



Corporate Asset Management Plan

Proposed Levels of Service



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1 EXECUTIVE SUMMARY

1.1 Background

The City of Barrie (the City) provides a wide range of services to its residents, businesses and visitors. This Asset Management Plan (AM Plan) focuses on nine City services areas and the assets which support them:

- Transportation
- Transit
- Parks, Outdoor Recreation, and Natural Assets
- Stormwater
- Water
- Wastewater
- Facilities
- Fleet
- Barrie Collingwood Railway

This AM Plan identifies the proposed Levels of Service (LOS) for the City's assets over the next 10 years, along with their forecasted lifecycle activities and costs. Risks associated with the current funding level are identified and mitigations are recommended. This AM Plan aligns with the City's 2019 Strategic Asset Management Policy and proposed levels of service requirements of Ontario Regulation 588/17: Asset Management Planning for Municipal Infrastructure (O. Reg. 588/17) made under the Infrastructure for Jobs and Prosperity Act.

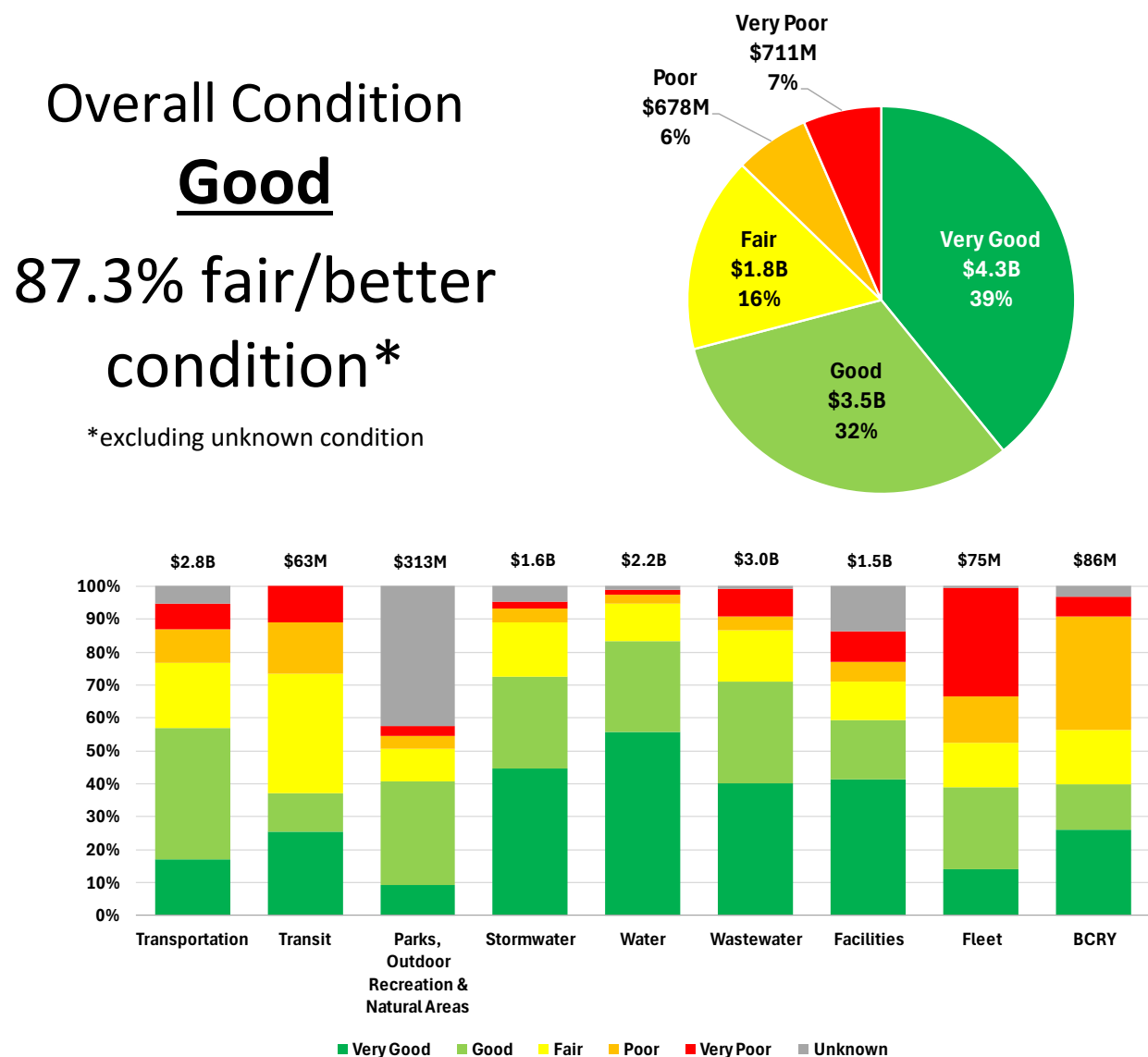
The AM Plan is intended to improve the City's ability to achieve its corporate goals and objectives in a way that best serves its customers. It provides a rational framework that uses data to inform decisions to manage costs, risks, and levels of service for the City's asset portfolio

1.2 State of Infrastructure

The estimated current replacement value of City assets is **\$11.5** billion. The current replacement value represents the estimated cost to replace assets today and is presented in 2025 dollars. Land is generally not included in the current replacement value of the asset inventory.

The City's assets are in good condition overall. The City conducts various assessments to evaluate the condition and maintenance needs of its infrastructure assets. These include formal condition assessments using standardized methodologies as well as staff-led inspections to identify maintenance and repair needs.

Figure 1-1 Condition Rating Summary (\$M/\$B)



Overall, 87.3% of the City's assets are in fair or better condition (excluding assets in unknown condition). Conversely, 6.5% (or \$711 million worth) of assets are in very poor condition. Assets in poor or very poor condition may require renewal investment to avoid increased maintenance costs or unexpected failures and are typically those that are prioritized in 10-year capital renewal programs and budget forecasts.

1.3 Levels of Service

Levels of Service (LOS) define the performance the City's assets are intended to deliver to its residents, businesses, and other stakeholders. Developing, monitoring and reporting on LOS are an integral part of an overall performance management program to improve service delivery and demonstrate accountability. The AM Plan establishes 64 technical performance measures to evaluate the capacity, function, and reliability of the City's assets to provide services to the

community. These measures will be updated and tracked annually to monitor trends and enable informed decisions about investments to support service levels.

‘Proposed levels of service’ or ‘proposed performance’ are defined as the levels of service or performance that the City proposes to achieve over the 10-year period from 2025-2034. Identifying proposed levels of service and performance are key requirements of O. Reg. 588/17 and must be included in municipal asset management plans by July 1 of 2025.

The proposed levels of service and performance identified in this AM Plan were developed through extensive consultation with technical staff from across the City representing each of the asset/service areas covered in this AM Plan and are based on consideration of available funding, service expectations, and risks.

1.4 Lifecycle Strategy

The lifecycle strategy in this AM Plan identifies the lifecycle activities and associated budgets needed to meet the proposed service levels over the next 10 years. Where currently planned budgets are not sufficient to meet the proposed LOS, investment gaps are identified.

An ‘investment gap’ is defined as a shortfall of the planned investment in the 10-Year Capital Plan compared to the forecasted needs to meet proposed service levels.

1.4.1 Growth

The investment needed to service growth is estimated at an average of \$146.7 million per year over the next 10 years. Barrie has been one of Canada’s fastest growing municipalities for the past several decades. Ensuring that this level of growth is managed in a sustainable, efficient, and financially responsible manner is central to the long-term health, prosperity, and well-being of the City and its residents. Through Master Plans and other studies, the City assesses options to best achieve the proposed service levels. Projects to address known capacity issues are scheduled in the City’s Capital Plan, such as new community centres and parks, widened roads, and new sewers and watermains in the Salem and Hewitt Secondary Plan Areas.

There is an estimated annual investment gap of approximately \$35 million to achieve the proposed LOS over the next 10 years. This is primarily related to parks, outdoor recreation, and natural areas and based on the service levels identified in the Outdoor Recreation Facilities Study and the Parkland Needs Assessment. These service levels and associated lifecycle strategies will be further refined through the development of the Parks Strategic Plan.

1.4.2 Upgrades

The upgrade need for City assets is estimated at an average of \$47.0 million per year over the next 10 years. Upgrade projects improve existing infrastructure by adding new features or enhancing functionality to meet updated standards, regulations, or evolving service expectations. These projects go beyond basic replacement by increasing the performance or service level of the asset. Functional enhancements currently planned over the next 10 years include upgrades at the Wastewater Treatment Facility, new and expanded stormwater infrastructure to reduce flood risks, and water distribution system improvements to improve

reliability and ensure adequate fire flow. There is no investment gap identified related to upgrade needs.

1.4.3 Renewal

The renewal need for City assets is estimated at an average of \$111.8 million per year over the next 10 years to meet proposed service levels. For most asset areas, the proposed service level is to maintain the current average condition of assets over the next 10 years. For some assets, improved condition is proposed based on recommendations from formal engineering reports or condition assessments such as those conducted for bridges, culverts, and stormwater management facilities.

Based on the 2025-2034 Capital plan, there is an annual average investment gap of \$21.2 million to meet the proposed levels of service. The investment gap represents renewal needs that exceed the overall funding available in the 10-year Capital Plan for renewal projects.

A substantial portion of the renewal investment gap is for water and wastewater vertical assets. Considerable progress has been made over the past few years to understand the renewal needs for water and wastewater facilities. Formal condition assessments continue to be completed on a number of facilities along with internal staff efforts focused on data collection for the wastewater treatment plant. As a result of this work, staff are recommending a renewal program in the 2026 capital plan. Continued work to improve the asset inventory, condition, and forecasting needs is an on-going improvement initiative. Key findings regarding the investment gaps are highlighted by asset area in Section 1.7.

Table 1-1 Renewal Needs Forecast and Investment Gap (\$M/year)

Asset Area	Needs Forecast for Proposed Service Levels (\$M/year)	2025-2034 Capital Plan Annual Investment (\$M/yr)	Average Annual Investment Gap (\$M/yr)	Proposed Condition over next 10 Years
Transportation	\$35.20	\$30.40	\$4.80	Maintain 
Transit	\$5.20	\$4.20	\$1.00	Maintain 
Parks, Outdoor Recreation & Natural Areas	\$5.70	\$4.70	\$1.00	Maintain 
Stormwater	\$7.50	\$7.10	\$0.40	Improve 
Water	Linear: \$10.0 Vertical: \$4.8	Linear: \$10.0 Vertical: \$3.0	\$1.80	Maintain 
Wastewater	Linear: \$4.9 Vertical: \$14.0	Linear: \$4.9 Vertical: \$2.5	\$11.50	Maintain 
Facilities	\$17.30	\$17.30	\$0	Improve 
Fleet	\$6.20	\$6.20	\$0	Improve 
Barrie Collingwood Railway	\$0.98	\$0.29	\$0.69	Improve 
Total	\$111.78	\$90.59	\$21.19	

1.4.4 Operations & Maintenance

The operating budget for asset-related operations and maintenance across all assets covered in this plan is \$168.3 million in 2025. The City is growing, and to account for operation and maintenance of new and expanded assets projected over the next 10 years, some operating budgets will need to increase in order to sustain service levels. These increases are estimated for the 10-year planning period and range from 1.2% for Stormwater to 4.7% for Wastewater over the next 10 years. These estimated increases are based on projected asset growth and do not include the impacts of changing economic conditions and inflation.

Operating budget pressures: Pressures on budgets for maintenance activities were noted primarily for Facilities; Parks, Outdoor Recreation, and Natural Areas; and Stormwater:

- Parks, Outdoor Recreation, and Natural Areas: The City's capacity to carry out necessary inspections and maintenance has been strained in recent years due to an operating budget that has not kept pace with asset portfolio growth and rising costs for materials and contracted services.
- Facilities: Similar operating budget pressures exist for facilities due to the increased costs of materials and contracted services.
- Stormwater: Sediment removal recommendations are based on bathymetric surveys completed on stormwater management facilities, and an investment gap of \$0.4 million per year is estimated based on the current funding in the operating budget.

1.5 Managing Risks

To manage risks associated with the investment gaps identified above, the City will continue to prioritize projects based on available funding and the criticality of projects to achieve service expectations, strategic priorities, and to address the risk of asset failure. Although most of the City's assets remain in fair or better condition, the City must continue to monitor condition and prioritize proactive planning and rational risk-based investments. Much of the City's infrastructure was constructed during recent periods of rapid growth and has not yet required significant reinvestment. As this substantial group of assets ages, the pressure on City resources for renewal will increase.

Staff continue to optimize the planning and coordination of capital projects and operating programs between departments to maximize existing resources. The City will also continue to identify funding opportunities through federal and provincial grants and explore potential partnerships and corporate sponsorships to raise external funds. Through continuous improvement and regular updates of asset management plans and related analysis, data, and asset performance monitoring, the City will improve its ability to proactively address and mitigate risks and ensure high levels of service for the community.

1.6 Limitations of Forecasts and Investment Gap Estimates

The performance forecasts and investment gap estimates in this AM Plan are based on currently available data and are expressed in current year dollars. Optimal timing of lifecycle activities can be improved by investment in data collection or expanding the condition assessment program, as was recently done for water and wastewater vertical infrastructure. Some forecasts are also based on older condition assessments which should be updated for

critical infrastructure to increase the accuracy of the renewal forecast. Data gaps were resolved where possible through consultation with City staff during development of this AM Plan.

Operating budget forecasts are limited to incorporating the impacts of expected growth in the asset portfolio. Understanding the quantitative costs associated with service level gaps will require more detailed tracking of specific operations and maintenance activities in the operating budget. Growth and upgrade service levels are based on currently available information; forecasts will be impacted by recommendations from on-going Master Plan updates, the future Parks Strategic Plan, and other studies.

1.7 Key Findings by Asset Area

Transportation

Key Findings

\$2.8B
Replacement
Value
Good
Overall
Condition

- The current average PCI across all roads is 71 (good condition) but based on projects in the 10-year Capital Plan, the PCI is projected to decline to 67.5 by 2034. **The additional road investment needed to maintain the PCI at 71 over the 10-year period is estimated at \$3.8 million per year.**
- A number of retaining walls have been identified that are at risk of failure, with an **estimated 20 retaining walls (valued at approximately \$10 million in total) needing renewal over the next 10 years.**
- **There is an investment gap of approximately \$350,000 annually for guiderails.** Addressing deficiencies requires dedicated funding that is not specifically allocated in the capital budget.

Transit

Key Findings

\$63M
Replacement
Value
Fair
Overall
Condition

- **There is an investment gap of approximately \$1.0 million per year for renewal based on the 10-year Capital Plan.** Purchase prices for new buses have been increasing, and this is putting pressure on the replacement budget.
- **The City is constructing a new Transit Terminal** that will improve service delivery and mobility for Barrie residents.

Parks, Outdoor Recreation, and Natural Areas

Key Findings

\$313M

Replacement
Value

Good

Overall
Condition

- There is an estimated **\$1.0 million per year investment gap for capital renewal** to maintain parks & outdoor recreation assets in a state of good repair.
- There is a **significant investment gap related to new baseball diamonds, soccer fields, and overall parkland to serve the City's growing population.** The Parks Strategic Plan will update service levels and identify the programming and upgrade needed to address this gap.
- Additional resources are needed for inspection and maintenance of park assets, as well as invasive species management for natural areas.

Stormwater

Key Findings

\$1.6B

Replacement
Value

Good

Overall
Condition

- The City's stormwater management facilities require an **additional \$0.4 million annual investment for sediment removal** to help mitigate risks of pollutant discharge into natural waterways.
- The City is **upgrading culverts to increase flood resiliency.** Critical areas are prioritized as funding is not available to upgrade all culverts.
- There is an **investment gap associated with replacing aging culverts over the next 10 years.** Deteriorated culverts present the risk of unplanned disruptions (sinkholes), which in turn force the need for costly reactive repairs.

Water

Key Findings

\$2.2B

Replacement
Value

Good

Overall
Condition

- **Watermains are generally in good condition with 97.2% in fair or better condition.** This supports reliable service with zero boil water advisories.
- There is an **investment gap associated with the renewal of vertical assets.** The City is continuing to implement condition assessments and capital programs to address this gap.
- There is an **investment gap for backup power upgrades and security improvements (fencing and cameras)** at booster pumping stations and water towers.

Wastewater

Key Findings

\$3.0B

Replacement
Value

Good

Overall
Condition

- **Sanitary sewers are generally in good condition with 90.3% in fair or better condition.** The City's sewer rehabilitation and maintenance programs support reliable service delivery and reduce sewer backups as well as costly infiltration of stormwater.
- **There is an investment gap associated with the renewal of vertical assets.** Condition assessments have been completed for a number of facilities and a capital renewal program is being developed to close this gap. The City must continue to evaluate and prioritize the remaining renewal needs.
- **The City is upgrading and expanding the Wastewater Treatment Facility** to meet Provincial regulations for phosphorus reduction, accommodate population growth, and improve aging components.

Facilities

Key Findings

\$1.5B

Replacement
Value

Good

Overall
Condition

- **The condition of facilities is proposed to improve over the next 10 years based on the 10-Year Capital Plan, but some unaddressed renewal needs remain.** Updated facility condition assessments are being implemented to support a cost-effective capital program that addresses the most critical needs.
- **Operating budgets are under pressure** due to increasing contract prices and rising utilities costs; this has resulted in less resources available for proactive maintenance and an increase in reactive repairs.
- **Planned new Recreation Facilities are essential to meet proposed service levels for the City's growing population.**

Fleet

Key Findings

\$75M

Replacement
Value

Fair

Overall
Condition

- **Approximately 33% of assets are past their optimal service life, resulting in increased repair costs, reduced reliability, and potential risks to service delivery.** 10% of fleet assets are classified as very high-risk, including critical firefighting apparatus.
- **A backlog of over \$24 million in fleet replacements has accumulated due to historical underinvestment.**
- **Continued funding of the Fleet Replacement Program is necessary to improve the reliability of the fleet, minimize spending on emergency repairs and address the backlog.**

Barrie Collingwood Railway

\$86M

Replacement
Value

Fair

Overall
Condition

Key Findings

- **The aging Lockhart Rd. rail bridge needs to be replaced and upgraded to address existing dimensional restrictions and accommodate future road widening.** Engineering studies are proposed to determine the ultimate design and optimal timing for this project.
- **The City has made progress improving the railway track infrastructure in recent years.** This work is proposed to continue to ensure safe and reliable railway operations.
- Additional investment is required to address aging grade crossing infrastructure as well as culverts crossing the railway tracks.

1.8 Recommendations for Continuous Improvement

The City of Barrie has made significant strides in asset management in recent years, evolving its practices to ensure sustainable service delivery and compliance with provincial regulations. Asset Management is a journey, and the City's practices are continuously improving. The City has previously developed individual asset management plans for each asset area, and this update consolidates all asset areas into one corporate AM Plan. The AM Plan is intended to be regularly updated through ongoing analysis and engagement. Recommendations for continuous improvement and future updates of this AM Plan include:

- Establish data standards to guide consistent collection of key asset information, including replacement value, asset age, and condition
- Consider expanding asset condition assessment programs to close data gaps and improve lifecycle activity forecasting, particularly for assets that are currently assessed based on age
- Develop a process to update level of service and performance metrics on a regular basis as part of annual reporting processes
- Incorporate recommendations from Master Plans including new or adjusted service levels
- Improve lifecycle models that reflect optimal lifecycle strategies supported with empirical data. Opportunities to start with include pavement management and fleet lifecycles.
- Conduct a detailed risk review to validate high risks and develop mitigation plans or capital projects for validated risks
- Enhance alignment between AM Plan recommendations and the annual budget cycle, ensuring that service levels and risk assessments inform investment and funding decisions

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2 INTRODUCTION

2.1 Background

The City of Barrie (the City) provides a wide range of services to its residents, businesses and visitors. These services include transportation, transit, parks, outdoor recreation and natural areas, stormwater, water, wastewater services and more, all of which are supported by the City's facilities and fleet of vehicles and equipment. This Asset Management Plan (AM Plan) identifies the proposed Levels of Service (LOS) for the City's assets over the next 10 years, along with their forecasted lifecycle activities and costs. Risks associated with the current funding level are identified and mitigations recommended. This AM Plan fulfils the requirements of the Ontario Regulation (O. Reg.) 588/17 Asset Management Planning for Municipal Infrastructure for July 2025.

2.2 Alignment with Regulatory Requirements

This AM Plan aligns with the City's 2019 Strategic Asset Management Policy and proposed levels of service requirements of O. Reg. 588/17 made under the Infrastructure for Jobs and Prosperity Act.

Figure 2-1 shows the required sections of the AM Plan down the left side. The columns to the right summarize O. Reg. 588/17 requirements for current levels of service by 2024 and proposed levels of service by 2025. This AM Plan meets O. Reg. 588/17, 2025 requirements for proposed levels of service.

Figure 2-1 Ontario Regulation 588/17 Requirements

	Current Levels of Service AMP July 2022 (core), 2024 (non-core)	Proposed Levels of Service AMP July 2025 (core, non-core)
State of Infrastructure (asset register)	• Inventory of assets, by category • Replacement cost of assets • Average age of assets • Condition of assets • Approach to assessing condition	• Inventory of assets, by category • Replacement cost of assets • Average age of assets • Condition of assets • Approach to assessing condition
Levels of Service (performance)	• Current LOS (performance) provided: - To community (qualitative metrics) - By assets (quantitative metrics) • For core assets as per Tables 1 to 5 in O.Reg. 588/17 (as minimum), and as established by City for other assets	• Proposed LOS (performance) for the next 10 years - For community (qualitative metrics) - By assets (quantitative metrics) • And why appropriate based on risk and affordability assessment
Lifecycle Management Strategy	• Population and employment forecasts per 2019 Growth Plan • Lifecycle activities needed for each of the next 10 years to: - Meet demand caused by growth or upgrade of existing assets - Maintain the current LOS at least cost and acceptable level of risk	• Population and employment forecasts per 2019 Growth Plan • Lifecycle activities needed for each of the next 10 years to: - Meet demand caused by growth or upgrade of existing assets - Provide proposed LOS at least cost and acceptable level of risk
Financing Strategy	• Cost of lifecycle activities needed for each of the next 10 years to: - Meet demand caused by growth or upgrade of existing assets - Maintain the current LOS	• Cost of lifecycle activities needed for each of the next 10 years to: - Meet demand caused by growth or upgrade of existing assets - Provide proposed LOS • Funding projected to be available to undertake needed lifecycle activities • For funding shortfalls which activities will not be funded and associated risks
Implementation and Key Assumptions	• Statement on how all State of Infrastructure background information and reports will be made available to the public	• The risks and mitigation strategies associated with implementing the AM Plan • Explanation of key assumptions underlying the AM Plan that have not previously been explained

2.3 Relationship with Other Municipal Documents

The AM Plan is a key tactical (10-year) planning document that relies on input from strategic planning activities and informs 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 levels of service that support goals in the 2022 to 2026 Council Strategic Plan and lifecycle management strategies intended to reduce the overall cost of asset ownership.

The AM Plan is aligned with other City planning documents such as the corporate Strategic Asset Management Policy, and the following documents:

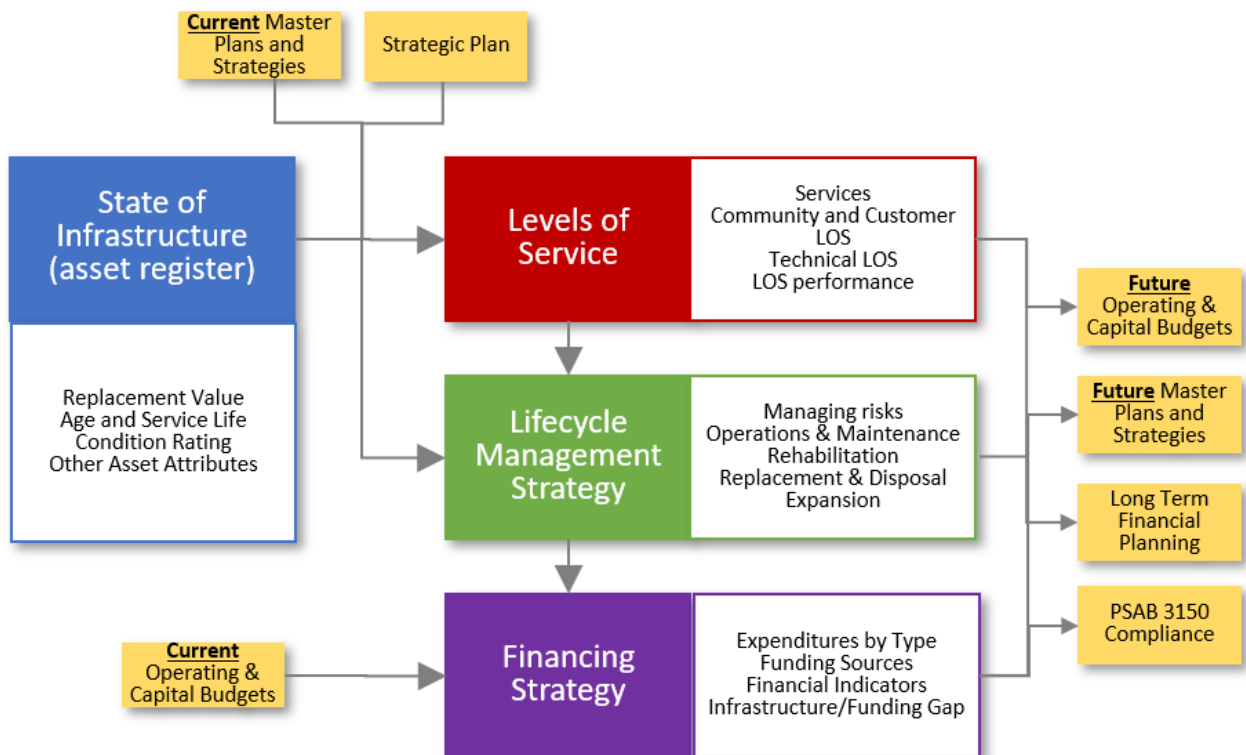
- Council's 2022 to 2026 Strategic Plan

- Official Plan
- Climate Change Adaptation Strategy
- Long-term Master Plans
- Long Range Financial Plan and Financial Policies Framework
- Finance Policies Framework
- Operating and Capital Plans
- Development Charge Background Study
- PSAB 3150 Compliance Process

Updates to the AM Plan will consider future plans and strategies such as Master Plans currently in development and the Corporate Net Zero Strategy, currently in development. The Net Zero Strategy will include actions to reduce the city's GHG emissions from facilities, fleet and transit vehicles.

The relationship of the AM Plan with other City documents is shown below which has been adapted from the Municipal Finance Officers' Association of Ontario (MFOA) AM Framework.

Figure 2-2 Relationship of AM Plan to Other City Documents



Key stakeholders of this AM Plan include:

- The City of Barrie community
- Internal Stakeholders

- City Council
- Senior City staff
- Departmental staff from Transportation; Water; Wastewater; Stormwater; Parks Planning; Parks, Forestry and Operations; Recreation Facilities; Corporate Facilities; Transit and Parking Strategy; Fleet; Corporate Asset Management; GIS; and Finance.

2.4 Purpose of the Plan

The City of Barrie is responsible for a broad portfolio of assets. The management of those assets is described through this AM Plan to support the City's strategic priorities and goals. These goals from the 2022 to 2026 Strategic Priorities include:

- Update and improve infrastructure
- Support the services the community needs while keeping tax increases low
- Financial stewardship which includes finding efficiencies and innovation
- Expand and maximize access to parks and recreation opportunities
- Support active transportation and pedestrian connections
- Implement climate action plans

This AM Plan is a medium to long range planning document that is used to support the City's goals by providing a rational strategy for proactively and effectively managing the City's assets. It provides a guide to understanding key items such as:

- The size, replacement value, and condition of the City's asset portfolio
- The current and proposed levels of service and performance
- The assets that will be needed in the future to support service delivery
- The planned activities to sustain current and future assets throughout their lifecycles at minimal cost, while managing risks
- The funding sources for planned lifecycle activities
- The steps to improve future iterations of the AM Plan.

This AM Plan is intended to improve the City of Barrie's ability to achieve its corporate goals and objectives in a way that best serves its customers. It provides a rational framework that enables systematic and repeatable processes to manage costs, risks, and levels of service for the City's asset portfolio.

2.5 AM Plan Scope

The information presented in the AM Plan is based on O. Reg. 588/17 requirements, the Guide for Municipal Asset Management Plans, originally issued by the Ontario Ministry of Infrastructure, and best in class asset management practices. Costs and replacement values in this AM Plan are estimated in 2025 dollars.

The AM Plan was developed by SLBC Inc. in collaboration with City staff through:

- Review of background materials available on the City's web site and provided by the City's project team including asset inventories, planning documents, and budgets
- Workshops with internal stakeholders
- Other interim meetings with the City's project team
- Numerous data and information transfers
- Review of interim outputs by the City's project team and other stakeholders, and incorporation of comments into the final AM Plan

This AM Plan focuses on nine (9) City asset areas which all assist in providing municipal services to the City's residential, commercial, industrial, and institutional customers.

Figure 2-3 AM Plan Asset Areas

Transportation	•This includes major transportation infrastructure assets including roads, bridges, traffic and roadside assets. The City maintains and upgrades these assets to ensure safe and efficient transportation for residents and businesses.
Transit	•This category includes assets needed for the delivery of safe, efficient, and accessible public transportation options for all residents and visitors.
Parks, Outdoor Recreation and Natural Areas	•This category includes parks, playgrounds, sportsfields and trails. These assets provide opportunities for leisure, sports, and community gatherings.
Stormwater	•The City's stormwater assets are critical to ensuring effective and sustainable stormwater management. This includes the maintenance, rehabilitation, and enhancement of infrastructure to protect the community from flooding, manage water quality, and support environmental stewardship.
Water	•The City's water services are a vital to providing safe, reliable, and high-quality water supply to residents and businesses. This involves the upkeep, optimization, and renewal of water infrastructure, including treatment plants, pipelines, reservoirs, and distribution systems.
Wastewater	•The City's wastewater services are critical for ensuring the efficient and safe collection and treatment of wastewater, while also protecting the environment and local water quality . This includes the maintenance and upgrading of infrastructure such as sewer lines, treatment plants, and pumping stations.
Facilities	•Public buildings owned and maintained by the City which include administrative offices, libraries, fire stations, recreation and community centres, and other municipal facilities.
Fleet	•Vehicles and equipment owned and operated by the City for maintenance, transportation, and emergency response.
Barrie Collingwood Railway (BCRY)	•This includes railway assets to maintain a safe and reliable railway system. Asset management efforts will focus on preserving infrastructure condition, minimizing service disruptions and ensuring long-term viability.

2.6 Organization of Document

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

Figure 2-4 AM Plan Contents

Chapter 2: Introduction:	• Outlines scope, background information, relationship to other municipal documents and plans, and applicable legislation.
Chapter 3: State of Infrastructure:	• Summarizes the inventory, valuation, condition, and remaining life of the assets in the inventory by category and asset type.
Chapter 4: Levels of Service:	• Defines levels of service through performance indicators and targets, and outlines current and proposed performance.
Chapter 5: Risk Management Strategy:	• Defines the framework for identifying critical assets and quantifies risk exposure to enable prioritization of lifecycle activities and optimization of lifecycle activities.
Chapter 6: Lifecycle Management Strategy:	• Summarizes the planned activities to manage the assets that will enable them to provide the required levels of service in a sustainable way, while managing risk at the lowest lifecycle cost.
Chapter 7: Financing Strategy:	• Summarizes the 10-year Capital Plan investment for the asset management strategies and any investment gaps.
Chapter 8: Risks associated with Implementing AM Plan	• Summarizes the risks from external factors that may impact implementing the AM Plan.
Chapter 9: Improvement Recommendations:	• Summarizes the next steps including improving future iterations of the AM Plan and monitoring of the AM Plan implementation progress.
Chapters 10 through 18:	Outlines all the chapters listed above in more detail for each individual asset area within the City

3 STATE OF INFRASTRUCTURE

This section of the AM Plan describes the City's asset inventory, and provides an overview of the valuation, age, and condition of its assets. Recommendations for the regular frequency of data collection and reporting are provided in the AM Plan Improvement and Monitoring section.

3.1 Asset Hierarchy and Inventory

Understanding the value, age, and condition of its assets is the starting point for a municipality to develop a plan for managing them. In this AM Plan, the City's asset inventory has been organized around the major service groups and program areas shown in Table 3-1.

3.2 Asset Valuation

The replacement value of an asset represents the expected cost to replace an asset to the same functional standard with a 'like for like' new version based on current market conditions and construction standards. For most asset types, replacement value is based on unit construction costs. For some asset types where unit construction costs were not available, the replacement values were calculated using historical costs indexed to Q4 of 2024 (projected) using the Non-Residential Building Construction Price Indices (NRBCPI) or Consumer Price Index (CPI). The replacement cost valuation represents the estimated cost to replace assets today and is presented in 2025 dollars. Land is generally not included in the current replacement costs of the asset inventory.

The estimated current replacement value of City assets is **\$11.5** billion, as outlined in Table 3-1. For a detailed summary of the assets covered in this AM Plan by Service Area, refer to Sections 10 through 18.

Table 3-1 Assets covered in AM Plan

Asset Area	Asset Categories	Replacement Value (\$2025, millions)	Replacement Value (%)
Transportation	Roads, Bridges, Traffic Assets, Streetlighting, Roadside Assets, Paid Public Parking	\$2,784	24.2%
Transit	Conventional Buses, TOD Buses, Specialized Buses, Electric Buses, Bus Shelters, Bus Stops	\$63	0.6%
Parks, Outdoor Recreation & Natural Areas	Active Recreation, Park Vehicular and Pedestrian Network, Other Parks and Recreation Assets, Maintained Parkland, Natural Areas	\$313	2.7%
Stormwater	Sewers, Culverts, Catch Basins, Maintenance Holes, Ditches, Stormwater Management Facilities (SWMF), Low Impact Development, Natural Features	\$1,552	13.5%
Water	<u>Linear</u> : Mains, Hydrants, Valves, Other Appurtenances <u>Vertical</u> : Surface Water Treatment Plant, Low Lift Pumping Station, Wells, Well Pumping Stations, Reservoirs, Water Towers, Booster Pumping Stations	\$2,209	19.2%
Wastewater	<u>Linear</u> : Mains, Laterals, Maintenance Holes <u>Vertical</u> : Pumping Stations, Wastewater Treatment Facility, Biosolids Storage Facility	\$2,956	25.7%
Facilities	Recreation and Culture, Corporate, Emergency, Environmental, Library, Transit, Parks, Marina	\$1,460	12.7%
Fleet	Vehicles (Light, Medium, Heavy-Duty, Firefighting), Equipment (Trailers, Light, Medium, Heavy)	\$75	0.7%
Barrie-Collingwood Railway (BCRY)	Tracks, Turnouts, Grade Crossings, Bridges, Culverts, Railway Yard, Maintenance Facilities, Ditches	\$86	0.7%
TOTAL		\$11,497	100.0%

3.3 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. For performance on levels of service, refer to Section 4.

Understanding an asset’s remaining life and current condition informs the timing of required lifecycle activities to maintain quality and reliability-related service levels. Using observed asset condition through inspection programs provides a higher degree of confidence in the state of the assets, more than what is provided in a strictly age-based analysis. Observed conditions are used in this AM Plan where such data is available. When observed condition data is not available, the remaining life is determined by estimating a useful life for each asset and comparing this value to its age (if construction or installation year data is available).

Condition Assessment Methodologies

- **Facility Condition Assessments:** Evaluations of the physical state of buildings to identify maintenance needs, potential repairs, and overall structural integrity.
- **Road Needs Assessments:** Evaluations of road conditions to determine maintenance, repair, and replacement priorities for ensuring safe and efficient transportation routes (described further in Section 8).
- **OSIM Inspections for Bridges & Culverts:** Ontario Structure Inspection Manual (OSIM) inspections assess the structural condition of bridges, culverts, and retaining walls to ensure safety and longevity.
- **CCTV Inspections for Sewers:** The use of cameras to inspect the interior of sewer and main pipelines, identifying blockages, damage, or deterioration for targeted maintenance and repairs.
- **Staff Reported Condition:** Informal evaluations by City staff of the physical state of an asset to identify maintenance needs or overall condition.

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 roads, bridges, structural culverts and other critical transportation infrastructure. In addition, City facilities undergo regular condition assessments to identify deficiencies and recommend repair and replacement of building elements.

To enable comparison of condition and condition trends over time between different asset types, a generic condition grading scale is 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 3-2 Five-Point Condition Grading System

Condition	Condition Criteria
Very Good	- Asset is physically sound and is performing its function as originally intended. - Required maintenance costs are well within standards and norms. - Typically, asset is new or recently rehabilitated.
Good	- Asset is physically sound and is performing its function as originally intended. - Required maintenance costs are within acceptable standards and norms but are increasing. - Typically, asset has been used for some time but is within mid-stage of its expected life.
Fair	- Asset is showing signs of deterioration and/or is performing at a lower level than originally intended. - Some components of the asset are becoming physically deficient. - Required maintenance costs exceed acceptable standards and norms and are increasing. - Typically, asset has been used for a long time and is within the later stage of its expected life.
Poor	- Asset is showing significant signs of deterioration and/or is performing to a much lower level than originally intended. - A major portion of the asset is physically deficient. - Required maintenance costs significantly exceed acceptable standards and norms. - Typically, asset is approaching the end of its expected life.
Very Poor	- Asset is physically unsound and/or not performing as originally intended. - Asset has higher likelihood of failure or failure is imminent. - Maintenance costs are unacceptable, and rehabilitation is not cost effective. - Replacement / major refurbishment is required.

The City converts industry standard condition rating systems and age-based estimates to the above condition grading system as summarized in Table 3-3. This table summarizes the main condition rating systems used across the Service Areas. Additional condition rating systems used for specific assets are described in the respective Service Area (sections 10 to 18).

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

Condition Grade	Pavement Condition Index (PCI)	Bridge Condition Index (BCI)	Facility Condition Index (FCI) – 3 Year	% Life Remaining for Age-Based Condition
Very Good	86 - 100	85 - 100	0 – 5%	75 to 100%
Good	71 – 85	70 – 85	6% - 10%	50 to 75%
Fair	56 – 70	60 – 70	11% - 15%	25 to 50%
Poor	41 – 55	40 – 60	16% - 30%	>0 to 25%
Very Poor	0 - 40	0 – 40	>30%	<= 0%

To adequately meet service levels and manage risk while minimizing lifecycle costs, most assets should generally be preserved in fair or better condition. In some cases, a condition rating of Poor may be considered acceptable, particularly in age-based assessments or when the asset management strategy is to maximize service life. However, assets in poor condition may require increased monitoring, inspection, or contingency planning to ensure that risks to safety, service delivery, or regulatory compliance are effectively managed. Figure 3-1 summarizes the value of assets that fall within each of the condition grades (very good, good, fair, poor, very poor). For clarity, assets in unknown condition have been excluded from this figure. The City currently has approximately \$605 million of assets in unknown condition which include:

- \$201 million in Facilities assets which mainly consists of site assets. Site assets are included as part of building condition assessments but are not factored into the Facility Condition Index, which focuses on the building components.
- \$144 million in Transportation assets which mainly consists of Streetlighting (\$52M), Paved Roads (\$50M), Retaining Walls (\$16M) and Active Transportation (\$15M). Active Transportation assets such as sidewalks do not have formal condition ratings but are regularly inspected per Minimum Maintenance Standards O. Reg. 239/02.
- \$133 million in Parks, Outdoor Recreation and Natural Areas which consists of Natural Areas (\$45M), Maintained Parkland (\$28M), Pathways (\$24M), and Fencing (\$15M). For natural areas, the City focuses on higher risk areas for conducting forest health assessments.
- \$73 million in Stormwater assets which mainly consists of Natural Watercourses (\$49M), Ditches (\$12M), Sewers (\$6M) and Culverts (\$5M). The more critical natural watercourses were assessed for condition as part of the 2019 Drainage Master Plan.

87.3% of the City's assets are in fair or better condition based on replacement value (excluding assets in unknown condition). 6.5% (\$711 million) of assets are in very poor condition. Assets in poor or very poor condition require increased attention and renewal investment (funding and staff resources) to avoid increased maintenance costs or unexpected failures. 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, especially if deemed critical by the City.

Figure 3-1 Condition Distribution by Replacement Value (\$M/\$B)

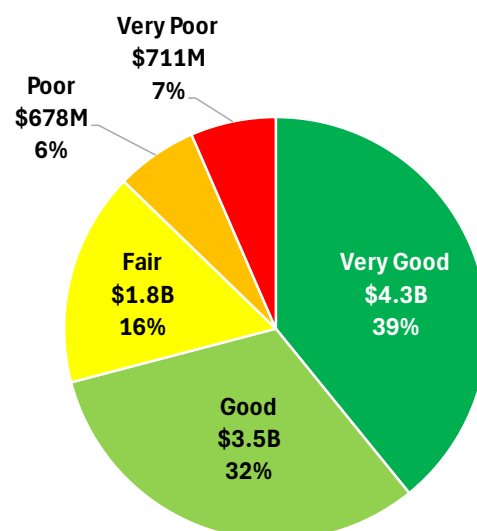
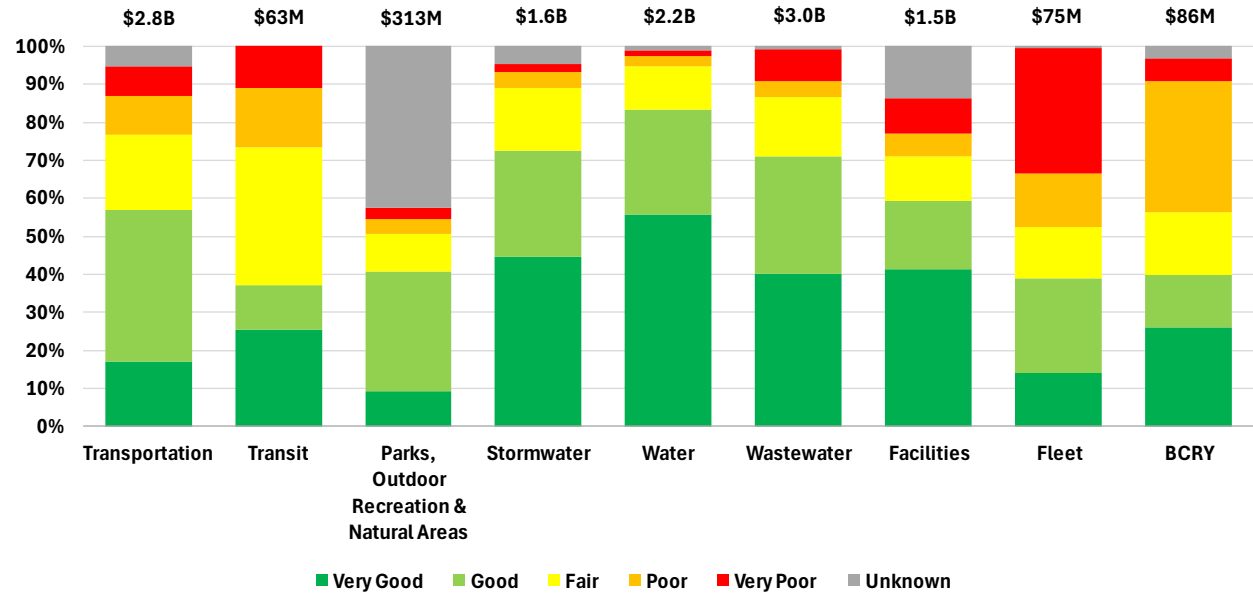


Figure 3-2 summarizes the condition profile by service area. The total replacement value of assets within each asset category is shown above the condition grade bars.

Figure 3-2 Asset Condition Profile (\$M/\$B), by Asset Category



4 LEVELS OF SERVICE

4.1 Overview

In the State of Infrastructure Section, the value, age, and condition of the City's infrastructure assets were discussed. The Levels of Service (LOS) chapter builds on the State of Infrastructure by defining the performance the City's assets are intended to deliver over their service lives. LOS are statements that describe the outputs and objectives the City intends to deliver to its residents, businesses, and other stakeholders.

In general, LOS are guided by a combination of customer expectations, legislative requirements, internal policies and procedures, and affordability. Effective asset management requires that LOS be formalized and supported through a framework of performance measures, performance levels, and timeframes to achieve performance levels, such that the costs to deliver the documented LOS can be understood.

4.2 Legislative Requirements

Legislated requirements define the standards according to which the City is legally obligated to provide services to the community, and these standards typically relate to asset safety, reliability, or function. The City delivers services in adherence to applicable legislative requirements, including required compliance monitoring and reporting. Information on regulatory inspections is contained within various databases and maintained by City staff at the operational level to ensure legislative compliance. Legislative requirements that impact the delivery of City services are outlined in Table 4-1.

In addition, O. Reg. 588/17 requires Ontario municipalities to document specific community and technical current and proposed levels of service. Technical levels of service are more quantitative in nature; however, community levels of services include qualitative descriptions and visuals such as maps, images etc. The required levels of services prescribed by O. Reg 588/17 can be found in the service level discussions for roads (Section 10), stormwater (Section 13), water (Section 14), and wastewater (Section 15).

Table 4-1 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: Asset Management Planning for Municipal Infrastructure. The Infrastructure for Jobs and Prosperity Act, 2015	Sets out the principles for the provincial government to regulate asset management planning for municipalities.

Legislation	Requirement
Accessibility for Ontarians with Disabilities Act (AODA), 2005	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 Sector 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 <i>Ontario Structure Inspection Manual</i> .
Minimum Maintenance Standards for Municipal Highways (MMS) Regulation 239/02 Routine Patrol	Sets out minimum standards for the maintenance of transportation assets under municipal jurisdiction for the purpose of clause 44 (3) (c) of the Municipal Act, 2001, S.O. 2001, c. 25.
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.
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.

Legislation	Requirement
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, structural sufficiency, construction materials, plumbing and mechanical systems.
Environmental Protection Act, 1990	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.
Lake Simcoe Protection Act, 2008	The purpose of this Act is to protect and restore the ecological health of the Lake Simcoe watershed by aiming to reduce pollutants, conserve natural habitats, promote sustainable development, and ensure ongoing monitoring.
Ontario Water Resources Act, 1990	The purpose of this act is to protect and manage water resources. The act regulates the use, management, and conservation of water, including lakes, rivers, groundwater, and other sources, to ensure clean and safe water for public use and the environment.

4.3 Strategic and Corporate Goals

The Corporate, or Strategic LOS establish service levels that describe the main vision or objective of service delivery at the City. The City's 2022-2026 strategic priorities and supporting goals were adopted in December 2022. The following are key supporting goals that provide strategic direction on the City's assets. The AM Plan is directly linked with goals related to infrastructure investment and responsible governance.

Table 4-2 Corporate Strategic Themes (2022-2026 Strategic Plan)

Strategic Priority	Supporting Goals
Affordable Place to Live	• Encourage a range of housing options to make housing attainable • Open for business environment to help encourage job creation
Community Safety	• Support neighbourhood safety and crime prevention • Work with our partners to implement community safety and well-being plan

Strategic Priority	Supporting Goals
Thriving Community	• Champion equity, diversity, and inclusion • Create and foster programs and opportunities to support community wellness • Foster growth in arts and culture • Expand and maximize access to parks and recreation opportunities • Continue to support a vibrant downtown
Infrastructure Investments	• Make it easier to move around the city • Update and improve infrastructure • Support active transportation and pedestrian connections • Implement climate action plans
Responsible Governance	• Support the services our community needs while keeping tax increases low • Maintain focus on city core services • Financial stewardship which includes finding efficiencies and innovation • Advocating to other levels of government for support • Ensure accountability and transparency

These priorities set a framework for the required actions that enable the City to provide relevant and high-quality services to the community. The Strategic Plan priorities align with the City's Strategic AM Policy's Vision for asset management planning: to effectively manage the City's capital assets to ensure community sustainability and a high quality of life. The goal of asset management is to ensure the City's financial sustainability by making informed investment decisions that deliver City services at the desired level while minimizing costs and maintaining an acceptable level of risk. To achieve this vision, the AM Policy sets out key Guiding Principles that help balance service, affordability, and risk related to the City's asset management decisions.

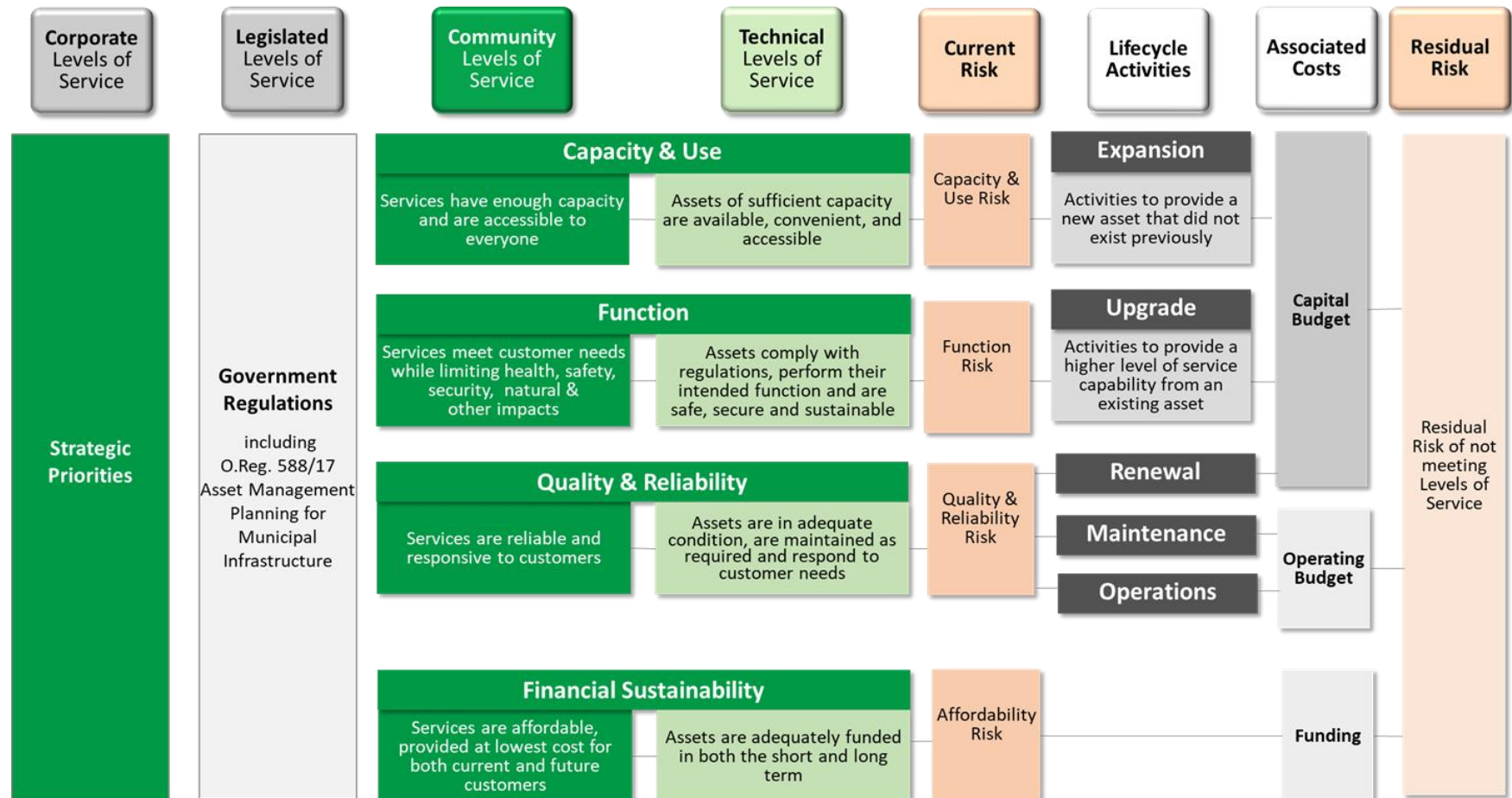
4.4 Community and Technical Levels of Service (LOS)

Figure 4-1 shows the LOS framework and line of sight from high-level Corporate initiatives to detailed asset-specific Technical LOS. Corporate commitments, along with Legislated LOS guide Community LOS that describe the services that the assets need to deliver to the City's residents and businesses. Community LOS can typically be categorized to one of the following service attributes:

- **Capacity & Use:** Services have enough capacity and are accessible to the customers. Capacity & Use LOS informs **Growth** needs
- **Function:** Services meet customer needs while limiting health, safety, security, natural and heritage impacts. Function LOS informs **Upgrade** needs
- **Quality & Reliability:** Services are reliable and responsive to customers. Quality & Reliability LOS informs **Renewal, Operations and Maintenance** needs
- **Financial Sustainability:** Services are affordable and provided at the lowest cost for both current and future customers. Financial Sustainability LOS informs **Funding** needs

Community LOS are translated into Technical LOS that define asset performance levels, which in turn define asset needs and drive the required lifecycle activities and funding to mitigate risk. As shown in Figure 4-1, Lifecycle management activities balance the cost of service with the risk to meeting service levels. This Line of Sight establishes the connection of how the day-to-day management of City assets contributes to the success of achieving corporate strategic priorities.

Figure 4-1 Levels of Service Framework



4.5 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 collect information about user service patterns, behaviours and preferences today and potentially into the future. This customer research provides insight into citizens' and other stakeholders' needs and perceptions related to areas of improvement. Completion of this AM Plan allows the City to first understand the service levels expected to be provided based on the available funding to set reasonable proposed service levels that provide baseline scenarios to better inform future discussions on service levels through further public engagement.

4.6 Service Level Performance

At the Corporate level, the current and proposed performance of each service area focuses on the state of good repair of the assets which is summarized in Table 4-3. Other LOS measures relating to Capacity & Use, Function, and Reliability (including those as required by O. Reg. 588/17) are discussed in more detail within each individual subsection (Sections 10 to 18).

Table 4-3 Levels of Service – State of Good Repair

Asset Area	Asset Category	Technical LOS	Performance		
			Current (2024)	10-yr Capital Plan (2034)	Proposed LOS (2034)
Community LOS: Assets are maintained in a state of good repair					
Transportation	Roads	Pavement Condition Index	71.0	67.5	>71.0
	Bridges	Bridge Condition Index	79.8	73.1	>79.1
	Other	% fair or better condition	54.7%	28.4%	>55%
Transit		% fair or better condition	73.7%	68.9%	>70%
Parks, Outdoor Recreation & Natural Areas		% fair or better condition	76.8%*	58%*	>70%*
Stormwater		% fair or better condition	93.5%	>85%	>85%
Water	Linear	% fair or better condition	97.2%	98.1%	>95%
	Vertical		91.5%	60.4%	>70%
Wastewater	Linear	% fair or better condition	90.3%	84.1%	>84%
	Vertical		82.0%	73.4%	>82%
Facilities		Facility Condition Index	10.7%	7.4%	7.4%
Fleet		% fair or better condition	52.6%	69%	69%
BCRY		% fair or better condition	56.4%	--	67%

*Excludes natural areas, which are generally maintained through operating budget and not tracked for condition

For state of good repair, proposed performance is determined based on what is appropriate for the City in consideration of the City's current 10-year planned funding provision for renewal in

the Capital Plan as well as risks associated with deteriorating asset condition. Additional details are provided in each asset category section (Sections 10 to 18).

5 RISK MANAGEMENT STRATEGY

5.1 Overview

A key asset management principle is to meet service levels and manage risk, while minimizing lifecycle costs. The relative importance of the assets to support service delivery, referred to as asset criticality, is a key driver in selection of the most appropriate asset management strategy for each asset. Critical assets are typically those that are key contributors to providing the required service levels and have the highest impacts upon failure to the City.

Risk events, such as an asset's failure to have sufficient capacity, function, or reliability, are events that may compromise the delivery of the City's strategic objectives. Lifecycle activities are used to manage the risk of failure by reducing the chance of asset failure to acceptable levels.

Asset risk may be associated to one or more aspects of failure across the following levels of service attributes:

- **Quality & Reliability:** Asset may have failed due to deteriorated physical condition.
- **Capacity & Use:** Asset may have failed to provide sufficient capacity in terms of availability, convenience, or accessibility
- **Function:** Asset may have failed to comply with regulations, perform its intended function, or is no longer considered sustainable due to factors such as obsolescence

Quality and Reliability risks related to asset condition are assessed in this AM Plan using the framework discussed in Section 5.2.1. Capacity and functional-related projects are generally assessed as part of the City's Capital Planning process using the City's Prioritization Framework (urgency and importance scales) described further in Section 5.3.

5.2 Quality & Reliability Related Risk

The City's preliminary risk strategy in the AM Plan estimates the quality and reliability (condition-based) risk exposure of its assets to inform the prioritization of projects across asset classes and service areas. Risk exposure is the multiplication of two factors:

$$\text{Risk Exposure} = \text{Consequence of Failure} \times \text{Probability of Failure}$$

The criticality or consequence of failure (CoF) is the direct and indirect impact on the City if an asset failure were to occur, and the probability of failure (PoF) is the probability that an asset failure may occur.

5.2.1 Consequence of Failure

Asset criticality or consequence of failure reflects the importance of an asset to the City's delivery of services. Consequence of failure is scored using a 1 to 5 scale based on the estimated financial, health & safety, environmental and service delivery impacts expected to occur in the event of asset failure:

Financial	•Considerations include asset replacement cost, damages to City or private property and infrastructure, loss of revenue, and fines.
Health & Safety	•Considerations include the ability to meet health and safety related regulatory requirements, as well as the degree and extent of injury
Environmental	•Considerations include length and extent of damages to the natural environment
Service Delivery	•Considerations include the extent (number of people impacted) and length of the service disruption

Table 5-1 summarizes the above listed impacts against an asset criticality rating scale from 1 to 5, with a higher score indicating a higher consequence of failure. The overall COF rating for an asset is taken as the maximum score across each of the COF categories. Understanding criticality enables risk to be incorporated into the development of the lifecycle management strategies. More critical assets are prioritized over less critical assets for expansion, inspection, cleaning, maintenance, and renewal, depending on their current and forecasted condition.

Table 5-1 Consequence of Failure (COF) Rating Scale

Score	Consequence of Failure	Financial	Health & Safety	Environmental	Service Delivery
5	Catastrophic	Damages, loses or fines > \$10M	Fatalities, extensive serious injuries, and/or significant long-term health impacts.	Irreversible damage, widespread and severe impact on the environment.	Major disruptions or complete failure of critical services. Severe and prolonged service outages that cause major operational challenges and require immediate and comprehensive recovery efforts.
4	Major	Damages, loses or fines \$1M to \$10M	Multiple serious injuries, long-term health impacts.	Long-term damage with lasting consequences, major impact on the environment.	Significant impact on critical or important services. Service disruptions that have substantial effects on operations and require extensive efforts to restore normal function.

Score	Consequence of Failure	Financial	Health & Safety	Environmental	Service Delivery
3	Moderate	Damages, losses or fines \$100,000 to \$1M	Serious injuries or multiple minor injuries, potential short-term health impacts.	Long-term damage with repairable consequences, moderate impact on the environment.	Minor (isolated) disruption in services. Noticeable service interruptions that require significant effort to resolve but do not cause long-term issues
2	Minor	Damages, losses or fines \$10,000 to \$100,000	Minor injuries, no long-term health impacts.	Short-term repairable damage, minor impact on the environment.	Minimal impact on services. Minor interruptions quickly resolved without major consequences.
1	Insignificant	Loss of replaceable asset < \$10,000	No injuries or health impacts.	Non-lasting damage, minimal to no impact on the environment	No impact on services. Normal operations maintained without significant issues.

5.2.2 Probability of Failure

Probability of Failure (PoF) is estimated based on the condition of the asset from Section 3, as summarized in Table 5-2. Assets in poorer condition have a higher probability of failure. Observed condition data is used where available, and percentage of remaining life based on age is used as a supporting factor or used when observed condition is not available. For facilities, the Facility Condition Index is used to assess the overall facility condition.

Table 5-2 Probability of Failure (POF) Rating Scale

Score	Condition Rating	Probability of Failure	Description
5	Very Poor	Almost Certain	The asset is physically unsound and/or not performing as originally intended. Asset has higher probability of failure or failure is imminent. Maintenance costs are unacceptable, and rehabilitation is not cost effective. Replacement / major refurbishment is required.
4	Poor	Very Likely	The asset is showing significant signs of deterioration and is performing to a much lower level than originally intended. A major portion of the asset is physically deficient. Required maintenance costs exceed acceptable standards and norms.
3	Fair	Moderate or Likely	The asset is showing some signs of deterioration and is performing at a lower level than originally intended. Some components of the asset are becoming physically deficient. Required maintenance costs are increasing. Typically, the asset has been used for a long time and is within the later stage of its expected life.
2	Good	Occasional or Possible	The asset is physically sound and is performing its function as originally intended. Required maintenance costs are within acceptable standards and norms but are increasing. Typically, the asset has been used for some time and is within mid-stage of its expected life.
1	Very Good	Very Rare	The asset is physically sound and is performing its function as originally intended. Required maintenance costs are well within standards & norms. Typically, the asset is new or recently rehabilitated.

5.2.3 City wide Asset Risk Profile

After assessing the criticality and probability of each asset's risk, the results are shown in a risk map in Figure 5-1. The risk profile identifies the various levels of risk and helps to prioritize the City's options to most effectively reduce overall risk when allocating its limited resources, time, and effort on the forecasted renewal needs discussed in Section 6.4. The risk map identifies the following risk categories:

- Assets that appear in the Very High (red) zone are significant risks to the City and therefore need to be actively managed and monitored in a more comprehensive manner than other risks.
- Assets that appear in the High (orange) or Moderate (yellow) zones may also need to be actively managed.
- Risks that appear in the Low (light green) or Very Low (dark green) zones are generally acceptable without significant mitigation strategies being implemented, although monitoring may still be beneficial.

Figure 5-1 Corporate Risk Exposure*

Risk exposure in year 2025 \$, millions									
Probability of Failure	Almost Certain	\$85.0	\$171.5	\$108.8	\$91.2	\$258.5	Risk Exposure	\$	%
	Very Likely	\$102.8	\$188.8	\$138.4	\$162.8	\$67.4	Very High	\$417.1	3.9%
	Moderate or Likely	\$220.9	\$484.0	\$418.0	\$353.6	\$216.3	High	\$487.9	4.6%
	Occasional or Possible	\$196.1	\$924.1	\$639.9	\$797.4	\$716.4	Moderate	\$1,379.8	13.0%
	Very Rare	\$113.0	\$903.8	\$1,768.8	\$927.1	\$521.7	Low	\$3,134.7	29.6%
		Insignificant	Minor	Moderate	Major	Catastrophic	Very Low	\$5,156.8	48.8%
	Consequence of Failure					Total	\$10,576.3	100.0%	

The City assesses the risk of various options to meet capacity service levels through the development of Master Plans and other studies that consider the options of how to best achieve the stated service levels. Projects to address known capacity issues are scheduled in the City's Capital Plan, such as the Salem and Hewitt Recreation Centre(s). The timing and costs of projects that address capacity service levels are discussed further in Section 6.

5.3.2 Risks to Functional LOS

The City also plans for service improvements to functional service levels, such as upgrades due to changes to legislation or strategic objectives, while balancing these risks against capacity and reliability-related needs. The City assesses the risk of various options to meet functional service levels through inspections and plans such as accessibility audits, energy efficiency assessments, and other plans that consider the options of how to best achieve the stated service levels. Function-related improvements on assets can also be rated on the 'importance' and 'urgency' scales as part of the City's Capital Planning process. Functional enhancements currently planned over the next 10 years include accessibility improvements as part of renewal work at facilities and playgrounds. The timing and costs of upgrade projects are discussed further in Section 6.

5.4 Affordability Risks

The City's forecasted needs to meet various service level scenarios is discussed in Section 6, and is compared to the City's ability to fund them in Section 6. In some cases, service levels are not affordable, and the City manages the risks of these unfunded activities through various approaches that aim to reduce the investment gap, such as seeking ways to operate more efficiently. Where appropriate, the City may also accept a higher level of risk in order to maximize the available resources. **The 'investment gap' is defined as shortfall of the planned investment in the 10-Year Capital Plan compared to the forecasted needs to meet proposed service levels.** Management of these risks are discussed in more detail in Sections 10 to 18 for each asset area.

6 LIFECYCLE MANAGEMENT STRATEGY

6.1 Overview

The City's ability to deliver the levels of service outlined in the AM Plan is impacted in large part by:

- Aging infrastructure and the associated need for operations, maintenance, and renewal investments
- Population growth and the associated need for additional infrastructure
- Changing functional, legislative and sustainability requirements and the associated need for existing assets to be upgraded to continue to be fit for purpose.
- Available funds that require an appropriate balance between costs, service levels and risk

To achieve its objectives, the City builds new infrastructure assets to meet capacity needs, upgrades assets to meet new functional needs and manages existing assets to meet reliability needs. Asset lifecycle management strategies are planned activities that enable assets to provide the defined levels of service in a sustainable way, while managing risk at the lowest lifecycle cost. Asset lifecycle management strategies are typically organized into the categories listed in Table 6-1 and are driven by the service levels defined for each Service Area.

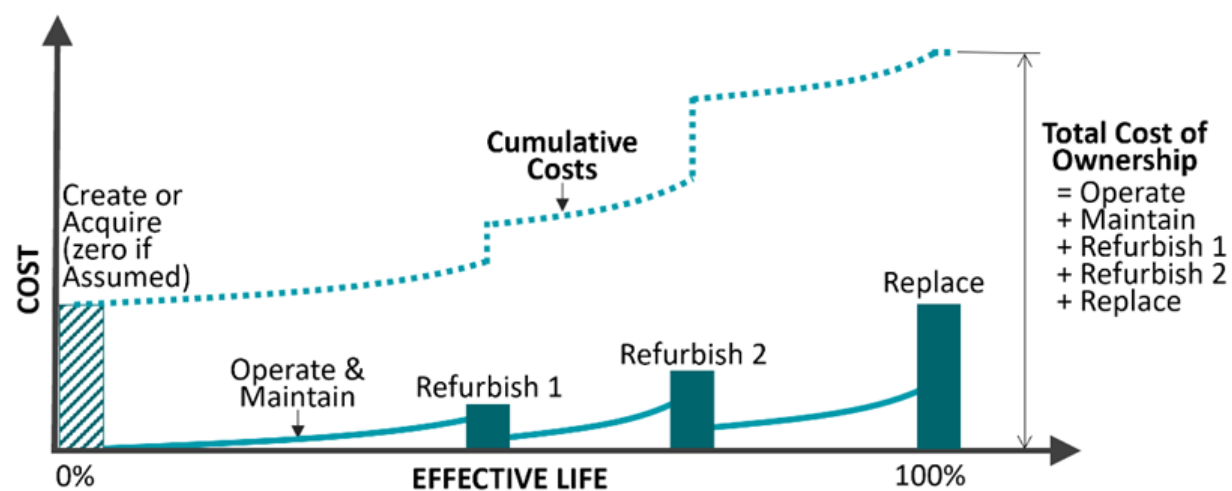
Table 6-1 Asset Lifecycle Management Categories

Lifecycle Management Category	Description	Examples of Activities	Informed by Service Levels
Operations	Regular activities to provide services	Inspections, cleaning, energy usage	Reliability service levels
Maintenance	Activities to retain asset condition to enable it to provide service for its planned life	Minor repairs, component replacements	Reliability service levels
Renewal	Activities that return the original service capability of an asset	Minor or major asset rehabilitations, asset replacements	Reliability service levels
Growth / Expansion	Activities to provide a new asset that did not exist previously or an expansion to an existing asset	New or expanded asset construction	Capacity service levels
Upgrade	Activities to provide a higher level of service capability from an existing asset to achieve better fit for purpose or meet regulatory requirements	Upgrades to accessibility requirements	Functional service levels

In addition to the above asset strategies, non-asset solutions are also considered which are actions or policies that can lower costs, lower demands, or extend asset life. Examples of non-asset solutions include better integrated infrastructure and land use planning, demand management, insurance, process optimization, and public education.

The City assesses the costs and benefits of potential lifecycle activities to develop a cost-effective strategy to manage each asset type while meeting required service levels. A typical total cost of ownership over an asset's life is shown in Figure 6-1. Sufficient investment of the right type and at the right time minimizes costs and mitigates risks such as interruption to service delivery or damage to other nearby infrastructure. Operations, maintenance, and renewal activities over the life of an asset are timed to reduce the risk of asset failures.

Figure 6-1 Lifecycle Management Model



Various scenarios are presented in this AM Plan to facilitate discussion on service levels that are achievable and appropriate for the City. In the following Sections 6.2 to 6.5, lifecycle activities and associated costs are considered for three scenarios:

- **Expected Performance:** The performance that is expected over the next 10 years based on the available funding in the City's 10-year Capital Plan
- **Target Performance:** Where available, some service levels have an aspirational target that is a long-term or established City goal. In this scenario, the costs required to achieve this aspirational target is considered
- **Maintain Current Performance:** The cost required to maintain current (year 2024) performance levels over the next 10 years

The proposed service level is selected based on a review of these scenarios and is considered an appropriate service level that balances affordability and manages risks to acceptable levels. Investment gaps related to meeting the proposed service levels are discussed in Section 7.

6.2 Growth Forecast

One main factor that municipalities must consider in asset management planning is the impact of future growth on meeting goals and objectives. The City monitors trends in its population to

ensure that its impacts on service levels are understood and that strategies are developed to address additional demands due to growth and demographic changes.

The City's historical and forecast population and employment growth is summarized in Table 6-2. Employment forecasts are based on the 2020 Growth Plan. The population forecasts are based on projections in the City's Parkland Needs Assessment. The population projections used in the Parkland Needs Assessment are based on these two primary sources:

- As part of the process of preparing the new Official Plan and other related projects, the City compiled forecasts for population growth across the City through to the year 2051.
- The Development Charges Background Study, dated April 21, 2023, forecasts projected growth through to 2041 and, in addition to the City's total population, provide projections for the Salem and Hewitt's areas, and the area within the former municipal boundaries (i.e., prior to the 2010 annexation)

Table 6-2 City Population and Employment Forecast

Year	Population*			Employment
	Former Municipality	Salem and Hewitt's	Total	
2021	149,331	3,228	152,560	83,400
2031	179,774	34,388	210,162	101,000
2041	207,760	45,390	253,150	129,000
2051	228,200	69,800	298,000	150,000

*From City's Parkland Needs Assessment (January 2024)

The City is currently updating various Master Plans that once completed, may revise proposed service levels and result in additional recommendations. The following plans are currently in development by the City:

- Update to the 2019 Transportation Master Plan (TMP) to accommodate the planned population growth through to 2051. This plan emphasizes the development of a multi-modal transportation network, integrating various modes of transport to meet the diverse needs of the community and will have direct impacts on growth required for transportation and transit assets.
- Parks Strategic Plan that will plan for the long-term provision of parkland amenities, service levels and natural heritage restoration over the next ten years.
- Update to the 2019 Water Supply Master Plan and the Water Storage and Distribution Master Plan to accommodate the planned population growth through to 2051 which will identify capacity constraints and opportunities for improvement for water storage distribution and supply
- Update the 2019 Wastewater Treatment Master Plan and the Wastewater Collection Master Plan which will assess the existing wastewater system to identify capacity constraints and opportunities for improvement

The City carefully plans for growth based on the increasing population and community needs, and has key projects planned over the next 10 years. Some of this infrastructure will be built through projects in the 10-year Capital Plan while other infrastructure will be assumed from developers. The growth needs currently identified over the next ten years to meet proposed service levels are summarized for each asset area in Table 6-3. Affordability of the proposed service levels are discussed in Section 7.

Table 6-3 Growth Needs Forecast (\$M/year)

Asset Area	Needs Forecast for Proposed Service Levels (\$M/year)
Transportation	\$28.4
Transit	\$3.7
Parks, Outdoor Recreation & Natural Areas	\$40.3
Stormwater	\$1.3
Water	\$6.2
Wastewater	\$22.5
Facilities	\$44.2
Fleet	\$0.1
Barrie Collingwood Railway	N/A
Total	\$146.7

6.3 Upgrade Forecast

In addition to adding new assets to the portfolio, the City also upgrades existing assets as required to ensure the safety, efficiency, and sustainability of the community. Examples include:

- Urban road cross-sections with sidewalks, streetlighting, and separated cycling infrastructure
- Providing sanitary service, storm sewers, watermain, and improved roadway infrastructure for previously unserved residential areas
- Compliance requirements, such as meeting regulatory standards for environmental protection
- Wastewater and stormwater treatment upgrades to improve effluent water quality
- Improving accessibility for assets such as facilities and playgrounds
- Improvements in energy efficiency to reduce operational costs and minimize environmental impact
- Technological upgrades enhancing service delivery

- Service delivery upgrades, such as establishing watermain connections between pressure zones

Neglecting infrastructure upgrades can lead to inefficiencies, safety hazards, and increased maintenance costs over time. Therefore, investing in infrastructure upgrades is a proactive approach that addresses changing needs and prepares the City for future challenges and opportunities. The upgrade needs currently identified over the next ten years are summarized for each asset area in Table 6-4. In some cases, upgrade needs are already covered under growth or renewal projects in Table 6-3 and Table 6-5, respectively.

Table 6-4 Upgrade Needs Forecast (\$M/year)

Asset Area	Needs Forecast for Proposed Service Levels (\$M/year)
Transportation	\$15.4
Transit	\$0.1
Parks, Outdoor Recreation & Natural Areas	Included in growth and renewal forecast
Stormwater	\$7.6
Water	\$6.3
Wastewater	\$1.5
Facilities	\$16.1
Fleet	Included in growth forecast
Barrie Collingwood Railway	N/A
Total	\$47.0

6.4 Renewal Forecast

Renewal efforts focus on rehabilitation and replacement activities to maintain assets in a state of good repair. The City plans rehabilitation activities to extend the life of an asset where possible. For other assets, rehabilitation is not possible or not cost effective, and the assets are replaced at their end-of-life.

The renewal forecast considers the asset's current condition or age, the potential rehabilitation and replacement activities, as well as the recommended strategies from specific studies such as facility condition assessments (FCAs) and for bridges, OSIM (Ontario Structure Inspection Manual) inspections. If condition or installation year data is missing, renewal needs are estimated as an average annual reinvestment rate based on the asset's value and estimated useful life. The renewal needs over the next ten years are summarized for each asset area in Table 6-5.

Table 6-5 Renewal Needs Forecast (\$M/year)

Asset Area	Needs Forecast for Proposed Service Levels (\$M/year)
Transportation	\$35.2
Transit	\$5.2
Parks, Outdoor Recreation & Natural Areas	\$5.7
Stormwater	\$7.5
Water	Linear Assets: \$10.0 Vertical Assets: \$4.8
Wastewater	Linear Assets: \$4.9 Vertical Assets: \$14.0
Facilities	\$17.3
Fleet	\$6.2
Barrie Collingwood Railway	\$1.0
Total	\$111.8

6.5 Operations and Maintenance Forecast

The Operations and Maintenance forecast for the City's AM Plan outlines the regular activities required to maintain the functionality and reliability of the City's infrastructure assets. These activities are essential to ensuring that assets continue to provide the defined levels of service while minimizing the risks of asset failure. Operations activities include routine tasks such as inspections, cleaning, and energy management, whereas maintenance involves actions to preserve asset condition, including minor repairs and component replacements.

The forecast considers the additional pressures resulting from population growth and evolving regulatory standards. Increases in the annual operating budget are required to continue service delivery and align with the City's service level objectives. Table 6-6 shows the current 2025 operations and maintenance budget and the required average annual percentage increase for each asset area. The increases in operations and maintenance needs are estimated based on the growth in the asset portfolio from planned capital projects. Assets anticipated to be assumed from developers over the next ten years have been included where reasonable forecasts could be estimated. The increases do not consider inflation. Operating budget pressures are discussed in Section 7.2.4.

Table 6-6 Operations and Maintenance Needs

Service Area	2025 Budget (\$M)	Average Annual Increase (%)
Transportation	\$25.5	2.1%
Transit	\$27.3	4.5%
Parks, Outdoor Recreation & Natural Areas	\$8.6	2.5%
Stormwater	\$7.1	1.2%
Water	\$27.7	2.8%
Wastewater	\$38.8	4.7%
Facilities	\$27.2	2.1%
Fleet	\$5.4	2.0%
Barrie Collingwood Railway	\$0.7	2.0%
Total	\$168.3	

6.6 Climate Change Considerations

The City recognizes the threat that climate change poses, both to its internal operations and the community, and continues to develop and implement actions for both adaptation and mitigation planning.

Adaptation Planning

In 2016, the City developed a Climate Change Adaptation Strategy guided by ICLEI Canada's Building Adaptive and Resilient Communities Framework. In 2017, the City developed an Implementation Plan to complement the Adaptation Strategy to take the City from the planning stages of adaptation to on-the-ground implementation of priority actions.

The resiliency provided by natural assets is one of the many reasons natural assets are seen as effective solutions to deal with climate change related challenges. Many of the specific implementation actions identified in the Climate Change Adaptation Strategy call for increased or improved natural assets which the City aligned with future planned work. For example, Heritage Park redevelopment's goals are to create a sustainable regenerative urban park with a resilient and ecologically driven design using native species. Other adaptation strategies planned by the City include culvert upgrades to reduce risks of flooding.

Mitigation Planning

One of the key initiatives for the City is energy conservation and reduction. The City's Community Energy and Greenhouse Gas Reduction Plan aims to reduce overall GHG emissions for the Barrie community with a goal to become net-zero by 2050. The specific goals and associated costs of City-owned assets with respect to net-zero requirements are expected to be defined through development of the City's Net Zero Strategy. Currently, energy efficiency projects are considered as part of upgrade or renewal work identified in Sections 6.3 and 6.4.

7 FINANCING STRATEGY

A key challenge to financial sustainability is aligning level of service decisions with affordability. The financial analysis considers the affordability of the proposed service levels based on the forecasted needs compared to the 10-year Capital Plan.

This AM Plan focuses on identifying the state of good repair or renewal need for infrastructure investments to meet proposed service levels and the investment gap. **The ‘investment gap’ is defined as shortfall of the planned investment in the 10-Year Capital Plan compared to the forecasted needs to meet proposed service levels.** Investment gaps for other lifecycle activities such as growth and service improvements are estimated where data is currently available but generally have not yet been quantified and will be informed by future development of Master Plans or Strategic Plans. Limitations of the forecast and infrastructure gap analysis are discussed in Section 7.4. The investment gap analysis informs responsible decision-making and aligns with O. Reg. 588/17, which requires municipalities to demonstrate financial sustainability through the AM Plan.

7.1 Funding Sources

Municipalities are primarily funded through a combination of property taxes, user rates (such as water and wastewater rates), development charges (DCs), and external funding sources such as grants. Generally, property taxes account for approximately 50% of municipal revenues, user rates provide about 20%, development charges contribute around 15%, and external grants and other sources make up the remaining 15%. These funding sources are used to support the delivery of municipal services, maintain infrastructure, and invest in future growth. A more detailed explanation of how these funds are allocated to operating and capital activities is provided in the following sections.

Through the City’s budgeting process, capital project and operating activity expenditure information is gathered from each service area, including investment needs, trends, and priorities, to enable preparation of the capital and annual operating budget plans. A 10-year Capital Plan is presented to Council, and the first year is reviewed for approval on an annual basis. The Operating Budget is also approved annually and includes a three-year operating forecast. The investments are proposed with careful line-of-sight to financial sustainability and affordability for residents and businesses. Once the expenditure plans are finalized, a financing plan is developed which includes several key sources of funding as outlined in the table below.

Table 7-1 Summary of Funding Sources

Funding Source	Description
Development Charges (DC)	Reserves (from current and prior years’ development charges collections in accordance with the DC Act)
Front Ending Agreements / Development Contributions	Reserves (from current and prior years’ developer front ending agreements and developer contributions outside the DC Act)

Funding Source	Description
Debt	Long term borrowing, to be paid for by future taxpayers; unless DC debt, which is paid by DC reserves and development charges
Canada Community-Building Fund	Funding available for eligible projects (formerly the Federal Gas Tax Fund)
Reserves	Reserves from current and prior years' contributions from City revenues such as Property Tax and facility-related revenues such as recreation programming and ticket sales
Grants	Project specific grants / subsidies (other than the Canada Community-Building Fund)

Development Charges (DCs) are collected by the City from developers under the City's DC Bylaw. DCs are held in designated DC reserve funds and used to fund a portion of growth-related infrastructure as prescribed by the City's DC Bylaw. Projections relating to DC revenues are based on DC rates and the projected growth in developments.

Capital renewal work is funded by reserves, with some federal Canada Community-Building funding, as well as grant and debt funding. Grants from the Provincial or Federal governments, including Canada Community-Building Fund grants, are also used to finance the capital program. However, many grants are a result of stimulus or other one-time funding that may be more difficult to forecast. Grants are not included in the budget forecast until confirmed.

Capital reserves are established as a source of pay-as-you-go funding for the City's capital program. Funding for these reserves is obtained annually through contributions from property tax and water/wastewater rates. The annual reserve contributions are based on forecasted financing requirements and provisions required to sustain reserve balances at appropriate levels to address infrastructure replacement costs in the future and inherent uncertainties in capital funding needs. Reserve contributions are evaluated annually to ensure adequate funds are raised to meet future capital requirements and to smooth out the impact on the annual operating budget.

7.2 Affordability of Proposed Service Levels

The Financial Strategy section compares the planned capital funding available in the City's 10-year Capital Plan against the forecasted capital needs to determine if there is an investment gap to meet proposed service levels.

7.2.1 Growth

As discussed in Section 6.2, the growth need for City assets is estimated at an average of \$146.7 million per year over the next 10 years, and on-going development of Master Plan updates will help inform future growth-related service levels and recommendations. An investment gap is currently estimated for Parks, Outdoor Recreation, and Natural Areas based on the recommendations from the 2024 Parkland Needs Assessment and 2019 Outdoor Recreation Facility Strategy. The Parks Strategic Plan to be completed by 2027 will validate and refine service levels and provide further insight on the growth investment gap.

7.2.2 Upgrade

As discussed in Section 6.3, the upgrade need for City assets is estimated at an average of \$47.0 million per year over the next 10 years. Similar to growth activities, on-going development of Master Plan updates will help inform future upgrade-related service levels and recommendations.

The City has an investment gap associated with meeting its proposed Net Zero pathway targets for water, wastewater, corporate, and recreation facilities. The City's Net Zero Strategy currently in development will inform the required actions to achieve the proposed reductions in energy consumption and GHG emissions and will inform the cost of the required investments.

In addition to energy targets, other investment gaps that have not yet been quantified by the City include standby power installation at water booster pumping stations and water towers, as well as installation of additional fencing and security cameras at these facilities.

The proposed service levels related to upgrade activities presented in Section 7.2.2 represent risks considered appropriate to the City given the associated affordability. The City is planning on upgrading eight storm culverts such that 67% will meet City standard design requirements by 2034. The aspirational target of upgrading all remaining culverts to reach 100% over the next 10 years is not affordable nor achievable given resources, but the City is managing the risks by prioritizing work on culverts in critical areas to address the higher risk flooding areas.

7.2.3 Renewal

As discussed in Section 6.4, the renewal need for City assets is estimated at an average of \$111.8 million per year over the next 10 years and total investment gap of \$21.2 million per year. This renewal need is forecasted to meet proposed service levels that are considered appropriate for the City given the associated affordability and risk. For most asset areas, the proposed service level at least maintains the current condition. For some assets, an improved condition is proposed where the service level is based on recommendations from formal engineering reports or inspections such as OSIM inspections for bridges and bathymetric surveys for stormwater management facilities.

The investment gaps represent needs that exceed the overall funding available in the 10-year Capital Plan for infrastructure renewal. An investment gap is estimated for water and wastewater vertical assets. Considerable progress has been made to understand the renewal needs for water and wastewater facilities. Formal condition assessments continue to be completed on a number of facilities as well as internal staff work on the wastewater treatment plant. Continued work to improve the asset inventory, condition, and forecasting needs is an on-going improvement initiative.

Table 7-2 Renewal Needs Forecast and Investment Gap (\$M/year)

Asset Area	Needs Forecast for Proposed Service Levels (\$M/year)	10-Year Capital Plan Annual Investment (\$M/yr)	Average Annual Investment Gap (\$M/yr)
Transportation	\$35.2	\$30.4	\$4.8
Transit	\$5.2	\$4.2	\$1.0

Asset Area	Needs Forecast for Proposed Service Levels (\$M/year)	10-Year Capital Plan Annual Investment (\$M/yr)	Average Annual Investment Gap (\$M/yr)
Parks, Outdoor Recreation & Natural Areas	\$5.7	\$4.7	\$1.0
Stormwater	\$7.5	\$7.1	\$0.4
Water	Linear: \$10.0 Vertical: \$4.8	Linear: \$10.0 Vertical: \$3.0	Linear: No gap Vertical: \$1.8
Wastewater	Linear: \$4.9 Vertical: \$14.0	Linear: \$4.9 Vertical: \$2.5	Linear: No gap Vertical: \$11.5
Facilities	\$17.3	\$17.3	No gap
Fleet	\$6.2	\$6.2	No gap
Barrie Collingwood Railway	\$1.0	\$0.3	\$0.7
Total	\$111.8	\$90.6	\$21.2

7.2.4 Operations & Maintenance

The operating budget focused on asset-related operations and maintenance is \$168.3 million in 2025. The estimated average annual increase beyond 2025 is summarized for each asset area in Section 6.5. The estimated increases account for growth in the asset portfolio to maintain service levels over the next 10 years.

Operating budget pressures were noted primarily for Facilities; Parks, Outdoor Recreation, and Natural Areas; and Stormwater:

- **Parks, Outdoor Recreation, and Natural Areas:** The City's ability to perform the required inspection and maintenance activities has been at risk over the past few years as the operating budget has not been sufficiently increased to align with recent and continued growth in the asset portfolio as well as the increased costs of materials and contracted services. Service level gaps that are not adequately being addressed include park lighting replacement planning, pickleball court maintenance, park structure inspections, bridge repairs, trails inspection and maintenance, and invasive species management.
- **Facilities:** Similar operating budget pressures exist for facilities due to the increased costs of materials and contracted services. Both corporate and recreation facilities utilize a Minor Capital account that is subject to potential underfunding. Funds can be quickly depleted with component replacements that are under the capital threshold but amount to significant costs when multiple components need to be replaced at a time. It is recommended that the City continue to monitor spending in this account to determine if additional funding will be required in future reviews of the Operating Budget.
- **Stormwater:** Sediment removal recommendations are based on bathymetric surveys on stormwater management facilities, and an investment gap of \$0.4 million per year is estimated based on the current funding available in the operating budget.

7.3 Managing Risks Associated with the Investment Gaps

The City reviews and updates Master Plans to assess what is working well and what may need adjustment, to ensure the plan continues to reflect the needs and priorities of a growing community. The Master Plan helps manage risks related to population growth by identifying where growth is occurring and deciding if planned projects are in the right places, or if changes are needed to better serve growing communities. As indicated in Section 7.2.1, the main growth investment gap is the provision for parkland and outdoor recreation assets. Outdoor recreation provision levels will be revisited in the Parks Strategic Plan. To minimize the impacts of potential decreases in parkland available on a per capita basis, future enhancement to the parks network will not only prioritize expansion of parkland but will also prioritize ways to improve and connect existing parkland and enhance inclusivity and accessibility for residents.

To manage the risks of the renewal investment gaps identified in Section 7.2.3, the City will:

- Continue to prioritize available funding based on the criticality of projects to prevent disruptions to service delivery
- Improve coordination and collaboration to improve planning and coordination of capital projects between departments to maximize resources
- Enhance its understanding of asset risks and condition data to support more informed decision-making and ensure that investments are targeted where they are most needed
- Continue to identify funding opportunities through federal and provincial programs and explore potential partnerships and corporate sponsorships to raise external funds

7.4 Limitations of Forecasts and Investment Gap Estimates

The forecasts and investment gap estimates in this AM Plan are based on currently available data and are expressed in current year dollars. For assets where construction year and formal condition assessments are not available, the renewal forecast assumes that these assets require a regular average annual reinvestment amount based on their replacement value and estimated service life. Timing of lifecycle activities can therefore be improved by investment in data collection or expanding the condition assessment program, as identified for facilities and water and wastewater vertical infrastructure. Some forecasts are also based on older condition assessments which should be updated for critical infrastructure to increase the accuracy of the renewal forecast. Data gaps were resolved where possible through consultation with City staff during development of this AM Plan.

Operating budget forecasts are limited to incorporating the impacts of expected growth in the asset portfolio. Understanding the quantitative costs associated with service level gaps will require more detailed tracking of specific operations and maintenance activities in the operating budget. Growth and upgrade service levels and associated forecasts will be impacted by recommendations from on-going Master Plan updates and the future Parks Strategic Plan. Overall recommendations for the City to improve the AM Plan and general AM practices are summarized in Section 9 and for each asset area in Sections 10 to 18.

8 RISKS ASSOCIATED WITH IMPLEMENTING THE AM PLAN

The City's ability to implement the AM Plan and meet proposed service levels may be impacted by external trends and factors. Future updates to the AM Plan will consider such factors as they occur and incorporate them into the reporting and setting of appropriate service levels and determining associated costs.

Figure 8-1 Factors Impacting AM Plan Implementation

Demographic Factors:	•Population and employment changes can impact the intensity and frequency of infrastructure use, resulting in the need for additional infrastructure or more frequent asset renewal strategies.
Social and Economic Factors:	•Increases in environmentally conscious behaviour and attitudes among residents and businesses can lead to infrastructure that lasts longer and is more efficient. From an economic perspective, higher costs due to increases to the cost of materials and energy can reduce the ability to maintain the same level of service. Population and demographic changes, as well as tourism initiatives will also have potential impacts on required service levels.
Technological Factors:	•Changes in technology or asset construction, operation, or maintenance methods may lead to the replacement of obsolete equipment or materials, helping to achieve higher quality service levels and better cost efficiencies over the asset lifecycle.
Regulatory Factors:	•The City is subject to various policies, programs, and legislative decisions issued by other levels of government (i.e., federal, provincial, and regional), and such legislative changes can impact the City's strategic direction and demand for services. Specific asset-related legislation can also impact the required performance levels of assets.
Environmental Factors:	•The City of Barrie recognizes the threat that climate change poses, both to its internal operations and the community. In 2017, the City developed an Implementation Plan to complement the Climate Change Adaptation Strategy to take the City from the planning stages of adaptation to on-the-ground implementation of priority actions. Mitigation and adaptation strategies to climate change will continue to be developed and implemented by the City as climate change impacts are better understood.

9 CONTINUOUS IMPROVEMENT

The City of Barrie has made significant strides in asset management over the years, evolving its practices to ensure sustainable service delivery and compliance with provincial regulations. The 2006 to 2010 City Council identified “Initiate an Infrastructure Renewal Program to Prioritize Rehabilitation and Repair of Roads, Pipes and other City Assets” as one of their strategic priorities. In recognition, under the guidance of the Executive Management Team, the Corporate Asset Management team was created in November 2008. Asset Management is a journey, and the City’s practices are evolving and continuously improving.

The City has previously developed individual asset management plans for each asset area, and this update consolidates all asset areas into one corporate AM Plan. The AM Plan is intended to be regularly updated through ongoing analysis and engagement.

Recommendations for continuous improvement and future updates of this AM Plan include:

- Establish data standards to guide consistent collection of key asset information, including replacement value, asset age, and condition
- Consider expanding asset condition assessment programs to close data gaps and improve lifecycle activity forecasting, particularly for assets that are currently assessed based on age
- Develop a process to update level of service and performance metrics on a regular basis as part of annual reporting processes
- Incorporate recommendations from Master Plans including new or adjusted service levels
- Improve lifecycle models that reflect optimal cost lifecycle strategies supported with empirical data. Opportunities to start with include pavement management and fleet lifecycles.
- Conduct a detailed risk review to validate high risks and develop mitigation plans or capital projects for validated risks
- Enhance alignment between AM Plan recommendations and the annual budget cycle, ensuring that service levels and risk assessments inform investment and funding decisions

Specific improvement recommendations for each asset area are provided in Sections 10 to 18.

10TRANSPORTATION

10.1 Overview

Transportation assets at the City aim to provide safe, efficient, and accessible transportation options for residents and visitors, facilitating mobility within the community. Additionally, the City offers services such as parking management, road maintenance, traffic control, and transportation planning to ensure the smooth functioning of transportation systems and support sustainable urban development.

Key Findings

- The current average PCI across all roads is 71 (good condition) but based on projects in the 10-year Capital Plan, the PCI is projected to decline to 67.5 by 2034. **The additional road investment needed to maintain the PCI at 71 over the 10-year period is estimated at \$3.8 million per year.**
- A number of retaining walls have been identified that are at risk of failure, with an **estimated 20 retaining walls (valued at approximately \$10 million in total) needing renewal over the next 10 years.**
- **There is an investment gap of approximately \$350,000 annually for guiderails.** Addressing deficiencies requires dedicated funding that is not specifically allocated in the capital budget.

10.2 State of Infrastructure

Assets that support transportation include approximately 1,646 lane-km of roads, 11 road bridges and other infrastructure such as traffic control and parking assets.

Table 10-1 shows the asset replacement value of approximately \$2,784M and includes a breakdown of the inventory by asset category and asset class. The largest portion of the asset portfolio is for Paved Roads which account for approximately 86% of assets by replacement value. Vehicles and equipment used by City staff to operate, maintain, and repair transportation infrastructure are covered in the fleet section of this AM Plan.

Table 10-1 Inventory Summary - Transportation Infrastructure

Asset Category	Asset Class	Quantity	Replacement Value (2025\$M)
Roads	Paved Roads	Arterial: 475.1 Lane-km Collector: 297.9 Lane-km Local: 872.7 Lane-km	\$2,376.6
	Traffic Control	248 Traffic Signals 30,000 Signs	\$138.8
	Streetlighting	9,362 Poles 13,072 Luminaires	\$61.7
	Roadside	6.8 km of Guiderails 237 Barricades 760 retaining walls (17,991 m²)	\$35.9

Asset Category	Asset Class	Quantity	Replacement Value (2025\$M)
Structures	Road Bridges*	11 bridges 5,678 m ²	\$48.3
Paid Public Parking	Paved Lots	30 lots 73,356 m ²	\$21.6
	Payment Systems	106 P&D units 347 Coin only units 2 Single – Beacon units 15 Double – Beacon units	\$1.2
Active Transportation	Paved Assets**	Sidewalks: 670.6 km Multi-use Paths: 12.4 km Walkways: 7.4 km	\$99.2
Road Weather Information Systems	N/A	5	\$0.5
Sub-Total			\$2,783.6

*Quantity and replacement value of Road Bridges does not include Rail Bridges (which are covered under the Barrie Collingwood Railway section) and Pedestrian Bridges (which are covered under the Parks, Outdoor Recreation and Natural Areas section).

****Sidewalks**: Paved pedestrian pathways located alongside roadways and separated from the road by a raised curb. **Walkways**: Pedestrian paths linking streets and sidewalks to other streets, parks or natural areas. **Multi-use Paths**: Paved pathways located along roadways designed to accommodate pedestrians and cyclists.

The City has typically retained a contractor to conduct a network-wide pavement condition assessment on a four-year cycle. This information is used to calculate the Pavement Condition Index (PCI) for each road segment. A pavement surface starts with a PCI value of 100 and based on the severity and type of distresses observed during assessment, the PCI is reduced to determine the final score (more information regarding this methodology can be found in ASTM D6433 Standard Practice for Roads and Parking Lots Pavement Condition Index Surveys). This information is uploaded to the City's pavement management system where needs and rehabilitation treatment decisions are made including crack sealing, resurfacing and reconstruction.

Bridges currently undergo a detailed inspection every two years following the guidelines in the Ontario Structure Inspection Manual (OSIM). The OSIM sets standards for the visual inspection and condition rating of bridges and their elements. It covers the complete inspection process, pre and post inspection operations, inspector qualifications, inspection frequency, inspection descriptions, and technical information to clearly identify structural elements, material defects and performance deficiencies. This information is used to calculate an overall bridge condition using a single value called the Bridge Condition Index (BCI). The BCI is calculated as a weighted average of the condition for each of the elements making up the structure. Although structural culverts are classified similarly as bridges under the OSIM, they are covered under the Stormwater service area within this AM Plan.

The City also completes frequent inspections where condition-related information is captured on many of its other transportation assets, such as sidewalks, guiderails, and parking lots. The following table outlines the condition methodology for each asset class within Transportation.

Table 10-2 Condition Methodology – Transportation Infrastructure

Asset Category	Asset Class	Condition Methodology	Comment
Roads	Paved Roads	Pavement Condition Index (PCI)	Roads and Parking Lots Pavement Condition Index Surveys
	Traffic Control	Age-Based	O. Reg. 239/02: Minimum Maintenance Standards for Municipal Highways (MMS): Requires municipalities to inspect their regulatory and warning traffic signs annually for retro reflectivity
	Streetlighting	Age-Based	MMS requires all luminaires to be inspected to check to see that they are functioning at least once per calendar year
Structures	Bridges Spanning >= 3m	Bridge Condition Index (BCI)	Ontario Structure Inspection Manual inspections
	Roadside	Bridge Condition Index (BCI) for some retaining walls; Age-Based for assets not inspected	Some retaining walls are inspected following the guidelines in Ontario's Structure Inspection Manual.
Paid Public Parking	Paved Lots	Pavement Condition Index (PCI)	Roads and Parking Lots Pavement Condition Index Surveys
	Payment Systems	Age-Based	N/A
Active Transportation	Paved Assets	Age-Based	In accordance with MMS. Inspections capture defects and identify action(s) needed to return conditions to a state of repair.
Road Weather Information Systems	N/A	Age-Based	N/A

The condition distribution for the City's Transportation assets is shown in Figure 10-1. The condition ratings for roads (PCI) and bridges (BCI) have been converted to a City-wide 5-point condition scale as previously shown in Table 2-3. For clarity, assets in unknown condition have been excluded from this figure. The City currently has approximately \$144 million of transportation assets in unknown condition.

Overall, Transportation assets are in good condition, with 81% of Transportation assets in fair or better condition (excluding assets in unknown condition).

Figure 10-2 shows the condition distribution in more detail by asset class.

Figure 10-1 Condition Distribution by Replacement Value - Transportation

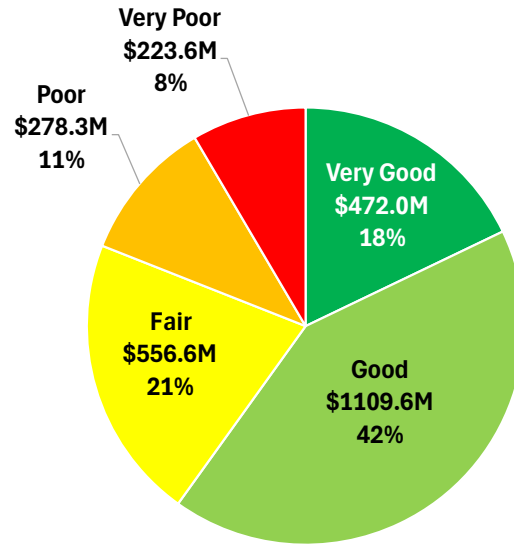
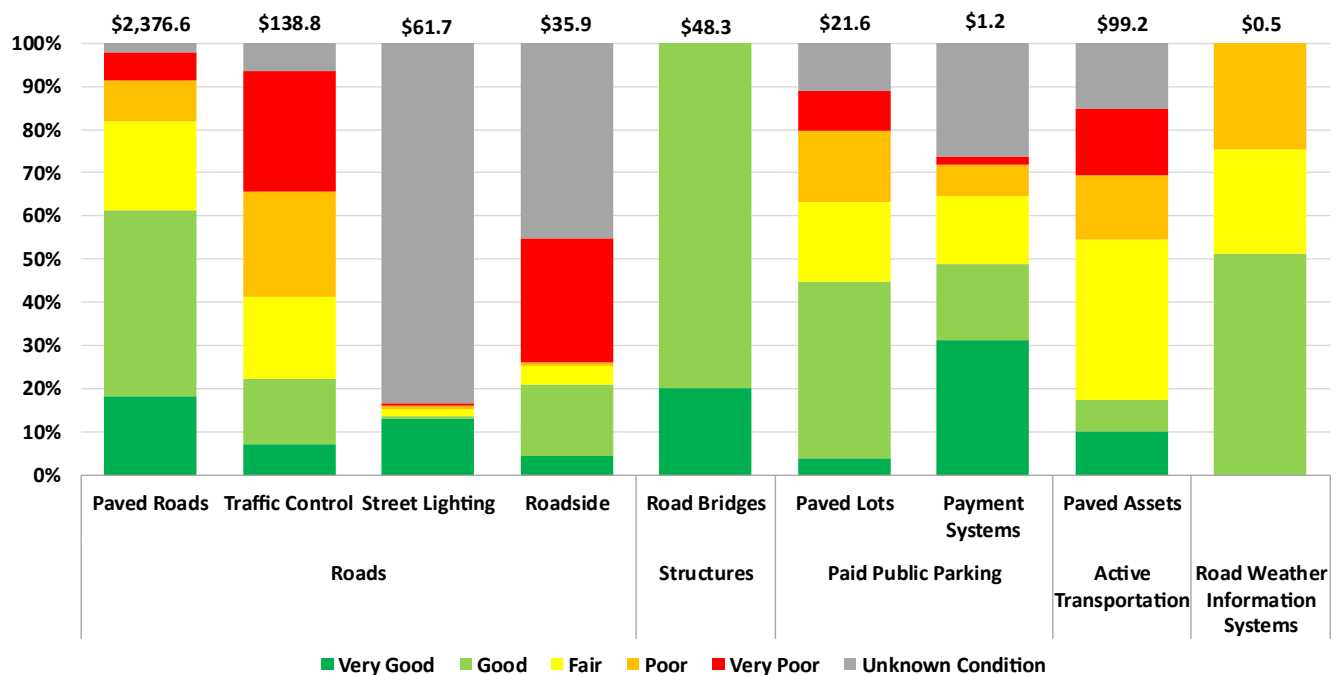
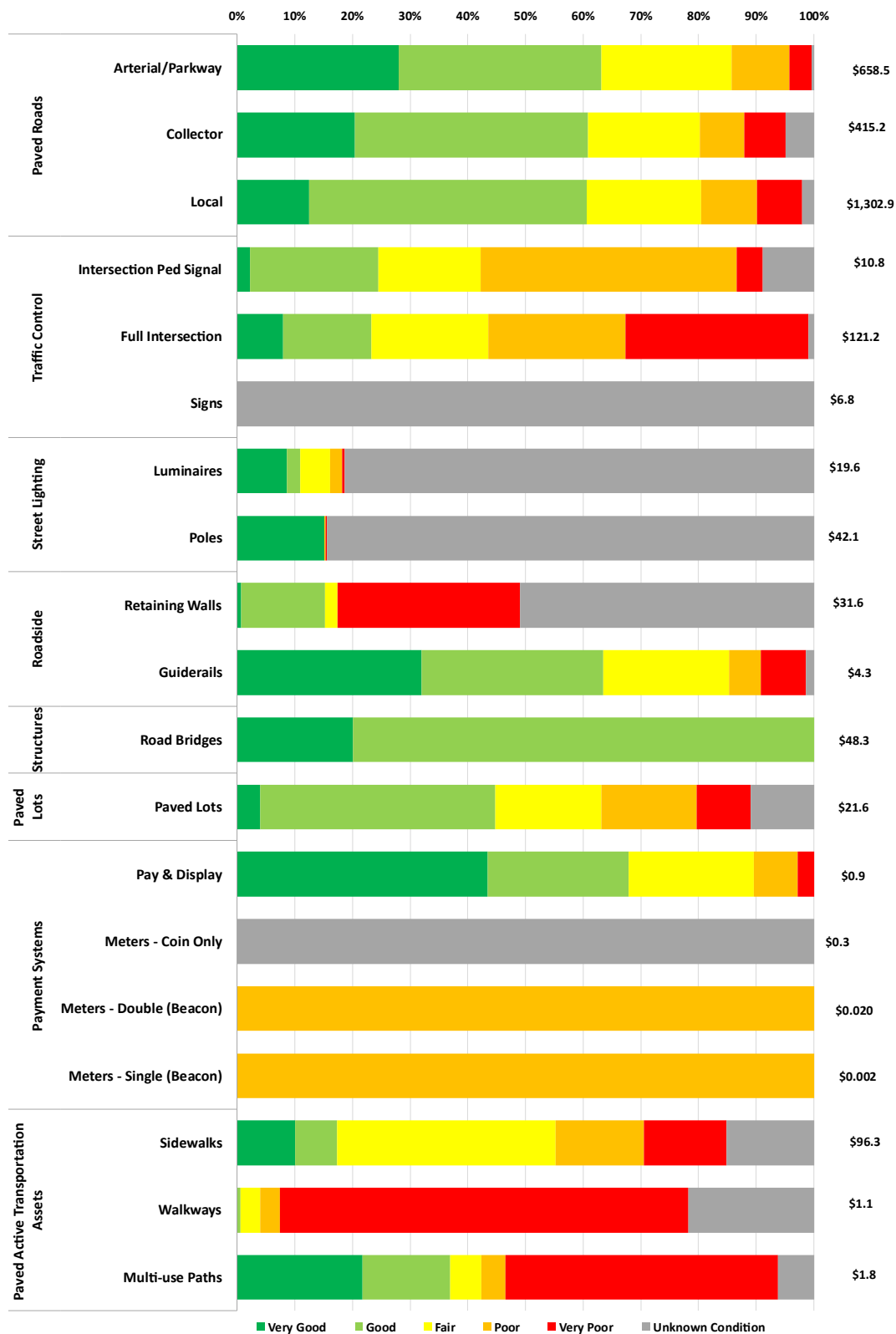


Figure 10-2 Condition Distribution by Replacement Value - Transportation by Asset Class (Percentage)



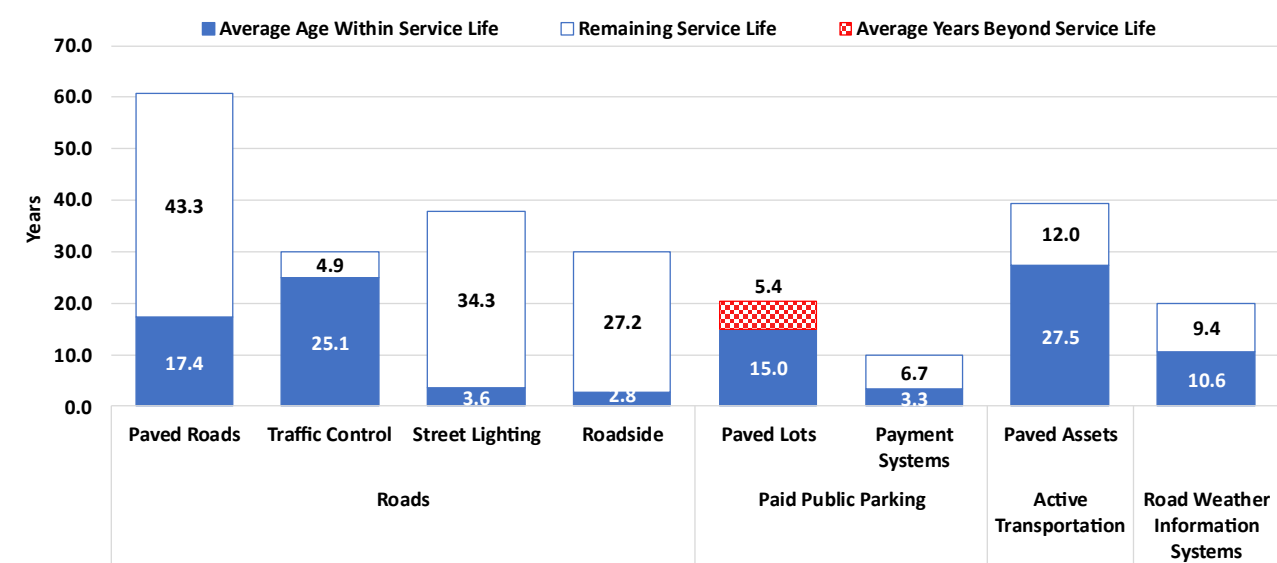
Streetlighting and Retaining Wall assets contain a large proportion in unknown condition but do not contribute significantly to the overall portfolio summary as these asset classes are relatively lower in replacement value. Critical retaining walls (Roadside assets) with unknown and preliminary condition concerns require further targeted investigation given their potential to compromise adjacent infrastructure if failures occur. Additionally, while Paved Roads have a relatively low proportion of assets in very poor condition (approx. 7%), these assets are valued at approximately \$157 million. Therefore, this requires attention in capital planning to avoid service-level impacts and escalating maintenance costs. Figure 10-3 shows the condition profile at the more detailed asset type level. Traffic Control and Paved lots have a higher proportion of assets in Poor and Very Poor condition. The full intersection signals represent the significant portion of Traffic Control assets in Very Poor assets estimated based on their age.

Figure 10-3 Condition Distribution by Replacement Value – Transportation by Asset Types (Percentage)



The age distribution for the City’s Transportation assets is shown in Figure 10-4 weighted by replacement value. Paved lots are on average five years past their estimated service life of 15 years, and traffic control assets are on average approaching end of life within the next five years. Payment systems are likely older than shown below as the “Coin Only” meters are missing data on installation year and are not included in Figure 10-4. However, the City plans to replace these assets in 2025/2026.

Figure 10-4 Average Asset Age - Transportation Assets



10.3 Levels of Service

The City is responsible for managing transportation assets within the municipality (excluding assets under the jurisdiction of other levels of government). This includes planning, designing, constructing, operating, and maintaining transportation assets within City lands. As required under O. Reg. 588/17 for the Community LOS for roads, the map provided in Figure 10-5 provides a visual description of the road connectivity throughout the City.

Per O. Reg. 588/17, the City also tracks the proportion of total length of arterial, collector, and local roads compared to the overall area of the City as well as the average Pavement Condition Index (PCI). These technical metrics in addition to other metrics are shown in Table 10-3. This table includes the current performance (as of the end of 2024), and any aspirational targets set out by the City and proposed performance over the next 10 years. Proposed performance is determined based on what is appropriate for the City in consideration of the City’s current 10-year planned funding provision in the Capital Plan as well as risks associated with various performance levels, discussed further in Section 10.6.

Table 10-3 LOS Framework - Transportation

Community LOS	Technical LOS			
	Metric(s)	Current LOS	Target LOS	Proposed LOS
Capacity & Use - Maintain adequate transportation and parking infrastructure within the City				
Description, which may include maps, of the road network in the municipality and its level of connectivity: The City owns and maintains all municipal roadways and sidewalks that serve a variety of purposes including local access and regional travel. The City's system consists of a network of arterial, collector, and local roadways. Most of these roads are local and provide connections to and within neighbourhoods, commercial sites, and industrial lands. Refer to Figure 10-5 for a map of the road network.	Number of lane-kilometres of each of arterial roads, collector roads and local roads as a proportion of square kilometres of land area of the municipality. *	Arterial Roads: 475.1 lane-km Collector Roads: 297.9 lane-km Local Roads: 872.7 lane-km City of Barrie Land Area: 108.5 km ²	N/A	 Arterial Roads: 513.4 lane-km Collector Roads: 297.9 lane-km Local Roads: 929 lane-km
Description of the traffic that is supported by municipal bridges: The bridges within the City of Barrie are dispersed through the City to provide connectivity across barriers such as watercourses and railways. Since the City is made up of industrial, commercial, and residential sectors, these assets can be exposed to a	Percentage of bridges in the municipality with loading or dimensional restrictions.	0% (Lockhart Rail Bridge with dimensional restriction covered in Section 18 – BCRY)	0%	 0%

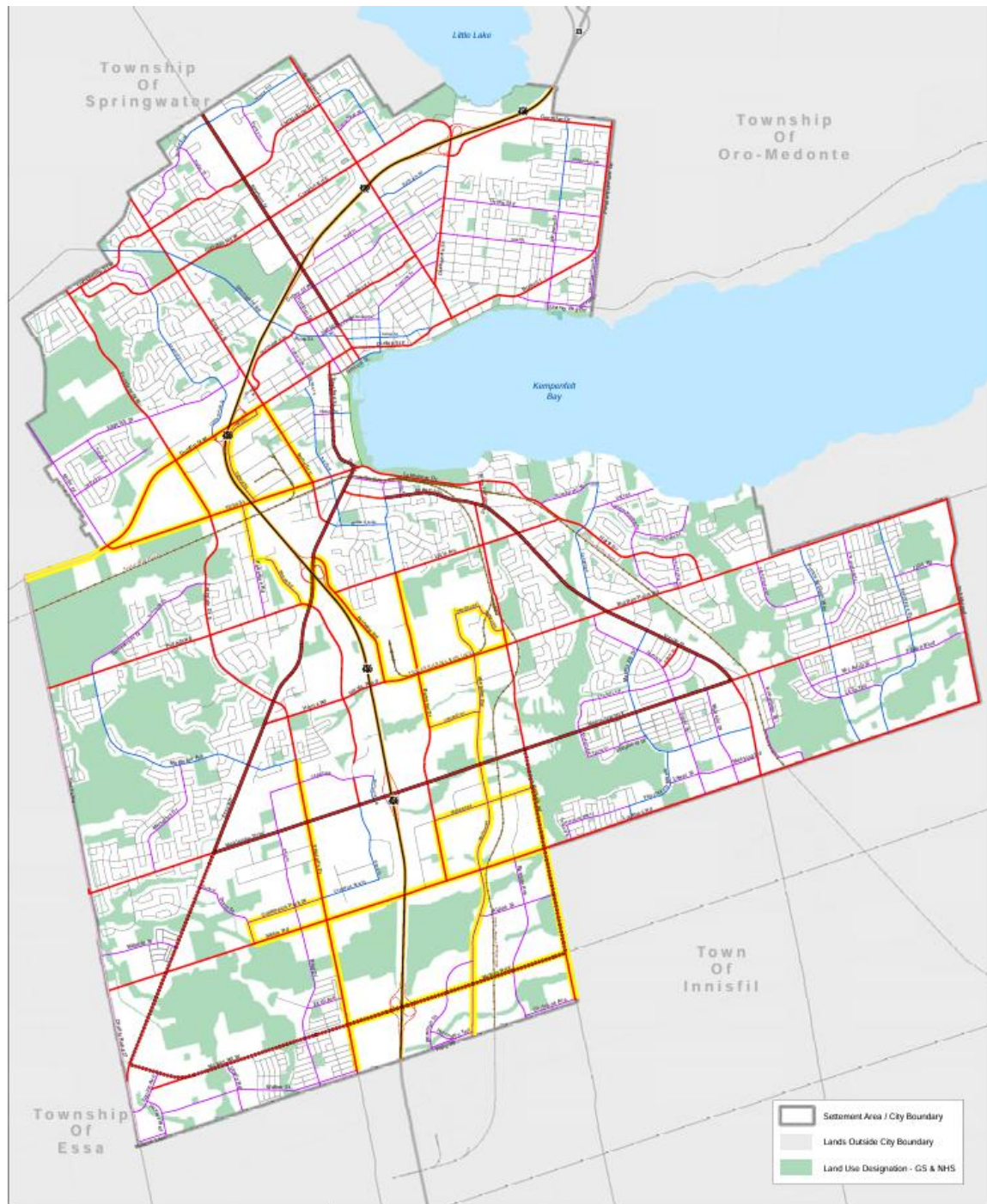
Community LOS	Technical LOS			
	Metric(s)	Current LOS	Target LOS	Proposed LOS
combination of heavy transport vehicles, motor vehicles, emergency vehicles, pedestrians or cyclists, depending on where they are located within the City.				
Provide adequate parking infrastructure within the City	Number of parking spaces	Future metric		
Function – Provide a safe and well-lighted road network				
Provide adequately lighted and safe roads within the City	Number of lane-km of roads that are deficient in lighting	Future metric		
Quality & Reliability**- Maintain transportation assets in a state of good repair				
Description or images that illustrate the different levels of road class pavement condition. Refer to Table 10-4.	For paved roads in the municipality, the average pavement condition index value.	71.0 (All Roads)	71.0 (Maintain LOS)	 71.0 (Maintain LOS)
Description or images of the condition of bridges and how this would affect use of the bridges. Refer to Table 10-5.	For bridges in the municipality, the average bridge condition index value.	79.8 (Structural Culverts are covered under Stormwater service area)	N/A	 79.1

Community LOS	Technical LOS			
	Metric(s)	Current LOS	Target LOS	Proposed LOS
Transportation assets are maintained in a state of good repair	Percentage of Roads & Bridges in fair or better condition)	Roads: 83.6% Road Bridges: 100%	N/A	 Roads: 83.6% Road Bridges: 100%
	Percentage of Traffic Control Assets in fair or better condition)	44.2%	N/A	 >52%
	Percentage of Parking Assets in fair or better condition)	71.7%	N/A	 ~72%
	Percentage of Active Transportation Assets in fair or better condition)	64.1%	N/A	 ~64%

*Service attribute is listed as “Scope” in O. Reg. 588/17, but is shown as “Capacity & Use” for consistency with LOS Framework

**Service attribute is listed as “Quality” in O. Reg. 588/17, but is shown as “Quality & Reliability” for consistency with LOS Framework

Figure 10-5 City of Barrie Road Network*



*Source: Official Plan Map 4B

Road Classification		Transportation Features HOV	
Provincial Highway	Major Collector	Transit Priority Features	
Existing Highway Interchange	Minor Collector	HOV (leftmost lane) (MTO 2017 Transportation Environmental Study Report)	
Proposed Highway Interchange	Parkway	HOV (rightmost lane)	
County Road	Local Road	Protected HOV beyond 2041 (rightmost lane)	
Arterial	Freight Supportive Corridor		

* Certain features like roads, parks and trails within the undeveloped designated greenfield area are conceptual and subject to change.

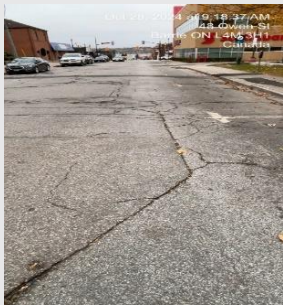
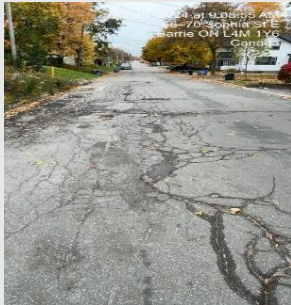
The City recognizes the importance of retaining walls in supporting the stability and safety of public infrastructure. While a formal condition assessment and Bridge Condition Index (BCI) framework for retaining walls is still under development, the City aims to ensure these assets remain functional, safe, and visually acceptable. The City is committed to continuous improvement in monitoring and managing retaining walls. As the BCI framework is refined, it will be integrated into the LOS framework to enhance decision-making and resource allocation.

Regarding parking infrastructure within the City, there are several proposed changes which will impact the number of parking spaces in the City. The new Allandale Station Park will potentially add approximately 35 new parking spaces (completion estimated fall 2025). The H-Block Parking Lot is currently listed for sale. However, the City is planning to have approximately 174 parking spaces be made available to them as part of the sale. The North Marina Lot and the Lakeshore Lot are to be potentially developed into parkland, while the new Spirit Catcher Lot is to be potentially reduced in parking significantly to approximately 40 parking spaces.

Descriptions for each of the PCI rating categories and the mapping of PCI to the five-point condition scale is provided in Table 10-4. Example photos are provided of roads in each condition category.

Table 10-4 PCI Rating Categories

Condition Grade	PCI	Road Condition Description	Road Example
Very Good	86 - 100	The road segment is relatively new, or recently reconstructed. There are no visible cracks and no structural issues. The ride is smooth.	
Good	71 – 85	The road segment is starting to exhibit few, if any, signs of surface deterioration, random cracks, and rutting. The ride is relatively smooth.	
Fair	56 – 70	The road segment is exhibiting signs of surface deterioration, random cracks, rutting, and other surface defects. The ride is becoming rough.	

Condition Grade	PCI	Road Condition Description	Road Example
Poor	41 – 55	The road segment shows signs of deterioration, cracks, rutting, and other surface defects that occurs over 50 percent of the surface. Some structural issues are starting to show. The ride is uncomfortable.	
Very Poor	0 - 40	The road segment is reaching the end of its useful life. There are significant structural issues with large visible cracks, rutting and other surface defects that occurs over 75 percent of the surface. The road is difficult to drive at the posted speed limit.	

Descriptions for each of the BCI rating categories and the mapping of BCI to the five-point condition scale is provided in Table 10-5.

Table 10-5 BCI Rating Categories

Condition Grade	BCI	Bridge Condition Description
Very Good	85 - 100	Overall, the components of the structure are in very good condition. Generally, the structure has been constructed within the last 10 years and does not require any work within the next 10 years.
Good	70 – 85	Overall, the components of the structure are in good condition. Generally, the structure is adequate or requires only minor maintenance within the next 10 years.
Fair	60 – 70	Overall, the components of the structure are in fair condition. Generally, the structure requires major rehab or replacement within the next 10 years or requires a Condition Survey (C/S), Load Capacity Evaluation (LCE) or Rehabilitation/ Replacement Analysis (RRA).
Poor	40 – 60	Overall, the components of the structure are in poor condition. Generally, the structure requires replacement within the next 5 years.
Very Poor	0 – 40	Overall, the components of the structure are in very poor condition. Generally, the structure requires replacement within the next 5 years.

10.4 Risk Management Strategy

The City uses an established risk framework for quantifying the condition-based risk exposure of its assets to enable prioritization of renewal projects across asset classes and services. Risk exposure is the multiplication of the criticality or consequence of failure (CoF) by the probability of failure (PoF).

The most critical transportation assets with a CoF of 5 are bridges on roads and guiderails on embankments or bridges, full intersection signals and retaining walls identified in the City's work on retaining wall prioritization. Other guiderails and arterial roads are the next most critical asset types, with a CoF of 4.

As shown in Figure 10-6, an estimated \$131.8 million (5.0%) of Transportation assets currently have a high-risk exposure and an estimated \$67.4 million (2.6%) of Transportation assets currently have a very high-risk exposure. The very high-risk assets consist mainly of various arterial road segments and traffic signals estimated to be at their end of life.

Figure 10-6 Risk Exposure for Transportation Assets* (\$M)

Risk exposure in year 2025 \$, millions									
Probability of Failure	Almost Certain	\$2.2	\$117.5	\$36.5	\$64.4	\$3.0	Risk Exposure	\$	%
	Very Likely	\$5.3	\$146.0	\$32.4	\$94.6	\$0.0	Very High	\$67.4	2.6%
	Moderate or Likely	\$3.1	\$298.0	\$81.2	\$173.7	\$0.7	High	\$131.8	5.0%
	Occasional or Possible	\$3.1	\$643.6	\$170.9	\$251.1	\$40.9	Moderate	\$364.4	13.8%
	Very Rare	\$2.3	\$173.5	\$92.1	\$194.3	\$9.8	Low	\$959.2	36.3%
		Insignificant	Minor	Moderate	Major	Catastrophic	Very Low	\$1,117.3	42.3%
	Consequence of Failure					Total	\$2,640.0	100.0%	

10.5.1 Renewal Forecast

The renewal needs forecast for Roads is determined using a comprehensive and data-driven approach by combining condition assessments, lifecycle cost analysis, and risk-based prioritization. At the core of the forecasting process is the Pavement Condition Index (PCI), which evaluates road segments based on surface condition. The City conducts automated pavement condition assessments every four years in accordance with ASTM D6433 standards. These assessments identify surface defects such as cracking, rutting, and potholes, which are then used to place each road segment on a deterioration curve that projects future degradation.

Roads in poorer condition (PCI below 56) are flagged for renewal, while those in fair to good condition (PCI between 56 and 85) are identified as candidates for preventative treatments like micro-surfacing and resurfacing. Roads that are in very good condition are ideal candidates for early life preservation activities such as asphalt rejuvenators and crack sealing. These treatments are modeled in a lifecycle strategy that selects the most cost-effective interventions based on road condition, timing, and cost-benefit analysis.

Summary of Recommended 10-Year Renewal Strategy:

- Roads

The proposed performance is recommended to maintain a PCI of 71 (Good condition) over the next 10 years. Renewal is based on various treatments applied at appropriate PCI thresholds with some deferrals for lower risk roads.

- Bridges

The proposed performance is to complete all rehabilitation recommendations from biennial bridge inspections, resulting in a BCI of approximately 79 (Good condition) in 2034.

- Other Transportation Assets

The proposed performance is recommended to maintain the asset condition over the next 10 years. Assets are replaced at expected end-of-life based on age, with some deferred replacements on less critical assets

For bridges, the renewal needs forecast is based on detailed OSIM condition assessments. The renewal forecast for all other assets considers the current condition or age and estimates the planned replacement year based on estimated service lives summarized in Table 10-6.

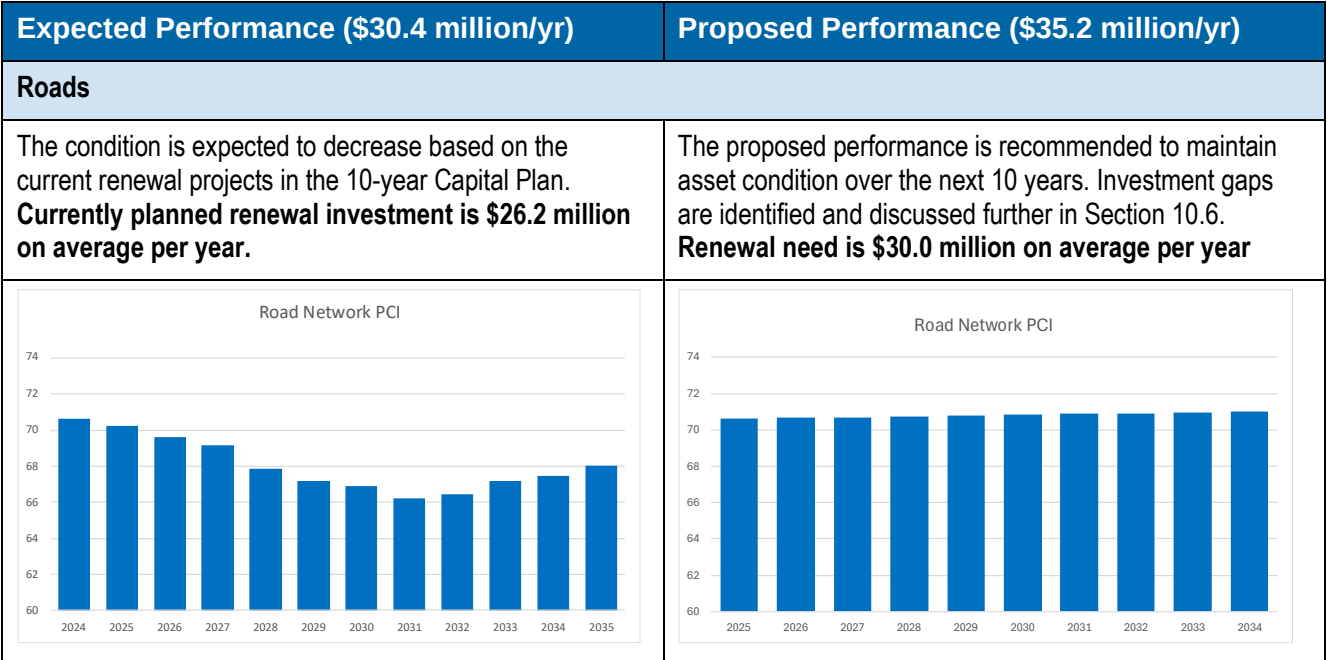
Table 10-6: Estimated Service Life – Other Transportation Assets

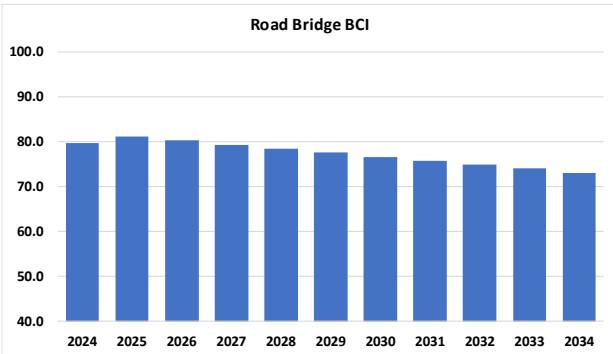
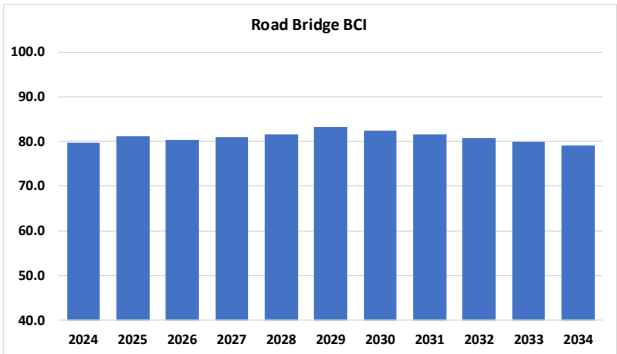
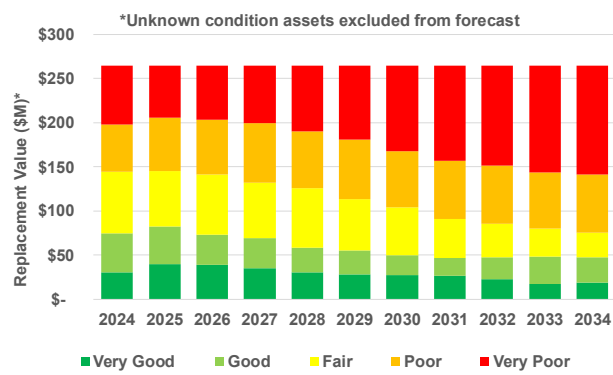
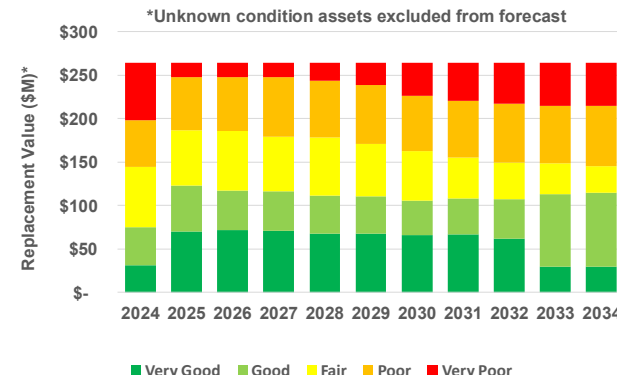
Asset	Estimated Service Life (Years)
Arterial/Parkway	45
Collector	60
Local	70
Road Bridges, Pedestrian Bridges (>3m span)	75
Traffic Signals	30
Signs, Streetlights	15
Guiderails	30
Streetlight Poles	50
Retaining Walls (Stone/Other)	30
Retaining Walls (Concrete)	75

Asset	Estimated Service Life (Years)
Paved Lots	15
Pay & Display Units, Parking Meters	10
Sidewalks/Walkways/Boulevards (Concrete)	40
Sidewalks/Walkways/Boulevards (Asphalt/Other)	20
Road Weather Information Systems	20

For Transportation infrastructure, the proposed performance is selected as appropriate for each asset type. The overall average annual renewal need is estimated at \$35.2 million per year, as shown in Figure 10-7. The expected performance based on the renewal investment currently available in the 10-year Capital Plan is lower than the proposed service level.

Figure 10-7 Renewal Needs Forecast – Transportation



Expected Performance (\$30.4 million/yr)		Proposed Performance (\$35.2 million/yr)	
Bridges			
The condition is expected to decrease based on the current renewal projects in the 10-year Capital Plan. Currently planned renewal investment is \$0.02 million on average per year (\$24,000)		The proposed performance is to complete all rehabilitation recommendations outlined in the OSIM report over the next 10 years. Investment gaps are identified and discussed further in Section 10.6. Renewal need is \$0.2 million on average per year (\$240,000)	
			
Remaining Assets			
The condition is expected to decrease based on the current renewal projects in the 10-year Capital Plan. Currently planned renewal investment is \$4.2 million on average per year		The proposed performance is recommended to maintain the asset condition over the next 10 years. Investment gaps are identified and discussed further in Section 10.6. Renewal need is \$5.0 million on average per year	
			

10.5.2 Growth Forecast

The City is currently updating the 2019 Transportation Master Plan (TMP) to accommodate the planned population growth through to 2051. This plan emphasizes the development of a multi-modal transportation network, integrating various modes of transport to meet the diverse needs of the community. Key components of the TMP as they relate to Transportation infrastructure include:

- **Active Transportation Enhancements:** The TMP aims to improve infrastructure for pedestrians and cyclists, promoting walking and cycling as viable and safe modes of

transportation. This includes expanding sidewalks, bike lanes, and multi-use trails to create a connected and accessible network throughout the city.

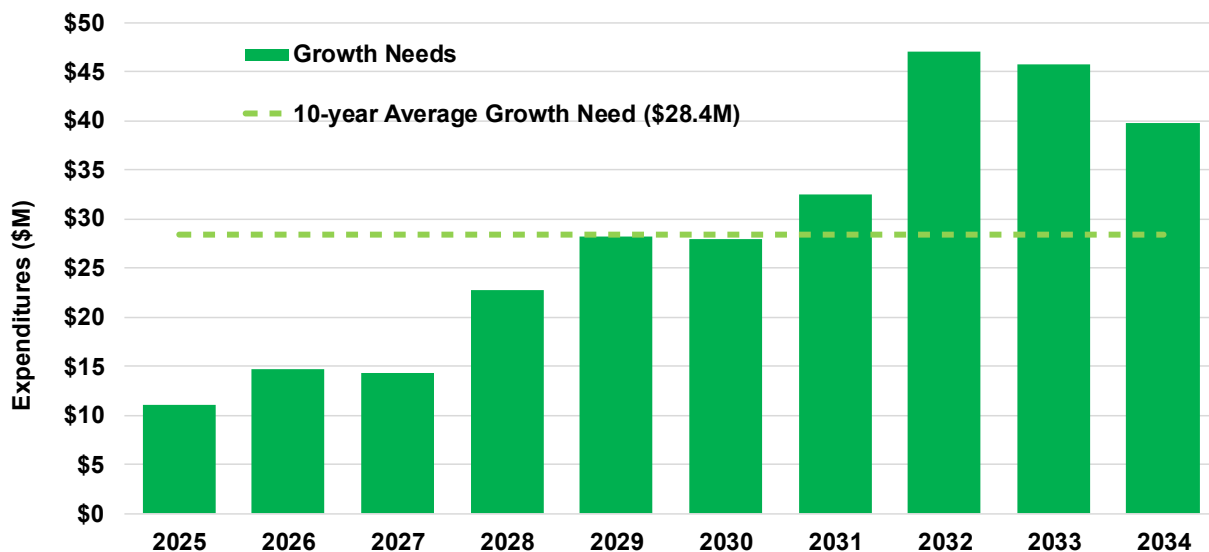
- Road Network Upgrades: To address vehicular traffic demands, the TMP includes plans for road widening and intersection improvements.

Figure 10-8 summarizes the currently identified growth needs over the next 10 years for Transportation. Growth projects currently include:

- The Bayfield Street Transportation Improvements widens Bayfield Street from Cundles Road to Coulter Street to support the MTO's new 7-lane interchange and enhance corridor capacity, safety, and active transportation infrastructure.
- The Veterans Drive Road Expansion from Salem to McKay increases road capacity and introduces urban design elements, including pedestrian and cycling facilities, to support planned development in the Salem Secondary Plan area.
- The Big Bay Point Road Transportation Improvements from Prince William Way to Terry Fox Drive will enhance traffic flow, safety, and connectivity by upgrading the road to a 3-lane urban standard with multi-use paths and supporting infrastructure.
- The Maplevue Drive East Road Expansion from Yonge Street to Prince William accommodates future growth by widening and urbanizing the corridor with improved transportation and active mobility features.

Some assets will also be constructed in part by developers and eventually be transferred to the City. The average annual growth need for Transportation infrastructure is estimated at \$28.4 million per year over the next 10 years.

Figure 10-8 Growth Needs Forecast – Transportation



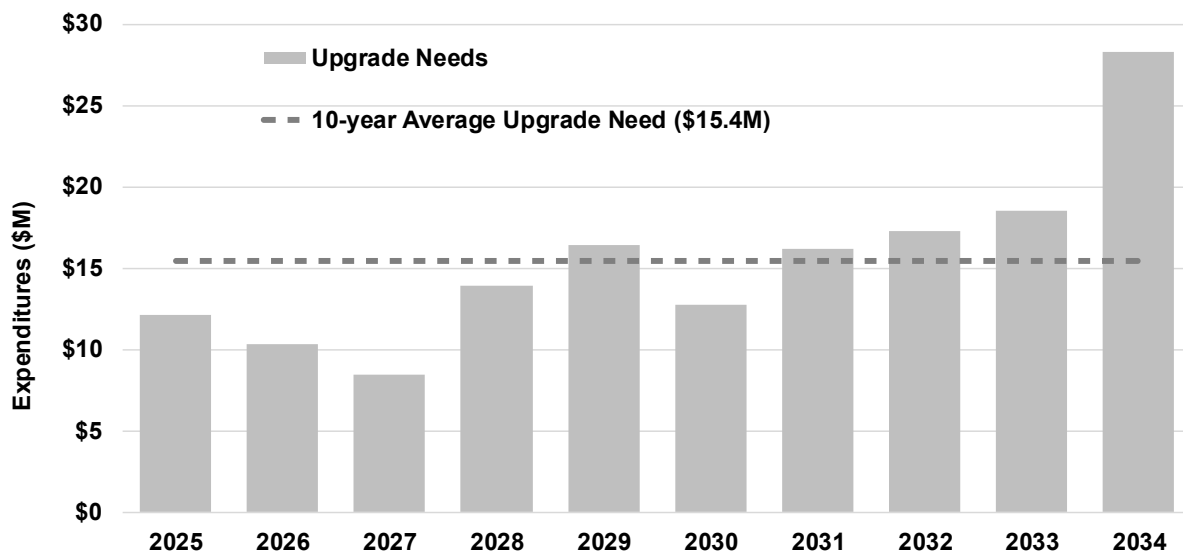
10.5.3 Upgrade Forecast

Figure 10-9 summarizes the currently identified upgrade needs over the next 10 years for Transportation. These projects are generally categorized as ‘additional capability/capacity’ in the City’s Capital Plan and may also consist of renewal or growth aspects. Upgrade projects currently include:

- The Huronia Road Transportation Improvements (Lockhart Road to Mapleview Drive) will upgrade Huronia Road to a 5-lane urban cross-section with sidewalks, streetlighting, and separated cycling infrastructure to support growing traffic demand from ongoing residential development and improve connectivity near the McKay interchange
- The Foster, Merrett, Garson, MacLaren and Yeates New Sanitary and Watermain and ROW Replacement includes full road reconstruction with urban design standards and utility replacements to provide sanitary service, storm sewers, watermains, and improved roadway infrastructure for previously unserved residential areas
- The Dunlop Street Interchange Replacement (Sarjeant Drive to Anne Street) represents the City’s contribution to the Ministry of Transportation’s replacement of the Dunlop Street Interchange

The average annual upgrade needs for Transportation infrastructure are currently estimated at \$15.4 million per year over the next 10 years.

Figure 10-9 Upgrade Needs Forecast – Transportation



10.5.4 Operations and Maintenance Forecast

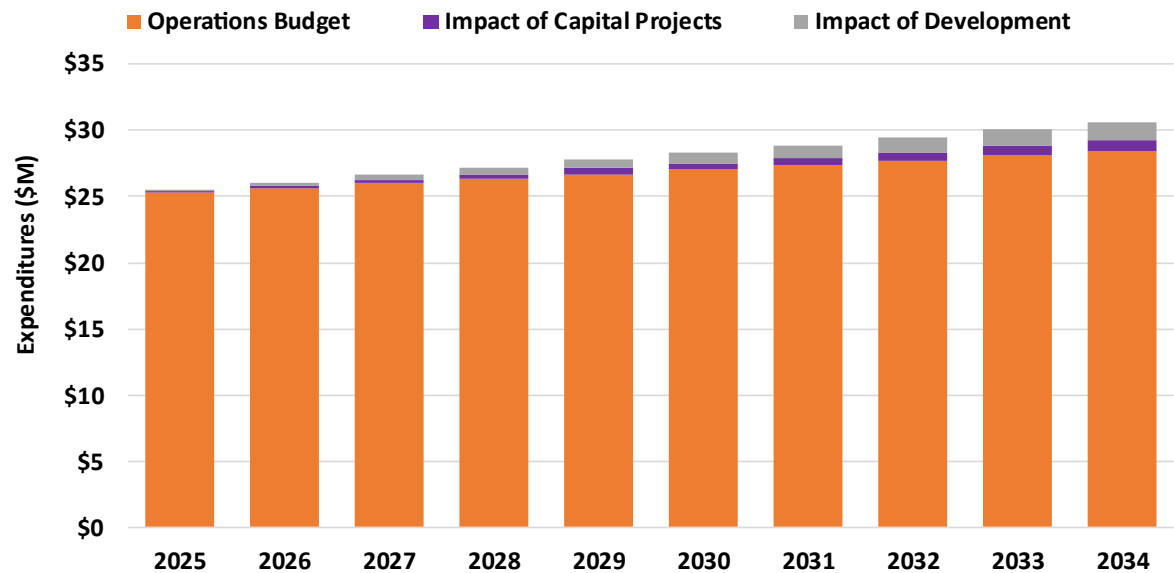
Operations and maintenance work is critical for ensuring the continued reliability of Transportation assets and meeting the proposed service levels. The Minimum Maintenance Standards (MMS), as outlined in Ontario Regulation 239/02, play a crucial role in guiding the City's operations and maintenance (O&M) strategies for transportation infrastructure. MMS establish benchmarks for inspecting, maintaining, and repairing roadways and associated infrastructure, such as sidewalks, signage, lighting, and traffic signals. These standards define minimum frequencies and response times for various activities.

Figure 10-10 shows the Operations and Maintenance needs over the next 10 years for Transportation. The increase in costs beyond 2025 in operations and maintenance activities is impacted by the estimated growth in the asset portfolio. To meet proposed service levels over the next 10 years, the Operating Budget is estimated to need to increase at an average annual rate of 2.1% (expressed in current year dollars). The Operations and Maintenance forecast below is determined by extrapolating the three-year trend in O&M provided by the City (2025-2028) and adding considerations for growth in the asset portfolio for capital projects and development.

Operations and maintenance activities include:

- Roadways
 - Pothole patching and crack sealing
 - Spot repairs to improve ride quality and drainage
 - Street sweeping and debris removal
 - Snow plowing, salting, and sanding during winter
- Traffic Signals and Streetlights
 - Lamp replacement and bulb upgrades
 - Pole inspections and maintenance
- Active Transportation Assets
 - Snow and ice control on multi-use paths
 - Repairs to cracked or uneven surfaces
- Bridges
 - Joint sealing and deck repairs
 - Minor concrete patching

Figure 10-10 Operations and Maintenance Needs Forecast – Transportation



10.6 Financing Strategy

The financial analysis considers the affordability of the proposed service levels based on the funding available in the 10-year Capital Plan compared to the forecasted needs.

The funding available for renewal of transportation infrastructure is estimated to be an average of \$30.4 million per year over the next 10 years based on the City’s Capital Plan. As discussed in Section 10.5.1, the estimated average annual renewal need is \$35.2 million per year to meet proposed service levels. This results in an investment gap of \$4.8 million per year, assuming that the City’s 10-Year Capital Plan is funded as currently planned, and that the City has the resources to carry out the projects as currently planned. As discussed in Section 10.5.1, the overall investment gap is comprised of:

- \$3.8 million per year for Roads
- \$0.2 million per year for Bridges
- \$0.8 million per year for all remaining transportation assets.

Figure 10-11: Capital Renewal Needs versus Funding – Transportation

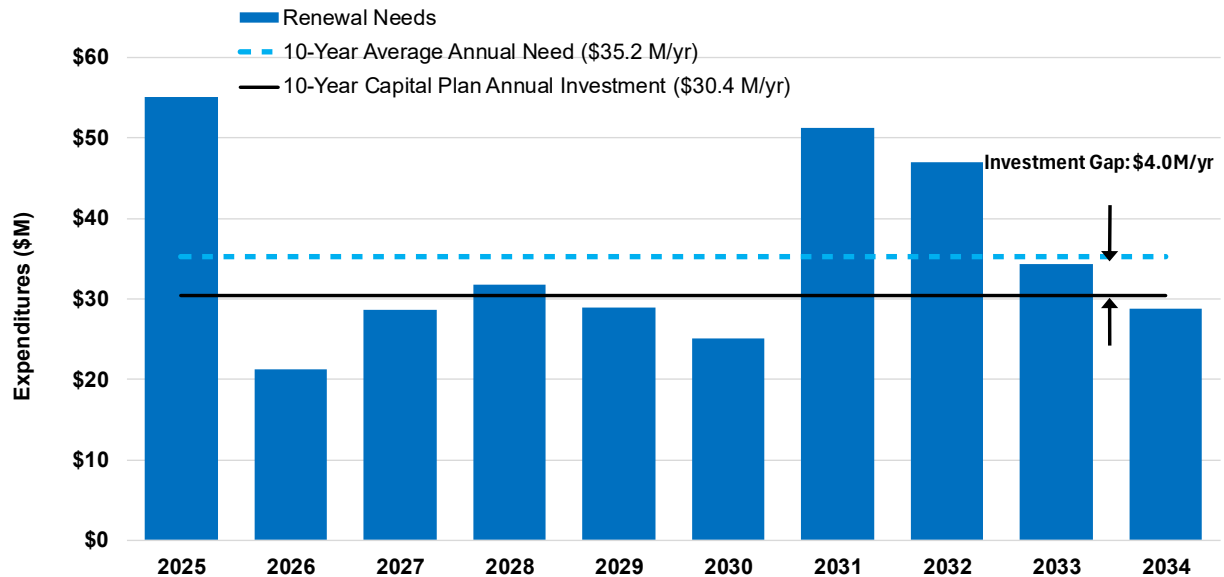


Table 10-7 summarizes the financial sustainability and affordability for growth, renewal and upgrade, and O&M activities. In terms of operations and maintenance, the Operating Budget is estimated to need to increase at an average annual rate of 2.1% to meet proposed service levels over the next 10 years.

Table 10-7: 10-Year Financial Sustainability of Proposed Service Levels

Asset Lifecycle	Average Annual Forecast Needs	10-Year Capital Plan Average Annual Investment	Average Annual Investment Gap	Potential Impacts
Capital Growth	\$28.4 M/yr	\$28.4 M/yr	No gap	Transportation Master Plan may recommend additional projects and updated service levels
Capital Upgrade	\$15.4 M/yr	\$15.4 M/yr	No gap	Transportation Master Plan may recommend additional projects and updated service levels
Capital Renewal	\$35.2 M/yr	\$30.4 M/yr	\$4.8M/yr	Deterioration in condition of infrastructure as shown in Figure 9-7.
Operations and Maintenance	\$25.5 M in 2025 to \$30.6 M in 2034	\$25.5 M in 2025	2.1% average annual increase	Failure to increase resources to operate and maintain new assets will result in reduced service levels and increased risks of not meeting Minimum Maintenance Standards

To manage the risk of the \$4.8 million per year renewal investment gap and ensure the transportation network remains in a state of good repair, the City proactively implements lifecycle activities such as routine operations, maintenance and rehabilitation. As discussed previously, preventative treatments play a vital role in the City’s asset management strategy by extending the useful life of road and bridge assets and deferring costly additional rehabilitation or replacement. These treatments are applied earlier in the asset’s lifecycle when conditions are still considered “Good” or “Fair” to slow the rate of deterioration and maintain acceptable service levels. Key preventative treatments used include:

- Micro-surfacing is a surface treatment that is typically used on roads where the surface shows early signs of wear (e.g., minor cracking or raveling) but the structural integrity remains sound.
- Asphalt rejuvenators are sprayed applications that penetrate the surface to restore the asphalt. This is especially effective for newer pavements where surface oxidation has begun but structural degradation has not occurred.
- Crack sealing involves routing and sealing cracks with hot rubberized asphalt sealant to prevent water infiltration and extend pavement life. It is typically used as a preventive maintenance treatment for roads with good structural condition but isolated cracking.

By implementing these treatments proactively rather than reactively, the City is able to reduce the frequency and associated cost of full road reconstruction, maintain a higher overall network condition and minimize service disruptions and maintain safe, reliable infrastructure for residents. The City also prioritizes projects based on a risk-based framework that considers criticality factors such as road function, traffic volumes, and connectivity to ensure that critical corridors such as arterial roads are prioritized in the City’s Capital Plan.

10.7 Recommendations for Continuous Improvement

Development of AM Plans is an iterative process that includes improving data, processes, systems, staff skills, and organizational culture over time. Continuous improvement recommendations include:

Table 10-8: AM Plan Improvement Recommendations – Transportation

AM Plan Section	Improvement Recommendation
State of Infrastructure	• Continue to build retaining wall inventory with condition and replacement value • Improve understanding of ownership of retaining walls
Levels of Service	• Develop measure to provide adequate parking infrastructure within the City, including consideration of utilization • Develop measure to provide adequately lighted and safe roads within the City
Risk Management	• Develop a more detailed risk assessment for retaining walls, considering both condition and functional design • Implement a risk review exercise to identify risks outside of data-driven approaches

AM Plan Section	Improvement Recommendation
Lifecycle Management	• Develop a detailed work plan for retaining wall renewal to address the estimated 20 retaining walls that need replacement over the next 10 years • Leverage existing data to develop sidewalk condition rating methodology • Continue to investigate lowest lifecycle cost options for road pavement management and prioritize projects based on risk
Financial Management	• Establish a program for retaining wall renewal and guiderail maintenance and replacement

11 TRANSIT

11.1 Overview

The City's Transit assets are essential to delivering safe, efficient, and accessible public transportation options for all residents and visitors, enhancing mobility throughout the community. This includes the maintenance and optimization of transit infrastructure, vehicles, and facilities, ensuring they meet the current and future needs of the community.

Key Findings

- **There is an investment gap of approximately \$1.0 million per year for renewal based on the 10-year Capital Plan.** Purchase prices for new buses have been increasing, and this is putting pressure on the replacement budget.
- **The City is constructing a new Transit Terminal** that will improve service delivery and mobility for Barrie residents.

11.2 State of Infrastructure

Assets that support Transit infrastructure include 67 buses, 176 bus shelters and over 600 bus stops. Figure 11-2 shows the replacement value of approximately \$64 million and includes a breakdown of the inventory by asset category and asset class.

The largest portion of transit asset portfolio is the Conventional Fleet which accounts for approximately 75% of assets by replacement value. Other City vehicles are covered under Section 17 (Fleet) and Transit facilities are covered under Section 16 (Facilities).

Table 11-1 Inventory Summary - Transit Infrastructure

Asset Category	Asset Class	Quantity	Replacement Value (2025\$M)
Fleet	Conventional Fleet	45	\$48.1
	Cutaways	20	\$9.0
	Electric Fleet	2	\$3.2
Bus Stops & Shelters	Bus Shelters	Half Shelter: 8 Small Shelter: 100 Medium Shelter: 57 Large Shelter: 11	\$1.5
	Bus Pads	325	\$1.7
Sub-Total			\$63.4

For most Transit assets, condition estimates are based on the age of the asset. The proportion of remaining life compared to estimated service life is converted to a City-wide 5-point condition scale as previously shown in Table 3-3. The condition ratings for concrete bus stops are based on general condition inspections.

The condition distribution for the City's Transit assets is shown in Figure 11-1.

Overall, Transit assets are in fair condition, with 73.4% of assets in fair or better condition. 15.7% of assets are in very poor condition based on asset age. The City currently does not have any Transit assets with unknown condition.

Figure 11-2 shows the condition distribution in more detail by asset class.

Figure 11-1 Condition Distribution by Replacement Value (\$M) - Transit

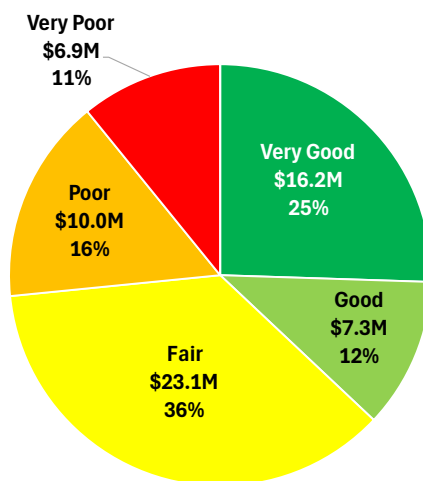
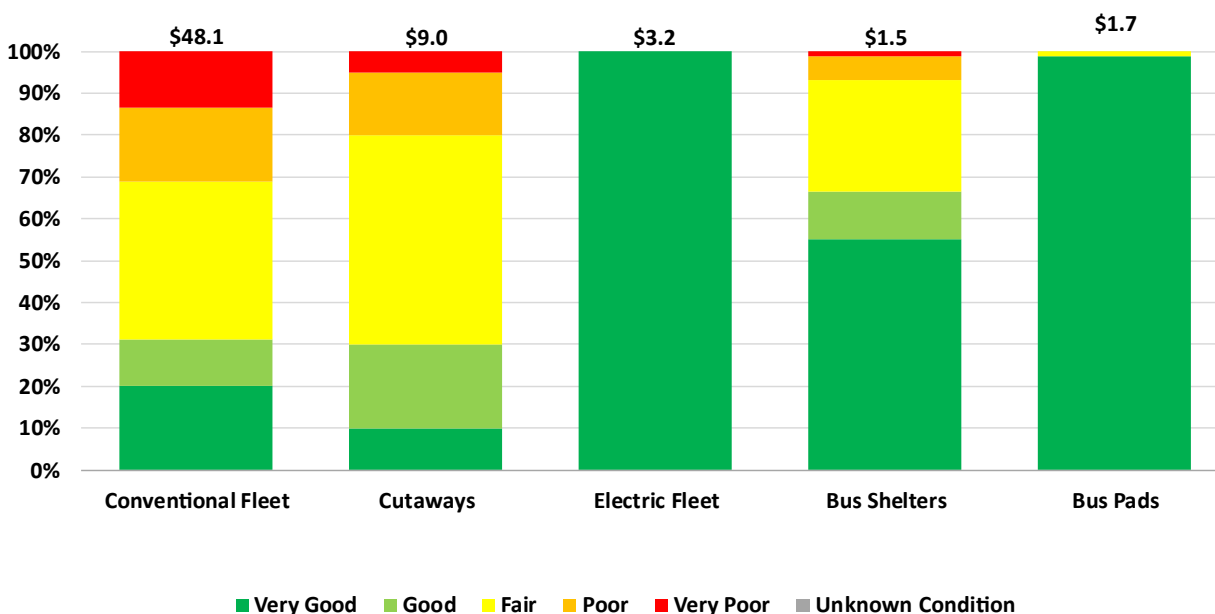
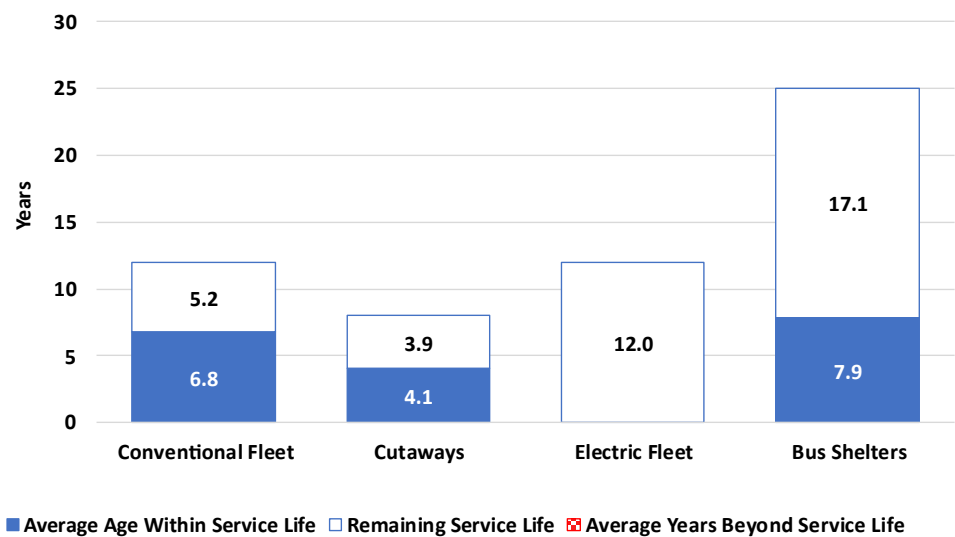


Figure 11-2 Condition Distribution by Replacement Value – Transit Assets by Asset Class (Percentage)



The age distribution for the City's Transit assets is shown in Figure 11-3. This figure shows the average age of assets relative to their average service lives weighted by replacement value. Bus pads do not have installation or purchase year data, therefore an age analysis for these assets is not included. Electric fleet and electric bus chargers are new assets with projected 12- and 10-year service lives, respectively.

Figure 11-3 Average Asset Age – Transit Assets



11.3 Levels of Service

Table 11-2 provides the LOS Framework for the City’s Transit infrastructure. This table includes the current performance (as of the end of 2024) Proposed performance is determined based on what is appropriate for the City in consideration of the City’s current 10-year planned funding provision in the Capital Plan as well as risks associated with various performance levels, discussed further in Sections 11.6.

Table 11-2 LOS Framework - Transit

Community LOS	Technical LOS			
	Metric(s)	Current LOS	Target LOS	Proposed LOS
Capacity & Use - Maintain adequate capacity for transit services				
The hours-of-service operation are from 4:20am to 1:00am. During peak hours, the frequency of service is between 30 and 60 minutes	Hours of operation	 Frequent Transit Network (FTN): Weekday: 6:00a.m. - 10:30p.m. Saturday: 7:00a.m. - 10:30p.m. Sunday: 9:00a.m. - 10:00p.m. Local Transit Network (LTN): Weekday: 7:00a.m. - 6:00p.m. Express Transit Network (ETN) & On Demand Zone: As demand warrants		
Barrie Transit delivers transit service to the community through various routes throughout the City of Barrie: The transit map with routes can be viewed on the City of Barrie website at: https://www.barrie.ca/TransitNetworkMap.pdf	Boardings per service hour	2A: 20 2B: 20 7A: 18 7B: 18 8A: 28 8B: 26 10: 27 11: 26 12A: 20 12B: 18 100: 38 101: 37 400: 15	 FTN: Minimum 15 LTN: Minimum 8 ETN: Minimum 30 On Demand Zone: Minimum 4	

Community LOS	Technical LOS			
	Metric(s)	Current LOS	Target LOS	Proposed LOS
	Percentage of residential and employment uses that are served by a Barrie Transit Service within 400m from a bus stop	>85%		 >85%
Quality & Reliability - Provide on-time delivery of transit services				
Transit provides reliable transit services through schedule adherence and minimizing route disruptions.	Percentage of bus trips with on time performance (between 3 minutes early and 5 minutes late)	Fixed routes: 83% On Demand: 92% (on-time performance for August 2024)	>85%	 >85%
	Number of spare buses in fleet	Spare ratio of 40%		 Spare ratio of 40%
Quality & Reliability – Maintain transit assets in a state of good repair				
Assets are maintained in a state of good repair to provide reliable services to the community.	Percentage of assets in fair or better condition	73.1%	75%	 >70%

The City is committed to improving transit accessibility and ensuring compliance with the Accessibility for Ontarians with Disabilities Act (AODA) by 2025. Currently, the City is actively allocating funds from the Investing in Canada Infrastructure Program (ICIP) to enhance the accessibility of transit stops. Plans have been developed to address accessibility improvements, with a focus on leveraging available funding to maximize progress. A detailed accessibility plan has been developed to guide these efforts, ensuring that the City's transit system becomes increasingly inclusive and accessible for all residents.

11.4 Risk Management Strategy

The City uses an established risk framework for quantifying the condition-based risk exposure of its assets to enable prioritization of renewal projects across asset classes and services. Risk exposure is the multiplication of the criticality or consequence of failure (CoF) by the probability of failure (PoF).

As shown in Figure 11-4, an estimated \$6.9 million of Transit assets currently have a high-risk exposure (orange). These assets consist of certain Conventional Fleet and Cutaways (with a moderate CoF rating of 3) that are estimated to be in very poor condition due to their age. The risk related to these assets is mitigated by the City's policy of keeping spare buses in the transit fleet. However, the City must continue to prioritize the transit bus replacement programs to maintain the reliability of the transit fleet.

Figure 11-4 Risk Exposure for Transit Assets* (\$M)

Risk exposure in year 2025 \$, millions						
Probability of Failure	Almost Certain	\$0.0	\$0.0	\$6.9	\$0.0	\$0.0
	Very Likely	\$0.0	\$0.0	\$10.0	\$0.0	\$0.0
	Moderate or Likely	\$0.0	\$0.0	\$23.1	\$0.0	\$0.0
	Occasional or Possible	\$0.0	\$0.0	\$7.3	\$0.0	\$0.0
	Very Rare	\$1.7	\$3.8	\$11.3	\$0.0	\$0.0
		Insignificant	Minor	Moderate	Major	Catastrophic
Consequence of Failure						

11.5.1 Renewal Forecast

The renewal forecast considers the current condition or age of each asset and estimates the planned replacement year based on estimated service lives summarized in Table 11-3. For assets that have an unknown condition or age (bus pads), an average annual investment rate is used based on the value of the asset and the estimated service life.

Summary of Recommended 10-Year Renewal Strategy:

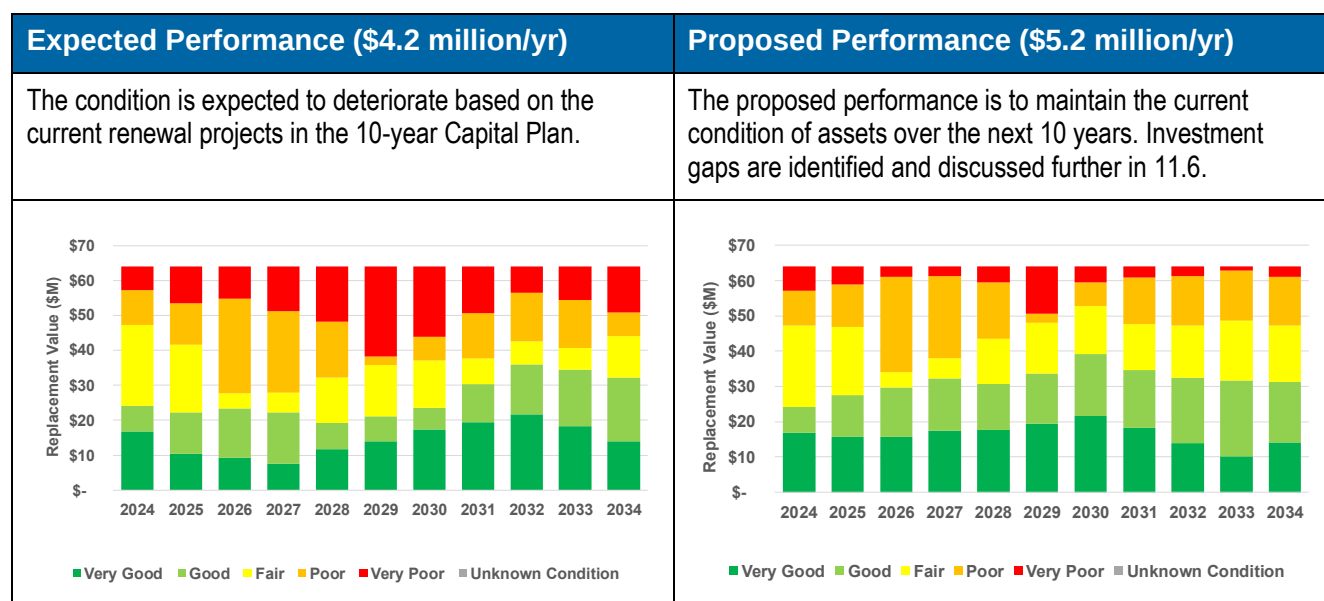
- Maintains % of assets in fair/better condition above 70% (overall portfolio in Fair condition)
- Vehicles and equipment are replaced at expected end-of-life based on age and the estimated service life, with some deferred replacements on less critical assets

Table 11-3: Estimated Service Life – Transit

Asset	Estimated Service Life (Years)
Conventional Fleet	12
Cutaways	8
Electric Fleet	12
Electric Bus Chargers	10
Bus Shelters	25
Bus Pads	60

For Transit, the proposed performance is to maintain the current condition of assets over the next 10 years, as shown in Figure 11-5. The average annual renewal need is estimated at \$5.2 million per year. The expected performance based on the renewal investment currently available in the 10-year Capital Plan is lower than the proposed service level.

Figure 11-5 Renewal Needs Forecast – Transit



11.5.2 Growth Forecast

The City is currently updating the 2019 Transportation Master Plan (TMP) to accommodate the planned population growth through to 2051. This plan emphasizes the development of a multi-modal transportation network, integrating various modes of transport to meet the diverse needs of the community. Key components of the TMP as they relate to Transit infrastructure include:

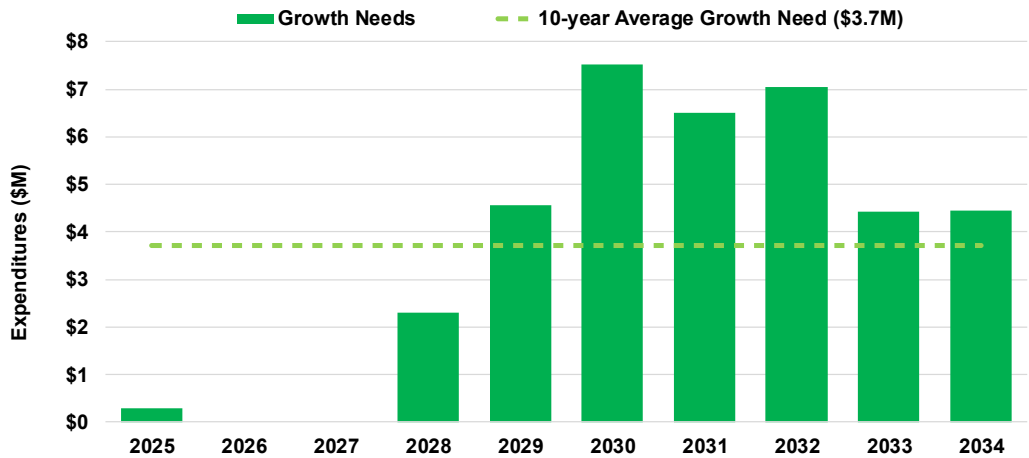
- **Public Transit Improvements:** Recognizing the importance of efficient public transit, the plan outlines strategies to enhance bus services and infrastructure. This involves implementing a new transit network, planning for future expansions beyond 2025, and developing a Bus Stop Infrastructure Plan to upgrade bus stops with features like shelters, bike racks, and benches.
- **Integration with Regional Transit:** The TMP considers collaboration with regional transit services to ensure seamless connectivity. This includes potential new GO Transit stations and enhanced services to facilitate commuter movement between the City and neighboring regions
- **Modal Share Targets:** The TMP establishes modal share targets to shift more trips to sustainable transportation options such as transit, walking, and cycling. These targets guide the scale and pace of transit network expansion needed to support broader mobility and environmental goals.

Figure 11-6 shows the Growth needs over the next 10 years for Transit. These projects are planned to implement Barrie's New Network and meet the proposed service levels identified in Section 11.3. Growth projects currently include:

- The Conventional Transit Bus - Growth Program supports the expansion of the conventional transit fleet to meet increased service demands in growing areas such as Salem and Hewitts, while also enhancing service coverage throughout the existing urban boundary to achieve the modal share targets established in the TMP.
- The Specialized Transit Bus - Growth Program anticipates the acquisition of specialized transit buses to expand services and accommodate future population growth and evolving community accessibility needs.
- The Transit Dynamic Bus Bays project funds the installation of dynamic bus bays to improve transit service efficiency and safety by allowing buses to pull out of traffic lanes during stops.

The Transit Garage Expansion is included with Facilities growth needs in Section 16.5.2. The average annual growth need for Transit infrastructure is estimated at \$3.7 million per year over the next 10 years.

Figure 11-6 Growth Needs Forecast – Transit

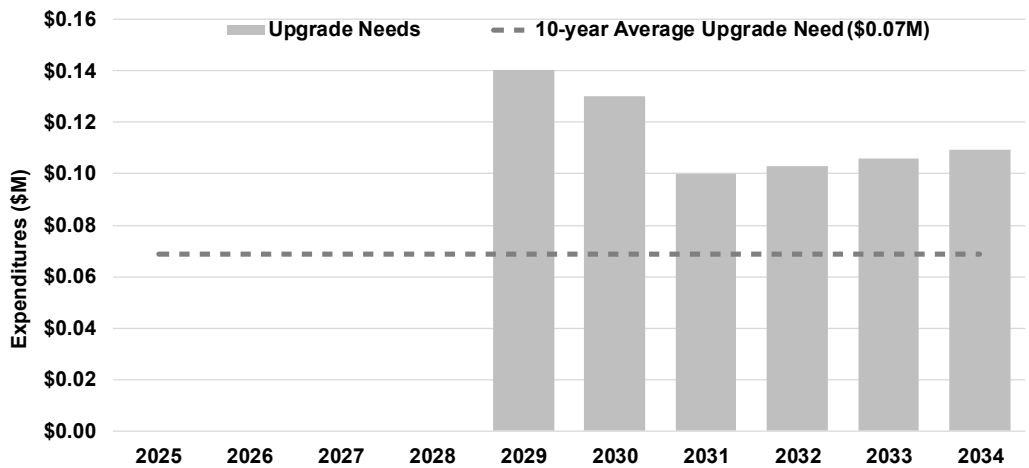


11.5.3 Upgrade Forecast

Figure 11-7 summarizes the currently identified upgrade needs for Transit over the next 10 years. These projects are generally categorized as ‘additional capability/capacity’ in the City’s Capital Plan and may also consist of renewal or growth-related aspects. Upgrade projects currently include the Bus Stop Infrastructure Replacements & Improvements Program which supports the future replacement and upgrade of aging bus stop infrastructure across the city to enhance accessibility, safety, and passenger experience.

The Allendale and Downtown Transit Mobility Hub upgrades are included with Facilities upgrades in Section 16.5.3. The average annual upgrade needs for Transit infrastructure is currently estimated at \$0.07 million per year over the next 10 years.

Figure 11-7 Upgrade Needs Forecast – Transit



11.5.4 Operations and Maintenance Forecast

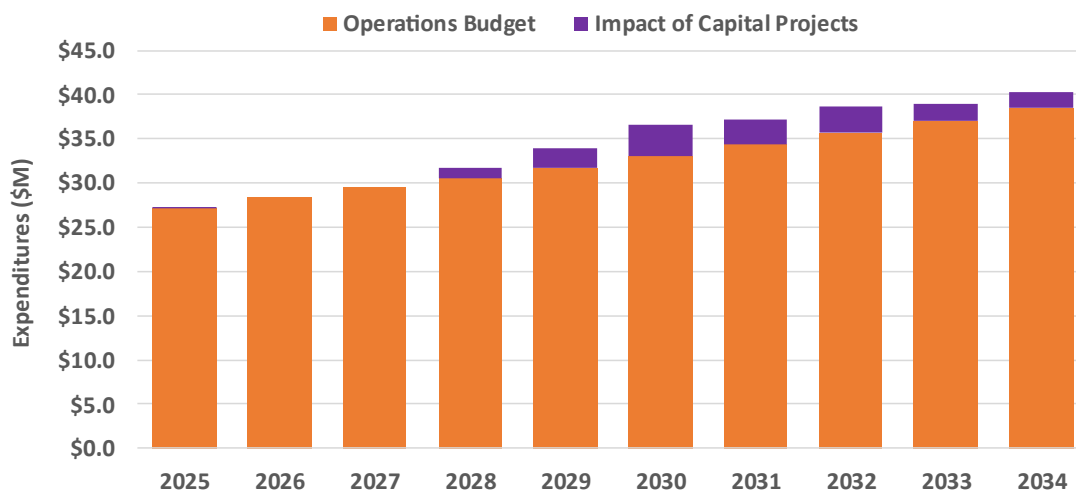
Operations and maintenance work is critical for ensuring the continued reliability of Transit assets and meeting the proposed service levels, such as meeting on-time performance expectations.

Figure 11-8 shows the Operations and Maintenance needs over the next 10 years for Transit. The increase in costs beyond 2025 in operations and maintenance activities is impacted by the estimated growth in the asset portfolio. To meet proposed service levels over the next 10 years, the Operating Budget is estimated to need to increase at an average annual rate of 4.5%. The Operations and Maintenance forecast below is determined by extrapolating the three-year trend in O&M provided by the City (2025-2028) and adding considerations for growth in the asset portfolio for capital projects.

Operations and maintenance activities include:

- Bus operators (contracted services)
- Fuel
- Bus repairs and maintenance
- Bus stop shelter cleaning and repairs
- Accessibility checks (ramps, tactile plates)

Figure 11-8 Operations and Maintenance Needs Forecast – Transit



11.6 Financing Strategy

The financial analysis considers the affordability of the proposed service levels based on the funding available in the 10-year Capital Plan compared to the forecasted needs.

The funding available for renewal of transit infrastructure is estimated to be an average of \$4.2 million per year over the next 10 years based on the City's Capital Plan. As discussed in Section 11.5.1, the estimated average annual renewal need is \$5.2 million per year to meet proposed service levels. This results in an investment gap of \$1.0 million per year, assuming that the City's 10-Year Capital Plan is funded as currently planned, and that the City has the resources to carry out the projects as currently planned.

Figure 11-9: Capital Renewal Needs versus Funding – Transit

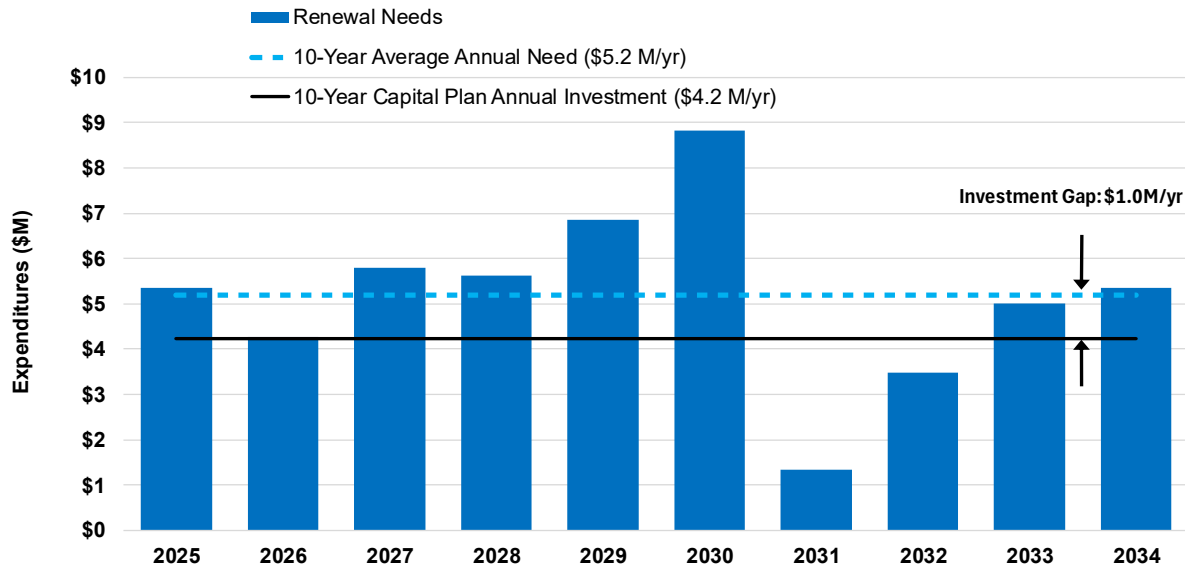


Table 11-4 summarizes the financial sustainability and affordability for growth, renewal, upgrade, and O&M activities. In terms of operations and maintenance, the Operating Budget is estimated to need to increase at an average annual rate of 4.5% to meet proposed service levels over the next 10 years.

Table 11-4: 10-Year Financial Sustainability of Proposed Service Levels

Asset Lifecycle	Average Annual Forecast Needs	10-Year Capital Plan Average Annual Investment	Average Annual Investment Gap	Potential Impacts
Capital Growth	\$3.7 M/yr	\$3.7 M/yr	No gap	N/A
Capital Upgrade	\$0.1 M/yr	\$0.1 M/yr	No gap	N/A
Capital Renewal	\$5.2 M/yr	\$4.2 M/yr	\$1.0M/yr	Deterioration in condition of assets as shown in Figure 11-5
Operations and Maintenance	\$27.3 M in 2025 to \$40.3 M in 2034	\$27.3 M in 2025	4.5%% average annual increase	Failure to increase resources to operate and maintain new assets will result in reduced service levels and increased risks such as reduced on-time performance

To manage the risk of the \$1.0 million per year renewal investment gap, the City aims to extend the lifecycle of fleet where possible while improving operational efficiency and supporting sustainability goals. The City maximizes the lifespan of fleet and minimizes long-term costs by:

- Lifecycle planning and forecasting replacement needs based on usage patterns, mileage, and historical maintenance data.
- Consideration of driving practices (reduce idle time, vehicle-friendly driving habits)

11.7 Recommendations for Continuous Improvement

Development of AM Plans is an iterative process that includes improving data, processes, systems, staff skills, and organizational culture over time. Continuous improvement recommendations include:

Table 11-5: AM Plan Improvement Recommendations – Transit

AM Plan Section	Improvement Recommendation
State of Infrastructure	• Develop a comprehensive inventory of bus shelters and stops with condition ratings
Levels of Service	• Consider incorporating ridership or modal split service level measures into future updates to the AM Plan
Risk Management	• Continue to improve the risk-based approach to prioritizing transit infrastructure investments
Lifecycle Management	• Enhance the preventative maintenance programs for bus shelters and stops • Ongoing evaluation of the transit network and adjust asset management planning along with network changes
Financial Management	• N/A

12 PARKS, OUTDOOR RECREATION AND NATURAL AREAS

12.1 Overview

Parks, Outdoor Recreation, and Natural Areas in a municipality offer residents opportunities for leisure and physical activity. Through parks, green spaces, and recreational areas, residents and visitors can engage in outdoor activities, sports, and relaxation. These services contribute to the overall well-being and livability of the City, enhancing the quality of life for its residents.

Key Findings

- **There is an estimated \$1.0 million per year investment gap for capital renewal** to maintain parks & outdoor recreation assets in a state of good repair.
- **There is a significant investment gap related to new baseball diamonds, soccer fields, and overall parkland to serve the City’s growing population.** The Parks Strategic Plan will update service levels and identify the programming and upgrade needed to address this gap.
- Additional resources are needed for inspection and maintenance of park assets, as well as invasive species management for natural areas.

12.2 State of Infrastructure

Assets that support Parks, Outdoor Recreation and Natural Areas include active recreation assets such as courts and fields, the park vehicular and pedestrian network such as trails and pathways and other recreation assets and natural areas.

Table 12-1 summarizes the replacement value of approximately \$313.1 million and includes a breakdown of the inventory by asset category and asset class. Replacement values are mainly based on unit construction costs. For active recreation assets, lighting is included in the cost of the court, diamond, or field. The largest portion of the asset portfolio is the Urban Forest which accounts for approximately 44% of assets by replacement value. Trees are valued based on the approach in the City’s Tree Protection Manual. Other Natural Areas and Maintained Parkland asset value are estimated based on a restoration value per hectare per the Ecological Offsetting Policy and conservation authority guidelines. Parks vehicles are covered under Section 17 (Fleet) and Parks facilities are covered under Section 16 (Facilities). The City Hall refrigerated ice rink and refrigerated equipment for Will Dwyer rink are also covered under Section 16.

Table 12-1 Inventory Summary - Parks, Outdoor Recreation & Natural Areas

Asset Category	Asset Class	Quantity	Replacement Value (2025\$M)
Active Recreation	Tennis Courts	27 Lit 6 Not Lit	\$5.4
	Basketball Courts	20 Full Courts 12 Half Courts	\$2.7

Asset Category	Asset Class	Quantity	Replacement Value (2025\$M)
Active Recreation (cont.)	Baseball Diamonds	3 Lit 1 Not Lit	\$3.4
	Softball Diamonds	19 Major 11 Minor	\$15.0
	Soccer Fields	17 Mini 19 Junior 16 Senior (Lit) 2 Senior (Not Lit)	\$3.5
	Horseshoe Pits	14	\$0.1
	Beach Volleyball	3	\$0.03
	Rugby Fields	1	\$0.7
	Football Fields	1	\$0.7
	Pickleball Courts	12 Lit 7 Not Lit	\$1.7
	Skate Parks	2	\$1.2
	Splash Pads	2	\$1.6
	Playgrounds	1 Adventure 10 Community 84 Neighbourhood 3 Open Space 12 Other 4 Exercise Equipment	\$25.6
Park Vehicular and Pedestrian Network	Disc Golf	1	\$0.3
	OSIM Bridges	25 bridges	\$5.7
	Non-OSIM Bridges	Wood: 13 bridges Steel: 8 bridges Concrete: 2 bridges	\$3.7
	Stairs	606 m ²	\$1.7
	Pathways	164.2 km	\$23.9
	Trails	81.9 km	\$6.6
	Plaza	10,764 m ²	\$1.6
Other Parks & Recreation Assets	Park Parking Lots	54 lots 56,413 m ²	\$5.8
	Park Structures	22	\$2.4
	Fencing	144.0 km	\$15.0
	Utility Lines	8.9 km	\$1.8
	Electric Service Panels	209	\$1.7
	Park Furniture	Pooled by install year	\$0.6
Maintained Parkland	Shoreline Protection	11.4 km	\$4.5
	Maintained Turf	189.1 ha	\$26.6
	Gores	2.4 ha	\$0.3
	Gardens	10.1 ha	\$1.4

Asset Category	Asset Class	Quantity	Replacement Value (2025\$M)
Maintained Parkland (cont.)	Beach	1.0 ha	\$0.04
Natural Areas	Urban Forest	34,143 Street Trees 6,679 Park Trees 797.7 ha Woodlot	\$136.6
	Wetlands	65.4 ha	\$6.4
	Ponds	1.8 ha	\$0.2
	Open Space	256.8 ha	\$4.7
Sub-Total			\$313.1

The condition ratings for Parks, Outdoor Recreation and Natural Areas assets are based on a combination of City observed condition and age-based condition. The City conducts regular playground inspections as well as on courts and sports fields as needed. Park parking lots, electric service panels, trails, and park structures were inspected as part of the City's 2019 Parks Condition Assessment. When observed condition data is not available, the estimated remaining life of the asset based on age is converted to a City-wide 5-point condition scale as previously shown in Table 3-3. If both condition and construction or installation year data is not available, the asset is reported in unknown condition.

The condition distribution for the City's Parks, Outdoor Recreation, and Natural Area assets is shown in Figure 12-1. Condition is not estimated for some assets such as football fields, stairs, utility lines, trails, shoreline protection, and most natural areas. Subsequently, \$48.0 million of Parks and Outdoor Recreation and \$85.0 million of Natural Areas have unknown condition by replacement value. Excluding the unknown condition assets, 76.8% of Parks and Outdoor Recreation assets and 98.9% of Natural Area assets are in fair or better condition.

Figure 12-1 Condition Distribution by Replacement Value (\$M)

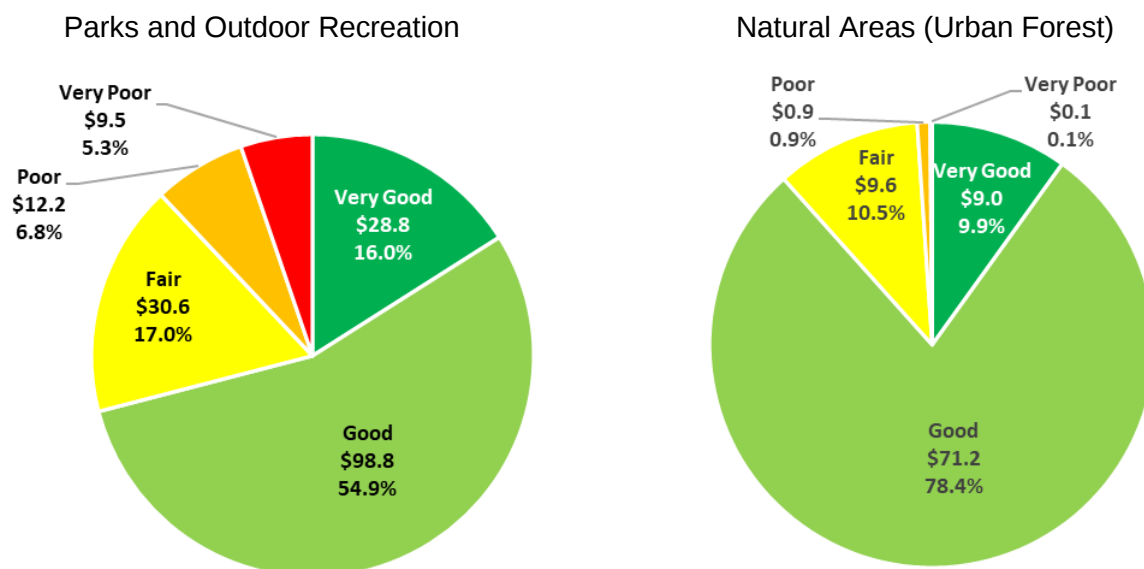
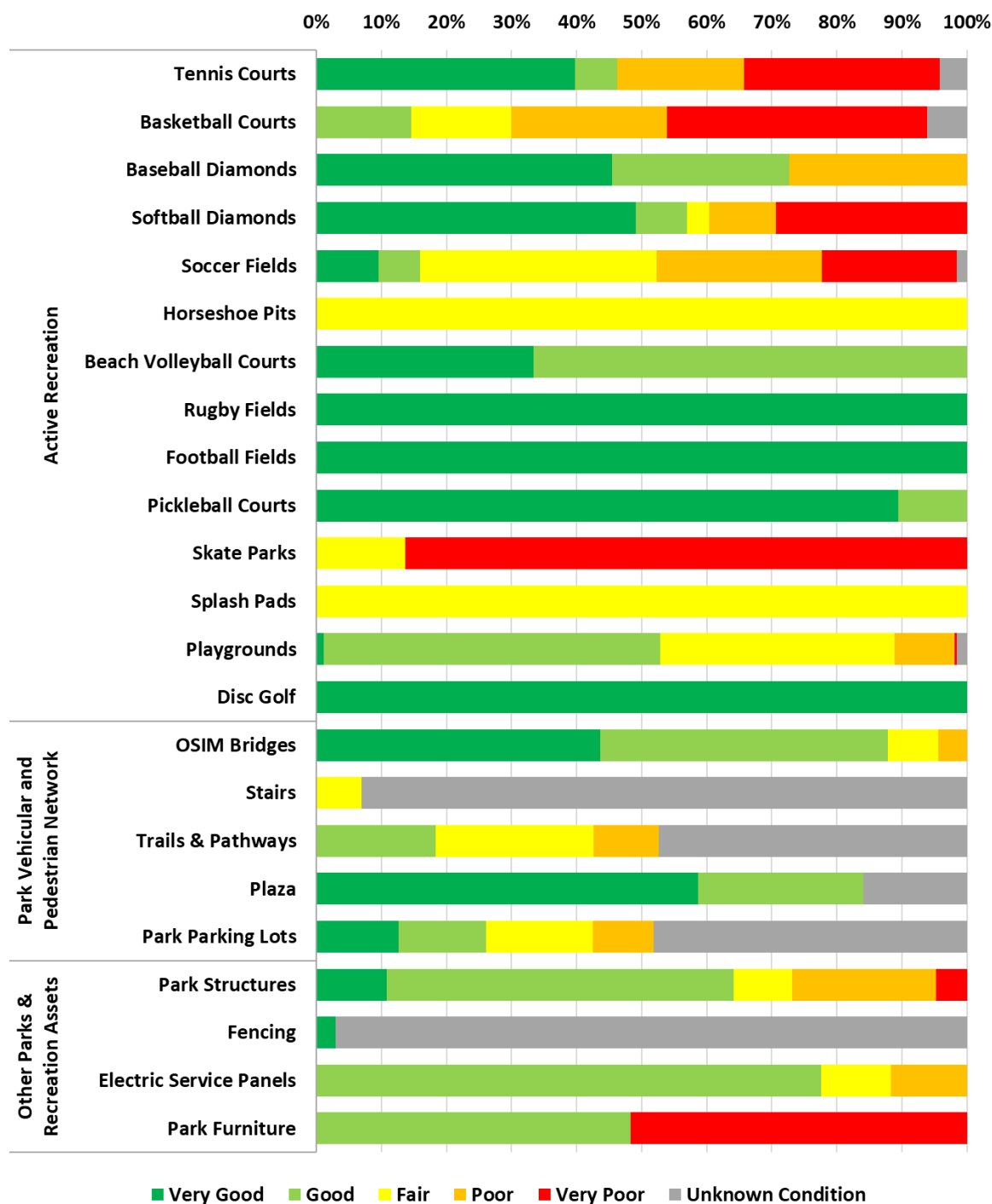


Figure 12-2 shows the condition distribution in more detail by asset class for Parks and Outdoor Recreation assets. A significant portion of tennis courts, basketball, softball fields, and soccer fields are near or at end-of-life, though the City continues to manage them such that they are adequate for use.

Figure 12-2 Condition Distribution by Replacement Value – Parks & Outdoor Recreation (Percentage)

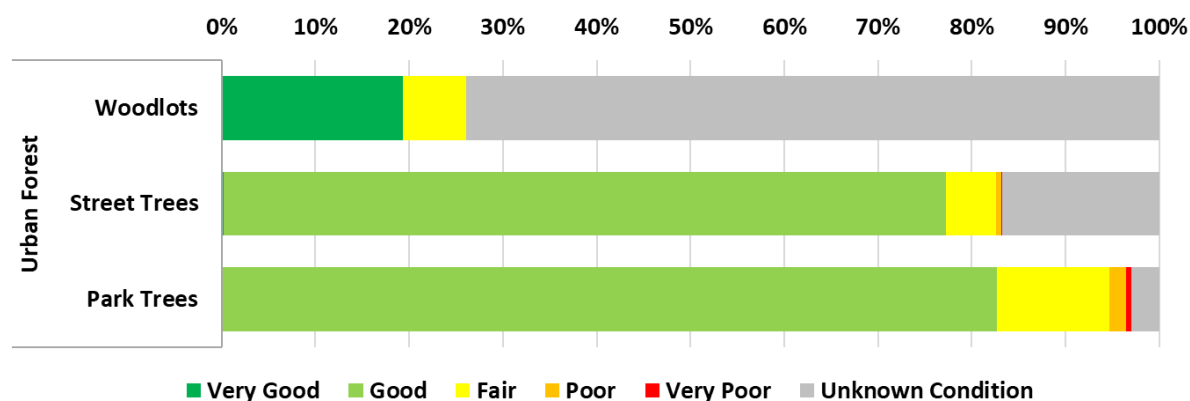


Street and park trees are assessed on a Very Good, Good, Fair, Poor, and Dead (Very Poor) rating scale. The park tree inventory is still in development. Of those recorded in the City's inventory, almost all street and park trees are in fair or better condition as shown in Figure 12-3. Aside from trees, condition data is not maintained for most natural assets and maintained parkland. The City has completed Forest Health Assessments for some of the City-owned woodlots using a risk-based approach with a focus on critical areas susceptible to Emerald Ash Borer and human impacts. These assessments provide a rating on a three-point scale:

- Healthy
- Moderately healthy, and
- Health is affected by obvious forest health issues.

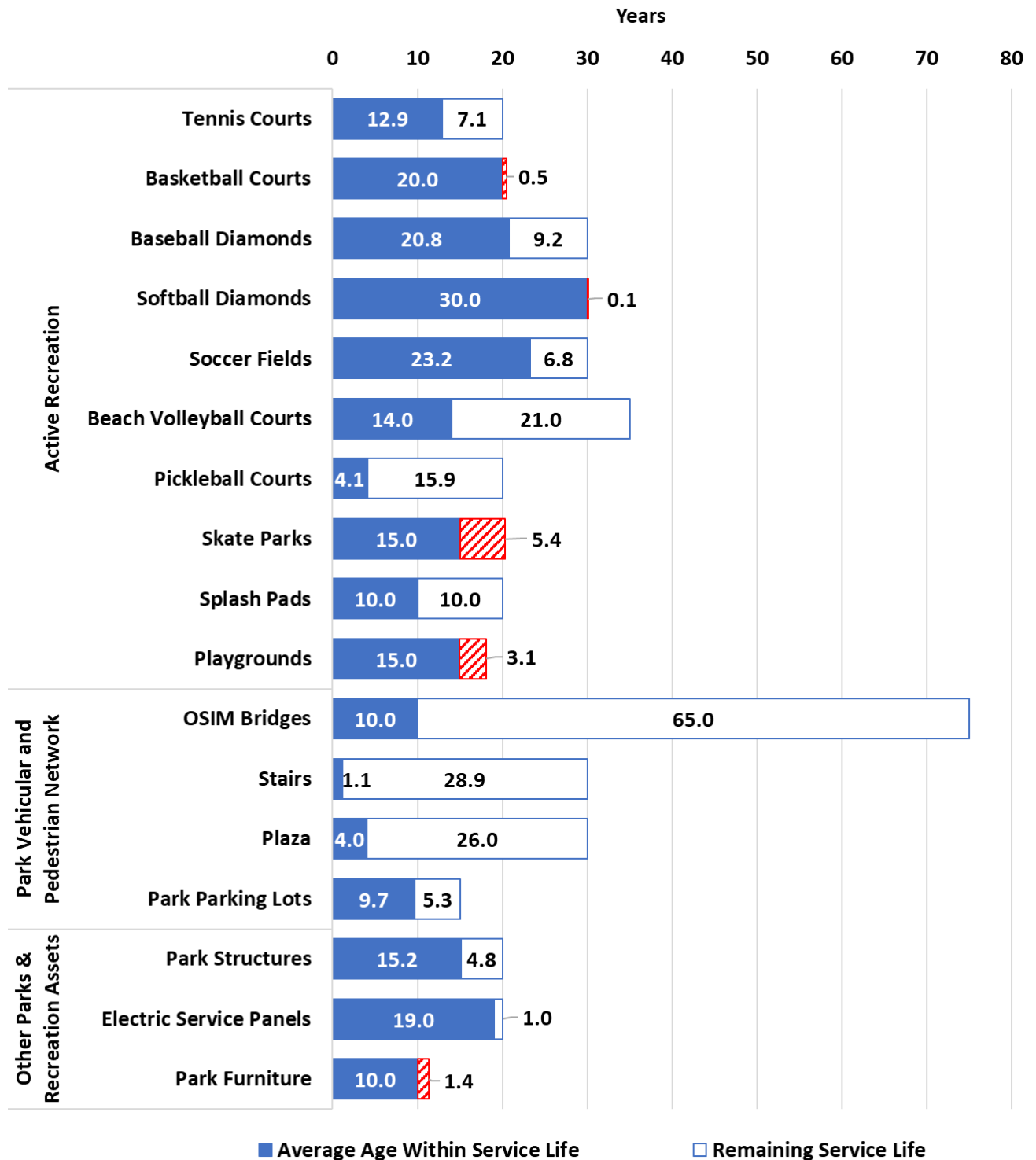
This work represents best practices, and it is recommended that the City continue these assessments using a risk-based approach. Most of the woodlots assessed are in healthy (Very Good) condition, with some in moderate health (Fair) condition.

Figure 12-3 Condition Distribution by Replacement Value – Urban Forest (Percentage)



The age distribution for the City's Parks and Outdoor Recreation assets is shown in Figure 12-4. This figure shows the average age of assets relative to their average service lives weighted by replacement value and are categorized by asset class. Any asset classes with an average age that surpasses its average service life is shown in red. Playgrounds, for example, are on average 3.1 years past their 15-year estimated service life. Asset types that do not currently have construction year data, such as horseshoe pits, football fields, fencing, and utility lines are not included in Figure 12-4.

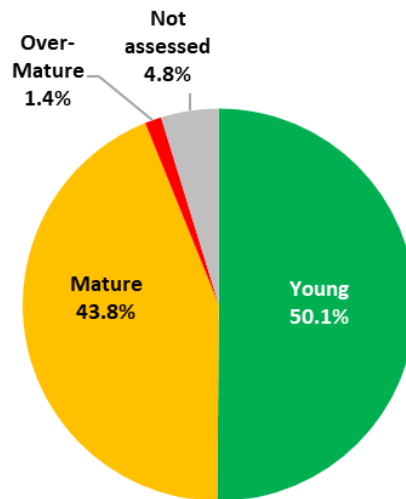
Figure 12-4 Average Asset Age – Parks & Outdoor Recreation



The age of most natural assets is not applicable as there is no construction or installation date. The only assets with an age assessment are street trees, which are categorized as young, mature, or over-mature in the City's datasets.

The replacement value of the City's street trees is summarized by tree age class in Figure 12-5. The City's street trees are relatively balanced between young and mature trees. Park trees are generally more mature trees.

Figure 12-5 Age Distribution by Replacement Value – Street Trees



12.3 Levels of Service

The City provides parks and outdoor recreation facilities to encourage healthy lifestyles, athletic development, and social interaction among its residents. The City is focused on continuing to provide quality outdoor recreation in light of changes to community demographics and recreation trends. Table 12-2 provides the LOS Framework for the City's Parks, Outdoor Recreation and Natural Areas infrastructure. This table includes the current performance (as of the end of 2024), any aspirational targets set out by the City and proposed performance over the next 10 years. Proposed performance is determined based on what is appropriate for the City in consideration of the City's current 10-year planned funding provision in the Capital Plan as well as risks associated with various performance levels, discussed further in Section 12.6.

The City's natural turf recreation assets, including soccer fields, baseball diamonds, and other similar facilities, play a vital role in supporting active recreation for the community. Utilization rates are reported for prime-time hours. 100% utilization is neither feasible nor sustainable as these assets require regular rest periods to maintain their quality and longevity. A realistic target utilization rate for these natural turf assets is approximately 75%, balancing community demand with the need for asset preservation. This approach ensures that the City can provide safe and high-quality recreation spaces while minimizing the risk of overuse and deterioration.

Table 12-2 LOS Framework, Parks, Outdoor Recreation & Natural Areas

Community LOS	Technical LOS																								
	Metric(s)	Current LOS		Target LOS		Proposed LOS																			
Capacity & Use – Provide adequate provision of parks and outdoor recreation facilities																									
An adequate provision of Parks & Outdoor Recreation facilities is available to the community. Trails provide year-round recreational opportunities for residents and visitors to access and enjoy public greenspace through a comprehensive and connected citywide system	Number of residents per facility**	<table><tr><th>Asset Type</th><th>Per Capita (2021)</th></tr><tr><td>Tennis</td><td>1:5088</td></tr><tr><td>Pickleball</td><td>1:6716</td></tr></table>		Asset Type	Per Capita (2021)	Tennis	1:5088	Pickleball	1:6716	<table><tr><th>Asset Type</th><th>Per Capita</th></tr><tr><td>Tennis</td><td>1:5000*</td></tr><tr><td>Pickleball</td><td>1:5000*</td></tr></table>		Asset Type	Per Capita	Tennis	1:5000*	Pickleball	1:5000*	<table><tr><th>Asset Type</th><th>Per Capita</th></tr><tr><td>Tennis</td><td>1:4767</td></tr><tr><td>Pickleball</td><td>1:5116</td></tr></table>		Asset Type	Per Capita	Tennis	1:4767	Pickleball	1:5116
Asset Type	Per Capita (2021)																								
Tennis	1:5088																								
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Asset Type	Per Capita																								
Tennis	1:4767																								
Pickleball	1:5116																								
Capacity & Use – Provide adequate provision of parkland and natural heritage lands																									
An adequate provision of parkland & natural heritage lands is available to the community, contributing to outdoor recreation, general wellbeing, and ecological resilience.	# of hectares parkland per 1000 residents	2.39ha/1,000 residents (2021)		2.35ha/1,000 residents (2031)		 2.35 ha/1,000 residents Expected: 1.74 to 1.98ha/1,000 residents (2031)																			
	# of hectares natural heritage lands per 1000 residents	10.01ha/1,000 residents		N/A		N/A																			

Community LOS	Technical LOS					
	Metric(s)	Current LOS		Target LOS	Proposed LOS	
Function – Provide adequate amenity features for active recreation						
Active recreation facilities are provided with adequate features	% of active recreation facilities that are lighted			N/A	Asset Type	% Lighted
					Tennis	81.8%
					Basketball	29.4%
					Soccer (including rugby, football)	3.7%
					Outdoor Rinks	100%
					Pickleball	89*
					Beach Volleyball	0%
					*City will be adding lighting to 4 existing courts)	
Function – Provide tree canopy cover for shade and vital community benefits						
Natural assets contribute to public health by reducing heat stress through provision of shade as well as providing environmental and social benefits	Local temperature reduction as measured by percent canopy cover	30.5% canopy cover across the City of Barrie (2018) (This metric is updated on a 5-year cycle)		Target to be confirmed after next canopy assessment	There will likely be a short-term decrease due to development but will increase in the long term with City planting initiatives. Target and Proposed LOS will be set after next assessment.	
Quality & Reliability – Maintain parks and outdoor recreation assets in a state of good repair and maintain healthy natural areas						

Community LOS	Technical LOS			
	Metric(s)	Current LOS	Target LOS	Proposed LOS
Parks and outdoor recreation, as well as street and park trees are maintained in a state of good repair to provide reliable services to the community.	Percentage of park and outdoor recreation assets in fair or better condition	76.8% (excluding unknown)	N/A	 Maintain >70%
	Percentage of active recreation assets beyond service life (by replacement value)	46%	N/A	 <40%
	Average Pruning Cycle for Street Trees (Based on Five-Year Rolling Annual Average)	2024: 5283 5-year Average: 4600	~ 7,000 trees per year Average 5-year cycle	 ~ 7,000 trees per year
	Percentage of trees in fair or better condition	Street Trees: 99% Park Trees: 95% Excludes trees not assessed	N/A	 Maintain current performance
	Age class distribution of street trees	Young: 78.5% Mature: 21.2% Over-Mature: 0.3%	Even distribution	Overall age distribution will gradually go from young to mature

*Outdoor Racquet Strategy timeline for target is 2036

**Other amenities are covered in the 2019 Outdoor Recreation Facility Strategy which provides recommendations based on per capita provision rates as well as trends in sports participation and utilization rates. The 2017 Parks & Recreation Growth Strategy recommends 1 soccer field per 2500 residents and 1 ball diamond per 3400 residents.

12.4 Risk Management Strategy

The City uses an established risk framework for quantifying the condition-based risk exposure of its assets to enable prioritization of renewal projects across asset classes and services. Risk exposure is the multiplication of the criticality or consequence of failure (CoF) by the probability of failure (PoF).

The more critical assets within Parks and Outdoor Recreation assets are sheet piling used for shoreline protection and pedestrian bridges with a span greater than 3 meters that are required to be inspected per OSIM. In general, playgrounds and well-utilized amenities such as senior soccer fields, major ball diamonds, and playgrounds are considered of moderate criticality.

Figure 12-6 considers \$76.9 million of assets and does not include assets for which condition has not been assessed, such as fencing, dirt trails, and utility lines.

An estimated \$3.1 million of assets currently have a high-risk exposure, including:

- Softball diamonds at Lampman Lane and MacMorrison Parks
- Queens Park Skate Park
- Various soccer fields, playgrounds, pedestrian bridges, electrical service panels, and park parking lots

Actual observed condition through inspections is recommended to improve the accuracy of the PoF assessment for assets such as softball diamonds and soccer fields. These inspection programs, particularly for critical assets, are also useful strategies to mitigate risk by identifying potential failures before they occur.

Figure 12-6 Risk Exposure for Parks, Outdoor Recreation & Natural Areas (\$M)*

Risk exposure in year 2025 \$, millions									
Probability of Failure	Almost Certain	\$0.3	\$5.9	\$3.1	\$0.0	\$0.0	Risk Exposure	\$	%
	Very Likely	\$0.0	\$4.9	\$4.1	\$0.0	\$0.0	Very High	\$0.0	0.0%
	Moderate or Likely	\$0.5	\$2.1	\$13.0	\$0.0	\$0.0	High	\$3.1	4.0%
	Occasional or Possible	\$0.3	\$4.6	\$18.3	\$0.0	\$0.0	Moderate	\$10.0	13.0%
	Very Rare	\$0.2	\$5.9	\$13.9	\$0.0	\$0.0	Low	\$38.5	50.1%
		Insignificant	Minor	Moderate	Major	Catastrophic	Very Low	\$25.3	32.9%
		Consequence of Failure					Total	\$76.9	100.0%

* Assets with unknown condition are not included

A condition-based risk map for natural assets, as identified in the Green Analytics Technical Memo as part of the previous AM Plan project, is to be considered as part of future improvements to the City's risk management framework. Currently, the City recognizes the potential risk posed by invasive species to the forest canopy within its Parks and Natural Areas. These invasive species could significantly impact the health and sustainability of the City's natural assets, and these risks highlight the need for a comprehensive invasive species study. This study would provide critical insights to guide mitigation strategies and ensure the long-term resilience of the City's forested areas.

In addition to asset condition and reliability risks, the City mitigates capacity-related risks by assessing the need for additional infrastructure for the increasing population and planning for the additional infrastructure that will be assumed by the City through development. The City assesses the risk of various options to meet capacity service levels through the development of Master Plans and other studies that consider the options of how to best achieve the stated service levels. The City also plans for service improvements to functional service levels, such as upgrades due to changes to legislation or strategic objectives, while balancing these risks against capacity and reliability-related needs. The City assesses the risk of various options to meet functional service levels through inspections and studies such as accessibility audits, canopy cover studies, and other plans that consider the options of how to best achieve the stated service levels.

12.5 Lifecycle Management Strategy

The City balances asset needs across renewal, growth, upgrade, and operations & maintenance activities to ensure that parks remain safe and accessible while also addressing increasing demands due to population growth. The costs for these activities are discussed in the following subsections.

12.5.1 Renewal Forecast

The renewal forecast considers the current condition or age of each asset and estimates the planned replacement year based on the estimated service lives summarized in Table 12-3. Park bridges classified under OSIM (Ontario Structure Inspection Manual) with a 3-meter span follow the renewal recommendations from biannual inspections. Rehabilitation and replacements for paved pathways are based on a condition assessment.

The lifecycle of natural assets such as trees and woodlots are managed through operations and maintenance activities and are not designated an estimated service life.

Summary of Recommended 10-Year Renewal Strategy:

- Maintains % of assets in fair/better condition above 70% (overall portfolio in Fair condition)
- Assets are replaced at expected end-of-life based on age and the estimated service life, with some deferred replacements on less critical assets
- Renewal for park bridges and pathways are based on inspection recommendations
- Natural assets are managed through operating and maintenance activities

Table 12-3: Estimated Service Life – Parks and Outdoor Recreation

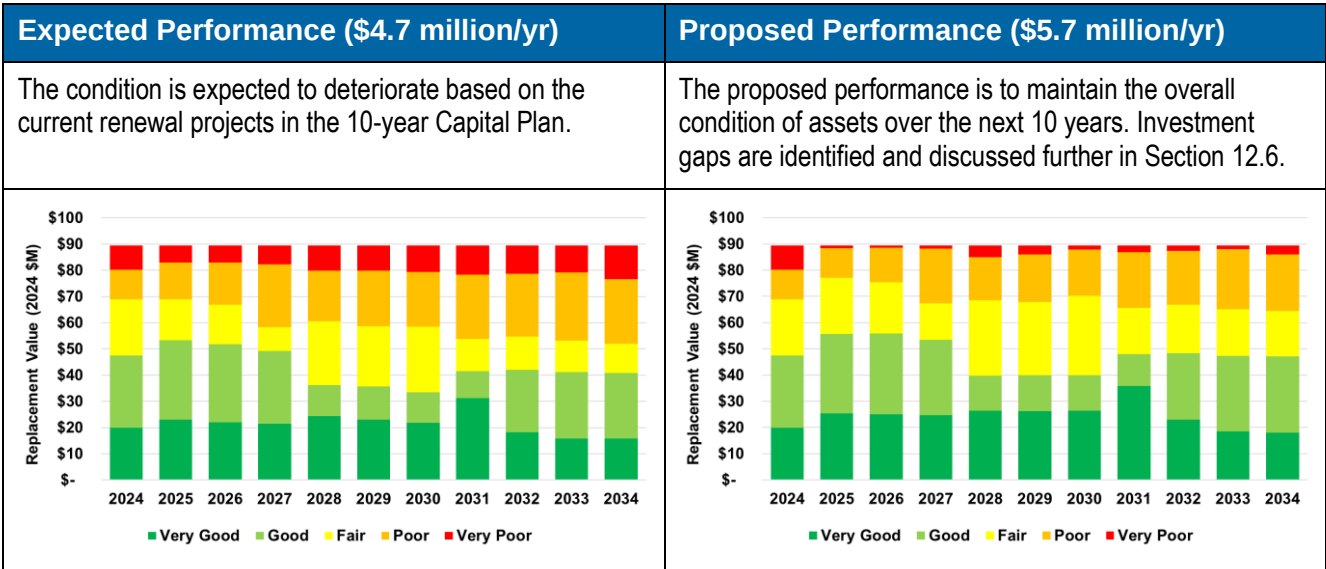
Asset Category	Asset Class	Estimated Service Life (Years)
Active Recreation	Tennis, Pickleball and Basketball Courts	20
	Baseball & Softball Diamonds; Cricket, Rugby, Football, Soccer Fields; Disc Golf	30
	Horseshoe Pits	20
	Beach Volleyball Courts	35
	Skate Parks	15

Asset Category	Asset Class	Estimated Service Life (Years)
Active Recreation (cont.)	Splash Pads	20
	Playgrounds	15
Park Vehicular and Pedestrian Network	Non-OSIM Bridges	25
	Stairs, Plaza	30
	Pathways	20 (asphalt, paved stone) 30 (concrete)
	Park Parking Lots	15
	EV Charging Stations	10
Other Parks & Recreation Assets	Park Structures	20
	Fencing	30
	Utility Lines	30
	Electric Service Panels	20
	Park Furniture	10
	Shoreline Protection	30

For park infrastructure, the proposed performance is to maintain the current condition of assets over the next 10 years, as shown in Figure 12-7. The average annual renewal need is estimated at \$5.6 million per year. The expected performance based on the renewal investment currently available in the 10-year Capital Plan is lower than the proposed service level.

Restoration projects for natural areas identified in the 10-year Capital Plan are included in the \$5.6 million per year estimate, but due to the unknown condition of these assets, the impacts of these projects are not reflected in the condition forecasts in Figure 12-7. Restoration projects for natural areas include those that will be funded through fees being collected per the Council-approved Ecological Offsetting Policy.

Figure 12-7 Renewal Needs Forecast – Parks, Outdoor Recreation, and Natural Areas



12.5.2 Growth Forecast

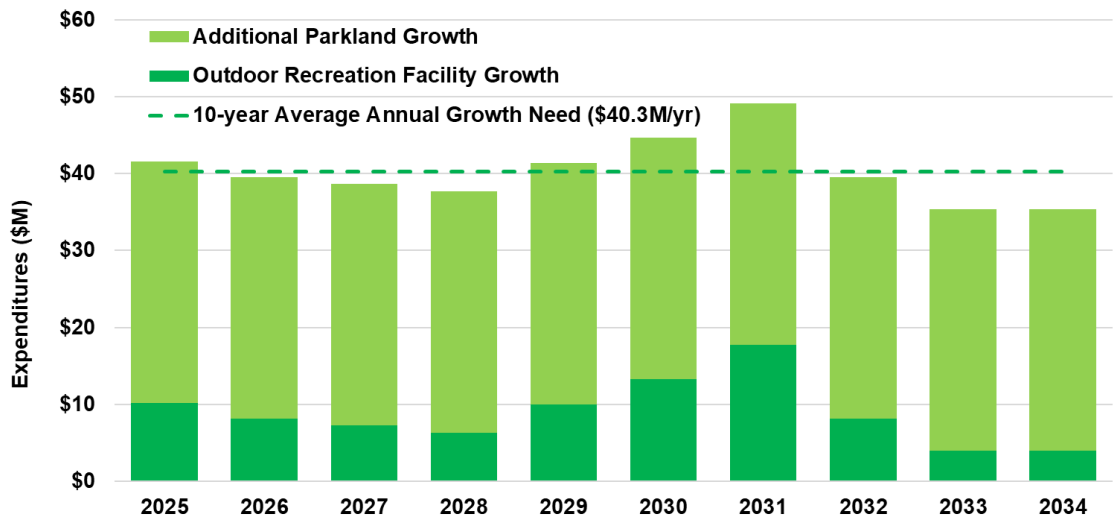
The City is developing a Parks Strategic Plan that will plan for the long-term provision of parkland amenities, service levels and natural heritage restoration over the next ten years. The Parks Strategic Plan will identify the required acquisition of parkland and develop the proposed service levels that will inform the required sport field facilities and recreation features.

Figure 12-8 summarizes the currently identified growth needs over the next 10 years for Parks, Outdoor Recreation, and Natural Areas. Growth needs are currently estimated based on:

- Master Plan implementation projects and new park development projects in the City’s 10-year Capital Plan
- Parkland Needs Assessment completed in 2023
- Tennis and pickleball recommended service levels in the 2024 Outdoor Racquet Sports Strategy
- Recommendations from the 2019 Outdoor Recreation Facility Study

Growth needs and proposed service levels will be refined and supplemented with the Parks Strategic Plan in the next AM Plan update. The average annual growth need for parks, outdoor recreation, and natural areas is estimated at \$40.3 million per year over the next 10 years. \$31.4 million per year is from the additional parkland identified in the Parkland Needs Assessment to meet proposed service levels (2.35 hectares per 1000 residents).

Figure 12-8 Growth Needs Forecast – Parks, Outdoor Recreation, and Natural Areas



12.5.3 Upgrade Forecast

For parks, outdoor recreation, and natural areas, upgrade projects are typically included under growth or renewal projects. Opportunities to upgrade assets such as adding ramps and changing playground surface materials for accessibility are typically considered as part of renewal projects. Upgrades may also be included as part of growth projects included in Section 12.5.2 such as Heritage Park Redevelopment which includes improved accessibility initiatives and improved pedestrian connections.

12.5.4 Operations and Maintenance Forecast

Operations and maintenance work is critical for ensuring the continued provision of parks and recreation services and meeting the proposed service levels related to asset condition.

Figure 12-9 shows the Operations and Maintenance needs over the next 10 years for Parks, Outdoor Recreation, and Natural Areas. The increase in costs beyond 2025 in operations and maintenance activities is impacted by the estimated growth in the asset portfolio. To meet proposed service levels over the next 10 years, the Operating Budget is estimated to need to increase at an average annual rate of 1.5%. The Operations and Maintenance forecast below is determined by extrapolating the three-year trend in O&M provided by the City (2025-2028) and adding considerations for growth in the asset portfolio for capital projects and development.

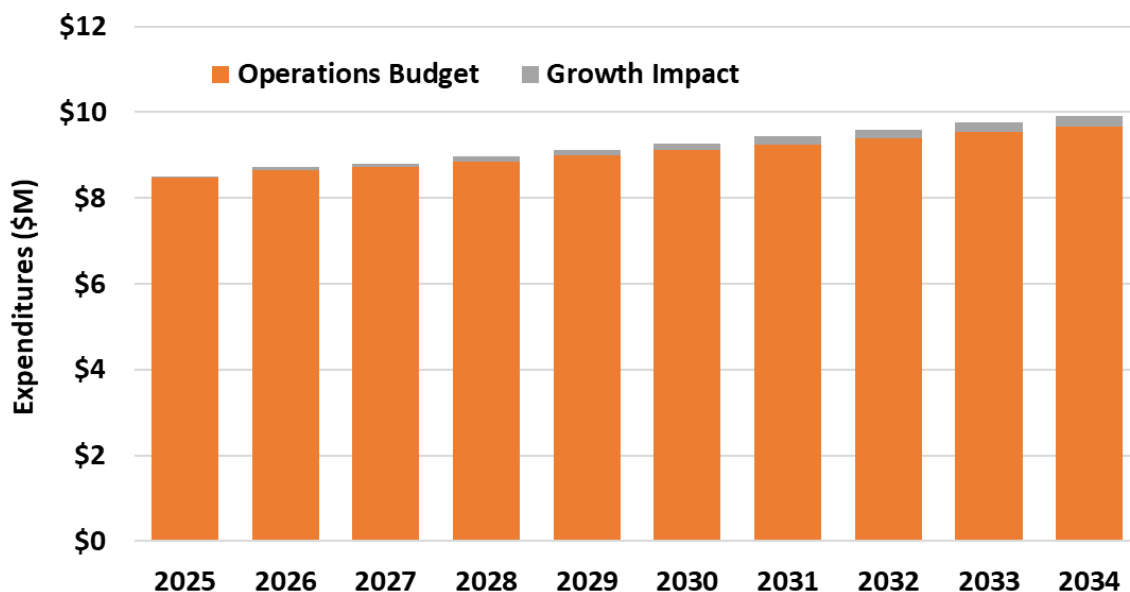
Operations and maintenance activities on built assets include:

- Playground and bridge inspections
- Grass cutting
- Court surface repairs
- Trail maintenance including vegetation trimming, removing trip hazards
- Asphalt and concrete patch repairs/sealing to pathways and parking lots
- Replacement of components: garbage cans, picnic tables

Operations and maintenance activities for natural areas include:

- Turf: aerating and mowing
- Trees: inspections, pruning, and removals & replacements
- Woodlots: forest health assessments, control of invasive species, hazard tree removals
- Wetlands: invasive and undesirable plant control, replanting of degraded areas
- Open Space: woody vegetation removal, intermittent mowing, invasive plant species control

Figure 12-9 Operations and Maintenance Needs Forecast – Parks, Outdoor Recreation, and Natural Areas



12.6 Financing Strategy

The financial analysis considers the affordability of the proposed service levels based on the funding available in the 10-year Capital Plan compared to the forecasted needs.

The funding available for renewal of parks, outdoor recreation and natural areas is estimated to be an average of \$4.7 million per year over the next 10 years based on the City’s Capital Plan. As discussed in Section Figure 12-10, the estimated average annual renewal need is \$5.7 million per year to meet proposed service levels. This results in an investment gap of \$1.0 million per year, assuming that the City’s 10-Year Capital Plan is funded as currently planned, and that the City has the resources to carry out the projects as currently planned.

Figure 12-10: Capital Renewal Needs versus Funding – Parks, Outdoor Recreation, and Natural Areas

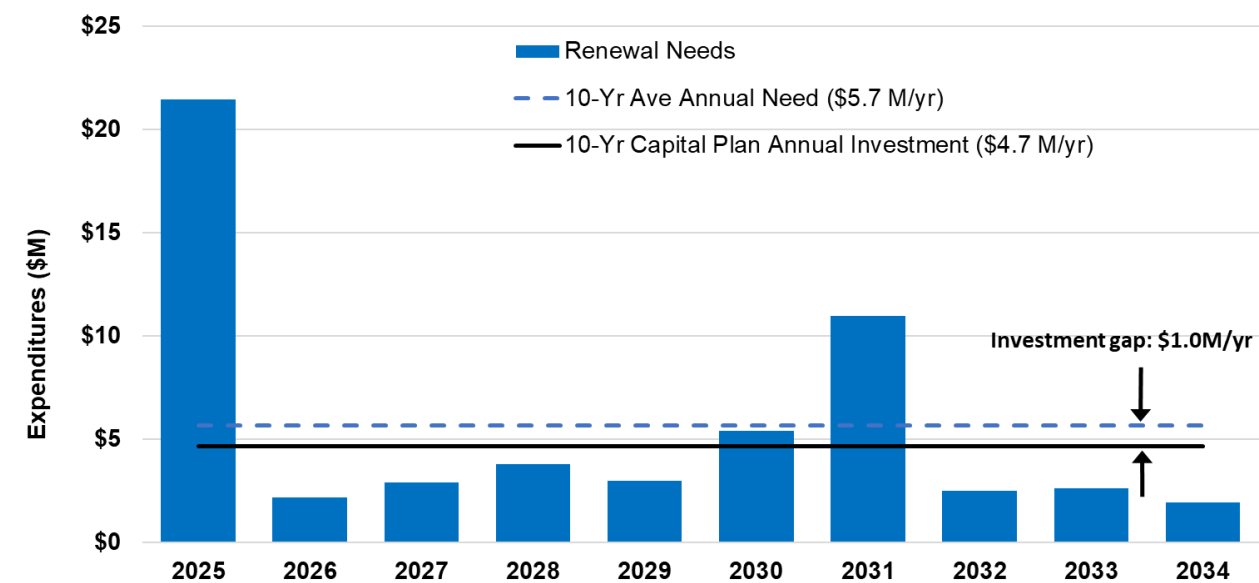


Table 12-4 summarizes the financial sustainability and affordability for growth, renewal and upgrade, and O&M activities. For growth, the main gap is associated with parkland acquisition recommended in the Parkland Needs Assessment to meet proposed service levels. To meet the needs of the increasing population and trends in sports participation, the Outdoor Recreation Facility Strategy also recommended new assets which are not all planned in the 10-year Capital Plan or expected to be assumed through development, particularly soccer fields and baseball diamonds. The City manages some of the risks to due to increasing demands by reviewing utilization rates at existing facilities to explore opportunities for additional capacity. The Parks Strategic Plan will build on this work and provide appropriate service levels to address increasing demand as the City continues to grow.

The City’s ability to perform the required inspection and maintenance activities has been at risk over the past few years as the operating budget has not been sufficiently funded to align with recent growth in the asset portfolio as well as the increased costs of materials and contracted services. Service level gaps that are not adequately being addressed include park lighting

replacement planning, pickleball court maintenance, park structure inspections, bridge repairs, trails inspection and maintenance, and invasive species management.

Table 12-4: 10-Year Financial Sustainability of Proposed Service Levels

Asset Lifecycle	Average Annual Forecast Needs	10-Year Capital Plan Average Annual Investment	Average Annual Investment Gap	Potential Impacts
Capital Growth	\$40.3 M/yr*	\$5.8 M/yr	\$34.5 M/yr	Capacity issues and the degradation of natural areas due to overuse
Capital Upgrade	Included in growth and renewal	Included in growth and renewal	Included in growth and renewal	Refer to growth and renewal
Capital Renewal	\$5.7 M/yr	\$4.7 M/yr	\$1.0M/yr	Deterioration in condition of infrastructure as shown in Figure 12-7, increasing risks related to resident safety and service disruption
Operations and Maintenance	\$8.5M in 2025 to \$9.9 M in 2034; 1.5% average annual increase	\$8.5 M in 2025	1.5% average annual increase**	In addition to impacts of growth, additional O&M funding is required to address service level gaps. Quality and reliability of park and outdoor recreation services may be affected.

*Cost of land acquisition is not included

**1.5% annual increase account for growth only. Additional funding required to address service level gaps is not quantified in this AM Plan.

To manage the risk of the \$1.0 million per year renewal investment gap as well as the operating budget pressures, the City will continue to prioritize critical infrastructure to maintain service delivery. For investment gaps related to growth, the Parks Strategic Plan will provide recommendations to achieve the required acquisition of parkland and update the proposed service levels for outdoor recreation assets.

12.7 Recommendations for Continuous Improvement

Development of AM Plans is an iterative process that includes improving data, processes, systems, staff skills, and organizational culture over time. Continuous improvement recommendations include:

Table 12-5: AM Plan Improvement Recommendations – Parks, Outdoor Recreation and Natural Areas

AM Plan Section	Improvement Recommendation
State of Infrastructure	• Develop inventory of park lighting and in particular, pathway lighting • Improve inventory of park structures and develop a condition assessment program • Improve inventory of sanitary laterals, wastewater systems, and irrigation infrastructure within park portfolio • Develop a comprehensive inventory of natural heritage assets within the City, with clear indication of ownership • Continue to complete forest health assessments for higher risk areas • Improve structure of GIS data and asset type classifications to align with AM Plan reporting hierarchy (e.g. trails, walkways and pathways)
Levels of Service	• Service levels for natural assets in this AM Plan are focused on trees and canopy cover. Future development of additional service levels may account for the wide range of tangible and intangible benefits (biodiversity, erosion risk reduction) • Consider additional measures that may be useful for asset decision-making and reporting, such as utilization rate of trails, the duration of playground closures, and operating costs per hectare for different parks • Review per capita provision rate service levels through the Parks Strategic Plan
Risk Management	• Refine risk scoring as additional attribute data is collected and documented. For example, trails can be assigned updated CoF ratings based on the new classification system once this classification data has been updated for each trail segment in the GIS inventory • For natural assets, consider a hazards risk assessment based on a geospatial analysis which identifies natural areas that are more likely to fail due to hazards such as invasive species, urban intensification, flooding, and extreme weather events
Lifecycle Management	• Prioritize and develop costs for actions from the Climate Change Adaptation Strategy • Improve understanding of growth and upgrade needs by incorporating recommendations from future studies, such as the Park Strategic Plan • Improved inventory and condition data on assets such as trails, park lighting and structures will enable a more robust forecasting of lifecycle renewal needs
Financial Management	• Review and incorporate funding impacts related to new legislation such as Bill 23 • Align investment gap analyses in AM Plan with the City's long-term financial strategies

13 STORMWATER

13.1 Overview

The City's stormwater assets are critical to ensuring effective and sustainable stormwater management. This includes the maintenance, rehabilitation, and enhancement of infrastructure to protect the community from flooding, manage water quality, and support environmental stewardship.

13.2 State of Infrastructure

Key Findings

- **The City's stormwater management facilities require an additional \$0.4 million annual investment for sediment removal** to help mitigate risks of pollutant discharge into natural waterways.
- **The City is upgrading culverts to increase flood resiliency.** Critical areas are prioritized as funding is not available to upgrade all culverts.
- **There is an investment gap associated with replacing aging culverts over the next 10 years.** Deteriorated culverts present the risk of unplanned disruptions (sinkholes), which in turn force the need for costly reactive repairs.

Assets that support the Stormwater system include Storm Sewers, Culverts, Stormwater Management Facilities, Low Impact Development and Natural Features. Table 13-1 shows the replacement value of approximately \$1.55 billion and includes a breakdown of the inventory by asset category and asset class. The largest portion of the asset portfolio are Storm Sewers, which account for approximately 55% of assets by replacement value. Most asset replacement values are based on unit construction costs, except for watercourses, ditches and stormwater management facilities. Watercourses and ditches are estimated based on estimated maintenance costs per meter and stormwater management facilities are based on a unit cost per drainage area.

Table 13-1 Inventory Summary – Stormwater Infrastructure

Asset Category	Asset Class	Quantity	Replacement Value (2025\$M)
Collection and Conveyance	Storm Sewers	Local: 420.2 km Trunk: 21.3 km	\$860.4
	Culverts	OSIM Culverts: 0.25 km (49 assets) Non-OSIM Culverts (Span < 1.2m): 16.0 km (922 assets) Non-OSIM Culverts (Span >= 1.2m): 13.9 km (406 assets)	\$122.7
	Catch Basins	14,319	Value included with Sewers
	Maintenance Holes	7,359	Value included with Sewers

Asset Category	Asset Class	Quantity	Replacement Value (2025\$M)
Collection and Conveyance (cont.)	Ditches	128.8 km	\$15.8
Storage and Treatment	Stormwater Management Facilities	Quality and Quantity Control: 42 (1,819 ha drainage area) Quantity Control Only: 50 (4,784 ha drainage area)	\$277.1
	Manufactured Treatment Devices	Filtration Devices: 2 Sediment Removal Devices: 99	\$9.1
Low Impact Development	Bioretention	16 (1246.9 m ²)	\$0.6
	Dry Swale	8 (241.9 m ²)	\$0.1
	Enhanced Grass Swale	1 (186.1 m ²)	\$0.1
	Vegetated Filter Strip	10 (428.0 m ²)	\$0.2
	Perforated Pipe System	4 (2205.4 m ²)	\$1.1
	Sand Filtration Bed	10 (2890.1 m ²)	\$1.4
	Soakaways, Infiltration Trenches & Infiltration Chambers	60 (23279.5 m ²)	\$11.4
Natural Features	Natural Watercourses	757 (103.0 km)	\$252.3
Sub-Total			\$1,552.3

The condition ratings of Stormwater assets are based on a combination of inspections and age-based estimates. For sewers, the City performs CCTV (Closed Circuit Television Video) inspections to provide information on defect location, severity and density, as well as overall structural and O&M (operations & maintenance) ratings for each pipe segment. The City's CCTV inspections follow the National Association of Sewer Service Companies (NASSCO) Pipeline Assessment Certification Program (PACP). This CCTV inspection data is converted to a 5-point condition scale by the City. For sewers without CCTV data, condition is estimated based on material and age. The proportion of remaining life is converted to a City-wide 5-point condition scale as previously shown in Table 3-3

For culverts, the City conducts regular detailed inspections such that each structural culvert with a span greater than 3m is inspected on a two-year cycle. All inspections are supervised by a Professional Engineer following the guidelines in Ontario's Structure Inspection Manual (OSIM), which sets standards for the visual inspection and condition rating of culverts and their elements. An overall Bridge Condition Index (BCI) is calculated from all collected data and informs the annual culvert rehabilitation and reconstruction program. For other culverts, in 2023, the City launched a new inspection program to collect inspection records and assign condition ratings. Some culverts still have unknown condition if they are for driveway entrances that are the responsibility of the property owner. Culvert inspections are prioritized based on overlying surface, with culverts situated below City roadways generally taking precedence.

For stormwater management facilities, the City performs annual inspections to determine maintenance and renewal requirements, including tracking of damage, debris, water quality and erosion issues. The City also has in place a contracted service for bathymetric surveys which

provides data on sediment volumes and sediment accumulation rates. For quality and quantity control stormwater management facilities, condition is based on the estimated time remaining before sediment cleanout will be required.

Table 13-2 Stormwater Management Facility - Time to Cleanout Condition Rating

Condition Grade	Time to Cleanout
Very Good	15 or more years
Good	8 to 14 years
Fair	4 to 7 years
Poor	2 to 4 years
Very Poor	Less than 2 years

For stormwater management facilities that only provide quantity control, condition is determined based on the age and remaining life of the asset. For Natural Watercourses, a condition assessment was completed as part of the City's 2019 Drainage Master Plan.

The condition distribution for the City's Stormwater assets is shown in Figure 13-1. Overall, Stormwater assets are in good condition, with 94% of assets in fair or better condition. 1.7% of assets are in very poor condition.

Assets with unknown condition represent only 4.7% of the overall inventory (not included in Figure 13-1).

Figure 13-1 Condition Distribution by Replacement Value (\$M) - Stormwater

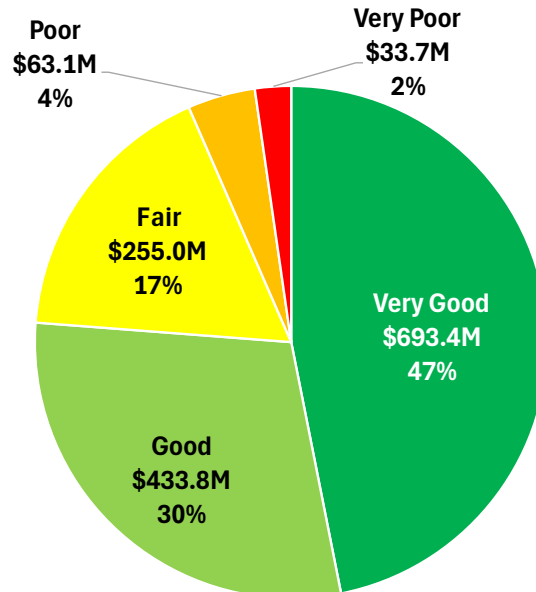
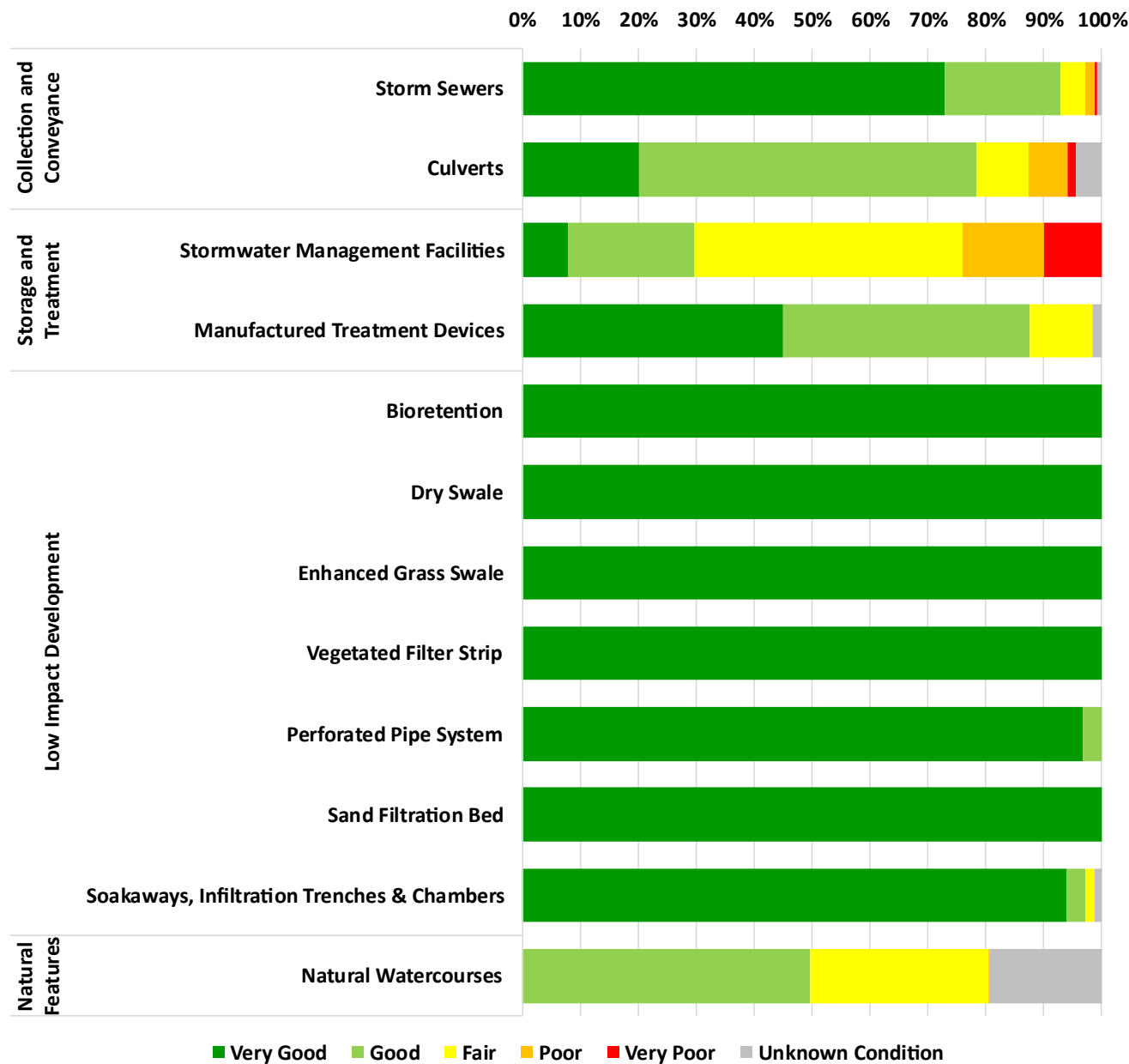


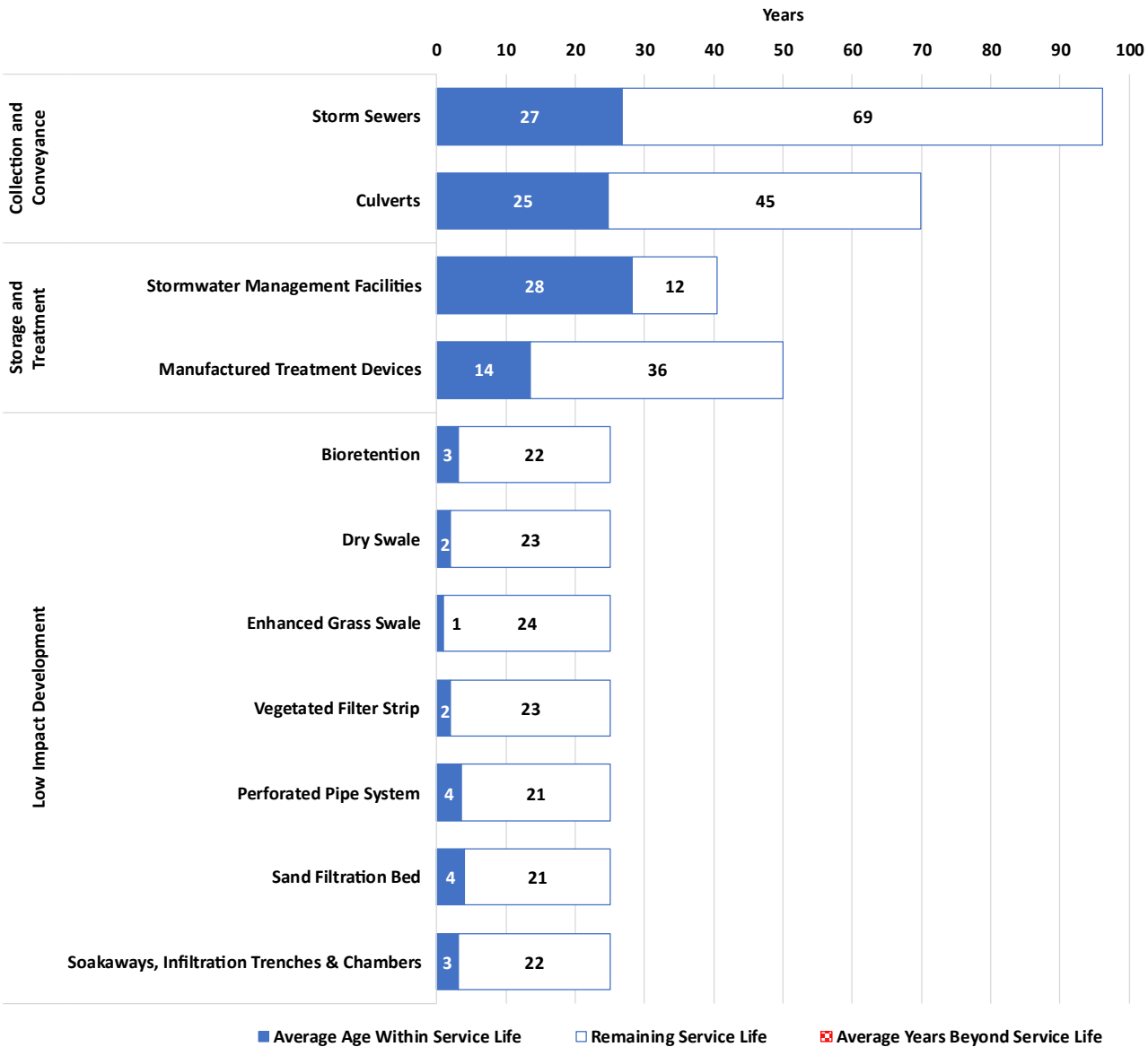
Figure 13-2 shows the condition distribution in more detail by asset class. Ditches are not currently assessed for condition and are not included. Stormwater management facilities have a significant portion in poor and very poor condition due to yearly sediment accumulation that requires cleanout on a routine basis.

Figure 13-2 Condition Distribution by Replacement Value – Stormwater by Asset Class (Percentage)



The average age of assets relative to their average service lives is summarized in Figure 13-3, weighted by replacement value. Natural watercourses and ditches do not have installation year data and an age analysis for these assets is not included.

Figure 13-3 Average Asset Age – Stormwater Assets



13.3 Levels of Service

The City is responsible for managing stormwater within the Municipality. The City’s storm sewer system collects rainwater and surface water runoff from roads, rooftops, parking lots and private storm systems and discharges it back into the natural environment. Discharge points include creeks within the Lake Simcoe Watershed, Kempenfelt Bay, the Bear Creek wetland and Little Lake located within the Nottawasaga Watershed. Short, high intensity rain events are becoming more prevalent in the City. Urban environments include large areas of paved surfaces that make them sensitive to heavy downpours. As rain cannot infiltrate into the ground, it immediately runs off the surface and may exceed storm drain capacity leading to urban flooding. Therefore, an effective stormwater management program is crucial in protecting public safety and health as it

works to reduce flood risk, control erosion, and maintain water quality in local natural waterways.

Additionally, O. Reg. 588/17 requires that the City track two technical metrics related to the resiliency of the properties and stormwater system to storm events. The City has also developed other measures to support asset decision-making for Stormwater. These technical levels of service, as well as those required by O. Reg. 588/17, are summarized in Table 13-3. This table includes the current performance (as of the end of 2024), any aspirational targets set out by the City and proposed performance over the next 10 years. Proposed performance is determined based on what is appropriate for the City in consideration of the City's current 10-year planned funding provision in the Capital Plan as well as risks associated with various performance levels, discussed further in Section 13.6.

The City is considering additional measures regarding work orders related to ECA compliance for inclusion in future updates to this AM Plan.

Table 13-3 LOS Framework - Stormwater

Community LOS	Technical LOS			
	Metric(s)	Current LOS	Target LOS	Proposed LOS
Capacity & Use - Provide adequate flood protection for properties and stormwater system capacity				
Description of the user groups or areas of the municipality that are protected from flooding, including the extent of the protection provided by the municipal stormwater management system. Refer to beginning of Section 13.3.	Percentage of properties in municipality resilient to a 100- year storm (O. Reg. 588/17)**	98.4%	100%	↔ Maintain current service level (>98.4%)
	Percentage of the municipal stormwater management system resilient to a 5-year storm (O. Reg. 588/17)	98.5%	100%	↔ Maintain current service level (>98.5%)
	Percentage of culverts meeting City standard design requirements	63%	100%	↑ 67% (8 upgraded culverts)
Function – Improve water quality of stormwater runoff				
Improve water quality of stormwater runoff	Percentage of impervious surfaces in the City receiving any water quality treatment	76%	N/A	↑ 77% (additional 39 hectares)
	Percentage of impervious surfaces in the City receiving enhanced water quality treatment	30%	N/A	↔ 30%

Community LOS	Technical LOS			
	Metric(s)	Current LOS	Target LOS	Proposed LOS
Quality & Reliability – Maintain stormwater assets in a state of good repair				
Maintain the stormwater system in a state of good repair	Percentage of assets in fair or better condition	Sewers: 97.9% Non-OSIM Culverts: 86.8% SWMF: 57.0% LID: 100.0%	Sewers: N/A Non-OSIM Culverts: 100% SWMF: ~95% LID: N/A	↔ Sewers: >98% ↑ Non-OSIM Culverts: 100% ↑ SWMF: ~95% ↔ LID: 100%
	For structural culverts in the municipality, the average bridge condition index value.	77.0	~69 (Resulting BCI after completing all rehabilitation work in the OSIM report)	↓ ~69*

*Service attribute is listed as “Scope” in O. Reg. 588/17 but is shown as “Capacity & Use” for consistency with LOS Framework.

**Average BCI decreases even though all OSIM recommendations are followed due to natural degradation of good condition culverts over forecast period

The City's Capacity & Use metrics reflect the ability of the stormwater system to meet current and future demands effectively. Through its capital plan, the City aims to address capacity constraints and optimize system usage. Each project in the Capital Plan has been designed to contribute toward achieving these goals, with the ultimate objective of improving the Capacity & Use metrics as close to 100% as possible. This demonstrates the City's proactive approach to providing reliable and efficient stormwater services for its residents while planning for long-term sustainability.

The City calculates the percentage of properties resilient to a 100-year storm using the number of structures (as opposed to the properties themselves).

One of the City's objectives is to continue to increase the quality of stormwater runoff. Currently, it is estimated that 76% of impermeable areas are receiving treatment for stormwater quality and 30% are receiving enhanced water treatment. Per the 10 years Capital Plan, the City expects to treat an additional 39 hectares of impermeable areas to increase the treated percentage to 77% based on installation of manufactured treatment devices (MTD). MTDs are engineered, prefabricated systems designed to treat stormwater runoff by removing pollutants before the water is discharged into natural water bodies. The MTDs are expected to be installed as part of linear renewal projects and stormwater management facility infill and upgrade projects. There are currently no projects within the 10-year Capital Plan to provide enhanced treatment within additional infill areas.

13.4 Risk Management Strategy

The City uses an established risk framework for quantifying the condition-based risk exposure of its assets to enable prioritization of renewal projects across asset classes and services. Risk exposure is the multiplication of the criticality or consequence of failure (CoF) by the probability of failure (PoF).

- Culverts greater than 3000mm in diameter (or span) and under an arterial, expressway, railway, or dead-end road.
- Sewers greater than 1050mm and culverts larger than 1500 mm and under collector roads.
- Specific stormwater management facilities based on a pond safety review.
- Specific low impact development assets categorized as a large, centralized facility.

As shown in Figure 13-4, an estimated \$8.4 million of Stormwater assets currently have a very high-risk exposure (red). The very high-risk assets consist mainly of sewers greater than 1050mm in size and in poor condition, and culverts greater than 1500mm in poor condition and under arterial or collector roads.

Figure 13-4 Risk Exposure for Stormwater Assets* (\$M)

Risk exposure in year 2025 \$, millions						
Probability of Failure	Almost Certain	\$0.2	\$3.1	\$23.3	\$7.0	\$0.1
	Very Likely	\$0.1	\$9.9	\$26.2	\$25.1	\$1.3
	Moderate or Likely	\$0.9	\$20.4	\$113.3	\$37.9	\$4.7
	Occasional or Possible	\$2.4	\$76.3	\$116.9	\$63.0	\$50.1
	Very Rare	\$4.5	\$284.0	\$233.9	\$153.4	\$17.6
		Insignificant	Minor	Moderate	Major	Catastrophic
		Consequence of Failure				

Risk Exposure	\$	%
Very High	\$8.4	0.7%
High	\$53.1	4.2%
Moderate	\$117.3	9.2%
Low	\$341.2	26.8%
Very Low	\$755.5	59.2%
Total	\$1,275.6	100.0%

13.5.1 Renewal Forecast

Storm sewers are in relatively good condition and the renewal needs are tied to the currently planned projects in the Capital Plan which are sufficient to maintain sewers in overall good condition.

For culverts with a span greater than 3 meters, the renewal needs forecast is based on detailed OSIM condition assessments. The non-OSIM culverts and Low Impact Development assets forecast considers the current condition or age of each asset and estimates the planned replacement based on deterioration of assets over the next 10 years based on the estimated service lives summarized in Table 13-4. In certain cases, it may be feasible to rehabilitate existing culverts in place using trenchless technologies that avoid traffic disruptions and costs associated with the management of excavated soils.

Summary of Recommended 10-Year Renewal Strategy:

- Sewers and watercourses renewal needs are forecasted based on planned projects in the 10-year Capital Plan which maintain current condition
- OSIM Culverts needs are based on inspection recommendations
- Non-OSIM Culverts are replaced at expected end-of-life based on age and the estimated service life
- Stormwater Management Facilities require sediment removal per bathymetric survey recommendations and are funded through the operating budget

Watercourse needs are based on erosion and channel improvements planned in the Capital Plan; however, if not addressed promptly, the extent of the repairs and associated costs have the potential to increase drastically. Accordingly, where appropriate, certain projects are undertaken operationally to address urgent needs not suitable for capital budget planning.

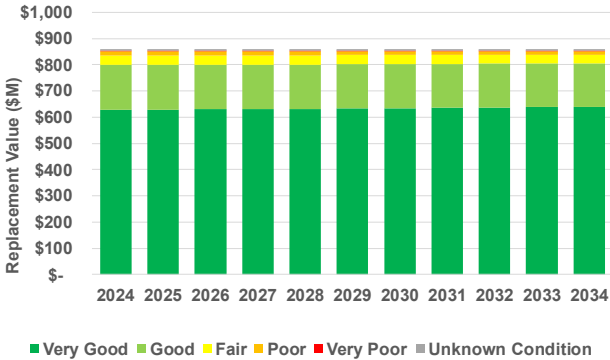
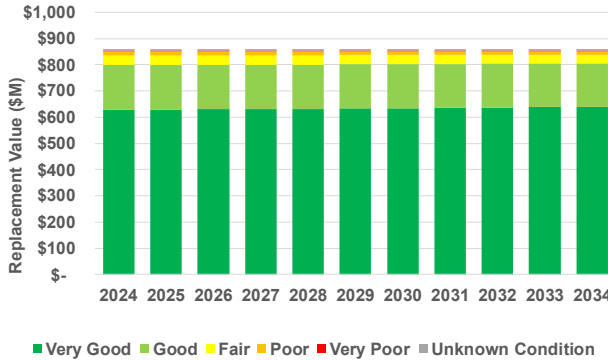
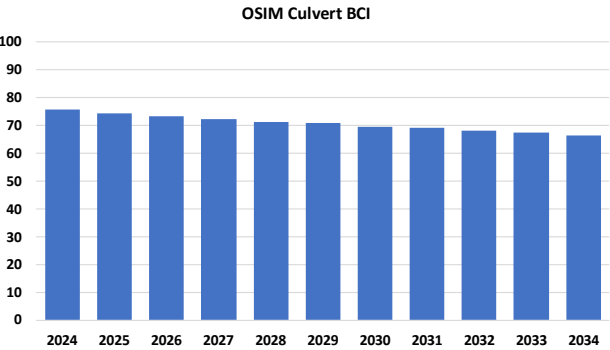
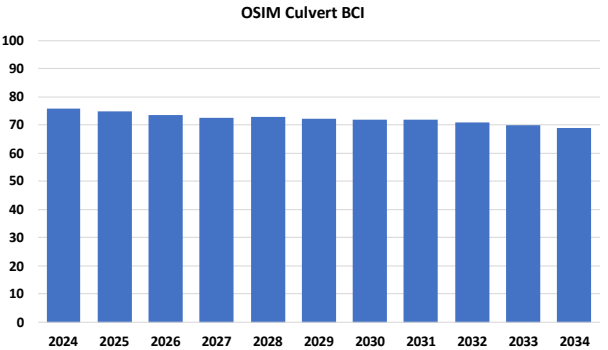
Table 13-4: Estimated Service Life – Stormwater

Asset	Estimated Service Life (Years)
Storm Sewers	100 (Asbestos Cement, Vitrified Clay) 50 (Steel) 75 (Remaining Assets)
Culverts	75 (Concrete) 50 (Remaining Assets)
Quality and Quantity Control Stormwater Management Facilities*	15 or 50 years depending on bathymetric survey timing
Filtration Devices	50
Sediment Removal Devices	50
Low Impact Development	25

*For quantity control only, it is estimated that five ponds will require cleanout over the next 10 years

Figure 13-5 summarizes the renewal needs to meet the proposed service levels related to asset condition. The average annual renewal need is estimated at \$7.5 million per year. The expected performance based on the renewal investment currently available in the 10-year Capital Plan is lower than the proposed service level for OSIM and non-OSIM culverts.

Figure 13-5 Renewal Needs Forecast – Stormwater

Expected Performance (\$7.1 million/yr)		Proposed Performance (\$7.5 million/yr)	
Storm Sewers			
The condition is expected to be maintained based on the current renewal projects in the 10-year Capital Plan. Currently planned renewal investment is \$2.1 million on average per year		The proposed performance is recommended to be the same as the expected performance, which maintains asset condition over the next 10 years. Renewal need is \$2.1 million on average per year	
			
OSIM Culverts			
The condition is expected to decrease based on the current renewal projects in the 10-year Capital Plan. Currently planned renewal investment is \$1.6 million on average per year		The proposed performance is to complete all rehabilitation recommendations outlined in the OSIM report over the next 10 years. Investment gaps are identified and discussed further in Section 13.6. Renewal need is \$1.7 million on average per year	
			

Non-OSIM Culverts	
The condition is expected to decrease based on the current renewal projects in the 10-year Capital Plan. Currently planned renewal investment is approximately \$1.7 million on average per year	The proposed performance is recommended to improve asset condition over the next 10 years. Investment gaps are identified and discussed further in Section 13.6. Renewal need is approximately \$2.0 million on average per year
*Unknown condition assets excluded from forecast	*Unknown condition assets excluded from forecast
Watercourses	
The remaining available Capital Plan of \$1.7 million per year funds projects relating to erosion control and channel improvements for Watercourses which maintain them to an acceptable standard.	

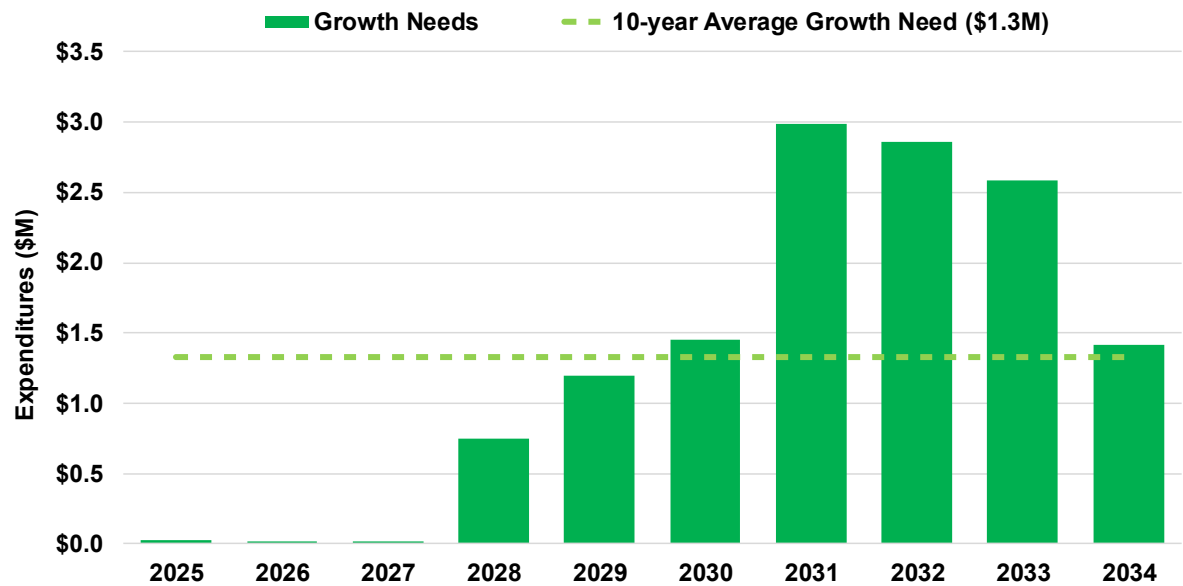
13.5.2 Growth Forecast

Figure 13-6 summarizes the currently identified growth needs over the next 10 years for Stormwater that support the City's resiliency measures in Section 13.3. Growth projects currently include:

- The Bayfield Street Transportation Improvements will consider complete street elements, which include stormwater management upgrades to align with corridor improvements and the MTO interchange replacement
- The Essa Road ROW Expansion includes the replacement of an existing watercourse crossing culvert to support development at Essa and Mapleview, addressing stormwater flow needs along the expanded roadway
- Mapleview Dr E New Sanitary Sewer & Road Expansion includes stormwater management elements to support growth in the Salem Secondary Plan area

Some of the assets will also be constructed in part by developers and eventually be transferred to the City. The average annual growth need for stormwater infrastructure is estimated at \$1.3 million per year over the next 10 years.

Figure 13-6 Growth Needs Forecast – Stormwater



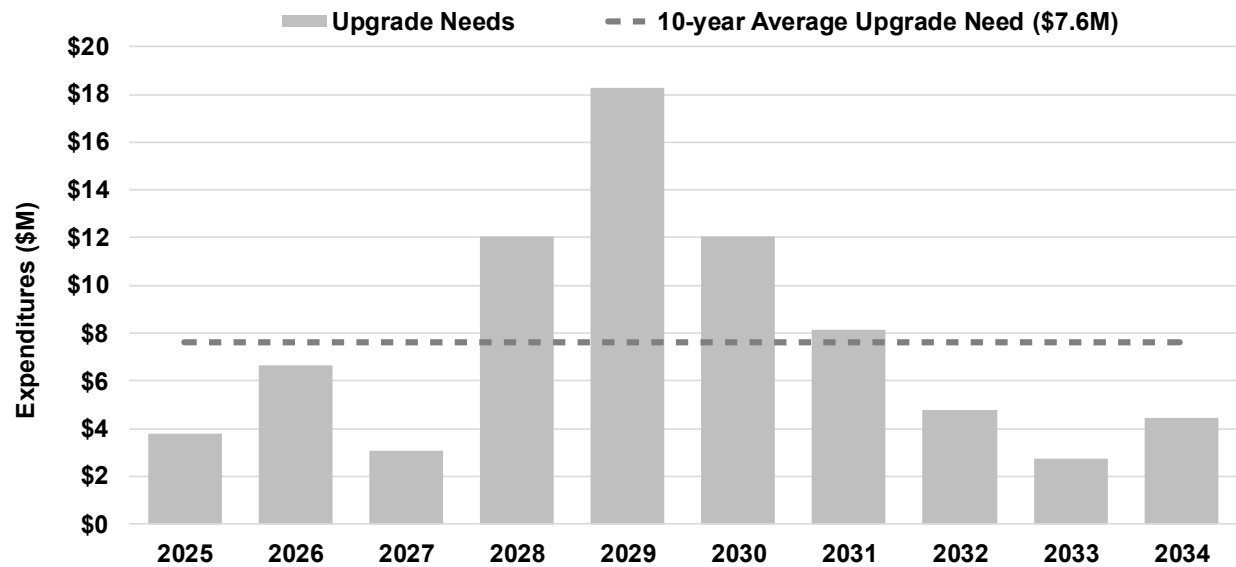
13.5.3 Upgrade Forecast

Figure 13-7 summarizes the currently identified upgrade needs over the next 10 years for Stormwater that support the City’s resiliency measures in Section 13.3. These projects are generally categorized as ‘additional capability/capacity’ in the City’s Capital Plan and may also consist of renewal or growth initiatives. Upgrade projects currently include:

- The Kidds and Sophia Creek Storm Pond Upgrades involve the expansion and upgrade of key stormwater management ponds to improve flood control and water quality in the underserved Kidds and Sophia Creek watersheds, supporting both current and future drainage needs
- The Dyments Creek New Storm Pond project includes the construction of a new stormwater management pond to control stormwater quantity and quality, mitigating downstream flooding, erosion, and property damage throughout the watershed
- The Sophia Trunk Storm Sewers project constructs new trunk storm sewers to convey 100-year storm flows from Sophia Creek, replacing aging infrastructure and reducing downtown flooding risks while supporting intensification in the city’s core.

The average annual upgrade needs for stormwater infrastructure are currently estimated at \$7.6 million per year over the next 10 years.

Figure 13-7 Upgrade Needs Forecast – Stormwater



13.5.4 Operations and Maintenance Forecast

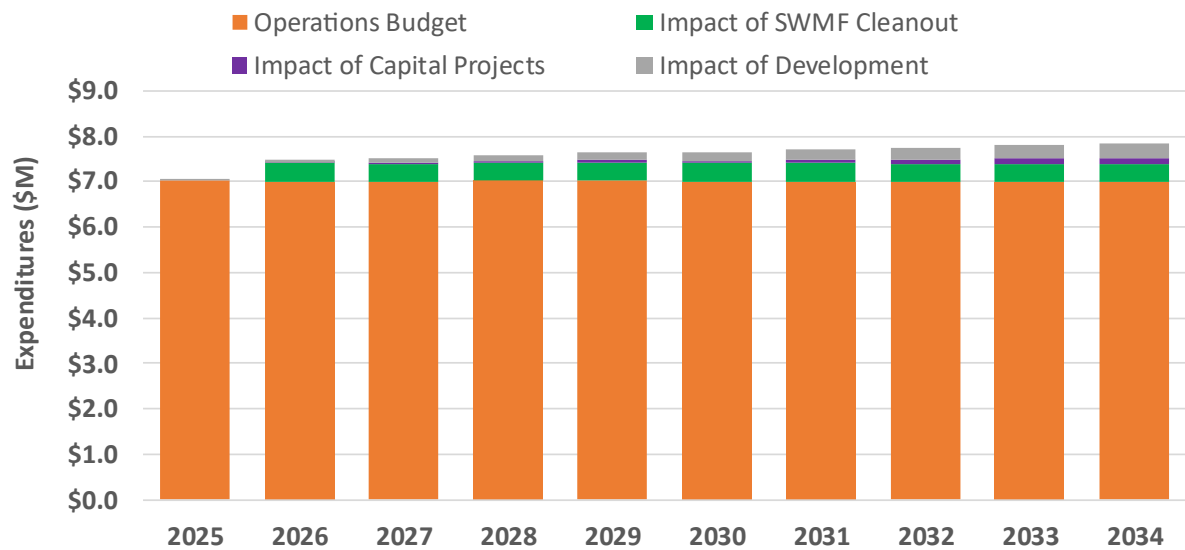
Operations and maintenance work is critical for ensuring the continued reliability of Stormwater assets and meeting the proposed service levels.

Figure 13-8 shows the Operations and Maintenance needs over the next 10 years for Stormwater. The increase in costs beyond 2025 in operations and maintenance activities is impacted by the estimated growth in the asset portfolio. To meet proposed service levels over the next 10 years, the Operating Budget is estimated to need to increase at an average annual rate of 1.2%. The Operations and Maintenance forecast below is determined by extrapolating the three-year trend in O&M provided by the City (2025-2028) and adding considerations for growth in the asset portfolio for capital projects and development.

Operations and maintenance include:

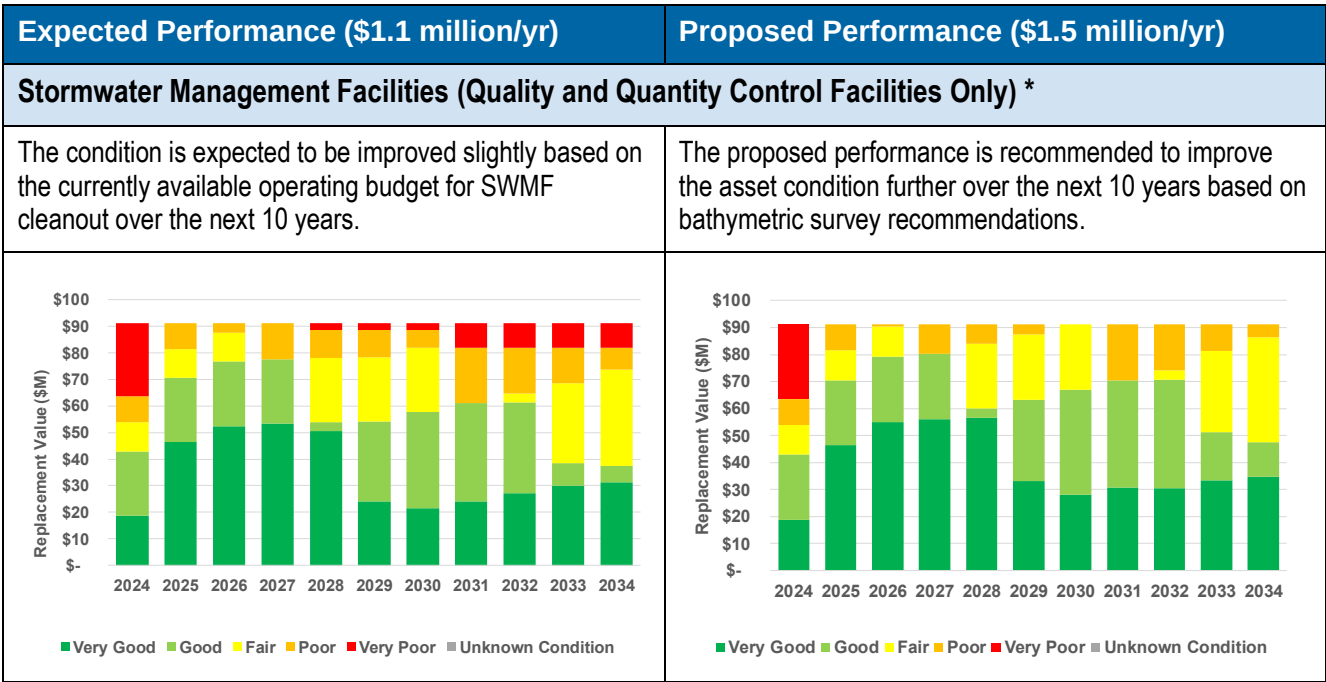
- Cleaning and flushing of storm sewers
- CCTV inspections of storm sewers
- Catch basin cleaning
- Debris and sediment removal for SWMF and culverts
- Erosion protection measures for culverts and structures

Figure 13-8 Operations and Maintenance Needs Forecast – Stormwater



For Quality and Quantity Control Stormwater Management Facilities, cleanout is funded through the City’s operating budget. Based on recent performance of the City’s cleanout operations, the spends approximately between \$0.9 and \$1.3 million per year (\$1.1 million per year average). The Proposed LOS is determined based on the need identified from the City’s bathymetric surveys for Quality and Quantity Control SWMFs as well as estimated cleanout needs for specific Quality Control Only SWMFs as provided by the City.

Figure 13-9 Operating Needs Forecast – SWMF



13.6 Financing Strategy

The financial analysis considers the affordability of the proposed service levels based on the funding available in the 10-year Capital Plan compared to the forecasted needs.

The funding available for renewal of stormwater infrastructure is estimated to be an average of \$7.1 million per year over the next 10 years based on the City's Capital Plan. As discussed in Section 13.5.1, the estimated average annual renewal need is \$7.5 million per year to meet proposed service levels. This results in an investment gap of \$0.4 million per year, assuming that the City's 10-Year Capital Plan is funded as currently planned, and that the City has the resources to carry out the projects as currently planned.

The overall investment gap is comprised of the following:

- \$0.1 million per year for OSIM culverts
- \$0.3 million per year for Non-OSIM culverts

The investment gap for OSIM Culverts arises from recommended rehabilitations in the OSIM report not included in the City's 10-Year Capital Plan. For Non-OSIM Culverts, there is approximately \$2.7 million worth of assets (average of \$0.3 million per year) that remain in very poor condition after accounting for all replacements listed in the City's 10-Year Capital Plan.

As shown in Table 13-3, the City has an aspirational target of 100% of their Culverts meeting City standard design requirements. The City noted that there is an investment gap of approximately \$241 million (in 2023 dollars) to achieve this target. Over the next 10 years, the City has chosen a proposed service level of 67% and is managing the associated risks.

Figure 13-10: Capital Renewal Needs versus Funding – Stormwater

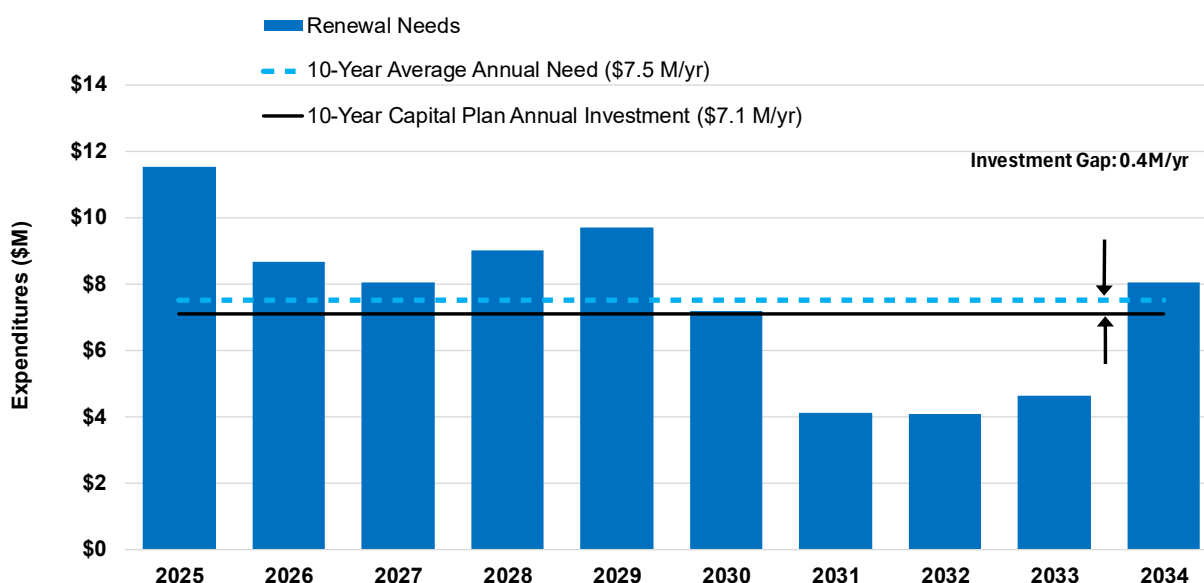


Table 13-5 summarizes the financial sustainability and affordability for growth, upgrade, renewal, and O&M activities. In terms of operations and maintenance, the Operating Budget is

estimated to need to increase at an average annual rate of 1.2% to meet proposed service levels over the next 10 years.

Table 13-5: 10-Year Financial Sustainability of Proposed Service Levels

Asset Lifecycle	Average Annual Forecast Needs	10-Year Capital Plan Average Annual Investment	Average Annual Investment Gap	Potential Impacts
Capital Growth	\$1.3 M/yr	\$1.3 M/yr	No gap	N/A
Capital Upgrade	\$7.6 M/yr	\$7.6 M/yr	No gap	N/A
Capital Renewal	\$7.5 M/yr	\$7.1 M/yr	\$0.4M/yr	Any asset classes with a renewal investment gap may result in the deterioration in condition of infrastructure as shown in Figure 13-5.
Operations and Maintenance	\$7.1 M in 2025 to \$7.9 M in 2034	\$7.1 M in 2025	1.2% average annual increase	Failure to increase resources to operate and maintain new assets will result in reduced service levels and increased risks related to flooding.

To manage the risk of any renewal investment gaps, the City has taken significant steps to improve the financial sustainability of its stormwater program. Following the initial recommendations of the Stormwater Funding Study (Phase 1), Phase 2 of the study was completed and led to the development and approval of a new stormwater investment model. In 2022, City Council approved the transition from tax-based funding to a dedicated stormwater user fee based on impervious surface area. This model provides a more equitable and sustainable revenue stream that directly links stormwater system funding to the impact each property has on the system. This approach will continue to improve the City's ability to invest in lifecycle renewal needs, address infrastructure risks, and meet long-term service level targets. Additionally, the City recognizes the need to build internal capacity to deliver an expanded renewal program. This includes evaluating staff and consultant resources and improving asset management practices through more accurate condition assessments, including conducting bathymetric surveys of stormwater management facilities to better monitor sediment buildup and more precise scheduling of cleanouts.

The proposed service levels presented in Section 13.3 represent risks considered appropriate to the City given the associated affordability. The City is planning on upgrading at least eight storm culverts to meet City standard design requirements over the next 10 years, which would bring the percentage of culverts meeting current design standards to 67%. The aspirational target of upgrade all remaining culverts to reach 100% over the next 10 years is not affordable nor

achievable given resources, but the City is managing the risks by prioritizing work on culverts in critical areas to address the higher risk flooding areas.

The City is also proposing that 77% of impervious surfaces in the City will receive water quality treatment by 2034 (30% receiving enhanced quality treatment) over the next 10 years. Some of the risk associated with pollutants being discharged to the natural waterways is managed by the City through activities such as street sweeping.

13.7 Recommendations for Continuous Improvement

Development of AM Plans is an iterative process that includes improving data, processes, systems, staff skills, and organizational culture over time. Continuous improvement recommendations include:

Table 13-6: AM Plan Improvement Recommendations – Stormwater

AM Plan Section	Improvement Recommendation
State of Infrastructure	• Ensure inventory of stormwater management facilities is distinguished from natural ponds to avoid overlap with natural areas covered in Section 12. • Consider refining the valuation methodology for dry ponds, as the current approach uses the same cost per hectare of drainage area for both wet and dry ponds
Levels of Service	• Develop a more detailed definition of "resiliency" that considers both flooding and surcharged pipes • Establish a more comprehensive approach to measuring water quality treatment for impervious surfaces
Risk Management	• Conduct a separate risk review for deficient pipes to better understand the implications of undersized storm infrastructure
Lifecycle Management	• Develop a more detailed approach to classifying projects as renewal, upgrade, or growth • Establish a lifecycle management strategy for dry ponds, including cleaning and maintenance requirements • Establish a more detailed approach to water course projects, particularly for erosion repair and bank stabilization • Consider the impact of enhanced treatment requirements when replacing dry ponds • Establish an annual in-situ storm sewer repair program
Financial Management	• Establish a dedicated budget of approximately \$100,000 per year for dry pond cleaning • Develop a more detailed approach to costing the full replacement of deficient pipes to identify investment gap • Establish a separate budget for OSIM culvert treatments based on recommended work • Develop a more detailed approach to budgeting for stormwater management in new development areas

14 WATER

14.1 Overview

The City's Water assets are vital to providing safe, reliable, and high-quality water supply to residents and businesses. This involves the upkeep, optimization, and renewal of water infrastructure, including treatment plants, pipelines, reservoirs, and distribution systems. The AM Plan prioritizes sustainability, cost-effectiveness, and regulatory compliance, ensuring that the water infrastructure meets the present and future needs of the community.

Key Findings

- Watermains are generally in good condition with 97.2% in fair or better condition.** This supports reliable service with zero boil water advisories.
- There is an investment gap associated with the renewal of vertical assets.** The City is continuing to implement condition assessments and capital programs to address this gap.
- There is an investment gap for backup power upgrades and security improvements (fencing and cameras)** at booster pumping stations and water towers.

14.2 State of Infrastructure

Assets that support water infrastructure include Mains, Hydrants, Valves and Chambers along with vertical infrastructure such as the Surface Water Treatment Plant (SWTP), Well Pumping Stations, Booster Pumping Stations, Reservoirs and Towers. Table 14-1 shows the inventory of the City's water infrastructure with a replacement value of approximately \$2.2 billion and includes a breakdown of the inventory by asset category and asset class. The largest portion of the asset portfolio are the watermains which accounts for approximately 85% of Linear assets and 66% of all water infrastructure by replacement value. Linear assets are mainly valued based on unit construction costs, and vertical assets are valued primarily with City financial (tangible capital asset) data. Three pump stations (Codrington Booster Pumping Station, Well Pumping Station 11, and Well Pumping Station 14) are valued based on recent condition assessments.

Table 14-1 Inventory Summary – Water Infrastructure

Asset Category	Asset Class	Quantity	Replacement Value (2025\$M)
Transmission & Distribution	Mains	Transmission: 61.7 km Distribution: 620.7 km Chlorine Contact: 3.8 km	\$1,471.0
	Hydrants	Fire: 4,156 Yard: 90	\$53.7
	PRVs	71	\$1.0
	PRV Chambers	34	\$22.1

Asset Category	Asset Class	Quantity	Replacement Value (2025\$M)
Transmission & Distribution (cont.)	Valves	7,510	\$90.1
	Curb Stop Assemblies	46,535	\$23.3
	Valve Chambers	Small: 53 Medium: 98 Large: 11	\$58.0
	Backflow Devices	413	\$1.1
	Automatic Flushers	16	\$0.1
	Sampling Stations	17	\$0.1
	Flush Boxes	38	\$0.2
	Bulk Water Station	1	\$0.2
	Billing	Residential Meters & Smart Points: 44,260 ICI Meters & Smart Points: 2,630	\$14.4
Linear Total			\$1,735.3
Supply & Treatment	Surface Water Supply	Surface Water Treatment Plant Low Lift Pumping Station	\$290.1 \$28.8
	Ground Water Supply	13 Well Pumping Stations 14 Wells	\$37.3
Storage	Underground Reservoirs	3 reservoirs	\$35.1
	Water Towers	3 towers	\$24.5
Transmission & Distribution	Booster Pumping Stations	7 pumping stations	\$58.2
Vertical Total			\$474.0
Water Total			\$2209.3

The condition of watermains is estimated as a function of age, material, and break history. For any watermains for which breaks have been recorded, the age-based rating is averaged with a break history rating factor. This break history rating factor was composed of two ratings, based on the watermain's past 5-year history (weighted 70%) and the total break history (weighted 30%).

Hydrant inspections are performed annually. Repairs and renewals are completed as needed, ensuring that all fire hydrants are functioning. Similarly, valves, pressure reducing valves (PRVs) and other appurtenances are tested and exercised on a regular basis. Condition ratings are not formally recorded for valves and chambers. For these assets, condition is estimated based on age versus service life, and the proportion of remaining life is converted to a City-wide 5-point condition scale as previously shown in Table 3-3.

Regarding vertical infrastructure, the City has retained a consultant to complete condition assessments for well and booster pumping stations and various process tanks at the Surface Water Treatment Plant. The condition assessment program enables the City to understand the physical condition of the assets and defects to provide strategic recommendations to inform

capital and maintenance planning. The program is on-going, and the City is planning to continue to complete assessments over the next few years. For vertical assets without a condition assessment completed, the condition is estimated based on age versus service life.

The condition distribution for the City’s Water assets is shown in Figure 14-1.

Overall, water assets are in average good condition, with 95.9% of assets in fair or better condition. 1.5% of assets are in very poor condition.

Assets with unknown condition represent only 1.1% of the overall inventory (not included in Figure 14-1), but the City is working on improvements to the condition estimates of vertical assets through inventory improvements and completion of additional condition assessments.

Figure 14-1 Condition Distribution by Replacement Value - Water

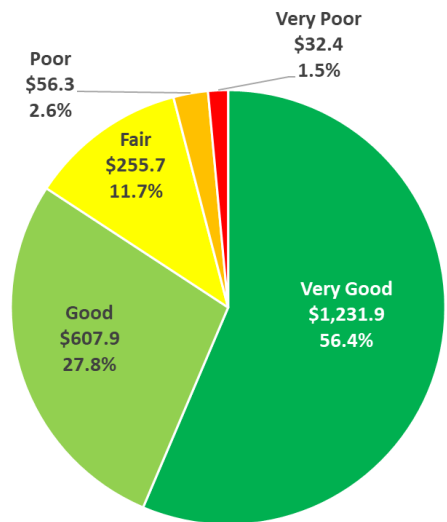
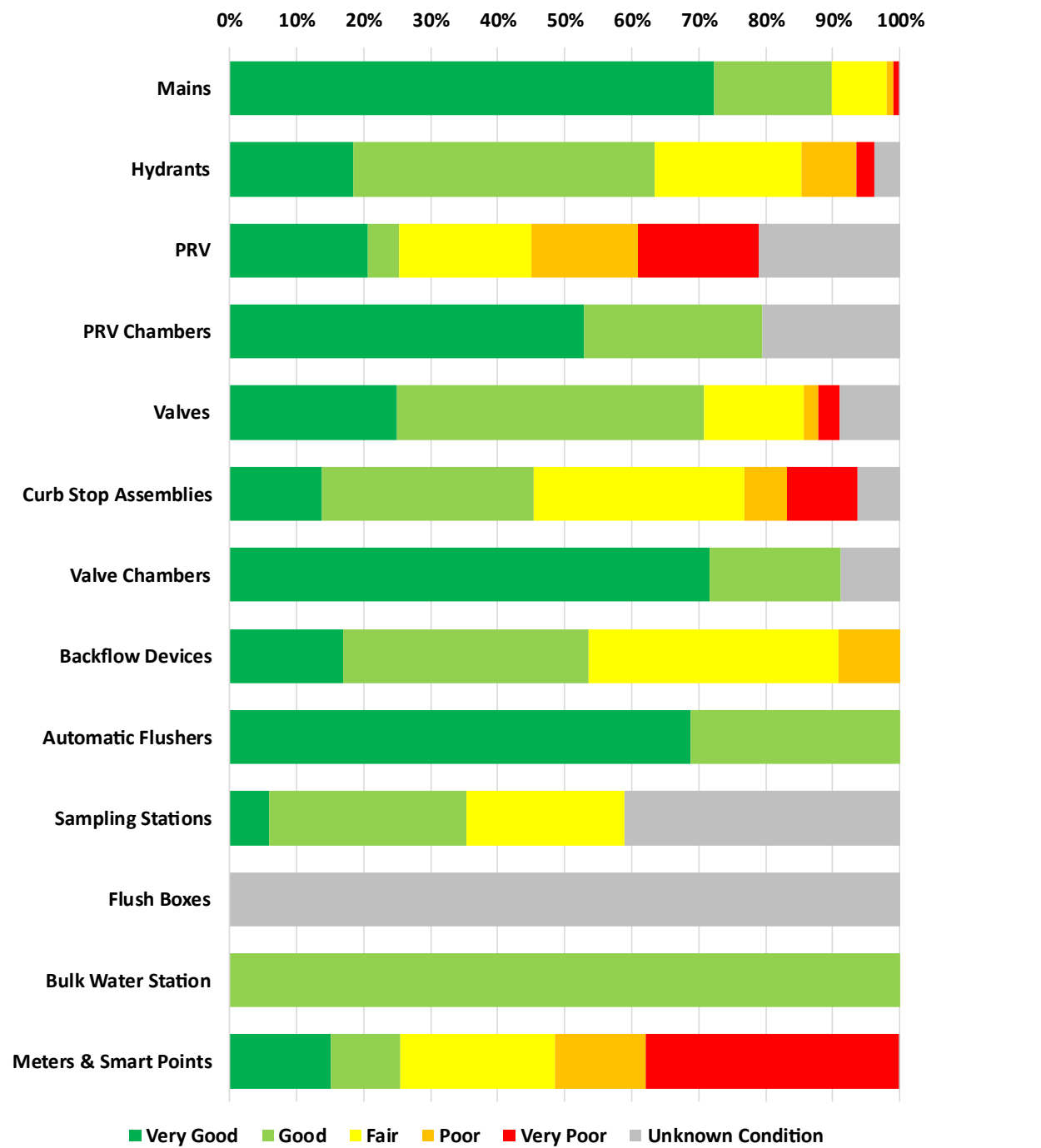


Figure 14-2 and Figure 14-3 show the condition distribution in more detail by asset class for linear and vertical assets, respectively. Mains are generally in good condition. A significant portion of water meters are in very poor condition as they are at their end of life and due for replacement.

The City is currently undertaking a meter replacement program whereby in 2024, 2694 water meters past their service life expectancy were replaced. This number of replacements is anticipated to continue for the next decade to ensure meters are all brought into the fair or better range of condition. Additionally, the creation of new staff compliment has been endorsed to ensure the continued success of this program.

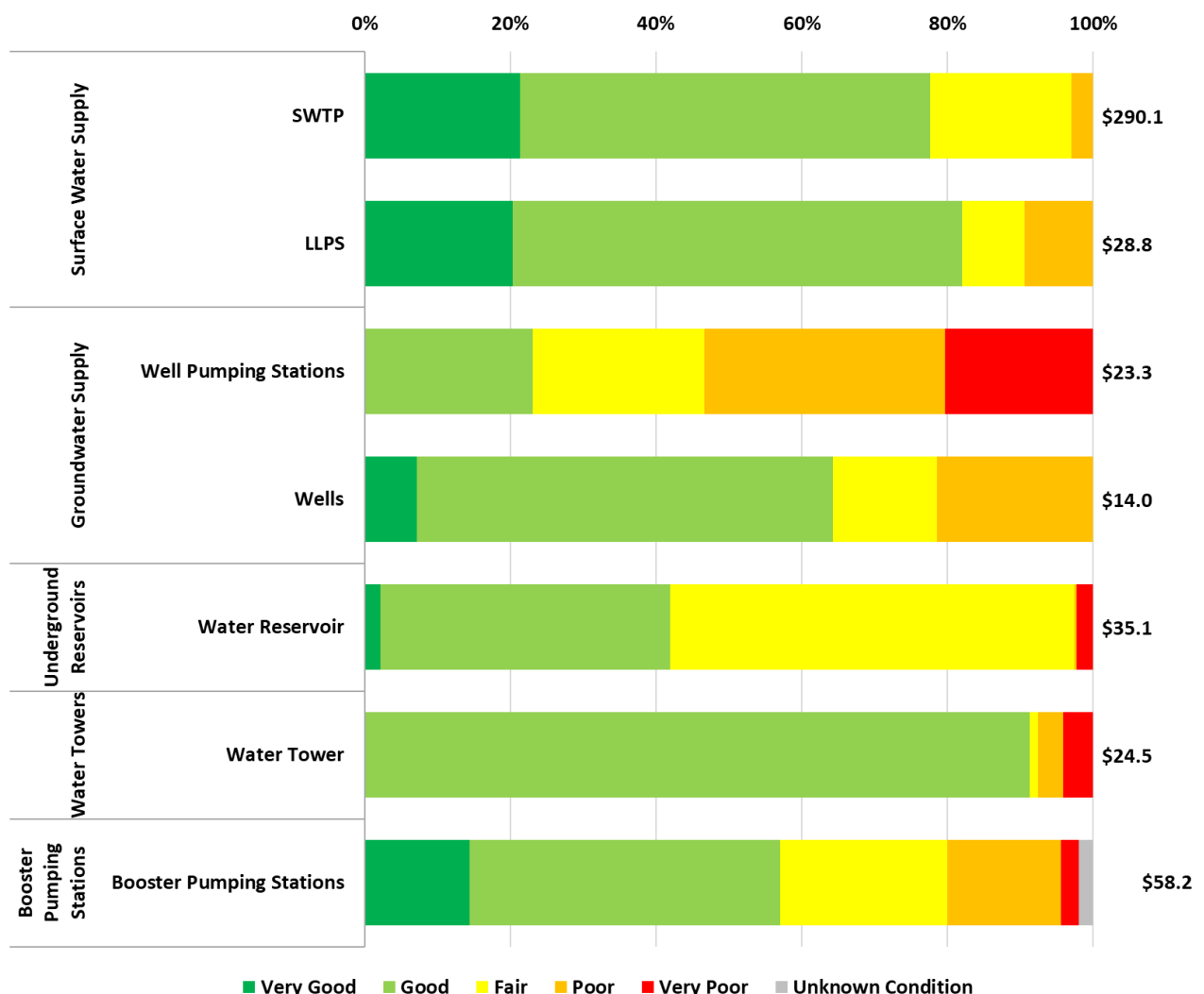
Approximately 18% of pressure reducing valves are past their estimated service life and therefore noted as in Very Poor condition. The City has developed a program in the Capital Plan to annually upgrade existing PRVs in the water distribution system to the new standard. The potential risk of failure of the existing PRVs is mitigated through regular testing and exercising of the valves.

Figure 14-2 Condition Distribution by Replacement Value - Linear Water Infrastructure (Percentage)



The City has recently completed condition assessments on WPS 11 (Heritage Park), WPS 14 (Heritage Park), BPS 01 (Codrington Booster Pumping Station), and various process tanks for the Surface Water Treatment Plant. As the City continues to complete these assessments, the accuracy of the condition profile in Figure 14-3 will improve.

Figure 14-3 Condition Distribution by Replacement Value – Vertical Water Infrastructure (Percentage)



The age distribution for the City's linear and vertical water assets is shown in Figure 14-4 and Figure 14-5, respectively. These figures show the average age of assets relative to their average service lives weighted by replacement value and are categorized by asset class (or asset type). Flush boxes do not have installation year data and an age analysis for these assets is not included.

Figure 14-4 Average Asset Age - Linear Water Infrastructure

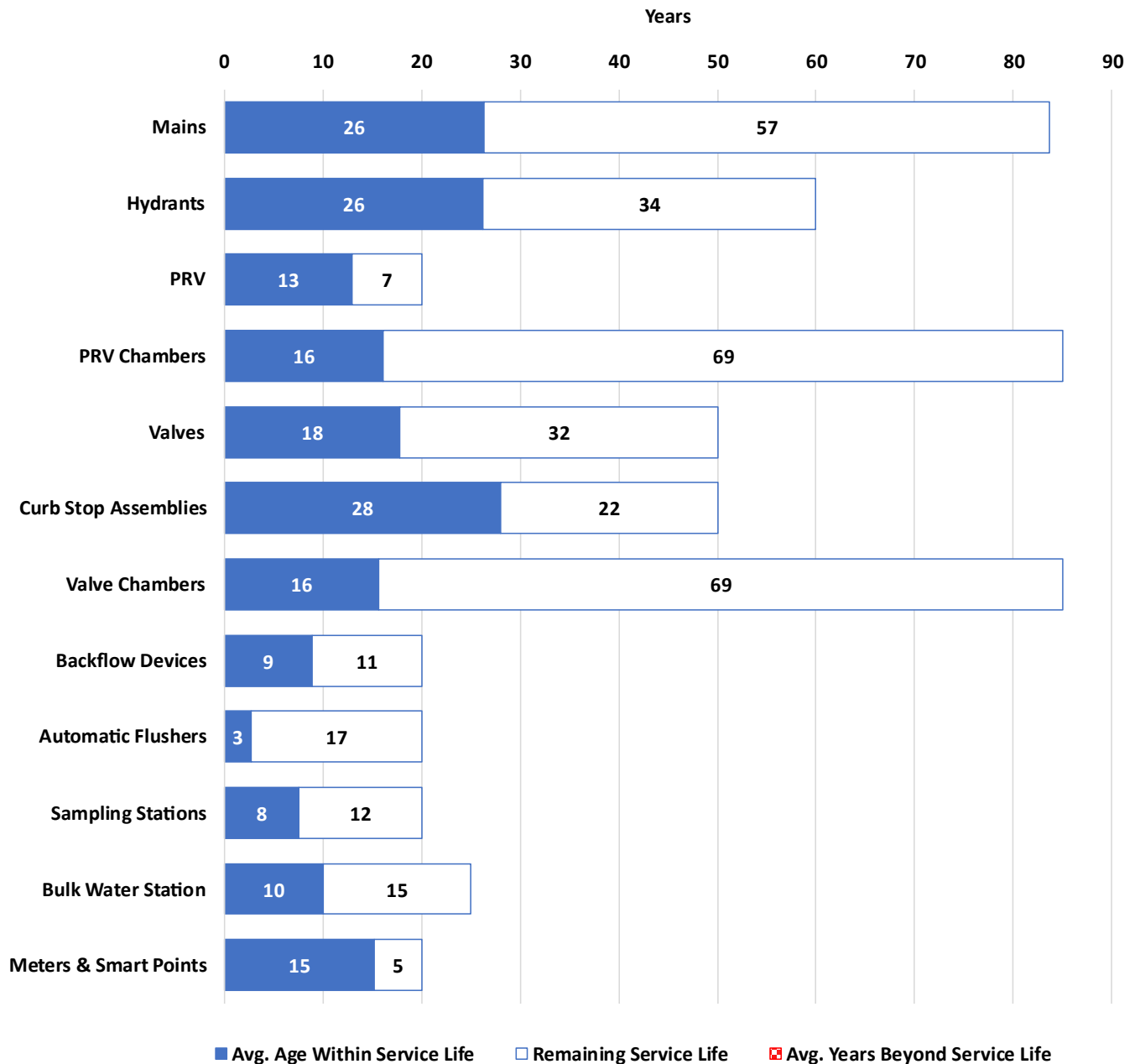
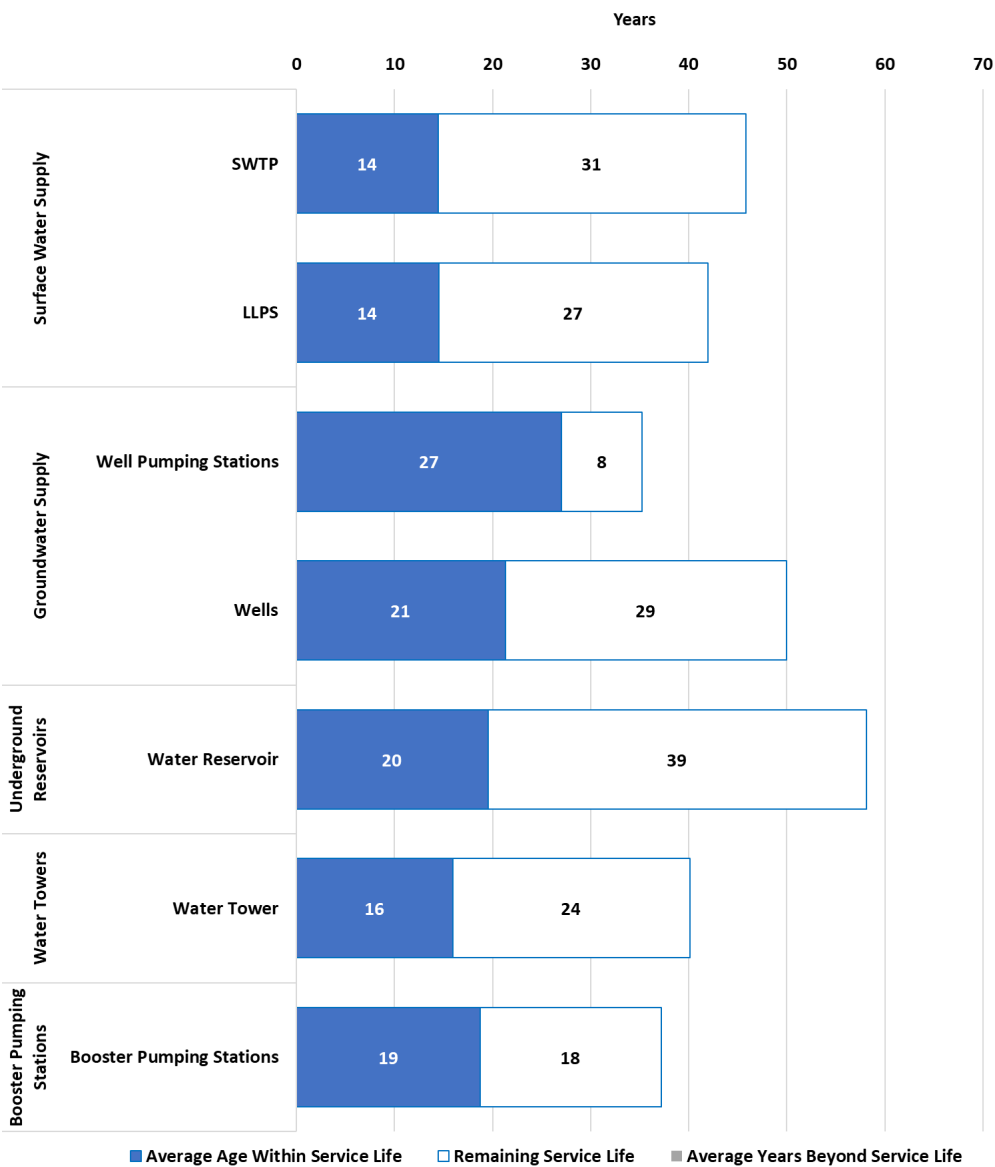


Figure 14-5 Average Asset Age – Vertical Water Infrastructure



14.3 Levels of Service

Due to the importance of safe drinking water to our communities, water service is highly regulated by the province. Key legislation includes the Safe Drinking Water Act, 2002, which provides a consistent set of province wide regulatory framework to help ensure access to safe, high quality, reliable drinking water; and the Clean Water Act, 2006, which provides a framework for protecting the raw water source for drinking water systems within source protection areas. These acts recognize that Ontario communities are entitled to expect safe drinking water from their municipalities.

In accordance with the Ministry of the Environment's Drinking Water Quality Management Standard, the City, as the owner of a municipal residential drinking water system, has adopted a

Quality Management System Policy, which formalizes the City's commitment to "ensuring the reliable and sustainable supply of safe drinking water". The policy further specifies that the Corporation of the City of Barrie will maintain and continually improve the effectiveness of the Quality Management System through the following commitments:

- Provide the resources necessary to ensure the delivery of safe and reliable water treatment and distribution services in an efficient and effective manner that meets or exceeds the legislation and regulations related to water quality.
- Invest in infrastructure, technology and process improvements to safeguard the environment while continually improving water service and delivery.
- Provide high quality response services and promote customer confidence through effective communications.

Table 14-2 provides the LOS Framework for the City's Water Service. This table includes the current performance (as of the end of 2024), any aspirational targets set out by the City and proposed performance over the next 10 years. Proposed performance is determined based on what is appropriate for the City in consideration of the City's current 10-year planned funding provision in the Capital Plan as well as risks associated with various performance levels, discussed further in Section 14.6.

Regarding availability of fire flow, there are some serviced locations where buildings are not within 90 meters of a hydrant. However, Barrie Fire & Emergency Services (BFES) are still able to provide adequate fire protection in these areas through their operational practices utilizing pumpers and closing roads as needed to ensure an adequate water supply. Locations with deficient fire hydrant spacing are being addressed through capital projects and new development. Furthermore, in areas where fire flow is thought to be deficient under modelled conditions, BFES and the Water Operations Branch achieve required fire flow through dynamic management of the water supply and distribution systems during emergencies. Proposed performance for this measure is expected to improve over time as more areas are serviced through new development and capital improvements are completed to improve service in developed areas.

Table 14-2 LOS Framework - Water

Community LOS	Technical LOS			
	Metric(s)	Current LOS	Target LOS	Proposed LOS
Capacity & Use - Provide adequate availability of water service to properties				
Description of the user groups or areas of the municipality that are connected to the municipal water system: The City's servicing goals are to ensure that adequate water supply is provided to the residents of the City and to ensure that development within the City is serviced by municipal water.	Percentage of properties connected to the municipal water system	99.98%	100%	 Maintain >99.98%
Description of the user groups or areas of the municipality that have fire flow Fire hydrants are located throughout the community and the Fire Department with access to water during fire emergencies. Adequate fire flow is provided throughout the City via fire hydrants connected to the water distribution system. In accordance with City Standards, the Ontario Building Code, and the Fire Underwriters Survey 2020 "Water Supply for Public Fire Protection: A Guide to Recommended Practice in Canada", fire hydrants should be placed within 150 metres of single residential buildings, and within 90 metres of multi-unit residential or ICI (industrial, commercial, and institutional) buildings. The City currently has 63,528 out of 65,188 buildings within 90m of a hydrant.	Percentage of properties where fire flow is available	97.5%	100%	 Maintain or increase current service level
Reduce the risk that maximum daily demand pressures will not be impacted by fire flow demand.	Percentage of pipes with Max Daily Demand (MDD) plus fire flow reach a flow velocity > 5m/s	0%	0%	 0%

Community LOS	Technical LOS			
	Metric(s)	Current LOS	Target LOS	Proposed LOS
Function - Provide safe drinking water				
Description of boil water advisories: The City is committed to ensuring the reliable and sustainable supply of safe drinking water that protects public health and the environment through the development, implementation, and maintenance of a Quality Management System. For emergencies related to water quality, the City may issue a boil water advisory or other drinking water quality advisory if it believes that the water from the drinking water system is unsafe for human consumption.	The number 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	0	0	 0
Function - Reduce energy consumption and associated costs				
The City strives to reduce its energy consumption, and the associated costs and greenhouse gas emissions. Energy management initiatives focus on communication, training and engagement activities to increase energy consumption awareness among staff and encourage behaviours that conserve energy.	Water energy consumption per Megalitre (ekWh/ML)	990 ekWh/ML (2023)	750 ekWh/ML (Net Zero Pathway target for 2034)	 750 ekWh/ML (Expected performance: 880 ekWh/ML)
Function – Reduce water loss				
Reduce water loss to improve efficiencies of the water network.	% of water loss in system	4.6%	<10%	 <10%

Community LOS	Technical LOS			
	Metric(s)	Current LOS	Target LOS	Proposed LOS
Quality & Reliability – Maintain water assets in a state of good repair and reliable operations				
Water assets are maintained in a state of good repair.	Percentage of assets in fair or better condition	Linear: 97.2% Vertical: 91.5%	N/A	 Linear: >95% Vertical: ~70%*
Risks to water services are reduced by minimizing the backlog of preventive maintenance and corrective repairs.	Percentage of preventive maintenance work orders completed on time	99.0%	100%	 As close to 100% as possible
The City aims to minimize watermain breaks and their impacts to the community.	The number of connection-days per year without service due to water main breaks compared to the total number of properties connected to the municipal water system	8.6 connection-days	0	Minimize number of breaks
	Watermain breaks per km	0.03 watermain breaks/km (22 breaks)	0	Minimize number of breaks
Description of fire hydrant inspection program and findings	Percentage of annual planned inspections completed	100%	100%	 100%

*Though a portion of assets are in poor condition, they are not at end-of-life. Very Poor assets are maintained at less than 5%

14.4 Risk Management Strategy

The City uses an established risk framework for quantifying the condition-based risk exposure of its assets to enable prioritization of renewal projects across asset classes and services. Risk exposure is the multiplication of the criticality or consequence of failure (CoF) by the probability of failure (PoF).

The most critical linear water assets are watermains greater than 700mm and chlorine contact mains. The most critical vertical assets are the process assets and the mechanical, electrical and structural building components of Leacock Booster Pumping Station and the SWTP.

As shown in Figure 14-6, an estimated \$26.9 million (1.2%) of Water assets currently have a very high-risk exposure. The very high-risk assets consist mainly of instrumentation and control assets at various pump stations and the SWTP. The City is currently undergoing a large SCADA upgrade project to address these assets. As the City completes additional condition assessments on vertical infrastructure, the accuracy and granularity of the risk profile will improve.

Figure 14-6 Risk Exposure for Water Assets (\$M)

Risk exposure in year 2025 \$, millions						
Probability of Failure	Almost Certain	\$0.5	\$15.4	\$1.9	\$14.5	\$0.0
	Very Likely	\$0.2	\$18.0	\$11.8	\$13.9	\$12.4
	Moderate or Likely	\$3.4	\$115.6	\$41.1	\$69.4	\$26.2
	Occasional or Possible	\$16.1	\$183.5	\$153.3	\$66.3	\$188.6
	Very Rare	\$27.8	\$411.6	\$549.8	\$93.2	\$149.5
		Insignificant	Minor	Moderate	Major	Catastrophic
Consequence of Failure						
Risk Exposure	\$	%				
Very High	\$26.9	1.2%				
High	\$42.1	1.9%				
Moderate	\$285.3	13.1%				
Low	\$544.4	24.9%				
Very Low	\$1,285.6	58.9%				
Total	\$2,184.2	100.0%				

* Assets with unknown condition are not included

In addition to asset condition and reliability risks, the City mitigates capacity and functional related risks related to providing adequate water supply and water quality by assessing the need for additional and upgraded infrastructure as well as planning for the additional infrastructure that will be assumed by the City through development. The City assesses the risk of various options to meet capacity and functional service levels through the development of studies such as the Water Supply Master Plan and Water Storage and Distribution Master Plan that considers the options of how to best achieve the stated service levels.

14.5 Lifecycle Management Strategy

The City balances asset needs across renewal, growth, upgrade, and operations & maintenance activities to ensure that the water system remains safe and reliable while also addressing increasing demands due to population growth. The costs for these activities are discussed in the following subsections.

14.5.1 Renewal Forecast

The renewal forecast for linear assets considers the current condition or age of each asset and estimates the planned replacement year based on the currently planned projects in the Capital Plan. Deterioration of assets over the next 10 years is forecasted based on the estimated service lives summarized in Table 14-3. In addition to pipe material, cathodic protection and lining are also considered in the service life estimates.

Summary of Recommended 10-Year Renewal Strategy:

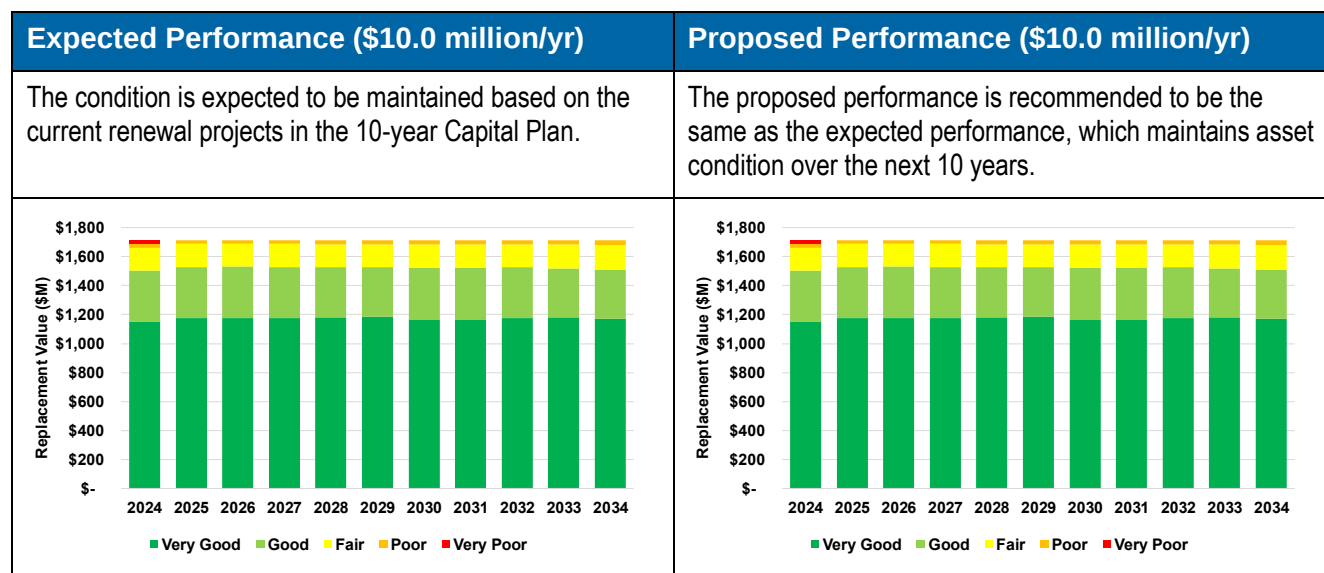
- Maintains current condition over next 10 years for both linear and vertical infrastructure
- Renewal of linear assets is based on the current 10-year Capital Plan projects
- Renewal of vertical assets is forecasted based on a mix of:
 - Condition assessment recommendations
 - Capital Plan projects
 - City staff observations
 - Where the above information is not available, replacement at the estimated service life

Table 14-3: Estimated Service Life – Watermains

Watermain Material	Estimated Service Life (Years)
Ductile Iron	60
Ductile Iron with Cathodic Protection	75
Cast Iron	80
Plastic	60
Cross linked Polyethylene	50
High Density Polyethylene	90
PVC	90
Concrete	90
Asbestos Cement	75
Stainless Steel	60
Steel	50
Galvanized	30
Copper	80
Cured-in-Place-Pipe (Lining)	50

For linear water infrastructure, the proposed performance is to maintain the current condition of assets over the next 10 years, as shown in Figure 14-7. The average annual renewal need is estimated at \$10.0 million per year.

Figure 14-7 Renewal Needs Forecast – Linear Water Infrastructure



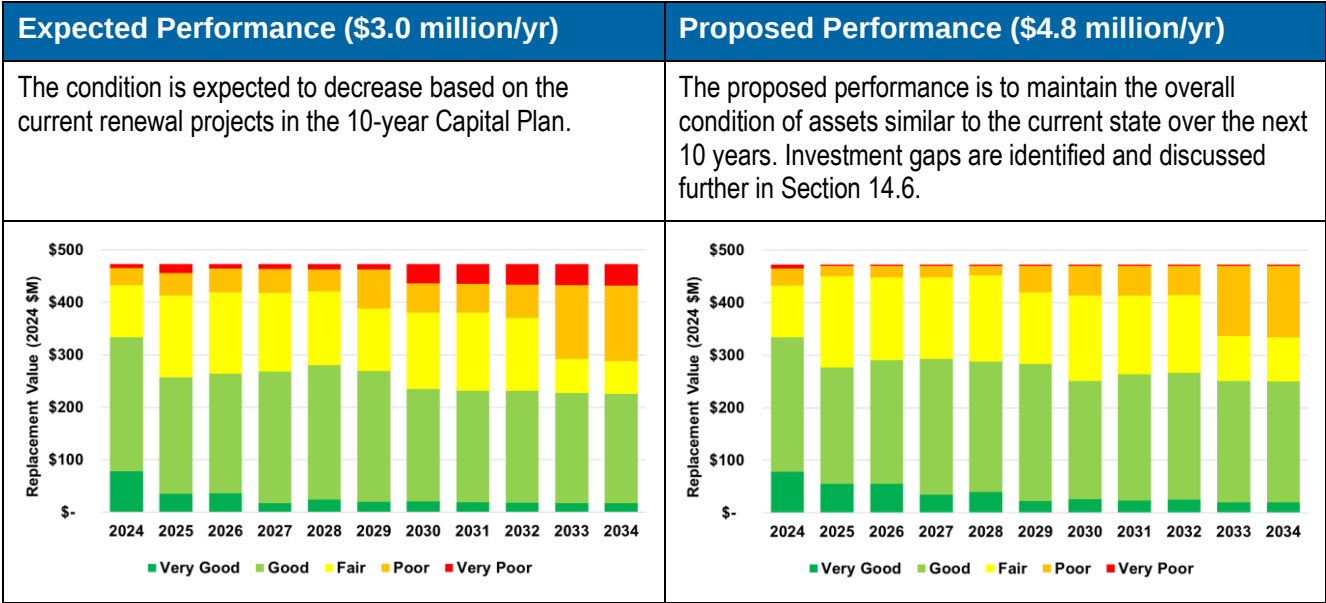
For vertical assets, the renewal needs for three facilities (WPS 11 Heritage Park, WPS 14 Heritage Park, and BPS 01 Codrington Booster Pumping Station) and various process tanks for the SWTP are based on detailed condition assessments. Other structural related needs are based on projects already identified through the City's Capital Plan as well as City staff recommendations informed by field-based observations. Other assets (mechanical, electrical, piping, and instrumentation and controls) are forecasted for renewal based on the estimated service lives in Table 14-4. Membranes have a 15-year service life but are covered under the Operating Budget through an annualized contribution.

Table 14-4: Estimated Service Life – Vertical Water Infrastructure

Water Facility Asset	Estimated Service Life (Years)
Building Architectural	25
Building Mechanical & Electrical	30
Process Electrical	30
Process Mechanical	30
Process Piping	60
Instrumentation & Controls	15

For vertical water infrastructure, the proposed performance is to maintain the current condition of assets over the next 10 years, as shown in Figure 14-8. The average annual renewal need is estimated at \$ 4.8 million per year. The expected performance based on the renewal investment currently available in the 10-year Capital Plan is lower than the proposed service level.

Figure 14-8 Renewal Needs Forecast – Vertical Water Infrastructure



14.5.2 Growth Forecast

The City is updating the 2019 Water Supply Master Plan and the Water Storage and Distribution Master Plan to accommodate the planned population growth through to 2051. Recommendations from the updated Water Master Plan are to be considered in future updates to this AM Plan. The Water Master Plan will:

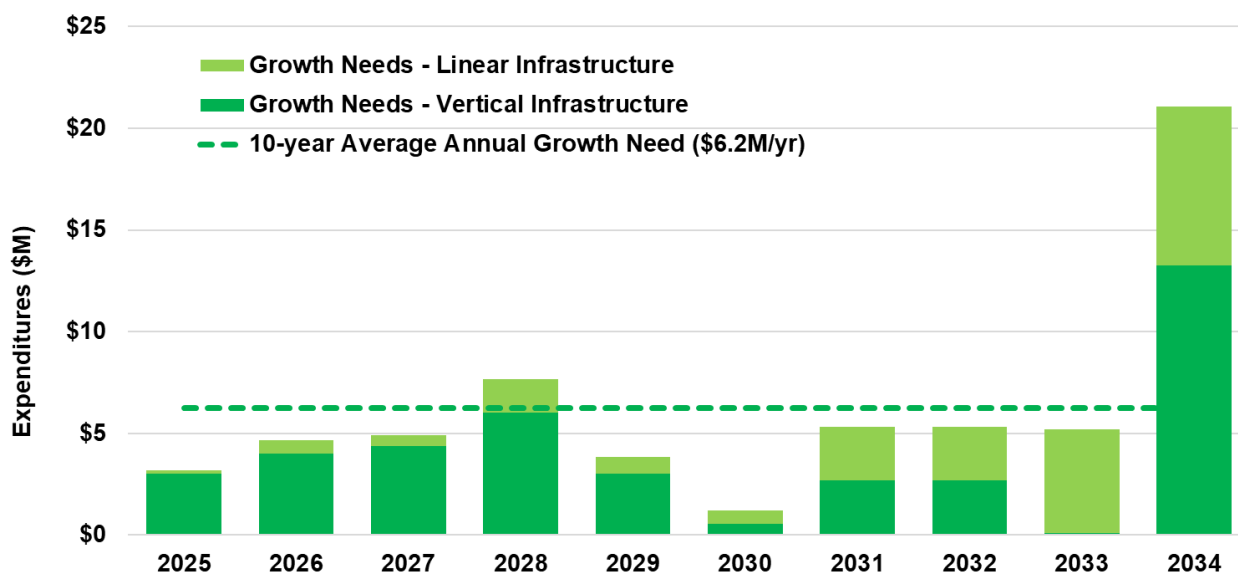
- Identify capacity constraints and opportunities for improvement for water storage distribution, and supply
- Ensure water services meet the current and future community needs by providing long-term and integrated water servicing strategies
- Recommend future infrastructure projects that will provide the required water service

Figure 14-9 summarizes the currently identified growth needs over the next 10 years for Water services. Growth projects currently include:

- A new Salem Road Reservoir and Pumping Station
- New watermains to be constructed in the Salem and Hewitt development areas
- A new Pressure Zone 3N Booster Pump Station to provide supply redundancy and system reinforcement in the event of a pumping station or discharge watermain failure
- Upsizing specific watermains within the former City boundary

Some of the assets will also be constructed in part by developers and eventually be transferred to the City. The average annual growth need for water infrastructure is estimated at \$6.2 million per year over the next 10 years.

Figure 14-9 Growth Needs Forecast – Water



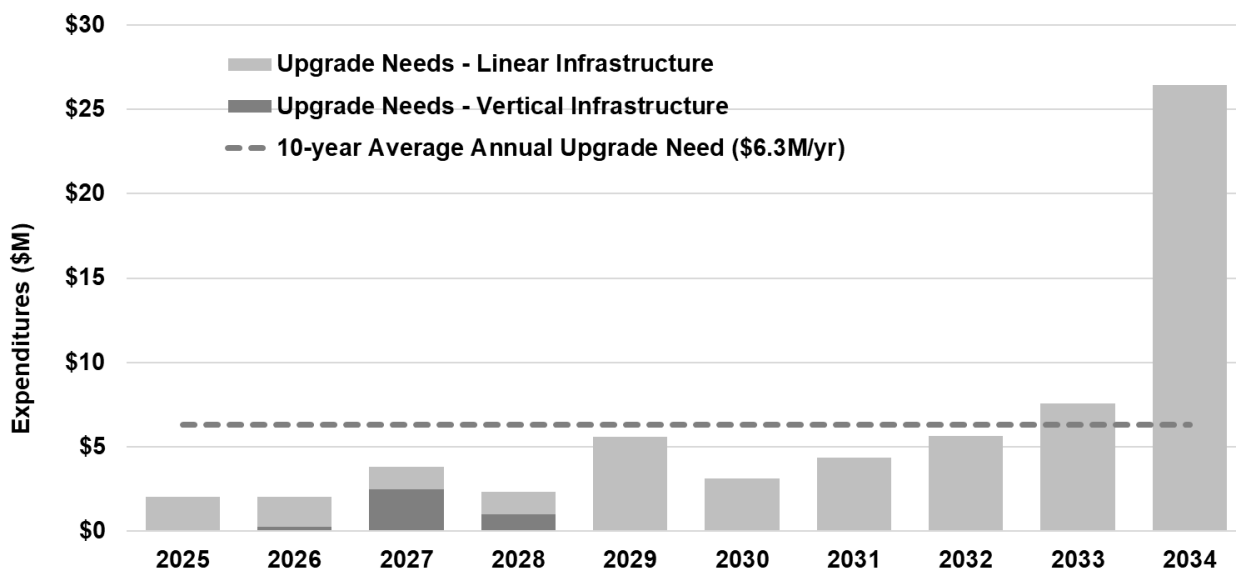
14.5.3 Upgrade Forecast

Figure 14-10 summarizes the currently identified upgrade needs over the next 10 years for Water. These projects are generally categorized as ‘additional capability/capacity’ in the City’s Capital Plan and may also consist of renewal or growth initiatives. Upgrade projects currently include:

- Watermain replacements to improve water conveyance capacity
- New watermains to provide security of supply to and from water storage facilities to downtown Barrie
- New transmission watermains which will provide connectivity between pressure zones
- Design and reinstallation of a third pump at the Codrington Booster Pumping Station
- Parking lot expansion at the Surface Water Treatment Facility

As indicated in Section 14.3, the City strives to reduce its energy consumption, and the associated costs and greenhouse gas emissions. The City expects its GHG emissions to decrease over the next 10 years but there is still an investment gap to achieve Net Zero targets. Other investment gaps that have not yet been quantified include standby power installations at booster pumping stations and water towers, and installation of additional fencing and security cameras. The average annual upgrade needs for water infrastructure are currently estimated at \$6.3 million per year over the next 10 years.

Figure 14-10 Upgrade Needs Forecast – Water



14.5.4 Operations and Maintenance Forecast

Operations and maintenance work is critical for ensuring the continued reliability of water assets and meeting the proposed service levels, including minimizing watermain breaks and water loss in the system, completing fire hydrant inspections, and ensuring no boil water advisories.

Figure 14-11 shows the Operations and Maintenance needs over the next 10 years for water. The increase in costs beyond 2025 in operations and maintenance activities is impacted by the estimated growth in the asset portfolio. To meet proposed service levels over the next 10 years, the Operating Budget is estimated to need to increase at an average annual rate of 2.8%. The Operations and Maintenance forecast below is determined by extrapolating the three-year trend in O&M provided by the City (2025-2028) and adding considerations for growth in the asset portfolio for capital projects and development.

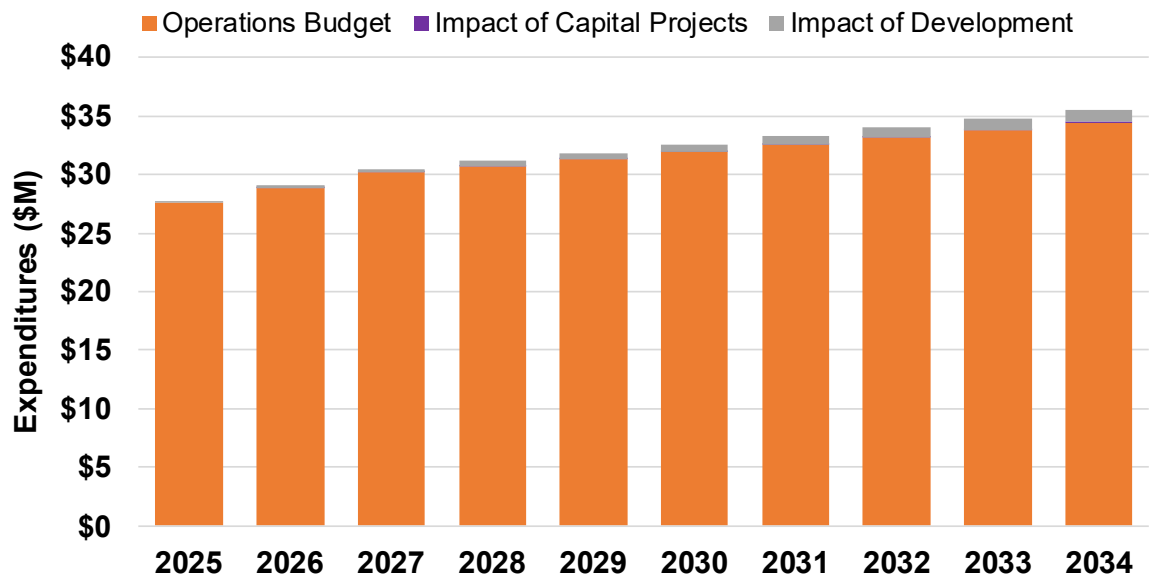
Operations and maintenance activities on linear assets include:

- Inspections, swabbing, flushing of mains
- Valve turning
- Pressure reducing valve inspections
- Valve chamber repairs

Operations and maintenance activities on vertical assets include:

- Grease and changing oil in motors annually
- Removing, servicing and install pumps and motors every 10 years for booster pumping stations and every 5 years for wells
- Measuring station voltage annually
- Generator maintenance every 6 months and load testing every 2 years
- Cleaning and lining inspections of water storage tanks on a one to three-year cycle, depending on the facility
- Reactive repairs on architectural and building envelope
- Grass cutting and snow clearing around facilities

Figure 14-11 Operations and Maintenance Needs Forecast – Water



14.6 Financing Strategy

The financial analysis considers the affordability of the proposed service levels based on the funding available in the 10-year Capital Plan compared to the forecasted needs.

The funding available for renewal of water infrastructure is estimated to be an average of \$13.0 million per year over the next 10 years based on the City's Capital Plan. As discussed in Section 14.5.1, the estimated average annual renewal need is \$10.0 million per year and \$4.8 million per year for linear and vertical water infrastructure, respectively, totaling \$14.8 million per year to meet proposed service levels. This results in an investment gap of \$1.8 million per year, assuming that the City's 10-Year Capital Plan is funded as currently planned, and that the City has the resources to carry out the projects as currently planned. Investment gaps will be further explored and addressed through the City's review of capital reserves and the annual contributions made to the reserves to further refine the investment gap and assess the true financial sustainability to meet proposed service levels over the next 10 years.

To manage the risk of the potential \$1.8 million per year renewal investment gap, the City will work towards improving the accuracy of the forecast by completing additional condition assessments for higher risk vertical infrastructure and developing and programming the required projects into the 10-year Capital Plan. Available funding will continue to be prioritized on critical infrastructure to maintain service delivery.

Figure 14-12: Capital Renewal Needs versus Funding – Water

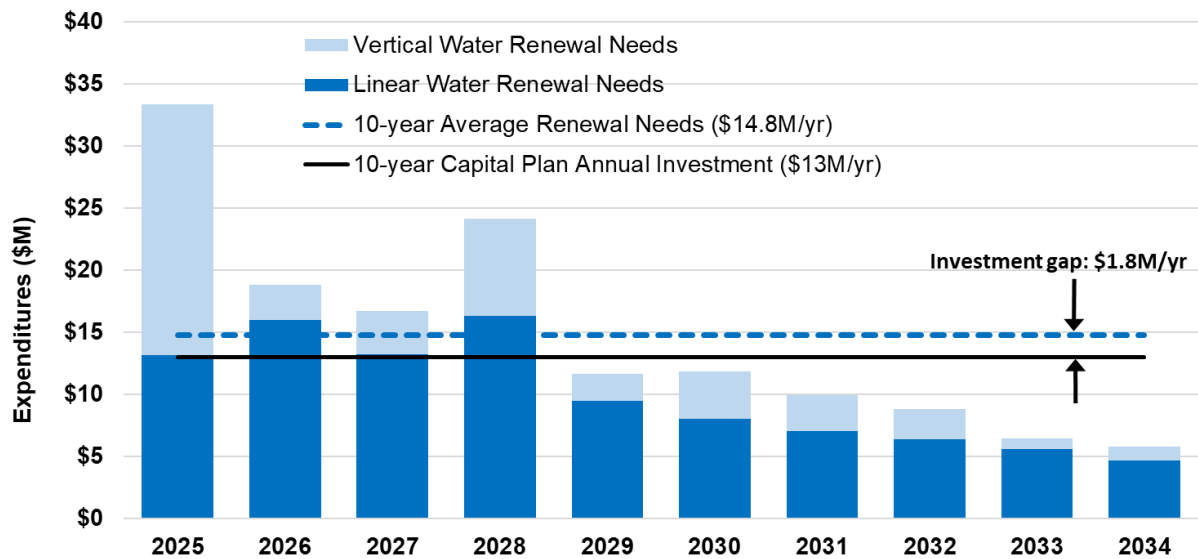


Table 14-5 summarizes the financial sustainability and affordability for growth, renewal and upgrade, and O&M activities. For upgrades, additional needs related to GHG emission reduction, installation of standby power, additional fencing, and security cameras represent a potential investment gap as needed costs are to be quantified through on-going City planning. In terms of operations and maintenance, the Operating Budget is estimated to need to increase at an average annual rate of 2.8% to meet proposed service levels over the next 10 years.

Table 14-5: 10-Year Financial Sustainability of Proposed Service Levels

Asset Lifecycle	Average Annual Forecast Needs	10-Year Capital Plan Average Annual Investment	Average Annual Investment gap	Potential Impacts
Capital Growth	\$6.2 M/yr	\$6.2 M/yr	No gap	Water Master Plan update may recommend additional projects and updated service levels
Capital Upgrade	\$6.3 M/yr	\$6.3 M/yr	Potential gap	Risks to the security of water service delivery due to lack to backup power and security at pumping stations and towers
Capital Renewal	\$14.8 M/yr	\$13.0 M/yr	\$1.8M/yr	Deterioration in condition of vertical infrastructure as shown in Figure 14-8, increasing risks related to water treatment and distribution
Operations and Maintenance	\$27.6 M in 2025 to \$35.6 M in 2034; 2.8% average annual increase	\$7.8 M in 2023	2.8% average annual increase	Failure to increase resources to operate and maintain new assets will result in reduced service levels and increased risks such as watermain breaks, increases in water loss throughout the system

14.7 Recommendations for Continuous Improvement

Development of AM Plans is an iterative process that includes improving data, processes, systems, staff skills, and organizational culture over time. Continuous improvement recommendations include:

Table 14-6: AM Plan Improvement Recommendations – Water

AM Plan Section	Improvement Recommendation
State of Infrastructure	- Develop more detailed inventories at lower level in asset hierarchy for vertical assets, including incorporation of inventories completed through pump station assessments - Improve accuracy of valuation of vertical assets. Consider overlap of site assets with park assets - Continue to complete condition assessments for critical vertical infrastructure
Levels of Service	Review and adjust service levels based on recommendations from Water Master Plan update
Risk Management	Verify required renewal work on higher risk assets and perform additional investigation as required

AM Plan Section	Improvement Recommendation
Lifecycle Management	• Develop projects and costs associated with net zero pathway for GHG emission reduction • Develop projects and costs for standby power and fencing/cameras at water booster pumping stations and water towers • Develop more complete and robust renewal project needs for vertical infrastructure based on formal condition assessments • Consider recommendations from Master Plan update
Financial Management	• Account for growth-related impacts in the operating budget as new assets are added to the system • Review available funding available through analysis of reserves and contributions to determine true affordability and investment gaps associated with proposed service levels

15 WASTEWATER

15.1 Overview

The City's Wastewater assets are critical for ensuring the efficient and safe collection, and treatment of wastewater. This includes the maintenance, upgrading, and management of infrastructure such as sewer lines, treatment plants, and pumping stations. The AM Plan focuses on sustainability, cost-effectiveness, and regulatory compliance, ensuring that the wastewater system meets the current and future needs of the community.

Key Findings

- **Sanitary sewers are generally in good condition with 90.3% in fair or better condition.** The City's sewer rehabilitation and maintenance programs support reliable service delivery and reduces sewer backups as well as costly infiltration of stormwater.
- **There is an investment gap associated with the renewal of vertical assets.** Condition assessments have been completed for a number of facilities and a capital renewal program is being developed to close this gap. The City must continue to evaluate and prioritize the remaining renewal needs.
- **The City is upgrading and expanding the Wastewater Treatment Facility** to meet Provincial regulations for phosphorus reduction, accommodate population growth, and improve aging components.

15.2 State of Infrastructure

Assets that support Wastewater infrastructure include Sewer Mains, Laterals and Maintenance Holes, along with vertical infrastructure such as the Wastewater Treatment Facility, Biosolids Storage Facility and Pumping Stations. Table 15-1 shows the inventory of the City's Wastewater infrastructure with a replacement value of approximately \$2,956 million and includes a breakdown of the inventory by asset category and asset class. The largest portion of the asset portfolio is the Wastewater Treatment Facility, which accounts for approximately 83% of vertical assets and 29% of all Wastewater infrastructure by replacement value.

Table 15-1 Inventory Summary – Wastewater Infrastructure

Asset Category	Asset Class	Quantity	Replacement Value (2025\$M)
Wastewater Collection	Sewer Mains	Local: 458.3 km Trunk: 124.0 km Force Mains: 11.7 km	\$1,232.4
	Sewer Laterals	484.6 km	\$562.3
	Maintenance Holes	8,436	\$113.0
Wastewater Linear Total			\$1,907.7

Asset Category	Asset Class	Quantity	Replacement Value (2025\$M)
Wastewater Collection	Pumping Stations	13 pumping stations	\$51.0
Wastewater Treatment	Wastewater Treatment Facility	1 Wastewater Treatment Facility	\$868.3
Biosolids Storage	Biosolids Storage Facility	Biosolids Storage Facility	\$128.8
Wastewater Vertical Total			\$1,048.1
Total Replacement Value			\$2955.8

The City performs CCTV inspections on sewers to provide information on defect location, severity and density, as well as overall structural and O&M (operations & maintenance) ratings for each pipe segment. The City's CCTV inspections follow the National Association of Sewer Service Companies (NASSCO) Pipeline Assessment Certification Program (PACP). This CCTV inspection data is converted to a 5-point condition scale by the City. For sewers, maintenance holes, and laterals without CCTV data, condition is estimated based on material and age. The proportion of remaining life is converted to a City-wide 5-point condition scale as previously shown in Table 3-3.

The condition of the vertical infrastructure asset inventory is based on a mix of visual condition and age-based estimates. Over the past five years, the City has completed condition assessments on all pumping stations, except for the newer Holly Sewage Pumping Station constructed in 2017. The City has also completed condition assessments of structural process assets at the Wastewater Treatment Facility, including Primary Digester 2 and Secondary Tank 4, as well as roof, tank, and geomembrane lagoon liner inspections at the Biosolids Storage Facility. As additional assessments are completed and tied to the asset inventory, the accuracy of the condition profile will improve.

The condition distribution for the City's Wastewater assets is shown in Figure 15-1.

Overall, Wastewater assets are in average good condition, with approximately 88% of assets are in fair or better condition. 8.2% of assets are in very poor condition.

Assets with unknown condition represent only 0.9% of the overall inventory (not included in Figure 15-1), but the City will continue to perform additional condition assessments on vertical infrastructure to improve the accuracy of the condition profile and move away from age-based estimates.

Figure 15-1 Condition Distribution by Replacement Value (\$M) - Wastewater

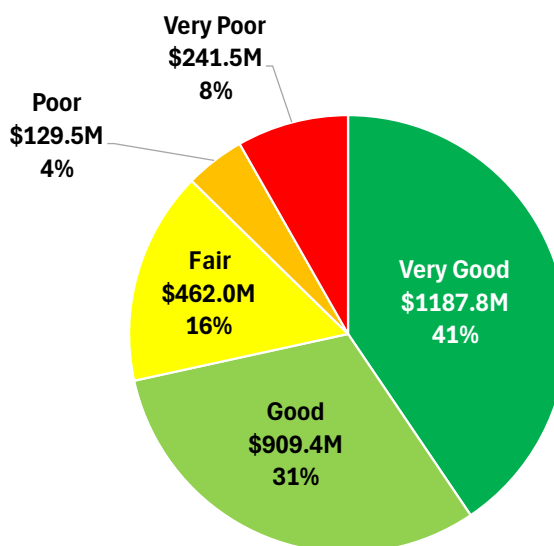


Figure 15-2 and Figure 15-3 show the condition distribution in more detail by asset class for linear and vertical assets, respectively. Sewers are generally in good condition. Laterals, maintenance holes, and the wastewater treatment facility have a relatively higher proportion of assets in poor or very poor condition due to the age-based estimates for those assets.

Figure 15-2 Condition Distribution by Replacement Value – Linear Wastewater (Percentage)

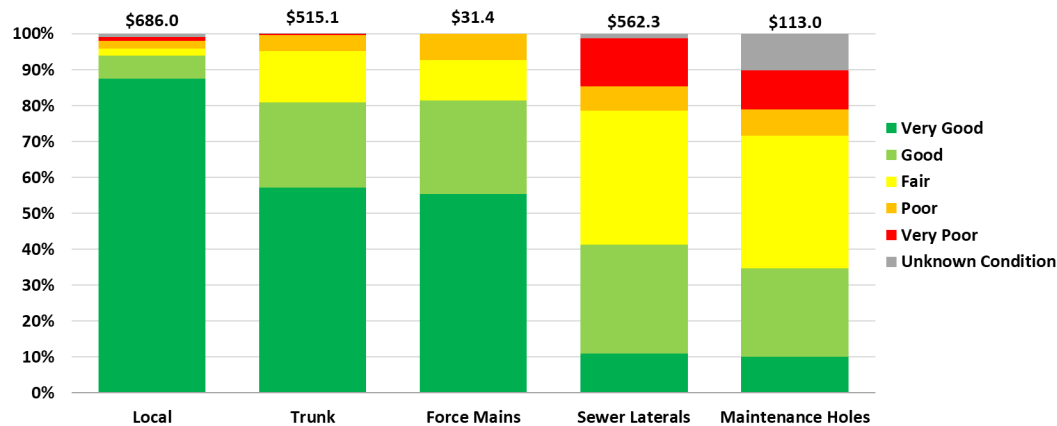
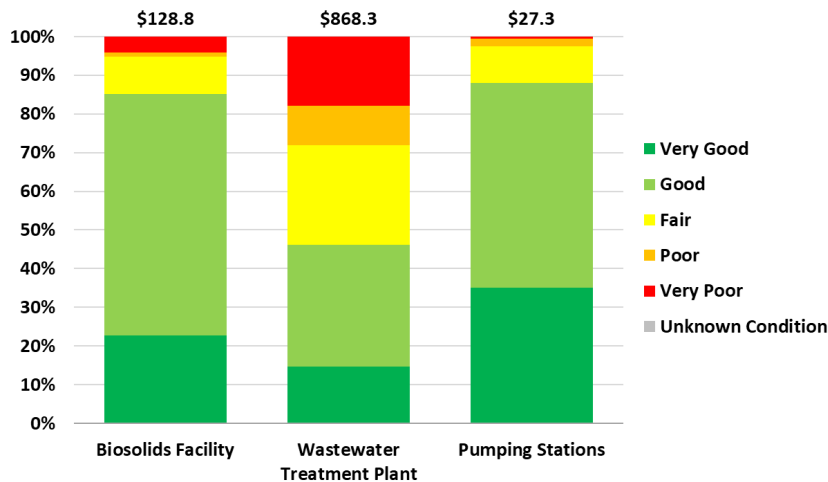


Figure 15-3 Condition Distribution by Replacement Value – Vertical Wastewater (Percentage)



The age distribution for the City’s linear and vertical Wastewater assets is shown in Figure 15-4 and Figure 15-5, respectively. These figures show the average age of assets relative to their average service lives weighted by replacement value and are categorized by asset class (or asset type).

Figure 15-4 Average Asset Age – Linear Wastewater Infrastructure

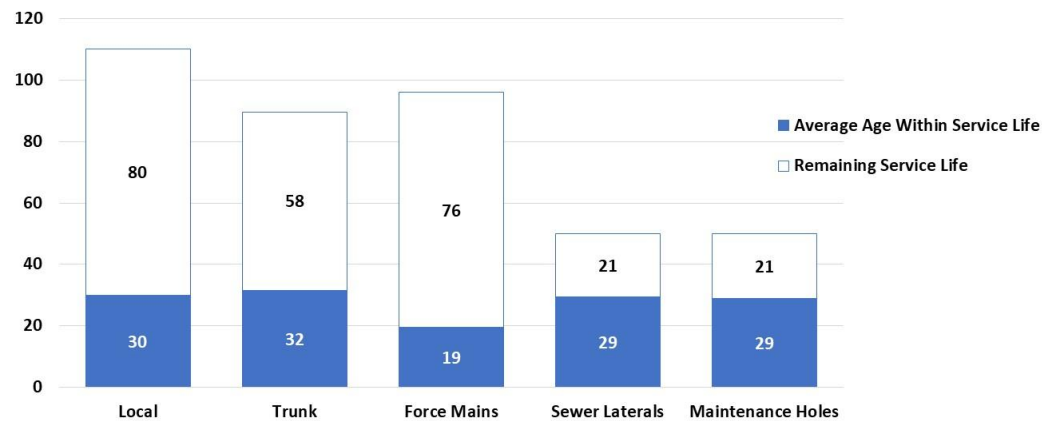
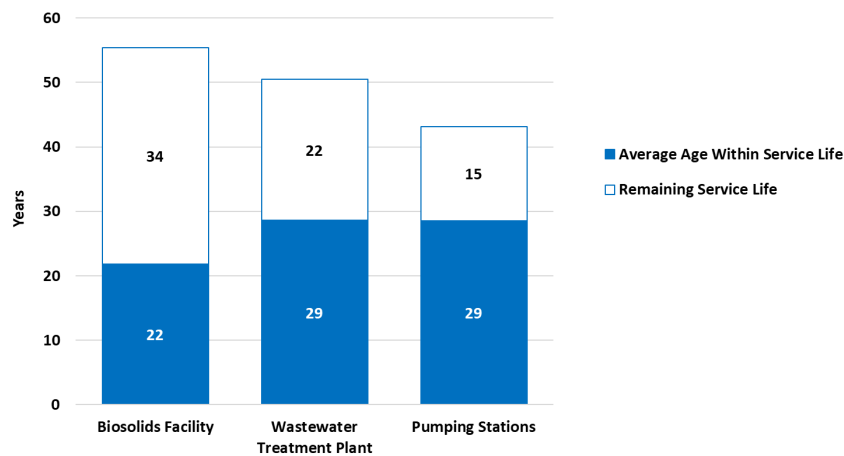


Figure 15-5 Average Asset Age – Vertical Wastewater Infrastructure



15.3 Levels of Service

The City’s goals for the wastewater asset portfolio include the long-term protection of drinking water sources, maintaining high water quality in Kempenfelt Bay and the various watercourses within Barrie, and providing clean, safe, and environmentally efficient methods of sanitary sewage treatment and collection for industrial, commercial, institutional and residential customers.

Table 15-2 provides the LOS Framework for the City’s Wastewater assets. This table includes the current performance (as of the end of 2024), any aspirational targets set out by the City and proposed performance over the next 10 years. Proposed performance is determined based on what is appropriate for the City in consideration of the City’s current 10-year planned funding provision in the Capital Plan as well as risks associated with various performance levels, discussed further in Sections 15.6. Measures specified in O. Reg.588/17 related to combined sewers are not included as the City does not have any combined sewer systems.

Table 15-2 LOS Framework - Wastewater

Community LOS	Technical LOS			
	Metric(s)	Current LOS	Target LOS	Proposed LOS
Capacity and Use: Provide adequate water supply				
Description of the user groups or areas of the municipality that are connected to the municipal wastewater system: The City provides wastewater services to 99.2% of its properties and plans for future connections to new development.	Percentage of properties connected to the wastewater system. (O. Reg. 588/17).	99.2%	100%	 Maintain current service level (>99.2%)
	Number of properties with no municipal servicing	213	0	 ~55
Function: Treat wastewater to the required quality limits				
Description of the effluent that is discharged from sewage treatment plants in the municipal wastewater system: The effluent discharged from the WWTF is the treated sewage from ICI and residential users that flows into Lake Simcoe. The effluent from the Barrie WWTF has compliance limits and objectives outlined in its ECA (No. 0284-B2ML52) that it must meet. Appendix A summarize the WWTF's 2019 performance against these objectives and limits.	The number of effluent violations per year due to wastewater discharge compared to the total number of properties connected to the municipal wastewater system. (O. Reg. 588/17).	0	0	 0
	No. of annual ECA effluent concentration limit exceedances	0	0	 0
	No. of annual ECA effluent concentration objective exceedances	13	0	 <5

Community LOS	Technical LOS			
	Metric(s)	Current LOS	Target LOS	Proposed LOS
	No. of annual ECA effluent loading limit exceedances	0	0	 0
Function - Reduce energy consumption and associated costs				
The City strives to reduce its energy consumption, and the associated costs and greenhouse gas emissions. Energy management initiatives focus on communication, training and engagement activities to increase energy consumption awareness among staff and encourage behaviours that conserve energy.	Wastewater energy consumption per Megalitre (ekWh/ML)	0.4960 ekWh/ML (2023)	1.1499* ekWh/ML (Net Zero Pathway target for 2034)	 1.1499* ekWh/ML Expected: 1.2008* (Business as Usual pathway for 2034)
Quality and Reliability: Minimize wastewater overflows and backups				
Description of how stormwater can get into sanitary sewers in the municipal wastewater system, causing sewage to overflow into streets or backup into homes: Infiltration and inflow into sanitary sewers during storm events may enter from a variety of sources such as cracks in the sanitary sewers and	The number of connection-days per year (that the properties connected to a municipal system are affected by a service issue) due to wastewater backups compared to the total number of properties connected to the municipal wastewater system. (O. Reg. 588/17).	0.2 connection days (2 backups in 2023 which took approx. 2 hours each to clear)	0	 0

Community LOS	Technical LOS			
	Metric(s)	Current LOS	Target LOS	Proposed LOS
downspout/sump pump connections to the system. Description of how sanitary sewers in the municipal wastewater system are designed to be resilient to avoid backups and overflow events: To mitigate sewage overflow or backup events into streets or homes, the City of Barrie has designed the sanitary sewers to accommodate flows so that infiltration is accounted for, and these events are minimized.	Inflow and infiltration prevalence in the collection system (% of unaccounted water when comparing treated water divided by produced water)	28.2%	Objective is to decrease over time	 Objective is to decrease over time
	Percentage of the City's wastewater collection system with elevated risk of sewer backups during the 1-25-year weather event conditions	1.6%	Objective is to decrease over time	 1.2%
Quality and Reliability: Maintain wastewater assets in a state of good repair				
Wastewater assets are maintained in a state of good repair to provide reliable services to the community	Percentage of linear assets where the condition is rated as fair to very good (by current replacement value)	90.3%	N/A	 >84%
	Percentage of vertical assets where the condition is rated as fair to very good (by current replacement value)	82.0%	N/A	 >82%
	% of City Local sewer length inspected annually	13.8%	10.0%	 10.0%
	% of Trunk sewers inspected and cleaned	9.6% (12 km)	10%	 5%

*Increase for wastewater energy consumption is related to the effluent quality upgrades will increase the energy consumption at the Wastewater Treatment Facility

15.4 Risk Management Strategy

The most critical linear wastewater assets are trunk sewers greater than 1500 mm adjacent to or crossing highway, watercourse, and environmentally sensitive areas. Force mains that are not twinned at pumping stations have a high impact on failure as there is no force main redundancy and are therefore rated a CoF of 4. The most critical vertical assets are the process structural (e.g. process tanks) and building structural assets for the Wastewater Treatment Facility, followed by process structural and building structural assets for larger pump stations with flows above 50 litres per second.

- Process structural, process mechanical equipment, and instrumentation and control equipment at the WWTF
- Process Mechanical components at Grove Street SPS, Minets Point SPS, Little Lake SPS, Tyndale SPS, and the Wastewater Treatment Facility

Risk exposure in year 2025 \$, millions						
Probability of Failure	Almost Certain	\$74.7	\$4.4	\$30.8	\$3.0	\$128.5
	Very Likely	\$37.8	\$0.3	\$31.7	\$24.5	\$35.2
	Moderate or Likely	\$208.2	\$7.3	\$82.3	\$71.5	\$92.8
	Occasional or Possible	\$168.8	\$2.5	\$119.4	\$206.4	\$412.3
	Very Rare	\$61.4	\$5.6	\$744.6	\$213.5	\$162.7
		Insignificant	Minor	Moderate	Major	Catastrophic
		Consequence of Failure				

In addition to asset condition reliability risks, the City mitigates capacity and other reliability related risks related to wastewater treatment and collection by completing Wastewater Master Plans that complete the following:

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- Assess the risk of various options to meet service levels that considers the options of how to best achieve the stated service levels.
- Planning for the additional infrastructure that will be assumed by the City through development

15.5 Lifecycle Management Strategy

The City balances asset needs across renewal, growth, upgrade, and operations & maintenance activities to ensure that the Wastewater system remains safe and reliable while also addressing increasing demands due to population growth. The costs for these activities are discussed in the following subsections.

15.5.1 Renewal Forecast

The renewal forecast for linear assets considers the current condition or age of each asset and estimates the planned replacement year based on the currently planned projects in the Capital Plan. Deterioration of assets over the next 10 years is forecasted based on the estimated service lives summarized in Table 15-3 and Table 15-4.

Summary of Recommended 10-Year Renewal Strategy:

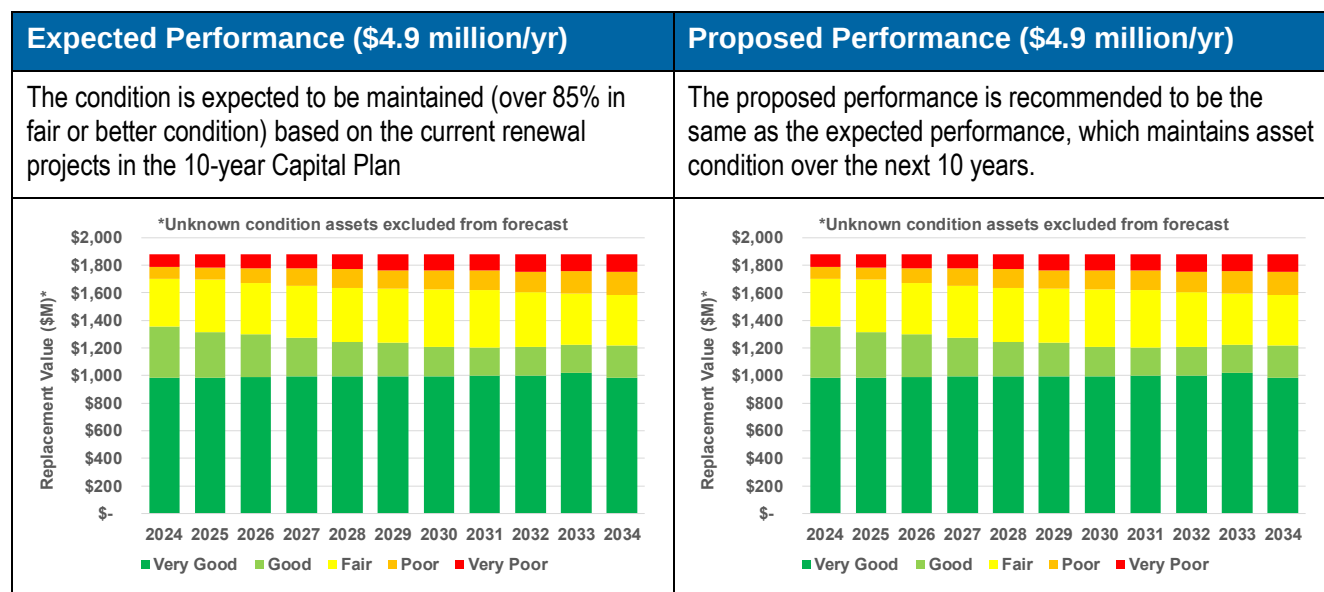
- Maintains current condition over next 10 years for both linear and vertical infrastructure
- Renewal of linear assets is based on the current 10-year Capital Plan projects
- Renewal of vertical assets is forecasted based on a mix of:
 - Condition assessment recommendations
 - Capital Plan projects
 - City staff observations
 - Where the above information is not available, replacement at the estimated service life

Table 15-3: Estimated Service Life – Linear Wastewater Assets

Asset	Estimated Service Life (Years)
Mains	120 (PVC) 100 (Vitrified Clay) 80 (Remaining Assets)
Sewer Laterals	50
Maintenance Holes	50

For linear wastewater infrastructure, the proposed performance is to maintain the current condition of assets over the next 10 years, as shown in Figure 15-7. The average annual renewal need is estimated at \$4.9 million per year.

Figure 15-7 Renewal Needs Forecast – Linear Wastewater Infrastructure



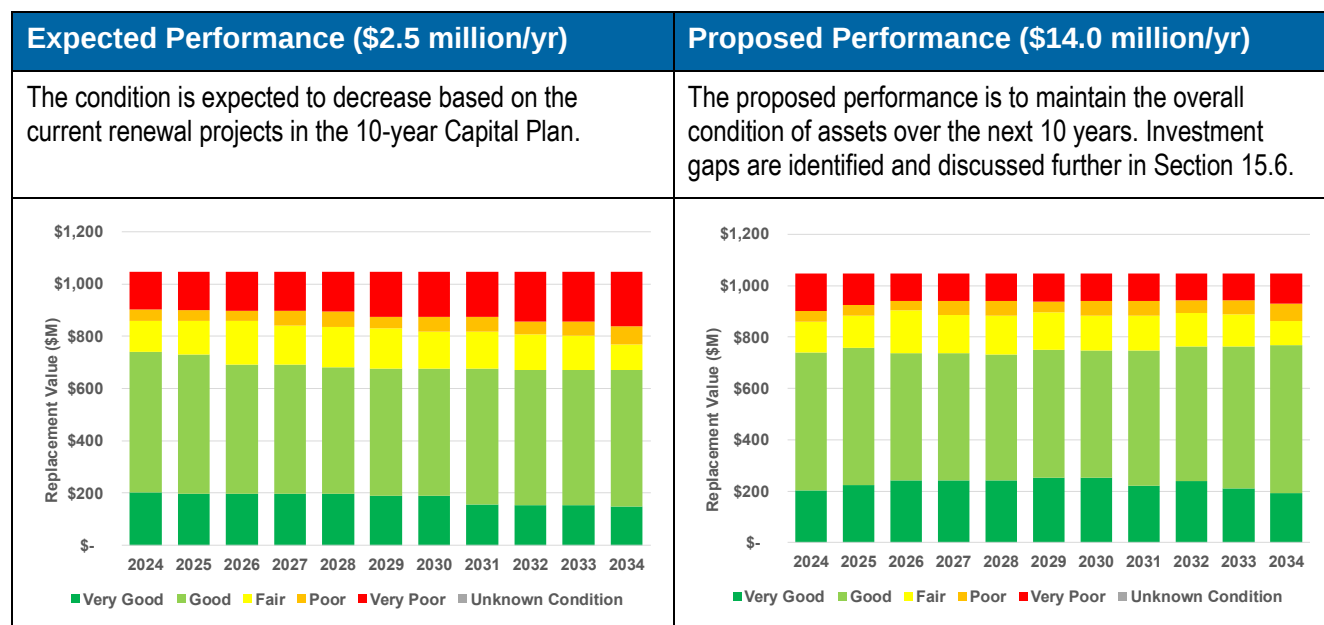
For vertical assets, the renewal needs for various components at the Biosolids Storage Facility (Lagoons, Roof, Tanks), the Wastewater Treatment Facility (Primary Digester 2 and Secondary Tank 4) and all pumping stations are based on detailed condition assessments. Other structural related needs are based on projects already identified through the City's Capital Plan as well as City staff recommendations informed by field-based observations. Other assets (such as mechanical, electrical, piping, and instrumentation and controls) are forecasted for renewal based on the estimated service lives in Table 15-4.

Table 15-4: Estimated Service Life – Vertical Wastewater Infrastructure

Wastewater Facility Asset	Estimated Service Life (Years)
Building Architectural	25
Building Electrical	30
Building Services	25
Instrumentation & Controls	15
Process Electrical	30
Process Mechanical	30
Process Piping	60
Site Works	25

For vertical wastewater infrastructure, the proposed performance is to maintain the current condition of assets over the next 10 years, as shown in Figure 15-8. The average annual renewal need is estimated at \$14.0 million per year. The expected performance based on the renewal investment currently available in the 10-year Capital Plan is lower than the proposed service level.

Figure 15-8 Renewal Needs Forecast – Vertical Wastewater Infrastructure



15.5.2 Growth Forecast

The City is updating the 2019 Wastewater Treatment Master Plan and the Wastewater Collection Master Plan to accommodate the planned population growth through to 2051. Recommendations from the updated Wastewater Master Plan are to be considered in future updates to this AM Plan. The Wastewater Master Plan will

- Assess the existing wastewater system to identify capacity constraints and opportunities for improvement.
- Ensure wastewater services meet the current and future community needs by providing long-term and integrated wastewater servicing strategies to 2051 and beyond; and
- Recommend future infrastructure projects that will provide the required wastewater service.

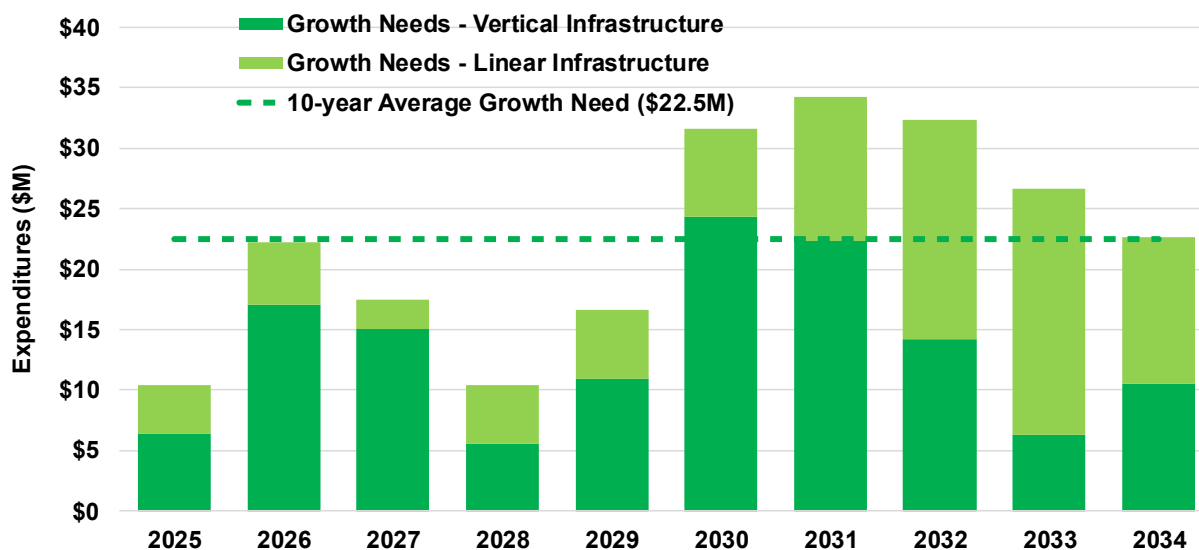
Figure 15-9 summarizes the currently identified growth needs over the next 10 years for Wastewater. Growth projects currently include:

- The WWTF Digester Capacity Expansion project expands the sludge digestion capacity at the Wastewater Treatment Facility by adding a fourth primary digester to meet biosolids processing needs and projected wastewater volumes by 2041.
- The Wastewater Peak Flow Attenuation Facility project involves constructing a facility to temporarily store and manage peak wastewater flows during storm events, protecting the treatment process from overload and ensuring compliance with environmental regulations.
- The WWTF Innovation Center project replaces the existing administration building with modernized lab, administration, and support spaces to accommodate wastewater plant capacity expansion and maintain compliance with operational and legislative requirements.

- The Mapleview Drive West Trunk Sanitary Sewer Expansion project provides a trunk sanitary sewer extension along Mapleview Drive West to support wastewater servicing needs for growth and development in the area.

Some assets will also be constructed in part by developers and eventually be transferred to the City. The average annual growth need for Wastewater assets is estimated at \$22.5 million per year over the next 10 years.

Figure 15-9 Growth Needs Forecast – Wastewater



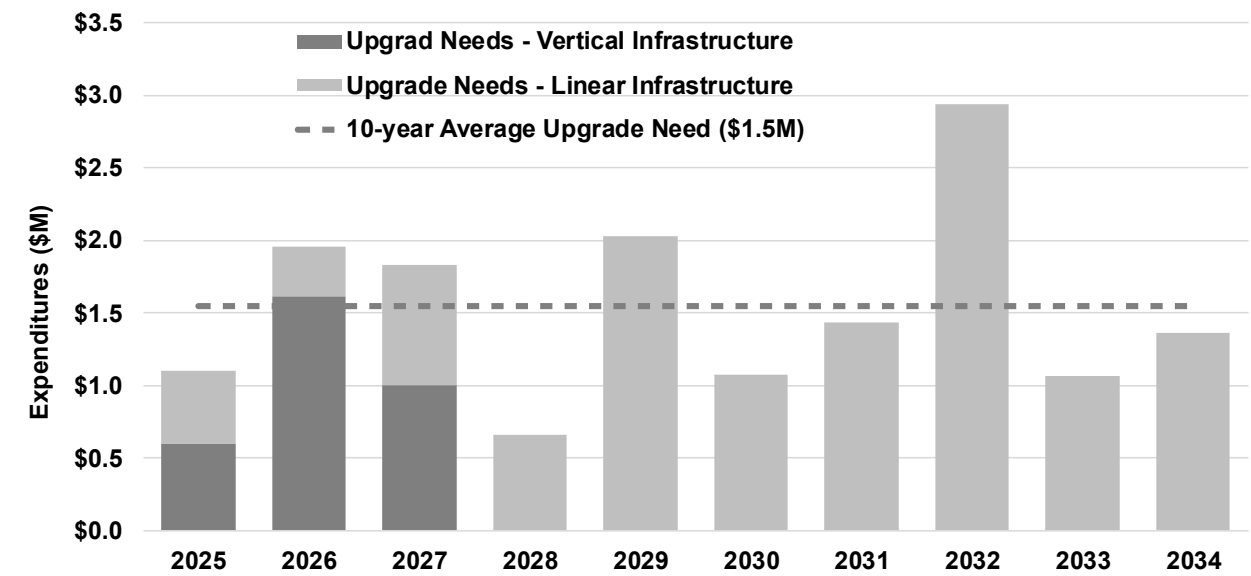
15.5.3 Upgrade Forecast

Figure 15-10 summarizes the currently identified upgrade needs over the next 10 years for Wastewater. These projects are generally categorized as ‘additional capability/capacity’ in the City’s Capital Plan and may also consist of renewal or growth initiatives. Upgrade projects currently include:

- The Foster, Merrett, Garson, MacLaren and Yeates New Sanitary and Watermain and Right-of-Way Replacement project provides new sanitary sewer servicing and watermain replacements to an area previously on aging septic systems, supporting a full right-of-way reconstruction to urban standards and ensuring equitable wastewater service delivery.
- The New Cogeneration and Biogas Treatment System project upgrades the Wastewater Treatment Facility's cogeneration and biogas system, including replacement of the existing flare to meet updated codes and reduce emissions, ensuring operational reliability and environmental compliance.
- The Salem Road and Lockhart Road Watermain and Sanitary project delivers essential watermain and sanitary sewer infrastructure along Salem and Lockhart Roads to support Phase 1 development in the Salem Secondary Plan area by enabling wastewater collection and conveyance through newly urbanized corridors.

The average annual upgrade needs for Wastewater are currently estimated at \$1.5 million per year over the next 10 years.

Figure 15-10 Upgrade Needs Forecast – Wastewater



15.5.4 Operations and Maintenance Forecast

Operations and maintenance work is critical for ensuring the continued reliability of Wastewater assets and meeting the proposed service levels.

Figure 15-11 shows the Operations and Maintenance needs over the next 10 years for Wastewater. The increase in costs beyond 2025 in operations and maintenance activities is impacted by the estimated growth in the asset portfolio. To meet proposed service levels over the next 10 years, the Operating Budget is estimated to need to increase at an average annual rate of 4.7% due to the wastewater treatment plant upgrades. The Operations and Maintenance forecast below is determined by extrapolating the three-year trend in O&M provided by the City (2025-2028) and adding considerations for growth in the asset portfolio for capital projects and development.

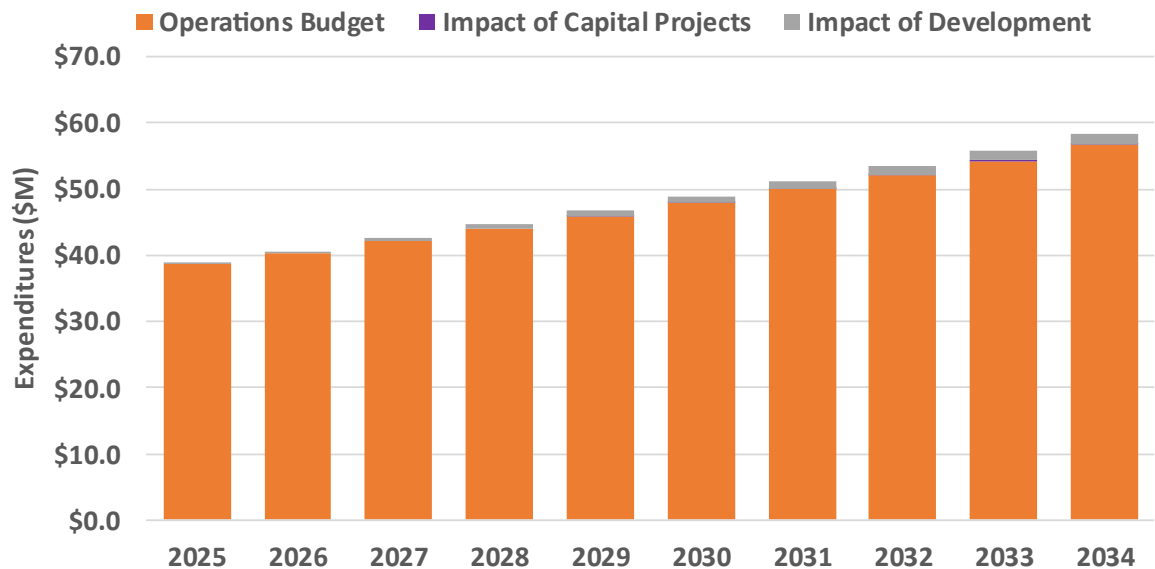
Operations and maintenance activities on linear assets include:

- CCTV inspections
- Inspection of maintenance holes

Operations and maintenance activities on vertical assets include:

- Grease and changing oil in motors annually
- Measuring station voltage annually
- Generator maintenance every 6 months and load testing every 2 years
- Reactive repairs on architectural and building envelope
- Grass cutting and snow clearing around facilities

Figure 15-11 Operations and Maintenance Needs Forecast – Wastewater



15.6 Financing Strategy

The financial analysis considers the affordability of the proposed service levels based on the funding available in the 10-year Capital Plan compared to the forecasted needs.

The funding available for renewal of wastewater infrastructure is estimated to be an average of \$7.4 million per year over the next 10 years based on the City’s Capital Plan. As discussed in Section 15.5.1, the estimated average annual renewal need is \$4.9 million per year and \$14.0 million per year for linear and vertical wastewater infrastructure, respectively, totaling approximately \$18.9 million per year to meet proposed service levels. This results in an investment gap of \$11.5 million per year, assuming that the City’s 10-Year Capital Plan is funded as currently planned, and that the City has the resources to carry out the projects as currently planned.

Investment gaps will be further explored and addressed through the City’s review of capital reserves and the annual contributions made to the reserves to further refine the investment gap and assess the true financial sustainability to meet proposed service levels over the next 10 years.

To manage the risk of the potential \$11.5 million per year renewal investment gap, the City will work towards improving the accuracy of the forecast by completing additional condition assessments for higher risk vertical infrastructure and developing and programming the required projects into the 10-year Capital Plan. Available funding will continue to be prioritized on critical infrastructure to maintain service delivery.

Figure 15-12: Capital Renewal Needs versus Funding – Wastewater

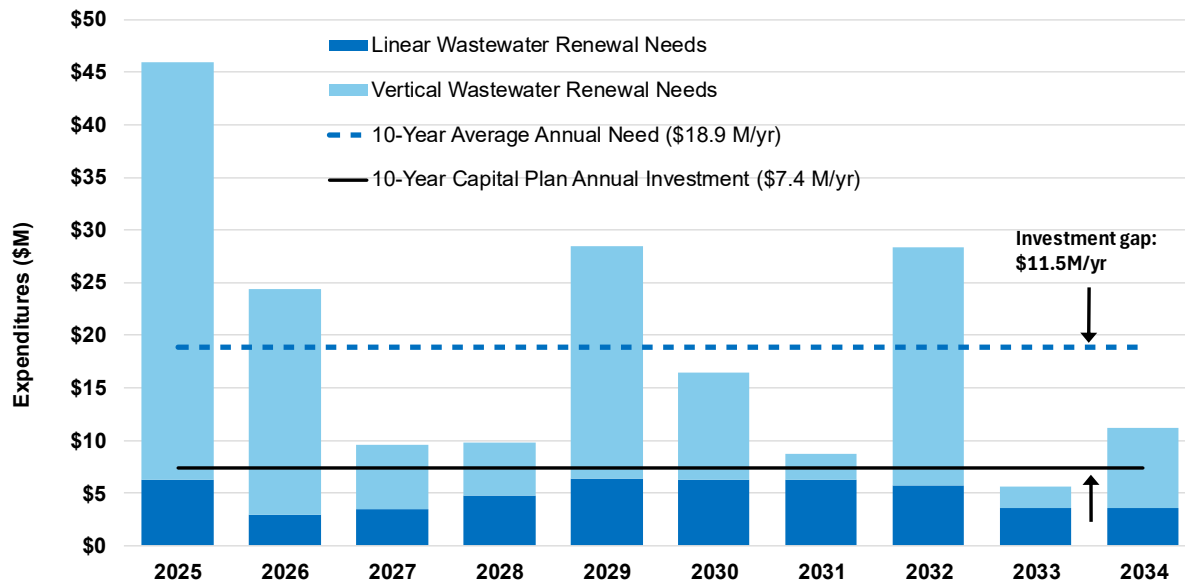


Table 15-5 summarizes the financial sustainability and affordability for growth, renewal and upgrade, and O&M activities.

Table 15-5: 10-Year Financial Sustainability of Proposed Service Levels

Asset Lifecycle	Average Annual Forecast Needs	10-Year Capital Plan Average Annual Investment	Average Annual Investment Gap	Potential Impacts
Capital Growth	\$22.5 M/yr	\$22.5 M/yr	No gap	Wastewater Master Plan update may recommend additional projects and updated service levels
Capital Upgrade	\$0.9 M/yr	\$0.9 M/yr	No gap	Wastewater Master Plan update may recommend additional projects and updated service levels
Capital Renewal	\$18.9 M/yr	\$7.4 M/yr	\$11.5M/yr	Possible deterioration in condition of vertical infrastructure as shown in Figure 15-8. However, any investment gaps will be further explored through the City's ongoing reserve planning process.
Operations and Maintenance	\$38.8 M in 2025 to \$58.4 M in 2034	\$38.8 M in 2025	4.7% average annual increase	Failure to increase resources to operate and maintain new assets will result in reduced service levels and increased risks such as sewer backups and increased inflow and infiltration

15.7 Recommendations for Continuous Improvement

Development of AM Plans is an iterative process that includes improving data, processes, systems, staff skills, and organizational culture over time. Continuous improvement recommendations include:

Table 15-6: AM Plan Improvement Recommendations – Wastewater

AM Plan Section	Improvement Recommendation
State of Infrastructure	• Improve condition data for laterals and maintenance holes, which are currently based on age, to better reflect actual conditions • Continue condition assessments for the wastewater treatment plant to improve understanding of asset condition • Develop a more detailed breakdown of vertical assets at the wastewater treatment facility to improve granularity of risk assessment
Levels of Service	• Review and adjust service levels based on recommendations from Wastewater Master Plan update • Continue to develop a more robust tracking system for inflow and infiltration in the collection system
Risk Management	• Verify required renewal work on higher risk assets and perform additional investigation as required
Lifecycle Management	• Develop projects and costs associated with net zero pathway for GHG emission reduction • Develop more complete and robust renewal project needs for vertical infrastructure based on formal condition assessments • Consider recommendations from Master Plan update
Financial Management	• Account for growth-related impacts in the operating budget as new assets are added to the system • Review available funding available through analysis of reserves and contributions to determine true affordability and investment gaps associated with proposed service levels

16 FACILITIES

16.1 Overview

City facilities and associated site infrastructure are constructed, managed, and maintained by two departments. The City's recreation and culture facilities are operated and maintained by the Recreation & Culture department. Capital planning for these facilities is a joint function between staff in the Corporate Facilities and Recreation & Culture departments.

Capital projects related to these facilities are led by Corporate Facilities and supported by Recreation & Culture.

The City's other facilities are operated and maintained by the Corporate Facilities department or jointly operated and maintained by the Corporate Facilities department and other City departments or service partners such as Barrie Police and Barrie Public Library. In these cases, the Corporate Facilities department is responsible for the operation, maintenance, renewal, expansion, and upgrade of the facility structural components, building systems, site works, and utility services including main electrical services, distribution, emergency generators, and uninterruptible power supply systems; the department or service partner manages the process components, programming and service operations. Water and wastewater facilities also have a similar joint function with Corporate Facilities. Assets are ultimately funded from water and wastewater rates and therefore water and wastewater facilities are covered under Sections 16 (Water) and 17 (Wastewater).

Key Findings

- **The condition of facilities is proposed to improve over the next 10 years based on the 10-Year Capital Plan, but some unaddressed renewal needs remain.** Updated facility condition assessments are being implemented to support a cost-effective capital program that addresses the most critical needs.
- **Operating budgets are under pressure** due to increasing contract prices and rising utilities costs; this has resulted in less resources available for proactive maintenance and an increase in reactive repairs.
- **Planned new Recreation Facilities are essential to meet proposed service levels for the City's growing population.**

16.2 State of Infrastructure

Facilities include administrative offices, community centers, libraries, fire stations, and other public facilities. Table 16-1 shows the replacement value of approximately \$1.46 billion and includes a breakdown of the inventory by asset class. The value of each facility is based on unit costs per building area as shown in Table 16-1. Similar unit construction costs were generally applied to similar types of facilities, with some modifications based on building condition assessments. The largest portion of the asset portfolio are the Recreation & Culture Facilities which account for approximately 44% of all Facilities assets by replacement value.

Recreation & Culture includes chiller equipment for Will Dwyer Ice Rink. The rink itself is a basketball court and is captured in Section 12 (Parks). EV chargers and the City docks are managed by the City and are covered in Table 16-1. The process-related wastewater assets for

Minet's Point and Tyndale Washroom/Pumping Station facilities are included in Wastewater in Section 15. Leased facilities are not owned by the City and are not included in the inventory summary.

Table 16-1 Inventory Summary - Facilities

Asset Class	Quantity	Unit Cost	Replacement Value (2025\$M)
Recreation & Culture	13	Standard facility: \$862-\$964/sq.ft. Barrie Sports Complex: \$463 /sq.ft. Dorian Parker: \$300/sq.ft. Lampman Lane and Parkview Seniors Centre - \$600/sq.ft.	\$644.1
Corporate Facilities	9	Standard facility: \$913-\$1126/sq.ft. 56 Mulcaster: \$731/sq.ft. Collier St Parkade: \$457/sq.ft. Operations Centre: \$457/sq.ft.	\$430.4
Emergency Facilities	6	Fire: \$964/sq.ft. Police HQ: \$1116/sq.ft. Police Training: \$412/sq.ft.	\$216.9
Environmental Facilities	1	Landfill: \$558/sq.ft	\$25.4
Library Facilities	2	\$1015/sq.ft.	\$70.4
Parks Facilities	12	Standard facility: \$913/sq.ft. Sunnidale Park: \$20,000	\$17.6
Marina	3	Bayfield Dock Shipping Container: \$25,000 Other Marina Buildings: \$913/sq.ft. Marina Docks: \$1046/sq.ft.	\$4.4
Transit	2	Garage: \$348/sq.ft. plus 2 EV chargers (\$150k each) Terminal: \$913/sq.ft.	\$50.0
EV Chargers	70 ports	\$8713/port	\$0.6
Total			\$1,459.9

The condition for facilities is based on the Facility Condition Index, a condition grade evaluated for each facility (rather than by building component), and is calculated based on the following formula:

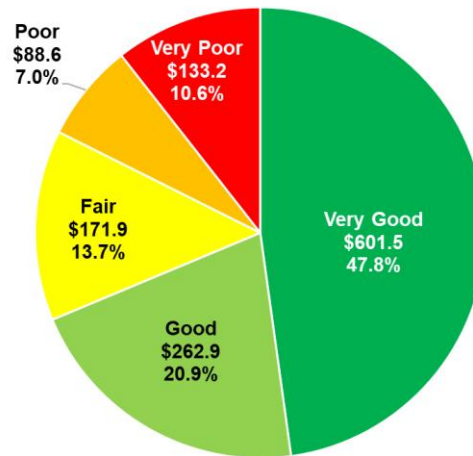
$$FCI = \left[\frac{\text{Current Need} + (\text{Planning Years 1} + 2 \text{ Need})}{\text{Current Replacement Value of Facility}} \right]$$

- **Current Need:** Deferred maintenance and repair/renewal requirements within current fiscal year (based on Facility Condition Assessment (FCA) forecast, inflated to 2025 dollars and increased for soft costs)

- **Planning Years 1 and 2 Need:** Maintenance and repair/renewal requirements in the next two Planning Years (based on FCA forecast, inflated to 2025 dollars and increased for soft costs)
- **Current Replacement Value:** Overall facility replacement cost (like-for-like)

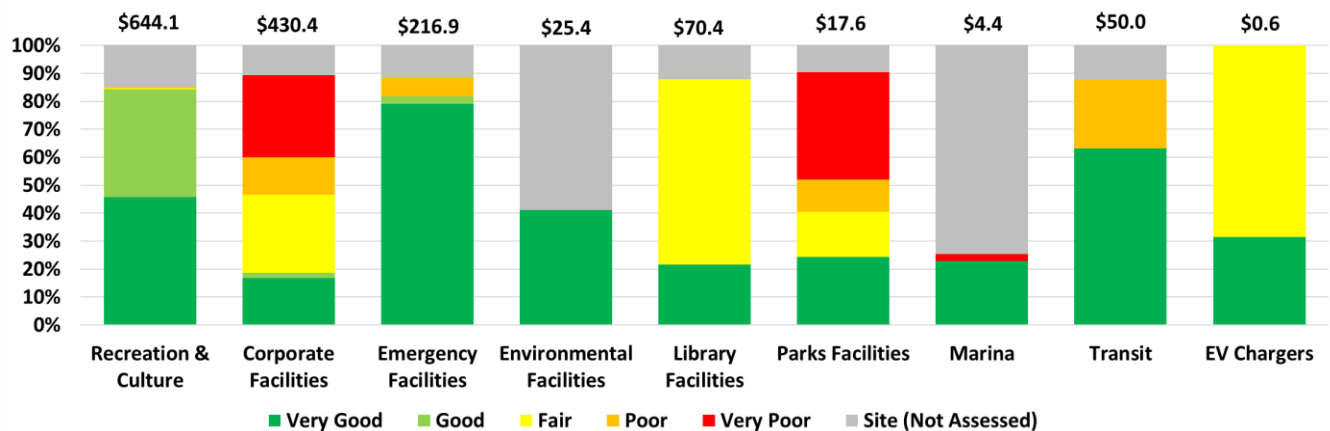
The Current Need and Planning Years 1 and 2 Need are based on the forecasted renewal needs from facility condition assessments and the City's CAFM (Computer-Aided Facility Management) software systems. The value of projects completed since the assessments were considered to reduce the forecasted needs. The condition distribution for the City's Facilities assets is shown in Figure 16-1. The condition ratings for Facilities (FCI) have been converted to a City-wide 5-point condition scale as previously shown in Table 3-3.

Figure 16-1 Condition Distribution by Replacement Value (\$M) - Facilities



82.3% of Facilities are in fair or better condition with 10.6% in very poor condition. Additionally, \$201 million of the portfolio value, including the marina docks and site components, are excluded from the FCI calculation and the overall facility condition estimate. Figure 16-2 shows the proportion of asset replacement value in each condition grade by asset class. A significant portion of Parks facilities and Corporate facilities are in poor or very poor condition.

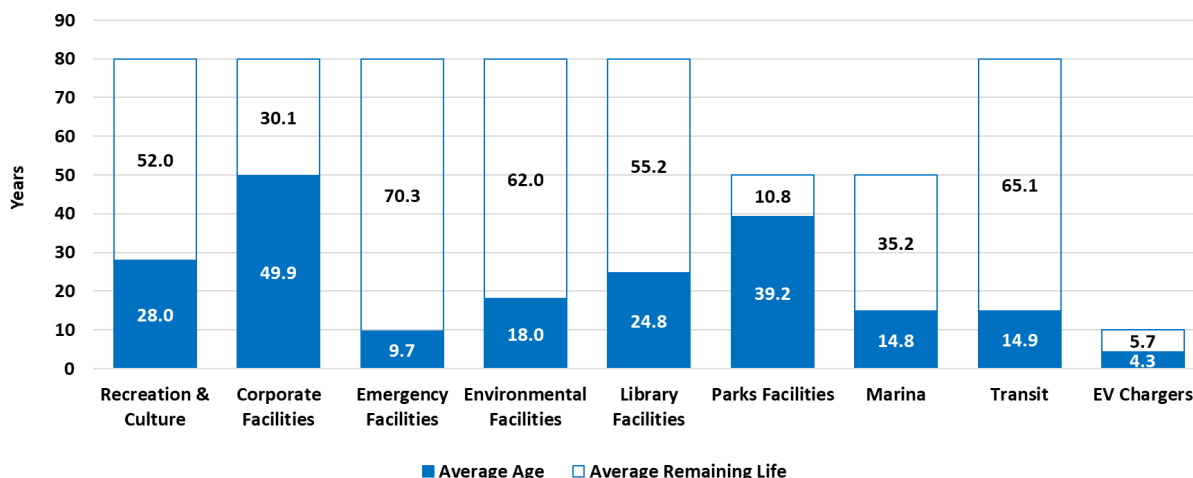
Figure 16-2 Condition Distribution by Replacement Value – Facilities (Percentage)



The age distribution for the City's Facilities assets is shown in Figure 16-3. This figure shows the average age of assets relative to their average service lives weighted by replacement value

and are categorized by asset class. For the Marina, the facilities are considered in the age analysis. The marina docks are not included in Figure 16-3 but they were installed approximately 25 years ago with some repairs and replacements since the original construction.

Figure 16-3 Average Asset Age - Facilities



16.3 Levels of Service

The City ensures that facilities are safe, functional, and well-maintained by overseeing tasks such as repairs, renovations, cleaning, security, and energy management. Additionally, the City may coordinate space planning, facility upgrades, and compliance with building codes and regulations to support the delivery of municipal services and enhance the overall quality of life for staff, residents, and visitors. Table 16-3 (next page) provides the LOS Framework for the City's Facilities assets and Table 16-2 below provides utilization rates of recreation facilities. Table 16-3 includes the current performance (as of the end of 2024), any aspirational targets set out by the City and proposed performance over the next 10 years. Proposed performance is determined based on what is appropriate for the City in consideration of the City's current 10-year planned funding provision in the Capital Plan as well as risks associated with various performance levels, discussed further in Section 16.6.

Table 16-2 Primetime Utilization Rates

Facility	Weekday Primetime Utilization (% in 2023)	Weekend Primetime Utilization (% in 2023)
Rinks	94%	82%
Indoor Aquatic Centers	95%	98%
Gymnasiums	Fall/Winter/Spring: 85%	Fall/Winter/Spring: 76%
	Summer: 90%	Summer: 45%
Meeting & Multi-Purpose Rooms in Recreation Centres	Fall/Winter/Spring: 21%	Fall/Winter/Spring: 38%
	Summer - 54%	Summer 32%
Ancillary Facility Rental Usage (Hall Rentals)	n/a	54%

Table 16-3 LOS Framework - Facilities

Community LOS	Technical LOS						
	Metric(s)	Current LOS			Target LOS		Proposed LOS
Capacity & Use - An adequate provision of facilities provides services that meet the changing demands of the community.							
Provide an adequate provision of facilities to provide services that meet the changing demands of the community.	Number of residents per facility type	Asset Type	Per Capita (2021)	Equivalent units	Asset Type	Per Capita (2021)	↓ Same as target
		Rinks	1:21,000	7.25	Rinks	1:15,000 to 1:19,000*	
		Indoor Aquatic Centers	1:50,773	3	Indoor Aquatic Centers	1:45,000*	
		Gymnasiums	1:60,928	2.5	Gymnasiums	1:45,000*	
		Fitness Spaces	1:50,773	3	Fitness Spaces	1:45,000*	
Provide an adequate provision of facilities to provide services that meet the changing demands of the community.	Area (sq.ft.) of library space per capita	0.40 sq. ft. per capita (2021)			0.7 sq. ft per capita		↑ 0.53 sq.ft.
	Number of theatre seats per 1,000 residents	5.4 seats per 1,000 residents (830 seats total)			N/A		↓ 4.1 seats per 1000 residents (850 seats total)
	Utilization Rate	Theatre Days of Use: Five Points – 181 days (2023) Georgian Campus – 106 days (2023) For Utilization rates of recreation facilities, refer to Table 16-2.			N/A		N/A

Community LOS	Technical LOS			
	Metric(s)	Current LOS	Target LOS	Proposed LOS
Function - Reduce energy consumption and associated costs				
Energy performance of City infrastructure is optimized with a goal to reduce utility consumption and support climate change priorities.	Facility Energy Intensity (ekWh/ft ²)	28.8 ekWh/sq.ft. (2023)	19.59 ekWh/sq.ft. (Net Zero Pathway target for 2034)	 19.59 ekWh/sq.ft. Expected: 28.09 ekWh/sq.ft.
	GHG Emissions	0.0036 tCO ₂ e/sq.ft. (2022)	0.0022 tCO ₂ e/sq.ft. (Net Zero Pathway target for 2034)	 0.0022 (Expected: 0.0039 tCO ₂ e/sq.ft)
Quality & Reliability - Facility assets are maintained in a state of good repair				
Facilities assets are maintained in a state of good repair to provide reliable services to the community.	Average Facility Condition Index (weighted by replacement value)	10.7% (Fair Condition)	N/A	 7.4% (Good condition)
	Percentage of Facilities in Fair or Better Condition	82.3%	N/A	Refer to FCI analysis
	Ratio of Scheduled to Unscheduled Maintenance Work (by hours)	73% (2023)	75%	 70 to 75%

*Targets from City of Barrie - 2017 Park & Recreation Growth Strategy

16.4 Risk Management Strategy

The City uses an established risk framework for quantifying the condition-based risk exposure of its assets to enable prioritization of renewal projects across asset classes and services. Risk exposure is the multiplication of the criticality or consequence of failure (CoF) by the probability of failure (PoF).

The most critical facilities with a CoF rating of 5 include City Hall, the Operations Centre, Fire Station 1, the Barrie-Simcoe Emergency Services Campus, and the Landfill. The next most critical facilities are other fire stations, Allandale Recreation Centre, Sadlon Arena, East Bayfield Community Centre, and Peggy Hill Community Centre. As shown in Figure 16-4, the Operations Centre (with a replacement value of \$121.7 million) is categorized as a very high-risk due to its criticality and high FCI (very poor condition). The value of assets with unknown condition (site assets) are not included.

Figure 16-4 Risk Exposure for Facility Assets* (\$M)

Probability of Failure	Almost Certain	\$0.0	\$12.7	\$0.0	\$0.0	\$121.7	Risk Exposure	\$ Value	%
	Very Likely	\$58.2	\$5.8	\$9.7	\$4.5	\$0.0	Very High	\$121.7	9.8%
	Moderate or Likley	\$0.4	\$33.1	\$46.7	\$0.0	\$91.7	High	\$96.2	7.7%
	Occasional or Possible	\$0.0	\$8.1	\$45.8	\$209.0	\$0.0	Moderate	\$22.4	1.8%
	Very Rare	\$12.6	\$17.5	\$121.1	\$271.5	\$175.8	Low	\$516.2	41.4%
		Insignificant	Minor	Moderate	Major	Catastrophic	Very Low	\$489.4	39.3%
		Consequence of Failure					Total	\$1,245.9	100.0%

against capacity and reliability-related needs. The City assesses the risk of various options to meet functional service levels through inspections and studies such as accessibility audits, the Conservation & Demand Management Plan, the Community Energy & Greenhouse Gas Reduction Plan and other plans that consider the options of how to best achieve the stated service levels.

16.5 Lifecycle Management Strategy

The City balances asset needs across renewal, growth, upgrade, and operations & maintenance activities to ensure that facilities are maintained in a state of good repair while also addressing changing demands due to facility usage and population growth. The costs for these activities are discussed in the following subsections.

16.5.1 Renewal Forecast

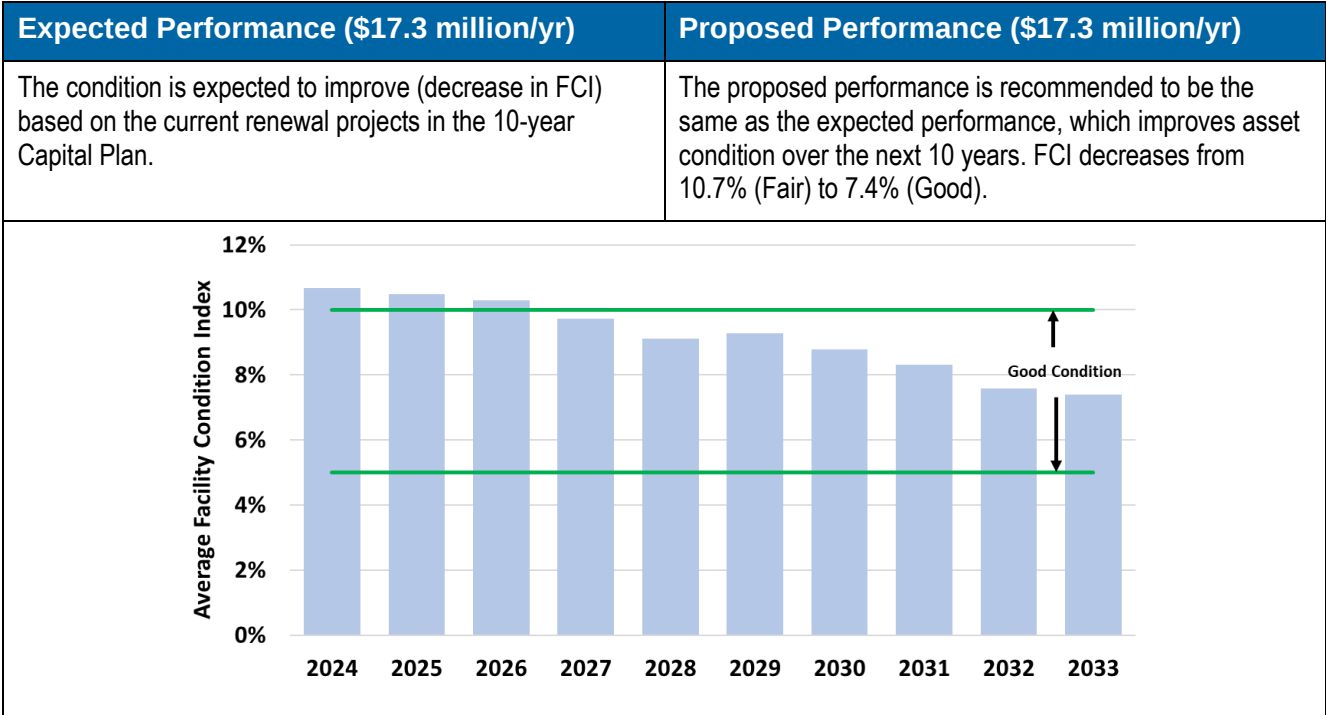
The renewal forecast is based on the rehabilitation and replacement recommendations from building condition assessments as well as the associated data maintained and updated in the City's CAFM systems. Less critical work is deferred while still reducing the overall backlog over the next 10 years.

Figure 16-6 summarizes the renewal needs to meet the proposed service levels related to asset condition. The proposed service level is based on the available funding in the 10-year Capital Plan, which is expected to improve the condition of facility assets through to 2033. FCI for 2034 is not determined as the subsequent two-year renewal forecast (up to 2036) is not available from condition assessments. The average annual renewal needs to meet proposed service levels is estimated at \$17.3 million per year. This includes \$500k per year for renewal of EV chargers, renewal on leased facilities, and renewal of marina docks.

Summary of Recommended 10-Year Renewal Strategy:

- Renewal forecast is based on building condition assessments, with some deferrals on less critical assets
- Improves Facility Condition Index from 10.7% (fair) to 7.4% (good condition)
- Site assets needs of \$1.4 million per year are included in the renewal forecast but are not part of the FCI analysis

Figure 16-6 Renewal Needs Forecast – Facilities



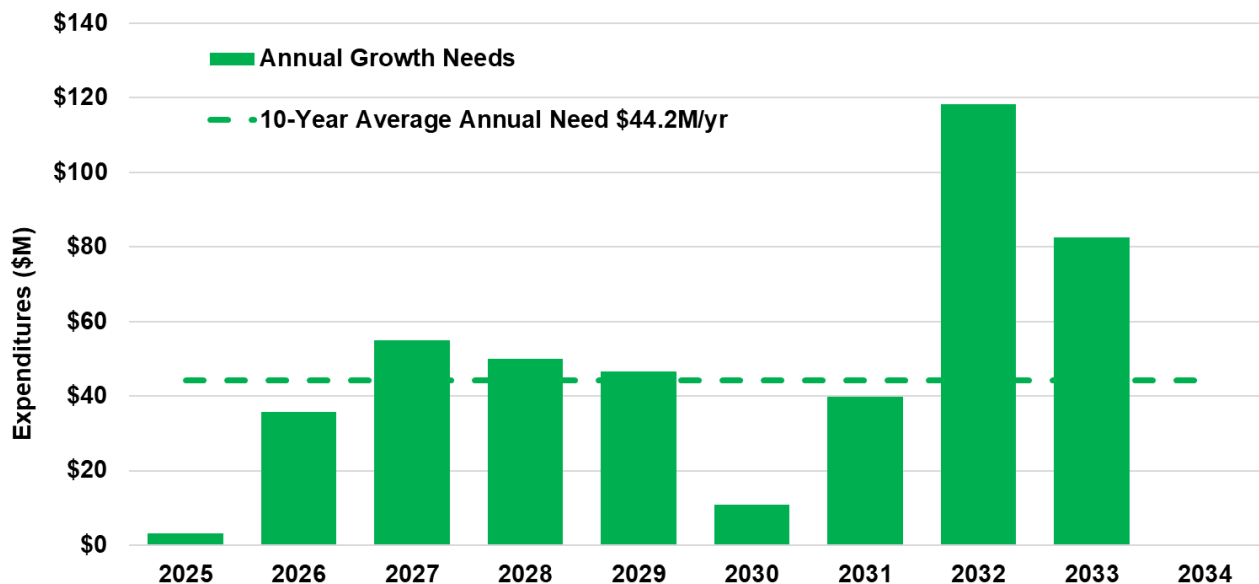
16.5.2 Growth Forecast

The City is planning on constructing new facilities over the next 10 years aligned with the proposed service levels in Section 16.3 and to meet growing population demands. Growth projects include:

- A new Salem Community Centre and Hewitt Community Centre
- Salem and Hewitt Library Branches
- Fire Station 6
- Phase 2 of the Barrie-Simcoe Emergency Services Campus
- Performing Arts Centre Redevelopment
- Transit Garage Expansion

The average annual growth need is estimated at \$44.2 million per year over the next 10 years. This growth does not include previously approved funding (prior to 2025). The new Wastewater Treatment Facility Innovation Centre is included under the Wastewater service area in Section 15.5.2.

Figure 16-7 Growth Needs Forecast – Facilities



16.5.3 Upgrade Forecast

The City's facility upgrades over the next 10 years average \$16.1 million per year, as shown in Figure 16-8. The significant expenditures in years 2031 to 2033 are associated with the Allandale Recreation Centre upgrade and Phase 3 of the Operations Centre redevelopment. Other upgrades include:

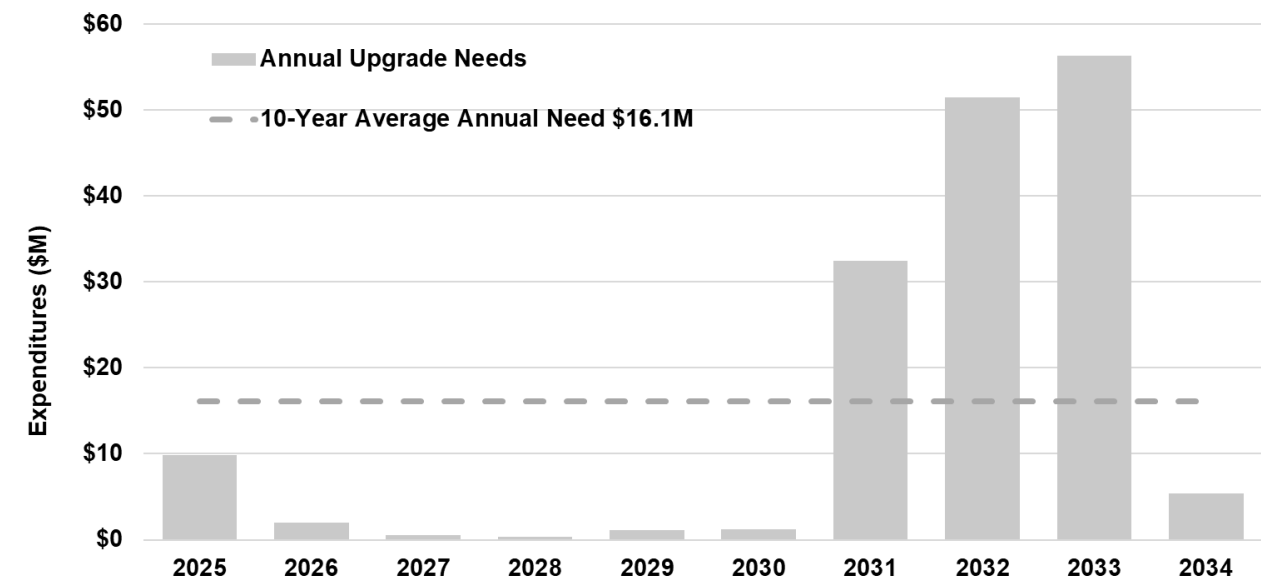
- Allandale and Downtown Transit Mobility Hubs
- Electric vehicle charger installation
- Security improvements at the Marina and Barrie Police Headquarters
- Solar panel installation at the EMS Campus

The City has a proposed net zero pathway for energy efficiency and GHG emission reduction as indicated in Section 16.3. Currently planned upgrade work related to energy efficiency improvements is considered and incorporated during the capital renewal work. The City expects its GHG emissions to decrease over the next 10 years but there is still an investment gap to achieve Net Zero targets. Determining the investment gap is noted as a future improvement in Section 16.7.

Upgrades related to accessibility are also typically considered as part of renewal work. The requirement for dedicated projects for accessibility are considered on a project-by-project basis as specific opportunities are pursued by the City. All new buildings and major renovations are built to accessibility requirements per the Ontario Building Code. As part of its accessibility initiatives, the City considers going above and beyond legal requirements and pursues individual projects that address resident expectations or projects that are opportunities for demonstrating industry leading practices. In such cases, the City minimizes the funding needs and impacts on the taxpayer by seeking out additional grants dedicated for accessibility improvements. It is recommended that the City integrate accessibility needs into future BCAs

such that both renewal and accessibility needs are considered in developing optimal project recommendations that balance the benefits and costs of completing accessibility upgrades at the same time as renewal work.

Figure 16-8 Upgrade Needs Forecast – Facilities



16.5.4 Operations and Maintenance Forecast

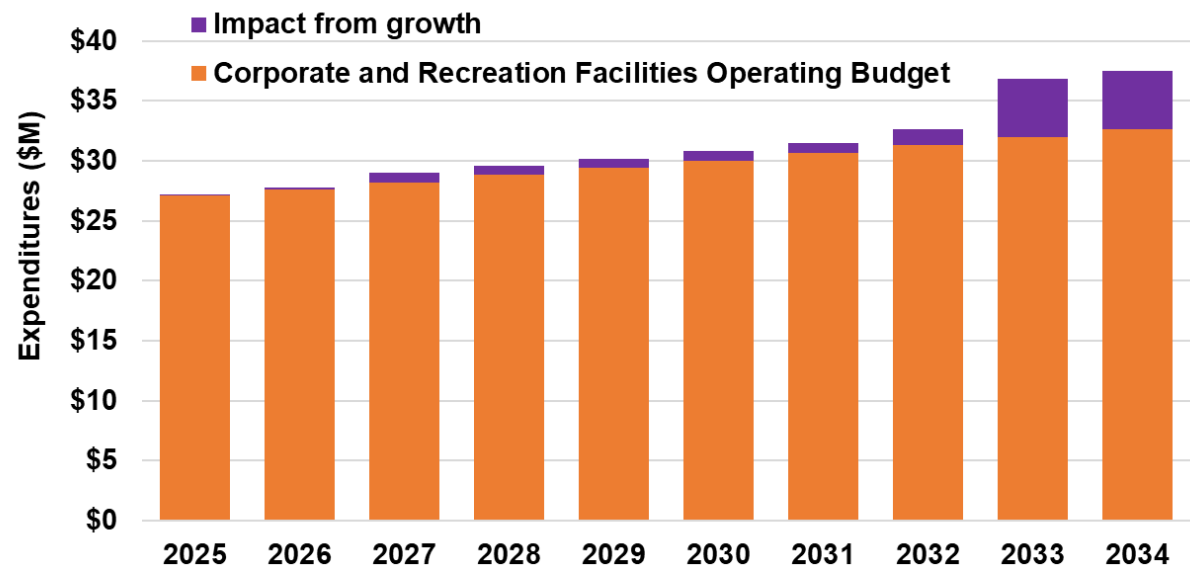
Operations and maintenance work is critical for ensuring the continued provision of facility services and meeting the proposed service levels.

Figure 16-9 shows the Operations and Maintenance needs over the next 10 years. The increase in costs beyond 2025 in operations and maintenance activities is impacted by the estimated growth in the asset portfolio. To meet proposed service levels over the next 10 years, the Operating Budget is estimated to need to increase at an average annual rate of 3.6%, with a significant increase required in 2033 with the completion of the Salem and Hewitt Community Centre(s). The Operations and Maintenance forecast below is determined by extrapolating the three-year trend in O&M provided by the City (2025-2028) and adding considerations for growth in the asset portfolio for capital projects.

Operations and maintenance activities include:

- Cleaning and re-painting
- Conduct Building Condition Assessments
- HVAC component replacements and repairs
- Piping and valve repairs
- Generator and emergency light testing
- Snow clearing and general grounds maintenance
- Parking lot asphalt repairs, crack sealing
- Sidewalk and walkway repairs
- Foundation wall/waterproofing repairs
- Brick and Masonry block repairs
- Interior wall and ceiling finish repairs
- Roof repairs
- Other investigations and repairs per building condition assessment recommendations

Figure 16-9 Operations and Maintenance Needs Forecast – Facilities



16.6 Financing Strategy

The financial analysis considers the affordability of the proposed service levels based on the funding available in the 10-year Capital Plan compared to the forecasted needs.

The proposed service level is to improve the FCI to 7.4% based on the estimated average annual funding of \$16.3 million per year over the next 10 years based on the City’s Capital Plan. It is recommended that the Town complete building condition assessments on the more critical facilities that may have out-of-date assessments to determine if additional renewal needs are required. An investment gap is not currently identified in this AM Plan based on currently available data, and assuming that the City’s 10-Year Capital Plan is funded as currently planned, and that the City has the resources to carry out the projects as currently planned. The City’s ability to sufficiently resource the approved Capital Plan has been at risk the last few years as unplanned Council prioritized projects have caused resourcing to shift in the 10-year Capital Plan.

Figure 16-10: Capital Renewal Needs versus Funding – Facilities

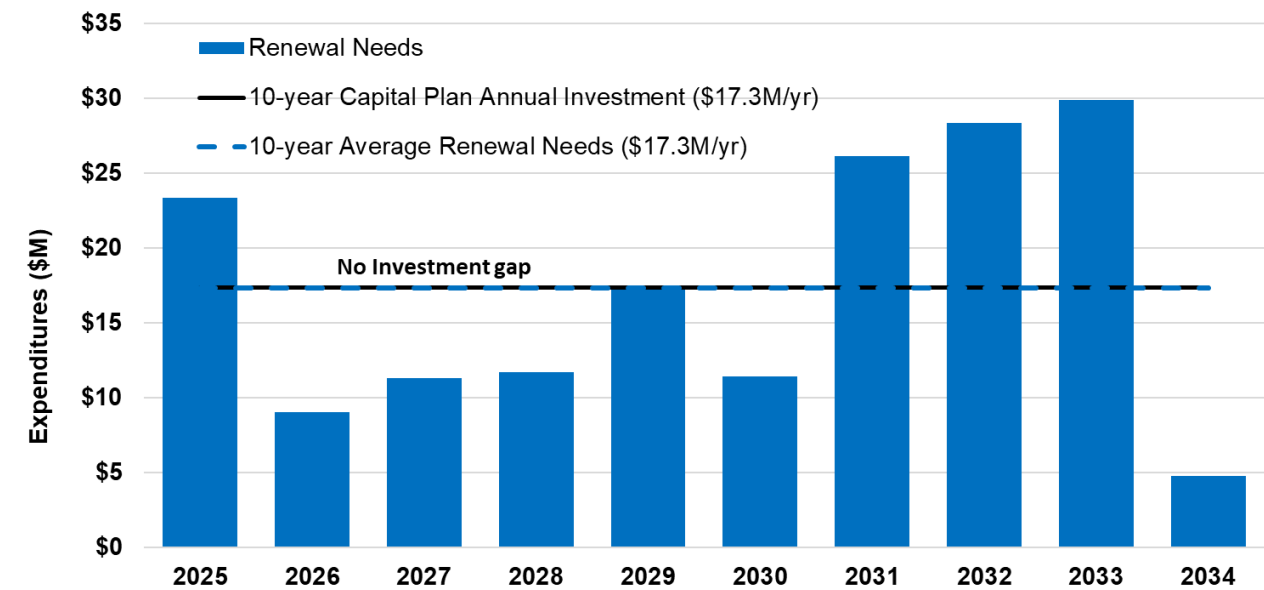


Table 16-4 summarizes the financial sustainability and affordability for growth, renewal and upgrade, and O&M activities. For capital investment, no investment gap is quantified, but the costs related to facility upgrades to achieve net zero emissions are to be developed and included in future updates of this AM Plan.

For the Operating budget, the City’s ability to perform the required inspection and maintenance activities has been at risk over the past few years as the operating budget has not been sufficiently funded to align with the increased costs of materials and contracted services over the past few years. Both corporate and recreation facilities utilize a Minor Capital account that is subject to potential underfunding.

Table 16-4: 10-Year Financial Sustainability of Proposed Service Levels

Asset Lifecycle	Average Annual Forecast Needs	10-Year Capital Plan Average Annual Investment	Average Annual Investment gap	Potential Impacts
Capital Growth	\$41.3 M/yr*	\$41.3 M/yr	No investment gap	Salem and Hewitt Community Centre are expected to achieve per capita provision rates to align with City’s population increase. A decrease in number of theatre seats per resident is expected based on the capacity of the new Performing Arts Centre.

Asset Lifecycle	Average Annual Forecast Needs	10-Year Capital Plan Average Annual Investment	Average Annual Investment gap	Potential Impacts
Capital Upgrade	\$15.9 M/yr	\$15.9 M/yr	No investment gap*	Expected performance on GHG emissions and energy consumption reduction do not meet net zero pathway proposed service levels. Costs to achieve these targets are to be developed for future inclusion.
Capital Renewal	\$16.3 M/yr	\$16.3 M/yr	No investment gap**	FCI should improve (decrease) with the planned budget. Some additional direction of resources may be required for site assets such as parking lots. Additional building condition assessments are required to increase accuracy of forecasted renewal needs.
Operations and Maintenance	\$27.1M in 2025 to \$37.5 M in 2034; 3.6% average annual increase	\$27.1 M in 2025	3.6% average annual increase**	Additional O&M funding is required to address growth in asset portfolio. Some budget pressures exist due to increased materials and contracted service costs.

*Costs for achieving proposed net zero pathway targets are not yet quantified.

**Additional condition assessments may result in increased needs and an investment gap

To manage the risks of the operating budget pressures, the City will continue to prioritize critical infrastructure to maintain service delivery. Regular staff walkaround inspections are completed to help identify hazards for site-related infrastructure. As the City completes additional building condition assessments, it will refine the renewal forecast and also continue to improve its Capital renewal planning while balancing renewal projects with minor capital work to achieve an overall lowest lifecycle approach for facility assets.

16.7 Recommendations for Continuous Improvement

Development of AM Plans is an iterative process that includes improving data, processes, systems, staff skills, and organizational culture over time. Continuous improvement recommendations include:

Table 16-5: AM Plan Improvement Recommendations – Facilities

AM Plan Section	Improvement Recommendation
State of Infrastructure	• Continue to improve accuracy of facility replacement costs • Maintain up-to-date condition of assets and recommended replacement/renewal year in CAFM software systems • Consider updating future Facility Condition Assessments (and CAFM inventory data) to Uniformat II Standard and use consistent hierarchy between the two software systems • Consider developing a master inventory of parking lots including both park and facility parking lots. • CAFM software: Determine the cost-benefit of adding the missing assets into CAFM software (building envelope assets as well as all assets for parks facilities). It may be beneficial to only add critical assets such as the roof for each facility.
Levels of Service	• Consider adding service levels regarding facility accessibility depending on future City policies and initiatives
Risk Management	• Apply risk at the building component level with CoF ratings and up-to-date condition ratings to better understand the level of risk across asset types (such as roofs, HVAC, and electrical components)
Lifecycle Management	• A more complete inventory and up-to-date condition data and renewal activity timing in CAFM software per the State of Infrastructure recommendations will enable a more robust renewal forecast • Continue to optimize the lifecycle activities from building condition assessments by considering various operations, maintenance, and renewal activity options
Financial Management	• Improve understanding of the investment gap related to net zero pathway targets • Review and incorporate funding impacts related to new legislation such as Bill 23

17 FLEET

17.1 Overview

Fleet assets ensure that vehicles and equipment are properly maintained, serviced, and repaired to meet safety standards and operational requirements, enabling various municipal departments to carry out their duties effectively and efficiently. Additionally, the City oversees fuel management, vehicle procurement, lifecycle planning, and fleet optimization efforts to maximize resource utilization and minimize costs.

Key Findings

- **Approximately 33% of assets are past their optimal service life, resulting in increased repair costs, reduced reliability, and potential risks to service delivery.** 10% of fleet assets are classified as very high-risk, including critical firefighting apparatus.
- **A backlog of over \$24 million in fleet replacements has accumulated due to historical underinvestment.**
- **Continued funding of the Fleet Replacement Program is necessary to improve the reliability of the fleet, minimize spending on emergency repairs and address the backlog.**

17.2 State of Infrastructure

Assets that support Fleet include vehicles (Light-duty, Medium-duty, Heavy-duty, Firefighting Apparatus) and Equipment (Trailers, Light, Medium, Heavy). Table 17-1 shows the replacement value of approximately \$75M and includes a breakdown of the inventory by asset category and asset class. The largest portion of the asset portfolio are the Firefighting Apparatus which account for approximately 24% of all Fleet assets by replacement value.

The City owns several small engine and/or handheld equipment which are not classified as fleet vehicles or equipment under the Fleet Management Policy, and which are not captured in this AM Plan. Examples include chain saws, leaf blowers, and similarly lower valued items. Additionally, this AM Plan does not include the Barrie Police Service fleet which are managed by Barrie Police and are covered under a separate AM Plan. The City also relies on several rented vehicles, primarily to deliver seasonal services. These assets are not owned by the City and are not included in the inventory summary.

Table 17-1 Inventory Summary – Fleet

Asset Category	Asset Class	Quantity	Replacement Value (2025\$M)
Vehicles	Light-duty Vehicles	217	\$15.3
	Medium-duty Vehicles	14	\$3.6
	Heavy-duty Vehicles	42	\$16.4
	Firefighting Apparatus	17	\$18.2
Equipment	Trailers	83	\$1.5
	Light Equipment	101	\$4.5
	Medium Equipment	45	\$6.9

Asset Category	Asset Class	Quantity	Replacement Value (2025\$M)
Equipment (cont.)	Heavy Equipment	15	\$8.5
Total			\$74.8

The City performs regular maintenance on its vehicles but does not currently have a program for assigning a formal condition rating on fleet assets. Condition ratings are estimated based on the age of each asset compared to its estimated service life. The proportion of remaining life is converted to a City-wide 5-point condition scale as previously shown in Table 3-3. The City is implementing a new fleet management system which will enable more sophisticated methodologies for assessing fleet asset condition, incorporating additional data such as mileage and maintenance history. These will be implemented in future iterations of this AM Plan.

The condition distribution for the City's Fleet assets is shown in Figure 17-1.

Figure 17-1 Condition Distribution by Replacement Value (\$M)- Fleet

Approximately 53% the City's fleet is in fair or better condition, as estimated based on age. Fleet assets that are older than their optimal service lives are considered to be in very poor condition. Assets with unknown condition represent only 0.3% of the overall inventory (not included in Figure 17-1), but the City is working on improvements to the condition estimates of assets.

Figure 17-2 summarizes the fleet condition profile by asset class.

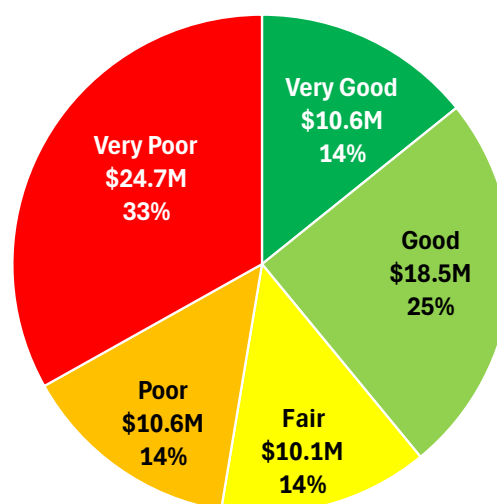
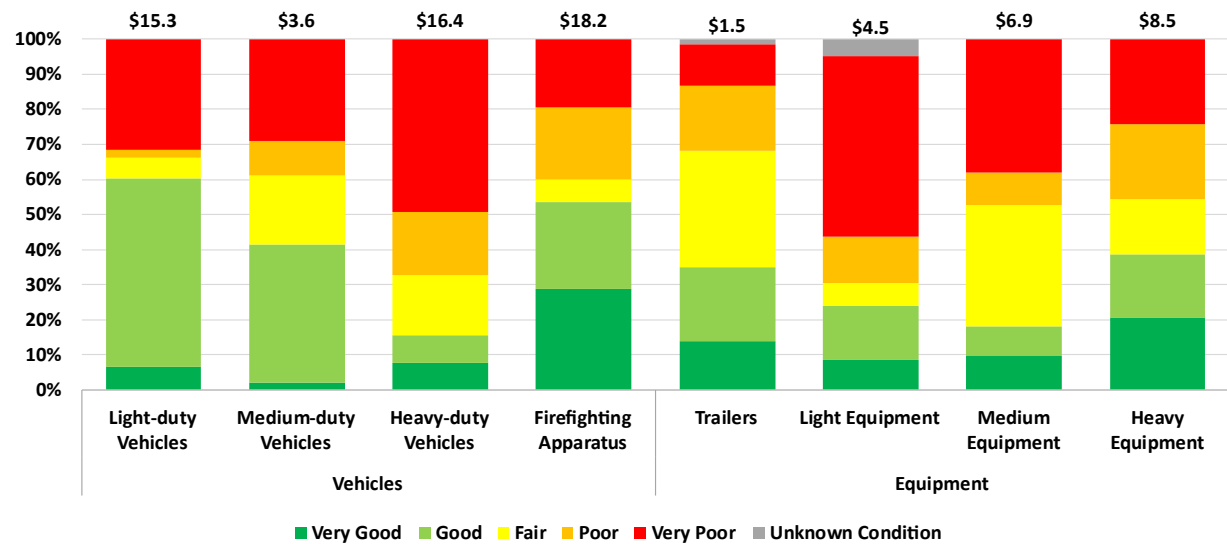
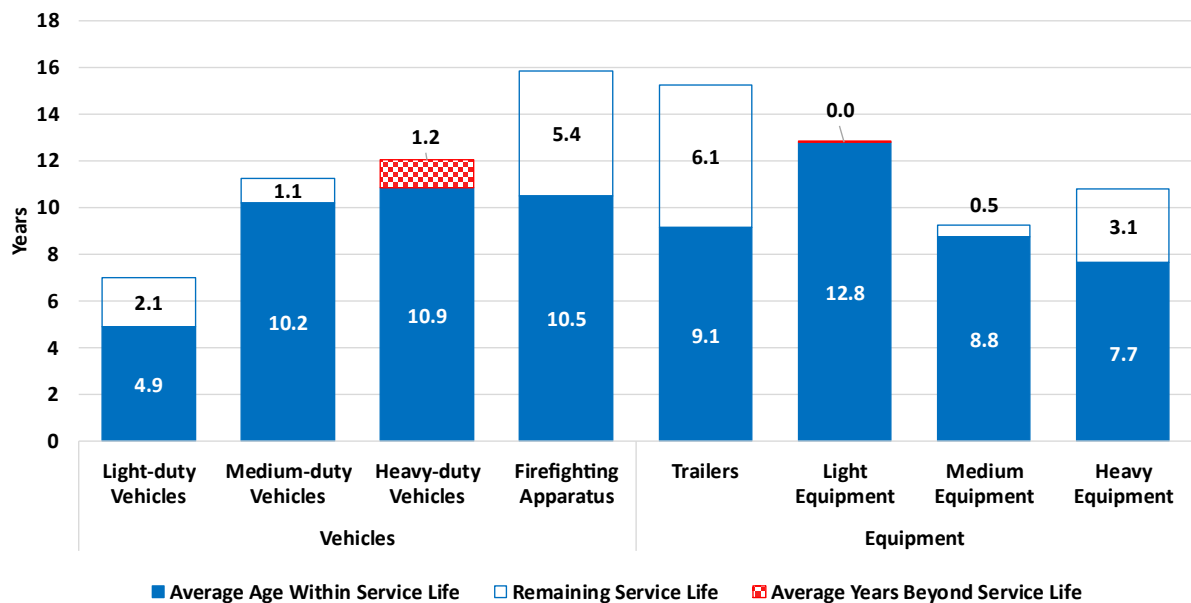


Figure 17-2 Condition Distribution by Replacement Value – Fleet (Percentage)



The age distribution for fleet assets is shown in Figure 17-3. This figure shows the average age of assets relative to their average service lives weighted by replacement value and are categorized by asset class. Any asset classes with an average age that surpasses its average service life is shown in red. Heavy-duty vehicles, for example, are on average 1.2 years past the estimated service life of 10.9 years (average age of 12.1 years).

Figure 17-3 Average Asset Age – Fleet



17.3 Levels of Service

Fleet assets enable City staff to deliver services to the community. Therefore, a key focus for managing the City’s fleet is to ensure that the fleet has the capacity, functionality, and reliability

to ensure that those services can be delivered at appropriate levels. Additionally, the City's fleet needs to be managed safely to protect both the public and City employees and comply with regulation.

Table 17-2 provides the LOS Framework for the City's Fleet assets. This table includes the current performance (as of the end of 2024), any aspirational targets set out by the City and proposed performance over the next 10 years. Proposed performance is determined based on what is appropriate for the City in consideration of the City's current 10-year planned funding provision in the Capital Plan as well as risks associated with various performance levels, discussed further in Section 17.6.

Table 17-2 LOS Framework - Fleet

Community LOS	Technical LOS			
	Metric(s)	Current LOS	Target LOS	Proposed LOS
Capacity & Function – City’s fleet network has adequate capacity for City staff and community needs				
The City's fleet of vehicles and equipment is fit for purpose and complies with established utilization thresholds to ensure it is appropriate to deliver services efficiently.	Technical utilization metrics are being developed as part of the City’s Corporate Fleet Management Policy and will be included in future updates to this AMP.	Future metric		
Quality & Reliability - Fleet assets are maintained in a state of good repair				
The City ensures that its fleet is well-maintained and managed to provide dependable services while prioritizing the safety of both the community and City staff.	% of fleet assets that are past their optimal service lives.	Light-duty Vehicles - 32% Medium-duty Vehicles - 29% Heavy-duty Vehicles - 49% Firefighting Apparatus - 20% Trailers - 12% Light Equipment - 51% Medium Equipment - 38% Heavy Equipment - 24% Overall – 33%	N/A	 Overall – 20%

Community LOS	Technical LOS			
	Metric(s)	Current LOS	Target LOS	Proposed LOS
	% of Fleet Assets in fair-or-better condition.	Light-duty Vehicles - 66% Medium-duty Vehicles - 61% Heavy-duty Vehicles - 33% Firefighting Apparatus - 60% Trailers - 68% Light Equipment - 30% Medium Equipment - 53% Heavy Equipment - 54% Overall – 52%	N/A	 Overall – 68%

17.4 Risk Management Strategy

The City uses an established risk framework for quantifying the condition-based risk exposure of its assets to enable prioritization of renewal projects across asset classes and services. Risk exposure is the multiplication of the criticality or consequence of failure (CoF) by the probability of failure (PoF).

CoF ratings are based on the replacement value of each asset. This approach is based on the fact that the more costly a fleet asset is, the more likely it is to be used for specialized work and the more difficult it is to repair or replace in the event of a failure. Furthermore, Firefighting Apparatus were assigned a COF rating of 5 to reflect the criticality of the service they provide, in addition to their high replacement cost.

As shown in Figure 17-4, an estimated \$3.6 million of Fleet assets currently have a high-risk exposure (orange) and an estimated \$7.3 million of Fleet assets currently have a very high-risk exposure (red). This includes seven Firefighting Apparatus that are near, at, or past their estimated service lives. These trucks are scheduled for replacement over the next few years, with funding approved in the 2023 and 2024 Capital Plans, and further capital requests forecasted for 2025 and 2026.

Figure 17-4 Risk Exposure for Fleet Assets* (\$M)

Risk exposure in year 2025 \$, millions									
Probability of Failure	Almost Certain	\$7.2	\$12.3	\$3.4	\$0.0	\$5.1	Risk Exposure	\$	%
	Very Likely	\$1.2	\$3.8	\$0.0	\$0.0	\$2.1	Very High	\$7.3	9.7%
	Moderate or Likely	\$4.5	\$5.6	\$2.8	\$0.4	\$0.2	High	\$3.6	4.8%
	Occasional or Possible	\$5.4	\$2.7	\$0.7	\$0.0	\$4.5	Moderate	\$17.2	23.1%
	Very Rare	\$2.5	\$2.1	\$0.5	\$1.2	\$6.2	Low	\$26.2	35.2%
							Very Low	\$20.2	27.2%
		Insignificant	Minor	Moderate	Major	Catastrophic	Total	\$74.5	100.0%
		Consequence of Failure							

17.5.1 Renewal Forecast

Figure 17-5 summarizes the renewal needs to meet the proposed service levels related to asset condition. The proposed service level is to maintain the current condition over the next 10 years.

The renewal forecast considers the current condition or age of each asset and estimates the planned replacement year based on estimated service lives summarized in Table 17-3.

Summary of Recommended 10-Year Renewal Strategy:

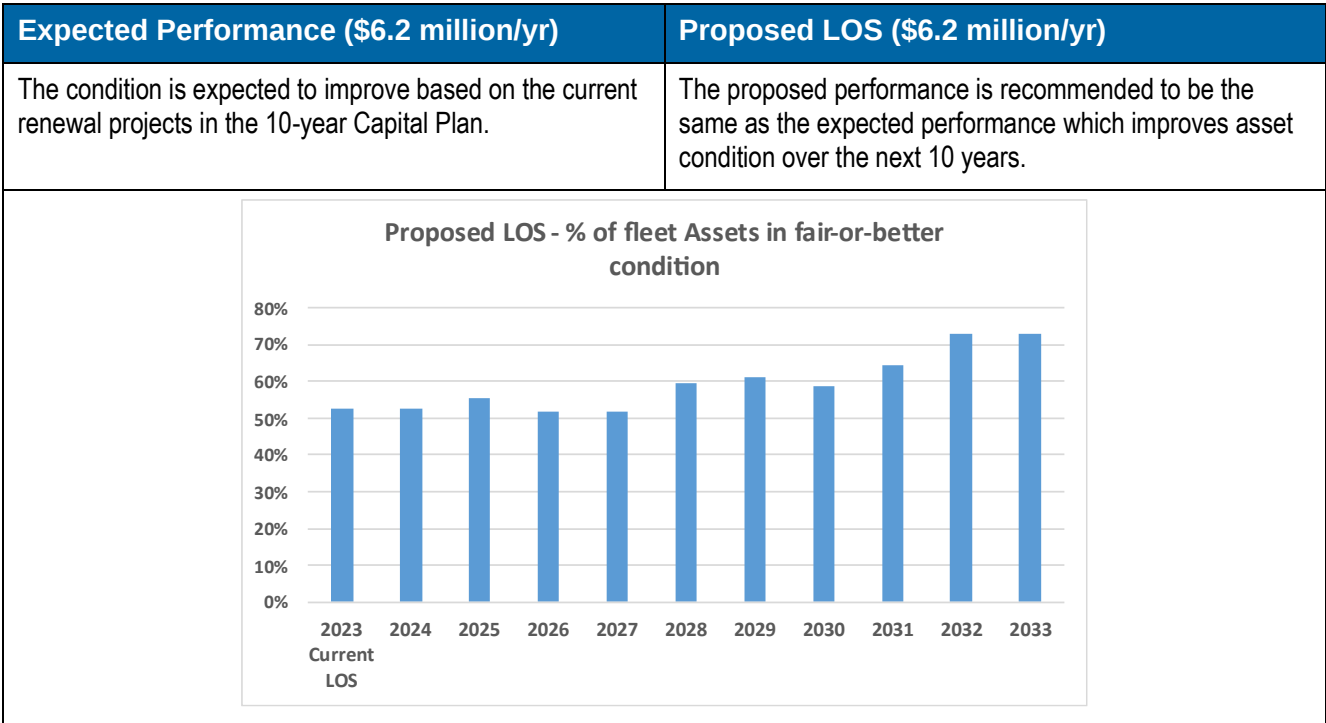
- Improves percentage of assets in fair or better condition from 52% to 69%
- Vehicles and equipment are replaced at expected end-of-life based on age and the estimated service life

Table 17-3: Estimated Service Life – Fleet

Asset	Estimated Service Life (Years)
Large Generator	22
Aerator, Boat, Boat Trailer, Snow Melter, Valve Maintenance Trailer	20
Aerial Ladder, Articulated Dump Truck, Brush Truck, Compressor, Concrete Mixer, Fire Training Trailer, Float, Hazmat, Irrigation Water Reel Overseeder, Pumper, Roller, Screener, Skid Steer, Stacker, Steamer, Stump Grinder, Tractors, Trailers, Turf Rake, Verti Cutter	15
Asphalt Patcher, Brush Chipper, Brush Chipper Mini, Excavator, Hovercraft, Medium Duty Truck, Scissor Lift, Street Sweeper, Tandem Axle Plow, Vac Trailer	12
Compactor, Dozer - D6, Forklift, Groomer, Heavy Duty Truck, Ice Resurfacer, Pressure washer Trailer, Sidewalk Machine, Sidewalk Mini Vac, Single Axle Plow, Turf Sweeper, Utility Vehicle, Vacuum Truck	10
Backhoe Loader, Infrared Asphalt Heater, Snow Machine, Tool Cat, Wheel Loader	8
Vans, Pickup Trucks, Mowers, SUVs	7

For Fleet, the proposed performance is to improve the overall condition of assets over the next 10 years, as shown in Figure 17-5. The average annual renewal need is estimated at \$5.8 million per year. The expected performance based on the renewal investment currently available in the 10-year Capital Plan is lower than the proposed service level.

Figure 17-5 Renewal Needs Forecast – Fleet



17.5.2 Growth Forecast

The additional fleet assets projected to be required to maintain service levels as the City’s population grows are estimated to result in approximately **\$1 million (2025\$) in annual expenditures from 2025-2034**. The actual need for additional fleet assets can be expected to vary substantially from year-to-year based on the timing of development and infrastructure projects, and the services and assets required. These will continue to be proposed as individual projects for approval through the City’s Capital Plan.

17.5.3 Upgrade Forecast

The City does not currently have projects in the Capital Plan that have been categorized as ‘additional capability/capacity’; however, the City is in the early stages of transitioning to electric and alternative-fuel vehicles. Fleet electrification represents a key asset upgrade strategy that supports both operational efficiency and the City’s climate objectives. Charging infrastructure is being installed at three City facilities to support this transition, with further expansion planned in alignment with the redevelopment of the Operations Centre and the construction of the new Wastewater Innovation Centre. Light-duty vehicles are planned to be replaced with electric alternatives at end-of-life, where operationally feasible and supported by available infrastructure. For heavy-duty and specialized vehicles, the City continues to monitor technological advancements and will adopt alternative-fuel options when proven solutions become available. These upgrades will be phased in as part of the fleet replacement program, ensuring a measured approach that balances innovation with cost and operational reliability.

17.5.4 Operations and Maintenance Forecast

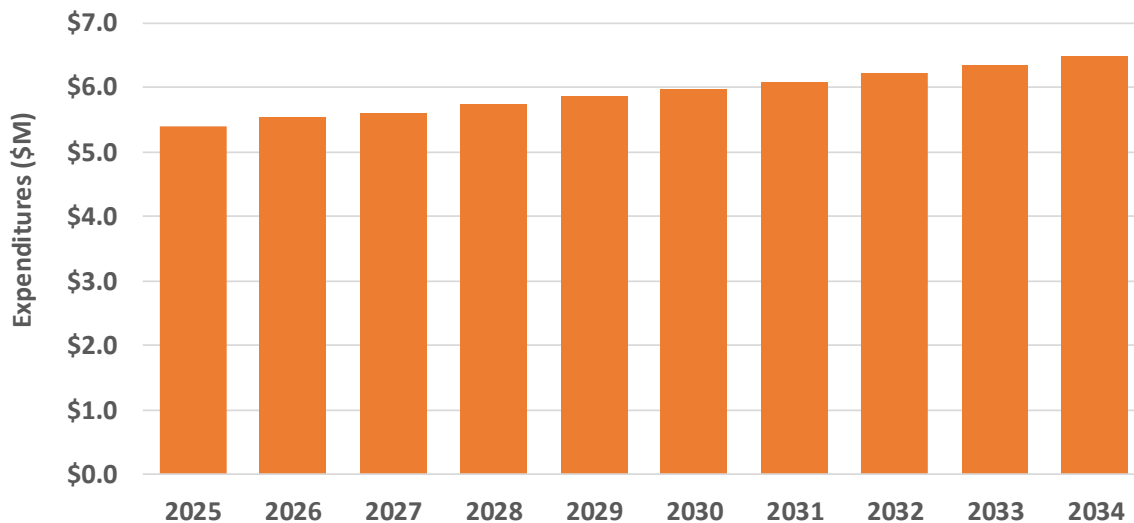
Operations and maintenance work is critical for ensuring the continued reliability of Fleet assets and meeting the proposed service levels.

Figure 17-6 shows the Operations and Maintenance needs over the next 10 years for Fleet. The increase in costs beyond 2025 in operations and maintenance activities is impacted by the estimated growth in the asset portfolio. To meet proposed service levels over the next 10 years, the Operating Budget is estimated to need to increase at an average annual rate of 2.0%.

Operations and maintenance activities include:

- Preventative vehicle maintenance
 - Oil changes, tire rotations, etc.
- Reactionary vehicle maintenance
 - Repair of broken components
 - Accident-related repairs
- Operational Support
 - Vehicle licensing and registration
 - Insurance Management

Figure 17-6 Operations and Maintenance Needs Forecast – Fleet



17.6 Financing Strategy

The financial analysis considers the affordability of the proposed service levels based on the funding available in the 10-year Capital Plan compared to the forecasted needs.

The funding available for renewal of fleet infrastructure is estimated to be an average of \$6.2 million per year over the next 10 years based on the City's Capital Plan. As discussed in Section 17.5.1, the estimated average annual renewal need is \$6.2 million per year to meet proposed service levels. Therefore, there is no investment gap, assuming that the City's 10-Year Capital Plan is funded as currently planned, and that the City has the resources to carry out the projects as currently planned.

Figure 17-7: Capital Renewal Needs versus Funding – Fleet

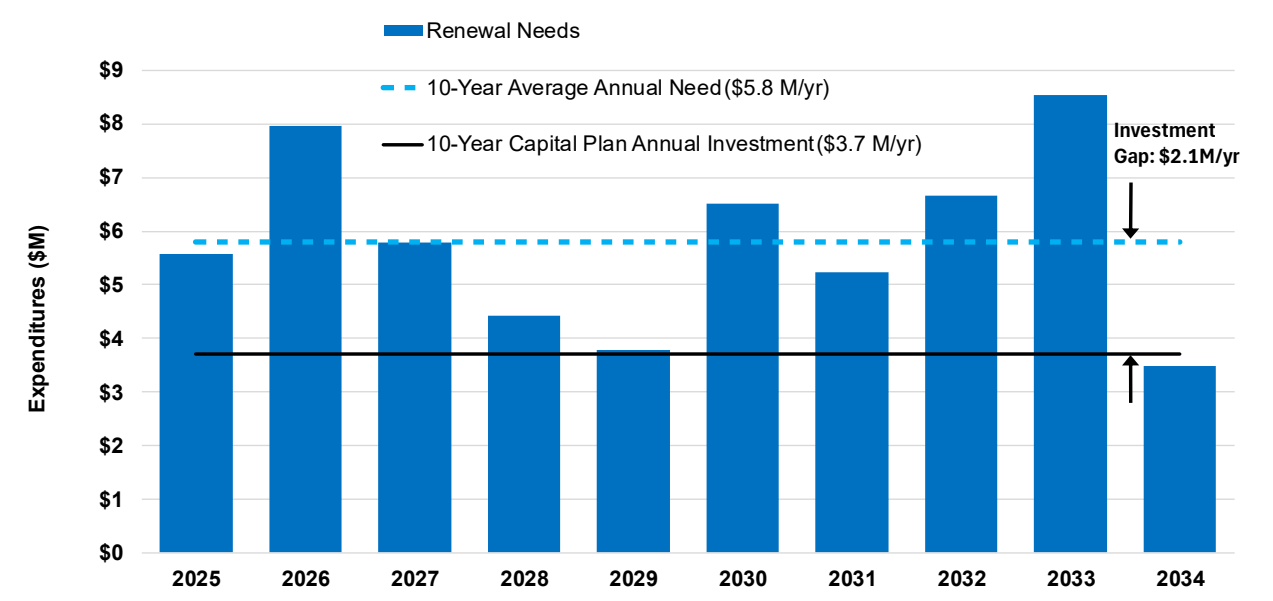


Table 17-4 summarizes the financial sustainability and affordability for growth, renewal and upgrade, and O&M activities.

Table 17-4: 10-Year Financial Sustainability of Proposed Service Levels

Asset Lifecycle	Average Annual Forecast Needs	10-Year Capital Plan Average Annual Investment	Average Annual Investment gap	Potential Impacts
Capital Growth	\$1.0 M/yr	\$1.0 M/yr	No gap	N/A
Capital Upgrade	Included in growth forecast			
Capital Renewal	\$6.2 M/yr	\$6.2 M/yr	No gap	N/A
Operations and Maintenance	\$5.4 M in 2025 to \$6.5 M in 2034	\$5.4 M in 2025	2.0% average annual increase	Failure to increase resources to operate and maintain new assets will result in reduced service levels and increased risks for vehicle breakdowns and increased reactive maintenance

The City will implement a range of financial and operational strategies to ensure the long-term reliability and sustainability of its fleet. One key strategy is to increase annual contributions to the fleet management reserve to align with fleet growth and lifecycle needs. Continued implementation of the fleet replacement program will help to reduce the existing replacement

backlog. The City will also leverage its new fleet management system to support data-driven decision-making around asset lifecycles. Enhanced tracking of maintenance history, usage data, and asset condition will enable more accurate forecasting, refined replacement schedules, and total cost-of-ownership optimization. Further risk mitigation will be achieved by improving asset utilization and fleet efficiency. This includes exploring asset pooling across departments, retiring underutilized assets, and optimizing the fleet to better match operational needs. In addition, a risk-based prioritization framework will guide replacement planning, ensuring that high-risk vehicles, such as firefighting apparatus and winter maintenance equipment, are prioritized to maintain public safety and service continuity.

Finally, the City will pursue alternative funding opportunities, including grants and partnerships, particularly those related to fleet electrification and innovation. These may help offset capital costs and reduce pressure on internal reserves.

17.7 Recommendations for Continuous Improvement

Development of AM Plans is an iterative process that includes improving data, processes, systems, staff skills, and organizational culture over time. Continuous improvement recommendations include:

Table 17-5: AM Plan Improvement Recommendations – Fleet

AM Plan Section	Improvement Recommendation
State of Infrastructure	- Continue to focus on optimizing asset service lives to minimize the total cost of ownership for the City’s fleet. - Development of improved methodologies for assessing fleet asset condition, incorporating additional data beyond age, such as maintenance history and mileage.
Levels of Service	- Continue to develop plans to support the smooth transition of the fleet to electric and alternative fuels, including the conversion of light-duty vehicles to EVs as charging infrastructure becomes available. Continue monitoring technological and market developments regarding alternative fuels for heavy-duty vehicles. - Establishing new performance metrics for energy usage and operating efficiency, leveraging the new fleet management system and AVL system.
Risk Management	Continue to monitor the risk profile of the fleet and prioritize fleet replacements with the goal of minimizing risks.

AM Plan Section	Improvement Recommendation
Lifecycle Management	• Regularly assess population and economic growth and associated infrastructure to ensure fleet and staffing resources are appropriately scaled to the City's needs. • Develop detailed plans for new fleet complement needed to sustain service levels as the City grows. • Enhance preventative maintenance programs as needed to reduce downtime and repair costs. • Ensure sufficient resources are allocated for fleet operations, including adequate staffing and equipment to prevent maintenance backlogs and minimize reliance on external services. • Continuously update workforce development plans to equip staff with the skills needed to handle evolving fleet technologies and maintenance practices. • Staff are exploring opportunities to increase fleet efficiency through asset pooling, sharing within and between departments, and optimizing the utilization of fleet assets. These will be implemented through fleet management policies. • Full implementation and integrations of the new fleet management system will enable the City to track maintenance data, mileage, and other critical metrics for more accurate lifecycle and condition assessments. • Undertaking analysis to determine the optimal lifecycle for each category of fleet asset based on City specific data, rather than relying on industry standards.
Financial Management	• Develop robust financial plans and risk management strategies to accommodate economic fluctuations and cost inflation. • Address the annual shortfall of \$2.1 million in the Fleet Management Reserve by increasing contributions from tax revenues and water/wastewater rates. • Explore additional debt issuance to support the Fleet Replacement Program while balancing the city's overall debt load and maintaining a strong credit rating.

18 BARRIE-COLLINGWOOD RAILWAY

18.1 Overview

The Barrie-Collingwood Railway (BCRY) is a short-line railway which extends from its junction with the Canadian Pacific Railway (CP Rail), just west of County Road 56 in Essa Township, through the City of Barrie and south to its terminus at the Innisfil Heights Employment Area in the Town of Innisfil. The City of Barrie has owned and operated the railway, through its contract with Cando Rail and Terminals Ltd., since 2012 after the previous owner, the non-profit Allandale Community Development Corporation (ACDC), was dissolved in 2011.

Key Findings

- **The aging Lockhart Rd. rail bridge needs to be replaced and upgraded to address existing dimensional restrictions and accommodate future road widening.** Engineering studies are proposed to determine the ultimate design and optimal timing for this project.
- **The City has made progress improving the railway track infrastructure in recent years.** This work is proposed to continue to ensure safe and reliable railway operations.
- Additional investment is required to address aging grade crossing infrastructure as well as culverts crossing the railway tracks.

The BCRY is connected to the major trunk network of the CP Rail, with an interchange located at the BCRY Utopia rail yard. The Utopia rail yard is a site in Essa Township located on County Road 56, 11 km west of Barrie. The rail yard supports transloading and other support services. The City shares ownership of the Utopia rail yard with the County of Simcoe.

18.2 State of Infrastructure

Assets that support BCRY include Tracks, Turnouts, Grade Crossings, Bridges, Culverts, Railway Facilities and Ditches. Table 18-1 shows the replacement value of approximately \$86 million and includes a breakdown of the inventory by asset type. The largest portion of the asset portfolio are Bridges which account for approximately 43% of all BCRY assets by replacement value. Assets owned by the operating contractor, Cando, including the BCRY locomotive, various vehicles and equipment, and the portable field office at the Utopia yard are not included.

Table 18-1 Inventory Summary – BCRY

Asset Type	Quantity	Replacement Value (2025\$M)
Tracks	32.8 km	\$26.9
Turnouts	21	\$2.2
Grade Crossings – Active	14	\$7.8
Grade Crossings – Passive	14	\$1.6
Bridges	2	\$36.5
Culverts	42	\$6.7

Asset Type	Quantity	Replacement Value (2025\$M)
Railway Yard, Maintenance Facility and Transload Station*	1	\$3.2
Ditches	5,000 m	\$0.8
Total		\$85.6

*Ownership of the Utopia railway yard is shared 50%/50% between the City of Barrie and the County of Simcoe.

The City and Cando monitor the condition of the BCRY assets to prioritize renewal and rehabilitation work undertaken through annual operating programs and capital projects.

The condition distribution for the City's Fleet assets is shown in Figure 18-1.

Approximately 58% the City's BCRY assets are in fair or better condition. Assets with unknown condition represent only 3.1% of the overall inventory (not included in Figure 18-1), but the City is working on improvements to the condition estimates of assets.

Figure 18-2 summarizes the BCRY assets condition profile by asset class.

Figure 18-1 Condition Distribution by Replacement Value (\$M) - BCRY

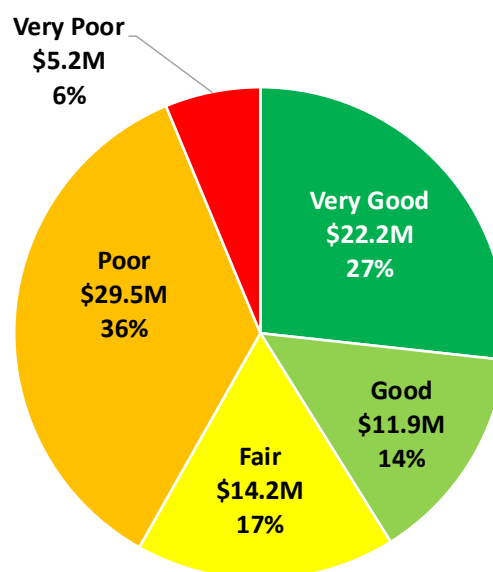
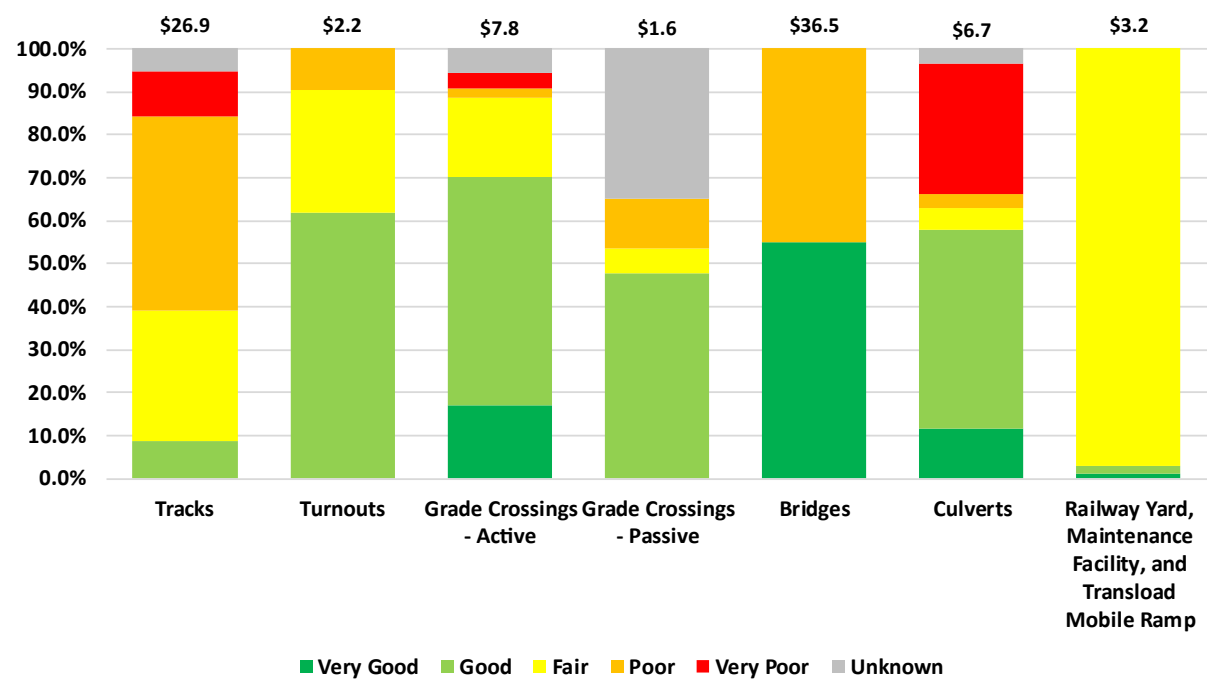
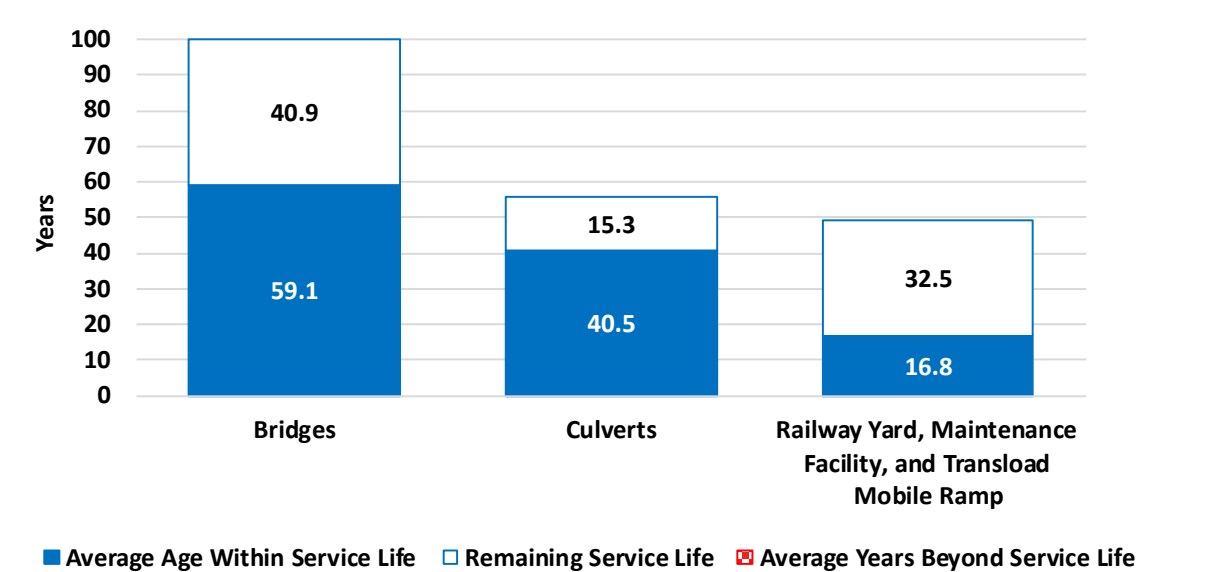


Figure 18-2 Condition Distribution by Asset Type – BCRY (Percentage)



The age distribution for BCRY assets is shown in Figure 18-3. This figure shows the average age of assets relative to their average service lives weighted by replacement value and are categorized by asset type. Any asset classes with unknown age have not been included in the analysis below.

Figure 18-3 Average Asset Age – BCRY



18.3 Levels of Service

Table 18-2 provides the LOS Framework for the City's BCRY assets. This table includes the current performance (as of the end of 2024), any aspirational targets set out by the City and proposed performance over the next 10 years. Proposed performance is determined based on what is appropriate for the City in consideration of the City's current 10-year planned funding provision in the Capital Plan as well as risks associated with various performance levels.

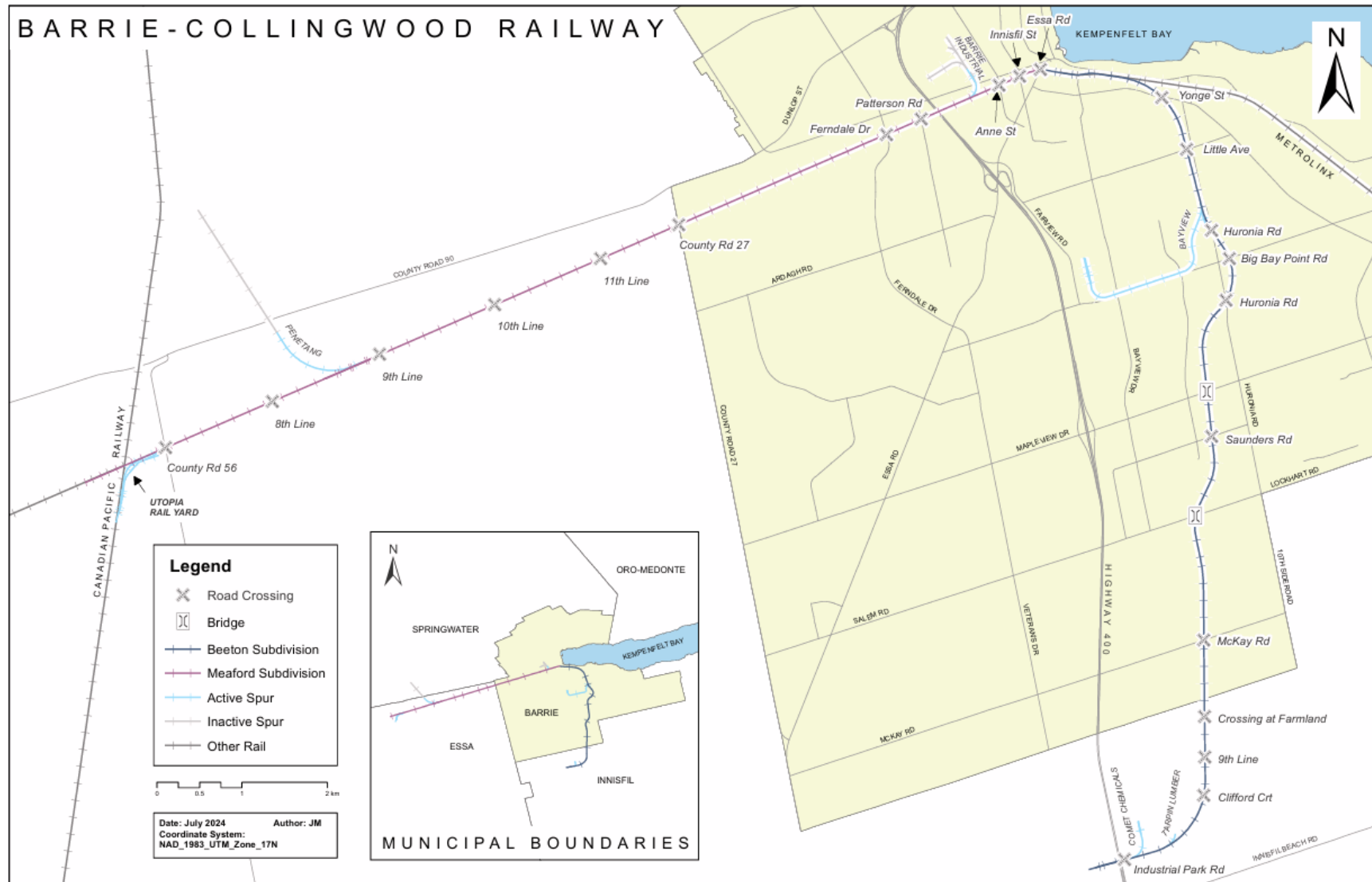
The map provided in Figure 18-4 provides a visual description of the rail connectivity throughout the City.

Table 18-2 LOS Framework - BCRY

Community LOS	Technical LOS			
	Metric(s)	Current LOS	Target LOS	Proposed LOS
Capacity & Use				
The BCRY is a short line railway providing freight services within its coverage area which extends from the track terminus just west of the Innisfil Heights industrial area in Innisfil Township, through Barrie, to the railway yard, maintenance facility, and transload ramp at County Road 56 and Side Rd. 30 in Essa Township, where it also connects to the CP Rail line. The railway includes a number of spurs and sidings to facilitate customer access to services.	Length of Active Track Map of Railway	32.8 km See Figure 18-4 for Overview Map	Same as current	 Same as current
Function				
The BCRY mandate is to provide rail service to all industries in and around Barrie and Simcoe County. BCRY can either arrange for the construction of a rail	Percentage of track with rail weight of 100 lb/yd or greater	57%	100%	 65%

Community LOS	Technical LOS			
	Metric(s)	Current LOS	Target LOS	Proposed LOS
siding directly into the customer's facility or alternatively provide trans-loading service at select locations in Barrie or at the Utopia Yard and arrange truck delivery to the customer's operation. BCRY currently operates one locomotive and provides rail service to a variety of shippers in the Barrie and Simcoe County areas. BCRY provides rail service to customers at the Utopia yard daily, and to its customers in Barrie on Monday and Thursday. The BCRY operates under the "Class 1" track speed classification. This influences the maintenance and operational requirements for the railway, as described further under the lifecycle strategy. In general, Class 1 is the lowest in terms of allowable speed, with a maximum operating speed of 16 km/h (10 mph) for freight services.	Percentage of [rail] bridges in the municipality with loading or dimensional restrictions. (O. Reg. 588/17)	50% (one bridge, at Lockhart Road. This restriction will be eliminated when this bridge is replaced in the next 20 years).	0%	 50%
Quality & Reliability				
The assets comprising the BCRY are, on average, in fair condition. The City and its contracted operator Cando have made progressive improvements to the rail infrastructure since taking over ownership and operations in 2012. Some components of the railway are currently in poor condition and the City is actively monitoring these in order to prioritize timely renewal.	% of Assets in fair-or-better condition	58%	75%	 67%
	For [rail] bridges in the municipality, the average bridge condition index value. (O. Reg. 588/17)	62	>60	 55

Figure 18-4 City of Barrie Rail Network



18.4 Risk Management Strategy

The City uses an established risk framework for quantifying the condition-based risk exposure of its assets to enable prioritization of renewal projects across asset classes and services. Risk exposure is the multiplication of the criticality or consequence of failure (CoF) by the probability of failure (PoF).

Bridges were assigned a COF rating of 5 to reflect the criticality of the service they provide. CoF ratings for other BCRY assets are based on the replacement value of each asset. This approach is based on the fact that the more costly a BCRY asset is, the more difficult it is to repair or replace in the event of a failure.

As shown in Figure 18-5, an estimated \$2.9 million of BCRY assets currently have a high-risk exposure (orange) and an estimated \$18.7 million of BCRY assets currently have a very high-risk exposure (red). The very-high risk assets include the Lockhart Bridge which has been reported in Poor condition, a major culvert located in Essa Township and the grade crossing at Big Bay Point Road.

Figure 18-5 Risk Exposure for BCRY Assets (\$M)

Risk exposure in year 2025 \$, millions									
Probability of Failure	Almost Certain	\$0.0	\$0.0	\$2.8	\$2.3	\$0.0	Risk Exposure	\$	%
	Very Likely	\$0.0	\$0.2	\$12.6	\$0.1	\$16.5	Very High	\$18.7	21.9%
	Moderate or Likely	\$0.0	\$1.9	\$14.5	\$0.7	\$0.0	High	\$2.9	3.4%
	Occasional or Possible	\$0.1	\$2.8	\$7.3	\$1.6	\$20.0	Moderate	\$33.3	38.9%
	Very Rare	\$0.0	\$0.5	\$1.6	\$0.0	\$0.0	Low	\$25.6	29.9%
		Insignificant	Minor	Moderate	Major	Catastrophic	Very Low	\$5.0	5.9%
		Consequence of Failure					Total	\$85.6	100.0%

Lockhart Rd. Rail Bridge Replacement and Upgrade

- The Lockhart Road Railway Bridge, located between Bayview Drive and Huronia Road, is over 100 years old and has dimensional constraints including limited height and width clearances. While the 2024 inspection recommends full reconstruction within 1–5 years, the bridge remains structurally adequate for current rail traffic, with interim renewal and monitoring measures recommended.
- Replacement planning should begin to support the future widening of Lockhart Road to five lanes and to address existing geometric limitations. The project must also include an upgrade to the adjacent BCRY culvert, as identified in the 2019 Drainage Master Plan.
- Preliminary cost estimates indicate a total of approximately \$34 million for the bridge and culvert upgrades and interim road works (excluding full five-lane expansion). An estimated \$1 million will be required in the short term to undertake planning, studies, and design work, which are expected to span several years.

Essa Township Stone Arch Culvert Replacement

- This culvert, located in Essa Township between 10th and 9th line, is over 100 years old and at risk of physical failure. Engineering assessments of this structure recommend its replacement or major rehabilitation within the next 1-5 years **with estimated costs of \$2 million or more.**
- Due to technical complexities, such as potentially needing to construct an access road in order to complete the construction of a new culvert, it is considered a high criticality asset. If the culvert were to fail, the railway service would suffer from a substantial disruption in service. City and Cando staff are monitoring the ongoing deterioration of the culvert and in the process of developing a plan for its replacement or rehabilitation.

For other BCRY assets that do not have a specific plan for the timing of asset renewals, the renewal need is estimated based on the average investment required to sustain the assets over the long term. A summary of the average annual renewal need for BCRY assets is shown in Table 18-3.

Table 18-3 Average Annual Renewal Need - BCRY

Asset Type	Estimated Costs (2025\$, millions) (10-year total)	Project included in Capital Plan	Timing
Lockhart Bridge & Culvert (planning and studies)	\$1.00	No	2026-2030
Essa Stone Arch Culvert	\$2.00	No	2025-2030
Other Culverts	\$2.85	No	2025-2034
Crossing - Big Bay Point Rd	\$0.65	No	2026-2029
Crossing - Anne St	\$0.4	No	2030-2034
Crossing - Essa Rd.	\$2.90	Yes	2025-2027
Total	\$9.80 (\$0.98 million/year)		

18.5.2 Growth Forecast

As the City grows, new and expanded infrastructure is required to ensure provision of services. In the case of the BCRY, no expansion of the existing railway is currently planned. The primary impact of population growth on BCRY infrastructure is the need to expand the City's roads to accommodate increased traffic. Where roads are widened, or traffic otherwise increases, railway grade crossings must also be upgraded to expand the crossing infrastructure and/or to improve the crossing control assets to maintain safety at the crossing. This might include upgrading a passive crossing to an active crossing by installing signals and/or gates. Costs related to crossing upgrades are captured as part of the road reconstruction cost included in Section 10 - Transportation.

18.5.3 Upgrade Forecast

The City is in the process of upgrading the BCRY tracks and turnout assets to 100lb/yd or greater rail weights in order to keep up with industry standards and ensure that the railway can support customer needs. This work is being undertaken through annual operating programs. At the current rate of annual upgrades, the complete upgrade of all BCRY track and turnouts is anticipated to take several years to complete.

18.5.4 Operations and Maintenance Forecast

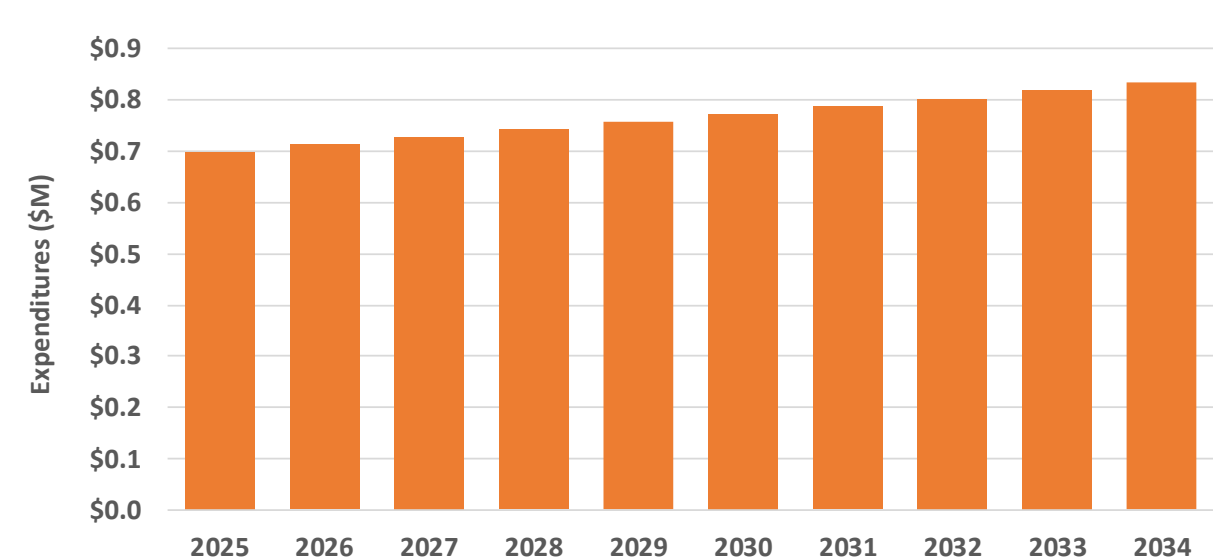
BCRY operations and maintenance activities are managed by the operations department, in collaboration with the operating contractor Cando, and funded through operating budgets. These activities include the day-to-day operations of the railway such as maintenance and operation of the locomotive (not City-owned), transloading, switching, and running railcars to and from customers on the BCRY line, as well as inspections, maintenance, and repair activities on the City-owned BCRY assets. Operations and maintenance work is critical for ensuring the continued reliability of BCRY assets and meeting the proposed service levels.

Operations and maintenance activities include:

- Operation and maintenance of the locomotive
- Switching operations
- Transloading operations
- Inspections, maintenance, and repair of City-owned BCRY assets
- Ballast renewal and replacement,
- Fence installation
- Tie replacement
- Rail replacement
- Switch renewal
- New sign installations

Current operating budgets, with the addition of annual increases identified through the operating contract, are expected to be sufficient to sustain current service levels and achieve proposed improvement to function (track weight upgrades) and reliability (track and switch condition). Figure 18-6 shows the Operations and Maintenance needs over the next 10 years for BCRY assets. To meet proposed service levels over the next 10 years, the Operating Budget is estimated to need to increase at an average annual rate of 2.0%.

Figure 18-6 Operations and Maintenance Needs Forecast – BCRY



18.6 Financing Strategy

The financial analysis considers the affordability of the proposed service levels based on the funding available in the 10-year Capital Plan compared to the forecasted needs.

The funding available for renewal of BCRY infrastructure is estimated to be an average of \$0.29 million per year over the next 10 years based on the City’s Capital Plan (\$2.9 million total). As discussed in Section 18.5.1, the estimated average annual renewal need is \$0.98 million per year to meet proposed service levels (\$9.8 million total). This results in an investment gap of \$0.69 million per year, assuming that the City’s 10-Year Capital Plan is funded as currently planned, and that the City has the resources to carry out the projects as currently planned.

Table 18-4 summarizes the financial sustainability and affordability for growth, renewal, upgrade, and O&M activities. In terms of operations and maintenance, the Operating Budget is estimated to need to increase at an average annual rate of 2.0% to meet proposed service levels over the next 10 years.

Table 18-4: 10-Year Financial Sustainability of Proposed Service Levels

Asset Lifecycle	Average Annual Forecast Needs	10-Year Capital Plan Average Annual Investment	Average Annual Investment gap	Potential Impacts
Capital Growth	N/A	N/A	N/A	N/A
Capital Upgrade	Included under O&M	Included under O&M	Refer to O&M	N/A

Asset Lifecycle	Average Annual Forecast Needs	10-Year Capital Plan Average Annual Investment	Average Annual Investment gap	Potential Impacts
Capital Renewal	\$0.98M/year	\$0.29M/year	\$0.69M/year	Deterioration in condition of assets.
Operations and Maintenance	\$0.7 M in 2025 to \$0.8 M in 2034	\$0.7 M in 2025	2.0% average annual increase	Failure to increase resources to operate and maintain new assets will result in reduced service levels and increased risks for breakdowns and increased reactive maintenance

To manage the risk of the \$0.69 million renewal investment gap, the City must proactively monitor and inspect its bridges and implement timely mitigation strategies, such as interim repairs, as and when necessary. The City will continue to improve operational efficiency to support sustainability goals. The City can maximize the lifespan of its BRCY assets and minimize long-term costs by:

- Performing preventive maintenance that helps to prevent premature wear and costly repairs.
- Lifecycle planning and forecasting replacement needs based on usage patterns and historical maintenance data.

18.7 Recommendations for Continuous Improvement

Development of AM Plans is an iterative process that includes improving data, processes, systems, staff skills, and organizational culture over time. Continuous improvement recommendations include:

Table 18-5: AM Plan Improvement Recommendations – BCRY

AM Plan Section	Improvement Recommendation
State of Infrastructure	• Enhance the tracking of asset condition to help support renewal forecasts.
Levels of Service	• Continue to monitor the performance and levels of service for the BCRY and provide regular reports to Council and leadership to support informed decisions about railway needs and investments.
Risk Management	• Continue to proactively monitor the risk profile of the BCRY assets and develop risk management strategies as needed with the goal of minimizing risks to the City.

AM Plan Section	Improvement Recommendation
Lifecycle Management	• Continue to proactively assess and plan forecasted renewal needs and identify in Capital Plans as appropriate (this should include creating a complete lifecycle forecast for all grade crossings and associated signal and gate infrastructure). • Create a process to regularly review warrants for grade crossing signalization upgrades based on up-to-date traffic counts. • Enhance the tracking of maintenance to help support renewal forecasts.
Financial Management	• Develop robust financial plans and risk management strategies to accommodate economic fluctuations and cost inflation. • Consider modifications to asset categorizations in the City's budgeting system to enable long term tracking of railway-related expenditures.