Asset Management Plan 2024

City of Orillia Land Acknowledgement

I would like to take this moment to respectfully acknowledge that the City of Orillia is situated on the traditional territory of the Anishnaabeg, specifically the Chippewas of Rama First Nation; is a member of the Chippewa Tri-Council and Three Fires Confederacy; and that it continues to be home to many diverse First Nations, Metis and Inuit Peoples.

As a City, we honour and value the significant historical and contemporary contributions of Indigenous Peoples to the area, which is home to one of North America's oldest human developments, the Mnjikaning Fish Weirs.

We acknowledge that this land is covered by the Williams Treaties and Upper Canada Treaties signed by our governments on behalf of the Anishinaabe and Canadian Peoples, and was once part of the Coldwater-Narrows Reserve.

The City of Orillia is committed to building a welcoming, caring, inclusive and accessible community for all citizens, which includes helping the community understand, acknowledge, and take action toward real truth and reconciliation so that we can move forward together with respect, harmony and dignity for all Indigenous Peoples of the past, present, and future.

Thank you. Merci. Miigwech

Mayor Don McIsaac

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Note on Accessibility

The alternative text provided may not fully detail the data contained within some figures. For tables of the data within those figures in a more accessible format, please visit the webpage https://www.orillia.ca/en/city-hall/asset-management.aspx

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1.0 Executive Summary

1.0 Executive Summary

Municipal infrastructure plays a crucial role in fostering the economic, social, and environmental well-being and development of a community by delivering essential services. Asset management aims to provide a defined level of service most cost-effectively while managing risks and accommodating growth. This involves creating and implementing strategies for the entire lifecycle of assets and engaging in long-term planning.

Asset management involves capturing a snapshot of current conditions, utilizing up-to-date information to inform future funding allocations and predict asset conditions. Alterations in the type or frequency of condition assessments can lead to varying asset requirements. Changes in funding levels, service levels, or lifecycle events also impact condition modeling. If assets undergo unwarranted lifecycle management activities or replacements earlier than planned, it can affect asset management forecasts.

For instance, resurfacing a road section before its scheduled date instead of a lower-condition section can disrupt the forecasted required infrastructure investments. Such deviations can decrease the accuracy of reports and potentially shift the City's asset spending from surplus to deficit. Adhering to 10-year capital plans grounded in robust asset management practices is recommended, with deviations only justified in cases like emergency repairs.

As a municipality experiencing growth, it's critical to handle expansion efficiently, sustainably, and with financial responsibility all while maintaining the existing assets of the City. This enables the long-term prosperity of both the City and its residents.

This Asset Management Plan (AMP) has been recently updated from its 2021 version and is designed to align with the City's mission of progressiveness and sustainability. The mission includes the commitment to offering an exceptional quality of life, fostering a vibrant culture, enhancing beautiful waterfronts, and creating a compassionate, welcoming, and inclusive community.

1.1 Scope of Assets

This plan outlines existing practices and strategies for overseeing public infrastructure and suggests improvements for further refinement. By adopting effective asset management strategies, the City can operate a well-managed state of public infrastructure, promoting the sustainable delivery of municipal services. The initial phase of developing an AMP involves comprehending the scope of assets under the City's management.

This plan includes the following asset categories:

Transportation	Facilities
Water	Solid Waste
Wastewater	Parks, Recreation, Culture, and Tourism
Stormwater	Municipal Law Enforcement and Parking
Fire Services	Information Technology
Fleet and Transit	Natural Assets

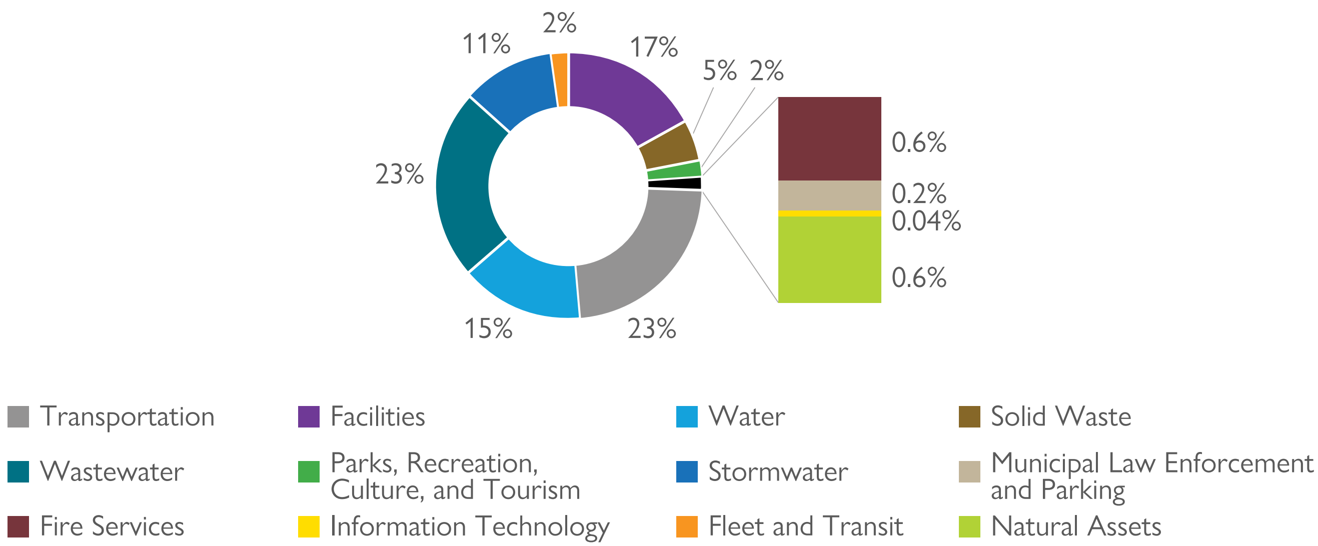
With the development of this plan, the City has achieved compliance with the July 1, 2024 requirements within Ontario Regulation 588/17. There are additional requirements for proposed levels of service that must be met by July 1, 2025.

1.2 State of Infrastructure Findings

The State of Infrastructure assesses and categorizes the asset portfolio based on estimated replacement cost, condition, and remaining service life. Asset conditions are usually rated on a five-point scale, ranging from Very Poor to Very Good, following industry-standard best practices. This consistent scale ensures a baseline comparability across various asset categories. The City is consistently enhancing its approach to assessing asset conditions and estimating replacement costs.

As of 2023, the City's asset portfolio holds an estimated replacement cost of approximately $2.06 billion (in 2023 dollars). The following figure displays the percentage distribution of the total replacement cost across different asset categories. This equates to an estimated replacement cost per household of around $142,500.

FIGURE 1: Total Replacement Cost by Category

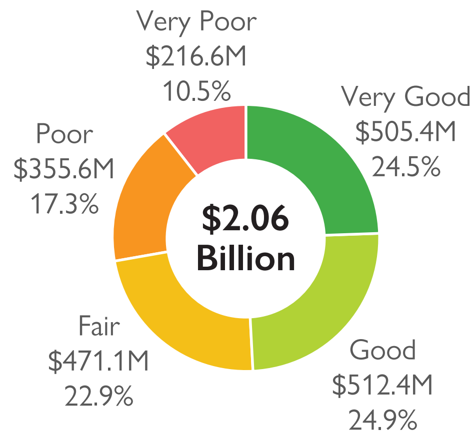


The value of an asset can be assessed either through its replacement cost or by considering its overall benefit to the wider community. However, this plan solely focuses on the replacement cost of assets. Determining the replacement cost involves considering the asset category and utilizing the best available information. When applicable, values from recent projects and procurement activities serve as the foundation for valuation. Alternatively, replacement cost estimates can be calculated using the historical cost, and the Consumer Price Index, the Non-Residential portion of the Building Construction Price Index, or expert knowledge in the relevant field.

Approximately 72.3% of assets fall within the categories of Very Good, Good, or Fair condition. While most assets are in Very Good or Good condition, ongoing investment in both capital and operating lifecycle management strategies is essential. This is necessary to address assets in poorer condition states and to sustain service levels. A comprehensive understanding of the current asset condition is crucial for effective asset management planning and the optimal utilization of lifecycle management strategies.

Strategic investments in lifecycle management, executed at the right time, play a pivotal role in minimizing the overall lifecycle cost of assets. This plan employs a blend of proactive lifecycle management strategies and replacement-only strategies. This approach helps determine the most cost-effective options to uphold the current level of service. The following figure displays the distribution of the total replacement cost across the five condition ratings.

FIGURE 2: Total Replacement Cost by Condition Rating



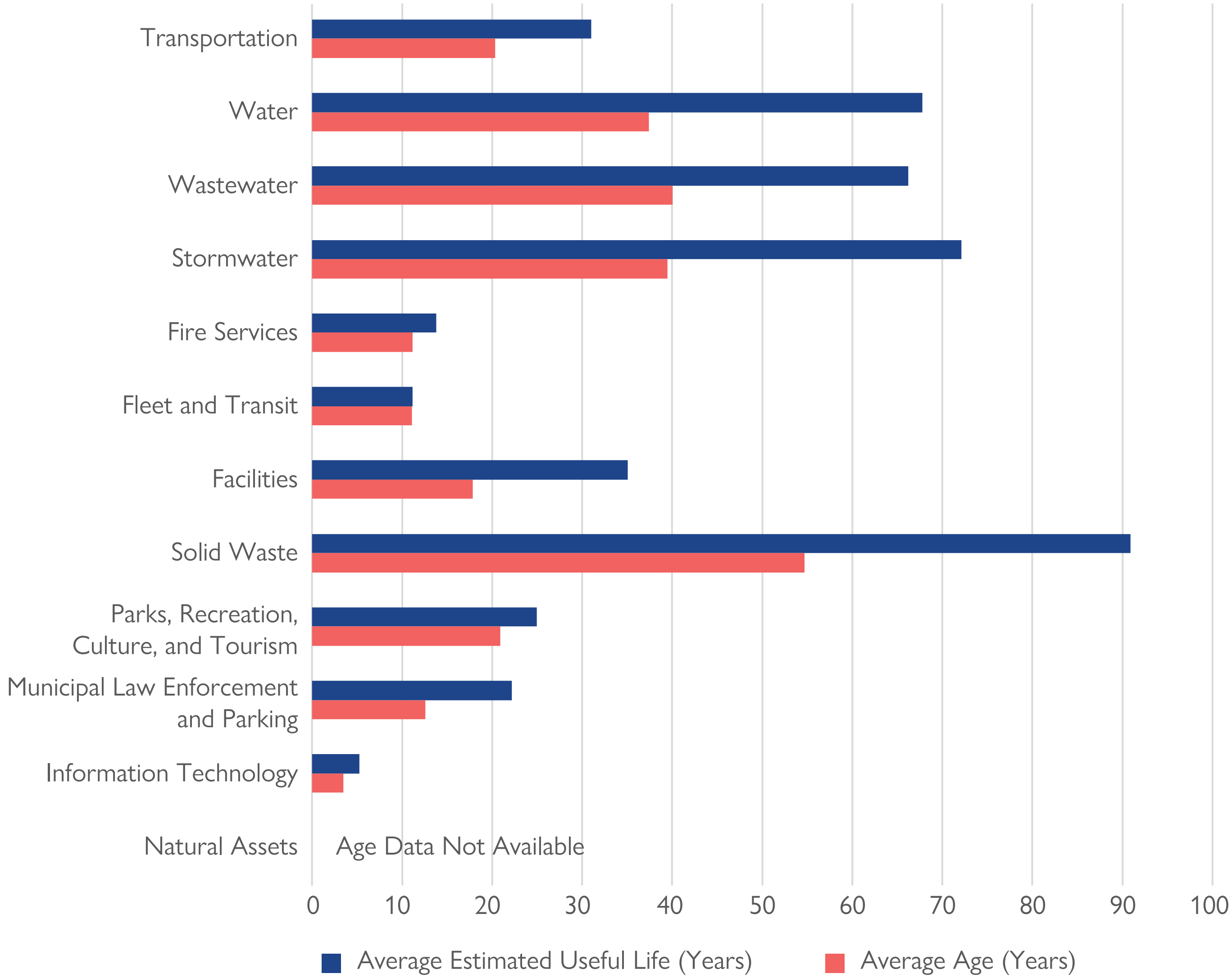
Condition data has been assessed for 64% of the assets covered in this plan. For the remaining 36% of assets, their age is utilized as an approximation for condition. Such data gaps are typical in municipal settings, especially for assets like underground infrastructure that are challenging to inspect due to cost and safety concerns. Relying on asset age might not accurately reflect their true condition, thus emphasizing the importance of assessments in asset management planning—a recurring recommendation in this plan.

It's crucial to acknowledge instances where asset records are limited, or data confidence is low. The effectiveness of this plan is directly tied to the available information. Efforts are underway to address these gaps, with staff actively working to collect more data and records. This ongoing data improvement initiative aims to enhance the confidence level in future iterations of this plan.

This plan serves as a snapshot in time, built upon the best available processes, data, and information accessible to the City at that particular moment. It's imperative to recognize that strategic asset management planning is a continuous and dynamic process, demanding ongoing improvement and dedicated resources. The document acknowledges areas of known deficiencies, and recommendations for addressing these shortcomings in future AMPs are outlined. This underscores the commitment to refining and advancing asset management practices over time.

Each asset has an Estimated Useful Life (EUL), which is the estimated amount of time that an asset is anticipated to be able to provide the target level of service. The EUL ranges from several months for frequently replaced assets such as sensors in the drinking water distribution system to 170 or more years for well-maintained heritage facilities. The following figure illustrates the average age and EUL for each category of assets.

FIGURE 3: **Average Asset Age and Estimated Useful Life by Category**



A considerable number of the City's assets are either at or nearing the end of their estimated useful life, reflecting their age with declining condition ratings. As assets age and undergo deterioration, operations and maintenance costs tend to rise until eventual renewal, rehabilitation, or replacement becomes necessary.

While strategic lifecycle management activities can sometimes extend an asset's life beyond its original estimated useful life, failure to undertake proper activities may result in the need for replacement or premature failure before reaching the end of its estimated useful life.

1.3 Lifecycle Management Strategies

Lifecycle management activities encompass a planned set of actions and endeavours aimed at maintaining current service levels and optimizing the economic life of assets. These specific actions are referred to as Lifecycle Events and cover various stages in the typical lifespan of an asset, including:

Acquiring the asset:

- Initiating the asset into the system.

Maintenance and operations:

- Ensuring the asset delivers the intended level of service throughout its useful life.

Renewal and rehabilitation activities:

- Undertaking actions to extend the asset's useful life.

Replacement and disposal activities:

- Managing the transition at the end of an asset's useful life.

Non-infrastructure solutions:

- Implementing policies and procedures that mitigate risk, reduce costs, or modify service delivery outcomes, providing alternatives beyond physical infrastructure.

In each asset category, there are optimal times for performing lifecycle activities, assuming a sustainable level of funding is available. Proactive utilization of lifecycle management activities at these strategic points is generally more cost-effective compared to a reactive "worst-first" approach, where assets in the poorest condition are replaced as issues arise. The City employs diverse methods and models to forecast the lifecycle of asset conditions over time. By utilizing these predictive tools, the City can pinpoint when assets necessitate funding to sustain the current level of service, enabling a more proactive and cost-efficient approach to asset management.

Continuing to utilize assets without sufficient funding for critical lifecycle management activities puts the City in a less-than-ideal situation. This circumstance may force the City to accept a reduced level of service, leading to increased lifecycle costs and a higher risk of asset failure. Despite financial constraints, the City remains dedicated to maintaining assets to meet regulatory requirements. This commitment extends to upholding standards related to public health, water quality, road safety, and environmental protection. Regulatory compliance remains a top priority, underscoring the City's ongoing commitment to essential public services and safety.

1.4 Levels of Service

"Levels of service are the parameters, or combination of parameters, that reflect the social, political, environmental and economic outcomes that the organization delivers. The parameters can include safety, customer satisfaction, quality, quantity, capacity, reliability, responsiveness, environmental acceptability, cost and availability." (ISO 55000:2014)

The primary purpose of the City's assets is to provide services to its users. Levels of service act as a metric to gauge the actual service delivered, ensuring that decisions are based on the nature and quality of the service rather than solely on the condition of an asset. These measures serve to capture the type of service provided, aligning with the values and preferences of stakeholders in the community.

Monitoring levels of service indicators over time allows staff, Council, and stakeholders to record and assess the City's progress toward its goals. It establishes a correlation between funding levels and the performance of the City's assets. By doing so, the City can obtain a comprehensive understanding of the costs associated with delivering services to the community. Furthermore, it provides a consistent framework to evaluate the long-term impacts of decision-making processes.

This plan incorporates measures mandated by Ontario Regulation 588/17, along with others deemed significant by City staff for measurement and evaluation. The City commits to ongoing development and refinement of levels of service measures and targets through this plan and future revisions, facilitated by public engagement opportunities.

In alignment with the July 1, 2025, deadline set by Ontario Regulation 588/17, the City is actively establishing proposed levels of service for a 10-year period. These proposed levels will adhere to the SMART criteria—specific, measurable, achievable, relevant, and time-based. The establishment process considers community expectations, Council priorities, fiscal capacity, regulatory requirements, corporate goals, climate change impacts, and long-term sustainability.

Once set, the City will outline a lifecycle management and financial strategy to attain these targets. If a funding shortfall arises, the City is committed to explaining how the associated risks of not completing all identified strategies will be managed. This ensures transparency and accountability in achieving established levels of service.

1.5 Financial Summary

To execute the necessary lifecycle management activities, a sustainable level of funding is critical. Sustainable funding represents the annual average amount required to be spent or saved to maintain assets at their existing level of service. When a funding deficit occurs, asset management strategies are underfunded, leading to inadequate maintenance, renewal, or replacement of assets and the accumulation of a backlog of work.

Effective asset management planning, aimed at providing a sustainable level of funding, ensures that assets are well-managed, any backlog of work is addressed, and sufficient reserves are set aside for future asset needs. The ultimate goal is to achieve a state where no long-term backlog exists, allowing the City to deliver the desired level of service at the best value for money to the community in a sustainable manner.

To maintain the current level of service, clear existing backlogs, prevent further infrastructure backlogs, accommodate growth, and achieve long-term sustainability, the City's average annual capital funding requirement for the period 2024-2033 is $37.8 million. Based on the 2024-2033 10-Year Capital Plan, the City is allocating an average of $39.0 million towards capital projects related to the assets covered in this plan. Consequently, there is presently an annual funding surplus of $1.2 million. It's important to note that any adjustments to the 10-Year Capital Plan will impact the level of this surplus.

The following table illustrates the average annual capital funding surplus of $1.9 million for core assets and a funding deficit of $0.7 million for non-core assets respectively per year over the 2024-2033 period.

Asset management requires a long-term perspective to effectively manage assets with extended useful lives. A 10-year forecast period may not fully capture the extended needs of the City's assets. By extending the forecast period and projecting the average annual capital funding requirement over a more extended timeframe, it becomes possible to assess different financial strategies and identify the most cost-effective approach for meeting the long-term needs of the assets.

In this context, a 50-year forecast of sustainable capital requirements has been generated to offer insights into the City's anticipated needs over the next five decades. This extended forecast enables a comprehensive evaluation of financial strategies, supporting the identification of the best-value approaches for addressing the long-term requirements of the City's assets.

TABLE 1: **2024-2033 Average Annual Capital Funding Summary – 10-Year Sustainable Requirement**

Set of Assets	10-Year Sustainable Annual Funding Requirement	2024-2033 10-Year Capital Plan Average Per Year	2024-2033 Average Funding Surplus or (Deficit)
Core Assets	$25.5M	$27.4M	$1.9M
Non-Core Assets	$12.3M	$11.6M	($0.7M)
All Assets	$37.8M	$39.0M	$1.2M

Comparing the differences in the 10-year and 50-year forecasts, the average annual capital funding requirement sees an increase of $3.9 million for core assets and $0.5 million for non-core assets. This results in the average asset needs over the 2024-2073 period being $4.4 million higher than the average asset needs over the 2024-2033 period. The following table provides a summary of the 50-year sustainable annual capital funding requirement and the revised 2024-2033 average capital funding surplus or deficit.

TABLE 2: 2024-2033 Average Annual Capital Funding Summary – 50-Year Sustainable Requirement

Set of Assets	10-Year Sustainable Annual Funding Requirement	2024-2033 10-Year Capital Plan Average Per Year	50-Year Sustainable Annual Funding Requirement	2024-2033 Average Funding Surplus or (Deficit)
Core Assets	$25.5M	$27.4M	$29.4M	($2.0M)
Non-Core Assets	$12.3M	$11.6M	$12.8M	($1.2M)
All Assets	$37.8M	$39.0M	$42.2M	($3.2M)

Considering the higher capital funding requirements projected in the 50-year forecast, the City changes from an overall surplus to an overall deficit over the 2024-2033 period. The annual surplus diminishes to an annual deficit of $3.2 million when accounting for both core and non-core assets collectively. Both core and non-core assets now experience a funding deficit.

Looking beyond 2033, assuming the backlog is cleared by 2034, the subsequent years from 2034-2073 would no longer bear the capital funding requirement associated with the backlog. The following table provides a summary of the updated 50-year sustainable annual capital funding requirement, now excluding the backlog, along with the revised funding surpluses or deficits for the 2034-2073 period.

TABLE 3: 2034-2073 Average Annual Capital Funding Summary – 50-Year Sustainable Requirement

Set of Assets	10-Year Sustainable Annual Funding Requirement	2024-2033 10-Year Capital Plan Average Per Year	50-Year Sustainable Annual Funding Requirement after Backlog Cleared	2034-2073 Average Funding Surplus or (Deficit) after Backlog Cleared
Core Assets	$25.5M	$27.4M	$22.4M	$5.0M
Non-Core Assets	$12.3M	$11.6M	$12.1M	($0.5M)
All Assets	$37.8M	$39.0M	$34.5M	$4.5M

It is important to consider several unique and high-cost capital projects, such as the Harvie Hill Reservoir project, Laclie Street reconstruction, Jarvis Street, West Street, and Brian Orser Arena reconstruction, all scheduled for the 2024-2028 period. Assuming that the average capital spending from the 2024-2033 capital plan remains constant until 2073 is a reasonable assumption only if the historically high level of average capital spending persists beyond 2033.

If the current level of capital funding is not sustained, the City may face a funding deficit in the long-term for certain asset categories. Such an outcome could potentially lead to the reestablishment of backlogs and necessitate future trade-offs between the level of service, risk, and affordability. This underscores the importance of carefully assessing and sustaining capital funding levels to ensure the continued well-being of the City's assets over the long-term.

As the City of Orillia experiences growth, there is an anticipation of incremental increases in the demand for services and the number of assets. Managing a growing number of assets will necessitate an increase in the total cost of funding operations and maintenance lifecycle management strategies to sustain the current level of service.

The following table provides a summary of the 10-year forecast of operations and maintenance costs for all assets covered in this plan over the 2024-2033 period, taking into account the impacts of growth.

TABLE 4: **2024-2033 Annual Operations and Maintenance Summary**

Set of Assets	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033
All Assets	$31.6M	$32.2M	$32.8M	$33.5M	$34.1M	$34.7M	$35.4M	$36.1M	$36.8M	$37.5M

1.6 Climate Change Considerations

The City's asset management system and this plan actively contribute to the City's environmental sustainability and climate change goals. In the face of ongoing climate change, the necessity for resilient and sustainable assets becomes critical. The City must assess climate risks, identify adaptation and mitigation opportunities, and integrate this information into the asset management process. This ensures the delivery of the desired level of service at the best value for money, fostering informed decision-making and strategic, long-term investments to manage the risks associated with the anticipated impacts of climate change.

Anticipated challenges in managing the impacts of climate change include:

Potential service disruptions:

- More frequent and prolonged disruptions due to increased frequency and severity of weather events.

Increased damage to infrastructure:

- Higher maintenance costs attributed to the damage and impact of severe weather events.

Water quality challenges:

- Potential deterioration in the quality of water, especially during hot weather, leading to increased demand. Water treatment facilities may struggle to meet all standards and objectives for drinking water quality.

Addressing these challenges requires a comprehensive approach that aligns with environmental sustainability goals and incorporates climate resilience into the City's asset management strategies.

The City is actively considering a range of adaptation and mitigation measures in response to the challenges posed by climate change. These measures aim to enhance resiliency while managing affordability.

Current measures include:

Incorporating new best practices and technology:

- Implementing advancements in the design, construction, and maintenance of assets to increase their resilience.

Altering inspection frequency:

- Adjusting the frequency of inspections to better support overall resiliency.

Traffic reduction for environmental benefits:

- Implementing measures to reduce vehicle traffic, promoting a variety of transportation options to minimize road wear and lower community greenhouse gas emissions.

Potential future measures include:

Utilization of lower embodied carbon materials:

- Adopting materials with lower embodied carbon to potentially reduce the carbon footprint of infrastructure.

Coordinated infrastructure planning with stormwater data:

- Coordinating infrastructure design, construction, and maintenance with updated stormwater data and flood mapping to enhance resilience during stormwater events.

These measures reflect a proactive approach, demonstrating the City's commitment to sustainability, resilience, and adapting to the challenges posed by climate change. They align with global efforts to foster environmental responsibility and address the impacts of a changing climate.

1.7 Next Steps and Recommendations

The City's commitment to continuous improvement in its asset management program is evident through the following recommendations:

Review, update, and enhance asset inventory:

- Regularly update and improve the asset inventory with new and relevant information to ensure accuracy and completeness.

Improve integration with GIS mapping:

- Enhance integration of asset information with Geographic Information System (GIS) mapping to streamline capital planning processes and facilitate coordination between different asset categories.

Align condition assessment projects with industry standards:

- Ensure that condition assessment projects adhere to industry standard methodologies, promoting improved benchmarking and consistent condition ratings over time.

Review and implement lifecycle management strategies:

- Continuously review, develop, and implement lifecycle management strategies that offer the best value for money across all asset categories.

Adjust project scheduling in 10-year capital plans:

- Review existing 10-year capital plans and propose changes in project scheduling to align project priorities with levels of service targets effectively.

Update estimated useful lives of assets:

- Continually adjust estimated useful lives of assets to better reflect observed longevity in service, ensuring accuracy in planning and budgeting.

Engage the community in asset management:

- Foster community engagement in the asset management program through various opportunities for public involvement. Seek community input on proposed levels of service, considering community values, priorities, technical feasibility, risk, and affordability.

These recommendations underscore a proactive approach to enhance asset management practices, promoting transparency, efficiency, and alignment with community values and expectations.

1.8 Continuous Improvement

The City is committed to continuous improvement in asset management, including improvements in data collection, decision-making processes, transparency, and strategic planning. The goal is to strengthen the City's asset management procedures, surpassing legislated requirements, and aligning with industry best practices. Notably, the City is dedicated to increasing the resiliency of its infrastructure in anticipation of climate change impacts, while aiming to minimize the climate impact associated with delivering the desired levels of service to the community.

This commitment reflects a forward-thinking approach, acknowledging the changing nature of infrastructure management and the need to proactively address challenges posed by climate change. By exceeding regulatory mandates and aligning with industry best practices, the City is poised to enhance the overall effectiveness and sustainability of its asset management practices.

2.0
Introduction and Context

2.0 Introduction and Context

2.1 Overview of Asset Management

"Asset management involves the balancing of costs, opportunities and risks against the desired performance of assets to achieve an organization's objectives." (ISO 55000)

As defined in the City's Strategic Asset Management Policy (SAMP), asset management means a combination of management, financial, economic, engineering, and other practices applied to physical assets with the objective of providing the required level of service in the most cost-effective manner at an acceptable level of risk. It involves data-driven decision-making and actions throughout the lifecycle of assets.

Asset management is a changing and iterative process that allows an organization to formulate, implement, and consistently enhance a comprehensive, long-term strategy for managing and investing in its assets. This happens in every stage in the lifecycle of an asset, starting from recognizing a community need, through design, acquisition, maintenance and operations, renewal and rehabilitation, and replacement, to the eventual disposal of the asset and addressing any associated liabilities. This structured approach serves as a decision-making framework, enabling the comparison of opportunities, prioritization of investments, and ensuring optimal value for money.

This plan focuses on the capital costs associated with managing assets over their lifecycle. These costs extend over many decades, demanding careful planning and foresight to distribute the financial responsibility fairly among generations and various users.

The goal is to maximize benefits, manage risk, and deliver satisfactory levels of service to the community in a way that is both sustainable and clear. Good asset management practices are fundamental to achieving sustainable and resilient communities.

2.1.1 What is an Asset?

Formally, an asset is *"any item, thing, or entity that has potential or actual value to an organization" (ISO 55000).* In practice, municipal assets, including infrastructure, exist to deliver services to the community to support growth, and the economic, social, and environmental health of the community.

Assets are vital components of the municipality, playing a crucial role in fostering a high quality of life in the City. They are instrumental in attracting new residents, visitors, and businesses to our community.

2.1.2 Purpose of an Asset Management Plan

The core goals of an AMP are to:

- Record the current value and condition of assets;
- Outline the existing level of service delivered by the assets;
- Recognize the strategies in use for managing these assets; and
- Propose enhancements for better management.

Using the best available information, the City developed this plan for the long-term management of capital assets to ensure that they are well-managed to support the sustainable delivery of municipal services.

2.1.3 Development of an Asset Management Plan

This plan was crafted by leveraging the City's asset management database, incorporating insights from various background studies, reports, and input from both staff and stakeholders.

The typical steps involved in developing an AMP are as follows:

1. **Collect and Organize Information:**
   - Gather and organize data on the assets to be covered, including details such as age, estimated useful life, location, and current replacement cost. Update replacement costs when necessary, using historical data, industry benchmarks, or applicable inflation indices.

2. **Define and Assess Asset Condition:**
   - Utilize standardized methodologies to define and assess the condition of assets. Where industry-standard methodologies are available, the City aims to adopt them. In cases with limited information, a simplified age-based condition methodology is applied.

3. **Establish Current Levels of Service:**
   - Develop, define, document, and measure the current levels of service provided by the assets.

4. **Document Lifecycle Management Strategies:**
   - Develop, define, and document the current lifecycle management strategies required to uphold the existing level of service.

5. **Forecast Capital Requirements:**
   - Forecast the capital spending necessary to maintain the current level of service.

6. **Create Asset Management Plan Report:**
   - Compile the AMP report to communicate the current state of assets and levels of service to decision-makers and stakeholders. Provide recommendations for improvements in strategies and present options that balance cost, opportunities, and risks.

2.1.4 The Plan's Relationship to Other Municipal Plans and Strategies

The asset management program at the City, as outlined in this plan, aligns with the priorities set in other City plans and policy documents. The asset management process plays a crucial role in incorporating asset-related information into all facets of municipal long-term planning. It contributes to realizing the City's strategic objectives and vision. By adopting a comprehensive approach, these documents mutually reinforce and advance each other's goals.

At a minimum, this plan supports the following City plans and studies:

- Official Plan
- Strategic Asset Management Policy
- Development Charges Background Study
- 10-Year Capital Plans and Annual Capital Budgets
- Multi-Modal Transportation Master Plan
- Water and Wastewater Master Plans
- City of Orillia Drinking Water System Long Range Financial Plan
- Stormwater Master Plan
- Fire Master Plan
- Parks, Recreation and Culture Master Plan and Trails Master Plan
- Waste Minimization Plan
- Orillia's Climate Future (Climate Change Action Plan)

2.1.5 What This Asset Management Plan is Not

The intent of this plan is not to function as a substitute for a long-term financial plan or a capital prioritization plan, nor to act in place of master plans, comprehensive service reviews, background studies, or rate studies. This plan is intended to provide stakeholders with a summary of the state of assets at a particular point in time and the long-term trends of what is needed to maintain the current level of service.

This plan documents trends and generalized infrastructure requirements with the focus on the capital needs of assets. This plan does not focus on operating revenues and needs beyond what is required for compliance with Ontario Regulation 588/17. This plan does not consider how the current and future needs of assets are to be funded. This plan does not provide a capital project schedule detailing the timing of lifecycle management strategies for individual assets.

2.2 Key Concepts in Asset Management

An effective asset management system is comprised of several key components, including lifecycle management strategies, levels of service, and risk management.

2.2.1 Lifecycle Management Strategies

The condition or performance of most assets will deteriorate over time. A wide range of factors affect this process, including material choice, location, usage, maintenance history, and environment. As assets deteriorate, there is a negative impact on the ability of the asset to continue to fulfill its intended function. This may come in the form of increased cost, increased risk, a lower level of service, or service disruption.

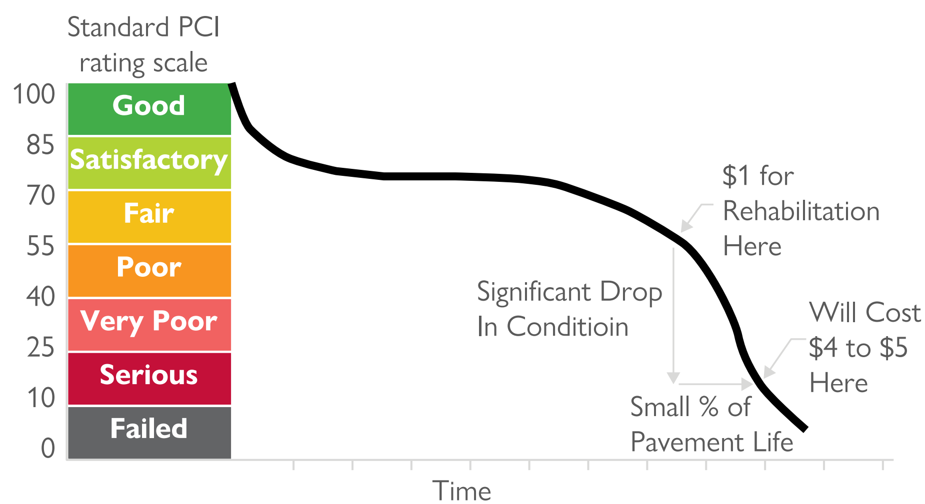
Lifecycle management activities encompass a series of planned actions designed to uphold current service levels and ensure optimal value for money from assets. These planned actions are referred to as Lifecycle Events and cover the standard lifecycle of an asset, including:

- Acquiring the asset;
- Maintenance and operations;
- Renewal and rehabilitation activities to extend the useful life;
- Replacement and disposal activities at the end of an asset's useful life; and
- Non-infrastructure solutions such as policies and procedures that mitigate risk, reduce costs, or modify service delivery outcomes.

The condition of assets typically does not degrade at a consistent rate over time. Some assets, such as roads, tend to degrade slowly for an initial portion of their estimated useful life, and then deteriorate rapidly once the condition reaches a tipping point.

For example, if small cracks in an asphalt road surface are left untreated over multiple winters and many freeze-thaw cycles, the cracks tend to progress first into more extensive cracking and small potholes, then into deeper and wider potholes, and finally into a deteriorated road base that can only be fixed through expensive full-depth resurfacing or reconstruction. The cost to remedy the deficiency increases significantly as the deterioration progresses. Spending a smaller amount earlier can lead to a cost avoidance of spending a much larger amount later at the trade-off of only a small portion of asset life compared to the large drop in asset condition. This choice of treatment timing versus treatment cost is illustrated as an example in the following figure.

FIGURE 4: **Colorado State University PAVER Software PCI Rating Scale**



Beyond the mentioned lifecycle events, the City must also factor in network expansion and service enhancement activities. This is essential to effectively handle growth and fulfil elevated levels of service when the need arises.

Ontario Regulation 588/17 requires that the City assesses all potential lifecycle activity options. A requirement is to identify the set of lifecycle activities that may be undertaken to maintain the current levels of service at the best value for money. Understanding the impact that these activities have on the lifecycle of assets enables staff to make improved recommendations on how to maintain the desired level of service.

AMPs must identify the lifecycle activities resulting from the lifecycle management strategy and include a 10-year capital forecast. Asset performance can typically be sustained through a combination of maintenance, operation, and renewal activities in the short term; however, eventually replacement is required.

2.2.2 Levels of Service

"Levels of service are the parameters, or combination of parameters, that reflect the social, political, environmental and economic outcomes that the organization delivers. The parameters can include safety, customer satisfaction, quality, quantity, capacity, reliability, responsiveness, environmental acceptability, cost and availability." (ISO 55000:2014)

The City's assets are here to deliver services to its users. Levels of service serve as a gauge, measuring the actual quality of service provided. This ensures decisions are based on the nature and excellence of the service rather than just the condition of an asset. These levels of service give a snapshot of the type of service offered, representing the values and preferences of the community stakeholders.

Tracking levels of service measures over time allows for staff, Council, and stakeholders to document and review the City's progress towards our goals. It also provides a connection between funding levels and the performance of the City's assets.

The measures included in this plan include a combination of those required by Ontario Regulation 588/17 and others determined by City staff to be worth measuring and evaluating. The City measures the level of service provided at two levels: Community Levels of Service and Technical Levels of Service.

2.2.2.1 Community Levels of Service

Community levels of service are a simple, plain language description or measure of the service that the community receives. This may also include maps illustrating the geographic extent of the City's assets.

2.2.2.2 Technical Levels of Service

Technical levels of service are a measure of key technical attributes of the service being provided to the community. These include primarily calculated values and tend to reflect the impact of the municipality's asset management strategies on the physical condition of assets, or the quality or capacity of the services they provide.

As this plan is first and foremost a communication tool, the City has chosen to include technical levels of service metrics that serve as inputs into the lifecycle management strategies rather than only reporting on outputs of the strategies. This includes activities such as inspection frequency, where an inspection alone is not a service that the community experiences, but it is an important part of the process that determines levels of service outcomes.

2.2.2.3 Current and Proposed Levels of Service

This plan focuses on the measurement of the current levels of service provided to the community to comply with the July 1, 2024 Ontario Regulation 588/17 deadline requirements.

The City is in the process of establishing proposed levels of service over a 10-year period to ensure compliance with the July 1, 2025 Ontario Regulation 588/17 deadline requirements.

The City will ensure that the proposed levels of service will be specific, measurable, achievable, relevant, and time-based. They are being established with consideration to community expectations, Council priorities, fiscal capacity, regulatory requirements, corporate goals, climate change impacts, and long-term sustainability. Once established, the City must identify a lifecycle management and financial strategy that allows for these targets to be achieved. If a funding shortfall exists, the City must provide an explanation of how the risks associated with not completing all the identified strategies will be managed.

2.2.3 Risk Management Strategies

The City prioritizes asset renewals, rehabilitations, and replacements using a risk-based approach. The risk assessment methodology varies across different categories of assets. However, it is generally based on the importance of each asset in terms of the likelihood of an asset failing and the consequence of that asset failing.

Historically, municipalities, including Orillia, would generally follow a "worst-first" approach to prioritizing which assets to allocate funding to. Rather than prioritizing assets in the context of their importance to delivering services, assets in the worst condition were allocated funding first. This led to an underfunding of critical infrastructure, which municipalities are aiming to correct.

Not all assets are equal in their consequence of failure. Some hold more importance than others due to their higher impact on the community in the event of a failure. For instance, the closure of a low-traffic local road typically has a much lower impact compared to the closure of a high-traffic arterial road.

By identifying the potential impacts of asset failure and estimating the likelihood that an asset could fail, the City can identify the higher risk assets and determine where spending should be focused. It is important to proactively manage asset deterioration through a lifecycle management strategy that balances cost, risk, and the level of service.

While recognizing the varying levels of importance, it remains crucial to responsibly maintain all assets, irrespective of their relative risk. A high quality of life in a community requires more than just focusing on critical infrastructure. Risk management is an ongoing, iterative process, not just an outcome. What is considered a priority may evolve over time as the community undergoes changes and development.

This plan includes a high-level evaluation of asset risk. All core infrastructure assets have been assigned a risk score based on a score for consequence of failure and a score for probability of failure. In the future, the City will determine a methodology for calculating risk for the non-core assets that ensures reasonable comparability across the wide variety of different categories of assets. These risk scores can be used to prioritize funding towards assets of higher risk.

2.3 Ontario Regulation 588/17

As part of the Infrastructure for Jobs and Prosperity Act, 2015, the Ontario government introduced Regulation 588/17: Asset Management Planning for Municipal Infrastructure (O. Reg. 588/17). Along with creating better performing organizations and more liveable and sustainable communities, the regulation is a key, mandated driver of asset management planning and reporting. It places substantial emphasis on current and proposed levels of service and the lifecycle costs incurred in delivering them.

The following figure below outlines the key reporting requirements under O. Reg. 588/17 and the associated deadlines for compliance.

FIGURE 5: **Summary of O. Reg. 588/17 Deadlines**

2019	2022	2024	2025
Strategic Asset Management Policy, and a review or update of the Policy within five years.	Asset Management Plan for Core Assets with the following components: ▪ Current levels of service; ▪ Inventory analysis; ▪ Lifecycle activities to sustain current levels of service; ▪ Cost of lifecycle activities; ▪ Population and employment forecasts; and ▪ Discussion of growth impacts.	Asset Management Plan for Core and Non-Core Assets (same components as 2022)	Asset Management Plan for all assets with the following additional components: ▪ Proposed levels of service for next 10 years; ▪ Updated inventory analysis; ▪ Lifecycle management strategy; ▪ Financial strategy and addressing shortfalls; and ▪ Discussion of how growth assumptions impacted lifecycle activities and financial forecasts.

2.3.1 O. Reg. 588/17 Compliance Review

The following table identifies the requirements outlined in O. Reg. 588/17 for municipalities. This table is adapted from the Ontario Ministry of Infrastructure Asset Management Planning Regulation (O. Reg. 588/17) Completeness Questionnaire. This plan is compliant with the July 1, 2024 regulatory requirements.

TABLE 5: **O. Reg. 588/17 Compliance Review Checklist**

Regulatory Requirements	O. Reg. 588/17 Section ("S")	Not Started	Partially Complete	Mostly Complete	Complete
Strategic Asset Management Policy (due by July 1, 2019)	S.3-4				✔
Asset Management Plan Covering Core Assets (Due by July 1, 2022)					
Summary of core assets in each category.	S.5(2), 3(i)				✔
Replacement cost of core assets in each category.	S.5(2), 3(ii)				✔
Average age of core assets in each category.	S.5(2), 3(iii)				✔
Condition of core assets in each category.	S.5(2), 3(iv)				✔
Description of municipality's approach to assessing condition of core assets in each category.	S.5(2), 3(v)				✔
Current levels of service (qualitative descriptions and technical metrics as per Tables 1-5 in regulation) for core assets in each category.	S.5(2), 1(i)				✔
Current performance measures of core assets in each category based on metrics established by the municipality (e.g. measures for energy usage, operating efficiency, etc.).	S.5(2), 2				✔
Lifecycle activities needed to maintain current levels of service for core assets in each category for 10 years.	S.5(2), 4				✔
Costs of providing lifecycle activities needed to maintain current levels of service for core assets in each category for 10 years.	S.5(2), 4				✔
Population and employment forecasts, and the estimated capital expenditures and significant operating costs related to the lifecycle activities required to maintain the current levels of service in order to accommodate projected increases in demand caused by growth.	S.5(2), 5(i-ii), 6(i-vi)				✔

Regulatory Requirements	O. Reg. 588/17 Section ("S")	Not Started	Partially Complete	Mostly Complete	Complete
Asset Management Plan Covering All Assets (Due by July 1, 2024)					
Summary of non-core assets in each category.	S.5(2), 3(i)				✔
Replacement cost of non-core assets in each category.	S.5(2), 3(ii)				✔
Average age of non-core assets in each category.	S.5(2), 3(iii)				✔
Condition of non-core assets in each category.	S.5(2), 3(iv)				✔
Description of municipality's approach to assessing condition of non-core assets in each category.	S.5(2), 3(v)				✔
Current levels of service (qualitative descriptions and technical metrics established by the municipality) for non-core assets, and updated information for core assets, as per Tables 1-5 in regulation, as applicable.	S.5(2), 1(i-ii)				✔
Current performance measures of non-core assets in each category based on metrics established by the municipality (e.g. measures for energy usage, operating efficiency, etc.) and updated measures for core assets, as applicable.	S.5(2), 2				✔
Lifecycle activities needed to maintain current levels of service for non-core assets in each category for 10 years.	S. 5(2), 4				✔
Costs of providing lifecycle activities needed to maintain current levels of service for non-core assets in each category for 10 years.	S. 5(2), 4				✔
Population and employment forecasts, and the estimated capital expenditures and significant operating costs related to the lifecycle activities required to maintain the current levels of service in order to accommodate projected increases in demand caused by growth.	S.5(2), 5(i-ii), 6(i-vi)				✔

Regulatory Requirements	O. Reg. 588/17 Section ("S")	Not Started	Partially Complete	Mostly Complete	Complete
Asset Management Plan Covering All Assets, Including Proposed Levels of Service, Lifecycle Management, and Financial Strategy (Due by July 1, 2025)					
Proposed levels of service for a 10-year period for non-core assets based on qualitative descriptions and technical metrics established by the municipality, and qualitative descriptions and technical metrics based on Tables 1-5 in regulation for core assets.	S.6(1), 1 (i-ii)		✔		
Identification of lifecycle activities needed to provide proposed levels of service for a 10-year period.	S.6(1), 4(i)		✔		
An estimate of annual costs for undertaking identified lifecycle activities over a 10-year period.	S.6(1), 4(ii)		✔		
Projections for annual funding to be available to undertake identified lifecycle activities over a 10-year period.	S.6(1), 4(iii)		✔		
Identification of funding shortfalls for lifecycle activities over a 10-year period and an explanation of how risks associated with not undertaking any of the lifecycle activities will be managed.	S.6(1), 4(iv)		✔		
Explanation of why proposed levels of service are appropriate over a 10-year period.	S.6(1), 2(i-iv)		✔		
Proposed performance of assets in each category over a 10-year period determined in accordance with performance measures established by the municipality.	S.6(1), 3		✔		
Population and employment forecasts, and the estimated capital expenditures and significant operating costs related to the lifecycle activities required to maintain the current levels of service in order to accommodate projected increases in demand caused by growth. The funding projected to be available, by source, as a result of increased population and economic activity, and an overview of the risks associated with implementation of the asset management plan and any actions that would be proposed in response to those risks.	S.6(1), 5, 6(i-iii)		✔		

2.3.2 Brief History of Asset Management in Ontario

Municipal asset management planning in Ontario has developed and evolved substantially over the past decades. Prior to the 2009 fiscal year, municipalities recorded their capital asset expenditures in the year that construction or acquisition occurred. This approach resulted in the lack of a consistent inventory of capital assets in both the municipality's financial statement and accounting systems.

Effective for the 2009 fiscal year, section 3150 of the Public Sector Account Board (PSAB) handbook was revised to require municipalities to capitalize their tangible capital assets that had a value above a specific threshold. As a result, a basic inventory of assets was created and could be built upon as time progressed.

In June 2011, the Province of Ontario released Building Together, a long-term infrastructure plan that set out a strategic framework to guide future investments in assets. The province committed through Building Together to work with municipalities and the federal government to establish a Municipal Infrastructure Strategy.

In 2012, the province launched the Municipal Infrastructure Strategy. As part of the new strategy, local service boards and municipalities that sought provincial funding were now required to demonstrate how proposed projects fit within AMPs. To assist in defining what a municipal AMP should include, the province produced Building Together: Guide for Municipal Asset Management Plans. This guide provided direction to municipalities and documented the information and analysis required to be included in all municipal AMPs. As well, a new requirement was added to the eligibility for the Federal Gas Tax Fund (GTF) that required municipalities to have a completed AMP prepared by the end of 2016. As of June 2021, the Gas Tax Fund has been renamed to the Canada Community-Building Fund (CCBF) and remains a key source of infrastructure funds for the City of Orillia.

In May 2016, the Province's *Infrastructure for Jobs and Prosperity Act* was proclaimed. In addition to giving the province the authority to guide municipal asset management through regulation, the act detailed sustainable and evidence-based long-term infrastructure planning principles for municipalities to follow.

In December 2017, the province filed Ontario Regulation 588/17: Asset Management Planning for Municipal Infrastructure under the 2015 *Infrastructure for Jobs and Prosperity Act.*

3.0
Scope and Methodology

3.0 Scope and Methodology

This plan was developed to be compliant with the July 1, 2024 Ontario Regulation 588/17 requirements. This plan summarizes the current state of the City's portfolio of assets, establishes the current levels of service including the associated community and technical measures, outlines the current lifecycle management strategies, and provides a 10-year capital requirement forecast for all asset categories.

3.1 Asset Categories

The categories of assets included in the scope of this plan are:

- Transportation Network;
- Water Network;
- Wastewater Network;
- Stormwater Network;
- Fire Services;
- Fleet and Transit;
- Facilities;
- Solid Waste;
- Parks, Recreation, Culture, and Tourism;
- Municipal Law Enforcement and Parking;
- Information Technology; and
- Natural Assets.

3.2 Replacement Cost

The cost to replace an asset at the end of its useful life can be determined through a variety of methods. The preferred method depends on the category of asset, availability of data, how unique an asset is, the effort required in the analysis compared to the estimated value of the asset, and how often the asset is replaced. Some methods are more accurate than others; however, improved accuracy often comes at the expense of increased complexity.

This plan relies primarily on the User-Defined Cost and Cost Per Unit methods. However, for some assets this plan also utilized the Cost Inflation and Index Tables method. These methodologies are outlined as follows:

1. User-Defined Cost and Cost Per Unit: Using the most recent, best available information, which may include data from recent contracts, engineering reports and assessments, master plans, industry standard pricing sources, and staff estimates based on knowledge and experience to determine an average cost per asset or per-unit quantity of an asset.

2. Cost Inflation and Index Tables: The historical cost of an asset is inflated based on an associated and relevant inflation index, such as the Consumer Price Index, the Construction Price Index, or only specific portions of the Building Construction Price Index.

User-defined costs based on recent and reliable sources are an accurate way to determine the replacement cost of assets. Where an asset is measured on a per-unit basis, such as metre of sidewalk, the City assigns a fixed replacement cost per unit across the network for the similar assets.

When the City does not have recent or reliable cost data, inflation indices with historical replacement costs are typically used. As assets age, and new materials, products, and technologies become available, inflating historical costs tends to become less accurate. However, for recently acquired assets, it can be a reliable method where a recent historical cost inflated over a small number of years will remain reflective of the actual costs of replacing a similar asset today. These indices also provide a consistent methodology that allows for comparability between different assets.

For some assets, an important distinction must be made between two replacement cost values:

1. The replacement cost of the asset itself.

2. The replacement cost of the service provided.

This distinction is important for assets such as natural assets since a natural asset may contribute to multiple different levels of service through the provision of co-benefits. If the natural asset was removed, the cost to replace all the various co-benefits may differ from the cost to replace the asset itself.

For example, a typical street tree provides shading, carbon sequestration, water retention, and soil stabilization services as four co-benefits from the single tree. To replicate these services with engineered infrastructure assets, a separate shade structure, carbon sequestration equipment, stormwater management assets, and geoengineered materials may all be required as four separate assets to match the level of service provided by the one tree asset. The replacement cost of the four co-benefits provided using the engineered infrastructure assets may differ from the value of the replacement cost of the original natural asset.

For many engineered infrastructure assets, the replacement cost of the asset itself is the same as the replacement cost of the service provided since only that engineered asset can provide that service. There are many services provided by the City that could not be provided with natural assets instead of engineered infrastructure.

3.3 Estimated Useful Life

The Estimated Useful Life (EUL) of an asset is the amount of time over which the City expects the asset to be available to provide the target level of service before requiring replacement or disposal. The EUL for each asset in this plan was assigned according to the knowledge and expertise of subject matter expert knowledge, historical data, and industry standards.

By using an asset's in-service date and its EUL, the City can estimate the Service Life Remaining (SLR) of each asset. The SLR is calculated as follows:

$$\textit{Service Life Remaining} = \textit{In-Service Date} + \textit{Estimated Useful Life} - \textit{Current Year}$$

Renewal and rehabilitation activities are undertaken to extend the useful life of the asset by improving the asset condition. A specific activity taking place is called a Lifecycle Event. When an asset has been assigned an assessed condition rating, the rating may increase or decrease the average service life remaining depending on if the rating is above or below the condition of a typical asset at that age. Using asset condition data and the asset's SLR, the City can more accurately forecast when an asset will require replacement. The SLR with lifecycle events included is calculated as follows:

$$\textit{Service Life Remaining (With Events)} = \textit{In-Service Date} + \textit{Lifecycle Estimated Useful Life} - \textit{Current Year}$$

where the Lifecycle Estimated Useful Life (LEUL) is the original EUL plus the additional years of useful life added because of the lifecycle events. The improved condition rating occurs because of the lifecycle events.

3.4 Annual Requirement

Using the replacement cost and the estimated useful life, the City can calculate the average annual replacement cost of an asset over its lifespan. This value is called the Annual Requirement and is calculated as follows:

$$\textit{Annual Requirement} = \frac{\textit{Replacement Cost}}{\textit{Estimated Useful Life}}$$

For assets with significant lifecycle management renewal activities that extend the EUL through lifecycle events, the cost of the events is added to the replacement cost and the EUL is replaced with the LEUL:

$$\textit{Annual Requirement (With Events)} = \frac{\textit{Replacement Cost} + \textit{Events Cost}}{\textit{Lifecycle Estimated Useful Life}}$$

The annual requirement with events provides a more accurate measure of the long-term financial needs of an asset when significant renewal lifecycle management events are involved.

To simplify the language and ensure conciseness, this plan does not always explicitly distinguish between the basic annual requirement and the annual requirement with events. For assets with lifecycle management strategies that include significant events, the cost of the events is built into the overall annual requirement values.

3.5 Reinvestment Rate

As described in the lifecycle management strategies previously, as assets age and deteriorate they typically require ongoing spending to maintain the target condition state. The use of capital funds through asset renewals or replacements is necessary to maintain the current level of service. The reinvestment rate is a measurement of the required or budgeted funding relative to the total asset replacement cost. The reinvestment rate measures are calculated as follows:

$$\text{Target Reinvestment Rate} = \frac{\text{Annual Requirement}}{\text{Total Replacement Cost}}$$

$$\text{Actual Reinvestment Rate} = \frac{\text{Annual Funding}}{\text{Total Replacement Cost}}$$

By comparing the actual to the target reinvestment rate, the City can determine the extent of any funding deficits or surpluses.

To perform the documented lifecycle activities, the proper level of funding is required. The sustainable funding level is the amount of annual funds required to be spent or saved to meet the anticipated costs to maintain the assets at the current level of service. When assets are underfunded through funding deficits, the asset does not receive the proper lifecycle management strategies and a backlog of work will accumulate. Sustainable funding strategies developed through the asset management planning process assist in preventing a funding deficit, reducing any backlog of work, and proactively allocating funding to reserves for future spending requirements.

A key goal of asset management is to achieve a state of balance where once any backlog has been cleared, consistently funding the lifecycle management strategies will ensure the best value for money over an asset's lifespan and prevent the reestablishment of backlogs. This allows for the City to maintain the current level of service at a lower long-term cost. Chronic underfunding of lifecycle management strategies leads to higher total lifecycle costs, puts further pressure on the limited funding available, and can lead to an increase in risk and decrease in the level of service provided.

3.6 Asset Condition

An incomplete or limited understanding of asset condition can mislead long-term planning and decision-making. Accurate and reliable condition data helps to prevent premature rehabilitation or replacement and ensures that lifecycle activities occur at the right time to maximize asset value and useful life. Confidence in asset condition data allows staff to shift away from unexpected reactive projects required to manage an asset after it has failed. Reactive projects may cause unplanned service disruptions and unexpected demands of staff resources and budgets. A better approach is through proactively planned projects that are scheduled to match a set budget and minimize disruptions to the public and staff resources.

A condition assessment rating system provides a standardized way to assess asset condition that allows for comparisons between different categories in the City's asset portfolio. The table below outlines the condition rating system used in this plan to determine asset condition. This rating system is aligned with the Canadian Core Public Infrastructure Survey, which is used to develop the Canadian Infrastructure Report Card. The table details the five condition ratings from Very Good to Very Poor and the associated description, criteria, and service life remaining.

The analysis in this plan is based on the assessed condition data where available. In the absence of assessed condition data, asset age is used as an alternative to approximate asset condition following the Service Life Remaining (%) ranges provided in the table.

TABLE 6: **Overall Asset Condition Scale**

Condition	Colour	Description	Criteria	Service Life Remaining (%)
Very Good		Fit for the future	Well maintained, good condition, new or recently rehabilitated.	100-81
Good		Adequate for now	Acceptable, generally approaching mid-stage of expected service life.	80-61
Fair		Requires attention	Signs of deterioration, some elements exhibit significant deficiencies.	60-41
Poor		Increasing potential of affecting service	Approaching end of service life, condition below standard, large portion of system exhibits significant deterioration.	40-21
Very Poor		Unfit for sustained service	Near or beyond expected service life, widespread signs of advanced deterioration; some assets may be unusable.	20-0

4.0
State of Local Infrastructure Summary

4.0 State of Local Infrastructure Summary

The State of Local Infrastructure Summary provides a high-level overview of the key information within the scope of this plan such as quantities, replacement cost, age, condition, backlogs, and capital requirements. Individual asset categories are examined in more detail in the category-specific chapters of this plan following this State of Local Infrastructure Summary.

4.1 Replacement Cost Summary

The asset categories captured in this plan have a total estimated replacement cost of approximately $2.06 billion. This estimate reflects replacement of existing assets with similar, but not necessarily identical, assets available to buy today to maintain the current level of service. Where significant changes in the level of service are expected or planned for, they are noted separately in the category-specific sections of this plan, including the actions contained within the City's Climate Change Action Plan.

The following table includes the approximate quantities, replacement cost in 2023 dollars, average age, and average condition of each category of assets in the City's asset inventory.

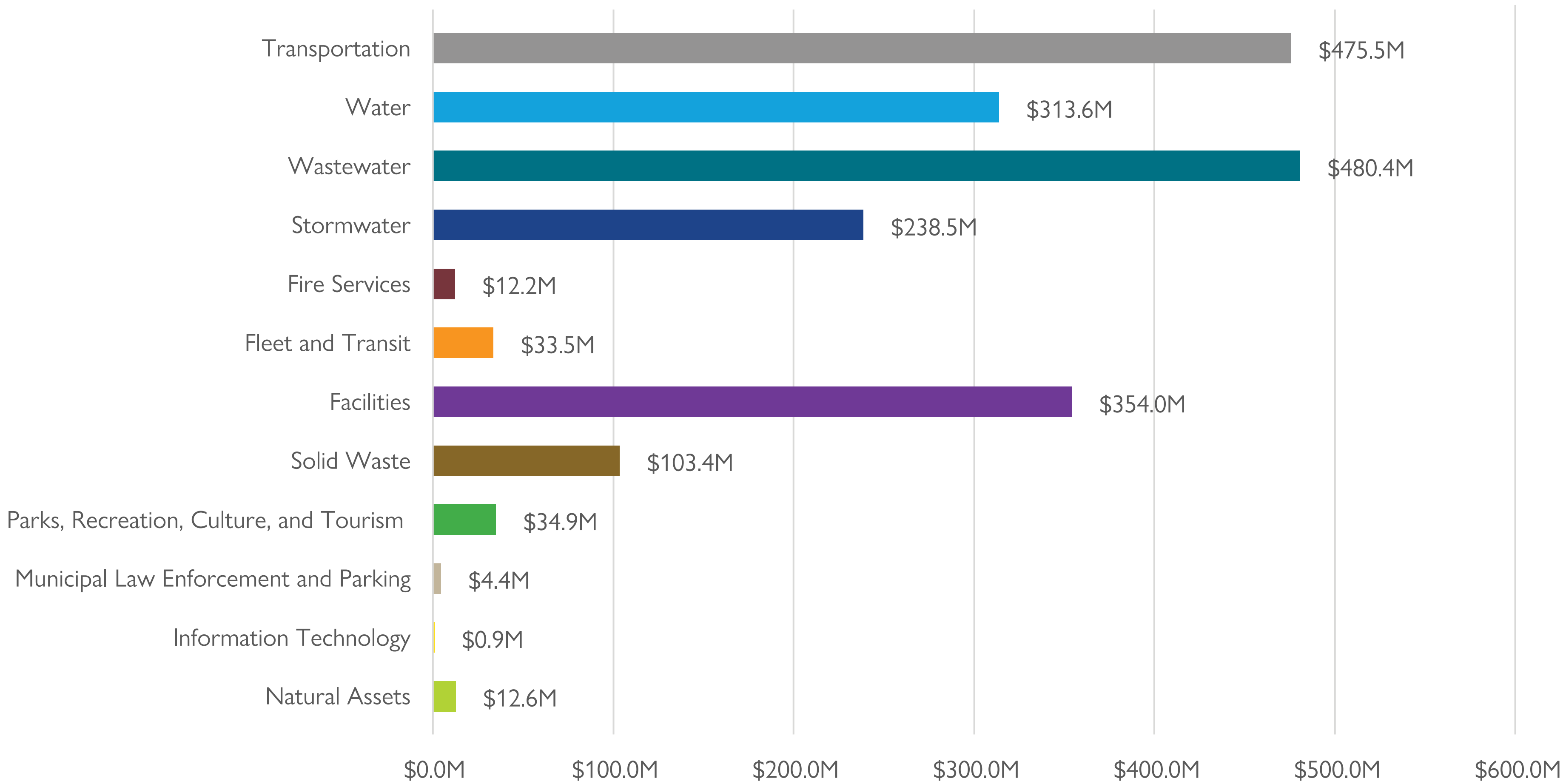
TABLE 7: Asset Quantities, Replacement Cost, Average Age, and Average Condition by Category

Asset Category	Quantities	Replacement Cost	Average Age	Average Condition	Average Condition Colour
Transportation	5 bridges 1 structural culvert 414.7 lane km of road 132.1 km of sidewalks 2 retaining walls	$475.5M	20.4	Good	
Water	183.7 km of watermain 951 fire hydrants 1 booster station 2 reservoir sites 3 wells 1 water filtration plant	$313.6M	37.5	Fair	
Wastewater	158.5 km of gravity sewermains 9.7 km of forcemains 1 wastewater treatment centre 20 pump stations	$480.4M	40.1	Fair	
Stormwater	85,401 m of sewers 1,780 maintenance holes 2 pump stations 6 stormwater management ponds 3 oil and grit separators 163,743 m of ditches 2,953 catch basins 23,688 m of catch basin leads 36,500 m of road and driveway culverts	$238.5M	39.6	Fair	
Fire Services	317 equipment assets in stations 7 apparatus vehicles with equipment Fire prevention kit and trailer 4 passenger vehicles with equipment	$12.2M	11.2	Good	

Asset Category	Quantities	Replacement Cost	Average Age	Average Condition	Average Condition Colour
Fleet and Transit	Roads: 51 vehicles Solid Waste: 4 vehicles Parks: 53 vehicles Recreation Facilities: 7 vehicles Water, Wastewater, and Stormwater: 19 vehicles Transit: 12 buses All Other Service Areas: 8 vehicles	$33.5M	11.1	Fair	
Facilities	26 corporate facilities 7 recreation facilities 9 parks washrooms facilities 9 parks auxiliary facilities	$354.0M	17.9	Fair	
Solid Waste	8 active cells 2 alternate cover plates 4 capped cells 1 compost pad with swale, pumps, and forcemain 11,578 m^2 of internal roadway 0.720 lane km of perimeter roadway 1,500 m of perimeter fence 2 structures 1 weighscale 3 roll-off steel bins 72 wells 12 gas probes 1 gas barrier and venting system	$103.4M	54.8	Good	
Parks, Recreation, Culture, and Tourism	36 parks or parkettes and amenities 34 km of trails	$34.9M	20.9	Fair	
Municipal Law Enforcement and Parking	8 parking lots 319 mech units 226 yokes 103 housings 130 posts and foundations 15 active and 5 inactive pay-and-display terminals	$4.4M	12.6	Fair	
Information Technology	123 networking 35 server 21 printers 30 TEAMS phones 252 workstations	$0.9M	3.5	Poor	
Natural Assets	3,194 trees 124.45 ha of forests	$12.6M	Not Available	Fair	

The following figure illustrates the replacement cost for each category of assets.

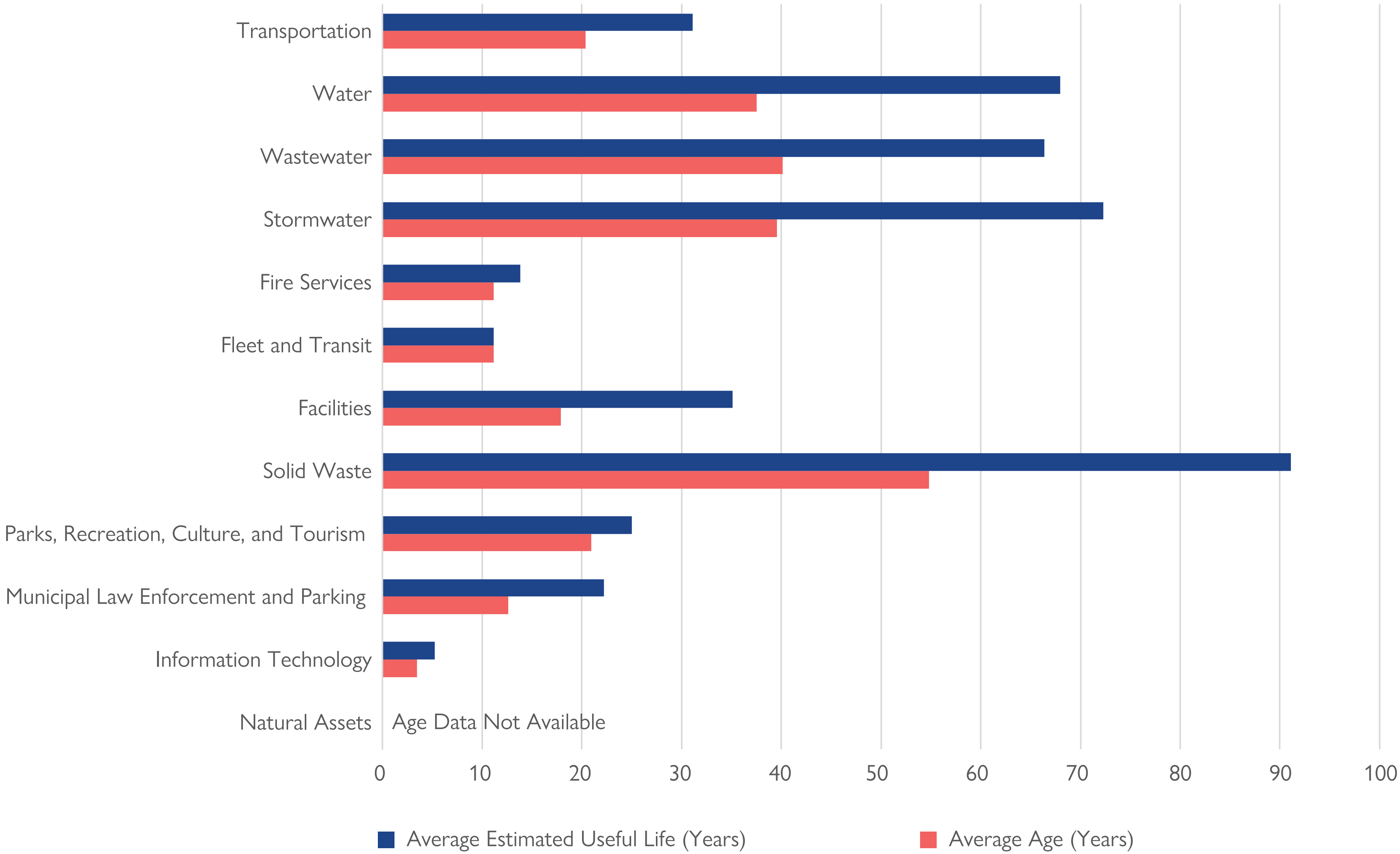
FIGURE 6: Replacement Cost by Category



4.2 Service Life Remaining

The following figure illustrates the average age and estimated useful life for each category of assets. The difference between the average age and estimated useful life is the estimated average service life remaining.

FIGURE 7: Average Asset Age and Estimated Useful Life by Category



4.3 Condition Summary

Many of the City's assets are at or approaching the end of their estimated useful life and are showing their age through worse condition ratings. As assets age and deteriorate, there are typically higher operations and maintenance costs until the renewal, rehabilitation, or replacement of the asset. Understanding the current condition of assets is fundamental to proper asset management planning and effective use of lifecycle management strategies. By investing in the lifecycle management strategies at the right time, asset management reduces the total lifecycle cost of assets ensuring the best value for money.

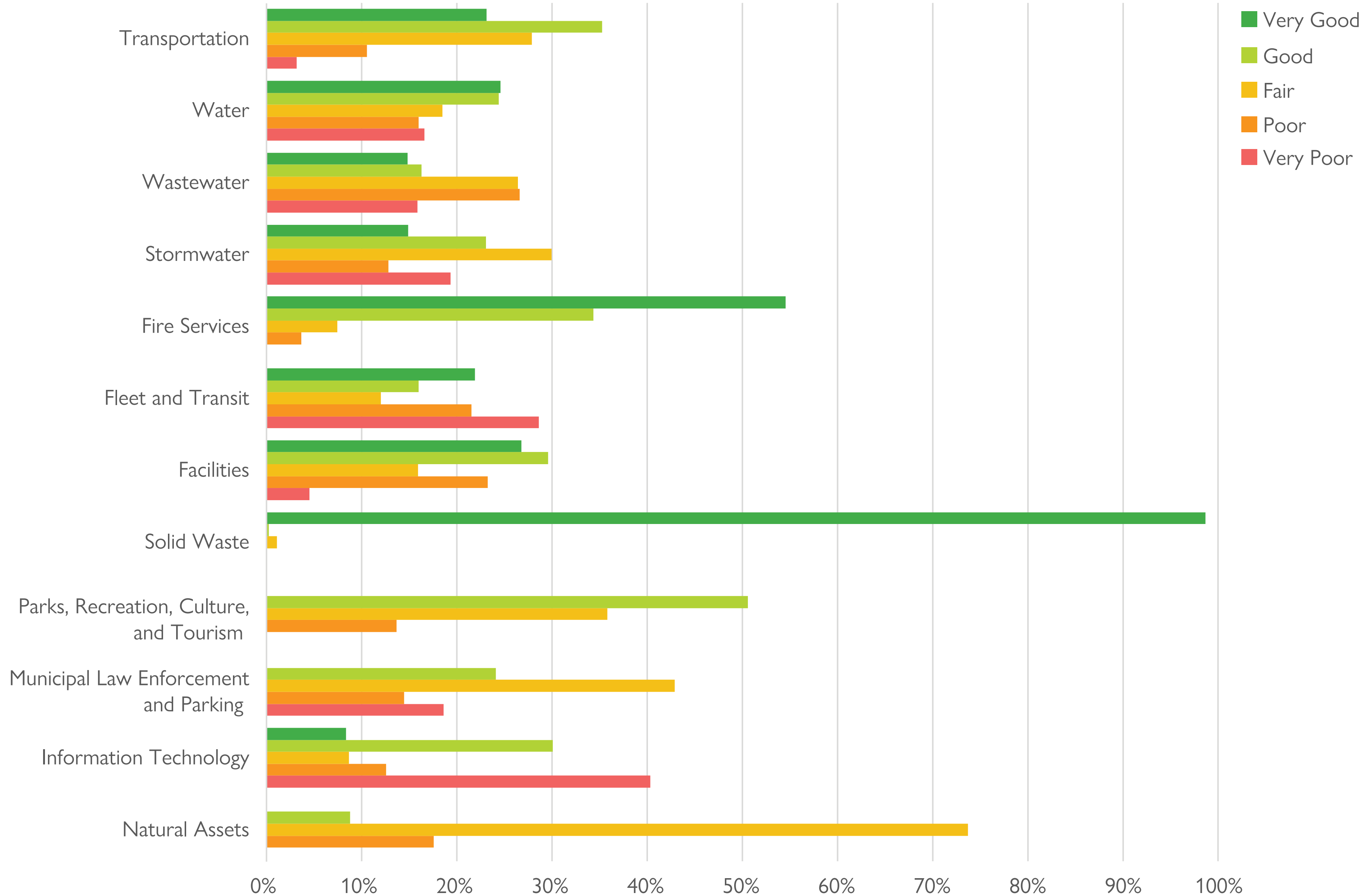
Collectively, approximately 72.3% of assets are in Fair or better condition. This estimate relies on both age-based estimates and on condition assessment data.

This plan relies on assessed condition data for approximately 64% of assets. For the remaining assets, age is used as an approximation of condition. It has been identified that there are records that are missing or incomplete, particularly in the stormwater category. Assessed condition data is invaluable in asset management planning as it reflects the true condition of the asset and its ability to perform its intended function.

The following figure illustrates the condition ratings for each category of assets in terms of the percentage of total replacement cost of that category.

A key point is that due to the differences in the method used for calculating condition between categories, direct comparisons between categories may not be consistent depending on which categories are compared.

FIGURE 8: Breakdown of Condition Rating - Percentage of Cost by Category



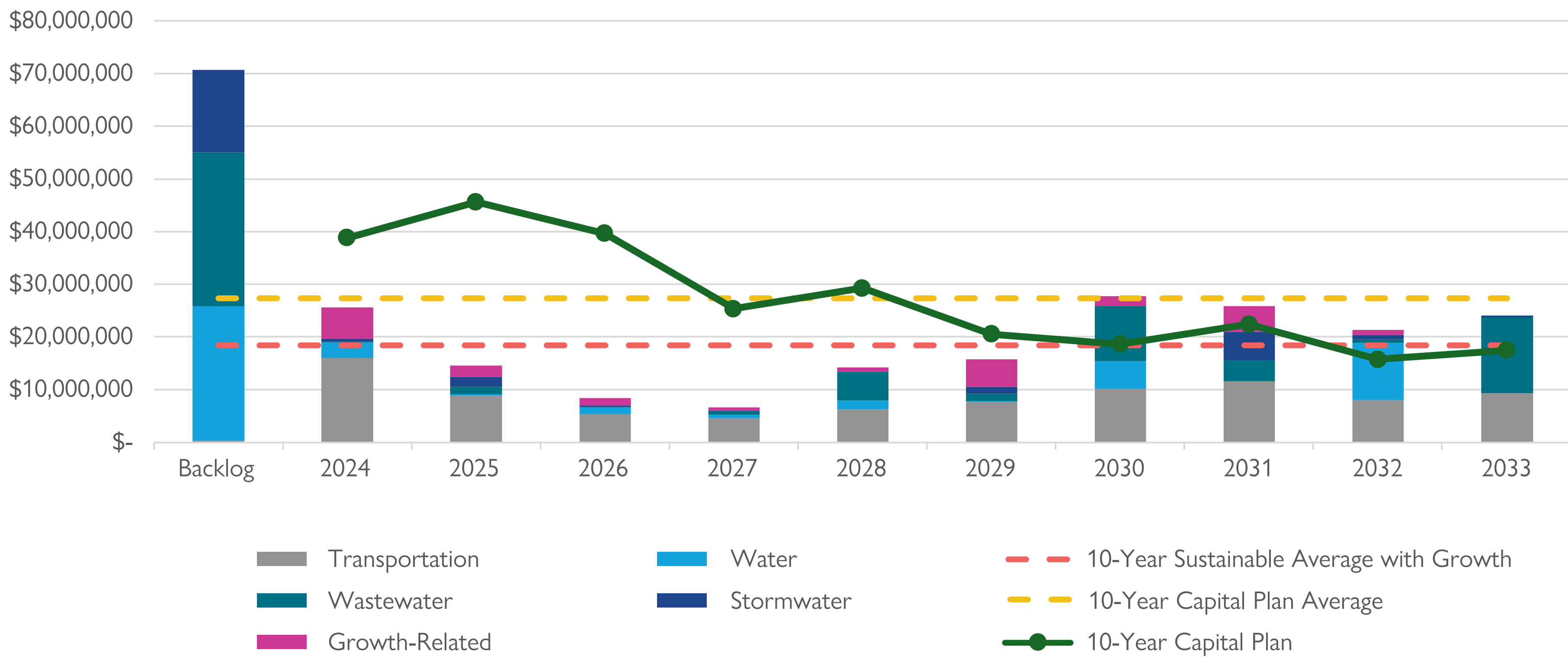
4.4 Capital Requirements Forecast for 2024-2033

The development of a 10-year capital forecast should include asset renewal and rehabilitation requirements in addition to asset replacements. With the development of asset-specific lifecycle strategies that include the timing and anticipated cost of future capital events, the City can produce a capital forecast that considers the entire estimated useful life of assets.

4.4.1 Core Assets

The following figure identifies the forecasted capital requirements, 10-year sustainable annual requirement trend, and 10-year capital plan average over the 2024-2033 period for core assets.

FIGURE 9: **Core Annual and Average Capital Requirement – 10-Year Forecast Including Growth**



Excluding the backlog, the forecasted 10-year average sustainable capital requirement for core assets over the 2024-2033 period is approximately $18.4 million per year in 2023 dollars.

Forecasting the capital requirements assists the City in proactively spreading the required spending over a longer time span while managing shorter-term fluctuations in requirements. Investments can be prioritized based on Council priorities, risk, and levels of service considerations.

The backlog is approximately $70.7 million and is primarily composed of watermains and wastewater and stormwater sewers beyond their estimated useful life. This represents the assets that are past due for renewal or replacement based on the best available information. Calculating the backlog is useful to understand the short-term needs of assets. Many assets can remain in service beyond their estimated useful life or preferred condition; however, it may increase the risk of failure.

In general, a backlog of infrastructure replacements typically results in a combination of:

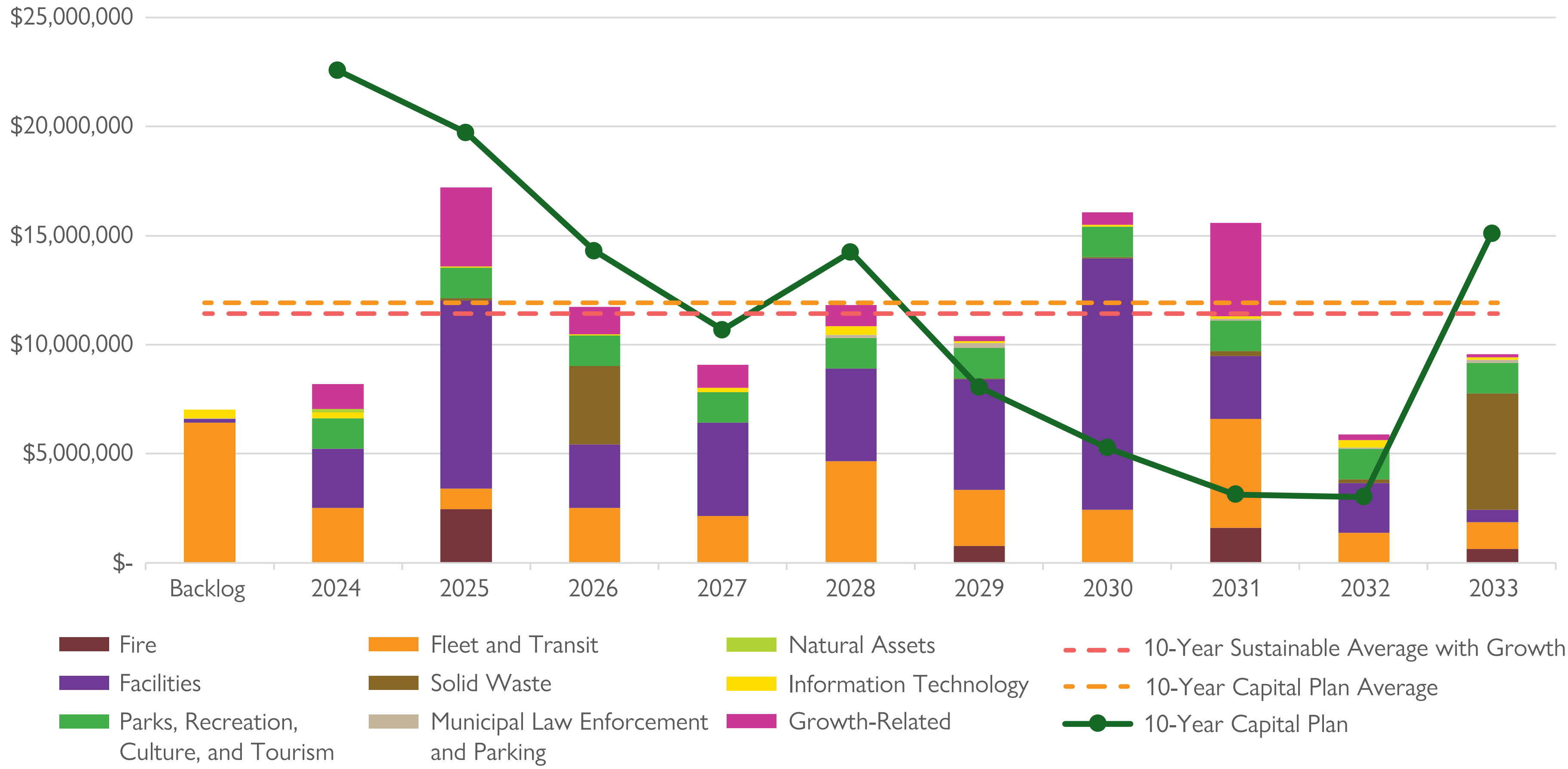
- Increased operations and maintenance costs to keep the asset functioning beyond its estimated useful life.
- Lower asset performance.
- Higher risk.
- A reduction in the level of service.

The Financial Summary portion of this plan includes discussion of the impact of clearing the backlog evenly over 10 years.

4.4.2 Non-Core Assets

The following figure identifies the forecasted capital requirements, 10-year sustainable annual requirement trend, and 10-year capital plan average over the 2024-2033 period for non-core assets.

FIGURE 10: Non-Core Annual and Average Capital Requirement – 10-Year Forecast Including Growth



Excluding the backlog, the forecasted 10-year average sustainable capital requirement for non-core assets over the 2024-2033 period is approximately $11.6 million per year in 2023 dollars.

Forecasting the capital requirements assists the City in proactively spreading the required spending over a longer time span while managing shorter-term fluctuations in requirements. Investments can be prioritized based on Council priorities, risk, and levels of service considerations.

The backlog is approximately $7.0 million and is primarily composed of transit assets beyond their estimated useful life. This represents the assets that are past due for renewal or replacement based on the best available information. Calculating the backlog is useful to understand the short-term needs of assets. Many assets can remain in service beyond their estimated useful life or preferred condition; however, it may increase the risk of failure.

In general, a backlog of infrastructure replacements typically results in a combination of:

- Increased operations and maintenance costs to keep the asset functioning beyond its estimated useful life.
- Lower asset performance.
- Higher risk.
- A reduction in the level of service.

The Financial Summary portion of this plan includes discussion of the impact of clearing the backlog evenly over 10 years.

4.5 Target Versus Actual Reinvestment Rate

By comparing the actual to the target reinvestment rate, the City can determine the extent of any funding deficits or surpluses.

4.5.1 Core Assets

To fully meet the sustainable 10-year capital needs of core assets at the current level of service, the City would need to allocate approximately $18.4 million annually, for a target reinvestment rate of 1.22%. The 10-year capital plan average funding is approximately $27.4 million annually, for an actual reinvestment rate of 1.81%. Therefore, over the 2024-2033 period, there is an estimated funding surplus of approximately $9.0 million annually. However, if the backlog is cleared over the 10-year period, the 10-year sustainable funding required increases to approximately $25.5 million annually, for a new target investment rate of 1.69% and an estimated funding surplus of $1.9 million annually. The following table summarizes the reinvestment rate outcomes for the core assets.

TABLE 8: **Core Assets Reinvestment Rates**

Forecast – Core Assets	Target Reinvestment Rate	Actual Reinvestment Rate	Reinvestment Rate Surplus or (Deficit)
10-Year Replacement Needs with Growth	1.22%	1.81%	0.59%
10-Year Replacement Needs with Growth and Backlog	1.69%	1.81%	0.12%

It is important to consider that the capital funding allocated during the 2024-2033 period is higher partially due to one-time, high-cost projects, including the Harvie Hill Reservoir project; the reconstruction of Laclie Street, Jarvis Street, and West Street; and the Downtown Streetscape project, all scheduled during 2024-2028. The Financial Summary section of this plan provides a more detailed analysis of the sustainable capital requirements and funding levels, including consideration of a 50-year annual capital requirement forecast.

The low-to-medium level of data maturity, especially for the stormwater assets, is also expected to cause an underestimation of the sustainable annual capital requirements during this period. The City is working on improving the data to increase the level of accuracy of such estimates, including a comprehensive look at the stormwater network through the ongoing Stormwater Management Infrastructure Inventory and Condition Assessment project.

4.5.2 Non-Core Assets

To fully meet the sustainable 10-year capital needs of non-core assets at the current level of service, the City would need to allocate approximately $11.6 million annually, for a target reinvestment rate of 2.08%. The 10-year capital plan average funding is approximately $11.6 million annually, for an actual reinvestment rate of 2.08%. Therefore, over the 2024-2033 period, the estimated funding meets the sustainable capital needs. However, if the backlog is cleared over the 10-year period, the 10-year sustainable funding required increases to approximately $12.3 million annually, for a new target investment rate of 2.20% and an estimated funding deficit of $0.7 million annually. The following table summarizes the reinvestment rate outcomes for the non-core assets.

TABLE 9: **Non-Core Assets Reinvestment Rates**

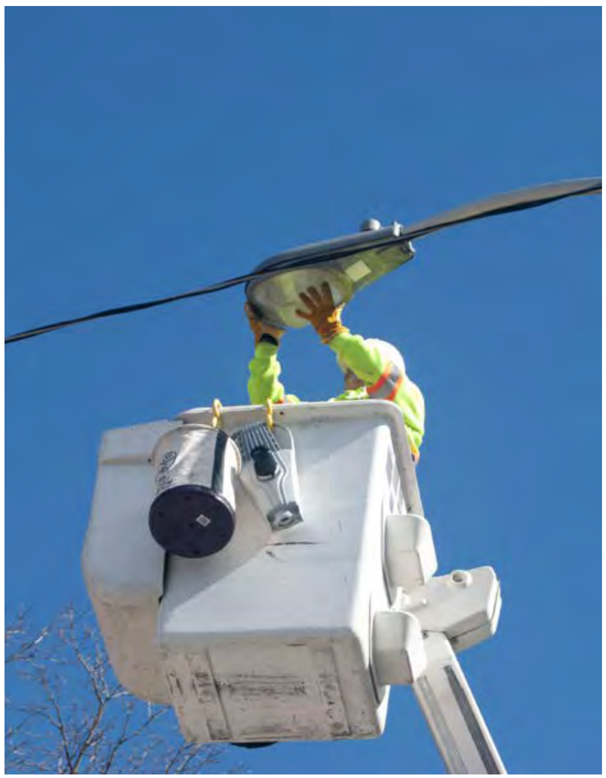
Forecast – Non-Core Assets	Target Reinvestment Rate	Actual Reinvestment Rate	Reinvestment Rate Surplus or (Deficit)
10-Year Replacement Needs with Growth	2.08%	2.08%	0%
10-Year Replacement Needs with Growth and Backlog	2.20%	2.08%	(0.12%)

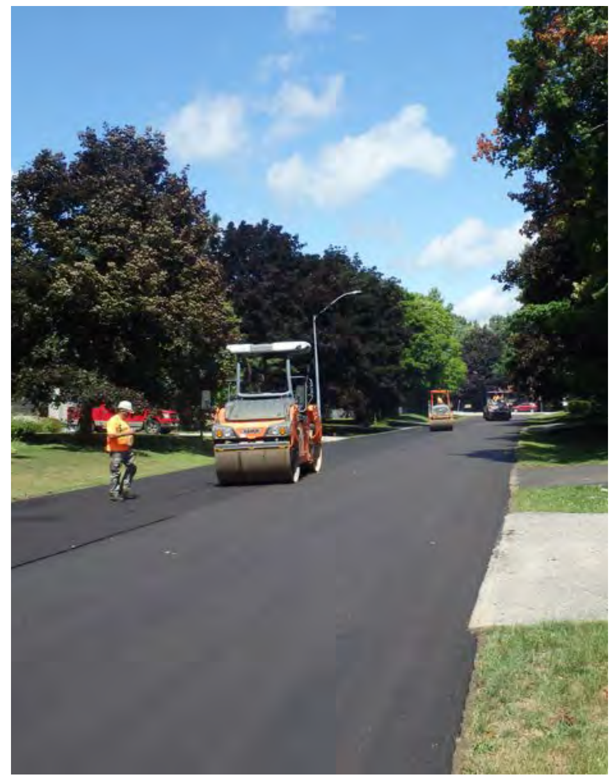
It is important to consider that the capital funding allocated during the 2024-2033 period is higher partially due to one-time, high-cost projects, including the Brian Orser Arena reconstruction, Municipal Operations Centre expansion or addition, and the construction of Fire Station 3. The Financial Summary section of this plan provides a more detailed analysis of the sustainable capital requirements and funding levels, including consideration of a 50-year annual capital requirement forecast.

The low-to-medium level of data maturity, especially for the parks, recreation, culture, and tourism assets, is also expected to cause an underestimation of the sustainable annual capital requirements during this period. The City is working on improving the data to increase the level of accuracy of such estimates.

5.0
Transportation


MAXIMUM
40
km/h
WHEN
FLASHING





5.0 Transportation

The City maintains a multi-modal transportation network to ensure reliable, safe, and efficient transportation options for the community. A well-functioning transportation network plays an integral part in the everyday life of the community, supporting employment, providing social and recreational opportunities, facilitating growth, and enabling a wide range of transportation options regardless of user age, means, or ability. Transportation infrastructure is the second-largest category of assets at a total replacement cost of $475,490,283 in 2023 dollars.

5.1 Asset Inventory and Replacement Cost

The City manages approximately 415 lane-kilometres of roads and 132 kilometres of sidewalks. The transportation network is comprised primarily of paved asphalt surfaces and concrete sidewalks. The City also manages one gravel roadway, five bridges, one structural culvert, and two retaining walls. To ensure a safe and efficient network, the City manages a network of traffic control and safety assets, and lighting assets that operate across the network. The two Brough's Creek bridges are subject to a cost-sharing agreement between the City of Orillia and the Township of Oro-Medonte. There is an additional bridge structure near the landfill access road that is no longer in service and is currently under review for demolition. The structure is known to be in Very Poor condition based on historical information. Future revisions of this plan will include this structure in full detail if demolition is not completed in 2024.

The replacement cost is estimated using primarily historic construction costs with consideration of standardized costing indices. Included in the cost of replacing each asset is a set of components that when put together make up a typical asset. The full set of components for each sub-segment is identified in Appendix 19.2.1.

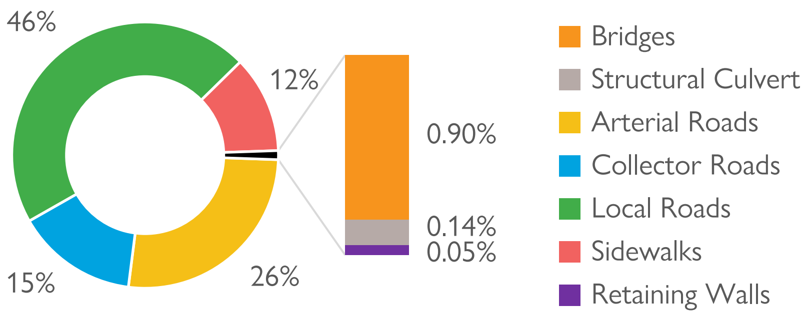
The following table includes the quantity, replacement cost method, and total replacement cost in 2023 dollars of each sub-segment of assets in the City's transportation network.

TABLE 10: Transportation – Inventory and Replacement Cost

Asset Sub-Segment	Quantity	Replacement Cost Method	Replacement Cost	Percentage of Total Replacement Cost
Bridges	5 structures	Asset-Specific Cost Estimation	$4,259,869	0.90%
Structural Culvert	1 structure	Asset-Specific Cost Estimation	$660,714	0.14%
Arterial Roads	104.9 lane km	Cost/Unit	$125,846,400	26.5%
Collector Roads	66.8 lane km	Cost/Unit	$70,159,950	14.8%
Local Roads	243.0 lane km	Cost/Unit	$218,184,200	45.9%
Sidewalks	132.1 km	Cost/Unit	$56,127,625	11.8%
Retaining Walls	2 structures	Asset-Specific Cost Estimation	$251,525	0.05%

The following figure provides the data in the previous table visually with each sub-segment as a percentage of the total replacement cost. Most of the City's transportation assets are roadways where almost half of the assets are local roads. Due to the small relative total value of bridges, the structural culvert, and retaining walls, an additional diagram is provided for clarity.

FIGURE 11: Transportation – Total Replacement Cost



5.2 Asset Age and Estimated Useful Life

The Estimated Useful Life (EUL) of transportation assets is determined using a combination of staff knowledge, historical data, and industry standards. The average service life remaining is determined by the difference between the average estimated useful life and the average age, except when an asset has been assigned an assessed condition rating that may increase or decrease the average service life remaining.

The following table summarizes the average age of each sub-segment based on the number of years that the assets have been in service.

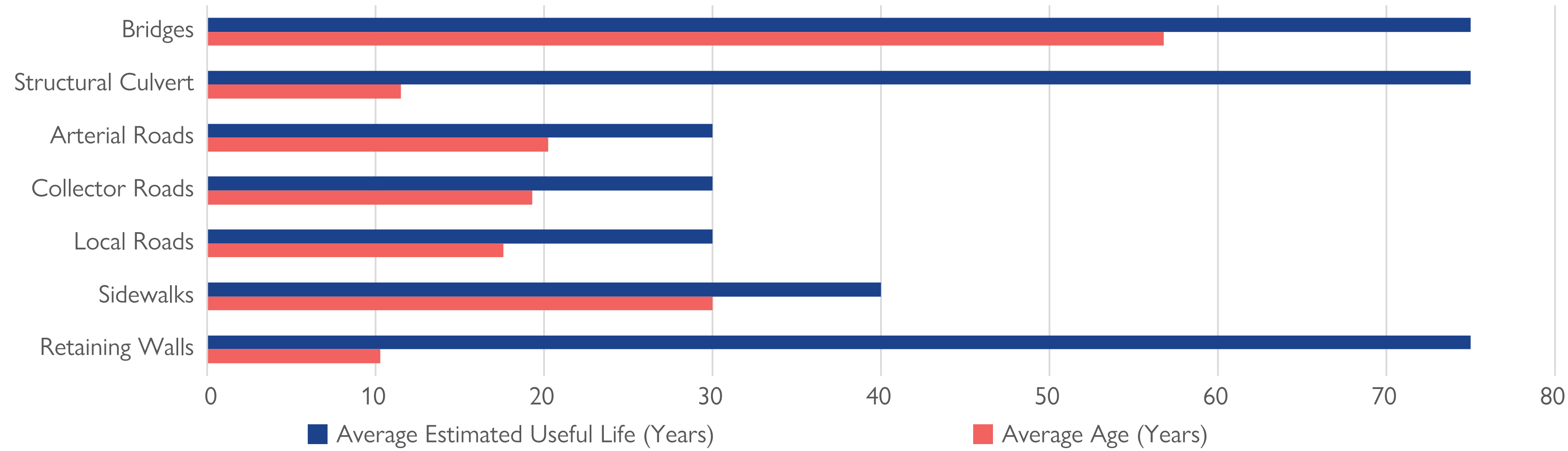
TABLE 11: Transportation – Average Age and Estimated Useful Life

Asset Sub-Segment	Average Estimated Useful Life (Years)	Average Age (Years)	Average Service Life Remaining (Years)	Percentage of Average Service Life Remaining
Bridges	75	56.8	18.2	24%
Structural Culvert	75	11.5	63.5	85%
Arterial Roads	30	20.3	9.7	32%
Collector Roads	30	19.3	10.7	36%
Local Roads	30	17.6	12.4	41%
Sidewalks	40	30.0	10.0	25%
Retaining Walls	75	10.3	64.7	86%

Due to poor historical data on sidewalk in-service dates, the average age and service life remaining are low-confidence estimations.

The age of an asset gives an indication of how close it is to the end of its estimated useful life and what lifecycle management strategies may be required. The following figure displays average asset age alongside the estimated useful life for each asset sub-segment.

FIGURE 12: Transportation – Average Age and Estimated Useful Life



Average asset ages have not exceeded the average estimated useful life for any asset sub-segment.

Lifecycle management activities are required at regular intervals to, on average, reach or exceed the full estimated useful life of the asset. For example, roads receive mid-life resurfacing at regular targeted intervals of 15 to 20 years to reach a longer combined lifecycle estimated useful life (LEUL) of up to 80 years. However, without these activities the estimated useful life of an average road is 30 years as displayed above. Similarly, bridges can have a LEUL of up to 150 or more years in some rare cases; however, the City's bridges have a more typical LEUL of 90 years. Without these activities, the estimated useful life of a bridge is 75 years as displayed above.

5.3 Condition

The following sections and tables outline the condition breakdown for each group of assets and the City's methods for assessing asset condition. Where available and feasible, the City follows industry standard best practices and generally accepted good engineering practices in the approach to assessing asset condition. When condition assessments are unavailable, an age-based condition rating is used based on the age of the asset compared to its estimated useful life.

The following table summarizes the variety of techniques used to assess the condition of the transportation assets on a regular basis.

TABLE 12: **Transportation – Approach to Assessing Condition**

Asset Sub-Segment	Condition Data Collection Techniques	Frequency of Data Collection	Year of Last Assessment
Bridges and Structural Culverts	Visual inspection in compliance with the Ontario Structure Inspection Manual (OSIM) requirements.	Every two years.	2022
Arterial Roads	Automatic road analysis or visual inspection.	Every two years.	2022
Collector Roads	Automatic road analysis or visual inspection.	Every two years.	2022
Local Roads	Automatic road analysis or visual inspection.	Every two years.	2022
Sidewalks	Automatic road analysis or visual inspection.	Every two years.	2022
Retaining Walls	Age-based and visual inspections in compliance with the Ontario Structure Inspection Manual (OSIM) requirements.	Varies (typically reactive).	2022

The following table provides a summary of the condition rating systems for each sub-segment of assets. Based on the condition data and information provided by subject matter experts, the condition of assets is rated on a scale from Very Good to Very Poor.

TABLE 13: Transportation – Condition Rating Scales

Rating	Rating Description	Bridges and Structural Culverts (Five-Point Scale)	Roads (Pavement Condition Index)	Sidewalks (Sidewalk Condition Index)	Retaining Walls (Five-Point Scale)
Very Good	Fit for Future	1.8 ≥ and ≥ 0	100 ≥ PCI > 85	100 ≥ SCI > 85	1
Good	Adequate for Now	2.6 ≥ and > 1.8	85 ≥ PCI > 70	85 ≥ SCI > 70	2
Fair	Requires Attention	3.4 ≥ and > 2.6	70 ≥ PCI > 55	70 ≥ SCI > 55	3
Poor	Increasing Potential of Affecting Service	4.2 ≥ and > 3.4	55 ≥ PCI > 40	55 ≥ SCI > 40	4
Very Poor	Unfit for Sustained Service	5.0 ≥ and > 4.2	40 ≥ PCI	40 ≥ SCI	5

The following figure illustrates the breakdown of condition ratings in terms of dollars of the City's transportation assets. 58.4% of these assets are in Very Good to Good condition with only a small proportion, 3.2%, rated as Very Poor.

FIGURE 13: Transportation – Condition Rating Summary

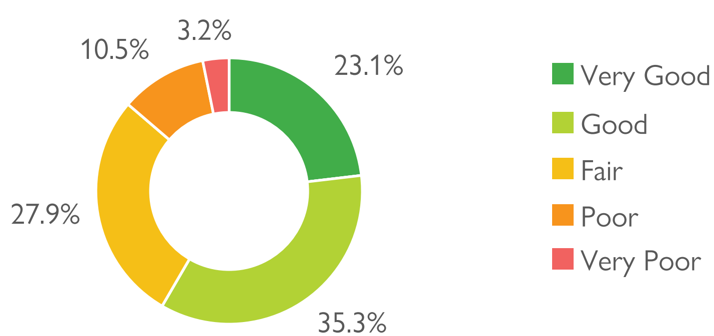
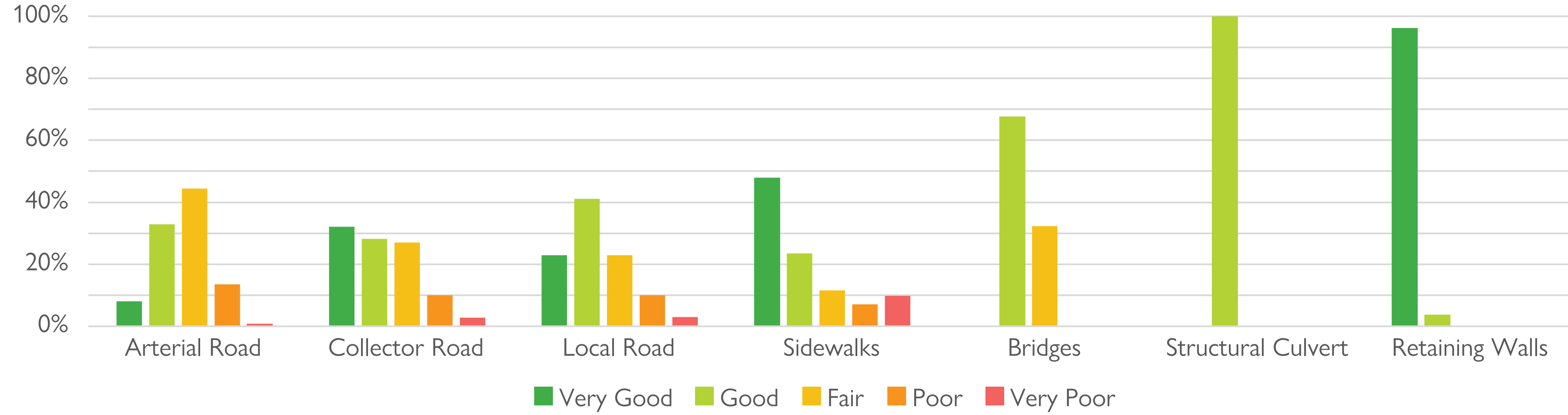


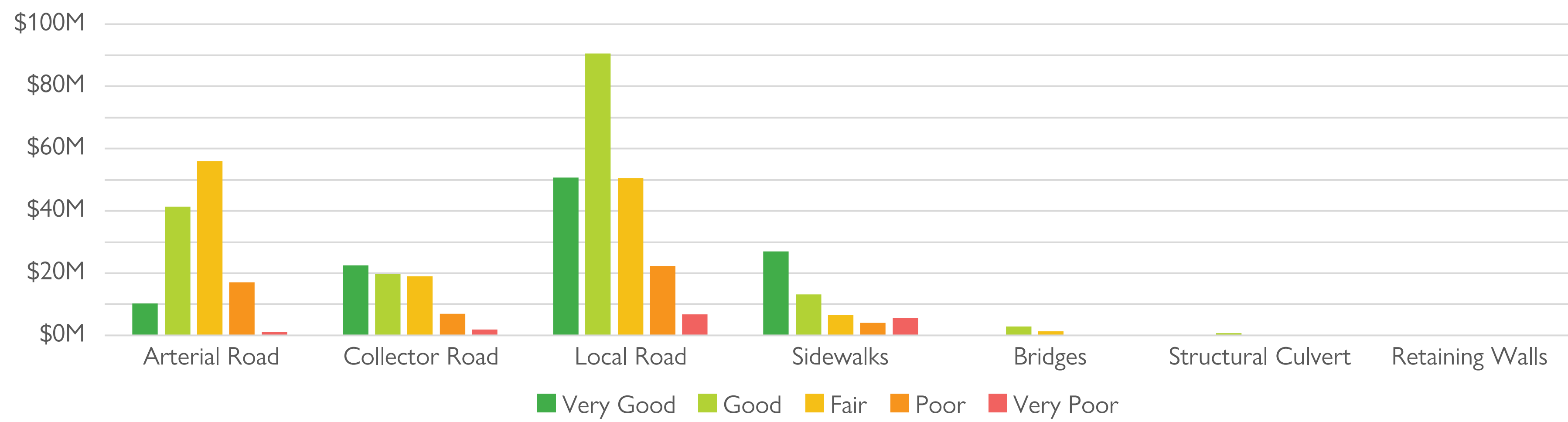
FIGURE 14: **Transportation – Breakdown of Condition Rating – Percentage of Cost**



The previous figure illustrates the breakdown of asset condition ratings for all transportation assets in terms of the percentage of total replacement cost. A key point is that due to the differences in methodology for calculating condition between sub-segments, direct comparisons between sub-segments may not be consistent depending on which sub-segments are compared.

The following figure illustrates the same breakdown but in terms of the total replacement cost rather than the percentage of total replacement cost for each sub-segment. This illustrates the large cost implications of the quantity of roads and sidewalks compared to the much smaller value of the other assets.

FIGURE 15: **Transportation – Breakdown of Condition Rating – Cost**



The average condition of transportation assets is Good. Assets are maintained by using the best treatment option to manage the current condition and anticipated future deterioration of the asset. More information is found in the lifecycle management strategy details in Section 5.5. The following sections will present the condition information for each group of assets in more detail.

5.3.1 Bridges and Structural Culverts

The following figures provide a breakdown of asset condition by asset sub-segment for bridges and the structural culvert.

FIGURE 16: Transportation – Breakdown of Condition Rating – Bridges

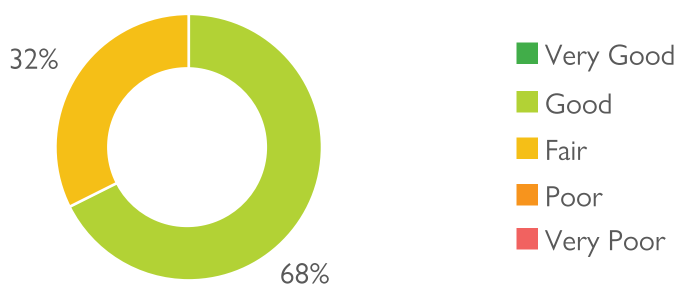
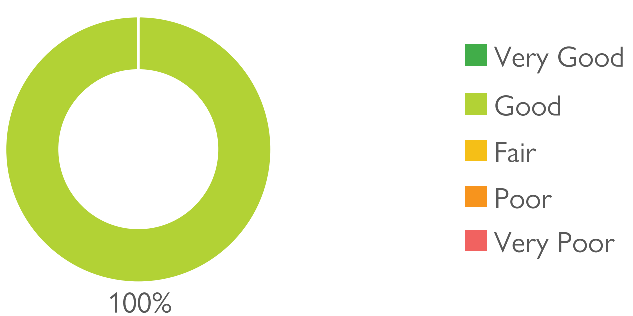


FIGURE 17: Transportation – Breakdown of Condition Rating – Structural Culvert



All municipally owned bridges and structural culverts with a span equal to or greater than 3 m are required to be inspected every two years in accordance with Ontario Regulation 104/97 and must follow the Ontario Structure Inspection Manual (OSIM). The results are analyzed to assign a rating score from 100 to 0 for each structure that corresponds to a rating between Very Good to Very Poor. The most recent inspections were completed in 2022.

Although on average the bridges are close to their original estimated useful life of 75 years, historical renewal and rehabilitation activities have resulted in these assets having a lifecycle estimated useful life of 90 years and maintaining their condition rating at Fair or Good. It is anticipated that these structures will continue to provide a sufficient level of service until they reach their lifecycle estimated useful life. Frequent inspections ensure risk is managed as any significant changes in condition will be documented every other year.

The following table illustrates the condition ratings defined with respect to the bridge condition index values. Since the City does not have any structures that are overall in the Very Good, Poor, or Very Poor condition states, the example photo is of a component of a structure that is in that state where available. A photo for the Very Poor state is omitted due to no component within this rating currently.

TABLE 14: Transportation – Condition Rating Descriptions and Photos – Bridges and Structural Culvert

Condition State: **Very Good**

Scale: 1.8 ≥ and ≥ 0

Description: Fit for Future

Condition State: **Good**

Scale: 2.6 ≥ and > 1.8

Description: Adequate for Now

Condition State: **Fair**

Scale: 3.4 ≥ and > 2.6

Description: Requires Attention

Condition State: **Poor**

Scale: 4.2 ≥ and > 3.4

Description: Increasing Potential of Affecting Service

Condition State: **Very Poor**

Scale: 5.0 ≥ and > 4.2

Description: Unfit for Sustained Service

Omitted due to no assets within this rating currently.

Currently, the City does not have sufficiently detailed replacement cost information at the OSIM element level of detail that is required to calculate a Bridge Condition Index (BCI) value from 100 to 0. Instead, the City assigned a condition rating from Very Good to Very Poor using subject matter expert knowledge of the structure inspector.

5.3.2 Roads

The following figures provide a breakdown of asset condition for all roads and each major sub-segment of road.

FIGURE 18: **Transportation – Breakdown of Condition Rating – All Roads**

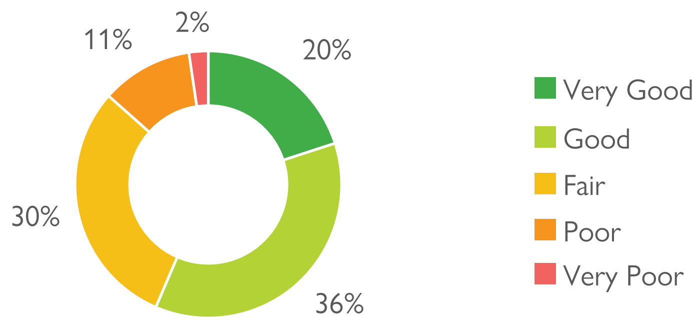


FIGURE 19: **Transportation – Breakdown of Condition Rating – Arterial Roads**

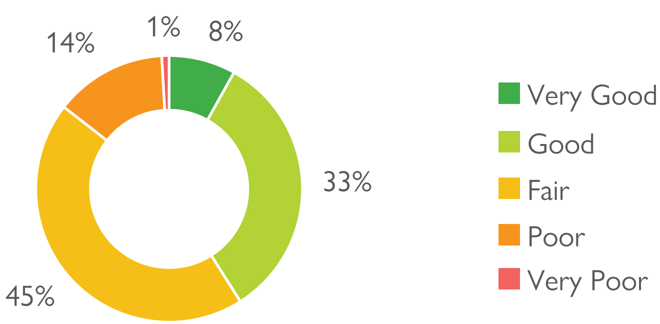


FIGURE 20: **Transportation – Breakdown of Condition Rating – Collector Roads**

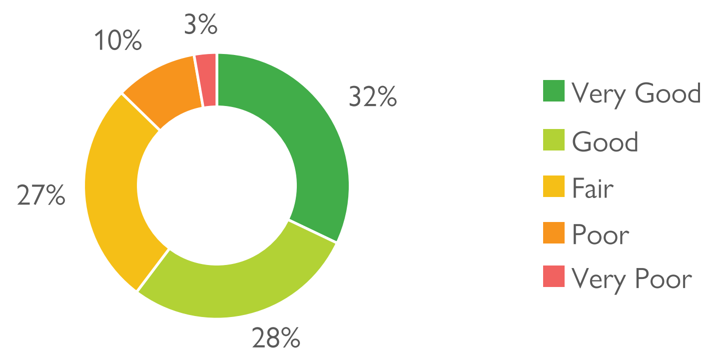
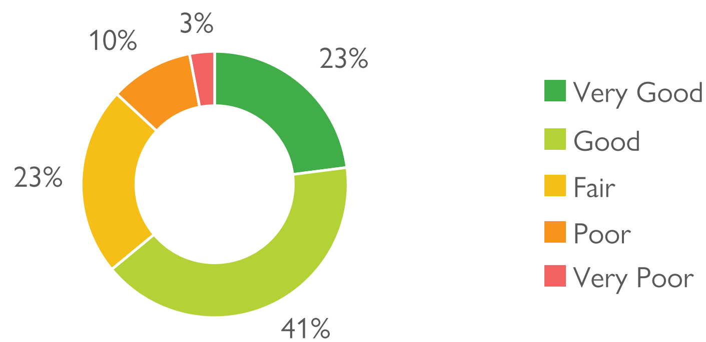


FIGURE 21: **Transportation – Breakdown of Condition Rating – Local Roads**

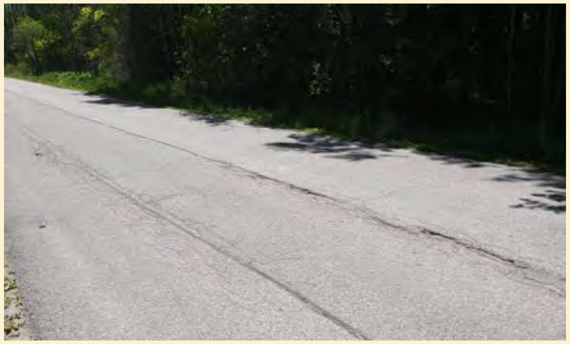


Every two years, the condition of the road network asphalt surface is evaluated by a consultant using a variety of condition assessment techniques. The results are analyzed to assign an industry-standard Pavement Condition Index (PCI) score from 100 to 0 for each segment of roadway that corresponds to a rating between Very Good to Very Poor. The most recent inspections were completed in 2022.

Considering all types of roads, 56% of the City's pavement surfaces are in Very Good or Good condition with only a small portion, 2%, rated as Very Poor. This indicates that roads are not typically reaching a state of failure. However, with 13% of roads in Poor or Very Poor condition, the data indicates that there is a need for both immediate-term and long-term investments to continue the management of deficiencies and meet the City's desired minimum condition rating. As well, since PCI only captures the type and severity of deficiencies on the pavement surface, additional non-surface data should be considered before making renewal, rehabilitation, or replacement decisions.

The following table illustrates the road condition ratings defined with respect to the pavement condition index values.

TABLE 15: Transportation – Condition Rating Descriptions and Photos – All Roads

Condition State: **Very Good**	Condition State: **Good**	Condition State: **Fair**
Scale: 100 ≥ PCI > 85	**Scale:** 85 ≥ PCI > 70	**Scale:** 70 ≥ PCI > 55
Description: Very smooth ride. Pavement is in excellent condition with few cracks.	**Description:** Smooth ride with just a few bumps or depressions. Frequent very slight or slight cracking.	**Description:** Comfortable ride with infrequent bumps or depressions. Infrequent moderate and frequent slight cracking, infrequent slight or moderate alligatoring and distortion.
		

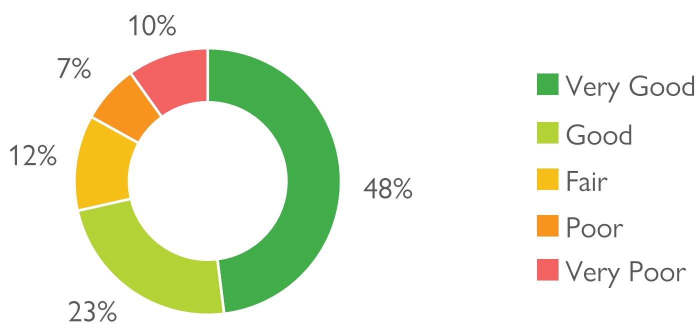
Condition State: **Poor**	Condition State: **Very Poor**
Scale: 55 ≥ PCI > 40	**Scale:** 40 ≥ PCI
Description: Uncomfortable ride with frequent to extensive bumps or depressions. Cannot maintain the posted speed at lower end of the scale. Frequent moderate cracking and distortion, infrequent moderate alligatoring.	**Description:** Very uncomfortable ride with constant bumps and depressions. Cannot maintain posted speed. Must steer to avoid bumps and depressions. Extensive severe cracking, distortion, or alligatoring,
	

Descriptions are adapted from the SP-024 Manual for Condition Rating of Flexible Pavements (Ontario Ministry of Transportation, 2016).

5.3.3 Sidewalks

The following figure provides a breakdown of asset condition for sidewalks.

FIGURE 22: Transportation – Breakdown of Condition Rating – Sidewalks

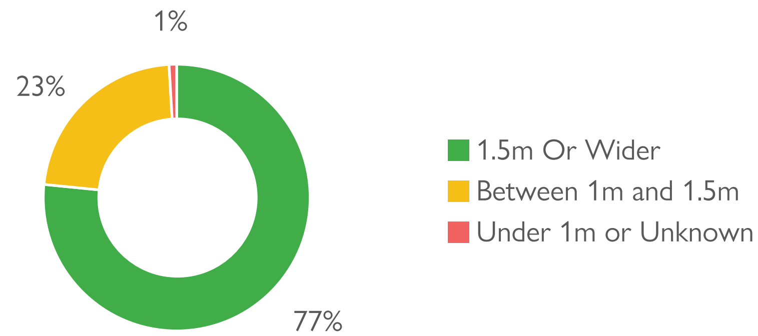


Every two years, the condition of the sidewalk network is evaluated by a consultant using a variety of condition assessment techniques. The results are analyzed to assign a Sidewalk Condition Index (SCI) score from 100 to 0 for each length of sidewalk that corresponds to a rating between Very Good to Very Poor. The most recent inspections were completed in 2022.

71% of the City's sidewalks are in Very Good or Good condition with a moderate portion, 10%, rated as Very Poor. This indicates that many sidewalks are reaching or exceeding the end of their service life. With 17% of sidewalks in Poor or Very Poor condition, the data indicates that there is a need for both immediate-term and long-term investments to continue the management of deficiencies.

In addition to the condition, sidewalk width was also captured during the condition assessment process to inform the City of the extent of undersized sidewalks. 77% of sidewalks meet or exceed the *Accessibility for Ontarians with Disabilities Act* (AODA) standard width of 1.5 m. The remaining sidewalks are of substandard width. The following figure provides a breakdown of groupings of sidewalk width.

FIGURE 23: Transportation – Breakdown of Sidewalk Width



There exist areas in the City where the municipal right-of-way is insufficient to install a 1.5 m wide sidewalk. It is the City's aim to ensure at least one side of the street has a sidewalk of AODA-compliant width, where feasible. Insufficient sidewalk width is considered along with condition in determining prioritization of lifecycle management strategies.

The following table illustrates the sidewalk condition ratings defined with respect to the sidewalk condition index values.

TABLE 16: Transportation – Condition Rating Descriptions and Photos – Sidewalks

Condition State: **Very Good**

Scale: 100 ≥ SCI > 85

Description: A very smooth and level surface with minimal cracking.

Condition State: **Good**

Scale: 85 ≥ SCI > 70

Description: A smooth and level surface with just a few cracks, distortions, or depressions.

Condition State: **Fair**

Scale: 70 ≥ SCI > 55

Description: A semi-smooth surface with intermittent cracking, distortions, or depressions.

Condition State: **Poor**

Scale: 55 ≥ SCI > 40

Description: A non-smooth surface with frequent to extensive cracking, distortions, or depressions.

Condition State: **Very Poor**

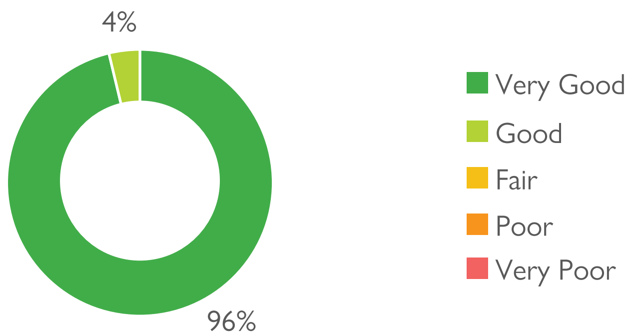
Scale: 40 ≥ SCI

Description: A very non-smooth surface with constant cracking, distortions, and depressions. May be impassable due to obstructions or overgrown vegetation.

5.3.4 Retaining Walls

The following figure provides a breakdown of asset condition for retaining walls.

FIGURE 24: **Transportation – Breakdown of Condition Rating – Retaining Walls**



The City manages two retaining walls. An additional retaining wall on Borland Street is in process of being redesigned as a gravity wall and is omitted from this plan. Condition assessments are conducted on an as-needed basis. All assessments are completed in compliance with the Ontario Structure Inspection Manual (OSIM) requirements. The results are analyzed to assign a rating score from 1 to 5 for each structure that corresponds to a rating between Very Good to Very Poor. No recent inspection following the OSIM manual is available. Instead, an age-based approach is used to determine the condition of the retaining walls.

Due to the limited number of retaining walls in the inventory, a table of condition ratings with photos and descriptions is omitted.

5.4 Levels of Service and Performance Measures

The City's assets exist to deliver services to its users. Levels of service are a measurement of the actual service provided so that decisions are made based on the nature and quality of that service, rather than only the condition of an asset. These are used to summarize the type of service being provided that reflects the values and desires of stakeholders in the community.

The following tables identify the City's current level of service for the transportation assets. These metrics include any technical and community level of service metrics that are required to comply with Ontario Regulation 588/17, as well as any additional metrics provided by the City. A future revision to this plan will include proposed levels of service targets for each measure.

5.4.1 Community Levels of Service

The following table identifies the qualitative descriptions that determine the community levels of service provided by the transportation assets.

TABLE 17: Transportation – Community Levels of Service

Service Attribute	Community Levels of Service	Related Assets
Scope	The City's bridges and structural culvert enable the movement of people and goods throughout the City and to provincial highways using a variety of transportation options. In addition to passenger vehicles, these assets support the movement of commercial vehicles, pedestrians, cyclists, trailered water vehicles, and provide reliable emergency vehicle response access. One of the bridges has a loading or dimension restriction. The extent of the City's transportation network, including the locations of the bridges and the structural culvert, is illustrated by Map 1. The extent of the sidewalk network is illustrated separately by Map 2.	Bridges, Structural Culvert
Quality	If the condition of a bridge or structural culvert were to progress to a state of disrepair, width or load restrictions may be implemented. If the condition degradation is severe, the structure may become unusable or fail. Regular inspections inform the City of when potential restrictions or closure may need to be put in place. The City inspects and maintains the transportation network at a condition level to operate as designed. Descriptions and images that illustrate the different condition ratings of bridges and structural culverts are provided in Table 14.	Bridges, Structural Culvert
Scope	The City's roads enable the movement of people and goods throughout the City and to provincial highways using a variety of transportation options. In addition to passenger vehicles, these assets support the movement of commercial vehicles, pedestrians, cyclists, and trailered water vehicles, and provide reliable emergency vehicle response access. The extent of the City's transportation network is illustrated by Map 1.	Roads
Quality	The City inspects and maintains the transportation network at a condition level to operate as designed. Descriptions and images that illustrate the different condition ratings of roads and sidewalks are provided in Table 15 and Table 16 respectively.	Roads, Sidewalks
Accessibility	The City strives to make its pedestrian pathways accessible to everyone.	Sidewalks

5.4.2 Technical Levels of Service

The following table identifies the quantitative metrics that determine the technical level of service provided by transportation assets.

TABLE 18: Transportation – Technical Levels of Service

Service Attribute	Description of What Performance Measure Captures	Performance Measure	2023 Performance	Target	Related Assets
Scope	Density of the arterial class road network.	Number of lane-kilometres of arterial roads as a proportion of square kilometres of land area of the municipality.	3.7		Roads
Scope	Density of the collector class road network.	Number of lane-kilometres of collector roads as a proportion of square kilometres of land area of the municipality.	2.3		Roads
Scope	Density of the local class road network.	Number of lane-kilometres of local roads as a proportion of square kilometres of land area of the municipality.	8.5		Roads
Scope	Adequacy of bridges to support typical traffic without restrictions.	Percentage of the bridges in the municipality with loading or dimensional restrictions.	20%		Bridges
Quality	Adequacy of paved road surfaces to provide a smooth and comfortable ride at the posted speed.	Average pavement condition index value for paved roads.	77.1		Roads
Quality	Adequacy of road surfaces for users to maintain the posted speed.	Target minimum pavement condition index value for paved roads.	50		Roads
Quality	Adequacy of unpaved road surfaces to provide a smooth and comfortable ride at the posted speed.	Average surface condition for unpaved roads.	Good		Roads
Quality	Adequacy of sidewalk surfaces to provide a smooth and level pedestrian pathway.	Average sidewalk condition index value.	79.7		Sidewalks
Quality	Adequacy of bridges to provide a smooth and comfortable ride at the posted speed.	Average bridge condition index value for bridges.	Good		Bridges
Quality	Adequacy of structural culverts to provide a smooth and comfortable ride at the posted speed.	Average bridge condition index value for structural culverts.	Good		Structural Culverts
Quality	Condition of transportation network.	Percentage of assets in Poor or Very Poor condition.	13.7%		All
Accessibility	Availability of accessible sidewalks.	Percentage of sidewalks that comply with the AODA minimum clearance width of 1.5 m.	77%		Sidewalks

5.5 Lifecycle Management Strategy

It is important to proactively manage asset deterioration through a lifecycle management strategy that balances cost, risk, and the level of service.

The following table describes the current lifecycle management activities completed. This table also includes the risks associated with not completing these activities through using a do-nothing approach.

TABLE 19: Transportation – Lifecycle Management Strategy

Activity Type	Description of Current Strategy	Risks Associated with Not Completing Activities
Operations and Maintenance	Bridges and Structural Culvert ▪ Inspections for structures more than 3 m in span. ▪ Expansion joint and drain cleaning. Roads ▪ Inspections per the Minimum Maintenance Standards (MMS) under Ontario Regulation 239/02. ▪ Small spot repairs, pothole patching, ditching, sweeping, and debris removal. Snow and Ice Removal ▪ Line marking application and road signage maintenance. ▪ Maintenance of vegetation within the road right-of-way. ▪ Current crack sealing is completed only by City staff. More comprehensive crack sealing services were previously completed by external suppliers in addition to the City staff activities. Sidewalks ▪ Inspections per MMS. ▪ Small spot repairs (less than one panel). ▪ Snow and ice removal. ▪ Grass replacement. Retaining Walls ▪ Inspections and drain cleaning. Maintenance and operations activities are completed by City staff with external contractors brought in as needed.	▪ Deficiencies are not identified through patrols and inspections. ▪ Higher lifecycle costs if maintenance is delayed or completed incorrectly. ▪ Premature asset failure, health and safety risks, service disruptions. ▪ Financial liabilities if MMS are not met. ▪ Congestion, closures, and other disruptions leading to user dissatisfaction.

Activity Type	Description of Current Strategy	Risks Associated with Not Completing Activities
Renewal and Rehabilitation	Bridges and Structural Culvert ▪ Minor capital activities: deck resurfacing, crack sealing, waterproofing, painting. ▪ Major capital activities: structural repairs, deck replacements. Roads ▪ Minor capital activities: localized resurfacing, lane section repairs. ▪ Major capital activities: base repair, full-depth reclamation and resurfacing of the asphalt wear surface at a target cycle of every 20 years. ▪ The decision-making process that determines whether rehabilitation or replacement is the better option is partially dependent on the requirements of the underground infrastructure (e.g. water, sanitary sewer, storm). Sidewalks ▪ Grinding and panel raising to address uplifts and misalignment between panels. ▪ Spot repairs and single panel replacements. ▪ Partial segment replacement. Retaining Walls ▪ Spot repairs and structural repairs.	▪ Renewal and rehabilitation activities may increase asset life less than anticipated resulting in a need for repeated activities or premature asset failure. ▪ Higher lifecycle costs if work is delayed or completed incorrectly.

Activity Type	Description of Current Strategy	Risks Associated with Not Completing Activities
Replacement and Disposal	Bridges and Structural Culvert ▪ Bridges and structural culverts are considered end of life when renewal and rehabilitation activities are no longer cost-effective compared to replacement of the structure. ▪ May also be replaced in coordination with the lifecycle of other infrastructure or due to vehicle impacts. Roads ▪ Roads are considered end of life when vehicles are no longer able to drive along them effectively at the posted speed limit. This is at a Pavement Condition Index of 50 or below, which is a condition rating of Poor. ▪ Major reconstruction including replacement of the driving surface asphalt, road base repair, drainage improvements, curb and gutter replacement or installation, traffic control and safety replacement and upgrades, and overall streetscape and accessibility improvements. ▪ The City aims to align road reconstruction timing with underground infrastructure needs to reduce total cost and disruption to the community. ▪ Reuse of reclaimed asphalt material during reconstruction. ▪ Disposal of contaminated materials and soils. Sidewalks ▪ Sidewalks are considered end of life when the extent of widespread distresses in the full segment length is beyond repair using replacement of individual panels or short sections. ▪ Full segment length replacement including replacements for accessibility improvements. ▪ Disposal of contaminated materials and soils. Retaining Walls ▪ Retaining walls are considered end of life when renewal and rehabilitation activities are no longer cost-effective compared to replacement of the structure. ▪ May also be replaced in coordination with the lifecycle of other infrastructure.	▪ Risk to public safety if structures are permitted to collapse due to lack of timely replacement or disposal. ▪ Delay in replacement and disposal projects may result in significantly higher costs, longer service disruptions, liability concerns, delays to emergency response times, and user dissatisfaction. ▪ Poor coordination with sub-surface infrastructure may result in significantly higher costs and repeated disruptions to the community. ▪ Improper disposal could lead to negative environmental impacts with associated cleanup expenses.

Activity Type	Description of Current Strategy	Risks Associated with Not Completing Activities
Growth-Related and Service Enhancements Lifecycle Needs	Bridges and Structural Culvert ▪ Adjustments due to capacity requirements. ▪ Addition of lighting, signalization. Roads ▪ Official Plan and Multi-Modal Transportation Master Plan targets. ▪ Adjustments due to capacity requirements. ▪ Updated streetscape design and materials. ▪ Changes to Ministry of Transportation infrastructure requirements. Sidewalks ▪ Official Plan and Multi-Modal Transportation Master Plan targets. ▪ Adjustments due to capacity requirements. ▪ Updated streetscape design and materials. ▪ Accessibility improvements including widening, tactile plate installation, and grade modifications. Retaining Walls ▪ New roads, road reconstructions, and infill developments requiring grade modification.	▪ Delay or cancellation of growth-related activities causing the network to be unable to sufficiently accommodate growth. ▪ Master plans may over or underestimate the required expansions to accommodate the impacts of growth. ▪ Increased lifecycle costs. ▪ Network congestion and disruption due to undercapacity. ▪ Non-compliance with Ministry of Transportation requirements.
Non-Infrastructure	Bridges and Structural Culvert ▪ Inspections and environmental assessments. Roads ▪ Inspections. ▪ Multi-Modal Transportation Master Plan. ▪ Traffic counts and signalization optimization. Sidewalks ▪ Inspections. Retaining Walls ▪ Inspections.	▪ Rate of asset deterioration is over or underestimated. ▪ Inaccurate growth impact analysis resulting in an incorrect funding allocation.

5.6 Forecasted Capital Requirements

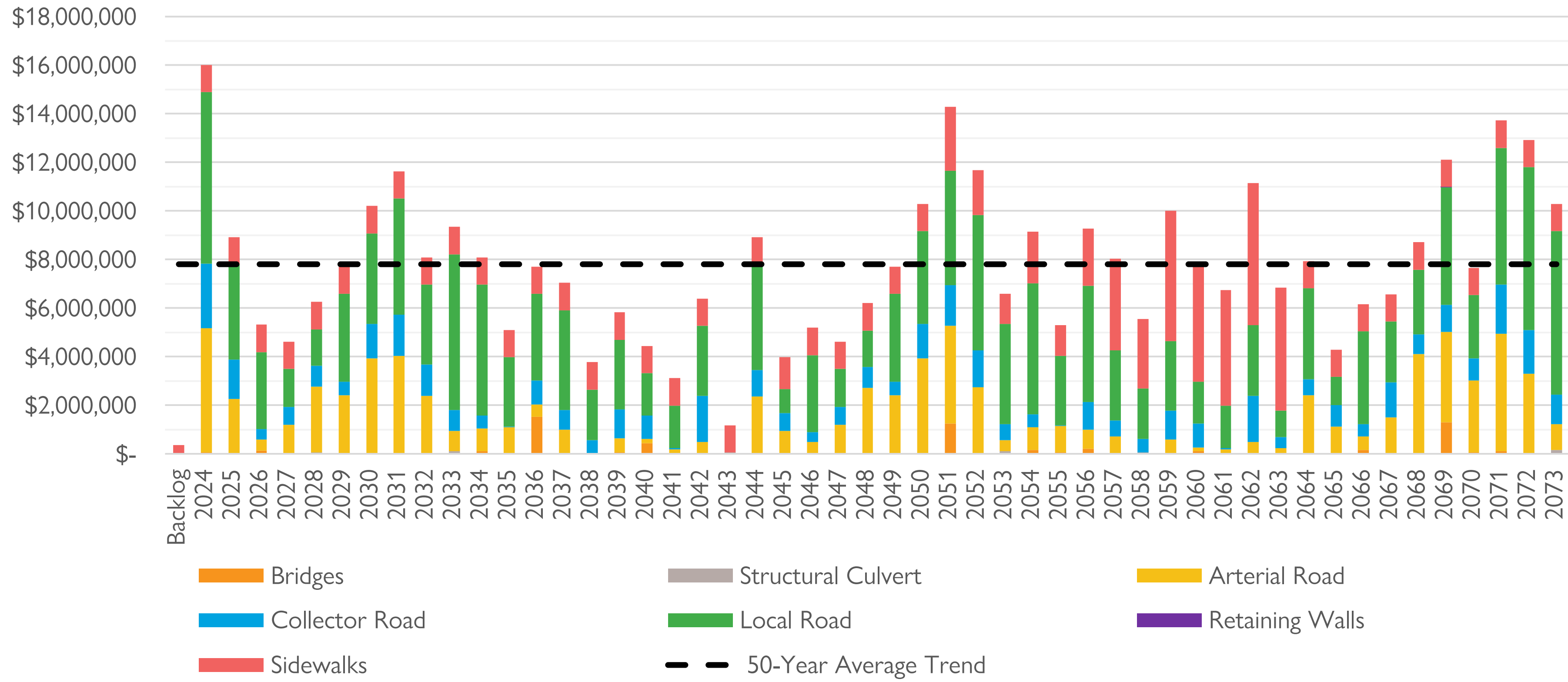
The City continuously invests in maintaining its assets and has been increasing budget amounts to align with asset needs. Until proposed levels of service are defined in the next revision of this asset management plan for July 1, 2025, there is no requirement to modify this funding arrangement.

The annual capital requirement represents the average cost per year that the City is estimated to require to allocate towards funding infrastructure needs. Based on the available data at the time of this plan, more information is required for this calculation. A more complete asset inventory would result in capturing more assets and more accurate lifecycle costs. When more assets are added to the portfolio, the average annual funding need would also increase and be better representative of the actual spending required to manage the City's assets.

Based on the best available current information, to maintain the current level of service and lifecycle management strategy, the annual sustainable capital funding requirement for existing transportation assets is estimated to be $7,804,763.

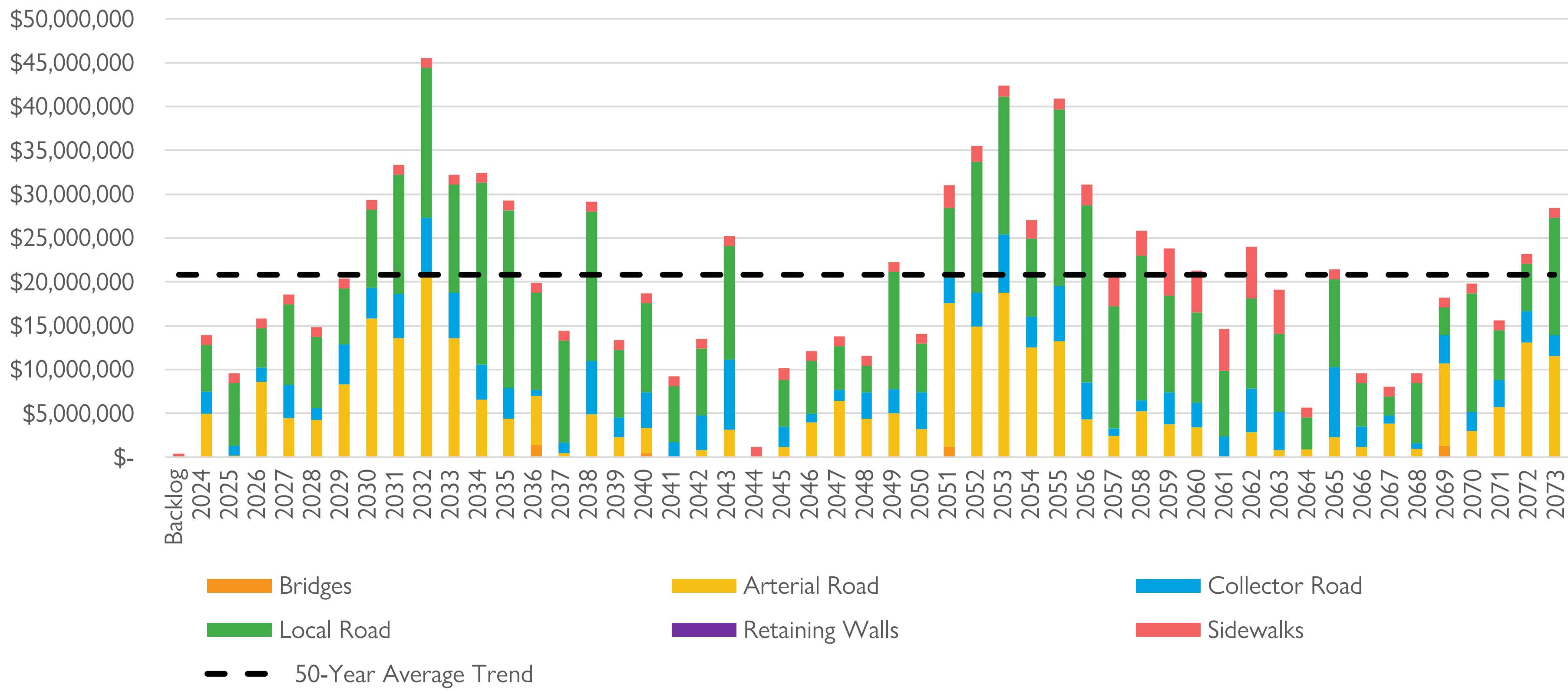
The 2024 capital budget funding allocation was $14,552,499. This means that there exists a funding surplus of $6,747,736 in 2024. The following figure illustrates a 50-year forecast of the annual capital asset needs for transportation network assets, including the cost and asset lifecycle impacts of completing renewal and rehabilitation activities.

FIGURE 25: Transportation – Annual Capital Requirement – 50-Year Forecast



The following figure illustrates the same 50-year forecast; however, it does not include the cost and asset lifecycle impacts of completing renewal and rehabilitation activities. The replacement date for the structural culvert is outside of this forecast range resulting in its exclusion from the figure.

FIGURE 26: **Transportation – Annual Capital Requirement – 50-Year Forecast – Replacement-Only Strategy**



Comparing the two figures, it is critical that long-term decisions regarding levels of service and funding needs must include the cost and impacts of lifecycle management strategies due to the significant difference in funding needs identified. The annual requirement for the replacement-only strategy is $20,806,094, which is $13,001,331 higher than the renewal and rehabilitation strategy. A replacement-only strategy is typically less cost effective than utilization of renewal and rehabilitation lifecycle management strategies for these types of assets.

A $365,075 backlog exists and is composed of sidewalks beyond their estimated useful life. These assets will be prioritized appropriately in the 10-year capital planning process for the sidewalk replacement capital program.

For further details on capital requirements, please see the Financial Summary portion of this plan that details the funding needs for all categories of assets over the next 10 years, including discussion of impacts from growth.

5.7 Climate Change and Other Risks

The following table summarizes key trends, challenges, and risks that the City is currently facing in delivering the desired level of service.

TABLE 20: Transportation – Climate Change and Other Risks

Trend, Challenge, or Risk	Summary
Climate Change and Extreme Weather Events	It is anticipated that there will be many challenges in managing the impacts of climate change, including: ▪ Potential increased damage to infrastructure through flooding and erosion due to more frequent extreme wet weather events. ▪ Potential increased maintenance and decreased estimated useful life of roads and sidewalks due to more frequent freeze-thaw events in the winter causing surfaces to heave and settle. ▪ Potential increased likelihood of damage to streetlights, decorative lighting, traffic control, and safety assets during extreme wind events. ▪ Potential increased deterioration of bridge components due to higher variability in summer and winter temperatures. ▪ Increased uncertainty in impacts of extreme weather events and what is the most cost-effective resiliency strategy or group of strategies. The City is considering the following adaptation and mitigation measures in response to the challenges: ▪ Incorporate new best practices and technology in the design, construction, and maintenance of assets to increase resiliency while managing affordability. ▪ Reduce vehicle traffic through improved multi-modal transportation options leading to less wear on roads and lower community greenhouse gas emissions. Potential future adaptation and mitigation measures include: ▪ Use of lower embodied carbon materials to potentially reduce the carbon footprint of infrastructure projects. ▪ Coordinate infrastructure design, construction, and maintenance with updated stormwater data and flood mapping to determine what options exist to improve resiliency during stormwater events.
Lifecycle Management Strategies	The adoption of a work order management system tied to the asset management inventory system will provide an improved connection between maintenance programs and service delivery outcomes.
Infrastructure Design and Installation	The City is getting better at standardizing engineering designs and ensuring that these are coordinated across departments and divisions through its 2015 Engineering Design Criteria Manual (DCM), which is due to be updated. Further efforts and refinements are continuously required to enhance and improve the process.
Infrastructure Reinvestment	Due to recent cost escalations, it may be difficult for the City to match the annual lifecycle requirement with the existing 10-year capital plan budgeted amounts for projects. Out-of-date cost estimations may lead to delays or cancellations of projects when actual construction cost bids are received and are beyond the allocated budget.

5.8 Recommendations and Improvement Plan

Asset Inventory

- Continue to review and refine the asset inventory to improve scope and accuracy.
- Continue to add asset information to GIS layers for improved staff efficiency.

Condition

- Ensure that the condition ratings from bridge and culvert inspections are entered into the asset inventory to support planning for deterioration modeling.
- Acquire bridge and structural culvert replacement cost data at the OSIM Element level of detail in required to calculate the industry standard Bridge Condition Index (BCI) condition rating value.
- Implement a recurring inspection schedule for retaining walls.
- Road and sidewalk network-wide condition assessments are completed every two years.
  - Ensure consistency in methodology and data processes between assessments so that results can be easily compared over time.
  - Align assessments with industry standard methodologies.
  - Consider assessing more than only the surface material condition.
- Continue to develop and conduct condition assessment methodology for all other transportation assets in preparation of including those assets in a future asset management plan.

Lifecycle Management Strategies

- Identify capital rehabilitation and renewal costs for bridges and the structural culvert and integrate these costs into long-term planning. Due to the 0% dedicated budget allocation for bridges and the structural culvert, separate tracking on spending on bridges and culverts currently through the roads reserve.
- Evaluate the efficacy of the City's lifecycle management strategies at regular intervals to determine the impact on cost, condition, and risk.
- Consider additional lifecycle management strategies and treatment options to lower lifecycle costs and improve levels of service. This may include items such as crack sealing services for roads and an edge grinding program for sidewalks. Adoption of new technology may be another source of new, more cost-effective strategies.
- Develop lifecycle management strategies for all other transportation assets.
- Integrate maintenance and operations work order data into the tracking of individual assets.

Levels of Service

- Continue to measure current levels of service in accordance with the metrics identified in Ontario Regulation 588/17 and the additional metrics included by the City.
- Identify proposed levels of service per Ontario Regulation 588/17 requirements and identify the strategies that are required to close any gaps between the current and proposed levels of service.


US MOTORS
H.L.P.606
H.L.P.605
US MOTORS
H.L.P.604
ZONE 2
ZONE 1
CALGON

6.0
Water


ORILLIA

6.0 Water

The City maintains a drinking water network to operate reliable, safe, and efficient distribution of potable water for the community. The water network services provided by the City include water treatment and distribution, water meter installation, cross-connection and backflow prevention, service connections, fire hydrants, and repair of watermain breaks. Water network infrastructure is the fourth-largest category of assets at a total replacement cost of $313,611,103 in 2023 dollars.

6.1 Asset Inventory and Replacement Cost

The City manages approximately 183.7 km of watermain, one booster station, two reservoir sites, three wells, and one water filtration plant. To support a safe and efficient network, the City also manages a network of 951 fire hydrants.

The replacement cost is estimated using primarily historic construction costs with consideration of standardized costing indices. Included in the cost of replacing each asset sub-segment is a set of components that together comprise a typical asset. The full set of components for each sub-segment is identified in Appendix 19.2.2.

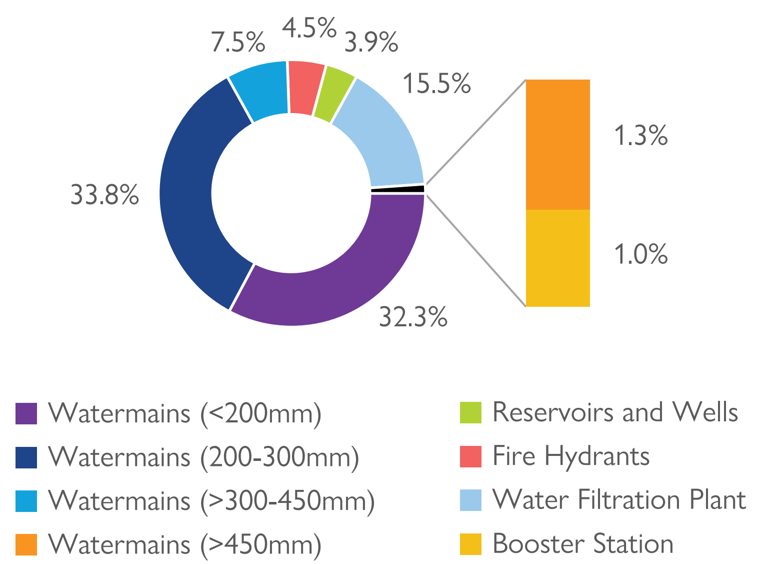
The following table includes the quantity, replacement cost method, and total replacement cost of each sub-segment of assets in the City's water network.

TABLE 21: **Water – Inventory and Replacement Cost**

Asset Segment	Asset Sub-Segment	Quantity	Replacement Cost Method	Replacement Cost	Percentage of Total Replacement Cost
Water Linear Network	Watermains (<200mm)	79,099 m	Cost/Unit	$101,325,819	32.3%
Water Linear Network	Watermains (200-300mm)	82,821 m	Cost/Unit	$106,093,701	33.8%
Water Linear Network	Watermains (>300-450mm)	18,470 m	Cost/Unit	$23,660,070	7.5%
Water Linear Network	Watermains (>450mm)	3,273 m	Cost/Unit	$4,192,713	1.3%
Water Linear Network	Fire Hydrants	951 hydrants	Cost/Unit	$14,265,000	4.5%
Water Vertical Network	Booster Station	1 station	Asset-Specific Cost Estimation	$3,116,850	1.0%
Water Vertical Network	Reservoirs and Wells	2 reservoir sites 3 wells	Asset-Specific Cost Estimation	$12,211,000	3.9%
Water Vertical Network	Water Filtration Plant	1 plant	Asset-Specific Cost Estimation	$48,745,950	15.5%

The following figure provides the data in the table above visually with each sub-segment as a percentage of the total replacement cost. Most of the City's water network assets are watermains. Due to the small relative total value of the large diameter watermains and booster station, an additional diagram is provided for clarity.

FIGURE 27: **Water – Total Replacement Cost**



6.2 Asset Age and Estimated Useful Life

The estimated useful life of water assets is determined using a combination of staff knowledge, historical data, and industry standards. The average service life remaining is determined by the difference between the average estimated useful life and the average age, except when an asset has been assigned an assessed condition rating that may increase or decrease the average service life remaining.

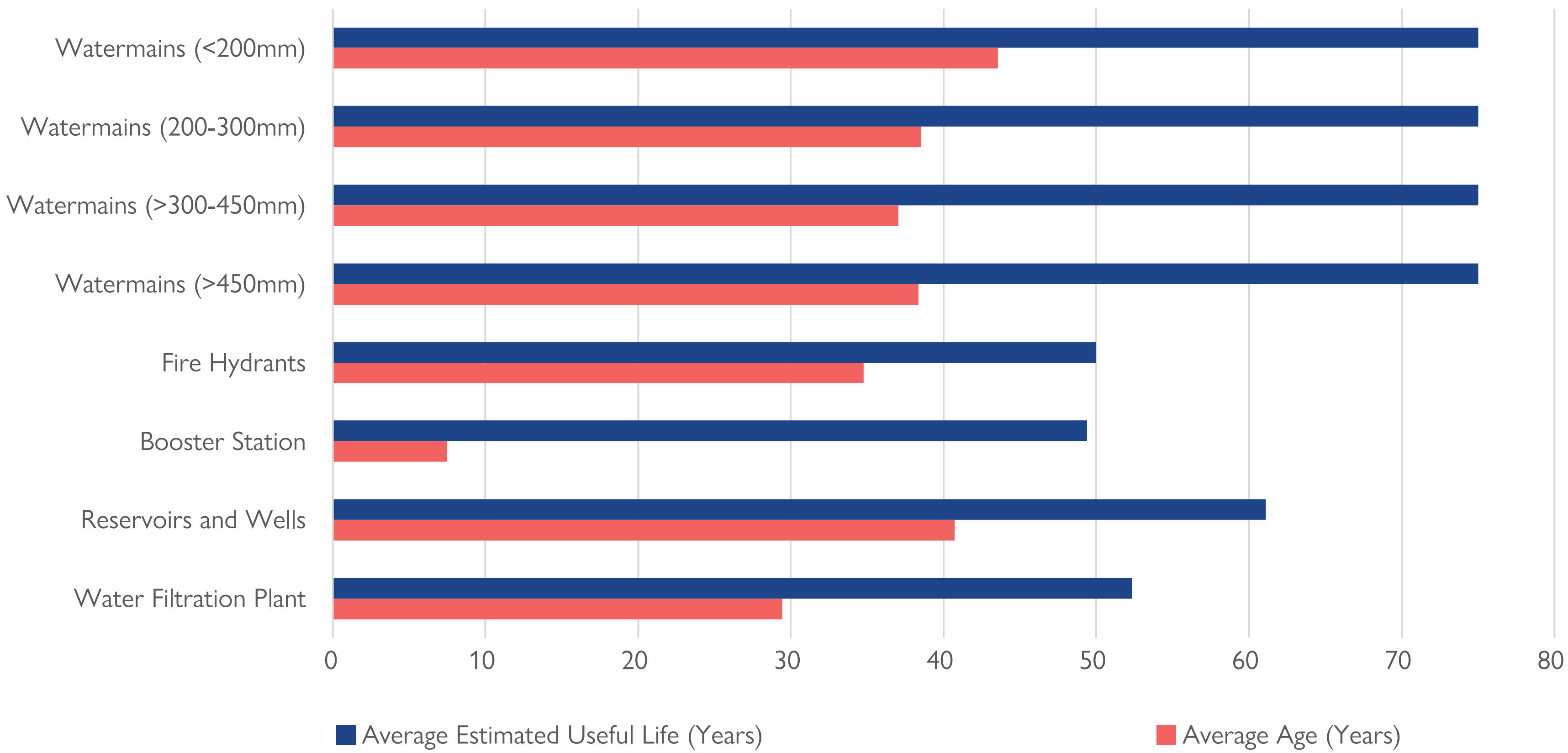
The following table summarizes the average age of each sub-segment based on the number of years that the assets have been in service.

TABLE 22: **Water – Average Age and Estimated Useful Life**

Asset Sub-Segment	Average Estimated Useful Life (Years)	Average Age (Years)	Average Service Life Remaining (Years)	Percentage of Average Service Life Remaining
Watermains (<200mm)	75.0	43.6	31.4	42%
Watermains (200-300mm)	75.0	38.5	36.5	49%
Watermains (>300-450mm)	75.0	37.0	38.0	51%
Watermains (>450mm)	75.0	38.3	36.7	49%
Fire Hydrants	50.0	34.7	15.3	31%
Booster Station	49.4	7.5	41.9	85%
Reservoirs and Wells	61.1	40.7	20.4	33%
Water Filtration Plant	52.3	29.5	22.8	44%

The age of an asset gives an indication of how close it is to the end of its estimated useful life and what lifecycle management strategies may be required. The following figure displays average asset age alongside the estimated useful life for each asset sub-segment.

FIGURE 28: Water – Average Age and Estimated Useful Life



Average asset ages have not exceeded the estimated useful life for any asset sub-segment.

6.3 Condition

The following sections and tables outline the condition breakdown for each group of assets and the City's methods for assessing asset condition. Where available and feasible, the City follows industry-standard best practices and generally accepted good engineering practices in the approach to assessing asset condition. When condition assessments are unavailable, an age-based condition rating is used based on the relative age of the asset compared to its estimated useful life.

The following table summarizes the variety of techniques used to assess the condition of the water assets on a regular basis.

TABLE 23: **Water – Approach to Assessing Condition**

Asset Segment	Asset Sub-Segment	Condition Data Collection Techniques	Target Frequency of Data Collection	Year of Last Assessment
Water Linear Network	Watermains (<200mm)	Age-based with tracking of watermain breaks.	Every year.	2023
Water Linear Network	Watermains (200-300mm)	Age-based with tracking of watermain breaks.	Every year.	2023
Water Linear Network	Watermains (>300-450mm)	Age-based with tracking of watermain breaks.	Every year.	2023
Water Linear Network	Watermains (>450mm)	Age-based with tracking of watermain breaks.	Every year.	2023
Water Linear Network	Fire Hydrants	Age-based and staff condition assessments.	Every year.	2023
Water Vertical Network	Booster Station	Age-based and condition assessments by staff and subject matter experts.	Every 5 years.	2017-2023
Water Vertical Network	Reservoirs and Wells	Age-based, reservoir and well inspections every five years, and condition assessments by staff and subject matter experts.	Every 5 years.	2017-2023
Water Vertical Network	Water Filtration Plant	Age-based and condition assessments by staff and subject matter experts.	Every 5 years.	2017-2023

The following table provides a summary of the condition rating systems for each sub-segment of assets. Based on the condition data and information provided by staff and subject matter experts, the condition of assets is rated on a scale from Very Good to Very Poor.

TABLE 24: **Water – Condition Rating Scales**

Rating	Rating Description	Watermains (Five-Point Scale)	Fire Hydrants Booster Station Reservoirs and Wells Water Filtration Plant (Five-Point Scale)
Very Good	Fit for Future	1.8 ≥ and ≥ 0	1 ≥ and ≥ 0
Good	Adequate for Now	2.6 ≥ and > 1.8	2 ≥ and > 1
Fair	Requires Attention	3.4 ≥ and > 2.6	3 ≥ and > 2
Poor	Increasing Potential of Affecting Service	4.2 ≥ and > 3.4	4 ≥ and > 3
Very Poor	Unfit for Sustained Service	5.0 ≥ and > 4.2	5 ≥ and > 4

The following figure illustrates the breakdown of condition ratings in terms of dollars of the City's water network assets. 49.0% of these assets are in Very Good to Good condition with a large proportion, 16.6%, rated as Very Poor.

FIGURE 29: **Water – Condition Rating Summary**

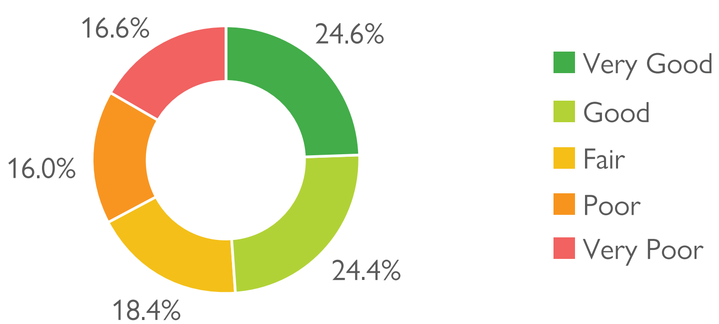
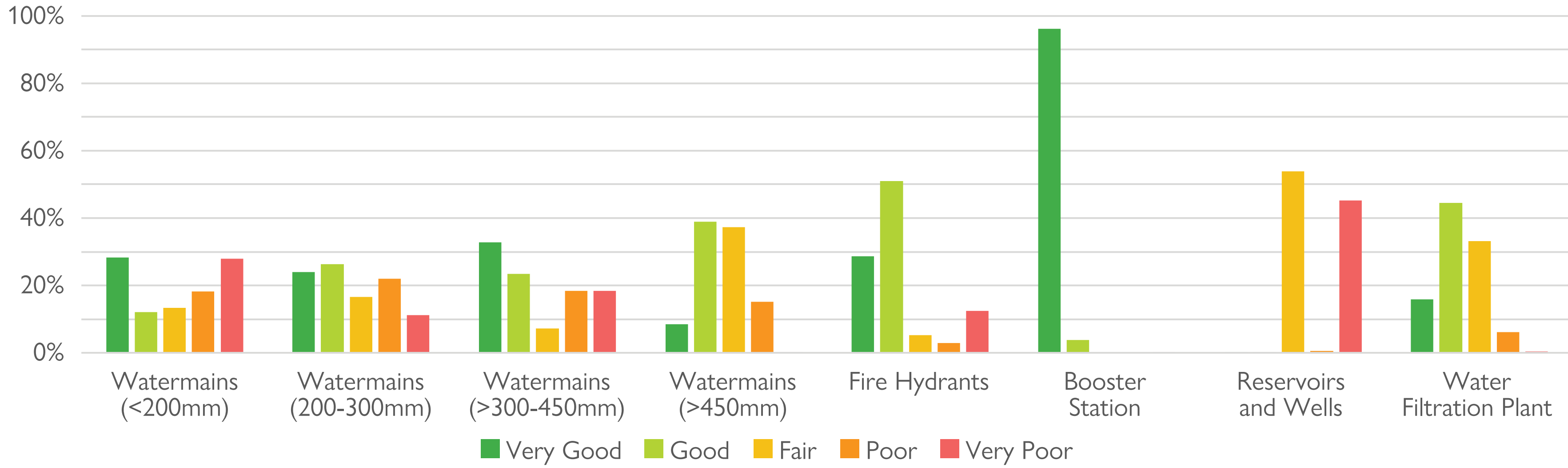


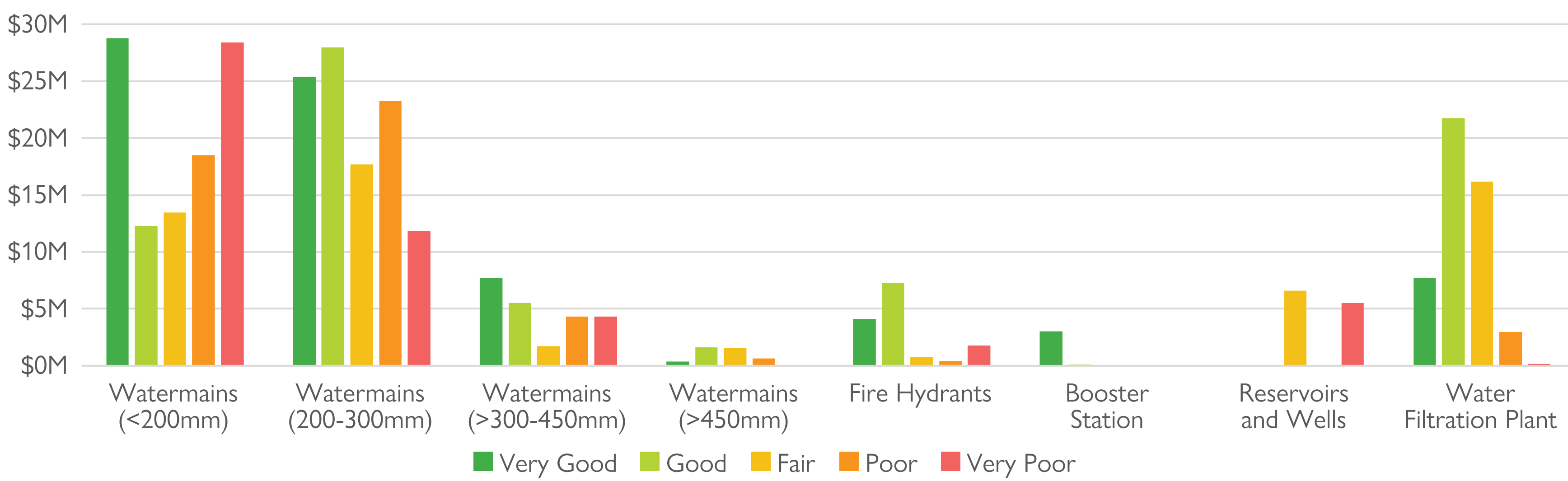
FIGURE 30: Water – Breakdown of Condition Rating – Percentage of Cost



The previous figure illustrates the breakdown of asset condition ratings for all water network assets in terms of the percentage of total replacement cost for that sub-segment. Due to the differences in methodology for calculating condition between sub-segments, direct comparisons between sub-segments may not be consistent depending on which sub-segments are compared.

The following figure illustrates the same breakdown but in terms of the total replacement cost rather than the percentage of total replacement cost for each sub-segment. This illustrates the substantial cost implications of the combined large quantity of watermains compared to the relatively smaller value of some of the non-watermain assets.

FIGURE 31: Water – Breakdown of Condition Rating – Cost



The overall average condition of water network assets is Fair. Assets are maintained through the selection of an optimal treatment method based on the current condition and anticipated future deterioration. More information is found in the lifecycle management strategy details in Section 6.5. The following sections will present the condition information for groups of these assets in more detail.

6.3.1 Watermains

The following figures provide a breakdown of watermain condition for all watermains, and also by asset sub-segment for the different diameter groupings.

FIGURE 32: **Water – Breakdown of Condition Rating – All Watermains**

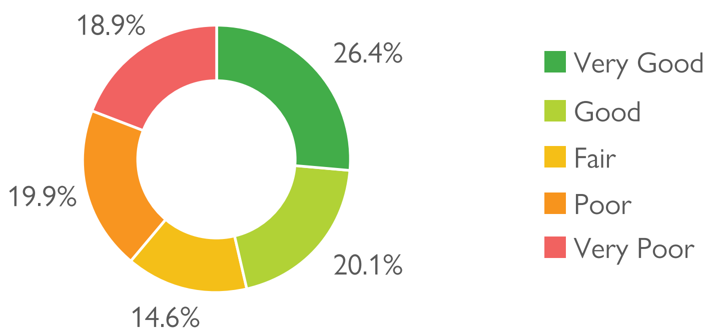


FIGURE 33: **Water – Breakdown of Condition Rating – Watermains (<200mm)**

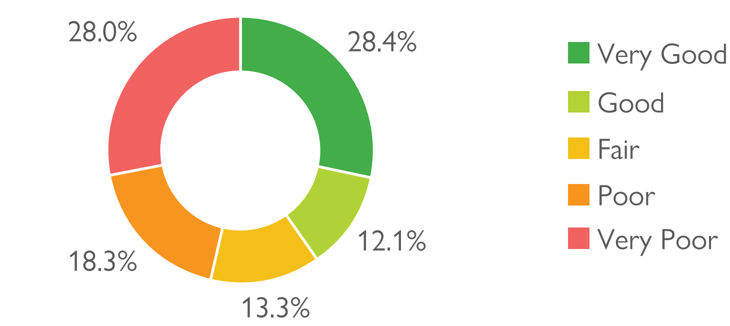


FIGURE 34: **Water – Breakdown of Condition Rating – Watermains (200-300mm)**

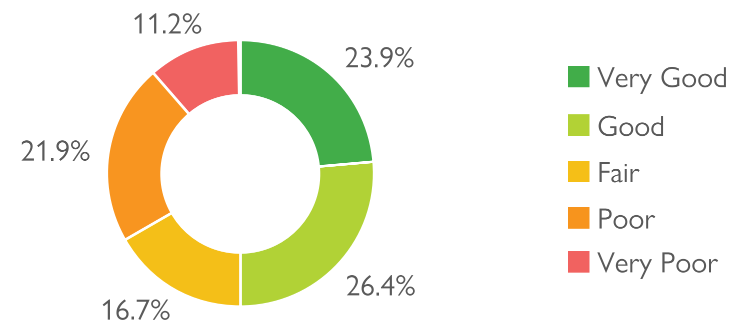


FIGURE 35: Water – Breakdown of Condition Rating – Watermains (>300-450mm)

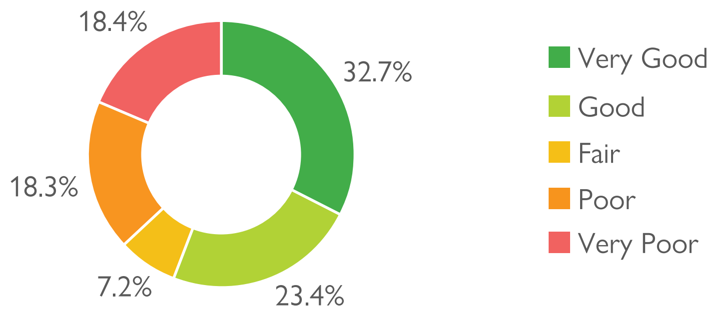
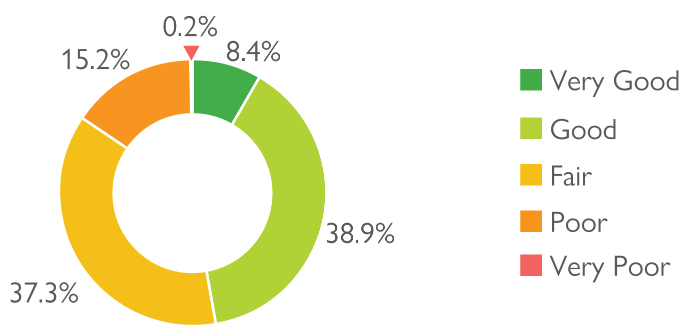


FIGURE 36: Water – Breakdown of Condition Rating – Watermains (>450mm)



46.5% of the City's watermains are in Very Good or Good condition with a large proportion, 18.9%, rated as Very Poor. This indicates that much of the watermain network is reaching or exceeding the end of its service life. With 38.8% of watermains in Poor or Very Poor condition, the data indicates that there is a need for both immediate-term and long-term investments to continue the management of deficiencies.

However, the breakdown of condition ratings varies significantly depending on the group of diameters considered. Smaller watermains with a diameter less than 200 mm have a larger portion, 46.3%, of the assets in Poor or Very Poor condition. Conversely, the largest watermains have only 15.4% in Poor or Very Poor condition. The City actively manages risk by prioritizing the larger diameter watermains in the capital planning process as their failure would impact the largest number of users.

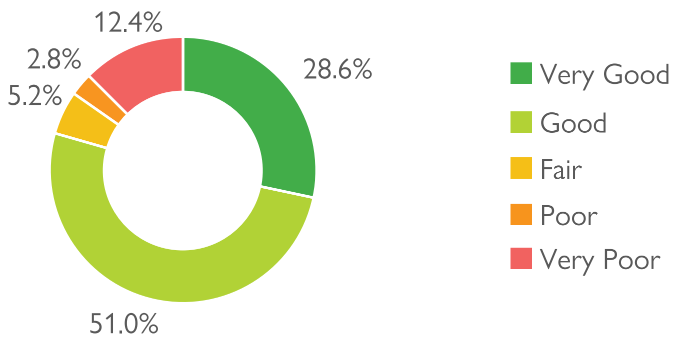
There are inherent challenges with completing condition assessments for active watermains, as the condition assessment generally requires in-pipe equipment, and significant staff and financial resources. The watermain condition assessment process is currently limited to a desktop exercise. It is recommended that a physical condition assessment program is considered for larger diameter watermains on a regular basis to have a more accurate understanding of the true condition of these assets. This will ensure that the most cost-effective approach to managing assets is used while ensuring that the City has the information required to accurately manage the level of risk for these critical assets.

Due to the current condition assessment process being a desktop exercise, a table of condition ratings with photos and descriptions is omitted.

6.3.2 Fire Hydrants

The following figure provides a breakdown of asset condition for the fire hydrant assets.

FIGURE 37: Water – Breakdown of Condition Rating – Fire Hydrants



City staff inspect the fire hydrants annually and assign a score from 1 to 5 that corresponds to a rating between Very Good to Very Poor. The most recent inspection data included in this plan is from 2022.

79.6% of the City's fire hydrants are in Very Good or Good condition with a significant proportion, 12.4%, rated as Very Poor. Only a small proportion of the hydrants are in Fair or Poor condition. The data indicates that most of the hydrants are well maintained; however, investment in the immediate-term is needed to manage the assets in Very Poor condition. Fire suppression is a critical service provided by the City where low-reliability or out-of-service hydrants could lead to delays in the time it takes for the fire services to effectively suppress a fire.

The following table illustrates the fire hydrant condition ratings.

TABLE 25: Water – Condition Rating Descriptions and Photos – Fire Hydrants

Condition State: **Very Good**	Condition State: **Good**	Condition State: **Fair**
Scale: 1 ≥ and ≥ 0	**Scale:** 2 ≥ and > 1	**Scale:** 3 ≥ and > 2
Description: Fit for Future	**Description:** Adequate for Now	**Description:** Requires Attention
		

Condition State: **Poor**	Condition State: **Very Poor**
Scale: 4 ≥ and > 3	**Scale:** 5 ≥ and > 4
Description: Increasing Potential of Affecting Service	**Description:** Unfit for Sustained Service
	Not available due to recent fire hydrant painting.

6.3.3 Booster Station, Reservoirs and Wells, and Water Filtration Plant

The following figures provide a breakdown of asset condition for the vertical water network assets and each sub-segment.

FIGURE 38: **Water – Breakdown of Condition Rating – All Vertical**

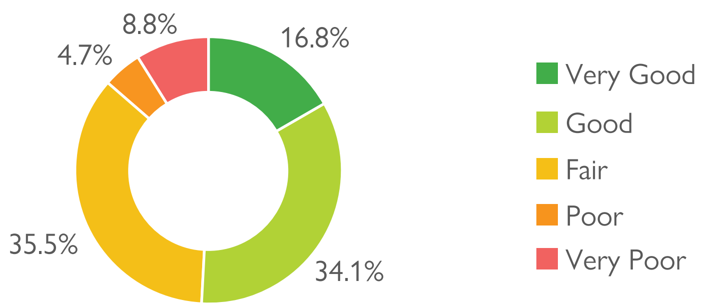


FIGURE 40: **Water – Breakdown of Condition Rating – Reservoirs and Wells**

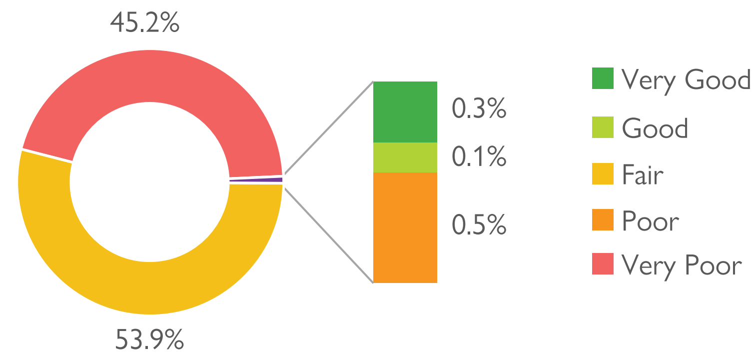


FIGURE 39: **Water – Breakdown of Condition Rating – Booster Station**

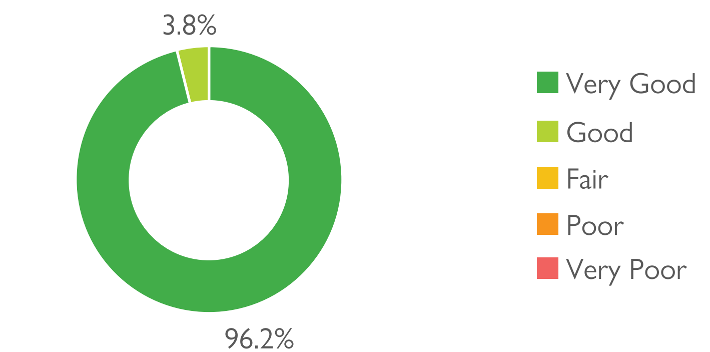
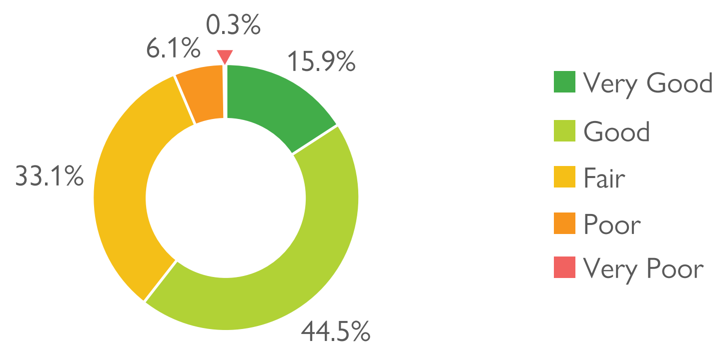


FIGURE 41: **Water – Breakdown of Condition Rating – Water Filtration Plant**



At a target interval of every five years, the condition of these assets is evaluated by external subject matter experts using a variety of condition assessment techniques. The results are analyzed to assign a condition score from 1 to 5 for each asset that corresponds to a rating between Very Good to Very Poor. The most recent inspections were completed in 2023. Staff also complete assessments on an as-needed basis in response to deficiencies, renewal projects, and upgrades. However, condition inspection data from 2017 is included for assets not recently inspected.

50.9% of the City's vertical water assets are in Very Good or Good condition with a moderate proportion, 8.8%, rated as Very Poor. This indicates that some assets are reaching or exceeding the end of their service life. With 13.5% of water vertical assets in Poor or Very Poor condition, the data indicates that there is a need for both immediate-term and long-term investments to continue the management of deficiencies.

However, the breakdown of condition ratings varies significantly depending on the sub-segment considered. The booster station is newer with all assets in Very Good or Good condition. On the other hand, the reservoir sites and wells assets are almost evenly split between Fair and Very Poor condition. The water filtration plant is on average in Good condition with a moderate proportion of assets in Poor or Very Poor condition. The investment priority will vary over time in response to the differences in the mix of asset condition between the different sub-segments.

The following table illustrates the condition ratings defined with respect to a variety of water vertical assets.

TABLE 26: Water – Condition Rating Descriptions and Photos – Vertical

Condition State: Very Good

Scale: 1 ≥ and ≥ 0

Description: Fit for Future

Condition State: Good

Scale: 2 ≥ and > 1

Description: Adequate for Now

Condition State: Fair

Scale: 3 ≥ and > 2

Description: Requires Attention

Condition State: Poor

Scale: 4 ≥ and > 3

Description: Increasing Potential of Affecting Service

Condition State: Very Poor

Scale: 5 ≥ and > 4

Description: Unfit for Sustained Service

6.4 Levels of Service and Performance Measures

The City's assets exist to deliver services to its users. Levels of service are a measurement of the actual service provided so that decisions are made based on the nature and quality of that service, rather than only the condition of an asset. These are used to summarize the type of service being provided that reflects the values and desires of stakeholders in the community.

The following tables identify the City's current level of service for the water network assets. These metrics include any technical and community level of service metrics that are required to comply with Ontario Regulation 588/17, as well as any additional metrics provided by the City. A future revision to this plan will include proposed levels of service targets for each measure.

6.4.1 Community Levels of Service

The following table identifies the qualitative descriptions that determine the community levels of service provided by the water assets.

TABLE 27: **Water – Community Levels of Service**

Service Attribute	Community Levels of Service	Related Assets
Scope	The City maintains a drinking water network to ensure reliable, safe, and efficient distribution of potable water for the community. The water network services provided by the City include water treatment and distribution, water meter installation, cross-connection and backflow prevention, service connections, fire hydrants, and repair of watermain breaks. Due to the geographical isolation of Grape Island, the City's water network does not extend across the waterway to service the properties located on the island. The extent of the City's water network including the locations of water vertical assets is illustrated by Map 3.	All
Scope	The extent of the area within 150 m of a fire hydrant is illustrated by Map 3.	Hydrants
Reliability	Boil water advisories are triggered because of adverse water quality reports from routine water quality testing or localized spot testing after events that have the potential to allow for contaminants to enter the system. Watermain breaks are one such type of event where this testing takes place. The City has a standard operating procedure for managing these events and the issuance of boil water advisories.	All
Reliability	Watermain breaks result from various reasons including soil conditions, weather, installation practices, and strikes during excavations. Extreme weather changes can cause the ground to swell and contract, placing excessive pressure on the watermain, causing a pipe to break. Also, as the water temperature starts to get colder in the fall, contraction of the pipes may cause pipe connections and joints to fail. If this happens, the water usually finds its way to the surface. Due to the watermain being under pressure, water will continue to flow until the break is repaired. Service interruptions can be caused by routine municipal projects including watermain replacement, distribution system repairs of pipe breaks, service connection repairs or replacements, and maintenance of vertical infrastructure. When feasible, users are informed in advance of any interruption, including details regarding location, duration, and any actions required by the user with instructions. If the duration of interruption is prolonged, a temporary water service may be installed to minimize the impact on users.	Watermains
Quality	The City inspects and maintains the drinking water system at a condition level to operate as designed.	All
Capacity	The City strives to align capacity of infrastructure to service demand.	All

6.4.2 Technical Levels of Service

The following table identifies the quantitative metrics that determine the technical level of service provided by water assets.

TABLE 28: **Water – Technical Levels of Service**

Service Attribute	Description of What Performance Measure Captures	Performance Measure	2023 Performance	Target	Related Assets
Scope	How much of the City is connected to the water system.	Percentage of properties connected to the municipal water system.	90.7%		Watermains
Scope	How much of the City is in the preferred proximity to a fire hydrant.	Percentage of properties where fire flow is available.	98.2%		Watermains, Hydrants
Reliability	Duration of boil water advisories.	The number of connection-days per year where a boil water advisory is in place compared to the total number of properties connected to the municipal water system.	0		All
Reliability	Duration of watermain breaks.	The number of connection-days per year due to watermain breaks compared to the total number of properties connected to the municipal water system.	0.0011		Watermains
Reliability	Frequency of watermain breaks.	Number of detected and repaired watermain breaks per kilometre of watermain.	0.0708		Watermains
Quality	Condition of water system.	Percentage of assets in Very Poor condition.	16.6%		All
Quality	Ability of the system to provide preferred flow rates for fire services.	Percentage of fire hydrants providing below-standard fire flows.	0.4%		Watermains, Hydrants
Quality	Frequency of inspections of the water distribution network.	Percentage of total watermain length inspected per year using in-pipe technologies.	0%		Watermains
Capacity	Sufficiency of capacity of infrastructure to meet user demand.	Percentage of treated potable water as a portion of the rated treatment capacity of the network.	39.6% (based on max day use)		Vertical

6.5 Lifecycle Management Strategy

It is important to proactively manage asset deterioration through a lifecycle management strategy that balances cost, risk, and the level of service.

The following table describes the current lifecycle management activities completed. This table also includes the risks associated with not completing these activities through using a do-nothing approach.

TABLE 29: **Water – Lifecycle Management Strategies**

Activity Type	Description of Current Strategy	Risks Associated with Not Completing Activities
Operations and Maintenance	Watermains ▪ Flushing, valve exercising, and air relief valve and chamber inspections. ▪ Repairing breaks and leaks of watermains and service laterals to the property line. Vertical Water Assets ▪ Comprehensive maintenance plans in accordance with the City's computerized maintenance management system using industry best practices and equipment manufacturer recommendations. ▪ Reservoirs are inspected and cleaned every five years. ▪ Wells are inspected every five years. Fire Hydrants ▪ Annual inspections. ▪ Painting, lubrication, and replacement of components such as seals, gaskets, and caps. Most maintenance and operations activities are completed by City staff with external contractors brought in as needed for activities that are beyond the capacity of internal resources. The City is implementing more preventative and predictive maintenance programs using a software solution tied to the asset inventory. The City's network of watermains is comprised of different pipe materials that require different maintenance depending on size, purpose, environmental factors, and location.	▪ Deficiencies are not identified through inspections. ▪ Higher lifecycle costs if maintenance is delayed or completed incorrectly. ▪ Premature asset failure, health and safety risks, and service disruptions. ▪ If a watermain break or replacement impacts the road network, then congestion, closures, and other disruptions may lead to user dissatisfaction.

Activity Type	Description of Current Strategy	Risks Associated with Not Completing Activities
Renewal and Rehabilitation	Watermains ▪ Minor capital activities: valve replacements, short partial pipe segment replacements, and new or replacement service connections. ▪ Major capital activities: trenchless relining where there is an opportunity to reduce the impact of open cut excavation, but re-lining is relatively uncommon for watermains. Vertical Water Assets ▪ Renewal options are considered for the larger or more difficult to replace assets such as concrete structures, pumps, and specialized system components with long lead-time for replacement. Fire Hydrants ▪ Internal components are rebuilt to extend life, as needed.	▪ Renewal and rehabilitation activities may increase asset life less than anticipated resulting in a need for repeated activities or premature asset failure. ▪ Higher lifecycle costs if work is delayed or completed incorrectly. ▪ Increased service disruption to users through lower system reliability. ▪ Increased risk of contaminants entering the system due to higher frequency of watermain break events.
Replacement and Disposal	Watermains ▪ Watermains are considered end of life when the estimated condition of the pipe has deteriorated to the state where repeated breaks or pipe collapses are occurring or are expected to occur soon. Anticipated to occur past an age of 75 years old. ▪ Focus on older assets due to reliance on an age-based assessment of current condition. ▪ The decision-making process that determines replacement timing is partially dependent on the requirements of the other underground infrastructure (e.g. sanitary sewer, storm) and the roadway above. ▪ The City aims to align replacement timing with roadways and the other sub-surface infrastructure needs to reduce total cost and disruption to the community. ▪ Safe disposal of hazardous or contaminated materials and soils. ▪ In recent years there has been a focus on replacement cast iron, ductile iron, and asbestos cement pipes with PVC. Water Vertical Assets ▪ Water vertical assets are considered end of life when renewal and rehabilitation activities are no longer cost-effective compared to replacement of the asset. ▪ Safe disposal of hazardous or contaminated materials and soils. Fire Hydrants ▪ Fire hydrants are considered end of life when the condition of the hydrant has deteriorated to the state where it is no longer able to reliably provide sufficient fire flows.	▪ Risk to public safety if contaminants enter the system due to assets in a very poor or failed condition state. ▪ Risk to public and fire service staff safety due to increased response times or reduced fire flows if hydrants are inoperable or operating at an insufficient flow rate. ▪ Delay in replacement and disposal projects may result in significantly higher costs, longer service disruptions, liability concerns, delays to emergency response times, and user dissatisfaction if watermain replacements impact the roads. ▪ Poor coordination with roads and the other sub-surface infrastructure may result in significantly higher costs and repeated disruptions to the community. ▪ Improper disposal could lead to negative environmental impacts with associated cleanup expenses.

Activity Type	Description of Current Strategy	Risks Associated with Not Completing Activities
Growth-Related and Service Enhancement Lifecycle Needs	Watermains ▪ Adjustments due to capacity requirements or availability of superior alternative materials. Water Vertical Assets ▪ Adjustments due to capacity requirements. ▪ Changes to Ministry of Environment, Conservation and Parks requirements. Fire Hydrants ▪ Adjustments due to capacity requirements.	▪ Delay or cancellation of growth-related activities causing the network to be unable to sufficiently accommodate growth. ▪ Master plans may over or underestimate the required expansions to accommodate the impacts of growth. ▪ Increased lifecycle costs. ▪ Reduction in watermain system pressure due to undercapacity. ▪ Non-compliance with Ministry of Environment, Conservation and Parks requirements.
Non-Infrastructure	Watermains ▪ Natural water hardness assists in limiting the concentration of lead in the system. Water Vertical Assets ▪ Capacity studies, modeling, and design guidelines. Fire Hydrants ▪ Inspections.	▪ Rate of asset deterioration is over or underestimated.

6.6 Forecasted Capital Requirements

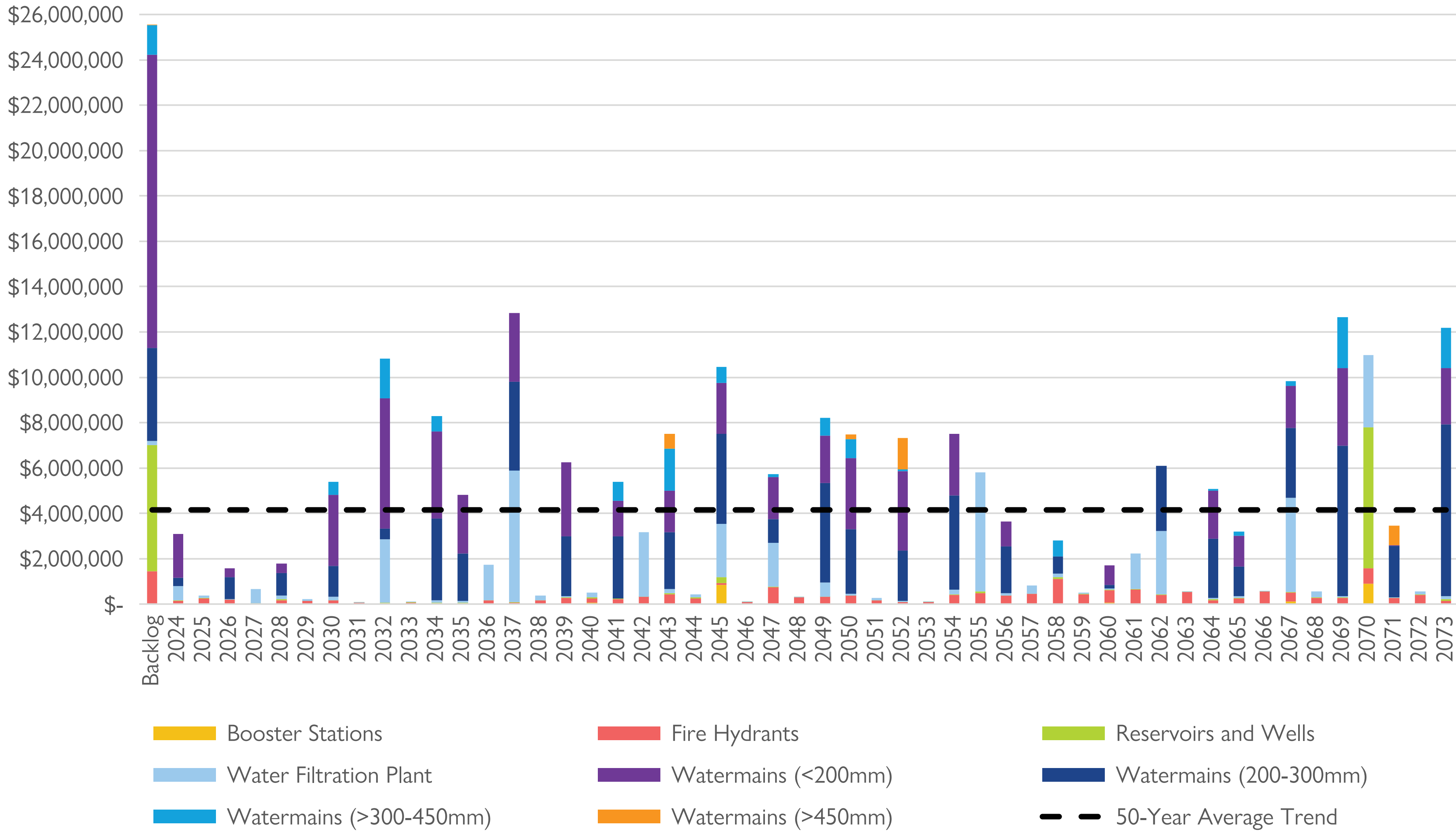
The City continuously invests in maintaining its assets and has been increasing budget amounts to align with asset needs. Until proposed levels of service are defined in the next revision of this asset management plan for July 1, 2025, there is no requirement to modify this funding arrangement.

The annual capital requirement represents the average cost per year that the City is estimated to require to allocate towards funding infrastructure needs. Based on the available data at the time of this plan, more information is required for this calculation. A more complete asset inventory would result in capturing more assets and more accurate lifecycle costs. When more assets are added to the portfolio, the average annual funding need would also increase and be better representative of the actual spending required to manage the City's assets.

Based on the best available current information, to maintain the current level of service and lifecycle management strategy, the annual sustainable capital funding requirement for existing water network assets is estimated to be $4,152,561.

The 2024 capital budget funding allocation was $15,861,676. This means that there exists a funding surplus of $11,709,115 in 2024. The following figure illustrates a 50-year forecast of the annual capital asset needs for water network assets, including the cost and asset lifecycle impacts of completing renewal and rehabilitation activities.

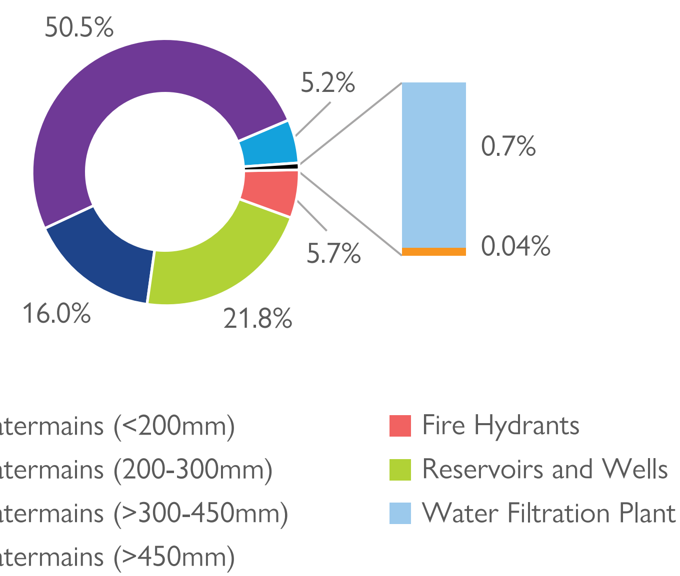
FIGURE 42: Water – Annual Capital Requirement – 50-Year Forecast



Due to historical inconsistency in the timing of the various assets coming into service, a sawtooth pattern is present where in some years the total annual requirement is near zero followed by a spike that reaches well above the long-term average. The City's asset management program aims to smooth out this behaviour in favour of a more consistent amount of annual spending. The 50-year average trend excludes the value of the backlog.

The City has a significant and growing backlog of $25,549,632, primarily composed of watermains beyond their estimated useful life of 75 years. The City's oldest in-service watermains date back to 1914 and are well overdue for replacement. The following figure provides a breakdown of the sources of the backlog.

FIGURE 43: Water – Breakdown of Backlog



Almost three-quarters of the backlog, 71.8%, is a result of Very Poor condition, end of life watermains; the group of smallest diameters, under 200 mm, make up half of this backlog. The Harvie Hill reservoir is also a significant source of the backlog, accounting for 21.5% of the total. A large, multi-year investment would be required to overcome the backlog. Otherwise, it can be expected that the current level of service will decrease, and the level of risk will increase over the coming years. In Ontario, the *Safe Drinking Water Act, 2002* sets the requirements the City must abide by to ensure that it is maintaining a safe and reliable drinking water supply to its users. A sustained and growing backlog increases the likelihood of adverse water quality events and increases the risk that the City could find itself in contravention of the drinking water quality standards.

An important note to consider is that the condition of watermains is primarily an age-based estimation. Watermains beyond their estimated useful life of 75 years may be able to remain in service for many more years if the condition of the pipe is better than anticipated. In-pipe condition assessments would generate a more accurate representation of the actual condition of the pipes in the ground. However, in-pipe inspections are not cost effective for small or medium-sized watermains. This potential condition assessment process is only applicable to critical, large watermains. Relining of watermains is not generally feasible based on cost or service interruptions to complete the work, nor is watermain relining expected to address the primary causes of failure of watermains in the City.

For further details on capital requirements, please see the Financial Summary portion of this plan that details the funding needs for all categories of assets over the next 10 years, including discussion of impacts from growth.

6.7 Climate Change and Other Risks

The following table summarizes key trends, challenges, and risks that the City is currently facing in delivering the desired level of service.

TABLE 30: **Water – Climate Change and Other Risks**

Trend, Challenge, or Risk	Summary
Climate Change and Extreme Weather Events	Risks, including those as a result of climate change, are considered as part of the Drinking Water Quality Management Standard. Risks to the water infrastructure are reviewed, assessed, and evaluated for mitigation as part of the Drinking Water Quality Management Standard process. Through the Orillia Water Master Plan Update project, a resiliency assessment of the water filtration plant was completed to determine the potential impacts of climate change on the facility, identify potentially vulnerable components, and recommend measures to improve climate change resiliency. The climate change effects that are the most likely to affect the water filtration plant are: ▪ Deterioration of the raw water quality, which could cause a deterioration of the treated water quality if the coagulation/flocculation and filtration processes cannot be adjusted or modified as necessary. ▪ Increases in water demands for extended periods, potentially above the currently projected maximum day demands could exceed the plant's capacity to produce drinking water that meets all quality standards and objectives. The City is considering the following adaptation and mitigation measures in response to the challenges: ▪ Incorporate new best practices and technology in the design, construction, and maintenance of assets to increase resiliency while managing affordability. Potential future adaptation and mitigation measures include: ▪ Use of lower embodied carbon materials to potentially reduce the carbon footprint of infrastructure projects. ▪ Coordinate infrastructure design, construction, and maintenance with updated stormwater data and flood mapping to determine what options exist to improve resiliency during stormwater events.
Infrastructure Design and Installation	The City is getting better at standardizing engineering designs and ensuring that these are coordinated across departments and divisions through its 2015 Engineering Design Criteria Manual (DCM), which is due to be updated. Further efforts and refinements are continuously required to enhance and improve the process.
Lifecycle Management Strategies	The City's network of watermains is comprised of several different pipe materials. Some materials have higher break rates and present more operational challenges. In recent years there has been a focus on replacing cast iron and ductile iron pipes with PVC or concrete pipes. There is also a new focus on replacing lead water service lines proactively ahead of roadway resurfacing projects to minimize long-term costs of removing lead from the water distribution system. Reconstruction is usually tied to road reconstruction, which may represent a concern as the lifecycle of sub-surface infrastructure and roads do not always align. The maintenance practice for vertical assets has generally been reactive. The City wants to implement more preventative and predictive maintenance programs in the future. The adoption of a work order management system tied to the asset management inventory system will provide an improved connection between maintenance programs and service delivery outcomes.
Infrastructure Reinvestment	The reinvestment in infrastructure has been very reactive. Renewal and rehabilitation budgets have not increased in proportion to the age of infrastructure, resulting in a growing backlog. There have been some moderate shifts to proactive reinvestment in the recent period.

6.8 Recommendations and Improvement Plan

Asset Inventory

- Continue to review and refine the asset inventory to improve scope, accuracy, and a more detailed breakdown of the assets within the water distribution network.
- Continue to add asset information to GIS layers for improved staff efficiency.

Condition

- Continue to identify condition assessment strategies for high-value and high-risk water network assets.
- Enhance the current approach to condition assessment to incorporate additional asset data as it becomes available; for example, using more detailed watermain break and/or leak detection information.
- Explore industry best practices and new technologies to develop a better condition assessment strategy for the water distribution network, including consideration of in-pipe inspections for large diameter watermains.

Lifecycle Management Strategies

- Evaluate the efficacy of the City's lifecycle management strategies at regular intervals to determine the impact of cost, condition, and risk.

Levels of Service

- Continue to measure current levels of service in accordance with the metrics identified in Ontario Regulation 588/17 and the additional metrics included by the City.
- Identify proposed levels of service per Ontario Regulation 588/17 requirements and identify the strategies that are required to close any gaps between the current and proposed levels of service.

7.0
Wastewater

7.0 Wastewater

The City maintains a wastewater network to support reliable, safe, and efficient collection and treatment of wastewater for the community. The wastewater network services provided by the City include collection, treatment, service connections, and repair of sanitary sewer breaks. Wastewater network infrastructure is the largest category of assets at a total replacement cost of $480,436,478 in 2023 dollars.

7.1 Asset Inventory and Replacement Cost

The City manages approximately 158.5 km of gravity sewermains, 9.7 km of forcemains, one wastewater treatment centre, and 20 pump stations.

The replacement cost is estimated using primarily historic construction costs with consideration of standardized costing indices. Included in the cost of replacing each asset sub-segment is a set of components that together comprise a typical asset. The full set of components for each sub-segment is identified in Appendix 19.2.3.

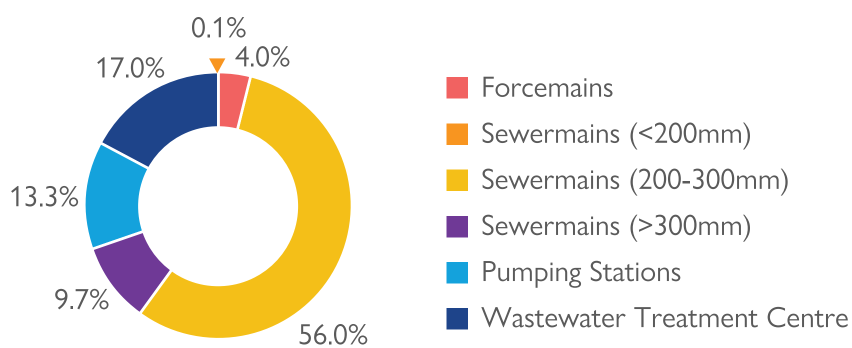
The following table includes the quantity, replacement cost method, and total replacement cost of each sub-segment of assets in the City's wastewater network.

TABLE 31: Wastewater – Inventory and Replacement Cost

Asset Segment	Asset Sub-Segment	Quantity	Replacement Cost Method	Replacement Cost	Percentage of Total Replacement Cost
Wastewater Linear Network	Forcemains	9,668 m	Cost/Unit	$19,278,510	4.0%
Wastewater Linear Network	Sewermains (<200mm)	331 m	Cost/Unit	$660,480	0.1%
Wastewater Linear Network	Sewermains (200-300mm)	134,862 m	Cost/Unit	$268,914,943	56.0%
Wastewater Linear Network	Sewermains (>300mm)	23,261 m	Cost/Unit	$46,382,545	9.7%
Wastewater Vertical Network	Pumping Stations	20 Stations	Asset-Specific Cost Estimation	$63,700,000	13.3%
Wastewater Vertical Network	Wastewater Treatment Centre	1 Centre	Asset-Specific Cost Estimation	$81,500,000	17.0%

The following figure provides the data in the previous table visually with each sub-segment as a percentage of the total replacement cost. Most of the City's wastewater network assets are sewermains.

FIGURE 44: Wastewater – Total Replacement Cost



7.2 Asset Age and Estimated Useful Life

The estimated useful life of wastewater assets is determined using a combination of staff knowledge, historical data, and industry standards. The average service life remaining is determined by the difference between the average estimated useful life and the average age, except when an asset has been assigned an assessed condition rating that may increase or decrease the average service life remaining.

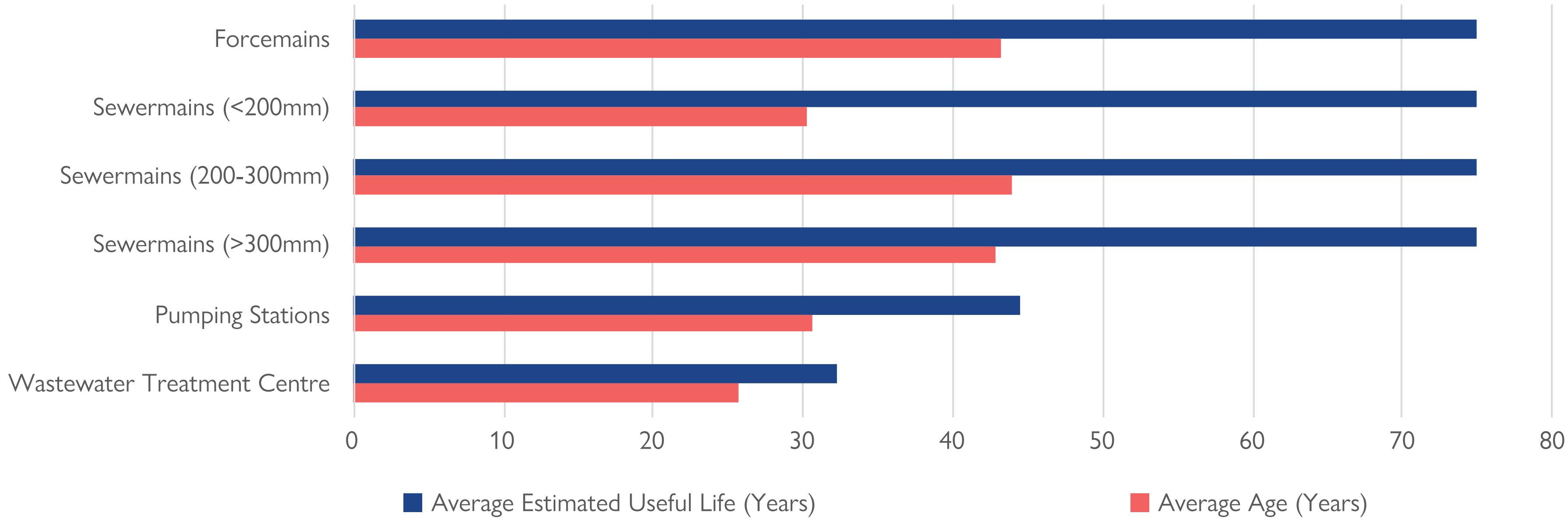
The following table summarizes the average age of each sub-segment based on the number of years that the assets have been in service.

TABLE 32: **Wastewater – Average Age and Estimated Useful Life**

Asset Sub-Segment	Average Estimated Useful Life (Years)	Average Age (Years)	Average Service Life Remaining (Years)	Percentage of Average Service Life Remaining
Forcemains	75.0	43.2	31.8	42%
Sewermains (<200mm)	75.0	30.3	44.7	60%
Sewermains (200-300mm)	75.0	43.9	31.1	41%
Sewermains (>300mm)	75.0	42.8	32.2	43%
Pumping Stations	44.5	30.5	14.0	31%
Wastewater Treatment Centre	32.2	25.6	6.6	20%

The age of an asset gives an indication of how close it is to the end of its estimated useful life and what lifecycle management strategies may be required. The following figure displays average asset age alongside the estimated useful life for each asset sub-segment.

FIGURE 45: Wastewater – Average Age and Estimated Useful Life



Average asset ages have not exceeded the average estimated useful life for any sub-segment.

7.3 Condition

The following sections and tables outline the condition breakdown for each sub-segment of assets and the City's methods for assessing asset condition. Where available and feasible, the City follows industry-standard best practices and generally accepted good engineering practices in the approach to assessing asset condition. When condition assessments are unavailable, an age-based condition rating is used based on the relative age of the asset compared to its estimated useful life.

The following table summarizes the variety of techniques used to assess the condition of the wastewater assets on a regular frequency.

TABLE 33: Wastewater – Approach to Assessing Condition

Asset Sub-Segment	Condition Data Collection Techniques	Frequency of Data Collection	Year of Last Assessment
Forcemains	Age-based.	Every year.	2023
Sewermains	Age-based and in-pipe camera inspections.	Every year and varies.	Varies
Pump Stations	Age-based and condition assessments by staff and subject matter experts.	Every 1-5 years.	2020-2023
Wastewater Treatment Centre	Age-based and condition assessments by staff and subject matter experts.	Every 1-5 years.	2020-2023

The following table provides a summary of the condition rating systems for all sub-segments of wastewater assets. Based on the condition data and information provided by subject matter experts, the condition of assets is rated on a scale from Very Good to Very Poor.

TABLE 34: **Wastewater – Condition Rating Scales**

Rating	Rating Description	Sewermains Forcemains (Five-Point Scale)	Pump Stations Wastewater Treatment Centre (Five-Point Scale)
Very Good	Fit for Future	1.8 ≥ and ≥ 1.0	1 ≥ and ≥ 0
Good	Adequate for Now	2.6 ≥ and > 1.8	2 ≥ and > 1
Fair	Requires Attention	3.4 ≥ and > 2.6	3 ≥ and > 2
Poor	Increasing Potential of Affecting Service	4.2 ≥ and > 3.4	4 ≥ and > 3
Very Poor	Unfit for Sustained Service	5.0 ≥ and > 4.2	5 ≥ and > 4

The following figure illustrates the breakdown of condition ratings in terms of dollars of the City's wastewater assets. 31.1% of these assets are in Very Good to Good condition with a large proportion, 15.9%, rated as Very Poor.

FIGURE 46: **Wastewater – Condition Rating Summary**

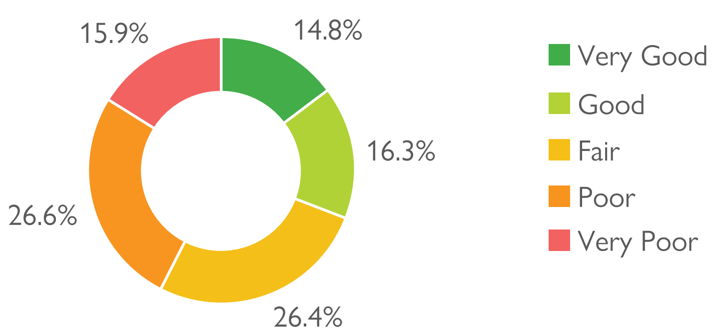
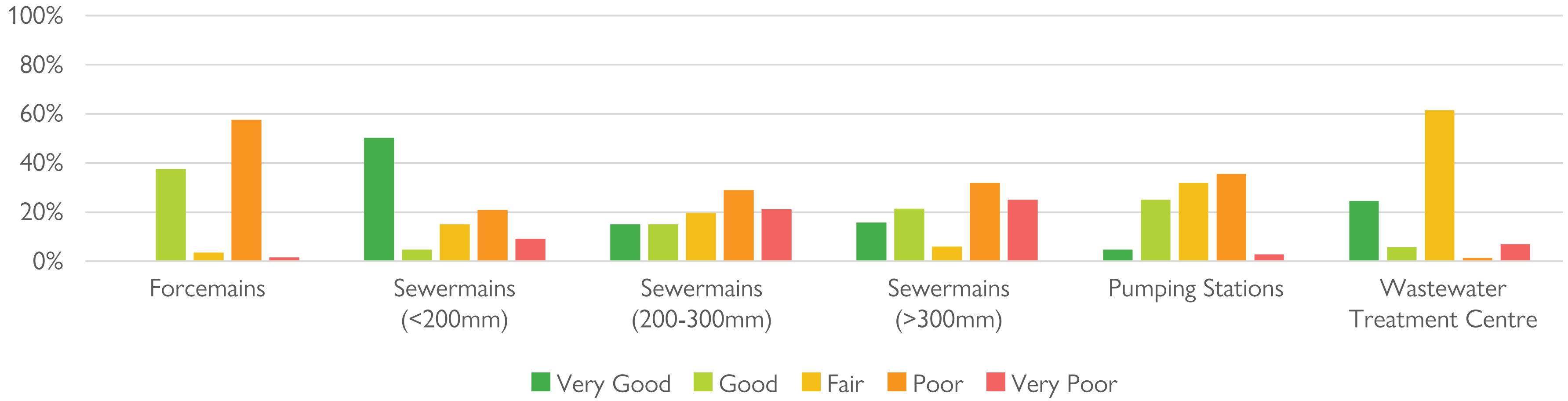


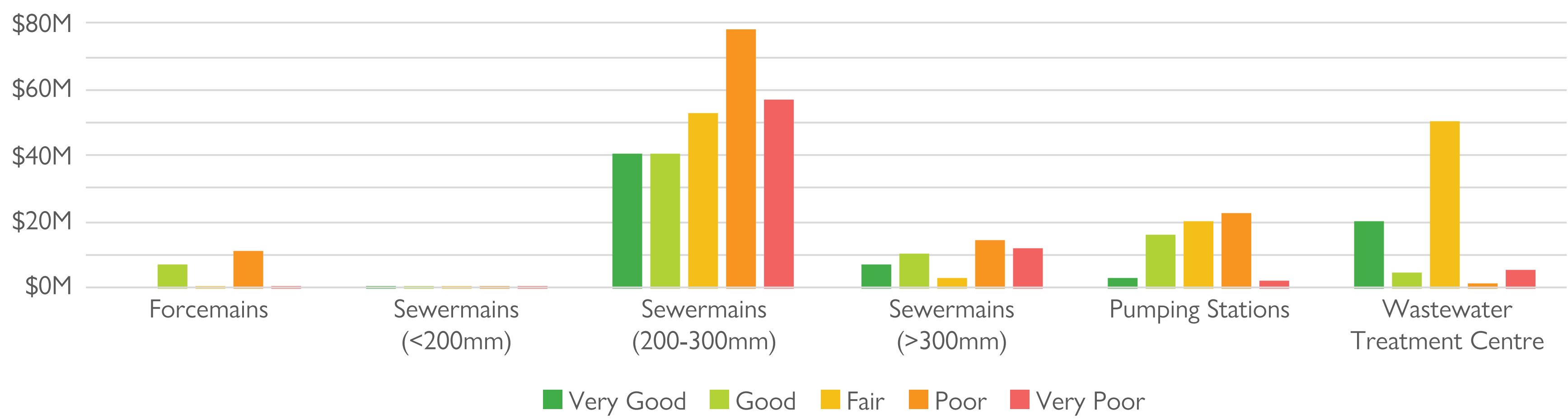
FIGURE 47: Wastewater – Breakdown of Condition Rating – Percentage of Cost



The previous figure illustrates the breakdown of condition ratings for all wastewater assets in terms of the percentage of total replacement cost. A key point is that due to the differences in methodology for calculating condition between sub-segments, direct comparisons between sub-segments may not be consistent depending on which sub-segments are compared.

The following figure illustrates the same breakdown but in terms of the total replacement cost, rather than the percentage of total replacement cost for each sub-segment. This illustrates the large cost implications of the quantity of 200 to 300 mm diameter sewermains compared to the smaller value of the other sub-segments.

FIGURE 48: Wastewater – Breakdown of Condition Rating – Cost



The overall condition of wastewater assets is Fair. Assets are maintained by using the best treatment option to manage the current condition and anticipated future deterioration of the asset. More information is found in the lifecycle management strategy details in Section 7.5. The following sections will present the condition information for each sub-segment or group of sub-segments of assets in more detail.

7.3.1 Forcemains and Sewermains

The following figures provide a breakdown of condition ratings for the linear network of forcemains and sewermains, and also by asset sub-segment for the different diameter groupings.

FIGURE 49: **Wastewater – Breakdown of Condition Rating – All Forcemains and Sewermains**

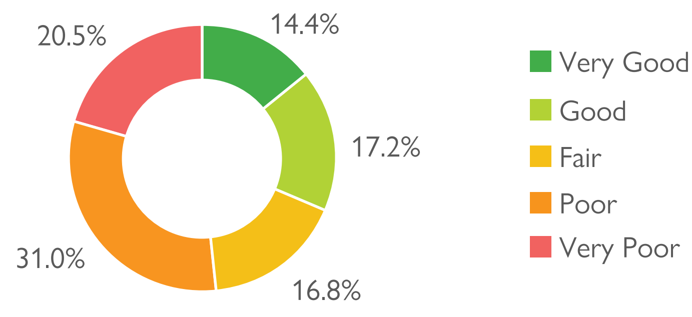


FIGURE 50: **Wastewater – Breakdown of Condition Rating – Forcemains**

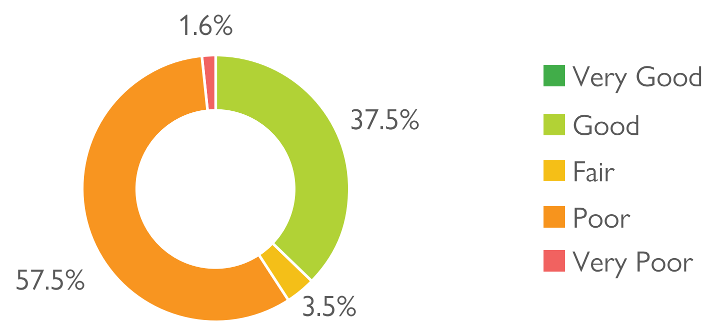


FIGURE 51: Wastewater – Breakdown of Condition Rating – Sewermains (<200mm)

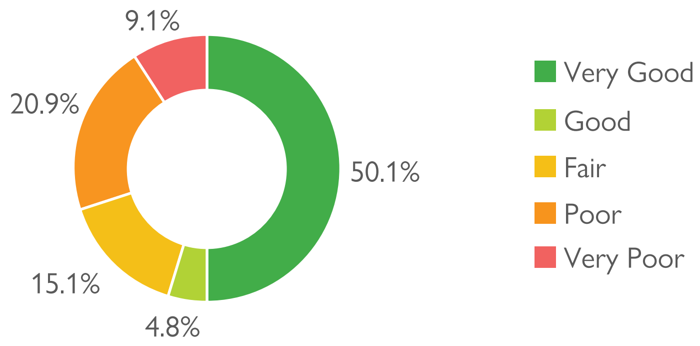


FIGURE 52: Wastewater – Breakdown of Condition Rating – Sewermains (200-300mm)

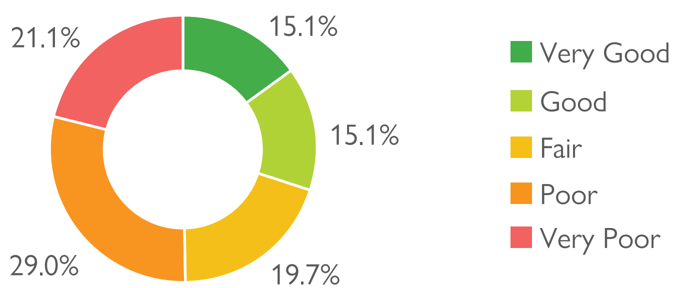
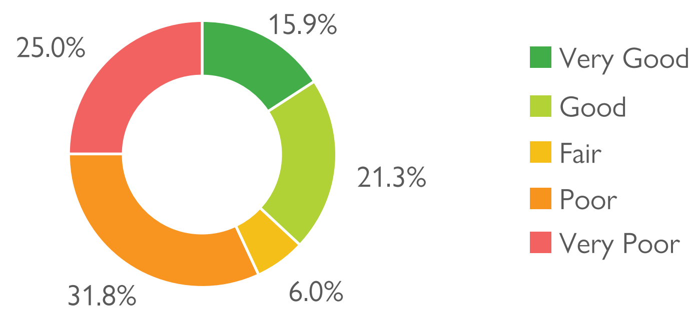


FIGURE 53: Wastewater – Breakdown of Condition Rating – Sewermains (>300mm)



31.6% of the City's wastewater forcemains and sewermains are in Very Good or Good condition with a large proportion, 20.5%, rated as Very Poor. This indicates that much of the wastewater network is reaching or exceeding the end of its service life. With 51.5% of the wastewater linear network in Poor or Very Poor condition, the data indicates that there is a need for both immediate-term and long-term investments to continue the management of deficiencies.

However, the breakdown of condition ratings varies significantly depending on the group of sewermain diameters considered. Smaller sewermains with a diameter less than 200 mm have 30.0% of the assets in Poor or Very Poor condition. The middle-sized sewermains with a diameter between 200 to 300 mm have 50.1% of assets in Poor or Very Poor condition. The largest sewermains have 56.8% in Poor and Very Poor condition. 59.1% of the forcemains are in Poor or Very Poor condition.

The following table illustrates the sewermains condition ratings. Example photos are not available for forcemains.

TABLE 35: Wastewater – Condition Rating Descriptions and Photos – Sewermains

Condition State: Very Good

Scale: 1.8 ≥ and ≥ 1.0

Description: Fit for Future

Condition State: Good

Scale: 2.6 ≥ and > 1.8

Description: Adequate for Now

Condition State: Fair

Scale: 3.4 ≥ and > 2.6

Description: Requires Attention

Condition State: Poor

Scale: 4.2 ≥ and > 3.4

Description: Increasing Potential of Affecting Service

Condition State: Very Poor

Scale: 5.0 ≥ and > 4.2

Description: Unfit for Sustained Service

7.3.2 Pumping Stations and Wastewater Treatment Centre

The following figures provide a breakdown of asset condition for the vertical wastewater network assets and each sub-segment.

FIGURE 54: **Wastewater – Breakdown of Condition Rating – All Vertical**

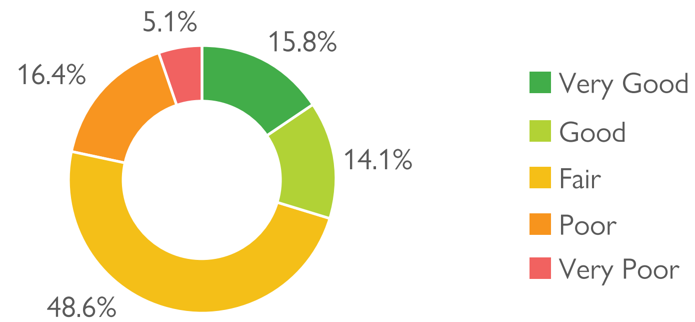


FIGURE 55: **Wastewater – Breakdown of Condition Rating – Pumping Stations**

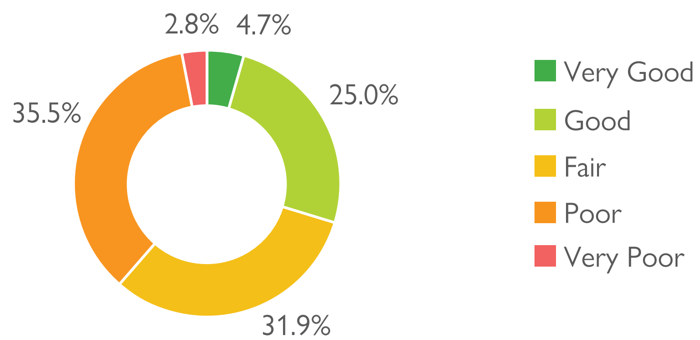
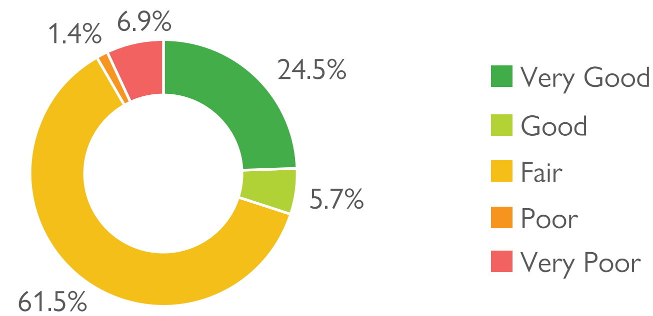


FIGURE 56: **Wastewater – Breakdown of Condition Rating – Wastewater Treatment Centre**



At a target interval of every five years, the condition of these assets is evaluated by external subject matter experts using a variety of condition assessment techniques. The results are analyzed to assign a condition score from 1 to 5 for each asset that corresponds to a rating between Very Good to Very Poor. The most recent inspections were completed in 2023. Staff also complete assessments on an as-needed basis in response to deficiencies, renewal projects, and upgrades. However, condition inspection data from 2020 is included for assets not recently inspected.

29.9% of the City's vertical wastewater assets are in Very Good or Good condition with a moderate proportion, 5.1%, rated as Very Poor. This indicates that some of the wastewater vertical assets are reaching or exceeding the end of their service life. With 21.5% of wastewater vertical assets in Poor or Very Poor condition, the data indicates that there is a need for both immediate-term and long-term investments to continue the management of deficiencies.

However, the breakdown of condition ratings varies significantly depending on the sub-segment considered. The wastewater pumping stations have a mix of condition ratings, but are primarily in Fair or Poor condition with a quarter of the assets in Good condition. Most of the wastewater treatment centre is in Fair condition with 30.2% of assets in Good or Very Good condition. The investment priority will vary over time in response to the differences in the mix of asset condition between the different sub-segments.

The following table illustrates the condition ratings defined with respect to a variety of wastewater vertical assets.

TABLE 36: Wastewater – Condition Rating Descriptions and Photos – Vertical

Condition State: **Very Good**

Scale: 1 ≥ and ≥ 0

Description: Fit for Future

Condition State: **Good**

Scale: 2 ≥ and > 1

Description: Adequate for Now

Condition State: **Fair**

Scale: 3 ≥ and > 2

Description: Requires Attention

Condition State: **Poor**

Scale: 4 ≥ and > 3

Description: Increasing Potential of Affecting Service

Condition State: **Very Poor**

Scale: 5 ≥ and > 4

Description: Unfit for Sustained Service

7.4 Levels of Service and Performance Measures

The City's assets exist to deliver services to its users. Levels of service are a measurement of the actual service provided so that decisions are made based on the nature and quality of that service, rather than only the condition of an asset. These are used to summarize the type of service being provided that reflects the values and desires of stakeholders in the community.

The following tables identify the City's current level of service for the wastewater network assets. These metrics include any technical and community level of service metrics that are required to comply with Ontario Regulation 588/17, as well as any additional metrics provided by the City. A future revision to this plan will include proposed levels of service targets for each measure.

7.4.1 Community Levels of Service

The following table identifies the qualitative descriptions that determine the community levels of service provided by the wastewater assets.

TABLE 37: **Wastewater – Community Levels of Service**

Service Attribute	Community Levels of Service	Related Assets
Scope	The City maintains a wastewater network to support reliable, safe, cost effective, and efficient collection, treatment, and discharge of wastewater within the community to the receiving water body. The extent of the City's wastewater network, including the locations of wastewater vertical assets, is illustrated by Map 4.	All
Reliability	The City does not have combined sewers in the wastewater system.	Sewermains
Reliability	Stormwater can enter the municipal wastewater system through improperly connected roof drains, damaged or deteriorated maintenance hole lids, frame, and chimneys, and through the pick holes in depressed maintenance holes. Groundwater can enter the system through deficiencies in the underground pipes such as breaks, cracks, root intrusion, and misaligned pipes taking up some of the available capacity of the collection and treatment infrastructure.	Sewermains
Reliability	The wastewater system is designed to be resilient against water inflow and infiltration. Maintenance holes are typically installed to be at grade and not in depressed areas. Repairs to maintenance holes are completed when issues are identified, and the necessary resources are available. Relining of sewermains to repair breaks, cracks, and misaligned pipes can reduce the quantity of groundwater entering the wastewater system through these pipe defects. The wastewater system is designed with capacity to manage peak flows significantly higher than typical daily flows. If a pumping station or the wastewater treatment centre is overwhelmed with higher-than-normal flows, bypasses or overflow procedures could be used to manage the flow overwhelming the infrastructure.	All
Reliability	Effluent discharged from the wastewater treatment centre conforms with the following standards: • TP – annual average limit is 0.1 mg/L and 996 kg/year; monthly average limit is 0.18 mg/L • CBOD5 – monthly average limit is 15 mg/L • TSS – monthly average limit is 15 mg/L • E.Coli – monthly average limit is 200 CFU/100 mL • pH – monthly average of 6.0-9.5 inclusive	Vertical
Quality	The City inspects and maintains the wastewater system at a condition level to operate as designed.	All

7.4.2 Technical Levels of Service

The following table identifies the quantitative metrics that determine the technical level of service provided by wastewater assets.

TABLE 38: Wastewater – Technical Levels of Service

Service Attribute	Description of What Performance Measure Captures	Performance Measure	2023 Performance	Target	Related Assets
Scope	How much of the City is connected to the wastewater system.	Percentage of properties connected to the municipal wastewater system.	90.1%		Sewermains
Reliability	How often the wastewater system is unable to manage the peak flows.	The number of events per year where combined sewer flow in the municipal wastewater system exceeds system capacity compared to the total number of properties connected to the municipal wastewater system.	0		All
Reliability	Duration of wastewater backups.	The number of connection-days per year due to wastewater backups compared to the total number of properties connected to the municipal wastewater system.	0.0007		All
Reliability	Frequency of wastewater effluent violations.	The number of effluent violations per year due to wastewater discharge compared to the total number of properties connected to the municipal wastewater system.	0		Vertical
Reliability	Frequency of unplanned repairs that significantly impact the transportation network.	Annual number of emergency road closures due to emergency wastewater network repairs.	9		Sewermains
Quality	Condition of wastewater system.	Percentage of assets in Very Poor condition.	15.9%		All
Quality	Frequency of inspections of the collection network.	Percentage of total sewermain length inspected per year using in-pipe technologies.	1.8%		Sewermains

7.5 Lifecycle Management Strategy

It is important to proactively manage asset deterioration through a lifecycle management strategy that balances cost, risk, and the level of service. The following table describes the current lifecycle management activities completed. This table also includes the risks associated with not completing these activities through using a do-nothing approach.

TABLE 39: Wastewater – Lifecycle Management Strategies

Activity Type	Description of Current Strategy	Risks Associated with Not Completing Activities
Operations and Maintenance	Sewermains and Forcemains ▪ CCTV inspections, flushing, rodding, and clearing of blockages. ▪ Repairing breaks and leaks. Wastewater Vertical Assets ▪ Comprehensive maintenance plans in accordance with the City's Wastewater Collection and Facility Operations Manual, using industry best practices and equipment manufacturer recommendations. ▪ Comprehensive maintenance plans in accordance with the City's Wastewater System Pumping Station and Collection System Operations and Maintenance Manual, using industry best practices and equipment manufacturer recommendations. Most maintenance and operations activities are completed by City staff with external contractors brought in as needed for activities that are beyond the capacity of internal resources.	Deficiencies are not identified through inspections. Higher lifecycle costs if maintenance is delayed or completed incorrectly. Premature asset failure, health and safety risks, and service disruptions. If a sewer break, replacement, or repair impacts the road network then congestion, closures, and other disruptions leading to user dissatisfaction.
Renewal and Rehabilitation	Sewermains and Forcemains ▪ Minor capital activities: short partial pipe segment replacements and maintenance hole leak repairs. ▪ Major capital activities: trenchless re-lining where there is an opportunity to reduce the impact of open cut excavation. When a sewermain is considered a high priority for replacement or rehabilitation, but does not align with road reconstruction plans, trenchless re-lining may be a feasible option. Wastewater Vertical Assets ▪ End of life replacement is the primary strategy. ▪ Renewal options are considered for the larger or more difficult to replace assets such as concrete structures, pumps, control systems, and specialized system components with long lead-time for replacements. Pumps and grinders may be refurbished every five to 10 years.	Renewal and rehabilitation activities may increase asset life less than anticipated resulting in a need for repeated activities or premature asset failure. Higher lifecycle costs if work is delayed or completed incorrectly. Increased service disruption to users through lower system reliability.

Activity Type	Description of Current Strategy	Risks Associated with Not Completing Activities
Replacement and Disposal	Sewermains and Forcemains ▪ Sewermains and forcemains are considered end of life when the estimated condition of the pipe has deteriorated to the state where repeated breaks or collapses are occurring or are expected to occur soon. Anticipated to occur past an age of 75 years old. ▪ Focus on older assets due to reliance on an age-based assessment of current condition. ▪ The decision-making process that determines replacement timing is partially dependent on the requirements of the other underground infrastructure (e.g. watermains, stormwater sewers) and the roadway above. ▪ The City aims to align replacement timing with roadways and the other sub-surface infrastructure needs to reduce total cost and disruption to the community. ▪ Safe disposal of hazardous or contaminated materials and soils. Wastewater Vertical Assets ▪ Pump station and wastewater treatment centre assets are considered end of life when renewal and rehabilitation activities are no longer cost-effective compared to replacement of the asset. ▪ Safe disposal of hazardous or contaminated materials and soils.	Delay in replacement and disposal projects may result in significantly higher costs, longer service disruptions, liability concerns, delays to emergency response times, and user dissatisfaction if replacements impact the roads. Poor coordination with roads and the other sub-surface infrastructure may result in significantly higher costs and repeated disruptions to the community. Improper disposal could lead to negative environmental impacts with associated cleanup and disposal expenses.
Growth-Related and Service Enhancements Lifecycle Needs	Sewermains and Forcemains ▪ Adjustments due to capacity requirements or availability of superior alternative materials. Wastewater Vertical Assets ▪ Adjustments due to capacity requirements. ▪ Changes to Ministry of Environment, Conservation and Parks requirements.	Delay or cancellation of growth-related activities causing the network to be unable to sufficiently accommodate growth. Master plans may over or underestimate the required expansions to accommodate the impacts of growth. Increased lifecycle costs. Increased likelihood of performance issues due to undercapacity. Non-compliance with Ministry of Environment, Conservation and Parks requirements.
Non-Infrastructure	Sewermains and Forcemains ▪ Capacity studies, modeling, and design guidelines. Wastewater Vertical Assets ▪ Capacity studies, modeling, and design guidelines.	Rate of asset deterioration is over or underestimated.

7.6 Forecasted Capital Requirements

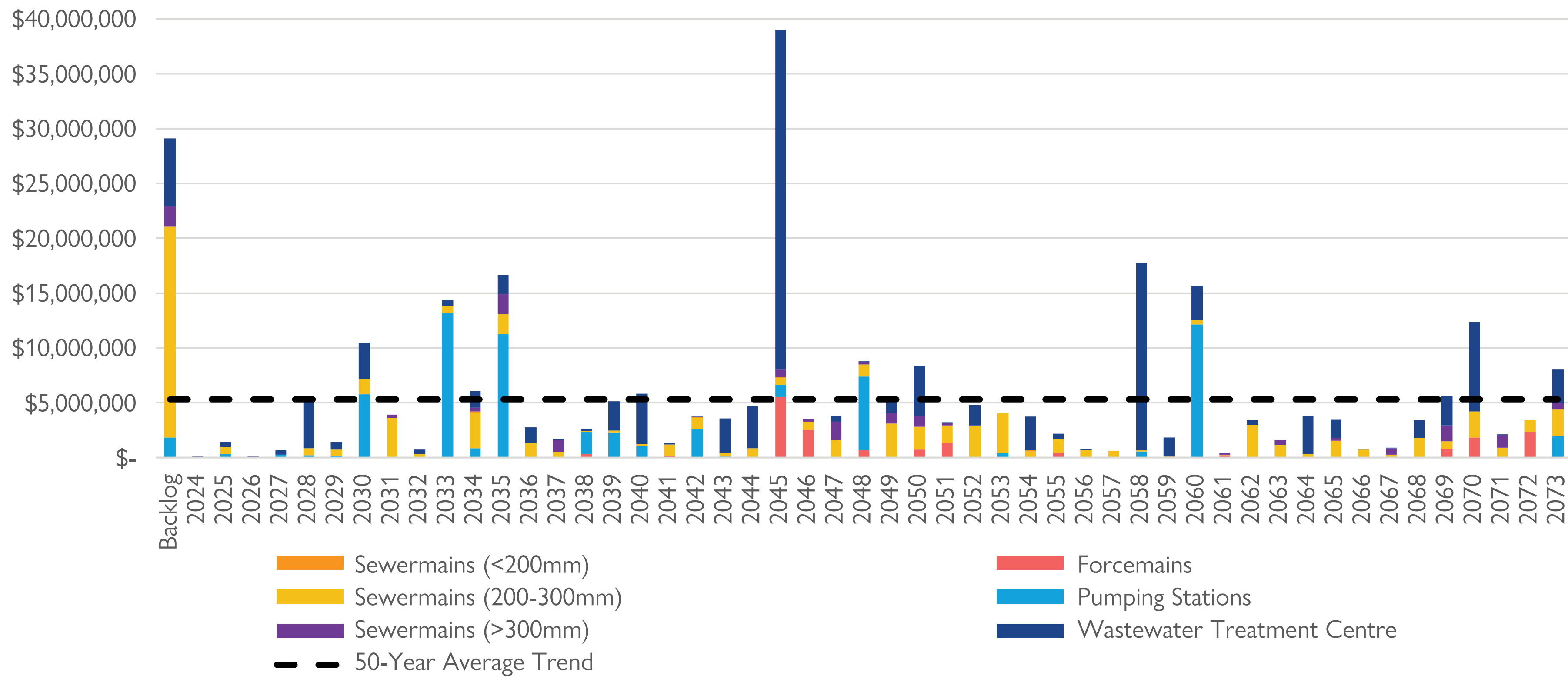
The City continuously invests in maintaining its assets and has been increasing budget amounts to align with asset needs. Until proposed levels of service are defined in the next revision of this asset management plan for July 1, 2025, there is no requirement to modify this funding arrangement.

The annual capital requirement represents the average cost per year that the City is estimated to require to allocate towards funding infrastructure needs. Based on the available data at the time of this plan, more information is required for this calculation. A more complete asset inventory would result in capturing more assets and more accurate lifecycle costs. When more assets are added to the portfolio, the average annual funding need would also increase and be better representative of the actual spending required to manage the City's assets.

Based on the best available current information, to maintain the current level of service and lifecycle management strategy, the annual sustainable capital funding requirement for existing wastewater network assets is estimated to be $5,307,667.

The 2024 capital budget funding allocation was $4,475,770. This means that there exists a funding deficit, or funding shortfall, of $831,897 in 2024. The following figure illustrates a 50-year forecast of the annual capital asset needs for wastewater network assets, including the cost and asset lifecycle impacts of completing renewal and rehabilitation activities.

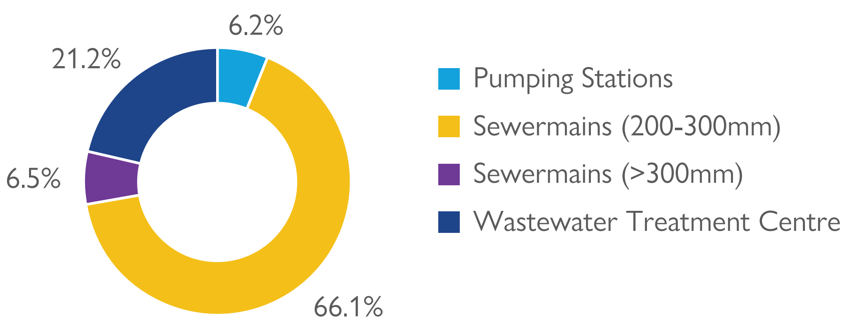
FIGURE 57: **Wastewater – Annual Capital Requirement – 50-Year Forecast**



Due to historical inconsistency in the timing of the various assets coming into service, a pattern is present where in some years the total annual requirement approaches zero followed by a wave that reaches a peak above the long-term average before again approaching zero. The City's asset management program aims to smooth out this wavy behaviour in favour of a more consistent amount of annual spending. The 50-year average trend excludes the value of the backlog.

The City has a significant and growing backlog of $29,105,300, primarily composed of wastewater sewermains and portions of the wastewater treatment centre beyond their estimated useful life. The City's oldest in-service sewermains date back to 1907 and are well overdue for replacement. The following figure provides a breakdown of the sources of the backlog.

FIGURE 58: Wastewater – Breakdown of Backlog



Almost three-quarters of the backlog, 72.6%, is a result of Very Poor condition, end of life wastewater sewermains. Approximately one-fifth of the backlog, 21.2%, is a result of Very Poor condition or end of life wastewater treatment centre assets. A large, multi-year investment would be required to overcome the backlog. Otherwise, it can be expected that the current level of service will decrease, and the level of risk will increase over the coming years.

An important note to consider is that due to the availability of in-pipe inspection condition information, there is a higher level of confidence in the scope of this backlog as the City can confirm the true level of deterioration inside the pipes in addition to using an age-based estimate. This data also provides some of the key information required to determine what pipes may be suitable for trenchless rehabilitation as a cost-saving lifecycle management strategy.

For further details on capital requirements, please see the Financial Summary portion of this plan that details the funding needs for all categories of assets over the next 10 years, including discussion of impacts from growth.

7.7 Climate Change and Other Risks

The following table summarizes key trends, challenges, and risks that the City is currently facing in delivering the desired level of service.

TABLE 40: **Wastewater – Climate Change and Other Risks**

Trend, Challenge, or Risk	Summary
Climate Change and Extreme Weather Events	It is anticipated that there will be many challenges in managing the impacts of climate change, including: ▪ Potential increased damage to wastewater infrastructure through flooding and erosion due to more frequent extreme wet weather events. ▪ Increased uncertainty in impacts of extreme weather events and what is the most cost-effective resiliency strategy or group of strategies. ▪ Increased inflow and infiltration into the wastewater system during more frequent extreme wet weather events. Significant inflow and infiltration (I and I) are challenging the wastewater treatment plant and pumping stations as wet weather events are exceeding the design capacity of the system. ▪ Severe weather events can cause power outages that complicate the operation of the City's 20 pumping stations. The City is considering the following adaptation and mitigation measures in response to the challenges: ▪ Incorporate new best practices and technology in the design, construction, and maintenance of assets to increase resiliency while managing affordability. Potential future adaptation and mitigation measures include: ▪ Use of lower embodied carbon materials to potentially reduce the carbon footprint of infrastructure projects. ▪ Coordinate infrastructure design, construction, and maintenance with updated stormwater data and flood mapping to determine what options exist to improve resiliency during stormwater events.
Infrastructure Design and Installation	The City is getting better at standardizing engineering designs and ensuring that these are coordinated across departments and divisions through its 2015 Engineering Design Criteria Manual (DCM), which is due to be updated. Further efforts and refinements are continuously required to enhance and improve the process.
Lifecycle Management Strategies	The City's network of wastewater sewermains are comprised of several different pipe materials. Some materials have higher break rates and present more operational challenges. In recent years there has been a focus on replacing clay and asbestos cement pipes with PVC or concrete. Reconstruction of wastewater sewermain and forcemain assets is usually tied to road reconstruction, which may represent a concern as the lifecycle of sub-surface infrastructure and roads do not always align. The maintenance practice for vertical assets has generally been reactive. The City wants to implement more preventative and predictive maintenance programs in the future. The adoption of a work order management system tied to the asset management inventory system will provide an improved connection between maintenance programs and service delivery outcomes.
Infrastructure Reinvestment	The reinvestment in infrastructure has been reactive. Renewal and rehabilitation budgets have not increased in proportion to the age of infrastructure resulting in a growing backlog. There have been some moderate shifts to proactive reinvestment in the recent period.

7.8 Recommendations and Improvement Plan

Asset Inventory

- Continue to review and refine the asset inventory to improve scope, accuracy, and a more detailed breakdown of the assets within the wastewater network.
- Continue to add asset information to GIS layers for improved staff efficiency.
- Review the replacement cost of the wastewater treatment centre to improve accuracy of the capital forecast and associated annual requirement.

Condition

- Continue the CCTV inspection program of the wastewater linear network to enhance the accuracy of condition assessments and to continuously gather up to date condition data.
- Explore industry best practices and new technologies to develop a better condition assessment strategy for the variety of non-pipe wastewater assets.

Lifecycle Management Strategies

- Evaluate the efficacy of the City's lifecycle management strategies at regular intervals to determine the impact of cost, condition, and risk.
- Consider implementing a flow monitoring program to address concerns with inflow and infiltration.
- Consider implementing a maintenance hole inspection program, as well as a lining and grouting program to correct deficiencies documented during the inspections.
- Develop more detailed preventative maintenance strategies and programs to maintain the current level of service.
- Consider actively managing risk by prioritizing the larger diameter sewermains in the capital planning process as their failure would impact the largest number of users.

Levels of Service

- Continue to measure current levels of service in accordance with the metrics identified in Ontario Regulation 588/17 and the additional metrics included by the City.
- Identify proposed levels of service per Ontario Regulation 588/17 requirements and identify the strategies that are required to close any gaps between the current and proposed levels of service.

8.0
Stormwater

8.0 Stormwater

The City maintains a stormwater network to support reliable, safe, and efficient collection, treatment, and discharge of stormwater within the community to the receiving water bodies. The stormwater network services provided by the City work in coordination with the transportation network and natural assets to convey runoff generated during precipitation events and provide ecosystem services to the community. Stormwater network infrastructure is the fifth-largest category of assets at a total replacement cost of $238,500,207 in 2023 dollars.

8.1 Asset Inventory and Replacement Cost

The City manages approximately 85.4 km of stormwater sewers, 1,780 maintenance holes, two pump stations, six stormwater management ponds, three oil and grit separators, 163.7 km of ditches, 2,953 catch basins with 23.7 km of leads connecting the catch basins to the sewers, and 36.5 km of culverts under roadways and driveways.

The stormwater network inventory remains at basic level of maturity with many missing or incomplete records, which is common across municipalities. Through the ongoing Stormwater Management Infrastructure Inventory and Condition Assessment project, improvements in data accuracy will provide more accurate findings in future revisions of this plan.

The replacement cost is estimated using primarily historic construction costs with consideration of standardized costing indices. Included in the cost of replacing each asset is a set of components that together comprise a typical asset. The full set of components for each sub-segment is identified in Appendix 19.2.4.

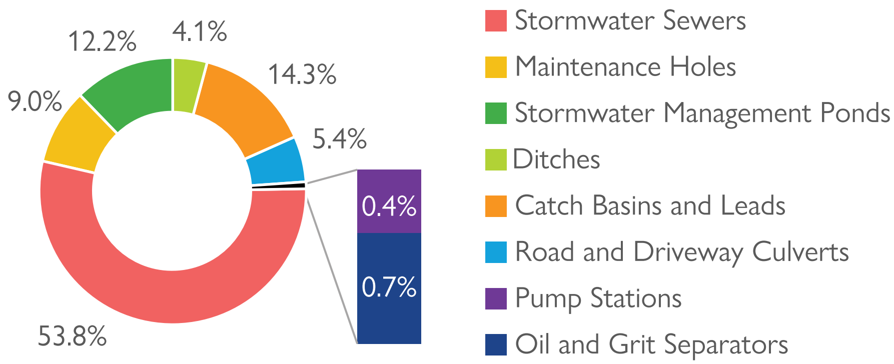
The following table includes the quantity, replacement cost method, and total replacement cost in 2023 dollars of each sub-segment of assets in the City's stormwater network.

TABLE 41: **Stormwater – Inventory and Replacement Cost**

Asset Sub-Segment	Quantity	Replacement Cost Method	Replacement Cost	Percentage of Total Replacement Cost
Stormwater Sewers	85,401 m	Cost/Unit	$128,331,775	53.8%
Maintenance Holes	1,780 maintenance holes	Cost/Unit	$21,495,280	9.0%
Pump Stations	2 stations	Asset-Specific Cost Estimation	$966,976	0.4%
Stormwater Management Ponds	486,054 m^3 of storage capacity	Cost/Unit	$29,163,238	12.2%
Oil and Grit Separators	3 separators	Asset-Specific Cost Estimation	$1,685,001	0.7%
Ditches	163,743 m	Cost/Unit	$9,872,522	4.1%
Catch Basins and Leads	2,953 basins 23,688 m	Cost/Unit	$34,210,415	14.3%
Road and Driveway Culverts	36,500 m	Cost/Unit	$12,775,000	5.4%

The following figure provides the data in the previous table visually with each sub-segment as a percentage of the total replacement cost. Most of the City's stormwater assets are stormwater sewers at approximately half of the assets by value. Due to the small relative total value of pump stations and oil and grit separators, an additional diagram is provided for clarity.

FIGURE 59: **Stormwater – Total Replacement Cost**



8.2 Asset Age and Estimated Useful Life

The estimated useful life of stormwater assets is determined using a combination of staff knowledge, historical data, and industry standards. Data revisions have been ongoing by City staff to address stormwater sewer network data gaps in support of the City's Comprehensive Stormwater Master Plan Update project. The average service life remaining is determined by the difference between the average estimated useful life and the average age, except when an asset has been assigned an assessed condition rating that may increase or decrease the average service life remaining.

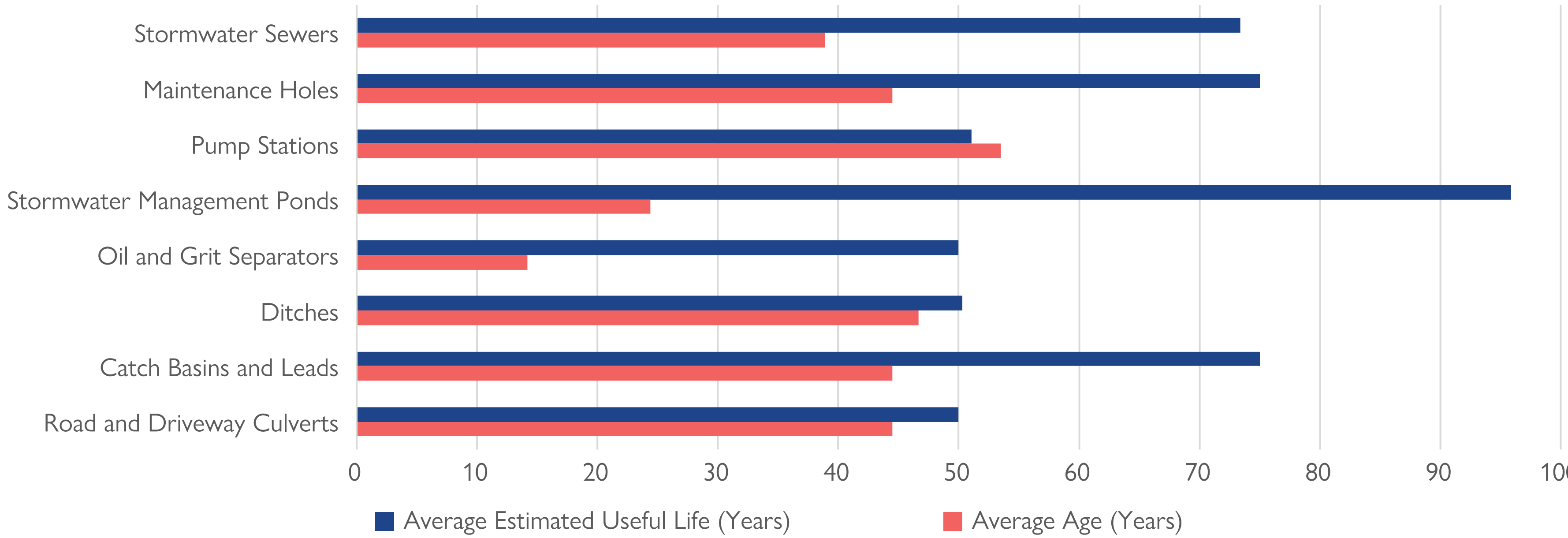
The following table summarizes the average age of each sub-segment based on the number of years that the assets have been in service.

TABLE 42: **Stormwater – Average Age and Estimated Useful Life**

Asset Sub-Segment	Average Estimated Useful Life (Years)	Average Age (Years)	Average Service Life Remaining (Years)	Percentage of Average Service Life Remaining
Stormwater Sewers	73.4	38.9	34.5	47%
Maintenance Holes	75.0	44.5	30.5	41%
Pump Stations	51.1	53.5	-2.4	-5%
Stormwater Management Ponds	95.9	24.4	71.5	75%
Oil and Grit Separators	50.0	14.2	35.8	72%
Ditches	50.3	46.7	3.6	7%
Catch Basins and Leads	75.0	44.5	30.5	41%
Road and Driveway Culverts	50.0	44.5	5.5	11%

The age of an asset gives an indication of how close it is to the end of its estimated useful life and what lifecycle management strategies may be required. The following figure displays average asset age alongside the estimated useful life for each asset sub-segment.

FIGURE 60: Stormwater – Average Age and Estimated Useful Life



Average asset ages have exceeded the average estimated useful life for the pump stations sub-segment.

Using the current limited information available on the culverts, catch basins and leads, and the ditches, an average installation year of 1980 was assumed for most of these assets. This results in all three of these sub-segments nearing their associated estimated useful life. Future improvements in data accuracy through the Stormwater Inventory and Condition Assessment capital project will allow the City to remove the installation year assumption for many of these assets and provide a more accurate average age.

8.3 Condition

The following sections and tables outline the condition breakdown for each sub-segment of assets and the City's methods for assessing asset condition. Where available and feasible, the City follows industry-standard best practices and generally accepted good engineering practices in the approach to assessing asset condition. When condition assessments are unavailable, an age-based condition rating is used based on the relative age of the asset compared to its estimated useful life.

The following table summarizes the variety of techniques used to assess the condition of the stormwater assets on a regular frequency.

TABLE 43: Stormwater – Approach to Assessing Condition

Asset Sub-Segment	Condition Data Collection Techniques	Frequency of Data Collection	Year of Last Assessment
Stormwater Sewers	Age-based and in-pipe camera inspection.	Every year and varies.	Varies
Maintenance Holes	Age-based.	Every year.	2023
Pump Stations	Age-based and condition assessments by staff and subject matter experts.	Every 1-5 years.	2020-2023
Stormwater Management Ponds	Age-based.	Every year.	2023
Oil and Grit Separators	Age-based.	Every year.	2023
Ditches	Age-based.	Every year.	2023
Catch Basins and Leads	Age-based.	Every year.	2023
Road and Driveway Culverts	Age-based.	Every year.	2023

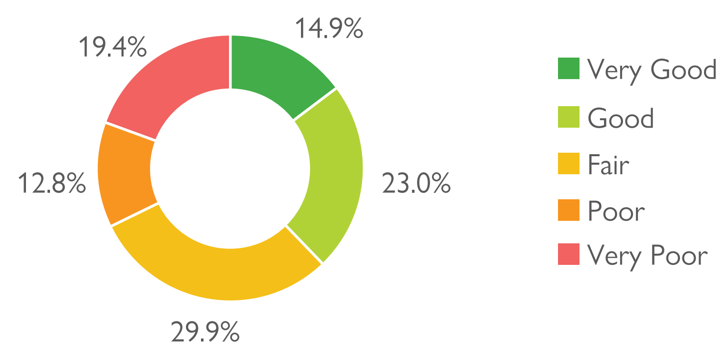
The following table provides a summary of the condition rating systems for all sub-segments of stormwater assets. Based on the condition data and information provided by subject matter experts, the condition of assets is rated on a scale from Very Good to Very Poor.

TABLE 44: Stormwater – Condition Rating Scales

Rating	Rating Description	All Stormwater Assets (Five-Point Scale)
Very Good	Fit for Future	1.8 ≥ and ≥ 1.0
Good	Adequate for Now	2.6 ≥ and > 1.8
Fair	Requires Attention	3.4 ≥ and > 2.6
Poor	Increasing Potential of Affecting Service	4.2 ≥ and > 3.4
Very Poor	Unfit for Sustained Service	5.0 ≥ and > 4.2

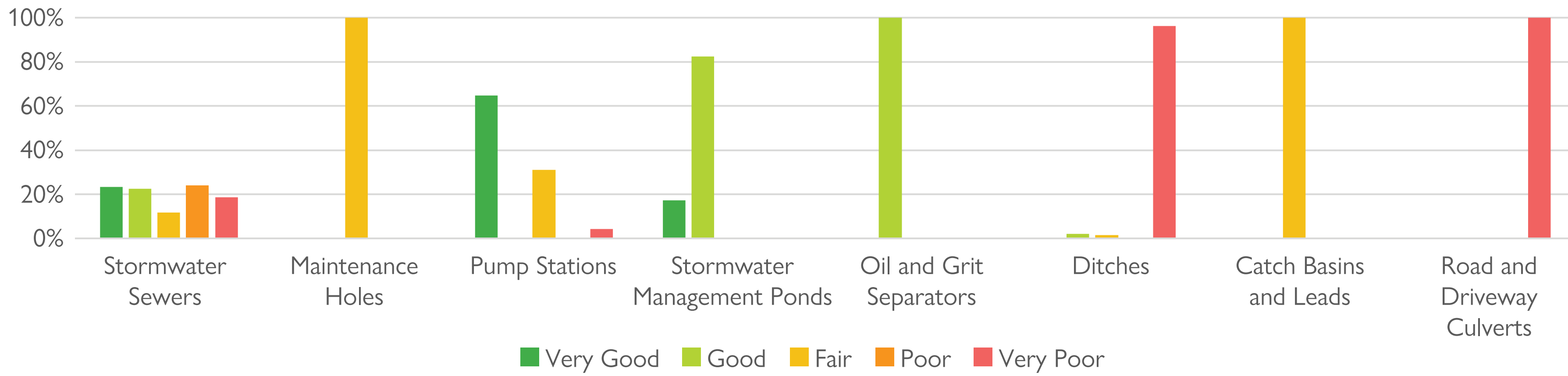
The following figure illustrates the breakdown of condition ratings of the City's stormwater assets. 37.9% of these assets are in Very Good to Good condition with a large proportion, 19.4%, rated as Very Poor.

FIGURE 61: Stormwater – Condition Rating Summary



The following figure illustrates the breakdown of condition ratings for all stormwater assets in terms of the percentage of total replacement cost. A key point is that due to the differences in methodology for calculating condition between sub-segments, direct comparisons between sub-segments may not be consistent depending on which sub-segments are compared.

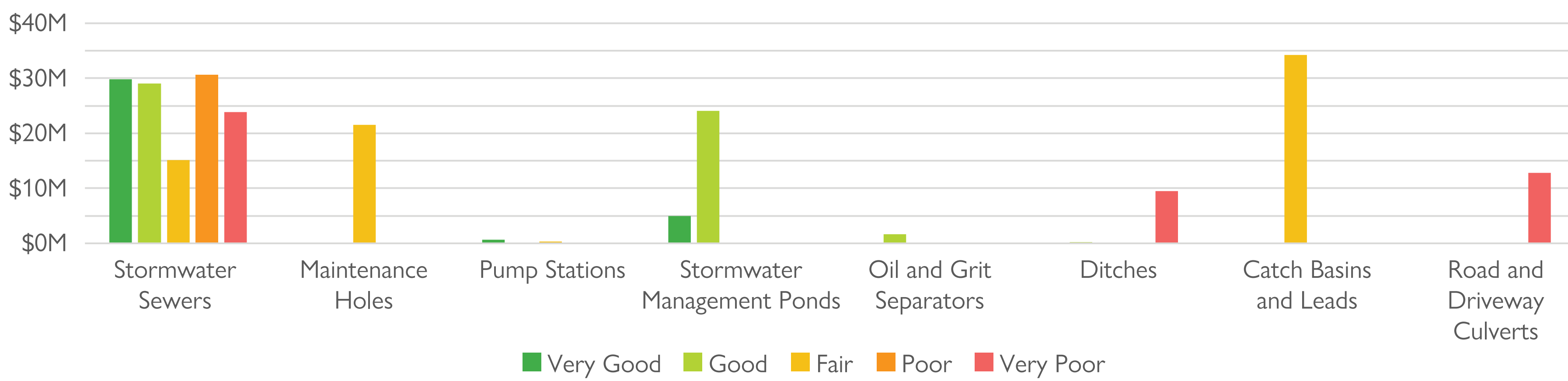
FIGURE 62: Stormwater – Breakdown of Condition Rating – Percentage of Cost



The following figure illustrates the same breakdown but in terms of the total replacement cost rather than the percentage of total replacement cost for each sub-segment. This illustrates the large cost implications of the quantity of sewers, maintenance holes, catch basins and leads, and stormwater management ponds compared to the smaller value of the other sub-segments.

The overall average condition of stormwater assets is Fair. Assets are maintained by using the best treatment option to manage the current condition and anticipated future deterioration of the asset. More information is found in the lifecycle management strategy details in Section 8.5. The following sections present the condition information for each sub-segment or group of sub-segments of assets in more detail.

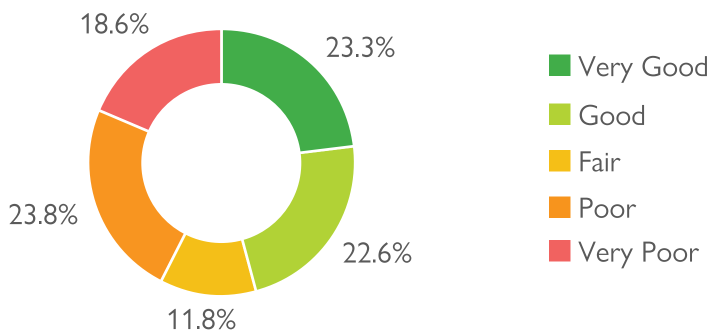
FIGURE 63: Stormwater – Breakdown of Condition Rating – Cost



8.3.1 Stormwater Sewers

The following figure provides a breakdown of condition ratings for all stormwater sewers.

FIGURE 64: **Stormwater – Breakdown of Condition Rating – Sewers**



45.9% of the City's stormwater sewers are in Very Good or Good condition with a large proportion, 18.6%, rated as Very Poor. This indicates that much of the stormwater sewer network is reaching or exceeding the end of its service life. With 42.4% of stormwater sewers in Poor or Very Poor condition, the data indicates that there is a need for both immediate-term and long-term investments to continue the management of deficiencies.

As data improves, the City will consider examining the breakdown of condition ratings for different groups of diameters as was discussed for watermains and sanitary sewers in this plan. The City actively manages risk by prioritizing the larger diameter stormwater sewers in the capital planning process as their failure has the potential to impact the largest number of users.

There are inherent challenges with completing condition assessments for stormwater sewers, as the condition assessment generally requires in-pipe equipment, and significant staff and financial resources. The stormwater sewer condition assessment process is currently limited to a desktop exercise using an age-based approach. In recent years, the City has expanded its CCTV in-pipe inspection program to include stormwater sewers. There is currently a 17-year cycle to inspect the entire network; however, this is a recent initiative with limited consistent condition data compared to the size of the network.

Through the ongoing Stormwater Management Infrastructure Inventory and Condition Assessment project, more accurate condition data will be obtained for all stormwater sewers in the City. This will establish a consistent baseline of data for the 17-year CCTV inspection cycle to build upon. This will ensure that the most cost-effective approach to managing assets is used while providing the City with more of the information required to accurately manage the level of risk for these assets.

Due to the current condition assessment process being a desktop exercise, a table of condition ratings with photos and descriptions is omitted.

8.3.2 Maintenance Holes, Ditches, Catch Basins and Leads, and Road and Driveway Culverts

The following figures provide a breakdown of condition ratings for the linear stormwater assets and each sub-segment, excluding the stormwater sewers.

FIGURE 65: **Stormwater – Breakdown of Condition Rating – Linear (Excluding Sewers)**

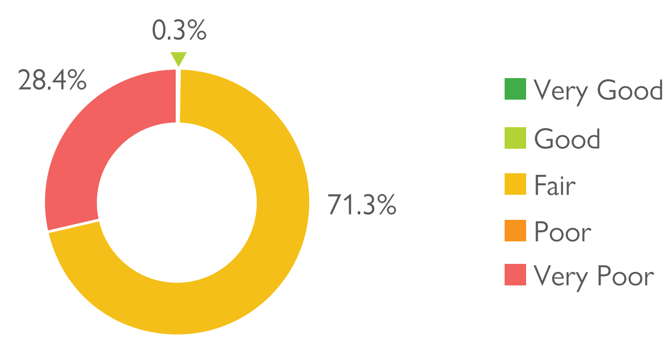


FIGURE 66: **Stormwater – Breakdown of Condition Rating – Maintenance Holes**

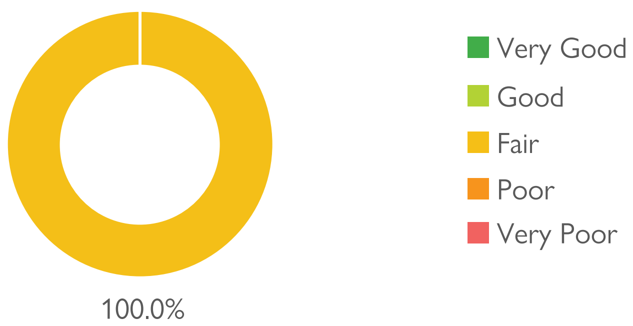


FIGURE 67: **Stormwater – Breakdown of Condition Rating – Ditches**

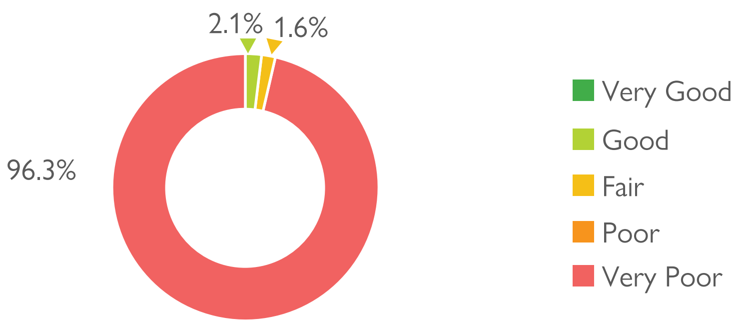


FIGURE 68: **Stormwater – Breakdown of Condition Rating – Catch Basins and Leads**

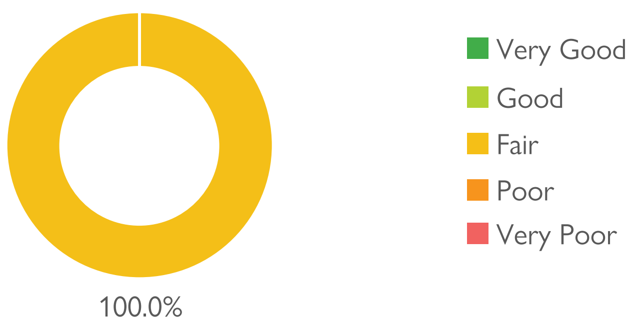
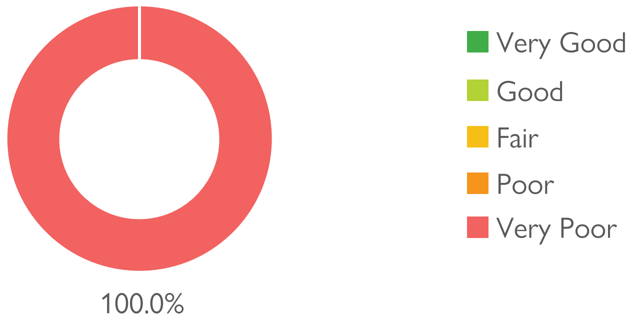


FIGURE 69: **Stormwater – Breakdown of Condition Rating – Road and Driveway Culverts**



Due to the 1980 average in-service date assumption for most of these assets, the breakdown of condition ratings lacks the typically varied distribution of ratings found in other asset sub-segments. All the maintenance holes, catch basins and leads have a rating of Fair while all the road and driveway culverts have a rating of Very Poor. There are a small number of ditches with a known in-service year other than 1980 that have an age-based condition in the Good (2.1%) or Fair (1.6%) rating; however, almost all the ditches (96.3%) have a rating of Very Poor.

The following table illustrates the condition ratings for variety of these assets. Photos and descriptions for the Very Good and Poor states are omitted due to no assets within these ratings currently.

TABLE 45: Stormwater – Condition Rating Descriptions and Photos – Linear (Excluding Sewers)

Condition State: **Very Good**	Condition State: **Good**	Condition State: **Fair**	Condition State: **Poor**	Condition State: **Very Poor**
Scale: 1.8 ≥ and ≥ 1.0	**Scale:** 2.6 ≥ and > 1.8	**Scale:** 3.4 ≥ and > 2.6	**Scale:** 4.2 ≥ and > 3.4	**Scale:** 5.0 ≥ and > 4.2
Description: Fit for Future	**Description:** Adequate for Now	**Description:** Requires Attention	**Description:** Increasing Potential of Affecting Service	**Description:** Unfit for Sustained Service
Omitted due to no assets within this rating currently.			Omitted due to no assets within this rating currently.	

8.3.3 Pump Stations, Stormwater Management Ponds, and Oil and Grit Separators

The following figures provide a breakdown of asset condition for the vertical stormwater network assets and each sub-segment.

FIGURE 70: **Stormwater – Breakdown of Condition Rating – All Vertical**

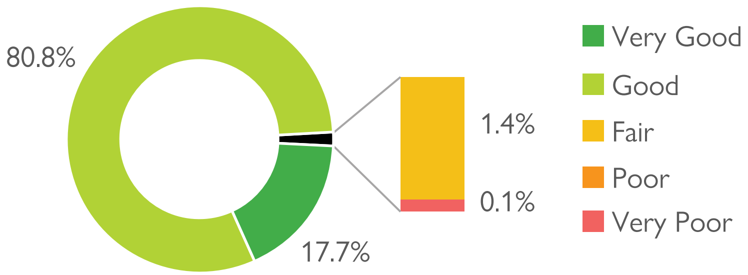


FIGURE 71: **Stormwater – Breakdown of Condition Rating – Pump Stations**

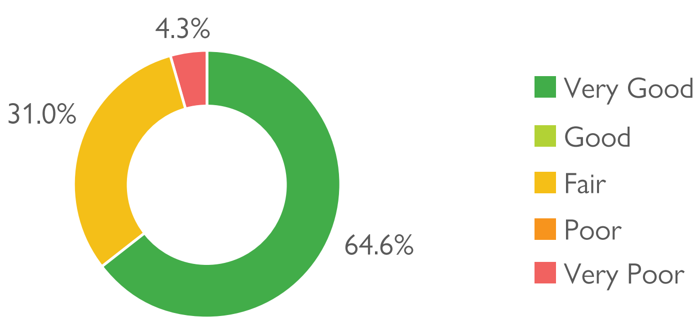


FIGURE 72: **Stormwater – Breakdown of Condition Rating – Stormwater Management Ponds**

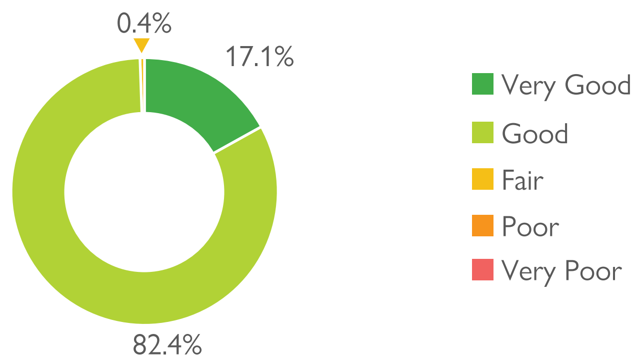
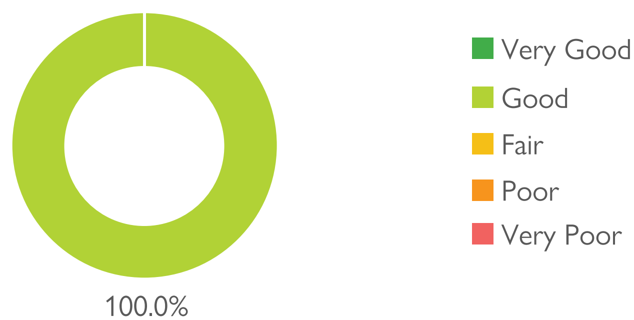


FIGURE 73: **Stormwater – Breakdown of Condition Rating – Oil and Grit Separators**



Every five years, the condition of the larger pump station's assets is evaluated by a subject matter expert using a variety of condition assessment techniques. The results are analyzed to assign a condition score from 1 to 5 for each asset that corresponds to a rating between Very Good to Very Poor. The most recent inspections were completed in 2023. Any assets missing a condition assessment are assigned an age-based condition. Staff also complete assessments on an as-needed basis in response to deficiencies, renewal projects, and upgrades. However, condition inspection data from 2020 is included for assets not recently inspected. The condition for the smaller pump station, stormwater management ponds, and oil and grit separators are an age-based assumption.

98.5% of the City's stormwater vertical assets are in Very Good or Good condition with an insignificant proportion, 0.1%, rated as Very Poor. This indicates that minimal assets are reaching or exceeding the end of their service life. With 0.1% of stormwater vertical assets in Poor or Very Poor condition, the data indicates that majority of the capital needs of these assets are being met. The pump station asset with the Very Poor rating is the Cedar Island Road Pump Station. This is a small pump station contained within a small underground concrete chamber with a pump that is near the end of its useful life. There is an ongoing assessment to address the performance capacity of that pump station and a new design will be considered as part of that assessment.

The following table illustrates the condition ratings defined with respect to a variety of stormwater vertical assets. A photo for the Poor state is omitted due to no assets within this rating currently.

TABLE 46: Stormwater – Condition Rating Descriptions and Photos – Vertical

Condition State: **Very Good**	Condition State: **Good**	Condition State: **Fair**
Scale: 1.8 ≥ and ≥ 1.0	**Scale:** 2.6 ≥ and > 1.8	**Scale:** 3.4 ≥ and > 2.6
Description: Fit for Future	**Description:** Adequate for Now	**Description:** Requires Attention
		

Condition State: **Poor**	Condition State: **Very Poor**
Scale: 4.2 ≥ and > 3.4	**Scale:** 5.0 ≥ and > 4.2
Description: Increasing Potential of Affecting Service	**Description:** Unfit for Sustained Service
Omitted due to no assets within this rating currently.	

8.4 Levels of Service and Performance Measures

The City's assets exist to deliver services to its users. Levels of service are a measurement of the actual service provided so that decisions are made based on the nature and quality of that service, rather than only the condition of an asset. These are used to summarize the type of service being provided that reflects the values and desires of stakeholders in the community.

The following tables identify the City's current level of service for the stormwater network assets. These metrics include any technical and community level of service metrics that are required to comply with Ontario Regulation 588/17, as well as any additional metrics provided by the City. A future revision to this plan will include proposed levels of service targets for each measure.

8.4.1 Community Levels of Service

The following table identifies the qualitative descriptions that determine the community levels of service provided by the stormwater assets.

TABLE 47: Stormwater – Community Levels of Service

Service Attribute	Community Levels of Service	Related Assets
Scope	The City maintains a stormwater network to support reliable, safe, and efficient collection, treatment, and discharge of surface water within the community to the receiving water bodies. The extent of the City's stormwater network, including the locations of stormwater vertical assets, is illustrated by Map 5.	All
Reliability	The stormwater system operates as intended to convey surface water runoff to the subsurface storm infrastructure.	All
Quality	The City inspects and maintains the stormwater system at a condition level to operate as designed.	All

8.4.2 Technical Levels of Service

The following table identifies the quantitative metrics that determine the technical level of service provided by stormwater assets.

TABLE 48: Stormwater – Technical Levels of Service

Service Attribute	Description of What Performance Measure Captures	Performance Measure	2023 Performance	Target	Related Assets
Scope	Quantifying the City's overland flow routes that can manage less frequent major storm events.	Percentage of properties in municipality resilient to a 100-year storm.	13.6%		All
Scope	Quantifying the City's stormwater sewer network that can manage more frequent wet weather events.	Percentage of the municipal stormwater management system resilient to a five-year storm.	0%		All
Reliability	Frequency of overwhelmed stormwater infrastructure that significantly impacts the transportation network.	Annual number of emergency road closures during major storm and wet weather events.	Future		All
Quality	Condition of the stormwater system.	Percentage of assets in Poor or Very Poor condition.	32.2%		All
Quality	Frequency of inspections of the collection network.	Percentage of total stormwater sewer length inspected per year using in-pipe technologies.	Future		Sewers

The City currently does not have comprehensive 100-year storm floodplain mapping available to determine the 100-year storm measure. Instead, the percentage of properties in the City resilient to a 100-year storm is calculated using the percentage of properties located within the Mill Creek regulatory floodplain or located on lands with an elevation below 220.5 m as described in the City's Zoning By-law 2014-44. All other properties are assumed resilient for the purpose of this measure. Regarding the resiliency to a five-year storm measure, the City's Engineering Design Criteria manual requires City infrastructure to be sized to accommodate a two-year storm event. The manual does not require City infrastructure to be resilient to a five-year storm event. Until the City completes a hydrological model that considers overland flows, there is insufficient data to estimate how much of the City's stormwater management system can handle a five-year storm event. It is assumed that none of the City is resilient to a five-year event.

8.5 Lifecycle Management Strategy

It is important to proactively manage asset deterioration through a lifecycle management strategy that balances cost, risk, and the level of service.

The following table describes the current lifecycle management activities completed. This table also includes the risks associated with not completing these activities through a do-nothing approach.

TABLE 49: **Stormwater – Lifecycle Management Strategy**

Activity Type	Description of Current Strategy	Risks Associated with Not Completing Activities
Operations and Maintenance	All operations and maintenance strategies listed are completed in accordance with the City's Operations and Maintenance Manual unless otherwise specified. Sewers and Maintenance Holes ▪ Flushing, CCTV inspections, clearing of blockages, and grate cleaning. ▪ Repairing breaks and leaks. Pump Stations ▪ Comprehensive maintenance plans in accordance with the City's Stormwater Collection and Facility Operations Manual using industry best practices and equipment manufacturer recommendations. Stormwater Management Ponds ▪ Safety checks, sediment surveys, full inspections, valve exercising, and other activities. Oil and Grit Separators ▪ Visual inspections and cleaning. Ditches ▪ Visual inspection and removal of sediment deposits as required. Catch Basins and Leads ▪ Visual inspection and cleaning. Road and Driveway Culverts ▪ Maintenance may be performed as required on an as-needed basis. Maintenance and operations activities are completed by City staff with external contractors brought in as needed.	▪ Failure to comply with provincial requirements, including, but not exclusive to, the City's Consolidated Linear Infrastructure – Environmental Compliance Approval (CLI-ECA). ▪ Deficiencies are not identified through inspections. ▪ Higher lifecycle costs if maintenance is delayed or completed incorrectly. ▪ Premature asset failure, health and safety risks, and service disruptions. ▪ Congestion, closures, and other disruptions leading to user dissatisfaction if road network is impacted. ▪ Excessive erosion, flooding, or overland flow during stormwater events. ▪ Decreased water quality due to increased contaminants. ▪ Increased probability of an adverse impact to the environment.

Activity Type	Description of Current Strategy	Risks Associated with Not Completing Activities
Renewal and Rehabilitation	Sewers and Maintenance Holes ▪ Minor capital activities: Valve replacements, short partial pipe segment replacements, maintenance hole leak repairs. ▪ Major capital activities: Trenchless relining where there is an opportunity to reduce the impact of open cut excavation. When a sewer is considered a high priority for replacement or rehabilitation, but does not align with road reconstruction plans, trenchless re-lining may be a feasible option. Pump Stations ▪ Renewal options are considered for the larger or more difficult to replace assets such as concrete structures, pumps, control systems, and specialized system components with long lead-time for replacements. Stormwater Management Ponds ▪ Embankment stabilization and repairs. ▪ Removal of accumulated sediment as required. Oil and Grit Separators ▪ End of life replacement is the primary strategy. Ditches ▪ Embankment stabilization and repairs. Catch Basins and Leads ▪ End of life replacement is the primary strategy. Road and Driveway Culverts ▪ End of life replacement is the primary strategy.	▪ Renewal and rehabilitation activities may increase asset life less than anticipated, resulting in a need for repeated activities or premature asset failure. ▪ Higher lifecycle costs if work is delayed or completed incorrectly. ▪ Increased service disruption to users through lower system reliability. ▪ Decreased water quality due to increased contaminants. ▪ Increased risk of downstream flood impacts due to lower stormwater management pond capacity if accumulated sediment obstructs the pond inlets and outlets and is not removed.

Activity Type	Description of Current Strategy	Risks Associated with Not Completing Activities
Replacement and Disposal	Sewers and Maintenance Holes ▪ Sewers and maintenance holes are considered end of life when the estimated condition of the pipe or maintenance hole has deteriorated to the state where repeated breaks or collapses are occurring or are expected to occur soon. Anticipated to occur past an age of 75 years old. ▪ Focus on older assets due to reliance on an age-based assessment of current condition. ▪ The decision-making process that determines replacement timing is partially dependent on the requirements of the other underground infrastructure (e.g. watermains, sanitary sewers) and the roadway above. ▪ The City aims to align replacement timing with roadways and the other sub-surface infrastructure needs to reduce total cost and disruption to the community. ▪ Safe disposal of hazardous or contaminated materials and soils. Pump Stations ▪ Pump station assets are considered end of life when renewal and rehabilitation activities are no longer cost-effective compared to replacement of the asset. ▪ Safe disposal of hazardous or contaminated materials and soils. Stormwater Management Ponds ▪ Current pond designs do not require replacement. Pond retrofit with partial reconstruction may be required to conform with new standards or to address current provincial guidance criteria. ▪ Evaluating sediment reuse options rather than disposal in a landfill.	▪ Risk to environment if contaminants enter the system and are discharged to the receiving water bodies due to assets in a very poor or failed condition state. ▪ Risk to property, City assets, and natural environment if erosion is not effectively managed. ▪ Delay in replacement and disposal projects may result in significantly higher costs, longer service disruptions, liability concerns, delays to emergency response times, and user dissatisfaction if replacements impact the roads. ▪ Poor coordination with roads and the other sub-surface infrastructure may result in significantly higher costs and repeated disruptions to the community. ▪ Improper disposal could lead to negative environmental impacts with associated cleanup and disposal expenses.

Activity Type	Description of Current Strategy	Risks Associated with Not Completing Activities
	Oil and Grit Separators ▪ Oil and grit separator assets are considered end of life when renewal and rehabilitation activities are no longer cost-effective compared to replacement of the asset. Ditches ▪ Replacement is not typically required for unpaved ditches. ▪ Replacement of surface material for paved ditches to restore the ditch to a vegetative condition. ▪ Replacement of armouring and erosion control materials once worn and no longer effective. Catch Basins and Leads ▪ Catch basins and leads are considered end of life when the estimated condition of the catch basin or lead has deteriorated to the state where repeated breaks or collapses are occurring or are expected to occur soon. Anticipated to occur past an age of 75 years old. Road and Driveway Culverts ▪ Road and driveway culverts are considered end of life when the estimated condition of the culvert has deteriorated to the state where repeated blockages or collapses are occurring or are expected to occur soon. Anticipated to occur past an age of 50 years old.	

Activity Type	Description of Current Strategy	Risks Associated with Not Completing Activities
Growth-Related and Service Enhancements Lifecycle Needs	Sewers and Maintenance Holes ▪ Adjustments due to capacity requirements or availability of superior alternative materials. Pump Stations ▪ Adjustments due to capacity requirements. ▪ Changes to Ministry of Environment, Conservation and Parks requirements. Stormwater Management Ponds ▪ Adjustments due to capacity or water quality requirements. Oil and Grit Separators ▪ Adjustments due to capacity, water quality requirements, or availability of superior designs. Ditches ▪ Adjustments due to capacity requirements. ▪ Naturalization of paved ditches to improve water quality. Catch Basins and Leads ▪ Adjustments due to capacity requirements. Road and Driveway Culverts ▪ Adjustments due to capacity requirements.	▪ Delay or cancellation of growth-related activities causing the network to be unable to sufficiently accommodate growth. ▪ Master plans may over or underestimate the required expansions to accommodate the impacts of growth. ▪ Increased lifecycle costs. ▪ Increased likelihood of performance issues due to undercapacity. ▪ Non-compliance with Ministry of Environment, Conservation and Parks requirements.
Non-Infrastructure	All Stormwater Sub-segments ▪ Capacity studies and modeling, stormwater design guidelines.	▪ Rate of asset deterioration is over or underestimated. ▪ Excessive erosion, flooding, or overland flow during stormwater events if designed capacity is based on outdated studies, modeling, and design guidelines.

8.6 Forecasted Capital Requirements

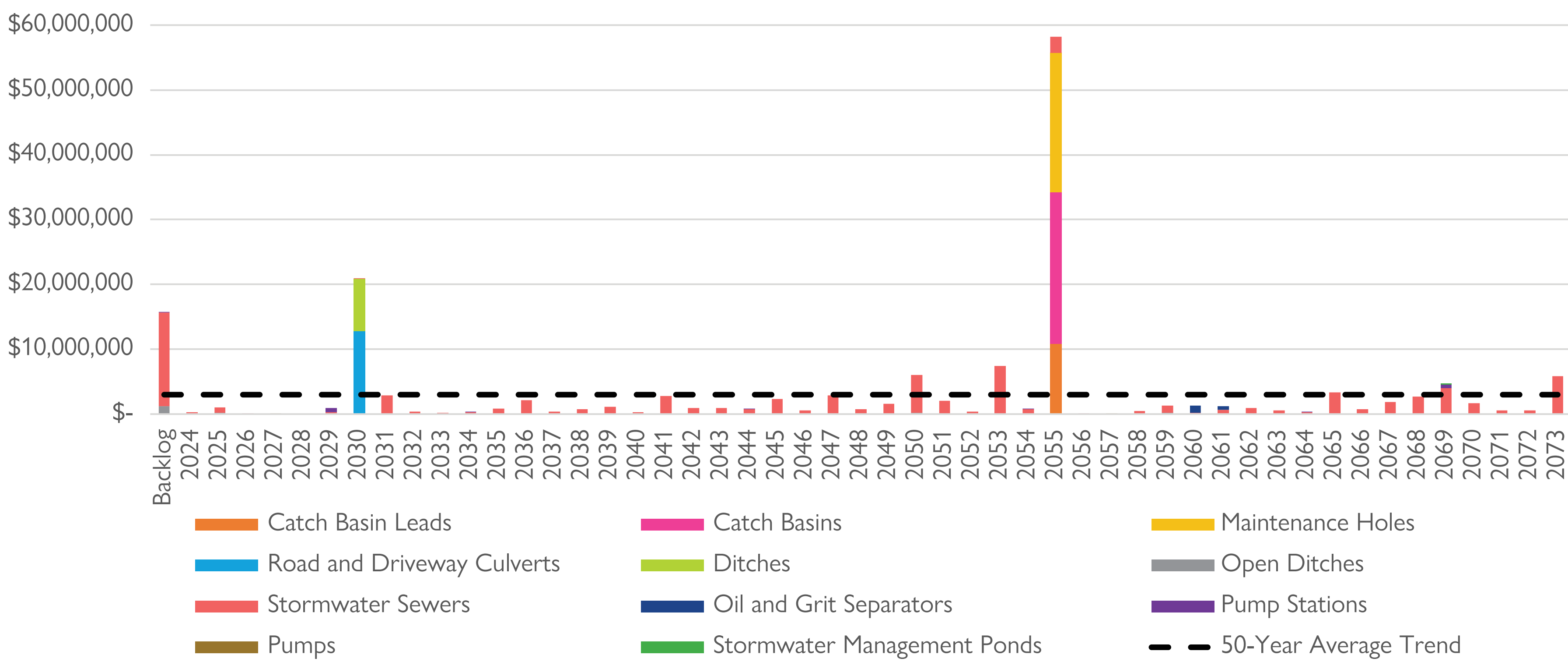
The City continuously invests in maintaining its assets and has been increasing budget amounts to align with asset needs. Until proposed levels of service are defined in the next revision of this asset management plan for July 1, 2025, there is no requirement to modify this funding arrangement.

The annual capital requirement represents the average cost per year that the City is estimated to require to allocate towards funding infrastructure needs. Based on the available data at the time of this plan, more information is required for this calculation. A more complete asset inventory would result in capturing more assets and more accurate lifecycle costs. When more assets are added to the portfolio, the average annual funding need would also increase and be better representative of the actual spending required to manage the City's assets.

Based on the best available current information, to maintain the current level of service and lifecycle management strategy, the annual sustainable capital funding requirement for existing stormwater network assets is estimated to be $2,731,761.

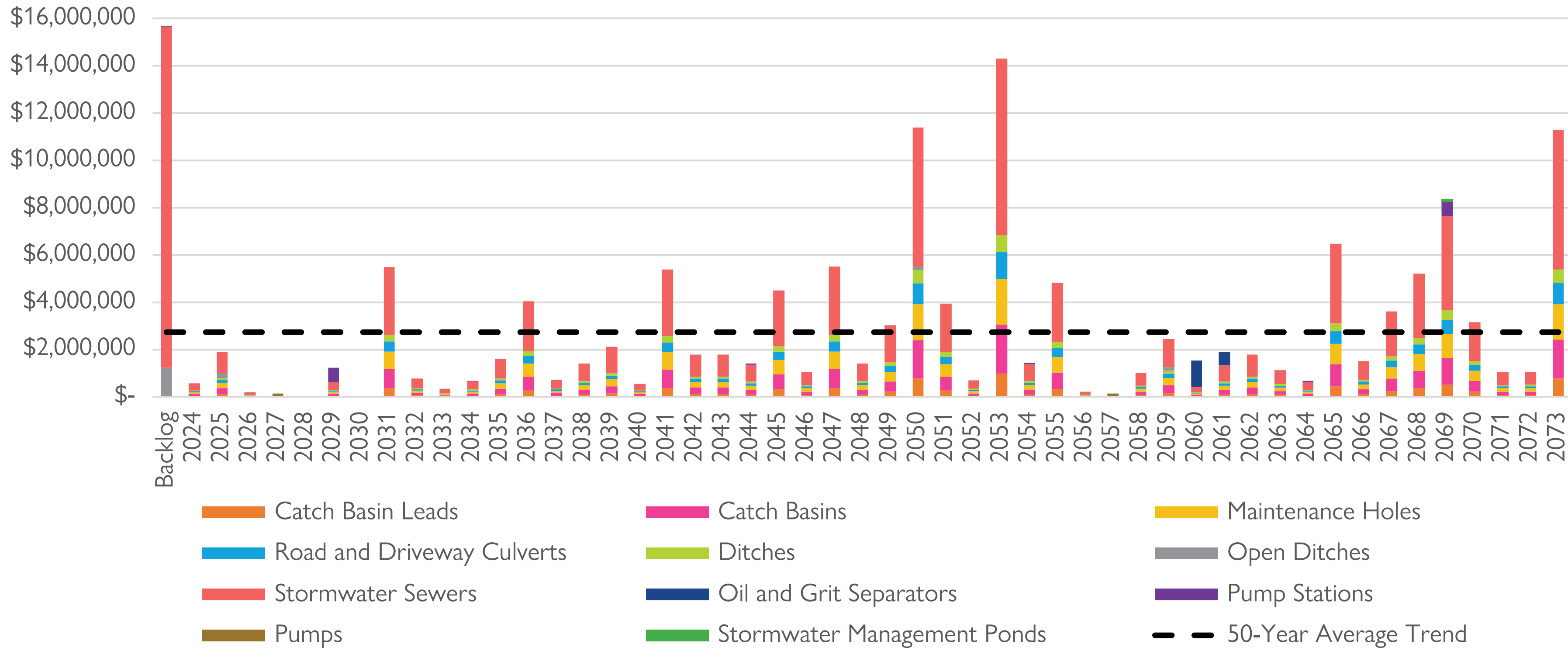
The 2024 capital budget funding allocation was $3,957,604. This means that there exists a funding surplus of $1,225,843 in 2024. The following figure illustrates a 50-year forecast of the annual capital asset needs for stormwater network assets, including the cost and asset lifecycle impacts of completing renewal and rehabilitation activities.

FIGURE 74: Stormwater – Annual Capital Requirement – 50-Year Forecast



Due to the 1980 in-service year assumption for maintenance holes, catch basins and leads, road and driveway culverts, and most ditches, outsized spikes exist in the forecast where all these assets come due for replacement in the same year. It is expected that the true age distribution of these assets is more aligned with the age distribution of the stormwater sewers. Using an assumption where the in-service year of these non-sewer assets matches the in-service year of stormwater sewers, the adjusted forecast is illustrated in the following figure.

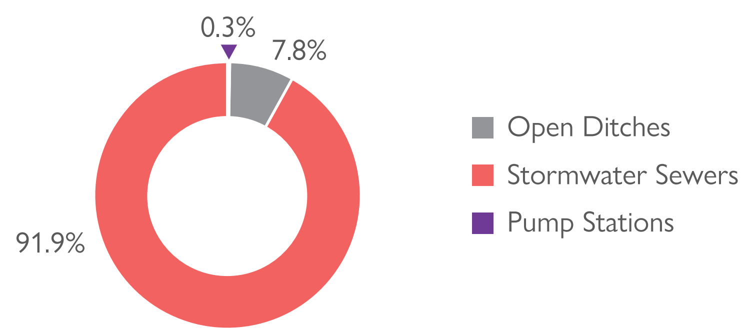
FIGURE 75: **Stormwater – Annual Capital Requirement – Adjusted 50-Year Forecast**



This adjusted forecast is a more realistic outlook of annual requirement that better matches how the City manages stormwater assets. Through reconstruction projects, the City replaces the various stormwater assets all at the same time along a corridor. The 50-year average trend excludes the value of the backlog.

The City has a significant and growing backlog of $15,675,405, primarily composed of stormwater sewers beyond their estimated useful life of 75 years. The City's oldest in-service stormwater sewers date back to 1905 and are well overdue for replacement. The following figure provides a breakdown of the sources of the backlog.

FIGURE 76: **Stormwater – Breakdown of Backlog**



Almost all of the backlog, 91.9%, is a result of very poor condition, end of life stormwater sewers. A large, multi-year investment would be required to overcome the backlog. Otherwise, it can be expected that the current level of service will decrease, and the level of risk will increase over the coming years.

An important note to consider is that the condition of stormwater sewers is primarily an age-based estimation. Stormwater sewers beyond their estimated useful life of 75 years may be able to remain in service for many more years if the condition of the pipe is better than anticipated. In-pipe condition assessments generate a more accurate representation of the actual condition of the pipes in the ground and may significantly decrease the backlog through the extension of the estimated useful life of old pipes. This data also provides some of the key information required to determine what pipes may be suitable for trenchless rehabilitation as a cost-saving lifecycle management strategy. Through the ongoing Stormwater Management Infrastructure Inventory and Condition Assessment project, a comprehensive condition assessment of stormwater sewers is taking place that will provide the City with in-pipe condition information.

For further details on capital requirements, please see the Financial Summary portion of this plan that details the funding needs for all categories of assets over the next 10 years, including discussion of impacts from growth.

8.7 Climate Change and Other Risks

The following table summarizes key trends, challenges, and risks that the City is currently facing in delivering the desired level of service.

TABLE 50: **Stormwater – Climate Change and Other Risks**

Trend, Challenge, or Risk	Summary
Asset Data and Information	There is a lack of confidence in the available inventory data. Staff have prioritized data collection and refinement to increase confidence in the accuracy and reliability of the data. Completion of the Stormwater Management Infrastructure Inventory and Condition Assessment project will provide accurate condition data for all known stormwater sewers in the City.
Climate Change and Extreme Weather Events	It is anticipated that there will be many challenges in managing the impacts of climate change, including: ▪ Potential increased damage to stormwater infrastructure through flooding and erosion due to more frequent extreme wet weather events. ▪ Increased uncertainty on the impact of higher intensity, frequency, and duration of rainfall events that can make it difficult to right-size infrastructure for the future. ▪ Increased uncertainty in impacts of extreme weather events and what is the most cost-effective resiliency strategy or group of strategies. The City is considering the following adaptation and mitigation measures in response to the challenges: ▪ Incorporate new best practices and technology in the design, construction, and maintenance of assets to increase resiliency while managing affordability. ▪ The City is looking to incorporate more Low Impact Developments (LIDs) as a good value for money investment to mitigate against more extreme wet weather events. Potential future adaptation and mitigation measures include: ▪ Use of lower embodied carbon materials to minimize the impact of infrastructure. ▪ Coordinate infrastructure design, construction, and maintenance with updated stormwater data and flood mapping to determine what options exist to improve resiliency during stormwater events.
Infrastructure Design and Installation	The City is getting better at standardizing engineering designs and ensuring that these are coordinated across departments and divisions through its 2015 Engineering Design Criteria Manual (DCM), which is due to be updated. Further efforts and refinements are continuously required to enhance and improve the process. City policy encourages the inclusion of Low Impact Development Best Management Practices (LID BMPs) including bioswales and other green infrastructure.
Lifecycle Management Strategies	The City's network of stormwater sewers is comprised of several different pipe materials. Some materials have higher break rates and present more operational challenges. In recent years there has been a focus on replacing clay and corrugated steel pipes with PVC. Reconstruction of stormwater assets is usually tied to road reconstruction, which may represent a concern as the lifecycle of sub-surface infrastructure and roads do not always align. The maintenance practice for vertical assets has generally been reactive. The City wants to implement more preventative and predictive maintenance programs in the future. The adoption of a work order management system tied to the asset management inventory system will provide an improved connection between maintenance programs and service delivery outcomes.

Trend, Challenge, or Risk	Summary
Infrastructure Reinvestment	The reinvestment in infrastructure has been reactive. Renewal and rehabilitation budgets have not increased in proportion to the age of infrastructure resulting in a growing backlog. There have been some moderate shifts to proactive reinvestment in the recent period.

8.8 Recommendations and Improvement Plan

Asset Inventory

- Continue to review and refine the asset inventory to improve scope, accuracy, and a more detailed breakdown of the assets within the stormwater network.
- Continue to add asset information to GIS layers for improved staff efficiency.

Condition

- Integrate the results of the ongoing Stormwater Management Infrastructure Inventory and Condition Assessment project into the asset inventory and adjust estimated useful lives to reflect the true condition of stormwater assets.
- Consider undertaking a stormwater infrastructure condition assessment project at regular 10-year intervals to update the condition assessment data.
- Explore industry best practices and new technologies to develop a better condition assessment strategy for the variety of non-pipe stormwater assets.

Lifecycle Management Strategies

- Evaluate the efficacy of the City's lifecycle management strategies at regular intervals to determine the impact of cost, condition, and risk.
- Develop more detailed preventative maintenance strategies and programs to maintain the current level of service.

Levels of Service

- Continue to measure current levels of service in accordance with the metrics identified in Ontario Regulation 588/17 and the additional metrics included by the City.
- Identify proposed levels of service per Ontario Regulation 588/17 requirements and identify the strategies that are required to close any gaps between the current and proposed levels of service.

9.0
Fire Services

9.0 Fire Services

The City provides fire services to prevent and mitigate losses and injuries as a result of events requiring a response. These services include fire suppression, emergency medical response, automobile extrication, search and rescue, hazardous materials spill response, public education, and building inspections. Fire services is the tenth-largest category of assets at a total replacement cost of $12,216,086 in 2023 dollars.

9.1 Asset Inventory and Replacement Cost

The City manages two fire halls, a wide variety of personal protective equipment and tools, four passenger vehicles, and a small fleet of fire apparatus vehicles including one aerial platform tower vehicle, one rescue vehicle, three pumper vehicles, two boats, and a fire prevention kit with trailer. The inventory is up to date as of the end of 2023. The structure of the fire halls is excluded from this category since those assets are managed separately through the Facilities service area.

The replacement cost is either based on estimates provided by vendors or on average purchase prices of recently acquired assets with similar characteristics. Included in the cost of replacing each asset is a set of components that together comprise a typical asset. The full set of components for each sub-segment is identified in Appendix 19.2.5.

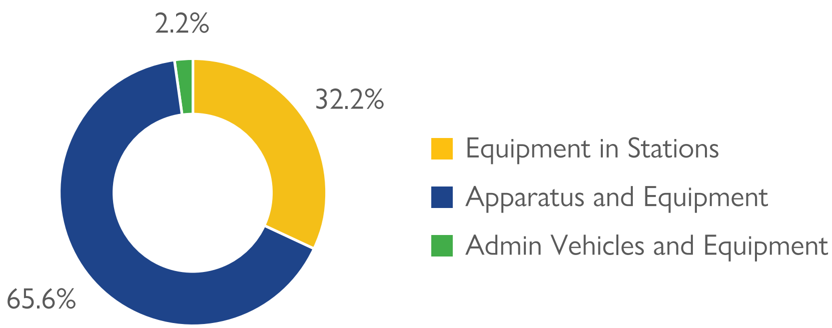
The following table includes the quantity, replacement cost method, and total replacement cost in 2023 dollars of each sub-segment of assets in the City's fire asset inventory.

TABLE 51: Fire – Inventory and Replacement Cost

Asset Sub-Segment	Quantity	Replacement Cost Method	Replacement Cost	Percentage of Total Replacement Cost
Equipment in Stations	317	Asset-Specific Cost Estimation	$3,933,815	32.2%
Apparatus and Equipment	7 apparatus vehicles with equipment Fire prevention kit and trailer	Asset-Specific Cost Estimation	$8,018,071	65.6%
Admin Vehicles and Equipment	4 passenger vehicles with equipment	Asset-Specific Cost Estimation	$264,200	2.2%

The following figure provides the data in the previous table visually with each sub-segment as a percentage of the total replacement cost. Most of the City's fire assets are apparatus and equipment at over half of the asset value.

FIGURE 77: **Fire – Total Replacement Cost**



9.2 Asset Age and Estimated Useful Life

The estimated useful life of fire assets is determined using a combination of staff knowledge, historical data, and industry standards. The average service life remaining is determined by the difference between the average estimated useful life and the average age, except when an asset has been assigned an assessed condition rating that may increase or decrease the average service life remaining.

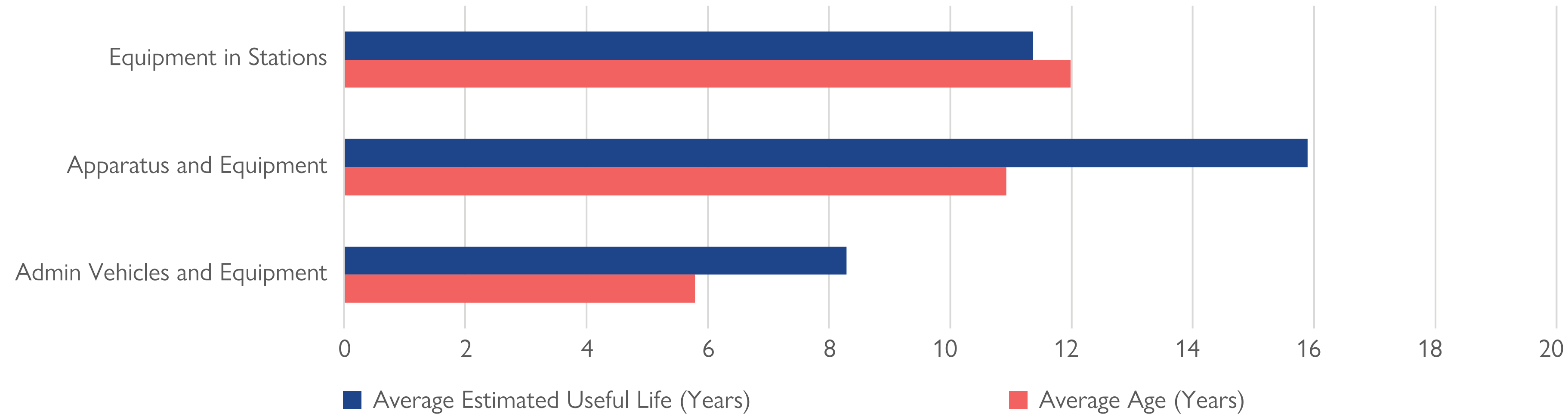
The following table summarizes the average age of each sub-segment based on the number of years that the assets have been in service.

TABLE 52: **Fire – Average Age and Estimated Useful Life**

Asset Sub-Segment	Average Estimated Useful Life (Years)	Average Age (Years)	Average Service Life Remaining (Years)	Percentage of Average Service Life Remaining
Equipment in Stations	11.4	12.0	-0.6	-6%
Apparatus and Equipment	15.9	10.9	5.0	31%
Admin Vehicles and Equipment	8.3	5.8	2.5	30%

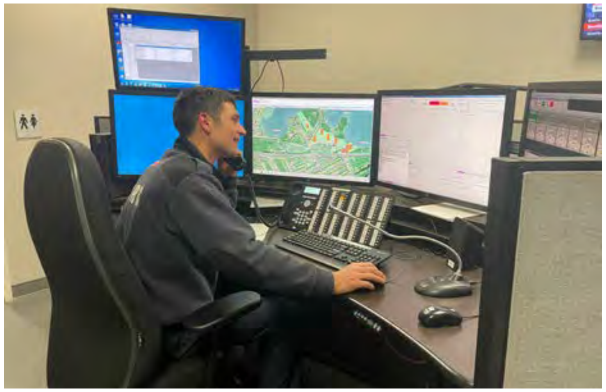
The age of an asset gives an indication of how close it is to the end of its estimated useful life and what lifecycle management strategies may be required. The following figure displays average asset age alongside the estimated useful life for each asset sub-segment.

FIGURE 78: Fire – Average Age and Estimated Useful Life



Average asset age has exceeded the average estimated useful life for the equipment in stations sub-segment. A significant portion of the value in the equipment in stations sub-segment is the 9-1-1 call equipment that is set to be updated to the new Next Generation 9-1-1 system. Once this update is complete, the average age of the equipment in stations is expected to significantly decrease and become less than the average estimated useful life.

Further improvements are required to the asset inventory to ensure that the estimated useful life assigned to assets is reflective of the true length of time that assets are typically in service.



9.3 Condition

The following sections and tables outline the condition breakdown for fire assets and the City's methods for assessing asset condition. Where available and feasible, the City follows industry standard best practices and generally accepted good engineering practices in the approach to assessing asset condition. When condition assessments are unavailable, an age-based condition rating is used based on the relative age of the asset compared to its estimated useful life. In addition to the techniques discussed below, a reliability grade is assigned by the Fire Underwriters Survey approximately every 10 years through a review of the entire fire department, including review of the asset inventory.

The following table summarizes the variety of techniques used to assess the condition of the fire assets on a regular frequency.

TABLE 53: **Fire – Approach to Assessing Condition**

Asset Sub-Segment	Condition Data Collection Techniques	Frequency of Data Collection	Year of Last Assessment
Equipment in Stations	Annual inspections in accordance with the National Fire Protection Association (NFPA) standards where required. Other assets are visually inspected annually by staff.	Every year or 10 years.	2023
Apparatus and Equipment	Annual inspections in accordance with the National Fire Protection Association (NFPA) standards where required. Other assets are visually inspected annually by staff.	Every year.	2023
Admin Vehicles and Equipment	Annual inspections by staff.	Every year.	2023

The following table provides a summary of the condition rating systems for all sub-segments of fire assets. Based on the condition data collected, the condition of assets is rated on a scale from Very Good to Very Poor.

TABLE 54: Fire – Condition Rating Summary

Rating	Rating Description	All Fire Assets (Five-Point Scale)
Very Good	Fit for Future	1.8 ≥ and ≥ 0
Good	Adequate for Now	2.6 ≥ and > 1.8
Fair	Requires Attention	3.4 ≥ and > 2.6
Poor	Increasing Potential of Affecting Service	4.2 ≥ and > 3.4
Very Poor	Unfit for Sustained Service	5.0 ≥ and > 4.2

The following figure illustrates the breakdown of condition ratings of the City's fire assets. 88.9% of these assets are in Very Good to Good condition with no assets rated as Very Poor.

FIGURE 79: Fire – Condition Rating Summary

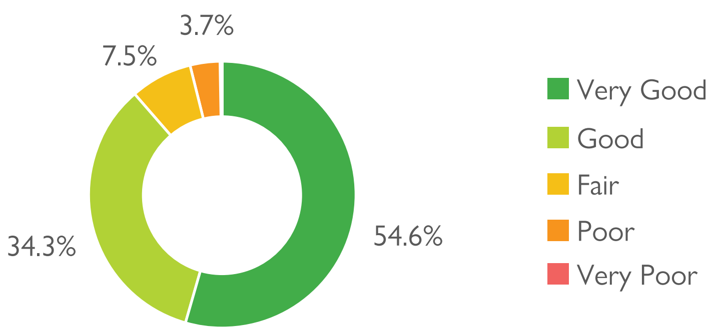
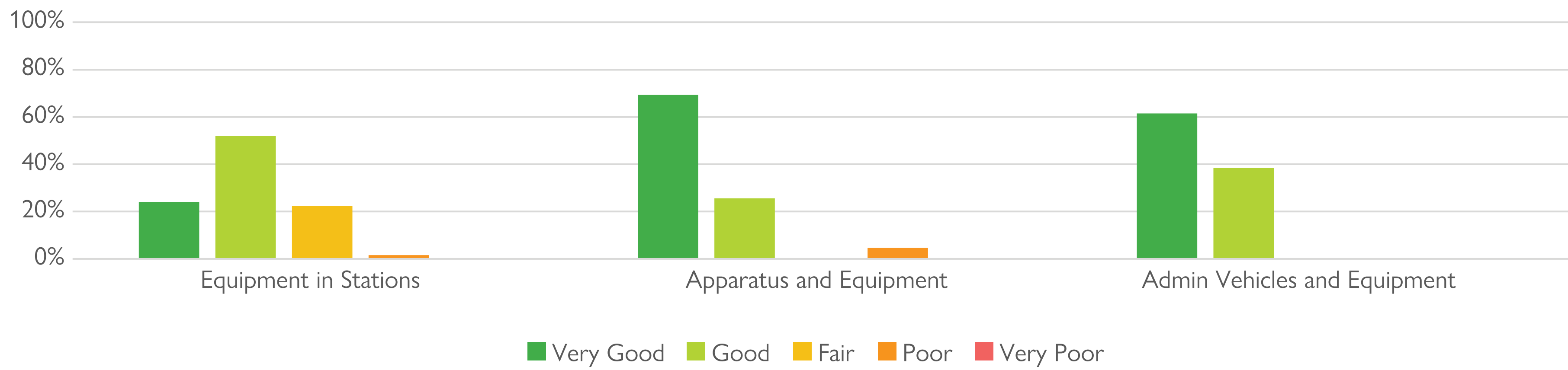


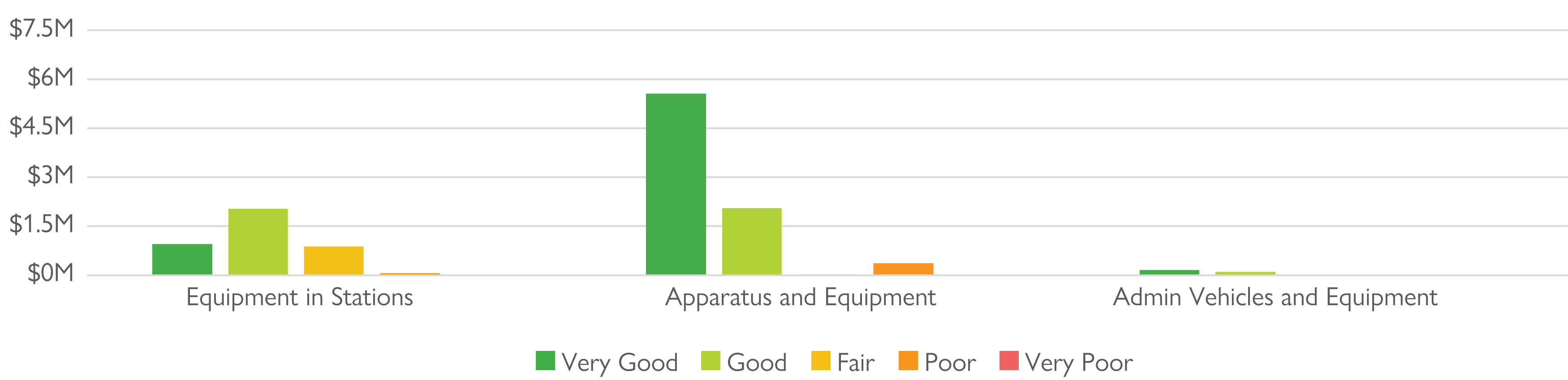
FIGURE 80: Fire – Breakdown of Condition Rating – Percentage of Cost



The previous figure illustrates the breakdown of condition ratings for all fire assets in terms of the percentage of total replacement cost. A key point is that due to the differences in methodology for calculating condition between sub-segments, direct comparisons between sub-segments may not be consistent depending on which sub-segments are compared.

The following figure illustrates the same breakdown but in terms of the total replacement cost rather than the percentage of total replacement cost for each sub-segment. This illustrates the smaller cost implications of the admin vehicles and equipment assets compared to the larger value of the other sub-segments.

FIGURE 81: Fire – Breakdown of Condition Rating – Cost



The overall average condition of fire assets is Good.

Assets are maintained by using the best treatment option to manage the current condition and anticipated future deterioration of the asset. More information is found in the lifecycle management strategy details in Section 9.5. Due to the upcoming upgrade to the Next Generation 9-1-1 system and the many equipment assets that will be impacted, this plan omits sections presenting the fully detailed condition information for each sub-segment or group of sub-segments of assets.

9.4 Levels of Service and Performance Measures

The City's assets exist to deliver services to its users. Levels of service are a measurement of the actual service provided so that decisions are made based on the nature and quality of that service, rather than only the condition of an asset. These are used to summarize the type of service being provided that reflects the values and desires of stakeholders in the community.

The following tables identify the City's current level of service for the fire assets. These metrics include any technical and community level of service metrics that are required to comply with Ontario Regulation 588/17, as well as any additional metrics provided by the City. A future revision to this plan will include proposed levels of service targets for each measure.

9.4.1 Community Levels of Service

The following table identifies the qualitative descriptions that determine the community levels of service provided by fire assets.

TABLE 55: **Fire – Community Levels of Service**

Service Attribute	Community Levels of Service	Related Assets
Minimize Lifecycle Cost	The City minimizes average annual lifecycle costs for fire apparatus and support vehicles.	Apparatus and Equipment, Admin Vehicles and Equipment
Reliability	The City strives to minimize breakdowns of fire apparatus and support vehicles.	Apparatus and Equipment, Admin Vehicles and Equipment
Availability	The City strives to minimize the number of days that fire apparatus and support vehicles are out of service.	Apparatus and Equipment, Admin Vehicles and Equipment
Quality	The City inspects and maintains the fire inventory at a condition level to ensure that it functions as designed.	All

9.4.2 Technical Levels of Service

The following table identifies the quantitative metrics that determine the technical level of service provided by fire assets.

TABLE 56: Fire – Technical Levels of Service

Service Attribute	Description of What Performance Measure Captures	Performance Measure	2023 Performance	Target	Related Assets
Minimize Lifecycle Cost	Replacement of fire apparatus when repair and maintenance costs become uneconomical.	Number of fire apparatus with repair and maintenance costs less than the age-based threshold percentage of replacement cost as a percentage of the total number of fire apparatus. The age-based threshold percentages for apparatus are: 0-3 Years: 20% 4-7 Years: 17.5% 8-10 Years: 15% 11-13 Years: 12.5% 14-15 Years: 10%	Future		Apparatus and Equipment
Minimize Lifecycle Cost	Replacement of fire support vehicles when repair and maintenance costs become uneconomical.	Number of fire support vehicles with repair and maintenance costs less than the age-based threshold percentage of replacement cost as a percentage of the total number of fire support vehicles. The age-based threshold percentages for support vehicles have not been determined yet.	Future		Admin Vehicles and Equipment
Reliability	Mechanical failures that prevent fire apparatus from completing trips.	Number of towing and roadside service incidents for fire apparatus that are due to mechanical failures per 100,000 km travelled.	Future		Apparatus and Equipment
Reliability	Mechanical failures that prevent fire support vehicles from completing trips.	Number of towing and roadside service incidents for fire support vehicles that are due to mechanical failures per 100,000 km travelled.	Future		Admin Vehicles and Equipment
Availability	Time fire apparatus are out of service.	Number of days fire apparatus are out of service per apparatus for unplanned maintenance or repairs.	Future		Apparatus and Equipment
Availability	Time fire support vehicles are out of service.	Number of days fire support vehicles are out of service per support vehicle for unplanned maintenance or repairs.	Future		Admin Vehicles and Equipment
Quality	Condition of the fire inventory.	Percentage of fire assets in Poor or Very Poor condition.	3.7%		All

9.5 Lifecycle Management Strategy

It is important to proactively manage asset deterioration through a lifecycle management strategy that balances cost, risk, and the level of service.

The following table describes the current lifecycle management activities completed. This table also includes the risks associated with not completing these activities through using a do-nothing approach.

TABLE 57: **Fire – Lifecycle Management Strategy**

Activity Type	Description of Current Strategy	Risks Associated with Not Completing Activities
Operations and Maintenance	Fire Services performs regular maintenance on its fire apparatus and support vehicles. Regular maintenance is a critical part of the lifecycle of these assets because failing to perform regular maintenance leads to higher repair costs.	▪ Deficiencies are not identified through inspections. ▪ Higher lifecycle costs if maintenance is delayed or completed incorrectly. ▪ Premature asset failure, health and safety risks, and service disruptions.
Renewal and Rehabilitation	Replacement is the primary strategy at the end of the asset estimated useful life; however, renewal and rehabilitation options are considered to ensure the best value for money option is chosen.	▪ Renewal and rehabilitation activities may increase asset life less than anticipated resulting in a need for repeated activities or premature asset failure. ▪ Higher lifecycle costs if work is delayed or completed incorrectly.
Replacement and Disposal	Replacements of assets with a replacement cost of $20,000 and over are funded through the City's capital budget. Assets with a replacement cost under $20,000 (e.g. communications equipment, fire hose nozzles, hand tools, etc.) are replaced on failure, and generally funded through the operating budget. The Fire Services Division maintains a 10-year replacement forecast for these assets in a spreadsheet format. The forecast is based on acquisition date and estimated expected useful life (based on NFPA estimates where available).	▪ Delay in replacement and disposal projects may result in significantly higher costs, longer service disruptions, liability concerns, delays to emergency response times, and user dissatisfaction.
Growth-Related and Service Enhancements Lifecycle Needs	The City's Fire Master Plan identifies capital assets that are needed to address population growth at a high level. For example, the 2017 Fire Master Plan identifies that there is a potential need for a third fire hall in the future and describes criteria for selecting a site, desired building attributes, and estimates of construction costs. Fire Services Division staff take the Fire Master Plan recommendations into consideration when developing the 10-year capital plan.	▪ Delay or cancellation of growth-related activities causing the service to be unable to sufficiently accommodate growth. ▪ Master plans may over or underestimate the required expansions to accommodate the impacts of growth.
Non-Infrastructure	Inspections and master plans.	▪ Rate of asset deterioration is over or underestimated.
Identification of Short-Term Priorities	Fire Services Division staff monitor fire apparatus, vehicles, and equipment for issues while they are in use, reporting them to management to be addressed.	▪ Decrease in service performance, higher lifecycle costs, and funding may not be prioritized in a way that ensures the best value for money option is picked to maintain the level of service.

9.6 Forecasted Capital Requirements

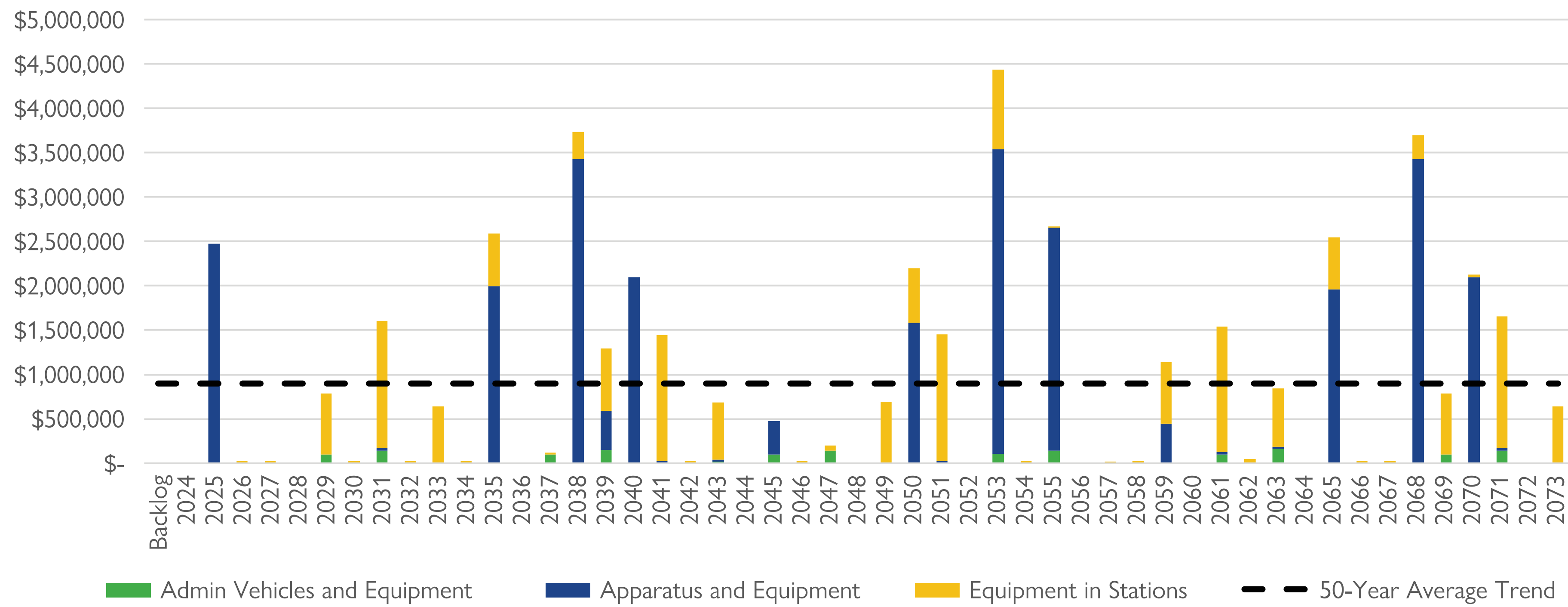
The City continuously invests in maintaining its assets and has been increasing budget amounts to align with asset needs. Until proposed levels of service are defined in the next revision of this asset management plan for July 1, 2025, there is no requirement to modify this funding arrangement.

The annual capital requirement represents the average cost per year that the City is estimated to require to allocate towards funding asset needs. Based on the available data at the time of this plan, more information is required for this calculation. A more complete asset inventory would result in capturing more assets and more accurate lifecycle costs. When more assets are added to the portfolio, the average annual funding need would also increase and be better representative of the actual spending required to manage the City's assets.

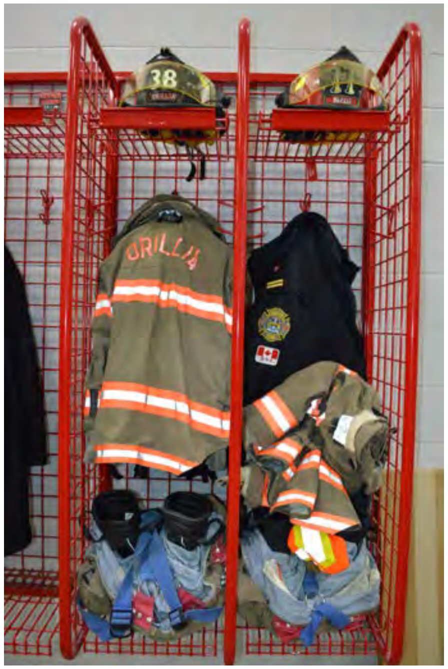
Based on the best available current information, to maintain the current level of service and lifecycle management strategy, the annual sustainable capital funding requirement for existing fire assets is estimated to be $898,641.

The 2024 capital budget funding allocation was $177,000. This means that there exists a funding deficit, or funding shortfall, of $721,641 in 2024. The following figure illustrates a 50-year forecast of the annual capital asset needs for fire assets, including the cost and asset lifecycle impacts of completing renewal and rehabilitation activities.

FIGURE 82: **Fire – Annual Capital Requirement – 50-Year Forecast**



Due to historical inconsistency in the timing of the various assets coming into service, a sawtooth pattern is present where in some years the total annual requirement is low followed by a spike that reaches well above the long-term average. The City's asset management program aims to smooth out this behaviour in favour of a more consistent amount of annual spending. However, due to the nature of the lifecycle of infrequently replaced and higher-cost fire apparatus, it is anticipated that spending will have to remain less consistent over time to match the lifecycle management strategy needs of the apparatus assets. Contributions to reserves for apparatus purchases will be considered in a future revision of this plan.



For further details on capital requirements, please see the Financial Summary portion of this plan that details the funding needs for all categories of assets over the next 10 years, including discussion of impacts from growth.

9.7 Climate Change and Other Risks

The following table summarizes key trends, challenges, and risks that the City is currently facing in delivering the desired level of service.

TABLE 58: Fire – Climate Change and Other Risks

Trend, Challenge, or Risk	Summary
Climate Change and Extreme Weather Events	It is anticipated that there will be challenges in managing the impacts of climate change, including: ▪ Potential increased call volume and frequency due to more frequent severe weather events. ▪ Potential delays to response times due to extreme wet weather events flooding or damaging roads, extreme snowfall events stressing winter control operations capacity, and extreme wind events downing trees resulting in blocked roads, fallen powerlines, and damaged buildings complicating rescue efforts. ▪ Increased uncertainty in impacts of extreme weather events and what is the most cost-effective resiliency strategy or group of strategies. The City is considering the following adaptation and mitigation measures in response to the challenges: ▪ Incorporate new best practices and technology in the design, procurement, and maintenance of assets to increase resiliency while managing affordability.

9.8 Recommendations and Improvement Plan

Asset Inventory

- Continue to review and refine the asset inventory to improve scope, accuracy, and update estimated useful life values.

Levels of Service

- Continue to measure current levels of service in accordance with the metrics identified in Ontario Regulation 588/17 and the additional metrics included by the City.
- Identify proposed levels of service per Ontario Regulation 588/17 requirements and identify the strategies that are required to close any gaps between the current and proposed levels of service.

10.0
Fleet and Transit


0918
Transit


Owls 705-327-0411
1802
Orillia's Specialized
Transit


18-5141
ORILLIA

10.0 Fleet and Transit

City-owned fleet and transit vehicles and equipment are operated in a variety of service areas across the City including transportation, parks, recreation, water, wastewater, stormwater, transit, and other City service areas. Activities include transportation of City staff, winter control, surveying, earthmoving, ice pad surfacing, public transit, grass mowing and fertilizing, and street sweeping. Fleet and transit is the eighth-largest category of assets at a total replacement cost of $33,516,574 in 2023 dollars.

10.1 Asset Inventory and Replacement Cost

The City fleet and transit asset inventory is comprised of 154 assets, including 12 buses, 15 plow trucks, nine sidewalk machines, six tractors, 39 trucks, cars, or vans, and a wide variety of other vehicles and equipment. Fire apparatus is excluded from this category since those assets are managed separately through the Fire service area.

The replacement cost is estimated using primarily historic purchase costs with consideration of standardized costing indices. Included in the cost of replacing each asset is a set of components that together comprise a typical asset. The City is aiming to better align with industry standards for vehicle and equipment categorization going forward, and future revisions of this plan may reflect changes in categorization. The full set of components for each sub-segment and a newly developed vehicle categorization system are identified in Appendix 19.2.6.

To ensure that the replacement cost estimated is reflective of the current model year of vehicles available from manufacturers and suppliers, a high-level replacement cost review took place in February of 2024.

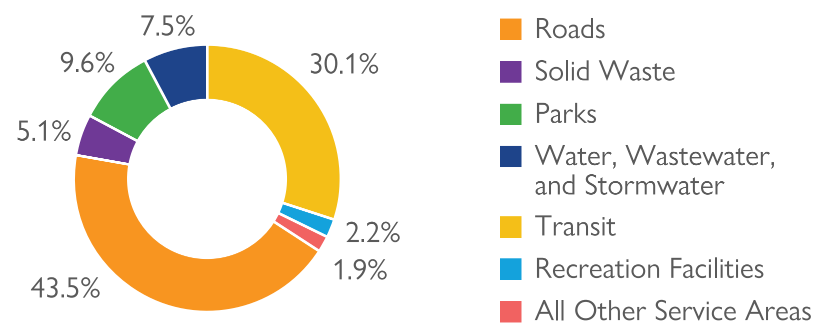
The following table includes the quantity, replacement cost method, and total replacement cost in 2023 dollars of each sub-segment of assets in the City's fleet and transit inventory.

TABLE 59: Fleet and Transit – Inventory and Replacement Cost

Asset Sub-Segment	Quantity	Replacement Cost Method	Replacement Cost	Percentage of Total Replacement Cost
Roads	51 vehicles	Asset-Specific Cost Estimation	$14,588,811	43.5%
Solid Waste	4 vehicles	Asset-Specific Cost Estimation	$1,725,000	5.1%
Parks	53 vehicles	Asset-Specific Cost Estimation	$3,216,013	9.6%
Recreation Facilities	7 vehicles	Asset-Specific Cost Estimation	$750,000	2.2%
Water, Wastewater, and Stormwater	19 vehicles	Asset-Specific Cost Estimation	$2,501,750	7.5%
Transit	12 buses	Asset-Specific Cost Estimation	$10,100,000	30.1%
All Other Service Areas	8 vehicles	Asset-Specific Cost Estimation	$635,000	1.9%

The following figure provides the data in the previous table visually with each sub-segment as a percentage of the total replacement cost.

FIGURE 83: Fleet and Transit – Total Replacement Cost



10.2 Asset Age and Estimated Useful Life

The estimated useful life of fleet and transit assets is determined using a combination of staff knowledge, historical data, and industry standards. The average service life remaining is determined by the difference between the average estimated useful life and the average age, except when an asset has been assigned an assessed condition rating that may increase or decrease the average service life remaining.

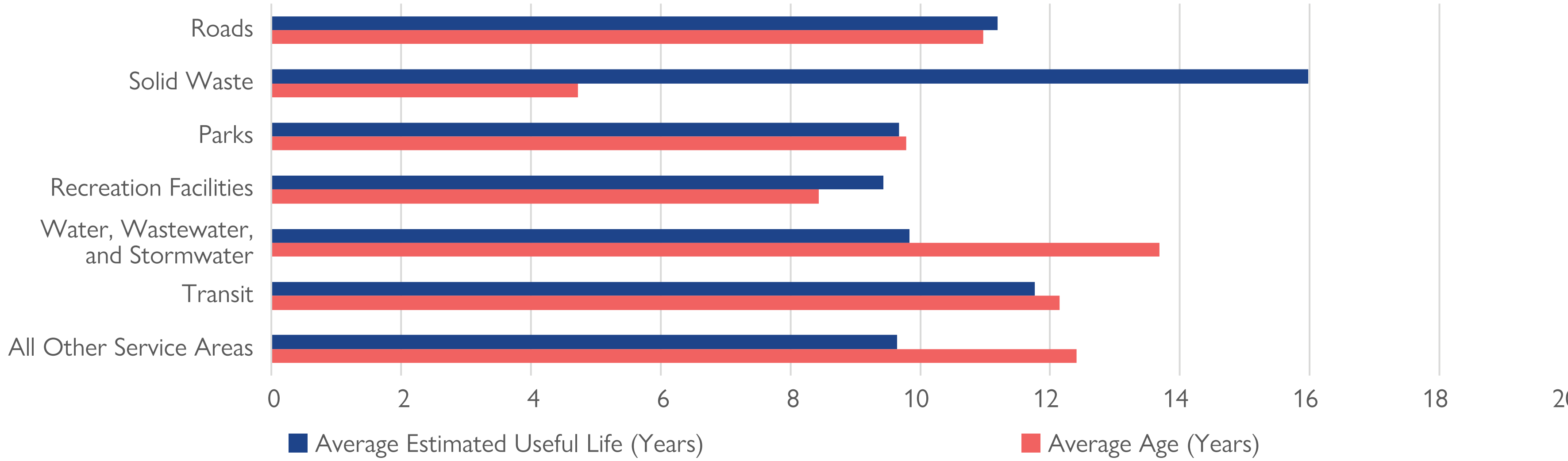
The following table summarizes the average age of each sub-segment based on the number of years that the assets have been in service.

TABLE 60: **Fleet and Transit – Average Age and Estimated Useful Life**

Asset Sub-Segment	Average Estimated Useful Life (Years)	Average Age (Years)	Average Service Life Remaining (Years)	Percentage of Average Service Life Remaining
Roads	11.2	11.0	0.2	2%
Solid Waste	16.0	4.7	11.3	70%
Parks	9.7	9.8	-0.1	-1%
Recreation Facilities	9.4	8.4	1.0	10%
Water, Wastewater, and Stormwater	9.8	13.7	-3.9	-39%
Transit	11.8	12.1	-0.3	-3%
All Other Service Areas	9.6	12.4	-2.8	-29%

The age of an asset gives an indication of how close it is to the end of its estimated useful life and what lifecycle management strategies may be required. The following figure displays average asset age alongside the estimated useful life for each asset sub-segment.

FIGURE 84: Fleet and Transit – Average Age and Estimated Useful Life



Average asset ages have exceeded the average estimated useful life for parks, water, wastewater, and stormwater, transit, and all other service areas sub-segments. The average age for roads and recreation facilities is close to the average estimated useful life. Further improvements are required to the asset inventory to ensure that the estimated useful life assigned to assets is reflective of the true length of time that assets are typically in service. A comprehensive review of the fleet asset estimated useful lives may be completed in 2024 as part of a potential fleet optimization review.

10.3 Condition

The following sections and tables outline the condition breakdown for each sub-segment of assets and the City's methods for assessing asset condition. Where available and feasible, the City follows industry-standard best practices and generally accepted good engineering practices in the approach to assessing asset condition. When condition assessments are unavailable, an age-based condition rating is used based on the relative age of the asset compared to its estimated useful life.

The following table summarizes the variety of techniques used to assess the condition of the fleet and transit assets on a regular frequency.

TABLE 61: Fleet and Transit – Approach to Assessing Condition

Asset Sub-Segment	Condition Data Collection Techniques	Frequency of Data Collection	Year of Last Assessment
Roads	Annual comprehensive condition assessment in accordance with the City's Fleet Management Policy.	Every year.	2023-2024
Solid Waste	Annual comprehensive condition assessment in accordance with the City's Fleet Management Policy.	Every year.	2023-2024
Parks	Annual comprehensive condition assessment in accordance with the City's Fleet Management Policy.	Every year.	2023-2024
Recreation Facilities	Annual comprehensive condition assessment in accordance with the City's Fleet Management Policy.	Every year.	2023-2024
Water, Wastewater, and Stormwater	Annual comprehensive condition assessment in accordance with the City's Fleet Management Policy.	Every year.	2023-2024
Transit	Age-based.	Every year.	2023
All Other Service Areas	Annual comprehensive condition assessment in accordance with the City's Fleet Management Policy.	Every year.	2023-2024

Based on the condition data and information provided by subject matter experts, the condition of assets is rated on a scale from Very Good to Very Poor. The annual comprehensive condition assessment for fleet assets includes a scoring system that considers the following factors:

- Age
- Lifecycle usage
- Reliability
- Maintenance and repair costs
- A mechanical and body assessment

Each factor is scored on a range from 1 to 5 and adding the scores together gives an overall condition score. For consistency, the same scale is used for the age-based condition assessment of the transit assets.

To ensure accurate and up to date information is available for this plan, a high-level reassessment of the condition of the roads, solid waste, and parks sub-segments was conducted in February of 2024 to supplement the information available from the 2023 annual comprehensive condition assessments. The following table provides a summary of the condition rating systems for all sub-segments of fleet and transit assets.

TABLE 62: **Fleet and Transit – Condition Rating Scales**

Rating	Rating Description	All Fleet and Transit Assets (Five-Point Scale)
Very Good	Fit for Future	8 ≥ and ≥ 0
Good	Adequate for Now	10 ≥ and > 8
Fair	Requires Attention	12 ≥ and > 10
Poor	Increasing Potential of Affecting Service	16 ≥ and > 12
Very Poor	Unfit for Sustained Service	> 16

The following figure illustrates the breakdown of condition ratings of the City's fleet and transit assets. 37.9% of these assets are in Very Good to Good condition with a large proportion, 28.6%, rated as Very Poor.

FIGURE 85: **Fleet and Transit – Condition Rating Summary**

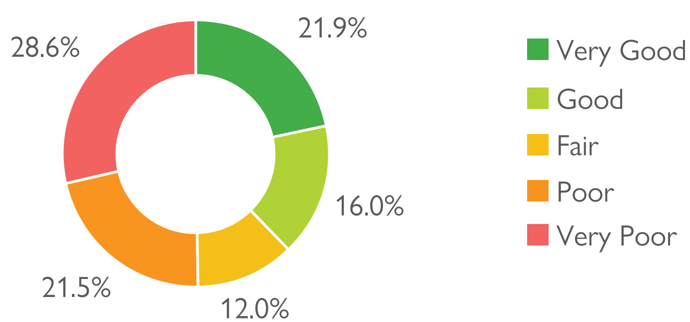
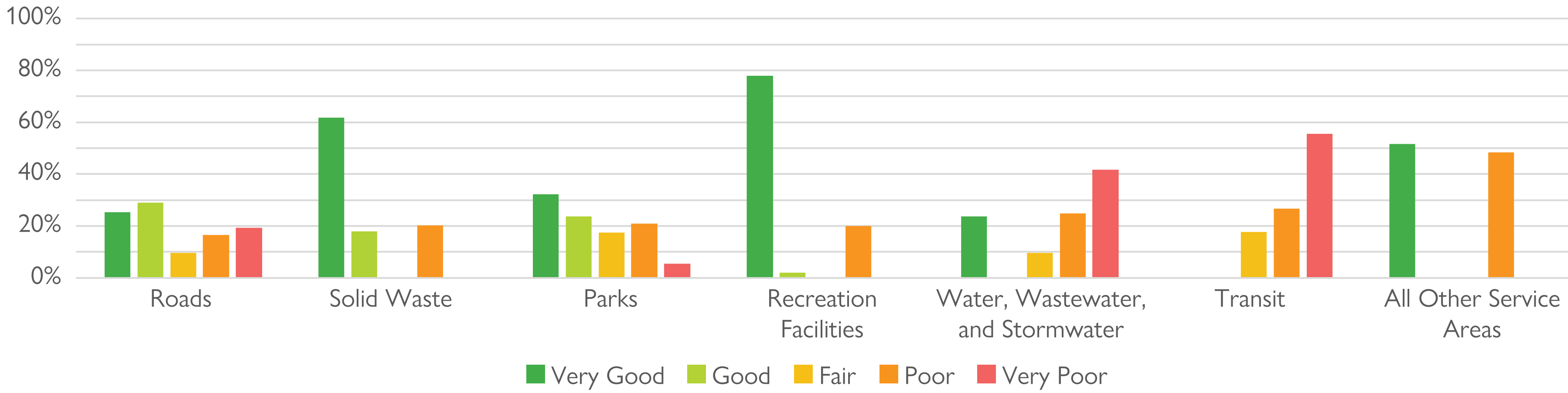


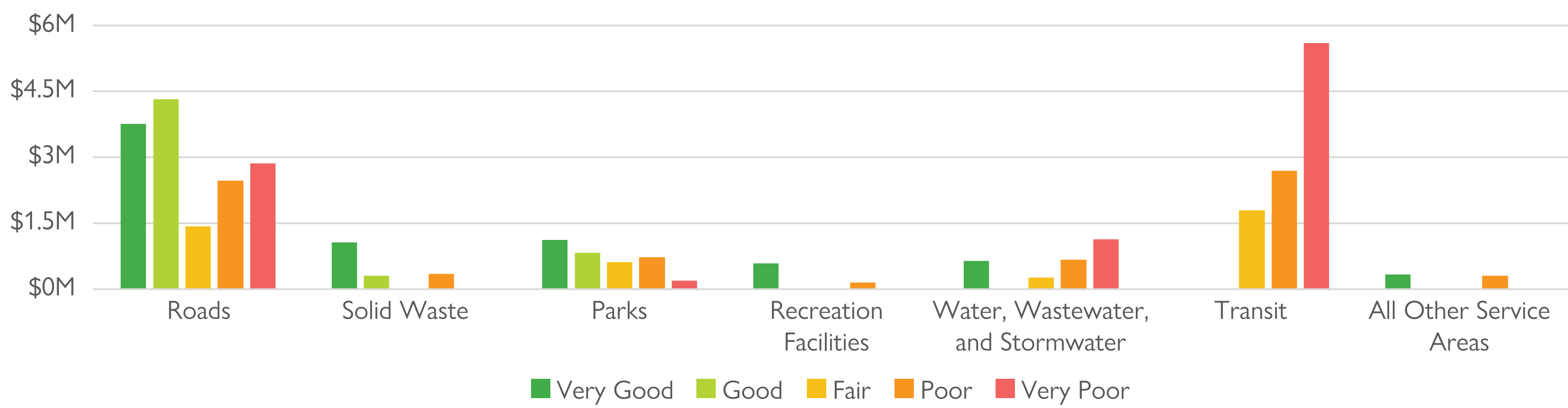
FIGURE 86: Fleet and Transit – Breakdown of Condition Rating – Percentage of Cost



The previous figure illustrates the breakdown of condition ratings for all fleet and transit assets in terms of the percentage of total replacement cost. A key point is that due to the differences in methodology for calculating condition between sub-segments, direct comparisons between sub-segments may not be consistent depending on which sub-segments are compared.

The following figure illustrates the same breakdown but in terms of the total replacement cost rather than the percentage of total replacement cost for each sub-segment. This illustrates the large cost implications of the roads and transit assets compared to the smaller value of the other sub-segments.

FIGURE 87: Fleet and Transit – Breakdown of Condition Rating – Cost



The overall average condition of fleet and transit assets is Fair. Assets are maintained by using the best treatment option to manage the current condition and anticipated future deterioration of the asset. More information is found in the lifecycle management strategy details in Section 10.5.

Due to a potential fleet optimization review occurring in 2024, this plan omits sections presenting the fully detailed condition information for each sub-segment or group of sub-segments of assets. This review may alter the service area composition of the fleet and therefore breakdown of asset condition. A future revision of this plan may include the fully detailed condition information for each sub-segment or group of sub-segments of assets after any fleet composition or categorization changes are finalized. The fleet optimization review will provide the following benefits to the City:

- Better alignment with industry standards for fleet categorization.
- Greater utilization for fleet assets.
- Improved fleet planning and lifecycle maintenance.

10.4 Levels of Service and Performance Measures

The City's assets exist to deliver services to its users. Levels of service are a measurement of the actual service provided so that decisions are made based on the nature and quality of that service, rather than only the condition of an asset. These are used to summarize the type of service being provided that reflects the values and desires of stakeholders in the community.

The following tables identify the City's current level of service for the fleet and transit assets. These metrics include any technical and community level of service metrics that are required to comply with Ontario Regulation 588/17, as well as any additional metrics provided by the City. A future revision to this plan will include proposed levels of service targets for each measure.

10.4.1 Community Levels of Service

The following table identifies the qualitative descriptions that determine the community levels of service provided by the fleet and transit assets.

TABLE 63: Fleet and Transit – Community Levels of Service

Service Attribute	Community Levels of Service	Related Assets
Reliability	The City strives to have vehicles perform as intended.	All
Availability	The City strives to ensure that vehicles are available for use when required by staff to perform their duties.	All
Environment	The City strives to lower its carbon emissions.	All
Quality	The City inspects and maintains the fleet inventory at a condition level to ensure that it functions as designed.	All

10.4.2 Technical Levels of Service

The following table identifies the quantitative metrics that determine the technical level of service provided by fleet and transit assets. Some measures are identified but the required data is not available for 2023 and as a result, they may be calculated in a future revision. Some measures also cannot be calculated until the new fleet categorization system is fully implemented.

TABLE 64: **Fleet and Transit – Technical Levels of Service**

Service Attribute	Description of What Performance Measure Captures	Performance Measure	2023 Performance	Target	Related Assets
Reliability	Mechanical failures that prevent vehicles from completing trips.	Number of towing and roadside service incidents that are due to mechanical failures per 100,000 km travelled.	Future		All
Reliability	Vehicles are not in need of immediate repair or replacement.	Number of vehicles not in the lowest condition rating as a percentage of the total number of vehicles.	83.1%		All
Reliability	Planning of maintenance work.	Number of proactive work orders as a percentage of the total number of work orders.	Future		All
Availability	Time vehicles are out of service.	Number of out-of-service days per vehicle.	Future		All
Availability	Availability of vehicles to fill in for ones that are out of service.	Number of spare vehicles as a percentage of the total number of vehicles.	Future		All
Environment	Alternative energy options of light-duty vehicles.	Number of alternative energy light-duty vehicles as a percentage of the total number of light-duty vehicles.	Future		All
Environment	Alternative energy options of medium-duty vehicles.	Number of alternative energy medium-duty vehicles as a percentage of the total number of medium-duty vehicles.	Future		All
Environment	Alternative energy options of heavy-duty vehicles.	Number of alternative energy heavy-duty vehicles as a percentage of the total number of heavy-duty vehicles.	Future		All
Environment	Alternative energy options of motorized special equipment.	Number of alternative energy specialized equipment units as a percentage of the total number of specialized equipment units.	Future		All
Environment	Total number of alternative energy fleet assets.	Number of alternative energy assets within the City of Orillia fleet.	1		All
Quality	Condition of the fleet inventory.	Percentage of fleet assets in Poor or Very Poor condition.	50.1%		All

10.5 Lifecycle Management Strategy

It is important to proactively manage asset deterioration through a lifecycle management strategy that balances cost, risk, and the level of service.

The following table describes the current lifecycle management activities completed for vehicles managed by the City. The transit buses are operated and maintained by TOK Transit under contract with the City. This table also includes the risks associated with not completing these activities through using a do-nothing approach.

TABLE 65: **Fleet and Transit – Lifecycle Management Strategy**

Activity Type	Description of Current Strategy	Risks Associated with Not Completing Activities
Operations and Maintenance	The City's operations and maintenance activities for fleet follow detailed guidelines in the Fleet Management Policy. For example, the policy states that the goal of the maintenance program is to keep "vehicles in sound operating condition."	▪ Deficiencies are not identified through inspections. ▪ Higher lifecycle costs if maintenance is delayed or completed incorrectly. ▪ Premature asset failure, health and safety risks, and service disruptions.
Renewal and Rehabilitation	Vehicle renewal and rehabilitation decisions are based on the Fleet Management Policy.	▪ Renewal and rehabilitation activities may increase asset life less than anticipated resulting in a need for repeated activities or premature asset failure. ▪ Higher lifecycle costs if work is delayed or completed incorrectly.
Replacement and Disposal	Vehicle replacement decisions are based on the Fleet Management Policy, which has detailed procedures for identifying when vehicles are to be replaced. The replacement forecast is currently maintained in a spreadsheet.	▪ Delay in replacement and disposal projects may result in significantly higher costs, longer service disruptions, liability concerns, and user dissatisfaction.
Growth-Related and Service Enhancements Lifecycle Needs	Growth requirements for fleet are driven by staffing increases.	▪ Delay or cancellation of growth-related activities causing the service to be unable to sufficiently accommodate growth.
Non-Infrastructure	Inspections and optimization studies.	▪ Rate of asset deterioration is over or underestimated.
Identification of Short-Term Priorities	The 10-year capital plan, which is mainly based on expected useful life, is revised as a vehicle nears its scheduled replacement date based on the vehicle's condition score and a formal review by City staff.	▪ Decrease in service performance, higher lifecycle costs, and funding may not be prioritized in a way that ensures the best value for money option is picked to maintain the level of service.

10.6 Forecasted Capital Requirements

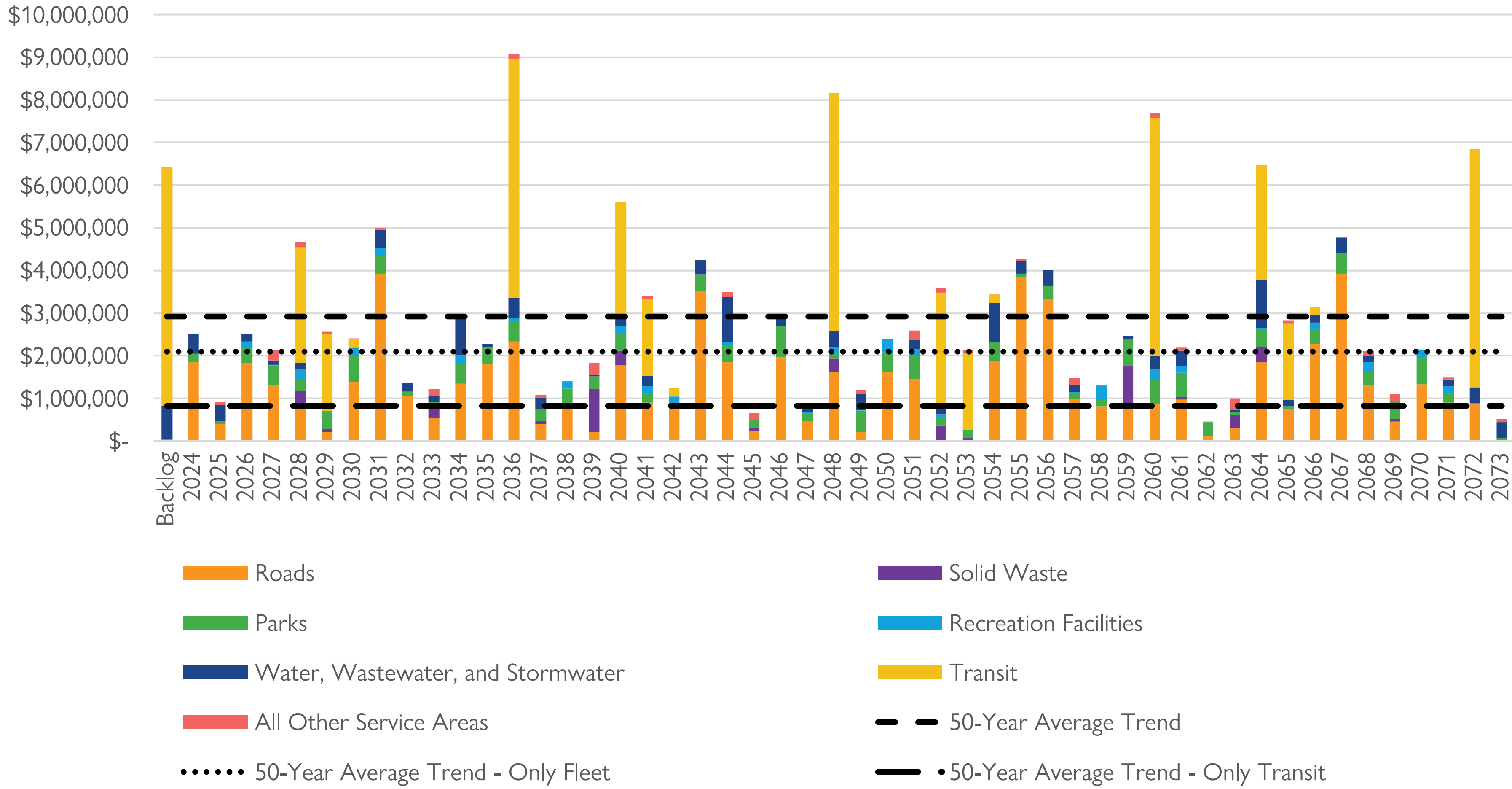
The City continuously invests in maintaining its assets and has been increasing budget amounts to align with asset needs. Until proposed levels of service are defined in the next revision of this asset management plan for July 1, 2025, there is no requirement to modify this funding arrangement.

The annual capital requirement represents the average cost per year that the City is estimated to require to allocate towards funding asset needs. Based on the available data at the time of this plan, more information is required for this calculation. A more complete asset inventory would result in capturing more assets and more accurate lifecycle costs. When more assets are added to the portfolio, the average annual funding need would also increase and be better representative of the actual spending required to manage the City's assets.

Based on the best available current information, to maintain the current level of service and lifecycle management strategy, the annual sustainable capital funding requirement for existing fleet and transit assets is estimated to be $2,095,708 for fleet and $824,000 for transit, totaling $2,919,708.

The 2024 capital budget funding allocation was $2,250,000 for fleet and $1,750,000 for transit. This means that there exists a funding surplus of $154,292 for fleet and $926,000 for transit in 2024. The following figure illustrates a 50-year forecast of the annual capital asset needs for fleet and transit assets, including the cost and asset lifecycle impacts of completing renewal and rehabilitation activities.

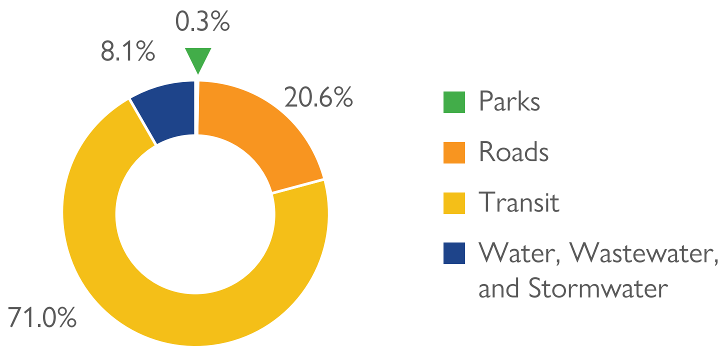
FIGURE 88: **Fleet and Transit – Annual Capital Requirement – 50-Year Forecast**



Due to historical inconsistency in the timing of the various assets coming into service, a sawtooth pattern is present where in some years the total annual requirement is lower than average followed by a spike that reaches well above the long-term average. The City's asset management program aims to smooth out this behaviour in favour of a more consistent amount of annual spending.

The City has a significant backlog of $6,435,000, primarily composed of transit buses and roads fleet beyond their estimated useful life or out of service. The following figure provides a breakdown of the sources of the backlog.

FIGURE 89: Fleet and Transit – Breakdown of Backlog



Most of the backlog, 71%, is a result of Very Poor condition, end of life transit buses. There is also a significant backlog of roads and water, wastewater, and stormwater fleet. A large, multi-year investment would be required to overcome the backlog. Otherwise, it can be expected that the current level of service will decrease, and the level of risk will increase over the coming years. The 2024 funding surplus will result in a reduction in the size of the backlog.

For further details on capital requirements, please see the Financial Summary portion of this plan that details the funding needs for all categories of assets over the next 10 years, including discussion of impacts from growth.

10.7 Climate Change and Other Risks

The following table summarizes key trends, challenges, and risks that the City is currently facing in delivering the desired level of service.

TABLE 66: Fleet and Transit – Climate Change and Other Risks

Trend, Challenge, or Risk	Summary
Climate Change and Extreme Weather Events	It is anticipated that there will be many challenges in managing the impacts of climate change, including: ▪ Transitioning to net-zero emission fleet to reduce greenhouse gas emissions, especially for medium and heavy-duty fleet where current technology may be operationally insufficient or not cost effective for Orillia's requirements. ▪ Increased pressure on winter control activities due to more frequent extreme snowfall events. ▪ Increased uncertainty in impacts of extreme weather events and what is the most cost-effective resiliency strategy or group of strategies. The City is considering the following adaptation and mitigation measures in response to the challenges: ▪ Incorporate new best practices and technology in the design, procurement, and maintenance of assets to increase resiliency while managing affordability.
Lifecycle Management Strategies	The adoption of a work order management system tied to the asset management inventory system will provide an improved connection between asset maintenance programs and service delivery outcomes.

10.8 Recommendations and Improvement Plan

Asset Inventory

- Continue to review and refine the asset inventory to improve scope, accuracy, and update estimated useful life values.
- Continue to integrate the City's asset management inventory with the information available in the fleet management processes.
- Implement the new vehicle categorization system that aligns better with industry standards and best practices.

Condition

- Explore industry best practices and new technologies to develop a better condition assessment strategy for the variety of fleet and transit assets.
- Consider comparing actual performance of vehicles as determined by the condition rating system to the expected useful lives in the Fleet Management Policy to determine if they are consistent.

Lifecycle Management Strategies

- Evaluate the efficacy of the City's lifecycle management strategies at regular intervals to determine the impact of cost, condition, and risk.
- Consider a comprehensive review of the Fleet Management Policy to align the City's processes and procedures with industry standard best practices.
- Consider the outcomes from the 2024 Fleet Optimization and Net-Zero Strategy project in determining which strategies will enable the City to be more cost-effective in the choice of lifecycle management strategies.
- Consider linking the planning for fleet expansion to the planning process for staffing increases.
- Consider multi-year budget approvals for vehicle replacements to better manage supply chain delays.

Levels of Service

- Continue to measure current levels of service in accordance with the metrics identified in Ontario Regulation 588/17 and the additional metrics included by the City.
- Identify proposed levels of service per Ontario Regulation 588/17 requirements and identify the strategies that are required to close any gaps between the current and proposed levels of service.
- Consider the outcomes from fleet optimization review in determining potential changes to the current levels of service and identifying proposed levels of service.

11.0
Facilities


LIBRARY


CIMCO

11.0 Facilities

The City manages a variety of facilities that are used by City staff, City Council, tenants, and members of the public. To ensure the efficient provision of City services, complex facilities must be continuously maintained to provide a reliable, safe, and accessible environment. Corporate facilities exist primarily to enable the provision of City services, including administrative municipal offices, operations municipal facilities, fire halls, water and wastewater treatment facilities, and historical sites. Recreation facilities exist to provide or support services related to the parks, recreation, culture, and tourism service areas. In the City's parks, the City manages both washroom facilities and additional auxiliary facilities, such as bandstands, pavilions, and storage locations. Facilities is the third-largest category of assets at a total replacement cost of $354,031,842 in 2023 dollars.

11.1 Asset Inventory and Replacement Cost

The City's facilities' asset inventory is comprised of 51 facilities, including 26 corporate facilities, seven recreation facilities, nine park washrooms, and a mix of nine auxiliary parks facilities. The individual parts of each facility are broken down in more detail following the ASTM UNIFORMAT II standard. Specific pieces of equipment, including some water heaters, HVAC units, electrical panels, among other similar assets, are not included in this category because those assets have not yet been integrated into the City's asset inventory. However, the estimated replacement cost for each sub-segment does include all relevant assets, including those pieces of equipment.

The replacement cost estimate is calculated by subject matter experts using industry-standard cost estimate processes. This includes unit rates published by Means Publishing and/or Marshall & Swift Valuation Service. The City is provided the estimated cost to reproduce a facility and all associated assets located on the same property. The estimate assumes the use of similar materials and includes the cost of demolishing the existing facility using current market prices for materials and labour. Appendix 19.2.7 identifies the full set of components for each sub-segment.

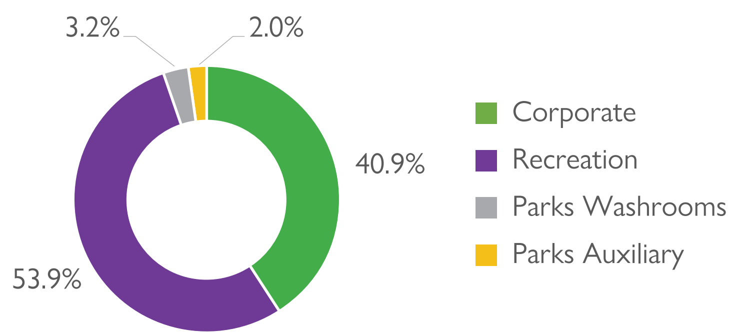
The following table includes the quantity, replacement cost method, and total replacement cost in 2023 dollars of each sub-segment of assets in the City's facilities' inventory.

TABLE 67: **Facilities – Inventory and Replacement Cost**

Asset Sub-Segment	Quantity	Replacement Cost Method	Replacement Cost	Percentage of Total Replacement Cost
Corporate	26	Asset-Specific Cost Estimation and Cost/ Unit	$144,824,808	40.9%
Recreation	7	Asset-Specific Cost Estimation and Cost/ Unit	$190,715,844	53.9%
Parks Washrooms	9	Asset-Specific Cost Estimation and Cost/ Unit	$11,487,732	3.2%
Parks Auxiliary	9	Asset-Specific Cost Estimation and Cost/ Unit	$7,003,458	2.0%

The following figure provides the data in the previous table visually with each sub-segment as a percentage of the total replacement cost.

FIGURE 90: **Facilities – Total Replacement Cost**



11.2 Asset Age and Estimated Useful Life

The estimated useful life of facilities' assets is determined using subject matter expert knowledge and industry standards. The average service life remaining is determined by the difference between the average estimated useful life and the average age, except when an asset has been assigned an assessed condition rating that may increase or decrease the average service life remaining.

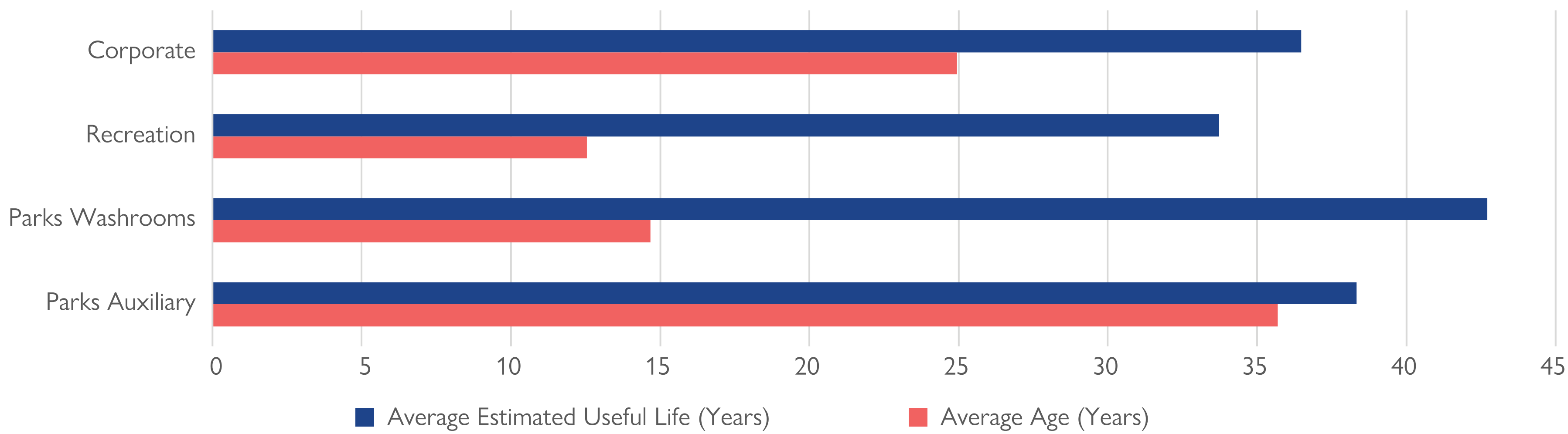
The following table summarizes the average age and service life remaining of each sub-segment based on the number of years that the assets have been in service.

TABLE 68: **Facilities – Average Age and Estimated Useful Life**

Asset Sub-Segment	Average Estimated Useful Life (Years)	Average Age (Years)	Average Service Life Remaining (Years)	Percentage of Average Service Life Remaining
Corporate	36.5	25.0	11.5	32%
Recreation	33.7	12.5	21.2	63%
Parks Washrooms	42.7	14.7	28.0	66%
Parks Auxiliary	38.3	35.7	2.6	7%

The age of an asset gives an indication of how close it is to the end of its estimated useful life and what lifecycle management strategies may be required. The following figure displays average asset age alongside the estimated useful life for each asset sub-segment.

FIGURE 91: **Facilities – Average Age and Estimated Useful Life**



Average asset ages have not exceeded the average estimated useful life for any sub-segments.

As a result of the comprehensive corporate facility condition assessments done in 2023, all facilities were assigned a condition rating that may change the average service life remaining for those assets. For each sub-segment of facilities' assets, the average service life remaining is longer than would be calculated using only the average estimated useful life and average age. This suggests that on average, assets are expected to be kept in service longer than their estimated useful life. Adjustments to the estimated useful life values may be required to ensure that they reflect the actual amount of time that assets can provide the required level of service.

11.3 Condition

The following sections and tables outline the condition breakdown for each sub-segment of assets and the City's methods for assessing asset condition. Where available and feasible, the City follows industry-standard best practices and generally accepted good engineering practices in the approach to assessing asset condition. When condition assessments are unavailable, an age-based condition rating is used based on the relative age of the asset compared to its estimated useful life.

The following table summarizes the variety of techniques used to assess the condition of the facilities' assets.

TABLE 69: **Facilities – Approach to Assessing Condition**

Asset Sub-Segment	Condition Data Collection Techniques	Frequency of Data Collection	Year of Last Assessment
Corporate	Condition assessments by subject matter experts and staff.	No set frequency.	2023
Recreation	Condition assessments by subject matter experts and staff.	No set frequency.	2023
Parks Washrooms	Condition assessments by subject matter experts and staff.	No set frequency.	2023
Parks Auxiliary	Condition assessments by subject matter experts and staff.	No set frequency.	2023

Formal building condition assessments are used to evaluate the condition of City facilities at an element level (UNIFORMAT II Level 3). The City performs monthly health and safety inspections of its facilities as required by the *Occupational Health and Safety Act*. Staff perform a variety of other routine inspections at facilities: annual fire alarm tests; bi-annual generator tests; regular inspections of some HVAC, refrigeration, and water treatment equipment; greenhouse gas audits; elevator maintenance inspections; backflow preventer inspections; and roof inspections. Streetlights are monitored continuously and maintained on an ongoing basis. Traffic signals are inspected in compliance with Minimum Maintenance Standards under the *Municipal Act,* 2001, S.O. 2001, c. 25.

The following table provides a summary of the condition rating systems for all sub-segments of facilities' assets. Based on the condition data and information provided by subject matter experts and staff, the condition of assets is rated on a scale from Very Good to Very Poor.

TABLE 70: **Facilities – Condition Rating Scales**

Rating	Rating Description	All Facilities Assets (Five-Point Scale)
Very Good	Fit for Future	1
Good	Adequate for Now	2
Fair	Requires Attention	3
Poor	Increasing Potential of Affecting Service	4
Very Poor	Unfit for Sustained Service	5

The following figure illustrates the breakdown of condition ratings of the City's facilities' assets. 56.4% of these assets are in Very Good to Good condition with a small proportion, 4.5%, rated as Very Poor.

FIGURE 92: **Facilities – Condition Rating Summary**

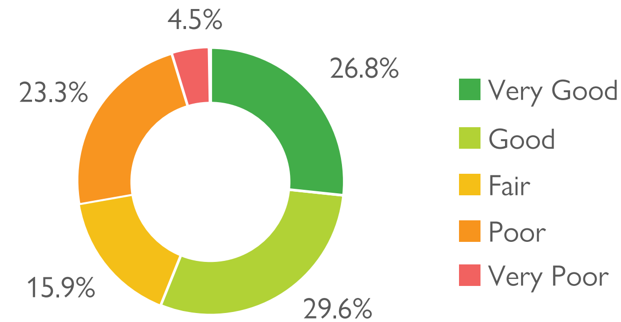
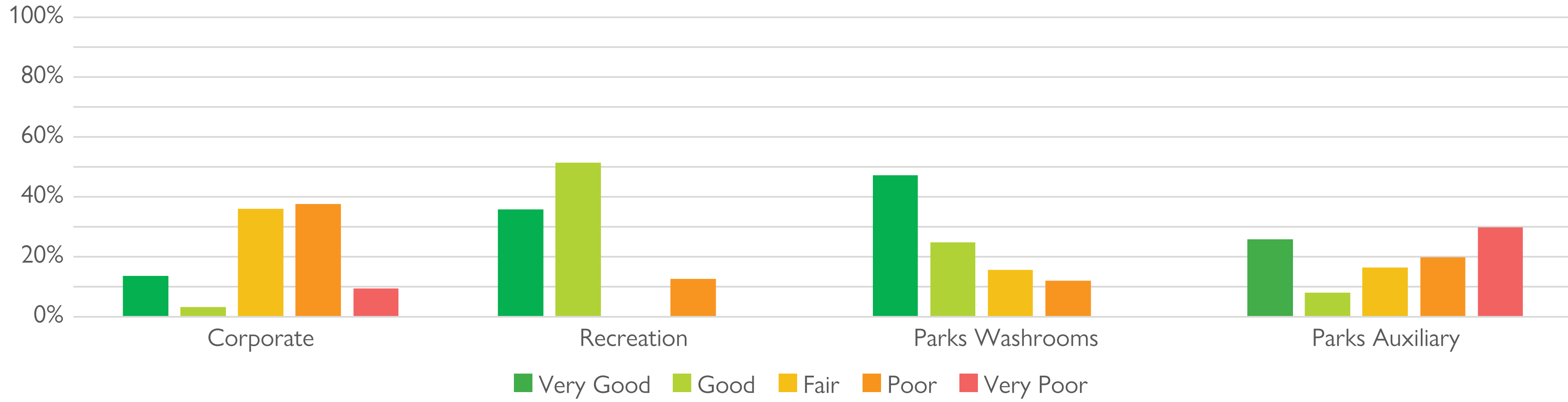


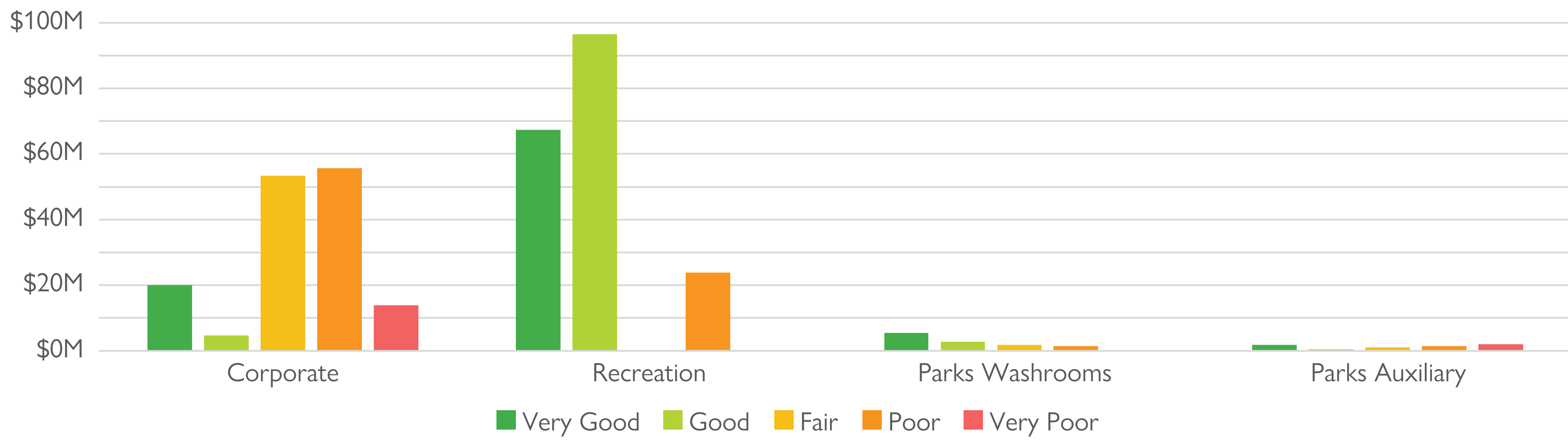
FIGURE 93: Facilities – Breakdown of Condition Rating – Percentage of Cost



The previous figure illustrates the breakdown of condition ratings for all facilities' assets in terms of the percentage of total replacement cost. A key point is that due to the differences in methodology for calculating condition between sub-segments, direct comparisons between sub-segments may not be consistent depending on which sub-segments are compared.

The following figure illustrates the same breakdown but in terms of the total replacement cost rather than the percentage of total replacement cost for each sub-segment. This illustrates the large cost implications of the corporate and recreation facilities' assets compared to the smaller value of the parks-related assets.

FIGURE 94: Facilities – Breakdown of Condition Rating – Cost



The overall average condition of facilities assets is Fair. Assets are maintained by using the best treatment option to manage the current condition and anticipated future deterioration of the asset. More information is found in the lifecycle management strategy details in Section 11.5.

Due to the asset inventory not currently including all specific pieces of equipment, such as water heaters, HVAC units, electrical panels, among other similar assets, this plan omits sections presenting the fully detailed condition information for each sub-segment or group of sub-segments of assets. A future revision of this plan may include the fully detailed condition information for each sub-segment or group of sub-segments of assets after the asset inventory is updated.

11.4 Levels of Service and Performance Measures

The City's assets exist to deliver services to its users. Levels of service are a measurement of the actual service provided so that decisions are made based on the nature and quality of that service, rather than only the condition of an asset. These are used to summarize the type of service being provided that reflects the values and desires of stakeholders in the community.

The following tables identify the City's current level of service for the facilities' assets. These metrics include any technical and community level of service metrics that are required to comply with Ontario Regulation 588/17, as well as any additional metrics provided by the City. A future revision to this plan will include proposed levels of service targets for each measure.

11.4.1 Community Levels of Service

The following table identifies the qualitative descriptions that determine the community levels of service provided by the facilities' assets.

TABLE 71: Facilities – Community Levels of Service

Service Attribute	Community Levels of Service	Related Assets
Accessibility	The City strives to make its facilities accessible to everyone.	All
Comfort	The City provides facilities that are pleasant to be in.	All
Security	The City takes steps to reduce risk of criminal activities at facilities.	All
Reliability	The City strives to have its facilities available for use during normal operating hours.	All
Energy Efficiency	The City strives to reduce emissions of greenhouse gases.	All
Capacity	The City strives to align capacity of facilities to service demand.	All
Capacity	The City stores vehicles indoors when doing so improves operational efficiency or reduces lifecycle costs.	Corporate
Quality	The City inspects and maintains facilities at a condition level to ensure that it functions as designed.	All

11.4.2 Technical Levels of Service

The following table identifies the quantitative metrics that determine the technical level of service provided by facilities assets. Some measures are identified but the required data is not available for 2023 and as a result, they may be calculated in a future revision.

TABLE 72: Facilities – Technical Levels of Service

Service Attribute	Description of What Performance Measure Captures	Performance Measure	2023 Performance	Target	Related Assets
Accessibility	Facilities that are accessible to people with disabilities.	Number of facilities that meet *Accessibility for Ontarians with Disabilities Act* requirements as a percentage of the total number of facilities.	Future		All
Comfort	Appropriateness of air temperature.	Number of complaints about air temperature per 1,000 sq ft of gross floor area.	Future		All
Comfort	Adequacy of lighting levels.	Number of complaints about lighting levels per 1,000 sq ft of gross floor area.	Future		All
Comfort	Cleanliness of facilities.	Number of complaints about cleanliness per 1,000 sq ft of gross floor area.	Future		All
Security	Extent of vandalism at facilities.	Dollar value of repairs required because of vandalism per 1,000 sq ft of gross floor area.	Future		All
Reliability	Frequency of unplanned closures.	Number of unplanned closures of facilities due to component failures per 1,000 sq ft of gross floor area.	Future		All
Reliability	Condition of facility mechanical systems.	Number of service facility components (components that are categorized under "D Services" in Level 1 of the UNIFORMAT II system) with a condition rating of fair or better as a percentage of the total number of service facility components.	Future		All
Energy Efficiency	Electricity consumption.	Kilowatt-hours of electricity consumed per 1,000 sq ft of gross floor area.	Future		All
Energy Efficiency	Natural gas consumption.	Cubic metres of natural gas consumed per 1,000 sq ft of gross floor area.	Future		All
Energy Efficiency	Propane consumption.	Litres of propane consumed per 1,000 sq ft of gross floor area.	Future		All
Energy Efficiency	Net-zero facilities.	Number of facilities that are net-zero as a percentage of the total number of facilities.	Future		All
Capacity	Sufficiency of capacity of facilities to meet user demand.	Number of facilities with utilization rates at or below design capacity as a percentage of the total number of facilities.	Future		All
Capacity	Adequacy of indoor parking facilities for City vehicles.	Number of vehicles stored indoors as a percentage of the total number of vehicles during the winter control season.	Future		Corporate
Quality	Condition of the facilities' inventory.	Percentage of facilities' assets in Poor or Very Poor condition.	27.8%		All

11.5 Lifecycle Management Strategy

It is important to proactively manage asset deterioration through a lifecycle management strategy that balances cost, risk, and the level of service.

The following table describes the current lifecycle management activities completed. This table also includes the risks associated with not completing these activities through using a do-nothing approach.

TABLE 73: **Facilities – Lifecycle Management Strategy**

Activity Type	Description of Current Strategy	Risks Associated with Not Completing Activities
Operations and Maintenance	The Facilities, Climate Change, and Operations Division has been developing maintenance plans for facilities and continues to refine and expand those maintenance plans over time. Improvements to security systems are being considered for operational reasons.	▪ Deficiencies are not identified through inspections. ▪ Higher lifecycle costs if maintenance is delayed or completed incorrectly. ▪ Premature asset failure, health and safety risks, and service disruptions.
Renewal and Rehabilitation	Renewal and rehabilitation capital projects are identified by Division staff operating facilities and through discussions with users of facilities. Division staff meet to review and prioritize the capital projects and to ultimately prepare a 10-year capital plan.	▪ Renewal and rehabilitation activities may increase asset life less than anticipated resulting in a need for repeated activities or premature asset failure. ▪ Higher lifecycle costs if work is delayed or completed incorrectly.
Replacement and Disposal	Replacement and disposal capital projects are identified by Division staff operating facilities and through discussions with users of facilities. Division staff meet to review and prioritize the capital projects and to ultimately prepare a 10-year capital plan.	▪ Delay in replacement and disposal projects may result in significantly higher costs, longer service disruptions, liability concerns, and user dissatisfaction.
Growth-Related and Service Enhancements Lifecycle Needs	The City undertakes Parks, Recreation, and Culture Master Plans to identify future capital needs resulting from growth.	▪ Delay or cancellation of growth-related activities causing the service to be unable to sufficiently accommodate growth. ▪ Master plans may over or underestimate the required expansions to accommodate the impacts of growth.
Non-Infrastructure	Inspections and master plans.	▪ Rate of asset deterioration is over or underestimated.
Identification of Short-Term Priorities	Capital projects are undertaken to address deficiencies identified by the staff involved in operating facilities.	▪ Decrease in service performance, higher lifecycle costs, and funding may not be prioritized in a way that ensures the best value for money option is picked to maintain the level of service.

11.6 Forecasted Capital Requirements

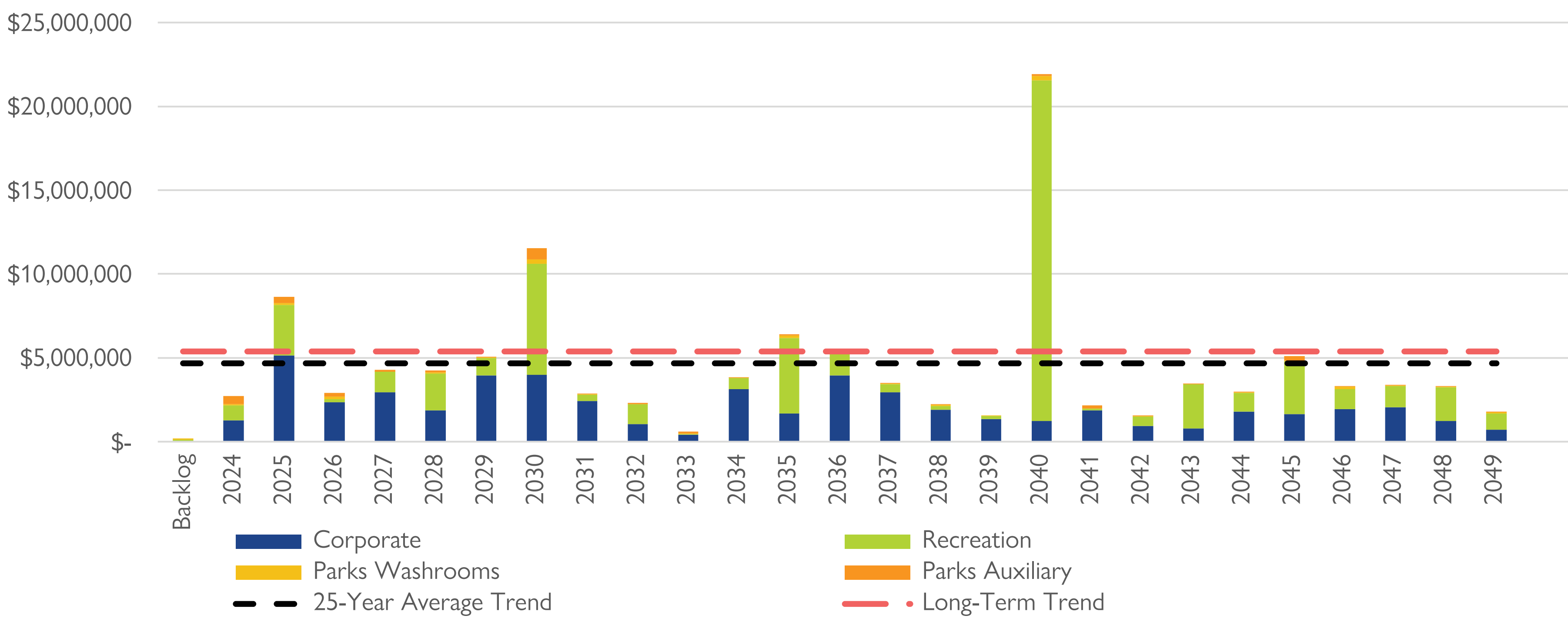
The City continuously invests in maintaining its assets and has been increasing budget amounts to align with asset needs. Until proposed levels of service are defined in the next revision of this asset management plan for July 1, 2025, there is no requirement to modify this funding arrangement.

The annual capital requirement represents the average cost per year that the City is estimated to require to allocate towards funding asset needs. Based on the available data at the time of this plan, more information is required for this calculation. A more complete asset inventory would result in capturing more assets and more accurate lifecycle costs. When more assets are added to the portfolio, the average annual funding need would also increase and be better representative of the actual spending required to manage the City's assets.

Based on the best available current information, to maintain the current level of service and lifecycle management strategy, the annual sustainable capital funding requirement for existing facilities' assets is estimated to be $5,381,653.

The 2024 capital budget funding allocation was $16,234,000. This means that there exists a funding surplus of $10,852,347. The following figure illustrates a 25-year forecast of the annual capital asset needs for facilities' assets, including the cost and asset lifecycle impacts of completing renewal and rehabilitation activities.

FIGURE 95: **Facilities – Annual Capital Requirement – 25-Year Forecast**

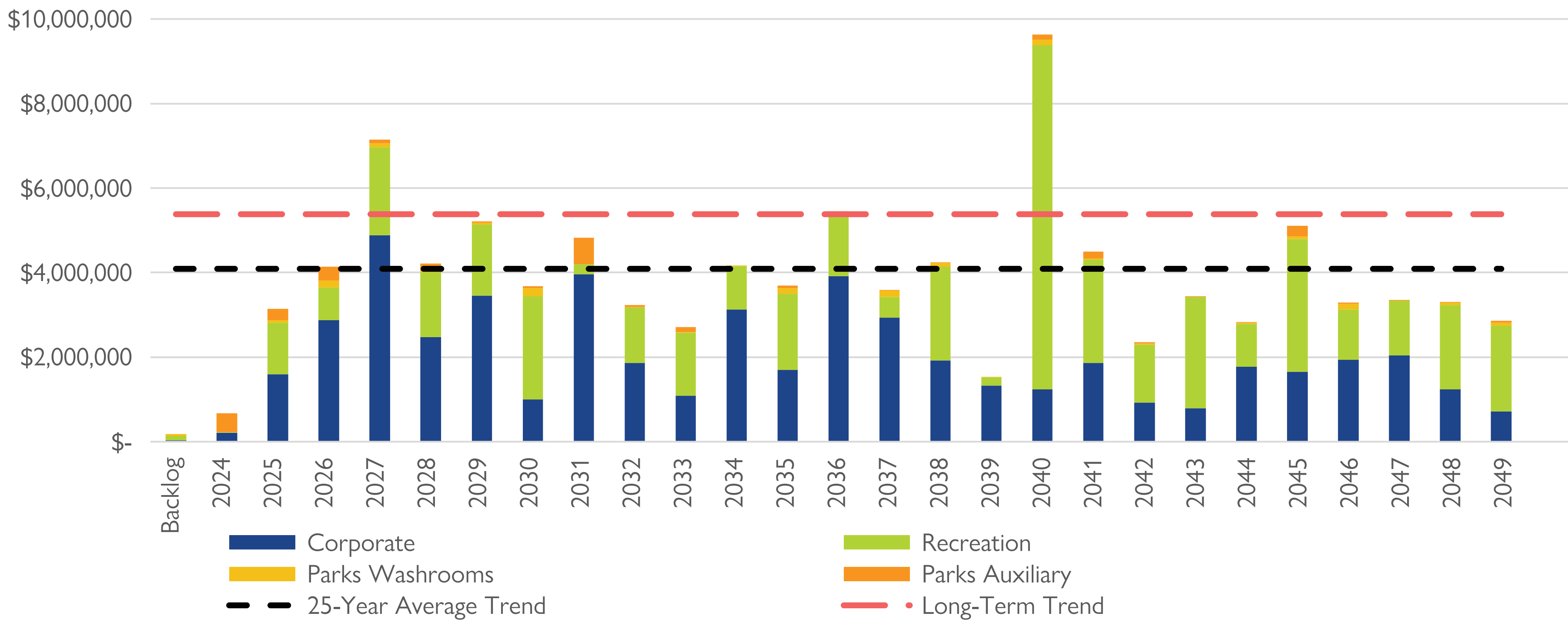


This forecast was developed as part of the comprehensive corporate facility condition assessments done in 2023 and is a modified approach compared to the 50-year forecast used for other asset categories. Due to a lot of equipment not being currently captured in the inventory, a 25-year annual requirement trend of $4,673,652 is undercounting the total asset needs over the forecast period. Some facilities' assets have an estimated useful life of up to 170 years, and as a result, a 25-year forecast period may also not account for major asset replacements in the long-term. The long-term trend of $5,381,653 in annual asset needs is a more comprehensive estimate of the long-term capital lifecycle costs.

However, the more detailed 25-year forecast that is based on recent and accurate condition assessments remains a very important and useful measure. To maintain the current level of service and estimate the costs of changing service levels, accurate short-term and medium-term forecasts are necessary. The City updates its 10-year capital plan each year during the budget process. The budget process requires the detailed short and medium-term asset need forecasts to ensure the projects selected provide the City with the best value for money. The City also aims to group projects together for cost efficiencies where possible by aligning the timing of different projects.

The following figure illustrates an example of a revised 25-year forecast of the annual capital needs where the timing of needs has been adjusted to take advantage of cost efficiencies, changes in the lifecycle management strategy scope, or smooth out some spikes.

FIGURE 96: **Facilities – Annual Capital Requirement – Adjusted 25-Year Forecast**



Due to historical inconsistency in the timing of the various assets coming into service, a sawtooth pattern is present where in some years the total annual requirement is lower than average followed by an uncommon spike that reaches well above the long-term average. The City's asset management program aims to smooth out this behaviour in favour of a more consistent amount of annual spending.

A small backlog of $180,000 exists for facilities' assets that are beyond their service life or are in a failed condition state requiring replacement or decommissioning. These assets are primarily related to plumbing, HVAC, or electrical services.

For further details on capital requirements, please see the Financial Summary portion of this plan that details the funding needs for all categories of assets over the next 10 years, including discussion of impacts from growth.

11.7 Climate Change and Other Risks

The following table summarizes key trends, challenges, and risks that the City is currently facing in delivering the desired level of service.

TABLE 74: **Facilities – Climate Change and Other Risks**

Trend, Challenge, or Risk	Summary
Climate Change and Extreme Weather Events	It is anticipated that there will be many challenges in managing the impacts of climate change, including: ▪ Potential increased damage to facility structures during extreme weather events. ▪ Increased uncertainty on the impact of higher intensity, frequency, and duration of rainfall events that can make it difficult to right-size stormwater management infrastructure for the future. ▪ Increased uncertainty in impacts of extreme weather events and what is the most cost-effective resiliency strategy or group of strategies. ▪ Additional discussion of challenges can be found in the City's Climate Change Action Plan report. The City is considering the following adaptation and mitigation measures in response to the challenges: ▪ The City is aiming to reach its Net-Zero targets by following three Big Moves: Local Renewable Energy, Transportation, and Buildings as detailed in the City's Climate Change Action Plan report. ▪ Update disaster management practices to ensure continuity of critical services during extreme weather events. ▪ Incorporate new best practices and technology in the design, procurement, and maintenance of assets to increase resiliency while managing affordability.
Lifecycle Management Strategies	The adoption of a work order management system tied to the asset management inventory system will provide an improved connection between asset maintenance programs and service delivery outcomes.

11.8 Recommendations and Improvement Plan

Asset Inventory

- Continue to review and refine the asset inventory to improve scope, accuracy, and update estimated useful life values.
- Expand the asset inventory to include all significant equipment assets.

Condition

- Consider setting a fixed condition assessment schedule to assess asset condition at regular intervals.
- Explore industry best practices and new technologies to develop a better condition assessment strategy for the variety of facilities' assets.

Lifecycle Management Strategies

- Evaluate the efficacy of the City's lifecycle management strategies at regular intervals to determine the impact of cost, condition, and risk.
- Integrate maintenance and operations work order data into the tracking of individual assets.
- Develop more detailed preventative maintenance strategies and programs to maintain the current level of service.
- Consider if facilities could be managed more efficiently if building management systems were consistent between facilities.
- Consider developing a facility security rating scoring system to identify and manage security concerns.

Levels of Service

- Continue to measure current levels of service in accordance with the metrics identified in Ontario Regulation 588/17 and the additional metrics included by the City.
- Identify proposed levels of service per Ontario Regulation 588/17 requirements and identify the strategies that are required to close any gaps between the current and proposed levels of service.

12.0
Solid Waste

12.0 Solid Waste

The City maintains a Waste Diversion Site to ensure the efficient management of solid waste materials. Activities at the Waste Diversion Site include landfilling, open air windrow composting, operation of the household hazardous waste depot, and operation of various other depots for divertible materials. Additionally, the City manages the closed Kitchener Park Landfill site. Solid waste is the sixth-largest category of assets at a total replacement cost of $103,403,962 in 2023 dollars.

12.1 Asset Inventory and Replacement Cost

At the active Waste Diversion Site, the City manages eight active landfill cells, two alternate cover plates, four capped landfill cells, one composting pad with an associated swale and two pumps to dewater the swale through a forcemain, roadways, fences, two structures, one weighscale, three roll-off bins, and 56 monitoring wells. At the Kitchener Park site, the City manages a gas barrier and venting system, 12 gas probes, and 16 monitoring wells. Fleet assets used at the Waste Diversion Site are captured in the Fleet and Transit chapter of this plan.

The replacement cost is estimated using primarily historic construction costs with consideration of standardized costing indices. Included in the cost of replacing each asset is a set of components that together comprise a typical asset. The full set of components for each sub-segment is identified in Appendix 19.2.8.

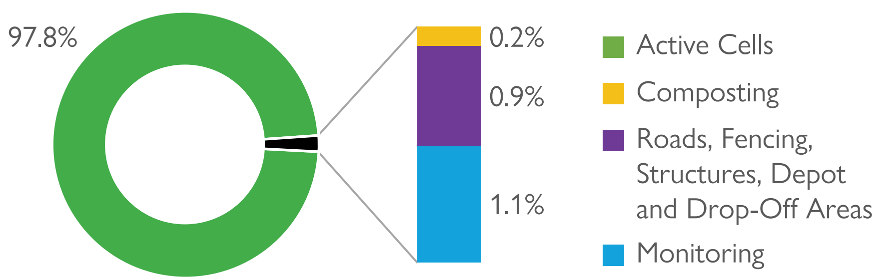
The following table includes the quantity, replacement cost method, and total replacement cost in 2023 dollars of each sub-segment of assets in the City's solid waste inventory.

TABLE 75: **Solid Waste – Inventory and Replacement Cost**

Asset Sub-Segment	Quantity	Replacement Cost Method	Replacement Cost	Percentage of Total Replacement Cost
Active Cells	8 active cells 2 alternate cover plates	Cost/Unit	$101,140,620	97.8%
Cell Final Caps	4 capped cells	Cost/Unit	$0	0.0%
Composting	1 pad with swale, pumps, and forcemain	Cost/Unit	$184,000	0.2%
Roads, Fencing, Structures, Depot and Drop Off Areas	11,578 m^2 of internal roadway 0.720 lane km perimeter roadway 1,500 m of perimeter fence 2 reuse depot structures 1 weighscale 3 roll-off steel bins	Asset-Specific Cost Estimation and Cost/Unit	$959,342	0.9%
Monitoring	72 wells 12 gas probes 1 gas barrier and venting system	Cost/Unit	$1,120,000	1.1%

The following figure provides the data in the previous table visually with each sub-segment as a percentage of the total replacement cost. Almost all the value of the City's solid waste assets are the eight active cells with landfilling capacity remaining. Due to the small relative total value of all other solid waste assets, an additional diagram is provided for clarity. The capped cells are omitted due to their $0 replacement value since capped cells are not replaced. Capped cells are instead monitored after capping.

FIGURE 97: Solid Waste – Total Replacement Cost



12.2 Asset Age and Estimated Useful Life

The estimated useful life of solid waste assets is determined using a combination of staff knowledge, historical data, and industry standards. The average service life remaining is determined by the difference between the average estimated useful life and the average age, except when an asset has been assigned an assessed condition rating that may increase or decrease the average service life remaining.

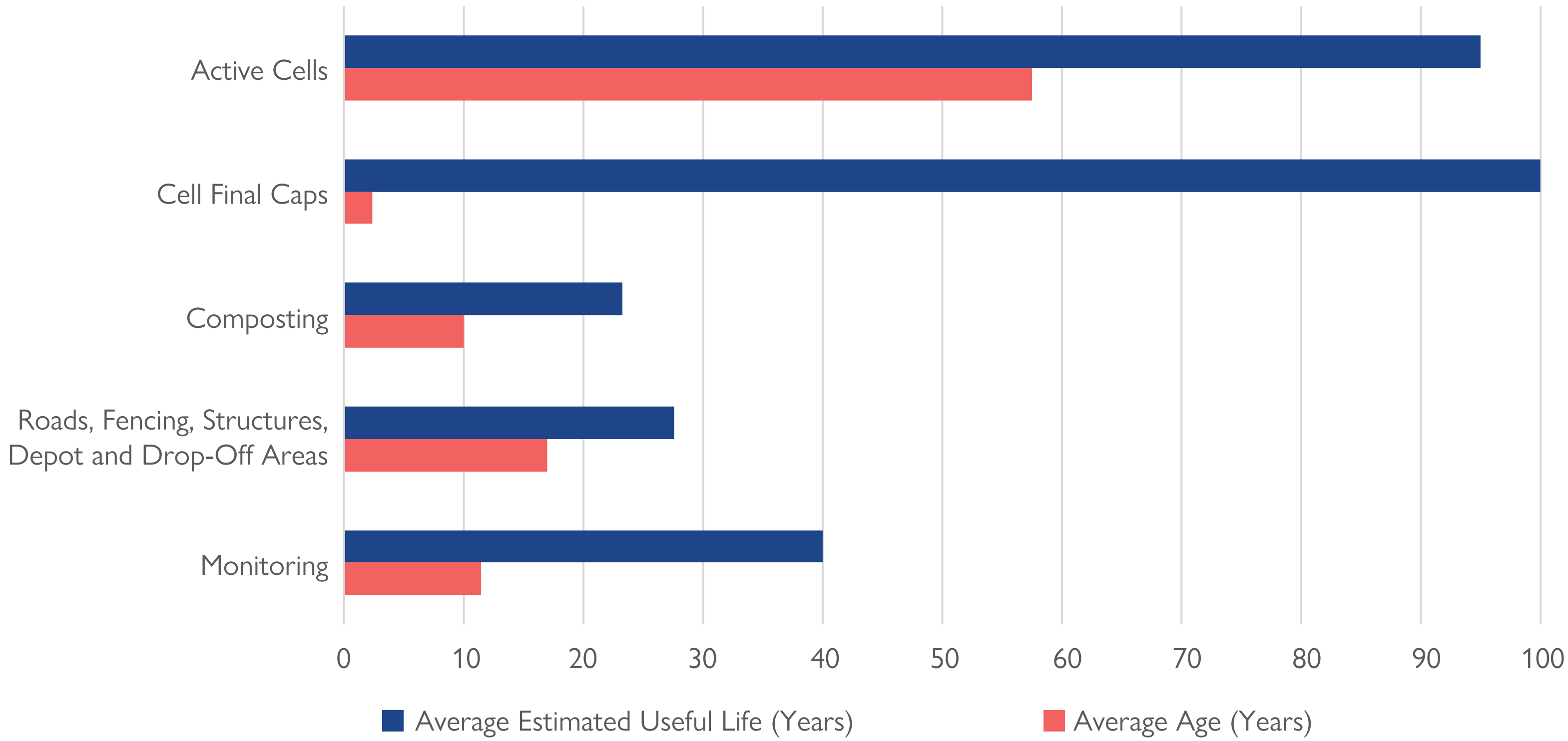
The following table summarizes the average age of each sub-segment based on the number of years that the assets have been in service.

TABLE 76: Solid Waste – Average Age and Estimated Useful Life

Asset Sub-Segment	Average Estimated Useful Life (Years)	Average Age (Years)	Average Service Life Remaining (Years)	Percentage of Average Service Life Remaining
Active Cells	95.0	57.5	37.5	39%
Cell Final Caps	100.0	2.4	97.6	98%
Composting	23.3	10.0	13.3	57%
Roads, Fencing, Structures, Depot and Drop-Off Areas	27.6	17.0	10.6	39%
Monitoring	40.0	11.5	28.5	71%

The age of an asset gives an indication of how close it is to the end of its estimated useful life and what lifecycle management strategies may be required. The following figure displays average asset age alongside the estimated useful life for each asset sub-segment.

FIGURE 98: Solid Waste – Average Age and Estimated Useful Life



Average asset ages have not exceeded the average estimated useful life for any sub-segments.

12.3 Condition

The following sections and tables outline the condition breakdown for each sub-segment of assets and the City's methods for assessing asset condition. Where available and feasible, the City follows industry-standard best practices and generally accepted good engineering practices in the approach to assessing asset condition. When condition assessments are unavailable, an age-based condition rating is used based on the relative age of the asset compared to its estimated useful life.

The following table summarizes the variety of techniques used to assess the condition of the solid waste assets on a regular frequency.

TABLE 77: **Solid Waste – Approach to Assessing Condition**

Asset Sub-Segment	Condition Data Collection Techniques	Frequency of Data Collection	Year of Last Assessment
Cells	Condition assessments by staff and subject matter experts.	Every 1-5 years.	2023
Cell Final Caps	Condition assessments by staff and subject matter experts.	Every 1-5 years.	2023
Composting	Condition assessments by staff and subject matter experts.	Every 1-5 years.	2023
Roads, Fencing, Structures, Depot and Drop-Off Areas	Condition assessments by staff and subject matter experts.	Every 1-5 years.	2023
Monitoring	Condition assessments by staff and subject matter experts.	Every 1-5 years.	2023

The following table provides a summary of the condition rating systems for all sub-segments of solid waste assets. Based on the condition data and information provided by subject matter experts, the condition of assets is rated on a scale from Very Good to Very Poor.

TABLE 78: Solid Waste – Condition Rating Scales

Rating	Rating Description	All Solid Waste Assets (Five-Point Scale)
Very Good	Fit for Future	1 ≥ and ≥ 0
Good	Adequate for Now	2 ≥ and > 1
Fair	Requires Attention	3 ≥ and > 2
Poor	Increasing Potential of Affecting Service	4 ≥ and > 3
Very Poor	Unfit for Sustained Service	5 ≥ and > 4

The following figure illustrates the breakdown of condition ratings of the City's solid waste assets. 98.9% of these assets are in Very Good to Good condition with 0.004% rated as Poor and none rated as Very Poor.

FIGURE 99: Solid Waste – Condition Rating Summary

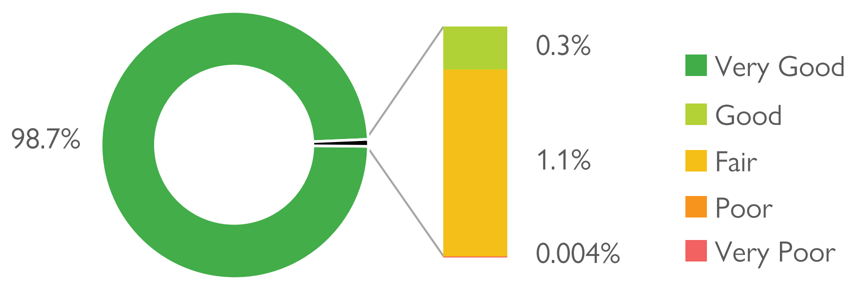
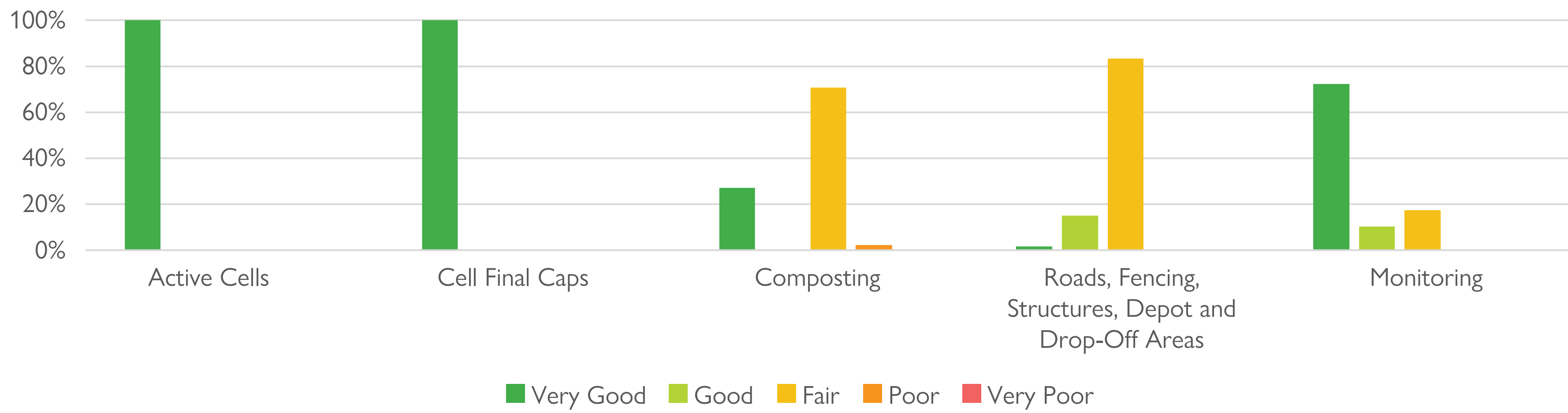


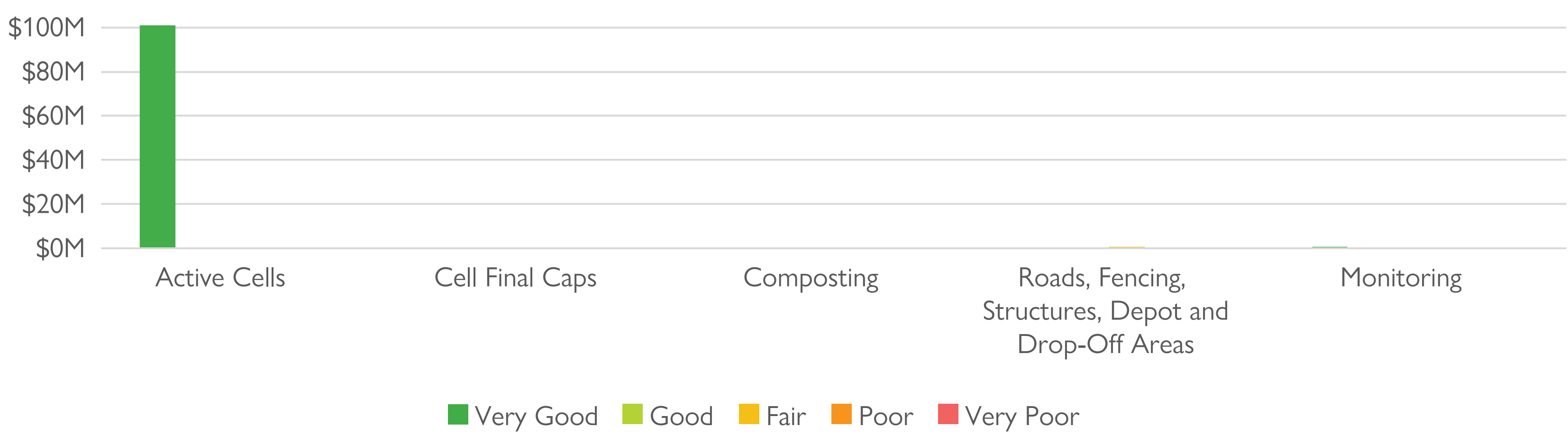
FIGURE 100: **Solid Waste – Breakdown of Condition Rating – Percentage of Cost**



The previous figure illustrates the breakdown of condition ratings for all solid waste assets in terms of the percentage of total replacement cost. A key point is that due to the differences in methodology for calculating condition between sub-segments, direct comparisons between sub-segments may not be consistent depending on which sub-segments are compared.

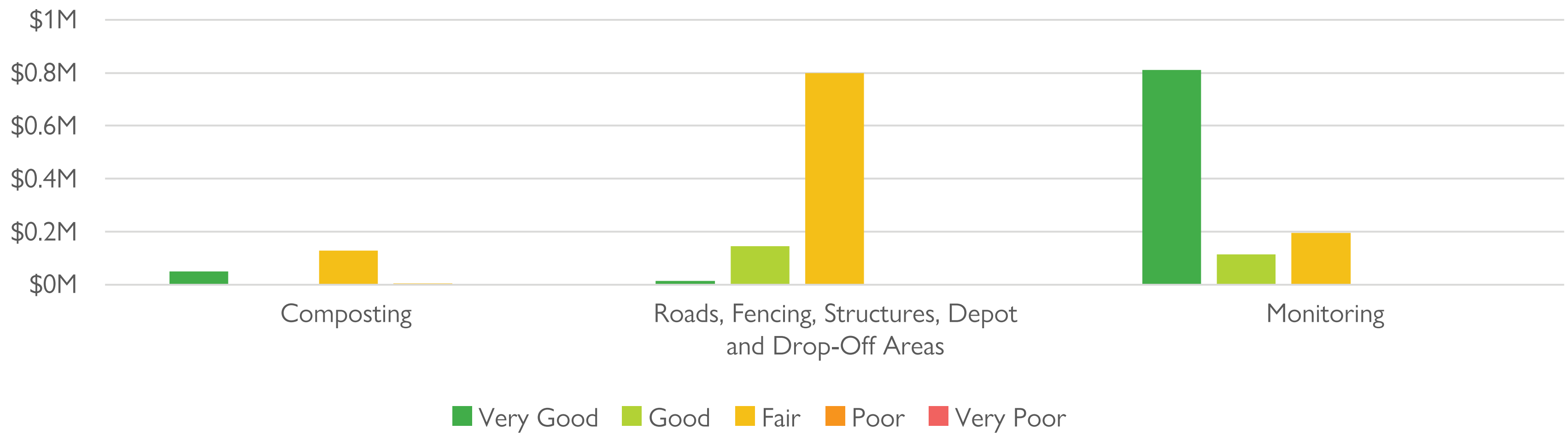
The following figure illustrates the same breakdown but in terms of the total replacement cost rather than the percentage of total replacement cost for each sub-segment. This illustrates the large cost implications of the landfill cells compared to the much smaller value of the other sub-segments.

FIGURE 101: **Solid Waste – Breakdown of Condition Rating – Cost**



Due to the very large difference in replacement costs, the other sub-segments are not visible. The following figure excludes the landfill cells to allow for better visibility of the other sub-segments. The capped cells are omitted due to their $0 replacement value.

FIGURE 102: **Solid Waste – Breakdown of Condition Rating – Cost – Excluding Cells and Cell Final Caps**

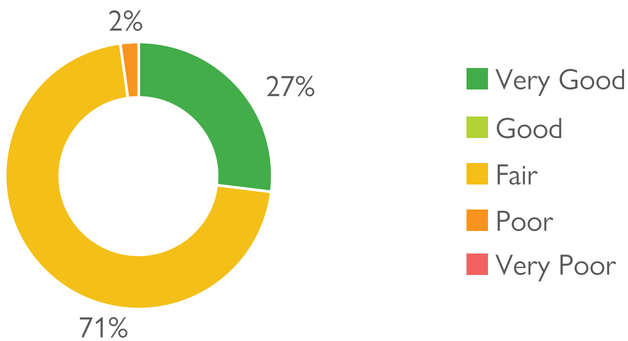


The overall average condition of solid waste assets is Very Good, largely due to the outsized impact of the value of the cells. Excluding the cells, the overage average condition of the other solid waste assets is Good. Assets are maintained by using the best treatment option to manage the current condition and anticipated future deterioration of the asset. More information is found in the lifecycle management strategy details in Section 12.5. The following sections will present the condition information for each sub-segment or group of sub-segments of assets in more detail, except for the cells and capped cells as they are all in Very Good condition.

12.3.1 Composting

The following figure provides a breakdown of asset condition for composting assets.

FIGURE 103: **Solid Waste – Breakdown of Condition Rating – Composting**



Every year, a visual inspection of the composting assets is undertaken by subject matter experts. This results in a condition rating score from 1 to 5 for each asset that corresponds to a rating between Very Good to Very Poor. The most recent inspections were completed in 2023.

27% of the City's composting assets are in Very Good or Good condition with no assets rated as Very Poor. This indicates that most of the composting assets are midlife. With 2% of composting assets in Poor or Very Poor condition, the data indicates that there is some near-term investment needed in addition to long-term investments required to continue the management of deficiencies.

12.3.2 Roads, Fencing, Structures, Depot and Drop-Off Areas

The following figures provide a breakdown of asset condition for roads, fencing, structures, depot and drop-off areas assets and each group of assets.

FIGURE 104: **Solid Waste – Breakdown of Condition Rating – Roads, Fencing, Structures, Depot and Drop-Off Areas**

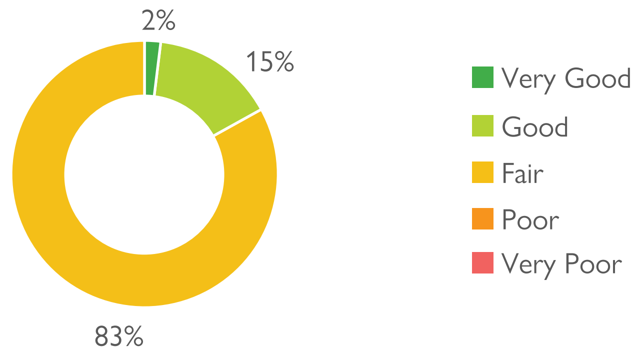


FIGURE 105: **Solid Waste – Breakdown of Condition Rating – Roads and Fencing**

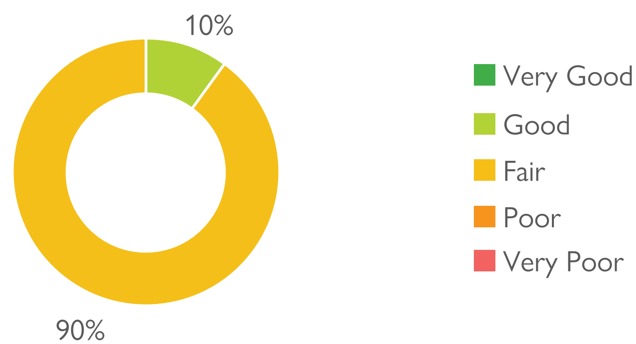


FIGURE 106: Solid Waste – Breakdown of Condition Rating – Structures

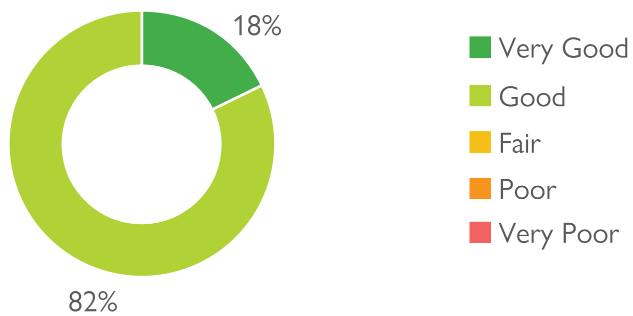
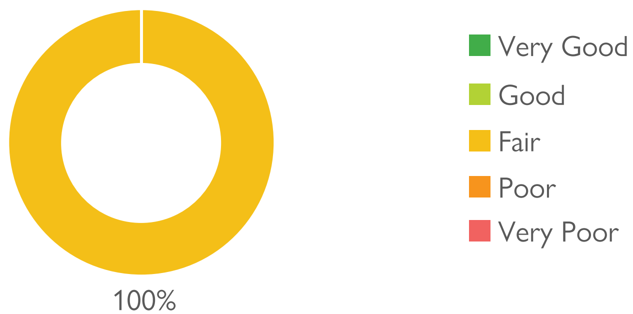


FIGURE 107: Solid Waste – Breakdown of Condition Rating – Depot and Drop-Off Areas



Every year, a visual inspection of the roads, fencing, structures, depot and drop-off areas assets is undertaken by subject matter experts. This results in a condition rating score from 1 to 5 for each asset that corresponds to a rating between Very Good to Very Poor. The most recent inspections were completed in 2023.

17% of the City's roads, fencing, structures, depot and drop-off areas assets are in Very Good or Good condition with no assets rated as Very Poor. This indicates that most of these assets are midlife. With none of these assets in Poor or Very Poor condition, the data indicates that overall there is minimal immediate investment needed in addition to the long-term investments required to continue the management of deficiencies.

However, the breakdown of condition ratings varies depending on the group considered. The structures are all in Very Good or Good condition while the large majority or entirety of the other sub-segments are in Fair condition. The investment priority will vary over time in response to the differences in the mix of asset conditions between the different groups.

The following table illustrates the condition ratings defined with respect to a variety of the roads, fencing, structures, depot and drop-off areas assets. Photos for the Poor and Very Poor states are omitted due to no assets within these ratings currently.

TABLE 79: Solid Waste – Condition Rating Descriptions and Photos – Roads, Fencing, Structures, Depot and Drop-Off Areas

Condition State: **Very Good**

Scale: 1 ≥ and ≥ 0

Description: Fit for Future

Condition State: **Good**

Scale: 2 ≥ and > 1

Description: Adequate for Now

Condition State: **Fair**

Scale: 3 ≥ and > 2

Description: Requires Attention

Condition State: **Poor**

Scale: 4 ≥ and > 3

Description: Increasing Potential of Affecting Service

Omitted due to no assets within this rating currently.

Condition State: **Very Poor**

Scale: 5 ≥ and > 4

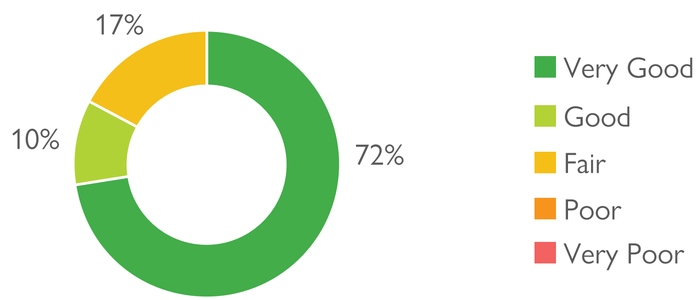
Description: Unfit for Sustained Service

Omitted due to no assets within this rating currently.

12.3.3 Monitoring

The following figure provides a breakdown of asset condition for monitoring assets.

FIGURE 108: **Solid Waste – Breakdown of Condition Rating – Monitoring**



Every year, a visual inspection of the monitoring assets is undertaken by subject matter experts. This results in a condition rating score from 1 to 5 for each asset that corresponds to a rating between Very Good to Very Poor. The most recent inspections were completed in 2023.

82% of the City's monitoring assets are in Very Good or Good condition with no assets rated as Very Poor. This indicates that most of the monitoring assets are newer to midlife and well-maintained. With none of these assets in Poor or Very Poor condition, the data indicates that there is minimal immediate investment needed in addition to the long-term investments required to continue the management of deficiencies.

12.4 Levels of Service and Performance Measures

The City's assets exist to deliver services to its users. Levels of service are a measurement of the actual service provided so that decisions are made based on the nature and quality of that service, rather than only the condition of an asset. These are used to summarize the type of service being provided that reflects the values and desires of stakeholders in the community.

The following tables identify the City's current level of service for the solid waste assets. These metrics include any technical and community level of service metrics that are required to comply with Ontario Regulation 588/17, as well as any additional metrics provided by the City. A future revision to this plan will include proposed levels of service targets for each measure.

12.4.1 Community Levels of Service

The following table identifies the qualitative descriptions that determine the community levels of service provided by the solid waste assets.

TABLE 80: **Solid Waste – Community Levels of Service**

Service Attribute	Community Levels of Service	Related Assets
Efficiency	The City strives to use capacity at landfills efficiently.	Active Cells
Capacity	The City strives to have sufficient capacity to manage compostable waste.	Composting
Reliability	Equipment at the landfill usually operates as intended.	Composting, Roads, Fencing, Structures, Depot and Drop-Off Areas, Monitoring
Quality	The City inspects and maintains the solid waste inventory at a condition level to ensure that it functions as designed.	All

12.4.2 Technical Levels of Service

The following table identifies the quantitative metrics that determine the technical level of service provided by solid waste assets.

TABLE 81: Solid Waste – Technical Levels of Service

Service Attribute	Description of What Performance Measure Captures	Performance Measure	2023 Performance	Target	Related Assets
Efficiency	The rate at which the landfill is being filled.	Tonnes of waste accepted per capita.	Future		Active Cells
Efficiency	Utilization of cover material.	Ratio of tonnes of waste accepted to cover material.	Future		Active Cells
Capacity	Utilization of capacity to process compost waste.	Tonnes of compostable waste processed as a percentage of processing capacity.	Future		Composting
Reliability	Planning of maintenance work.	Number of proactive work orders for landfill equipment repairs as a percentage of the total number of work orders.	Future		Composting, Roads, Fencing, Structures, Depot and Drop-Off Areas, Monitoring
Reliability	Availability of garbage bunkers.	Number of days garbage bunkers are unavailable per bunker.	Future		Depot and Drop-Off Areas
Reliability	Availability of weighscale.	Number of days weighscale is unavailable.	Future		Structures
Reliability	Availability of compost swale pumps.	Number of days swale pumps are unavailable per pump.	Future		Composting
Quality	Condition of the solid waste inventory.	Percentage of solid waste assets in Poor or Very Poor condition.	0.004%		All
Quality	Condition of the solid waste inventory, excluding cells and cell final caps.	Percentage of solid waste assets in Poor or Very Poor condition, excluding cells and cell final caps.	0.2%		Composting, Roads, Fencing, Structures, Depot and Drop-Off Areas, Monitoring

12.5 Lifecycle Management Strategy

It is important to proactively manage asset deterioration through a lifecycle management strategy that balances cost, risk, and the level of service. The following table describes the current lifecycle management activities completed. This table also includes the risks associated with not completing these activities through using a do-nothing approach.

TABLE 82: **Solid Waste – Lifecycle Management Strategy**

Activity Type	Description of Current Strategy	Risks Associated with Not Completing Activities
Operations and Maintenance	Any minor operations and maintenance needs are managed by staff.	▪ Deficiencies are not identified through inspections. ▪ Higher lifecycle costs if maintenance is delayed or completed incorrectly. ▪ Premature asset failure, health and safety risks, and service disruptions.
Renewal and Rehabilitation	Renewal and rehabilitation activities are identified based on industry standards. Division staff are considering using PSD Citywide to formalize planning for lifecycle renewal and rehabilitation activities. Lifecycle planning is guided by the Landfill Progression Plan, which is updated every 10 years.	▪ Renewal and rehabilitation activities may increase asset life less than anticipated, resulting in a need for repeated activities or premature asset failure. ▪ Higher lifecycle costs if work is delayed or completed incorrectly.
Replacement and Disposal	Replacement and disposal lifecycle activities are identified based on industry standards. Division staff are considering using PSD Citywide to formalize planning for lifecycle replacement and disposal activities. Lifecycle planning is guided by the Landfill Progression Plan, which is updated every 10 years.	▪ Delay in replacement and disposal projects may result in significantly higher costs, longer service disruptions, liability concerns, and user dissatisfaction.
Growth-Related and Service Enhancements Lifecycle Needs	A new Waste Disposal Assessment Study (currently underway) will determine long-term capital needs, including how the landfill site is used and what assets are needed to operate them. The new study will also recommend a frequency for future updates to the study (the current update is the first in about 10 years).	▪ Delay or cancellation of growth-related activities causing the service to be unable to sufficiently accommodate growth.
Non-Infrastructure	Inspections and the landfill progression plans.	▪ Rate of asset deterioration is over or underestimated.
Identification of Short-Term Priorities	Short-term priorities for capital projects are identified by the contractor who operates the site. Replacements over $20,000 are considered capital.	▪ Decrease in service performance, higher lifecycle costs, and funding may not be prioritized in a way that ensures the best value for money option is picked to maintain the level of service.

12.6 Forecasted Capital Requirements

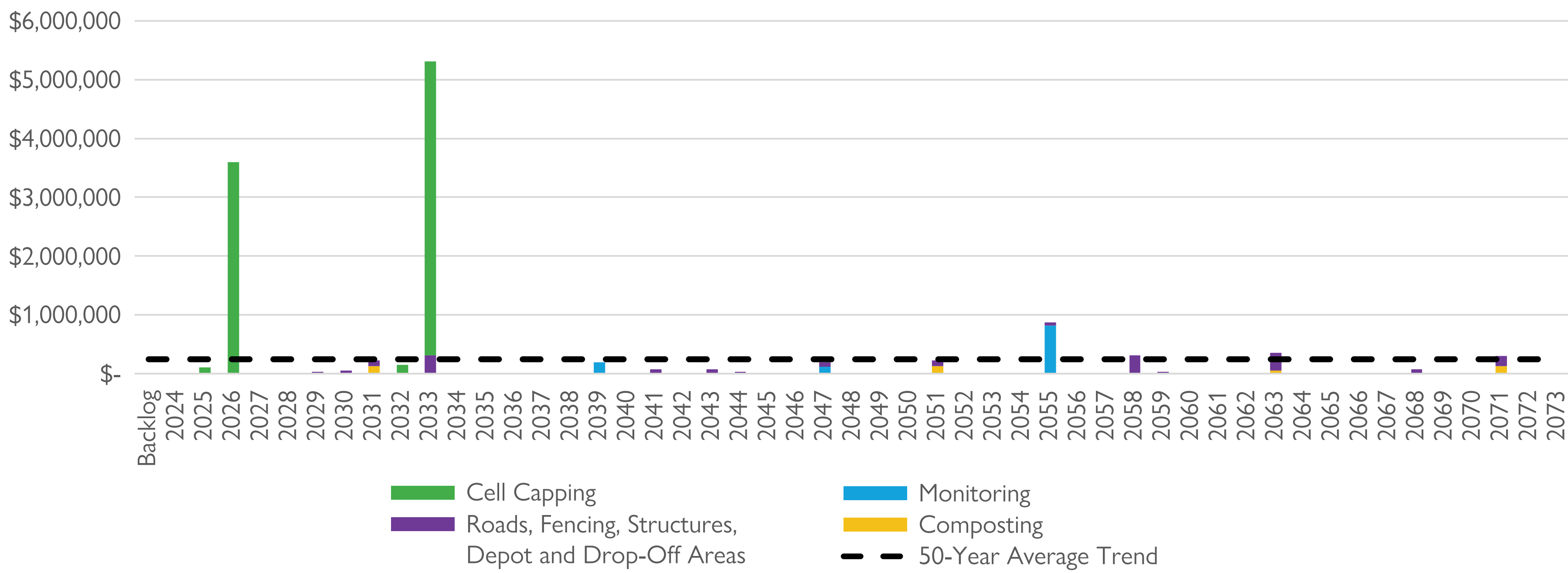
The City continuously invests in maintaining its assets and has been increasing budget amounts to align with asset needs. Until proposed levels of service are defined in the next revision of this asset management plan for July 1, 2025, there is no requirement to modify this funding arrangement.

The annual capital requirement represents the average cost per year that the City is estimated to require to allocate towards funding infrastructure needs. Based on the available data at the time of this plan, more information is required for this calculation. A more complete asset inventory would result in capturing more assets and more accurate lifecycle costs. When more assets are added to the portfolio, the average annual funding need would also increase and be better representative of the actual spending required to manage the City's assets.

Based on the best available current information, to maintain the current level of service and lifecycle management strategy, the annual sustainable capital funding requirement for existing solid waste assets is estimated to be $244,280. This is comprised of $67,280 for current assets plus an additional $177,000 for future capping costs. There is a further additional average of $10,000 per year of maintenance and repair costs not itemized to specific asset sub-segment lifecycle management activities at this time.

The 2024 capital budget funding allocation was $155,000. However, $95,000 of this allocation is for maintenance projects that are not currently captured as lifecycle events in the City's asset management system. To avoid overstating the 2024 budget funding allocation compared to the annual requirement calculated, this plan will consider the $60,000 Household Hazardous Waste Depot Rehab project as the 2024 level of allocated funding. This means that there exists an infrastructure deficit, or funding shortfall, of $7,720 in 2024. The following figure illustrates a 50-year forecast of the annual capital asset needs for solid waste assets, including the cost of capping cells and asset lifecycle impacts of completing renewal and rehabilitation activities.

FIGURE 109: Solid Waste – Annual Capital Requirement – 50-Year Forecast

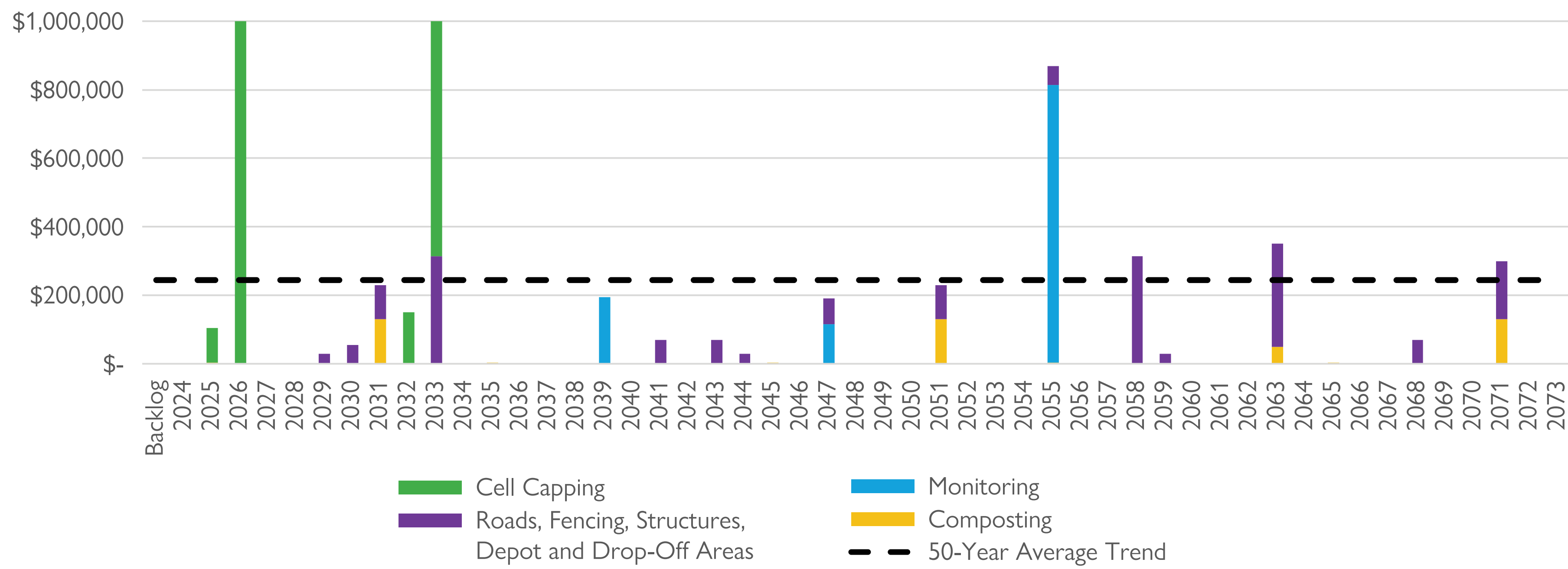


Separate from the annual requirement to support the current assets as part of an active site, the City's landfill closure obligations are captured in this plan. Landfill cells are not disposed of, rather a new landfill cap asset is created during the cell closure process. This process converts an active cell to an inactive capped cell. This cost associated with capping landfill cells in the future is included in this plan. As illustrated in the previous figure, the infrequent cell capping costs are much higher than the other requirements. Due to the very large difference in requirements, the other sub-segments are not easily visible. The following figure cuts off the vertical height at $1,000,000 to allow for better visibility of the other values.

Due to historical inconsistency in the timing of the various assets coming into service, a sawtooth pattern is present where in some years the total annual requirement is zero followed by a spike that reaches near or above the long-term average. The City's asset management program aims to smooth out this behaviour in favour of a more consistent amount of annual spending. As the City approaches all active cells reaching their capacity, the City will consider various options for managing solid waste, including export to an outside waste disposal or processing facility. The cost of establishing a new landfill site is excluded from this plan.

For further details on capital requirements, please see the Financial Summary portion of this plan that details the funding needs for all categories of assets over the next 10 years, including discussion of impacts from growth.

FIGURE 110: Solid Waste – Annual Capital Requirement – 50-Year Forecast – Truncated Axis



12.7 Climate Change and Other Risks

The following table summarizes key trends, challenges, and risks that the City is currently facing in delivering the desired level of service.

TABLE 83: Solid Waste – Climate Change and Other Risks

Trend, Challenge, or Risk	Summary
Climate Change and Extreme Weather Events	It is anticipated that there will be many challenges in managing the impacts of climate change, including: ▪ Potential increased landfill leachate and disruption to composting activities due to more frequent extreme wet weather events. ▪ Increased uncertainty on the impact of higher intensity, frequency, and duration of rainfall events that can make it difficult to right-size infrastructure for the future. ▪ Increased uncertainty in impacts of extreme weather events and what is the most cost-effective resiliency strategy or group of strategies. The City is considering the following adaptation and mitigation measures in response to the challenges: ▪ Incorporate new best practices and technology in the design, construction, and maintenance of assets to increase resiliency while managing affordability. Potential future adaptation and mitigation measures include: ▪ Use of lower embodied carbon materials to minimize the impact of infrastructure.
Lifecycle Management Strategies	The maintenance practices for solid waste assets have historically been reactive. The City wants to implement more preventative and predictive maintenance programs in the future. The adoption of a work order management system tied to the asset management inventory system will provide an improved connection between maintenance programs and service delivery outcomes.
Infrastructure Reinvestment	The reinvestment in infrastructure has been reactive. There have been some moderate shifts to proactive reinvestment in the recent period.

12.8 Recommendations and Improvement Plan

Asset Inventory

- Continue to add asset information to GIS layers for improved staff efficiency.

Condition

- Consider implementing a process to assess the condition of the landfill using how water and wastewater assets are assessed as a starting point (incorporating age, risk of failure, etc.).
- Explore industry best practices and new technologies to develop a better condition assessment strategy for the variety of solid waste assets.

Lifecycle Management Strategies

- Evaluate the efficacy of the City's lifecycle management strategies at regular intervals to determine the impact of cost, condition, and risk.
- Develop more detailed preventative maintenance strategies and programs to maintain the current level of service.
- Consider forecasting the costs of options to meet post landfill closure solid waste needs, potentially including options such as, but not limited to:
  - Cost sharing of regional energy from waste or mixed-waste processing facilities, including haulage costs.
  - Cost of haulage and exporting material to privately managed landfills.

Levels of Service

- Continue to measure current levels of service in accordance with the metrics identified in Ontario Regulation 588/17 and the additional metrics included by the City.
- Identify proposed levels of service per Ontario Regulation 588/17 requirements and identify the strategies that are required to close any gaps between the current and proposed levels of service.

13.0
Parks, Recreation, Culture, and Tourism

13.0 Parks, Recreation, Culture, and Tourism

The City manages parks, recreation, culture, and tourism (PRCT) assets to support the goals of increasing engaging recreation experiences, supporting and enhancing culture, arts, and an active lifestyle, and improving accessibility. PRCT is the seventh-largest category of assets at a total replacement cost of $34,916,750 in 2023 dollars.

13.1 Asset Inventory and Replacement Cost

The City manages 36 parks and parkettes, a trail network, and variety of other amenities including splash pads, athletic fields, baseball diamonds, courts, and off-leash dog zones. Vehicles used by PRCT are excluded from this category since those assets are managed separately through the Fleet service area. Facilities related to PRCT services are also excluded from this category since those assets are managed separately through the Facilities service area. The inventory is up to date as of the end of 2021.

The replacement cost is estimated using the values in the City's 2022 Development Charges Background Study. Included in the cost of replacing each asset is a set of components that together comprise a typical asset. The full set of components for each sub-segment is identified in Appendix 19.2.9.

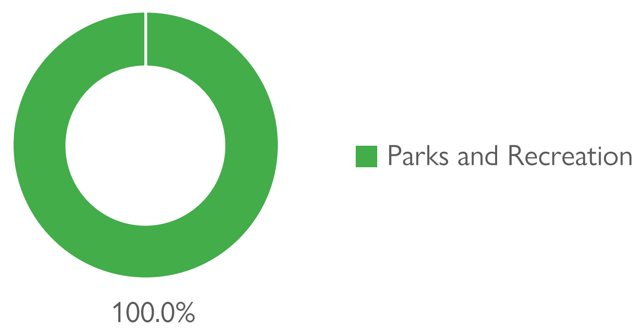
The following table includes the quantity, replacement cost method, and total replacement cost in 2023 dollars of each sub-segment of assets in the City's PRCT asset inventory.

TABLE 84: Parks, Recreation, Culture, and Tourism – Inventory and Replacement Cost

Asset Sub-Segment	Quantity	Replacement Cost Method	Replacement Cost	Percentage of Total Replacement Cost
Parks and Recreation	36 parks or parkettes and amenities 34 km of trails	Asset-Specific Cost Estimation and Cost/ Unit	$34,916,750	100%

The following figure provides the data in the previous table visually with each sub-segment as a percentage of the total replacement cost.

FIGURE 111: **Parks, Recreation, Culture, and Tourism – Total Replacement Cost**



13.2 Asset Age and Estimated Useful Life

The estimated useful life of PRCT assets is determined using a combination of staff knowledge, historical data, and industry standards. The average service life remaining is determined by the difference between the average estimated useful life and the average age, except when an asset has been assigned an assessed condition rating that may increase or decrease the average service life remaining.

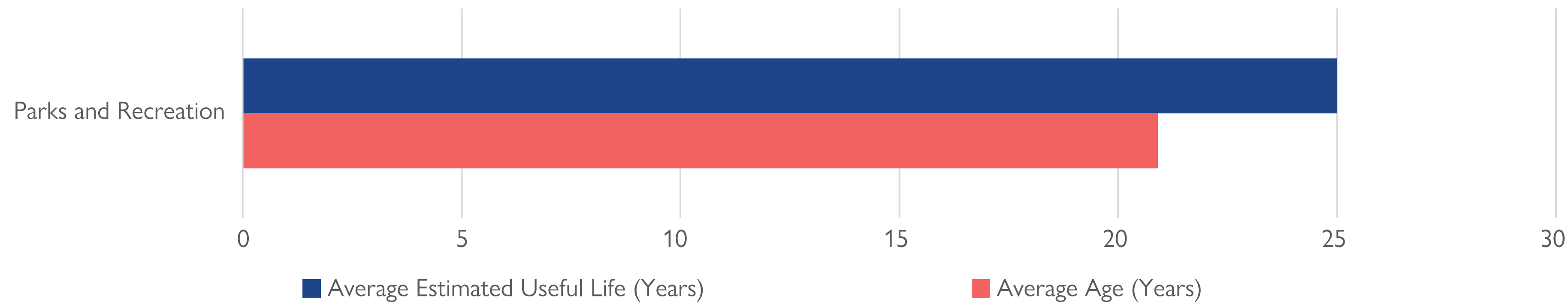
The following table summarizes the average age of each sub-segment based on the number of years that the assets have been in service. Due to poor historical data on Parks and Recreation assets in-service dates, the average age and service life remaining are low-confidence estimations.

TABLE 85: **Parks, Recreation, Culture, and Tourism – Average Age and Estimated Useful Life**

Asset Sub-Segment	Average Estimated Useful Life (Years)	Average Age (Years)	Average Service Life Remaining (Years)	Percentage of Average Service Life Remaining
Parks and Recreation	25.0	20.9	4.1	16%

The age of an asset gives an indication of how close it is to the end of its estimated useful life and what lifecycle management strategies may be required. The following figure displays average asset age alongside the estimated useful life for each asset sub-segment.

FIGURE 112: Parks, Recreation, Culture, and Tourism – Average Age and Estimated Useful Life



Average asset ages have not exceeded the average estimated useful life for any sub-segment. Further improvements are required to the asset inventory to ensure that the estimated useful life assigned to assets is reflective of the true length of time that assets are typically in service.

13.3 Condition

The following sections and tables outline the condition breakdown for PRCT assets and the City's methods for assessing asset condition. Where available and feasible, the City follows industry-standard best practices and generally accepted good engineering practices in the approach to assessing asset condition. When condition assessments are unavailable, an age-based condition rating is used based on the relative age of the asset compared to its estimated useful life.

The following table summarizes the variety of techniques used to assess the condition of the PRCT assets on a regular frequency.

TABLE 86: **Parks, Recreation, Culture, and Tourism – Approach to Assessing Condition**

Asset Sub-Segment	Condition Data Collection Techniques	Frequency of Data Collection	Year of Last Assessment
Parks and Recreation	Condition assessments by subject matter experts and staff.	During Master Plans.	2014

Routine inspections are completed for several specific types of assets to identify issues that need to be resolved. The types of inspections and their frequencies are listed below:

- Fitness equipment (e.g. cardio and selectorized machines, etc.) are inspected quarterly by a third party.
- Aquatic equipment is inspected visually daily for safety issues and more comprehensively inspected monthly.
- Some larger assets at recreation centres (e.g. rock wall, Tarzan rope, moveable floors, etc.) are inspected annually by a third party.
- Every park is visited by City staff at least every two weeks. Larger parks may have staff on-site daily during peak seasons.
- Playgrounds are inspected monthly in accordance with CSA standards.
- Courts (e.g. basketball, tennis, etc.) are inspected weekly.
- Ice rinks are inspected daily when operating.
- Park furniture is inspected regularly during park patrols.
- Trails are inspected at least once per month, excluding trails in Scout Valley.
- Trees are inspected annually by a staff arborist, except for trees in wood lots.
- Lighting at parks is inspected quarterly.
- Joint Health and Safety inspections of staff work areas are completed monthly.

The City has an Excel-based complaints tracker for parks that is used by front desk staff to document complaints (it is also used for roads, stormwater, water, and wastewater). The City is working to create a single complaints tracking system using the work order module in PSD Citywide software that will be used by all departments.

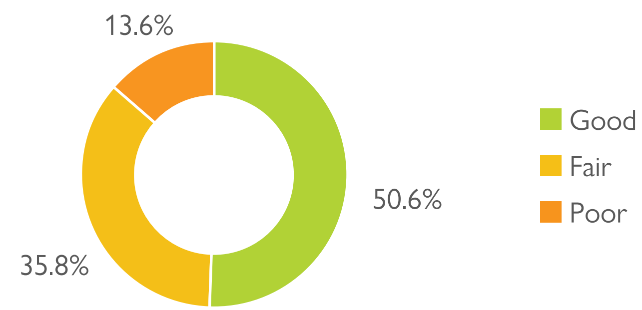
The following table provides a summary of the condition rating systems for all sub-segments of PRCT assets. Based on the condition data and information provided by subject matter experts, the condition of assets is rated on a scale from Good to Poor.

TABLE 87: **Parks, Recreation, Culture, and Tourism – Condition Rating Scales**

Rating	Rating Description	Parks and Recreation (Three-Point Scale)
Good	Good	1
Fair	Fair	2
Poor	Poor	3

The following figure illustrates the breakdown of condition ratings of the City's PRCT assets. 50.6% of these assets are in Good condition with the with a significant proportion, 13.6%, rated as Poor.

FIGURE 113: **Parks, Recreation, Culture, and Tourism – Condition Rating Summary**



The overall average condition of PRCT assets is Fair. Assets are maintained by using the best treatment option to manage the current condition and anticipated future deterioration of the asset. More information is found in the lifecycle management strategy details in Section 13.5.

Since there is only one sub-segment of PRCT assets included in this plan, further breakdowns of the condition ratings are excluded for PRCT assets.

13.4 Levels of Service and Performance Measures

The City's assets exist to deliver services to its users. Levels of service are a measurement of the actual service provided so that decisions are made based on the nature and quality of that service, rather than only the condition of an asset. These are used to summarize the type of service being provided that reflects the values and desires of stakeholders in the community.

The following tables identify the City's current level of service for the PRCT assets. These metrics include any technical and community level of service metrics that are required to comply with Ontario Regulation 588/17, as well as any additional metrics provided by the City. A future revision to this plan will include proposed levels of service targets for each measure.

13.4.1 Community Levels of Service

The following table identifies the qualitative descriptions that determine the community levels of service provided by the PRCT assets.

TABLE 88: Parks, Recreation, Culture, and Tourism – Community Levels of Service

Service Attribute	Community Levels of Service	Related Assets
Proximity	The City strives to incorporate parks and greenspace into residential neighbourhoods.	All
Availability	The City's parks and park amenities are typically available for use with low to moderate congestion and waiting times.	All
Accessibility	The City strives to ensure that parks and park amenities can be used by everyone.	All
Quality	The City inspects and maintains the PRCT inventory at a condition level to ensure that it functions as designed.	All

13.4.2 Technical Levels of Service

The following table identifies the quantitative metrics that determine the technical level of service provided by PRCT assets. Some of the performance measures will be calculated as part of the next Parks, Recreation, Culture and Trails Master Plan update project and will be included in a future revision of this plan.

TABLE 89: **Parks, Recreation, Culture, and Tourism – Technical Levels of Service**

Service Attribute	Description of What Performance Measure Captures	Performance Measure	2023 Performance	Target	Related Assets
Proximity	Availability of parks within walking distance from residential properties.	Percentage of residentially zoned properties within the service radius of a park using the smallest service radius (400 m).	Future		All
Proximity	Availability of off-leash dog areas within walking distance from residential properties.	Percentage of residentially zoned properties within the service radius of a park with an off-leash dog area using the smallest service radius (400 m).	Future		All
Availability	Availability of parks for active use.	Hectares of parkland developed for active use per 1,000 residents.	Future		All
Availability	Availability of greenspace area.	Hectares of naturalized parkland (no regular maintenance or fertilizer) per 1,000 residents.	Future		All
Availability	Availability of parking at community parks.	Number of parking spots at community parks per 1,000 residents.	Future		All
Accessibility	Availability of accessible park amenities.	Number of AODA-compliant park amenities as a percentage of the total number of park amenities.	Future		All
Quality	City is following planned lifecycle for park amenities.	Replacement cost of park amenities that are within their design life as a percentage of total replacement cost of all park amenities.	Future		All
Quality	Condition of the PRCT inventory.	Percentage of PRTC assets in Poor condition.	13.6%		All
Quality	Paved versus unpaved parking lots.	Area of park parking lots that are paved as a percentage of the area of all parking lots.	Future		All
Quality	Paved versus unpaved trails.	For trails (excluding natural trails and snowmobile trails), the length of paved sections as a percentage of the length of all sections.	Future		All

13.5 Lifecycle Management Strategy

It is important to proactively manage asset deterioration through a lifecycle management strategy that balances cost, risk, and the level of service. The following table describes the current lifecycle management activities completed. This table also includes the risks associated with not completing these activities through using a do-nothing approach.

TABLE 90: **Parks, Recreation, Culture, and Tourism – Lifecycle Management Strategy**

Activity Type	Description of Current Strategy	Risks Associated with Not Completing Activities
Operations and Maintenance	The City takes a proactive approach to managing its parks and recreation assets through a variety of operations and maintenance programs. The operations and maintenance programs are tailored to each park or facility and include activities such as: ▪ Component replacement, painting, and repair/cleaning of furniture, signs, playgrounds, swings, docks, walkways, courts, etc. on an as-needed basis based on inspection results. ▪ Crack sealing and cleaning of asphalt and concrete surfaces and courts as needed. ▪ Daily brooming and flooding of ice rinks. ▪ A third party manages larger recreational assets in recreation centres (e.g. rock wall, tarzan rope, moveable floor, etc.). ▪ Flushing and winterization of irrigation systems annually. ▪ Monitoring for and removal of invasive species, and monitoring and spraying of poison ivy. ▪ Collaborating with community partners to remove invasive phragmites (reeds). ▪ Aeration and fertilization of playing fields twice annually and turf annually. ▪ Clearing of snow from pathways, trails, and driving surfaces daily and as needed during precipitation events. ▪ Gravel parking lots graded twice a year and as needed. ▪ Management of debris left behind in encampments in parks and removal of garbage and debris left on trails. ▪ Garbage and recycling collection is done daily in the summer and twice a week in the winter. In addition to the proactive operations and maintenance activities identified above, staff respond to complaints as needed. The City plans to use the work order module in the PSD Citywide software to manage these activities in the future.	▪ Deficiencies are not identified through inspections. ▪ Higher lifecycle costs if maintenance is delayed or completed incorrectly. ▪ Premature asset failure, health and safety risks, and service disruptions.

Activity Type	Description of Current Strategy	Risks Associated with Not Completing Activities
Renewal and Rehabilitation	The major capital lifecycle activities for parks and recreation assets include replacement, rehabilitation, renewal, and significant upgrades. The timing of capital lifecycle activities is based on date of purchase, expected useful life (from Master Plans), and information on prior repairs completed. This data is tracked for all equipment in an asset tracker in Microsoft Teams. The City maintains a 10-year replacement plan for larger assets to ensure sufficient funding is available. A description of the major capital lifecycle activities specific to each asset category is provided below. ▪ When playground equipment reaches the end of its useful life, it is replaced with equipment that meets current design standards and accessibility requirements. ▪ Trails are resurfaced on an as-needed basis to maintain quality and safety. Resurfacings typically involve removing the surface material, regrading the trail base, and placement of a new surface. ▪ Replacement of other parks assets (e.g. furniture, lighting, trees, signage, plaques, shoreline protection, parking lots, etc.) is done on an as-needed basis, based on the asset condition, accessibility, and safety considerations. Replacements are typically like-for-like unless adjustments in design are needed to address accessibility concerns or other requirements. ▪ Where feasible, multiple park projects are bundled into single contracts to improve cost efficiency and to reduce the length of the service disruption to the public. ▪ Responding to community demand and new trends in recreation (e.g. disc golf, pickleball).	▪ Renewal and rehabilitation activities may increase asset life less than anticipated, resulting in a need for repeated activities or premature asset failure. ▪ Higher lifecycle costs if work is delayed or completed incorrectly.
Replacement and Disposal	Same as Renewal and Rehabilitation.	▪ Delay in replacement and disposal projects may result in significantly higher costs, longer service disruptions, liability concerns, and user dissatisfaction.
Growth-Related and Service Enhancements Lifecycle Needs	Population growth, urban design and active transportation factors are considered when planning new parks and trails. Other factors considered include: ▪ Emerging Needs: Adaptability to emerging trends, community preferences, and technological advancements help identify evolving needs. ▪ Community Input: Input from staff and the community is actively sought to understand concerns. ▪ External Assessments: Periodic external assessments and expert opinions, if available, inform the decision-making process.	▪ Delay or cancellation of growth-related activities causing the service to be unable to sufficiently accommodate growth. ▪ Master plans may over or underestimate the required expansions to accommodate the impacts of growth.
Non-Infrastructure	Inspections and master plans.	▪ Rate of asset deterioration is over or underestimated.

Activity Type	Description of Current Strategy	Risks Associated with Not Completing Activities
Identification of Short-Term Priorities	Any findings during inspections that impact usage, safety, or compliance with regulations are addressed promptly. Any issues identified are sent via email to staff supervisors. If an issue with an asset cannot be immediately addressed and it is not fit for use, it will be taken out of service until the issue is addressed.	▪ Decrease in service performance, higher lifecycle costs, and funding may not be prioritized in a way that ensures the best value for money option is picked to maintain the level of service.

13.6 Forecasted Capital Requirements

The City continuously invests in maintaining its assets and has been increasing budget amounts to align with asset needs. Until proposed levels of service are defined in the next revision of this plan for July 1, 2025, there is no requirement to modify this funding arrangement.

The annual capital requirement represents the average cost per year that the City is estimated to require to allocate towards funding asset needs. Based on the available data at the time of this plan, more information is required for this calculation. A more complete asset inventory would result in capturing more assets and more accurate lifecycle costs. When more assets are added to the portfolio, the average annual funding need would also increase and be better representative of the actual spending required to manage the City's assets.

Based on the best available current information, to maintain the current level of service and lifecycle management strategy, the annual sustainable capital funding requirement for existing PRCT assets is estimated to be $1,396,670.

The 2024 capital budget funding allocation was $1,302,000. This means that there exists a funding deficit, or funding shortfall, of $94,670 in 2024. The following figure illustrates a 50-year forecast of the annual capital asset needs for PRCT, including the cost and asset lifecycle impacts of completing renewal and rehabilitation activities.

Due to low confidence in the in-service date of many parks and recreation assets, this plan assumes a constant spending requirement. The constant spending amount is aligned with a long-term average annual requirement calculated from the average estimated useful life and total replacement cost.

For further details on capital requirements, please see the Financial Summary portion of this plan that details the funding needs for all categories of assets over the next 10 years, including discussion of impacts from growth.

FIGURE 114: Parks, Recreation, Culture, and Tourism – Annual Capital Requirement – 50-Year Forecast

13.7 Climate Change and Other Risks

The following table summarizes key trends, challenges, and risks that the City is currently facing in delivering the desired level of service.

TABLE 91: Parks, Recreation, Culture, and Tourism – Climate Change and Other Risks

Trend, Challenge, or Risk	Summary
Climate Change and Extreme Weather Events	It is anticipated that there may be some challenges in managing the impacts of climate change, including: ▪ Potential increased damage to outdoors park amenities during more frequent severe wind and wet weather events. ▪ Potential increased demand and reliance on PRCT assets for shade and cooling during extreme heat events. ▪ Increased uncertainty in impacts of extreme weather events and what is the most cost-effective resiliency strategy or group of strategies. The City is considering the following adaptation and mitigation measures in response to the challenges: ▪ Incorporate new best practices and technology in the design, construction, and maintenance of assets to increase resiliency while managing affordability.

13.8 Recommendations and Improvement Plan

Asset Inventory

- Continue to review and refine the asset inventory to improve scope, accuracy, and update estimated useful life values.
- Expand the asset inventory to include assets in related service areas, and include fitness and non-park recreation assets.

Condition

- Align parks and recreation condition rating system with the Very Good to Very Poor system used for all other asset categories.
- Consider a more frequent condition assessment schedule to assess asset condition between master plans.
- Explore industry best practices and new technologies to develop a better condition assessment strategy for the variety of PRCT assets.
- Continue to integrate the City's asset management inventory with the information available in the PRCT service area service request and work order processes.

Levels of Service

- Continue to measure current levels of service in accordance with the metrics identified in Ontario Regulation 588/17 and the additional metrics included by the City.
- Identify proposed levels of service per Ontario Regulation 588/17 requirements and identify the strategies that are required to close any gaps between the current and proposed levels of service.

14.0

Municipal Law Enforcement and Parking

14.0 Municipal Law Enforcement and Parking

The City maintains municipal law enforcement (MLE) and parking assets to support the enforcement of municipal by-laws and manage the network of parking locations and equipment. MLE and parking is the eleventh-largest category of assets at a total replacement cost of $4,403,690 in 2023 dollars.

14.1 Asset Inventory and Replacement Cost

The City manages eight City-owned parking lots, 15 active and five inactive or spare parts pay-and-display terminals, and 778 components of parking meters. Parking lots managed but not owned by the City and MLE personal equipment are excluded from the scope of this plan, except for discussions of levels of service and the annual cost for leased parking lots. Vehicles used by MLE are excluded from this category since those assets are managed separately through the Fleet service area. The inventory is up to date as of the end of 2023.

The replacement cost is estimated using primarily historic construction and procurement costs. Included in the cost of replacing each asset is a set of components that together comprise a typical asset. The full set of components for each sub-segment is identified in Appendix 19.2.10.

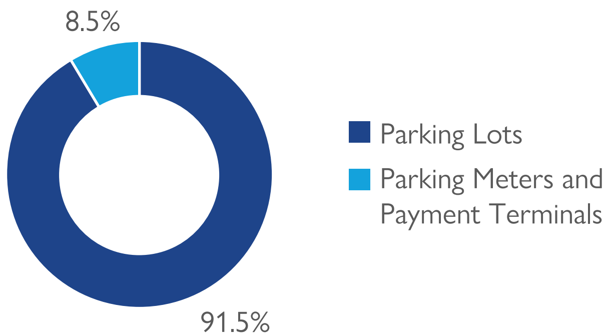
The following table includes the quantity, replacement cost method, and total replacement cost in 2023 dollars of each sub-segment of assets in the City's MLE and parking asset inventory.

TABLE 92: **Municipal Law Enforcement and Parking – Inventory and Replacement Cost**

Asset Sub-Segment	Quantity	Replacement Cost Method	Replacement Cost	Percentage of Total Replacement Cost
Parking Lots	8 parking lots	Cost/Unit	$4,028,000	91.5%
Parking Meters and Payment Terminals	319 Mech Units 226 Yokes 103 Housings 130 Posts and Foundations 15 active and 5 inactive pay-and-display terminals	Cost/Unit	$375,690	8.5%

The following figure provides the data in the previous table visually with each sub-segment as a percentage of the total replacement cost.

FIGURE 115: Municipal Law Enforcement and Parking – Total Replacement Cost



14.2 Asset Age and Estimated Useful Life

The estimated useful life of MLE and parking assets is determined using a combination of staff knowledge, historical data, and industry standards. The average service life remaining is determined by the difference between the average estimated useful life and the average age, except when an asset has been assigned an assessed condition rating that may increase or decrease the average service life remaining.

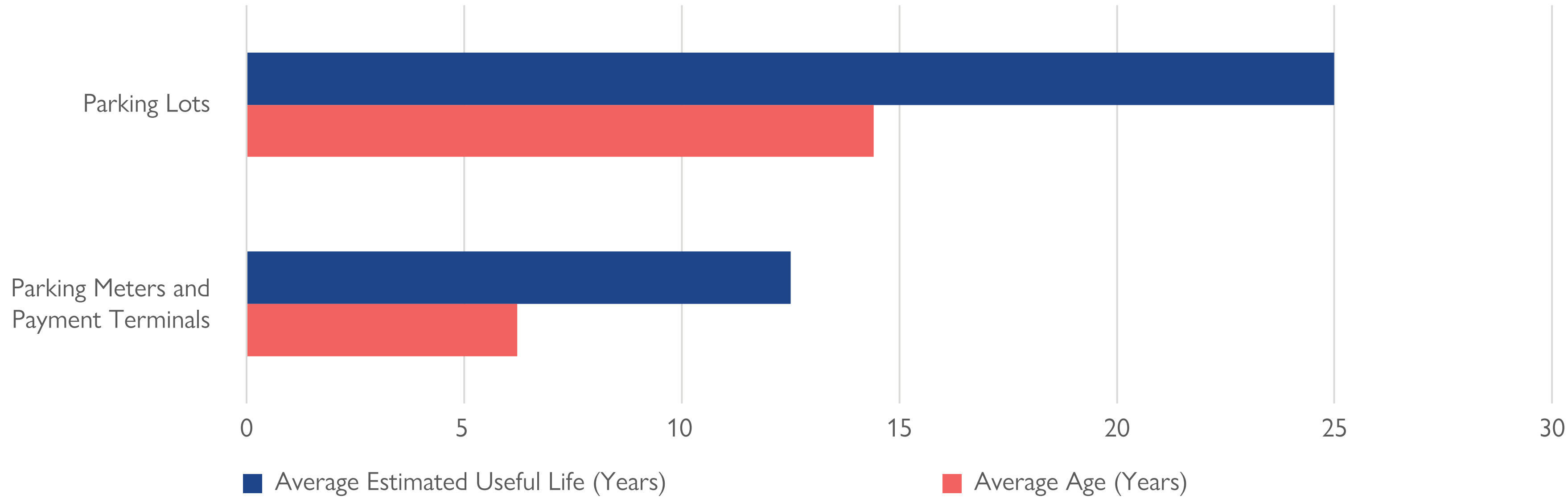
The following table summarizes the average age of each sub-segment based on the number of years that the assets have been in service.

TABLE 93: Municipal Law Enforcement and Parking – Average Age and Estimated Useful Life

Asset Sub-Segment	Average Estimated Useful Life (Years)	Average Age (Years)	Average Service Life Remaining (Years)	Percentage of Average Service Life Remaining
Parking Lots	25.0	14.4	10.6	42%
Parking Meters and Payment Terminals	12.5	6.2	6.3	50%

The age of an asset gives an indication of how close it is to the end of its estimated useful life and what lifecycle management strategies may be required. The following figure displays average asset age alongside the estimated useful life for each asset sub-segment.

FIGURE 116: **Municipal Law Enforcement and Parking – Average Age and Estimated Useful Life**



Average asset ages have not exceeded the average estimated useful life for any sub-segment. Further improvements are required to the asset inventory to ensure that the estimated useful life assigned to assets is reflective of the true length of time that assets are typically in service.

14.3 Condition

The following sections and tables outline the condition breakdown for MLE and parking assets and the City's methods for assessing asset condition. Where available and feasible, the City follows industry-standard best practices and generally accepted good engineering practices in the approach to assessing asset condition. When condition assessments are unavailable, an age-based condition rating is used based on the relative age of the asset compared to its estimated useful life.

The following table summarizes the variety of techniques used to assess the condition of the MLE and parking assets on a regular frequency.

TABLE 94: Municipal Law Enforcement and Parking – Approach to Assessing Condition

Asset Sub-Segment	Condition Data Collection Techniques	Frequency of Data Collection	Year of Last Assessment
Parking Lots	Age-based and visual inspections by staff on an as-needed basis.	Every year and varies.	2023
Parking Meters and Payment Terminals	Age-based and visual inspections by staff on an as-needed basis.	Every year and varies.	2023

Parking lots are inspected annually (painted lines and asphalt surface) to identify defects that need to be addressed. However, the results of the inspections are not formalized into the condition rating system. Instead, an age-based estimate of condition is used.

The following table provides a summary of the condition rating systems for all sub-segments of MLE and parking assets. Based on the condition data and information provided by subject matter experts, the condition of assets is rated on a scale from Very Good to Very Poor.

TABLE 95: **Municipal Law Enforcement and Parking – Condition Rating Scales**

Rating	Rating Description	All MLE and Parking Assets (Five-Point Scale)
Very Good	Fit for Future	1.8 ≥ and ≥ 1
Good	Adequate for Now	2.6 ≥ and > 1.8
Fair	Requires Attention	3.4 ≥ and > 2.6
Poor	Increasing Potential of Affecting Service	4.2 ≥ and > 3.4
Very Poor	Unfit for Sustained Service	5.0 ≥ and > 4.2

The following figure illustrates the breakdown of condition ratings of the City's MLE and parking assets. 24.1% of these assets are in Very Good to Good condition with a large proportion, 18.6%, rated as Very Poor.

FIGURE 117: **Municipal Law Enforcement and Parking – Condition Rating Summary**

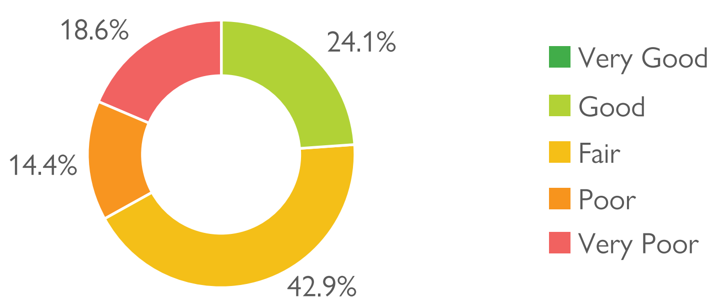
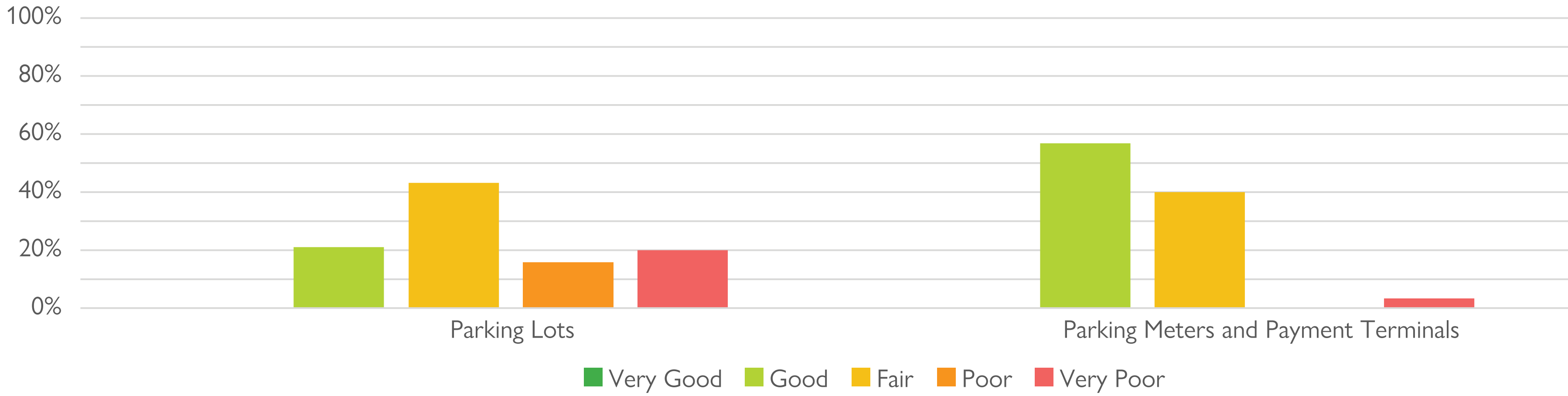


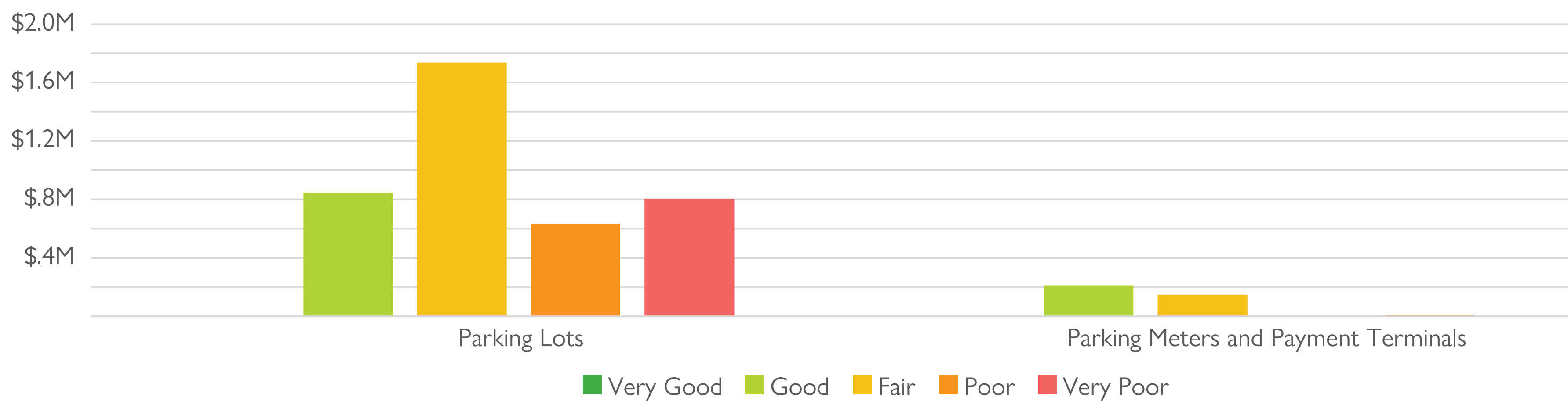
FIGURE 118: Municipal Law Enforcement and Parking – Breakdown of Condition Rating – Percentage of Cost



The previous figure illustrates the breakdown of condition ratings for all MLE and parking assets in terms of the percentage of total replacement cost. A key point is that due to the differences in methodology for calculating condition between sub-segments, direct comparisons between sub-segments may not be consistent depending on which sub-segments are compared.

The following figure illustrates the same breakdown but in terms of the total replacement cost rather than the percentage of total replacement cost for each sub-segment.

FIGURE 119: Municipal Law Enforcement and Parking – Breakdown of Condition Rating – Cost



The overall average condition of MLE and parking assets is Fair. Assets are maintained by using the best treatment option to manage the current condition and anticipated future deterioration of the asset. More information is found in the lifecycle management strategy details in Section 14.5. Due to the use of primarily an age-based condition rating, this plan omits sections presenting the fully detailed condition information for each sub-segment or group of sub-segments of assets.

14.4 Levels of Service and Performance Measures

The City's assets exist to deliver services to its users. Levels of service are a measurement of the actual service provided so that decisions are made based on the nature and quality of that service, rather than only the condition of an asset. These are used to summarize the type of service being provided that reflects the values and desires of stakeholders in the community.

The following tables identify the City's current level of service for the MLE and parking assets. These metrics include any technical and community level of service metrics that are required to comply with Ontario Regulation 588/17, as well as any additional metrics provided by the City. A future revision to this plan will include proposed levels of service targets for each measure.

14.4.1 Community Levels of Service

The following table identifies the qualitative descriptions that determine the community levels of service provided by the MLE and parking assets.

TABLE 96: **Municipal Law Enforcement and Parking – Community Levels of Service**

Service Attribute	Community Levels of Service	Related Assets
Capacity	The City ensures that parking spots are generally available where and when motorists want them.	Parking Lots
Accessibility	The City strives to ensure that everyone has access to parking options that meet their needs.	Parking Lots
Quality	The City inspects and maintains the MLE and parking inventory at a condition level to ensure that it functions as designed.	All

14.4.2 Technical Levels of Service

The following table identifies the quantitative metrics that determine the technical level of service provided by MLE and parking assets.

TABLE 97: Municipal Law Enforcement and Parking – Technical Levels of Service

Service Attribute	Description of What Performance Measure Captures	Performance Measure	2023 Performance	Target	Related Assets
Capacity	Availability of parking.	Number of City-owned parking spaces per 1,000 residents.	15.3		Parking Lots
Capacity	Availability of parking.	Number of leased parking spaces per 1,000 residents.	11.7		N/A
Accessibility	Availability of accessible parking spaces.	Number of accessible City-owned parking spaces as a percentage of the total number of City-owned parking spaces.	5.0%		Parking Lots
Accessibility	Availability of accessible parking spaces.	Number of accessible leased parking spaces as a percentage of the total number of leased parking spaces.	1.4%		N/A
Quality	Condition of the MLE and parking inventory.	Percentage of MLE and parking assets in Poor or Very Poor condition.	33.0%		All

14.5 Lifecycle Management Strategy

It is important to proactively manage asset deterioration through a lifecycle management strategy that balances cost, risk, and the level of service.

The following table describes the current lifecycle management activities completed. This table also includes the risks associated with not completing these activities through using a do-nothing approach.

TABLE 98: **Municipal Law Enforcement and Parking – Lifecycle Management Strategy**

Activity Type	Description of Current Strategy	Risks Associated with Not Completing Activities
Operations and Maintenance	The City maintains an inventory of replacement and spare parts for the parking meters and pay-and-display machines to perform repairs on an as-needed basis.	▪ Deficiencies are not identified through inspections. ▪ Higher lifecycle costs if maintenance is delayed or completed incorrectly. ▪ Premature asset failure, health and safety risks, and service disruptions.
Renewal and Rehabilitation	The City maintains a 10-year capital plan for renewing or rehabilitating parking meters and pay-and-display machines. The City aims to resurface parking lots on average every 25 years.	▪ Renewal and rehabilitation activities may increase asset life less than anticipated, resulting in a need for repeated activities or premature asset failure. ▪ Higher lifecycle costs if work is delayed or completed incorrectly.
Replacement and Disposal	The City maintains a 10-year capital plan for replacing parking meters and pay-and-display machines. There is currently no formalized plan for redeveloping parking lots. The City aims to replace parking lots through redevelopment every 50 years.	▪ Delay in replacement and disposal projects may result in significantly higher costs, longer service disruptions, liability concerns, delays to emergency response times, and user dissatisfaction.
Growth-Related and Service Enhancements Lifecycle Needs	The City performs parking studies to determine if there is sufficient parking capacity.	▪ Delay or cancellation of growth-related activities causing the service to be unable to sufficiently accommodate growth. ▪ Studies may over or underestimate the required expansions to accommodate the impacts of growth.
Non-Infrastructure	Inspections and parking studies.	▪ Rate of asset deterioration is over or underestimated.
Identification of Short-Term Priorities	Parking lots are redeveloped if it is determined that the asphalt surface has deteriorated to a point where further rehabilitation of the surface is not cost effective.	▪ Decrease in service performance, higher lifecycle costs, and funding may not be prioritized in a way that ensures the best value for money option is picked to maintain the level of service.

14.6 Forecasted Capital Requirements

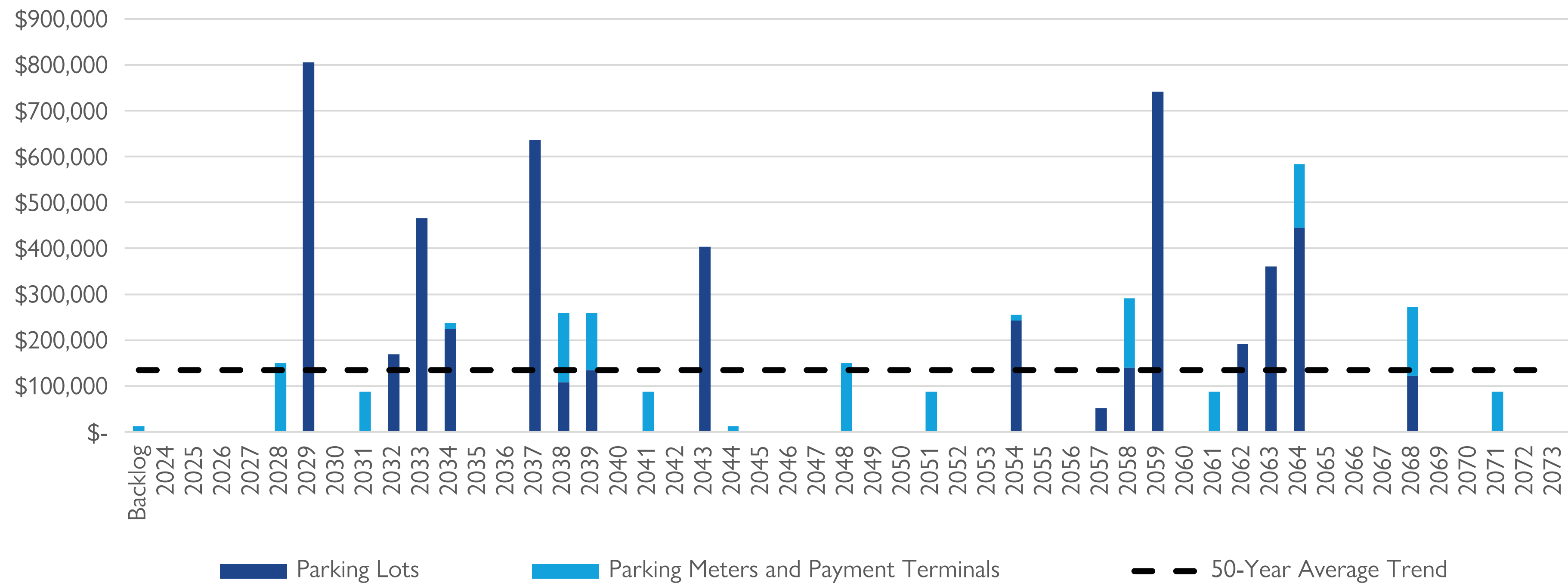
The City continuously invests in maintaining its assets and has been increasing budget amounts to align with asset needs. Until proposed levels of service are defined in the next revision of this plan for July 1, 2025, there is no requirement to modify this funding arrangement.

The annual capital requirement represents the average cost per year that the City is estimated to require to allocate towards funding asset needs. Based on the available data at the time of this plan, more information is required for this calculation. A more complete asset inventory would result in capturing more assets and more accurate lifecycle costs. When more assets are added to the portfolio, the average annual funding need would also increase and be better representative of the actual spending required to manage the City's assets.

Based on the best available current information, to maintain the current level of service and lifecycle management strategy, the annual sustainable capital funding requirement for existing MLE and parking assets is estimated to be $134,671.

The 2024 capital budget funding allocation was $0. This means that there exists a funding deficit, or funding shortfall, of $134,671 in 2024. To provide more parking than the capacity of the City-owned lots, the City also leases lots at an operating cost of $59,304 per year. If the leasing of lots was stopped, a large new capital expenditure would be required in addition to the $134,671 per year to maintain the current level of service. The following figure illustrates a 50-year forecast of the annual capital asset needs for MLE and parking assets, including the cost and asset lifecycle impacts of completing renewal and rehabilitation activities.

FIGURE 120: Municipal Law Enforcement and Parking – Annual Capital Requirement – 50-Year Forecast



Due to historical inconsistency in the timing of the various assets coming into service, a sawtooth pattern is present where in some years the total annual requirement is low followed by a spike that reaches well above the long-term average. The City's asset management program aims to smooth out this behaviour in favour of a more consistent amount of annual spending. However, due to the nature of the lifecycle of MLE and parking assets, it is anticipated that spending will have to remain less consistent over time to match the lifecycle management strategy needs of the assets.

The City has a backlog of $12,500. However, the assets comprising the backlog are inactive pay-and-display terminals that are spare terminals or used for parts for the active terminals. These inactive terminals do not require immediate replacement to maintain the current level of service.

For further details on capital requirements, please see the Financial Summary portion of this plan that details the funding needs for all categories of assets over the next 10 years, including discussion of impacts from growth.

14.7 Climate Change and Other Risks

The following table summarizes key trends, challenges, and risks that the City is currently facing in delivering the desired level of service.

TABLE 99: **Municipal Law Enforcement and Parking – Climate Change and Other Risks**

Trend, Challenge, or Risk	Summary
Climate Change and Extreme Weather Events	It is anticipated that there may be some challenges in managing the impacts of climate change, including: ▪ Potential increased damage to exterior mounted parking meters and pay-and-display terminals during more frequent severe wind events. ▪ Increased uncertainty in impacts of extreme weather events and what is the most cost-effective resiliency strategy or group of strategies. The City is considering the following adaptation and mitigation measures in response to the challenges: ▪ Incorporate new best practices and technology in the design, construction, and maintenance of assets to increase resiliency while managing affordability.

14.8 Recommendations and Improvement Plan

Asset Inventory

- Continue to review and refine the asset inventory to improve scope, accuracy, and update estimated useful life values.

Lifecycle Management Strategies

- Consider developing a long-term plan for eventual replacement or redevelopment of parking lots.

Levels of Service

- Continue to measure current levels of service in accordance with the metrics identified in Ontario Regulation 588/17 and the additional metrics included by the City.
- Identify proposed levels of service per Ontario Regulation 588/17 requirements and identify the strategies that are required to close any gaps between the current and proposed levels of service.

15.0
Information Technology

15.0 Information Technology

The City maintains a collection of information technology (IT) assets to deliver reliable and efficient software and hardware support, management of business applications, digital corporate services, business intelligence services, security, and training. IT also manages the City's corporate networking and telecommunications systems. IT is the smallest category of assets at a total replacement cost of $857,849 in 2023 dollars.

15.1 Asset Inventory and Replacement Cost

The City manages 123 networking assets, 35 server assets, 21 City-owned printers, 30 TEAMS phones, and 252 bundles of workstation assets. The inventory is up to date as of the end of February 2024. Software, audiovisual equipment managed by the Facilities service area, and leased printers are excluded from the scope of the IT inventory. The City is transitioning to leasing a portion of its printers as a portion of the existing printer inventory reaches the end of its useful life. Also excluded from the scope of the IT inventory are the specialty emergency response system used by Fire Services and the specialty monitoring systems used in the Water and Wastewater service areas.

The replacement cost is estimated using primarily historic purchase costs. Included in the cost of replacing each asset is a set of components that together comprise a typical asset. The full set of components for each sub-segment is identified in Appendix 19.2.11.

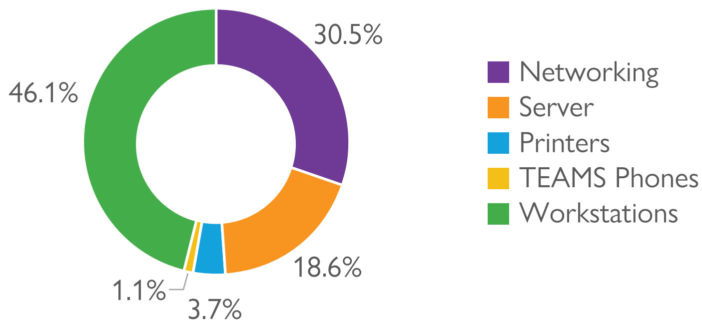
The following table includes the quantity, replacement cost method, and total replacement cost in 2023 dollars of each sub-segment of assets in the City's IT asset inventory.

TABLE 100: Information Technology – Inventory and Replacement Cost

Asset Sub-Segment	Quantity	Replacement Cost Method	Replacement Cost	Percentage of Total Replacement Cost
Networking	123	Asset-Specific Cost Estimation	$261,243	30.5%
Server	35	Asset-Specific Cost Estimation	$159,924	18.6%
Printers	21	Asset-Specific Cost Estimation	$31,817	3.7%
TEAMS Phones	30	Asset-Specific Cost Estimation	$9,050	1.1%
Workstations	252	Asset-Specific Cost Estimation	$395,815	46.1%

The following figure provides the data in the previous table visually with each sub-segment as a percentage of the total replacement cost.

FIGURE 121: **Information Technology – Total Replacement Cost**



15.2 Asset Age and Estimated Useful Life

The estimated useful life of IT assets is determined using a combination of staff knowledge, historical data, and industry standards. The average service life remaining is determined by the difference between the average estimated useful life and the average age, except when an asset has been assigned an assessed condition rating that may increase or decrease the average service life remaining.

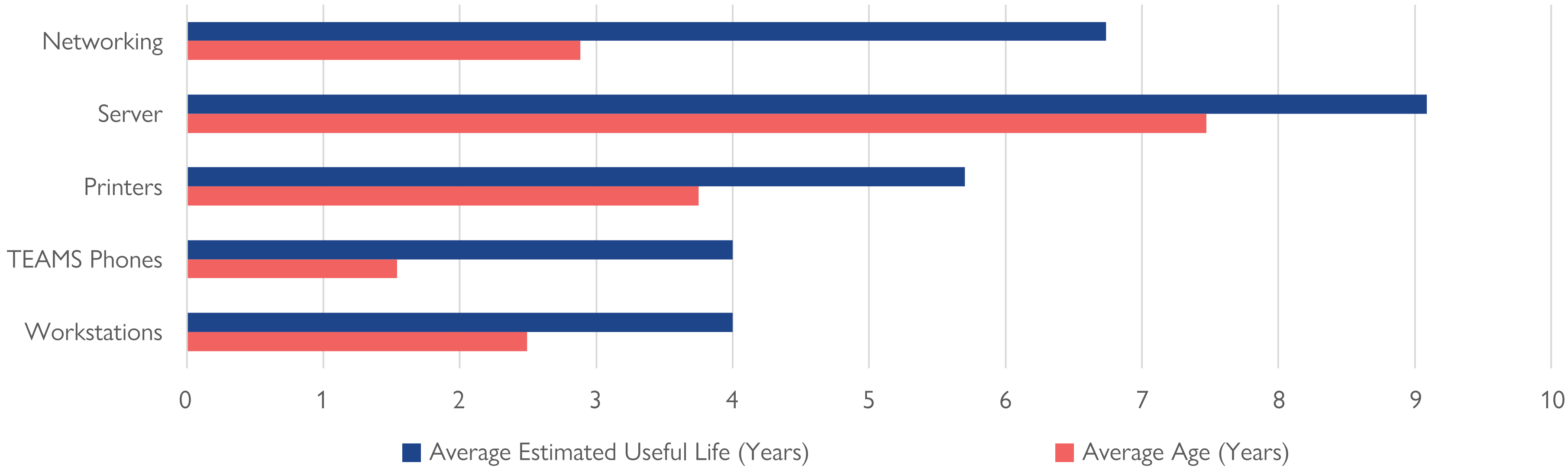
The following table summarizes the average age of each sub-segment based on the number of years that the assets have been in service.

TABLE 101: **Information Technology – Average Age and Estimated Useful Life**

Asset Sub-Segment	Average Estimated Useful Life (Years)	Average Age (Years)	Average Service Life Remaining (Years)	Percentage of Average Service Life Remaining
Networking	6.7	2.9	3.8	57%
Server	9.1	7.5	1.6	18%
Printers	5.7	3.8	1.9	34%
TEAMS Phones	4.0	1.5	2.5	62%
Workstations	4.0	2.5	1.5	38%

The age of an asset gives an indication of how close it is to the end of its estimated useful life and what lifecycle management strategies may be required. The following figure displays average asset age alongside the estimated useful life for each asset sub-segment.

FIGURE 122: **Information Technology – Average Age and Estimated Useful Life**



Average asset ages have not exceeded the average estimated useful life for any sub-segment.

15.3 Condition

The following sections and tables outline the condition breakdown for IT assets and the City's methods for assessing asset condition. Where available and feasible, the City follows industry-standard best practices and generally accepted good engineering practices in the approach to assessing asset condition. When condition assessments are unavailable, an age-based condition rating is used based on the relative age of the asset compared to its estimated useful life.

The following table summarizes the variety of techniques used to assess the condition of the IT assets on a regular frequency.

TABLE 102: Information Technology – Approach to Assessing Condition

Asset Sub-Segment	Condition Data Collection Techniques	Frequency of Data Collection	Year of Last Assessment
Networking	Age-based.	Every year.	2024
Server	Age-based.	Every year.	2024
Printers	Age-based.	Every year.	2024
TEAMS Phones	Age-based.	Every year.	2024
Workstations	Age-based.	Every year.	2024

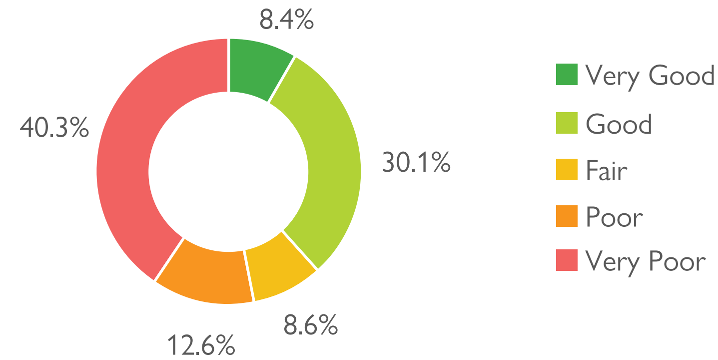
The following table provides a summary of the condition rating systems for all sub-segments of IT assets. Based on the condition data and supplemental information provided by subject matter experts, the condition of assets is rated on a scale from Very Good to Very Poor.

TABLE 103: Information Technology – Condition Rating Scales

Rating	Rating Description	All IT Assets (100-Point Scale)
Very Good	Fit for Future	100 ≥ and ≥ 80
Good	Adequate for Now	80 > and ≥ 60
Fair	Requires Attention	60 > and ≥ 40
Poor	Increasing Potential of Affecting Service	40 < and ≥ 20
Very Poor	Unfit for Sustained Service	20 > and ≥ 0

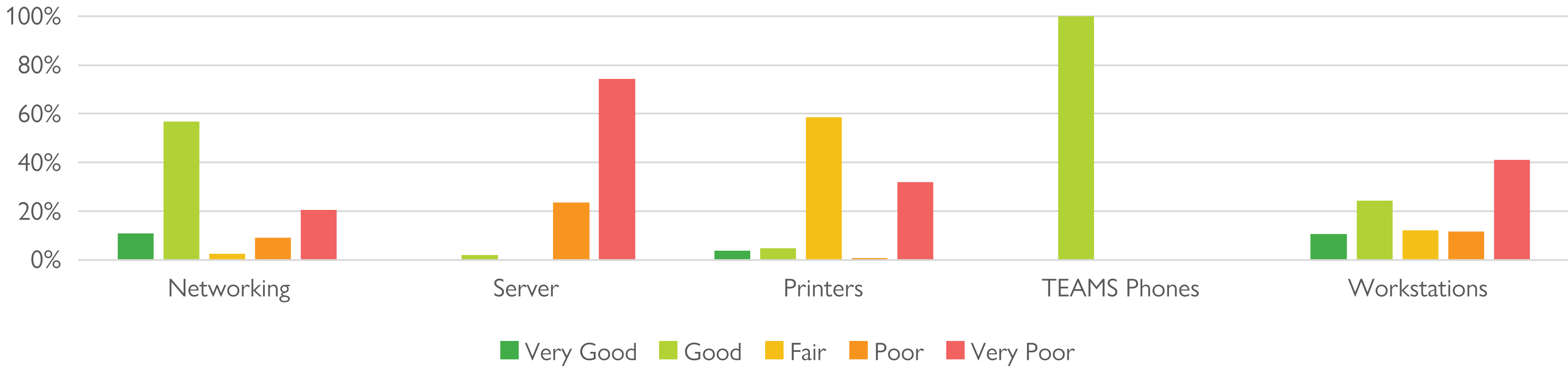
The following figure illustrates the breakdown of condition ratings of the City's IT assets. 38.5% of these assets are in Very Good to Good condition with a large proportion, 40.3%, rated as Very Poor.

FIGURE 123: Information Technology – Condition Rating Summary



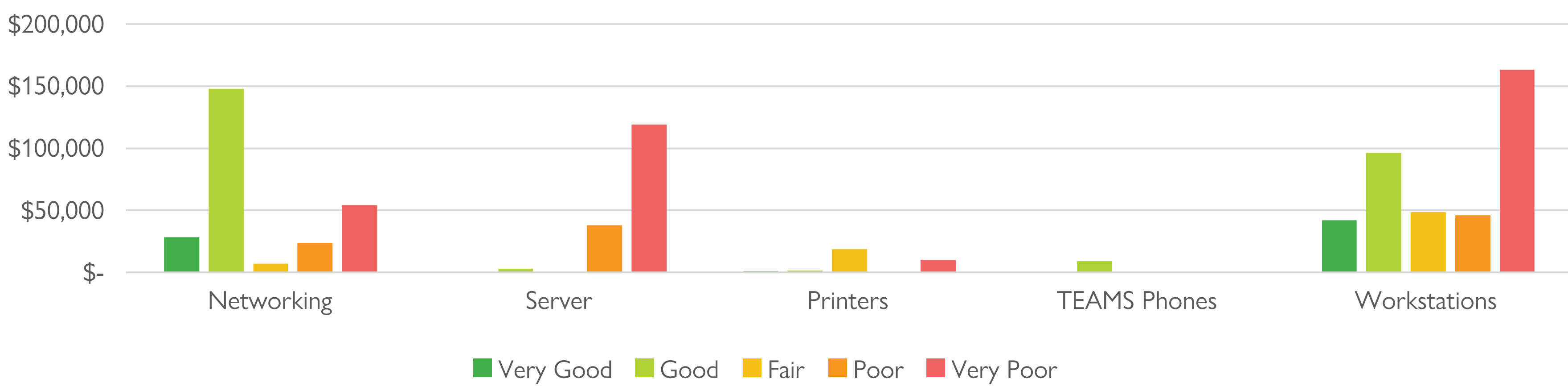
The following figure illustrates the breakdown of condition ratings for all IT assets in terms of the percentage of total replacement cost.

FIGURE 124: Information Technology – Breakdown of Condition Rating – Percentage of Cost



The following figure illustrates the same breakdown but in terms of the total replacement cost rather than the percentage of total replacement cost for each sub-segment. This illustrates the smaller cost implications of the printers and TEAMS phones assets compared to the larger value of the other sub-segments.

FIGURE 125: Information Technology – Breakdown of Condition Rating – Cost



The overall average condition of IT assets is Fair. However, it is important to note that the use of only an age-based approach misstates the true condition of many of the IT assets. The City currently does not assess condition on individual IT assets beyond the age-based approximation.

Assets are maintained by using the best treatment option to manage the current condition and anticipated future deterioration of the asset. More information is found in the lifecycle management strategy details in Section 15.5. Due to the low total replacement cost and use of only an age-based condition rating, this plan omits sections presenting the fully detailed condition information for each sub-segment or group of sub-segments of assets.

15.4 Levels of Service and Performance Measures

The City's assets exist to deliver services to its users. Levels of service are a measurement of the actual service provided so that decisions are made based on the nature and quality of that service, rather than only the condition of an asset. These are used to summarize the type of service being provided that reflects the values and desires of stakeholders in the community.

The following tables identify the City's current level of service for the IT assets. These metrics include any technical and community level of service metrics that are required to comply with Ontario Regulation 588/17, as well as any additional metrics provided by the City. A future revision to this plan will include proposed levels of service targets for each measure.

15.4.1 Community Levels of Service

The following table identifies the qualitative descriptions that determine the community levels of service provided by the IT assets.

TABLE 104: Information Technology – Community Levels of Service

Service Attribute	Community Levels of Service	Related Assets
Quality	The City maintains the IT inventory at a condition level to operate as designed.	All

15.4.2 Technical Levels of Service

The following table identifies the quantitative metrics that determine the technical level of service provided by IT assets.

TABLE 105: Information Technology – Technical Levels of Service

Service Attribute	Description of What Performance Measure Captures	Performance Measure	2023 Performance	Target	Related Assets
Quality	Condition of the asset inventory.	Percentage of assets in Poor or Very Poor condition.	52.9%		All

15.5 Lifecycle Management Strategy

It is important to proactively manage asset deterioration through a lifecycle management strategy that balances cost, risk, and the level of service.

The following table describes the current lifecycle management activities completed. This table also includes the risks associated with not completing these activities through using a do-nothing approach.

TABLE 106: **Information Technology – Lifecycle Management Strategy**

Activity Type	Description of Current Strategy	Risks Associated with Not Completing Activities
Operations and Maintenance	▪ IT staff and users of hardware and software provide concerns and submit requests through the City's IT Service Desk ticket management system. ▪ Routine monitoring and preventative maintenance, including continuous improvements to security and communication with vendors to ensure sufficient software support.	▪ Service requests may become backlogged if insufficient resources are allocated to managing the ticket management system. ▪ Unanticipated loss or gaps in vendor support may result in service disruptions.
Renewal and Rehabilitation	▪ End of useful life replacement is the primary strategy. ▪ Renewal options are considered for the larger or more difficult to replace assets, or assets where components are readily available and cost effective to replace.	▪ Higher lifecycle costs if assets are kept beyond their warranty period or the City is required to renew assets where spare parts are expensive or difficult to source. ▪ Increased service disruption to users through lower system reliability.
Replacement and Disposal	▪ Replacement schedules are established for assets. Assets are replaced when they are out of warranty, no longer supported by a vendor, no longer meeting operational requirements, or are technologically obsolete. ▪ Technologically obsolete hardware is disposed of at disposal or recycling facilities where feasible through authorized facility operators.	▪ Increased service disruption to users through lower system reliability.
Growth-Related and Service Enhancements Lifecycle Needs	▪ Adjustments due to increases in staffing levels, improvements in software capability through additional modules, or technological advancements.	▪ Delay or cancellation of growth-related activities causing the City to be unable to sufficiently accommodate growth through loss of productivity or increased disruption to users.
Non-Infrastructure	▪ Continuous focus on training staff to detect security risks, report suspected phishing and scam attempts, and prevent breaches.	▪ Increased likelihood of cybersecurity incidents.

15.6 Forecasted Capital Requirements

The City continuously invests in maintaining its assets and has been increasing budget amounts to align with asset needs. Until proposed levels of service are defined in the next revision of this asset management plan for July 1, 2025, there is no requirement to modify this funding arrangement.

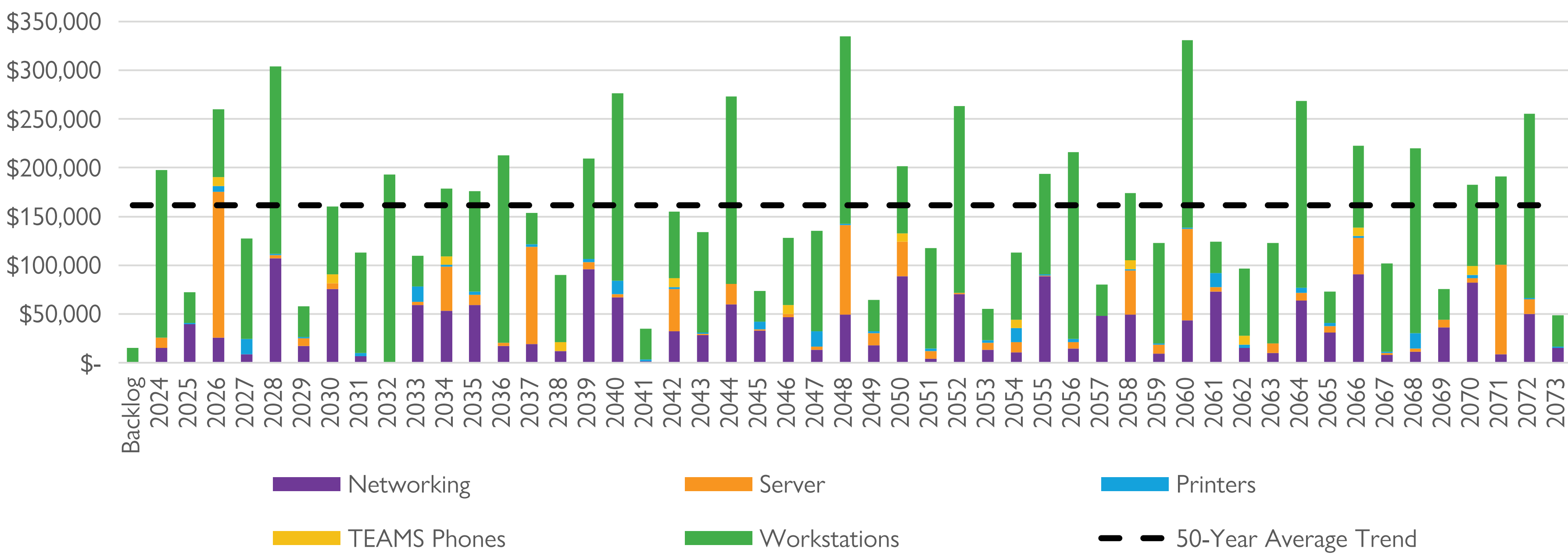
The annual capital requirement represents the average cost per year that the City is estimated to require to allocate towards funding asset needs. Based on the best available current information, to maintain the current level of service and lifecycle management strategy, the annual sustainable capital funding requirement for existing IT assets is estimated to be $161,559.

The 2024 capital budget funding allocation was $242,000. This means that there exists a funding surplus of $80,441 in 2024. The following figure illustrates a 50-year forecast of the annual capital asset needs for IT assets, including the cost and asset lifecycle impacts of completing renewal and rehabilitation activities.

Due to historical inconsistency in the timing of the various assets coming into service, a sawtooth pattern is present where in some years the total annual requirement is low followed by a spike that reaches well above the long-term average. The City's asset management program aims to smooth out this behaviour in favour of a more consistent amount of annual spending. The City has a small backlog of $15,370 that represents workstations that are beyond their estimated useful life of four years.

For further details on capital requirements, please see the Financial Summary portion of this plan that details the funding needs for all categories of assets over the next 10 years, including discussion of impacts from growth.

FIGURE 126: Information Technology – Annual Capital Requirement – 50-Year Forecast



15.7 Climate Change and Other Risks

The following table summarizes key trends, challenges, and risks that the City is currently facing in delivering the desired level of service.

TABLE 107: Information Technology – Climate Change and Other Risks

Trend, Challenge, or Risk	Summary
Climate Change and Extreme Weather Events	It is anticipated that there may be some challenges in managing the impacts of climate change, including: ▪ Potential increased damage to exterior mounted communications equipment during more frequent severe wind events. ▪ Potential increased frequency of power outages at City facilities causing assets to become offline. ▪ Increased uncertainty in impacts of extreme weather events and what is the most cost-effective resiliency strategy or group of strategies. The City is considering the following adaptation and mitigation measures in response to the challenges: ▪ Incorporate new best practices and technology in the design, construction, and maintenance of assets to increase resiliency while managing affordability.

15.8 Recommendations and Improvement Plan

Asset Inventory

- Continue to review and refine the asset inventory to improve scope, accuracy, and update estimated useful life values.

Levels of Service

- Continue to measure current levels of service in accordance with the metrics identified in Ontario Regulation 588/17 and the additional metrics included by the City.
- Identify proposed levels of service per Ontario Regulation 588/17 requirements and identify the strategies that are required to close any gaps between the current and proposed levels of service.

16.0
Natural Assets

16.0 Natural Assets

The City maintains a variety of natural assets supporting the provision of a wide range of benefits and ecosystem services. These include improved air quality, natural wildlife habitats, urban shading, water filtration, unique recreation opportunities, carbon dioxide sequestration, and erosion control. Natural Assets is the ninth largest category of assets at a total replacement cost of $12,610,500 in 2023 dollars.

16.1 Asset Inventory and Replacement Cost

The City's incomplete inventory of natural assets is under comprehensive review by staff with assistance from subject matter experts. The City completed a preliminary natural assets inventory project in 2021 that set a high-level foundation of the major types of natural assets in the City. This preliminary inventory is in the process of a major revision that will redefine the structure of the natural asset inventory and better link service objectives to each sub-segment of natural assets. Through this process, more comprehensive levels of service and lifecycle management strategies are in development.

Since all existing data is undergoing significant changes, the scope of this service area is limited to the City's inventory of 124.45 ha of forested areas and the 3,194 digitally tracked trees located primarily in parks or in downtown Orillia. There exist many more trees managed by the City; however, the location, diameter, species, or other information of these additional trees is not fully tracked in an inventory at this time and is not available to be included in the scope of this plan.

The replacement cost for trees is estimated using primarily historic construction project costs involving the removal, replacement, or addition of trees. The replacement cost for the forests is aligned with the Lake Simcoe Region Conservation Authority (LSRCA) 2021 offsetting fee for woodland replacement of approximately $50,000 per hectare. These estimates are high-level approximations and are under review. Included in the cost of replacing each asset is a set of components that together comprise a typical asset. The full set of components for each sub-segment is identified in Appendix 19.2.12.

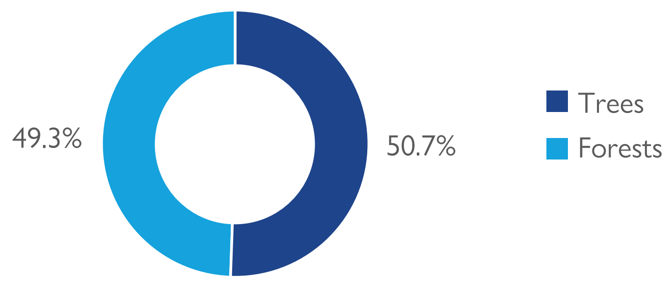
The following table includes the quantity, replacement cost method, and total replacement cost in 2023 dollars of each sub-segment of assets in the City's natural assets inventory.

TABLE 108: Natural Assets – Inventory and Replacement Cost

Asset Sub-Segment	Quantity	Replacement Cost Method	Replacement Cost	Percentage of Total Replacement Cost
Trees	3,194	Cost/Unit	$6,388,000	50.7%
Forests	124.45 ha	Cost/Unit	$6,222,500	49.3%

The following figure provides the data in the previous table visually with each sub-segment as a percentage of the total replacement cost.

FIGURE 127: **Natural Assets – Total Replacement Cost**



Assigning a monetary value to natural assets is a complex task as there can be different replacement costs for only the natural asset itself compared to the replacement cost of the ecosystem services provided by the asset. Standardized appraisal methods exist such as those found in i-Tree and other software; however, this is an evolving field in both the urban forestry and municipal asset management sectors. To avoid misrepresenting the benefits of ecosystem services, a simplified approach of only considering the replacement cost of the asset itself is used. A significant amount of time, effort, and funding would be required to accurately inventory the trees in parks, on streets, and in the forests to the level of detail required to accurately value ecosystem services.

In addition to trees and forests, the City is reviewing the following sub-segments of natural assets as potential additions to the inventory:

- Water courses
- Wetlands
- Riparian buffers
- Beaches
- Natural shoreline
- Parks – natural areas
- Parks – mowed areas
- Parks – horticultural and planted areas
- Remnant channels

Each sub-segment of natural assets will be linked to a variety of service objectives and benefits including:

- Absorption of greenhouse gases
- Cleaning of air
- Cooling during extreme heat
- Cleaning of rainwater
- Absorption of rainwater
- Recreation opportunities
- Stormwater conveyance
- Erosion protection
- Biodiversity enhancement

16.2 Asset Age and Estimated Useful Life

Data on the age of the tree inventory is widely unavailable since historical tree planting dates were not consistently recorded. The City is reviewing the available information on tree plantings and is recording planting dates, species, and replacement costs in ongoing projects. For the forests, data is similarly unavailable as some areas such as Scout Valley are naturalized forest where the City limits its impact on the natural cycle of a forest. Other forest areas are more actively managed by City staff; however, historical records of plantings and removals are limited. Due to the lack of data, a table summarizes the average age of each sub-segment and a figure illustrating the age data are omitted.

16.3 Condition

The following sections and tables outline the condition breakdown for natural assets and the City's methods for assessing asset condition. Where available and feasible, the City follows industry-standard best practices and generally accepted good engineering practices in the approach to assessing asset condition. When condition assessments are unavailable, an age-based condition rating is used based on the relative age of the asset compared to its estimated useful life.

As part of the 2021 preliminary inventory project, a desktop exercise condition assessment was undertaken for the forest sub-segment of assets. Neither sufficient age data nor condition data is available on the trees sub-segment and as a result, condition data on trees is omitted.

The following table summarizes the variety of techniques used to assess the condition of natural assets.

TABLE 109: **Natural Assets – Approach to Assessing Condition**

Asset Sub-Segment	Condition Data Collection Techniques	Frequency of Data Collection	Year of Last Assessment
Forests	Desktop exercise condition assessment using GIS data that considers four factors each rated out of 10 possible points. i. Surface Permeability ii. Adjacent Land Use iii. Road Density iv. Relative Asset Size	No set frequency.	2021

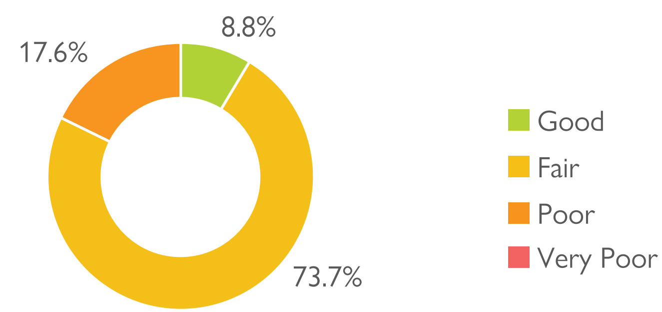
The following table provides a summary of the condition rating system for natural assets. The condition of forests is rated on a scale from Good to Very Poor.

TABLE 110: **Natural Assets – Condition Rating Scales**

Rating	Rating Description	All Natural Assets (40-Point Scale)
Good	Adequate for Now	40 ≥ and > 30
Fair	Requires Attention	30 ≥ and > 20
Poor	Increasing Potential of Affecting Service	20 ≥ and > 10
Very Poor	Unfit for Sustained Service	10 ≥ and ≥ 0

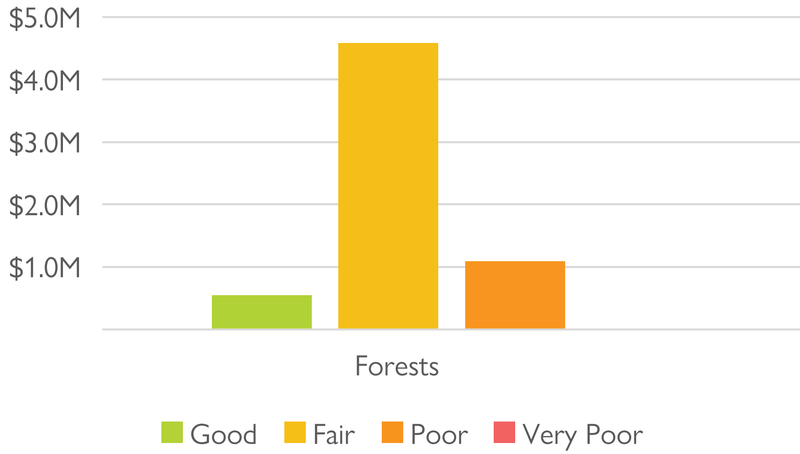
The following figure illustrates the breakdown of condition ratings of the City's forests. 8.8% of the forests are in Good condition with none rated as Very Poor.

FIGURE 128: **Natural Assets – Condition Rating Summary**



The following figure illustrates the same breakdown but in terms of the total replacement cost rather than the percentage of total replacement cost.

FIGURE 129: Natural Assets – Breakdown of Condition Rating – Cost



The overall average condition of forest assets is Fair.

Assets are maintained by using the best treatment option to manage the current condition and anticipated future deterioration of the asset. More information is found in the lifecycle management strategy details in Section 16.5.

16.4 Levels of Service and Performance Measures

The City's assets exist to deliver services to its users. Levels of service are a measurement of the actual service provided so that decisions are made based on the nature and quality of that service, rather than only the condition of an asset. These are used to summarize the type of service being provided that reflects the values and desires of stakeholders in the community.

The following tables identify the City's current level of service for the natural assets. These metrics include any technical and community level of service metrics that are required to comply with Ontario Regulation 588/17, as well as any additional metrics provided by the City. A future revision to this plan will include proposed levels of service targets for each measure.

16.4.1 Community Levels of Service

The following table identifies the qualitative descriptions that determine the community levels of service provided by natural assets.

TABLE 111: Natural Assets – Community Levels of Service

Service Attribute	Community Levels of Service	Related Assets
Quality	The City maintains the natural asset inventory at a condition level to operate as designed.	All

16.4.2 Technical Levels of Service

The following table identifies the quantitative metrics that determine the technical level of service provided by natural assets.

TABLE 112: Natural Assets – Technical Levels of Service

Service Attribute	Description of What Performance Measure Captures	Performance Measure	2023 Performance	Target	Related Assets
Quality	Condition of the asset inventory.	Percentage of assets in Poor or Very Poor condition.	17.6%		All

16.5 Lifecycle Management Strategy

It is important to proactively manage asset deterioration through a lifecycle management strategy that balances cost, risk, and the level of service.

The following table describes the current lifecycle management activities completed. This table also includes the risks associated with not completing these activities through a do-nothing approach.

TABLE 113: Natural Assets – Lifecycle Management Strategy

Activity Type	Description of Current Strategy	Risks Associated with Not Completing Activities
Operations and Maintenance	▪ Trees are inspected by a staff arborist, except for trees in wood lots. ▪ Trees that are determined to be safety hazards are trimmed or felled by the staff arborist. Trees felled in naturalized wood lots may be left to decompose naturally, providing nutrients and habitat back to the local ecosystem. ▪ In addition to the proactive operations and maintenance activities identified, staff respond to complaints as needed. Maintenance and operations activities are completed by City staff with external contractors brought in as needed.	▪ Deficiencies are not identified through inspections. ▪ Premature asset failure, health and safety risks, and service disruptions if fallen trees impact other assets.
Renewal and Rehabilitation	▪ Injection of a treatment to preserve ash trees against the invasive Emerald Ash Borer insect.	▪ Increased prevalence of Emerald Ash Borer and accelerated loss of ash trees. Dead ash trees are brittle and unstable, potentially increasing the likelihood in health and safety risks.
Replacement and Disposal	▪ Replacement of trees that are removed for safety concerns or due to conflicts with other infrastructure assets. ▪ Grinding or removal of tree stumps in areas of prior tree removal.	▪ Loss of urban forest if removed trees are not replaced.
Growth-Related and Service Enhancements Lifecycle Needs	▪ Plantings in new developments and during park redevelopments.	▪ Lack of urban forest in newly developed or redeveloped areas.
Non-Infrastructure	▪ Enforcement of the City Tree Conservation By-law.	▪ Loss of urban forest due to unnecessary removals. ▪ Insufficient replacement value of City-owned trees in the event of an unauthorized removal.

16.6 Forecasted Capital Requirements

The City continuously invests in maintaining its assets and has been increasing budget amounts to align with asset needs. Until proposed levels of service are defined in the next revision of this asset management plan for July 1, 2025, there is no requirement to modify this funding arrangement.

The annual capital requirement represents the average cost per year that the City is estimated to require to allocate towards funding asset needs. Due to the widely incomplete inventory and lack of historical data, an accurate estimate of the long-term annual capital requirement of natural assets is unavailable. Once the comprehensive review of natural assets is complete, the City will revisit forecasting the capital needs of its natural assets to the same level of detail provided for the other categories of assets in this plan.

Although an annual capital requirement estimate is not available, the City is allocating funding to the lifecycle management strategies of natural assets. The 2024 capital budget funding allocation was $135,000. Of the 2024 funding, $100,000 is for the cutting, removal and stumping of dead and diseased ash trees throughout the City, using contracted services. Restoration will also be provided in the areas affected, with City resources assigned as required. This highlights the ongoing costs of the managing the impacts of invasive species.

For further details on capital requirements, please see the Financial Summary portion of this plan that details the funding needs for all categories of assets over the next 10 years, including discussion of impacts from growth.

16.7 Climate Change and Other Risks

The following table summarizes key trends, challenges, and risks that the City is currently facing in delivering the desired level of service.

TABLE 114: Natural Assets – Climate Change and Other Risks

Trend, Challenge, or Risk	Summary
Climate Change and Extreme Weather Events	It is anticipated that there may be many challenges in managing the impacts of climate change, including: ▪ Potential increased damage to trees during more frequent severe wind events, droughts, and extreme heat events. ▪ Increased uncertainty in impacts of extreme weather events and what is the most cost-effective resiliency strategy or group of strategies. The City is considering the following adaptation and mitigation measures in response to the challenges: ▪ Incorporate new best practices and technology in the maintenance and replacement of assets to increase resiliency while managing affordability.
Other Risks	The 2021 preliminary inventory identifies a variety of other potential risks to the City's natural assets, including: ▪ Overuse of trails and illegal dumping ▪ Invasive species ▪ Flooding ▪ Forest fire ▪ Pollutant loading from urban, agricultural, or industrial sources

16.8 Recommendations and Improvement Plan

Asset Inventory

- Complete the comprehensive review of the natural asset inventory and fill in essential data gaps that prevent the development of long-term capital requirement forecasts.
- Continue to review and refine the asset inventory to improve scope, accuracy, and estimate age and useful life values.
- Continue to add asset information to GIS layers for improved staff efficiency.

Condition

- Reevaluate the condition assessment framework used during the 2021 preliminary inventory and update to better reflect the local context of and data available within the City of Orillia.
- Align the four-level condition rating system used for natural assets with the five-level system used for most other City assets.

Lifecycle Management Strategies

- Evaluate the efficacy of the City's lifecycle management strategies at regular intervals to determine the impact on cost, condition, and risk.
- Develop lifecycle management strategies for all other natural asset sub-segments once added to the inventory.
- Integrate maintenance and operations work order data into the tracking of individual natural assets.

Levels of Service

- Continue to measure current levels of service in accordance with the metrics identified in Ontario Regulation 588/17 and the additional metrics included by the City.
- Identify proposed levels of service per Ontario Regulation 588/17 requirements and identify the strategies that are required to close any gaps between the current and proposed levels of service.

17.0
Impacts of Growth

17.0 Impacts of Growth

The demand for infrastructure and services will change over time based on a combination of internal and external factors. Understanding the key drivers of growth and demand will allow the City to plan for new infrastructure more effectively, and upgrades or disposals of existing infrastructure. Increases or decreases in demand can affect what assets are needed and what level of service meets the needs of the community.

The City's Official Plan indicates that the City is anticipated to accommodate a population of 41,000 people and 21,000 jobs by the year 2031. The Official Plan has not yet been brought into compliance with the August 2020 update to the Growth Plan for the Greater Golden Horseshoe, which extended the horizon for land use planning to 2051 and which requires that the City accommodate 49,000 people and 26,000 jobs by 2051. The City is currently in the process of updating its Official Plan through a Municipal Comprehensive Review. It is expected that the review will be completed for Council's consideration in 2025. Further information on the Municipal Comprehensive Review can be found on the City website or by contacting the Planning and Housing Division.

Growth in the City of Orillia is expected to result in incremental increases in the demand for services that may impact the current level of service. The City's 2022 Development Charges Background Study details the growth-related long-term capital and operating costs for the 2022-2031 period. Managing the incremental growth will require an associated incremental increase in the total cost of funding the lifecycle management strategies to maintain the current level of service.

18.0
Financial Summary

18.0 Financial Summary

Ontario Regulation 588/17 requires municipalities to report the costs of providing the lifecycle activities needed to maintain the current levels of service for all assets in each category for 10 years by July 1, 2024, including accommodating the expected growth.

To better understand the long-term requirements of City assets, a 50-year forecast of asset needs was developed using an inventory and lifecycle management strategies that maintain the current level of service. Due to fluctuations in the timing of needs for assets, a 50-year average forecast provides a consistent measure of long-term needs of assets. Assets can last from approximately one-to-170 years, and this forecast helps smooth out short-term fluctuations. This plan separates the core and non-core assets as defined by Ontario Regulation 588/17 into two separate forecasts.

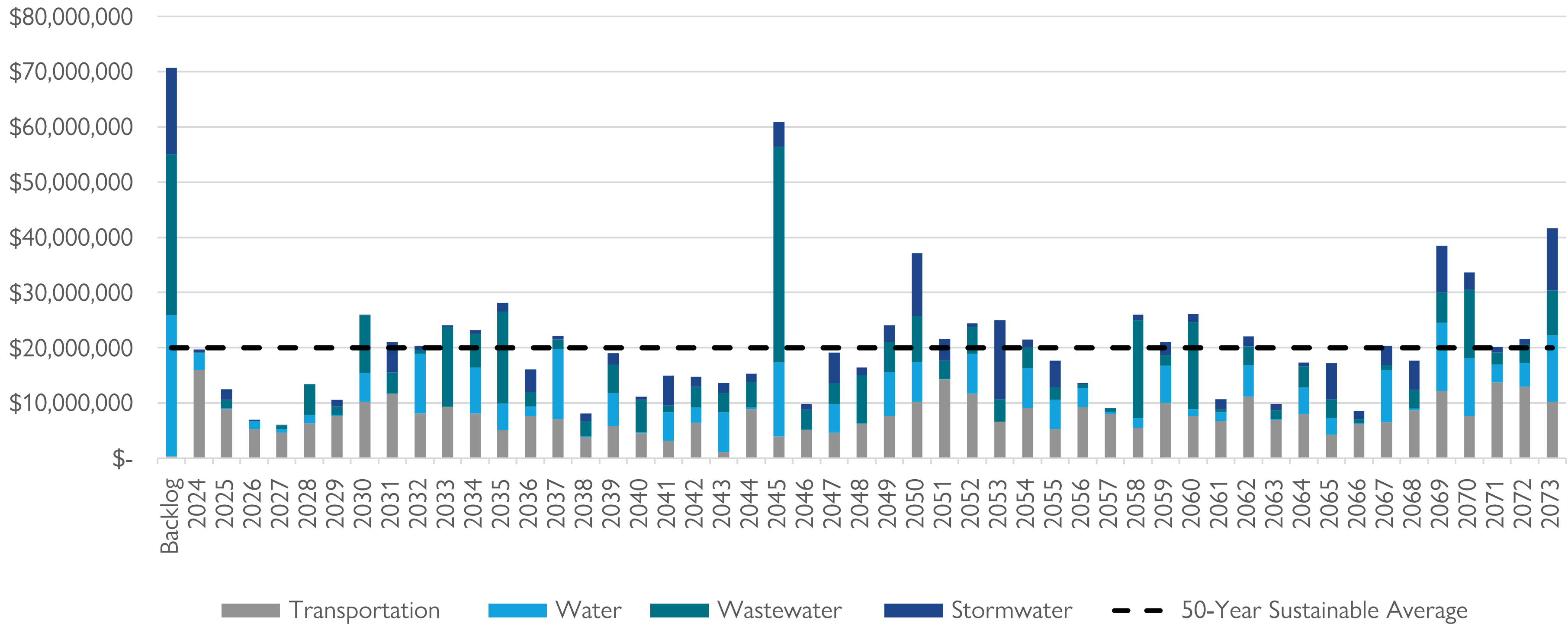
Since the focus of this plan is on capital needs and funding sources differ between capital and operations budgets, the discussion of operations and maintenance funding requirements are reported separately. The available funding amounts are taken from the 2024 Capital Budget and 2024-2033 10-Year Capital Plan.

An update to this plan will include a Financial Strategy to ensure compliance with the July 1, 2025 Ontario Regulation 588/17 requirements.

18.1 Capital Requirements for Core Assets

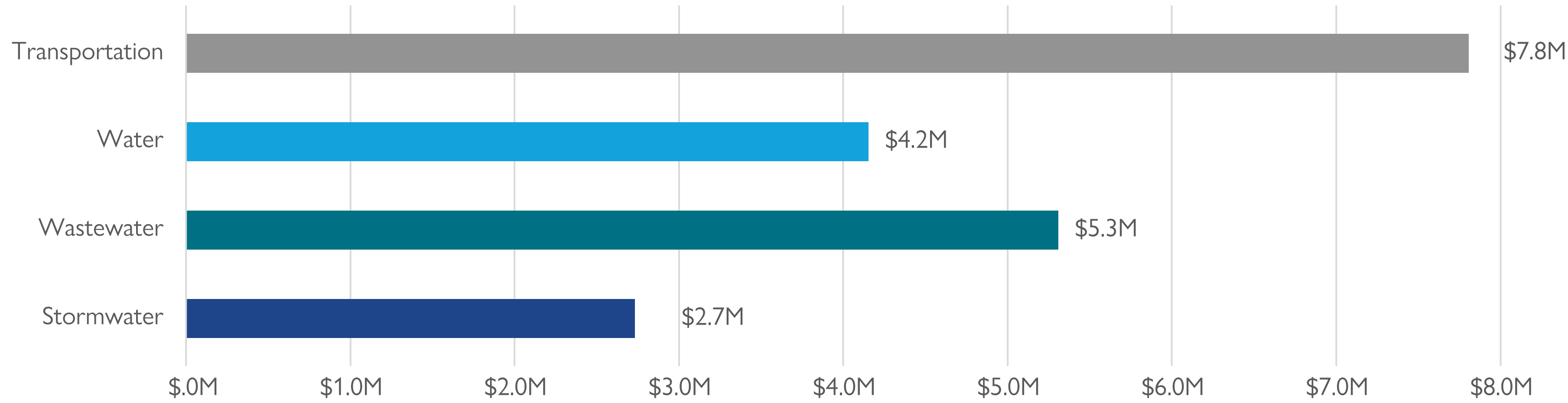
The following figure illustrates a 50-year forecast of the annual capital asset needs of core assets, excluding growth. This figure illustrates the lifecycle needs detailed in previous sections of this plan for Transportation, Water, Wastewater, and Stormwater assets. The sustainable 50-year average annual requirement trend is $19,996,751.

FIGURE 130: Core Assets – Annual Capital Requirement – 50-Year Forecast – Excluding Growth



The following figure illustrates the 50-year average annual requirement trend by category of core asset with growth excluded.

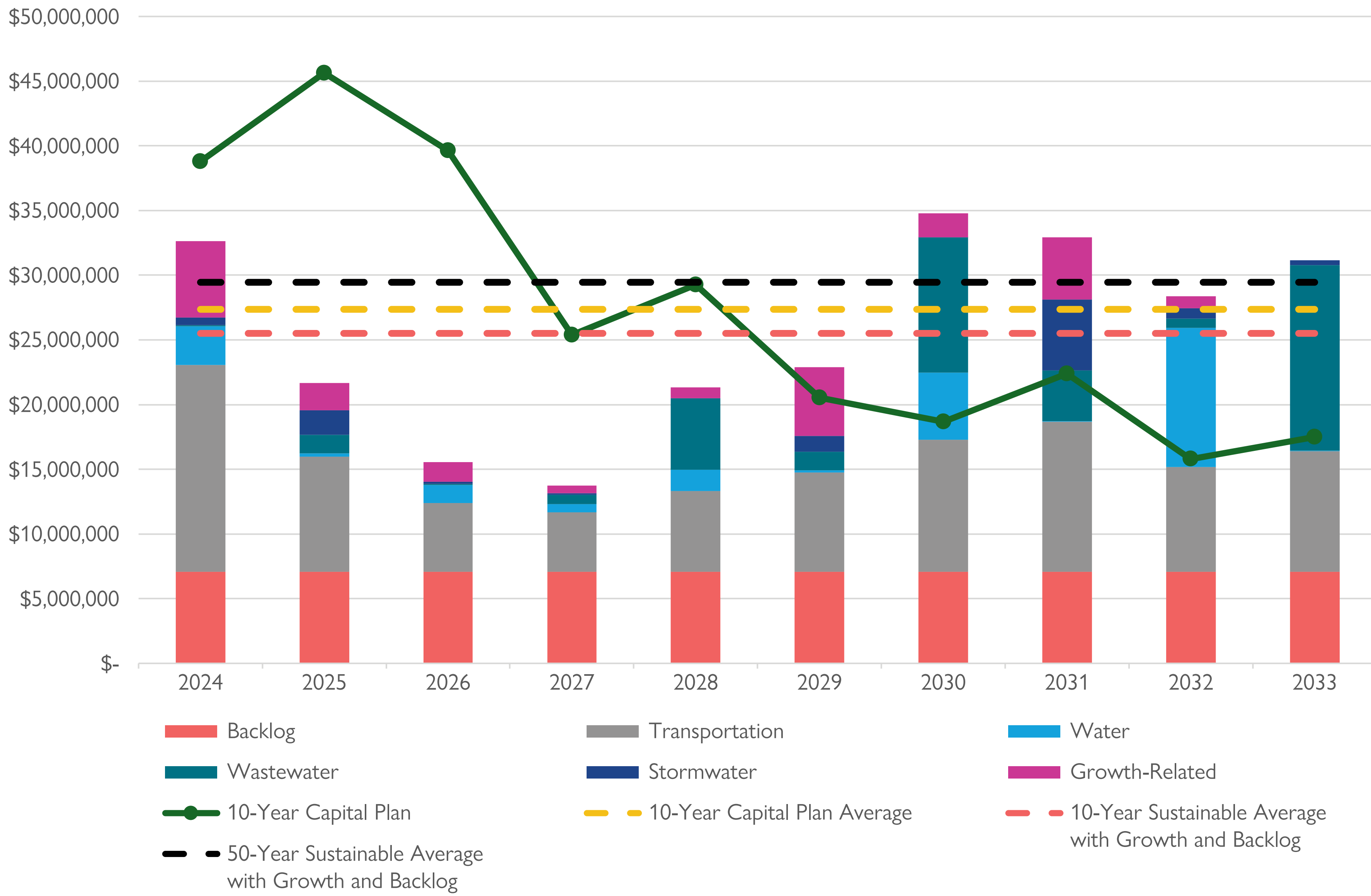
FIGURE 131: Core Assets – Average Capital Requirement – 50-Year Forecast – Excluding Growth



The City has a significant backlog of $70,695,412, primarily composed of watermains and wastewater and stormwater sewers beyond their estimated useful life of 75 years. This represents the assets that are past due for renewal or replacement based on the best available information. Calculating the backlog is useful to understand the short-term needs of assets. Many assets can remain in service beyond their estimated useful life or preferred condition; however, it may increase the risk of failure.

The following figure illustrates a 10-year forecast of the annual core asset needs, including clearing of the backlog across 10 years and anticipated growth impacts from 2024 to 2033. Since the scope of the 2022 Development Charges Background Study is limited to the 2022-2031 period, the growth needs over 2024-2033 are taken from the portion of projects funded by development charge-related funding sources in the 2024-2033 10-Year Capital Plan.

FIGURE 132: Core Assets – Annual and Average Capital Requirement – 10-Year Forecast – Including Growth and Backlog



Including growth from 2024-2033 and clearing the backlog, the sustainable 50-year average annual requirement is $29,453,417 and the sustainable 10-year average annual requirement is $25,505,551. The difference in these values represents that the 10-year forecasted sustainable asset needs are, on average, less than the forecasted 50-year asset needs.

The 10-year average funding allocated in the 2024-2033 10-Year Capital Plan of $27,362,772 exceeds the 10-year average annual requirement but falls short of the 50-year average annual requirement. As a result, no funding deficit exists over the medium-term 2024-2033 period; however, a funding deficit exists over the longer-term 2024-2073 period. This outcome is partially driven by higher-cost projects during 2024-2028, including the Harvie Hill Reservoir project; the reconstruction of Laclie Street, Jarvis Street and, West Street; and the Downtown Streetscape project.

A key point to note is that this funding surplus is solely based on the funding allocated in the 2024-2033 10-Year Capital Plan. Any changes to the 10-Year Capital Plan will change the level of the surplus.

The following table summarizes these annual requirement and funding allocations per year for core assets for both forecast periods.

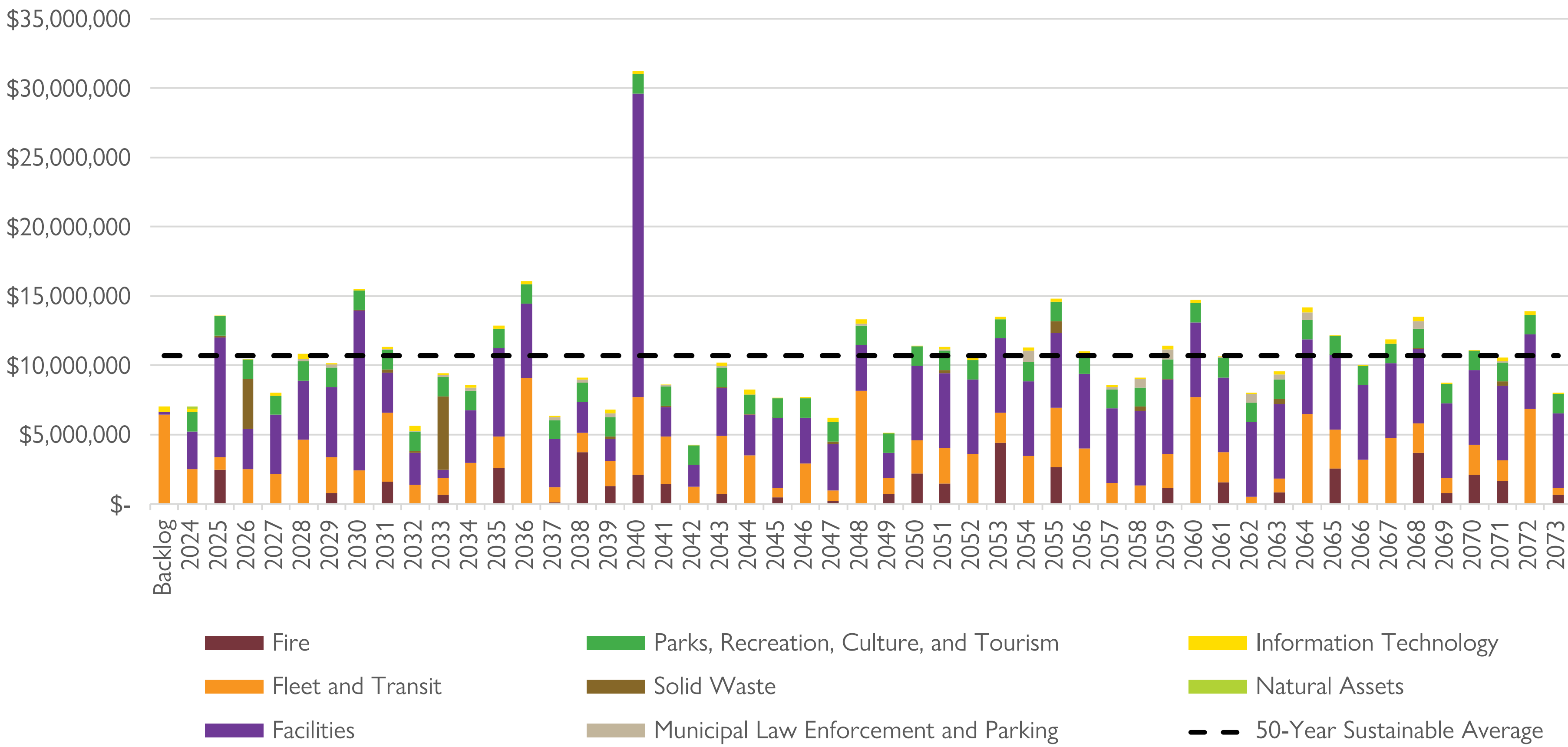
TABLE 115: Core Assets – Average Capital Requirement – 10-Year and 50-Year Forecasts – Including Growth and Backlog

Annual Value	10-Year Forecast	50-Year Forecast
Required Funding		
Average Requirement to Clear Backlog Over 10 Years	$7,069,541	$7,069,541
Sustainable Average with Growth	$18,436,010	$22,383,876
Sustainable Average with Growth and Backlog	$25,505,551	$29,453,417
Funding Based on 2024-2033 10-Year Capital Plan		
10-Year Capital Plan Average	$27,405,222	$27,405,222

18.2 Capital Requirements for Non-Core Assets

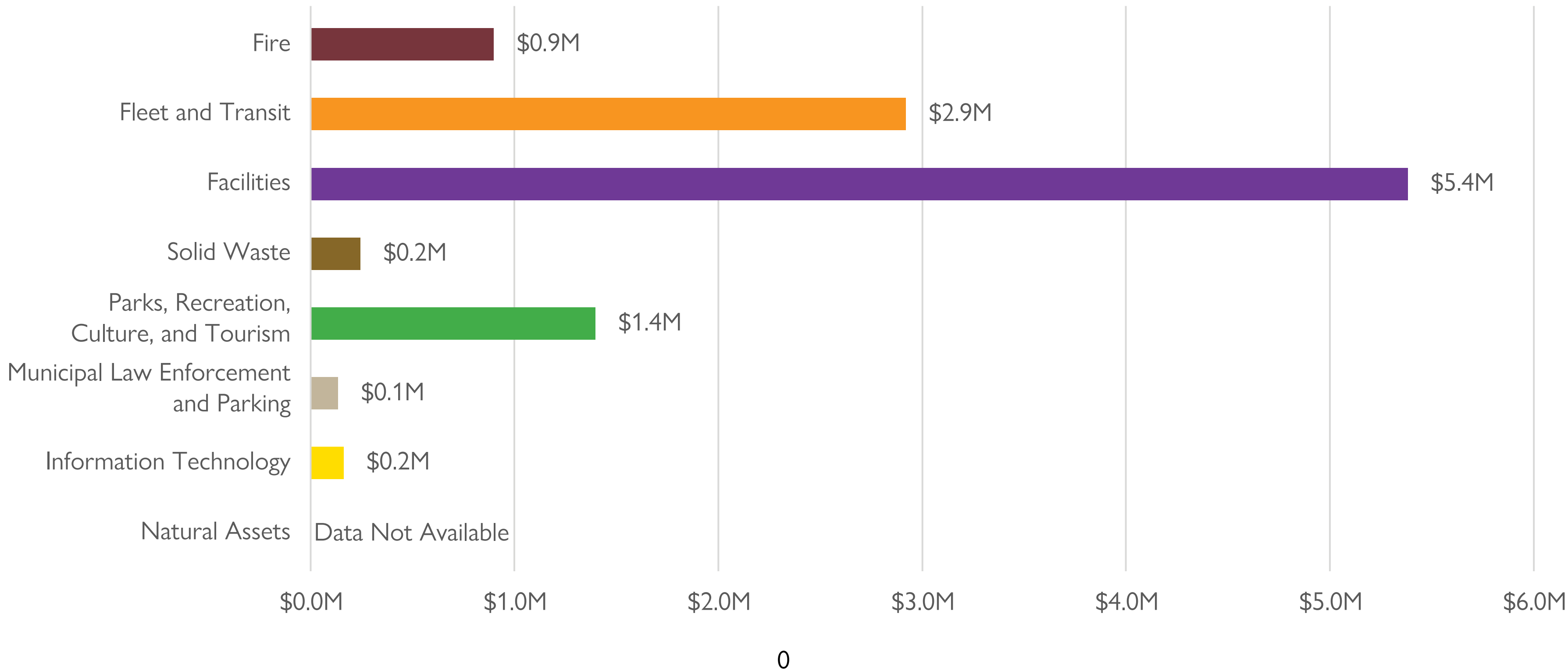
The following figure illustrates a 50-year forecast of the annual capital asset needs of non-core assets, excluding growth. This figure illustrates the lifecycle needs detailed in previous sections of this plan for Fire, Fleet and Transit, Facilities, Solid Waste, Parks, Recreation, Culture, and Tourism, Municipal Law Enforcement and Parking, Information Technology, and Natural Assets. Excluding growth, the sustainable 50-year average annual requirement trend is $10,697,363.

FIGURE 133: **Non-Core Assets – Annual Capital Requirement – 50-Year Forecast – Excluding Growth**



The following figure illustrates the 50-year average annual requirement trend by category of non-core asset with growth excluded.

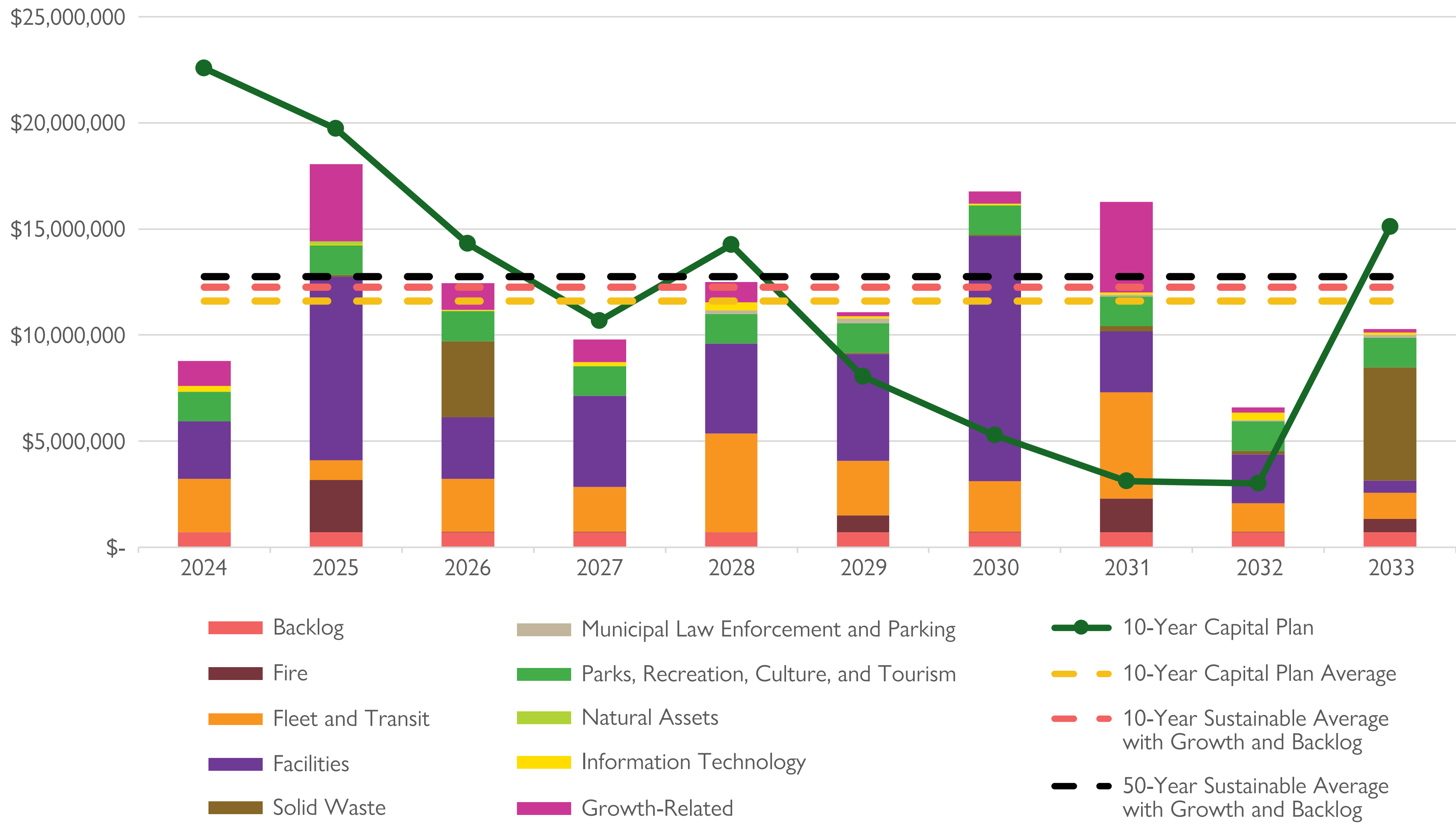
FIGURE 134: Non-Core Assets – Average Capital Requirement – 50-Year Forecast – Excluding Growth



The City has a significant backlog of $7,033,147 primarily composed of transit assets beyond their estimated useful life. This represents the assets that are past due for renewal or replacement based on the best available information. Calculating the backlog is useful to understand the short-term needs of assets. Many assets can remain in service beyond their estimated useful life or preferred condition; however, it may increase the risk of failure.

The following figure illustrates a 10-year forecast of the annual asset needs of non-core assets, including clearing of the backlog across 10 years and anticipated growth impacts from 2024 to 2033. Since the scope of the 2022 Development Charges Background Study is limited to the 2022-2031 period, the growth needs over 2024-2033 are taken from the portion of projects funded by development charge related funding sources in the 2024-2033 10-Year Capital Plan.

FIGURE 135: Non-Core Assets – Annual and Average Capital Requirement – 10-Year Forecast – Including Growth and Backlog



Including growth from 2024-2033 and clearing the backlog, the sustainable 50-year average annual requirement is $12,754,500. The sustainable 10-year average annual requirement is $12,258,545. The difference in these values represents that the 10-year forecasted sustainable asset needs are, on average, less than the forecasted 50-year asset needs.

The 10-year average funding allocated in the 2024-2033 10-Year Capital Plan of $11,604,558 is below both the 10-year and 50-year average annual requirements. As a result, a funding deficit exists over both forecast periods. This outcome is partially driven by higher-cost projects, including the Brian Orser Arena reconstruction, Municipal Operations Centre expansion or addition, and the construction of Fire Station 3.

A key point to note is that this funding deficit is solely based on the funding allocated in the 2024-2033 10-Year Capital Plan. Any changes to the 10-Year Capital Plan will change the level of the deficit.

The following table summarizes these annual requirement and funding allocations per year for non-core assets for both forecast periods.

TABLE 116: Non-Core Assets – Average Capital Requirement – 10-Year and 50-Year Forecasts – Including Growth and Backlog

Annual Value	10-Year Forecast	50-Year Forecast
Required Funding		
Average Requirement to Clear Backlog	$703,315	$703,315
Sustainable Average with Growth	$11,555,231	$12,051,185
Sustainable Average with Growth and Backlog	$12,258,545	$12,754,500
Funding Based on 2024-2033 10-Year Capital Plan		
10-Year Capital Plan Average	$11,604,558	$11,604,558

18.3 Operations and Maintenance Lifecycle Activities Requirements of All Assets

Growth in the City of Orillia is expected to result in incremental increases in the demand for services and the number of assets. Managing more assets will require an increase in the total cost of operations and maintenance lifecycle management strategies to maintain the current level of service. The following table summarizes the 10-year forecast of operations and maintenance costs for all assets over the 2024-2033 period, including impacts of growth.

TABLE 117: **Core and Non-Core Assets – Operations and Maintenance Lifecycle Costs**

Set of Assets	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033
All Assets	$31.6M	$32.2M	$32.8M	$33.5M	$34.1M	$34.7M	$35.4M	$36.1M	$36.8M	$37.5M

19.0
Appendices

19.0 Appendices

19.1 Key Assumptions and Exclusions

- The forecasts of capital needs are not constrained by budgetary limits. This is done to show the funding required to complete the capital-funded lifecycle activities as planned in the lifecycle management strategies. This is an important assumption to note as it results in all assets being replaced when required based on the lifecycle management strategies. These forecasts assume that all the funding requested would be provided. The annual budget process aims to smooth out the timing of asset needs with the direction of City Council. The forecasts in this plan may not align with the 10-year capital forecasts developed annually by each City department through the budget process. Any changes to the 10-Year Capital Plan will change the level of funding available to manage forecasted asset needs.
- The Financial Summary in this plan does not distinguish between what portion of available funding will reduce the backlog versus what portion will not reduce the backlog. How much of the backlog is cleared by 2033 is dependent on what specific projects are funded, and the detailed breakdown of those projects is outside of the scope of this plan.
- Unless specified otherwise, all currency-related values in this plan are in 2023 dollars and all forecasts are not adjusted for inflation.
- Unless specified otherwise, all averaged values are weighted averages that use the annual requirement of an asset as the weighting factor to account for large differences in the replacement cost and estimated useful life of the wide variety of assets in the City's portfolio.
- Contributions to reserves are not captured as capital spending in this plan. A future revision of this plan will consider contributions to reserves as part of an overall financial strategy.
- Growth rate of the number of households is assumed to be 1.9% per year. If the actual growth rate in the number of households differs from 1.9%, the growth-related funding needs of assets per year will also differ.
- Assets managed by the Orillia Public Library Board are excluded from this plan. The Library Board manages these assets separately from the rest of the inventory captured in this plan. The City's asset management inventory system does not track quantity, age, condition, estimated useful life, replacement cost, nor levels of service for assets under the management of the Library Board.
- City-owned land is excluded from this plan due to land not having a well-defined estimated useful life.
- The threshold for inclusion of an asset in this plan is determined by considering the asset's importance to the delivering the level of service. This plan diverges from the capitalization thresholds set in the City's Tangible Capital Asset Policy for both core and non-core service areas.

19.2 Detailed Replacement Cost Components

19.2.1 Transportation

Bridges and Structural Culverts

- Materials comprising the structure, including foundations, abutments, barriers, girders, piles, piers, deck, guiderails, and drainage.
- Earthworks and landscaping to accommodate the approaches, create embankments, and direct waterways.

Roads

- The base material, asphalt layers.
- Curb and gutter, islands, attached bike lanes.
- Guardrails, signage, and paint markings.

Sidewalks

- Base material, surface material.
- Tactile plates.

Retaining Walls

- Wall material, foundation, fencing, and engineered backfill.

Streetlights and Decorative Lighting

- The light luminaire, bracket and pole where City owned.
- All associated electrical devices, cabling, and wiring.

Traffic Control and Safety

- Traffic signals, pedestrian crossings.
- All associated electrical devices, cabling, and wiring.
- Due to data constraints, Streetlights, Decorative Lighting, Traffic Control, and Safety assets are not separated from the overall road assets in the current asset inventory.

19.2.2 Water

Watermains

- All lengths of underground pipe and connections, and automatic flushing stations.

Fire Hydrants

- Above-ground hydrant assembly, lateral service connection to the watermain, and lateral service connection shutoff valve.

Booster Station, Reservoirs and Wells, and the Water Filtration Plant

- All electrical devices, mechanical equipment, piping, storage tanks, lab equipment, pumps, instrumentation, and structures not managed by the Facilities group at the City.

19.2.3 Wastewater

Sewermains and Forcemains

- All lengths of underground pipe and connections, and maintenance holes.

Pump Stations and Wastewater Treatment Centre

- All electrical devices, mechanical equipment, piping, pumps, instrumentation, lagoons, and structures.

19.2.4 Stormwater

Stormwater Sewers

- All lengths of underground pipe and connections.

Maintenance Holes

- Structures and lids.

Pump Stations

- All electrical devices, mechanical equipment, piping, pumps, instrumentation, and structures.

Stormwater Management Ponds

- All inlets, outlets, banks, fencing, signage, and the landscaped pond structure.

Oil and Grit Separators

- All separator structures and components.

Ditches

- All lengths of ditch.

Catch Basins and Leads

- All lengths of underground pipe, catch basin structure, and surface grates or lids.

Road and Driveway Culverts

- All lengths of underground culvert with a diameter under three m.

19.2.5 Fire Services

Equipment in Stations

- All assets within the two fire halls, including equipment, tools, personal protective equipment, furniture, appliances, fitness equipment, communications equipment, medals and memorabilia, and the two historical fire vehicles.

Apparatus and Equipment

- All fire apparatus vehicles with all equipment, tools, personal protective equipment, and communications equipment stored on the vehicles.

Admin Vehicles and Equipment

- All fire passenger vehicles with all equipment, tools, personal protective equipment, and communications equipment stored on the vehicles.

19.2.6 Fleet and Transit

Roads

- Plow truck, half-ton to one-ton truck, sidewalk machine, loader, tractor, backhoe, street sweeper, flusher, trailer, chipper, grader, and bucket truck assets.

Solid Waste

- A loader, dump truck, grader, and half-ton truck.

Parks

- Half-ton to three-ton truck, SUV, tractor, fertilizer spreader, rototiller, mower, and trailer assets.

Recreation Facilities

- Half-ton truck, ice resurfacer, manlift, and bobcat assets.

Water, Wastewater, and Stormwater

- Half-ton to one-ton truck, SUV, minivan, dump truck, backhoe, valve machine, steamer, vacuum truck, and trailer assets.

Transit

- Buses.

All Other Service Areas

- Half-ton to three-quarter-ton truck, car, SUV, floor scrubber, and bucket truck assets.

New vehicle categorization system:

Vehicle Categorization	Vehicle Classification Standard (Class 1-8)
Light-Duty Vehicles (LDV)	Class 1: <6,000 lbs. (<2,721kgs) ▪ Example vehicle: Sedan or sport-utility vehicle (SUV) Class 2: 6,001 – 10,000 lbs. (2,722kgs – 4,535kgs) ▪ Example vehicle: Utility van, Standard pick-up truck
Medium-Duty Vehicles (MDV)	Class 3: 10,001 – 14,000 lbs. (4,536kgs – 6,350kgs) ▪ Example vehicle: Mini bus Class 4: 14,001 – 16,000 lbs. (6,351kgs – 7,257kgs) ▪ Example vehicle: Step van Class 5: 16,001 – 19,500 lbs. (7,258kgs – 8,845kgs) ▪ Example vehicle: Bucket truck Class 6: 19,501 – 26,000 lbs. (8,846kgs – 11,793kgs) ▪ Example vehicle: School bus
Heavy-Duty Vehicles (HDV)	Class 7: 26,001 – 33,000 lbs. (11,794kgs – 14,968kgs) ▪ Example vehicle: City transit bus Class 8: >33,000 lbs. (>14,969kgs) ▪ Example vehicle: Refuse truck
Non-Motorized Vehicle (NMV)	Any unit that is intended to be towed by a motorized vehicle and does not have its own power source. ▪ All standard trailers that are not specially manufactured for specialized use fall into this category. ▪ All units in this category must follow *Highway Traffic Act* rules as deemed applicable. ▪ Example unit: Open or enclosed trailers
Motorized Special Equipment (MSE)	Any unit that falls outside of the vehicle classification standard listed above. Requirements of inclusion in MSE: ▪ Must not fall into any of the LDV, MDV, HDV, NMV or NMSE categories. ▪ Must have a motor, engine, or energized power unit. ▪ May have GVWR but is not classed in LDV, MDV or HDV. ▪ Units in this category may be subject to *Highway Traffic Act* rules as deemed applicable. ▪ Units in this category may be subject to Transport Canada regulations. ▪ Example unit: Wachs Valve Turning Trailer Kit, zero-turn mowers, boats, ATVs
Non-Motorized Special Equipment (NMSE)	Any unit that falls outside of the vehicle classification standard listed above. Requirements of inclusion in NMSE: ▪ Must not fall into any of the LDV, MDV, HDV, NMV or MSE categories. ▪ Example Unit: Plow accessories (blades, salters), vehicle caps, etc.

19.2.7 Facilities

Each sub-segment in the facilities category asset inventory follows the ASTM UNIFORMAT II classification for building elements standard up to the Level 3 Individual Elements scope of detail.

19.2.8 Solid Waste

Cells

- Six active cells, two inactive cells, and two alternate covers.

Cell Final Caps

- Caps on cells 1, 2, 3, and 4.

Composting

- A composting pad with attached swale, two pumps for dewatering the swale, and a forcemain to connect the pumps to the sanitary sewer system.

Roads, Fencing, Structures, Depot and Drop-Off Areas

- All paved asphalt driving surfaces, a perimeter roadway around cells 1 to 4, perimeter fencing around the site, the reuse depot and weighscale, steel roll-off bins, and the push-wall system with concrete pad.

Monitoring

- All monitoring wells, gas probes, and a gas barrier and venting system at the Kitchener Park Landfill.

19.2.9 Parks, Recreation, Culture, and Tourism

Parks and Recreation

- All amenities within parks, including playgrounds, pathways, picnic tables, benches, playsets, garbage cans, bike racks, drinking fountains, splash pads, lighting, courts, fencing, and signage.

19.2.10 Municipal Law Enforcement and Parking

Parking Lots

- All parking lot surfaces and line painting.

Payment Meters and Payment Terminals

- All components of parking meters and pay-and-display terminals, including mechanical units, yokes, housing, posts, foundations, and backup batteries.

19.2.11 Information Technology

Networking

- Access points, firewalls, switches, and wireless radios.

Server

- KVMs, servers, storage devices, and uninterruptible power supplies.

Printers

- Various types and formats of printers and scanners.

TEAMS Phones

- Desk phones.

Workstations

- Desktop computers, laptops, keyboards, monitors, tablets, and port replicators.

19.2.12 Natural Assets

Trees

- Individual trees tracked separately.

Forests

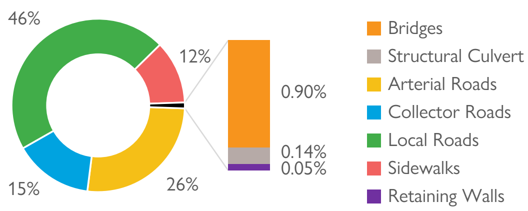
- Areas of trees and other vegetation located in a forest or woodlot that are tracked as a group.

19.3 Information at a Glance

19.3.1 Transportation at a Glance

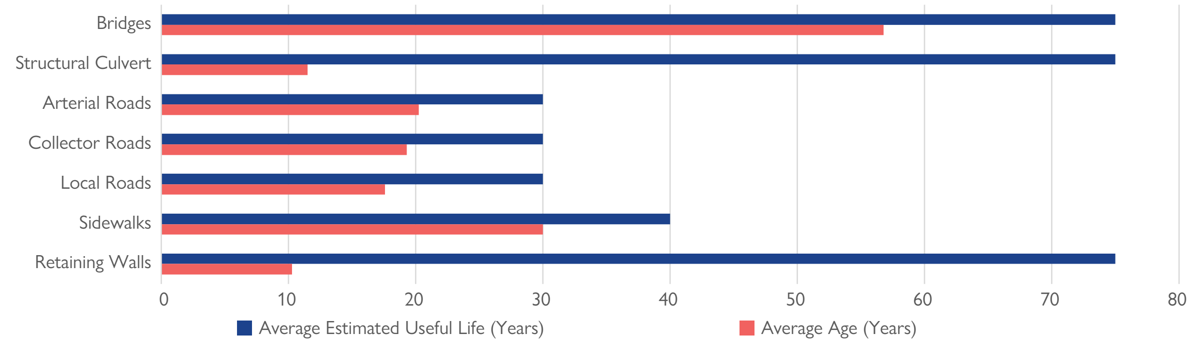
$475.5M Replacement Cost Breakdown

Figure 11



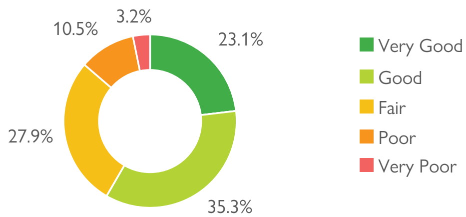
Average Age and Estimated Useful Life

Figure 12



Condition Rating Summary

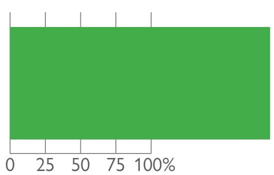
Figure 13



Breakdown of Condition Rating – Percentage of Cost

Figure 14

2024 Capital Funding



50yr Need: $7.8M

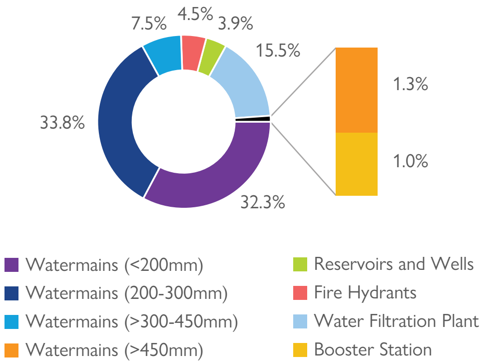
186% Funded

2024: $14.6M

19.3.2 Water at a Glance

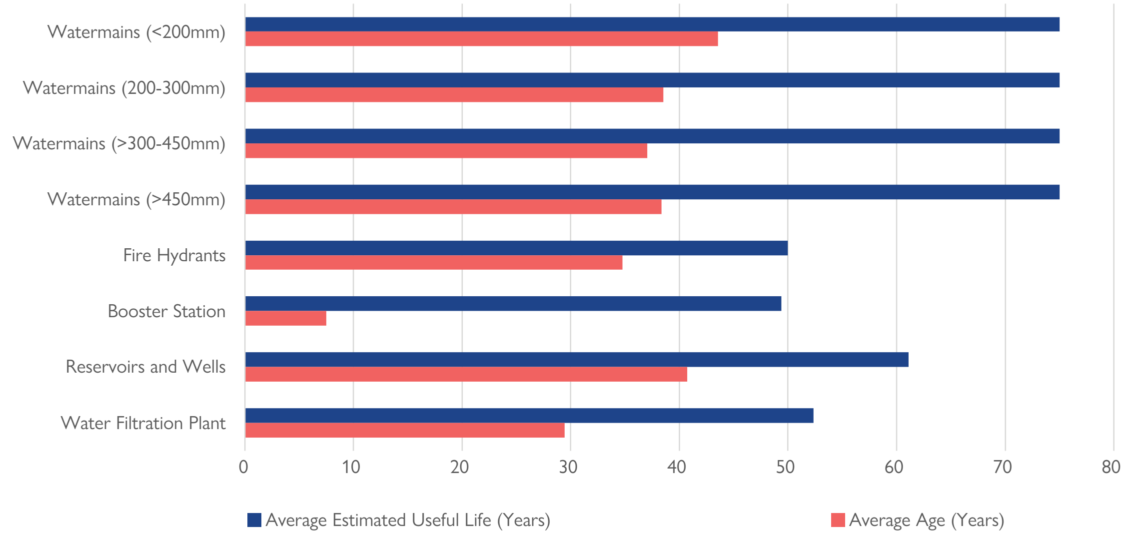
$313.6M Replacement Cost Breakdown

Figure 27



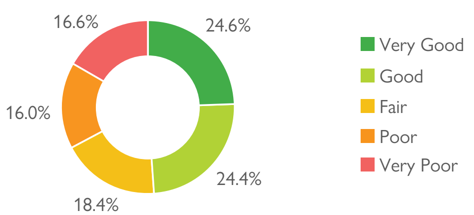
Average Age and Estimated Useful Life

Figure 28



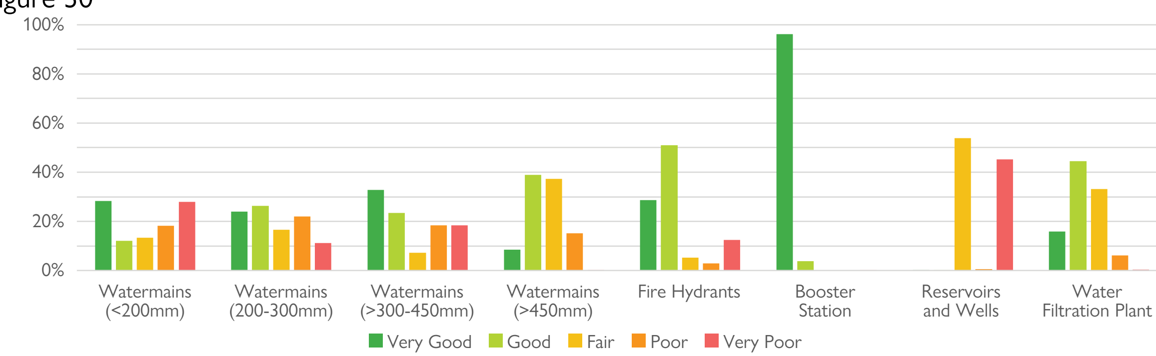
Condition Rating Summary

Figure 29

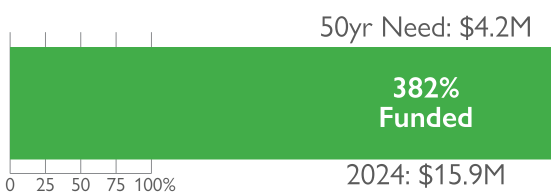


Breakdown of Condition Rating – Percentage of Cost

Figure 30



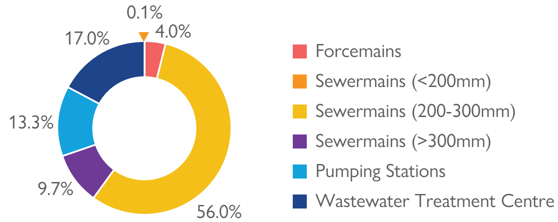
2024 Capital Funding



19.3.3 Wastewater at a Glance

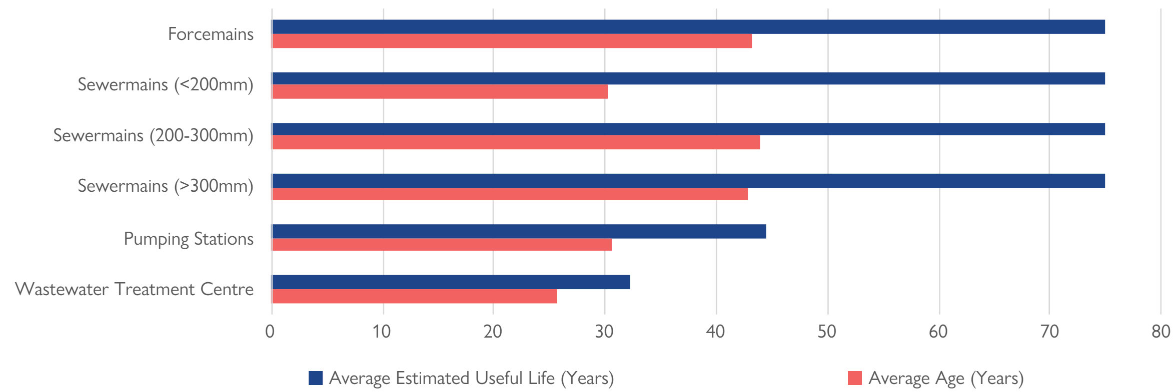
$480.4M Replacement Cost Breakdown

Figure 44



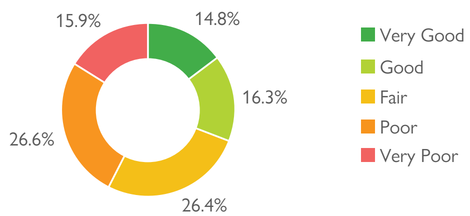
Average Age and Estimated Useful Life

Figure 45



Condition Rating Summary

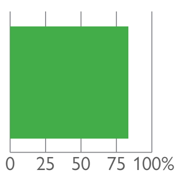
Figure 46



Breakdown of Condition Rating – Percentage of Cost

Figure 47

2024 Capital Funding



50yr Need: $5.3M

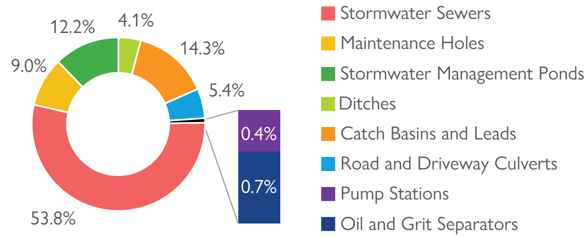
84% Funded

2024: $4.5M

19.3.4 Stormwater at a Glance

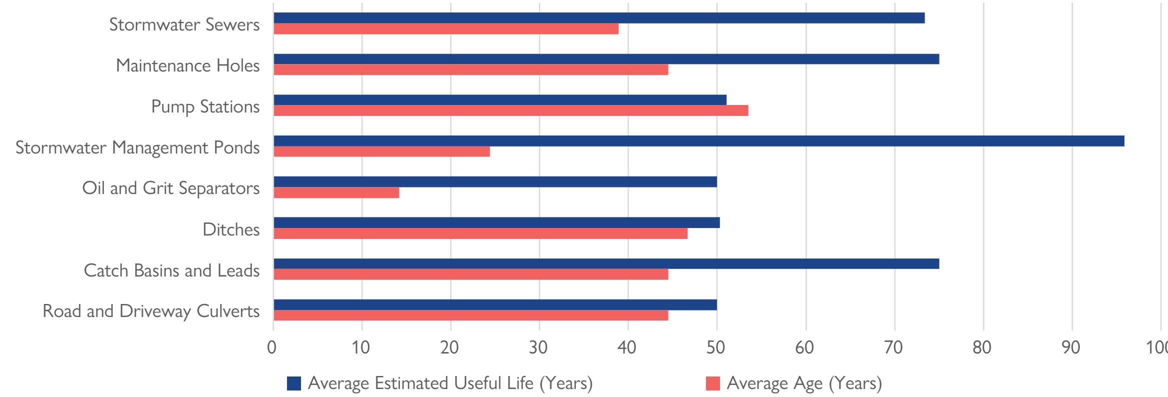
$238.5M Replacement Cost Breakdown

Figure 59



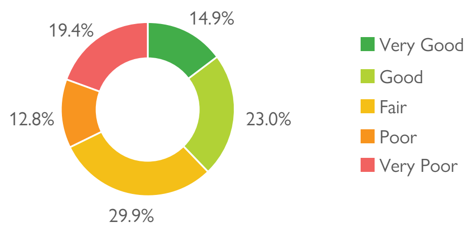
Average Age and Estimated Useful Life

Figure 60



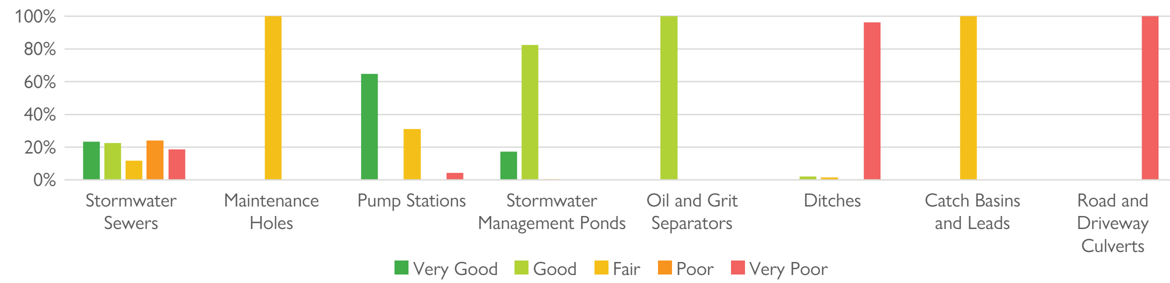
Condition Rating Summary

Figure 61

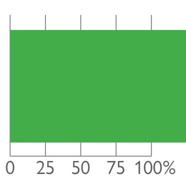


Breakdown of Condition Rating – Percentage of Cost

Figure 62



2024 Capital Funding



50yr Need: $2.7M

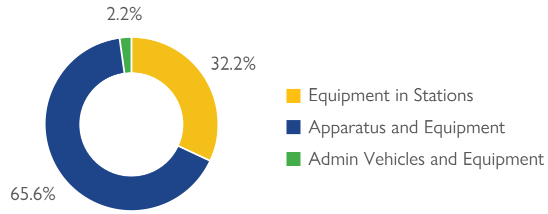
145% Funded

2024: $4.0M

19.3.5 Fire Services at a Glance

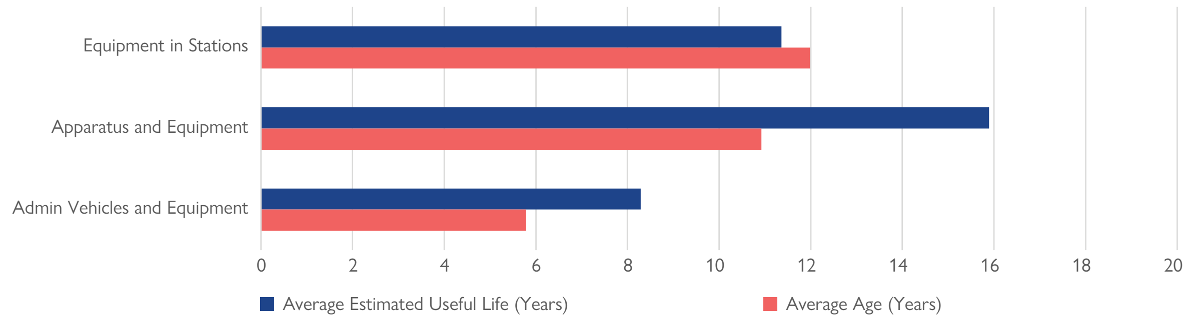
$12.2M Replacement Cost Breakdown

Figure 77



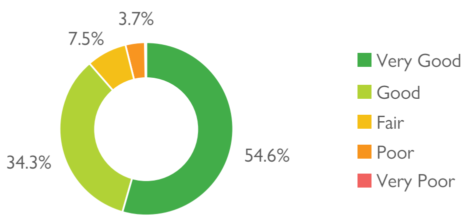
Average Age and Estimated Useful Life

Figure 78



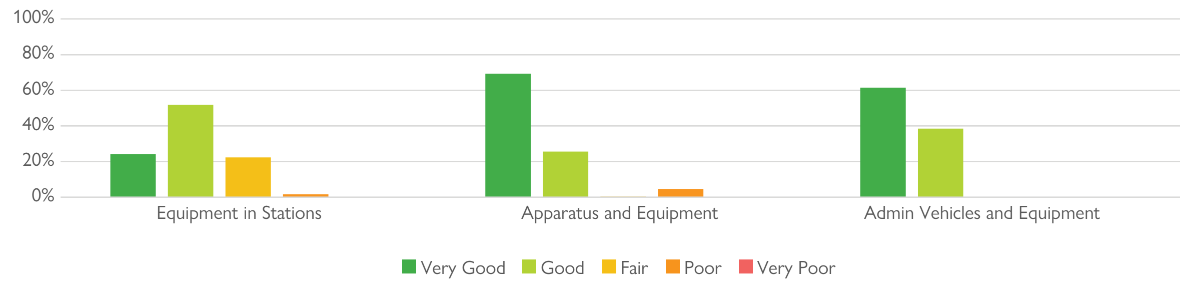
Condition Rating Summary

Figure 79

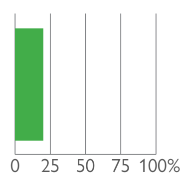


Breakdown of Condition Rating – Percentage of Cost

Figure 80



2024 Capital Funding



50yr Need: $0.90M

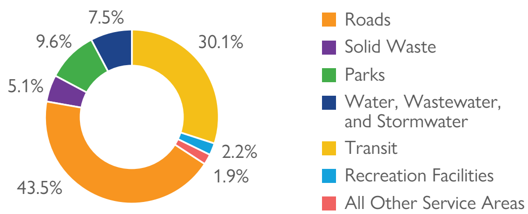
20%
Funded

2024: $0.18M

19.3.6 Fleet and Transit at a Glance

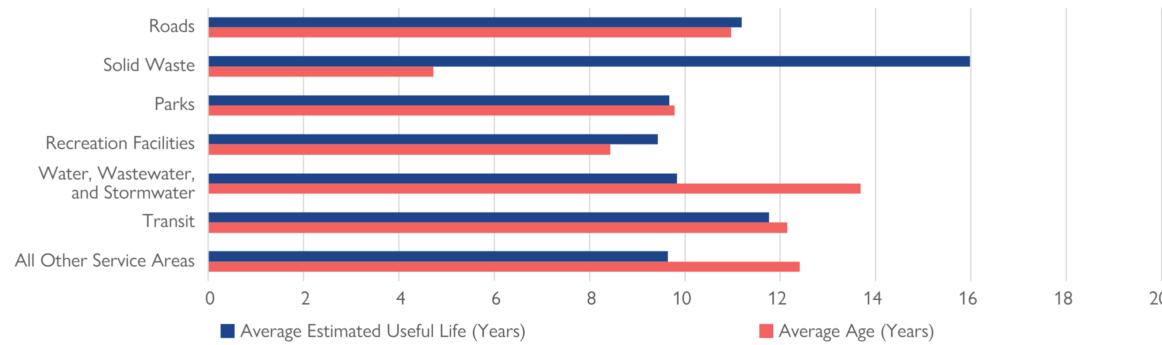
$33.5M Replacement Cost Breakdown

Figure 83



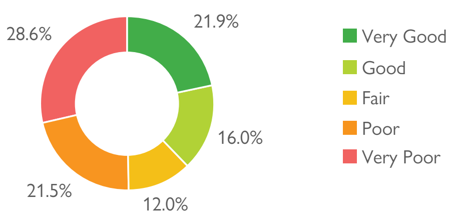
Average Age and Estimated Useful Life

Figure 84



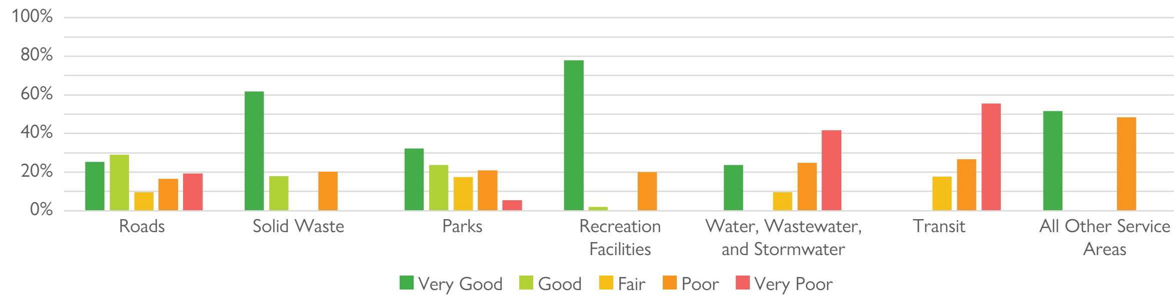
Condition Rating Summary

Figure 85

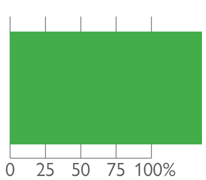


Breakdown of Condition Rating – Percentage of Cost

Figure 86



2024 Capital Funding



50yr Need: $2.9M

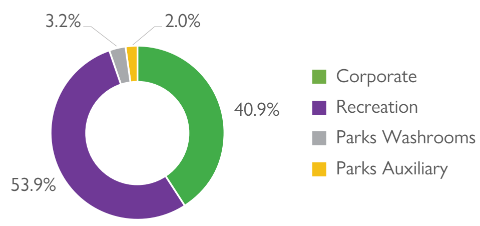
137% Funded

2024: $4.0M

19.3.7 Facilities at a Glance

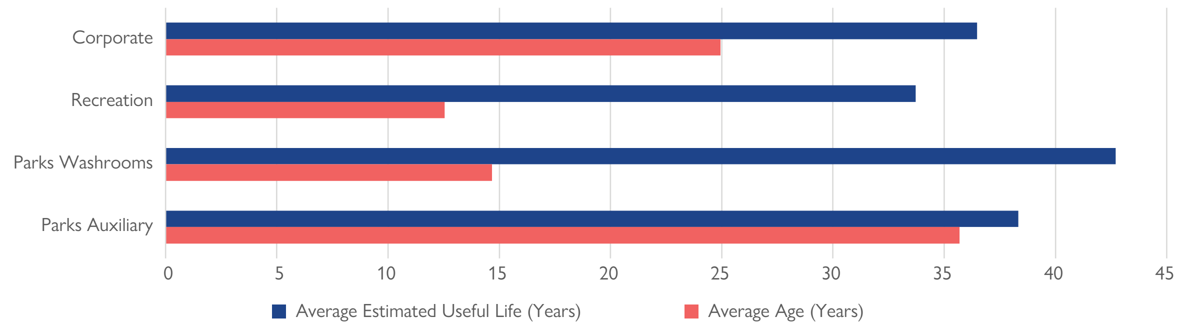
$354.0M Replacement Cost Breakdown

Figure 90



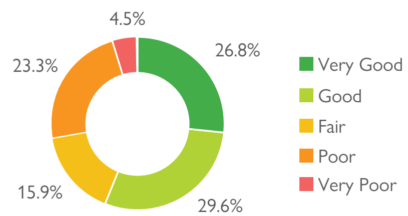
Average Age and Estimated Useful Life

Figure 91



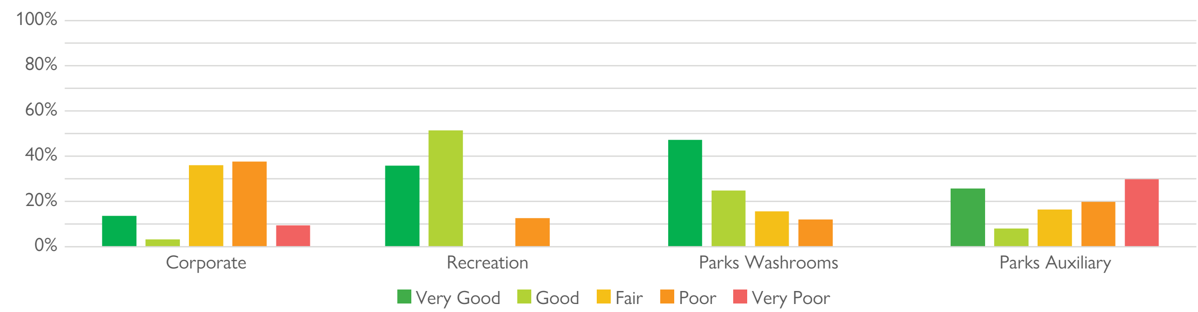
Condition Rating Summary

Figure 92

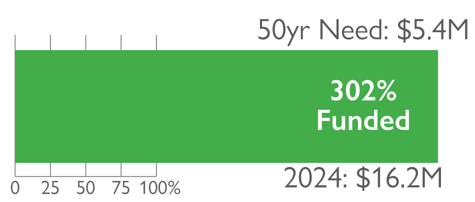


Breakdown of Condition Rating – Percentage of Cost

Figure 93



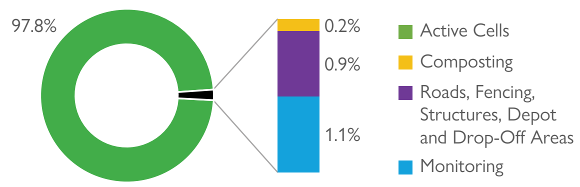
2024 Capital Funding



19.3.8 Solid Waste at a Glance

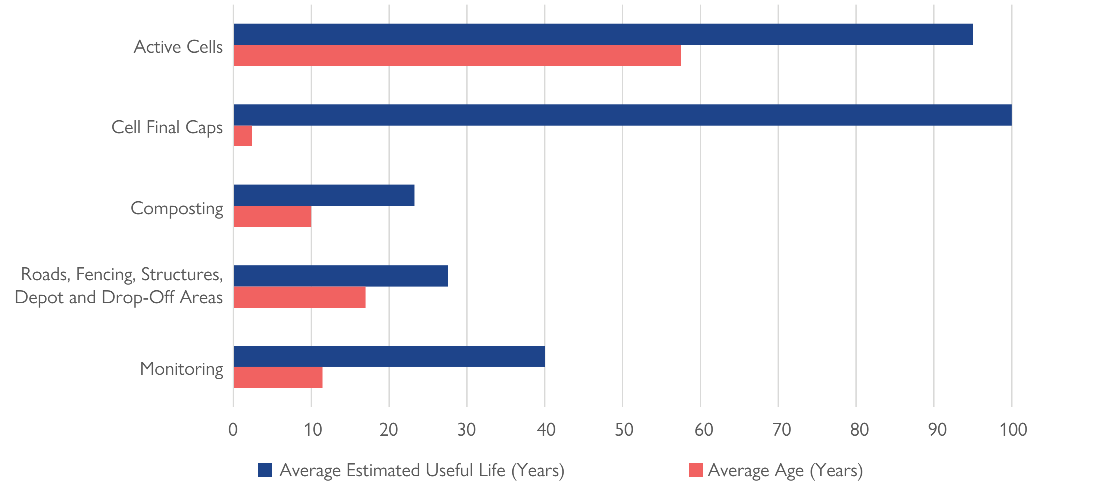
$103.4M Replacement Cost Breakdown

Figure 97



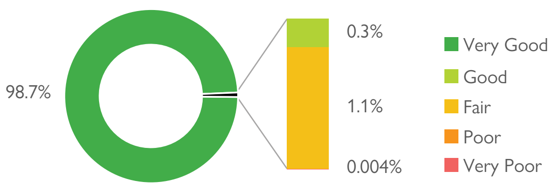
Average Age and Estimated Useful Life

Figure 98



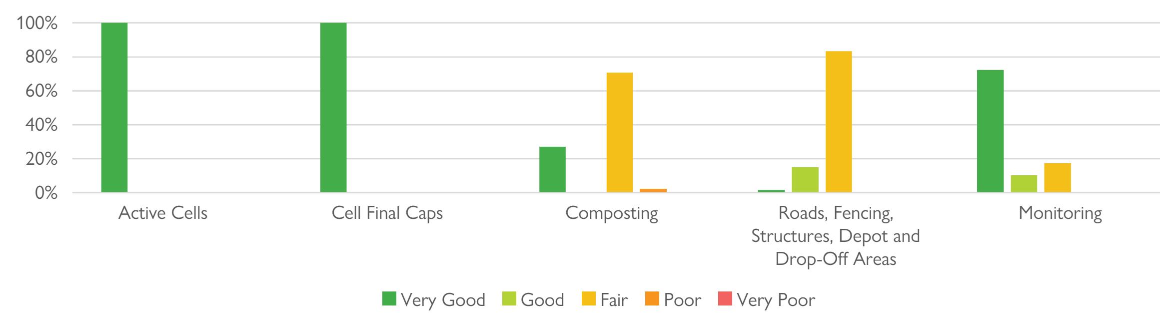
Condition Rating Summary

Figure 99

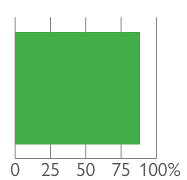


Breakdown of Condition Rating – Percentage of Cost

Figure 100



2024 Capital Funding



50yr Need: $0.067M

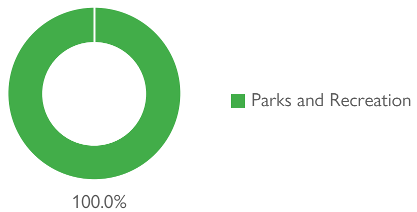
89% Funded

2024: $0.060M

19.3.9 Parks, Recreation, Culture, and Tourism at a Glance

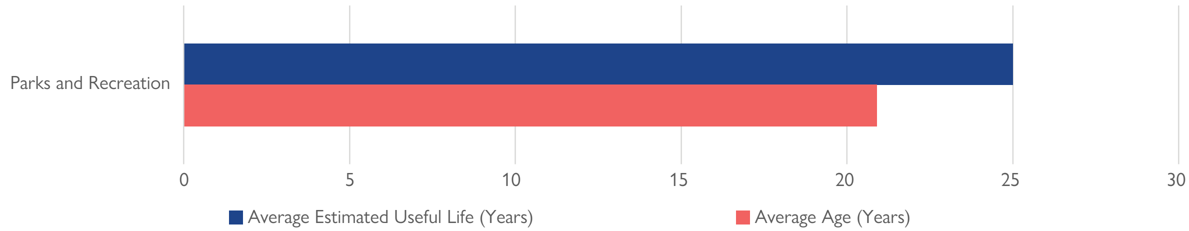
$34.9M Replacement Cost Breakdown

Figure 111



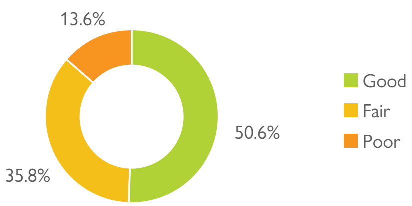
Average Age and Estimated Useful Life

Figure 112



Condition Rating Summary

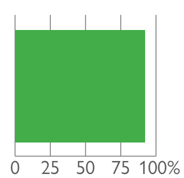
Figure 113



Breakdown of Condition Rating – Percentage of Cost

Figure omitted since there is currently only one sub-segment of assets.

2024 Capital Funding



50yr Need: $1.4M

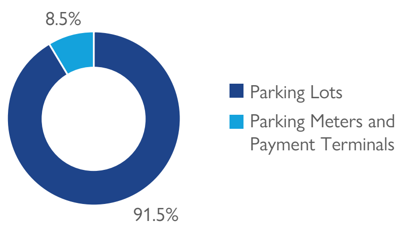
93% Funded

2024: $1.3M

19.3.10 Municipal Law Enforcement and Parking at a Glance

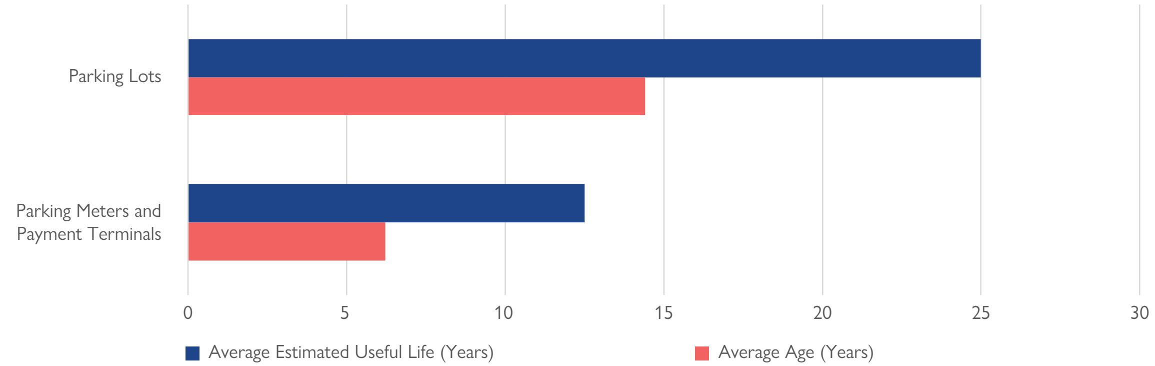
$4.4M Replacement Cost Breakdown

Figure 115



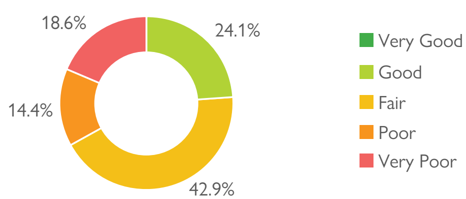
Average Age and Estimated Useful Life

Figure 116



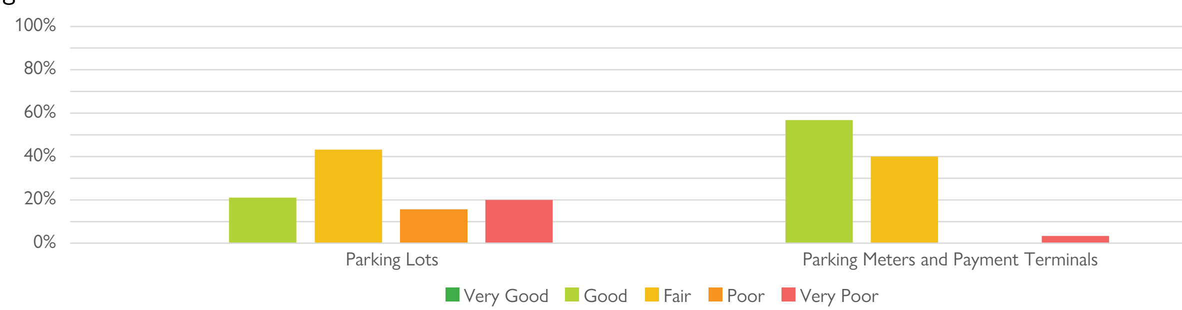
Condition Rating Summary

Figure 117

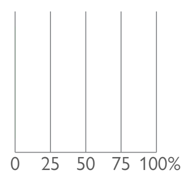


Breakdown of Condition Rating – Percentage of Cost

Figure 118



2024 Capital Funding



50yr Need: $0.13M

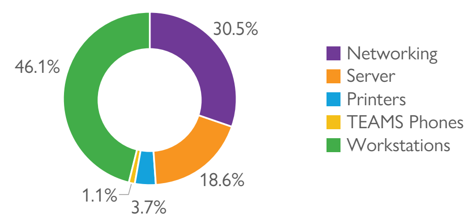
0%
Funded

2024: $0.0M

19.3.11 Information Technology at a Glance

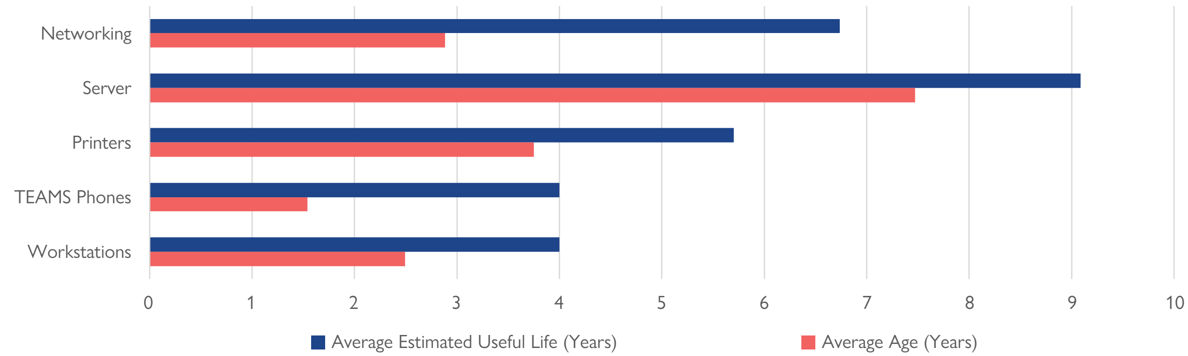
$0.9M Replacement Cost Breakdown

Figure 121



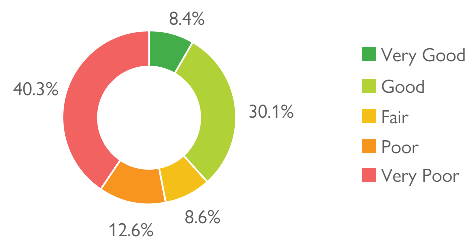
Average Age and Estimated Useful Life

Figure 122



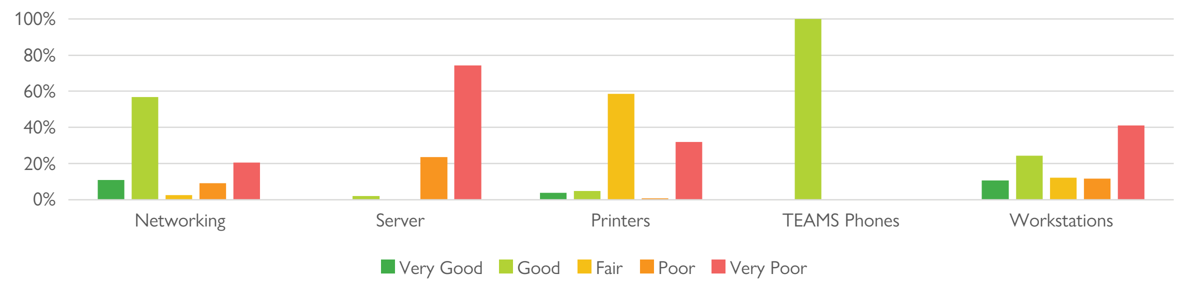
Condition Rating Summary

Figure 123

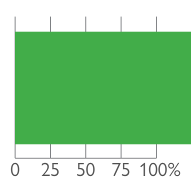


Breakdown of Condition Rating – Percentage of Cost

Figure 124



2024 Capital Funding



50yr Need: $0.16M

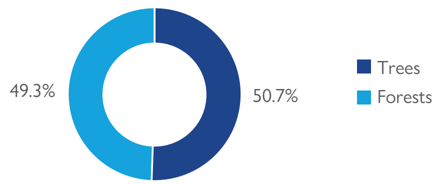
150% Funded

2024: $0.24M

19.3.12 Natural Assets at a Glance

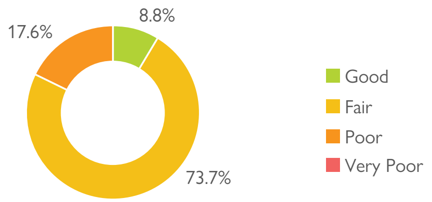
$12.6M Replacement Cost Breakdown

Figure 127

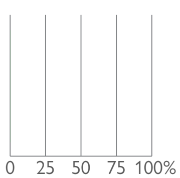


Condition Rating Summary

Figure 128



2024 Capital Funding



50yr Need: Unknown

Unknown% Funded

2024: $0.14M

Average Age and Estimated Useful Life

Figure omitted due to insufficient data.

Breakdown of Condition Rating – Percentage of Cost

Figure omitted since there is currently only one sub-segment of assets.

19.4 Mapping

MAP #1 - TRANSPORTATION INFRASTRUCTURE

Legend

Collector Roads
Arterial Roads
Local Roads
Structural Culvert
Bridge

Date created: December 2023

0 500 1,000 2,000 Metres

1 : 65,000

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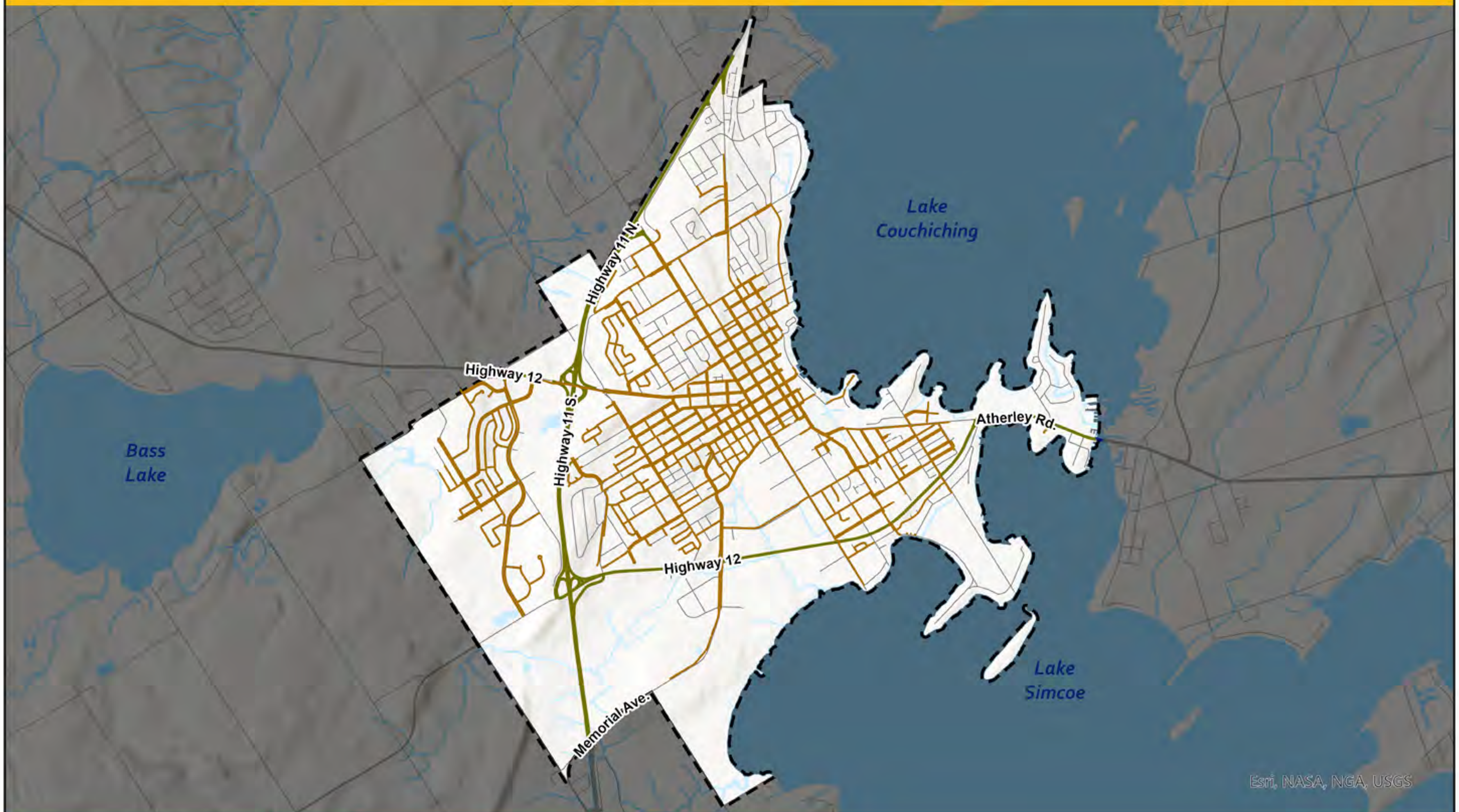
MAP #2 - SIDEWALK INFRASTRUCTURE



Date created: December 2023

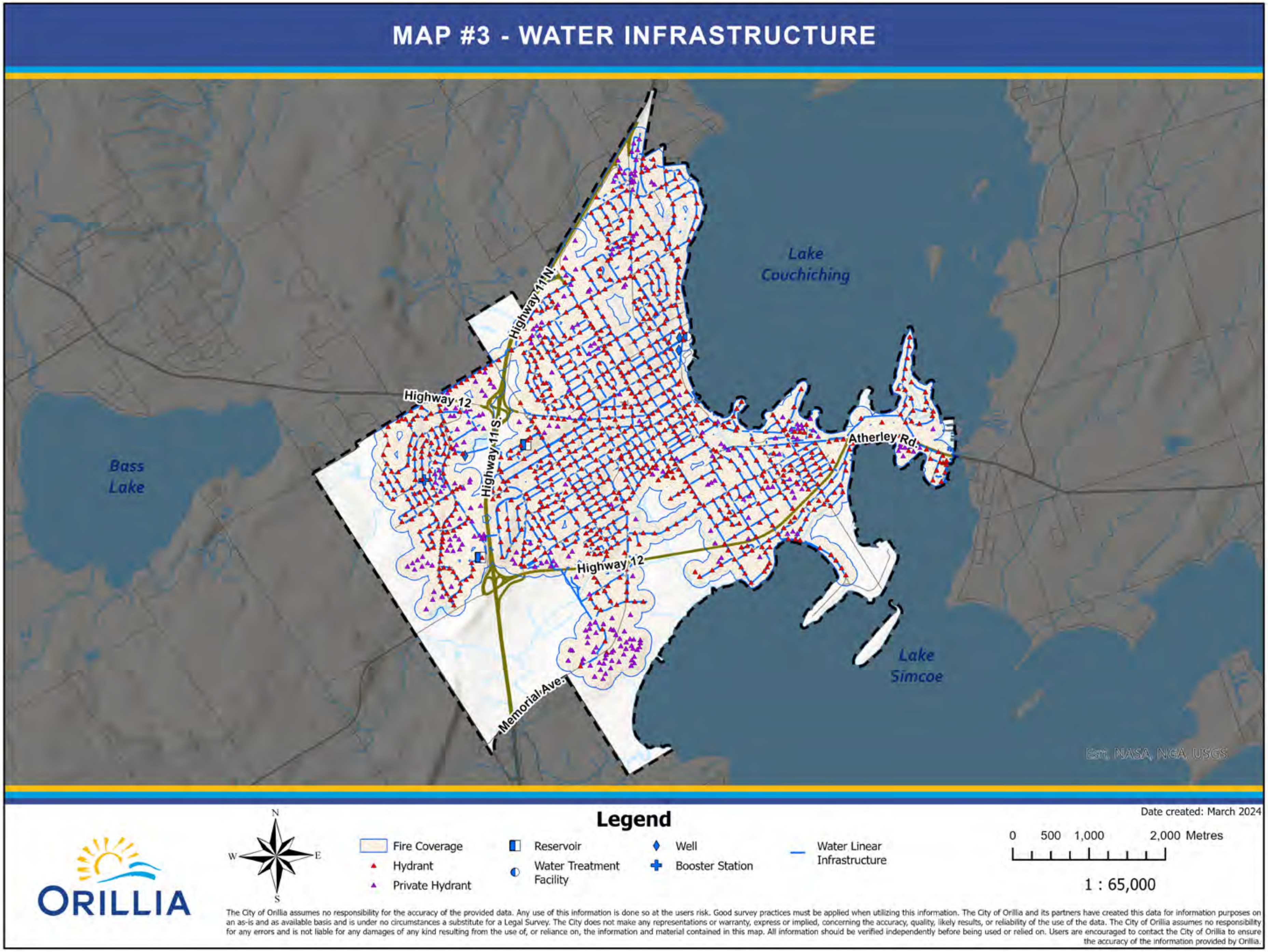
Legend

Sidewalk Infrastructure

0 500 1,000 2,000 Metres

1 : 65,000

ORILLIA


MAP #3 - WATER INFRASTRUCTURE
Lake Couchiching
Bass Lake
Lake Simcoe
Highway 11 N.
Highway 11 S.
Highway 12
Highway 12
Atherley Rd.
Memorial Ave.
Esri, NASA, NGA, USGS
Legend
Date created: March 2024
Fire Coverage
Hydrant
Private Hydrant
Reservoir
Water Treatment Facility
Well
Booster Station
Water Linear Infrastructure
0 500 1,000 2,000 Metres
1 : 65,000
N
S
E
W
ORILLIA
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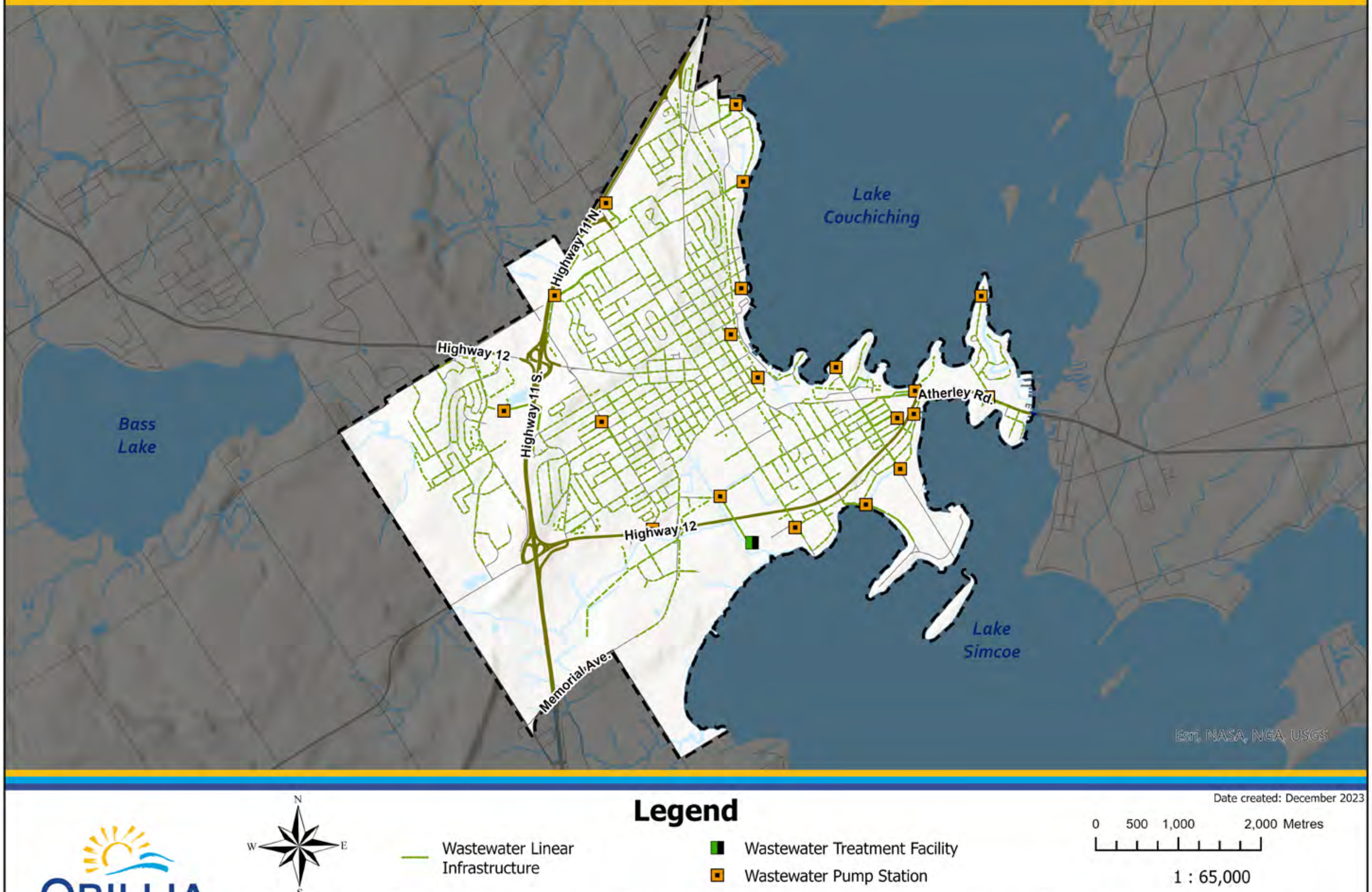
MAP #4 - WASTEWATER INFRASTRUCTURE



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MAP #5 - STORMWATER INFRASTRUCTURE

ORILLIA

N
W E
S

Legend

- Oil Grit Seperator
- Stormwater Pump Station
- Stormwater Management Pond
- Stormwater Linear Infrastructure

Date created: December 2023

0 500 1,000 2,000 Metres

1 : 65,000

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