Asset Management Plan

Current Levels of Service

June, 2024
Final Report

EXECUTIVE SUMMARY

The Purpose of the Plan

Asset management planning is a comprehensive process that ensures the delivery of infrastructure services in a financially sustainable manner.

This City of Belleville Asset Management Plan (AM Plan) Current Levels of Service (LOS) provides information about the City's infrastructure assets, including the actions required to provide the current level of service in a cost-effective manner, while outlining associated risks. The AM Plan defines the services to be provided, how the services are provided and what funds are required to provide the services over the 10 year planning period. Details related to each program area are provided in Section 7 Service and Program Area Details.

Asset Descriptions

This AM Plan covers the infrastructure assets that provide general government, protection, transportation, operational, environmental, recreation, cultural, library, social and family, and planning, and development services. The AM Plan includes a variety of asset categories including, but not limited to, linear networks, facilities, fleet, equipment, information technology, and natural assets. The overall condition and replacement value of assets that support the service areas included in this AM Plan are shown in the following figure. The total estimated replacement value of the assets captured within this AM Plan is **$3.36 billion**, expressed in current (2024) dollars.
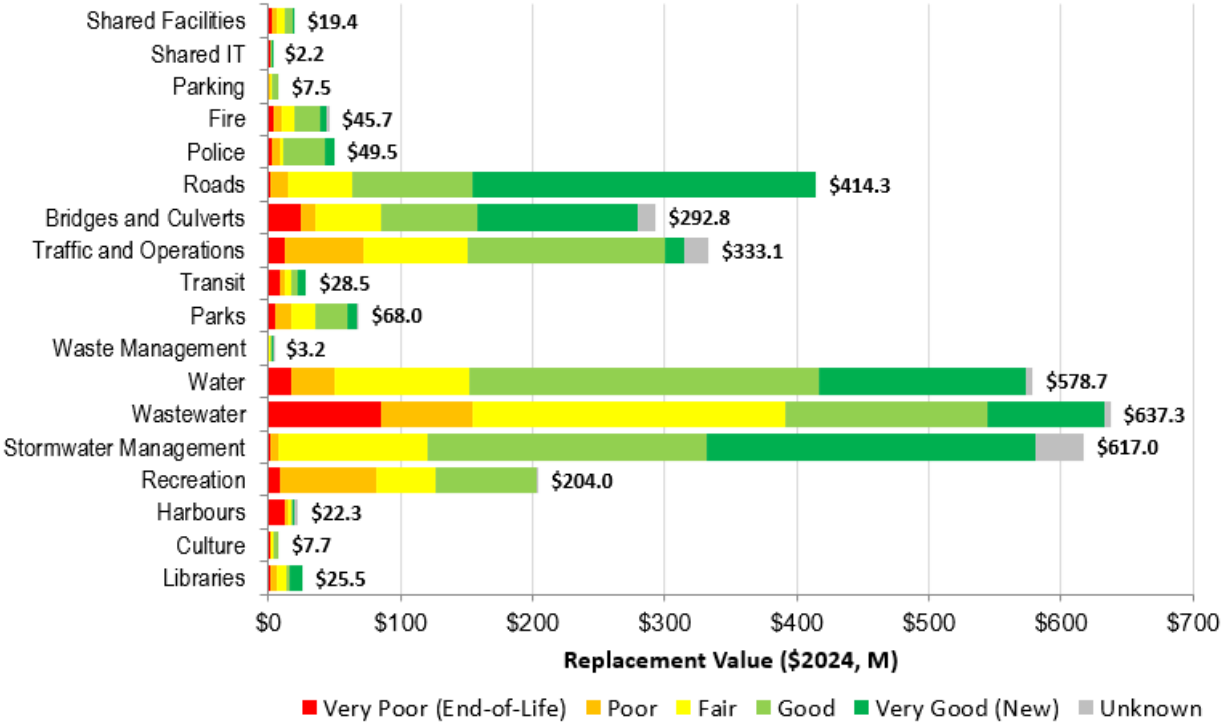
Levels of Service

Levels of Service (LOS) can be defined as the parameters, or combination of parameters, which reflect social, political, environmental, and economic outcomes that the organization delivers. Establishing and reporting on LOS offers many benefits including, but not limited to, linking asset management activities and funding to service outcomes experienced by residents, and improving transparency of decision-making processes. This AM Plan establishes levels of service for all City Service Areas. Service levels, where appropriate and available, are categorized by the following service attributes:

- **Capacity:** Services have enough capacity and are accessible enough to everyone
- **Function:** Services meet customer needs while limiting health, safety, security, natural, and heritage impacts
- **Reliability and Quality:** Services are continuous, predictable, and responsive to customers
- **Affordability:** Services are adequately funded for the long-term and are financially sustainable.

O.Reg. 588/17 Asset Management Planning for Municipal Infrastructure requires reporting of current levels of service. The City's current performance is summarized as follows.

Service Area	Program Area	Capacity	Function	Reliability and Quality	Affordability
General Government	Shared Facilities	--	--	Poor	Very Good
	Shared IT	Fair	Good	Poor	Good
	Parking	--	Poor	Fair	Very Good
Fire & Emergency Services	Fire	Fair	--	Fair	Very Good
Belleville Police Service	Police	--	--	Fair	Very Poor
Transportation & Operations Services	Roads	--	--	Good	Very Good
	Bridges & Culverts	--	Very Good	Fair	Very Poor
	Traffic & Operations	--	Poor	Fair	Very Poor
	Transit	Good	Fair	Poor	Fair
	Parks	Fair	Good	Good	Very Poor
	Waste Management	Very Good	--	Good	Fair
Environment Services	Water	Good	Good	Good	Very Good
	Wastewater	Fair	Good	Fair	Fair
	Stormwater Management	Good	Good	Very Good	Good
Community Services	Recreation	Fair	Good	Poor	Poor
	Harbours	Fair	--	Poor	Very Poor
	Culture	--	--	Fair	--
Belleville Public Library	Library	--	--	Fair	--

Note: "--" indicates a future measure

Overall, present funding levels are insufficient to enable the City to continue to provide current reliability and quality levels of service in the medium term for the program areas with a Very Poor affordability performance grading. This is a result of insufficient funding to meet asset renewal needs for the following Program Areas: police, bridges and culverts, traffic operations, parks, and harbours. Further details are provided in the body of the AM Plan – both Section 3 Levels of Service and Section 7 Service and Program Area Details.
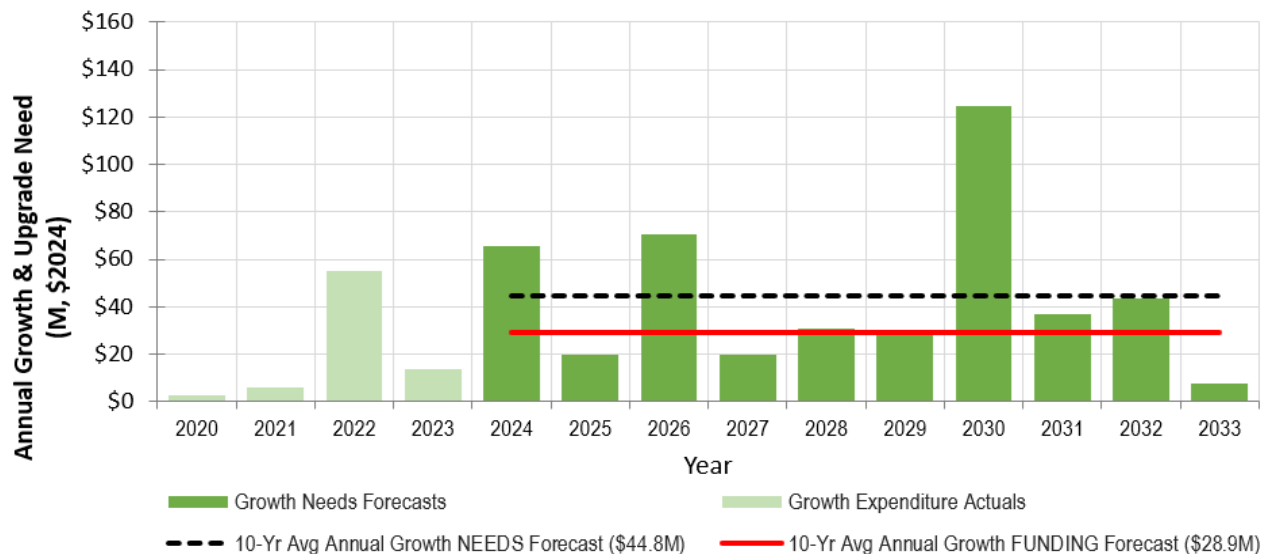
Lifecycle Management Plan and Financial Summary

What does it Cost?

The projected outlays needed to maintain the current levels of services covered by this AM Plan for each of the next 10 years are shown as the dark coloured solid bars in the following graphs. For reference, the lighter coloured solid bars provide historic expenditures. The dashed black line is the average needs forecast over the 10 year period and the solid red line is the average available funding forecast. Note that a constant vertical axis is used in all three graphs.
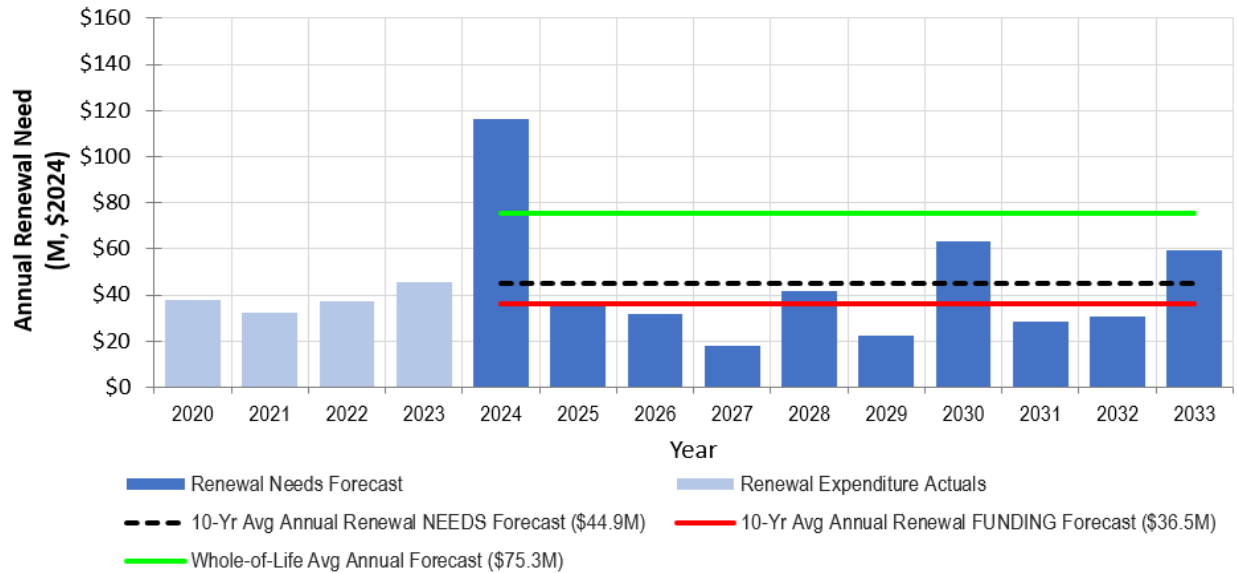
"Growth and Upgrade" needs describe a category of projects where a new asset is being acquired or an existing asset is being upgraded, at the City's expense, to accommodate increased demand as a result of the City's growth and expansion. "Renewal" needs, by contrast, describe lifecycle activities including replacement and rehabilitation of existing City assets to restore function or reliability. For example, if a sanitary main has reached the end of its useful life and is being replaced like-for-like with a main of the same size, that is considered a "Renewal" activity. If that same sanitary main is only halfway through its expected useful life, but is being replaced with a main of increased diameter to support the demand from new housing developments being constructed, that is then considered a "Growth and Upgrade" activity. On occasion, cost distributions between the two categories may be appropriate. If an asset were to remain functional past its useful life, but is being replaced with an upgrade to accommodate demands of planned growth and expansion, that could constitute the project costs being allocated into both "Growth and Upgrade" as well as "Renewal" needs.

Growth and Upgrade Needs and Funding Forecasts

Legend: Growth Needs Forecasts | Growth Expenditure Actuals | 10-Yr Avg Annual Growth NEEDS Forecast ($44.8M) | 10-Yr Avg Annual Growth FUNDING Forecast ($28.9M)
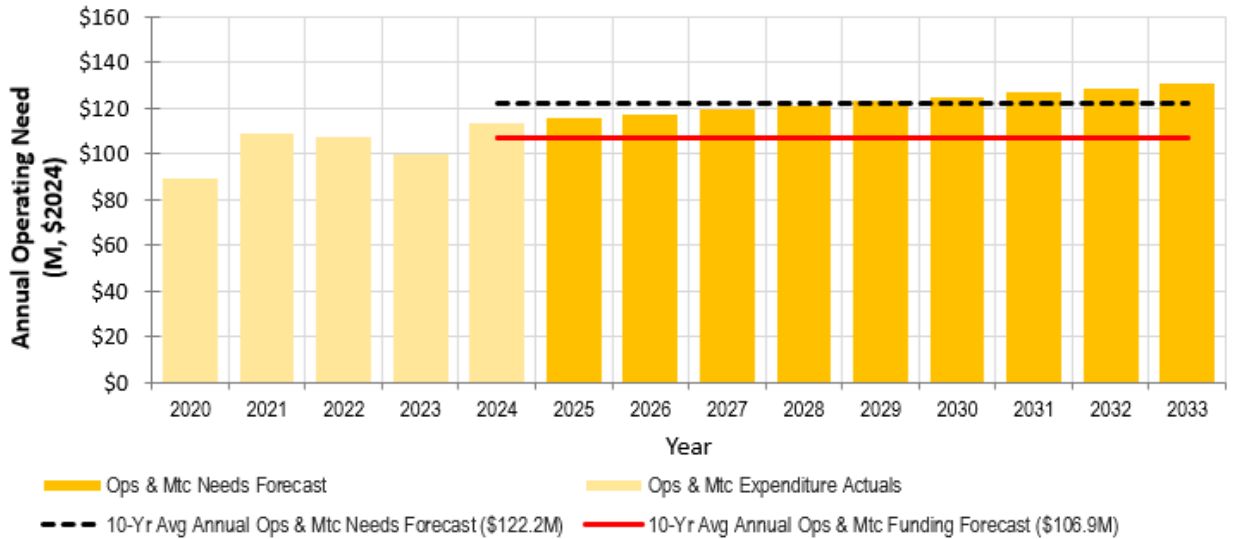
Renewal Needs and Funding Forecasts

The solid green line provides the amount to renew the assets over their entire lives. The high bar in year 2024 represents a significant backlog of renewal work.

Operations and Maintenance Needs and Funding Forecasts

The information presented in the above graphs is summarized in the following table which shows the 10-year average annual shortfalls, in millions of 2024 dollars and as a percentage of needs / funding. These findings predict shortfalls in all three lifecycle activity areas, with the most substantial gap expected in City-funded Growth and Upgrade activities. Further details are provided in the body of the AM Plan – both Section 3 Levels of Service and Section 7 Service and Program Area Details.

Service Attribute	Lifecycle Activity	10-Yr Avg Annual Needs Forecast (2024$M)	10-Yr Avg Annual Available Funding (2024$M)	10-Yr Avg Annual Shortfalls / Surplus (2024$M)	10-Yr Avg Annual Funding / Funding (%)
Capacity	Growth & Upgrade – City	$44.81	$28.94	($15.87)	65%
Reliability	Renewal	$44.98	$36.51	($8.47)	81%
	Operations & Maintenance	$122.20	$106.91	($15.29)	87%
Totals		**$211.99**	**$172.37**	**($39.62)**	**81%**

To manage the projected funding gap, based on the current tax levy and estimated infrastructure gap related to tax funded assets, the City would need to increase the tax levy by over 25% to close that gap immediately. Alternatively, the gap could be closed over the 10-year period with an average annual levy increase of about 2.30%.

On the user rate side, current calculations show that Water is sufficiently funded over the next 10 years, while Wastewater and Parking rates would need to immediately increase 65% and 18%, respectively, in order to close the infrastructure gap associated with those assets. This could also be achieved by a roughly 5.13% and 1.69% average annual increases, respectively, over the next 10-years.

Rather than increasing funding, the City may consider accepting higher risk of managing assets that continue to deteriorate, or accepting reduced levels of service.

Managing the Risks

There are risks associated with providing the service and being unable to complete all identified activities. The following major risks were identified, predominantly related to the deferral of renewal activities:

- Higher annual costs over the life of assets,

- Assets are in worse overall condition,

- Reduced levels of service, and

- Intergenerational inequity, where intergenerational equity refers to the concept of ensuring future generations experience fair and equitable access to the assets and services available to the residents of today

The City will strive to manage these risks within available funding by:

- Prioritizing needed activities by their associated 'risk impact rating' and employing suitable lower cost renewal methods, where possible

- Endeavouring to improve the organization's understanding of specific asset lifecycle activities and their impacts upon risk exposure and levels of service

- Continuing to identify and request increased funding and staffing incrementally over time to maintain current levels of service and achieve the proposed levels of service.

- Actively manage and perform long-term planning of assets to mitigate unreasonable future costs in efforts to support intergenerational equity

Asset Management Practices Monitoring and Improvement Program

Overall, the data sources and data utilized in the preparation of this AM plan were assessed as having a medium confidence level. Confidence was assessed as high in areas such as condition modelling and renewals predictions for pavement, bridges, and structural culverts as they are based on recently collected industry standard condition inspection data. The City is currently undertaking industry standard condition assessments and renewal forecasts for facilities and sanitary sewers to improve the confidence in asset management planning. Lower data confidence ratings were generally encountered in areas where standardized condition assessments were not available and suitable proxies needed to be employed such as age-based condition modelling.

The next steps resulting from this AM Plan to improve asset management practices are:

- Continue to monitor and incorporate changes to demand drivers including pace of population growth, community needs, and other impacts such as climate change
- Continue to update asset lifecycle activity and replacement values based on recent tenders
- Continue to implement levels of service measures listed in the AM Plan as "future" while also refining existing levels of service and defining proposed levels of service
- Continue to communicate the need to fully fund the whole of lifecycle needs through reserve funds and the risks associated with underfunding (i.e., reduced life of the asset, higher annual cost over the life of the asset, assets in worse overall condition, less effective use of resources, intergenerational inequity).
- Continue to implement industry standard condition assessments and renewal forecasting to improve overall data quality and confidence
- Evaluate opportunities for improving organizational data management processes and procedures, as well as resource requirements (staffing, software capabilities, etc.)
- Continue to engage with the community to ensure alignment of strategic planning with City needs

Progress implementing this AM Plan will be reported annually including:

- Update of valuation of infrastructure
- Update of condition and performance scores
- Update on status of recommended improvement actions.

TABLE OF CONTENTS

Figure Index

Table Index

1   INTRODUCTION

1.1   Background

The Corporation of the City of Belleville (City) was created in the 1990's through the amalgamation of the former City of Belleville, the former Township of Thurlow, and a portion of the former Township of Sidney. The City has a population of approximately 58,000 and regionally the population exceeds 220,000. The current and expected growth in population should result in a total population of approximately 63,500 by 2030. The Corporation is a single tier municipal government system responsible for infrastructure assets such as transportation, potable water treatment and distribution, wastewater collection and treatment, storm drainage, parks and open spaces, harbours, and various types of facilities such as arenas, public works buildings, and community centres.

This Asset Management Plan (AM Plan) communicates the requirements for the sustainable delivery of services to City residents. The AM Plan investigates the balance of service delivery, lifecycle management activities, and regulatory compliance with required funding to continue providing the current levels of service over the planning period of 10 years.

1.2   Alignment with Regulatory Requirements

This 2024 Current Levels of Service (LOS) AM Plan is an update to the City's 2022 AM Plan, intended to meet the requirements of Ontario Regulation (O.Reg.) 588/17 "Asset Management Planning for Municipal Infrastructure" under the Infrastructure for Jobs and Prosperity Act, 2015. Specifically, by July 2024, O.Reg. 588/17 requires municipalities to adopt an AM Plan reporting current LOS for all assets, as well as lifecycle needs to maintain those LOS.

In accordance with the requirements of O.Reg. 588/17, this AM Plan is posted on the City's website, along with related background documents, such as condition assessments.

1.3   Relationship with Other Municipal Documents

Asset management planning is a medium to long-term planning activity that relies on input from strategic planning activities and informs shorter-term decision making. The AM Plan provides a framework to validate the City's budgeting processes and assist in prioritizing work activities, including capital projects, based on risk. It also discusses LOS that support goals in the City's Strategic Plan and lifecycle management strategies intended to reduce the overall cost of asset ownership.

The AM Plan is intended to be read with other City policies and planning documents, including the following:
- Policies
    - Strategic Asset Management Policy
    - Budget and Financial Controls Policy
    - Reserve and Reserve Fund Policy
    - Municipal Debt Financing Policy
- Strategic Plan (2012 – 2032)
- Official Plan

- Loyalist West Secondary Plan Update (2022)
- Multi-year Accessibility Plan (2023-2027)
- 5-Year Corporate Energy Conservation and Demand Management Plan (2019, being updated in 2024)
- Operating and Capital Budgets
- Fire Master Plan (2024)
- Transportation Master Plan (2014, being updated in 2024)
- Transit Operational Review (2023)
- Water Financial Plan (2020)
- Wet Weather and Wastewater Servicing Master Plan (2019)
- Parkland and Recreation Master Plan (2021).
- Corporate IT Master Plan (2024)
- Development Charge Background Study

1.4   Key Stakeholders

Key stakeholders in the preparation and implementation of this AM Plan are shown in Table 2.2 below.

Table 1-1 Key Stakeholders in the AM Plan

Key Stakeholder	Role in Asset Management Plan
City of Belleville Elected Council	Approves asset management policies and asset funding allocation through the annual corporate budget process. An overarching expectation of a standard of care is required by Council to ensure commitment to effective asset management practices.
Executive Management Team (EMT)	Provides corporate oversight to the program to ensure that the goal and directions of the Corporate Asset Management program are maintained, and the program remains consistent with the overall Strategic Plan.
Finance Committee	Reviews the Strategic Asset Management Policy and Asset Management Plan. Makes recommendations to Council and provides recommendations to City staff on strategy, policy, and procedural development surrounding asset management. Works with EMT to coordinate the update of the Asset Management Plan.
AM Working Group	Provides leadership and strategic direction for supporting systems/processes specific to the delivery of asset/work management information for the City of Belleville. Further, in support of the city-wide asset management strategies, the group provides leadership and governance to the Asset Management Policy statement through the provision of information necessary for the long-range forecasts of asset investment needs, services levels, risks, costs and other performance measures.
Corporate Services	Finance provides historic Tangible Capital Asset (TCA) amounts, and historic and current capital and operating budgets. Further, provides coordination on input data and development of the AM Plan from each of the service and program areas.
Departments	Provide input data, forecasts and text for the AM Plan relative their service and program area or area of functional expertise.
Service Boards	Provide input data, forecasts and text for the AM Plan relative their service and program area or area of functional expertise. The Service Boards incorporated in this AM Plan include the Belleville Police Service Board and the Library Service Board.

1.5   Goals and Objectives of Asset Ownership

The City exists to provide services. Some of these services are provided by infrastructure assets or systems of assets. The City acquires infrastructure assets by purchase, by contract, construction by City staff, and by donation of assets constructed by developers and others to maintain existing levels of service as well as meet increased levels of service.

The goal in managing infrastructure assets is to meet the defined level of service (as amended from time to time) in the most cost effective manner for present and future consumers.

The key elements of infrastructure asset management are:

- Providing a defined level of service and monitoring performance
- Managing the impact of growth through demand management and infrastructure investment
- Taking a 'lifecycle approach' to developing cost-effective management strategies for the long-term that sustainably meet the defined level of service
- Identifying, assessing and appropriately controlling risks
- Linking to a long-term financial plan which identifies required, affordable expenditure and how it will be financed.

Key elements of the planning framework are:

- **Levels of service:** organizational goals for assets, asset systems, and service areas, specifying the services and expected quality or performances to be provided
- **Future demand:** expected impacts to future service delivery and strategies to meet the increased demand
- **Lifecycle management:** strategies for managing existing and future City assets to provide defined levels of service
- **Financial management:** what funds are required to provide the defined services over the planning period
- **Asset management practices:** how provision of the services is managed
- **Monitoring and improvement plan:** how the plan will be updated and improved to ensure objectives are met, including how asset management practice maturity increases throughout the organization.

1.6   Corporate Asset Management System

An Asset Management System aims to achieve a line of sight between and strategic alignment with the overall goals of an organization. These include corporate strategic goals outlined in the strategic plan and master plans, as well as operational plans, policies and procedures, as illustrated in Figure 1-1. The Strategic AM Policy, completed in 2019 and pending review and update in 2024, provides guidance in this system by documenting the intent, scope and principles of asset management at the City of Belleville, and who is responsible for enacting the policy. The objectives of the Strategic AM Policy are to:

- Provide a consistent framework for implementing asset management throughout the organization.

- Provide transparency and accountability and to demonstrate to stakeholders the legitimacy of decision-making processes which combine strategic plans, budgets, service levels and risks.

Figure 1-1 Strategic Plan Line-of-Sight to Work Plan

STRATEGIC PLAN	STRATEGIC AM POLICY	AM PLAN	BUSINESS PLAN	WORK PLAN
Identifies corporate strategic vision, objectives and action plan	Documents intent, scope and principles of AM, and who is responsible for enacting the policy	Identifies service objectives, AM performance measures, targets, gaps and risks, lifecycle activities and costs, available funding and gaps, and residual risks	Coordinates needs with stakeholders, prioritizes and bundles preferred projects and operating plans for funding	Documents rationale and scope for funded work activities

1.7   Organization of Document

The contents of this AM Plan follow the recommended elements of a detailed AM Plan:

- **Introduction:** Outlines scope, background information, relationship to other Municipal documents and plans, and applicable legislation
- **State of Infrastructure:** Summarizes the inventory, valuation, condition and remaining life of the assets in the inventory by service and asset type
- **Levels of Service:** Defines levels of service through performance indicators and targets, and outlines current performance
- **Lifecycle Management Strategy:** Defines the framework for identifying critical assets and quantifying risk to enable prioritization of lifecycle activities, and summarizes the asset management strategies (i.e., planned actions) that will enable the assets to provide the required levels of service in a sustainable way, while managing risk, at the lowest lifecycle cost
- **Financing:** Estimates the predicted funding available to asset management activities as well as the funding required to maintain levels of service. Summarizes the infrastructure gap based on these determined infrastructure needs and associated budgets. Recommends strategy for closing the infrastructure gap.
- **AM Plan Improvement and Monitoring:** Summarizes the next steps including improving future iterations of the AM Plan and monitoring of AM Plan implementation progress.

2   STATE OF INFRASTRUCTURE

The State of Infrastructure section of the AM Plan describes the City's asset inventory, and provides a snapshot in time of the valuation, age and condition of its assets. Recommendations for the sustainment of data collection and reporting are provided in the AM Plan Improvement and Monitoring section.

2.1   Asset Hierarchy and Inventory

Understanding the assets owned by the City that are used to support each major service area is important to enable their effective and efficient management. In this AM Plan, the City's asset inventory has been organized around the major service groups and program areas shown in Table 2-1 in the following sub-section.

Most infrastructure assets owned by the City are included and organize into linear networks, facilities, fleet, equipment, information technology, and natural assets. Leasehold improvements in facilities not owned by the City are not included. Land is generally not included in the current replacement costs of the asset inventory. Data and information are considered important assets to an organization and were utilized in the development of this AM Plan; however, due to the subjectivity of importance and value, are not currently included as assets in this Plan.

2.2   Asset Valuation

Financial accounting valuation uses historical costs and depreciation assumptions to determine the book value of capital assets in accordance with the Public Sector Accounting Board (PSAB). Policies and procedures relating to the development of net book values for accounting purposes have been developed by the City to comply with PSAB 3150 Tangible Capital Assets (TCA) reporting.

While financial accounting valuations are based on historical costs, managerial accounting valuations are based on replacement costs. For some asset types, the replacement values were calculated using historical costs indexed to December 31, 2023 using the Non-Residential Building Construction Price Indices (NRBCPI) or Consumer Price Index (CPI), as appropriate for the asset type. For the most part, replacement values are benchmark values calculated from current and previous construction year contracts. The replacement cost valuation represents the estimated cost to replace assets today and is presented in current (2024) dollars and does not account for future technology improvements but does account for increased regulatory requirements and technology improvements to date.

The estimated current replacement value of City assets is **$3.36** billion presented in current (2024) dollars, as outlined in the following table. For a detailed summary of the assets covered in this AM Plan refer to Section 7 Service and Program Area Details.

Table 2-1 Assets covered by this AM Plan

Service Area	Program Area	Assets	Replacement Value 2024$M	%
General Government	Shared Facilities	City Hall, City Professional Building (Storam), Log Cabin - Chamber Of Commerce	$19.36	0.6%
	Shared IT	IT Equipment, SAN, Servers, Switches & WIFI, UPS, Software	$2.22	0.1%
	Parking	Parking Equipment (Lighting, Signs), Parking IT (Meters, Pay Machines), Parking Fleet	$7.51	0.2%
Fire and Emergency Services	Fire	Aerials, Pumper (Urban, Rural), Rescue Vehicle (Urban, Rural), Tankers, Light Vehicles, Equipment, Boats and Trailers, Fire Facilities, Fire IT (Corporate)	$45.72	1.4%
Belleville Police Service	Police	Police Fleet, Police Equipment, Police Bikes, Police IT, Police Facility	$49.50	1.5%
Transportation & Operations Services	Roads	Paved Urban: Arterial (HCB), Collector (HCB), Local (HCB), Paved Semi-Urban & Rural: Arterial (HCB), Collector (HCB), Collector (LCB), Local (HCB), Local (LCB), Paved Other	$414.34	12.3%
	Bridges and Culverts	Bridges, Structural Culverts, Non-Structural Culverts	$292.84	8.7%
	Traffic & Operations	Sidewalks & Active Transportation, Roadside - Other, Signage, Traffic & Pedestrian Signals, Streetlights, Traffic IT, Fleet & Equipment, Traffic and Operations Facilities	$333.12	9.9%
	Transit	Conventional Transit Facilities, Fleet, Equipment, Non-Conventional Transit Fleet, Transit IT (Program Area), Transit Facilities	$28.53	0.8%
	Parks	Park Amenities, Park Infrastructure, Parks Transportation, Parks Equipment, Parks Fleet, Horticulture, Parkland, Parks Facilities	$68.12	2.0%
	Waste Management	WM Facilities (Program Area), WM Fleet, WM Equipment, WM Other, WM Facilities (Corporate)	$3.25	0.1%
Environment Services	Water	Water Valves, Water Hydrants, Water Services, Watermains, Water Fleet and Equipment, SCADA, Water Treatment Plants, Water	$578.68	17.2%
	Wastewater	Force/Pressure Mains, Sanitary Mains, Laterals & Appurtenances, SCADA, WW Fleet & Equipment, Sewage Pumping Stations, Wastewater Treatment Plant	$637.27	19.0%
	Stormwater Management	Storm Mains, Appurtenances, Stormwater Management Ponds, Stormwater Pumping Station	$616.97	18.4%
Community Services	Recreation	Recreation Facilities, Recreation Fleet & Equipment	$203.98	6.1%
	Harbours	Harbour Facilities, Docks, Boat Launches, Boats and Trailers, Fuel Tanks, Security Gates, Meyers Pier	$22.33	0.7%
	Culture	Culture Facilities	$7.72	0.2%
Belleville Library	Library	Belleville Public Library	$25.46	0.8%
Total			**$3,356.92**	**100%**

2.3   Asset Age and Remaining Life

Understanding the estimated life of an asset and the proportion of life that remains provides an insight into potential risk of asset failure and potential renewal need. The following graph shows, for each program area, the average age of the assets against the average estimated useful life, in years. Averages are "weighted" by replacement cost to give more importance to asset types with more value. Although some of the City's assets are relatively new due to recent growth to meet population and economic growth demands, many others are reaching the middle to late stages of their useful lives and will require rehabilitation or replacement in the upcoming years. The assets shown as red are beyond service life, including historic buildings and some harbour assets.

Figure 2-1 Asset Life Consumed Profile, By Program Area
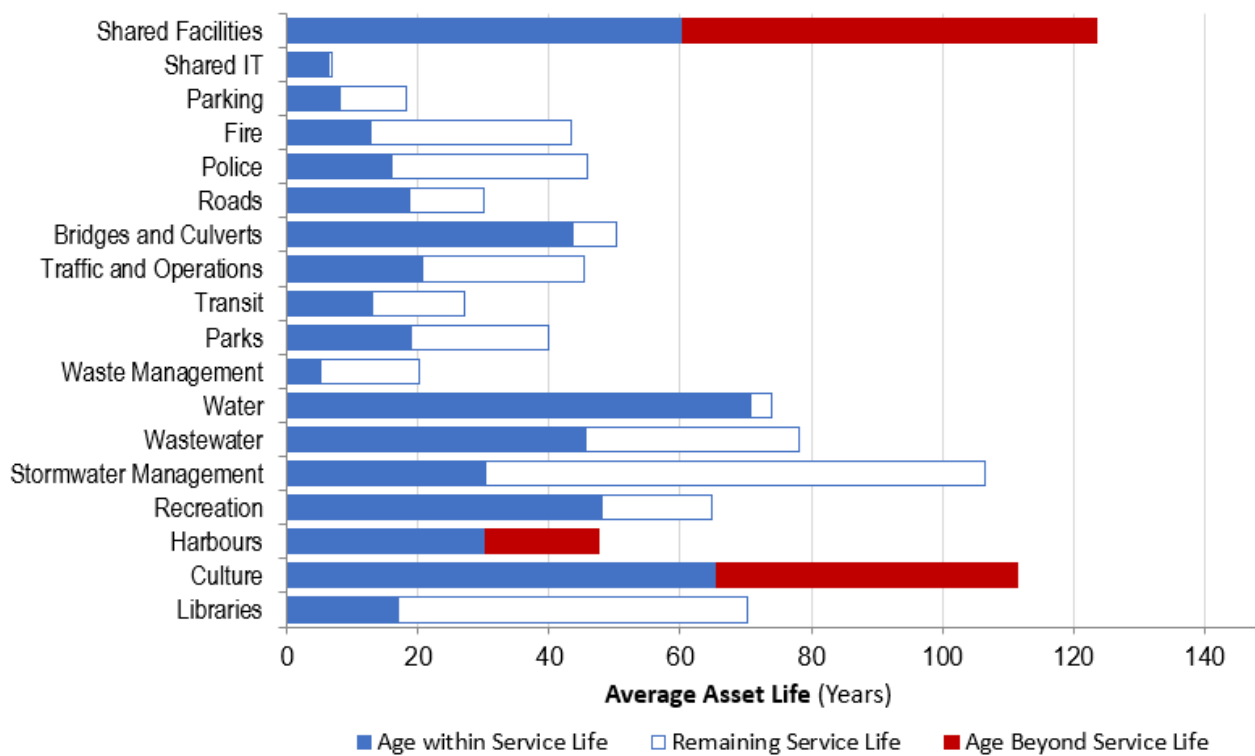
2.4 Asset Condition

In this AM Plan, the term "condition" refers to the degree of physical deterioration of an asset. "Performance" is a more general term that typically describes an asset's ability to achieve levels of service through measures such as capacity, function and operational quality.

Condition assessment programs evaluate current physical condition, determine rate of deterioration over time, enable forecasts of future condition, and inform the most beneficial type and timing of treatment. Condition assessment methods and rating systems have become relatively standard for some assets but vary depending on the type of asset. The City conducts inspections more frequently on more critical assets such as bridges and structural culverts, while condition assessments are undertaken for less critical assets such as parking lots and recreational trails at an appropriate frequency for the asset group. Some City assets have no reported physical condition. These include assets which the City is in the process of collecting the data, assets where the renewal decision is not based on condition (e.g. age or mileage), and assets that are run-to-failure.

For those assets with no condition data, age-based condition is estimated as the percentage of age to useful life. Using age data as a surrogate for condition data is common in municipal organizations, but it can be misleading as age does not always directly reflect condition or remaining life. The City is working to increase the percentage of assets with industry standard condition assessment data for facilities through building condition assessments (BCAs) as well as wastewater and stormwater CCTV assessments.

To enable comparison of condition and condition trends over time between different asset types, a generic condition grading scale is often used to translate detailed engineering data about assets into information that can be compared across asset groups. For this purpose, the City uses a five-point condition grading system, summarized in the table below, which is consistent with the general condition grading system included in the International Infrastructure Management Manual (IIMM).

Table 2-2 Five-Point Condition Grading System

Grade	Description	Condition Criteria	Criteria Description
VG	Very Good	Fit for the future	Well maintained, good condition, new or recently rehabilitated
G	Good	Adequate for now	Acceptable, generally approaching mid-stage of expected service life
F	Fair	Requires attentions	Signs of deterioration, some elements exhibit deficiencies
P	Poor	Increasing potential of affecting service	Approaching end of service life, below standard, significant deterioration
VP	Very Poor	Unfit for sustained service	Near or past service life, advanced deterioration, assets may be unusable

Details relating to the condition of each asset are currently maintained in various databases and spreadsheets. The City converts industry standard condition rating systems and age-based assets to the above condition grading system as provided in the table below.

Table 2-3 Conversion of Industry Condition to Five-Point Condition Grade

Condition Grade	Pavement Condition Index (PCI)	Bridge Condition Index (BCI)	% Life Remaining for Age-Based "Condition"
Very Good (New)	80 to 100	> 80 to 100	75 to 100%
Good	60 to < 80	> 70 to 80	50 to 75%
Fair	40 to < 60	> 60 to 70	25 to 50%
Poor	20 to < 40	> 50 to 60	0 to 25%
Very Poor (End-Of-Life)	0 to < 20	0 to 50	<= 0%

The following graph depicts, by colour, the value of assets that fall within each of the condition grades (very good or new, good, fair, poor, very poor or end-of-life), organized by program area. The total replacement value of assets within each service area is shown to the right of the condition grade bar.

Figure 2-2 Asset Condition Grade Profile, By Program Area
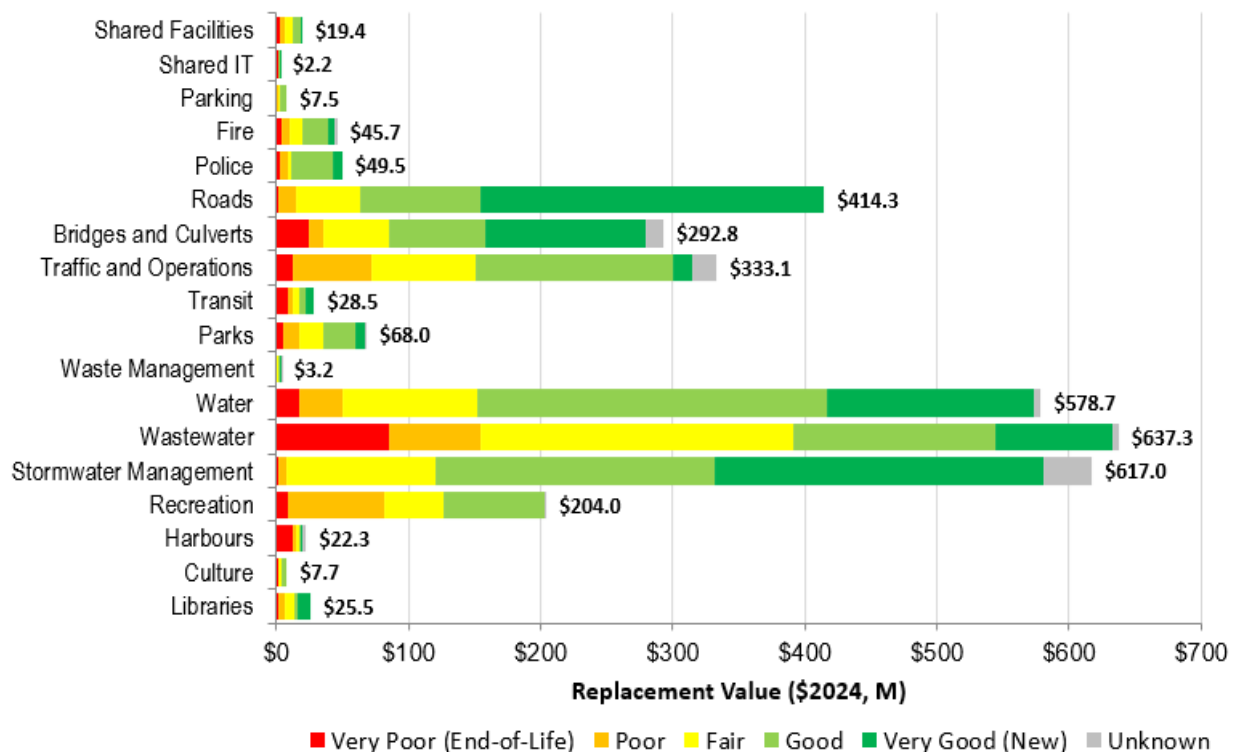
To adequately meet service levels and manage risk while minimizing lifecycle costs, most assets should generally be preserved in fair or better condition. The above figures show that the majority of the City's assets – in fact **80%** – are in fair or better condition based on weighted value. Assets in poor or very poor condition require increased attention and renewal investment (i.e., funding and staff resources) to avoid increased maintenance costs and/or unexpected

failure. The assets that are currently in poor or very poor condition are typically those that are included in 10-year capital renewal programs and budget forecasts.

2.5   Confidence of Data

The City has well-developed policies, procedures, and guidelines for sustainability of Tangible Capital Asset (TCA) information. The information that supports this AM Plan is also continuously updated. The City intends to update this AM Plan every five years, as required by Ontario Regulation 588/17, Asset Management Planning for Municipal Infrastructure, or more frequently as needed.

The City's asset management program is always developing and implementing standards to improve the quality and consistency of information captured. Section 6 of this AM Plan provides a summary of the confidence in the data used to develop this AM Plan and an improvement and monitoring plan.

The following graph shows the approaches to assessing the condition of the assets within each of the program areas, by replacement value, which range from condition unknown to industry standard assessment.

Figure 2-3 Approaches to Assessing Asset Condition, By Program Area
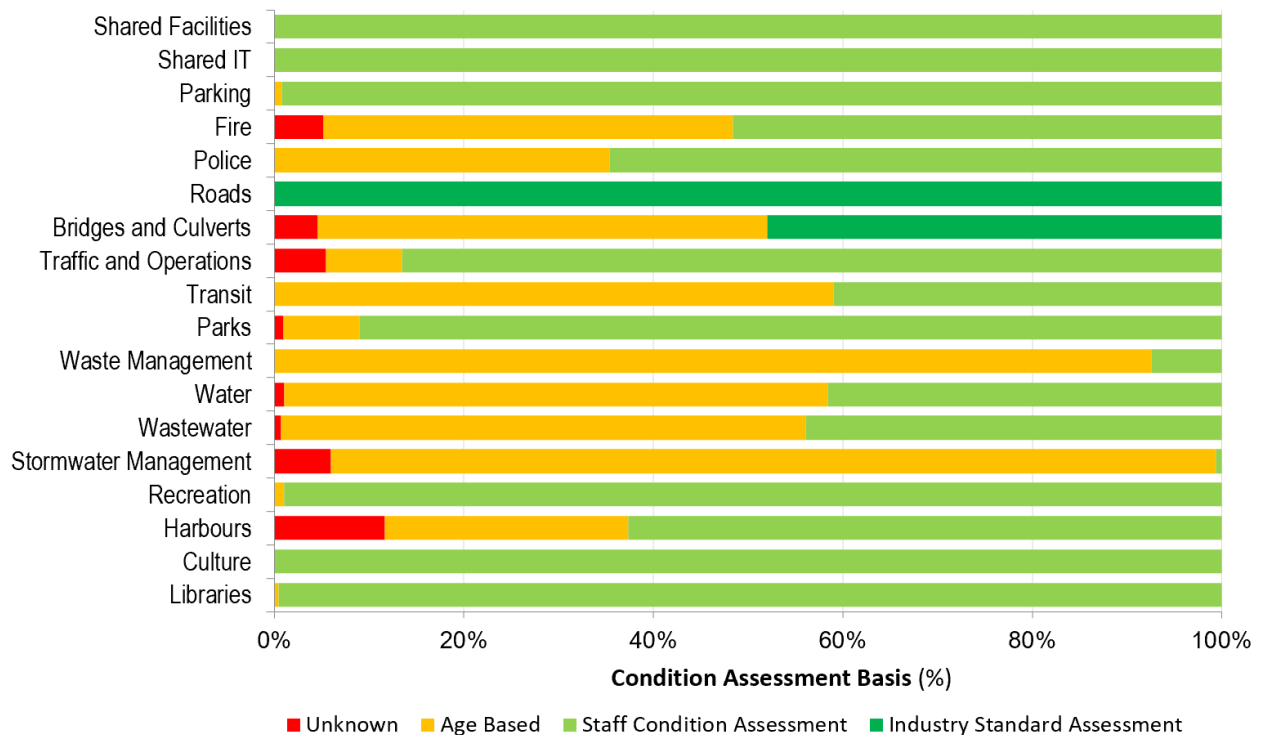
3 LEVELS OF SERVICE

3.1 Overview

One of the basic principles of sound asset management practice is to describe the levels of service the current and future community want and are prepared to pay for, and the associated lowest cost to deliver those levels of service. Performance management is the systematic and cyclical process of identifying objectives, collating information regarding the achievement of those objectives, reporting the information in a meaningful way, and using the information to improve delivery of services to the community.

Monitoring the City's performance against defined levels of service helps to improve the City's service delivery by focusing program activities and assets on priorities, and identifying under-performance so that it can be addressed. Performance measures or indicators are used for this purpose.

> **GOOD PERFORMANCE MANAGEMENT**
>
> **Helps the City to**
> - improve service delivery
> - demonstrate affordability
> - provide accountability to the community

3.2 Current Services and Programs

The City provides the following scope of services to the community that are included in the AM Plan:

Service Area	Program Area
General Government (Corporate Services) 	- **Parking:** Provides safe and accessible parking facilities and manages parking infrastructure. It also maintains parking lots, street parking spaces and associated assets in a state of good repair.
Information Services 	- **Information Technology:** Supports the organization by developing, operating and maintaining the City's technology networks and software, and distributing and maintaining end-user devices. Maintains and oversees functions of network management, data management, cybersecurity, application support, communication systems, online service management, and GIS.

Service Area	Program Area

Fire and Emergency Services

- **Fire:** Provides fire and emergency response services to the City's nearly 60,000 citizens. Ensures the safety and well-being of residents by assessing and managing risks and providing community education on fire safety. Maintains the assets to provide services in a state of good repair.

Belleville Police Service

- **Belleville Police Service:** Provides crime prevention and law enforcement to the City's nearly 60,000 citizens. There are some 170 dedicated sworn and civilian members who serve the City's diverse communities, ensuring that our neighbourhoods, roads and schools are safe for all residents, which includes 98 officers. Maintains the assets to provide services in a state of good repair.

Transportation and Operational Services

- **Roads, Bridges and Culverts:** Assists in the safe and efficient transport of people and goods through interconnecting roads between urban and rural areas. Maintains the road network, including bridges and culverts, in a state of good repair.
- **Roadside and Traffic Operations:** Develops, operates and maintains roadside infrastructure including sidewalks, bicycle lanes, intersections, signage and illumination. Also provides winter control.
- **Fleet and Equipment:** Acquires, maintains and disposes of the City's fleet and equipment for other program areas.
- **Transit:** Provides reliable, convenient and seamless travel across the City through both conventional and specialized mobility transit services. Maintains the transit assets in a state of good repair.
- **Parks:** Develops, operates and maintains parkland, open spaces, forests and outdoor park recreation facilities, amenities, infrastructure and transportation assets.
- **Waste Management:** Manages curbside collection of blue box, green bin, yard waste and residual waste, and delivers the materials to facilities for processing, energy recovery and/or disposal.

Environmental Services

- **Water**: Secures, treats and protects drinking water and distributes it to residents and businesses. Maintains water assets in a state of good repair.
- **Wastewater**: Collects wastewater from residents and businesses, conveys it through trunk sewers to wastewater treatment plants before releasing it to the environment. Maintains wastewater assets in a state of good repair.
- **Stormwater Management**: Provides safe and effective drainage and preserves water quality through natural and engineered linear networks and facilities. Maintains storm networks in a state of good repair.

Service Area	Program Area
Community Services 	• **Facilities Management:** Supports the organization by developing, operating and maintaining corporate administration offices, leased office space, mixed-use facilities, and facilities for other service areas. Tracks the environmental impacts of City energy use and works to mitigate them, reduces net operating costs through energy management, and promotes sustainable practices. • **Recreation and Harbour Services**: Provides spaces and programs that foster community engagement and social interaction through recreational and educational programs. Maintains assets in a state of good repair. • **Cultural Services**: supports and promotes artistic and cultural initiatives within the community, fostering creativity, heritage preservation, and community engagement. Maintains assets in a state of good repair.
Library Services 	• **Library Services**: Supports and inspires lifelong learning, creativity, growth, and success by providing equitable access to information, print and digital resources, technology, and the arts in a welcoming environment. Maintains library assets in a state of good repair.

3.3 Legislative Requirements

There are many legislative requirements relating to the management of assets. Legislative requirements that impact the delivery of City services are outlined in **Table 3-1**.

Table 3-1 Legislative Requirements

Legislation	Requirement
Municipal Act, 2001	The main statute governing the creation, administration and government of municipalities in Ontario, other than the City of Toronto.
Ontario Regulation 588/17 The Infrastructure for Jobs and Prosperity Act, 2015	Sets out the principles for the provincial government to regulate asset management planning for municipalities.
Accessibility for Ontarians with Disabilities Act (AODA)	Develops, implements, and enforces accessibility standards to achieve accessibility for Ontarians with disabilities with respect to goods, services, facilities, accommodation, employment, buildings, structures, and premises on or before January 1, 2025.
Public Section Accounting Board Standard 3150	Standards on how to account for and report on tangible capital assets in government financial statements.
O.Reg. 104/97, Standards for Bridges	Requires municipalities to undertake an inspection, under the direction of a Professional Engineer, for every bridge and major culvert at least once every two years in accordance with the *Ontario Structure Inspection Manual*.
Minimum Maintenance Standards for Municipal Highways (MMS) Regulation 239/02 Routine Patrol	Sets out the standard for the frequency of patrolling of highways to check for conditions described such as snow, ice, potholes, cracks, etc.

Legislation	Requirement
Highway Traffic Act R.R.O. 1990 Reg. 615: Signs	Sets out the standard for the erection and maintenance of signs.
Highway Traffic Act R.R.O. 1990 Reg. 626: Traffic Control Signal Systems	Sets out the standard for the erection and maintenance of traffic control signal systems.
Highway Traffic Act R.R.O. 1990	Sets out fleet and equipment inspection requirements Reg. 174/22: Classes of Vehicles Requiring Annual and Semi-Annual Inspections Reg. 611: Safety Inspections Reg. 199/07: Commercial Motor Vehicle Inspections Reg. 587: Equipment
Ontario Traffic Manual Book 18: Cycling Facilities	Provides guidelines for developing municipal cycling facilities.
Ministry of Transportation: Transit-Supportive Guidelines	Provides processes for planning Complete Streets.
Technical Standards and Safety Act, 2000	Sets out the technical standards and safety regulations to enhance public safety by providing for the efficient and flexible administration of various industries or equipment.
Fire Protection and Prevention Act, 1997	Sets out the legislative and regulatory framework for the establishment of fire protection in Ontario, which is a mandated municipal responsibility.
Ontario Building Code Act, 1992	The legislative framework governing the construction, renovation and change-of-use of a building in Ontario. The Ontario Building Code, a regulation under the Act, establishes detailed technical and administrative requirements and minimum standards for building construction in public health and safety, fire protection, structual sufficiency, construction materials, plumbing and mechanical systems.
Safe Drinking Water Act, 2002, S.O. 2002, c. 32	Requires that all municipal drinking water systems obtain an approval from the Director of MOE to operate, and operators must be trained and certified to provincial standards. Provides a framework for testing with legally-binding standards for contaminants in drinking water and the mandatory use of licensed and accredited laboratories for drinking water testing. The Drinking Water Quality Management System (DWQMS) Operational Plan sets out the required service levels related to water systems.
Environmental Protection Act	The primary pollution control legislation in Ontario. Prohibits discharge of any contaminants to the environment that cause or are likely to cause adverse effects. Amounts of approved contaminants must not exceed limits prescribed by the regulations. Requires that spills of pollutants are reported and cleaned up promptly. Has the authority to establish liability on the party at fault.
Ontario Water Resources Act	Focuses on both groundwater and surface water throughout the province. Regulates sewage disposal and "sewage works" and prohibits the discharge of polluting materials that may impair water quality.
Lakes and Rivers Improvement Act	Introduced in 1990 to protect the province's surface water resources. The Act regulates the public and private use of Ontario's lakes and rivers, including the construction, repair and use of dams.
Navigable Waters Act	Includes protections for navigation on all navigable waters in Canada.

Legislation	Requirement
Federal Fisheries Act	Updated in 2019 to provide better support the sustainability of Canada's marine resources for future generations. Regulations aim to reduce impacts of pollution from wastewater systems into receiving waters (e.g. rivers, lakes, oceans) by setting national minimum effluent quality standards achievable through secondary-level (physical and biological) wastewater treatment and removes up to 95% of pollutants typically found in wastewater. The standards include limits on key substances that are indicators of overall effluent quality and treatment effectiveness: carbonaceous biochemical oxygen demand; suspended solids; total residual chlorine and un-ionized ammonia. In addition, the standards require that wastewater effluent be not acutely lethal to fish based on standard testing methodologies.
Public Pools Ontario Regulation	Regulates public pools and all buildings, appurtenances and equipment used in theoperation of public pools.
Standards for Community Museums in Ontario (Ontario Museum Standards)	Outlines the minimum requirements for the operation of a good community museum.

Legislated Community Levels of Service

Legislated requirements define the standards according to which the City is legally obligated to provide services to the community. The City delivers services in adherence to applicable legislative requirements, including required compliance monitoring and reporting. Many legislated levels of services relate to service and asset safety and reliability. Information on regulatory inspections is contained within various databases and maintained by City staff at the operational level to ensure legislative compliance. It is typical that details of compliance be held at the operational level, but the reporting that confirms that the City complies is reported at a higher level.

Corporate community performance, in the format required by Ontario Regulation 588/17 Asset Management Planning for Municipal Infrastructure, is provided in the Appendix.

3.4 Strategic and Corporate Goals

The 2012 to 2032 Strategic Plan outlines the vision, mission and corporate operting principles, and strategic themes. The Strategic Plan's nine strategic themes and their strategic objectives are provided in Table 3-2.

Table 3-2 Corporate Strategic Themes

Theme	Definition	Objectives
Infrastructure	We need to protect our investment in existing infrastructure through proper maintenance and provide for growth of the community through extension and expansion of infrastructure as required.	• Develop asset management strategies and programs to resolve delivery shortfalls and protect our investment in existing infrastructure • Plan for and invest in new or expanded infrastructure to establish sufficient capacity to provide for growth of our community. • Invest in new infrastructure technologies to maximize efficiencies and better serve our citizens.
Industrial and Commercial Development	We need to establish a foundation for economic prosperity in the future and ensure jobs are created for our citizens.	• Ensure suitable serviced employment lands are available to meet the needs of all potential industrial and commercial investments • Market the City's unique strengths to attract leading-edge industries that provide high paying job opportunities • Encourage remediation and redevelopment of underutilized lands • Create initiatives that support an available skilled labour force, immigration and innovation, including programs to retain youth in the community
Growth and Housing	We need to ensure a full range of housing options is available to meet the housing needs of our residents and to provide for growth of the community.	• Plan for residential growth to meet our needs for 20 years and designate sufficient land in our planning documents to accommodate residential growth for 10 years • Provide for a variety of housing forms to reflect out changing demographics and need for affordability

Theme	Definition	Objectives
Transportation and Mobility	We need to ensure our citizens and businesses have access to and benefit from a full range of transportation alternatives in context with the changing needs of the community.	• Plan and develop a safe and efficient road and transportation system that addresses the needs of our residents and businesses • Develop a viable, affordable and accessible public transit system that addresses the needs of our citizens • Plan and develop transportation networks for cyclists and pedestrians • Encourage and support development and upgrading of transportation systems and networks beyond City limits that address the needs of our citizens and businesses in an environmentally sustainable/progressive manner
City Centre Sustainability	We need to improve the image of the City, counter urban decay and create an environment that will stimulate investment, create job opportunities and strengthen the City's regional role.	• Encourage the creation of a vibrant downtown, accented with pedestrian-friendly services and unique residential and commercial opportunities • Promote the City's core as a place for government, financial, legal and related services • Ensure a strong partnership with the DBIA • Ensure the preservation of Heritage
Arts, Culture and Recreation	We need to create opportunities for residents to participate in meaningful arts, cultural and recreational activities and enhance the City's quality of life and lifestyle including stimulation of community pride.	• Develop multi-purpose, marketable sports and recreation facilities • Plan and develop a parks system with facilities and services that promote health and wellness and address the needs of an aging population on our youth • Support a culturally diverse community • Support the arts and preservation of our heritage • Promote beautification of the community through excellence in urban design
Destination City	We need to stimulate new investment and job creation in the tourism sector and improve the image of our community through an enhanced waterfront.	• Promote and support the development of attractions, events, facilities and services that will draw visitors to the community. • Encourage the creation of a vibrant waterfront based on recreation and entertainment, accented with unique commercial and residential opportunities.
Community Health, Safety and Security	We need to ensure our residents are safe and secure and to foster a caring, responsive, and inclusive community that is compassionate to the needs of all of its citizens.	• Support the establishment of responsive emergency and protective services with strong emphasis on prevention and preparedness to respond to emergencies • Support the provision of programs and services to reduce incidence of crime • Support and advocate for the establishment of responsive public health services and accessible medical care • Encourage development of a viable social safety net

Theme	Definition	Objectives
Environment	We need to protect and enhance the quality of our natural environment to ensure there is clean water and air and a liveable environment, for the benefit of current residents and future generations.	• Provide facilities and support initiatives that reduce water and air pollution and limit noise and light pollution and ensure the availability and security of a safe drinking water supply • Promote energy conservation and use of alternative forms of energy • Provide and support effective solid waste management practises that include enhanced waste diversion initiatives • Preserve prime agricultural lands and support the development of viable agricultural activities • Provide facilities and support initiatives that reduce water, air, light, noise and greenhouse gas pollution

3.5 Customer and Technical Levels of Service

Customer LOS measure how the customer receives the service and whether value to the customer is provided. Figure 3-1 shows that Corporate LOS commitments and the legislated LOS referenced by them drive the definition of more specific Customer (also known as Community) LOS, which can be categorized as relating to one of the following service attributes:

- **Capacity:** Measures that reflect whether the service and supporting assets are of sufficient capacity to meet user demand both now and in the future.

  - Does the City need more or less of these services and assets?

- **Function:** Measures that reflect the suitability of the services, operations and assets for the user or other stakeholder.

  - Do they meet the needs of the community?
  - Do they meet regulatory requirements including those for health and safety, environmental protection and barrier free access?
  - Do they support the City's strategic priorities?

- **Reliability & Quality:** Measures that reflect whether services and supporting assets are reliable, available when needed, and responsive to customers.

  - Are assets maintained and renewed to ensure a state of good repair (i.e., condition)?
  - Are services continuous?
  - Is the community involved in planning, treated respectfully and responded to promptly?

- **Affordable:** Measures that reflect whether services and supporting assets are adquately funded in both the short and long term.

Technical LOS measures support the customer LOS. They relate to the allocation of resources to service activities to best achieve the desired customer outcomes and demonstrate effective performance.

Customer LOS are translated into Technical LOS, where:

- **Capacity LOS** drive assessment of expansion needs
- **Function LOS** drive assessment of upgrade needs

- **Reliability & Quality LOS** drive assessment of renewal, maintenance and operations (and programming) needs
- **Affordability LOS** drive assessment of financial sustainability of asset ownership relative to the asset needs and projected funding adeqaucy.

The risks of failing to achieve the defined Customer and Technical LOS are assessed, and lifecycle activities are prioritized to address those risks. Lifecycle activities may include expansion, upgrade, renewal, maintenance or operational activities, depending on the category of LOS to be addressed. In some cases, lifecycle activities address several Customer and Technical LOS. For example, a project at the pollution control plant may simultaniously increase capacity, make upgrades to meet regulatory requirements, and renew existing equipment. The nature of the lifecycle activity determines whether it should be funded as capital or operating, as well as eligible funding sources. As shown in the figure below, even after the lifecycle intervention, some residual risk may remain.

Figure 3-1 Levels of Service Framework

Legislated Requirements	Corporate Priorities	Customer Service Attributes	Community Levels of Service	Technical Levels of Service	Current Risk	Lifecycle Activities	Associated Costs	Residual Risk
Government Regulations	Strategic Plan · Official Plan · Customer Expectations · Long Range Financial Plan	CAPACITY	Services are of sufficient capacity	Assets and operations are of sufficient capacity →	Risk of not meeting Community and Technical Levels of Service	→ Expansion and Disposal →	Cost of Capital **NEEDS** versus **FUNDING**	Risk of not meeting Community and Technical Levels of Service
		FUNCTION	Services meet legal requirements and customer needs →	Assets and operations meet legal requirements and are fit for purpose →		→ Upgrade →		
		RELIABILITY and QUALITY	Services are reliable and responsive to the community	Assets are available when needed, being maintained and renewed as required →		→ Renewal →		
				Operations are responsive to the community →		→ Maintenance →	Cost of Operating **NEEDS** versus **FUNDING**	
		AFFORDABLE	Services are adequately funded →	Assets and operations are adequately funded →		→ Operations →		
							Shortfall / Surplus	

Benefits

Costs

3.6 Customer Research and Expectations

Resident, business and other stakeholder input is sought during the update of the City's Strategic Plan, Official Plan, Master Plans and annual budgets. This includes public opinion and stakeholder group surveys that collected information about user service patterns, behaviours and preferences today and potentially in the future. This customer research provides insight into citizens' and other stakeholders' needs and perceptions related to areas of improvement.

3.7 Current Performance

The following table summarizes current performance and the confidence in the data used to assess the performance, by program area. Customer and Technical LOS and performance is provided by service and program area in Section 7 Service and Program Area Details with measures as required by O.Reg.588/17 for core assets provided in Section 8 O.Reg. 588/17 Community LOS Documentation.

Table 3-3 Current Customer Service Performance and Data Confidence

Program Area	Capacity — Services have enough capacity and are accessible enough to everyone		Function — Services meet customer needs while limiting health, safety, security, natural, and heritage impacts		Reliability and Quality — Services are continuous, predictable, and responsive to customers		Affordability — Services are adequately funded in the long term, and are financially sustainable	
	Current Performance	Data Confidence	Current Performance	Data Confidence	Current Performance	Data Confidence	Current Performance	Data Confidence
Shared Facilities	--		--		Poor	Moderate	Very Good	Low
Shared IT	Fair	Moderate	Good	Moderate	Poor	Moderate	Good	Moderate
Parking	--		Poor	High	Fair	Moderate	Very Good	High
Fire	Fair	High	--		Fair	Moderate	Very Good	High
Police	--		--		Fair	High	Very Poor	Moderate
Roads	--		--		Good	High	Very Good	High
Bridges & Culverts			Very Good	Very High	Fair	Very High	Very Poor	High
Traffic & Operations	--		Poor	High	Fair	High	Very Poor	High
Transit	Good	Very High	Fair	Very High	Poor	Very High	Fair	High
Parks	Fair	High	Good	High	Good	High	Very Poor	High
Waste Management	Very Good	Very High	--		Good	High	Fair	Very High
Water	Good	High	Good	High	Good	Low	Very Good	High
Wastewater	Fair	Moderate	Good	High	Fair	Low	Fair	Moderate
Stormwater Management	Good	Moderate	Good	Very High	Very Good	Moderate	Good	Low
Recreation	Fair	Low	Good	Moderate	Poor	Moderate	Poor	Moderate
Harbours	Fair	Moderate	--		Poor	High	Very Poor	Moderate
Culture	--		--		Fair	Moderate	--	
Library	--		--		Fair	Moderate	--	

"--" represents a future measure

3.8 Factors Impacting Levels of Service Performance

External trends and issues affecting expected levels of services or the City's ability to meet the defined levels of services include the following.

- Population and employment changes (e.g. growth, demographics), which will impact infrastructure use.
- Changes in expectations for programs or patterns of use from the public, which will impact infrastructure use and revenue for services.
- Potential changes in technology or methods, which may replace obsolete equipment, provide longer asset life, and/or achieve higher quality and greater efficiencies.
- Potential changes to the cost of input variables (e.g. cost of power, fuel), which will impact costs to deliver the services.
- Infrastructure failing prematurely due to environmental factors and/or construction practices requiring renewal much earlier than the expected life of the asset.
- Availability of external funding (e.g. federal and provincial infrastructure programs), which may affect the infrastructure improvement activities that can be undertaken.
- Unexpected downloading of services by more senior levels of government.
- Popularity of sustainability initiatives and "greening" trends (e.g. LEED, electrification and GHG reduction).
- Climate change, including changing storm events and patterns (e.g., higher frequency and intensity of storms), which will impact the infrastructure.
- Potential changes in Federal or Provincial legislation.

4 ASSET MANAGEMENT STRATEGY

The Asset Management Strategy section of the AM Plan describes the framework that the City uses to identify critical assets and quantify risk to enable prioritization of lifecycle activities, and summarizes the asset management strategies (i.e., planned actions) that will enable the assets to maintain the current levels of service in a sustainable way, while managing risk, at the lowest lifecycle cost.

4.1 Overview of AM Strategy Development

Monitoring the City's performance against defined levels of service helps to improve the City's service delivery by identifying under-performance so that it can be addressed. Assessing the risks associated with failing to achieve the defined Customer and Technical LOS helps to priotize lifecycle activities and minimize residual risks.

To achieve its program objectives, the City builds new infrastructure assets to meet growth needs and manages existing assets to meet reliability needs – all with limited funds.

Asset lifecycle management strategies are typically organized into the following categories:

- **Non-asset solutions** – actions or policies that can lower costs or extend asset life (e.g., better integrated infrastructure planning and land use planning, demand management, insurance, process optimization, managed failures).

- **Growth or expansion** – activities to provide a new asset that did not exist previously (e.g. a new library) or an expansion to an existing (e.g., widening a road, replacing a pipe with a larger size).

- **Upgrade or enhancement** – activities to provide a higher level of service capability from an existing asset to achieve better fit for purpose (e.g., sealing an unsealed road) or to meet regulatory or corporate requirements.

- **Renewal** – activities that return the original service capability of an asset (e.g. the lining of iron watermains to defer the need for replacement or replacing an existing bus with a new bus).

- **Maintenance** – activities to retain asset condition to enable it to provide service for its planned life (e.g. road patching, unsealed road grading, building and structure repairs), including regularly scheduled inspection and maintenance, or more significant repair and activities associated with unexpected events.

- **Operations** – regular activities to provide services (e.g., using / running a piece of equipment, cleaning, provision of energy)

- **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.

The City assesses the costs of potential lifecycle activities to determine the lowest lifecycle cost strategy to manage each asset type. The sum of all asset lifecycle management strategies informs the minimum cost to sustain each asset type, for each service area (i.e. the whole of lifecycle cost). Failing to take care of assets can impact the total cost of ownership for that asset and can also have other impacts such as causing interruption to service delivery, damage to other infrastructure, health and safety, environmental and/or social impacts.

4.2　Risk Assessment

4.2.1　Risk Management Framework

Risk management refers to the management of uncertainty on business objectives. For this AM Plan, risk management was guided by the ISO 31000 Standard for Risk Management, which provides globally accepted principles and guidelines for risk assessment.

The ISO 31000 Risk Management Standard outlines the steps involved in Risk Management as shown in Figure 4-1.

Figure 4-1 ISO 31000 Risk Management Process
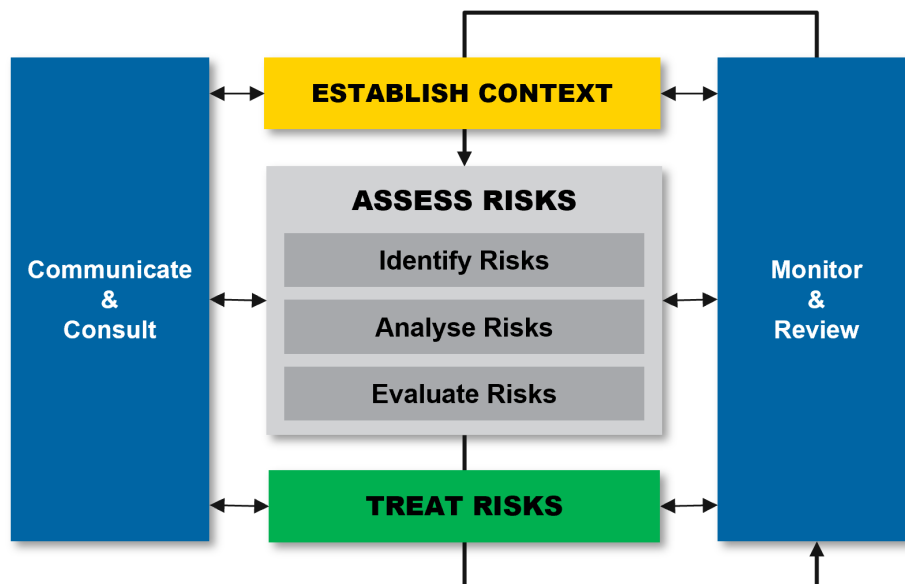
- **Establish Context** – the environment in which the City seeks to define and achieve its objectives
- **Identify Risks** – that could affect achievement of City's LOS
- **Analyze Risks** – estimate the level of a risk by approximating likelihood and consequence of occurrence
- **Evaluate Risks** – determine whether or not a specified level of risk is acceptable or tolerable
- **Treat Risks** – select and implement one or more treatment options
- **Monitor and Review** – determine the current status and whether or not required LOS are being achieved
- **Communicate and Consult** – an iterative two-way dialogue between the City and its stakeholders throughout the risk management process.

4.2.2 Risk Context

For this AM Plan, the City defines the risk as the failure to maintain current levels of service.

4.2.3 Risk Assessment

Table 4-2, on the following page, presents the **Consequence Rating Criteria** used to determine consequence ratings, which details the ratings for the severity of consequences of risks. For each risk, consequences for the following five consequence categories are considered: service delivery, economic, health and safety, environmental, and social. An overall consequence rating is calculated by taking the highest consequence rating from across the five consequence categories.

Table 4-3, two pages ahead, presents the **Probability (or Likelihood) Rating Criteria** used to determine the likelihood of occurrence (i.e., the chance of a significant single event or ongoing/cumulative occurrence). The likelihood of occurrence can be defined for each of the three service attributes: capacity, function, reliability.

Table 4-1, shown below, presents the **Risk Evaluation Matrix Framework** that depicts the risk exposure, based on the likelihood of occurrence and overall consequence rating for each risk.

Table 4-1 Risk Evaluation Matrix Framework

Table 4-2 Consequence Rating Criteria

CoF Score	Consequence (Impacts) of Failure				
	Service Delivery	**Economic**	**Health and Safety**	**Environmental**	**Social**
1	No impact to services or small number of customers experience disruption or impact to non-essential service.	Damages, losses, or fines of under $10,000	No obvious potential for injury or affects to health.	Asset degradation/failure has negligible impact on environment, emissions, and pollution. Impact fully reversible within 1 week.	Event only of interest to individuals. No community concern.
2	Localized service disruption or impact to non-essential services.	Damages, losses, or fines of $10,000-$200,000	Potential for minor injury or affects to health of an individual.	Asset degradation/failure has minor impact to the environment including potential for increased emissions or pollution. Prosecution possible. Impact fully reversible within 3 months.	Minor community interest. Local media report.
3	Significant localized disruption or impact to non-essential services and/or localized disruption to essential services.	Damages, losses, or fines of $200,000-$2,000,000	Potential for serious injury or affects to health of one or more individuals with a possibility of short term disability or hospitalization.	Asset degradation/failure has significant short-term impact to the environment including a likely increase of emissions or pollution. Prosecution probably. Impact fully reversible within 1 year.	There will likely be moderate local media exposure which may last several days. Public Community Discussion. Broad adverse media coverage.
4	Widespread short-term disruption or localized long-term disruption of essential services.	Damages, losses, or fines of $2,000,000-$10,000,000	Potential for serious injury or affects to health of one or more individuals with a possibility of loss of a life.	Asset degradation/failure poses risk of environmental contamination and/or has significant long-term impact. Likely a substantial increase to emissions or pollution. Prosecution expected. Impact fully reversible within 5 years.	There will likely be significant, negative, local or provincial media exposure which may last several days. Loss of confidence in Council. National publicity. Public agitation for action.
5	City-wide or long-term disruption of essential services.	Damages, losses, or fines of over $10,000,000	Potential for death or multiple deaths with probable permanent damage.	Asset degradation/failure poses significant risk to environment including a major long-term impact. Likely to result in contamination. May become of Provincial or Federal importance. Prosecution. Long term study. Impact not fully reversible.	There will likely be significant, negative, national or international media exposure lasting several days or weeks. Public investigation. International coverage. Management changes demanded.

Table 4-3 Probability (Likelihood) Rating Criteria

PoF Score	Probability (Likelihood) of Failure				
	Frequency	Probability	Capacity	Function	Reliability
1	Within 10 to 20 years	0% to 10%	Demand corresponds well with actual capacity and no operational problems experienced. Meets current and future capacity needs within planning horizon.	The infrastructure in the system or network meets all service delivery needs (i.e., health, safety, security, legislative, etc.) in a fully efficient and effective manner.	Asset is physically sound and is performing its function as originally intended. Asset is new or at the beginning of its service life. (< 20% Life Consumed)
2	Within 6 to 10 years	11% to 30%	Demand is within actual capacity and occasional operational problems experienced.	The infrastructure in the system or network meets service delivery needs (i.e., health, safety, security, legislative, etc.) in an acceptable manner.	Asset is physically sound and is performing its function as originally intended. Typically, asset has been used for some time but is within mid-stage of its expected life. (20% < Life Consumed <=40%)
3	Within 3 to 5 years	31% to 60%	Demand is approaching actual capacity and/or operational problems occur frequently. Meets current capacity needs but not future without modifications.	The infrastructure in the system or network meets service delivery needs (i.e., health, safety, security, legislative, etc.) with some inefficiencies and ineffectiveness present	Asset is showing signs of deterioration and is performing at a lower level than originally intended. (40% < Life Consumed <=60%)
4	Within 2 years	61% to 80%	Demand exceeds actual capacity and/or significant operational problems are evident.	The infrastructure in the system or network has a limited ability to meet service delivery needs (i.e., health, safety, security, legislative, etc.).	Asset is showing significant signs of deterioration and is performing to a much lower level than originally intended. (60% < Life Consumed <=80%)
5	Within 1 year	81% to 100%	Demand exceeds actual capacity and/or operational problems are serious and ongoing. Does not meet current capacity requirements.	The infrastructure in the system or network is seriously deficient and does not meet service delivery needs (i.e., health, safety, security, legislative, etc.) and is neither efficient nor effective.	Asset is physically unsound and/or not performing as originally intended. Asset has reached end of life and failure is imminent. (> 80% Life Consumed)

Table 4-4 summarizes the City's Risk Evaluation Matrix, based on the likelihood of occurrence and overall consequence rating for each risk, for all service and program area assets. Risk Evaluation Matrices, by service and program area, are provided in Section 7 Service and Program Area Details.

Table 4-4 Risk Evaluation Matrix ($M)

Likelihood of Failure						
	5	$0.03	$0.52	$73.88	$39.27	$65.89
	4	$0.00	$2.45	$92.31	$58.00	$152.33
	3	$0.71	$2.68	$271.74	$235.35	$217.83
	2	$2.07	$7.74	$364.99	$277.77	$462.58
	1	$0.02	$0.85	$417.95	$354.32	$156.40
		1	**2**	**3**	**4**	**5**
		Consequence of Failure				

Risk Exposure	CRV($M)	CRV(%)
Very High	$257.49	7.9%
High	$677.37	20.8%
Moderate	$1,539.15	47.2%
Low	$780.72	24.0%
Very Low	$2.94	0.1%
Total	**$3,257.67**	**100.0%**

Note that the total value of assets captured within the risk matrix may not align with the total value of the City's asset portfolio. This is a result of instances where assets could not be assigned a condition rating due to lack of available assessment information or data to support proxy methodology.

A breakdown of the current replacement value of Very High risk exposure assets are listed in Table 4-5 below.

Table 4-5 Very High Risk Exposure Assets by Program Area

Program Area	CRV($2024M)	% of Assets in Program Area
Shared Facilities	$2.5	13%
Shared IT	$1.0	43%
Parking	$0.0	0%
Fire	$7.2	17%
Police	$5.0	10%
Roads	$2.8	1%
Bridges and Culverts	$25.0	9%
Traffic and Operations	$54.3	17%
Transit	$12.0	42%
Parks	$3.1	5%
Waste Management	$0.0	0%
Water	$5.2	1%
Wastewater	$62.5	10%
Stormwater Management	$0.0	0%
Recreation	$60.9	30%

Program Area	CRV($2024M)	% of Assets in Program Area
Harbours	$14.0	71%
Culture - Museums & Historic	$1.2	15%
Library	$0.8	3%
TOTAL	**$257.5**	

Note that the risk exposure for facilties relates to most Program Areas. Also note that the likelihood of failure was determined at the Uniformat element Level 2 by staff assessment of condition grade 1 (very good) to 5 (very poor) and that the City is currently undertaking detailed building condition assessments that will greatly improve the level of confidence that supports the risk assessment.

4.3   Asset Management Strategies

The City uses its understanding of current service delivery gaps and potential future gaps to inform the timing, location and amount of needed investments in infrastructure assets. The City aims to provide sufficient service capacity to meet demand and manages the condition and renewal of assets to sustain defined service levels, including meeting legislated and other corporate requirements.

4.3.1 Growth and Expansion Strategies

Roughly 58,000 people currently live in the City of Belleville, of which about 35,000 are employed. The population grew by 2.6% from 2011 to 2016 and by 8.6% from 2016 to 2021.

The expected distribution of population and employment growth for the City are as follows:

Table 4-6 2022 Population Employment Growth Forecasts, to 2051

	2021	2031	2041	2051
Population (1)	56,550	64,270	70,820	75,190
Employment (2)	31,700	36,400	39,300	41,000

(1) excluding Institutional Population
(2) including no fixed place of work
Reference: Belleville Population, Housing and Employment Growth Forecast Update, 2022

The following graph depicts population growth, incorporating Census data with the 2022 Population, Housing & Employment Growth Forecast Update for the City of Belleville. The population is forecast to increase by 12.9% over the 10 year AM Plan period of 2024 to 2033.

Figure 4-2 2022 Population Growth Forecasts
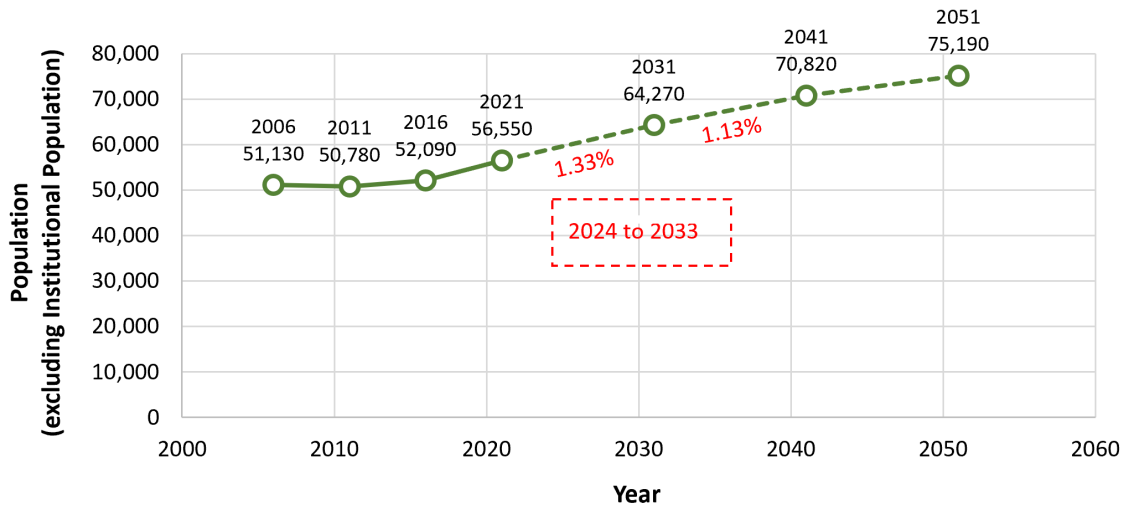
Population growth and its geography have major impacts on the scale of services delivered by the City and the assets that support that service delivery. The City invests in roads, transit, water and wastewater systems and other infrastructure to serve both existing and new housing, commercial and other development. Servicing growth requires significant infrastructure investments.

The City's approaches to accommodate growth needs are described in the Official Plan and include consultation with the public and other stakeholders. For many service areas, master plans propose new or expanded assets and non-asset solutions to address current and forecast future capacity performance gaps. Where no service area master plan growth forecast exists or it is deemed no longer current or has no associated costs, the 2021 Development Charge Background Study is used to provide a growth forecast. For some service areas, the asset portfolio is forecast to expand over the next 10 years at the same rate as the the forecast growth in population (i.e., 12.9%).

4.3.2 Upgrade and Enhancement Strategies

Upgrade and enhancement activities provide a higher level of service capability from an existing asset to achieve a better fit for purpose (e.g., sealing an unsealed road) or to meet regulatory or corporate requirements such as for health, safety, and environmental protection.

In many cases, service area master plans include both upgrade and enhancement strategies. In addition, the City produces functional needs plans that apply across the corporation. Examples include the Multi-year Accessibility Plan (2023-2027 draft) and the 5-Year Corporate Energy Conservation and Demand Management Plan (2019). These plans provide upgrade and enhancement needs forecasts. As it is common for growth and upgrade strategies to be undertaken simultaneously, these lifecycle strategies are oftern reported together. Summaries of the needs to accommodate growth and upgrade of assets, by program area, are provided in Section 7 Service and Program Area Details.

4.3.3 Renewal Strategies

All assets physically deteriorate at different rates to reach eventual failure and loss of ability to deliver the required levels of service. The City invests in condition assessments to gain the

critical knowledge needed to understand where the assets are in their lifecycles and identify performance gaps.

For each identified renewal performance gap, technically feasible lifecycle options are assessed to determine the lowest cost solution to adequately address the gap. For each asset type, the City develops an asset renewal strategy that identifies the frequency and cost of activities that provide the defined level of service, at the lowest lifecycle cost. The renewal strategies are applied to the asset portfolio over time to determine the program of renewal activities and the amount that must be invested in the City's asset portfolio to sustain current service levels.

For some asset types, such as most fleet and information technology assets, the renewal strategy is very simple – replace the asset at the end of its useful life. For other asset types, such as a facility or roadway pavement, the renewal strategy is much more complicated. For a facility, there are hundreds if not thousands of individual components, some of which may be rehabilitated or replaced numerous times throughout the life of the facility. For roadway pavement, there are numerous treatment types and they may each only be applied a limited number of times throughout the life of the pavement, and only under certain conditions.

Summaries of the City's strategies to renew aging assets are described in Section 7 Service and Program Area Details. Over time, as the City refines the asset management strategies through optimization analyses, the tracking of condition against targets and the application of renewal activities to meet defined levels of service becomes more routine.

4.3.4 Operations and Maintenance Strategies

The distinction between renewals (which are capital works) and maintenance (which is an operational expense) is set by accounting policies and standard operating procedures. Maintenance ensures the asset continues to deliver defined levels of services, while renewals can extend the asset's useful life. Renewals and maintenance are strongly linked; maintenance strategies can hasten or delay the need for renewals, and, if renewals are deferred, maintenance needs will often increase.

Asset operations and maintenance requirements and required resources are assessed and prioritized based on:

- Carrying out legislated operations and maintenance activities to ensure safety and environmental sustainability in accordance with appropriate regulations.
- Conducting routine and preventative maintenance activities to ensure preservation of existing assets.
- Analysis of current operations and maintenance contracts and known historical costs of delivering defined levels of services to forecast future operations and maintenance costs. For example, in some cases operations and maintenance costs increase at the rate of inflation, and in other cases such as energy and oil for pavement, costs have increased significantly more over time than the overall rate of inflation.
- Assessing consequential operations and maintenance requirements of significant new or upgraded infrastructure planned for the asset portfolio.

The level of expected population and asset portfolio growth will place significant pressure on the capacity of existing operations and maintenance. Consequential operational expenditure is the operations and maintenance cost associated with new and upgraded assets. For example, for a

new facility, the costs of electricity, natural gas and routine maintenance all contribute to the consequential operational expenditure associated with that new asset. These costs will be incurred by the City into the future for as long as the facility is in use. For most assets, a good estimate of the consequential operational expenditure required to operate and maintain the new assets is simply the existing operations and maintenance cost multiplied by the growth factor.

Summaries of the operations and maintenance strategies, by program area, are provided in Section 7 Service and Program Area Details.

5 FINANCING STRATEGY

5.1 Introduction

The purpose of a financial strategy is to provide a path to financial sustainability.

Financial sustainability involves managing service levels, infrastructure and financial assets in both the short and the long term. A municipality is considered financially sustainable if:

- Its tax effort and other revenues are commensurate with its level of service aspirations
- It can adjust its capital plan, operating programs and service levels in response to changes in economic conditions or transfer payments
- It can keep its infrastructure in a state of good repair and replace it at the right time
- It can achieve intergenerational equity (i.e., share financial responsibility fairly between current and future tax- and rate-payers)
- It can accommodate growth without unpalatable tax levy, user rate, or debt increases
- It can sustain service levels as the municipality continues to grow.

Potential risks to achieving municipal financial sustainability include:

- A mismatch between level of service aspirations and fiscal capacity
- Uncertainty in the future cost of needed infrastructure investments
- Unforeseen shocks to revenue, such as an economic downturn or a reduction in transfer payments
- Growth that does not materialize as expected.

Intergenerational equity has profound implications for municipal finance. As infrastructure is less expensive in the early part of its lifecycle compared to the latter parts when rehabilitation and replacement expenses occur, today's generation of tax- and rate-payers pay significantly less than the true cost of their use of infrastructure. The implication for municipal finance is that robust saving for future asset management needs is a matter of intergenerational fairness.

The elements of a sound municipal financial strategy are:

- **Manage the capital plan:** to balance delivery ability and short-and long-run financial capacity. Define future short and long term AM renewal needs and begin saving now in attempt to mitigate intergenerational inequity. Define the financial impact of the shortfall, including the impact to tax levy and user fees, and develop a plan to address it.
- **Manage reserves:** aggressively build reserves, particularly for future asset management needs and contingencies (and potentially for shortfalls in DC collections)
- **Manage debt:** manage debt levels for strategic investment in infrastructure while adhering to policy limits
- **Enhance revenue:** identify additional sources of revenue and advocate for financial assistance from applicable upper levels of government.

5.2   Needs Forecasts

5.2.1 Capital Needs Forecast

Note that the graphs shown in the following subsections are plotted using a constant vertical axis scale to show the relative scale of growth, renewal and operating needs forecasts. Growth activities only occur once in the lifecycle of each asset, while renewal and operating costs are required in perpetuity to support service delivery. Summaries of the capital needs forecasts, by program area, are provided in Section 7 Service and Program Area Details.

Capital Needs Forecast for Growth and Upgrade

To meet the increases in demand for services, the City constructs new and upgrades existing assets within the portfolio, in addition to implementing non-asset strategies. To meet demand for functional improvements to services, the City upgrades the suitability of assets within the asset portfolio.

The projected capital outlays needed to maintain the current capacity and function levels of services covered by this AM Plan for each of the next 10 years are shown as the dark coloured solid bars in the following graph. These forecasts are for City constructed works and are generally based on the implementation plans outlined in various Master Plans and the 2021 Development Charges Study. Upgrades to existing infrastructure capacity are anticipated to be required to continue to meet demand includes upsizing the Avonlough Sewage Pumping Station and immediately associated linear infrastructure, sanitary sewer oversizing and extensions, and enhancements to the Wastewater Treatment Plant. In addition to the necessary improvements to existing infrastructure to accommodate growth, it will also be necessary to construct and procure new assets to support City expansion such as additional conventional buses, playgrounds and other park amenities, roads, bridges and culverts, and more.

For reference, the lighter coloured solid bars provide historic expenditures. The dashed black line is the average needs forecast over the 10 year period and the solid red line is the average available funding forecast.

Figure 5-1 Annual Capital Growth and Upgrade Needs Forecast (M$2024)
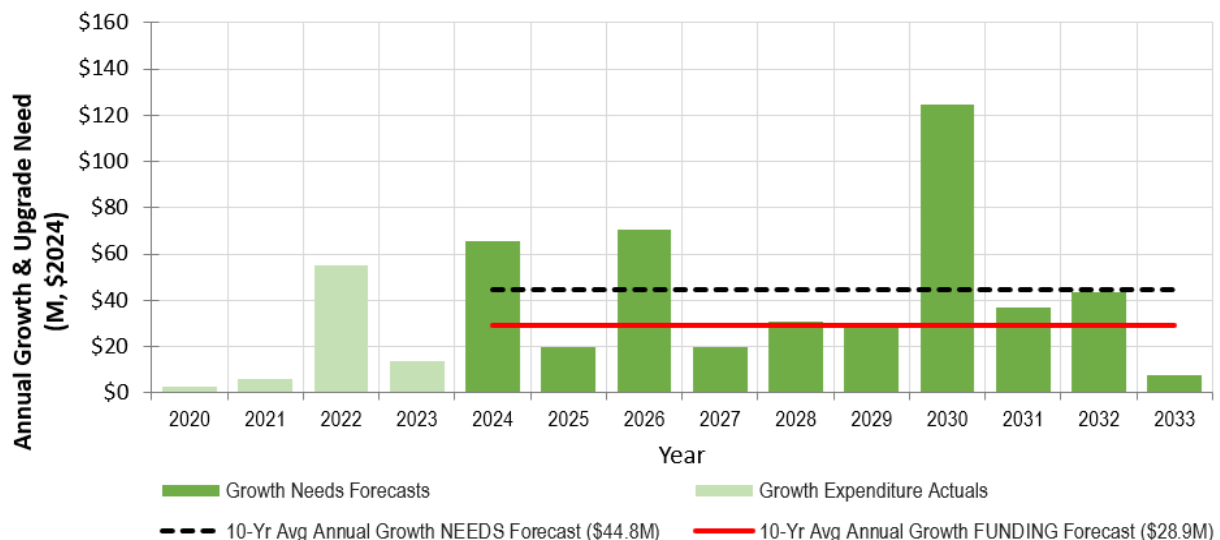
Capital Needs Forecast for Renewal

To manage asset condition and risk, as well as address potential asset and associated service reliability gaps, the City continuously renews assets in the asset portfolio. The projected capital outlays needed to maintain the current reliability and quality levels of services covered by this AM Plan for each of the next 10 years are shown as the dark coloured solid bars in the following graph. These forecasts are based on a range of methods including industry standard physical condition assessments and needs forecasts, staff-report condition assessments and needs forecasts, install date and estimated useful life, and annuities (replacement cost divided by the estimated useful life).

For reference, the lighter coloured solid bars provide historic expenditures. The dashed black line is the average needs forecast over the 10 year period and the solid red line is the average available funding forecast. The solid green line provides the amount to renew the assets over their entire lives. The high bar in year 2024 represents a significant backlog of renewal work.

Figure 5-2 Annual Capital Renewal Needs Forecast (M$2024)
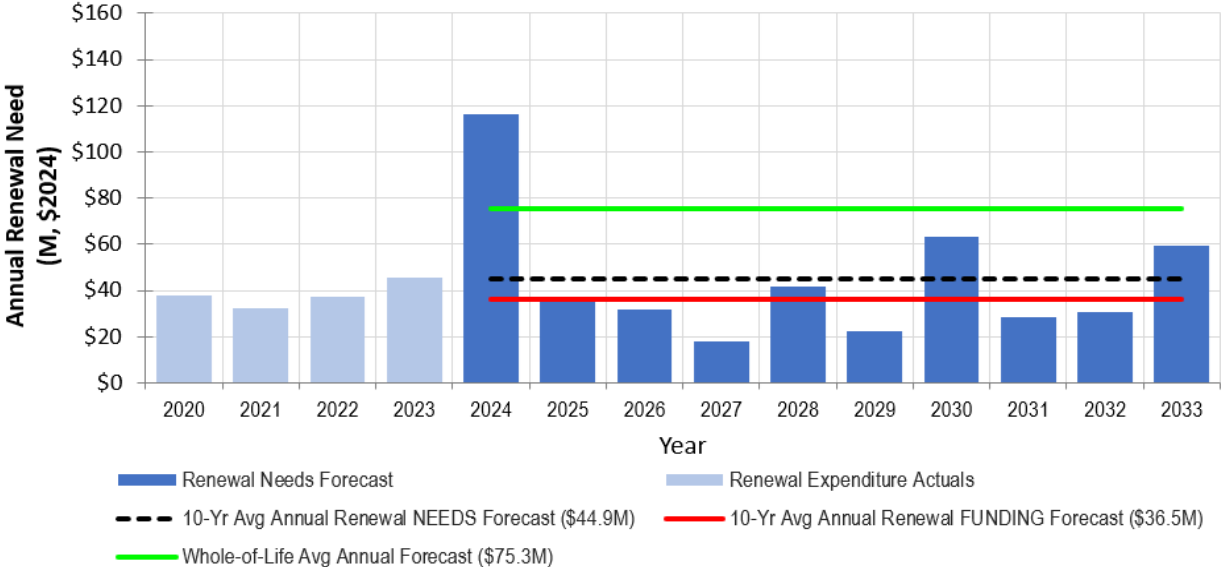
5.2.2 Operating Needs Forecast

To deliver the defined levels of service, the City undertakes regularly programmed activities, including operating and maintaining the assets and providing programming. The forecast population and asset portfolio growth will place pressure on the capacity of existing operations and maintenance needs. The projected operating outlays needed to maintain the current reliability and quality levels of services covered by this AM Plan for each of the next 10 years are shown as the dark coloured solid bars in the following graph. For reference, the lighter coloured solid bars provide historic expenditures. The dashed black line is the average needs forecast over the 10 year period and the solid red line is the average available funding forecast. As the City continues to grow and acquire upgraded and additional assets within its portfolio, there will be additional costs associated with the operations and maintenance of those assets.

Figure 5-3 Annual Operating Needs Forecasts (M$2024)
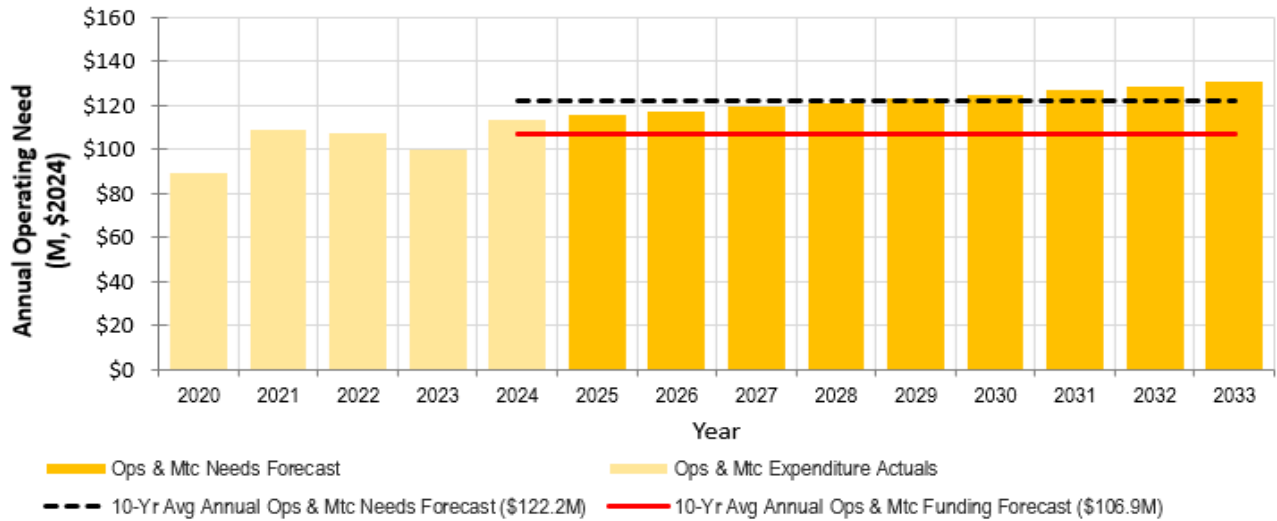
5.2.3 Summary of Needs Forecasts

Table 5-1 summarizes the City's needs forecasts for each of the service attributes based on the analysis from the preceeding sections for all service and program area assets. Detailed needs forecasts, by service and program area, are provided in Section 7 Service and Program Area Details.

Table 5-1 Summary of 10-Year Annual Needs Forecasts ($M)

Service Area	Program Area	City Growth & Upgrade	Renewal	O&M	TOTAL
General Government	Shared Facilities	$0.26	$0.34	$1.05	$1.65
	Shared IT	$0.03	$0.41	$1.94	$2.38
	Parking	$0.10	$0.23	$0.88	$1.21
Fire & Emergency Services	Fire	$0.62	$1.67	$17.62	$19.91
Belleville Police Service	Police	$0.68	$2.19	$30.43	$33.30
Transportation & Operations Services	Roads	$8.10	$9.96	$2.07	$20.13
	Bridges and Culverts	$4.00	$1.97	$0.04	$6.01
	Traffic and Operations	$0.74	$7.43	$9.03	$17.20
	Transit	$0.24	$0.85	$7.85	$8.94
	Parks	$3.92	$1.82	$6.46	$12.20
	Waste Management	$0.04	$0.03	$5.32	$5.39
Environment Services	Water	$2.01	$1.94	$8.49	$12.44
	Wastewater	$14.60	$9.97	$9.00	$33.57
	Stormwater Management	$2.74	$1.70	$1.17	$5.61
Community Services	Facilities	$6.25	$2.31	$16.35	$24.91
	Harbours	$0.01	$1.75	$0.79	$2.55
	Culture	$0.11	$0.18	$0.77	$1.06
Belleville Public Library	Library	$0.35	$0.24	$2.94	$3.53
TOTALS		**$44.81**	**$44.98**	**$122.20**	**$211.99**

5.3 Funding Sources for Asset Lifecycle Strategies

The above sections provide a summary of the forecasted financial needs to expand, upgrade, renew, operate and maintain City programs and assets. A municipality's ability to deliver on its AM Plan depends on the quality of its financial strategy. Financial sustainability requires long-term planning so that the necessary steps can be taken in the near-term to manage long-term financial risks.

A number of revenue sources are available to fund the capital needs of assets throughout their lifecycles:

- **Development Charges** to pay for the majority of growth through a development charge reserve fund.
- **Tax Levy, User Rates** (parking, water, wastewater)**, and User Fees** (recreation, harbours, transit) to pay for:
  - Minor rehabilitation and a portion of growth through a "flow through" pay-as-you-go renewal capital reserve fund
  - Major rehabilitation and replacement through a renewal reserve fund.
- **Grants and Gas Tax Revenue** to pay for major rehabilitation and replacement.
- **Debt** (on which interest is paid) to pay primarily for growth related funding gaps

The City is currently developing a strategy to determine how best to fund each of the asset lifecycle needs, across each of the service and program areas. Alternative procurement and funding models are also being considered.

When determining funding sources, the City also considers how costs and benefits are spread between current and future users (i.e. intergenerational equity). The objective is to ensure all users pay their share of costs in manner that balances equality and equity, and to ensure that no users are unfairly burdened. In efforts to support this objective, services typically utilized and experienced by the general population such as roads are paid for through the tax base, while services utilized and experienced at the individual consumer level such as swimming programs are additionally paid for through user fees.

5.4 Available Funding, Shortfalls / Surpluses and Risks

As the City does not currently budget for a ten year period, the funding estimated to be available to maintain current levels of service to the next ten years has been estimated. The methodology used for estimating funding included using a total annual budget availability based on a two year average (2023, 2024) with allocations amongst individual service areas based on five year average percentage of funding distributions.

Table 5-2 summarizes the estimated funding available to maintain current levels of service for each of the service attributes and compares it to the City's needs forecasts based on the analysis from the preceeding sections for all service and program area assets. The available funding was determined as the average funding available through the 2023 and 2024 budgets. Note that the figures are not inflated. Available funding compared to needs forecasts, by service and program area, are provided in Section 7 Service and Program Area Details.

Table 5-2 Summary of Available Funding and Shortfalls / Surpluses ($M)

Service Attribute	Lifecycle Activity	10-Yr Avg Annual Needs Forecast (2024$M)	10-Yr Avg Annual Available Funding (2024$M)	10-Yr Avg Annual Shortfalls / Surplus (2024$M)	10-Yr Avg Annual Funding / Funding (%)
Capacity	Growth & Upgrade – City	$44.81	$28.94	($15.87)	65%
Reliability	Renewal	$44.98	$36.51	($8.47)	81%
	Operations & Maintenance	$122.20	$106.91	($15.29)	87%
Totals		**$211.99**	**$172.37**	**($39.62)**	**81%**

There are risks associated with providing the service and not being able to complete all identified activities. The major risks are identified as follows:

- Deferral of renewal activities which results in reduced whole of life of the infrastructure, higher annual cost over the life of the asset, assets in worse overall condition, less effective use of resources, and intergenerational inequity (i.e., consumption of benefits by one generation and payment for those benefits by another).

These risks will be managed within available funding by:

- Prioritizing needed activities by risk impact rating related to the following:
  - service delivery: the necessity of service, the breadth and duration of potential disruption
  - health and safety: the potential for death or enduring injury
  - economic: the value of potential damages, losses, or fines
  - environmental: the breadth, duration and reversability of potential damage
  - social: the significance of potential negative impacts.
- Prioritizing needed activities based on likelihood to fail to support capacity, function, reliability and quality of service
- Continuing to identify and request increased funding and staffing incrementally over time to achieve the proposed levels of service.

5.5 Financial Sustainability Options

One of the key drivers of the Ontario Regulation 588/17 is to help ensure that all municipalities are actively managing finances to achieve "financial sustainability". Based on current calculations it is evident that the City has an 'infrastructure gap'. Although this gap exists, it is very common across most municipalities.

It is the City's responsibility to ensure that the City's assets are managed sustainably and hence the City of Belleville shall actively manage this 'gap'. Typically, this is achieved through:

- Increase Funding
- Accepting Increased Risk
- Accepting Lower Level of Service

It should be noted that there is no singular method for addressing the 'infrastructure gap'. Often this is an iterative process to balance cost, risk, and LOS, through consultation with the community, particularly in relation to 'willingness to pay' for services.

5.5.1 Option 1: Increase Funding

Increasing the revenue or funding available to support assets is one method of reducing the infrastructure gap. This could be achieved by increasing the tax base or where assets are supported by "user pays" rates and fees (ie. water, wastewater, parking, recreation, transit), which might involve review of the current rates levels.

Based on the current tax levy and estimated infrastructure gap related to tax funded assets, the City would need to increase the tax levy by over 25% to close that gap immediately. Alternatively, the gap could be closed over the 10-year period with an average annual levy increase of about 2.30%. The funding gap for tax funded assets is outlined below:

Lifecycle Activity	10-Yr Avg Annual Needs Forecast (2024$M)	10-Yr Avg Annual Available Funding (2024$M)	10-Yr Avg Annual Shortfalls / Surplus (2024$M)	Required Levy Increase to Close Gap (%)
Growth & Upgrade	$28.09	$17.58	-$10.51	8.32%
Renewal	$32.84	$23.76	-$9.08	7.18%
Operations & Maintenance	$103.83	$91.14	-$12.69	10.04%
Totals	**$164.76**	**$132.48**	**-$32.28**	**25.54%**

On the user rate side, current calculations show that Water is sufficiently funded over the next 10 years, while Wastewater and Parking rates would need to increase 65% and 18%, respectively, in order to close the infrastructure gap associated with those assets. This could also be achieved by a roughly 5.13% and 1.69% average annual increase, respectively, over the next 10-years.

Water

Lifecycle Activity	10-Yr Avg Annual Needs Forecast (2024$M)	10-Yr Avg Annual Available Funding (2024$M)	10-Yr Avg Annual Shortfalls / Surplus (2024$M)	Required Revenue Increase to Close Gap (%)
Growth & Upgrade	$2.01	$2.39	$0.38	Adequately Funded
Renewal	$1.94	$5.45	$3.51	Adequately Funded
Operations & Maintenance	$8.49	$7.81	-$0.68	3.56%
Totals	**$12.45**	**$15.66**	**$3.21**	Adequately Funded

Wastewater

Lifecycle Activity	10-Yr Avg Annual Needs Forecast (2024$M)	10-Yr Avg Annual Available Funding (2024$M)	10-Yr Avg Annual Shortfalls / Surplus (2024$M)	Required Revenue Increase to Close Gap (%)
Growth & Upgrade	$14.60	$8.97	-$5.64	35.13%
Renewal	$9.97	$7.05	-$2.91	18.17%
Operations & Maintenance	$9.00	$7.15	-$1.85	11.50%
Totals	**$33.57**	**$23.17**	**-$10.40**	**64.80%**

Parking

Lifecycle Activity	10-Yr Avg Annual Needs Forecast (2024$M)	10-Yr Avg Annual Available Funding (2024$M)	10-Yr Avg Annual Shortfalls / Surplus (2024$M)	Required Revenue Increase to Close Gap (%)
Growth & Upgrade	$0.10	$0.00	-$0.10	12.31%
Renewal	$0.23	$0.24	$0.02	Adequately Funded
Operations & Maintenance	$0.88	$0.82	-$0.07	7.81%
Totals	**$1.21**	**$1.06**	**-$0.15**	**18.23%**

5.5.2 Option 2: Increase Risk

Although not always desirable, it may be possible to accept a higher degree of asset risk at the City to help lower ongoing asset costs. The City's leadership, in consultation with subject matter experts (SMEs), may select to adjust the risk threshold across the risk framework or for specific asset classes. An example of how this may be practically applied would be conduct less frequent inspections or maintenance of less critical assets (i.e. minor/small culverts which have less impact of city service).

5.5.3 Option 3: Accept Lower Level of Service

The City must balance public (community) expectations, the City's objectives, risk and affordability. If the City is not able to sustainably fund the current LOS it may be beneficial to seek opportunities for adjustment to service standards through public consultation. It is critical in this process to link consideration of the public expectations with understanding of constraints such as financing, resourcing, and affordability and the options for addressing these (higher taxes). Only after these constraints have been considered will it be possible to determine public expectations and willingness to pay for these services.

An example of this could be deferring projects that aim to increase road capacity through road widening. The deferment eliminates approximately $40.5M of total investment need (or an annual need of $4.05 M) of capital investment and the associated future infrastructure liability (O&M requirements). However, this option will likely increase risks from road usage exceeding the road capacity and may result in higher customer complaints.

6 PLAN IMPROVEMENT AND MONITORING

6.1 AM Plan Data Confidence

Data for asset management is created and collected through documented data specifications and protocols in phases that correspond to the general lifecycle of the assets:

- **Inventory Data** is collected during the asset acquisition / creation phase and provides identification, location and description data. Examples include asset ID, description, purchase year, installation year, in-service date, purchase cost, make, model, serial number, physical attributes (e.g. length, material, power rating), class, and parent asset.

- **AM Planning Data** is collected throughout the lifecycle of the assets and provides the base data for analysis of asset condition / maintenance, utilization / operations, and performance. Examples include updated demand / utilization / access restrictions data, updated condition data, updated criticality, risk and resilience data, physical works plans / achievements and related estimated / actual costs.

- **AM Analysis Data** is developed to report AM performance and make decisions to minimize impacts of failure to meet performance targets. For example to determine customer service performance, technical assets performance, and costs of asset ownership (lifecycle needs).

The quality of AM data can include its completeness and accuracy, and can be dictated by what it is based upon. The grades for evaluating data confidence are shown below.

Table 6-1 Data Confidence Grading

Grade	Quantity, Size, Install Year, Service Life	Condition	Replacement Value	Growth / Upgrade Needs Forecast	Renewal Needs Forecast
	% complete & accurate	Based upon	Based upon	Based upon	Based upon
Very High (VH)	90% to 100%	current industry standard condition assessment	current tender documents, quotes	historic budget actuals and current master plan / DC study forecast, with costs	current industry standard condition assessments & needs forecast, with costs
High (H)	80% to 90%	2+ year old industry standard condition assessment	2+ year old tender documents, quotes	historic budget actuals and 2+ year old master plan / DC study forecast, with costs	2+ year old industry standard condition assessments & needs forecast, with costs
Moderate (M)	70% to 80%	staff-reported condition	staff-reported costs	historic budget actuals and master plan forecast, with staff forecast costs	staff-reported condition assessment and needs forcast, with costs
Low (L)	50% to 70%	install date and useful life	inflated historical costs	population growth forecast	Needs forecast from install date & useful life
Very Low (VL)	0% to 50%	Unknown	Unknown	Unknown	Unknown

In compiling this AM Plan, a review of the data from which the asset registries, levels of service, and other report details were created was performed. The review assessed the completeness and accuracy of the asset registries. The following table provides the assessment of the data used for meaningful asset management planning.

Table 6-2 AM Plan Data Confidence Grades

Service Area	Program Area	State of Infrastructure					Needs Forecast	
		Quantity & Size	Install Year	Service Life	Condition	Replacement Costs	Growth & Upgrade	Renewal
General Government	Shared Facilities	VH	VH	H	M	M	M	H
	Parking	VH	VH	VH	L	VH	M	M
Information Systems	Shared IT	H	H	VH	H	H	M	M
Fire and Emergency Services	Fire	VH	H	VH	L	H	M	M
Belleville Police Service	Police	VH	VH	VH	VL	H	M	M
Transportation & Operations Services	Roads, Bridges and Culverts	H	M	VH	H	H	M	H
	Traffic & Operations	M	M	VH	M	M	M	M
	Transit	VH	H	VH	VL	VH	M	M
	Parks	M	L	H	M	M	H	M
	Waste Management	H	H	H	M	M	M	M
Environment Services	Water	H	H	M	L	M	H	M
	Wastewater	H	H	H	L	M	H	M
	Stormwater Management	H	M	H	M	H	M	M
Community Services	Recreation	M	M	H	L	L	H	M
	Harbours	L	L	H	L	L	M	M
	Culture	VH	VH	H	M	M	M	H
Belleville Public Library	Library	H	VH	H	M	H	M	M

6.2 AM Plan Improvement and Monitoring

The next steps resulting from this AM Plan to improve asset management practices are:

- Continue to monitor and incorporate changes to demand drivers including pace of population growth, community and other impacts such as climate change
- Continue to update asset values based on recent tenders
- Continue to implement levels of service measures listed in the AM Plan as "future"
- Continue to communicate the need to fully fund the whole of lifecycle needs through reserve funds and the risks associated with underfunding (i.e., reduced life of the asset, higher annual cost over the life of the asset, assets in worse overall condition, less effective use of resources, intergenerational inequity).

Progress implementing this AM Plan will be reported annually including:

- Update of valuation of infrastructure
- Update of condition and performance scores
- Update on status of recommended improvement actions.

Improvement Area	Action	Outcome	Priority	Timeline
Asset Data Quality and Consistency	Standardize unique Asset IDs across all assets in the organization that fall within the scope of AM Planning Evaluate opportunities to improve data management processes and procedures Update asset lifecycle replacement values based on recent tenders and undertake industry standard condition assessments and renewal forecasting to improve overall data quality and confidence	Reduced likelihood of incidental asset data overwriting on the wrong asset Improved reliability of information maintained in AM database Improved confidence in input data and recommended solutions	HIGH	In Progress
Asset Information Systems	Standardize systems across the City. Review the functionality of the current WorkTech solution against other enterprise systems.	Improved confidence in input data and recommended solutions	MED	Q3/4 2024
Asset Management Processes	Engage with the community to ensure alignment of strategic planning with City needs Continue to update service standards based on changing demand drivers Continue to refine selection of the lowest lifecycle cost lifecycle activities based on risk Continue to communicate the need to fully fund the whole of lifecycle needs through reserve funds and the risks	Improved asset management decision-making	MED	In Progress

Improvement Area	Action	Outcome	Priority	Timeline
	associated with underfunding (i.e., reduced life of the asset, higher annual cost over the life of the asset, assets in worse overall condition, less effective use of resources, intergenerational inequity)			
Organization and People	Evaluate staffing needs to support data and process improvements: consider needs related to roles, capabilities, and numbers.	Appropriate support for AM decision-making	MED	Ongoing

7   SERVICE AND PROGRAM AREA DETAILS

This section provides details, for each service and program area listed below, the following:

- State of Infrastructure
- Levels of Service
- Risk Management
- Asset Management Strategy, based on maintaining current levels of service
- Financing Strategy, based on allocations of capital funding similar to the past five years
- Identified Opportunities for Plan Improvement and Monitoring.

Service and Program Areas

General Government (Corporate Services)

Shared Facilities
Parking

Information Systems

Shared Information Technology (IT)

Fire & Emergency Services

Belleville Police Service

Transporation & Operational Services

Roads
Bridges and Culverts
Traffic & Operations
Transit
Parks
Waste Management

Environmental Services

Water
Wastewater
Stormwater

Community Services Department

Recreation
Harbours
Culture

Belleville Public Library

Library

State of Infrastructure ($19.4 million)

This service area supports the organization by developing, operating and maintaining corporate administration offices, leased office space, mixed-use facilities, and facilities for other service areas. It tracks the environmental impacts of City energy use and works to mitigate them, reduces net operating costs through energy management, and promotes sustainable practices.

Shared Facilities include:
- City Hall
- Professional Building (Storam)
- Log Cabin (Chamber of Commerce)

As historic buildings, City Hall and the Log Cabin are well beyond defined end-of-life.
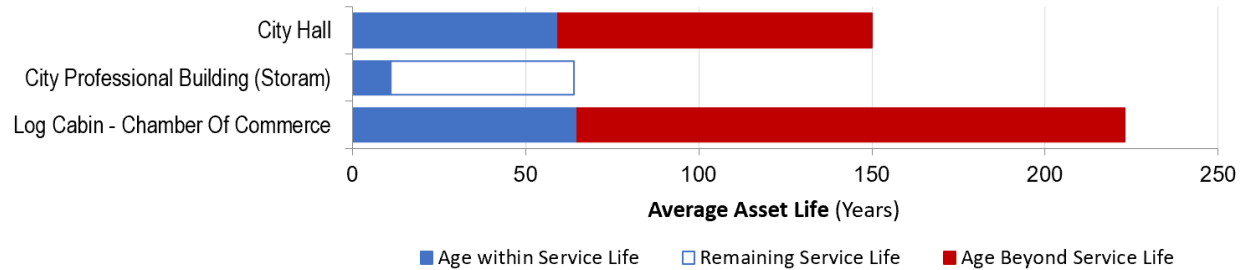
The City's Shared Facility assets are generally in fair condition, as determined by staff assigned condition grades, with a significant proportion is in poor and very poor condition.

Levels of Service

Service Attribute	Community Levels of Service		Technical Levels of Service				
	Statements	Current Performance	Performance Indicators	Performance			Data Confidence
				2021	2022	2023	
Capacity	Provide adequate shared facilities space		Future			Future	
Function	Meet customer needs while limiting health, safety, and data security impacts		% of facilities equipped with a fully compliant Universal Washroom			Future	
			# of incident reports documented annually			Future	
Reliability & Quality	Keep assets in a state of good repair	Poor	% of assets with very high-risk exposure rating			13% P	Mod
			% of assets with high-risk exposure rating			43% P	Mod
	Provide effective and responsive maintenance		% of outstanding maintenance Work Orders on an annual reporting basis			Future	
	Provide effective and responsive operations		% of outstanding operations Work Orders on an annual reporting basis			Future	
Affordability	City services are adequately funded	Very Good	Ratio of 10-year renewal budget to needs			197% VG	Low
	City services are sustainable in the long term	Future	% Average annual renewal rate (reinvested or put into reserve) for IT assets			Future	

Risk Assessment

The consequence of failure (CoF) was determined as outlined in the table to the right, by asset group in conjunction with the facility elements. The likelihood of failure (LoF) was determined by the condition of the assets. The risk evaluation matrix below shows the results of the risk assessment.

Asset Group	CoF
City Hall	5
Professional Building, Log Cabin	3

Risk Evaluation Matrix

LoF						Risk Exposure	CRV($)	CRV(%)
5	$0.00	$0.00	$0.00	$1.71	$0.76	Very High	$2.49	12.9%
4	$0.00	$0.00	$0.69	$2.72	$0.03	High	$8.37	43.3%
3	$0.00	$0.02	$1.03	$2.84	$2.12	Moderate	$7.24	37.5%
2	$0.00	$0.18	$0.17	$0.57	$5.34	Low	$1.21	6.2%
1	$0.00	$0.00	$0.00	$1.02	$0.12	Very Low	$0.00	0.0%
	1	2	3	4	5		$19.32	100.0%
			CoF					

Assets in the Very High or High risk exposure categories include exterior vertical enclosures, roof, HVAC, conveying systems, plumbing services, fire protection, and site features.

Lifecycle Management

The following graphs provide the forecast needed lifecycle activities over each of the next 10 years to maintain current levels of service.

Growth and Upgrade Needs Forecast

Growth and upgrade needs are based on forecast population growth and are minimal.

Renewal Needs Forecast

Renewal needs are based on maintaining the current reliability levels of service, giving priority to the renewal of assets with higher risk ratings, consequently deferring the renewal of lower risk assets as necessary.

Operations and Maintenance Needs Forecast

The Operating needs forecast is based on the anticipated growth of the asset portfolio.

Available Funding, Shortfalls / Surpluses

The following table summarizes the City's needs forecasts for each lifecycle activity based on the analysis from the preceeding graphs and provides the estimated funding detemined as the average funding available over the past two years. Funding for operating and capital needs is sourced from tax levies.

Lifecycle Activity	10-Yr Avg Annual Needs Forecast (2024$M)	10-Yr Avg Annual Available Funding (2024$M)	10-Yr Avg Annual Shortfalls / Surplus (2024$M)	10-Yr Avg Annual Funding / Funding (%)
Growth & Upgrade	$0.26	$0.00	-$0.26	0%
Renewal	$0.34	$0.66	$0.33	197%
Operations & Maintenance	$1.05	$0.99	-$0.06	94%
Totals	**$1.65**	**$1.65**	**$0.00**	**100%**

Based on calculations to maintain current levels of service, Shared Facilities are adequately funded to cover the 10 year forecast.

Plan Improvements and Monitoring

Please refer to the 'All Facilities' section for facility related Plan Improvement and Monitoring details.

State of Infrastructure ($2.22 million)

This program area supports the City's organization by developing, operating, and maintaining the City's technology networks, and distributing and maintaining end-user devices.

Information Technology assets include:
- End user devices
- Voice and data infrastructure
- Management Systems
- Software Applications

Key business drivers at this time are continuous management of the scheduled renewal of technology assets, while keeping up-to-date with technology advances and procurement opportunities.

Assets that are approaching the later stages of life or beyond, will need to be replaced or require further maintenance.
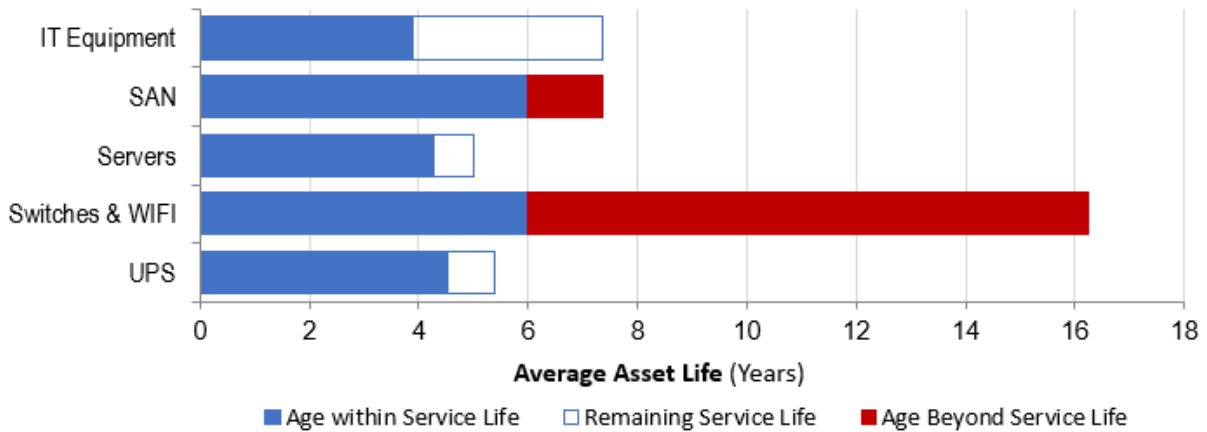
The City's IT assets are generally in poor to fair condition, based on age. The assets shown in poor and very poor "condition" are in the latter stages of their useful life – typically related to obsolescence. Note that the replacement cost of software is zero.

Levels of Service

Service Attribute	Community Levels of Service		Technical Levels of Service				
	Statements	Current Performance	Performance Indicators	Performance			Data Confidence
				2021	2022	2023	
Capacity	Provide timely IT support services	Fair	% of IT Tickets resolved within 1 day			80.0% G	High
			% of IT Projects completed on time every year			60.0% P	High
			% of On-site Data Storage space used efficiently			75.0% P	Mod
Function	Meet customer needs while limiting health, safety, and data security impacts	Good	% of time that system is functional			97.0% G	High
			% of user survey requests fulfilled within 1 day			90.0% F	Mod
			# of Data Breach Incidents per year			0.0 VG	Mod
			% of time that TOMRMS System is functional			Future	
			% redundancy in Emergency Systems			75.0% F	High
			% of time that Traffic Network is functional			99.0% G	Mod
			% compliance with Cybersecurity Audit of measures to protect City data			96.0% VG	Mod
Reliability & Quality	Keep assets in a state of good repair	Very Poor	% of IT assets with very high-risk exposure rating			43% VP	High
			% of IT assets with high-risk exposure rating			51% VP	Mod
			% of Hardware Assets within warranty period			30.0% VP	High
	Provide effective and responsive operations	Good	# hours average incident / ticket response time			1.4 F	High
			% of time that Environmental Data Systems are available			99.9% G	Mod
			% Real-time Service Information Availability			95.0% G	Mod
			% Customer Satisfaction Rate			80.0% G	High
Affordability	City services are adequately funded	Good	Ratio of 10-year renewal budget to needs			80% G	Mod
	City services are sustainable in the long term	Future	% Average annual renewal rate (reinvested or put into reserve) for IT assets			Future	

Risk Assessment

The consequence of failure (CoF) was determined as outlined in the table to the right, by asset group. The likelihood of failure (LoF) was determined by the condition of the assets. The risk evaluation matrix below shows the results of the risk assessment.

Asset Group	CoF
San, Servers, Switches & WIFI, Software	5
IT Equipment	4
UPS	3

Risk Evaluation Matrix

LoF						Risk Exposure	CRV($)	CRV(%)
5	$0.00	$0.00	$0.01	$0.49	$0.47	Very High	$0.99	44.5%
4	$0.00	$0.00	$0.00	$0.02	$0.03	High	$0.88	39.7%
3	$0.00	$0.00	$0.00	$0.84	$0.01	Moderate	$0.28	12.5%
2	$0.00	$0.00	$0.00	$0.05	$0.15	Low	$0.08	3.4%
1	$0.00	$0.00	$0.02	$0.05	$0.07	Very Low	$0.00	0.0%
	1	2	3	4	5		$2.22	100.0%
			CoF					

Assets in the Very High or High risk exposure categories include Servers, SAN, and Switches & WIFI.

Lifecycle Management

The following graphs provide the forecast needed lifecycle activities over each of the next 10 years to maintain current levels of service.

Growth and Upgrade Needs Forecast

Growth and upgrade needs are based on forecast population growth and are minimal.
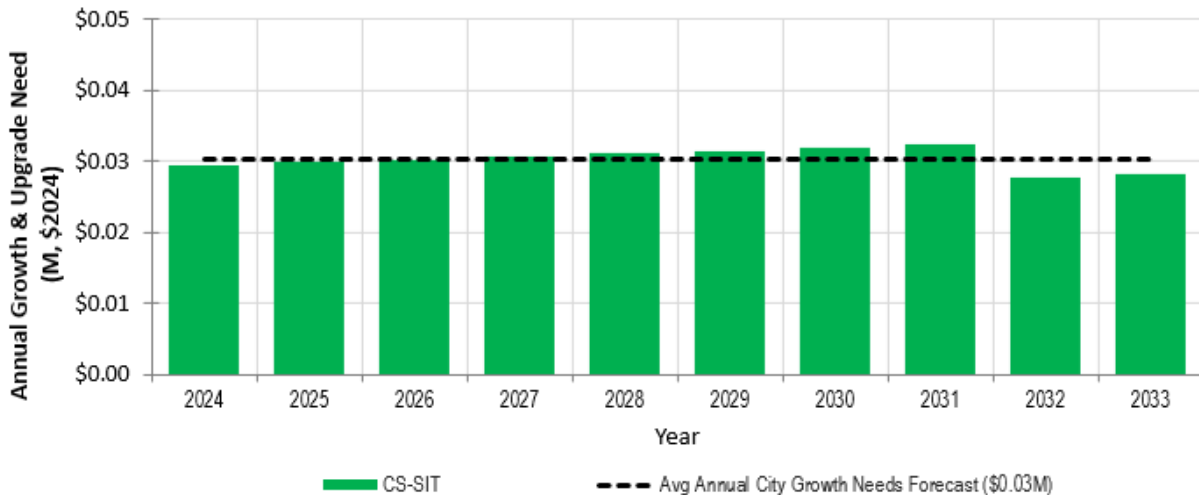
Renewal Needs Forecast

Renewal needs are based on staff forecasts to maintain the current reliability levels of service, giving priority to the renewal of assets with higher risk ratings, consequently deferring the renewal of lower risk assets as necessary.

Operations and Maintenance Needs Forecast

The Operating needs forecast is based on the anticipated growth of the asset portfolio.

Available Funding, Shortfalls / Surpluses

The following table summarizes the City's needs forecasts for each lifecycle activity based on the analysis from the preceeding graphs and provides the estimated funding detemined as the average funding available over the past two years. Funding for operating and capital needs is sourced from the tax levy.

Lifecycle Activity	10-Yr Avg Annual Needs Forecast (2024$M)	10-Yr Avg Annual Available Funding (2024$M)	10-Yr Avg Annual Shortfalls / Surplus (2024$M)	10-Yr Avg Annual Funding / Funding (%)
Growth & Upgrade	$0.03	$0.11	$0.08	367%
Renewal	$0.41	$0.33	-$0.08	80%
Operations & Maintenance	$1.94	$1.79	-$0.15	92%
Totals	**$2.38**	**$2.23**	**-$0.15**	**94%**

Based on calculations to maintain current levels of service, Shared Information Technology would require a 0.12% tax levy increase to close the 10 year funding gap immediately.

Plan Improvements and Monitoring

Improvement Area	Action	Outcome	Priority	Timeline
Asset Data Quality and Consistency	Implement standardized methodologies for condition rating, replacement value, and risk assessment for Software	Improved reliability of information maintained in AM database Improved confidence in input data and recommended solutions	HIGH	In Progress
Asset Information Systems	Include labour costs within IT tickets to understand IT operating needs.	Improved confidence in input data and recommended solutions	MED	Medium Term
Asset Management Processes	Establish formal Service Level Agreements (SLAs) with City customer groups for setting service level expectations.	Improved asset management decision-making	MED	Medium Term
Asset Management Processes	Formalize risk management processes and integrate within business planning and budgeting.	Improved asset management decision-making	MED	In Progress
Asset Management Processes	Utilize outcomes from the City's Digital Master Plan to support future AM growth and upgrade needs.	Improved asset management decision-making	MED	In Progress

State of Infrastructure ($7.5 million)

This service area assists to provide safe and accessible parking facilities and manage parking infrastructure. It also maintains parking lots, street parking spaces and associated assets in a state of good repair.

Most of the assets are relatively new due to recent growth in the City.

Parking assets include:
- 17 Parking Lots with 829 Spaces
- 65 Lighting and Signs
- 403 Pay machines and Meters
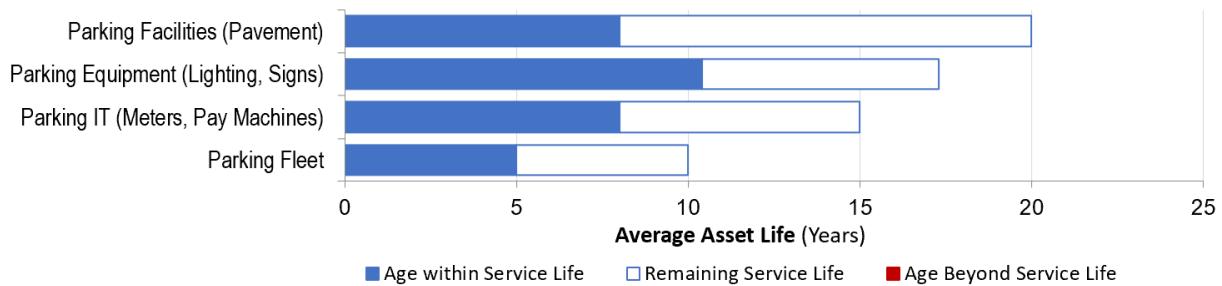
The City's Parking assets are generally in fair to good condition, as determined by staff assigned condition grades for parking lot pavement, equipment and IT.

Levels of Service

Service Attribute	Community Levels of Service		Technical Levels of Service					Data Confidence
	Statements	Current Performance	Performance Indicators	Performance				
				2021	2022	2023		
Capacity	Provide sufficient parking capacity where needed	Future				Future		
Function	Meet customer needs while limiting natural impacts	Poor	% of Parking Lot Lighting Fixtures that are LED	35%	50%	65%	F	High
			% of Parking Lot Spaces dedicated to EV Charging Stations	0%	0%	0%	P	High
	Meet all customer needs	Fair	% of Parking Lot Spaces dedicated to Accessible parking	2%	2%	2%	F	High
			% of Street Parking Spaces dedicated to Accessible parking	4%	4%	4%	F	High
Reliability & Quality	Keep assets in a state of good repair	Fair	% of Parking Lot area in poor or very poor condition	30%	20%	15%	F	Mod
	Provide responsive maintenance	Future	% of outstanding maintenance Work Orders			Future		
	Provide responsive operations / winter control	Future	% of outstanding operations Work Orders			Future		
Affordability	City services are adequately funded	Very Good	Cost per hour of parking	$1.00	$1.00	$1.00	VG	High
			Ratio of 10-year renewal budget to needs			107%	VG	High
	City services are sustainable in the long term	Future	% Average annual renewal rate (reinvested or put into reserve)			Future		

Risk Assessment

The consequence of failure (CoF) was determined as outlined in the table to the right, by asset group. The likelihood of failure (LoF) was determined by the condition of the assets. The risk evaluation matrix below shows the results of the risk assessment.

Asset Group	CoF
Parking Facilities (Pavement)	2
Parking Equipment	2
Parking IT	1

Risk Evaluation Matrix

LoF	1	2	3	4	5		Risk Exposure	CRV($)	CRV(%)
5	$0.00	$0.00	$0.00	$0.00	$0.00		Very High	$0.00	0.0%
4	$0.00	$1.21	$0.00	$0.00	$0.00		High	$0.00	0.0%
3	$0.68	$0.39	$0.00	$0.00	$0.00		Moderate	$1.60	21.4%
2	$1.92	$3.27	$0.00	$0.00	$0.00		Low	$3.94	52.9%
1	$0.00	$0.00	$0.00	$0.00	$0.00		Very Low	$1.92	25.7%
	1	2	3	4	5			$7.46	100.0%

CoF

As no Parking assets are in the highest criticality categories and none are in very poor condition, no Parking assets are in the Very High or High risk exposure categories.

Lifecycle Management

The following graphs provide the forecast needed lifecycle activities over each of the next 10 years to maintain current levels of service.

Growth and Upgrade Needs Forecast

Growth and upgrade needs are based on forecast population growth and are minimal.

Renewal Needs Forecast

Renewal needs are based on maintaining the current reliability levels of service, giving priority to the renewal of assets with higher risk ratings, consequently deferring the renewal of lower risk assets as necessary.

Operations and Maintenance Needs Forecast

The Operating needs forecast is based on the anticipated growth of the asset portfolio.

Available Funding, Shortfalls / Surpluses

The following table summarizes the City's needs forecasts for each lifecycle activity based on the analysis from the preceeding graphs and provides the estimated funding detemined as the average funding available over the past two years. Funding for operating and capital needs is sourced from user fees.

Lifecycle Activity	10-Yr Avg Annual Needs Forecast (2024$M)	10-Yr Avg Annual Available Funding (2024$M)	10-Yr Avg Annual Shortfalls / Surplus (2024$M)	10-Yr Avg Annual Funding / Funding (%)
Growth & Upgrade	$0.10	$0.00	-$0.10	0%
Renewal	$0.23	$0.24	$0.02	107%
Operations & Maintenance	$0.88	$0.82	-$0.07	93%
Totals	**$1.21**	**$1.06**	**-$0.15**	**87%**

Based on calculations to maintain current levels of service, Parking Services would require a 18.23% user rate increase to close the 10 year funding gap immediately.

Plan Improvements and Monitoring

Improvement Area	Action	Outcome	Priority	Timeline
Asset Management Processes	Formalize risk management processes and integrate within business planning and budgeting.	Improved asset management decision-making	MED	In Progress
Asset Management Processes	Develop condition and performance assessment protocols for assets within the portfolio.	Improved asset management decision-making	MED	In Progress

State of Infrastructure ($45.7 million)

Belleville Fire provides emergency response and fire protection services to the City's nearly 60 thousand citizens. Ensure the safety and well-being of residents by providing community education on fire safety.

Belleville Fire assets include:
- Five facilities
- Information technology assets
- 38 Fleet assets
- Specialized equipment

Most of the assets are more than half way through their service life, with rural rescue vehicles and IT assets beyond service life.
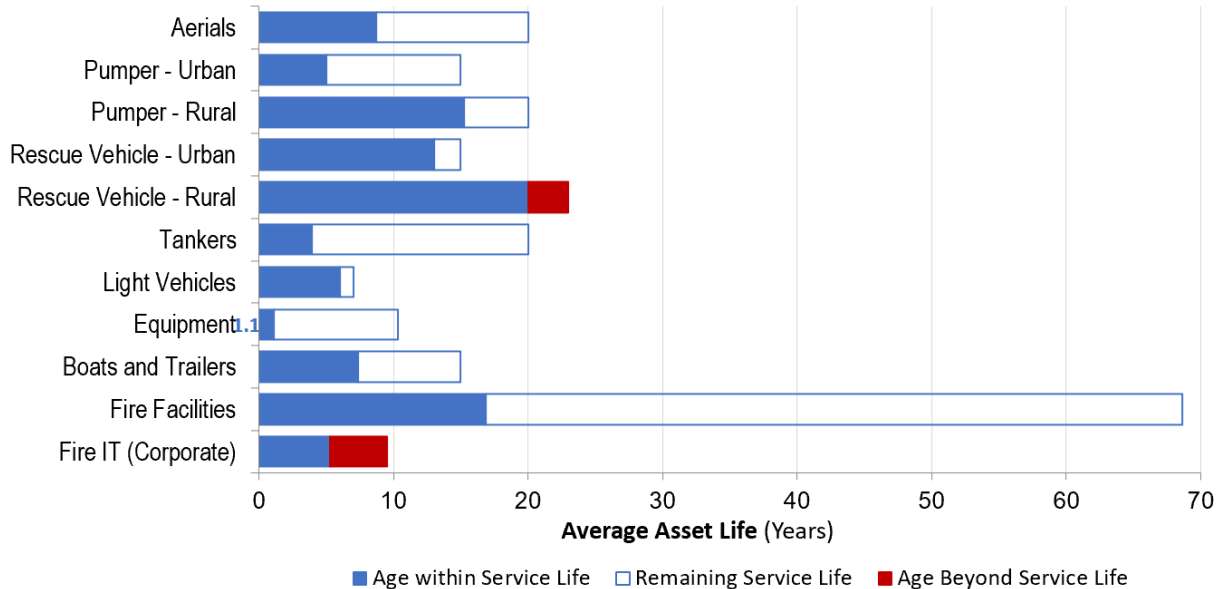
The City's Fire assets are generally in poor to fair condition, as assessed based on age.

Levels of Service

Service Attribute	Community Levels of Service		Technical Levels of Service					Data Confidence
	Statements	Current Performance	Performance Indicators	Performance				
				2021	2022	2023		
Capacity	Provide prompt emergency response within the City	Fair	% of Emergency Responses that meet NFPA 1710 standards for Total Response Times	64%	61%	TBD*	F	High
			% of Emergency Responses that meet NFPA 1720 standards for Total Response Times	42%	41%	TBD*	P	High
Function	Provide prompt emergency response within the City	Future	Annual reduction in tonne carbon dioxide equivalent (tCO2e) for Fire Fleet			Future		
Reliability & Quality	Keep assets in a state of good repair	Poor	% of Fire assets with very high-risk exposure rating			17%	VP	Mod
			% of Fire assets with high-risk exposure rating			27%	G	Mod
			% of Firefighter Equipment that has surpassed the expected useful life			30%	F	High
			% of Light Duty Vehicles within their expected useful life of 7-years			69%	F	Mod
	Provide responsive maintenance	Fair	Average # of annual reactive repairs to urban Front Line Fire Vehicles			110	P	High
			Average # of annual reactive repairs to rural Front Line Fire Vehicles			10	G	High
	Provide responsive operations	Future	% of staff trained to NFPA 1031 (Fire Inspector) Standards - captains			Future		
			% of staff trained to NFPA 1035 (Public Educator) Standards - suppression staff			Future		
Affordability	City services are adequately funded	Very Good	Cost per capita for Fire Services			Future		
			Ratio of 10-year renewal budget to needs			94%	VG	High
	City services are sustainable in the long term		% Average annual renewal rate (reinvested or put into reserve)			Future		

* Current Performance is based on 2022 performance where 2023 not available

Risk Assessment

The consequence of failure (CoF) was determined as outlined in the table to the right, by asset group. The likelihood of failure (LoF) was determined by the condition of the assets. The risk evaluation matrix below shows the results of the risk assessment.

Asset Group	CoF
Fire Halls, Aerials, Pumpers, Tankers	5
Rescue Vehicles	4
Trailers, Light Vehicles, Boats, Heavy & Other Equipment	3

Risk Evaluation Matrix

LoF	1	2	3	4	5
5	$0.00	$0.00	$0.49	$0.82	$2.24
4	$0.00	$0.00	$0.12	$2.44	$4.19
3	$0.00	$0.00	$0.28	$1.64	$7.01
2	$0.00	$0.00	$0.55	$8.70	$10.22
1	$0.00	$0.00	$0.25	$1.42	$2.99

CoF

Risk Exposure	CRV($)	CRV(%)
Very High	$7.24	16.7%
High	$11.71	27.0%
Moderate	$22.75	52.5%
Low	$1.67	3.8%
Very Low	$0.00	0.0%
	$43.37	100.0%

Assets in the Very High or High risk exposure categories include aerials, pumpers, and rescue vehicles.

Lifecycle Management

The following graphs provide the forecast needed lifecycle activities over each of the next 10 years to maintain current levels of service.

Growth and Upgrade Needs Forecast

Growth and upgrade needs are based on forecast population growth and are minimal.

Renewal Needs Forecast

Renewal needs are based on maintaining the current reliability levels of service, giving priority to the renewal of assets with higher risk ratings, consequently deferring the renewal of lower risk assets as necessary.

Operations and Maintenance Needs Forecast

The Operating needs forecast is based on the anticipated growth of the asset portfolio.

Available Funding, Shortfalls / Surpluses

The following table summarizes the City's needs forecasts for each lifecycle activity based on the analysis from the preceeding graphs and provides the estimated funding detemined as the average funding available over the past two years. Funding for operating and capital needs is sourced from tax levies.

Lifecycle Activity	10-Yr Avg Annual Needs Forecast (2024$M)	10-Yr Avg Annual Available Funding (2024$M)	10-Yr Avg Annual Shortfalls / Surplus (2024$M)	10-Yr Avg Annual Funding / Funding (%)
Growth & Upgrade	$0.62	$0.01	-$0.61	2%
Renewal	$1.67	$1.57	-$0.10	94%
Operations & Maintenance	$17.62	$15.99	-$1.63	91%
Totals	**$19.92**	**$17.57**	**-$2.35**	**88%**

Based on calculations to maintain current levels of service, Fire would require a 1.86% tax levy increase to close the 10 year funding gap immediately.

Plan Improvements and Monitoring

Improvement Area	Action	Outcome	Priority	Timeline
Asset Management Processes	Formalize risk management processes and integrate within business planning and budgeting.	Improved asset management decision-making	MED	In Progress
Asset Management Processes	Develop condition and performance assessment protocols for assets within the portfolio.	Improved asset management decision-making	MED	In Progress
Asset Management Processes	Utilize outcomes from the City's Fire Master Plan to support future AM growth and upgrade needs.	Improved asset management decision-making	MED	In Progress

State of Infrastructure ($49.5 million)

Belleville Police provides crime prevention and law enforcement to the City's nearly 60 thousand citizens. These are dedicated sworn and civilian members who serve the City's diverse communities, ensuring that the City's neighbourhoods, roads and schools are safe for all residents.

Belleville Police assets include:
- Police Headquarters
- Fleet
- Information technology assets
- Specialized equipment

The asset types are at a variety of life stages, as shown below.
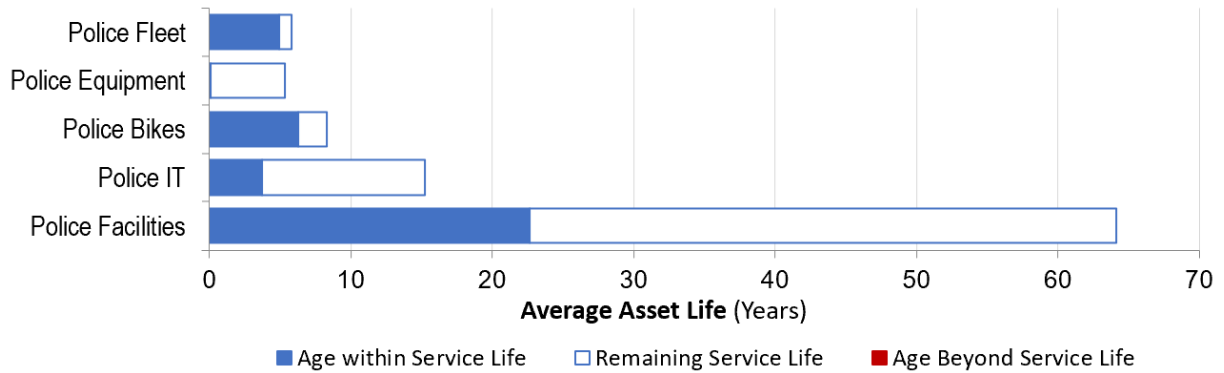
The City's Police assets are generally in good to very good condition. Note the Police Facility, originally constructed in 1966, was fully renovated in 2020.

Levels of Service

Service Attribute	Community Levels of Service		Technical Levels of Service				
	Statements	Current Performance	Performance Indicators	Performance			Data Confidence
				2021	2022	2023	
Capacity	Provide sufficient policing capacity	**Future**	# of Police Staff (Officers and Civilians) per 100,000 Population			Future	
Function	Meet customer needs while limiting safety impacts	**Future**	Annual reduction in tonne carbon dioxide equivalent (tCO2e) for Fire Fleet			Future	
Reliability & Quality	Keep assets in a state of good repair	**Fair**	% of Police assets with very high-risk exposure rating			10%　P	High
			% of Police assets with high-risk exposure rating			12%　VG	High
	Provide responsive maintenance	**Future**	% of outstanding maintenance Work Orders on an annual reporting basis			Future	
	Provide responsive operations	**Future**	% of outstanding operations Work Orders on an annual reporting basis			Future	
Affordability	City services are adequately funded	**Very Poor**	Total Annual Cost for Police Services per Capita			Future	
			Ratio of 10-year renewal budget to needs			43%　VP	High
	City services are sustainable in the long term	**Future**	% Average annual renewal rate (reinvested or put into reserve)			Future	

Risk Assessment

The consequence of failure (CoF) was determined as outlined in the table to the right, by asset group. The likelihood of failure (LoF) was determined by the condition of the assets. The risk evaluation matrix below shows the results of the risk assessment.

Asset Group	CoF
Headquarters Building, Vehicles, IT Assets	5
Officer Equipment & Gear	4
Bikes	3
Mowers, Snow Throwers	2

Risk Evaluation Matrix

LoF						Risk Exposure	CRV($)	CRV(%)
5	$0.00	$0.00	$0.00	$0.00	$2.07	Very High	$5.04	10.2%
4	$0.00	$0.00	$0.01	$3.71	$2.97	High	$5.85	11.8%
3	$0.00	$0.00	$0.00	$0.20	$1.94	Moderate	$35.13	71.0%
2	$0.00	$0.01	$0.00	$10.01	$21.35	Low	$3.46	7.0%
1	$0.00	$0.02	$0.00	$3.45	$3.76	Very Low	$0.02	0.0%
	1	2	3	4	5		$49.50	100.0%

CoF

Assets in the Very High or High risk exposure categories include vehicles and IT assets. The police fleet is nearly end-of-life and is in need of replacement in the near future.

Lifecycle Management

The following graphs provide the forecast needed lifecycle activities over each of the next 10 years to maintain current levels of service.

Growth and Upgrade Needs Forecast

Growth and upgrade needs are based on forecast population growth and are minimal.

Renewal Needs Forecast

Renewal needs are based on maintaining the current reliability levels of service, giving priority to the renewal of assets with higher risk ratings, consequently deferring the renewal of lower risk assets as necessary.

Operations and Maintenance Needs Forecast

The Operating needs forecast is based on the anticipated growth of the asset portfolio.

Available Funding, Shortfalls / Surpluses

The following table summarizes the City's needs forecasts for each lifecycle activity based on the analysis from the preceeding graphs and provides the estimated funding detemined as the average funding available over the past two years. Funding for operating and capital needs is sourced from tax levies.

Lifecycle Activity	10-Yr Avg Annual Needs Forecast (2024$M)	10-Yr Avg Annual Available Funding (2024$M)	10-Yr Avg Annual Shortfalls / Surplus (2024$M)	10-Yr Avg Annual Funding / Funding (%)
Growth & Upgrade	$0.68	$0.18	-$0.50	27%
Renewal	$2.19	$0.95	-$1.24	43%
Operations & Maintenance	$30.43	$27.04	-$3.38	89%
Totals	**$33.30**	**$28.17**	**-$5.12**	**85%**

Based on calculations to maintain current levels of service, Police would require a 4.05% tax levy increase to close the 10 year funding gap immediately.

Plan Improvements and Monitoring

Improvement Area	Action	Outcome	Priority	Timeline
Asset Data Quality and Consistency	Complete detailed inventory of Police IT and Police Equipment assets, collecting pertinent AM Planning data (replacement value, useful life, condition, etc.)	Increased data quality and confidence in state of local infrastructure and lifecycle management activity forecast	HIGH	Short Term
Asset Management Processes	Implement further Levels of Service measures	Improved monitoring of service levels against targets (proposed levels of service), increased accuracy of costs to maintain current and meet proposed levels of service	HIGH	Short Term

State of Infrastructure ($414.3 million)

This service area assists in the safe and efficient transport of people and goods through interconnecting roads between urban and rural areas. It also provides safe and effective drainage and preserves water quality. It maintains the road and storm networks in a state of good repair.

Road assets include:
- 156 lane-kilometers of Arterial roads
- 242 lane-kilometers of Collector roads
- 557 lane-kilometers of Local roads

Key business drivers at this time are future population and associated asset growth and aging infrastructure.

Many of the assets are reaching the middle to later stages of their useful lives and will require renewal and or maintenance in the upcoming years.
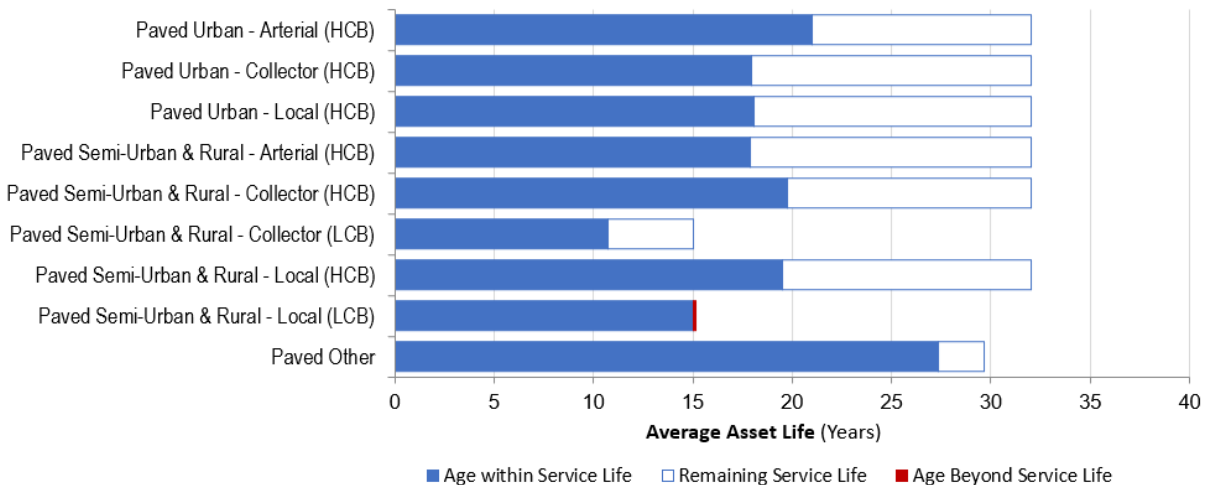
The City's road assets are generally in fair to good condition, as assessed in alignment with industry standard inspection protocols through regularly updated Roads Need Studies using Pavement Condition Index ratings (PCI).

Levels of Service

Service Attribute	Community Levels of Service		Technical Levels of Service				
	Statements	Current Performance	Performance Indicators	Performance			Data Confidence
				2021	2022	2023	
Capacity	Provide convenient access to properties		# of lane-km of **Arterial** roads as a proportion of City land area in km2 (O.Reg.588)	0.44	0.73	0.63	High
			# of lane-km of **Collector** roads as a proportion of City land area in km2 (O.Reg.588)	0.92	0.80	0.98	High
			# of lane-km of **Local** roads as a proportion of City land area in km2 (O.Reg.588)	2.18	2.28	2.25	High
Reliability & Quality	Keep assets in a state of good repair	Good	For paved roads, the average PCI value (O.Reg.588)	78.0	78.0	78.0 G	High
			For paved roads, the lowest PCI value	11.0	11.0	11.0 VP	High
			# of annual complaints regarding road pavement condition across the network			500 F	Mod
			% of roads with very high-risk exposure rating			1% VG	Very High
			% of roads with high-risk exposure rating			15% VG	Very High
	Provide responsive maintenance	Future	% of outstanding maintenance Work Orders on an annual reporting basis		Future		
	Provide responsive operations	Future	% of outstanding operations Work Orders on an annual reporting basis		Future		
Affordability	City services are adequately funded	Very Good	Ratio of 10-year renewal budget to needs			105% VG	High
	City services are sustainable in the long term		% Average annual renewal rate (reinvested or put into reserve) for paved roads		Future		

Risk Assessment

The consequence of failure (CoF) was determined as outlined in the table to the right, by asset group. The likelihood of failure (LoF) was determined by the condition of the assets. The risk evaluation matrix below shows the results of the risk assessment.

Asset Group	CoF
Class 2 and 3 roads	5
Class 4, 5, and 6 roads	4

Risk Evaluation Matrix

LoF	1	2	3	4	5		Risk Exposure	CRV($)	CRV(%)
5	$0.00	$0.00	$0.00	$1.36	$0.52		Very High	$2.81	0.7%
4	$0.00	$0.00	$0.00	$11.90	$0.93		High	$60.43	14.6%
3	$0.00	$0.00	$0.00	$45.22	$3.31		Moderate	$162.63	39.2%
2	$0.00	$0.00	$0.00	$61.91	$29.57		Low	$188.47	45.5%
1	$0.00	$0.00	$0.00	$188.47	$71.14		Very Low	$0.00	0.0%
	1	2	3	4	5			$414.34	100.0%

CoF

Roads that have fallen in the Very High or High risk exposure include those identified as being in poor or very poor condition based on their Pavement Condition Index (PCI) rating assigned in the 2021 Roads Need Study.

Lifecycle Management

The following graphs provide the forecast needed lifecycle activities over each of the next 10 years to maintain current levels of service.

Growth and Upgrade Needs Forecast

Growth and upgrade needs are based on planned City growth.

Renewal Needs Forecast

Renewal needs are based on maintaining the current reliability levels of service, giving priority to the renewal of assets with higher risk ratings, consequently deferring the renewal of lower risk assets as necessary.

Operations and Maintenance Needs Forecast

The Operating needs forecast is based on the anticipated growth of the asset portfolio.

Available Funding, Shortfalls / Surpluses

The following table summarizes the City's needs forecasts for each lifecycle activity based on the analysis from the preceeding graphs and provides the estimated funding detemined as the average funding available over the past two years. Funding for operating and capital needs is sourced from tax levies.

Lifecycle Activity	10-Yr Avg Annual Needs Forecast (2024$M)	10-Yr Avg Annual Available Funding (2024$M)	10-Yr Avg Annual Shortfalls / Surplus (2024$M)	10-Yr Avg Annual Funding / Funding (%)
Growth & Upgrade	$8.10	$6.49	-$1.61	80%
Renewal	$9.96	$10.48	$0.52	105%
Operations & Maintenance	$2.07	$1.78	-$0.29	86%
Totals	**$20.12**	**$18.74**	**-$1.38**	**93%**

Based on calculations to maintain current levels of service, Roads would require a 1.09% tax levy increase to close the 10 year funding gap immediately.

Plan Improvements and Monitoring

Improvement Area	Action	Outcome	Priority	Timeline
Asset Management Processes	Formalize risk management processes and integrate within business planning and budgeting.	Improved asset management decision-making	MED	In Progress
Asset Management Processes	Develop condition and performance assessment protocols for assets within the portfolio.	Improved asset management decision-making	MED	In Progress

State of Infrastructure ($292.8 million)

This service area assists in the safe and efficient transport of people and goods through grade separations. It also provides safe and effective drainage and preserves water quality. It maintains the road and storm networks in a state of good repair.

Bridges and Culverts assets include:
- 52 bridges
- 30 structural culverts
- non-structural culverts

Key business drivers at this time are future population and associated asset growth and aging infrastructure.

Many of the assets are reaching the middle to later stages of their useful lives and will require renewal and or maintenance in the upcoming years. Steel culverts are beyond service life.
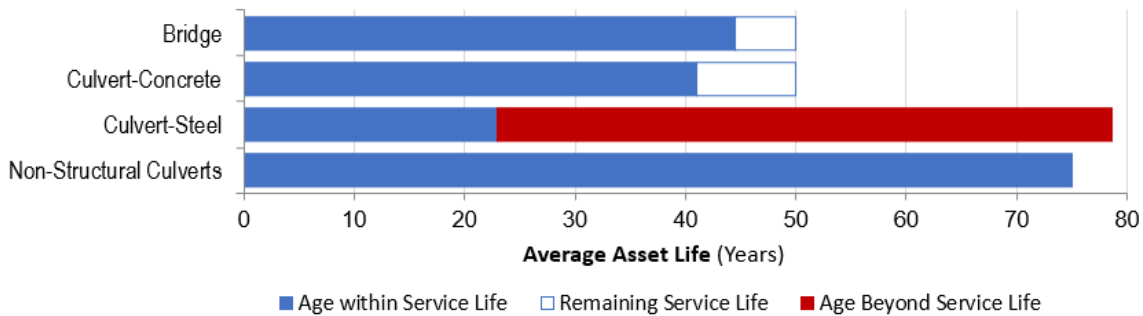
The City's bridges and and structural culverts are generally in fair to good condition, as assessed using industry standard inspection protocols. The condition of non-structural culverts is not known as install date is not known and no condition assessments have been performed.

Levels of Service

Service Attribute	Community Levels of Service		Technical Levels of Service				
	Statements	Current Performance	Performance Indicators	Performance			Data Confidence
				2021	2022	2023	
Capacity	Provide convenient access across grade separations at all times	Future					
Function	Meet customer needs while limiting safety impacts	Very Good	% of bridges in the City with loading or dimensional restrictions (O.Reg.588)	0%	0%	0%	VG	Very High
Reliability & Quality	Keep assets in a state of good repair	Fair	For bridges, the average BCI value (O.Reg.588)	74.1	74.1	72.7	G	Very High
			For bridges, the lowest BCI value	64.7	64.7	58.5	P	Very High
			For structural culverts, the average BCI value (O.Reg.588)	68	68	70.5	G	Very High
			For structural culverts, the lowest BCI value	51	51	52.5	P	Very High
			For Non-structural culverts (crossroad and driveway), the average condition		Future			
			% of bridges and structural, culverts with very high-risk exposure rating			9%	F	Very High
			% of bridges and structural culverts with high-risk exposure rating			18%	G	Very High
	Provide responsive maintenance	Future	% of outstanding maintenance Work Orders on an annual reporting basis		Future			
	Provide responsive operations	Future	% of outstanding operations Work Orders on an annual reporting basis		Future			
Affordability	City services are adequately funded	Very Poor	Ratio of 10-year renewal budget to needs			60%	VP	High
	City services are sustainable in the long term		% Average annual renewal rate (reinvested or put into reserve) for bridges and structural culverts		Future			

Risk Assessment

The consequence of failure (CoF) was determined as outlined in the table to the right, by asset group. The likelihood of failure (LoF) was determined by the condition of the assets. The risk evaluation matrix below shows the results of the risk assessment.

Asset Group	CoF
OSIM structures over a railway or high volume roadway	5
OSIM structures over the Moira River or on Urban Arterial Roadways	4
All other OSIM structures	3
Non-OSIM Culverts (Entry and Stormwater)	2

Risk Evaluation Matrix

LoF						Risk Exposure		CRV($)	CRV(%)
5	$0.00	$0.00	$0.00	$0.00	$25.00	Very High		$25.00	8.9%
4	$0.00	$0.00	$7.40	$2.80	$0.00	High		$50.30	18.0%
3	$0.00	$0.00	$9.50	$12.60	$27.50	Moderate		$151.50	54.2%
2	$0.00	$0.00	$11.60	$33.40	$27.90	Low		$52.80	18.9%
1	$0.00	$0.00	$5.90	$46.90	$69.10	Very Low		$0.00	0.0%
	1	2	3	4	5			$279.60	100.0%
			CoF						

Assets in the Very High or High risk exposure categories include bridges and structural (OSIM) culverts.

Lifecycle Management

The following graphs provide the forecast needed lifecycle activities over each of the next 10 years to maintain current levels of service.

Growth and Upgrade Needs Forecast

Growth and upgrade needs are based on forecast population growth.

Renewal Needs Forecast

Renewal needs are based on maintaining the current reliability levels of service, giving priority to the renewal of assets with higher risk ratings, consequently deferring the renewal of lower risk assets as necessary.

Operations and Maintenance Needs Forecast

The Operating needs forecast is based on the anticipated growth of the asset portfolio.

Available Funding, Shortfalls / Surpluses

The following table summarizes the City's needs forecasts for each lifecycle activity based on the analysis from the preceeding graphs and provides the estimated funding detemined as the average funding available over the past two years. Funding for operating and capital needs is sourced from tax levies.

Lifecycle Activity	10-Yr Avg Annual Needs Forecast (2024$M)	10-Yr Avg Annual Available Funding (2024$M)	10-Yr Avg Annual Shortfalls / Surplus (2024$M)	10-Yr Avg Annual Funding / Funding (%)
Growth & Upgrade	$4.00	$0.00	-$4.00	0%
Renewal	$1.97	$1.17	-$0.80	60%
Operations & Maintenance	$0.04	$0.03	-$0.01	78%
Totals	**$6.01**	**$1.21**	**-$4.81**	**20%**

Based on calculations to maintain current levels of service, Bridges & Culverts would require a 3.80% tax levy increase to close the 10 year funding gap immediately.

Plan Improvements and Monitoring

Improvement Area	Action	Outcome	Priority	Timeline
Asset Data Completeness	Fill asset attribute data gaps for non-structural culverts	Increased data quality and confidence in state of local infrastructure and lifecycle management activity forecast	HIGH	Short Term
Asset Information Systems	Develop central asset registry to house asset data and attribute information in a single location. Digitize asset information which currently is only available in paper format.	Improved confidence in input data and recommended solutions	MED	Medium Term
Asset Management Processes	Formalize risk management processes and integrate within business planning and budgeting.	Improved asset management decision-making	MED	In Progress
Asset Management Processes	Develop condition and performance assessment protocols for assets within the portfolio.	Improved asset management decision-making	MED	In Progress

State of Infrastructure ($333.1 million)

This service area develops, operates, and maintains roadside infrastructure including sidewalks, bicycle lanes, intersections, signage, and illumination. It also provides winter control.

Key business drivers at this time are future population and associated asset growth and aging infrastructure.
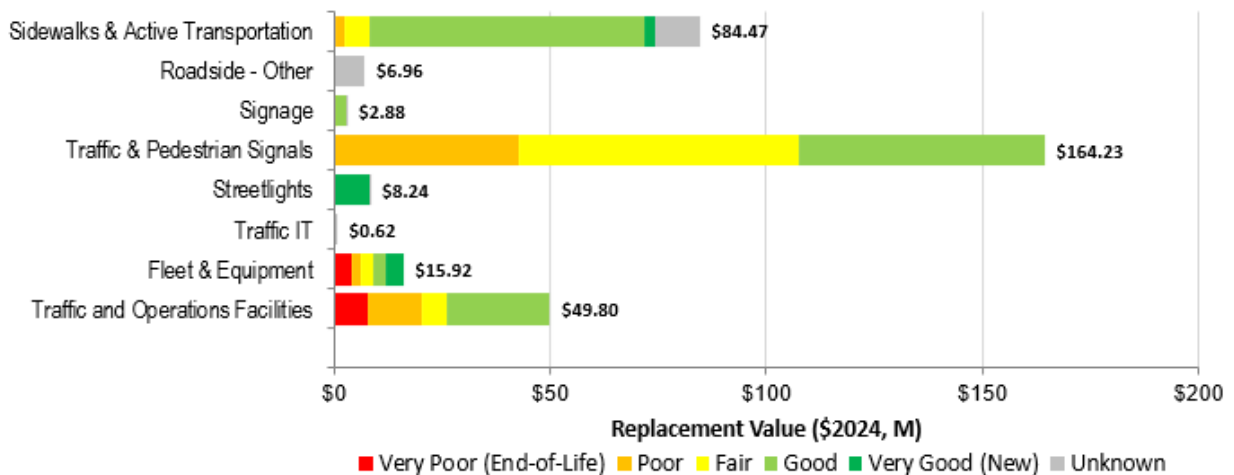
Traffic and Operations assets include:
- Sidewalks & Active Transportation
- Streetlight assets
- Traffic and Pedestrian Signals
- TOS Fleet & Equipment

On average, the assets are halfway through their service life. Those assets that may be approaching the later stages of age and may need to be replaced or require further maintenance.
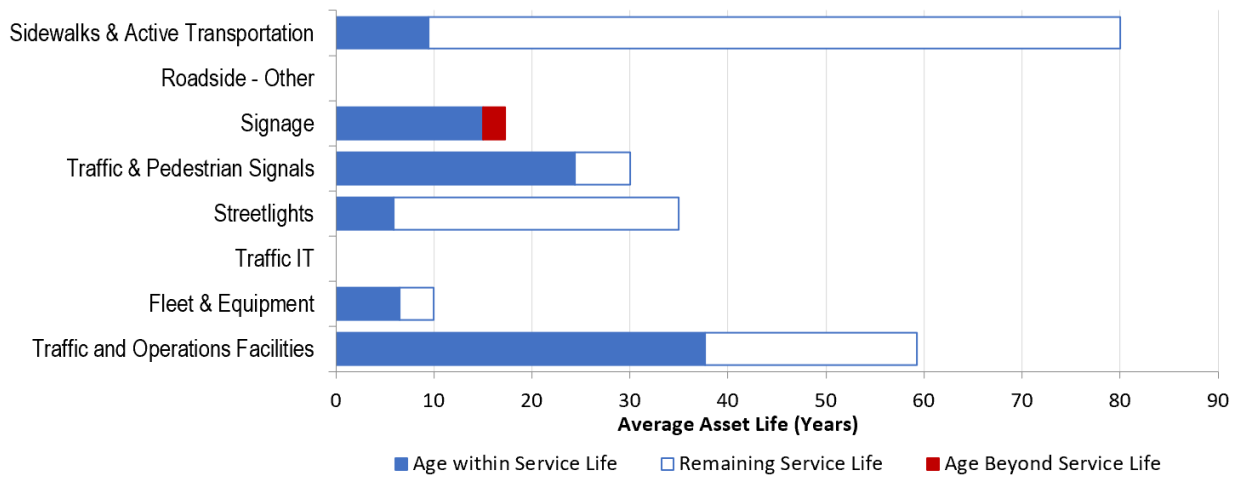
The City's assets are generally in fair to very good condition. A number of assets are assessed to be poor to very poor and are nearing end of life and will require rehabilitation or replacement in the upcoming years.

Levels of Service

Service Attribute	Community Levels of Service		Technical Levels of Service					
	Statements	Current Performance	Performance Indicators	Performance				Data Confidence
				2021	2022	2023		
Capacity	Provide sufficient traffic and operations capacity where and when needed	Future	Ratio of vehicles to bays		Future			
			Ratio of vehicles to staff		Future			
Function	Meet customer needs while limiting health, safety, and natural impacts	Good	% of streetlights with LED fixtures	91%	92%	93%	G	High
			% of signalized intersections equipped with Accessible Pedestrian Signals	43%	45%	45%	VP	High
			% of fleet in compliance with all applicable legislation	100%	100%	100%	VG	
			CVOR Overall Violation Rate	53%	47%	42%	F	Very High
			% of fleet vehicles considered 'Green'	0%	0%	0%	VP	
Reliability & Quality	Keep assets in a state of good repair	Fair	% of Traffic & Ops assets with very high-risk exposure rating			17%	VP	Very High
			% of Traffic & Ops assets with high-risk exposure rating			28%	F	Very High
			% of streetlights equipped with functional digital monitoring node	83%	85%	87%	F	Very High
			% of fleet vehicles in road-worthy condition	99%	100%	100%	VG	High
			# of customer complaints regarding the condition of fleet		Future			
	Provide responsive maintenance	Good	% of assets maintained in accordance with Minimum Maintenance Standards	100%	100%	100%	VG	Very High
			# of outstanding sidewalk deficiencies, as defined by the Annual Sidewalk Inspection Program scope of work			166	F	Very High
	Provide responsive operations	Fair	Average # of lane kilometers per snowplow route	34.0	34.1	33.8	G	High
			Average # of kilometers per sidewalk snowplow route	39.1	39.6	34.6	F	High
Affordability	City services are adequately funded	Very Poor	Ratio of 10-year renewal budget to needs			35%	VP	High
	City services are sustainable in the long term	Future	% Average annual renewal rate (reinvested or put into reserve) for sidewalks, traffic signals, etc.		Future			

Risk Assessment

The consequence of failure (CoF) was determined as outlined in the table to the right, by asset group. The likelihood of failure (LoF) was determined by the condition of the assets. The risk evaluation matrix below shows the results of the risk assessment.

Asset Group	CoF
Active transportation, intersections, mechanics shop, Wallbridge PW building	3
Guiderails, regulatory signs, streetlighting, other buildings	2
Warning signs	1

Risk Evaluation Matrix

LoF						Risk Exposure	CRV($)	CRV(%)
5	$0.00	$0.02	$1.12	$10.09	$0.97	Very High	$54.25	17.2%
4	$0.00	$0.04	$8.04	$8.30	$43.20	High	$87.60	27.8%
3	$0.00	$0.04	$9.16	$5.29	$64.86	Moderate	$157.08	49.8%
2	$0.00	$1.54	$73.40	$14.63	$59.78	Low	$16.10	5.1%
1	$0.00	$0.08	$2.67	$11.89	$0.00	Very Low	$0.08	0.0%
	1	2	3	4	5		$315.11	100.0%

CoF

Assets in the Very High or High risk exposure categories include assets in the high CoF group that are in very poor or poor condition, in particular fleet, equipment and facilities.

Lifecycle Management

The following graphs provide the forecast needed lifecycle activities over each of the next 10 years to maintain current levels of service.

Growth and Upgrade Needs Forecast

Growth and upgrade needs are based on planned City growth.

Renewal Needs Forecast

Renewal needs are based on maintaining the current reliability levels of service, giving priority to the renewal of assets with higher risk ratings, consequently deferring the renewal of lower risk assets as necessary.

Operations and Maintenance Needs Forecast

The Operating needs forecast is based on the anticipated growth of the asset portfolio.

Available Funding, Shortfalls / Surpluses

The following table summarizes the City's needs forecasts for each lifecycle activity based on the analysis from the preceeding graphs and provides the estimated funding detemined as the average funding available over the past two years. Funding for operating and capital needs is sourced from tax levies.

Lifecycle Activity	10-Yr Avg Annual Needs Forecast (2024$M)	10-Yr Avg Annual Available Funding (2024$M)	10-Yr Avg Annual Shortfalls / Surplus (2024$M)	10-Yr Avg Annual Funding / Funding (%)
Growth & Upgrade	$0.74	$0.74	$0.00	101%
Renewal	$7.43	$2.62	-$4.81	35%
Operations & Maintenance	$9.03	$8.44	-$0.60	93%
Totals	**$17.20**	**$11.80**	**-$5.40**	**69%**

Based on calculations to maintain current levels of service, Traffic & Operations would require a 4.27% tax levy increase to close the 10 year funding gap immediately.

Plan Improvements and Monitoring

Improvement Area	Action	Outcome	Priority	Timeline
Asset Information Systems	Develop central asset registry to house asset data and attribute information in a single location. Digitize asset information which currently is only available in paper format.	Improved confidence in input data and recommended solutions	MED	Medium Term
Asset Management Processes	Formalize risk management processes and integrate within business planning and budgeting.	Improved asset management decision-making	MED	In Progress
Asset Management Processes	Develop condition and performance assessment protocols for assets within the portfolio that do not currently have any, such as guiderails.	Improved state of local infrastructure quality and reliability, confidence in renewal needs	MED	Short Term
Asset Data Quality	Complete more refined replacement cost estimates for signalized intersections	Increased accuracy of renewal cost projections and subsequent financing strategy	HIGH	Short Term

State of Infrastructure ($28.5 million)

This service area provides reliable, convenient, and seamless travel across the City through both conventional and specialized mobility transit services. It maintains the transit assets in a state of good repair.

Key business drivers at this time are future population and associated asset growth and aging infrastructure.
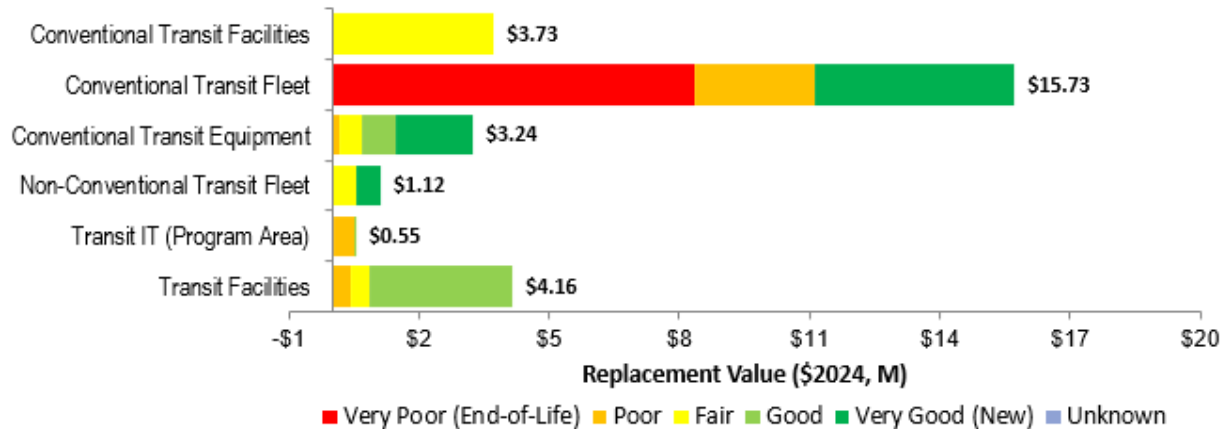
Transit assets include:
- 17 Conventional and 4 Non-Conventional Transit fleet
- One Terminal
- Transit stops including platforms & shelters.
- 308 Transit equipment
- Information Technology

The age of assets compared to the service life is shown below.
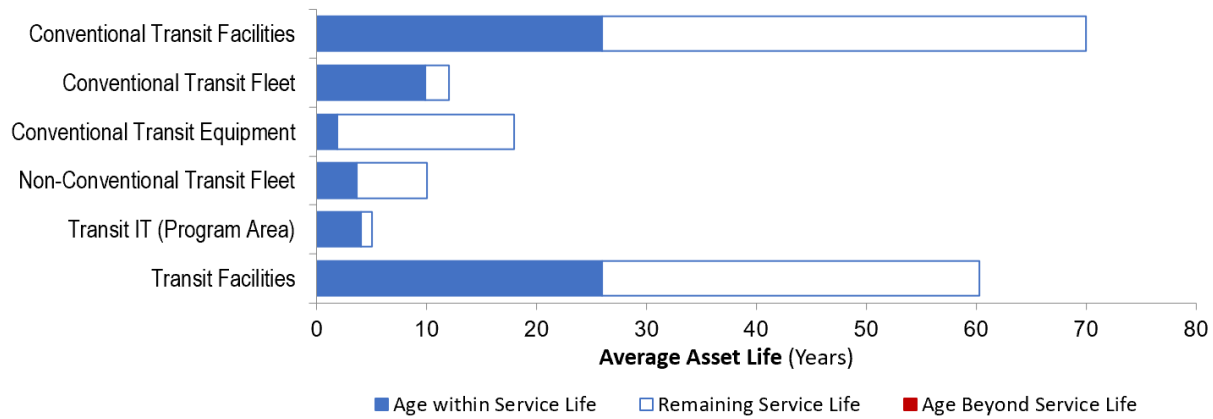
The City's transit assets include a significant portion that was assessed to be "Very Poor" and are nearing end of life, and will require replacement in the upcoming years.

Levels of Service

Service Attribute	Community Levels of Service		Technical Levels of Service					Data Confidence
	Statements	Current Performance	Performance Indicators	Performance				
				2021	2022	2023		
Capacity	The public transit network is available to and accessible for all City residents	**Good**	Annual operating hours	70,212	69,444	69,129	VG	Very High
			Hours of operation per capita	1.40	1.32	1.26	G	Very High
			Trips per capita	11	20	22	F	Very High
			% of urban area residents within 500m of a bus stop	90%	90%	90%	G	Very High
Function	Meet customer needs while limiting safety impacts	**Fair**	% of bus stops in compliance with AODA standards	53%	62%	67%	VP	Very High
			% of residents with access to specialized mobility services, if required	100%	100%	100%	VG	Very High
Reliability & Quality	Keep assets in a state of good repair	**Very Poor**	% of Transit assets with very high-risk exposure rating			42%	VP	Very High
			% of Transit assets with high-risk exposure rating			19%	G	Very High
			% of buses past their expected useful life	50%	50%	46%	VP	Very High
	Provide responsive maintenance	**Fair**	# of buses available for simultaneous operation	16	13	13	F	Very High
	Provide responsive operations	**Future**	# of annual route delays		Future			
			# of annual complaints regarding the public transit system		Future			
Affordability	City services are adequately funded	**Very Good**	Ratio of 10-year renewal budget to needs			198%	VG	Very High
	City services are sustainable in the long term	**Fair**	Revenue to cost ratio	14%	28%	30%	F	High
			% Average annual renewal rate (reinvested or put into reserve)		Future			

Risk Assessment

The consequence of failure (CoF) was determined as outlined in the table to the right, by asset group. The likelihood of failure (LoF) was determined by the condition of the assets. The risk evaluation matrix below shows the results of the risk assessment.

Asset Group	CoF
Fleet and IT	5
Facilities & Equipment	4
Transit Terminal	3

Risk Evaluation Matrix

LoF	1	2	3	4	5
5	$0.00	$0.00	$0.00	$0.01	$8.34
4	$0.00	$0.00	$0.02	$0.17	$3.67
3	$0.00	$0.00	$0.00	$4.54	$0.70
2	$0.00	$0.19	$1.96	$1.89	$0.05
1	$0.00	$0.00	$0.00	$1.80	$5.18

CoF

Risk Exposure	CRV($)	CRV(%)
Very High	$12.02	42.1%
High	$5.43	19.0%
Moderate	$9.09	31.9%
Low	$1.99	7.0%
Very Low	$0.00	0.0%
	$28.53	100.0%

Assets in the Very High or High risk exposure categories include assets in the high CoF group that are in very poor or poor condition, in particular the conventional transit fleet.

Lifecycle Management

The following graphs provide the forecast needed lifecycle activities over each of the next 10 years to maintain current levels of service.

Growth and Upgrade Needs Forecast

Growth and upgrade needs are based on planned City growth.

Renewal Needs Forecast

Renewal needs are based on maintaining the current reliability levels of service, giving priority to the renewal of assets with higher risk ratings, consequently deferring the renewal of lower risk assets as necessary.

Operations and Maintenance Needs Forecast

The Operating needs forecast is based on the anticipated growth of the asset portfolio.

Available Funding, Shortfalls / Surpluses

The following table summarizes the City's needs forecasts for each lifecycle activity based on the analysis from the preceeding graphs and provides the estimated funding detemined as the average funding available over the past two years. Funding for operating and capital needs is sourced from user fees, tax levies, and Provincial Gas Tax.

Lifecycle Activity	10-Yr Avg Annual Needs Forecast (2024$M)	10-Yr Avg Annual Available Funding (2024$M)	10-Yr Avg Annual Shortfalls / Surplus (2024$M)	10-Yr Avg Annual Funding / Funding (%)
Growth & Upgrade	$0.24	$0.89	$0.65	371%
Renewal	$0.85	$1.69	$0.84	198%
Operations & Maintenance	$7.85	$7.33	-$0.53	93%
Totals	**$8.95**	**$9.91**	**$0.96**	**111%**

Based on calculations to maintain current levels of service, Transit is adequately funded to cover the 10 year forecast.

Plan Improvements and Monitoring

Improvement Area	Action	Outcome	Priority	Timeline
Asset Management Processes	Utilize outcomes from the Transit Master Plan to support future AM growth and upgrade needs.	Improved asset management decision-making	MED	In Progress
Asset Management Processes	Formalize risk management processes and integrate within business planning and budgeting.	Improved asset management decision-making	MED	In Progress
Asset Information Systems	Integrate and adopt an Enterprise Asset Management software solution within the department to support work order management.	Improved confidence in input data and recommended solutions	MED	In Progress

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State of Infrastructure ($68.0 million)

This service area develops, operates, and maintains parkland, open spaces, forests and outdoor park recreation facilities, amenities, infrastructure, and transportation assets.

Key business drivers at this time are future population and associated asset growth and aging infrastructure.

Parks assets include:
- 33 Parks Facilities
- 364 Parks Amenities
- 124 Parks Infrastructure Assets
- 26 Parks Fleet

Most of the assets are in the mid to later stages of age and may need to be replaced or require further maintenance.
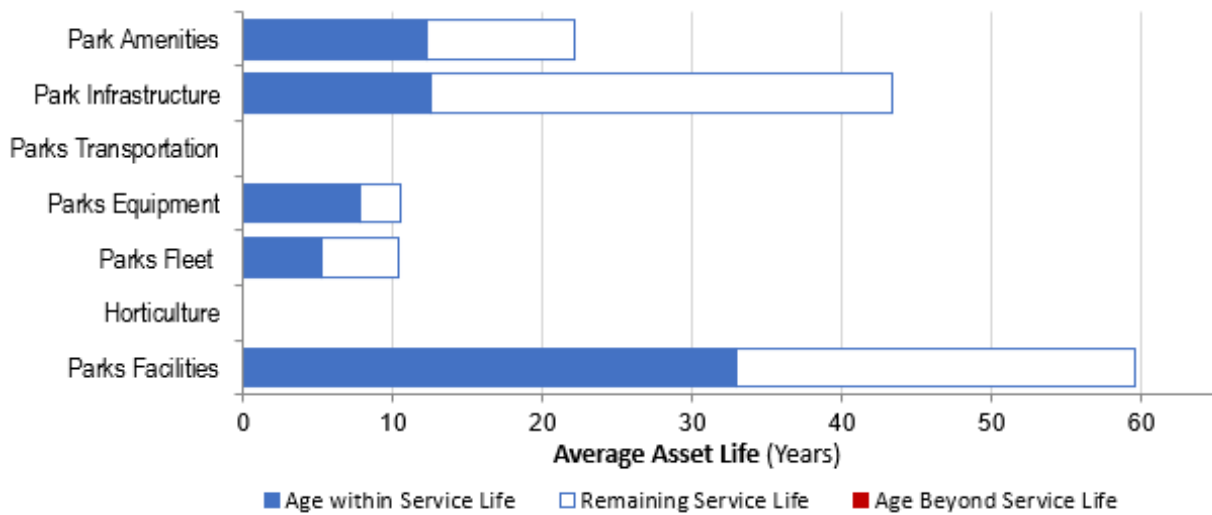
The City's Park assets are generally in fair to good condition. A number of amenities, facilities and infrastructure are assessed to be "Very Poor" and are nearing end of life and will require rehabilitation or replacement in the upcoming years.

Levels of Service

| Service Attribute | Community Levels of Service | | Technical Levels of Service | | | | | |
| | Statements | Current Performance | Performance Indicators | Performance | | | | Data Confidence |
				2021	2022	2023		
Capacity	Provide access to Parklands for the whole community	Good	# of hectares of Parkland per 1,000 residents	4.19	4.19	4.19	G	
	Provide access to maintained Parkland parking spaces, both regular & accessible	Future	# of total Parkland parking spaces per 1,000 residents	Future				
	Provide access to Parklands for varying public uses	Very Good	% of Parklands available for public use for special events, tournaments, etc.	100%	100%	100%	VG	
	Provide access to Park amenities and programs for the whole community	Poor	Number of registered participants per ball diamond	176	176	176	VP	
			Number of registered participants per rectangular field	148	148	148	P	
			# of tennis courts per every 5,000 residents	0.0	0.1	0.1	VP	
			# of pickleball courts per every 5,000 residents	0.0	0.1	0.8	F	
			# of basketball courts per every 750-850 youth (ages 10-19)	0.0	0.62	0.78	F	
			# of Skate Parks per 5,000 youth (aged 10-19)	1.1	1.1	1.1	G	
			# of natural outdoor rinks	2	2	2	F	
			Ratio of off leash dog park area (sq.m) to the number of dwelling units	1.3	1.3	1.3	F	
Function	Provide an Active Transportation Network that enables sustainable transportation	Good	# of kilometers of Recreational trails (parkland)	50	50	50	G	
			# of kilometers of Multiuse trails (within ROW)	13.2	13.2	13.2	G	
Reliability & Quality	Keep assets in a state of good repair	Fair	% Parks Assets with very high-risk exposure rating			5%	G	High
			% Parks Assets with high-risk exposure rating			22%	G	
			% of Parkland Parking Lots in poor or very poor condition			20%	P	High
	Provide responsive maintenance	Future	% of outstanding maintenance Work Orders	Future				
	Provide responsive operations	Future	% of outstanding operations Work Orders	Future				
Affordability	City services are adequately funded	Very Poor	Ratio of 10-year renewal budget to needs			39%	VP	High
	City services are sustainable in the long term	Future	% Average annual renewal rate (reinvested or put into reserve)	Future				

Risk Assessment

The consequence of failure (CoF) was determined as outlined in the table to the right, by asset group. The likelihood of failure (LoF) was determined by the condition of the assets. The risk evaluation matrix below shows the results of the risk assessment.

Asset Group	CoF
Fleet	4
Amenities, Transportation, Infrastructure, Equipment, Field House Park Services Bldg,	3
Greenhouses, Pump House	2
Horticulture, Storage	1

Risk Evaluation Matrix

LoF						Risk Exposure	CRV($)	CRV(%)
5	$0.00	$0.15	$1.69	$2.31	$0.71	Very High	$3.21	4.8%
4	$0.00	$1.20	$9.75	$0.93	$0.20	High	$14.76	21.9%
3	$0.03	$1.98	$14.19	$2.35	$0.04	Moderate	$40.13	59.6%
2	$0.15	$1.55	$13.25	$8.46	$0.24	Low	$8.35	12.4%
1	$0.02	$0.71	$6.25	$0.53	$0.65	Very Low	$0.88	1.3%
	1	2	3	4	5		$67.33	100.0%

CoF

Assets in the Very High or High risk exposure categories include assets in the high CoF group that are in very poor or poor condition, in particular park amenities, facilities and fleet.

Lifecycle Management

The following graphs provide the forecast needed lifecycle activities over each of the next 10 years to maintain current levels of service.

Growth and Upgrade Needs Forecast

Growth and upgrade needs are based on planned City growth.
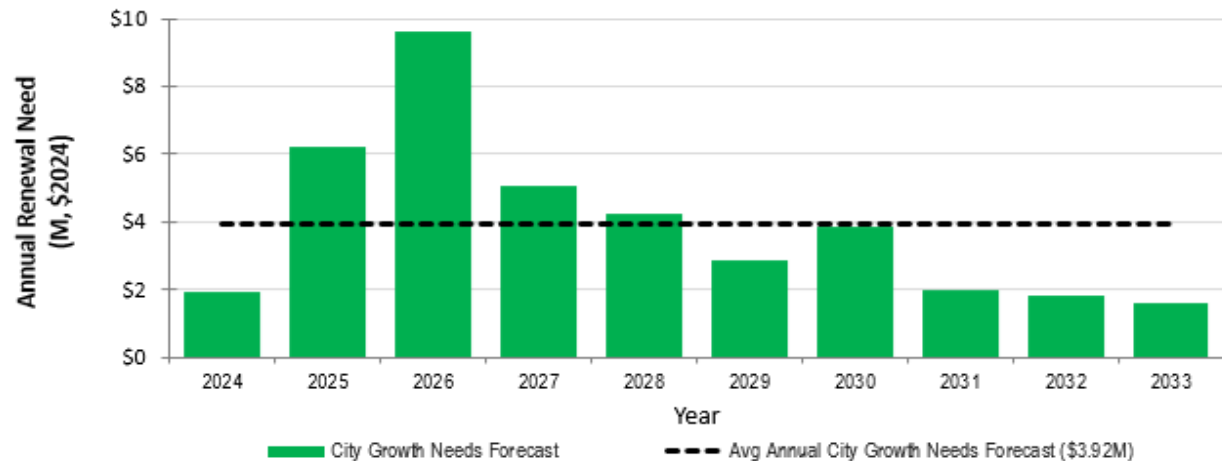
Renewal Needs Forecast

Renewal needs are based on maintaining the current reliability levels of service, giving priority to the renewal of higher risk assets and deferring the renewal of lower risk assets.

Operations and Maintenance Needs Forecast

The Operating needs forecast is based on the anticipated growth of the asset portfolio.

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Available Funding, Shortfalls / Surpluses

The following table summarizes the City's needs forecasts for each lifecycle activity based on the analysis from the preceeding graphs and provides the estimated funding detemined as the average funding available over the past two years. Funding for operating and capital needs is sourced from tax levies and user fees.

Lifecycle Activity	10-Yr Avg Annual Needs Forecast (2024$M)	10-Yr Avg Annual Available Funding (2024$M)	10-Yr Avg Annual Shortfalls / Surplus (2024$M)	10-Yr Avg Annual Funding / Funding (%)
Growth & Upgrade	$3.92	$2.60	-$1.32	66%
Renewal	$1.82	$0.71	-$1.11	39%
Operations & Maintenance	$6.46	$4.70	-$1.76	73%
Totals	**$12.20**	**$8.02**	**-$4.18**	**66%**

Based on calculations to maintain current levels of service, Parks would require a 3.31% tax levy increase to close the 10 year funding gap immediately.

Plan Improvements and Monitoring

Improvement Area	Action	Outcome	Priority	Timeline
Asset Management Processes	Formalize risk management processes and integrate within business planning and budgeting.	Improved asset management decision-making	MED	In Progress
Asset Management Processes	Develop condition and performance assessment protocols for assets within the portfolio.	Improved asset management decision-making	MED	In Progress

State of Infrastructure ($3.3 million)

This program area manages curbside collection of blue boxes, green bin, yard waste and residual waste, and delivers the materials to facilities for processing, energy recovery and/or disposal.

Waste Management assets include:
- Thurlow Landfill
- Landfill Facilities
- WM equipment and IT

The City's waste management assets are in the first half of useful life.
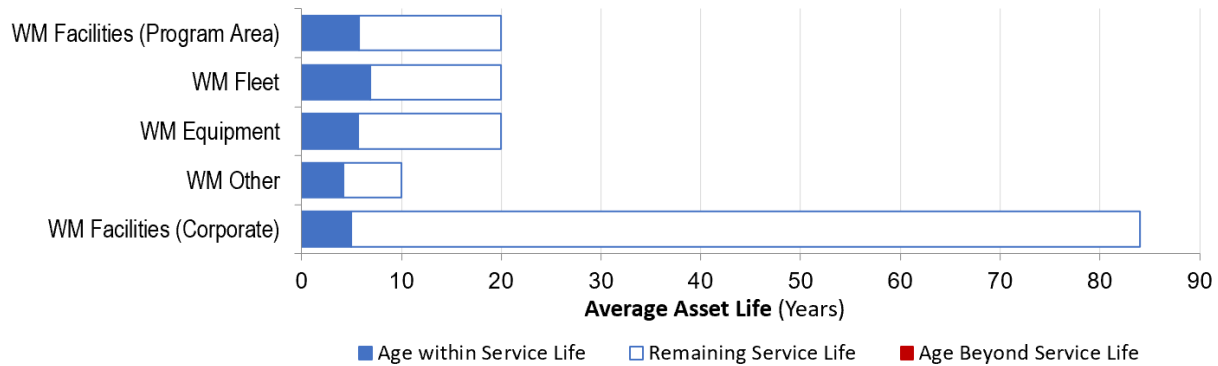
The City's waste management assets are in good overall condition.

Levels of Service

Service Attribute	Community Levels of Service		Technical Levels of Service					Data Confidence
	Statements	Current Performance	Performance Indicators	Performance				
				2021	2022	2023		
Capacity	Provide services to all properties	**Very Good**		100%	100%	100%	VG	Very High
Function	Meet customer needs while limiting health, safety, and natural impacts	**Future**	% of facilities equipped with a fully compliant Universal Washroom	Future				
		Future	Annual electrical consumption (kWh) of the corporation as reported for Regulation 25/23	Future				
		Future	# of incident reports documented annually	Future				
Reliability & Quality	Keep assets in a state of good repair	**Good**	% Waste Management assets with very high-risk exposure rating			0%	VG	High
			% Waste Management assets with high-risk exposure rating			39%	F	High
	Provide responsive maintenance	**Future**	% of outstanding maintenance Work Orders on an annual reporting basis	Future				
	Provide responsive operations	**Future**	% of outstanding operations Work Orders on an annual reporting basis	Future				
Affordability	City services are affordable	**Fair**	Cost per garbage bag tag	$3.00	$3.00	$3.00	G	Very High
			Total Cost for Solid Waste Collection per Tonne - All Property Classes	$145	$148	$155	F	Very High
			Total Cost for Garbage Disposal per Tonne - All Property Classes	$79	$81	$84	F	Very High
			Total Cost for Organics Disposal per Tonne - All Property Classes	$150	$153	$160	P	Very High
			Ratio of 10-year renewal budget to needs	Future				
	City services are sustainable in the long term		% Average annual renewal rate (reinvested or put into reserve) for shared facilities	Future				

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Risk Assessment

The consequence of failure (CoF) was determined as outlined in the table to the right, by asset group. The likelihood of failure (LoF) was determined by the condition of the assets. The risk evaluation matrix below shows the results of the risk assessment.

Asset Group	CoF
Thurlow Landfill Facilities	2
Solid Waste Equipment	4
Solid Waste Fleet	4
Solid Waste IT	4

Risk Evaluation Matrix

LoF						Risk Exposure	CRV($)	CRV(%)
5	$0.00	$0.00	$0.00	$0.00	$0.00	Very High	$0.00	0.0%
4	$0.00	$0.00	$0.00	$0.00	$0.00	High	$1.28	39.5%
3	$0.00	$0.00	$0.06	$1.28	$0.00	Moderate	$1.00	31.0%
2	$0.00	$0.06	$0.11	$0.84	$0.00	Low	$0.96	29.5%
1	$0.00	$0.00	$0.00	$0.89	$0.00	Very Low	$0.00	0.0%
	1	2	3	4	5		$3.24	100.0%
			CoF					

As no assets are in the highest criticality categories and none are in very poor condition, no Waste Management assets are in the Very High or High risk exposure categories.

Lifecycle Management

The following graphs provide the forecast needed lifecycle activities over each of the next 10 years to maintain current levels of service.

Growth and Upgrade Needs Forecast

Growth and upgrade needs are based on forecast population growth and are minimal.

Renewal Needs Forecast

Renewal needs are based on maintaining the current reliability levels of service, giving priority to the renewal of assets with higher risk ratings, consequently deferring the renewal of lower risk assets as necessary.

Operations and Maintenance Needs Forecast

The Operating needs forecast is based on the anticipated growth of the asset portfolio.

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Available Funding, Shortfalls / Surpluses

The following table summarizes the City's needs forecasts for each lifecycle activity based on the analysis from the preceeding graphs and provides the estimated funding detemined as the average funding available over the past two years. Funding for operating and capital needs is sourced from tax levies and user fees.

Lifecycle Activity	10-Yr Avg Annual Needs Forecast (2024$M)	10-Yr Avg Annual Available Funding (2024$M)	10-Yr Avg Annual Shortfalls / Surplus (2024$M)	10-Yr Avg Annual Funding / Funding (%)
Growth & Upgrade	$0.04	$0.00	-$0.04	0%
Renewal	$0.03	$0.00	-$0.03	0%
Operations & Maintenance	$5.32	$4.88	-$0.44	92%
Totals	**$5.40**	**$4.88**	**-$0.52**	**90%**

Based on calculations to maintain current levels of service, Waste Management would require a 0.41% tax levy increase to close the 10 year funding gap immediately.

Plan Improvements and Monitoring

Improvement Area	Action	Outcome	Priority	Timeline
Organization and People	Formalize service area / department responsible for Asset Management activities such as data collection and maintenance	Clearly identified roles and responsibilities with a single source for information will enable improved AM data collection and planning	HIGH	Short Term
Asset Management Processes	Formalize risk management processes and integrate within business planning and budgeting.	Improved asset management decision-making	MED	In Progress

State of Infrastructure ($578.7 million)

This program area secures, treats, stores, and distributes drinking water to its serviced customers. It also maintains water assets in a state of good repair.

Key business drivers at this time are quality management, future population growth and associated infrastructure required, timing of growth, and aging infrastructure.

On average, the City's water assets are relatively young as compared to their expected service lives. However, some assets are reaching, have reached, or have even exceeded the later stages of their useful lives and will require rehabilitation or replacement in the upcoming years.

Water assets include:

- Water Treatment and Distribution Facilities
- Water Distribution and Transmission Linear Networks
- Supervisory Control and Data Acquisition (SCADA) Systems
- Storage tanks / reservoirs
- Water Fleet and Equipment
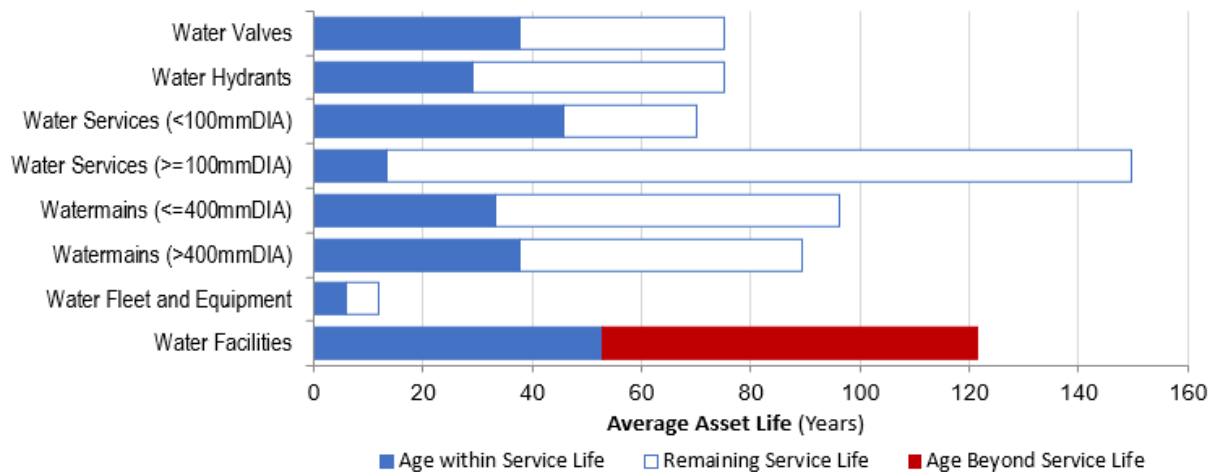
The City's water assets are generally in fair to good condition, as assessed based on inspected conditions.

Levels of Service

| Service Attribute | Community Levels of Service | | Technical Levels of Service | | | | | |
| | Statements | Current Performance | Performance Indicators | Performance | | | | Data Confidence |
				2021	2022	2023		
Capacity	Water system has capacity to provide current and future serviced customers with uninterrupted access to treated water at an adequate pressure	Good	% of properties connected to the municipal water system (O.Reg.588)	77%	77%	79%	G	High
			% of properties where fire flow is available (O.Reg.588)	76%	76%	78%	G	High
			% of water distribution system operating below quantity or pressure objectives	0%	0%	0%	VG	Mod
			% of urban customers or developments seeking connection which are able to be connected	100%	100%	100%	VG	Very High
			% of average day demand / existing water licence capacity	32%	34%	36%	G	Very High
Function	Water treated and transported throughout the system meets or exceeds all regulatory requirements for quality	Good	# of Adverse Water Quality Incidents (AWQIs) in the past year	2	1	1	G	Very High
			# of boil water advisories declared in the past year	0	0	0	VG	Very High
	Water services are provided prioritizing safety	Very Good	# of connection-days per year where a boil water advisory notice is in place compared to the total number of properties connected to the municipal water system (O.Reg.588)	0	0	0	VG	High
			% of distribution network capable of providing firefighting support	99.6%	99.7%	99.8%	G	Very High
			% of critical and dangerous areas secured	100%	100%	100%	VG	High
	Water services are provided in an environmentally responsible and sustainable way	Very Good	# of instances where the limits of Permits to Take Water were exceeded	0	0	0	VG	Very High

Levels of Service, cont'd

Service Attribute	Community Levels of Service		Technical Levels of Service					
	Statements	Current Performance	Performance Indicators	Performance				Data Confidence
				2021	2022	2023		
Reliability & Quality	Keep assets in a state of good repair	**Good**	# of connection-days per year due to water main breaks compared to the total number of properties connected to the municipal water system (O.Reg.588)	7.5	15.83	14.17	F	High
			% of water assets with very high-risk exposure rating			1%	VG	Low
			% of water assets with high-risk exposure rating			10%	VG	Low
	Provide responsive maintenance	**Very Good**	% of works conducted where attempts are made to notify all affected customers of possible disruptions to water service	100%	100%	100%	VG	High
	Provide responsive operations	**Very Good**	# of complaints caused by city-owned assets per 1,000 accounts	<1	<1	<1	VG	Very High
Affordability	City services are affordable	**Very Good**	Ratio of 10-year renewal budget to needs for water assets			281%	VG	High
	City services are sustainable in the long term	**Future**	% Average annual renewal rate (reinvested or put into reserve) for Water Distribution and Transmission			Future		
			% Average annual renewal rate (reinvested or put into reserve) for Water Treatment			Future		

Risk Assessment

The consequence of failure (CoF) was determined as outlined in the table to the right, by asset group. The likelihood of failure (LoF) was determined by the condition of the assets. The risk evaluation matrix below shows the results of the risk assessment.

Asset Group	CoF
Plants, Pumping/Booster Stations, Elevated Storage Tanks	5
Valves, Services >= 100mmDIA, Watermains > 400mm DIA, Heavy Duty Equipment, SCADA	4
Hydrants, smaller Services, and Watermains	3
Light/Med Duty Equip, Trailers	1, 2

Risk Evaluation Matrix

LoF	1	2	3	4	5
5	$0.00	$0.00	$7.40	$2.15	$2.88
4	$0.00	$0.00	$31.95	$1.23	$0.22
3	$0.00	$0.00	$82.64	$8.99	$9.39
2	$0.00	$0.00	$43.04	$27.04	$194.05
1	$0.00	$0.04	$145.71	$7.98	$2.09
	1	2	3	4	5

CoF

Risk Exposure	CRV($)	CRV(%)
Very High	$5.25	0.9%
High	$58.95	10.4%
Moderate	$348.86	61.6%
Low	$153.68	27.1%
Very Low	$0.04	0.0%
	$566.78	100.0%

Very few assets are in the Very High or High risk exposure categories.

Lifecycle Management

The following graphs provide the forecast of necessary lifecycle activities over each of the next 10 years to maintain current levels of service.

Growth and Upgrade Needs Forecast

Growth and upgrade needs are based on planned City growth.

Renewal Needs Forecast

Renewal needs are based on maintaining the current reliability levels of service, giving priority to the renewal of assets with higher risk ratings, consequently deferring the renewal of lower risk assets as necessary.

Operations and Maintenance Needs Forecast

The Operating needs forecast is based on the anticipated growth of the asset portfolio.

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Available Funding, Shortfalls / Surpluses

The following table summarizes the City's needs forecasts for each lifecycle activity based on the analysis from the preceeding graphs and provides the estimated funding detemined as the average funding available over the past two years. Funding for operating and capital needs is sourced from user rates.

Lifecycle Activity	10-Yr Avg Annual Needs Forecast (2024$M)	10-Yr Avg Annual Available Funding (2024$M)	10-Yr Avg Annual Shortfalls / Surplus (2024$M)	10-Yr Avg Annual Funding / Funding (%)
Growth & Upgrade	$2.01	$2.39	$0.38	119%
Renewal	$1.94	$5.45	$3.51	281%
Operations & Maintenance	$8.49	$7.81	-$0.68	92%
Totals	**$12.45**	**$15.66**	**$3.21**	**126%**

Based on calculations to maintain current levels of service, Water is adequately funded to cover the 10 year forecast.

Plan Improvements and Monitoring

Improvement Area	Action	Outcome	Priority	Timeline
Risk Management	Variations to consequences of failure (CoF) ratings within classes of most linear water infrastructure assets are based on size as a proxy for relative importance to the network, e.g. larger mains service larger areas, more users, and more critical user groups such as hospitals. Conduct review of asset CoF ratings related to more precise asset or system attributes.	Improved accuracy of risk analysis which would enable more suitable prioritization of lifecycle activity planning	HIGH	Short Term
Data Accuracy and Completeness	Utilize Building Condition Assessment data and projections to overwrite proxy data utilized for Water facilities	Improved accuracy of state of local infrastructure and lifecycle activities, increased granularity of asset inventories and risk assessments.	HIGH	In Progress
Data Accuracy and Completeness	Close gaps and resolve assumptions related to asset data describing the state of local infrastructure. Validate assumptive information for hydrants, hydrant laterals,	Improved accuracy of state of local infrastructure and lifecycle activities, quality of AM planning	MED	Short Term

	meter chambers, valves, valve chambers, etc.			
Asset Condition Ratings	Investigate alternative and new opportunities for assessing the condition of Water linear infrastructure	Improved accuracy of state of local infrastructure data and lifecycle management projections to overwrite those developed through age-based condition data	MED	Medium Term

State of Infrastructure ($637.3 million)

This program area collects wastewater from residents and businesses, conveys it through trunk sewers to wastewater treatment plant for extensive processing before releasing it to the environment. It also operates and maintains wastewater assets in a state of good repair.

Key business drivers at this time are environmental protection, future population growth and associated infrastructure required, timing of growth, wet weather resilience, and aging infrastructure.

Wastewater assets include:
- Wastewater Collection Linear Network
- Wastewater Pumping Stations
- Treatment and Disposal Plant
- Sanitary Forcemains
- Supervisory Control and Data Acquisition (SCADA) Systems

On average, the City's wastewater assets are reaching the middle stages of their useful lives and many will require rehabilitation or replacement in the upcoming years.
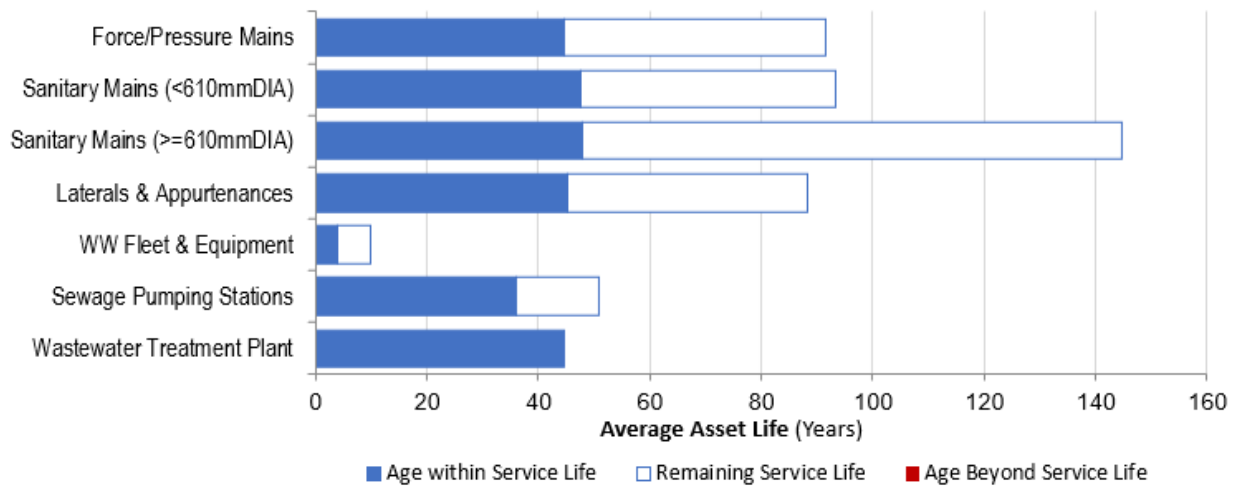
The City's wastewater assets are generally in poor condition, with many nearing end of life, requiring rehabilitation or replacement in the upcoming years.

Bar chart: Replacement Value ($2024, M) by asset category

Asset	Value
Force/Pressure Mains	$31.51
Sanitary Mains (<610mmDIA)	$218.33
Sanitary Mains (>=610mmDIA)	$50.62
Laterals & Appurtenances	$55.32
WW Fleet & Equipment	$1.31
Sewage Pumping Stations	$12.78
Wastewater Treatment Plant	$267.40

Legend: ■ Very Poor (End-of-Life) ■ Poor ■ Fair ■ Good ■ Very Good (New) ■ Unknown

Levels of Service

Service Attribute	Community Levels of Service		Technical Levels of Service					
	Statements	**Current Performance**	**Performance Indicators**	**Performance**				**Data Confidence**
				2021	**2022**	**2023**		
Capacity	Wastewater system has the capacity to provide uninterrupted wastewater collection, conveyance and treatment from current and future serviced customers	**Good**	% of system at risk of backflow/ overflow based on modelling of combined sewer flows	2.8%	2.8%	2.8%	G	Low
			# of bypasses caused by plant flow rate exceedance	1	5	9	F	Very High
			% availability of service in urban area	100%	100%	99%	F	Mod
			% of properties connected to the municipal wastewater system (O.Reg. 588)	76%	76%	77%	G	High
Function	Impact of untreated wastewater spills to the natural environment are minimized	**Very Good**	# of spills involving the conveyance and treatment system	3	4	0	VG	Very High
	Wastewater system is adequate to cope with extreme operational conditions	**Good**	# of events per year where combined sewer flow in the municipal wastewater system exceeds system capacity compared to the total number of properties connected to the municipal wastewater system (O.Reg.588)	3	0	0	VG	Very High
			# of connection-days per year due to wastewater backups compared to the total number of properties connected to the municipal wastewater system (O.Reg.588)	9.4	14.2	2.5	G	Low
			# of effluent violations per year due to wastewater discharge compared to the total number of properties connected to the municipal wastewater system (O.Reg.588)	0	4	10	F	Very High
			# of incidents of backflow/ overflows during/ following storm events where City assets are the cause	0	0	0	VG	Mod
			# of treatment plant bypasses conducted in response to high flows	1	4	9	P	Very High
			% of total effluent volume discharged during bypass events	~0.0%	1.2%	2.3%	F	Very High
			# of formal odor complaints received	3	4	1	VG	Very High

Levels of Service

| Service Attribute | Community Levels of Service | | Technical Levels of Service | | | | |
| | Statements | Current Performance | Performance Indicators | Performance | | | Data Confidence |
				2021	2022	2023	
Reliability & Quality	Keep assets in a state of good repair	**Poor**	% of wastewater system with very high-risk exposure rating			10% F	Low
			% of wastewater system with high-risk exposure rating			41% P	Low
	Provide responsive maintenance	**Very Good**	All excavations either limit disruption to services or inform affected customers in a timely manner	100%	100%	100% VG	High
	Provide responsive operations	**Good**	% of service requests completed within their prescribed timeline	86%	84%	80% G	Mod
Affordability	City services are adequately funded	**Fair**	Ratio of 10-year renewal budget to needs			71% F	Mod
	City services are sustainable in the long term	**Future**	% Average annual renewal rate (reinvested or put into reserve) for Wastewater Collection and Conveyance		Future		
			% Average annual renewal rate (reinvested or put into reserve) for Wastewater Treatment and Disposal		Future		

Risk Assessment

The consequence of failure (CoF) was determined as outlined in the table to the right, by asset group. The likelihood of failure (LoF) was determined by the condition of the assets. The risk evaluation matrix below shows the results of the risk assessment.

Asset Group	CoF
Plants, Pumping Stations	5
Pressure/Force Mains, Sanitary Mains >= 610 mmDIA, Heavy Duty Equip, SCADA	4
Sanitary Mains < 610 mmDIA, Laterals, SM Structures & Overflows	3
Light/Med Duty Vehicles & Equip, Trailers	1, 2

Risk Evaluation Matrix

LoF	1	2	3	4	5
5	$0.03	$0.00	$61.82	$4.86	$17.09
4	$0.00	$0.00	$23.91	$4.14	$40.53
3	$0.00	$0.08	$67.36	$100.54	$68.43
2	$0.00	$0.00	$42.36	$56.74	$52.78
1	$0.00	$0.00	$74.80	$13.27	$1.30

CoF

Risk Exposure	CRV($)	CRV(%)
Very High	$62.48	9.9%
High	$258.83	41.1%
Moderate	$220.64	35.0%
Low	$88.06	14.0%
Very Low	$0.00	0.0%
	$630.01	100.0%

The majority of wastewater assets (by replacement value) in the High or Very High risk exposure categories are represented by assets with a high to very high CoF that are in poor to very poor condition. These are predominantly facilities and large wastewater mains.

Lifecycle Management

The following graphs provide the forecast needed lifecycle activities over each of the next 10 years to maintain current levels of service.

Growth and Upgrade Needs Forecast

Growth and upgrade needs are based on planned City growth.

Renewal Needs Forecast

Renewal needs are based on maintaining the current reliability levels of service, giving priority to the renewal of assets with higher risk ratings, consequently deferring the renewal of lower risk assets as necessary.

Operations and Maintenance Needs Forecast

The Operating needs forecast is based on the anticipated growth of the asset portfolio..

Available Funding, Shortfalls / Surpluses

The following table summarizes the City's needs forecasts for each lifecycle activity based on the analysis from the preceeding graphs and provides the estimated funding detemined as the average funding available over the past two years. Funding for operating and capital needs is sourced from user rates.

Lifecycle Activity	10-Yr Avg Annual Needs Forecast (2024$M)	10-Yr Avg Annual Available Funding (2024$M)	10-Yr Avg Annual Shortfalls / Surplus (2024$M)	10-Yr Avg Annual Funding / Funding (%)
Growth & Upgrade	$14.60	$8.97	-$5.64	61%
Renewal	$9.97	$7.05	-$2.91	71%
Operations & Maintenance	$9.00	$7.15	-$1.85	79%
Totals	**$33.57**	**$23.17**	**-$10.40**	**69%**

Based on calculations to maintain current levels of service, Wastewater would require a 64.80% user rate increase to close the 10 year funding gap immediately.

Plan Improvements and Monitoring

Improvement Area	Action	Outcome	Priority	Timeline
Asset Management Processes	Variations to consequences of failure (CoF) ratings within most linear wastewater infrastructure assets classes are based on size as a proxy for relative importance to the network, e.g. larger sewers service larger areas and disruptions affect a greater number of individuals. Conduct review of asset CoF ratings related to more precise asset or system attributes.	Improved accuracy of risk analysis which would enable more suitable prioritization of lifecycle activity planning	HIGH	Short Term
Data Quality and Completeness	Investigate gaps associated with asset classes recently added to the asset register via separation from their parent asset, such as pipe appurtenances and service lines, collecting appropriate data where available and resolving assumptions related to asset data.	Improved reliability of information maintained in AM database Improved confidence in input data and recommended solutions	MED	Short Term
Asset Data Quality and Consistency	Generally, the wastewater service area uses estimated costs for asset renewal and	Improved reliability of replacement and major rehabilitation activities	MED	In Progress

	replacement activities. Asset replacement values are often based on a combination of staff input, past contracts, and industry standards, extrapolated to suit asset sizes or other categorizing variables as necessary. The City should continue to update these figures with more tailored costing as it becomes available, particularly in areas where recent historical data could not be obtained for this AM Plan.	recommended in future iterations of the AM Plan. This improvement activity is particularly relevant to assets at the extremes of size or complexity scales where the accuracy of extrapolated costs may be diminished.		
Asset Data Quality and Consistency	Perform CCTV assessments of Wastewater linear infrastructure to collect standardized, accurate condition data, and overwrite age-based condition data	Improved accuracy of state of local infrastructure data and lifecycle management projections. Additional data may be collected through the process to improve inventory completeness, inform risk, aid prioritization, and provide options for rehabilitation.	HIGH	In Progress

State of Infrastructure ($617.0 million)

This service area collects and controls stormwater from Belleville's drainage area. Stormwater is collected through structures such as catch basins, conveyed, and controlled by elements of the linear network and management facilities and released into the environment. It also operates and maintains stormwater assets in a state of good repair.

Stormwater assets include:
- Stormwater Management Linear Network and Appurtenances
- Stormwater Management Facilities including Management Ponds
- A Stormwater Pumping Station

Key business drivers at this time are quality and quantity control objectives, future population growth and associated infrastructure required and timing of growth.

The City's stormwater management assets are generally young compared to the other service area's buried pipe networks and associated infrastructure. While these assets are younger on average, their high replacement values will require considerable planning for replacement and rehabilitation activities to avoid high costs in the medium to long term.
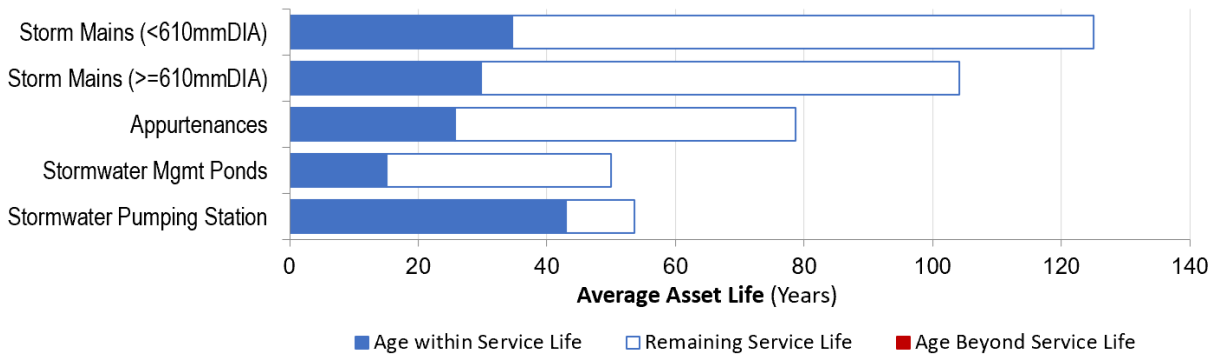
The City's stormwater assets are generally in good to very good condition, as assessed based predominantly on asset ages compared to expected useful lives.

Levels of Service

Service Attribute	Community Levels of Service		Technical Levels of Service					
	Statements	Current Performance	Performance Indicators	Performance				Data Confidence
				2021	2022	2023		
Capacity	Stormwater system protects the municipality from flooding	Good	% of properties in municipality resilient to a 100-year storm (O.Reg.588)	94.6%	94.6%	TBD*	G	Low
			% of the municipal stormwater management system resilient to a 5-year storm (O.Reg.588)	99.25%	99.25%	TBD*	G	Low
Function	Stormwater system protects the municipality from flooding	Good	Mass of solid waste captured by stormwater catch basin inserts annually (kg)		5.1	409.4	G	Very High
Reliability & Quality	Keep assets in a state of good repair	Very Good	% of stormwater system with very high-risk exposure rating			0%	VG	Mod
			% of stormwater with high-risk exposure rating			7%	VG	Mod
	Provide responsive maintenance	Future	% of major maintenance projects such as rehabilitations, rebuilds or expansions communicated to nearby residents or widely			Future		
	Provide responsive operations	Future	% of service requests completed within their prescribed timeline			Future		
Affordability	City services are adequately funded	Very Good	Ratio of 10-year renewal budget to needs			89%	VG	Low
	City services are sustainable in the long term	Future	% Average annual renewal rate (reinvested or put into reserve) for Stormwater Linear System			Future		
			% Average annual renewal rate (reinvested or put into reserve) for Stormwater Facilities			Future		

* Current Performance is based on 2022 performance where 2023 not available – a more reliable method for assessing performance is currently under investigation

Risk Assessment

The consequence of failure (CoF) was determined as outlined in the table to the right, by asset group. The likelihood of failure (LoF) was determined by the condition of the assets. The risk evaluation matrix below shows the results of the risk assessment.

Asset Group	CoF
Pumping Station (Cannifton Road)	5
Storm Mains >= 610 mmDIA, Ponds	4
Storm Mains < 610 mmDIA, Structures, Ditches, Swales, Fencing	3

Risk Evaluation Matrix

LoF						Risk Exposure	CRV($)	CRV(%)
5	$0.00	$0.00	$0.01	$0.00	$0.00	Very High	$0.00	0.0%
4	$0.00	$0.00	$5.72	$0.71	$0.00	High	$37.99	6.6%
3	$0.00	$0.00	$80.33	$31.55	$0.00	Moderate	$291.07	50.4%
2	$0.00	$0.00	$173.47	$37.26	$0.00	Low	$248.86	43.1%
1	$0.00	$0.00	$182.27	$66.58	$0.00	Very Low	$0.00	0.0%
	1	2	3	4	5		$577.92	100.0%

CoF

As no assets are in the highest criticality categories and nearly none are in very poor condition, overall asset risk in the stormwater portfolio was assessed to be within the low-moderate range.

Lifecycle Management

The following graphs provide the forecasted necessary lifecycle activities over each of the next 10 years to maintain current levels of service. Note that graphs are plotted using different vertical scales.

Growth and Upgrade Needs Forecast

Growth and upgrade needs are based on planned City growth.

Renewal Needs Forecast

Renewal needs are based on maintaining the current reliability levels of service, giving priority to the renewal of assets with higher risk ratings, consequently deferring the renewal of lower risk assets as necessary.

Operations and Maintenance Needs Forecast

The Operating needs forecast is based on the anticipated growth of the asset portfolio.

Available Funding, Shortfalls / Surpluses

The following table summarizes the City's needs forecasts for each lifecycle activity based on the analysis from the preceeding graphs and provides the estimated funding detemined as the average funding available over the past two years. Funding for operating and capital needs is sourced from tax levies.

Lifecycle Activity	10-Yr Avg Annual Needs Forecast (2024$M)	10-Yr Avg Annual Available Funding (2024$M)	10-Yr Avg Annual Shortfalls / Surplus (2024$M)	10-Yr Avg Annual Funding / Funding (%)
Growth & Upgrade	$2.74	$1.20	-$1.55	44%
Renewal	$1.70	$1.50	-$0.19	89%
Operations & Maintenance	$1.17	$0.72	-$0.45	61%
Totals	**$5.61**	**$3.41**	**-$2.20**	**61%**

Based on calculations to maintain current levels of service, Stormwater would require a 1.74% tax levy increase to close the 10 year funding gap immediately.

Plan Improvements and Monitoring

Improvement Area	Action	Outcome	Priority	Timeline
Asset Management Processes	Variation to consequences of failure (CoF) ratings within most linear stormwater infrastructure assets classes are based on size as a proxy for relative importance to the network, e.g. larger pipes carry greater volumes and pose larger threats to upstream areas should they fail. Conduct review of asset CoF ratings related to more precise asset or system attributes.	Improved accuracy of risk analysis which would enable more suitable prioritization of lifecycle activity planning	HIGH	Short Term
Asset Data Quality and Consistency	Investigate gaps associated with asset classes recently added to the asset register via separation from their parent asset, such as catch basins and leads, collecting appropriate data where available and resolving assumptions related to asset data.	Improved completeness of stormwater management asset inventory. Improved reliability of information maintained in AM database Improved confidence in input data and recommended solutions	MED	Short Term

Asset Data Quality and Consistency	Generally, the stormwater management service area uses estimated costs for asset renewal and replacement activities. Asset replacement values, such as those for stormwater ponds, are often based on a combination of staff input, past contracts, and industry standards, extrapolated to suit asset sizes or other categorizing variables as necessary. The City should continue to update these figures with more tailored costing as it becomes available, particularly in areas where recent historical data could not be obtained for this AM Plan.	Improved reliability of replacement and major rehabilitation activities recommended in future iterations of the AM Plan. This improvement activity is particularly relevant to assets at the extremes of size or complexity scales where the accuracy of extrapolated costs may be diminished.	MED	In Progress
Asset Data Quality and Consistency	Perform CCTV assessments of stormwater linear infrastructure where possible as well as continuing/ adapting stormwater pond inspections to collect accurate condition data and overwrite age-based condition data.	Improved accuracy of state of local infrastructure data and lifecycle management projections, additional data may be collected through the process to inform risk and lifecycle activity prioritization	HIGH	In Progress

State of Infrastructure ($204.0 million)

The City provides spaces and programs that foster community engagement and social interaction through recreational and educational programs.

Key business drivers at this time are uncertainty of future demand and aging infrastructure.

Recreation assets include:
- Quinte Sports and Wellness Center
- Operations Building
- Community Centers
- Pools

Many of the assets may be reaching the later stages of their useful lives and will require rehabilitation or replacement in the upcoming years.

The City's assets are generally in poor to fair condition, as assessed based on their conditon grading. The assets shown in poor and very poor "condition" are in the latter stages of their useful life.

Levels of Service

Service Attribute	Community Levels of Service		Technical Levels of Service					Data Confidence
	Statements	Current Performance	Performance Indicators	Performance				
				2021	2022	2023		
Capacity	Provide access to recreational facilities for the whole community	**Fair**	Ice pads per 15,000 residents	1.25	1.0	1.0	F	Mod
			Gymnasiums per 36,000 residents	1.5	1.5	1.5	F	Low
			Splash pads per 2,500 children (ages 0-9)	1.4	1.4	1.4	VG	Low
Function	City facilities support accessibility for all residents and staff	**Future**	% of facilities equipped with a fully compliant Universal Washroom	Future				
	City facilities support environmental sustainability	**Very Good**	Annual electrical consumption (kWh) of the corporation as reported for Regulation 25/23	15.4	15.1	TBD*	VG	Mod
	City facilities provide a safe environment for residents and staff	**Future**	# of incident reports documented annually	Future				
	City recreation fleet and equipment support environmental sustainability	**Very Poor**	% of Zambonis that are electric	0%	0%	0%	VP	High
Reliability & Quality	Keep assets in a state of good repair	**Poor**	% of recreation assets with very high-risk exposure rating			63%	VP	Mod
			% of recreation assets with high-risk exposure rating			24%	G	Mod
			% of facility roofs with leakage per year	5%	3%	3%	VG	Mod
	Provide responsive maintenance	**Future**	% of outstanding maintenance Work Orders on an annual reporting basis	Future				
	Provide responsive operations	**Future**	% of outstanding operations Work Orders on an annual reporting basis	Future				
Affordability	City services are affordable	**Poor**	Ratio of 10-year renewal budget to needs			69%	P	Mod
	City services are sustainable in the long term	**Future**	% Average annual renewal rate (reinvested or put into reserve)	Future				

* Current Performance is based on 2022 performance where 2023 not available

Risk Assessment

The consequence of failure (CoF) was determined as outlined in the table to the right, by asset group. The likelihood of failure (LoF) was determined by the condition of the assets. The risk evaluation matrix below shows the results of the risk assessment.

Asset Group	CoF
Recreation Facilities	3
Recreation IT	5

Risk Evaluation Matrix

LoF						Risk Exposure	CRV($)	CRV(%)
5	$0.00	$0.31	$0.89	$3.14	$3.07	Very High	$60.94	30.4%
4	$0.00	$0.00	$4.40	$13.79	$54.73	High	$58.33	29.1%
3	$0.00	$0.18	$4.85	$7.36	$31.89	Moderate	$80.17	40.0%
2	$0.00	$0.94	$3.43	$10.25	$61.15	Low	$0.94	0.5%
1	$0.00	$0.00	$0.00	$0.00	$0.00	Very Low	$0.00	0.0%
	1	2	3	4	5		$200.38	100.0%
			CoF					

Assets in the Very High or High risk exposure categories include assets in the high CoF group that are in very poor or poor condition, including elements of facilities deemed high consequence of failure due to health and safety impacts.

Lifecycle Management

The following graphs provide the forecast needed lifecycle activities over each of the next 10 years to maintain current levels of service.

Growth and Upgrade Needs Forecast

Growth and upgrade needs are based on planned City growth.

Renewal Needs Forecast

Renewal needs are based on maintaining the current reliability levels of service, giving priority to the renewal of assets with higher risk ratings, consequently deferring the renewal of lower risk assets as necessary.

Operations and Maintenance Needs Forecast

The Operating needs forecast is based on the anticipated growth of the asset portfolio.

Available Funding, Shortfalls / Surpluses

The following table summarizes the City's needs forecasts for each lifecycle activity based on the analysis from the preceeding graphs and provides the estimated funding detemined as the average funding available over the past two years. Funding for operating and capital needs is sourced from tax levies and user fees.

Lifecycle Activity	10-Yr Avg Annual Needs Forecast (2024$M)	10-Yr Avg Annual Available Funding (2024$M)	10-Yr Avg Annual Shortfalls / Surplus (2024$M)	10-Yr Avg Annual Funding / Funding (%)
Growth & Upgrade	$6.25	$4.93	-$1.32	79%
Renewal	$2.31	$1.60	-$0.71	69%
Operations & Maintenance	$16.35	$13.01	-$3.33	80%
Totals	**$24.90**	**$19.55**	**-$5.36**	**78%**

Based on calculations to maintain current levels of service, Recreation would require a 4.24% tax levy increase to close the 10 year funding gap immediately.

Plan Improvements and Monitoring

Improvement Area	Action	Outcome	Priority	Timeline
Asset Data Quality and Consistency	Conduct building condition assessments at least every five (5) years and integrate assessment information to inform capital planning and decision making.	Improved reliability of information maintained in AM database Improved confidence in input data and recommended solutions	HIGH	In Progress
Asset Information Systems	Integrate and adopt an Enterprise Asset Management software solution within the department to support work order management.	Improved confidence in input data and recommended solutions	MED	In Progress

State of Infrastructure ($22.3 million)

The City supports and promotes artistic and cultural initiatives within the community, fostering creativity, heritage preservation, and community engagement.

Key business drivers at this time are uncertainty of future demand and aging infrastructure.

Harbour assets include:
- Harbour Facilities
- Dock and Boat Launches
- Meyers Pier
- Boats and Trailers
- Fuel Tanks

Most of the assets are reaching the middle to later stages of their useful lives and will require rehabilitation or replacement in the upcoming years.
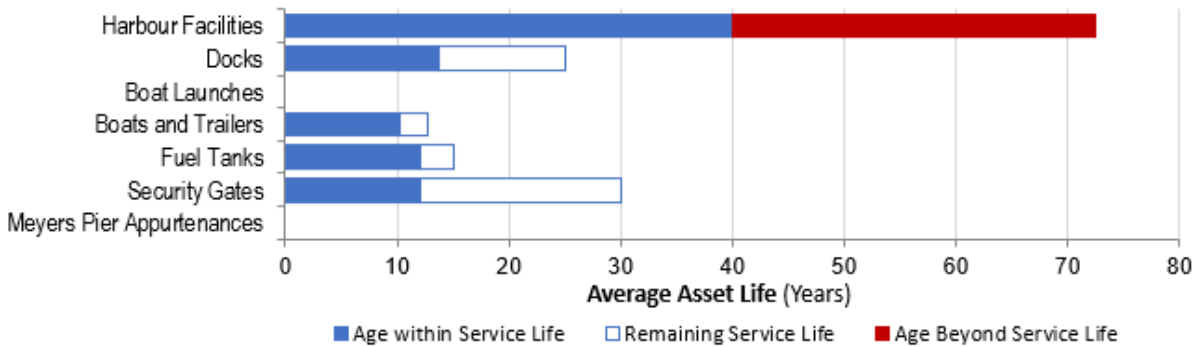
The City's harbour assets are generally in very poor to poor condition, as assessed based on their conditon grading. The assets shown in poor and very poor "condition" are in the latter stages of their useful life.

Levels of Service

Service Attribute	Community Levels of Service		Technical Levels of Service					
	Statements	Current Performance	Performance Indicators	Performance				Data Confidence
				2021	2022	2023		
Capacity	Provide adequate slips to allow for residents to utilize the waterfront	Fair	# on waiting list as maintained by the QSWC			20	F	Mod
	Provide docking for transient usage	Future	% of transient slips utilized in season vs. available for use		Future			
Function	City Harbours provide a safe environment for residents and staff	Future	# of incident reports documented annually		Future			
Reliability & Quality	Keep assets in a state of good repair	Poor	% of harbour assets with very high-risk exposure rating			71%	VP	High
			% of harbour assets with high-risk impact rating			17%	G	High
	Provide responsive maintenance	Very Good	% of outstanding maintenance Work Orders on an annual reporting basis		Future			
			# of months boat ramps provide access to the bay	6	6	6	VG	High
	Provide responsive operations	Very Good	% of outstanding operations Work Orders on an annual reporting basis		Future			
			% of annually budgeted fuel services revenue achieved	113%	84%	100%	VG	High
Affordability	City services are affordable	Very Poor	Ratio of 10-year renewal budget to needs			23%	VP	Mod
	City services are sustainable in the long term	Future	% Average annual renewal rate (reinvested or put into reserve)		Future			

Risk Assessment

The consequence of failure (CoF) was determined as outlined in the table to the right, by asset group. The likelihood of failure (LoF) was determined by the condition of the assets. The risk evaluation matrix below shows the results of the risk assessment.

Asset Group	CoF
Boat Launches	5
Docks	4
Facilities (Meyers Pier, Bay of Quinte Yacht Club)	3

Risk Evaluation Matrix

LoF						Risk Exposure	CRV($)	CRV(%)
5	$0.00	$0.04	$0.43	$10.52	$1.82	Very High	$13.98	70.9%
4	$0.00	$0.00	$0.25	$0.31	$1.64	High	$3.41	17.3%
3	$0.00	$0.00	$0.12	$1.78	$0.64	Moderate	$1.48	7.5%
2	$0.00	$0.00	$0.00	$1.32	$0.00	Low	$0.86	4.4%
1	$0.00	$0.00	$0.09	$0.77	$0.00	Very Low	$0.00	0.0%
	1	2	3	4	5		$19.73	100.0%

CoF

Assets in the Very High or High risk exposure categories include assets in the high CoF group that are in very poor or poor condition, including elements of facilities deemed high CoF due to health and safety impacts (i.e. structural elements on Meyers Pier).

Lifecycle Management

The following graphs provide the forecast needed lifecycle activities over each of the next 10 years to maintain current levels of service.

Growth and Upgrade Needs Forecast

Growth and upgrade needs are based on planned City growth.

Renewal Needs Forecast

Renewal needs are based on maintaining the current reliability levels of service, giving priority to the renewal of assets with higher risk ratings, consequently deferring the renewal of lower risk assets as necessary.

Operations and Maintenance Needs Forecast

The Operating needs forecast is based on the anticipated growth of the asset portfolio.

Available Funding, Shortfalls / Surpluses

The following table summarizes the City's neqeds forecasts for each lifecycle activity based on the analysis from the preceeding graphs and provides the estimated funding detemined as the average funding available over the past two years. Funding for operating and capital needs is sourced from user fees and tax levies.

Lifecycle Activity	10-Yr Avg Annual Needs Forecast (2024$M)	10-Yr Avg Annual Available Funding (2024$M)	10-Yr Avg Annual Shortfalls / Surplus (2024$M)	10-Yr Avg Annual Funding / Funding (%)
Growth & Upgrade	$0.01	$0.00	-$0.00	63%
Renewal	$1.75	$0.41	-$1.34	23%
Operations & Maintenance	$0.79	$1.04	$0.25	131%
Totals	**$2.55**	**$1.45**	**-$1.10**	**57%**

Based on calculations to maintain current levels of service, Harbours would require a 0.87% tax levy increase to close the 10 year funding gap immediately.

Plan Improvements and Monitoring

Improvement Area	Action	Outcome	Priority	Timeline
Asset Data Quality and Consistency	Collect condition data in alignment with the corporate condition rating system, where condition and age were not available (docks, launches)	Improved accuracy of state of local infrastructure and lifecycle management activities projections, increased completeness of risk matrix	MED	Short Term
Asset Management Processes	Formalize risk management processes and integrate within business planning and budgeting.	Improved asset management decision-making	MED	In Progress

State of Infrastructure ($7.7 million)

The City supports and promotes artistic and cultural initiatives within the community, fostering creativity, heritage preservation, and community engagement.

> Culture assets include:
> • Glanmore Museum
> • Pinnacle Playhouse

Key business drivers at this time are uncertainty of future demand and aging infrastructure.

The two facilities are beyond useful life.
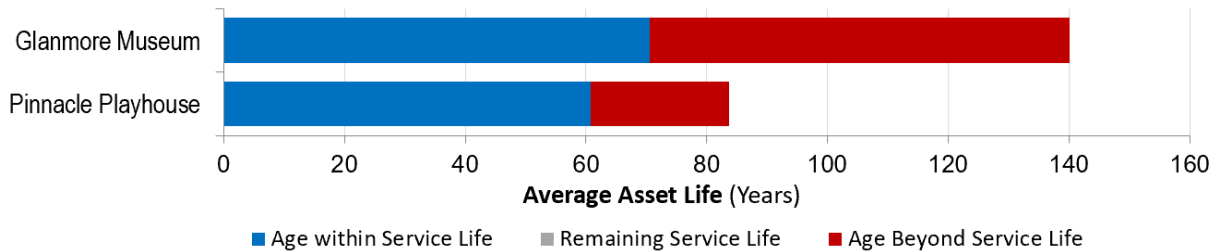
The City's Cultural assets are generally in fair to good condition, as assessed based on their conditon grading. The assets shown in poor and very poor "condition" are in the latter stages of their useful life, as assessed based on age and physical condition.

Levels of Service

Service Attribute	Community Levels of Service		Technical Levels of Service				
	Statements	**Current Performance**	**Performance Indicators**	**Performance**			**Data Confidence**
				2021	**2022**	**2023**	
Capacity	Provide adequate cultural facitlties capacity	**Future**				Future	
Function	City facilities support accessibility for all residents and staff	**Future**	% of facilities equipped with a fully compliant Universal Washroom			Future	
Reliability & Quality	Keep assets in a state of good repair	**Fair**	% of cultural assets with very high-risk exposure rating			15% P	Mod
			% of cultural assets with high-risk exposure rating			24% G	Mod
	Provide responsive maintenance	**Future**	% of outstanding maintenance Work Orders on an annual reporting basis			Future	
	Provide responsive operations	**Future**	% of outstanding operations Work Orders on an annual reporting basis			Future	
Affordability	City services are affordable	**Future**	Ratio of 10-year renewal budget to needs for Cultural Facilities			Future	
	City services are sustainable in the long term	**Future**	% Average annual renewal rate (reinvested or put into reserve) for Cultural Facilities			Future	

Risk Assessment

The consequence of failure (CoF) was determined as outlined in the table to the right, by asset group. The likelihood of failure (LoF) was determined by the condition of the assets. The risk evaluation matrix below shows the results of the risk assessment.

Asset Group	CoF
Museum, Playhouse	4

Risk Evaluation Matrix

LoF						Risk Exposure	CRV($)	CRV(%)
5	$0.00	$0.00	$0.00	$1.16	$0.00	Very High	$1.16	15.4%
4	$0.00	$0.00	$0.01	$0.07	$0.00	High	$1.77	23.6%
3	$0.00	$0.00	$0.90	$1.70	$0.00	Moderate	$4.59	61.0%
2	$0.00	$0.00	$1.06	$2.63	$0.00	Low	$0.00	0.0%
1	$0.00	$0.00	$0.00	$0.00	$0.00	Very Low	$0.00	0.0%
	1	2	3	4	5		$7.53	100.0%

CoF

Assets in the Very High or High risk exposure categories include assets in the high CoF group that are in very poor or poor condition, including elements of facilities deemed high consequence of failure due to health and safety impacts.

Lifecycle Management

The following graphs provide the forecast needed lifecycle activities over each of the next 10 years to maintain current levels of service.

Growth and Upgrade Needs Forecast

Growth and upgrade needs are based on forecast population growth and are minimal.

Renewal Needs Forecast

Renewal needs are based on maintaining the current reliability levels of service, giving priority to the renewal of assets with higher risk ratings, consequently deferring the renewal of lower risk assets as necessary.

Operations and Maintenance Needs Forecast

The Operating needs forecast is based on the anticipated growth of the asset portfolio.

Available Funding, Shortfalls / Surpluses

The following table summarizes the City's needs forecasts for each lifecycle activity based on the analysis from the preceeding graphs and provides the estimated funding detemined as the average funding available over the past two years. Funding for operating and capital needs is sourced from tax levies and user fees.

Lifecycle Activity	10-Yr Avg Annual Needs Forecast (2024$M)	10-Yr Avg Annual Available Funding (2024$M)	10-Yr Avg Annual Shortfalls / Surplus (2024$M)	10-Yr Avg Annual Funding / Funding (%)
Growth & Upgrade	$0.11	$0.39	$0.28	370%
Renewal	$0.18	$0.00	-$0.18	0%
Operations & Maintenance	$0.77	$0.67	-$0.10	87%
Totals	**$1.05**	**$1.06**	**$0.01**	**101%**

Based on calculations to maintain current levels of service, Culture is adequately funded to cover the 10 year forecast.

Plan Improvements and Monitoring

Please refer to the 'All Facilities' section for facility related Plan Improvement and Monitoring details.

State of Infrastructure ($25.5 million)

The City supports and promotes artistic and cultural initiatives within the community, fostering creativity, heritage preservation, and community engagement.

Key business drivers at this time are uncertainty of future demand and aging infrastructure.

Library assets include:
- Belleville Public Library
- Library IT

Many of the assets may be relatively new, others may be reaching the middle to later stages of their useful lives and will require rehabilitation or replacement in the upcoming years.
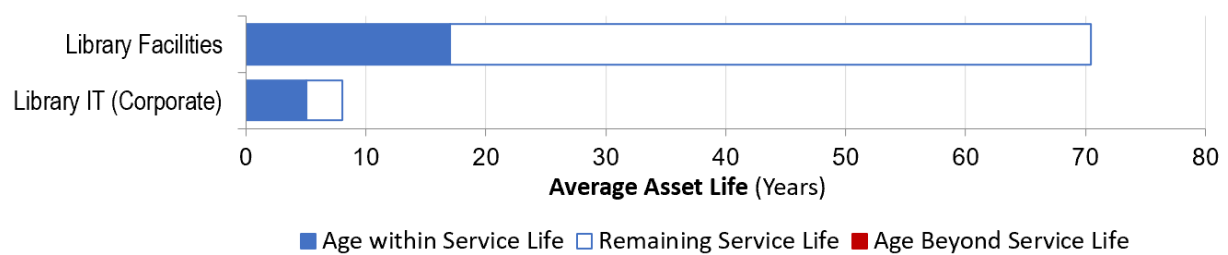
The City's Library assets are generally in poor to fair condition, as assessed based on their condition grading. The assets shown in poor and very poor "condition" are in the latter stages of their useful life.

Levels of Service

Service Attribute	Community Levels of Service		Technical Levels of Service				
	Statements	Current Performance	Performance Indicators	Performance			Data Confidence
				2021	2022	2023	
Capacity	Provide adequate library facitlties capacity	**Future**			Future		
Function	City facilities support accessibility for all residents and staff	**Future**	% of facilities equipped with a fully compliant Universal Washroom		Future		
Reliability & Quality	Keep assets in a state of good repair	**Fair**	% of cultural assets with very high-risk exposure rating			3% G	Mod
			% of cultural assets with high-risk exposure rating			45% P	Mod
	Provide responsive maintenance	**Future**	% of outstanding maintenance Work Orders on an annual reporting basis		Future		
	Provide responsive operations	**Future**	% of outstanding operations Work Orders on an annual reporting basis		Future		
Affordability	City services are affordable	**Future**	Ratio of 10-year renewal budget to needs for Cultural Facilities		Future		
	City services are sustainable in the long term	**Future**	% Average annual renewal rate (reinvested or put into reserve) for Cultural Facilities		Future		

Risk Assessment

The consequence of failure (CoF) was determined as outlined in the table to the right, by asset group. The likelihood of failure (LoF) was determined by the condition of the assets. The risk evaluation matrix below shows the results of the risk assessment.

Asset Group	CoF
Library Facility	4
Library IT	4

Risk Evaluation Matrix

LoF	1	2	3	4	5		Risk Exposure	CRV($)	CRV(%)
5	$0.00	$0.00	$0.00	$0.77	$0.00		Very High	$0.77	3.0%
4	$0.00	$0.00	$0.05	$4.73	$0.00		High	$11.34	44.7%
3	$0.00	$0.00	$1.31	$6.55	$0.00		Moderate	$3.94	15.5%
2	$0.00	$0.00	$0.58	$2.05	$0.00		Low	$9.30	36.7%
1	$0.00	$0.00	$0.00	$9.30	$0.00		Very Low	$0.00	0.0%
	1	2	3	4	5			$25.34	100.0%

CoF

Assets in the Very High or High risk exposure categories include assets in the high CoF group that are in very poor or poor condition, including elements of facilities deemed high consequence of failure due to health and safety impacts.

Lifecycle Management

The following graphs provide the forecast needed lifecycle activities over each of the next 10 years to maintain current levels of service.

Growth and Upgrade Needs Forecast

Growth and upgrade needs are based on forecast population growth and are minimal.

Renewal Needs Forecast

Renewal needs are based on maintaining the current reliability levels of service, giving priority to the renewal of assets with higher risk ratings, consequently deferring the renewal of lower risk assets as necessary.

Operations and Maintenance Needs Forecast

The Operating needs forecast is based on the anticipated growth of the asset portfolio.

Available Funding, Shortfalls / Surpluses

The following table summarizes the City's needs forecasts for each lifecycle activity based on the analysis from the preceeding graphs and provides the estimated funding detemined as the average funding available over the past two years. Funding for operating and capital needs is sourced from tax levies and user fees.

Lifecycle Activity	10-Yr Avg Annual Needs Forecast (2024$M)	10-Yr Avg Annual Available Funding (2024$M)	10-Yr Avg Annual Shortfalls / Surplus (2024$M)	10-Yr Avg Annual Funding / Funding (%)
Growth & Upgrade	$0.35	$0.03	-$0.32	9%
Renewal	$0.24	$0.06	-$0.18	25%
Operations & Maintenance	$2.94	$2.73	-$0.21	93%
Totals	**$3.52**	**$2.82**	**-$0.70**	**80%**

Based on calculations to maintain current levels of service, Library services would require a 0.55% tax levy increase to close the 10 year funding gap immediately.

Plan Improvements and Monitoring

Improvement Area	Action	Outcome	Priority	Timeline
Asset Data Quality and Consistency	Collect further detailed inventories, particularly for Library equipment and specialties, as well as integrated Building Condition Assessment data into forecasting and state of local infrastructure once that information is collected	Improved inventory completeness and accuracy of state of local infrastructure and lifecycle management activities	HIGH	In Progress
Asset Management Processes	Utilize outcomes from the Library Strategic Plan to support future AM growth and upgrade needs.	Improved asset management decision-making	MED	In Progress

Facilities – ALL

State of Infrastructure ($924.8 million)

The following sheets provide the same age distribution and condition data for all City facilities, organized by Uniformat2 and by Program Area.
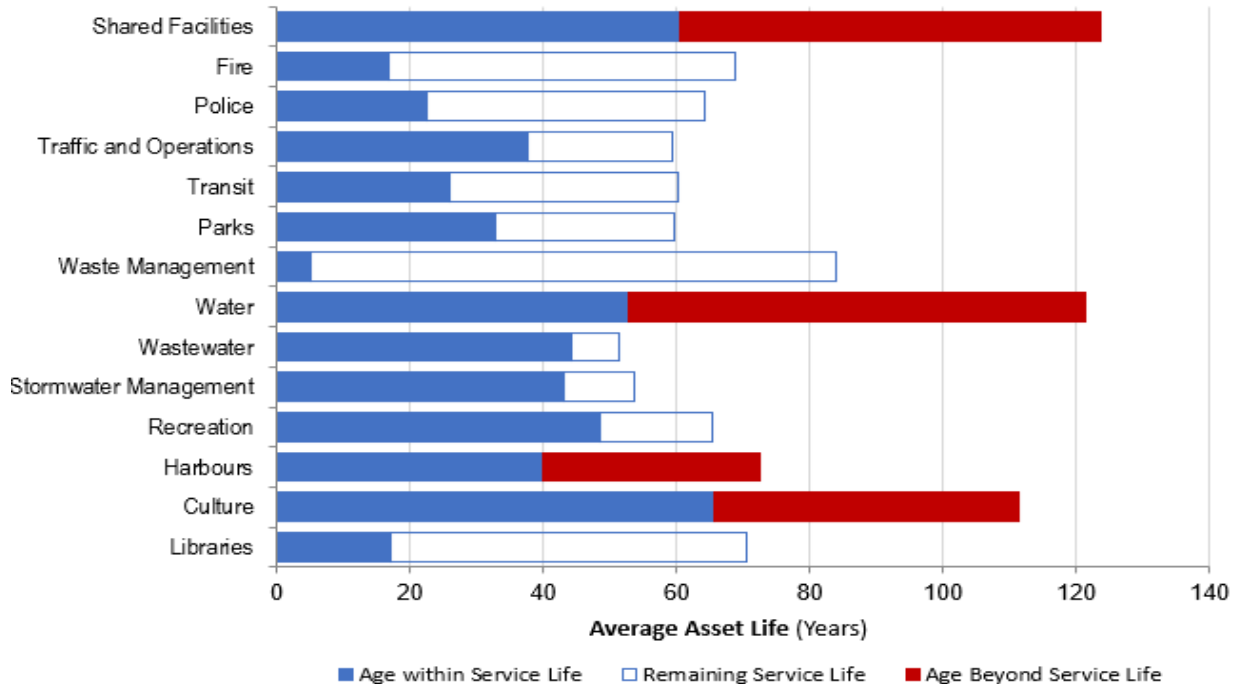
State of Infrastructure ($924.8 million)

Organized by Uniformat2 (Elements)

Organized by Program Area (Whole Facility)

Facilities – ALL

State of Infrastructure ($924.8 million)

Organized by Uniformat2 (Elements)

Organized by Program Area (Whole Facility)
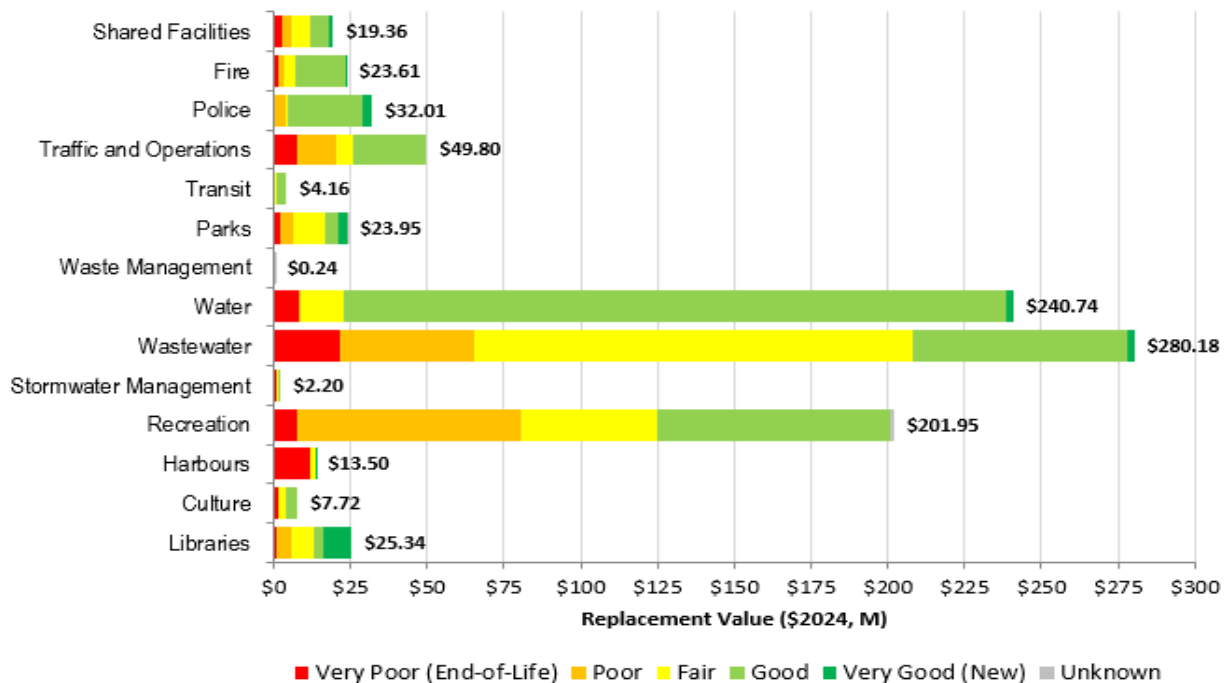
Risk Assessment

The consequence of failure (CoF) was determined as outlined in the table below, by Uniformat2 Element. The CoF of each facility is provided in the previous sections, by Program Area. The CoF of each element within each facility was determined as follows:

CoF(element within facility) = Squareroot [CoF(facility) * CoF(element)]

The likelihood of failure (LoF) was determined by the condition of the assets based on staff reported condition grade (currently being verified by building condition assessments).

Uniformat2 Element	CoF		Uniformat2 Element	CoF
A10 - Foundations	4		D40 - Fire Protection Services	5
A40 - Slabs-on-Grade	4		D50 - Electrical Services	5
A60 - Water & Gas Mitigation	5		D60 - Communications Services	4
B10 - Superstructure	5		D70 - Safety and Security Services	4
B20 - Exterior Vertical Enclosures	5		D80 - Building Automation	4
B30 - Roof	5		E10 - Equipment	4
C10 - Interior Construction	4		E20 - Furnishings	3
C20 - Interior Finishes	4		F10 - Special Construction	5
D10 - Conveying Systems	5		G20 - Site Features	5
D20 - Plumbing Services	5		G30 - Liquid & Gas Site Utilities	5
D30 - HVAC	5			

Risk Evaluation Matrix

LoF	1	2	3	4	5
5	$0.00	$0.50	$2.31	$29.81	$28.90
4	$0.00	$1.20	$13.96	$35.63	$97.95
3	$0.03	$2.18	$18.62	$104.44	$115.31
2	$0.15	$4.46	$22.20	$83.72	$336.20
1	$0.02	$0.75	$1.58	$13.88	$5.01

CoF →

Risk Exposure	CRV($)	CRV(%)
Very High	$156.66	17.0%
High	$271.66	29.6%
Moderate	$469.62	51.1%
Low	$19.95	2.2%
Very Low	$0.92	0.1%
	$918.81	100.0%

Assets in the Very High or High risk exposure categories include HVAC systems, electrical systems, windows, roofing, and site features such as parking lots and walkways.

Plan Improvements and Monitoring

Improvement Area	Action	Outcome	Priority	Timeline
Asset Data Quality and Consistency	Complete Building Condition Assessments across the entire facility portfolio to populate a detailed and accurate inventory of assets including up to date replacement values, conditions, ages, and renewal recommendations with costs and timelines	Substantial increase to data quality and confidence in state of local infrastructure and lifecycle management activity forecast	HIGH	In Progress
Asset Management Processes	Establish formal Service Level Agreements (SLAs) with City customer groups for setting service level expectations.	Improved asset management decision-making	MED	Medium Term
Asset Management Processes	Formalize risk management processes and integrate within business planning and budgeting.	Improved asset management decision-making	MED	In Progress
Asset Information Systems	Integrate and adopt an Enterprise Asset Management software solution within the department to support data management and documentation, including work order management.	Improved confidence in input data and recommended solutions	HIGH	In Progress

8   O.REG. 588/17 COMMUNITY LOS DOCUMENTATION

8.1   Water Assets

Areas Connected to Municipal Water System

The City is responsible for the supply of safe drinking water to customers connected to its two drinking water systems. These systems are known as the Belleville Water System and the Point Anne Water System depicted in figure 8.1. Collectively these systems include two surface water treatment plants, four storage facilities, three pump stations, and two bulk water filling stations in addition to the buried water pipe networks and their appurtenances.

The Belleville Water System services the majority of customers within the municipality and extends throughout the area known as the Urban Serviced Area. The Point Anne system by contrast is much smaller and serves approximately 12 properties at present. The Point Anne Water System is distinct and separate from the Belleville system. In total, these municipal water systems service approximately 15,477 or about 79% of properties within the City. In most instances, the rural areas have not been connected to the municipal system.

Drinking water is also supplied to a small portion of Prince Edward County via a trunk main connected to the Bay Bridge. This service is provided by Belleville to the County in accordance with a Service Level Agreement between the two municipalities.

Figure 8-1 Areas Connected to the Belleville Drinking Water System
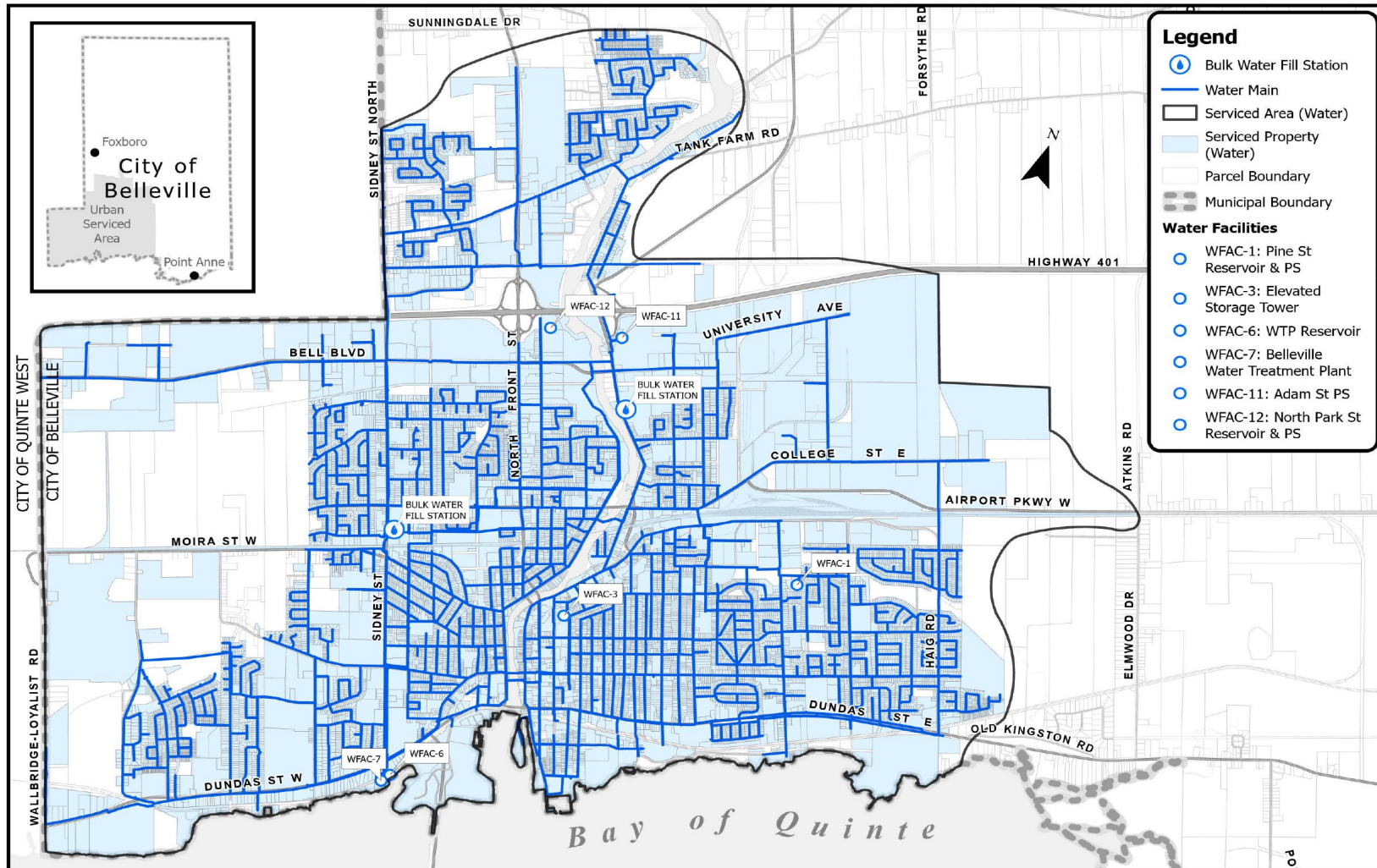
Belleville Water Distribution System

Figure 8-2 Properties Connected to the Point Anne Drinking Water System
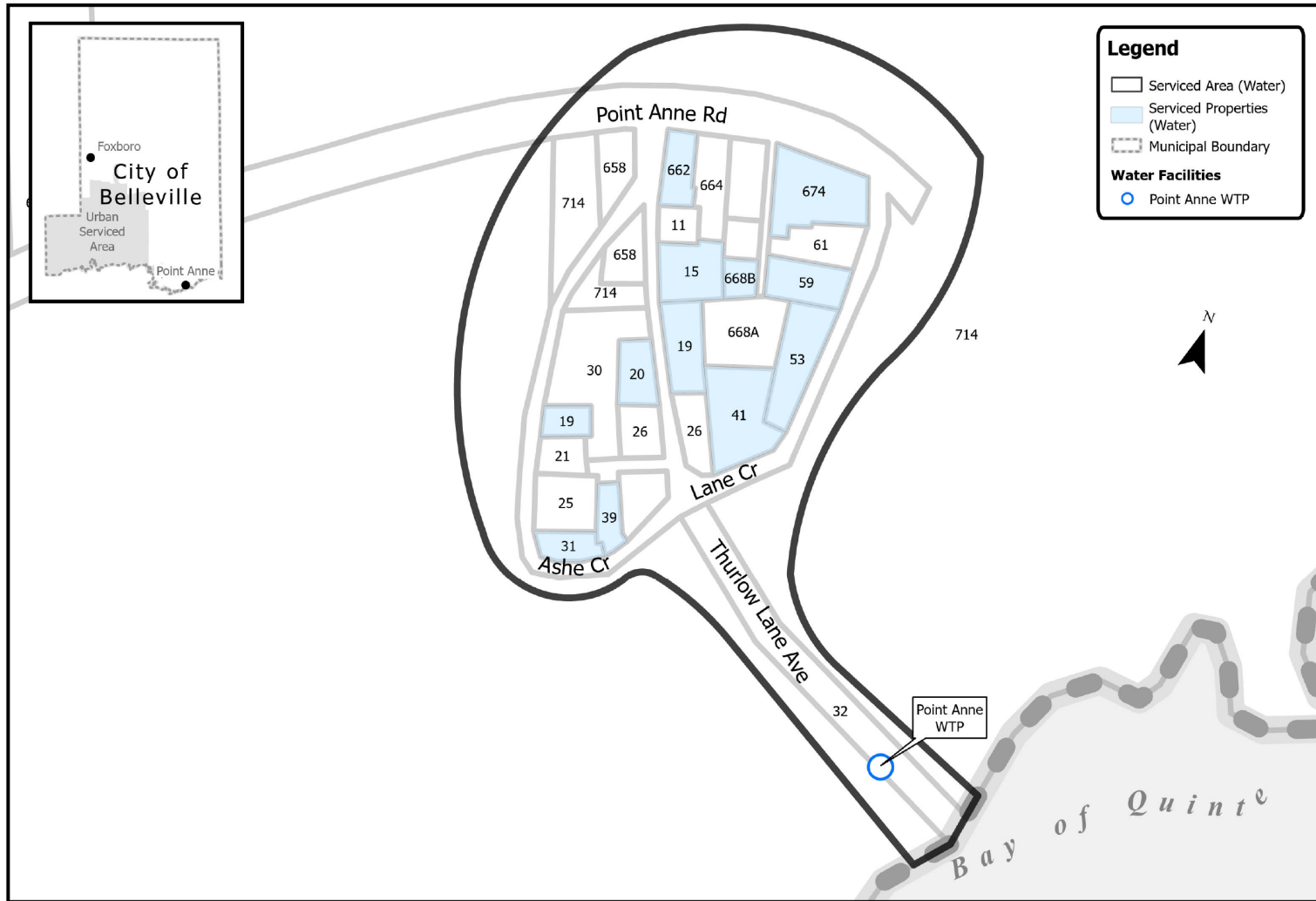
Point Anne Water Distribution System
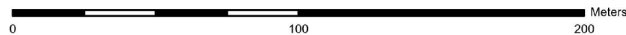
Areas with Fire Flow

All properties within the Urban Serviced Area and connected to the Belleville Drinking Water System are presumed to have fire flow available (See figure 8.1). This subset represents approximately 78.6% of all parcels within the municipal boundary and effectively 100% of all connected properties apart from those connected to the Point Anne Drinking Water System. Properties connected to the Point Anne Drinking Water System are not presumed to be protected by fire flow as this network is not equipped with fire hydrants.

Properties outside of the Urban Serviced area and not connected to the Belleville Drinking Water System are not presumed to have fire flow available. The City continues to conduct pressure testing and monitoring programs to increase its confidence in these figures.

Description of Boil Water Advisories and Service Interruptions

The Environmental Services Area, in collaboration with the Public Health Department, manages drinking water treatment, storage and distribution to ensure a safe water supply for its customers. In rare instances, boil water advisories are issued when conditions or concerns may adversely affect the quality or safety of the potable water supply. A boil water advisory is put in place to protect the community from potentially harmful organisms which may be in the water and may be detrimental to the health of the community.

Most boil water advisories are issued because the equipment and processes used to treat, store or distribute drinking water break down, require maintenance, or have been adversely affected by environmental conditions. Issues could include broken water mains, planned system maintenance, power failures or equipment problems. Also, extreme weather or heavy rains may cause the quality of surface or ground water sources to temporarily worsen, challenging the drinking water treatment system.

It is the experience of the City's Environmental Services department that boil water advisories are rare and seldom linked to asset degradation but arise instead from circumstances which are unpredictable or outside the City's control.

Service Interruptions (Breaks)

Water main breaks, unlike boil water advisories, are a regular occurrence within the City, attributable to such causes as asset degradation, improper installation, environmental factors, and third party damages. Main breaks and more significant leaks tend to occur most in the Winter months arising from issues caused or worsened by cold weather.

Annually the City typically responds to between 10 and 20 main breaks or leak repairs which require service interruption to an average of 20 properties over the course of an hour. In 2023, the City experienced approximately 14.17 connection-days due to watermain breaks compared to approximately 15,477 connected properties. The system does include sections of redundancy however the breaks in question typically occurred in regions where no redundancy existed. The City strives to respond to these issues rapidly and keep the affected members of the community as informed as possible during the course of repairs.

8.2 Wastewater Assets

### Areas Connected to Municipal Wastewater System

The City is responsible for the collection of connected customer wastewater and its conveyance to a treatment plant where it can be treated to meet federal and provincial standards before being released into the environment. The Belleville Wastewater Collection and Treatment Systems depicted in figure 8.3 are operated to provide this service. Collectively these systems include a Pollution Control Plant (PCP) also known as a Wastewater Treatment Plant, a groundwater pre-treatment facility, and several sewage pumping stations in addition to the buried pipe network and its appurtenances.

Like the Bellevile Water System, the Wastewater System serves most properties within the municipality and extends throughout the area known as the Urban Serviced Area. While coverage does not extend to all customers currently serviced by the Belleville Water System, there is near parity of connection between these two systems with some known exceptions within the urban serviced area. Currentlythere are approximatley 15,101 or about 77% of properties connected to the municipal wastewater system within the City. There are no sewer services within Point Anne Hamlet.

Figure 8-3 Areas Connected to Municipal Wastewater System
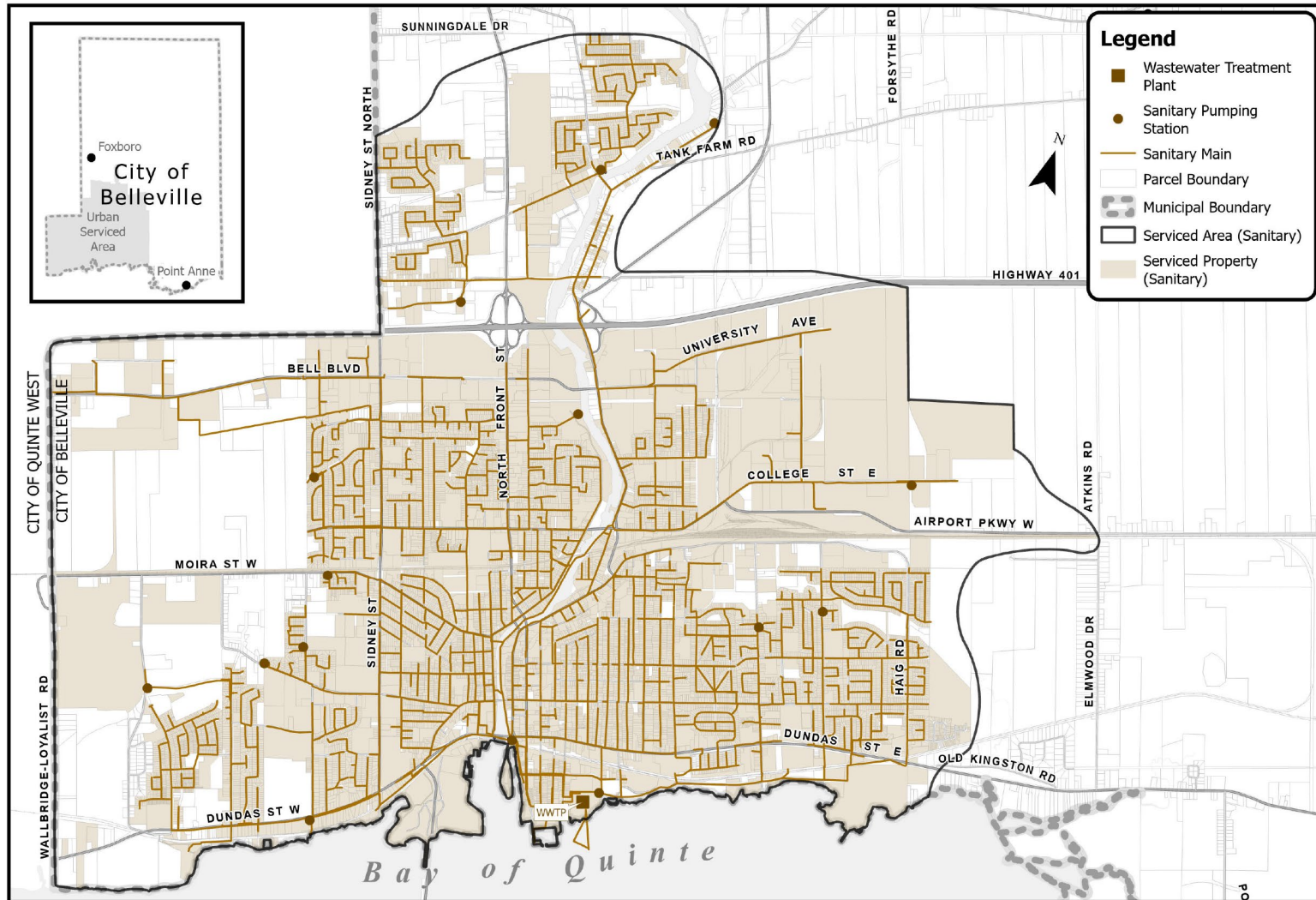
Belleville Sanitary Collection System
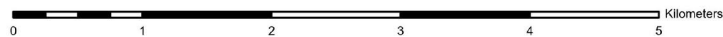
Overflow Structures in Place to Prevent Backups into Homes

Combined sewers in the municipal wastewater collection system may feature systems for designed overflow to manage wastewater volumes during storm events and prevent back ups into homes or other undesired areas such as pumping stations and streets. These are known as collection sewer overflows and may discharge some of this untreated volume into the natural environment or to alternative pathways in the collection network.

The City has identified three such combined or partially separated sewer overflow points in the collection system including pumping stations. One of these is located at the Dundas/Coleman Junction Structure and discharges to the Moira River via a gravity bypass pipe. The remaining two are associated with the Front Street Sewage Pumping Station, one of which discharges via a gravity sewer to the Moira River, the second discharges to the PCP inlet chambers via an interconnection force main connecting to the Moira Pressure Sewer pipe.

Combined Sewer Overflows Occurring in Habitable Areas or Beaches

Combined Sewer Overflows in the wastewater collection system occurring in habitable areas or beaches are rare but can occur. Historically these have occurred in streets where untreated sewage has backed up from a maintenance hole or similar structures due to high flow volumes driven by wet weather including precipitation and snow melt. These are not designed overflow points and as such have no flow monitoring devices by which to estimate volumes discharged. In the 2023 calendar year there were no such events.

Inflow and Infiltration (I/I)

Stormwater entry into Sanitary Sewers typically occurs by a combination of Inflow and Infiltration (I/I). Inflow occurs when stormwater enters the sanitary sewer systems at points of direct connection to the systems such as rain leaders, basement sump pumps, and foundation drains. Infiltration occurs when groundwater enters the sanitary sewer systems through cracks and/or leaky joints in the pipes, service connections or maintenance holes. As such infiltration can be increased dramatically in areas with aging, damaged or improperly installed infrastructure. I/I can also occur by design in areas where sanitary and storm conveyance systems were historically constructed intentionally as a combined system. The City is exploring the prevalence of these combined sewers throughout the municipality and is seeking to separate these services when and where possible.

Stormwater in the wastewater network increases flow to the sanitary collection system which is ultimately received by the Pollution Control Plant (PCP). These extraneous flows by extension increase the risk of sanitary sewage backups into homes, businesses, and the environment as well as the risk of upset to PCP processes including higher bypass frequency and volumes.

The City is currently in the process of an Inflow and Infiltration Study to identify and remedy some I/I issues, including separation of pipework, flow monitoring, CCTV inspections, and rehabilitation/ repair work.

Resilience of Sanitary Sewers to Stormwater Inflow and Infiltration

Sanitary sewers in the municipal Wastewater Collection System are designed in accordance with guidelines provided in the Ontario Water Resources Act and by extension the Ontario Design Guidelines for Sewage Works. These designs use historical, geographic, demographic and other forms of data to anticipate design flows including peak design flows. Consideration in these designs is given to known or suspected impacts for inflow and infiltration which are assessed based on appropriate storm return periods for the area. These design considerations may take the form of increased pipe sizes, greater grading of gravity sewers, improved pumping station capacities and the like to manage additional flows.

Like the combined sewer system, the sanitary sewer system features a number of designed overflow points. These are associated with four sewage pumping stations and may discharge into environment via the Moira River, Potters Creek or the Bay of Quinte.

Wastewater Treatment Effluent Discharge

All effluent discharged from a sewage treatment plant within the City of Belleville is discharged from the Pollution Control Plant (PCP) located at 131 St. Paul St. This facility receives raw wastewater collected from all points within the network and subjects it to a conventional activated sludge treatment process followed by chlorination and subsequent dechlorination prior to discharge into the Bay of Quinte. Typically >95% of flows through the PCP are treated in this manner. During periods of heavy flows brought on by considerable precipitation and/or snow melt conventional plant flow capacity may be exceeded, requiring some flows to be diverted via secondary bypass. Secondary bypass flows are diverted around the activated sludge process and proceed directly to the chlorination contact chambers until influent flow rate returns to a level within the normal range.

The City monitors all effluent leaving the Pollution Control Plant to ensure all legislative requirements are met. In the 2018 Wet Weather and Wastewater Servicing Master Plan, the future effluent objectives are outlined as well as the recommended level of treatment for the facility. Effluent objectives are established to support protection of the receiving natural environment as well as to meet current and future regulatory requirements.

8.3   Stormwater Assets

Areas Connected to the Stormwater Management Network and Extent of Protected from Flooding

The City is responsible for the collection and management of stormwater on municipal roadways and allowances. As the City expands so to do the extent of these systems, requiring ongoing expansion of the stormwater management network. Belleville manages stormwater runoff through an Environmental Compliance Approval (ECA) in accordance with specific rules and standards set by the Ministry of the Environment, Conservation and Parks. The current extent of the City's stormwater management network is shown in figures 8.4 and 8.5 below.

To lower the risk of flooding and protect water quality, the City uses a variety of practices and technologies to manage stormwater. Some assets used to provide these services include storm

sewers and catch basins, ditches and swales, culverts, oil and grit seperators, stormwater management ponds, and a stormwater pumping station.

The extent of flooding protection offered by these services requires additional investigation to determine performance with respect to levels of service required under O. Reg. 588/17. Design criteria for storm sewers has changed throughout the history of this network's construction increasing considerations for minimum design flows from 2 to 5 year storm return events. The City recognizes the expansion and evaluation of its stormwater service area's levels of service (LoS) as priority for improvement. Given the anticipated changes to operational requirements under the consolidated linear infrastructure ECA for the City's Stormwater Management System and the expected impacts of climate change, there are many opportunities for strategic alignment of these LoS.

Figure 8-4 Urban Areas Protected from Flooding
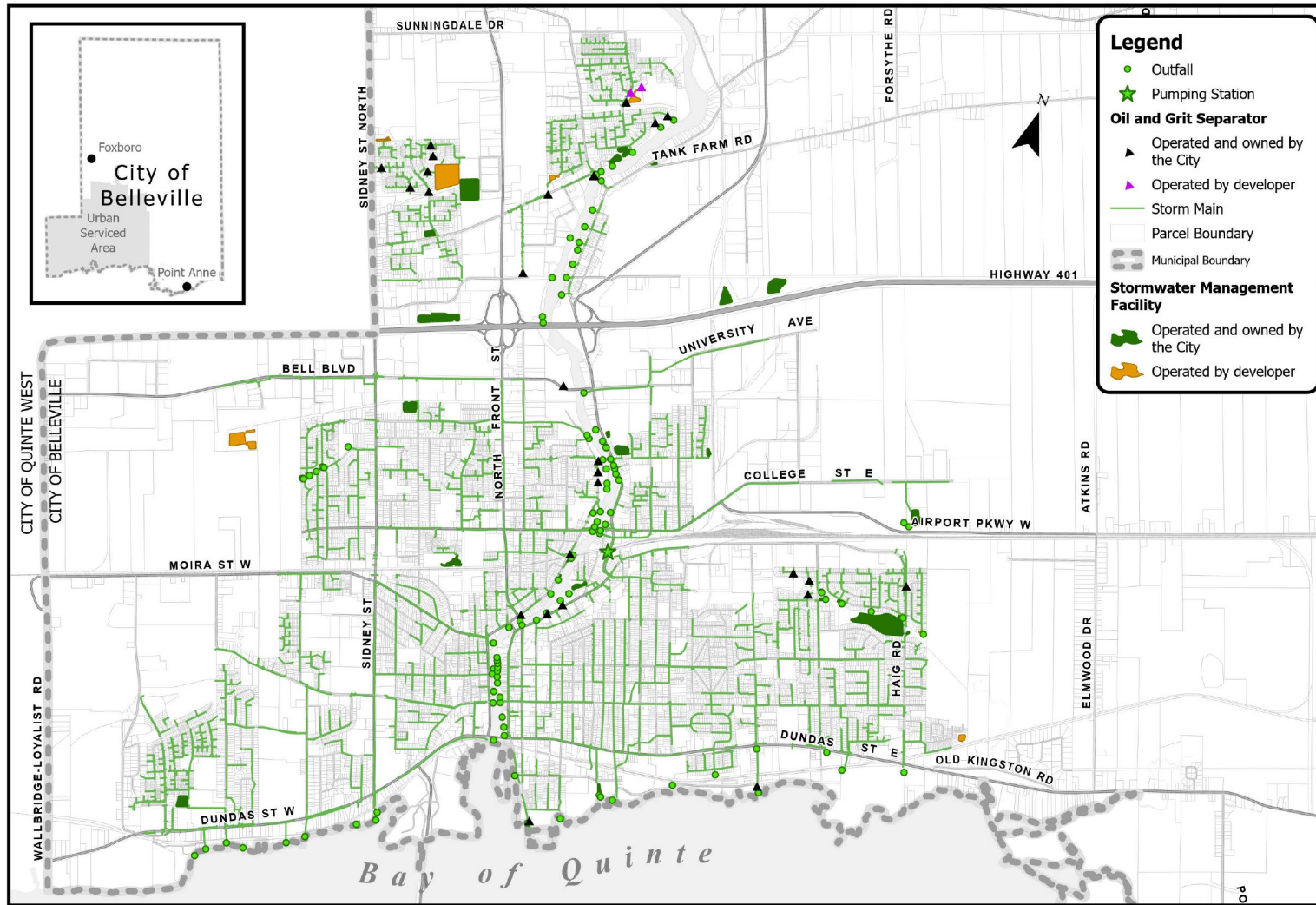
Belleville Storm Drainage System

Figure 8-5 Rural Areas Protected from Flooding

Belleville Storm Drainage System (Rural)

Produced: 2024-01-22
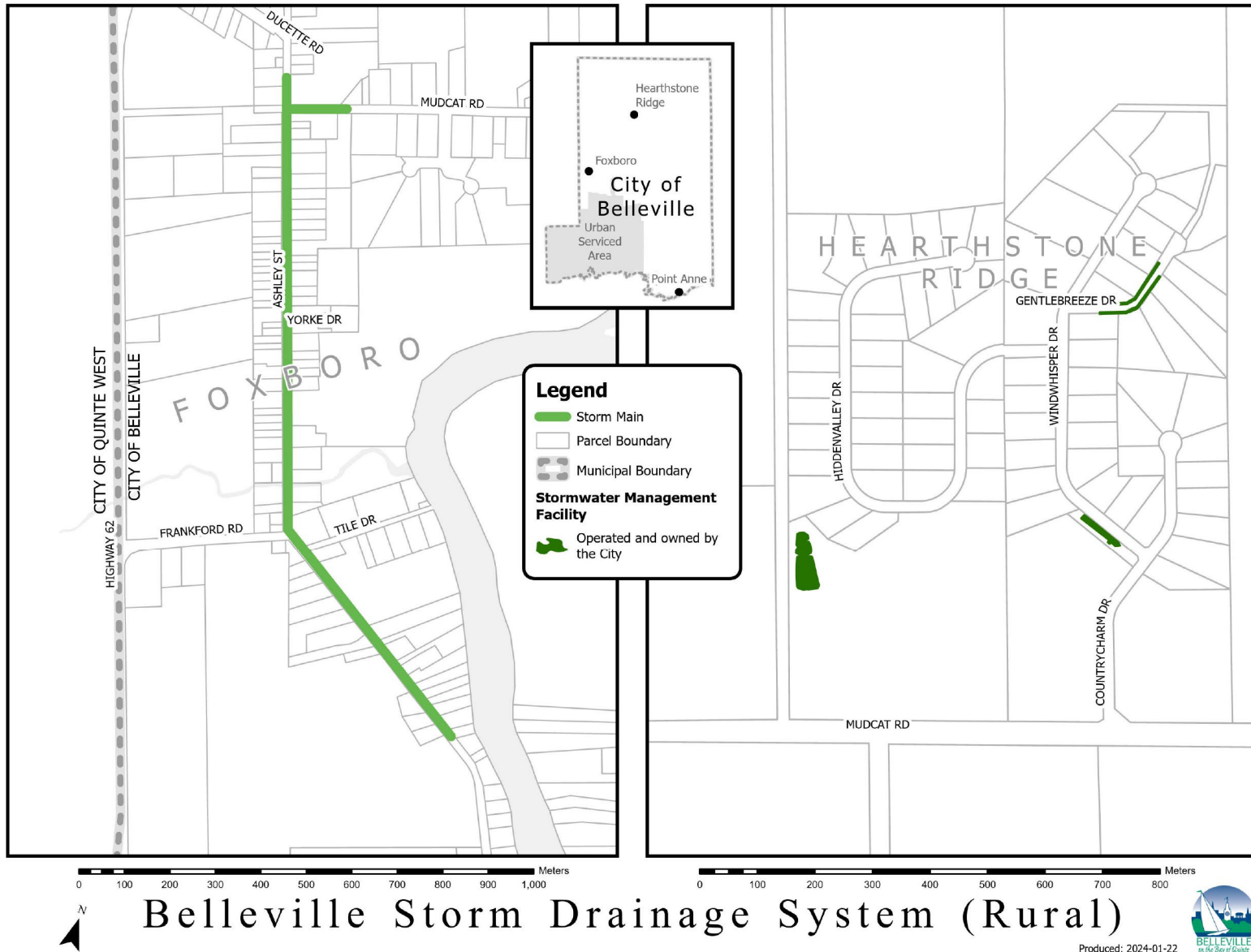
8.4   Roads

Road Network Description and its Connectivity

Belleville serves as an approximate halfway point between Toronto and Ottawa along the Highway 401 corridor. Belleville's road network is made up of highways, arterial roads, collector roads and local roads, each serving an integral function in the road network. Higher order roads such as arterials are primarily intended to serve a mobility function, while lower order roads provide access to adjacent properties. These roads provide connections to and within neighborhoods, urban areas, the City Centre, commercial sites, and industrial lands.

The City's Transportation Master Plan states that the city's road network is expected to provide Safe, equitable, and sustainable transportation system. A map of the City's is shown in

.

Figure 8-6 City of Belleville – Road Network
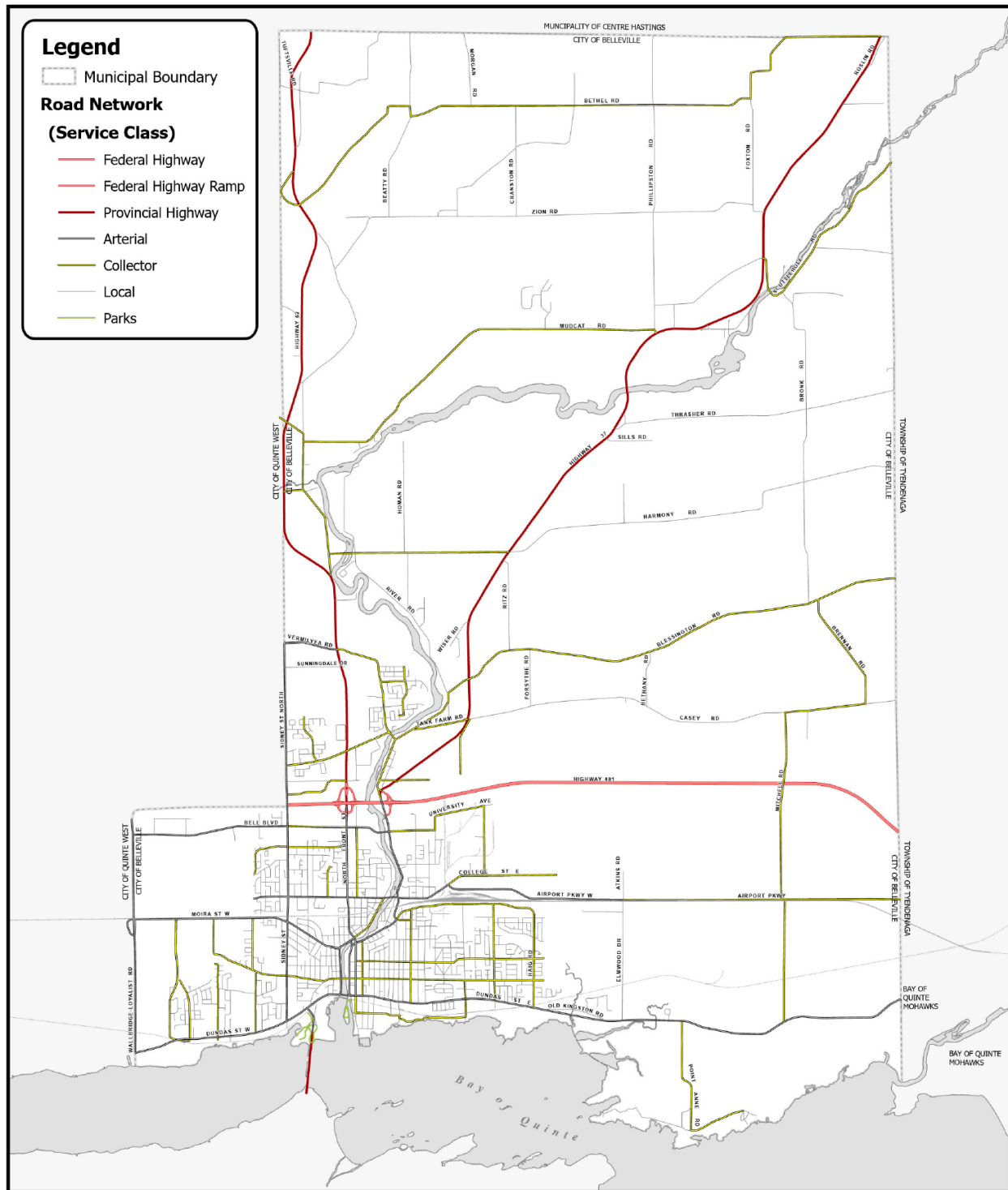
Belleville Road Network
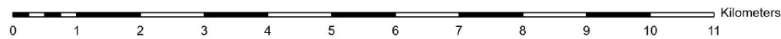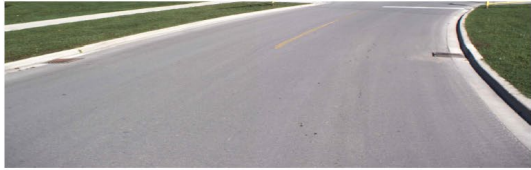
Figure 8-7 City of Belleville – Urban Road Network
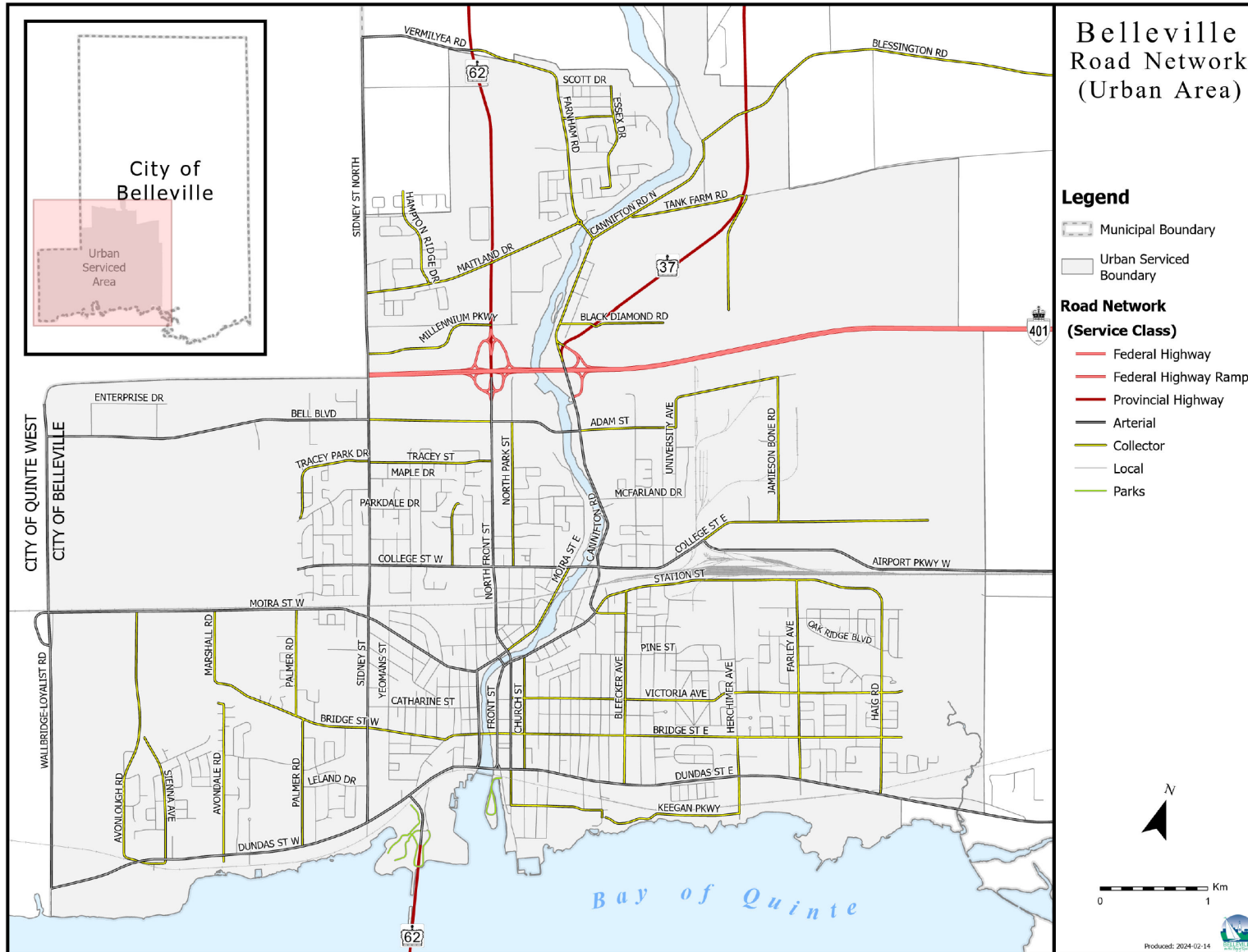
Different Levels of Road Class Pavement Condition

Pavement condition data is collected on the entire road network every three years through a Roads Needs Study. Data collected includes the type, extent and severity of distresses (cracks and rutting) and smoothness or ride comfort of the road. An overall PCI is calculated from all collected data and is used as input into the annual road resurfacing and reconstruction program. The index is scaled from zero to 100 and has been divided into ranges to assess condition. Examples of roads in each of the PCI rating categories are provided in Table 8-1.

Table 8-1 Road Condition Grades

Condition Grade	Urban Road Example
Very Good (PCI = 90 to 100)	
Good (PCI = 80 to 89)	
Fair (PCI = 65 to 79)	
Poor (PCI = 55 to 64)	
Very Poor (PCI < 55)	

8.5   Bridges and Culverts

Levels of Bridge and Structural Culvert Condition

The need for mobility requires that the City's roadway system be kept in a state of good repair. Structures are a vital part of this system. An effective structure management system involving the systematic inspection of the structures on the roadway network is required to maintain structures in a state of good repair. In accordance with O. Reg. 104/97 Standards for Bridges, the City conducts detailed inspections of all of its bridges every two years. All inspections are supervised by a trained Professional Engineer following the guidelines in Ontario's Structure Inspection Manual (OSIM) which sets standards for the visual inspection and condition rating of

bridges and their elements. The inspector assesses each bridge element and records the amount of the element in each of four condition states: Excellent, Good, Fair, and Poor. The inspector also records suspected performance deficiencies and recommends maintenance and renewal activities, with costs. The typical follow-up action for a suspected load carrying capacity deficiency would be to carry out a strength evaluation of the structure (or element) to determine the load carrying capacity in accordance with the requirements of the Canadian Highway Bridge Design Code.

An overall Bridge Condition Index (BCI) or Culvert Condition Index (CCI) is calculated from all collected data and informs the annual bridge and structural culvert rehabilitation and reconstruction program. The index is scaled from zero to 100 and has been divided into ranges to assess condition. The BCI is not used to rate or indicate the safety of a bridge or structural culvert. Any safety issues are immediately reported by the inspector to supervising engineers and maintenance crews. Condition grade examples are provided in Table 8-2.

Table 8-2 Bridge and Culvert Condition Grades

Condition Grade	Bridge Examples	Culvert Examples
Very Good BCI = >80 to 100		
Good BCI = >70 to 80		
Fair BCI = >60 to 70		
Poor BCI = >50 to 60		
Very Poor BCI = <50		