) is shown in **Figure 3-1**. There is approximately 12.4% of the assets that are in very good to fair condition, while 64.9% of the assets with an unknown condition.

## Library Services

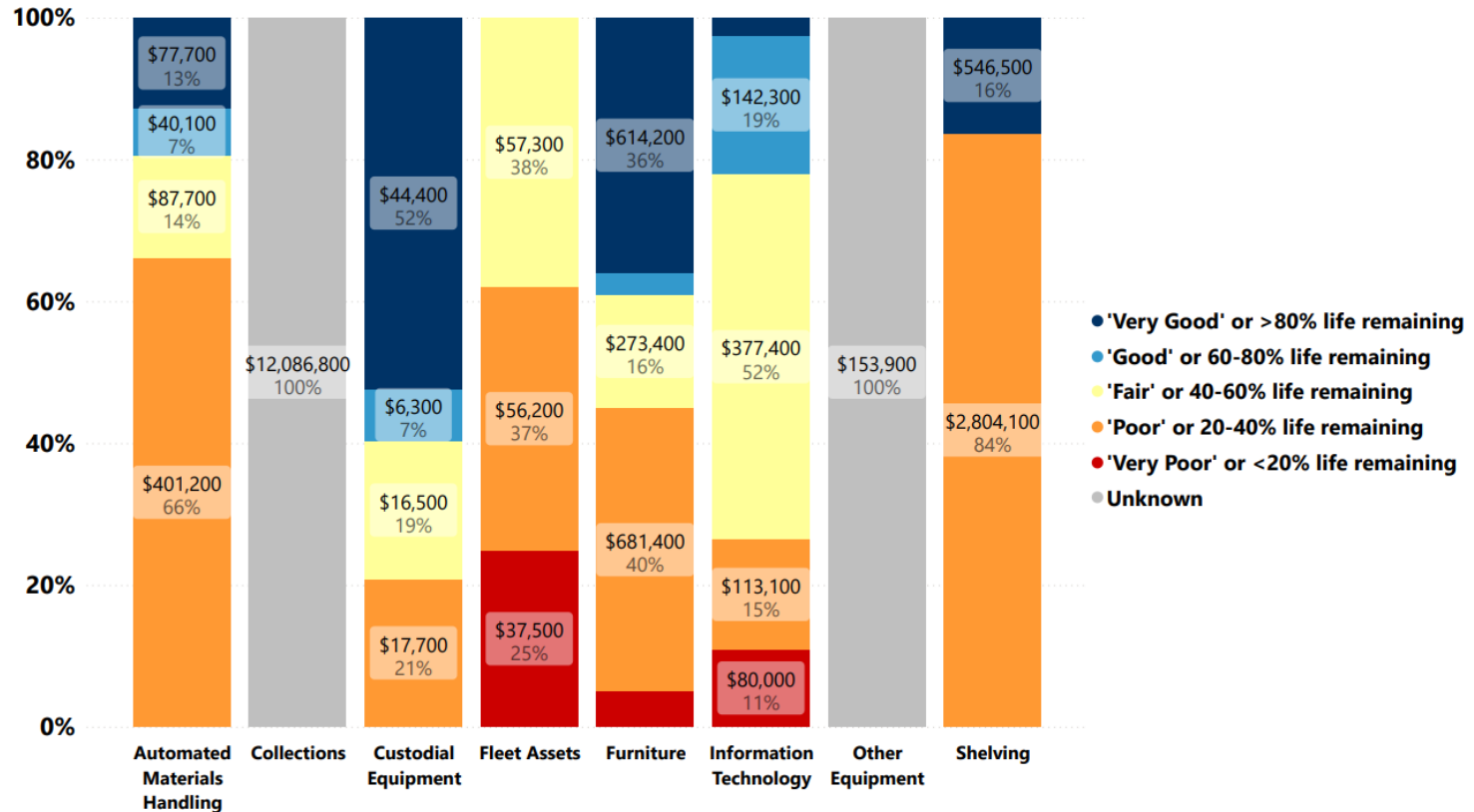
Figure 3-1: Condition Summary by 2023 Replacement Cost – Library Services



A condition summary for Library Services assets is provided in **Figure 3-2** by asset class and replacement cost (in 2023 dollars). With limited condition assessment data, asset conditions have been primarily determined based on age and EUL.

## Library Services

Figure 3-2: Condition Summary by Asset Class and Replacement Cost - Library Services



Based on Figure 14 in the Facilities AMP (2023), approximately 2% of the total replacement value of building elements in library facilities are in poor condition. The remaining building elements are evenly distributed between fair and good condition, representing approximately 98% of the total replacement cost. Additional details regarding the library facilities can be found in the Facilities AMP (2023).



## Library Services

### 3.1.4 Data Sources and Confidence

Asset data for Library Services is maintained by KFPL and data sources vary by asset class. Currently, there is no centralized repository for Library Services asset information. However, KFPL utilizes several platforms to manage their asset inventory. This includes the City’s web-based fleet and equipment management solution from AssetWorks called FleetFocus M5 for its fleet asset inventory and maintenance records, the V-Smart Integrated Library Systems Platform for its Collections, and the Halo ITSM Help Desk System for Information Technology assets. For other asset categories, KFPL staff compiled asset data for the inventories in 2023. Therefore, this AMP assumes that the data source is reliable.

Data confidence can be estimated based on the confidence level of various qualifiers and is presented on a scale from 0% (low) to 100% (high), as shown in **Table 3-3**. The qualifiers chosen for evaluation are specifically targeted to estimate the overall confidence in condition reporting within the SOLI. Applications and software assets are digital in nature and therefore have been excluded from consideration in the following data confidence estimation.

For discussion on data confidence related to library facilities, please refer to the Facilities AMP (2023).

**Table 3-3: Data Confidence Scale**

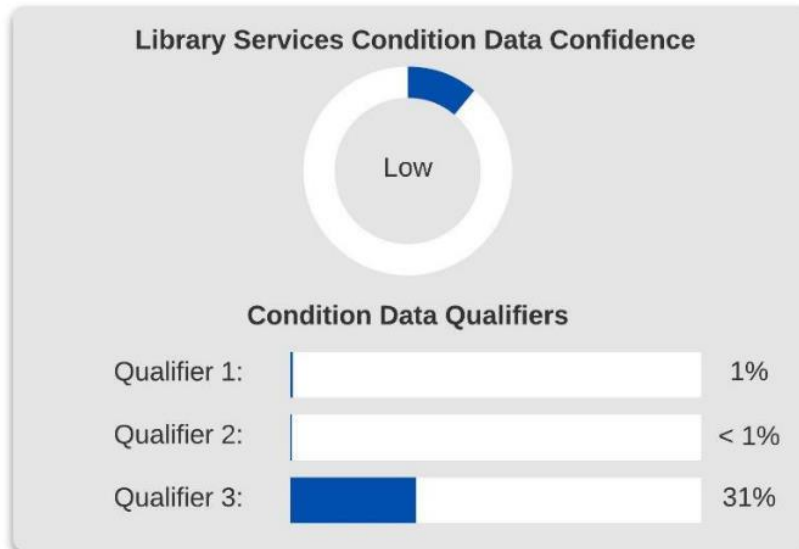
Confidence Level	Low	Low/ Moderate	Moderate	Moderate/ High	High
Average of Qualifiers	0% to 19%	20% to 39%	40% to 59%	60% to 79%	80% to 100%

Assuming the data sources are reliable, the following qualifiers were considered to estimate data confidence regarding the data utilized in the creation of this SOLI report:

## Library Services

- **Qualifier 1:** The percentage of assets in the asset inventory where construction, installation, or acquisition years are documented (1%);
- **Qualifier 2:** The percentage of assets in the asset inventory that have condition assessment data documented (< 1%); and,
- **Qualifier 3:** The percentage of the estimated overall replacement value, in 2023 dollars, attributed to assets in the asset inventory with documented condition assessment data (i.e., condition is not solely age-based) (31%).

**Figure 3-3: SOLI Report Data Confidence – Library Services**



As summarized in **Figure 3-3**, the overall asset condition data confidence for Library Services assets is estimated to be Low. Currently, the condition of Collections assets is unknown. Data confidence can be increased by improving the quality of the data and/or filling data gaps.

## Library Services

### 3.2 Levels of Service

In 2023, KFPL developed a Strategic Plan to help guide priorities and resources for a five-year planning cycle. The Strategic Plan has four strategic directions:

1. Facilitate energizing experiences rooted in inclusivity and diversity;
2. Optimize spaces and services;
3. Strengthen strategic partnerships and operations; and
4. Champion environmental accountability.

In addition to considering the strategic direction, the KFPL’s Senior Management team developed and established the community and technical LOS based on input from staff. Many of the core services offered by KFPL and referred to in the Strategic Plan rely on the facilities from which they operate, and on the availability of collection materials. **Table 3-4** and **Table 3-5** outline the current community and technical levels of service for Library Services.

**Table 3-4: Community LOS - Library Services**

LOS Parameter	LOS Statement	Performance Measure	Current LOS (2023)
<b>Capacity/ Availability</b>	Library Collections meet user needs and expectation.	Number of items per capita.	1.9
<b>Capacity/ Availability</b>	Library space meets the needs of the community.	Square foot per capita.	0.87

## Library Services

**Table 3-5: Technical LOS - Library Services**

LOS Parameter	LOS Statement	Performance Measure	Current LOS (2023)
Quality	Fleet, Equipment, Collections, and Information Technology assets are maintained in good working condition.	Percentage of assets that are in poor or better condition.	98%

### 3.3 Risk Assessment

The risk scores were calculated using the risk methodology and approach outlined in the Introduction materials which were provided under a separate document. **Table 3-6** summarizes the risk factors for the Library Services assets.

**Table 3-6: Risk Factors - Library Services**

Factors	Risk Ratings
<b>A - Condition</b>	The condition of the assets was determined either by visual or age-based and can be found in the SOLI section of the AMP.
<b>B - Performance</b>	The performance of all the asset classes, except Collections was identified as "always reliable" and assigned a score of 1 for calculating risk score. Collections was identified as "usually reliable" and assigned a score of 3 for calculating risk score.

Library Services

Factors	Risk Ratings
<b>C - Climate Change</b>	The climate change ratings were determined at the asset level by identifying climate change hazard interactions. The Fleet Assets were identified as a “high” risk and assigned a rating of 5 for calculating the risk score. The remaining asset classes were identified as a “low” risk and assigned a rating of 1 for calculating the risk score.
<b>D - Impact</b>	The impact for Automated Materials Handling and Shelving assets classes was identified as “high” impact and assigned a score of 2 for calculating risk score. The impact of the Fleet Assets, Custodial Equipment, and Furniture asset classes was identified as "moderate" impact and assigned a score of 1 for calculating risk score. The impact of the Collections, Information Technology, and Other Equipment asset classes was identified as "low" impact and assigned a score of 0 for calculating risk score.
<b>E - Importance</b>	A “high” importance rating was applied to the Fleet Assets, Custodial Equipment, and Shelving asset classes and a score of 3 was assigned for calculating risk score. The Automated Materials Handling asset class was assigned a “moderate” importance and given a score of 2. The Collections, Information Technology, Other Equipment, and Furniture asset classes was identified as “low” importance and assigned a score of 1 when calculating risk.

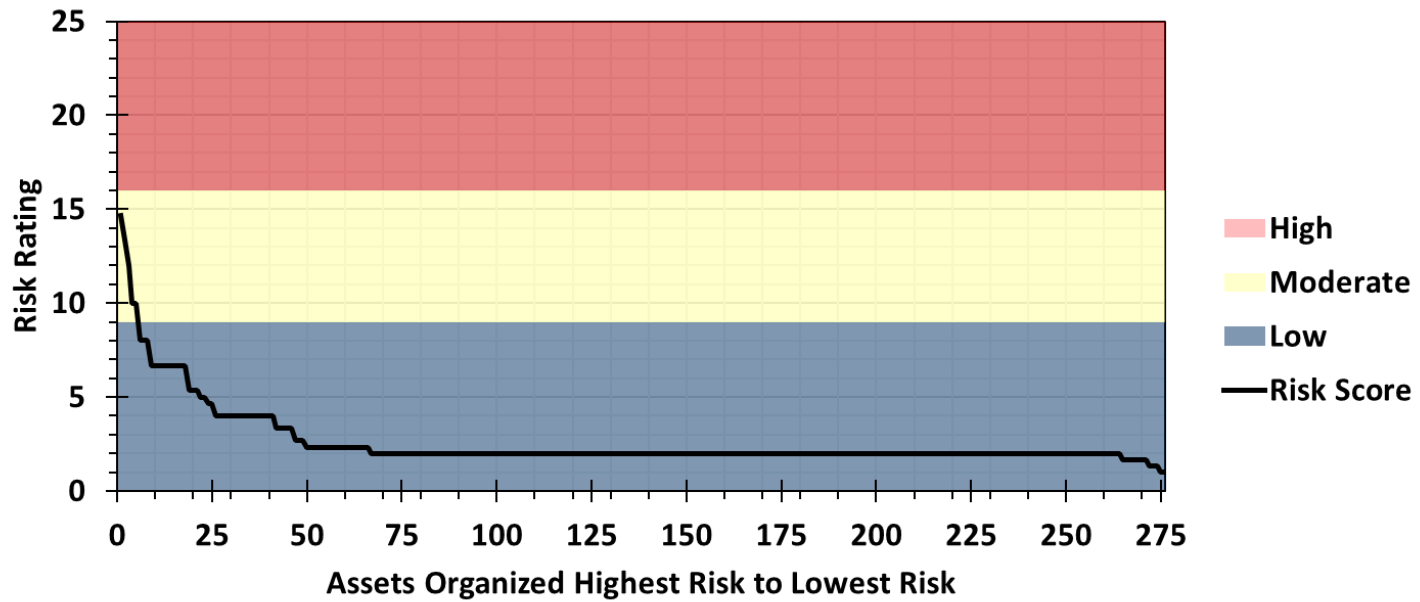
The individual risk ratings were used in calculating the risk score for each of the assets.

## Library Services

### 3.3.1 Risk Profile

The Risk profile of the Library Services assets is displayed in **Figure 3-4**. Based on the risk assessment, about 1.8% (five) of assets are considered Moderate risk and the remaining 98.2% (271) of assets tracked in the asset inventory are considered as Low risk. The assets considered to be Moderate risk include the three Fleet Assets and the Shelving units at the Pittsburgh and Isabel Turner library branches. It is important to note many assets are pooled within the existing inventory data.

**Figure 3-4: Risk Profile - Library Services**



## Library Services

### 3.4 Asset Management Strategy

#### 3.4.1 Lifecycle Activities

The lifecycle activities considered include:

- **Non-Infrastructure Solutions:** Actions or policies that can lower costs and extend useful lives.
- **Maintenance Activities:** Regularly scheduled inspection and maintenance, or more significant repair and activities associated with unexpected events.
- **Renewal / Rehabilitation Activities:** Significant repairs designed to extend the life of the asset.
- **Replacement / Construction Activities:** Activities that are expected to occur once an asset has reached the end of its useful life and renewal/rehabilitation is no longer an option.
- **Disposal Activities:** Activities associated with disposing of an asset once it has reached the end of its useful life or is otherwise no longer needed.
- **Expansion / Growth / Service Improvement Activities:** Planned activities required to extend services to previously unserved areas or expand services to meet growth demands.

**Table 3-7** describes the lifecycle activities that can be implemented within the asset management strategy for Library Services assets. The lifecycle activities presented below are existing activities performed by the City, identified during a workshop with City and Library staff in January 2024.

**Table 3-7: Lifecycle Activities - Library Services**

Lifecycle Type	Description of Activity	Frequency / Timing
Non-Infrastructure Solutions	Library Policies including Defined Procedures for Management and Regular Inspections of Buildings	Updated as needed
Non-Infrastructure Solutions	Review and update of 15-Year Capital Plan	Annually

## Library Services

Lifecycle Type	Description of Activity	Frequency / Timing
Non-Infrastructure Solutions	KFPL Strategic Plan	Approximately every 3 years
Maintenance Activities	Building Condition Assessments (facilitated by the FMCS Group)	As per policies
Maintenance Activities	Regular building maintenance	As needed
Replacement / Construction Activities	Replacement at EUL	End of EUL
Disposal Activities	Re-use of assets in a different location or for different staff as appropriate	As per disposal policy
Expansion / Growth / Service Improvement Activities	KFPL Facilities Plan	Approximately every 10 years

### 3.4.2 Funding the Lifecycle Activities

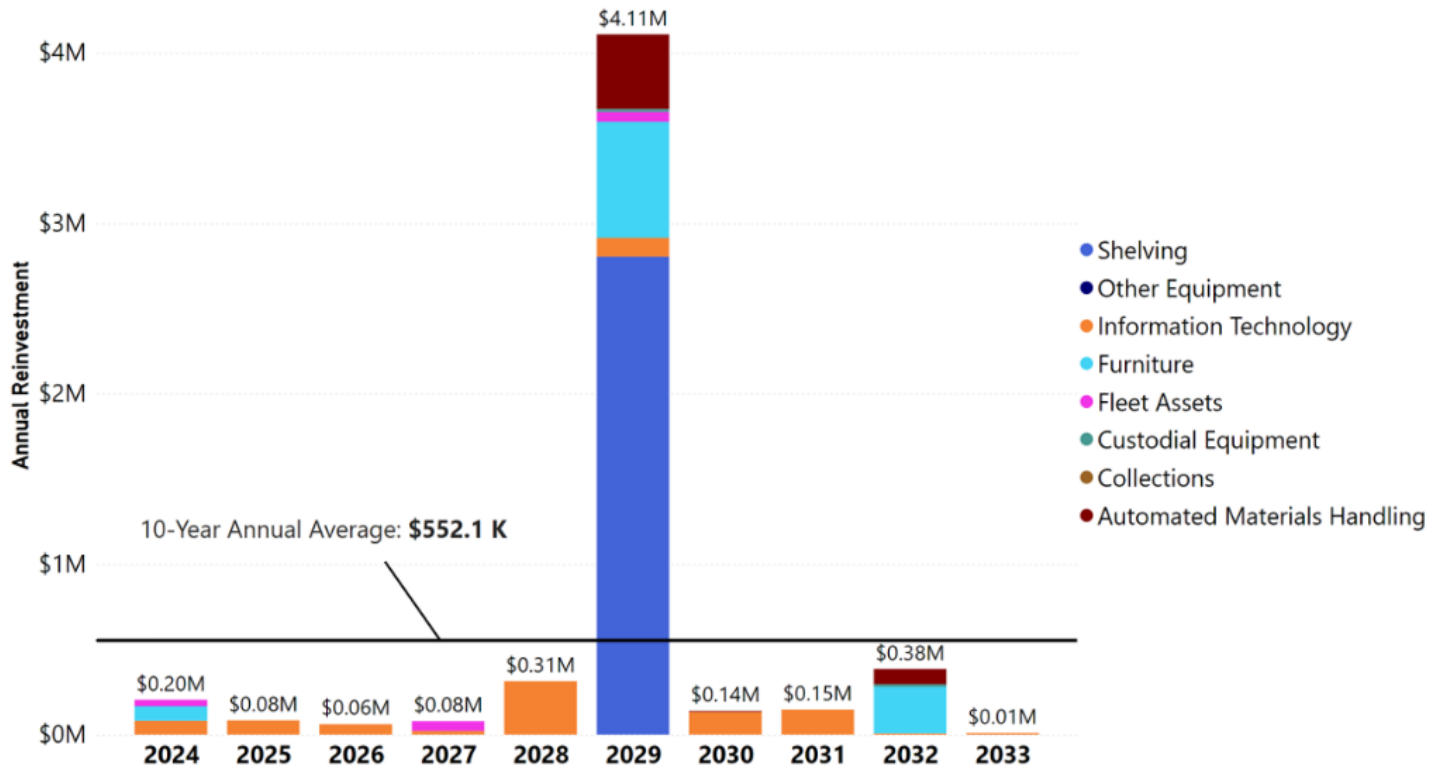
Lifecycle modeling allows the City and KFPL to understand the future reinvestment needs of their existing assets by generating a theoretical asset replacement forecast based on available asset inventory data. The age, EUL, replacement cost, condition, and risk score of each asset are leveraged within the lifecycle model to proactively plan for reinvestment over a specified period. Asset replacement forecasts within this subsection estimate the required reinvestment for Library Services over the next 10 years based on available asset inventory data.



### Library Services

A total of approximately **\$5.5 M** will need to be reinvested into Library Services over the next 10 years, excluding reinvestment in associated facilities. This translates to an annual average of approximately **\$552.1 K** per year, as presented in **Figure 3-5**. In 2029, significant reinvestment is expected within the Shelving asset class due to the replacement of Shelving units in several libraries.

**Figure 3-5: 10-Year Capital Reinvestment Needs - Library Services**

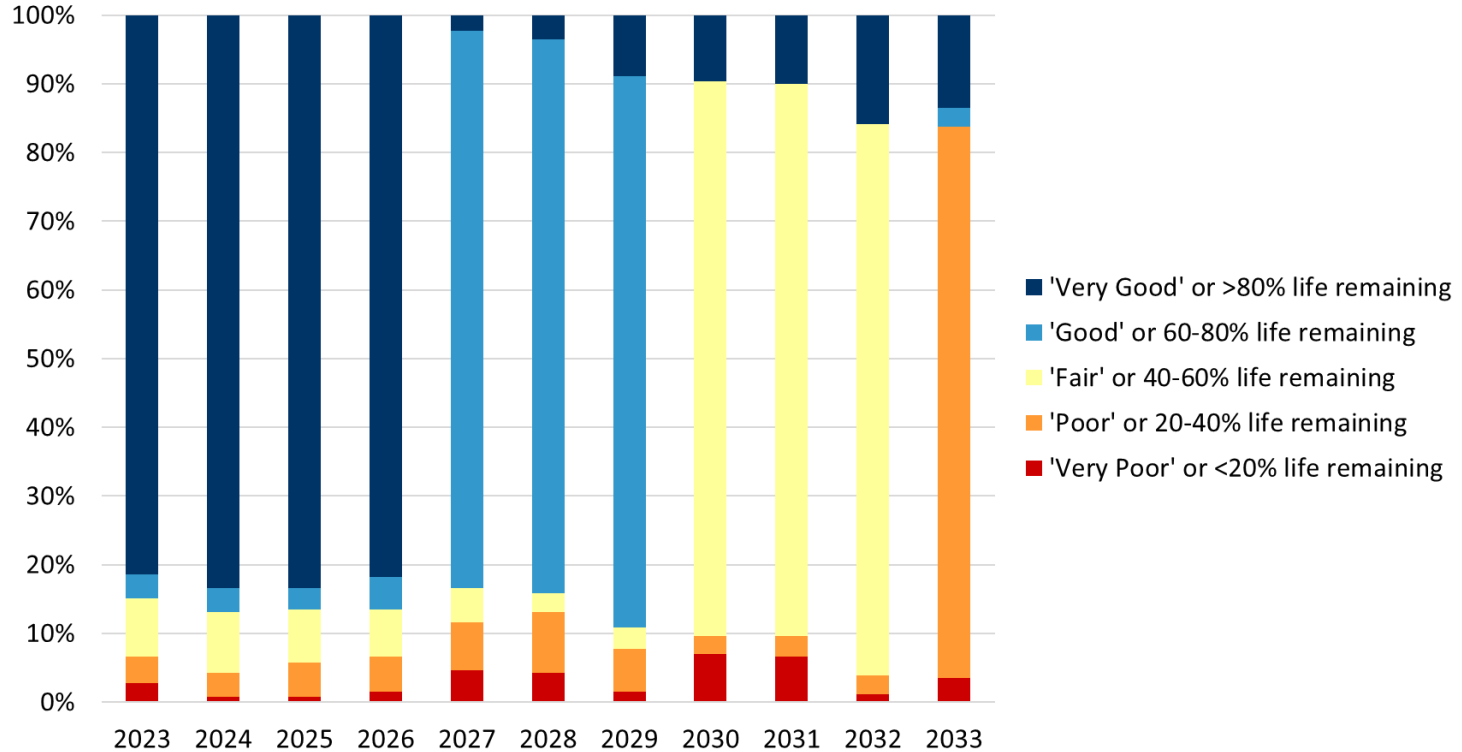


It is important to note that forecasting in this lifecycle model relies heavily on age and EUL to determine renewal or replacement needs.

## Library Services

The LOS defined in this AMP includes maintaining assets in poor or better condition (98%). From the lifecycle model, the percentage of Library Services assets in poor or better condition fluctuates throughout the next 10-years due to the EUL of the assets. With an EUL of 5, 10 and 15 years the assets reach a high of 99% in 2024, 2025, and 2032. For Library Services assets, 97% of assets are expected to be in poor or better condition as of 2033. **Figure 3-6** shows an overview of Library Services asset throughout the next 10 years based on the lifecycle model.

**Figure 3-6: Condition Overview by Year Based on Lifecycle Model - Library Services**





#### 4.0 City Real Estate & Environment

The City of Kingston acknowledges that we are on the traditional homeland of the Anishinaabe, Haudenosaunee, and the Huron-Wendat, and thanks these nations for their care and stewardship over this shared land. The City's Real Estate & Environment departments manage and oversee the operation of land and property throughout the City. This includes city-owned land assets and some environmental remediation infrastructure assets. This chapter of the AMP summarizes asset inventories for City Real Estate & Environment and applies key asset management principles in accordance with the requirements of O. Reg. 588/17: Asset Management Planning for Municipal Infrastructure.

**Note on Scope:** During the preparation of this AMP, the market value of City-Owned Land assets could not be ascertained due to existing data gaps. It is recommended that the City enhance its inventory for this asset class to be included in future iterations of the AMP, incorporating current assessed market values.

## City Real Estate & Environment

### 4.1 State of the Local Infrastructure

#### 4.1.1 Asset Inventory and Valuation

**Table 4-1** summarizes the asset inventory for City Real Estate & Environment by asset class, asset type, asset count, and total replacement cost (in 2023 dollars). The total replacement cost (2023 dollars) is estimated at **\$4.2 million** for the **40 assets** included in the inventory.

Although land is a major asset to the City, its value and condition should not be viewed the same as other assets such as buildings, vehicles, or equipment for example. It has value, but not a lifecycle. Land is assessed based on market value and specific characteristics related to zoning. This is very different than other asset types and the associated infrastructure requirements.

**Note:** On July 9<sup>th</sup>, 2024, Council approved a staff recommendation to work with Our Livable Solutions (OLS) to develop terms and conditions for the sale of the sleeping cabins to OLS. However, the asset inventory and replacement values remain in the current asset management plan as it is based on fiscal year 2023 city-owned infrastructure assets.

**Table 4-1: Inventory Summary by Asset Type – City Real Estate & Environment**

Asset Class	Asset Type	Count	Total Replacement Cost (2023)
Environmental Remediation Infrastructure	Leachate Control System	19	\$3,000,000
Environmental Remediation Infrastructure	Passive Reactive Barrier	1	\$750,000
Sleeping Cabins	Sleeping Cabins	20	\$424,000
<b>Overall</b>	<b>N/A</b>	<b>40</b>	<b>\$4,174,000</b>

## City Real Estate & Environment

### 4.1.2 Asset Age Summary

**Table 4-2** summarizes the average age, the average condition, the expected useful life, and the average remaining useful life of assets pertaining to City Real Estate & Environment.

**Table 4-2: Average Age, Average Condition, Expected Useful Life, and Remaining Useful Life – City Real Estate & Environment**

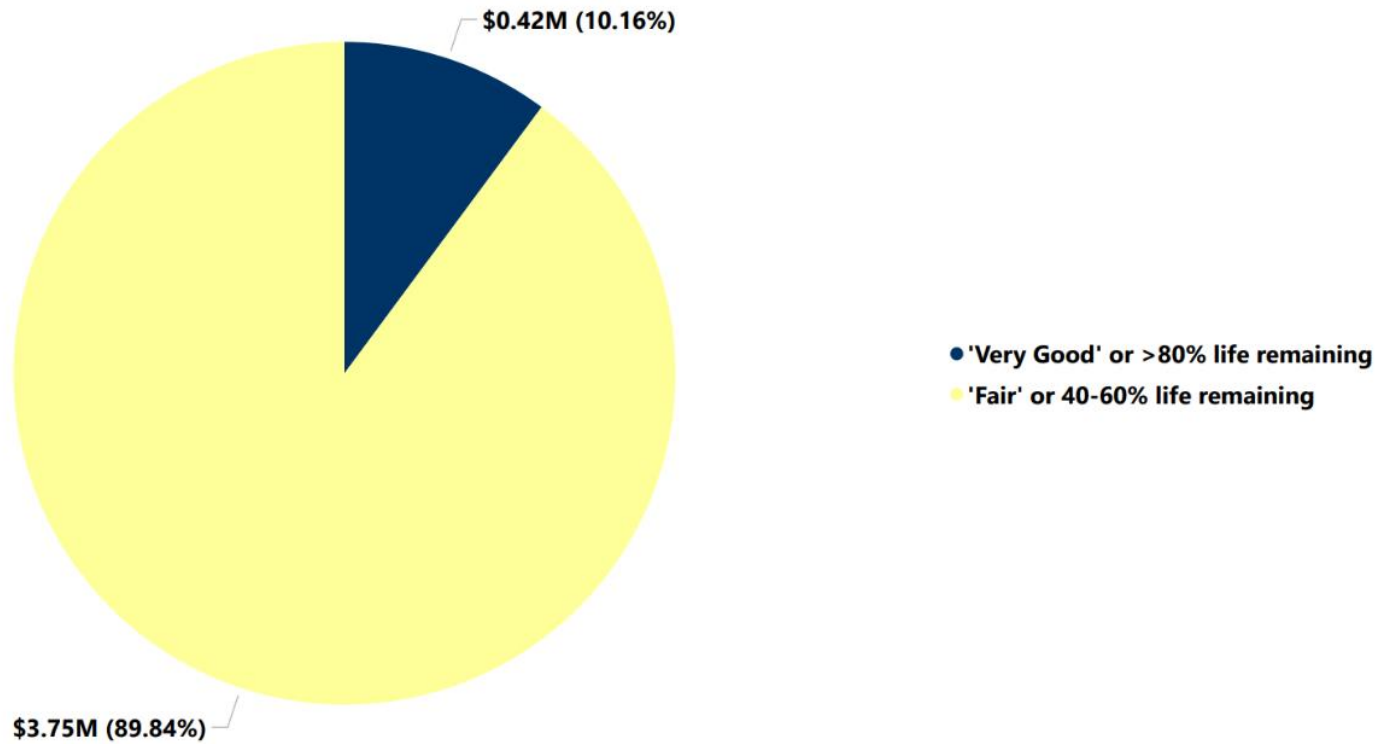
Asset Class	Asset Type	Average Age (Years)	Average Condition Grade	Expected Useful Life (Years)	Average Remaining Useful Life (Years)
Environmental Remediation Infrastructure	Leachate Control System	17	Fair	30	13
Environmental Remediation Infrastructure	Passive Reactive Barrier	11	Fair	20	9
Sleeping Cabins	Sleeping Cabins	3	Very Good	20	18
<b>Overall</b>	<b>N/A</b>	<b>10</b>	<b>Good</b>	<b>20 to 30</b>	<b>13</b>

### 4.1.3 Asset Condition

The overall condition summary for City Real Estate & Environment assets by replacement cost (in 2023 dollars) is shown in **Figure 4-1**. 100% of the assets are in very good to fair condition.

City Real Estate & Environment

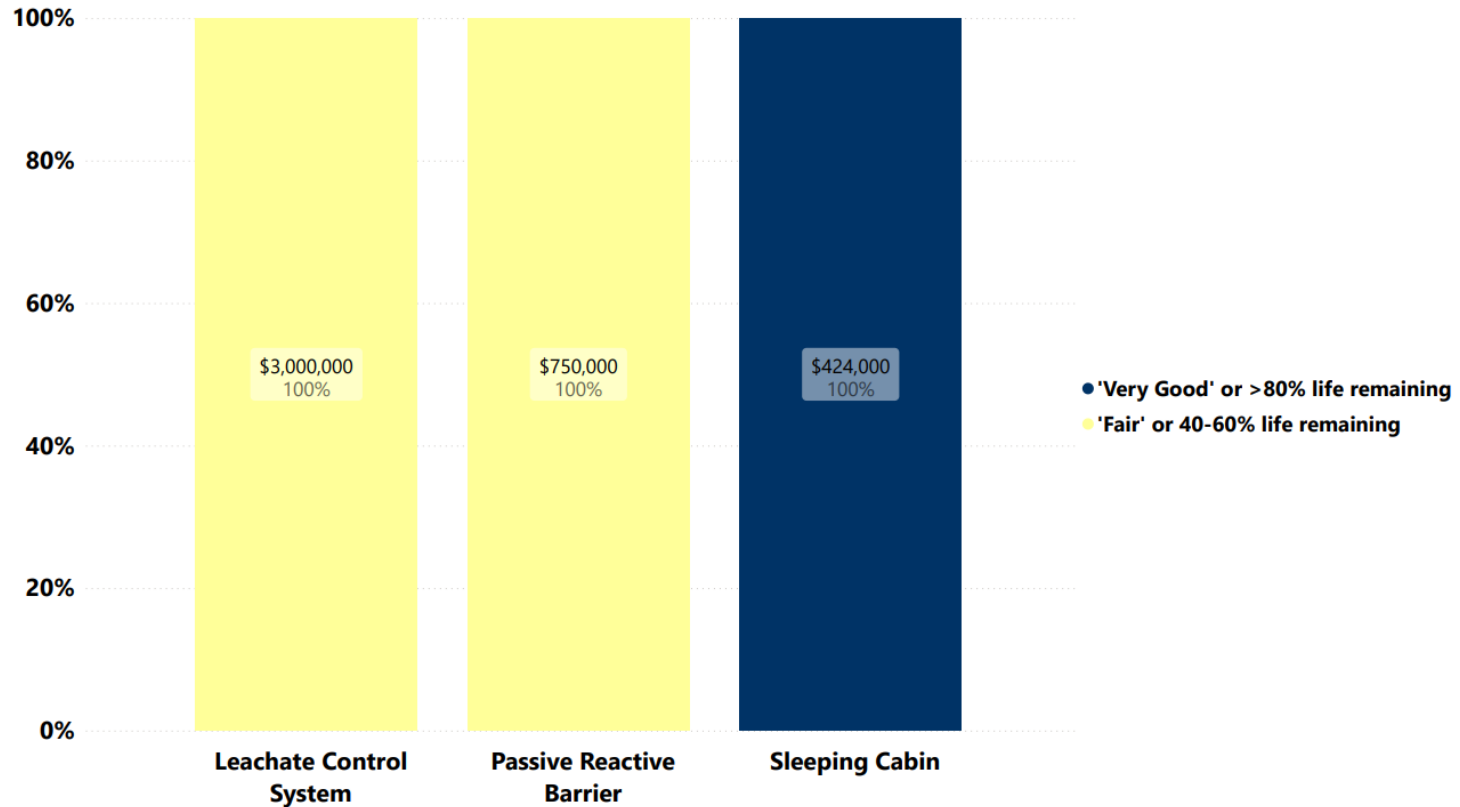
Figure 4-1: Condition Summary by 2023 Replacement Cost – City Real Estate & Environment



A condition summary for Environmental Remediation Infrastructure and Sleeping Cabins assets is provided in **Figure 4-2** by asset type and replacement cost (in 2023 dollars).

City Real Estate & Environment

Figure 4-2: Condition Summary by Asset Type and Replacement Cost – City Real Estate & Environment (Environmental Remediation Infrastructure and Sleeping Cabins)



4.1.4 Data Sources and Confidence

Asset data for City Real Estate & Environment assets, particularly land, is maintained by City staff within the Public Sector Digest (PSD) CityWide application, which at this point serves as the centralized repository for land asset information. City staff provided PSD CityWide exports to inform inventories in 2023, translating to the assumption that the data source for this AMP can be seen as reliable.

## City Real Estate & Environment

There is currently no automated central land data registry within the City beyond the information included in the TCA database and some GIS information. Ownership information can be obtained by performing a title search at the Land Registry Office, Service Ontario, or online. For future AMP updates, the City will explore the opportunity to simplify and consolidate the City-owned land records into a centralized inventory system.

Data confidence can be estimated based on the confidence level of various qualifiers and is presented on a scale from 0% (low) to 100% (high), as shown in **Table 4-3**. The qualifiers chosen for evaluation are specifically targeted for estimating overall confidence of condition reporting within the SOLI.

**Table 4-3: Data Confidence Scale**

Confidence Level	Low	Low/ Moderate	Moderate	Moderate/ High	High
Average of Qualifiers	0% to 19%	20% to 39%	40% to 59%	60% to 79%	80% to 100%

Assuming the data source is reliable, the following qualifiers were considered to estimate data confidence regarding the data utilized in the creation of this SOLI report:

- **Qualifier 1:** The percentage of assets in the asset inventory where construction, installation, or acquisition years are documented (95%);
- **Qualifier 2:** The percentage of assets in the asset inventory that have condition assessment data documented (0%); and,
- **Qualifier 3:** The percentage of the estimated overall replacement value, in 2023 dollars, attributed to assets in the asset inventory with documented condition assessment data (i.e., condition is not solely age-based) (0%).



## City Real Estate & Environment

Figure 4-3: SOLI Report Data Confidence – City Real Estate & Environment



As summarized in **Figure 4-3**, the overall asset condition data confidence for City Real Estate & Environment assets is estimated to be Low/Moderate. Data confidence can be increased by improving the quality of the data and/or filling in data gaps.

### 4.2 Levels of Service

The City has developed technical LOS for the Environmental Remediation Infrastructure. It was decided that Environmental Acceptability was the key attribute in gauging the performance of the assets. **Table 4-4** outlines the City’s current technical levels of service for environmental assets.

City Real Estate & Environment

Table 4-4: Technical LOS – Environment

LOS Parameter	LOS Statement	Performance Measure	Current LOS (2023)
<b>Environmental Acceptability</b>	Ensure protection of the natural environment from closed landfills.	Number of groundwater seeps observed requiring remedial action.	0
<b>Environmental Acceptability</b>	Ensure protection of the natural environment from historical industrial uses.	Percentage of annual monitoring and maintenance of passive reactive barrier to treat groundwater completed.	100%

4.3 Risk Assessment

The risk scores were calculated using the risk methodology and approach outlined in the Introduction. **Table 4-5** summarizes the risk factors for the City Real Estate & Environment assets.

Table 4-5: Risk Factors – City Real Estate & Environment

Factors	Risk Ratings
<b>A - Condition</b>	The condition of the assets was determined either by visual or age-based and can be found in the SOLI section of this AMP.
<b>B - Performance</b>	The performance of the Environmental Remediation Infrastructure assets was identified as “always reliable” and assigned a score of 1 for calculating risk score. The Sleeping Cabins were identified as "usually reliable" and assigned a score of 3 for calculating risk score.

**City Real Estate & Environment**

Factors	Risk Ratings
<b>C - Climate Change</b>	The Environmental Remediation Infrastructure assets and Sleeping Cabins were identified as a “high” risk and assigned a rating of 5 for calculating the risk score.
<b>D - Impact</b>	The Sleeping Cabins were recognized as "low" impact and assigned a score of 0 for calculating risk score. The impact of the Environmental Remediation Infrastructure assets was identified as "moderate" impact and assigned a score of 1 for calculating risk score.
<b>E - Importance</b>	The Environmental Remediation Infrastructure assets and Sleeping Cabins were identified as “low” importance and assigned a score of 1 when calculating risk.

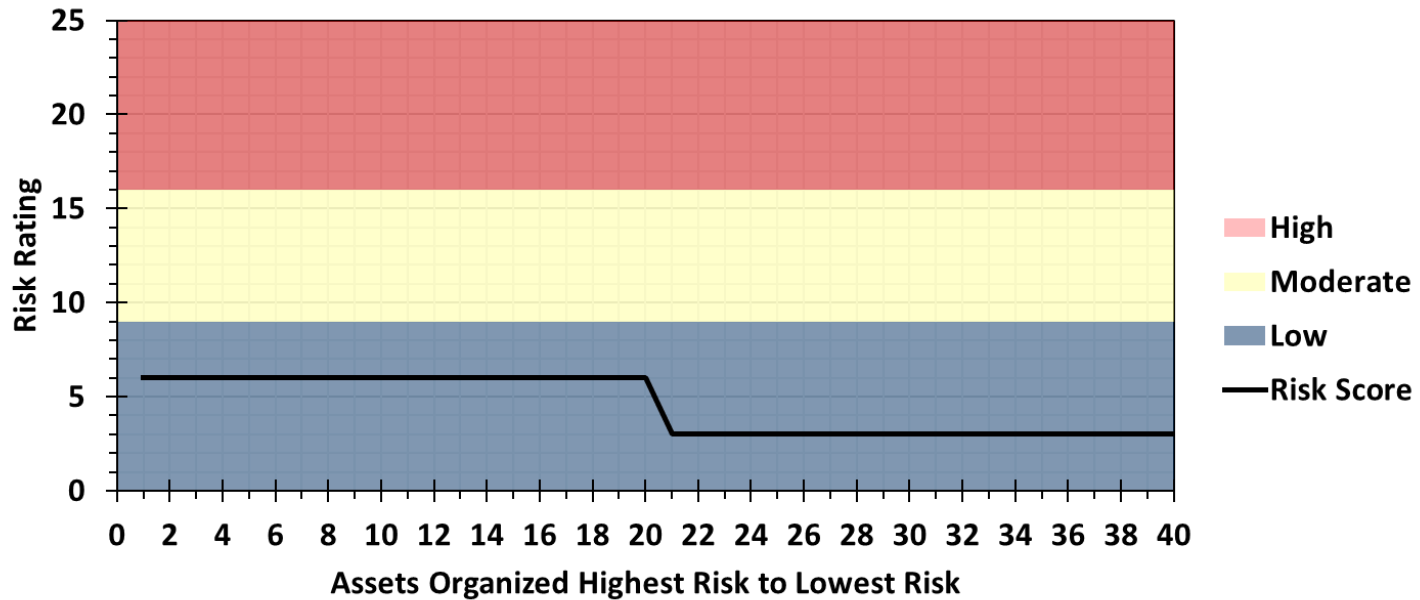
The individual risk ratings were used in calculating the risk score for each of the assets.

**4.3.1 Risk Profile**

The Risk profile of the City Real Estate & Environment assets is displayed in **Figure 4-4**. All 40 (i.e., 100%) of the assets tracked within the asset inventory were assessed as Low risk.

## City Real Estate & Environment

Figure 4-4: Risk Profile – City Real Estate & Environment



## 4.4 Asset Management Strategy

### 4.4.1 Lifecycle Activities

The lifecycle activities considered include:

- **Non-Infrastructure Solutions:** Actions or policies that can lower costs and extend useful lives.
- **Maintenance Activities:** Regularly scheduled inspection and maintenance, or more significant repair and activities associated with unexpected events.
- **Renewal / Rehabilitation Activities:** Significant repairs designed to extend the life of the asset.
- **Replacement / Construction Activities:** Activities that are expected to occur once an asset has reached the end of its useful life and renewal/rehabilitation is no longer an option.

### City Real Estate & Environment

- **Disposal Activities:** Activities associated with disposing of an asset once it has reached the end of its useful life or is otherwise no longer needed.
- **Expansion / Growth / Service Improvement Activities:** Planned activities required to extend services to previously unserved areas or expand services to meet growth demands.

**Table 4-6** describes the lifecycle activities that can be implemented within the asset management strategy for City Real Estate & Environment assets. The lifecycle activities presented below are existing activities performed by the City and were identified during a workshop with City staff in January 2024.

**Table 4-6: Lifecycle Activities – City Real Estate & Environment**

Lifecycle Type	Description of Activity	Frequency / Timing
Non-Infrastructure Solutions	Development approvals	As needed
Non-Infrastructure Solutions	Policies surrounding operational / asset functioning and improvement	As needed
Non-Infrastructure Solutions	Groundwater sampling program	Annually
Maintenance Activities	Regular maintenance of roads, utilities, maintenance of vacant lands prior to sale	Annually
Maintenance Activities	Monitoring and maintenance of passive reactive barrier to treat groundwater	Annually

**City Real Estate & Environment**

<b>Lifecycle Type</b>	<b>Description of Activity</b>	<b>Frequency / Timing</b>
Disposal Activities	Disposition of surplus municipal lands including serviced lands, utility infrastructure, residential development, heritage building redevelopment	As needed
Expansion / Growth / Service Improvement Activities	Acquisition of land, development approvals, servicing (roads/utilities)	As needed (annual review)
Expansion / Growth / Service Improvement Activities	New funding opportunities for creation of more housing stock in community	Annually

**4.4.2 Funding the Lifecycle Activities**

Lifecycle modeling allows the City to understand the future reinvestment needs of their existing assets by generating a theoretical asset replacement forecast based on available asset inventory data. The age, EUL, replacement cost, condition, and risk score of each asset are leveraged within the lifecycle model to proactively plan for reinvestment over a specified period.

Due to existing data gaps pertaining to condition, inventory, and costing, the estimated asset replacement schedule and lifecycle modeling could not be assessed for City Real Estate & Environment assets.



**2023**  
**Facilities Asset Management Plan**



## Foreword

The City of Kingston acknowledges that it is situated on the traditional homeland of the Anishinaabe, Haudenosaunee and the Huron-Wendat, and thanks these nations for their care and stewardship over this shared land. Today, the City is committed to working with Indigenous peoples and all residents to pursue a united path of reconciliation.

The City of Kingston was amalgamated in 1998 and today serves a population of approximately 136,600 residents as well as more than 30,000 students attending local post-secondary institutions, typically between September and May. The City is uniquely situated between Toronto, Ottawa and Montreal with easy access to all three by Highway 401. In its picturesque location along the shores of Lake Ontario, at the mouth of the Cataraqui River and start of the St. Lawrence River, Kingston is surrounded by natural beauty that enhances life for its residents.

Kingston's diverse economy encompasses vibrant culture and arts, global industry sectors that are creating new jobs and driving innovation, as well as numerous public institutions including Queens University, the Royal Military College of Canada, St. Lawrence College, Kingston Health Sciences Centre, Correctional Services Canada and CFB Kingston. The City has also played a unique role in the Nation's history, being the First Capital of a United Canada in 1841. Today you can see this reflected in its historical downtown and monuments.

Over time, the City has established asset management practices for its infrastructure assets; however, more recent efforts have been made to formalize those practices within an Asset Management Framework in accordance with Ontario Regulation, O. Reg. 588/17, "Asset Management Planning for Municipal

Infrastructure". This framework already includes the following elements:

- 2019 Strategic Asset Management Policy (Report #19-091), which defines the expectations, key principles, and overall governance framework for the practice of asset management throughout the corporation.
- 2022 Asset Management Plan (AMP) for Core Assets (Transportation and Stormwater infrastructure).

Water & Wastewater infrastructure, also defined as a Core Asset under O. Reg. 588/17, is managed by Utilities Kingston and captured in their AMP, originally created in 2017 and recently updated in 2021 (Council Report #21-234).

The advancement of the City's Asset Management Framework will result in improved decision-making abilities and sustainable financial practices. The AMPs are living documents that present the City's asset portfolio in terms of what is owned, the levels of service provided, required life cycle management activities and financial strategies. The policy, AMPs and other documents related to asset management, are also developed to be in alignment with Council's Strategic Plan as well as other important planning documents.

Council has established priorities for the current term, up to 2026. These priorities are in multiple ways supported by the City's infrastructure, thus improvements to the management of that infrastructure will support the achievement of these priorities.



## Executive Summary

Located along the beautiful shores of eastern Lake Ontario, the City of Kingston offers a stable and diversified economy that includes global corporations, advanced healthcare facilities, world-class educational institutions, affordable living, and vibrant entertainment and tourism activities. With a population of approximately 136,000 residents and 30,000 post-secondary students between September and May, City of Kingston staff are responsible for delivering a wide array of services that support the quality of life and prosperity of the community. With the goal of delivering the services to the quality and level expected by the community, the City has made a commitment to asset management planning with the goal of balancing expenditures, services, and risk across the diverse asset portfolios.

This Asset Management Plan (AMP) includes all municipal facilities which support a wide range of services that are provided to the Kingston community within the following categories:

- Administration & Offices
- Airport
- Ambulance Services
- Aquatic Centres
- Arenas
- Arts & Culture
- Community Centres
- Fire & Emergency Services
- Fleet Services
- Housing & Social Services
- Large Venue Entertainment Centre
- Leased

- Libraries
- Long Term Care
- Marinas
- Parks
- Police Services
- Public Works & Solid Waste
- Transit
- Utilities
- Other

The City's Facilities Management & Construction Services (FMCS) department is responsible for maintenance and renewals in accordance with best practices. The goal is to ensure a high level of performance and reliability for all City facilities.

For the purposes of this AMP, facilities assets consist of buildings, grounds or site elements, as well as electric vehicle (EV) charging stations. The replacement cost for the entire facilities portfolio is approximately \$1.3 billion as outlined below in Table ES 1. This plan excludes airport airside infrastructure, parking structures and surface lots, aquatic facility filtration and treatment infrastructure, as well as arena refrigeration plants.

The overall facility condition index (FCI) was used to determine the performance of the Facilities asset portfolio. For each facility, FCI is determined by taking the annual percentage of facility components requiring investment as a proportion of the total facility replacement value. The categorization of FCI into applicable condition ratings is provided in Table ES 2. Facilities with a FCI greater than 30% are not meeting relevant performance or level of service (LOS) objectives.

**Executive Summary**

**Table ES 1. Facilities Asset Portfolio - Replacement Values**

Category	Count	Replacement Value (M)
Administration & Offices	6	\$197.2
Airport	4	\$30.9
Ambulance Services	2	\$1.2
Aquatic Centres	2	\$25.5
Arenas	6	\$167.5
Arts & Culture	5	\$77.7
Community Centres	2	\$30.3
Fire & Emergency Services	25	\$55.0
Fleet Services	2	\$32.4
Housing & Social Services	4	\$30.1
Large Venue Entertainment Centre	1	\$81.0
Leased	13	\$76.3
Libraries	5	\$66.2
Long Term Care	1	\$74.9
Marinas	3	\$28.7
Parks	31	\$78.4
Police Services	2	\$81.0
Public Works	16	\$47.1
Transit	4	\$27.6
Utilities	2	\$47.1
Other	11	\$36.0
<b>Total Facilities Management</b>	<b>147</b>	<b>\$1,294</b>

**Table ES 2. Asset Condition Rating**

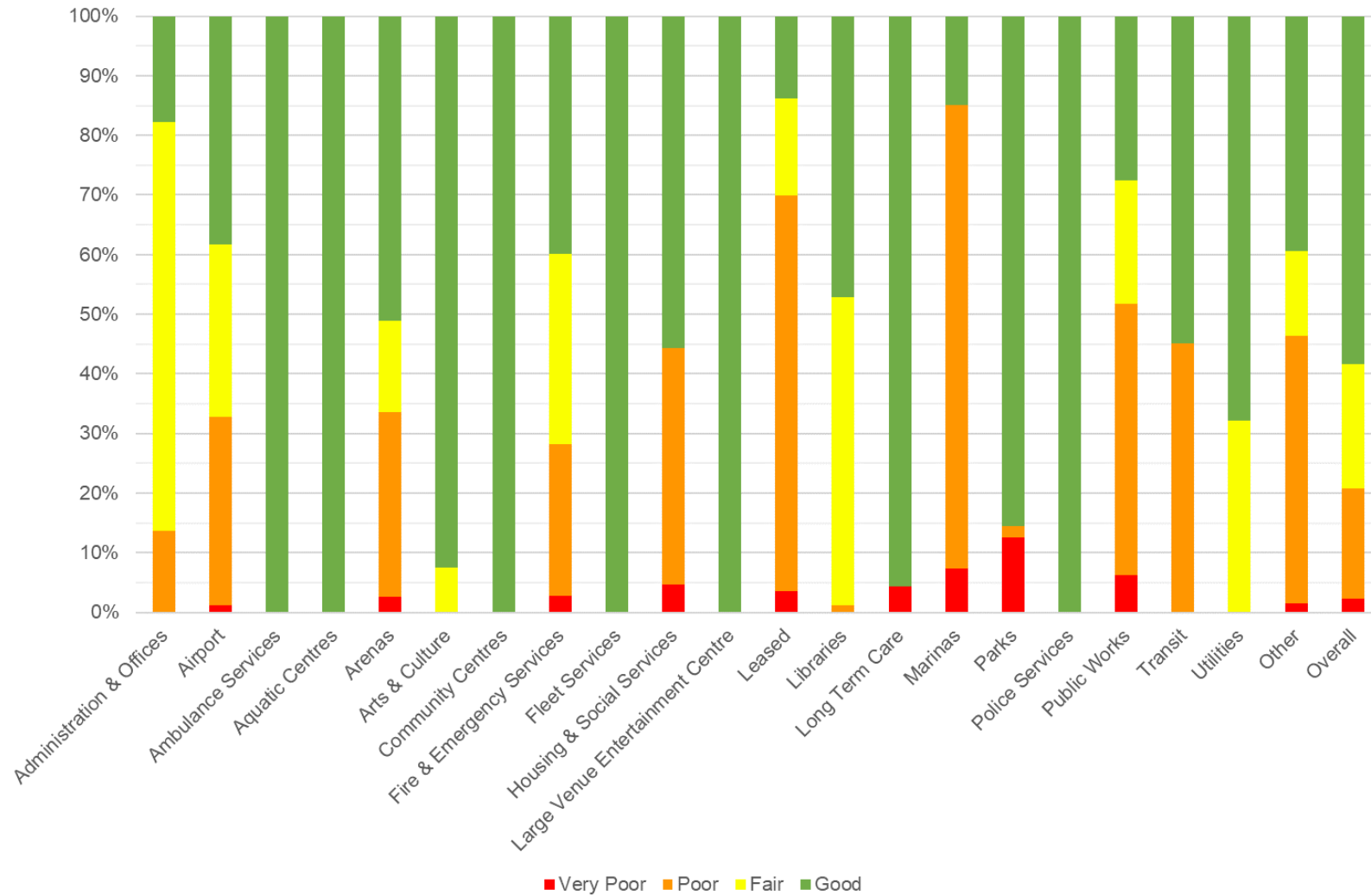
Condition Rating	Definition	Facilities: FCI
Very Good	The asset is fit for the future. It is in excellent condition, new or recently rehabilitated	N/A <sup>1</sup>
Good	The asset is adequate. It is well maintained, acceptable and generally within the mid-stage of its expected service life	0% to 5%
Fair	The asset requires attention. The asset shows signs of deterioration, and some elements exhibit deficiencies.	5% to 10%
Poor	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.	10% to 30%
Very Poor (Critical)	The asset is un-fit for sustained service. It is near or beyond its expected service life and shows signs of advanced deterioration. Elements may be unusable.	>30%

<sup>1</sup> FMCS does not differentiate between good and very good with respect to FCI.

Executive Summary

The breakdown of the assets within each condition rating category is shown in Figure ES 1. As can be seen in the figure, a large proportion of the assets are in the Good to Fair categories.

Figure ES 1. Current Condition of Facilities Assets in Each Category – Distribution by Replacement Value



**Executive Summary**

The City of Kingston has developed this Asset Management Plan (AMP) to address the requirements of Ontario Regulation 588/17. In order to support the AMP, a comprehensive Level of Service (LOS) Framework has been developed. This framework will help establish a relationship between the levels of service being provided by the City’s facilities and the associated operating and capital expenditures required to achieve the LOS. The LOS Framework for the facilities portfolio is outlined as follows in Table ES 3 to Table ES 6.

**Table ES 3. Customer LOS for Accessibility**

Performance Measure	2023 Performance	Proposed Performance
Description of facilities and level of accessibility	City facilities support a diverse range of services and are accessible to people using mobility devices. New construction and renovations are implemented according to best practices as well as the Ontario Building Code and City's Facility Accessibility Design Standards (FADS).	Incorporate and support relevant initiatives associated with the City's Inclusion, Indigenization, Diversity, Equity and Accessibility (IIDEA) journey.

**Table ES 4. Customer LOS for Quality**

Performance Measure	2023 Performance	Proposed Performance
Percentage of facilities assets in fair or better condition (FCI of 10% or lower/better)	79%	Future <sup>2</sup>
Average Facility Condition Index (FCI) value for all facilities	10% and projected to be 19% at end of 10-year horizon based on anticipated budget	10% or less (fair or better condition) sustained over 10-year horizon

<sup>2</sup> Facilities are currently managed by maintaining average FCI. This accounts for facilities that have low utilization. A proposed performance can be set once the facilities are further classified.

Executive Summary

**Table ES 5. Technical LOS for Reliability**

Performance Measure	2023 Performance	Proposed Performance
Percentage of planned maintenance events as a proportion of total maintenance activities (i.e. planned vs. reactive)	47%	60%

**Table ES 6. Technical LOS for Climate Leadership**

Performance Measure	2023 Performance	Proposed Performance
Greenhouse gas (GHG) emissions (equivalent emissions from all energy sources)	6,843 tonnes CO2e	19% reduction below 2018 emissions by 2026 (per Facilities Energy & Asset Management Plan), 30% reduction by 2030 and carbon neutrality (net zero energy) by 2040 (per Climate Leadership Plan)

The lifecycle strategy describes the set of planned actions that the City undertakes to sustain levels of service while managing risk at the lowest possible lifecycle cost. The types of lifecycle activities are shown in Table ES 7.

**Table ES 7. Lifecycle Activities**

Lifecycle Activity	Description
Non-Infrastructure	Actions or policies that can lower costs or extend asset life
Maintenance	Regularly scheduled inspection and maintenance, or more significant repair and activities associated with unexpected events
Renewal / Rehabilitation	Significant repairs designed to extend the life of the asset.
Replacement / Construction	Activities that are expected to occur once an asset has reached the end of its useful life and renewal / rehabilitation is no longer an option.
Disposal	Activities associated with disposing of an asset once it has reached the end of its useful life or is otherwise no longer needed by the municipality.
Expansion / Growth / Service Improvements	Planned activities required to extend services to previously un-serviced areas or expand services to meet growth demands.

**Executive Summary**

The Lifecycle Strategy has been combined with the LOS and Risk Management frameworks in a decision support system (DSS) model, which allows the City to run various forecasting scenarios. The following scenarios focused on renewal spending were analyzed for each asset class:

**Scenario 1: Anticipated Budget:**

Evaluates asset performance under the current 10-year capital plan that the City anticipates to allocate towards that asset class. The current budgets were obtained from the City’s 2023 financial plan. This illustrates the change in LOS under anticipated conditions and is also used as a baseline scenario to assess the other scenarios analyzed.

**Scenario 2: Maintain Levels of Service**

This scenario determines the cost that would be required to maintain current LOS over a 10-year forecast period. Understanding the cost to maintain current LOS is a requirement of the July 1, 2024 milestone of O.Reg. 588/17. Individual facilities are meeting LOS if they have an FCI of 10% or lower and average FCI of the portfolio was used to determine the cost to maintain LOS.

**Scenario 3: Achieve Proposed Levels of Service**

This scenario determines the costs and associated asset performance to achieve the proposed LOS over a 10-year forecast period. These targets generally apply to the reliability and condition-based LOS that the City has established. The proposed LOS for this AMP is the same as Scenario 2 to maintain the average FCI over the 10-year period.

The results of the scenario analyses and financial plan are illustrated in Table ES 8<sup>4</sup> and Figure ES 2. The Asset Management analyses were conducted under the assumption that non-infrastructure, operating and maintenance, disposal and expansion expenditures will remain the same for all scenarios and are fully accommodated under the City’s existing budget. Since the lifecycle models were developed around renewal interventions, the forecasting analysis provided a comparison of capital needs against anticipated capital funding. The annual funding gap to achieve the proposed LOS is \$10.8M.

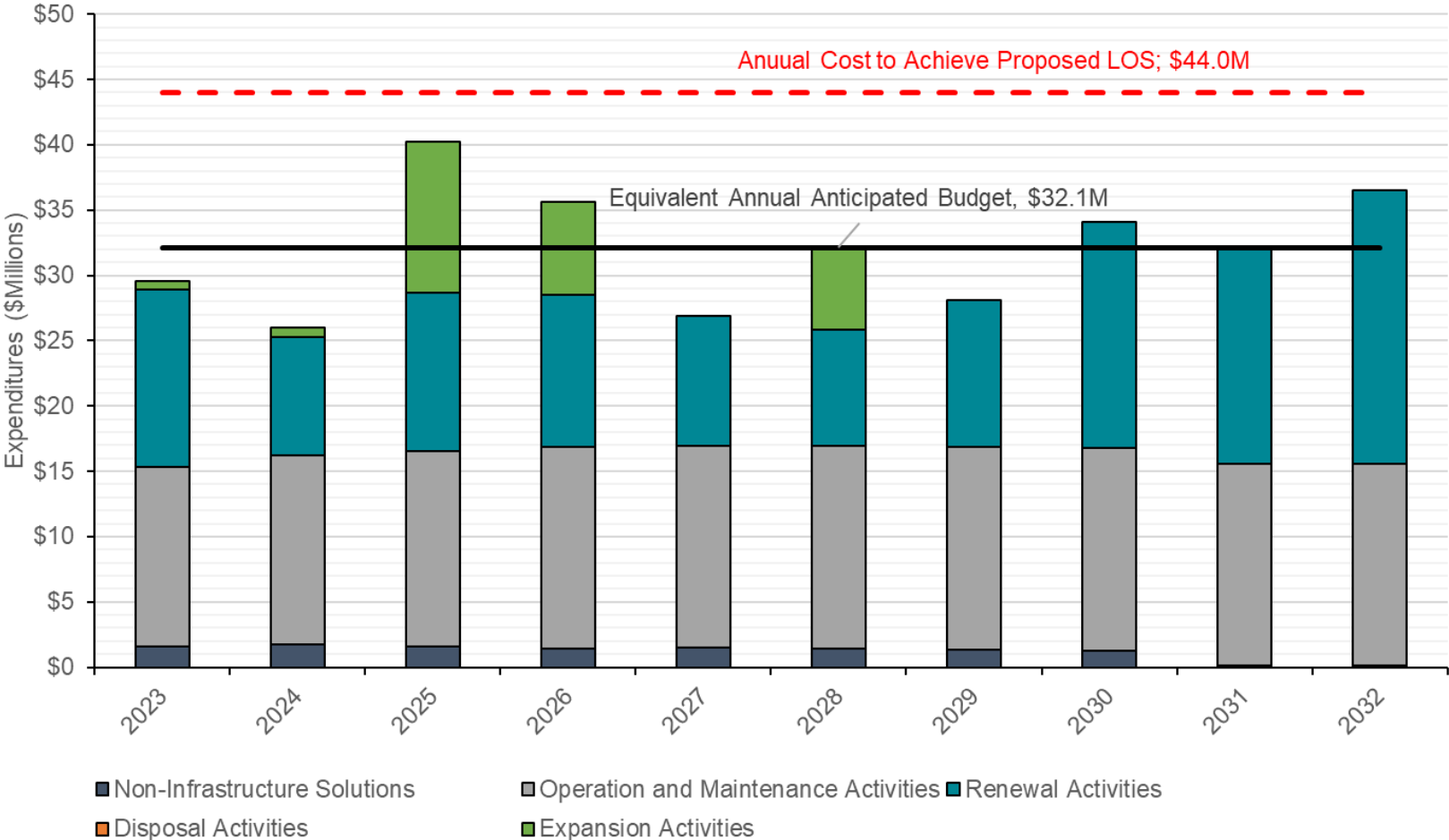
**Table ES 8. Facilities Management Average Annual Lifecycle Activity Investments**

Lifecycle Activity	Anticipated Budget	Achieve Proposed LOS <sup>3</sup>
Non-Infrastructure Solutions	\$1,205,500	\$1,205,500
Operation and Maintenance Activities	\$15,166,203	\$15,166,203
Disposal Activities	\$0	\$0
Expansion Activities	\$2,633,929	\$2,633,929
Renewal Activities	\$13,134,739	\$25,000,000
<b>Total</b>	<b>\$32,140,371</b>	<b>\$44,005,632</b>
<b>Annual Funding Gap</b>	Not Applicable	<b>\$11,865,261</b>

<sup>3</sup> The proposed LOS is to maintain average FCI of 10%.

Executive Summary

Figure ES 2. Facilities Management Scenario Comparison



This asset management plan is intended to be a living document that is updated at recurring intervals. A key component of asset management is ensuring the continuous improvement of asset management practices. The final section of the plan outlines strategies for enhancing the asset management plan, as well as overall improvements to the asset management program at the City.

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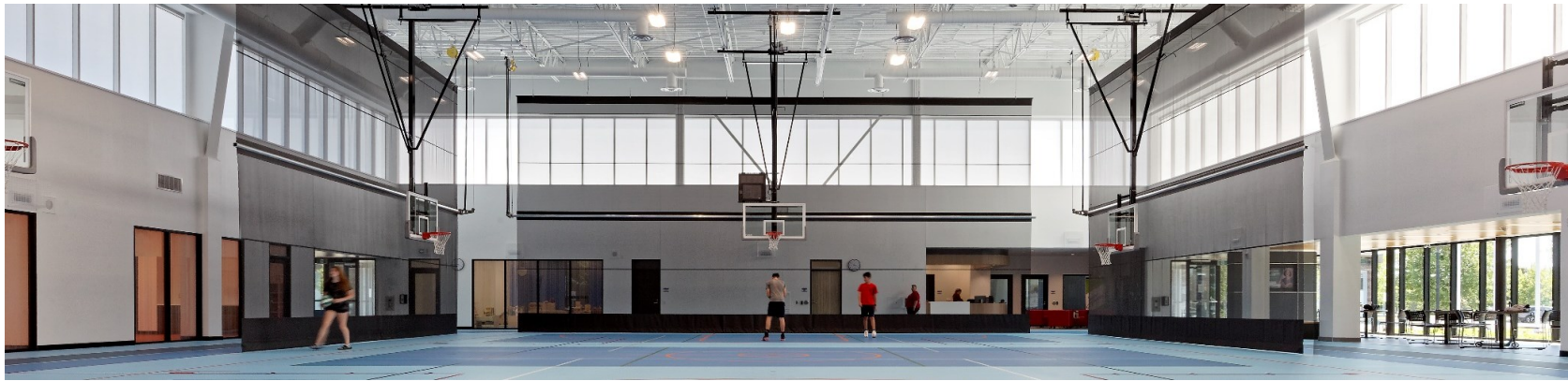


Figure 1. New Kingston East Community Centre

## 1.0 Introduction

Located along the beautiful shores of eastern Lake Ontario, the City of Kingston offers a stable and diversified economy that includes global corporations, advanced healthcare facilities, world-class educational institutions, affordable living, and vibrant entertainment and tourism activities. With a population of approximately 136,000 residents and 30,000 post-secondary students between September and May, City of Kingston staff are responsible for delivering a wide array of services that support the quality of life and prosperity of the community. With the goal of delivering the services to the quality and level expected by the community, the City has made a commitment to asset management planning with the goal of balancing expenditures, services, and risk across the diverse asset portfolios.

## 1.1 Purpose of the Asset Management Plan

An asset management plan (AMP) is a crucial component of any asset management framework, and thus its development and implementation will greatly improve the City's current efforts in Asset Management. The Federation of Canadian Municipalities (FCM) defines an asset management plan as, "a plan developed for the management of one or more infrastructure assets that combines multidisciplinary management techniques (including technical and financial) over the life cycle of the asset in the most cost-effective manner to provide a specified level of service". This AMP will focus on the City's Facility assets and build upon work completed for the City's Transportation and Stormwater AMP, approved by Council on June 21, 2022. Water & Wastewater services which are managed by Utilities Kingston have been captured in their Asset Management Plan, originally created in 2017, then updated and subsequently approved by Council on October 19, 2021.

## Introduction

A significant component of the Asset Management Framework is the Asset Management Policy, which was adopted by Council in 2019. The AM objectives as outlined in the Asset Management Policy are listed below:

- Establish an asset management system that integrates strategic planning, budgeting, service levels, and risk;
- Provide service levels that balance customer expectations with financial means and risk;
- Enhance transparency and accountability of the decision-making process;
- Ensure asset investment is considered through a holistic approach to maximize the lifecycle of the assets as well as included in the planning for new assets;
- Provide justification of investment decisions related to infrastructure assets by linking these decisions to long-term consequences;
- Prepare long-term financial plans to ensure sustainable funding for rehabilitation, replacement or decommissioning of assets;
- Ensure that the addition of new assets or enhancements of existing consider the City's ability to fund the required additional maintenance and future upgrades within a sustainable plan; and
- Define the processes for future decision makers within the City, while maintaining corporate knowledge.

## 1.2 Scope of Assets

This AMP includes all municipal facilities which support a wide range of services that are provided to the Kingston community. These assets are managed and maintained by the Facilities Management & Construction Services (FMCS) department. Below is the list of Facility Categories included:

This Asset Management Plan (AMP) includes all municipal facilities which support a wide range of services that are provided to the Kingston community within the following categories:

- Administration & Offices
- Airport
- Ambulance Services
- Aquatic Centres
- Arenas
- Arts & Culture
- Community Centres
- Fire & Emergency Services
- Housing & Social Services
- Large Venue Entertainment Centre
- Leased
- Libraries
- Long Term Care
- Marinas
- Parks
- Police Services
- Public Works & Solid Waste
- Transit
- Utilities
- Fleet Services
- Other

Introduction

### 1.3 Alignment with the City’s Vision, Mission and Strategic Goals

One of the foundational concepts of asset management is ensuring there is a clear line of sight between organizational objectives, asset management objectives and any activities related to asset management. Therefore, when determining the purpose and desired outcomes of AM for the City, it is important to first consider the City’s broad goals and overall strategic direction.

The City of Kingston’s Mission and Vision statements broadly define what the City strives to provide for its citizens and how they intend to do so. In June of 2024, this was updated after feedback and collaboration from Council and city employees across the corporation. The City redefined its path with a clear Vision, inspiring Mission, and updated core Values.

#### Mission

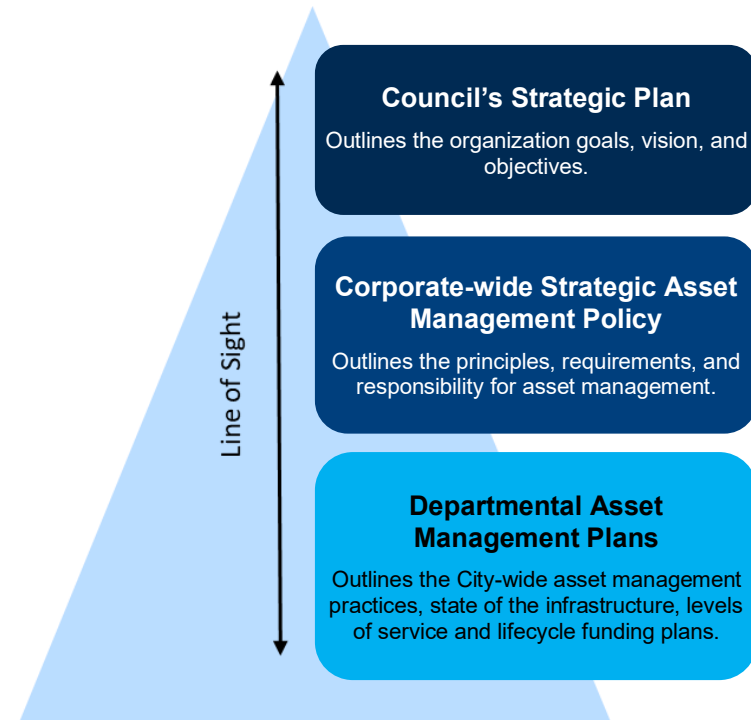
We embrace innovation, foster collaboration, respect the environment, and provide exceptional services that reflect the needs of a diverse community.

#### Vision

Vibrant. Sustainable. Inclusive. Elevating our communities together.

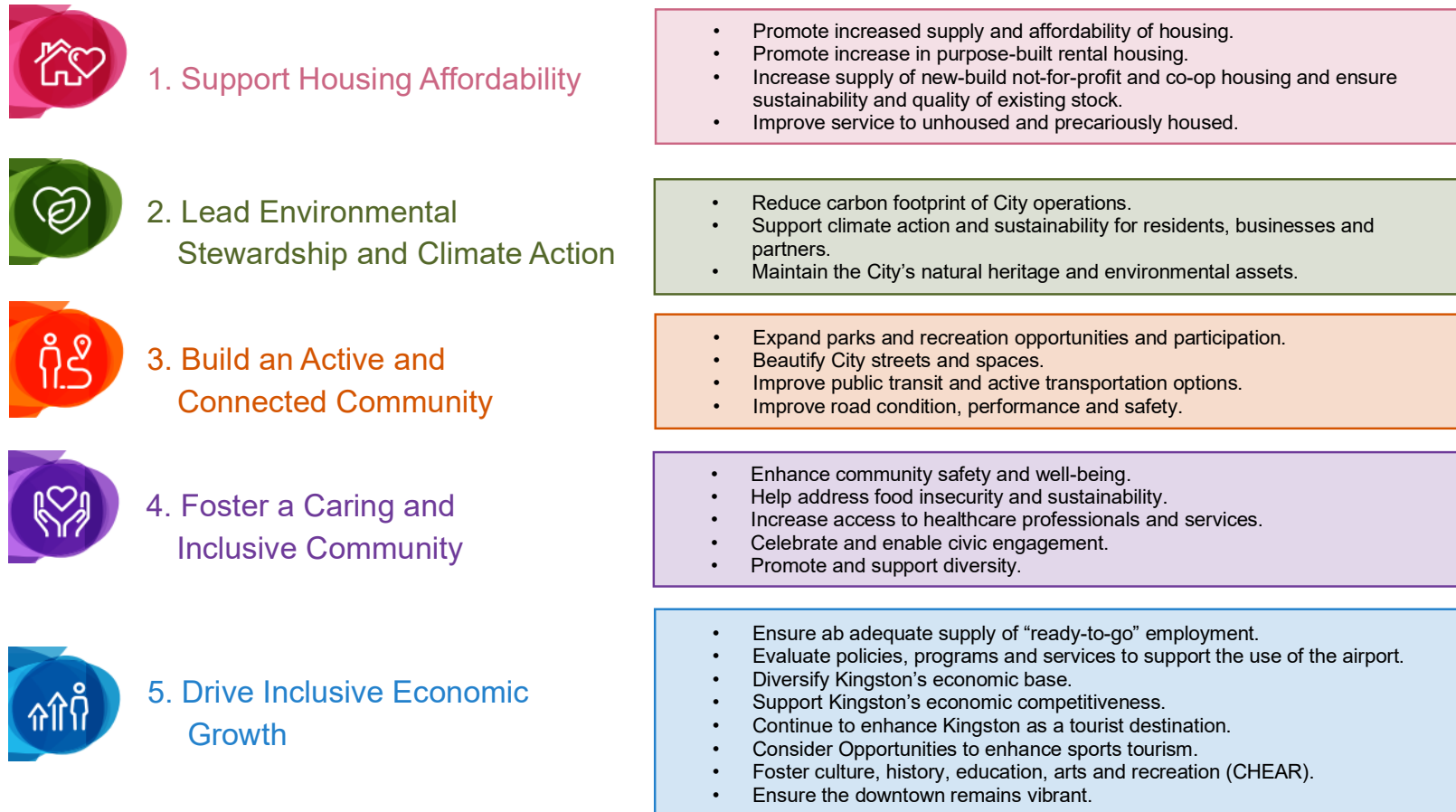
In addition to these broad goals, each term, City Council approves a Strategic Plan that defines a Vision and priorities for the next four years. Most recently, in May 2023, Council approved the 2023-2026 Strategic Plan, which is designed to help the community build more together, move better together, and grow faster together.

**Figure 2. Line of Sight between Strategic Objectives and Asset Management**



Introduction

Figure 3. City of Kingston 2023-2026 Strategic Priorities



In addition, Council has identified Foundational Principles that will help to build the City's organizational resilience, capacity, and culture to deliver on the City's Strategic priorities and asset management practices. These include:

- Invest in the organization's capacity.

Introduction

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- Invest in process improvement.
- Maintain financial sustainability.
- Advance Indigenization, Inclusion, Diversity, Equity and Accessibility (IIDEA) in the corporation.
- Continue to advance community partnerships and advocacy with other levels of government.

**Introduction**

**The City’s Key Principles for Asset Management**

The City’s Asset Management Policy has defined some key principles to be used in support of the City’s organizational goals as they relate to asset management. These are summarized below in Table 1.

**Table 1. The City of Kingston’s Key Principles for Asset Management**

<b>Principle</b>	<b>Definition</b>
Holistic	Take a comprehensive approach that looks at the “big picture” (i.e. the combined implications of managing all aspects rather than a compartmental approach). This includes the functional interdependencies and contributions of assets within asset systems and the different management of assets across all lifecycle phases.
Systematic	Take a methodical approach (i.e. formal, repeatable, and consistent) to the management of assets.
Systemic	Make asset investment decisions in an asset system context, not just to optimize the individual asset itself.
Risk-based	Manage asset risk associated with attaining levels of service and focusing resources, expenditures, and priorities based on risk and associated cost/benefit.
Optimal	Make asset investment decisions based on trade-offs between competing factors of service level (including asset performance), risk and cost.
Sustainable	Take a long-term, lifecycle-based approach in estimating asset investment and activities, thus developing effective asset management strategies for the long term.
Integrated	Coordinate the above principles to ensure the delivery of justified services and well-defined outcomes.
Aligned	Ensure that the asset management system complements the strategic objectives of the City, as well as other key business systems, legislation, and regulation.



Introduction

## 1.4 Governance and Relationships to Other Planning Documents

In support of the effort to achieve line of sight between Asset Management and other planning initiatives at the City, it is necessary to integrate this AMP and any future iterations with other documents that set out how the City operates. Table 2 summarizes some of these key documents.

**Table 2. City of Kingston Strategic Documents**

Strategic Document	Purpose
Kingston's Strategic Plan	Sets out the strategic vision and priorities for the current Council term.
The Official Plan	Sets out land-use planning goals and policies that guide physical development, protection of natural and cultural heritage, resource management, and necessary supporting infrastructure.
Climate Leadership Plan (CLP)	Updated in 2021, this plan is an integrated corporate and community change management strategy which outlines the impacts of ongoing initiatives, objectives, and actions to chart a path of achieving the City's target of carbon neutrality by 2040.
Emergency Management Plan	In the event of an emergency, the plan assigns responsibilities and guides the actions of key officials.
Utilities Kingston Asset Management Plan	Provides an overview of the state of the infrastructure, levels of service, lifecycle management strategies and financial strategies for water, wastewater assets, as well as other assets operated by Utilities Kingston.
Multi-year Accessibility Plan	Outlines the strategies in place to prevent and remove barriers and meet the requirements under the Accessibility of Ontarians with Disabilities Act (AODA) and the Integrated Accessibility Standards Regulation. Applies to Customer Service, Employment, Transportation, Information and Communication, and Design of Public Spaces.
Multi-year Capital Plan	Sets out 15-year capital expenditures for infrastructure replacement and renewal and other capital priorities.
Multi-year Financial Plan	4-year operating budget to fund day-to-day operations.
City of Kingston Accessibility Standards	Provides the overarching framework to guide the review and development of the City of Kingston policies, standards, procedures, by-laws and guidelines to comply with O.Reg. 191/11, the Integrated Accessibility Standards Regulation developed under the AODA.
City of Kingston Annual Report	An overview of the progress made on the priorities outlined in Council Strategic Plans.
Corporate Master Plans	Several plans that recommend the preferred long-term strategies for the infrastructure or program in question. For example: Transportation Master Plan, Active Transportation Master Plan, Waterfront Master Plan, Parks and Recreation Master Plan, Archeological Master Plan, 10-Year Housing and Homelessness Plan, Kingston Culture Plan, Public Art Master Plan.

Introduction

## 1.5 Provincial Asset Management Planning Requirements

The 'Building Together: Guide for Municipal Asset Management Plans' was published by the Province of Ontario in 2012 to encourage municipalities in Ontario to develop AMPs in a consistent manner. The guide outlines sections that should be included and the content that should be found within each one, including: State of Local Infrastructure, Levels of Service, Asset Lifecycle Management Strategies, and Financing Strategies. To further encourage municipalities to develop AMPs, Provincial and Federal governments made them a pre-requisite to access capital funding grants.

In 2015, Ontario passed the *Infrastructure for Jobs and Prosperity Act* which affirmed the role that municipal infrastructure systems play in supporting the vitality of local economies. The first regulation made under this act was Ontario Regulation 588/17 – Asset Management Planning for Municipal Infrastructure. O. Reg. 588/17 further expands on the Building Together Guide, mandating specific requirements for municipal AM Policies and AMPs, phased in over a five-year period.

Below is a summary of timelines and general requirements of O. Reg. 588/17. This AMP is intended to be compliant with the July 1, 2024, requirements only for facilities.

### July 1, 2019 ✓

The City requires an AM policy that articulates specific principles and commitments that will guide decisions around when, why and how money is spent on infrastructure systems.

### July 1, 2022 ✓

The City requires an AMP that documents the current levels of service being provided and the costs to sustain them for the City's water, wastewater, stormwater, roads and bridges infrastructure systems (i.e. 'core' assets per O.Reg. 588/17).

### July 1, 2024 ✓

The City requires an AMP that documents the current levels of service being provided and costs to sustain them for all infrastructure systems in the City.

### July 1, 2025 (To Be Completed)

The City requires an AMP that documents the current levels of service being provided, the costs to sustain the current levels of service, the desired levels of service, the costs to achieve the desired levels of service, and the financial strategy to fund the expenditures necessary to achieve the desired levels of service for all infrastructure systems in the City.

Introduction

## 1.6 Developing the Facilities Asset Management Plan

Developing, implementing, and updating an AMP is a large undertaking that requires buy-in and support from various levels of the City’s organization. FMCS has been implementing reliability centered maintenance and asset management activities along with the ongoing transition to a corporate-wide shared services model. This work has been critical in establishing a program to maintain assets in a way that ensures elements will meet their expected service lives. FMCS maintains a comprehensive facilities asset inventory within the Ameresco AssetPlanner system, a web-based relational database which integrates information from reactive and planned maintenance, energy management, and asset planning. The system’s central registry contains relevant asset inventory data, current age and physical condition ratings for various facility elements, recommended timing and estimated costs for required life cycle activities, work order level details, as well as priority scoring for applicable actions based on a customized internal risk management framework.

The shared services approach along with AssetPlanner application are also being leveraged to support asset management (non-core assets) within other departments and boards across the corporation.

Table 3 identifies the roles and responsibilities of the key stakeholders involved.

**Table 3. Asset Management Plan Stakeholders**

Key Stakeholder	Roles and Responsibilities
City Council	<ul style="list-style-type: none"> <li>• Approve the Asset Management policy and Corporate Asset Management Plan.</li> <li>• Serve as representatives of stakeholder and community needs particularly as it relates to determining the services and service levels to be provided.</li> <li>• Approve funding levels for both capital and operating budgets developed through the Asset Management Framework.</li> <li>• Support ongoing efforts to continuously improve and implement asset management plans.</li> </ul>
Corporate Management Team (CMT)	<ul style="list-style-type: none"> <li>• Endorse corporate asset management plans and policy.</li> <li>• Participate in the process of aligning asset management strategies and plans with organizational strategies and objectives.</li> <li>• Communicate the vision of asset management at a corporate level, encourage engagement with the processes and provide the guidance necessary to ensure alignment and integration across the organization.</li> </ul>
Asset Management Steering Committee	<ul style="list-style-type: none"> <li>• Implement the Asset Management policy.</li> <li>• Provide input on needs of department, current status of assets, and current levels of service.</li> <li>• Support and comply with data collection requirements.</li> <li>• Participate in the regular review of all documentation, data, and asset measurement tools to ensure continued relevance and applicability of existing policies and practices.</li> </ul>

Introduction

Key Stakeholder	Roles and Responsibilities
Asset Management Steering Committee (Continued)	<ul style="list-style-type: none"> <li>Document the alignment of Asset Management Plans with the priorities established and projects requested through the budget process.</li> <li>Participate in the development of the corporate asset management work plans pertaining to their areas of expertise.</li> </ul>
Chief Financial Officer & Treasurer	<ul style="list-style-type: none"> <li>Ensure alignment between the City's asset management financing plan and the City's long-term financial plan.</li> </ul>

For the creation of this AMP, initial steps included data collection and compilation, developing an analysis tool, and meeting with the City's subject matter experts to discuss, review and provide feedback on each component of the AMP. Key tasks included:

- Inventory Assessment and Gap Analysis
- Level of Service Analysis
- Evaluation of Lifecycle Management Strategy
- Financial Analysis
- Performance and Investment Needs Forecasting and Analysis
- Submission of the Final AMP and Presentation to Council

A detailed process, workflow and resource analysis was also undertaken during a previous stage of the project. The FMCS department uses the Ameresco AssetPlanner system, which contains relevant facilities asset inventory information and lifecycle data.

The development of this AMP is also defined and supported by several legislated requirements, policies and guidelines including:

- Ontario Regulation 588/17: Asset Management Planning for Municipal Infrastructure
- Infrastructure for Jobs and Prosperity Act, 2015
- Building Together – Guide for Municipal Asset Management Plans
- The ISO 55000 series of standards for asset management
- International Infrastructure Management Manual
- Federation of Canadian Municipalities, Asset Management Readiness Scale
- Institute of Asset Management, Asset Management – an Anatomy
- Reliability Centered Maintenance Best Practices



Figure 4. New Fleet Maintenance Garage Under Construction

Introduction

### 1.7 Continually Improving the Asset Management Plan

The future of asset management in municipalities has a large data and analytical component. This approach has the advantage of providing a progressive system that can help the City operationalize the processes over the coming years, while being able to continually improve its structure.

In future iterations, this AMP will evolve to further reflect the City’s Strategic Plan and advances made to the City’s Asset Management Policy. This will enable the City to develop more sophisticated AMPs to accompany future budgets, Official Plans and Infrastructure Master Plans. Table 4 below outlines components of the AM Framework that should be continually updated and the necessary timelines to do so.

**Table 4. Timeframes and Update Frequency of Asset Management Planning Documents**

Document	Frequency
Asset Management Policy	<ul style="list-style-type: none"> <li>Reviewed by the Asset Management Steering Committee annually and following any updates to the Strategic Plan</li> <li>Full re-evaluation every 5 years</li> </ul>
Asset Management Plans	<ul style="list-style-type: none"> <li>Annual update to data</li> <li>Full update every 5 years to be approved by Council</li> </ul>
Capital and Operating Budget	<ul style="list-style-type: none"> <li>Annual development process</li> <li>Multi-year budgets specific to some asset classes</li> </ul>



Figure 5. New Kingston East Community Centre



Figure 6. City Hall Mechanical Room

**Introduction**

## **1.8 Climate Change and Asset Management**

Climate change is one of the most complex challenges facing municipalities today. In recent years, Ontario has experienced a significant number of extreme weather events and adverse impacts such as flooding, ice storms, power outages, and infrastructure damage. As outlined in the City’s Climate Leadership Plan, rising average temperatures, shifting historical precipitation patterns along with increased intensity, changes in duration and frequency of storm events and periods of drought, increasing windstorms, and fluctuations in lake levels are all anticipated to continue. Asset Management Plans and future practices must reflect this reality.

The City is in the process of evaluating climate impacts, risks, and vulnerabilities the municipal government currently faces, or is expected to experience in the future. Understanding climate related risks and vulnerabilities that impact the City allows municipal operations, policies, and procedures to best align with the future climate. Positioning adaptation planning throughout the municipal government will also encourage proactive decision-making, climate orientated action and implementation focused on creating a climate responsible and resilient community.

The City has partnered with local experts in climate change and asset management to ensure that the City’s policies and practices adapt to reduce both immediate and long-term impacts to municipal infrastructure. By assessing the probability and risk associated with potential climate factors, various design and operational practices can be altered to proactively build resilience into existing systems to help mitigate the impacts from extreme weather. This strategy will ensure that all assets are maintained efficiently.

This AMP does not currently address potential LOS impacts or specific costs related to the greenhouse gas (GHG) reduction targets outlined in the Climate Leadership Plan.

The FMCS department is already implementing several initiatives and programs that incorporate climate change planning as well as energy efficiency and GHG reduction strategies within various projects and ongoing asset management work. Work is also underway to establish a detailed roadmap and costs to achieve specific targets outlined in the Climate Leadership Plan.

## **1.9 Risk Management Framework**

### **1.9.1 Asset Risk**

The FMCS department uses the Ameresco AssetPlanner system, a web-based relational database which integrates information from reactive and planned maintenance, energy management, and asset planning. The system’s central registry contains relevant asset inventory data, current age and physical condition ratings for various facility elements, recommended timing and estimated costs for required life cycle activities, work order level details, as well as priority scoring for applicable actions based on a customized internal risk management framework. The system also allows for simulation and modelling of the condition of facilities based on forecasted levels of funding.

FMCS can support effective decision-making and long-term capital planning for facilities by incorporating this detailed, risk-based asset information with the evaluation of needs identified through consultation with other

Introduction

departments who are providing services directly to members of the community or other internal clients. This work is also now integrating strategic planning that will help to optimize the timing of regular facility renewals within the context of specific GHG reduction targets established within the approved Climate Leadership Plan.

**1.9.2 Service Risk**

This section summarizes potential risks associated with the lifecycle strategies, funding analyses, and recommendations. Risks are described below, and potential mitigation strategies are also discussed.

**Data Confidence**

The asset management analyses completed as part of this AMP are reliant on the City’s asset and financial data. The confidence of that data affects the confidence of the results of each analysis. Overall, most of the data was provided from reliable sources.

This risk is considered to be low, but the City should continue to invest in keeping data up-to-date.

**Funding and Costs**

Within the scope of this AMP, the City has conducted comprehensive analyses to identify the asset classes that require additional funding to maintain the LOS. The funding gap exposes the City to the risk of operating at a lower LOS. This could include:

- **Increase to Service Disruptions and Deterioration:** Inadequate funding for asset lifecycle activities could lead to increased instances of asset breakdowns, service interruptions, and accelerated deterioration. This could result in reduced service quality, disruptions to public services, and potential safety hazards.
- **Higher Maintenance Costs:** Neglecting proper lifecycle activities may lead to deferred maintenance, which can escalate future maintenance and repair costs. The longer maintenance is deferred, the more extensive and expensive the repairs become.
- **Unplanned Expenditures:** Insufficient funding for lifecycle activities can result in unexpected and unplanned capital expenditures when assets fail prematurely or require emergency repairs to maintain services.
- **Reduced Longevity:** Assets that do not receive appropriate lifecycle activities are likely to have shorter lifespans, leading to more frequent replacements and associated costs.
- **Increased Liability and Legal Risks:** Assets not maintained according to their lifecycle requirements could pose safety risks to the public, potentially resulting in accidents, injuries, or legal claims against the municipality.
- **Decreased Public Satisfaction:** Service disruptions, deteriorating infrastructure, and reduced service quality can negatively impact public perception and satisfaction with municipal services.
- **Impact on Economic Development:** Infrastructure that does not meet the required lifecycle activities could deter potential investors and businesses, hindering economic growth and development in the municipality.
- **Non-Compliance with Regulations:** Failure to meet lifecycle activities could lead to non-compliance with regulatory standards and requirements, resulting in potential fines, penalties, or loss of funding.

## Introduction

It should be emphasized that the improvement to data confidence will have a direct impact to this risk because the expenditure forecasts are directly linked to the data assumptions. The funding gap could increase or decrease depending on improvements to the costing and performance data.

### Climate Change

Climate change also poses a significant risk to the City. The effects of climate change could result in impacts to assets that would require additional funding from the City. Impacts could include increased risk of failures, accelerated deterioration, or a reduction in capacity of some assets that are impacted by the effects of climate change. In addition, while FMCS is projecting to be on track to meet short term targets, this AMP does not currently address potential LOS impacts or specific costs related to the long term GHG reduction targets outlined in the Climate Leadership Plan. This is further discussed in Section 1.8.

### Regulatory Environment

There are also potential risks associated with a changing business environment. Regulatory changes could impact the way that the City renews and replaces its infrastructure. These risks are generally considered to be low, since the City endeavours to keep current with legislated changes, and incorporate them into its planning, which ensures that assets are up to date within the current regulatory environment. This also means that the City will be adequately equipped to adapt to any future regulatory changes.

## 1.10 Asset Management Plan Limitations and Assumptions

This AMP was developed based on the best available information and by employing professional judgement and assumptions to address gaps where necessary. Asset specific assumptions are recorded in the following sections. Where gaps or opportunities were identified, they have been included in the continuous improvement plan.

This plan excludes airport airside infrastructure, parking structures and surface lots, aquatic facility filtration and treatment infrastructure, as well as arena refrigeration plants.

Background information and reports related to this AMP are available to the public upon request and will be accessible on the City's website once all non-core Asset Management Plans have been completed.

## 1.11 Asset Management Plan Structure

This plan has been designed to meet the July 1, 2024, O. Reg. 588/17 requirements, which is an AMP that documents the current levels of service being provided and costs to sustain them for the City's facilities assets. The following subsections will be applied:

1. State of Local Infrastructure
2. Levels of Service
3. Lifecycle Management Strategy
4. Forecasted Lifecycle Activity Costs

The plan is concluded with the Improvement and Monitoring sections. The following describes each of the subsections in detail.



**Introduction**

**1.11.1 State of Local Infrastructure**

The State of Local Infrastructure includes the following information:

- A summary of the asset portfolio along with associated replacement and financial valuation costs.
- Asset age summary, including the average age of assets in each category compared to their average estimated service life.
- Overview of observed condition (e.g. Facility Condition Index— FCI) or predicted condition based on asset age.
- Data sources used in the analysis, rated for confidence, with any assumptions made clearly documented.

Depending on the method used to determine condition (e.g. age, FCI), scores were converted to condition ratings based on methods that are outlined in the service area Asset Condition sections. For example, condition scores for facilities were based on the Facility Condition Index (FCI), which is the ratio between renewal needs (costs) and the overall total replacement value of the facility. These scores were categorized into the descriptive categories that are provided in Table 5.

**Table 5. Asset Condition Rating**

Condition Rating	Definition	Facilities: FCI
Very Good	The asset is fit for the future. It is in excellent condition, new or recently rehabilitated	N/A <sup>4</sup>
Good	The asset is adequate. It is well maintained, acceptable and generally within the mid-stage of its expected service life	0% to 5%
Fair	The asset requires attention. The asset shows signs of deterioration, and some elements exhibit deficiencies.	5% to 10%
Poor	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.	10% to 30%
Very Poor (Critical)	The asset is un-fit for sustained service. It is near or beyond its expected service life and shows signs of advanced deterioration. Elements may be unusable.	>30%

<sup>4</sup> FMCS does not differentiate between good and very good with respect to FCI.

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Given the reliance that appropriate asset management planning has on data quality, documenting data sources and assessing their quality is an important step in the development of asset management plans. Taking the time to ensure the best available data is being used will result in high quality analysis that builds the foundation for all AMPs moving forward. This practice also provides a level of transparency to understand that some assumptions may have been necessary to fill gaps in the data. The data confidence ratings and their respective criteria is provided in Table 6. This information has been used as a basis to provide recommendations for improvement in future iterations of the plan.

**Table 6. Data Confidence Ratings**

Data Quality Rating	Definition
High	No concerns identified, and data appears to be very consistent, or further information from staff on the origin of the data has been provided suggesting high confidence.
Medium	Minor or no data concerns identified
Low	Major data concerns identified

**1.11.2 Levels of Service**

FMCS developed this AMP that follows the Province’s structure outlined in the Building Together: Guide for Municipal Asset Management Plans, and also addresses the requirements of Ontario Regulation 588/17. A comprehensive Level of Service (LOS) Framework was developed to support the AMP based on practices that were already in place. These frameworks help establish a relationship between the LOS being provided by the City’s infrastructure systems and the associated operating and capital expenditures required to achieve the LOS.

The structure of the LOS tables for the City were developed by leveraging international best practices. The tables were developed in accordance with Ontario Regulation 588/17 Asset Management Planning for Municipal Infrastructure made under the Infrastructure for Jobs and Prosperity Act, 2015.

The LOS framework for the facilities portfolio consists of the following structure:

- 1. Service Attributes** consists of a phrase which describes an important area of focus for each service group. Examples of Key Service Attributes include Cost Efficient, Safe, Reliable, etc. The listed Key Service Attributes are meant to cover all important aspects of the service and be easy for the community to understand and recognize.
- 2. LOS Statements** consist of a short sentence, which describes the outputs of the service category. Each LOS Statement corresponds to a Key Service Attribute. Each LOS Statement should clearly state customer standards and be measurable.

**Introduction**

- 3. Performance Measures** identify specific areas of focus that can be measured to support each Key Service Attribute. One or more performance measures can be listed for each Key Service Attribute. The LOS tables provide two types of Performance Measures: Customer and Technical. Each Performance Measure should be defined to be SMART (specific, measurable, achievable, relevant, and time-based). Each Performance Measure is further subdivided into four components, which are represented as additional columns in the LOS table. These components detail the Performance Measure and Current Performance.
- 4. Current Performance** refers to values (for the most recent complete calendar year) that summarize the current performance for each measure.

**1.11.3 Lifecycle Management Strategy**

The City’s lifecycle strategy describes the set of planned actions that the City undertakes to sustain levels of service, while managing risk at the lowest possible lifecycle cost, in alignment with LOS and risk strategies. The types of lifecycle activities are shown in Table 7.

These activities form the basis of the Lifecycle Management Strategy section of the AMP. This will enable the City to establish and report on possible options for which lifecycle activities could potentially be undertaken to maintain the current levels of service as well as the associated risks and costs. This reporting is necessary to meet the requirements of O. Reg. 588/17.

**Table 7. Lifecycle Activities**

Lifecycle Activity	Description
Non-Infrastructure	Actions or policies that can lower costs or extend asset life
Operations and Maintenance	Costs to deliver the service. Including regularly scheduled inspection and maintenance or more significant repair and activities associated with unexpected events.
Renewal, Rehabilitation and Replacement	Significant repairs designated to extend the life of the asset. Activities that are expected to occur once an asset has reached the end of its useful life and renewal/rehab is no longer an option.
Disposal	Activities associated with disposing of an asset once it has reached the end of its useful life or is otherwise no longer needed by the municipality.
Expansion, Growth and Service Improvements	Planned activities required to extend services to previously un-serviced areas– or expand services to meet growth demands.

Introduction

### 1.11.4 Funding the Lifecycle Activities

The costs associated with each lifecycle activity are considered as part of the strategy. A long-term investment forecast has been developed for each asset in scope to illustrate the capital and operational needs to support the current levels of service.

The Lifecycle Strategy has been combined with the City's LOS and Risk Management strategies in a decision support system (DSS) model, which allows the City to run various forecasting scenarios. The following scenarios focused on renewal spending were analyzed for each asset class:

#### Scenario 1: Anticipated Budget:

Evaluates asset performance under the current 10-year capital plan that the City anticipates to allocate towards that asset class. The current budgets were obtained from the City's 2023 financial plan. This illustrates the change in LOS under anticipated conditions and is also used as a baseline scenario to assess the other scenarios analyzed.

#### Scenario 2: Maintain Levels of Service

This scenario determines the cost that would be required to maintain current LOS over a 10-year forecast period. Understanding the cost to maintain current LOS is a requirement of the July 1, 2024 milestone of O.Reg. 588/17. Individual facilities are meeting LOS if they have an FCI of 10% or lower and average FCI of the portfolio was used to determine the cost to maintain LOS.

#### Scenario 3: Achieve Proposed Levels of Service

This scenario determines the costs and associated asset performance to achieve the proposed LOS over a 10-year forecast period. These targets generally apply to the reliability

and condition-based LOS that the City has established. The proposed LOS for this AMP is the same as Scenario 2 to maintain the average FCI over the 10-year period.

These scenarios provided analysis and insights into the City's spending needs with respect to asset renewals, rehabilitations, replacements, and disposal. The results also help inform the City's Financial Strategy.



Figure 7. Bishop's House and Kingston Frontenac Public Library Central Branch

Introduction



**Figure 8. Disassembly of Kirkpatrick Fountain for Restoration (Frontenac County Courthouse)**

### 1.11.5 Improvement and Monitoring

The improvement and monitoring section provides the City with prioritized areas for improvement by asset type, as well as suggestions for continual improvement to the AMP in the years to come.

Through the project the City established roles and responsibilities of the various stakeholder groups for monitoring and execution. This is important as it follows the guiding principles of the City's Strategic Plan of ensuring fiscal responsibility and accountability.

The City has taken the suggestions from O. Reg. 588/17 and the Building Together – Guide for Municipal Asset Management Plans to create an integrated and holistic plan that can be continually adjusted and be treated as a “living document”. The City of Kingston's Asset Management Policy ensures that to support the City's Strategic Plan a continual review and improvement of the AM framework, practices, strategy, and related processes must occur.

# Facilities Management & Construction Services



## Facilities

Total Replacement Value	\$1,292,136,000
Overall Average Condition	Fair

## 2.0 Facilities Management & Construction Services

The Facilities Management & Construction Services (FMCS) department serves to ensure that citizens, employees, elected officials and visitors have safe, comfortable and efficient facilities in which to carry out civic activities. This asset portfolio supports a wide range of services essential for everyday living. Work undertaken by the department is carefully planned to meet client and community needs.

The following internal Mission and Vision statements broadly define what FMCS strives to provide for its 'clients' and how they intend to do so:

*Our mission is to provide safe, comfortable and well-maintained facilities for Kingston citizens, City employees, elected officials and visitors by planning and delivering professional facility management and construction services that are sustainable and supportive of service delivery excellence.*

*As leading professionals in the provision of facility management and construction services, FMCS will provide centralized planning and management resulting in better-maintained, fit-for-purpose, energy-efficient, climate resilient, economically rationalized facilities for which there exists a sustainable long-range funding model.*

FMCS supports Council initiatives for a range of clients including various City departments, as well as external boards and agencies and their respective employees by:

- Collaborating with strategic partners to conceive, design, construct and renovate facilities that support the needs of various City programs and services.
- Supporting operations and maintaining corporate facility assets at an optimum level of performance and reliability.
- Facilitating corporate planning and priority setting for future developments and expansion of facilities.
- Advancing sustainability initiatives that demonstrate leadership on climate action.

## 2.1 State of the Local Infrastructure

### 2.1.1 Asset Inventory and Valuation

The City of Kingston owns and maintains a diverse portfolio of municipal facilities and is responsible for maintaining and renewing them where necessary to meet operational and community objectives. The goal is to consistently provide a high level of performance and reliability for all City facilities.

The replacement cost for the entire facilities portfolio is approximately \$1.3 billion. This is shown compared to its financial valuation in Table 8. The financial valuation differs from the replacement valuation as it is based on the historic costs of construction and applies depreciation over time, up until the current year. The replacement valuation that asset management analyses use is the cost to replace the asset with what is needed (not necessarily like-for-like replacement) and in today's dollars. Note that FMCS is the final stages of implementation of a shared services model that is centralizing services related facilities across the corporation, which will increase these values. 218 and 206 Concession have been excluded from the 2024 Facilities Asset Management Plan and will be included in the 2025 update. These properties were owned at the end of 2023, their information will be integrated into Asset Planner during the 2025 planning cycle.

**Table 8. Financial Accounting Valuation and Replacement Cost Valuation**

Financial Accounting Valuation	Replacement Valuation
\$381,649,343	\$1,292,136,214

Table 9 and Figure 9 present the facilities portfolio breakdown by asset categories. The Administration & Offices category

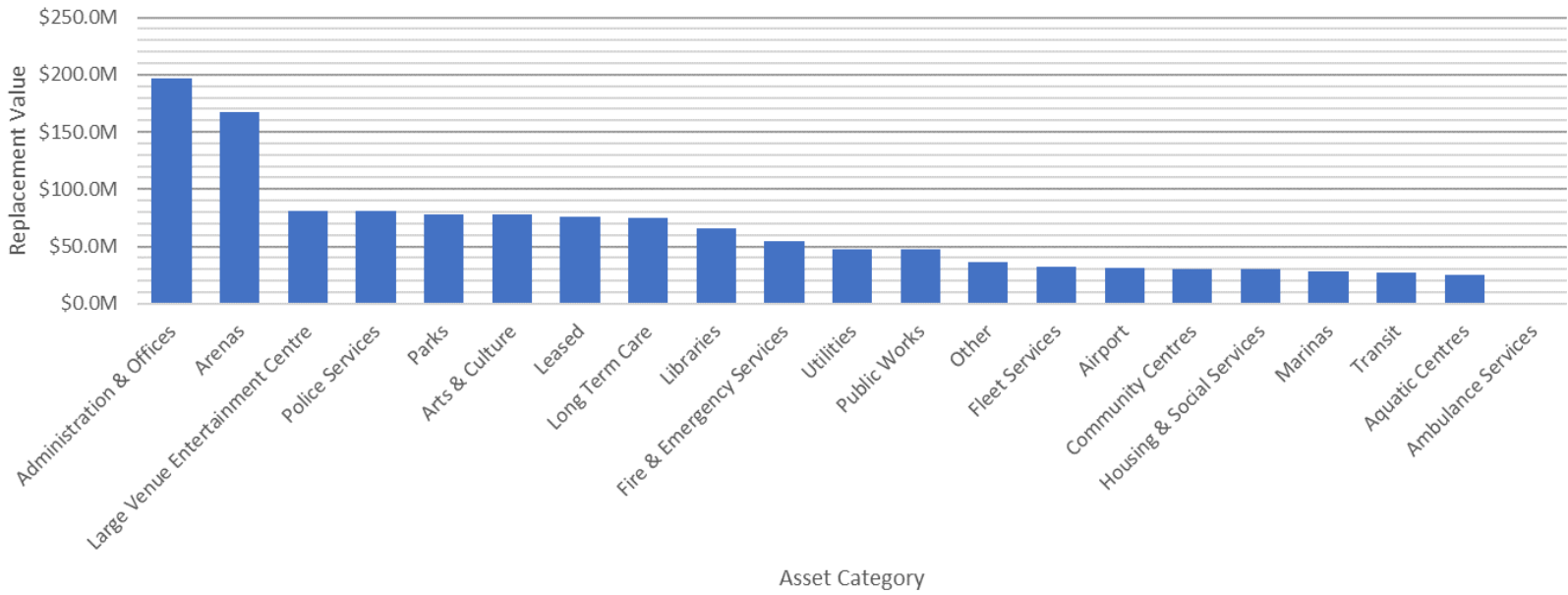
comprises the majority of the portfolio and accounts for approximately \$197M or 15% of all assets included in this plan.

**Table 9. Asset Quantities and Replacement Values**

Category	Count	Replacement Value (M)
Administration & Offices	6	\$197.2
Airport	4	\$30.9
Ambulance Services	2	\$1.2
Aquatic Centres	2	\$25.5
Arenas	6	\$167.5
Arts & Culture	5	\$77.7
Community Centres	2	\$30.3
Fire & Emergency Services	25	\$55.0
Fleet Services	2	\$32.4
Housing & Social Services	4	\$30.1
Large Venue Entertainment Centre	1	\$81.0
Leased	13	\$76.3
Libraries	5	\$66.2
Long Term Care	1	\$74.9
Marinas	3	\$28.7
Parks	31	\$78.4
Police Services	2	\$81.0
Public Works	16	\$47.1
Transit	4	\$27.6
Utilities	2	\$47.1
Other	11	\$36.0
<b>Total Facilities Management</b>	<b>147</b>	<b>\$1,292</b>



Figure 9. Asset Categories by Replacement Value



### 2.1.2 Asset Age Summary

Buildings are often not replaced outright, but rather undergo a process of continuous renewal due to a combination of economic, environmental, and practical factors. Replacing entire buildings can be financially burdensome, requiring significant upfront investment and potentially disrupting ongoing critical municipal operations. Moreover, the environmental impact of demolition and construction, including resource consumption and waste generation, encourages a more sustainable approach through refurbishment and renovation. Continuous renewal also allows buildings to adapt to changing needs, incorporating modern technologies, energy-efficient systems, and improved designs while preserving a sense of history and architectural heritage. By incrementally upgrading structures over time, communities can strike a balance between maintaining functional spaces, minimizing ecological footprint, and honoring the past.

Given the wide range of building equipment and systems with unique requirements that may be contained within a particular location, individual facility assets are typically broken down into elements grouped according to ASTM E1557, Standard Classification for Building Elements and Related Sitework – Uniformat II. Major element groups consist of:

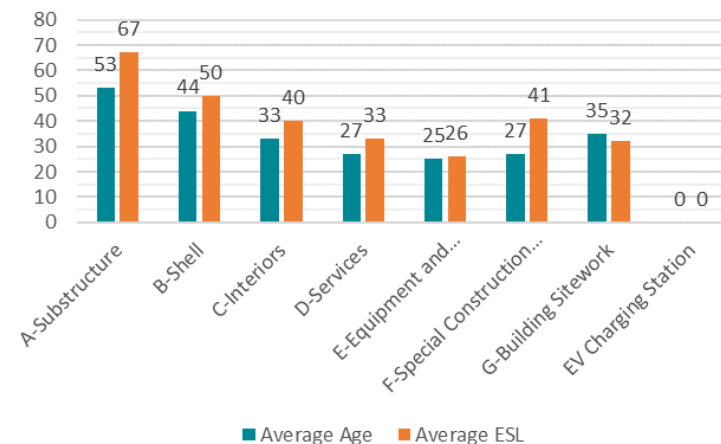
- A – Substructure (foundations)
- B – Shell (roofing, cladding, windows, and doors)
- C – Interiors (floor, wall, and ceiling finishes)
- D – Services (mechanical and electrical systems)
- E – Equipment & Furnishings (functional components)
- F – Special Construction (other small structures)
- G – Building Sitework (landscaping, pavement, and site servicing)

The figures presented in this section reflect this classification of facility elements. EV charging stations have been separated into an additional grouping for clarity.

The overall age of facilities in the portfolio ranges from 0 to more than 200 years. Due to heritage and other cultural significance, some of these assets will be maintained indefinitely (infinite lifecycle).

The average age of asset elements within the facilities compared to the average estimated service lives (ESL) of the element group is summarized in Figure 10. The year of last major action was used to determine the age of each component. Presenting the asset portfolio in this manner provides a quick snapshot of where the facility components generally are within their lifecycle, which in turn can provide an idea of overall condition based on age. Based on this data alone, facilities would be expected to be in poor condition since components appear to be past their service lives.

**Figure 10. Average Facility Element Age as a Proportion of Average Asset ESL**



Facilities Management

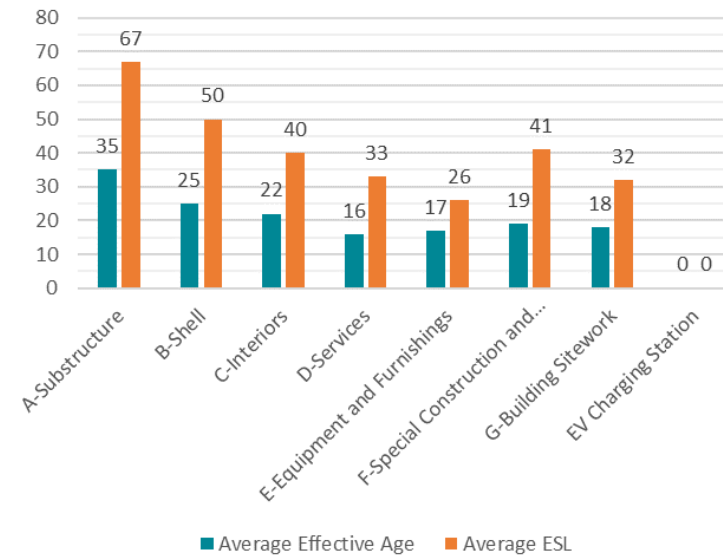


Figure 11. New Kingston East Community Centre

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The effective age was also used for comparison and is provided in Figure 12. The effective age was calculated using the anticipated year of renewal relative to the average ESL of all facility elements in the group. This provides a clearer picture of asset needs since it factors in the results of the building condition assessments. Based on this data, facilities would be expected to be in fair condition since the average facility components are meeting their performance objectives but are nearing the end of their service lives.

Figure 12. Average Facility Element Effective Age as a Proportion of Average Asset ESL



Facilities Management

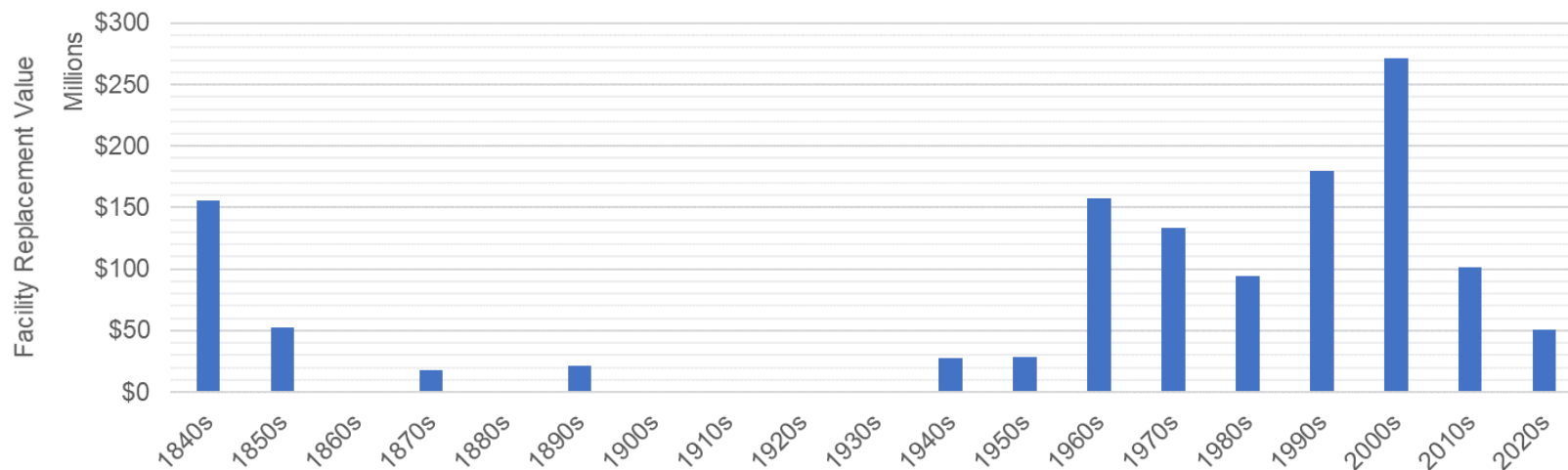
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Figure 14 presents the construction decade for facility assets by replacement costs. This also shows that the majority of investment in the facilities occurred in the 1960s and onward. There is approximately \$308M in replacement costs which corresponds to designated heritage buildings that were constructed the 1800s. Heritage facilities include locations such as City Hall and Frontenac County Courthouse buildings, among other locations.



Figure 13. PumpHouse Museum Addition

Figure 14. Construction Decade by Facility Replacement Value



### 2.1.3 Asset Condition

This section outlines the breakdown of assets in each condition category. City facilities are managed and maintained through a centralized reliability-centered maintenance program administered by the City’s Facilities Management & Construction Services team. Comprehensive condition assessments are typically performed on a regular basis (e.g. 4-year cycle) with additional interim or specialized assessments as required. Condition can be assessed at the asset element or system level, as well as the overall facility level using the industry standard Facility Condition Index (FCI). The overall facility condition index (FCI) was used for the AMP to determine the performance of the Facilities asset portfolio. Each facility FCI is determined by the annual percentage of facility components requiring investment as a proportion of total facility replacement value. The categorization of FCI to condition ratings is provided in Table 10. Facilities with an FCI greater than 10% are not meeting relevant performance or LOS objectives.

**Table 10. Condition Rating Scale and its Asset Condition Values (Facilities)**

Condition Rating	Facilities: FCI
Very Good	N/A
Good	0% to 5%
Fair	5% to 10%
Poor	10% to 30%
Very Poor (Critical)	>30%

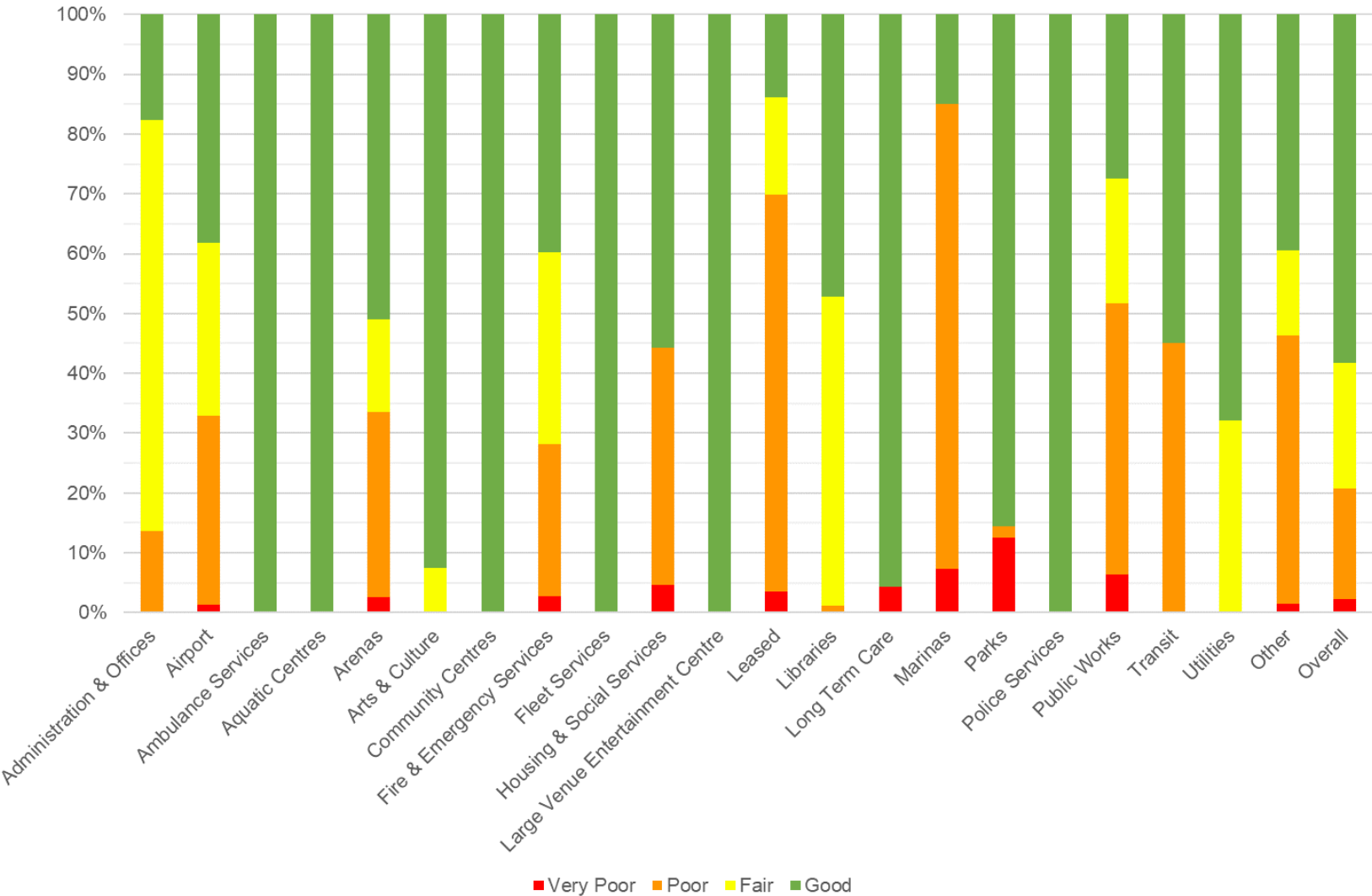
The distribution of facilities in each condition category are provided in Figure 15.

Overall, 79% of the Facilities Management assets are in fair or better condition (based on overall facility replacement value).

Since most facilities assets have condition data obtained during recent condition assessments, the information provided here does not necessarily align with the age-based information presented in the preceding section. This illustrates the importance of having good, timely and reliable condition data to avoid relying solely on age-based condition ratings.

The condition scores, replacement and remediation triggers found within this AMP are presented in the absence of public input, more specifically, tolerability. Customer tolerability studies and surveys present users of the infrastructure systems and residents, with an option for level of service or condition of an asset along with an associated cost. Condition or level of service states and costs are presented in such a way that the customer can connect a given level of service with a corresponding cost and at a scale that they can understand.

Figure 15. Current Condition of Facilities Assets in Each Category - Distribution by Replacement Value



### 2.1.4 Data Sources and Confidence

FMCS maintains a comprehensive facilities asset inventory within the Ameresco AssetPlanner system, a web-based relational database which integrates information from reactive and planned maintenance, energy management, and asset planning. The system’s central registry contains relevant asset inventory data, current age and physical condition ratings for various facility elements, recommended timing and estimated costs for required life cycle activities, work order level details, as well as priority scoring for applicable actions based on a customized internal risk management framework. Table 11 provides the data confidence scores for various facilities asset categories. 95% of Facilities BCA’s completed with the remaining locations (small park buildings) to be completed by Q2 2025. Frequency to complete a building BCA to be done every 3 - 5 years based on the criticality of the facility, and internal condition updates are done by FMCS staff throughout the year.

**Table 11. Data and Confidence**

Asset Category	Confidence Rating	Confidence Comment
All Facilities	High	Information comes from building condition assessments. Few data discrepancies, no data gaps. Performance is based on expected renewal year and replacement costs were reviewed in preparation of this AMP.



**Figure 16. Kingston Senior's Association During Roof Replacement**



## 2.2 Levels of Service

Establishing levels of service (LOS) can provide an understanding of the relationship between requirements and costs. It is important to set realistic LOS targets, which support the City’s goals and strategic plan. This section will outline the Facilities LOS Framework, to provide a better understanding of what is required to achieve and maintain desired performance.

### 2.2.1 Ontario’s Requirements for Asset Management Planning

O. Reg. 588/17 requires municipalities to report current LOS performance in the AMP for all assets by July 1, 2024. There are two levels required from the regulation:

1. Community – uses **qualitative** parameters to explain the desired LOS.
2. Technical – uses **quantitative** metrics to explain the scope and LOS delivered.

### 2.2.2 Levels of Service Performance Metrics

The LOS in this AMP have been developed by taking a service-centric approach to AM. This is achieved by identifying the key customer-facing services and sub-services that the City provides and relating them to the assets that support the delivery of those services. Thus, asset-related decisions can be made and understood in the context of key service attributes such as Accessibility, Quality, Safety, Reliability, and Environmental Stewardship (Climate Leadership).

The performance measures for this AMP were selected based on the City’s overall strategic goals along with the internal mission and vision for FMCS as outlined above. The following sections outline the customer focused performance measures followed by the technical -focused performance measures.



**Customer Service Attribute: Accessibility**

**LOS Statement:** Facilities are accessible for intended use.

**Table 12. Customer LOS for Accessibility**

Performance Measure	2023 Performance	Proposed Performance
Description of facilities and level of accessibility	City facilities support a diverse range of services and are accessible to people using mobility devices. New construction and renovations are implemented according to best practices as well as the Ontario Building Code and City's Facility Accessibility Design Standards (FADS).	Incorporate and support relevant initiatives associated with the City's Inclusion, Indigenization, Diversity, Equity and Accessibility (IIDEA) journey.

**Customer Service Attribute: Quality**

**LOS Statement:** Facilities are at the appropriate level of quality and condition.

**Table 13. Customer LOS for Quality**

Performance Measure	2023 Performance	Proposed Performance
Percentage of facilities assets in fair or better condition (FCI of 10% or lower/better)	79%	Future <sup>5</sup>
Average Facility Condition Index (FCI) value for all facilities	10% and projected to be 19% at end of 10-year horizon based on anticipated budget	10% or less (fair or better condition) sustained over 10-year horizon

<sup>5</sup> Facilities are currently managed by maintaining average FCI. This accounts for facilities that have low utilization. A proposed performance can be set once the facilities are further classified.

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**Technical Service Attribute: Reliability**

**LOS Statement:** Facilities are proactively maintained and reliable for intended use.

**Table 14. Technical LOS for Reliability**

Performance Measure	2023 Performance	Proposed Performance
Percentage of planned maintenance events as a proportion of total maintenance activities (i.e. planned vs. reactive)	47%	60%

**Technical Service Attribute: Climate Leadership**

**LOS Statement:** Facilities are energy efficient and demonstrate leadership on climate action.

**Table 15. Technical LOS for Climate Leadership**

Performance Measure	2023 Performance	Proposed Performance
Greenhouse gas (GHG) emissions (equivalent emissions from all energy sources)	6,843 tonnes CO2e	19% reduction below 2018 emissions by 2026 (per Facilities Energy & Asset Management Plan), 30% reduction by 2030 and carbon neutrality (net zero energy) by 2040 (per Climate Leadership Plan)

## 2.3 Asset Lifecycle Management Strategy

This section of the Plan outlines the specific activities required to maintain the levels of service previously outlined. Defining a set of preferred lifecycle activities for each asset is important to maintain coordination of investments and optimize the asset lifecycle. The lifecycle strategies for Facility assets were developed based on consultation with City staff and industry best practices and are summarized in the following subsections.

### 2.3.1 Lifecycle Activities

These activities form the basis of an Asset Management Strategy section of the City's AMP. The development of appropriate and cost-effective strategies is foundational for ensuring service sustainability and reliability. This will enable the City to establish and report on possible options for which lifecycle activities could potentially be undertaken to maintain the current levels of service as well as the associated risks and costs. This reporting is necessary to meet the requirements of O. Reg. 588/17. Table 16 to Table 20 describe the lifecycle management strategies and activities currently completed or planned to be implemented by the City for Facility assets.



Facilities Management

State of the Local Infrastructure – Levels of Service – Lifecycle Management Strategy

**Non-Infrastructure Solutions**

Actions or policies that can lower costs and extend useful lives.

**Table 16. Non-Infrastructure Solutions**

Description of Activities Practiced by the City	Frequency
Conservation and Demand Management Plan	5-year cycle (O. Reg. 25/23)
Condition Assessments	4-year cycle, or as required
Space Planning	As required
Municipal Campus Planning	As required
Review of work in process, prioritization of current and upcoming needs, and updating of the 15-year Capital Budget Forecast	Annual cycle
Other technical studies and assessments	As required

**Operations and Maintenance Activities**

This includes regularly scheduled inspection and maintenance, or more significant repairs and activities associated with unexpected events.

FMCS has been implementing reliability centered maintenance and asset management activities along with the ongoing transition to a corporate-wide shared services model. This work has been critical in establishing a program to maintain assets in a way that ensures elements will meet their expected service lives.

**Table 17. Operations and Maintenance Activities**

Description of Activities Practiced by the City	Frequency
Planned Maintenance (PM)	According to various PM programs - implemented using Computerized Maintenance Management System (CMMS)
Service Requested Maintenance	As required - requested directly through CMMS
Reactive Maintenance	As required - requested through Facilities Immediate Maintenance Support Hotline
Building Automation System (BAS) monitoring	Daily monitoring of heating, ventilation, and air conditioning systems including response to equipment alarms
Retro-Commissioning of building HVAC systems	4-year cycle, or as required

Facilities Management

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**Renewal, Rehabilitation, Replacement Activities**

Significant repairs designed to extend the life of the asset such as roof replacement, heritage masonry restoration, lighting retrofits and mechanical equipment upgrades, etc.

**Table 18. Renewal, Rehabilitation, Replacement Activities**

Description of Activities Practiced by the City	Frequency
Renewal or Rehabilitation	Varies depending on asset type and potential risk - based on feedback from maintenance services and detailed condition assessments. May involve mid-life or near end-of-life intervention to extend service life.
Building system, equipment or component replacement	As required - when asset elements reach end of service life or are no longer fit for purpose

**Disposal Activities**

Activities associated with disposing of an asset once it has reached the end of its useful life or is otherwise no longer needed by the municipality.

**Table 19. Disposal Activities**

Description of Activities Practiced by the City	Frequency
Building and equipment disposal	Coordinated with asset replacement
Critical equipment kept as spares	As required where possible

**Expansion, Growth and Service Improvement Activities**

Planned activities required to extend services to previously unserved areas or expand services to meet growth demands.

**Table 20. Expansion / Growth / Service Improvement Activities**

Description of Activities Practiced by the City	Frequency
New Facilities	As identified through planning and studies
Expansion or major renovation of existing Facilities	As identified through planning and studies
Facility repurposing or change of use	As identified through planning and studies
Interior renovations	As required - to suit various department needs or other changes of use
Enhancements to support Inclusion, Indigenization, Diversity, Equity and Accessibility (IIDEA) initiatives	As identified through planning and studies

Facilities Management

2.3.2 Funding the Lifecycle Activities

The City uses the lifecycle strategies described in Subsection 2.3.1 to plan work and determine future expenditure needs. The LOS used in the AM analysis for Facilities assets was defined as the average FCI of the portfolio.

Each of the scenarios considers only the asset renewal needs, further details of the funding required for the remaining lifecycle activities are shown in Section **Error! Reference source not found..** The scenarios and its purpose in the overall analysis are further explained in Subsection 1.11.4.



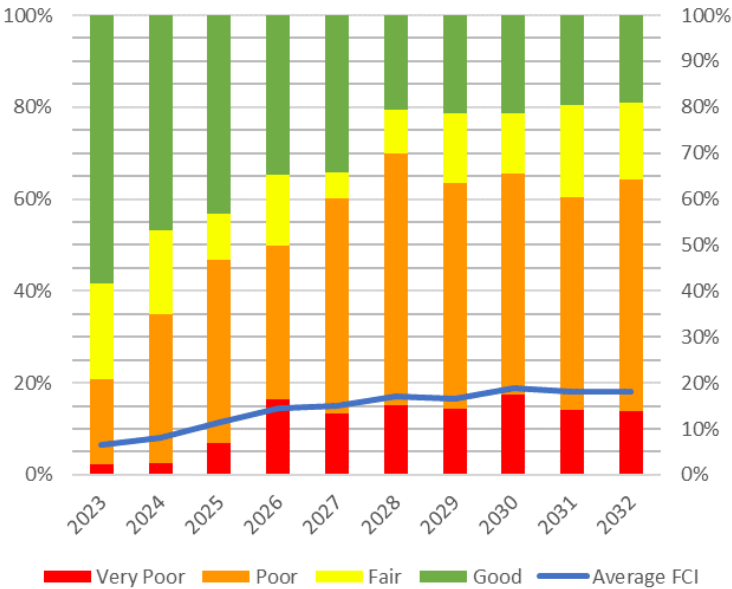
Figure 17. Kingston Fire & Rescue Headquarters During Installation of New Cooling Equipment

State of the Local Infrastructure – Levels of Service – Lifecycle Management Strategy

Scenario 1: Anticipated Budget

The current average anticipated renewal investments of \$13M annually, resulted in the performance forecast illustrated in Figure 18. Under this scenario, average FCI reaches 18% by the end of the 10-year forecast period, which is a decrease to LOS.

Figure 18. Facilities Management Performance Forecast for Anticipated Budget



Facilities Management

State of the Local Infrastructure – Levels of Service – Lifecycle Management Strategy

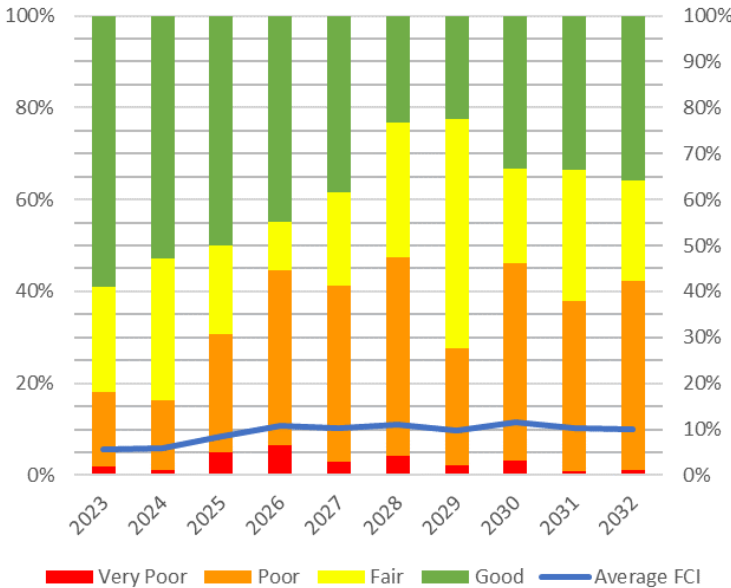
**Scenario 2: Maintain Levels of Service**

The renewal costs required to maintain the existing service levels of 10% FCI was determined to be \$25M annually over a 10-year period and resulted in the performance forecast illustrated in Figure 19.

**Scenario 3: Achieve Proposed Levels of Service**

The proposed LOS is to maintain an average FCI of 10%. Therefore, the renewal cost required to achieve proposed service levels is the same as Scenario 2 of \$25M over a 10-year period.

**Figure 19. Facilities Management Performance Forecast for Maintain LOS**



Financial Strategy



Figure 20. New Kingston Fire & Rescue Maintenance Garage



### 3.0 Improvement and Monitoring

This asset management plan is intended to be a living document that is updated at recurring intervals. A key component of asset management is ensuring continuous improvement of asset management practices. This section outlines strategies to be implemented for improving the asset management plan, as well as overall improvements to the asset management program at the City.



**Figure 21. Kingston Frontenac Public Library Central Branch**

### 3.1 Improving Future Asset Management Plans

Opportunities to improve the Facilities Asset Management plan include:

- Continued efforts in refining the inventory. Data accuracy should be improved as new information on performance, lifecycle costing and attribute data changes.
- The assets that are tracked by FMCS in AssetPlanner but are not incorporated in the FMCS Capital or Operating plans should be reviewed and potentially included in the next version of the Facilities AMP.
- Currently, some facilities, equipment & structures managed by FMCS are budgeted in their respective service area. The City should consider a more streamlined approach that would capture all facilities managed by FMCS in their budget.
- There is currently a draft project closeout process. The City should consider finalizing it for new and decommissioned assets. This is an opportunity to improve the process for renovation/maintenance projects, which currently are not being captured in the inventory. A new coordinator position will help to establish enhanced processes, capturing changes in asset data more regularly. This will improve the results and outcomes of this AMP and future capital planning.
- Facilities should be classified by criticality or utilization levels to adjust LCM and LOS strategies (i.e. low utilization facilities are managed at a higher FCI than higher utilized facilities).

## 3.2 Advancing Facilities Management Asset Management Capabilities

### 3.2.1 Asset Management Maturity Assessment

In the development of the 2022 core assets AMP, an Asset Management Maturity Assessment was carried out with various stakeholder groups across the City of Kingston. This exercise engaged stakeholders from 19 different groups covering 16 categories associated with enterprise asset management. This exercise provided a snapshot of the current state of AM practices and established a target for where those practices could be in three and five years. Facilities Management & Construction Services was included as one of the groups.

The maturity assessment was based on industry best practices from the International Infrastructure Management Manual (IPWEA, 2015), and the ISO 55000 Series of Standards (ISO/IEC, 2014). In advance of the workshops, an online survey was developed and distributed to stakeholders to capture key information. The survey asked participants to identify the current and target (3-year and 5-year) maturity against the key categories of asset management listed below:

- Asset Condition
- Asset Management Decision-Making
- Asset Management Framework and Strategy
- Asset Management Plans
- Asset Management Service Delivery Models (Internal and external)
- Asset Management Team
- Asset Register Data
- Capital Planning
- Continuous Improvement

- Demand Forecasting
- Financial and Funding Strategies
- Information Systems
- Levels of Service
- Management Systems
- Operations and Maintenance Planning
- Risk Management

Each question was rated according to a defined scale of one (1) to five (5) as shown in Table 21.

**Table 21. Maturity State Descriptions**

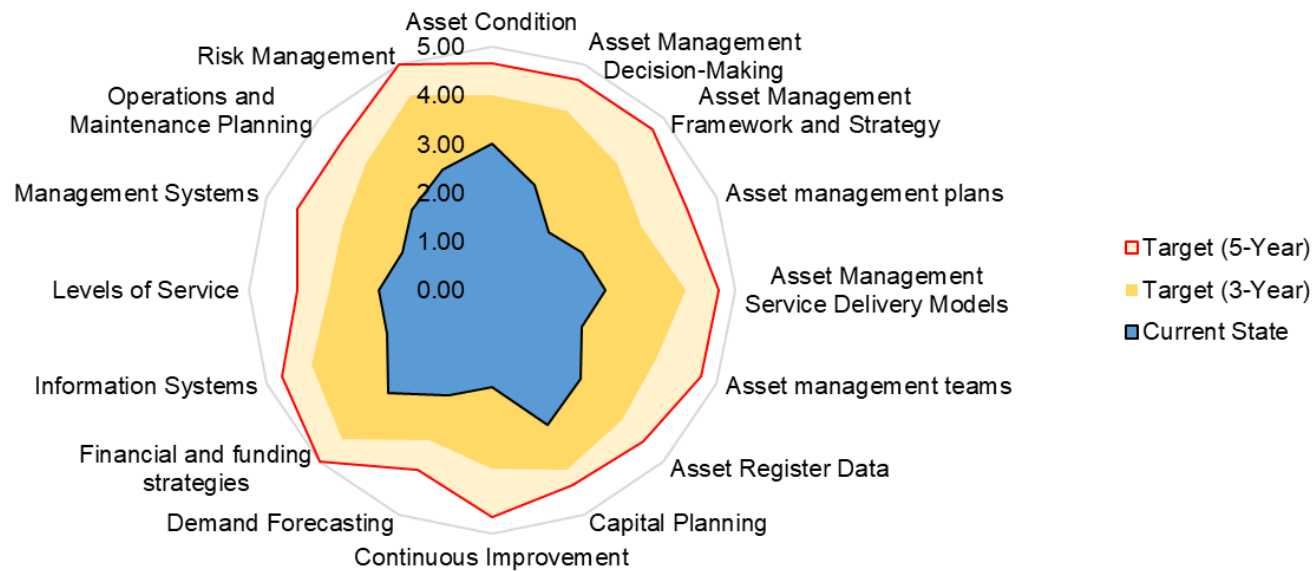
Numerical Rating	Maturity Level	Description
1	Aware	The organization is aware of the benefits of the capability/processes; however, no implementation has started
2	Basic	The processes/capability are in development or are partially implemented.
3	Core	The organization's processes/capabilities are developed and implemented.
4	Intermediate	The activities are fully developed, implemented and are being integrated
5	Advanced	The processes are fully implemented, optimized and are being continually improved.

Improvement and Monitoring

FMCS rated the current state of AM practices to be at approximately “2.5”, meaning “The processes and capabilities are in development or are partially implemented” and have set a 5-year target of approximately “4.5” – “The activities are fully developed, implemented and are being integrated”. Detailed results are included in the following section. The results observed are typical to those of most municipalities beginning their Asset Management program. The ratings are shown in Figure 22.

Overall, the City of Kingston is taking significant steps forward in the asset management journey. The City has recently reviewed the current maturity, best practices and technology environment and recommended a future state and implementation. Several recommended initiatives, organizational structure modifications, governance changes and resourcing requirements have been identified and are currently under development.

Figure 22. Asset Management Maturity Assessment Results for Facilities Management (Radar Chart)





City of Kingston

# Asset Management Policy

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## Context

The City of Kingston and its utility company, Utilities Kingston, manage a wide range of assets to provide a variety of essential services to the community. Each must continually balance expenditures, services, and risk across the diversified portfolios to provide the level and quality of services expected by the residents, institutions, and businesses of Kingston. In response to the *Infrastructure for Jobs and Prosperity Act, 2015* (“IJP Act”) Section 6(2) that sets out principles for the provincial government to regulate asset management planning for municipalities in Ontario, the City of Kingston and Utilities Kingston have developed Asset Management Policies to govern the assets in each of their portfolios. The subsequent Ontario Regulation, O.Reg. 588/17, “Asset Management Planning For Municipal Infrastructure” prescribes the requirements to be met and/or satisfied by municipalities when undertaking asset management. Clause 3. (1) of the regulation states “*Every municipality shall prepare a strategic asset management policy*” and Clause 4. states, “*Every municipality shall prepare its first strategic asset management policy by July 1, 2019 and shall review and, if necessary, update it at least every five years.*”

Asset Management is a process used in decision-making. It helps municipalities care for the infrastructure that delivers valuable services to our community in a way that considers the service needs of our community, manages risks and opportunities, and uses resources wisely. City management is committed to documenting this approach and defining this management system with an asset management strategy that will guide the City’s processes, meet regulatory requirements, improve efficiency, and provide strong governance and accountability.

This Asset Management Policy is specific to those assets that are managed by the City of Kingston. It should also be read in conjunction with the Utilities Kingston Asset Management Policy for the City assets that are operated and maintained by Utilities Kingston.

## Purpose

The asset management policy aims to:

- set expectations with Council, Public, and other stakeholders
- provide leadership and commitment to asset management
- establish responsible governance for the practice of asset management by the City of Kingston
- document the City’s commitment to asset management and the continuous improvement of asset management practices

- provide transparency and demonstrate to stakeholders the legitimacy of decision-making processes by combining strategic plans, budgets, service levels, and risks
- provide a set of principles that guide the City's development of an asset management program and to formally link asset management to organizational strategic objectives and plans
- better demonstrate the long-term consideration of short-term decisions
- optimize the lifecycle costs while maintaining acceptable levels of service
- link infrastructure investment decisions to service outcomes
- enable staff to provide quality customer service

## Vision and Objectives

### Asset Management Vision

- ★ Meet the agreed to service levels in the most efficient and effective way possible through asset lifecycle management.
- ★ Ensure actual needs of existing and future assets are prioritized and aligned with the City's strategic documents in order to manage service level expectations and risk across all City assets.
- ★ Ensure that financial management is sound and aligns with the means of the City's stakeholders.
- ★ Have regard for and pursue sustainable development and a commitment to consider climate change mitigation and adaptation.
- ★ Public engagement framework. Provide opportunities for residents, stakeholders and customers to engage in discussions, offer input, and understand the decision-making process.

### Asset Management Objectives

Asset Management allows the City to:

- establish an asset management system that integrates strategic planning, budgeting, service levels, and risk
- provide service levels that balance customer expectations with financial means and risk
- enhance transparency and accountability of the decision making process
- ensure asset investment is considered in a holistic approach to maximize the lifecycle of the assets as a whole including planning for new

- provide justification of investment decisions related to infrastructure assets by linking these decisions to their long-term consequences
- prepare long-term financial plans to ensure sustainable funding for rehabilitation, replacement or decommissioning of assets
- ensure that the addition of new assets or enhancements of existing take into account the City's ability to fund the additional maintenance and future upgrades within a sustainable plan
- define the processes for future decision makers within the City maintaining the corporate knowledge

## Scope

### Assets

This Asset Management Policy will be applied to all physical assets of the City of Kingston that provide service to the residents, businesses and institutions, and require proactive management. The assets of the City of Kingston are diverse. They range from assets applicable to transportation such as roads, bridges, sidewalks, and buses, to recreation assets such as parks, sport fields, play structures, etc. We have buildings and properties and all of the components therein. There are information systems assets such as computers, software, and servers. It also covers the ecological services provided by the natural assets including public shorelines and City-owned environmental protected lands such as wetlands and forests that serve the city. Compiling, confirming, and maintaining the asset list will be a significant component of the resulting Asset Management Plan.

As noted in the Context section of this document, Utilities Kingston manages and operates the water and sewage systems, including related facilities and appurtenances for the City of Kingston. In this capacity, they have developed an independent Asset Management Policy that was adopted by Council on August 7, 2018. Other City-owned assets operated and maintained by Utilities Kingston include natural gas assets, street lighting, traffic signals, and hot water tanks. The City will work in conjunction with Utilities Kingston to ensure a coordinated asset management plan that prioritizes investment in assets to minimize risk and meet regulations. The asset management plans will report on those assets meeting the capitalization threshold as identified in the Tangible Capital Assets Policy.

The City will collaborate with adjacent municipalities to operate and maintain boundary roads and promote the principles outline in this policy.



The City will also collaborate with contracted service providers for facilities such as the Leon's Centre and Social Housing.

## Personnel

This policy applies to all departments and employees of the Corporation of the City of Kingston that have a direct and indirect link with assets or asset systems in order to provide services to residents, businesses, and institutions of the City of Kingston.

## Complementary Processes

The asset management process is meant to align with and complement existing corporate processes such as budgeting and strategic planning. The intent of the process is to provide a long-term perspective that is focused on the integral challenges associated with the assets that support achievement of the City's strategies and objectives.

## Strategic Direction

To achieve the objectives of this policy, senior management will:

- create and maintain an asset management governance structure to lead the development of asset management tools and practices and oversee their application across the organization
- adopt an asset management strategy to:
  - implement industry-recognized asset management protocols, document and consistently adhere to them;
  - define levels of service that balance customer expectations with risks, affordability, and time constraints;
  - ensure asset management recognizes that changes in the City's demographics may alter customer expectations and needs;
  - adopt risk-based decision-making processes that consider the likelihood of asset failure and the associated consequences to safety and service levels;
  - acquire knowledge and skills in asset management in accordance with recognized competency frameworks;
  - embed the evaluation of the total lifecycle costs within the decision-making process for the allocation of investments across assets; and
  - monitor asset performance and the effectiveness of asset management practices with a perspective of continuous improvement.

- strive, wherever possible, to go beyond minimal legislated solutions to improve municipal assets' resilience to social, environmental, and economic changes
- remain vigilant for funding and service delivery opportunities to meet infrastructure investment needs
- keep Council informed about the state of the infrastructure and expected trends as part of the submission of long-term financial plans
- remain abreast of asset management best practices
- innovation:
  - look for technology/solutions that help integrate data across the City
  - when possible, scope RFPs in such a way that data can immediately be uploaded into City database for planning purposes with the goal of optimizing life expectancy i.e. manufactures' recommended general maintenance, lifecycle maintenance requirements, and estimated replacement date based on industry standards

## Commitment and Accountability

The policy requires commitment from all stakeholders. The following provides the roles of the various stakeholders as it relates to the Asset Management Policy for the City of Kingston.

### Council

Council is responsible for:

- the adoption, periodic review, and updating of this policy
- setting the vision, service mandates, and management policies
- ensuring commitment to a financial strategy that enables the asset management plan to deliver on the service mandates balancing customer expectations with risk, affordability, and time constraints
- fostering informed dialogue with the public using the best available information to enhance transparency

### Sponsor: Chief Administrative Officer

The Chief Administrative Officer will assume the role of Sponsor and will:

- make recommendations to Council based on professional expertise
- champion the asset management strategy within the organization
- through the assistance of the Corporate Management Team, ensure department resources are available to undertake asset management
- provide the executive lead direction and support for the development and implementation of asset management initiatives

- maintain the necessary capabilities to support the elements and practices of the asset management system
- continually improve the asset management system and practices in support of the City's Strategic Plan
- review and continually improve the asset management strategy and related processes

### **Executive Lead: Deputy Commissioner, Transportation & Infrastructure Services, Engineering and Special Projects**

The Deputy Commissioner, Transportation & Infrastructure Services, Engineering and Special Projects will assume the role of Executive Lead. The Executive Lead will:

- coordinate and advise on asset management initiatives within the organization
- maintain support for asset management through annual updates to CMT on progress in the implementation of the asset management policy and strategy across the organization
- coordinate the development of an asset management charter to ensure consistency in asset management practices throughout all departments of the City organization
- review and revise the charter as necessary with department leads

### **Directors**

The Directors of the City of Kingston will:

- support the Executive Lead by ensuring human capital is made available to implement the asset management system by building resources into operating budgets
- support the Executive Lead in the process of developing a consistent corporate asset management system across the City of Kingston
- adopt an asset management strategy specific to their department which aligns with the established asset management charter
- create departmental asset management plans to meet the objectives of the corporate asset management system and to ensure informed and collaborative approaches with other departments that have shared or overlapping assets
- align with the financial strategies of the City of Kingston and those directed by Council

## Technical and Operational Staff

Technical and Operational Staff will:

- adhere to the asset management system by providing data and information on assets and services, participate in daily risk management and complete the required analyzes to ensure an up-to-date asset management system

## Key Asset Management Principles

To effectively use asset management to support achievement of the City's organizational goals, Administration should ensure the following principles are applied within the Asset Management System:

**Holistic** – Take a comprehensive approach that looks at the “big picture” (i.e. the combined implications of managing all aspects rather than a compartmental approach). This includes the functional interdependencies and contributions of assets within asset systems and the different management of assets across all lifecycle phases.

**Systematic** – Take a methodical approach (i.e. formal, repeatable, and consistent) to the management of assets.

**Systemic** – Make asset investment decision in an asset system context, not just to optimize the individual asset itself.

**Risk-based** – Manage asset risk associated with attaining levels of service and focusing resources, expenditures, and priorities based on risk and associated cost/benefit.

**Optimal** – Make asset investment decisions based on trade-offs between competing factors of service level (including asset performance), risk and cost.

**Sustainable** – Take a long-term, lifecycle-based approach in estimating asset investment and activities, thus developing effective asset management strategies for the long term.

**Integrated** – Coordinate the above principles to ensure the delivery of justified services and well-defined outcomes.

**Aligned** – Ensure that the asset management system complements the strategic objectives of the City, as well as other key business systems, legislation, and regulation.

## Strategic Documents

The following is a list of the City's strategic documents for guidance when developing the City of Kingston Asset Management Plan.

- Kingston's Strategic Plan
- The Official Plan
- Sustainable Kingston Plan
- Emergency Management Plan
- Multi-year Accessibility Plan
- Multi-year Capital Plan
- Multi-year Financial Plan
- City of Kingston Accessibility Standards
- City of Kingston Annual Report
- Corporate Master Plans – see Appendix "A"

## Benefits of Compliance

The benefits of compliance with the policy include but are not limited to:

- maintains alignment with the City's strategic objectives
- maintains service area investment priorities, the coordination of delivery of services, corporate efficiencies, and expenditure optimization
- capital planning that is consistent with the needs identified in the asset management plans maintains the alignment of financial, infrastructure, and land use goals and objectives
- optimal planning for growth, maintenance, and replacement of existing assets as well as the development of new assets, maintains the ability to meet expected levels of service
- timely investment in assets maintains the optimal lifecycle, reliability, safety, security of the asset and service delivery
- retention of the City's institutional memory
- minimize risks to users associated with failure

## Review Period

This policy will be reviewed at a minimum every five (5) years from its effective date.

## Definitions

In the policy the following definitions are used:

**“Asset”** – means an item, thing or entity that has potential or actual value to an organization. The value can be tangible or intangible, financial or non-financial, and includes consideration of risks and liabilities.

**“Asset Management”** – means planned actions and coordinated activities of an organization to optimally and sustainably manage its assets that will enable the assets to provide the desired level of service in sustainable way, while managing the risk at the lowest lifecycle cost. It encompasses all asset types, tangible or intangible, individual components or complex systems, and all activities involved in the assets lifecycle from acquisition/creation, through maintenance to renewal or disposition.

**“Asset Management Plan”** – means a strategic document (long term) that states how a group of assets are to be managed over a period of time. The plan describes the characteristics and condition of infrastructure assets, the levels of service expected from them, planned actions to ensure the assets are providing the expected level of service, and financing strategies to implement the planned actions.

**“Asset Management System”** – means a management system or framework for asset management. It is a standard management approach outlining the linkages between key elements and practices of an effective asset management program. It is a set of interrelated or interacting practices and techniques of an organization enabling the management of assets at various levels from the operational level up to where integration across asset systems and networks is required.

**“Asset Management Strategy”** – means a high level action plan that gives effect to an organization’s Asset Management Policy.

**“Capitalization Threshold”** – means the value of the infrastructure asset at or above which the City of Kingston will capitalize the value of it and below which it will expense the value of it.

**“Condition”** – means the physical state of an asset.

**“Infrastructure”** – means the network of physical assets (and natural assets) developed and/or used by the City to support its social, cultural, and economic activities and services.

**“Level of Service”** – means the parameters or combination of parameters that reflect the social, political, economic, and environmental outcomes the organization delivers.

Levels of service statements describe the outputs or objectives of the organizations activities that are intended to be delivered to customers.

**“Lifecycle”** – means the time interval that commences with the identification of the need for an asset and terminates with the disposal of the asset.

**“Performance Monitoring”** – means continuous or periodic quantitative and qualitative assessments of the actual performance compared to specific objectives, targets or standards.

**“Risk”** – means the effect of uncertainty on objectives. Risk events are events which may compromise the delivery if the organizations strategic objectives.

**“Service/Useful Life”** – means the period over which an asset or component is expected to be available for use.

## Appendix “A” - City of Kingston Master Plans

The following is a list of the City of Kingston Master Plans approved and adopted by Council.

- Transportation Master Plan
- Active Transportation Master Plan
- Waterfront Master Plan
- Parks and Recreation Master Plan
- Archeological Master Plan
- 10-Year Housing and Homelessness Plan
- Kingston Culture Plan
- Public Art Master Plan