Asset Management Plan 2025

Township of Cavan Monaghan

September 2025

psdcitywide

This Asset Management Plan was prepared by:

psdcitywide

Empowering your organization through advanced asset management, budgeting & GIS solutions

Key Statistics

$155 m	2024 Replacement Cost of Asset Portfolio
$42 k	Replacement Cost of Infrastructure Per Household
83%	Percentage of Assets in Fair or Better Condition
26%	Percentage of Assets with Assessed Condition Data
$1.5 m	Annual Capital Infrastructure Deficit
10 Years	Recommended Timeframe to reach Proposed Levels of Service
2.8%	Target Investment Rate to meet Proposed Levels of Service
1.8%	Actual Investment Rate

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1. Definition of Key Concepts

Asset Management Plan (AMP)

The Asset Management Plan (AMP) presents the outcomes of the Township's asset management program and identifies the resource requirements needed to achieve a defined level of service. The AMP represents a snapshot in time and should be updated regularly as information becomes available.

Asset Management Policy

An asset management policy represents a statement of the principles guiding the Township's approach to asset management activities. It aligns with the organizational strategic plan and provides clear direction to municipal staff on their roles and responsibilities as part of the asset management program.

Asset Management Strategy

An asset management strategy outlines the translation of organizational objectives into asset management objectives and provides a strategic overview of the activities required to meet these objectives. It provides greater detail than the policy on how the Township plans to achieve asset management objectives through planned activities and decision-making criteria.

Replacement Cost

The replacement cost of an asset is the money needed to replace the asset with a new one of similar kind and quality. It is the current price of replacing the item. For the purposes of this AMP, all replacement costs are reflective of 2024 prices and do not account for future inflation.

Reinvestment Rate

The reinvestment rate is a measurement of available or required funding relative to the total replacement cost.

Lifecyle Management Strategies

Lifecycle management strategies are coordinated activities that aid an organization in realizing the value from their assets. These strategies include mains, repairs, rehabilitation, and replacement activities.

Levels of Service

A level of service is a user-focused outcome of an asset's performance. Levels of service provide a way to measure the service outcomes that the community receives. It is a measure of how well a Township provides for its citizens in a cost-effective and efficient manner.

Community Levels of Service

Community levels of service are a simple measure or description of how the community experiences the service. It is a qualitative measure that provides insight into the service that the community receives.

Technical Levels of Service

Technical levels of service are key performance indicators (KPIs) that measure how the municipality is performing. They may or may not impact what the customer is directly experiencing, but they provide insight into asset management planning and strategies.

Current Levels of Service

Current levels of service are the past performance metrics of an asset category up to the present day.

Proposed Levels of Service

Proposed levels of service define the municipality's goal for asset performance by a defined future date.

2. Executive Summary

Municipal infrastructure delivers critical services that are foundational to the economic, social, and environmental health and growth of a community. The goal of asset management is to enable infrastructure to deliver an adequate level of service in the most cost-effective manner. This involves the ongoing review and update of infrastructure information and data alongside the development and implementation of asset management strategies and long-term financial planning.

It is important to note that this AMP represents a snapshot in time and is based on the best available processes, data, and information at the Township. Strategic asset management planning is an ongoing and dynamic process that requires continuous improvement and dedicated resources.

2.1 Scope

This Asset Management Plan (AMP) identifies the current practices and strategies that are in place to manage public infrastructure and makes recommendations where they can be further refined. Through the implementation of sound asset management strategies, the Township of Cavan Monaghan can ensure that public infrastructure is managed to support the sustainable delivery of municipal services.

This AMP includes the following asset categories:

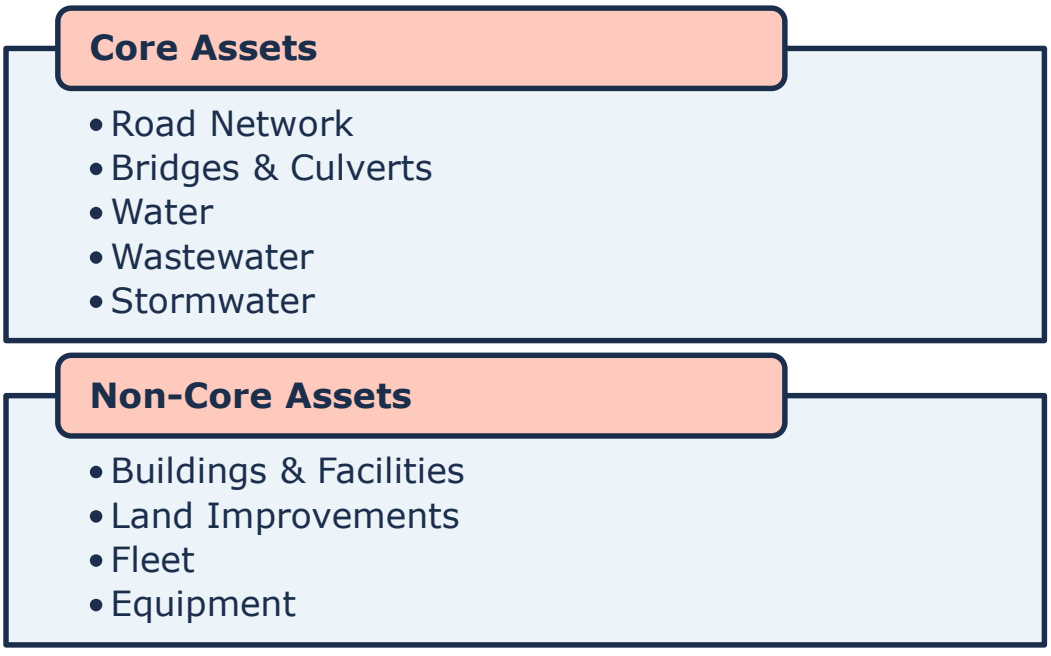

Figure 1 Core and Non-Core Asset Categories

2.2 Compliance

With the development of this AMP the Township of Cavan Monaghan has achieved compliance with July 1, 2025, requirements under O. Reg. 588/17. This includes requirements for proposed levels of service and inventory reporting for all asset categories.

2.3 Findings

The overall replacement cost of the asset categories included in this AMP totals $155.2 million. 83% of all assets analyzed in this AMP are in fair or better condition and assessed condition data was available for 26% of assets. For the remaining 74% of assets, assessed condition data was unavailable, and asset age was used to approximate condition – a data gap that persists in most municipalities. Generally, age misstates the true condition of assets, making assessments essential to accurate asset management planning, and a recurring recommendation in this AMP.

The development of a long-term, sustainable financial plan requires an analysis of whole lifecycle costs. This AMP uses a combination of proactive lifecycle strategies (paved roads and sanitary mains) and replacement only strategies (all other assets) to determine the lowest cost option to maintain the current level of service.

To meet capital replacement and rehabilitation needs for existing infrastructure, prevent infrastructure backlogs, and achieve long-term sustainability, based on replacement and rehabilitation activities defined in Citywide, the Township's average annual capital requirement totals $4.3 million. Based on a historical analysis of sustainable capital funding sources, the Township is committing approximately $2.8 million towards capital projects per year, excluding the Asset Replacement Reserve (ARR). As a result, there is currently an annual funding gap of $1.5 million.

2.4 Recommendations

A financial strategy was developed to address the annual capital funding gap. The following graphics shows annual tax change required to eliminate the Township's infrastructure deficit based on a 10-year plan:

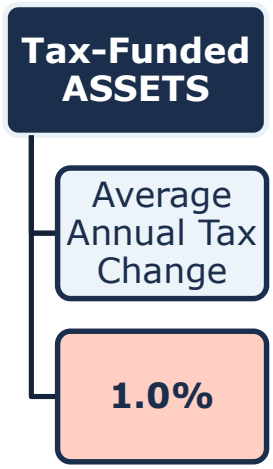

Figure 2 Proposed Tax Changes

Recommendations to guide continuous refinement of the Township's asset management program. These include:

- Review data to update and maintain a complete and accurate dataset
- Develop a condition assessment strategy with a regular schedule
- Review and update lifecycle management strategies
- Development and regularly review short- and long-term plans to meet capital requirements
- Measure current levels of service and review sustainability of proposed levels of service

3. Introduction & Context

3.1 Community Profile

Census Characteristic	Township of Cavan Monaghan	Ontario
Population 2021	10,016	14,223,942
Population Change 2016-2021	13.4	5.8%
Total Private Dwellings	3,704	5,929,250
Population Density	32.7/km^2	15.9/km^2
Land Area	306.29 km^2	892,411.76 km^2

Table 1 Township of Cavan Monaghan Community Profile

The Township of Cavan Monaghan is located 20 kilometers southwest of the City of Peterborough, in Peterborough County. It is a rural municipality, comprising several small hamlets and villages. The region was first established in the 1810s by settlers from County Cavan and County Monaghan in Ireland, and the Township's history and culture has reflected the Country.

As with many rural Townships, Cavan Monaghan was created through the amalgamation of different Townships in the late 1990s. The Township was renamed and shortened in 2007 to the Township of Cavan Monaghan.

Cavan Monaghan's current land use includes agricultural, employment, rural residential, villages and hamlets and natural areas. The proximity to the City of Peterborough and the City of Toronto, as well as convenient access to several highways, allows residents to commute to larger cities for work.

Demand in the region is notably driven by considerable population growth. Population growth is largely due to urban sprawl and housing prices. The Township generates a total revenue of $12.1 million from taxes and rates and has an annual capital funding budget of $5.5 million.

Municipal staff have acknowledged the need to operationalize asset management through the establishment of a centralized asset inventory, identifying missing infrastructure data, and ensuring that infrastructure data from new developments is consolidated. This will allow for effective decision-making and the use of risk-based project prioritization, which is essential for capital planning since major infrastructure projects are heavily reliant on the availability of grants.

Staff intend to support continuous growth within the Township by investing in critical infrastructure and advancing their asset management program.

3.2 Climate Change

Climate change can cause severe impacts on human and natural systems around the world. The effects of climate change include increasing temperatures, higher levels of precipitation, droughts, and extreme weather events. In 2019, Canada's Changing Climate Report (CCCR 2019) was released by Environment and Climate Change Canada (ECCC).

The report revealed that between 1948 and 2016, the average temperature increase across Canada was 1.7°C; moreover, during this time period, Northern Canada experienced a 2.3°C increase. The temperature increase in Canada has doubled that of the global average. If emissions are not significantly reduced, the temperature could increase by 6.3°C in Canada by the year 2100 compared to 2005 levels. Observed precipitation changes in Canada include an increase of approximately 20% between 1948 and 2012. By the late 21st century, the projected increase could reach an additional 24%. During the summer months, some regions in Southern Canada are expected to experience periods of drought at a higher rate. Extreme weather events and climate conditions are more common across Canada. Recorded events include droughts, flooding, cold extremes, warm extremes, wildfires, and record minimum arctic sea ice extent.

The changing climate poses a significant risk to the Canadian economy, society, environment, and infrastructure. The impacts on infrastructure are often a result of climate-related extremes such as droughts, floods, higher frequency of freeze-thaw cycles, extended periods of high temperatures, high winds, and wildfires. Physical infrastructure is vulnerable to damage and increased wear when exposed to these extreme events and climate variabilities. Canadian Municipalities are faced with the responsibility to protect their local economy, citizens, environment, and physical assets.

3.2.1 Cavan Monaghan's Climate Profile

The Township of Cavan Monaghan is located in southern Ontario within the County of Peterborough. The Township is expected to experience notable effects of climate change which include higher average annual temperatures, an increase in total annual precipitation, and an increase in the frequency and severity of extreme events. According to Climatedata.ca – a collaboration supported by Environment and Climate Change Canada (ECCC) – the Township of Cavan Monaghan will likely experience the following trends:

Higher Average Annual Temperature:

1. Between the years 1981 to 2010 the annual average temperature was 6.8 ºC
2. Under a high emissions scenario, the annual average temperatures are projected to increase by 1.9 ºC by the year 2050 and over 5 ºC by the end of the century.

Increase in Average Annual Precipitation:

3. Under a high emissions scenario, Cavan Monaghan is projected to experience an 7% increase in precipitation by the year 2050 and a 15% increase by the end of the century.

Increase in Frequency of Extreme Weather Events:

4. It is expected that the frequency and severity of extreme weather events will change.
5. In some areas, extreme weather events will occur with greater frequency and severity than others.

3.2.2 Integrating Climate Change into Asset Management

Asset management practices aim to deliver sustainable service delivery - the delivery of services to residents today without compromising the services and well-being of future residents. Climate change threatens sustainable service delivery by reducing the useful life of an asset and increasing the risk of asset failure. Desired levels of service can be more difficult to achieve as a result of climate change impacts such as flooding, high heat, drought, and more frequent and intense storms.

In order to achieve the sustainable delivery of services, climate change considerations should be incorporated into asset management practices. The integration of asset management and climate change adaptation observes industry best practices and enables the development of a holistic approach to risk management.

The Township has been collaborating with Peterborough County and neighbouring municipalities since 2012 to develop a number of official documents to inform sustainability, climate change adaptation and mitigation strategies. This has culminated in the development of the Greater Peterborough Area Climate Change Action Plan in 2014. This plan has identified a priority action with the Climate Change theme for each community to become active members of the Partners for Climate Protection (PCP) program and establish a baseline and climate action plan to reduce greenhouse gas emissions.

3.3 Asset Management Overview

Municipalities are responsible for managing and maintaining a broad portfolio of infrastructure assets to deliver services to the community. The goal of asset management is to minimize the lifecycle costs of delivering infrastructure services, manage the associated risks, while maximizing the value ratepayers receive from the asset portfolio.

The acquisition of capital assets accounts for only 10-20% of their total cost of ownership. The remaining 80-90% comes from operations and maintenance. This AMP focuses its analysis on the capital costs to maintain, rehabilitate and replace existing municipal infrastructure assets.

Figure 3 Total Cost of Asset Ownership

These costs can span decades, requiring planning and foresight to ensure financial responsibility is spread equitably across generations. An asset management plan is critical to this planning, and an essential element of broader asset management program. The industry-standard approach and sequence to developing a practical asset management program begins with a Strategic Plan, followed by an Asset Management Policy and an Asset Management Strategy, concluding with an Asset Management Plan.

This industry standard, defined by the Institute of Asset Management (IAM), emphasizes the alignment between the corporate strategic plan and various asset management documents. The strategic plan has a direct, and cascading impact on asset management planning and reporting.

3.3.1 Foundational Asset Management Documentation

The industry-standard approach and sequence to developing a practical asset management program begins with a Strategic Plan, followed by an Asset Management Policy and an Asset Management Strategy, concluding with an Asset Management Plan.

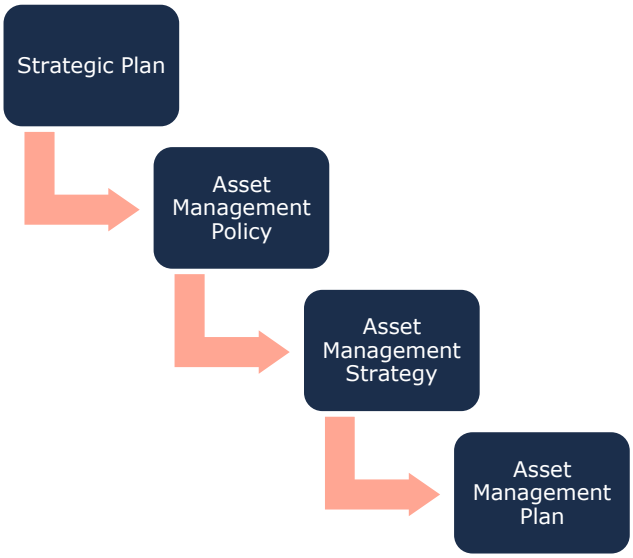

Figure 4 Foundational Asset Management Documents

This industry standard, defined by the Institute of Asset Management (IAM), emphasizes the alignment between the corporate strategic plan and various asset management documents. The strategic plan has a direct, and cascading impact on asset management planning and reporting.

Asset Management Policy

An asset management policy represents a statement of the principles guiding the Township's approach to asset management activities. It aligns with the organizational strategic plan and provides clear direction to municipal staff on their roles and responsibilities as part of the asset management program.

The Township of Cavan Monaghan's "Corporate Strategic Asset Management Policy" was approved by Council as Policy No. 2019-07 in accordance with Ontario Regulation 588/17.

The policy provides a foundation for the development of an asset management program within the Township. It covers key components that define a comprehensive asset management policy:

- The policy's statements dictate the use of asset management practices to ensure all assets meet the agreed levels of service in the most efficient and effective manner;
- The policy commits to, where appropriate, incorporating asset management in the Township's other plans;
- There are formally defined roles and responsibilities of internal staff and stakeholders;
- The guiding principles include the use of a cost/benefit analysis in the management of risk; and
- The policy statements are well defined.

Asset Management Strategy

An asset management strategy outlines the translation of organizational objectives into asset management objectives and provides a strategic overview of the activities required to meet these objectives. It provides greater detail than the policy on how the Township plans to achieve asset management objectives through planned activities and decision-making criteria.

The Township's Asset Management Policy contains many of the key components of an asset management strategy and may be expanded in future revisions or as part of a separate strategic document.

Asset Management Plan

The asset management plan (AMP) presents the outcomes of the Township's asset management program and identifies the resource requirements needed to achieve a defined level of service. The AMP typically includes the following content:

- State of Infrastructure
- Asset Management Strategies
- Levels of Service
- Financial Strategies

The AMP is a living document that should be updated regularly as additional asset and financial data becomes available. This will allow the Township to re-evaluate the state of infrastructure and identify how the organization's asset management and financial strategies are progressing.

3.3.2 Key Concepts in Asset Management

Effective asset management integrates several key components, including lifecycle management, risk & criticality, and levels of service. These concepts are applied throughout this asset management plan and are described below in greater detail.

Lifecycle Management Strategies

The condition or performance of most assets will deteriorate over time. This process is affected by a range of factors including an asset's characteristics, location, utilization, maintenance history and environment. Asset deterioration has a negative effect on the ability of an asset to fulfill its intended function, and may be characterized by increased cost, risk and even service disruption.

To ensure that municipal assets are performing as expected and meeting the needs of customers, it is important to establish a lifecycle management strategy to proactively manage asset deterioration.

There are several field intervention activities that are available to extend the life of an asset. These activities can be generally placed into one of three categories: maintenance, rehabilitation, and replacement. The following table provides a description of each type of activity and the general difference in cost.

Depending on initial lifecycle management strategies, asset performance can be sustained through a combination of maintenance and rehabilitation, but at some point, replacement is required. Understanding what effect these activities will have on the lifecycle of an asset, and their cost, will enable staff to make better recommendations.

Lifecycle Activity	Cost	Typical Associated Risks
Maintenance Activities that prevent defects or deteriorations from occurring	**$**	♦ Balancing limited resources between planned maintenance and reactive, emergency repairs and interventions; ♦ Diminishing returns associated with excessive maintenance activities, despite added costs; ♦ Intervention selected may not be optimal and may not extend the useful life as expected, leading to lower payoff and potential premature asset failure;
Rehabilitation/ Renewal Activities that rectify defects or deficiencies that are already present and may be affecting asset performance	**$$$**	♦ Useful life may not be extended as expected; ♦ May be costlier in the long run when assessed against full reconstruction or replacement; ♦ Loss or disruption of service, particularly for underground assets;
Replacement/ Reconstruction Asset end-of-life activities that often involve the complete replacement of assets	**$$$$$**	♦ Incorrect or unsafe disposal of existing asset; ♦ Costs associated with asset retirement obligations; ♦ Substantial exposure to high inflation and cost overruns; ♦ Replacements may not meet capacity needs for a larger population; ♦ Loss or disruption of service, particularly for underground assets;

Table 2 Lifecycle Management: Typical Lifecycle Interventions

The Township's approach to lifecycle management is described within each asset category outlined in this AMP. Staff will continue to evolve and innovate current practices for developing and implementing proactive lifecycle strategies to determine which activities to perform on an asset and when they should be performed to maximize useful life at the lowest total cost of ownership.

Risk & Criticality

Asset risk and criticality are essential building blocks of asset management, integral in prioritizing projects and distributing funds where they are needed most based on a variety of factors. Assets in disrepair may fail to perform their intended function, pose substantial risk to the community, lead to unplanned expenditures, and create liability for the municipality. In addition, some assets are simply more important to the community than others, based on their financial significance, their role in delivering essential services, the impact of their failure on public health and safety, and the extent to which they support a high quality of life for community stakeholders.

Risk is a product of two variables: the probability that an asset will fail, and the resulting consequences of that failure event. It can be a qualitative measurement, (i.e. low, medium, high) or quantitative measurement (i.e. 1-5), that can be used to rank assets and projects, identify appropriate lifecycle strategies, optimize short- and long-term budgets, minimize service disruptions, and maintain public health and safety.

Figure 5 Risk Equations

The approach used in this AMP relies on a quantitative measurement of risk associated with each asset. The probability and consequence of failure are each scored from 1 to 5, producing a minimum risk index of 1 for the lowest risk assets, and a maximum risk index of 25 for the highest risk assets.

Probability of Failure

Several factors can help decision-makers estimate the probability or likelihood of an asset's failure, including its condition, age, previous performance history, and exposure to extreme weather events, such as flooding and ice jams—both a growing concern for municipalities in Canada.

Consequence of Failure

Estimating criticality also requires identifying the types of consequences that the organization and community may face from an asset's failure, and the magnitude of those consequences. Consequences of asset failure will vary across the infrastructure portfolio; the failure of some assets may result primarily in high direct financial cost but may pose limited risk to the community. Other assets may have a relatively minor financial value, but any downtime may pose significant health and safety hazards to residents.

Table 3 illustrates the various types of consequences that can be integrated in developing risk and criticality models for each asset category and segments within. We note that these consequences are common, but not exhaustive.

Type of Consequence	Description
Direct Financial	Direct financial consequences are typically measured as the replacement costs of the asset(s) affected by the failure event, including interdependent infrastructure.
Economic	Economic impacts of asset failure may include disruption to local economic activity and commerce, business closures, service disruptions, etc. Whereas direct financial impacts can be seen immediately or estimated within hours or days, economic impacts can take weeks, months and years to emerge, and may persist for even longer.
Socio-political	Socio-political impacts are more difficult to quantify and may include inconvenience to the public and key community stakeholders, adverse media coverage, and reputational damage to the community and the Municipality.
Environmental	Environmental consequences can include pollution, erosion, sedimentation, habitat damage, etc.
Public Health and Safety	Adverse health and safety impacts may include injury or death, or impeded access to critical services.
Strategic	These include the effects of an asset's failure on the community's long-term strategic objectives, including economic development, business attraction, etc.

Table 3 Risk Analysis: Types of Consequences of Failure

This AMP includes a preliminary evaluation of asset risk and criticality. Each asset has been assigned a probability of failure score and consequence of failure score based on available asset data. These risk scores can be used to prioritize maintenance, rehabilitation, and replacement strategies for critical assets.

Levels of Service

A level of service (LOS) is a measure of the services that the Township is providing to the community and the nature and quality of those services. Within each asset category in this AMP, technical metrics and qualitative descriptions that measure both technical and community levels of service have been established and measured as data is available.

The Township measures the level of service provided at two levels: Community Levels of Service, and Technical Levels of Service.

Community Levels of Service

Community levels of service are a simple, plain language description or measure of the service that the community receives. For core asset categories as applicable (Roads, Bridges & Culverts, Water, Wastewater, Stormwater) the province, through O. Reg. 588/17, has provided qualitative descriptions that are required to be included in this AMP.

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 mostly quantitative measures and tend to reflect the impact of the Township's asset management strategies on the physical condition of assets or the quality/capacity of the services they provide.

For core asset categories as applicable, the province, through O. Reg. 588/17, has also provided technical metrics that are required to be included in this AMP.

Current and Proposed Levels of Service

Current LOS are the past performance metrics of an asset category up until present day. In contrast, Proposed LOS looks toward the municipality's goal for asset performance by a defined future date.

It is important to note that O. Reg 588/17 does not dictate which proposed LOS metrics municipality's need to strive for. A proposed LOS will be very specific to each community's resident desires, political goals, and financial capacity. This can range from increasing service levels and costs, to maintaining or even reducing current performance in order to mitigate future cost increases. Regardless of the proposed LOS chosen, O. Reg 588/17 requires municipalities to demonstrate the achievability of their selected metrics.

3.4 Scope & Methodology

3.4.1 Asset Categories for this AMP

This asset management plan for the Township of Cavan Monaghan is produced in compliance with O. Reg. 588/17. The July 2025 deadline under the regulation—the third of three AMPs—requires analysis of core and non-core asset categories, as well as proposed service levels and how to fund them.

The AMP summarizes the state of the infrastructure for the Township's asset portfolio, establishes current levels of service and the associated technical and customer oriented key

metrics, outlines lifecycle strategies for optimal asset management and performance, and provides financial strategies to reach sustainability for the asset categories listed below.

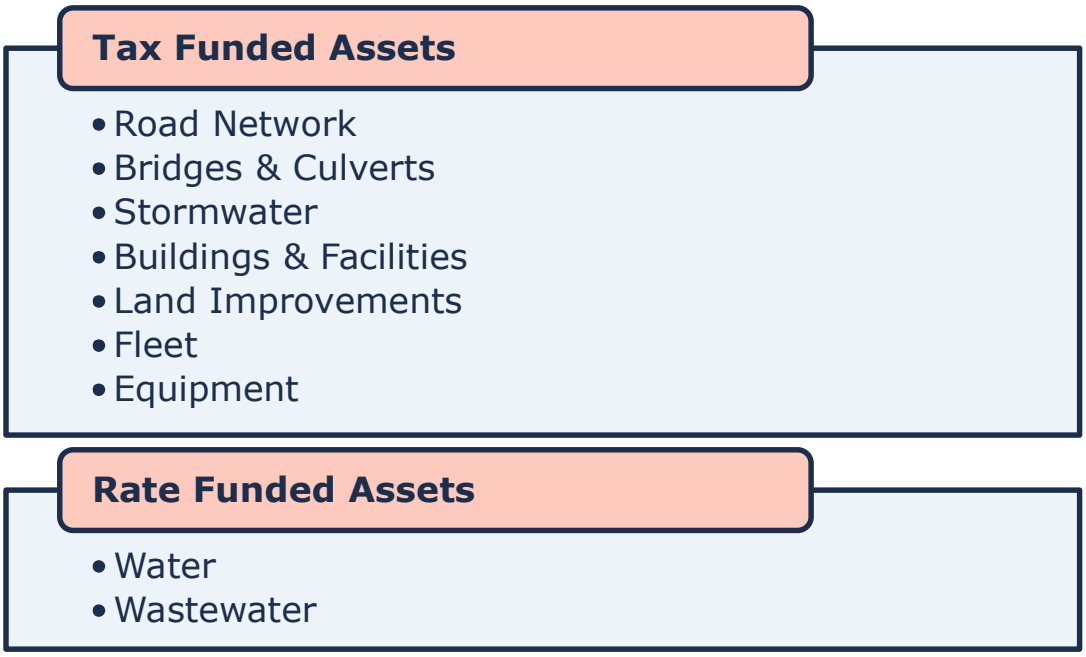

Figure 6 Tax Funded and Rate Funded Asset Categories

3.4.2 Data Effective Date

It is important to note that this plan is based on data as of **December 2024**; therefore, it represents a snapshot in time using the best available processes, data, and information at the Township. Strategic asset management planning is an ongoing and dynamic process that requires continuous data updates and dedicated data management resources.

3.4.3 Deriving Replacement Costs

There are a range of methods to determine the replacement cost of an asset, and some are more accurate and reliable than others. This AMP relies on two methodologies:

User-Defined Cost and Cost Per Unit

Based on costs provided by municipal staff which could include average costs from recent contracts; data from engineering reports and assessments; staff estimates based on knowledge and experience.

Cost Inflation / CPI Tables

Historical costs of the assets are inflated based on Consumer Price Index or Non-Residential Building Construction Price Index.

User-defined costs based on reliable sources are a reasonably accurate and reliable way to determine asset replacement costs. Cost inflation is typically used in the absence of reliable replacement cost data. It is a reliable method for recently purchased and/or constructed assets

where the total cost is reflective of the actual costs that the Township incurred. As assets age, and new products and technologies become available, cost inflation becomes a less reliable method.

3.4.4 Estimated Service Life & Service Life Remaining

The estimated useful life (EUL) of an asset is the period over which the Township expects the asset to be available for use and remain in service before requiring replacement or disposal. The EUL for each asset in this AMP was assigned according to the knowledge and expertise of municipal staff and supplemented by existing industry standards when necessary.

By using an asset's in-service data and its EUL, the Township can determine the service life remaining (SLR) for each asset. Using condition data and the asset's SLR, the Township can more accurately forecast when it will require replacement. The SLR is calculated as follows:

Figure 7 Service Life Remaining Calculation

3.4.5 Reinvestment Rate

As assets age and deteriorate they require additional investment to maintain a state of good repair. The reinvestment of capital funds, through asset renewal or replacement, is necessary to sustain an adequate level of service. The reinvestment rate is a measurement of available or required funding relative to the total replacement cost.

By comparing the actual vs. target reinvestment rate the Township can determine the extent of any existing funding gap. The reinvestment rate is calculated as follows:

Figure 8 Target Reinvestment Rate Calculation

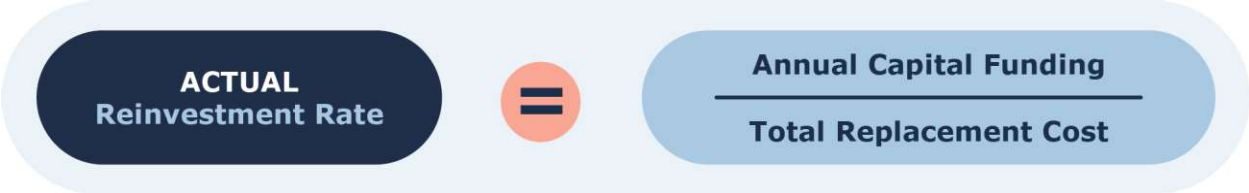

Figure 9 Actual Reinvestment Rate Calculation

3.4.6 Deriving 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 and costly rehabilitation or replacement and ensures that lifecycle activities occur at the right time to maximize asset value and useful life.

A condition assessment rating system provides a standardized descriptive framework that allows comparative benchmarking across the Township's asset portfolio. The table below outlines the condition rating system used in this AMP 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. When assessed condition data is not available, service life remaining is used to approximate asset condition.

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

Table 4 Standard Condition Rating Scale

The analysis in this AMP is based on assessed condition data only as available. In the absence of assessed condition data, asset age is used as a proxy to determine asset condition.

3.5 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)[1]. Along with creating better performing organizations, 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.

Figure 10 below outlines key reporting requirements under O. Reg 588/17 and the associated timelines.

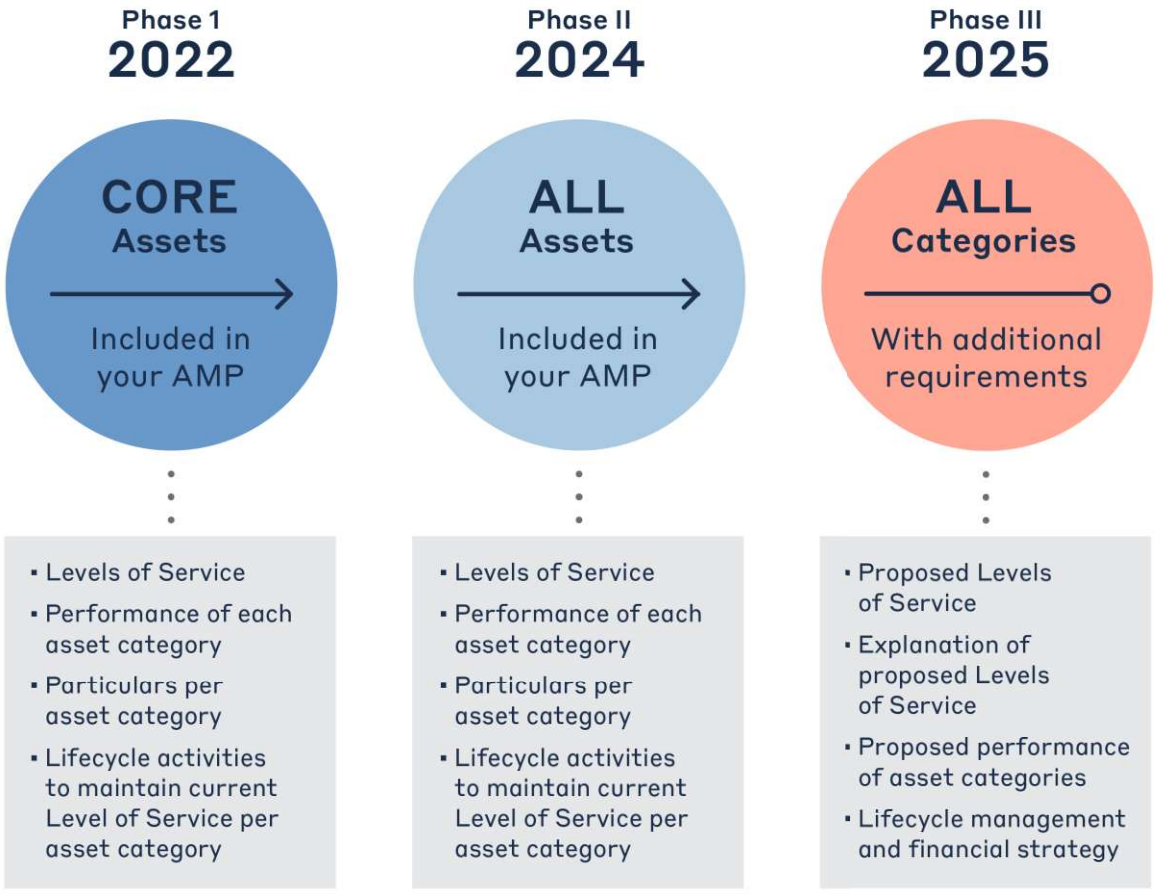

Figure 10 O. Reg. 588/17 Requirements and Reporting Deadlines

[1] O. Reg. 588/17: Asset Management Planning for Municipal Infrastructure https://www.ontario.ca/laws/regulation/170588

3.5.1 O. Reg. 588/17 Compliance Review

Requirement	O. Reg. 588/17 Section	AMP Section Reference	Status
Summary of assets in each category	S.5(2), 3(i)	6.1 – 14.1	Complete
Replacement cost of assets in each category	S.5(2), 3(ii)	6.1 – 14.1	Complete
Average age of assets in each category	S.5(2), 3(iii)	6.3 – 14.3	Complete
Condition of core assets in each category	S.5(2), 3(iv)	6.2 – 14.2	Complete
Description of municipality's approach to assessing the condition of assets in each category	S.5(2), 3(v)	6.4 – 14.4	Complete
Current levels of service in each category	S.5(2), 1(i-ii)	6.7 – 14.7	Complete
Current performance measures in each category	S.5(2), 2	6.7 – 14.7	Complete
Lifecycle activities needed to maintain current levels of service for 10 years	S.5(2), 4	6.4 – 14.4	Complete
Costs of providing lifecycle activities for 10 years	S.5(2), 4	6.5 – 14.5	Complete
Growth considerations	S.6(1), 5	15.1 – 15.2	Complete
Proposed levels of service for each category for next 10 years	S.6(1), 1(i-ii)	6.8 – 14.8	Complete
Explanation of appropriateness of proposed levels of service	S.6(1), 2(i-iv)	5.2	Complete
Lifecycle management activities for proposed levels of service	S.6(1), 4(i)	5.2	Complete
10-year capital costs for proposed levels of service	S.6(1), 4(ii)	Appendix B	Complete
Annual funding availability projections	S.6(1), 4(iii)	5.2	Complete

Table 5 O. Reg. 588/17 Compliance Review

Portfolio Overview

4. State of the Infrastructure

The state of the infrastructure (SOTI) summarizes the inventory, condition, age profiles, and other key performance indicators for the Township's infrastructure portfolio. These details are presented for all core and non-core asset categories.

4.1 Asset Hierarchy & Data Classification

Asset hierarchy explains the relationship between individual assets and their components, and a wider, more expansive network and system. How assets are grouped in a hierarchy structure can impact how data is interpreted. Assets were structured to support meaningful, efficient reporting and analysis. Key category details are summarized at asset segment level.

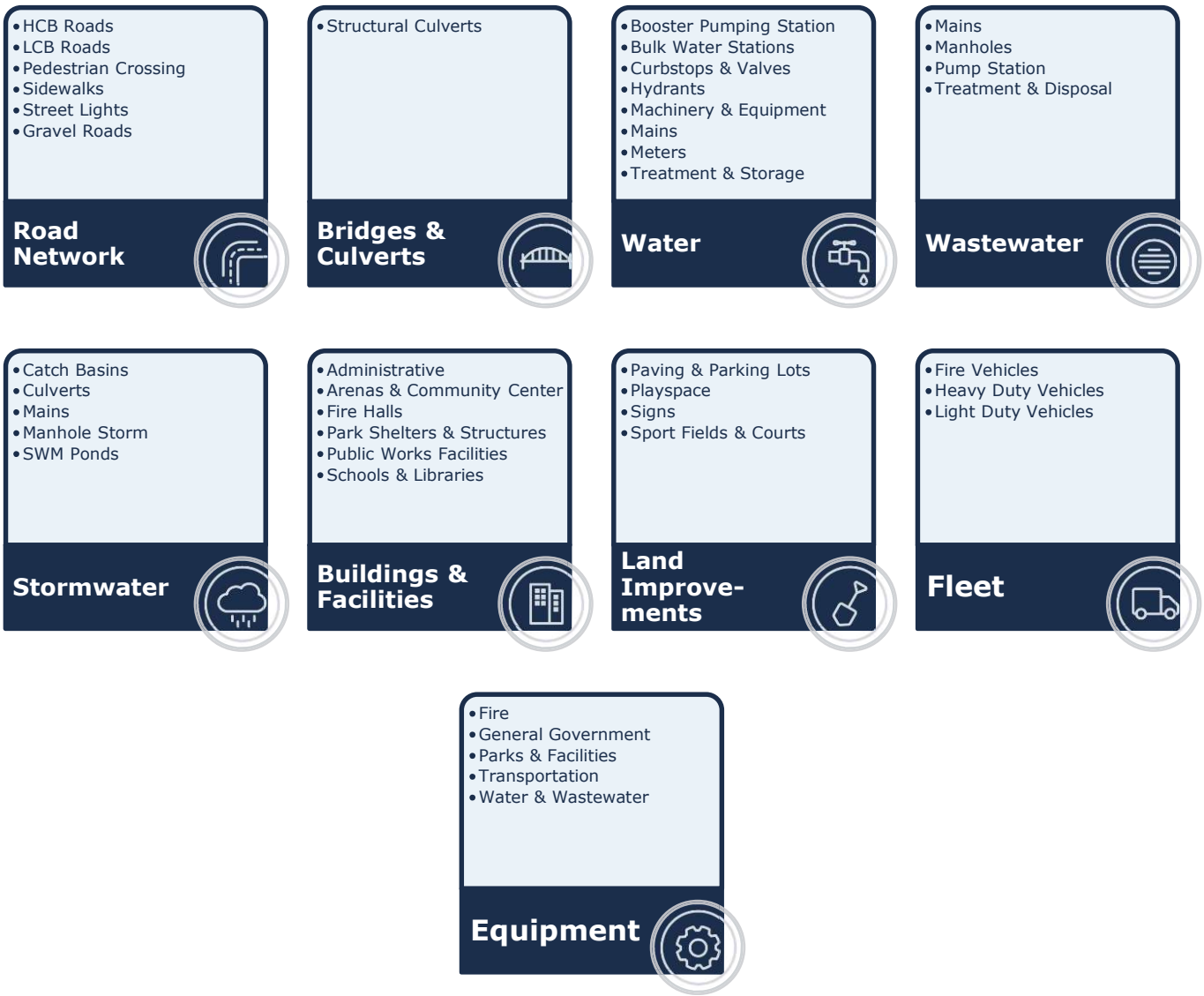

Figure 11 Asset Hierarchy and Data Classification

4.2 Portfolio Overview

4.2.1 Total Replacement Cost of Asset Portfolio

The nine asset categories analyzed in this Asset Management Plan have a total current replacement cost of $155.2 million. This estimate was calculated using user-defined costing, as well as inflation of historical or original costs to current date. This estimate reflects replacement of historical assets with similar, not necessarily identical, assets available for procurement today. The replacement cost of the portfolio represents the total cost required if all assets were to be replaced today. Figure 12 illustrates the replacement cost of each asset category; at 28% of the total portfolio, the wastewater network forms the largest share of the Township's asset portfolio, followed by the buildings and facilities at 25%.

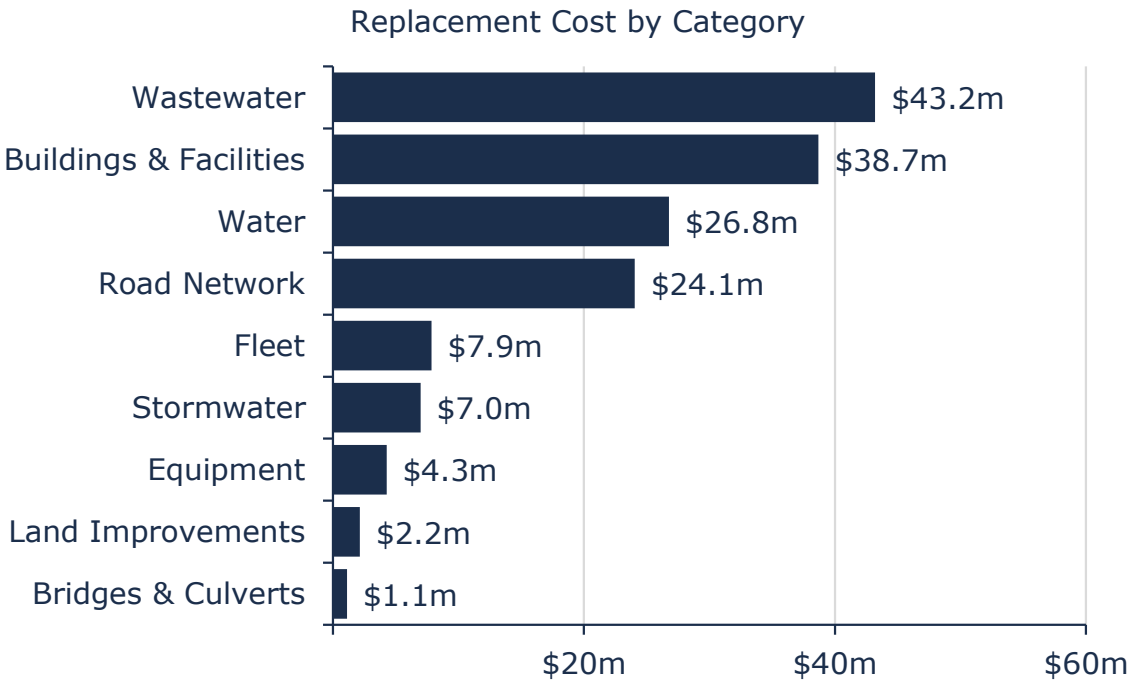

Figure 12 Current Replacement Cost by Asset Category

4.2.2 Target vs. Actual Reinvestment Rate

The graph below depicts funding gaps by comparing the target to the current reinvestment rate. To meet the existing long-term capital requirements, based on replacement and rehabilitation activities defined in Citywide, the Township requires an annual capital investment of $4.3 million, for a target portfolio reinvestment rate of 2.8%. Currently, annual investment from sustainable revenue sources, excluding the ARR, is $2.8 million, for a current portfolio reinvestment rate of 1.8%. Target and current re-investment rates by asset category are detailed below.

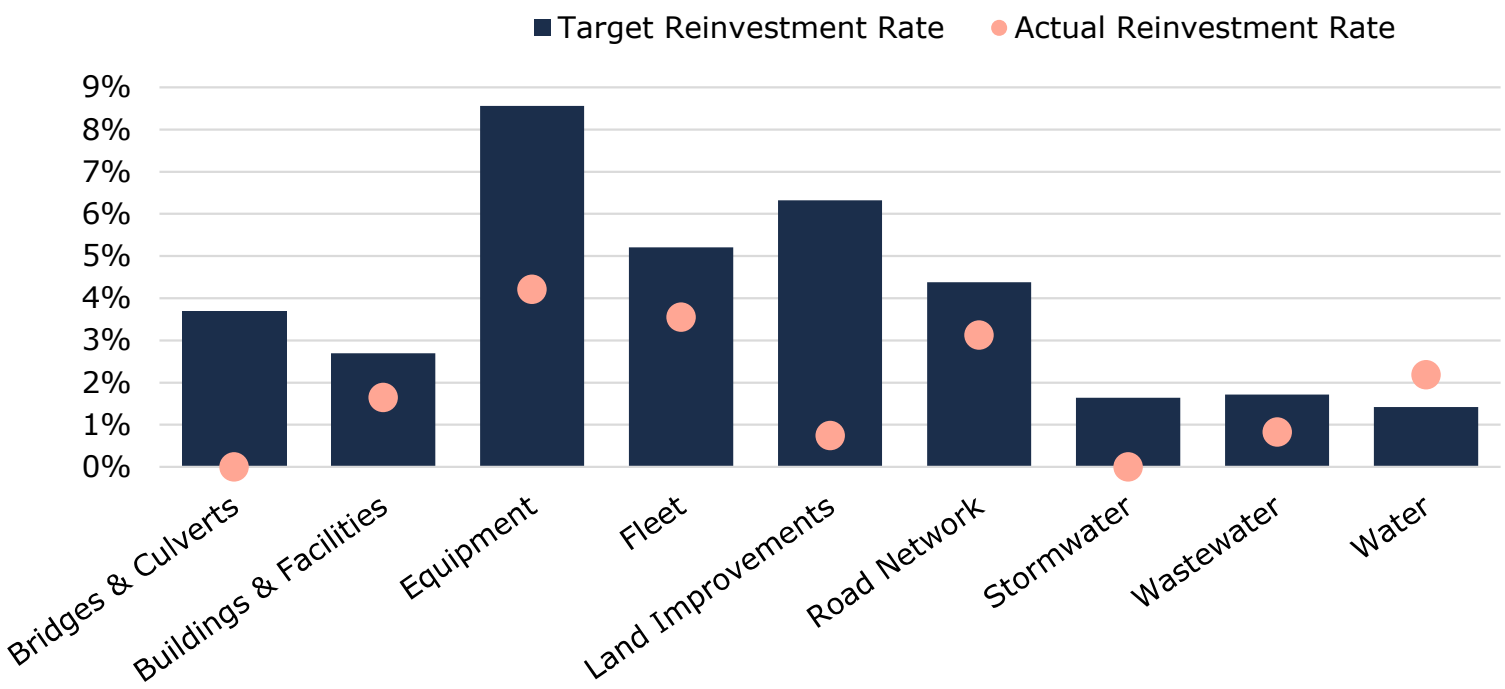

Figure 13 Current Vs. Target Reinvestment Rate

4.2.3 Condition of Asset Portfolio

Condition data was available for majority of the road network, all bridges & culverts, and some stormwater and water assets. For all remaining assets, including major infrastructure such as sewer mains and buildings, age was used as an approximation of condition for these assets. Age-based condition estimations can skew data and lead to potential under- or overstatement of asset needs.

Further, when past assessed condition data was available, it was projected to the current year-end (2024). This 'projected condition' can generate lower condition ratings than those established at the time of the original condition assessment. The rate of this deterioration will also depend on lifecycle curves used to project condition over time.

Figure 14 and Figure 15 summarize asset condition at the portfolio and category levels, respectively. Based on both assessed condition and age-based analysis, 83% of the Township's infrastructure portfolio is in fair or better condition, with the remaining 17% in poor or worse condition. Typically, assets in poor or worse condition may require replacement or major rehabilitation in the immediate or short-term. Targeted condition assessments may help further refine the list of assets that may be candidates for immediate intervention, including potential replacement or reconstruction.

Similarly, assets in fair condition should be monitored for disrepair over the medium term. Keeping assets in fair or better condition is typically more cost-effective than addressing assets needs when they enter the latter stages of their lifecycle or decline to a lower condition rating, e.g., poor or worse.

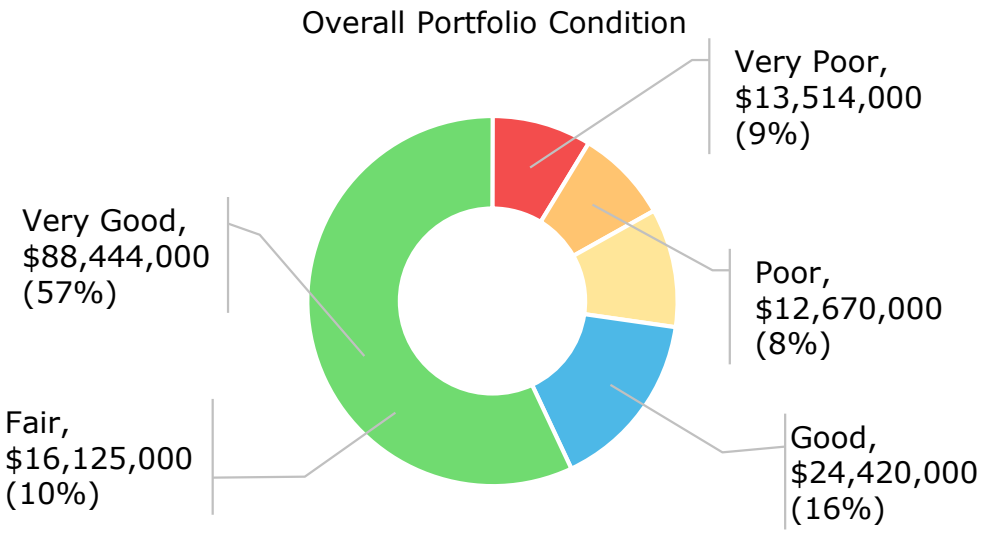

Figure 14 Asset Condition: Portfolio Overview

As further illustrated in Figure 15 at the category level, the majority of major, core infrastructure including roads and structural culverts are in fair or better condition, based on in-field condition assessment data. See Table 6 for details on how condition data was derived for each asset segment.

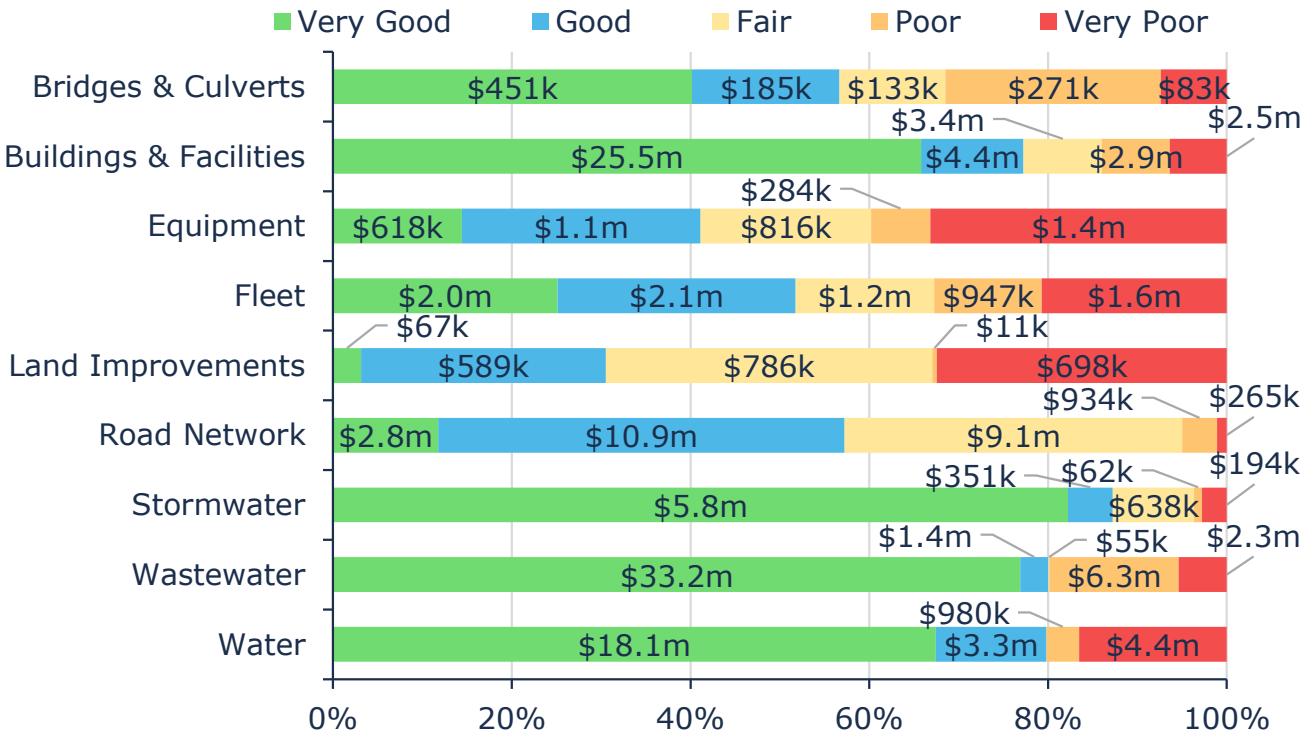

Figure 15 Asset Condition by Asset Category

Source of Condition Data

This AMP relies on assessed condition for 26% of assets, based on and weighted by replacement cost. For the remaining assets, age is used as an approximation of condition.

The Township is actively working towards developing a process for condition assessments in house to better determine asset life. This includes the implementation of a maintenance module for water and wastewater assets.

Assessed condition data is invaluable in asset management planning as it reflects the true condition of the asset and its ability to perform its functions. Table 6 below identifies the source of condition data used throughout this AMP.

Asset Category	Asset Segment(s)	% of Assets with Assessed Conditions	Source of Condition Data
Road Network	Paved Roads (HCB) Paved Roads (LCB)	100%	2024 Road Needs Study
	Sidewalks	64%	Assessments/Benchmarking
Bridges & Culverts	Structural Culverts	100%	2024 OSIM Report
Water	All	33%	Assessments/Benchmarking
Wastewater	All	20%	Assessments/Benchmarking
Stormwater	All	0%	Age-Based
Buildings & Facilities	All	0%	Age-Based
Land Improvements	All	0%	Age-Based
Fleet	All	0%	Age-Based
Equipment	All	0%	Age-Based

Table 6 Source of Condition Data

4.2.4 Service Life Remaining

Based on asset age, available assessed condition data and estimated useful life, 17% of the Township's assets will require replacement within the next 10 years. Refer to Appendix B – 10-Year Capital Requirements.

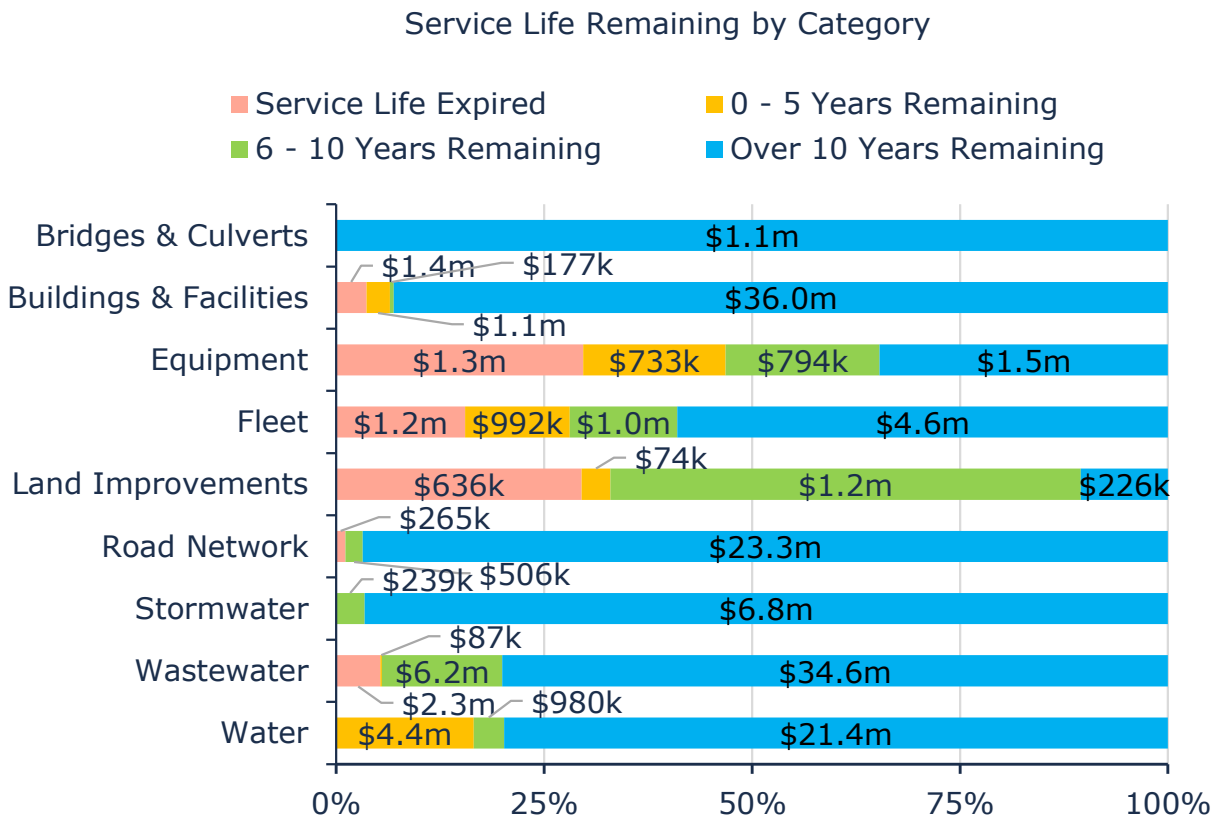

Figure 16 Service Life Remaining by Asset Category

4.2.5 Risk Matrix

Using the risk equation and preliminary risk models, Figure 17 shows how assets across the different asset categories are stratified within a risk matrix.

Figure 17 Risk Matrix: All Assets

The analysis shows that based on current risk models, approximately 11% of the Township's assets, with a current replacement cost of approximately $16.6 million, carry a risk rating of 15 or higher (red) out of 25. Assets in this group may have a high probability of failure based on

available condition data and age-based estimates and were considered to be most essential to the Township.

As many assets in the Township's database are reliant on age-based condition data, this may result in these assets reporting a higher risk than actual. All risk ratings are an estimate based on the best available information, and do not necessarily mean imminent risk of failure. As new asset attribute information and condition assessment data are integrated with the asset register, asset risk ratings will evolve, resulting in a redistribution of assets within the risk matrix. Staff should also continue to calibrate risk models.

We caution that since risk ratings rely on many factors beyond an asset's physical condition or age, assets in a state of disrepair can sometimes be classified as low-risk, despite their poor condition rating. In such cases, although the probability of failure for these assets may be high, their consequence of failure ratings were determined to be low based on the attributes used and the data available.

Similarly, assets with very high condition ratings can receive a moderate to high-risk rating despite a low probability of failure. These assets may be deemed as highly critical to the Township based on their costs, economic importance, social significance, and other factors. Continued calibration of an asset's criticality and regular data updates are needed to ensure these models more accurately reflect an asset's actual risk profile.

4.2.6 Forecasted Capital Requirements

Aging assets require maintenance, rehabilitation, and replacement. Figure 18 below illustrates the cyclical short-, medium- and long-term infrastructure replacement requirements for all asset categories analyzed in this AMP over a 10-year time horizon. On average, $4.3 million is required each year to remain current with capital replacement needs for the Township's asset portfolio (red dotted line). Although actual spending may fluctuate substantially from year to year, this figure is a useful benchmark for annual capital expenditure targets (or allocations to reserves) to ensure projects are not deferred and replacement needs are met as they arise. This figure relies on age and available condition data.

The chart also illustrates a backlog of more than $7.1 million, comprising assets that remain in service beyond their estimated useful life. It is unlikely that all such assets are in a state of disrepair, requiring immediate replacements. This makes continued and expanded targeted and consistent condition assessments integral. Risk frameworks, proactive lifecycle strategies, and levels of service targets can then be used to prioritize projects, continuously refine estimates for both backlogs and ongoing capital needs, and help select the right treatment for each asset. In addition, more effective componentization of buildings will improve these projections, including backlog estimates.

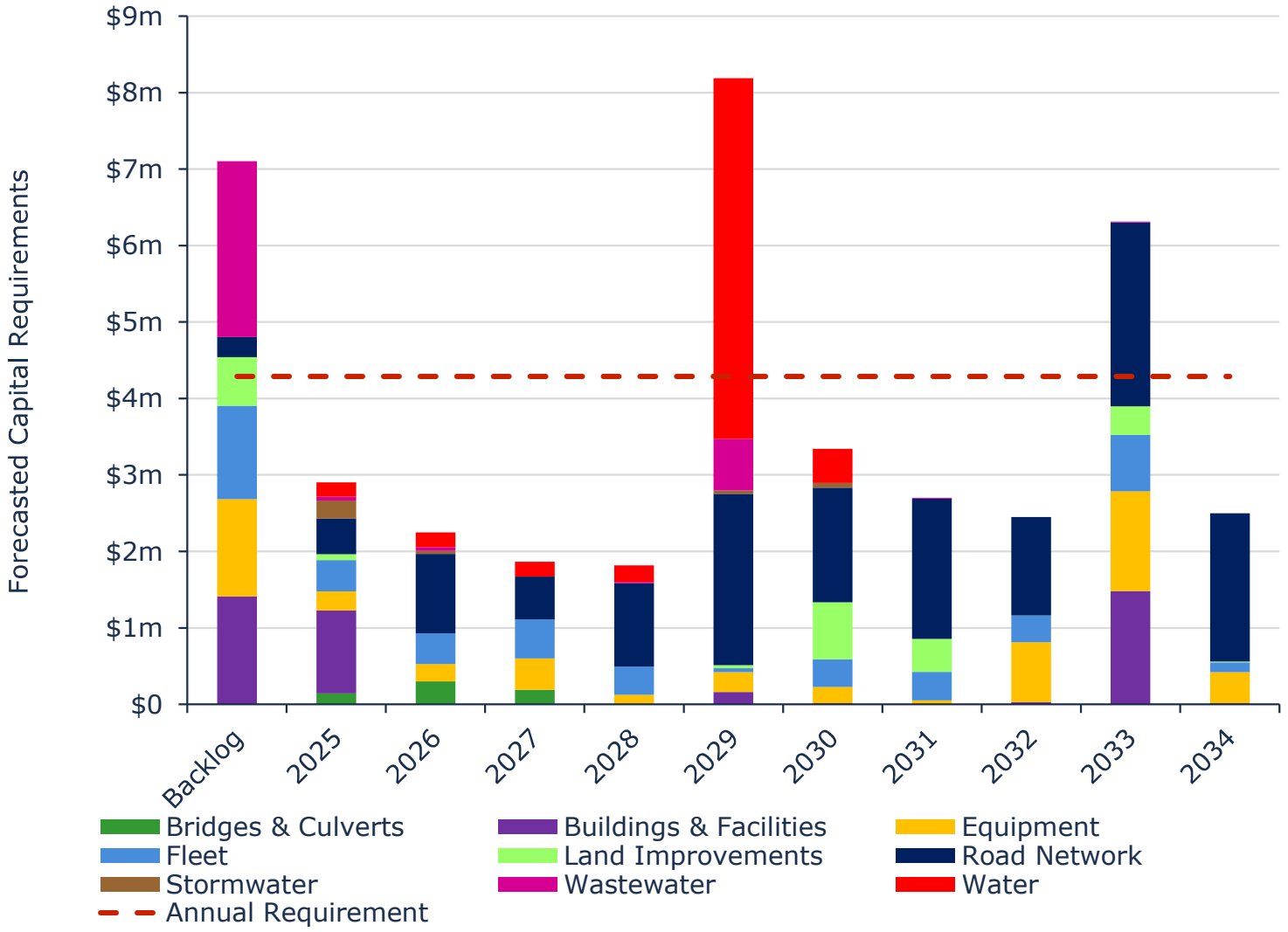

Figure 18 Capital Replacement Needs: Portfolio Overview 2025-2034

Proposed Levels of Service

5. Proposed Levels of Service Analysis

5.1 Overview

5.1.1 O. Reg. 588/17 Proposed Levels of Service Requirements

The third iteration of municipal Asset Management Plans required under O. Reg. 588/17 requires the evaluation of levels of service (LOS) that includes:

- Proposed LOS options (i.e. increase, decrease, or maintain current LOS) and the risks associated with these options.
- How the proposed LOS may differ from current LOS.
- Whether the proposed LOS are achievable; and
- The municipality's ability to afford proposed LOS.

Additionally, a lifecycle management and financial strategy to support the proposed LOS must be identified for a period of 10 years with specific reporting on:

- Identification of lifecycle activities needed to provide the proposed LOS.
- Annual costs over the next 10 years to achieve the proposed LOS; and
- Identification of proposed funding projected to be available.

5.1.2 Considerations

Proposed LOS for the Township have been developed through comprehensive engagement with Township staff. In order to achieve any target LOS goal, careful consideration should be given to the following:

Financial Impact Assessments

- Assess historical expenditures/budget patterns to gauge feasibility of increasing budgets to achieve increased service levels.
- Consider implications of LOS adjustments on other services and other infrastructure programs (i.e. trade-offs).

Infrastructure Condition Assessments

- Regularly assess the condition of critical infrastructure components.
- Use standardized condition assessment protocols (where possible) to quantify the state of the infrastructure.
- Identify non-critical components where maintenance could potentially be deferred without causing severe degradation.
- Use current condition metrics as benchmarks to gauge feasibility of large adjustments to LOS.

Service Metrics

- Measure user satisfaction, response times, and other relevant indicators for specific services.

Service Impact Assessments

- Evaluate potential impacts on user satisfaction and service delivery due to changes in infrastructure condition.

Key Lifecycle Activities

- Implement routine maintenance and inspections to ensure infrastructure reaches its optimal useful life.
- Monitor and optimize operational processes for efficiency.
- Regularly review and update preventive maintenance schedules.
- Prioritize critical infrastructure components for maintenance.
- Implement cost-saving measures without compromising safety or compliance.
- Develop strategies for managing and communicating service impacts to stakeholders.
- Invest in technology and process improvements to enhance maintenance efficiency.
- Upgrade critical infrastructure components to improve overall reliability.
- Explore opportunities for innovation and efficiency gains.

Risk Management

- Identify potential risks to infrastructure and service quality resulting from adjusted service levels.
- Develop contingency plans to address unforeseen challenges without compromising service quality.
- Monitor performance closely to ensure that the target investment translates to the desired infrastructure condition.

Infrastructure Condition Enhancements

- Identify areas for improvement and increased maintenance to enhance overall infrastructure condition.

Timelines

- Although O. Reg. 588/17 requires evaluation of expenditures for a 10-year period in pursuit of proposed LOS, it does not require municipalities to achieve the LOS within this 10-year timeframe (ex. a municipality may have a goal to reach X% condition by 2050, the AMP is required to review the first 10 years of the strategy to reach this goal).
- Careful consideration should be given to setting realistic targets for when proposed service levels can be achieved.

Stakeholder Engagement

- It is recommended to ensure adjustments to LOS are not made in isolation and without consultation of various stakeholders. This could include, but is not limited to:
  - Department Heads/Infrastructure Managers
  - Residents
  - Service Users
  - Council
- Efforts should be made to communicate changes to LOS transparently to all affected stakeholders.

Flexibility

- Priorities may change over time due to a variety of factors, such as:
  - Financial state of the municipality
  - Availability of grants
  - Significant increases or decreases in population
  - Changes in political priorities
  - Changes in resident priorities
  - New technologies
  - Changes in legislation
- Any proposed changes to LOS should be flexible and able to adapt to changes listed above, and other unforeseen circumstances.

5.2 Proposed Levels of Service Scenarios

The three scenarios outlined in the following section were analyzed as options for proposed service levels for all categories included in this Asset Management Plan.

While all three scenarios were reviewed, ***the Township of Cavan Monaghan has selected Scenario 1 as their preferred path forward regarding proposed levels of service for water and wastewater, and Scenario 2 as their path forward for tax funded assets***, which is reflected in the financial strategy and 10-year capital replacement forecasts.

The Township will be performing an external rate study to determine the rate increase required for water and wastewater and have therefore opted to maintain existing funding levels for these asset categories, pending recommendations from the rate study.

4.2.1 Scenario 1: Maintain Existing Funding

This scenario assumes no increases to taxes or rates for the purpose of increasing capital funding.

- Annual capital allocation for tax-funded assets: $1.9m.[2]
- Annual capital allocation for water rate-funded assets: $585k.
- Annual capital allocation for wastewater rate-funded assets: $357k.

Lifecycle Changes Required for Scenario 1

For all asset classes, no changes to lifecycle strategies are required in order to achieve Scenario 1. With the lack of funding, although existing lifecycle strategies are modelled within the Township's asset management system, a significant number of lifecycle events will not have sufficient funds and will move from projected events into the infrastructure backlog.

[2] This value does not include transfers to the Annual Replacement Reserve.

Affordability/Achievability of Scenario 1

Of the three scenarios analyzed, Scenario 1 is the least expensive option. Maintaining existing funding levels would require no tax or rate increases. The available capital funding over the next 10 years for Scenario 1 would remain consistent as indicated in the table below:

Categories	Available Capital Funding									
	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035
Tax-Funded	$1.9m	$1.9m	$1.9m	$1.9m	$1.9m	$1.9m	$1.9m	$1.9m	$1.9m	$1.9m
Rate-Funded (Water)	$585k	$585k	$585k	$585k	$585k	$585k	$585k	$585k	$585k	$585k
Rate-Funded (Sanitary)	$357k	$357k	$357k	$357k	$357k	$357k	$357k	$357k	$357k	$357k

Table 7 Scenario 1 Available Capital Funding Over Next 10 Years

It is important to note that an AMP is a dynamic document which should be reviewed regularly to ensure up-to-date information is incorporated including accurate replacement costs, changes in inventory, changes in available funding sources, and reflection on progress made on previous recommendations.

Risks Associated with Scenario 1

There are pros and cons associated with each scenario analyzed, and each benefit is counter-balanced with consequences. For Scenario 1, the following risks have been identified:

- Increased infrastructure backlog
  - While modelling no financial increases on residents and businesses, knowingly continuing with insufficient infrastructure funding the Township is committing to sub-optimal lifecycle management of its assets. Being unable to complete strategic lifecycle interventions and replacements may result in increased asset failures, reduced reliability, and the potential for costly unbudgeted repairs to maintain services.
  - The risks of maintaining a funding level of 59% of the recommendation, Scenario 1 increases the risk of services being impacted by deteriorating asset conditions.
- Reliance on Grants
  - As Scenario 1 maintains a position of 59% of recommended funding levels, the Township will be more reliant on conditional grants, as they become available. While these are beneficial to all municipalities to secure to reduce their tax/rate burden on residents, they are considered an unsustainable revenue source. The Township will be more vulnerable to changes in provincial and federal policy and funding programs.
- Missed opportunities for efficiencies
  - While analyzing Scenario 1, no alternative lifecycle strategies were proposed. Mid-lifecycle interventions, such as asphalt overlays and sewer lining, can result in extended lifespans of assets and reduced costs over the lifetime of the assets. By

relying on existing lifecycle strategies, the Township risks paying more than necessary to maintain their asset inventory.

Appropriateness of Scenario 1 to Meet the Township's Needs

Township staff emphasized a need to balance financial impacts on residents with the reality of the current state of infrastructure within the municipality. Upon review of all three scenarios, Scenario 1 was selected as the most appropriate option for the water and wastewater assets, as The Township will be performing an external rate study to determine the rate increase required for water and wastewater and have therefore opted to maintain existing funding levels for these asset categories, pending recommendations from the rate study.

Scenario 2: Achieving 100% of Target Funding in 10 Years for Tax, 20 Years for Wastewater

This scenario assumes gradual tax and rate increases, stabilizing at 100% funding in 10 years for tax funded assets, and 20 years for wastewater rate funded assets.

- Annual tax increase to gradually reach $3.2 million total capital available in 10 years.
- Annual wastewater rate increase to gradually reach $741,000 total capital available in 20 years.

Lifecycle Changes Required for Scenario 2

For all asset classes, no changes to lifecycle strategies are required in order to achieve Scenario 2. In future iterations of the AMP, it is recommended to more closely analyze changes to lifecycle management strategies to find long-term cost savings and efficiencies.

Affordability/Achievability of Scenario 2

Of the three scenarios analyzed, Scenario 2 is the middle ground in terms of tax/rate increases, however, it is very similar (financially) to Scenario 3, which is condition target based. Reaching 100% of the recommended funding immediately would require an increase of 10.3% in tax revenue. With the recommended implementation timeframe of 10 years, tax revenue would be increased gradually from $12.5 million to $13.8 million, water revenue would remain the same, and wastewater revenue would increase from $1.2 million to $1.5 million. Based on these gradual proposed increases, while maintaining existing sustainable grant funding, the available **capital** funding over the next 10 years for Scenario 2 is indicated in the table below:

Categories	Available Capital Funding									
	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035
Tax-Funded	$1.97m	$2.10m	$2.23m	$2.36m	$2.49m	$2.62m	$2.75m	$2.88m	$3.02m	$3.16m
Rate-Funded (Water)	$381k	$381k	$381k	$381k	$381k	$381k	$381k	$381k	$381k	$381k

Categories	Available Capital Funding									
	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035
Rate-Funded (Sanitary)	$374k	$392k	$410k	$428k	$446k	$465k	$483k	$502k	$522k	$542m

Table 8 Scenario 2 Available Capital Funding Over Next 10 Years

It is important to note that an AMP is a dynamic document which should be reviewed regularly to ensure up-to-date information is incorporated including accurate replacement costs, changes in inventory, changes in available funding sources, and reflection on progress made on previous recommendations.

Risks Associated with Scenario 2

There are pros and cons associated with each scenario analyzed, and each benefit is counter-balanced with consequences. For Scenario 2, the following risks have been identified:

- Increased infrastructure backlog
  - While mitigating the impact of financial increases on residents and businesses, taking 10 years to reach the targeted funding levels means 10 years of sub-optimal lifecycle management of assets. Being unable to complete strategic lifecycle interventions and replacements may result in increased asset failures, reduced reliability, and the potential for costly unbudgeted repairs to maintain services.
- Missed opportunities for efficiencies
  - While analyzing Scenario 2, no alternative lifecycle strategies were proposed. Mid-lifecycle interventions, such as asphalt overlays and sewer lining, can result in extended lifespans of assets and reduced costs over the lifetime of the assets. By relying on existing lifecycle strategies, the Township risks paying more than necessary to maintain their asset inventory.

Appropriateness of Scenario 2 to Meet the Township's Needs

TownshipTownship staff emphasized a need to balance financial impacts on residents with the reality of the current state of infrastructure within the municipality. Increasing tax revenue to $13.8 million would require an increase of 1.0% annually for 10 years, plus approximately an additional 1.6% to account for Construction Price Index (CPI) inflation. This would result in an annual tax increase of 2.6% annually for the next 10 years. If the Township continues to allocate the historical amount of approximately $2.7 million towards the ARR, then only a 1.6% increase to account for CPI inflation would be required.

Upon review of all three scenarios, Scenario 2 was selected as the most appropriate option for tax funded assets as an annual tax increase of 2.6% for the next 10 years was determined to be subjectively manageable to implement, while creating a sustainable future for the Township's infrastructure. The risks associated with relying on conditional grants from higher levels of government were deemed to be too great considering the country-wide trend of downloading responsibilities (and costs) to municipal governments and reducing funding opportunities.

Scenario 3: Targeted Conditions by Category

This scenario includes a combination of targeted conditions and recommended funding level.

Categories with Targeted Condition:

- Road Network
  - Sidewalks Target: 65%
- Land Improvements Target: 65%

Lifecycle Changes Required for Scenario 3

For all asset classes, no changes to lifecycle strategies were required in order to achieve Scenario 3 the PLOS target, relying solely on the increase in funding to transition from the norm of routine rehabilitation/replacements being deferred to having sufficient funding for the assets' lifecycle interventions.

In future iterations of the AMP, it is recommended to more closely analyze changes to lifecycle management strategies to find long-term cost savings and efficiencies.

Affordability/Achievability of Scenario 3

Of the three scenarios analyzed, Scenario 3 is the most expensive option, surpassing Scenario 2 by only $51,000/year. Reaching full funding immediately would require an increase of 10.5% in tax revenue. With the recommended implementation timeframe of 10 years, tax revenue would be increased gradually from $12.5 million to $13.8 million, water revenue would remain the same, and wastewater revenue from $1.2 million to $1.5 million. Based on these gradual proposed increases, while maintaining existing sustainable grant funding, the available **capital** funding over the next 10 years for Scenario 3 is indicated in the table below:

Categories	Available Capital Funding									
	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035
Tax-Funded	$1.97m	$2.10m	$2.23m	$2.36m	$2.49m	$2.62m	$2.75m	$2.88m	$3.02m	$3.16m
Rate-Funded (Water)	$381k	$381k	$381k	$381k	$381k	$381k	$381k	$381k	$381k	$381k
Rate-Funded (Sanitary)	$374k	$392k	$410k	$428k	$446k	$465k	$483k	$502k	$522k	$542m

Table 9 Scenario 3 Available Capital Funding Over Next 10 Years

The above table accounts for both current and future expenditures in order to achieve and maintain the proposed levels of service. This requires a combination of capital spending and saving (i.e. reserves) to ensure future large expenditures can be financed.

It is important to note that an AMP is a dynamic document which should be reviewed regularly to ensure up-to-date information is incorporated including accurate replacement costs, changes in inventory, changes in available funding sources, and reflection on progress made on previous recommendations.

Risks Associated with Scenario 3

There are pros and cons associated with each scenario analyzed, and each benefit is counter-balanced with consequences. For Scenario 3, the following risks have been identified:

- Increased infrastructure backlog
  - While mitigating the impact of financial increases on residents and businesses, taking 10 years to reach the targeted funding levels means 10 years of sub-optimal lifecycle management of assets. Being unable to complete strategic lifecycle interventions and replacements may result in increased asset failures, reduced reliability, and the potential for costly unbudgeted repairs to maintain services.
- Missed opportunities for efficiencies
  - While analyzing Scenario 3, no alternative lifecycle strategies were proposed. Mid-lifecycle interventions, such as asphalt overlays and sewer lining, can result in extended lifespans of assets and reduced costs over the lifetime of the assets. By relying on existing lifecycle strategies, the Township risks paying more than necessary to maintain their asset inventory.
- Consistency of condition assessments
  - When selecting a scenario based on condition ratings, there is a risk of outdated or inconsistent assessments being performed which can skew the Township's progress. This can be mitigated by implementing a robust condition assessment protocol for each asset category, to be performed at regularly scheduled intervals.

Category Analysis: Tax Funded Assets

6. Road Network

The road network is a critical component of the provision of safe and efficient transportation services and represents one of the highest value asset categories in the Township. It includes all municipally owned and maintained roadways in addition to supporting roadside infrastructure including sidewalks, pedestrian crossings and streetlights.

The Township's road network is maintained by the Public Works department who are responsible for the maintenance, rehabilitation and construction of roads and supporting roadside infrastructure.

6.1 Inventory & Valuation

Table 10 summarizes the quantity and current replacement cost of the Township's various road network assets as managed in its primary asset management register, Citywide.

Segment	Quantity	Unit of Measure	Replacement Cost	Primary RC Method
HCB Roads	32	km	$4,380,000	Cost/Unit
LCB Roads	182	km	$14,222,000	Cost/Unit
Pedestrian Crossing	1	Quantity	$17,000	CPI
Sidewalks	14,030	m	$4,528,000	User-Defined
Street Lights	375	Quantity	$908,000	User-Defined
Gravel Roads	30	km	Not Planned for Replacement	
TOTAL			**$24,056,000**	

Table 10 Detailed Asset Inventory: Road Network

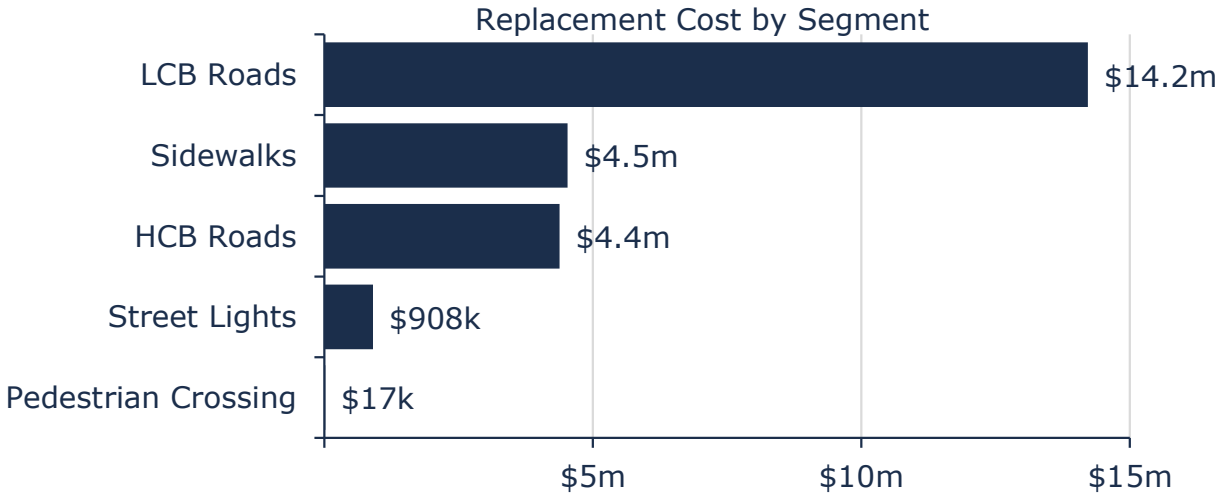

Figure 19 Portfolio Valuation: Road Network

6.2 Asset Condition

Figure 20 summarizes the replacement cost-weighted condition of the Township's road network. Based on a combination of field inspection data and age, 95% of assets are in fair or better condition; the remaining 5% of assets are in poor to very poor condition. Condition assessments were available for 100% of paved roads and 64% of sidewalks, based on replacement cost. This condition data was projected from inspection date to current year to estimate their condition today. No condition data was available for the remaining asset types.

Assets in poor or worse condition may be candidates for replacement in the short term; similarly, assets in fair condition may require rehabilitation or replacement in the medium term and should be monitored for further degradation in condition. As illustrated in Figure 20, the majority of the Township's road network assets are in fair or better condition.

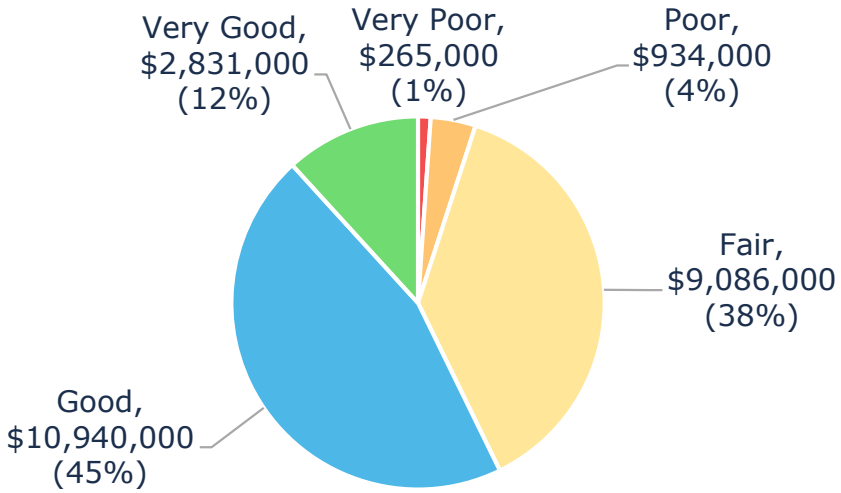

Figure 20 Asset Condition: Road Network Overall

As illustrated in Figure 21, based on condition assessments, the majority of the Township's paved road network is in fair or better condition.

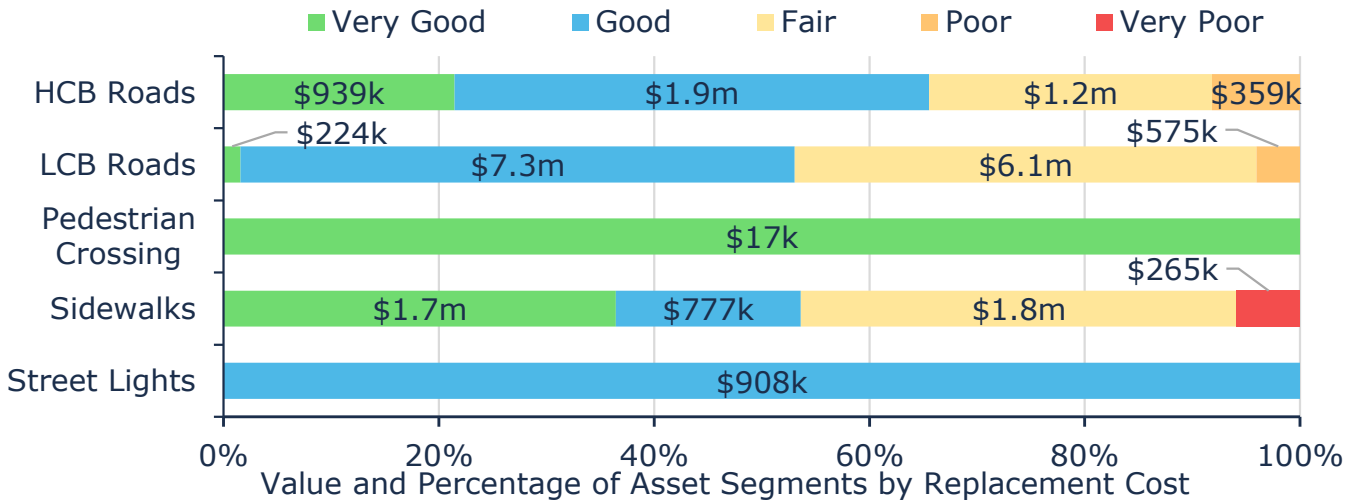

Figure 21 Asset Condition: Road Network by Segment

6.3 Age Profile

An asset's age profile comprises two key values: estimated useful life (EUL), or design life; and the percentage of EUL consumed. The EUL is the serviceable lifespan of an asset during which it can continue to fulfil its intended purpose and provide value to users, safely and efficiently. As assets age, their performance diminishes, often more rapidly as they approach the end of their design life.

In conjunction with condition data, an asset's age profile provides a more complete summary of the state of infrastructure. It can help identify assets that may be candidates for further review through condition assessment programs; inform the selection of optimal lifecycle strategies; and improve planning for potential long-term replacement spikes.

Figure 22 illustrates the average current age of each asset type and its estimated useful life. Both values are weighted by the replacement cost of individual assets.

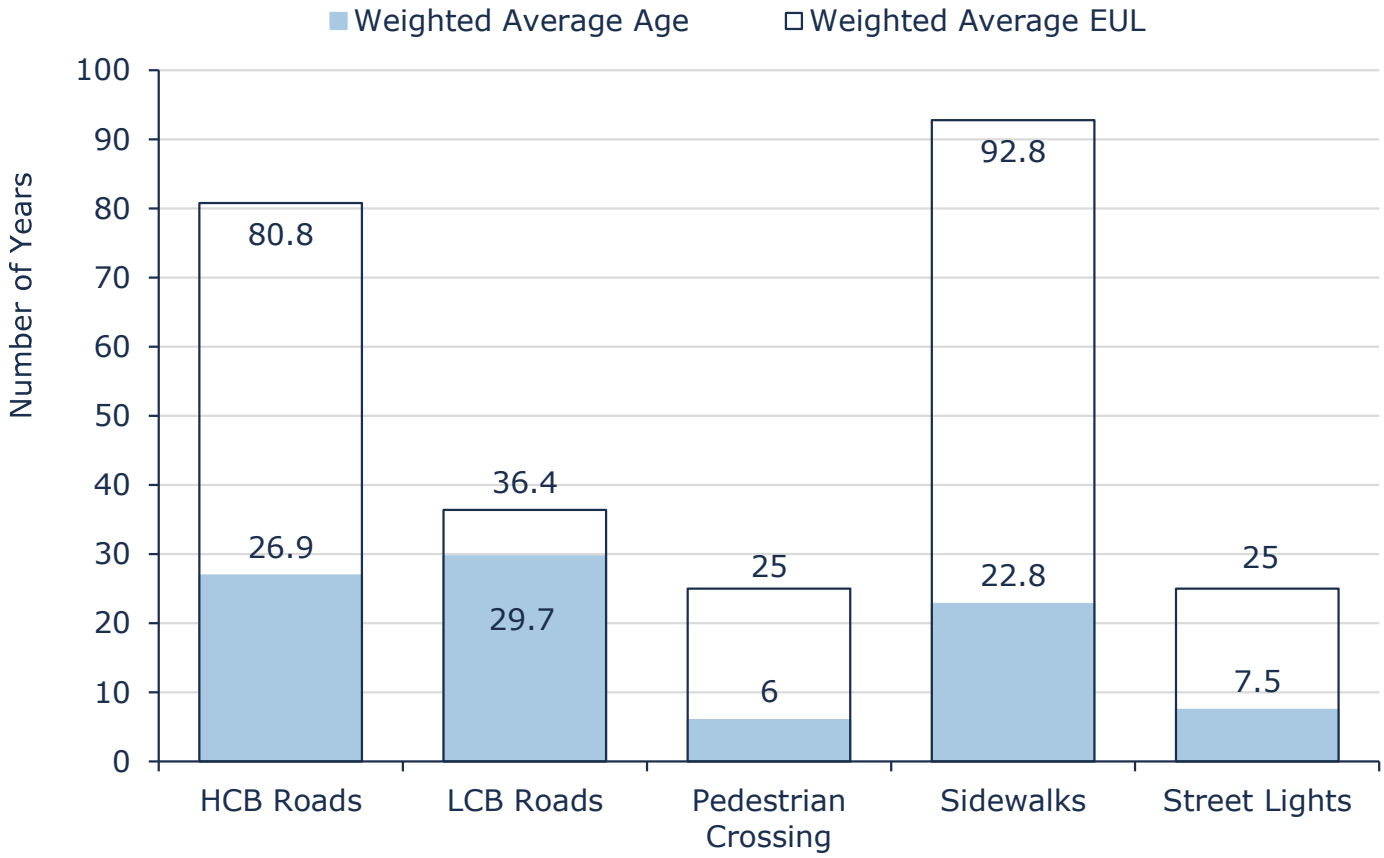

Figure 22 Estimated Useful Life vs. Asset Age: Road Network

Although asset age is an important measurement for long-term planning, condition assessments provide a more accurate indication of actual asset needs. Further, useful life estimates established as part of the PSAB 3150 implementation may not be accurate and may not reflect in-field asset performance.

6.4 Current Approach to Lifecycle Management

The condition or performance of most assets will deteriorate over time. This process is affected by a range of factors including an asset's characteristics, location, utilization, maintenance history and environment.

The following lifecycle strategies have been developed as a proactive approach to managing the lifecycle of HCB and LCB roads. Instead of allowing the roads to deteriorate until replacement is required, strategic rehabilitation is expected to extend the service life of roads at a lower total cost.

Paved Roads (HCB)		
Event Name	**Event Class**	**Event Trigger**
General Maintenance	Maintenance	As needed
Crack Sealing	Preventative Maintenance	Condition: 84 - 92
Overlay	Rehabilitation	Condition: 64 - 76
Pulverize and Pave	Rehabilitation	Condition: 48 - 64
Full Reconstruction	Replacement	Condition: 44

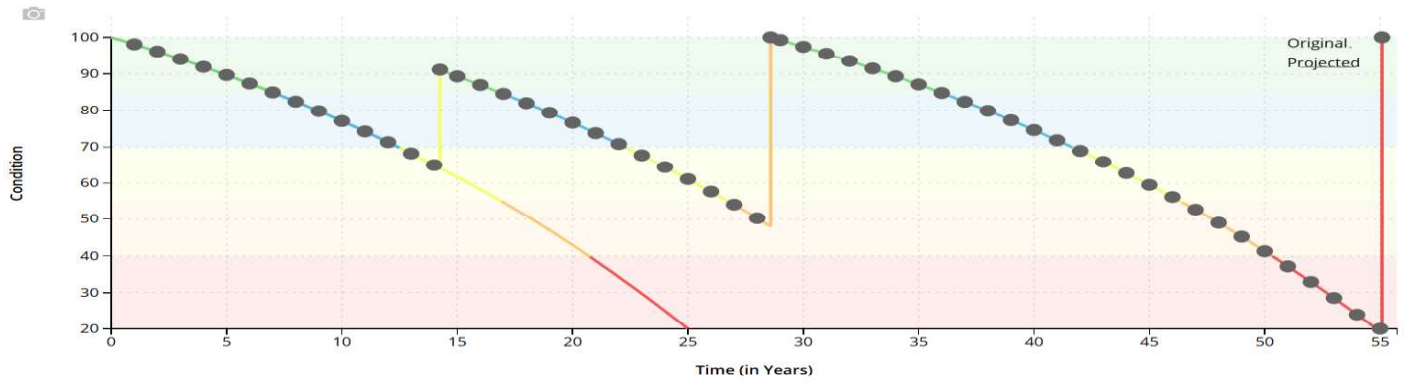

Table 11 Lifecycle Management Strategy: Road Network (HCB Roads)

Paved Roads (LCB)		
Event Name	**Event Class**	**Event Trigger**
General Maintenance	Maintenance	As needed
Slurry Seal	Preventative Maintenance	1 – 2 Years after Surface Replacement
Double Surface Treatment (Full Surface Replacement)	Rehabilitation	Condition: 50 - 65

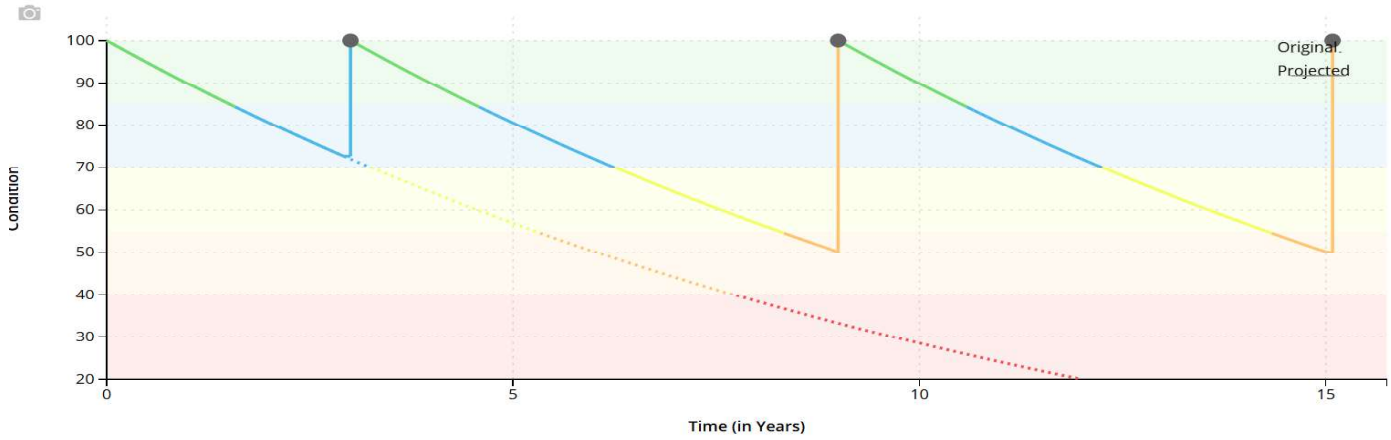

Table 12 Lifecycle Management Strategy: Road Network (LCB Roads)

The following table outlines the Township's current lifecycle management strategy.

Activity Type	Description of Current Strategy
Maintenance	Pothole repairs are completed annually based on deficiencies identified through regular road patrols and feedback from the public.
	Seasonal maintenance activities include asphalt patching, graveling, and tree cutting.
	Summer maintenance activities include sidewalk repairs, grading, re-gravelling, dust control, ditching, roadside mowing, tree trimming, brush cleanup, road sign installation/maintenance, and line painting.
	Winter maintenance activities include snow plowing, slating, and snow removal.
	Some crack sealing has been conducted in the past
Rehabilitation	Rehabilitation activities include slurry seal, microsurfacing, surface treatments, asphalt overlay and pulverize and pave
	Road replacement prioritization is determined by consideration of growth, risk, condition, health and safety, and social impact

Activity Type	Description of Current Strategy
Replacement	HCB road reconstruction projects (base and surface) are identified based on road condition, risk, and sub-surface asset requirements (water/sanitary/storm)
	LCB road reconstruction projects are identified based on the road condition, risk, and surface requirements. It will include base top up and double surface treatment
Inspection	A road needs study through an external source is typically conducted every 5 years. The most recent study was completed in 2024, a year early, to align with the requirements of the 2025 AMP updates and future budget planning
	Road patrols are undertaken every 2 weeks, granular roads are also visually inspected during grading activities. Other road network assets are inspected as per O.Reg 239/02

Table 13 Lifecycle Management Strategy: Road Network

6.5 Forecasted Long-Term Replacement Needs

Figure 13 illustrates the cyclical short-, medium- and long-term infrastructure rehabilitation and replacement requirements for the Township's road network. The graph identifies capital requirements over the next 10 years. The Township's average annual requirements (red dotted line) total $1.1 million for all assets in the road network. Although actual spending may fluctuate substantially from year to year, this figure is a useful benchmark value for annual capital expenditure targets (or allocations to reserves) to ensure projects are not deferred and replacement needs are met as they arise.

The chart illustrates substantial capital needs through the forecast period. It also shows a backlog of $265,000, dominated by sidewalks. These projections are based on asset replacement costs, age analysis, and condition data when available, as well as lifecycle modeling (roads only). They are designed to provide a long-term, portfolio-level overview of capital needs and should be used to support improved financial planning over several decades.

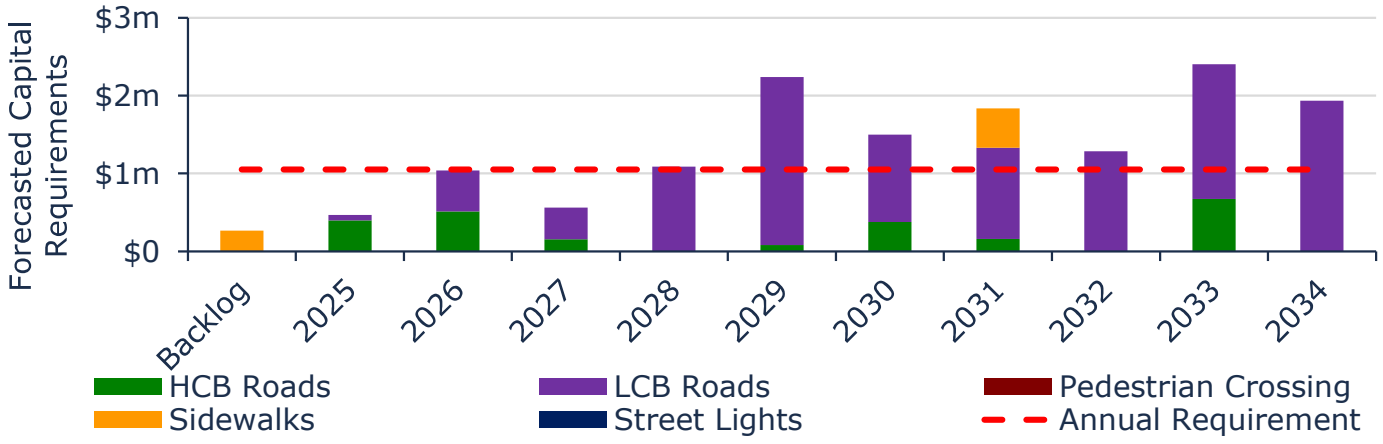

Figure 23 Forecasted Capital Replacement Needs: Road Network 2025-2034

Often, the magnitude of replacement needs is substantially higher than most municipalities can afford to fund. In addition, most assets may not need to be replaced. However, quantifying and monitoring these spikes is essential for long-term financial planning, including establishing dedicated reserves. Regular pavement condition assessments and a robust risk framework will ensure that high-criticality assets receive proper and timely lifecycle intervention, including replacements.

A summary of the 10-year replacement forecast can be found in Appendix B – 10-Year Capital Requirements.

6.6 Risk Analysis

The risk matrix below is generated using available asset data, including condition, service life remaining, replacement costs, average annual daily traffic, and number of lanes. The risk ratings for assets without useful attribute data were calculated using only condition and their replacement costs.

The matrix stratifies assets based on their individual probability and consequence of failure, each scored from 1 to 5. Their product generates a risk index ranging from 1-25. Assets with the highest criticality and likelihood of failure receive a risk rating of 25; those with lowest probability of failure and lowest criticality carry a risk rating of 1. As new data and information is gathered, the Township may consider integrating relevant information that improves confidence in the criteria used to assess asset risk and criticality.

These risk models have been built into the Township's Asset Management Database (Citywide Assets). See *Risk & Criticality* section for further details on approach used to determine asset risk ratings and classifications.

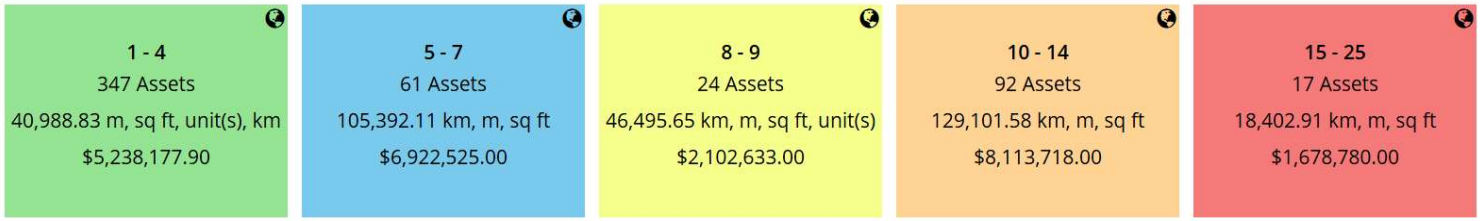

Figure 24 Risk Matrix: Road Network

6.7 Levels of Service

The tables that follow summarize the Township's current levels of service with respect to prescribed KPIs under Ontario Regulation 588/17, as well as any additional performance measures that the Township selected for this AMP.

6.7.1 Community Levels of Service

Service Attribute	Qualitative Description	Current LOS (2024)
Scope	Description, which may include maps, of the road network in the municipality and its level of connectivity	The Township's road infrastructure system spans a total of 245 km primarily within a rural setting, with small areas of urban and semi-urban development. The road network consists of approximately 30 km of gravel roads, 182 km of low class bituminous (LCB) roads and 32 km of high class bituminous roads. The road network also contains other roadside appurtenances such as sidewalks, streetlights and pedestrian crossing.
Quality	Description or images that illustrate the different levels of road class pavement condition	The Township completed a Road Needs Study report in July 2024 in coordination with D.M. Wills Associates Limited. In addition to the assessment of roads, surface condition ratings and structural adequacy ratings were also determined for each road section. Every road section received a structural adequacy rating (1-10). (1-5) Road surface exhibits moderate to significant deterioration and requires renewal or full replacement within 1-5 years (6-10) Road surface is in good condition or has been recently re-surfaced. Renewal or reconstruction is not required for 6-10+ years

Table 14 O. Reg. 588/17 Community Levels of Service: Road Network

6.7.2 Technical Levels of Service

Service Attribute	Technical Metric	Current LOS (2024)
Scope	Lane-km of arterial roads (MMS classes 1 and 2) per land area (km/km^2)	0 km/km^2
	Lane-km of collector roads (MMS classes 3 and 4) per land area (km/km^2)	0.07 km/km^2
	Lane-km of local roads (MMS classes 5 and 6) per land area (km/km^2)	0.75 km/km^2
Quality	Average pavement condition index for paved roads in the Township	HCB 65% LCB: 65%
	Average surface condition for unpaved roads in the Township (e.g. excellent, good, fair, poor)	Good
Affordability	O&M costs for paved roads/lane-km (excluding winter control)	$1,349.78
	O&M costs for unpaved roads/lane-km (excluding winter control)	$638.00
	Winter control costs/lane-km	$486.47
Performance	Target reinvestment rate	4.4%
	Capital reinvestment rate	3.1%

Table 15 O. Reg. 588/17 Technical Levels of Service: Road Network

6.8 Proposed Levels of Service

As per O. Reg. 588/17, by July 1, 2025, municipalities are required to consider proposed levels of service (PLOS), discuss the associated risks and long-term sustainability of these service levels, and explain the Township's ability to afford the PLOS.

The below tables and graphs explain the proposed levels of service scenarios that were analyzed for the road network. Further PLOS analysis at the portfolio level can be found in Section *5. Proposed Levels of Service Analysis.*

6.8.1 PLOS Scenarios Analyzed

Scenario	Description
Scenario 1: Maintain Current Funding Level	This scenario maintains existing capital funding levels for those categories that are underfunded. ♦ Road Network capital funding maintained at $751,000/year
Scenario 2: Achieving 100% Target Funding in 10 Years	This scenario assumes gradual tax increases of ~1.0%/year, stabilizing at 100% funding across all asset categories in 10 years. ♦ Road Network capital funding increases from $757,000/year to $1.1m/year over a span of 10 years
Scenario 3: Specific Condition Targets	This scenario aims to maintain target conditions for different road network asset types: ♦ Sidewalks Target Condition: 65% No funding limitations were placed on this scenario.

Table 16 Road Network PLOS Scenario Descriptions

6.8.2 PLOS Analysis Results

Scenario	Technical LOS Outcomes	Initial Value (2025)	15 Year Projection (2039)	30 Year Projection (2054)	Comments
Scenario 1 (All Segments)	Average Condition	62%	57%	56%	
	Average Asset Risk	8.6	8.4	9.0	
	Annual Investment Required		$751,000		This is the maintained parameter in this scenario
	Capital Reinvestment Rate		3.1%		
Scenario 2 (All Segments)	Average Condition	62%	62%	61%	
	Average Asset Risk	8.6	7.8	8.2	
	Annual Investment Required		$1,053,000		This parameter is increased from $751,000 to reach a target portfolio investment of $1.1 million over 10 years
	Capital Reinvestment Rate		4.4%		
Scenario 3	Average Condition	Sidewalks – 46% Other – 58%	Sidewalks – 90% Other – 61%	Sidewalks – 58% Other – 60%	Sidewalks Target Condition: 65%
	Average Asset Risk	Sidewalks – 9.1 Other – 9.6	Sidewalks – 3.1 Other – 7.9	Sidewalks – 7.5 Other – 8.5	
	Annual Investment Required		Sidewalks - $119,000 Other - $985,000 TOTAL - $1,104,000		
	Capital Reinvestment Rate		4.6%		

Table 17 Road Network PLOS Scenario Analysis

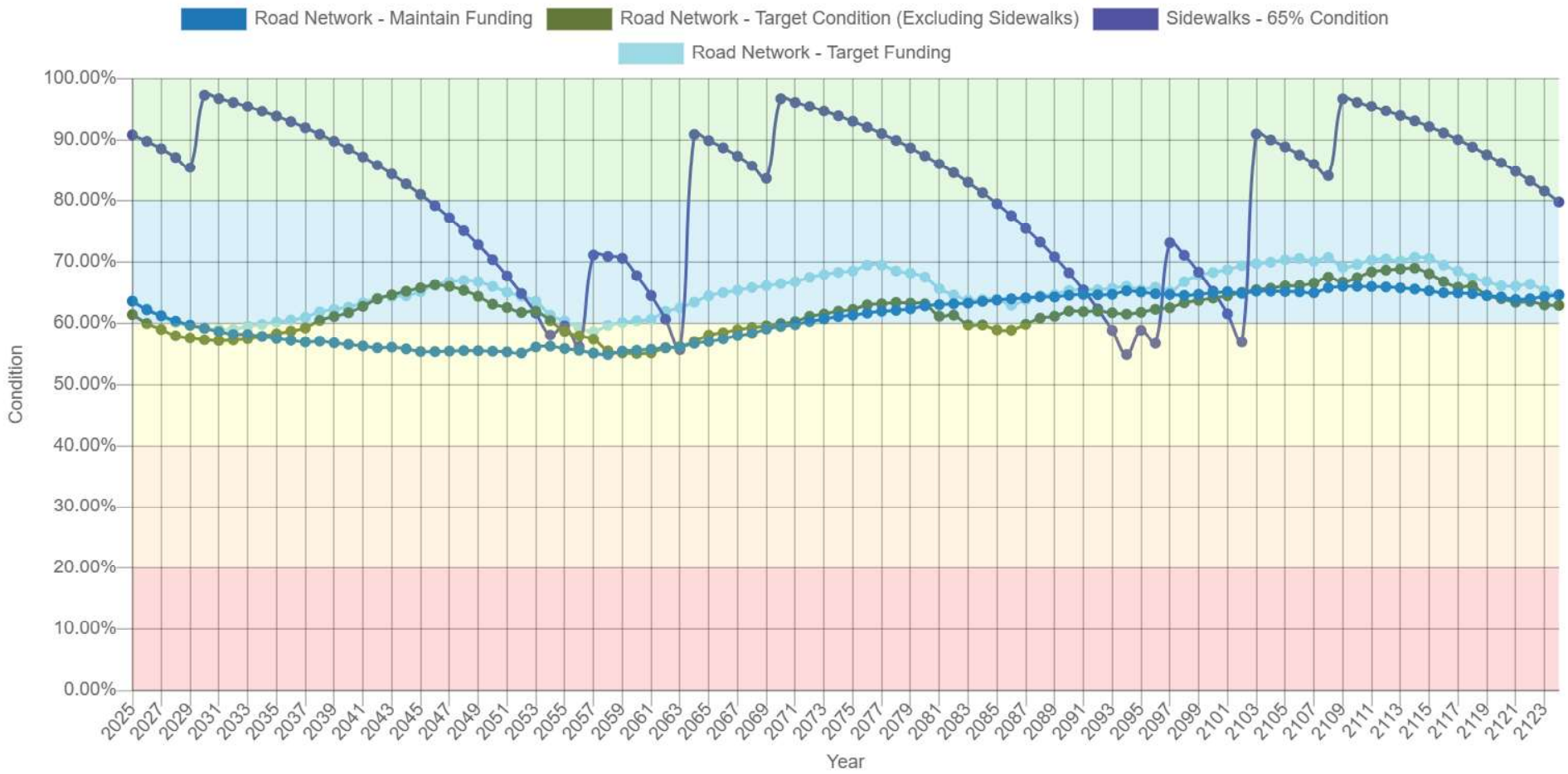

Figure 25 Road Network PLOS Scenario Condition Result

7. Bridges & Culverts

The Township's transportation network also includes structural culverts, with a current replacement cost of $1.1 million.

7.1 Inventory & Valuation

Table 18 summarizes the quantity and current replacement cost of structural culverts. The Township owns and manages 13 structural culverts.

Segment	Quantity	Unit of Measure	Replacement Cost	Primary RC Method
Structural Culverts	13	Quantity	$1,123,000	Cost/Unit
TOTAL			**$1,123,000**	

Table 18 Detailed Asset Inventory: Bridges & Culverts

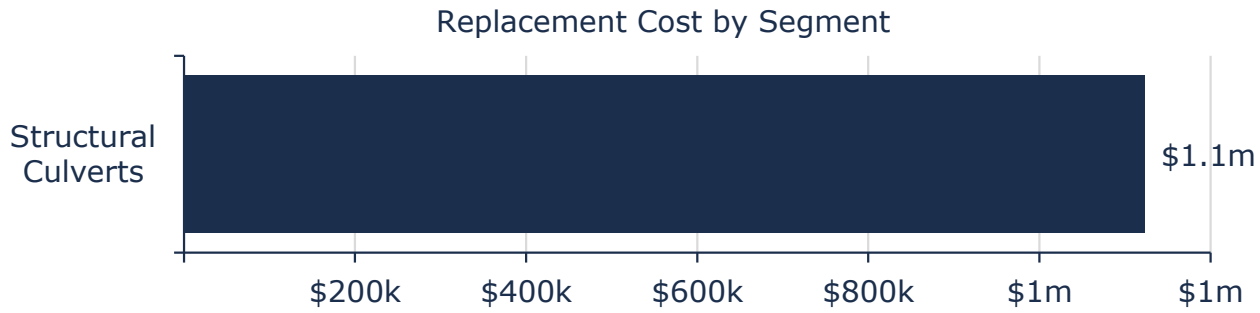

Figure 26 Portfolio Valuation: Bridges & Culverts

7.2 Asset Condition

Figure 27 summarizes the replacement cost-weighted condition of the Township's structural culverts. Based on the Township's recent Ontario Structures Inspection Manual (OSIM) assessments, 68% of culverts are in fair or better condition. Some elements or components of these structures may be candidates for replacement or rehabilitation in the medium term and should be monitored for further degradation in condition. At 32% of the total culverts portfolio, assets in poor or worse condition may require replacement in the immediate or short term.

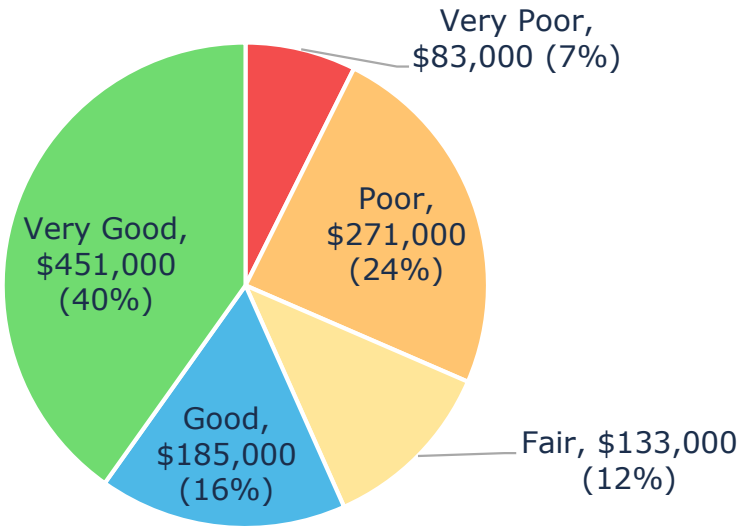

Figure 27 Asset Condition: Bridges & Culverts Overall

As further detailed in Figure 28, based on in-field condition assessments, $271,000 of culvert assets were assessed as being in poor condition. Structures with a poor or worse rating (i.e., a bridge condition index of less than 60) are not necessarily unsafe for regular use. The OSIM ratings are designed to identify repairs needed to elevate condition ratings to a fair or higher.

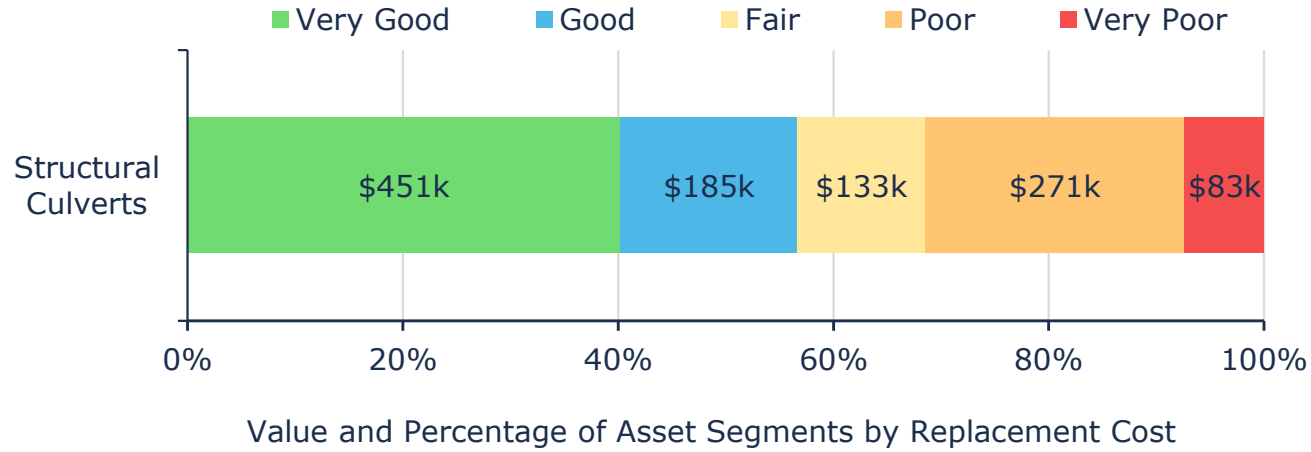

Figure 28 Asset Condition: Bridges & Culverts by Segment

7.3 Age Profile

An asset's age profile comprises two key values: estimated useful life (EUL), or design life; and the percentage of EUL consumed. The EUL is the serviceable lifespan of an asset during which it can continue to fulfil its intended purpose and provide value to users, safely and efficiently. As assets age, their performance diminishes, often more rapidly as they approach the end of their design life.

In conjunction with condition data, an asset's age profile provides a more complete summary of the state of infrastructure. It can help identify assets that may be candidates for further review

through condition assessment programs; inform the selection of optimal lifecycle strategies; and improve planning for potential replacement spikes.

Figure 29 illustrates the average current age of each asset type and its estimated useful life. Both values are weighted by the replacement cost of individual assets.

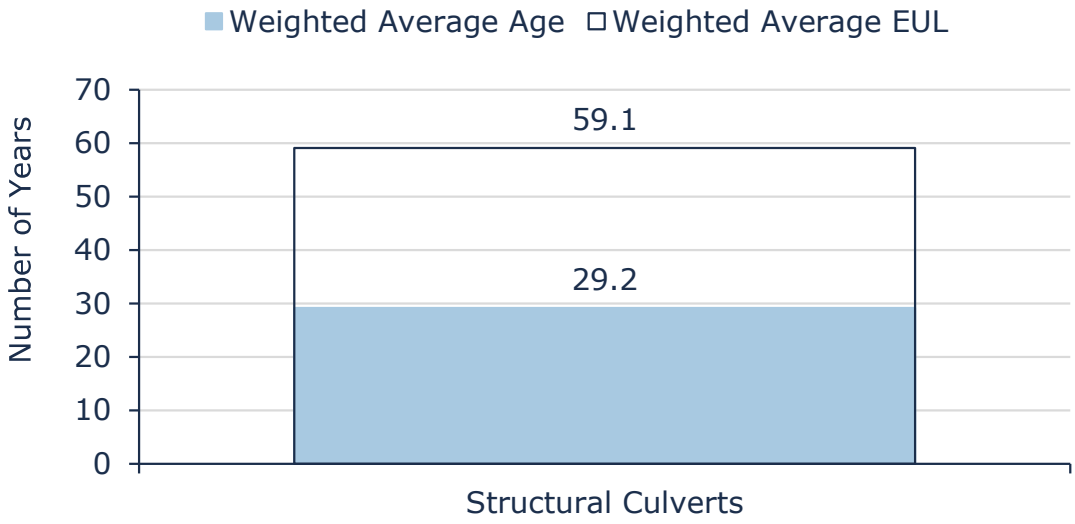

Figure 29 Estimated Useful Life vs. Asset Age: Bridges & Culverts

7.4 Current Approach to Lifecycle Management

The condition or performance of most assets will deteriorate over time. To ensure that municipal assets are performing as expected and meeting the needs of customers, it is important to establish a lifecycle management strategy to proactively manage asset deterioration.

The following table outlines the Township's current lifecycle management strategy.

Activity Type	Description of Current Strategy
Maintenance	Biennial OSIM inspection reports include a list of recommended maintenance activities that the Township considers and completes according to cost and urgency.
Rehabilitation / Replacement	Biennial OSIM inspection reports include a Capital Needs List identifying recommended rehabilitation and replacement activities with estimated costs.
Inspection	Condition assessments of all structural culverts with a span greater than or equal to 3 meters are completed every 2 years in accordance with OSIM requirements. The most recent OSIM inspection was completed in 2024.

Table 19 Lifecycle Management Strategy: Bridges & Culverts

7.5 Forecasted Long-Term Replacement Needs

Figure 30 illustrates the cyclical short-, medium- and long-term infrastructure rehabilitation and replacement requirements for the Township's bridges and culverts. The Township's average annual requirements (red dotted line) for structural culverts total $41,000. Although actual spending may fluctuate substantially from year to year, this figure is a useful benchmark value for annual capital expenditure targets (or allocations to reserves) to ensure projects are not deferred and replacement needs are met as they arise.

These projections and estimates are based on asset replacement costs, age analysis, and condition data. They are designed to provide a long-term, portfolio-level overview of capital needs and should be used to support improved financial planning over several decades.

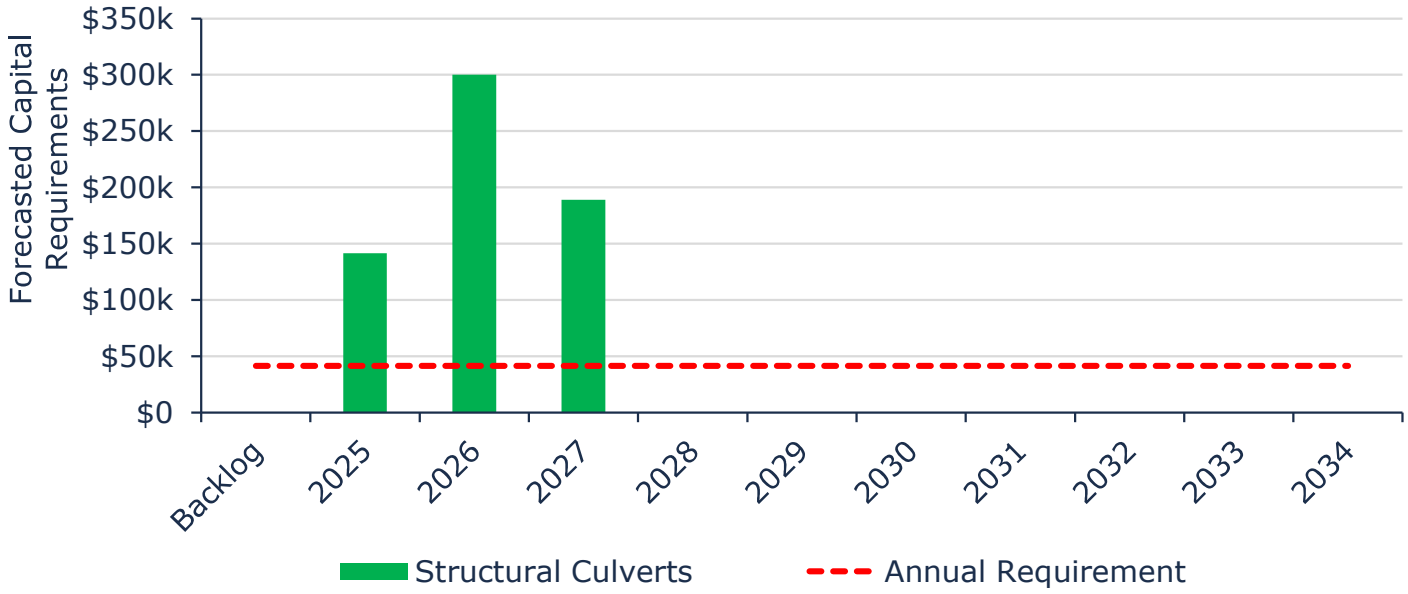

Figure 30 Forecasted Capital Replacement Needs: Bridges & Culverts 2025-2034

Often, the magnitude of replacement needs is substantially higher than most municipalities can afford to fund. In addition, most assets may not need to be replaced. However, quantifying and monitoring these spikes is essential for long-term financial planning, including establishing dedicated reserves. OSIM condition assessments and a robust risk framework will ensure that high-criticality assets receive proper and timely lifecycle intervention, including replacements.

A summary of the 10-year replacement forecast can be found in Appendix B – 10-Year Capital Requirements.

7.6 Risk Analysis

The risk matrix below is generated using available asset data, including condition, service life remaining, replacement costs, AADT, and detour distance. The risk ratings for assets without useful attribute data were calculated using only condition and their replacement costs.

The matrix stratifies assets based on their individual probability and consequence of failure, each scored from 1 to 5. Their product generates a risk index ranging from 1-25. Assets with the

highest criticality and likelihood of failure receive a risk rating of 25; those with lowest probability of failure and lowest criticality carry a risk rating of 1. As new data and information is gathered, the Township may consider integrating relevant information that improves confidence in the criteria used to assess asset risk and criticality.

These risk models have been built into the Township's Asset Management Database (Citywide Assets). See *Risk & Criticality* section for further details on approach used to determine asset risk ratings and classifications.

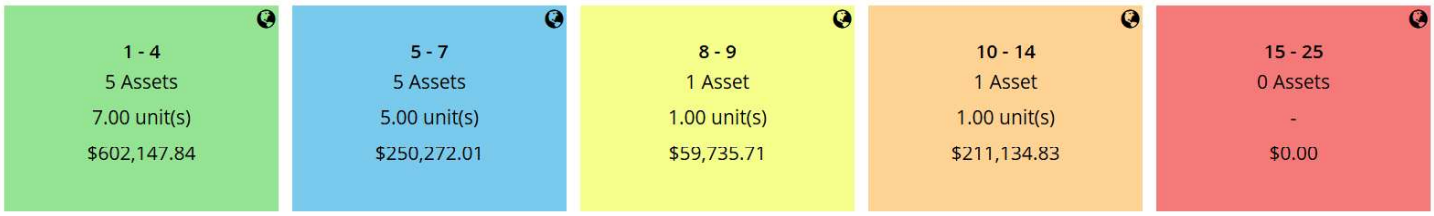

Figure 31 Risk Matrix: Bridges & Culverts

An asset's criticality rating, determined by the nature and magnitude of the consequences of its potential failure should be used to prioritize projects, particularly lifecycle management strategies. Using risk in conjunction with levels of service, and the recommended workplans in OSIM inspections, can assist in optimizing limited funds.

7.7 Levels of Service

The tables that follow summarize the Township's current levels of service with respect to prescribed KPIs under Ontario Regulation 588/17 as well as any additional performance measures that the Township has selected for this AMP.

7.7.1 Community Levels of Service

Service Attribute	Qualitative Description	Current LOS (2024)
Scope	Description of the traffic that is supported by municipal bridges (e.g., heavy transport vehicles, motor vehicles, emergency vehicles, pedestrians, cyclists)	The traffic on structural culverts is generally light as these are local roads. However, some heavy vehicle traffic, such as transport, is common.
Quality	Description or images of the condition of bridges & culverts and how this would affect use of the bridges & culverts	See Appendix C – Level of Service Maps & Photos

Table 20 O. Reg. 588/17 Community Levels of Service: Bridges & Culverts

7.7.2 Technical Levels of Service

Service Attribute	Technical Metric	Current LOS (2024)
Scope	% of bridges in the Township with loading or dimensional restrictions	N/A
Quality	Average bridge condition index value for bridges in the Township	N/A
	Average bridge condition index value for structural culverts in the Township	78%
Performance	Target reinvestment rate	3.7%
	Capital reinvestment rate	0%

Table 21 O. Reg. 588/17 Technical Levels of Service: Bridges & Culverts

7.8 Proposed Levels of Service

As per O. Reg. 588/17, by July 1, 2025, municipalities are required to consider proposed levels of service (PLOS), discuss the associated risks and long-term sustainability of these service levels, and explain the Township's ability to afford the PLOS.

The below tables and graphs explain the proposed levels of service scenarios that were analyzed for structural culverts. Further PLOS analysis at the portfolio level can be found in section *5. Proposed Levels of Service Analysis.*

7.8.1 PLOS Scenarios Analyzed

Scenario	Description
Scenario 1: Maintain Current Funding Level	This scenario maintains existing capital funding levels for those categories that are underfunded. ♦ Bridges and culverts capital funding maintained at $0/year.
Scenario 2: Achieving 100% Target Funding in 10 Years	This scenario assumes gradual tax increases of ~1.0%/year, stabilizing at 100% funding across all asset categories in 10 years. ♦ Bridges and culverts capital funding increases from $0/year to $41,000/year over a span of 10 years

Table 22 Bridges & Culverts PLOS Scenario Descriptions

7.8.2 PLOS Analysis Results

Scenario	Technical LOS Outcomes	Initial Value (2025)	15 Year Projection (2039)	30 Year Projection (2054)	Comments
Scenario 1 (All Segments)	Average Condition	78%	49%	24%	
	Average Asset Risk	5.8	9.6	12.7	
	Annual Investment Required		$0		This is the maintained parameter in this scenario
	Capital Reinvestment Rate		0%		
Scenario 2 (All Segments)	Average Condition	78%	65%	50%	
	Average Asset Risk	5.8	7.2	10.3	
	Annual Investment Required		$41,000		This parameter is increased from $0 incrementally to reach a target portfolio investment of $41,000 over 10 years
	Capital Reinvestment Rate		3.7%		

Table 23 Bridges & Culverts PLOS Scenario Analysis

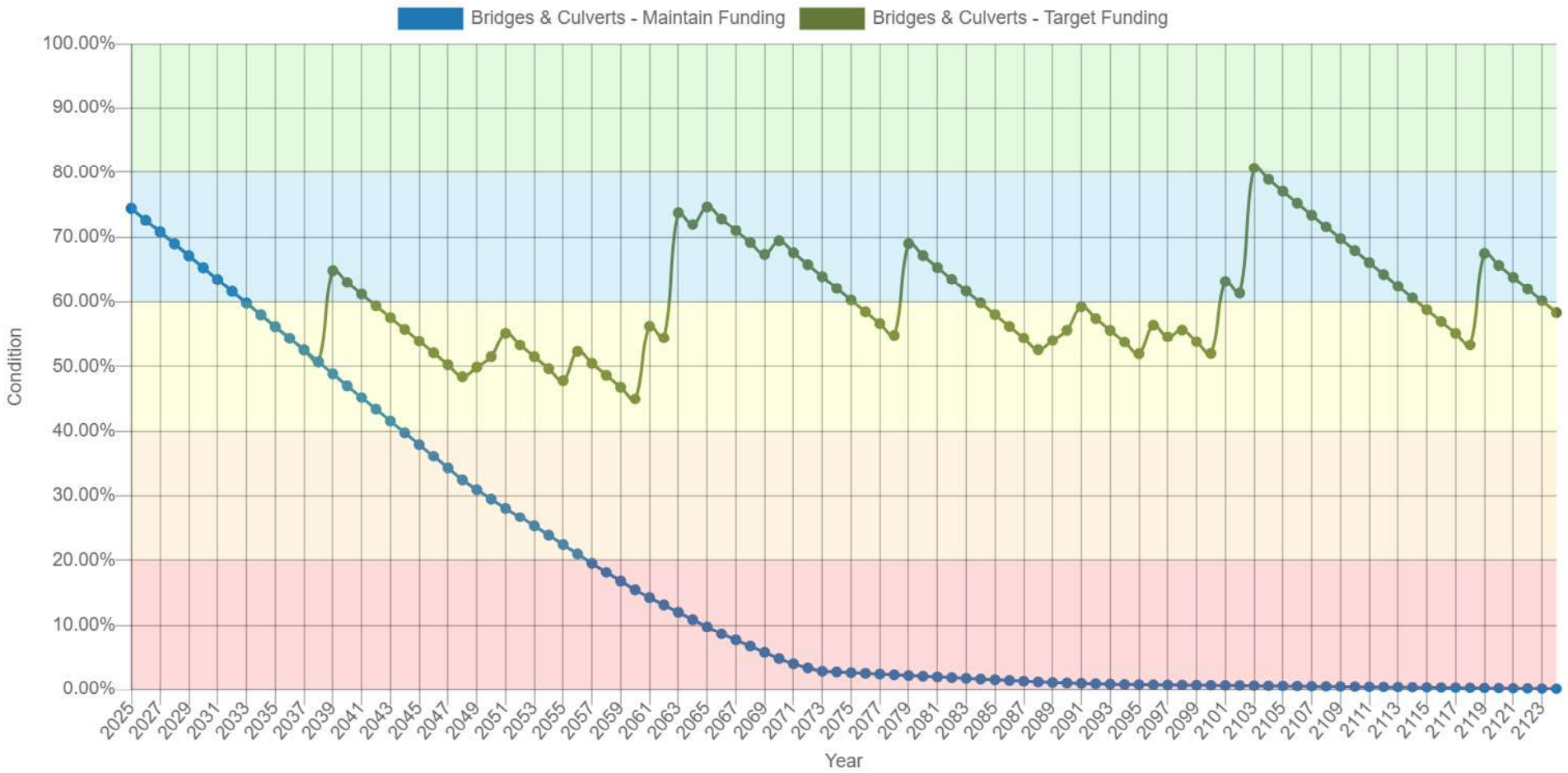

Figure 32 Bridges & Culverts PLOS Scenario Condition Results

8. Stormwater

The Township is responsible for owning and maintaining a stormwater network of around 6 km of storm sewer mains, non-structural culverts, catch basins and other supporting infrastructure such as stormwater management ponds.

The Township's Public Works department is responsible for planning and managing stormwater infrastructure.

Stormwater infrastructure generals poses the greatest uncertainty for municipalities, including Cavan Monaghan. Staff have expressed a lack of confidence in the current inventory but are working towards improving the accuracy and reliability to assist with long-term asset management planning.

8.1 Inventory & Valuation

Table 24 summarizes the quantity and current replacement cost of all stormwater network assets available in the Township's asset register.

Segment	Quantity	Unit of Measure	Replacement Cost	Primary RC Method
Catch Basins	217	Quantity	$1,358,000	User-Defined
Culverts	137	Quantity	$614,000	CPI
Mains	6,060	m	$4,178,000	Cost/Unit
Manhole Storm	57	Quantity	$841,000	User-Defined
SWM Ponds	5	Quantity	$10,000	CPI
TOTAL			**$7,001,000**	

Table 24 Detailed Asset Inventory: Stormwater

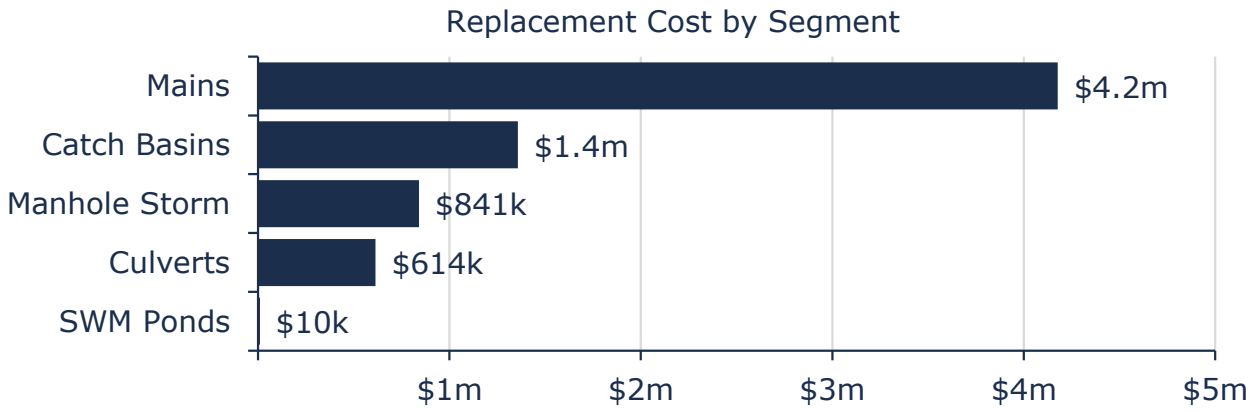

Figure 33 Portfolio Valuation: Stormwater

8.2 Asset Condition

Figure 34 summarizes the replacement cost-weighted condition of the Township's stormwater network assets. Based on age data only, approximately 96% of assets are in fair or better condition, with the remaining 4% in poor or very poor condition. These assets may be candidates for replacement in the short term; similarly, assets in fair condition may require rehabilitation or replacement in the medium term and should be monitored for further degradation in condition.

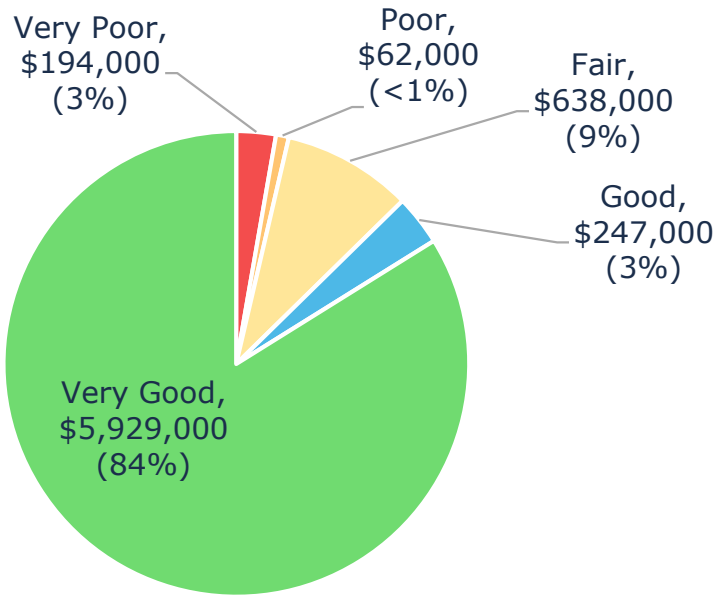

Figure 34 Asset Condition: Stormwater Overall

Figure 35 summarizes the age-based condition of stormwater network assets. The analysis illustrates that the majority of stormwater mains are in fair or better condition. However, 6% of mains, with a current replacement cost of $256,000, are in poor or worse condition.

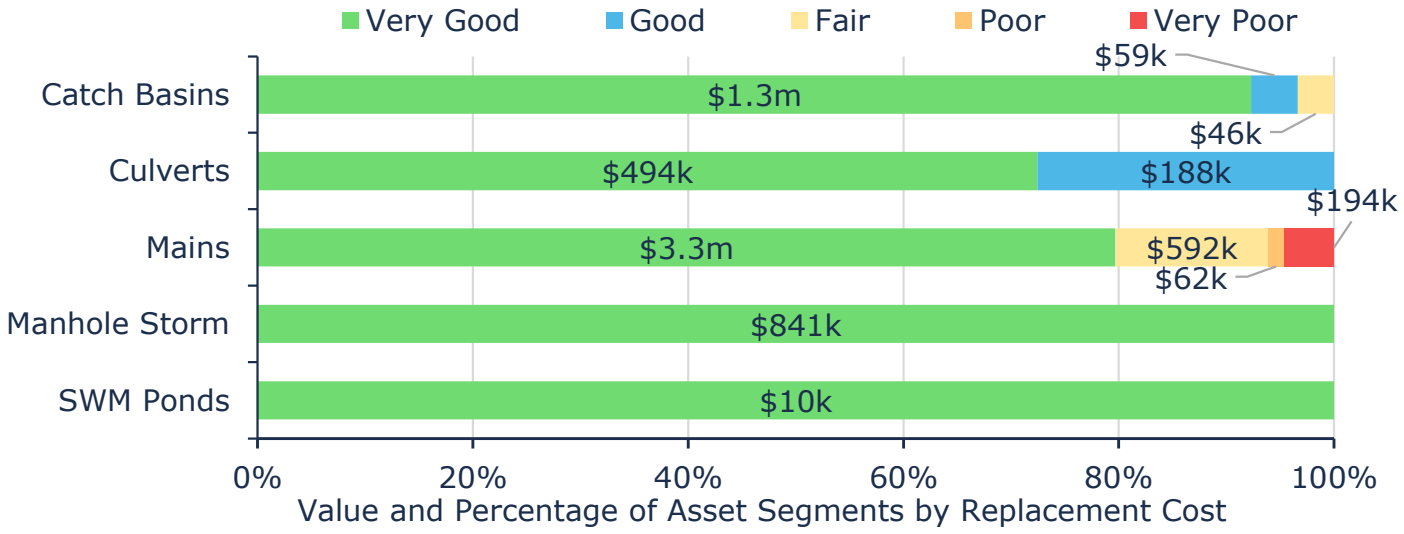

Figure 35 Asset Condition: Stormwater by Segment

8.3 Age Profile

An asset's age profile comprises two key values: estimated useful life (EUL), or design life; and the percentage of EUL consumed. The EUL is the serviceable lifespan of an asset during which it can continue to fulfil its intended purpose and provide value to users, safely and efficiently. As assets age, their performance diminishes, often more rapidly as they approach the end of their design life.

In conjunction with condition data, an asset's age profile provides a more complete summary of the state of infrastructure. It can help identify assets that may be candidates for further review through condition assessment programs; inform the selection of optimal lifecycle strategies; and improve planning for potential replacement spikes.

Figure 36 illustrates the average current age of each asset type and its estimated useful life. Both values are weighted by the replacement cost of individual assets.

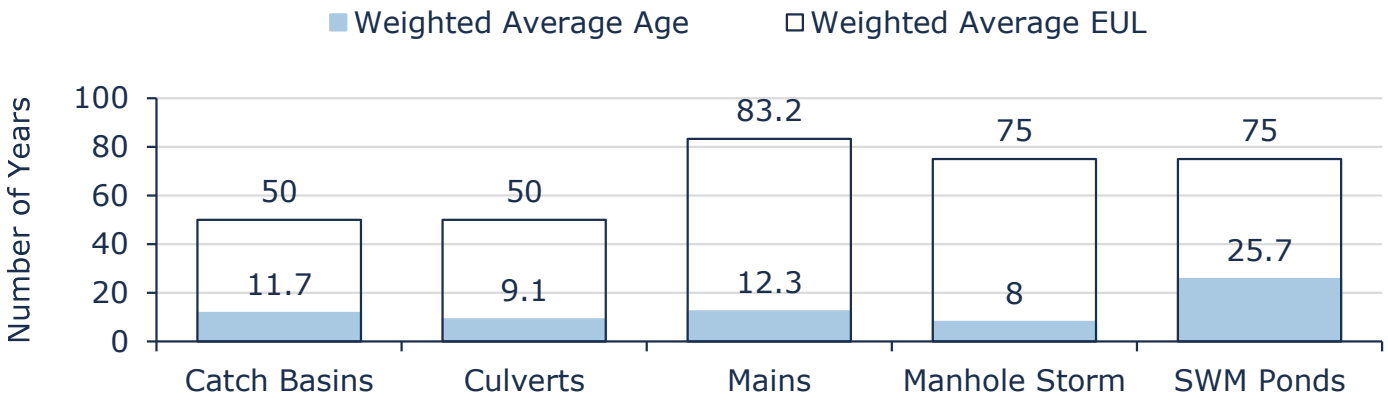

Figure 36 Estimated Useful Life vs. Asset Age: Stormwater

8.4 Current Approach to Lifecycle Management

The condition or performance of most assets will deteriorate over time. To ensure that municipal assets are performing as expected and meeting the needs of customers, it is important to establish a lifecycle management strategy to proactively manage asset deterioration.

The following table outlines the Township's current lifecycle management strategy.

Activity Type	Description of Current Strategy
Maintenance	Maintenance activities are completed to a lesser degree compared to other underground linear infrastructure
	Primary activities include catch basin cleaning and reactive storm main flushing
	All other maintenance activities are completed on a reactive basis when operational issues are identified (e.g., blockages, backups)

Activity Type	Description of Current Strategy
Rehabilitation	Trenchless re-lining has the potential to reduce total lifecycle costs but would require a formal condition assessment program to determine viability
Replacement	Without the availability of up-to-date condition assessment information replacement activities are purely reactive in nature
Inspection	There are currently no formal condition assessment programs in place for stormwater infrastructure. Currently age-based estimates are used to determine asset condition, although confidence in the accuracy of these estimates is low.

Table 25 Lifecycle Management Strategy: Stormwater

8.5 Forecasted Long-Term Replacement Needs

Figure 37 illustrates the cyclical short-, medium- and long-term infrastructure replacement requirements for the Township's stormwater network assets. The Township's average annual requirements (red dotted line) total $15,000 for all assets in the stormwater network. Although actual spending may fluctuate substantially from year to year, this figure is a useful benchmark value for annual capital expenditure targets (or allocations to reserves) to ensure projects are not deferred and replacement needs are met as they arise.

These projections and estimates are based on asset replacement costs and age analysis. They are designed to provide a long-term, portfolio-level overview of capital needs and should be used to support improved financial planning over several decades.

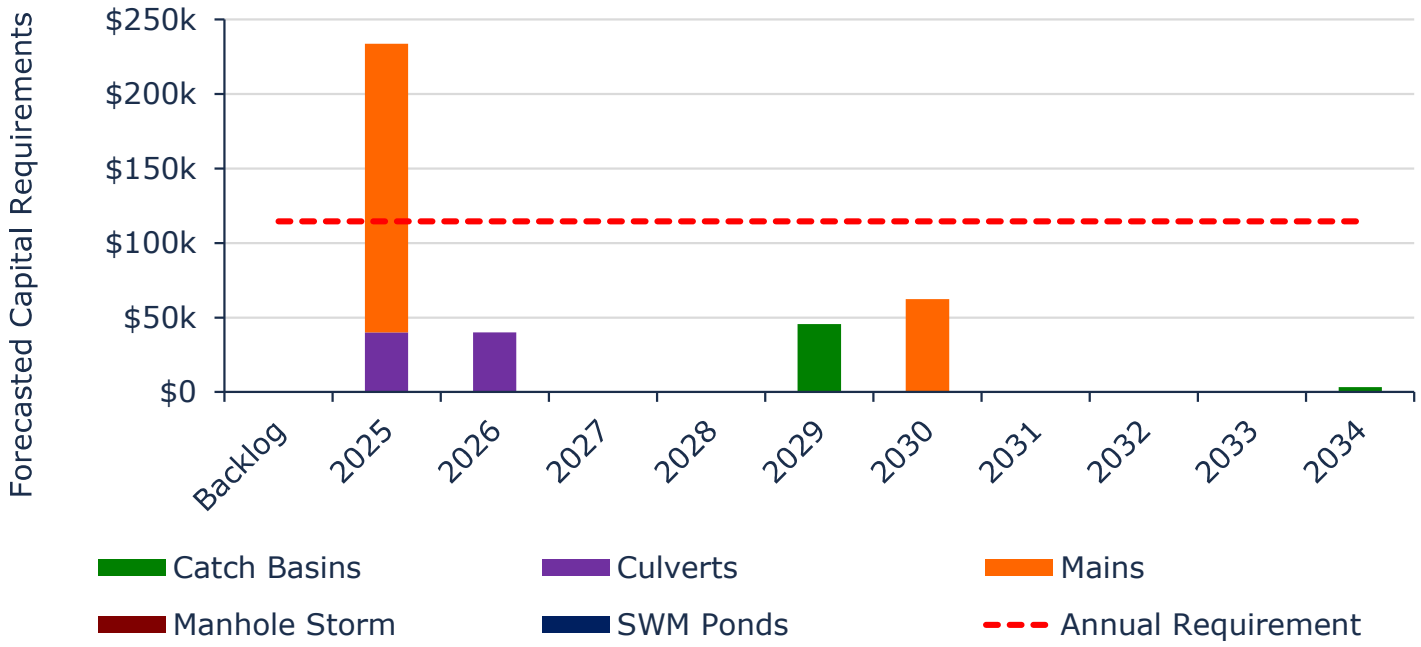

Figure 37 Forecasted Capital Replacement Needs Stormwater 2025-2034

Often, the magnitude of replacement needs is substantially higher than most municipalities can afford to fund. In addition, most assets may not need to be replaced. However, quantifying and monitoring these spikes is essential for long-term financial planning, including establishing dedicated reserves. In addition, a robust risk framework will ensure that high-criticality assets receive proper and timely lifecycle intervention, including replacements.

A summary of the 10-year replacement forecast can be found in Appendix B – 10-Year Capital Requirements.

8.6 Risk Analysis

The risk matrix below is generated using available asset data, including condition, service life remaining, replacement costs, pipe material, pipe diameter and asset type. As no attribute data was available for storm assets, the risk ratings for assets were calculated using only condition and replacement cost.

The matrix stratifies assets based on their individual probability and consequence of failure, each scored from 1 to 5. Their product generates a risk index ranging from 1-25. Assets with the highest criticality and likelihood of failure receive a risk rating of 25; those with lowest probability of failure and lowest criticality carry a risk rating of 1. As new data and information is gathered, the Township may consider integrating relevant information that improves confidence in the criteria used to assess asset risk and criticality.

These risk models have been built into the Township's Asset Management Database (Citywide Assets). See *Risk & Criticality* section for further details on approach used to determine asset risk ratings and classifications.

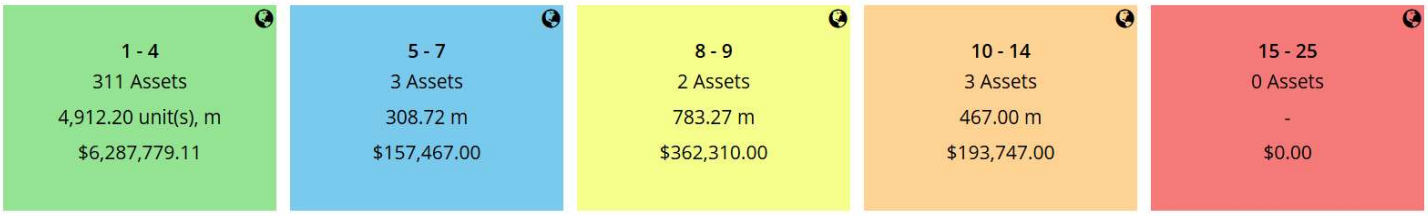

Figure 38 Risk Matrix: Stormwater

An asset's criticality rating, determined by the nature and magnitude of the consequences of its potential failure should be used to prioritize projects, particularly lifecycle management strategies.

8.7 Levels of Service

The tables that follow summarize the Township's current levels of service with respect to prescribed KPIs under Ontario Regulation 588/17 as well as any additional performance measures that the Township has selected for this AMP.

8.7.1 Community Levels of Service

Service Attribute	Qualitative Description	Current LOS (2024)
Scope	Description, which may include map, of the user groups or areas of the Township that are protected from flooding, including the extent of protection provided by the municipal storm water network	Description and/or mapping are not available at this time. Staff will have this metric determined for the next review of the AMP. New subdivisions within the Township do not have stormwater infrastructure.

Table 26 O. Reg. 588/17 Community Levels of Service: Stormwater

8.7.2 Technical Levels of Service

Service Attribute	Technical Metric	Current LOS (2024)
Scope	% of properties in municipality designed to be resilient to a 100-year storm	TBD[3]
	% of the municipal stormwater management system designed to be resilient to a 5-year storm	TBD[4]
Performance	% of culverts inspected every 2 years	100%
	% of ponds inspected annually	100%
	% of storm mains inspected annually (for operations)	100%
	Target reinvestment rate	1.64%
	Capital reinvestment rate	0%

Table 27 O. Reg. 588/17 Technical Levels of Service: Stormwater

8.8 Proposed Levels of Service

As per O. Reg. 588/17, by July 1, 2025, municipalities are required to consider proposed levels of service (PLOS), discuss the associated risks and long-term sustainability of these service levels, and explain the Township's ability to afford the PLOS.

The below tables and graphs explain the proposed levels of service scenarios that were analyzed for the stormwater network. Further PLOS analysis at the portfolio level can be found in Section *5. Proposed Levels of Service Analysis.*

[3] The Township does not currently have data available to determine this technical metric but will have it for the next iteration of the AMP.
[4] The Township does not currently have data available to determine this technical metric but will have it for the next iteration of the AMP.

8.8.1 PLOS Scenarios Analyzed

Scenario	Description
Scenario 1: Maintain Current Funding Level	This scenario maintains existing capital funding levels for those categories that are underfunded. ♦ Stormwater network capital funding maintained at $0
Scenario 2: Achieving 100% Target Funding in 10 Years	This scenario assumes gradual tax increases of ~1.0%/year, stabilizing at 100% funding across all asset categories in 10 years. ♦ Stormwater network capital funding increases from $0/year to $115,000/year.

Table 28 Stormwater Network PLOS Scenario Descriptions

8.8.2 PLOS Analysis Results

Scenario	Technical LOS Outcomes	Initial Value (2025)	15 Year Projection (2039)	30 Year Projection (2054)	Comments
Scenario 1	Average Condition	88%	69%	50%	
	Average Asset Risk	2.6	4.2	5.2	
	Annual Investment Required		$0		This is the maintained parameter in this scenario
	Capital Reinvestment Rate		0%		
Scenario 2	Average Condition	88%	73%	63%	
	Average Asset Risk	2.6	3.9	4.0	
	Annual Investment Required		$115,000		This parameter was increased from $0/year to $115,000/year gradually over 10 years.
	Capital Reinvestment Rate		1.6%		

Table 29 Stormwater Network PLOS Scenario Analysis

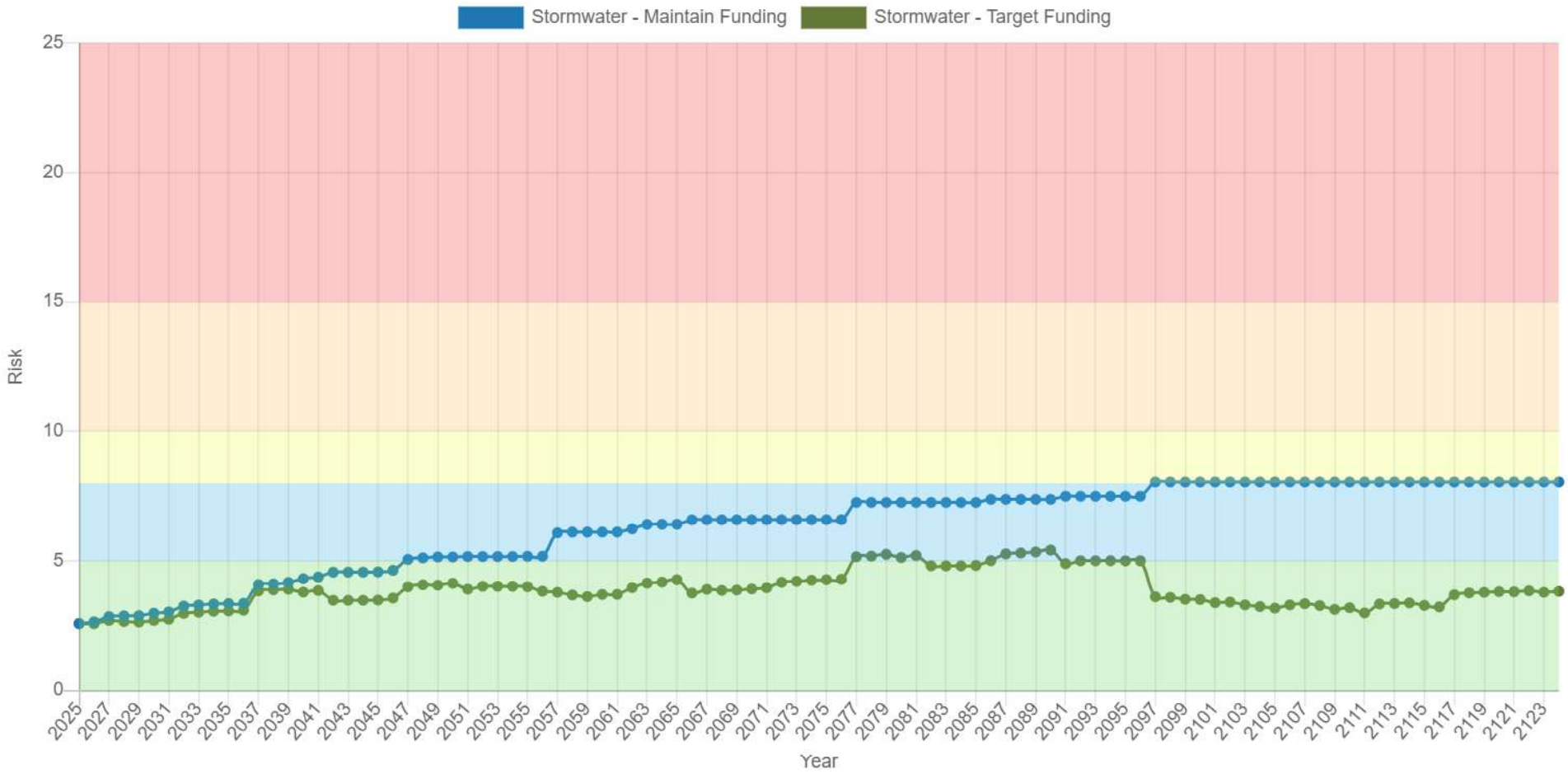

Figure 39 Stormwater Network PLOS Scenario Condition Result

9. Buildings & Facilities

The Township of Cavan Monaghan owns and maintains several facilities and recreation centers that provide key services to the community. These include:

- administrative offices
- schools and public libraries
- fire halls and associated offices and facilities
- public works garages and storage sheds
- arenas and community centers
- park shelters and structures

9.1 Inventory & Valuation

Table 30 summarizes the quantity and current replacement cost of all buildings assets available in the Township's asset register. The majority of buildings and facilities are not componentized. The quantity listed represents the number of asset records currently available for each department.

Segment	Quantity	Unit of Measure	Replacement Cost	Primary RC Method
Administrative	3	Assets	$3,551,000	User-Defined
Arenas & Community Centre	3	Assets	$22,811,000	User-Defined
Fire Halls	2	Assets	$1,081,000	User-Defined
Parks Shelters & Structures	1	Assets	$361,000	User-Defined
Public Works Facilities	5	Assets	$7,600,000	User-Defined
Schools & Libraries	2	Assets	$3,290,000	User-Defined
TOTAL			**$38,695,000**	

Table 30 Detailed Asset Inventory: Buildings & Facilities

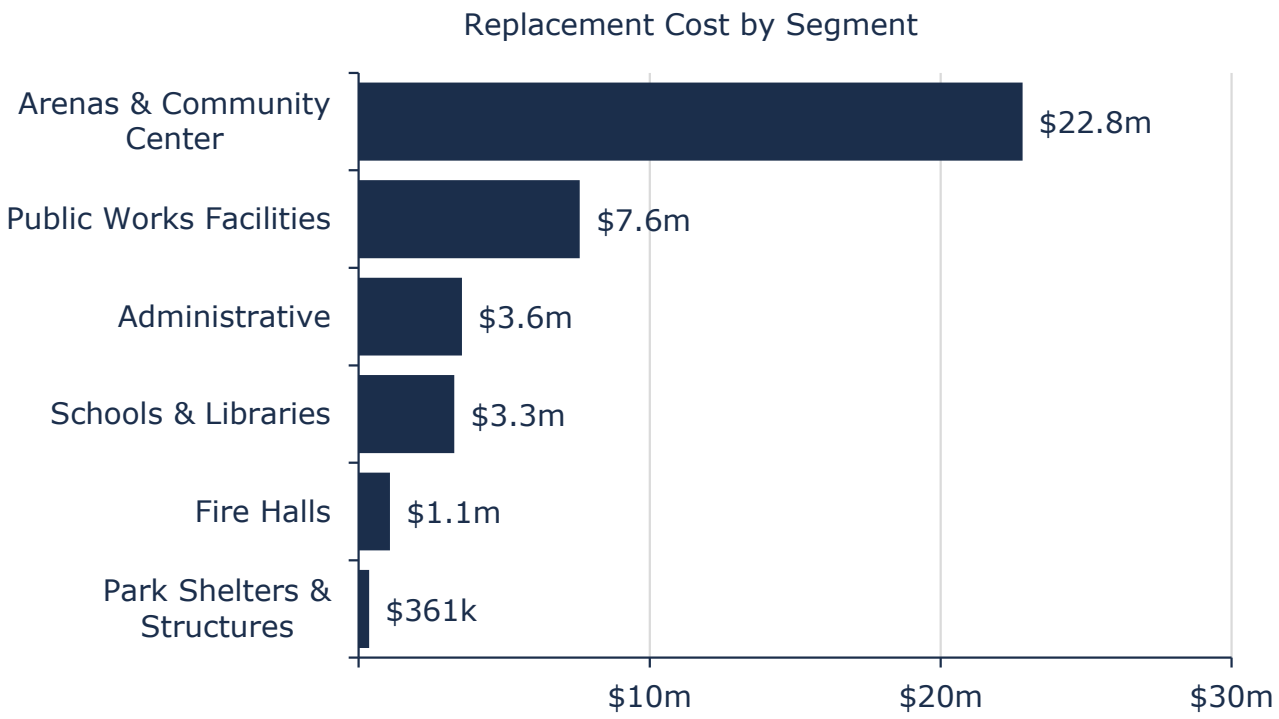

Figure 40 Portfolio Valuation: Buildings & Facilities

9.2 Asset Condition

Figure 47 summarizes the replacement cost-weighted condition of the Township's buildings and facilities portfolio. Based only on age data, 86% of buildings and facilities assets are in fair or better condition; however, 14%, with a current replacement cost of more than $5 million are in poor or worse condition. These assets may be candidates for replacement in the short term; similarly, assets in fair condition may require rehabilitation or replacement in the medium term and should be monitored for further degradation in condition.

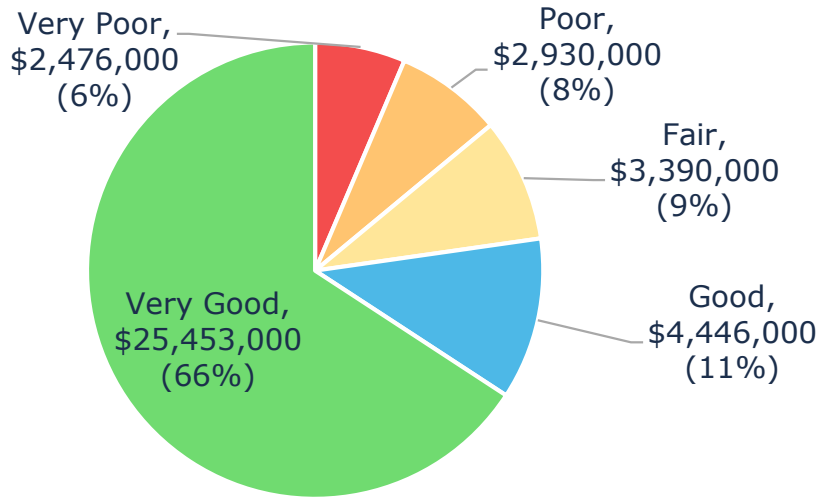

Figure 41 Asset Condition: Buildings & Facilities Overall

Figure 42 summarizes the age-based condition of buildings and facilities by each department. A substantial portion of public works facilities and the majority of schools & library assets are in poor to worse condition. However, in the absence of componentization, this data has limited value. Componentization of assets and integration of condition assessments will provide a more accurate and reliable estimation of the condition of various facilities.

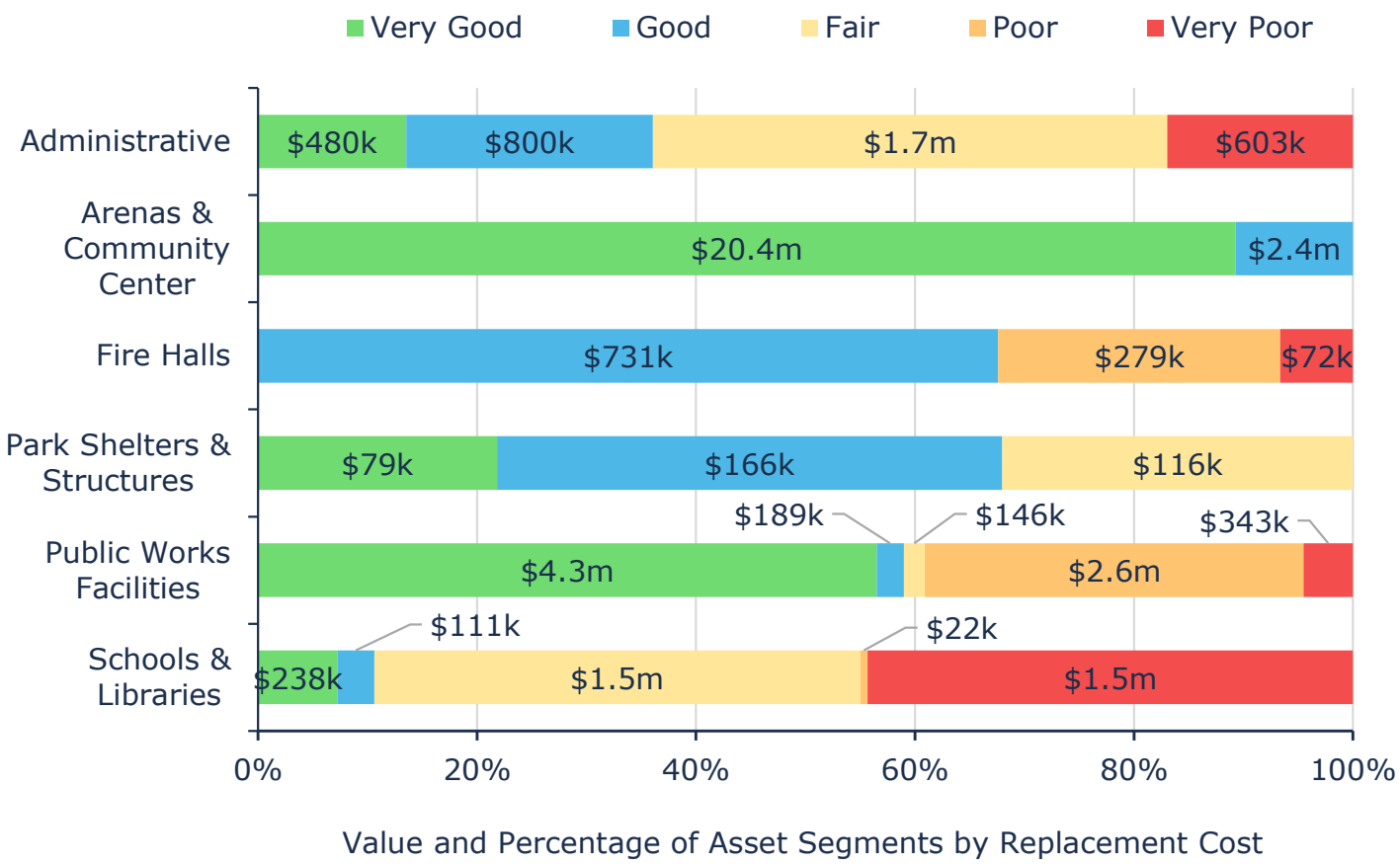

Figure 42 Asset Condition: Buildings & Facilities by Segment

9.3 Age Profile

An asset's age profile comprises two key values: estimated useful life (EUL), or design life; and the percentage of EUL consumed. The EUL is the serviceable lifespan of an asset during which it can continue to fulfil its intended purpose and provide value to users, safely and efficiently. As assets age, their performance diminishes, often more rapidly as they approach the end of their design life.

In conjunction with condition data, an asset's age profile provides a more complete summary of the state of infrastructure. It can help identify assets that may be candidates for further review through condition assessment programs; inform the selection of optimal lifecycle strategies; and improve planning for potential replacement spikes.

Figure 43 illustrates the average current age of each asset type and its estimated useful life. Both values are weighted by the replacement cost of individual assets.

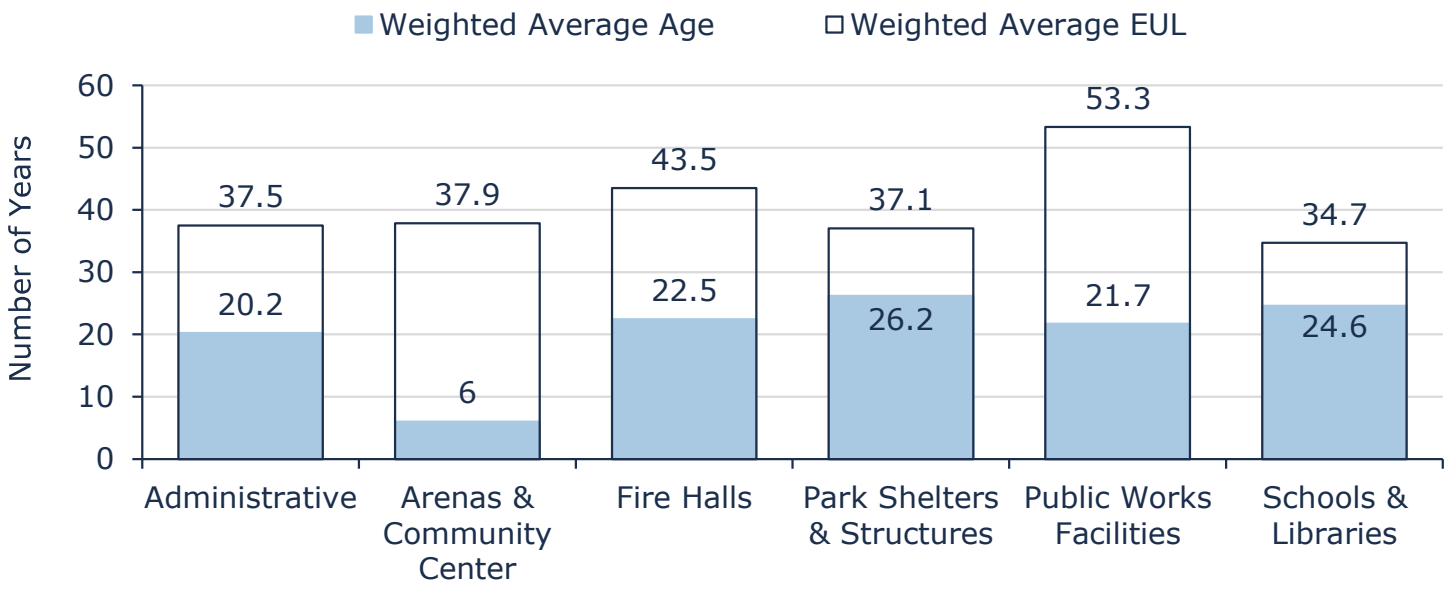

Figure 43 Estimated Useful Life vs. Asset Age: Buildings & Facilities

9.4 Current Approach to Lifecycle Management

The condition or performance of most assets will deteriorate over time. To ensure that municipal assets are performing as expected and meeting the needs of customers, it is important to establish a lifecycle management strategy to proactively manage asset deterioration.

Table 31 outlines the Township's current lifecycle management strategy.

Activity Type	Description of Current Strategy
Maintenance/ Rehabilitation	Municipal buildings are subject to regular inspections to identify health & safety requirements as well as structural deficiencies that require additional attention
	Critical buildings (Fire Halls, Arenas, Treatment Plants, etc.) have a detailed maintenance and rehabilitation schedule, while the maintenance of other facilities are dealt with on a case-by-case basis
Replacement	Assessments are completed strategically as buildings approach their end-of-life to determine whether replacement or rehabilitation is appropriate
Inspections	Formal workplace inspections are conducted every year through the Township's health and safety program. High-level assessments by internal staff are performed annually to determine the condition of facilities and identify deficiencies

Table 31 Lifecycle Management Strategy: Buildings & Facilities

9.5 Forecasted Long-Term Replacement Needs

Figure 44 illustrates the cyclical short-, medium- and long-term infrastructure replacement requirements for the Township's buildings and facilities portfolio. The Township's average annual requirements (red dotted line) total $1.0 million for all buildings and facilities. Although actual spending may fluctuate substantially from year to year, this figure is a useful benchmark value for annual capital expenditure targets (or allocations to reserves) to ensure projects are not deferred and replacement needs are met as they arise.

The chart also illustrates a backlog of more than $1.4 million comprising assets that have reached the end of their useful life but still remain in operation. These projections and estimates are based on current asset records, their replacement costs, and age analysis. They are designed to provide a long-term, portfolio-level overview of capital needs and should be used to support improved financial planning over several decades.

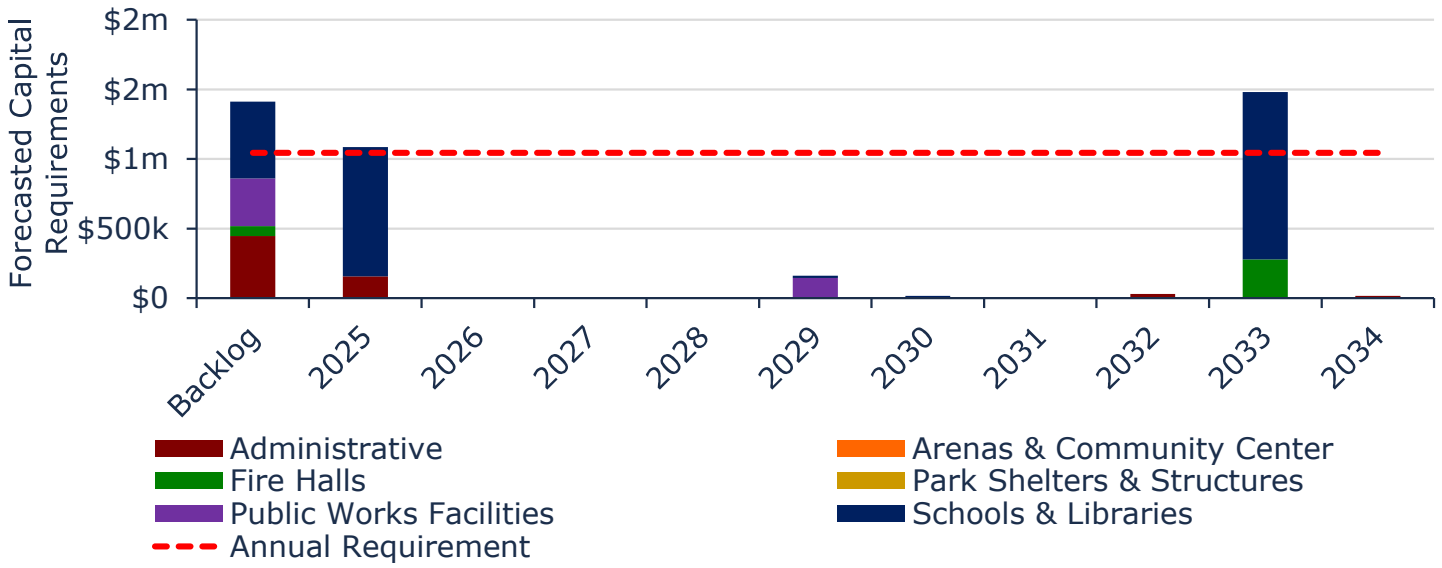

Figure 44 Forecasted Capital Replacement Needs Buildings & Facilities 2025-2034

Often, the magnitude of replacement needs is substantially higher than most municipalities can afford to fund. In addition, most assets may not need to be replaced. However, quantifying and monitoring these spikes is essential for long-term financial planning, including establishing dedicated reserves. In addition, a robust risk framework will ensure that high-criticality assets receive proper and timely lifecycle intervention, including replacements. In the case of buildings and facilities, detailed componentization is necessary to develop more reliable lifecycle forecasts that reflect the needs of individual elements and components.

A summary of the 10-year replacement forecast can be found in Appendix B – 10-Year Capital Requirements.

9.6 Risk Analysis

The risk matrix below is generated using available asset data, including service life remaining, replacement costs, condition, and facility function. The risk ratings for assets without useful attribute data were calculated using only condition and their replacement costs.

The matrix classifies assets based on their individual probability and consequence of failure, each scored from 1 to 5. Their product generates a risk index ranging from 1-25. Assets with the highest criticality and likelihood of failure receive a risk rating of 25; those with lowest probability of failure and lowest criticality carry a risk rating of 1. As new data and information is gathered, the Township may consider integrating relevant information that improves confidence in the criteria used to assess asset risk and criticality.

These risk models have been built into the Township's Asset Management Database (Citywide Assets). See *Risk & Criticality* section for further details on approach used to determine asset risk ratings and classifications.

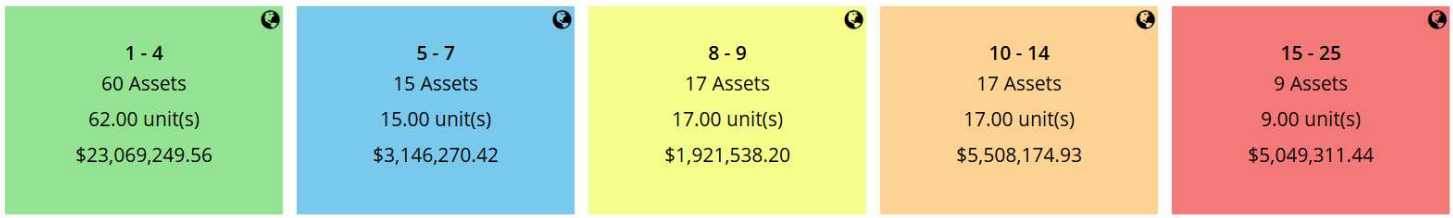

Figure 45 Risk Matrix: Buildings & Facilities

9.7 Levels of Service

The tables that follow summarize the Township's current levels of service. There are no specifically prescribed KPIs under Ontario Regulation 588/17 for non-core assets, therefore the KPIs below represent performance measures that the Township has selected for this AMP.

9.7.1 Community Levels of Service

Service Attribute	Qualitative Description	Current LOS (2024)
Reliability	Description of the facilities health and safety inspection process	A dedicated health and safety committee is responsible for monthly inspections and walkhroughs
	Description of maintenance and renewal activities to maintain buildings in a suitable condition	Rehabilitation of major components is generally completed on an as-needed basis
Scope	Description, which may include maps, of facilities owned by the Township	The Township owns administrative buildings, arenas and community centers, fire halls, parks, shelters, public works facilities and schools and libraries
	Description of the significant operating costs	Repairs and energy costs

Table 32 Community Levels of Service: Buildings & Facilities

9.7.2 Technical Levels of Service

Service Attribute	Technical Metric	Current LOS (2024)
Safety and Regulatory Compliance	% of buildings inspected monthly for safety	100%
	Adequate power to control entire Arena (yes/no)	Yes
	% of buildings in AODA compliance	45%
Reliability	Average Condition of Buildings	69%
Accessibility	m^2 of indoor recreation facilities per 1,000 people	670
Affordability	O&M costs per household	$243
	Average Annual Reinvestment Rate	1.65%

Table 33 Technical Levels of Service: Buildings & Facilities

9.8 Proposed Levels of Service

As per O. Reg. 588/17, by July 1, 2025, municipalities are required to consider proposed levels of service (PLOS), discuss the associated risks and long-term sustainability of these service levels, and explain the Township's ability to afford the PLOS.

The below tables and graphs explain the proposed levels of service scenarios that were analyzed for buildings and facilities. Further PLOS analysis at the portfolio level can be found in Section *5. Proposed Levels of Service Analysis.*

9.8.1 PLOS Scenarios Analyzed

Scenario	Description
Scenario 1: Maintain Current Funding Level	This scenario maintains existing capital funding levels for those categories that are underfunded. ♦ Buildings capital funding maintained at $639,000/year
Scenario 2: Achieving 100% Target Funding in 10 Years	This scenario assumes gradual tax increases of ~1.0%/year, stabilizing at 100% funding across all asset categories in 10 years. ♦ Buildings' capital funding gradually increases from $639,000/year to $1.0m/year over a span of 10 years

Table 34 Buildings & facilities PLOS Scenario Descriptions

9.8.2 PLOS Analysis Results

Scenario	Technical LOS Outcomes	Initial Value (2025)	15 Year Projection (2039)	30 Year Projection (2054)	Comments
Scenario 1 (All Segments)	Average Condition	72%	47%	30%	
	Average Asset Risk	8.7	14.6	18.7	
	Annual Investment Required		$639,000		This is the maintained parameter in this scenario
	Capital Reinvestment Rate		1.65%		
Scenario 2 (All Segments)	Average Condition	72%	52%	40%	
	Average Asset Risk	8.7	13.5	16.0	
	Annual Investment Required		$1,044,000		This parameter is increased from $639,000 incrementally to reach a target portfolio investment of $1.0M over 10 years
	Capital Reinvestment Rate		2.70%		

Table 35 Buildings & facilities PLOS Scenario Analysis

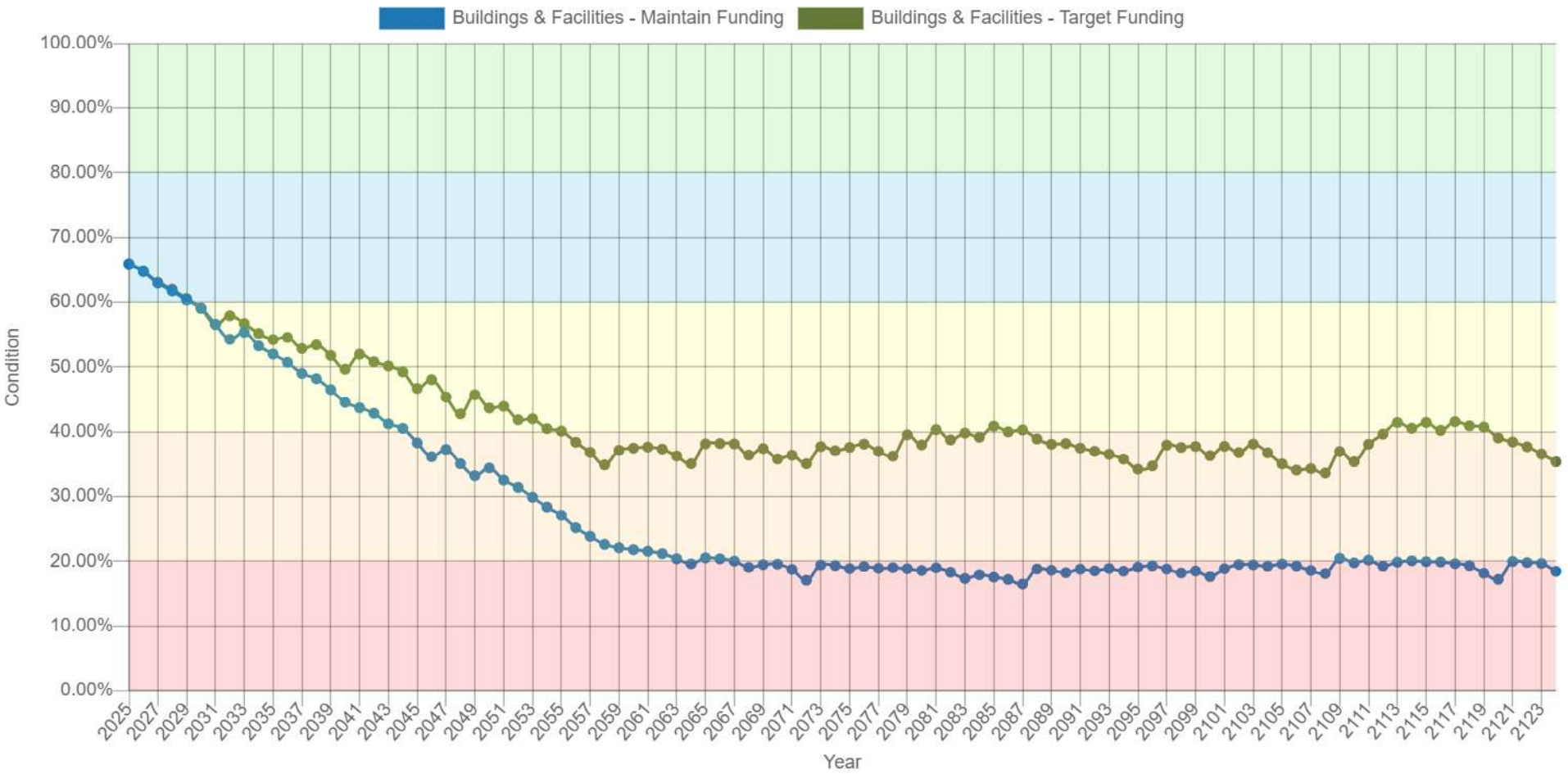

Figure 46 Buildings & facilities PLOS Scenario Condition Results

10. Land Improvements

The Township of Cavan Monaghan owns a number of assets that are considered land improvements. This category includes:

- Parking lots for municipal facilities
- Recreational play spaces
- Sport fields & courts
- Miscellaneous landscaping and other assets

10.1 Inventory & Valuation

Table 36 summarizes the quantity and current replacement cost of all land improvements assets available in the Township's asset register.

Segment	Quantity	Unit of Measure	Replacement Cost	Primary RC Method
Paving & Parking Lots	19	Quantity	$1,033,000	CPI
Playspace	1	Quantity	$43,000	CPI
Signs	13	Quantity	$143,000	CPI
Sport Fields & Courts	5	Quantity	$934,000	CPI
TOTAL			**$2,152,000**	

Table 36 Detailed Asset Inventory: Land Improvements

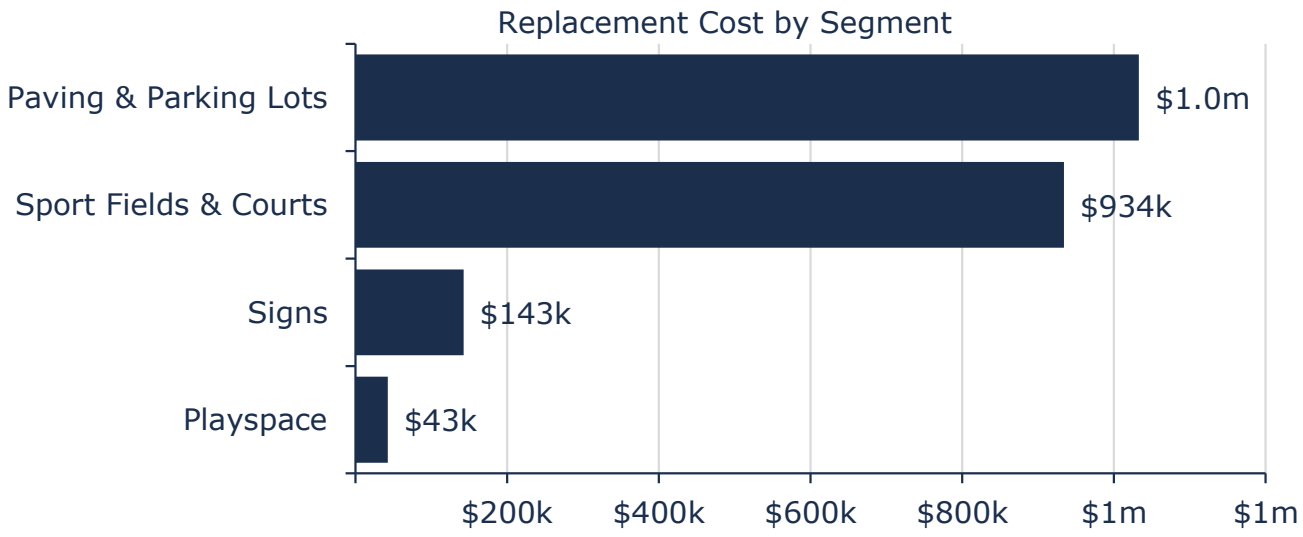

Figure 47 Portfolio Valuation: Land Improvements

10.2 Asset Condition

Figure 48 summarizes the replacement cost-weighted condition of the Township's land improvements portfolio. Based on age data only, 67%% of assets are in fair or better condition, the remaining 33% are in poor or worse condition. These assets may be candidates for replacement in the short term; similarly, assets in fair condition may require rehabilitation or replacement in the medium term and should be monitored for further degradation in condition.

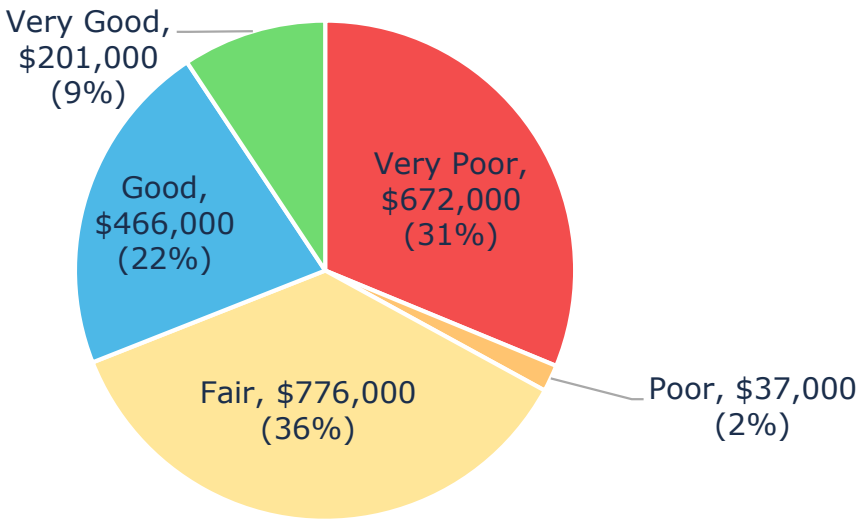

Figure 48 Asset Condition: Land Improvements Overall

Figure 49 summarizes the age-based condition of land improvements by each department. Assets in poor or worse condition are concentrated primarily in signs and playspaces.

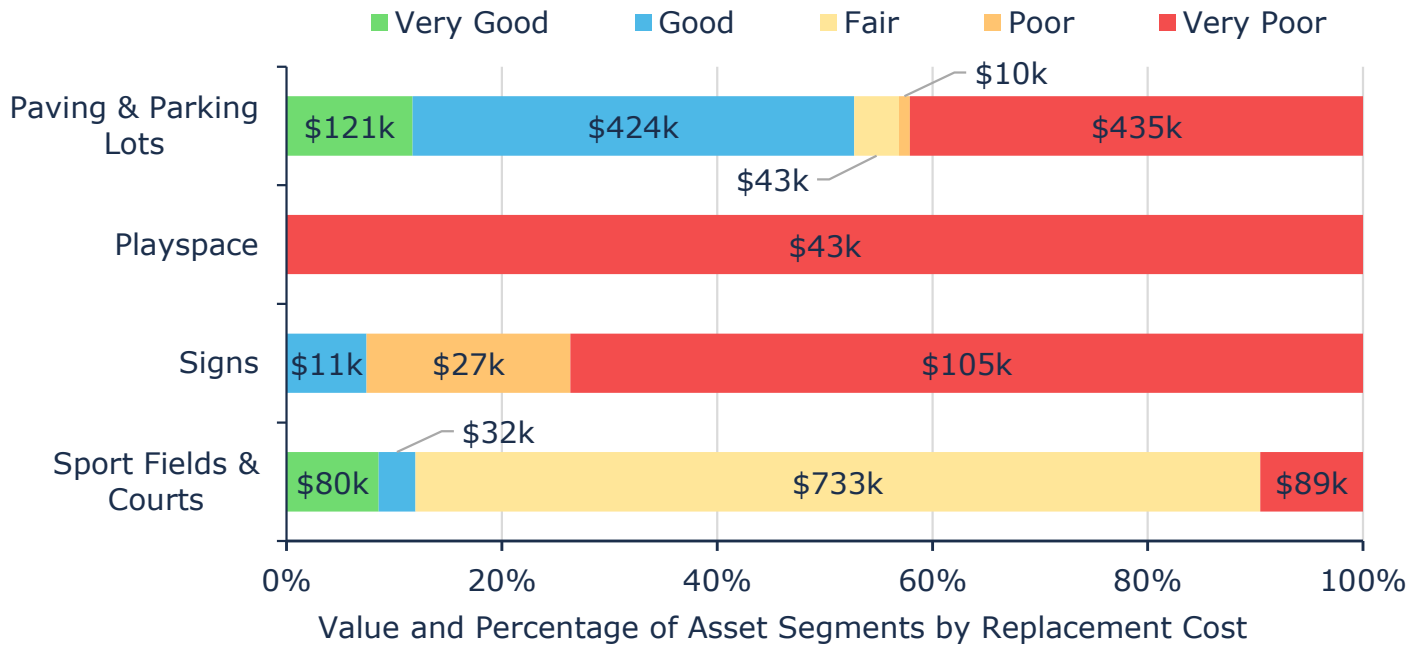

Figure 49 Asset Condition: Land Improvements by Segment

10.3 Age Profile

An asset's age profile comprises two key values: estimated useful life (EUL), or design life; and the percentage of EUL consumed. The EUL is the serviceable lifespan of an asset during which it can continue to fulfil its intended purpose and provide value to users, safely and efficiently. As assets age, their performance diminishes, often more rapidly as they approach the end of their design life.

In conjunction with condition data, an asset's age profile provides a more complete summary of the state of infrastructure. It can help identify assets that may be candidates for further review through condition assessment programs; inform the selection of optimal lifecycle strategies; and improve planning for potential replacement spikes.

Figure 50 illustrates the average current age of each asset type and its estimated useful life. Both values are weighted by the replacement cost of individual assets.

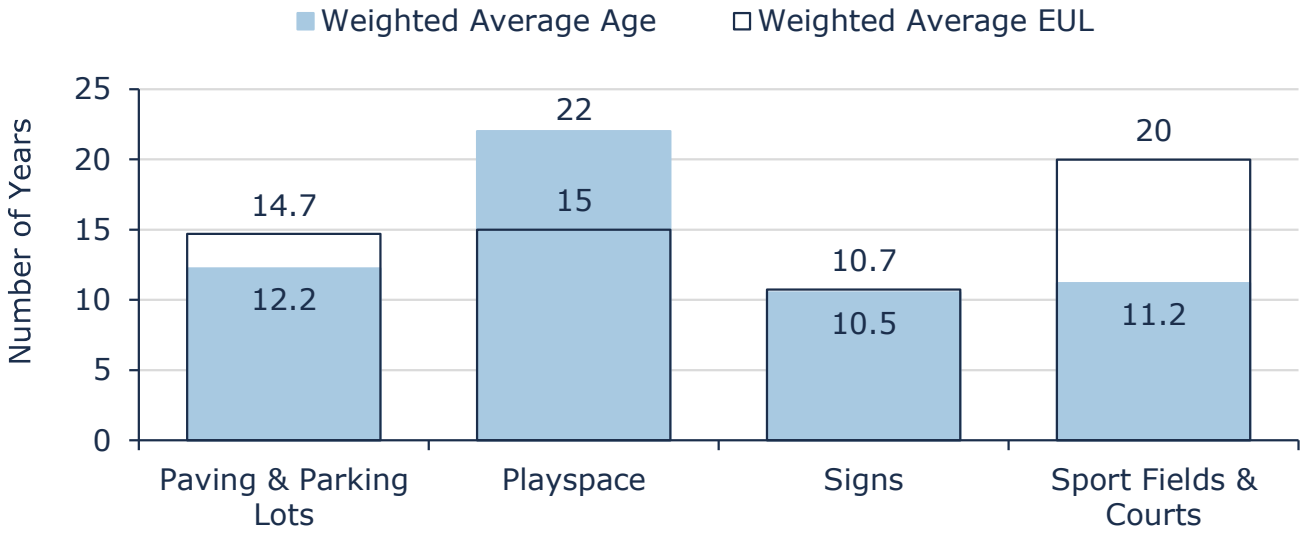

Figure 50 Estimated Useful Life vs. Asset Age: Land Improvements

10.4 Current Approach to Lifecycle Management

The condition or performance of most assets will deteriorate over time. To ensure that municipal assets are performing as expected and meeting the needs of customers, it is important to establish a lifecycle management strategy to proactively manage asset deterioration.

Table 37 outlines the Township's current lifecycle management strategy.

Activity Type	Description of Current Strategy
Maintenance, Rehabilitation & Replacement	The Land improvements asset category includes several unique asset types and lifecycle requirements are dealt with on a case-by-case basis

Activity Type	Description of Current Strategy
Inspections	Staff complete regular visual inspections of land improvement assets to ensure they are in a state of adequate repair. Staff conduct formal inspections of outdoor play space, fixed play structures and surfacing in accordance with CAN/CSA-Z614 and required as per O.Reg. 137/15

Table 37 Lifecycle Management Strategy: Land Improvements

10.5 Forecasted Long-Term Replacement Needs

Figure 51 illustrates the cyclical short-, medium- and long-term infrastructure replacement requirements for the Township's land improvements portfolio. The Township's average annual requirements (red dotted line) total $136,000 for all land improvements. Although actual spending may fluctuate substantially from year to year, this figure is a useful benchmark value for annual capital expenditure targets (or allocations to reserves) to ensure projects are not deferred and replacement needs are met as they arise.

These projections and estimates are based on asset replacement costs and age analysis. They are designed to provide a long-term, portfolio-level overview of capital needs and should be used to support improved financial planning over several decades.

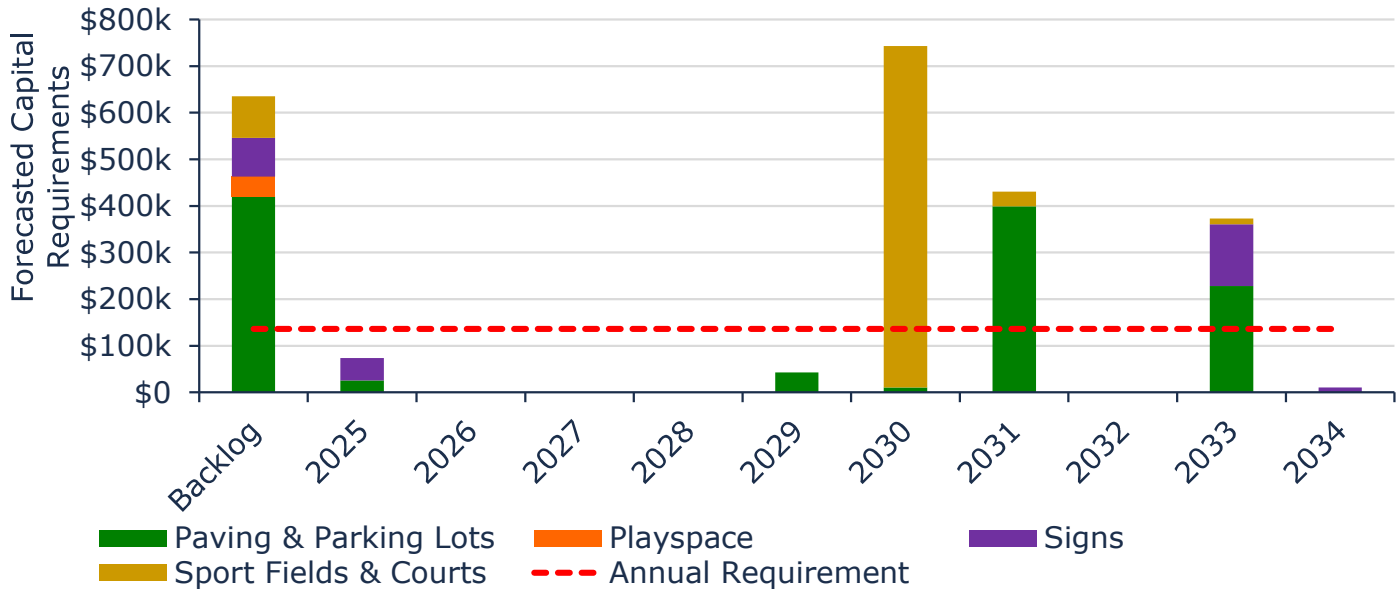

Figure 51 Forecasted Capital Replacement Needs: Land Improvements 2025-2034

Often, the magnitude of replacement needs is substantially higher than most municipalities can afford to fund. In addition, most assets may not need to be replaced. However, quantifying and monitoring these spikes is essential for long-term financial planning, including establishing dedicated reserves. In addition, a robust risk framework will ensure that high-criticality assets receive proper and timely lifecycle intervention, including replacements.

A summary of the 10-year replacement forecast can be found in Appendix B – 10-Year Capital Requirements.

10.6 Risk Analysis

The risk matrix below is generated using available asset data, including condition, service life remaining, replacement costs, and asset type. The risk ratings for assets without useful attribute data were calculated using only condition, service life remaining, and their replacement costs.

The matrix stratifies assets based on their individual probability and consequence of failure, each scored from 1 to 5. Their product generates a risk index ranging from 1-25. Assets with the highest criticality and likelihood of failure receive a risk rating of 25; those with lowest probability of failure and lowest criticality carry a risk rating of 1. As new data and information is gathered, the Township may consider integrating relevant information that improves confidence in the criteria used to assess asset risk and criticality.

These risk models have been built into the Township's Asset Management Database (Citywide Assets). See *Risk & Criticality* section for further details on approach used to determine asset risk ratings and classifications.

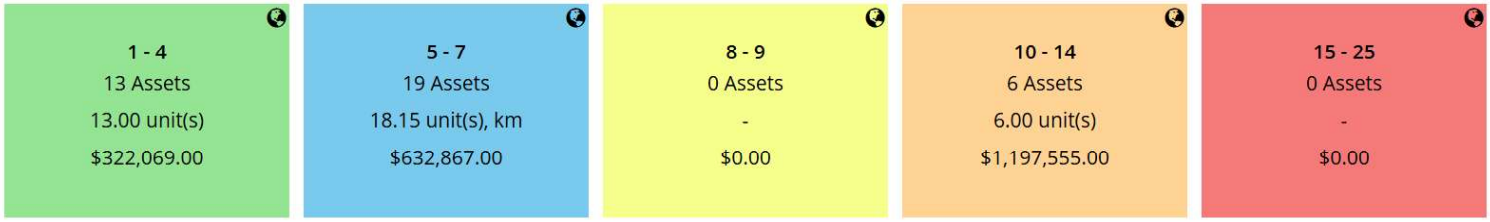

Figure 52 Risk Matrix: Land Improvements

10.7 Levels of Service

The tables that follow summarize the Township's current levels of service. There are no specifically prescribed KPIs under Ontario Regulation 588/17 for non-core assets, therefore the KPIs below represent performance measures that the Township has selected for this AMP.

10.7.1 Community Levels of Service

Service Attribute	Qualitative Description	Current LOS (2024)
Safety and Regulatory Compliance	Description of parks and trails inspection process	Monthly safety inspections are performed on all parks. Trails are inspected monthly.
Sustainability	Description of maintenance and renewal activities to maintain land improvements in a suitable condition	Sport fields undergo regular maintenance and inspections 2-3 times per week. Replacements ae based on asset condition.
Affordability	Description, which may include maps, of parklands maintained by the Township	See Appendix C

Table 38 Community Levels of Service: Land Improvements

10.7.2 Technical Levels of Service

Service Attribute	Technical Metric	Current LOS (2024)
Safety and Regulatory Compliance	% of parks inspections completed monthly	100%
Reliability	Average condition of sports fields and courts	46%
Affordability	Hectares of parkland per 1,000 people	4.72
	% of park amentities or open spaces that are AODA compliant	70%

Table 39 Technical Levels of Service: Land Improvements

10.8 Proposed Levels of Service

As per O. Reg. 588/17, by July 1, 2025, municipalities are required to consider proposed levels of service (PLOS), discuss the associated risks and long-term sustainability of these service levels, and explain the Township's ability to afford the PLOS.

The below tables and graphs explain the proposed levels of service scenarios that were analyzed for land improvements. Further PLOS analysis at the portfolio level can be found in section *5. Proposed Levels of Service Analysis.*

10.8.1 PLOS Scenarios Analyzed

Scenario	Description
Scenario 1: Maintain Current Funding Level	This scenario maintains existing capital funding levels for those categories that are underfunded. ♦ Land Improvements capital funding maintained at $16,000/year
Scenario 2: Achieving 100% Target Funding in 10 Years	This scenario assumes gradual tax increases of ~1.0%/year, stabilizing at 100% funding across all asset categories in 10 years. ♦ Land Improvements capital funding increases from $16,000/year to $136,000/year.
Scenario 3: Specific Condition Targets	This scenario aims to maintain target conditions for land improvements: ♦ Land Improvements Target Condition: 65% No funding limitations were placed on this scenario.

Table 40 Land Improvements PLOS Scenario Descriptions

10.8.2 PLOS Analysis Results

Scenario	Technical LOS Outcomes	Initial Value (2025)	15 Year Projection (2039)	30 Year Projection (2054)	Comments
Scenario 1	Average Condition	44%	5%	4%	
	Average Asset Risk	10.4	15.4	15.5	
	Annual Investment Required		$16,000		This is the maintained parameter in this scenario
	Capital Reinvestment Rate		0.7%		
Scenario 2	Average Condition	44%	39%	39%	
	Average Asset Risk	10.4	11.5	11.6	
	Annual Investment Required		$136,000		This parameter was increased from $16,000/year to $136,000/year gradually over 10 years.
	Capital Reinvestment Rate		6.3%		
Scenario 3	Average Condition	44%	55%	51%	Target Condition: 65%
	Average Asset Risk	10.4	8.7	9.4	
	Annual Investment Required		$169,000		
	Capital Reinvestment Rate		7.8%		

Table 41 Land Improvements PLOS Scenario Analysis

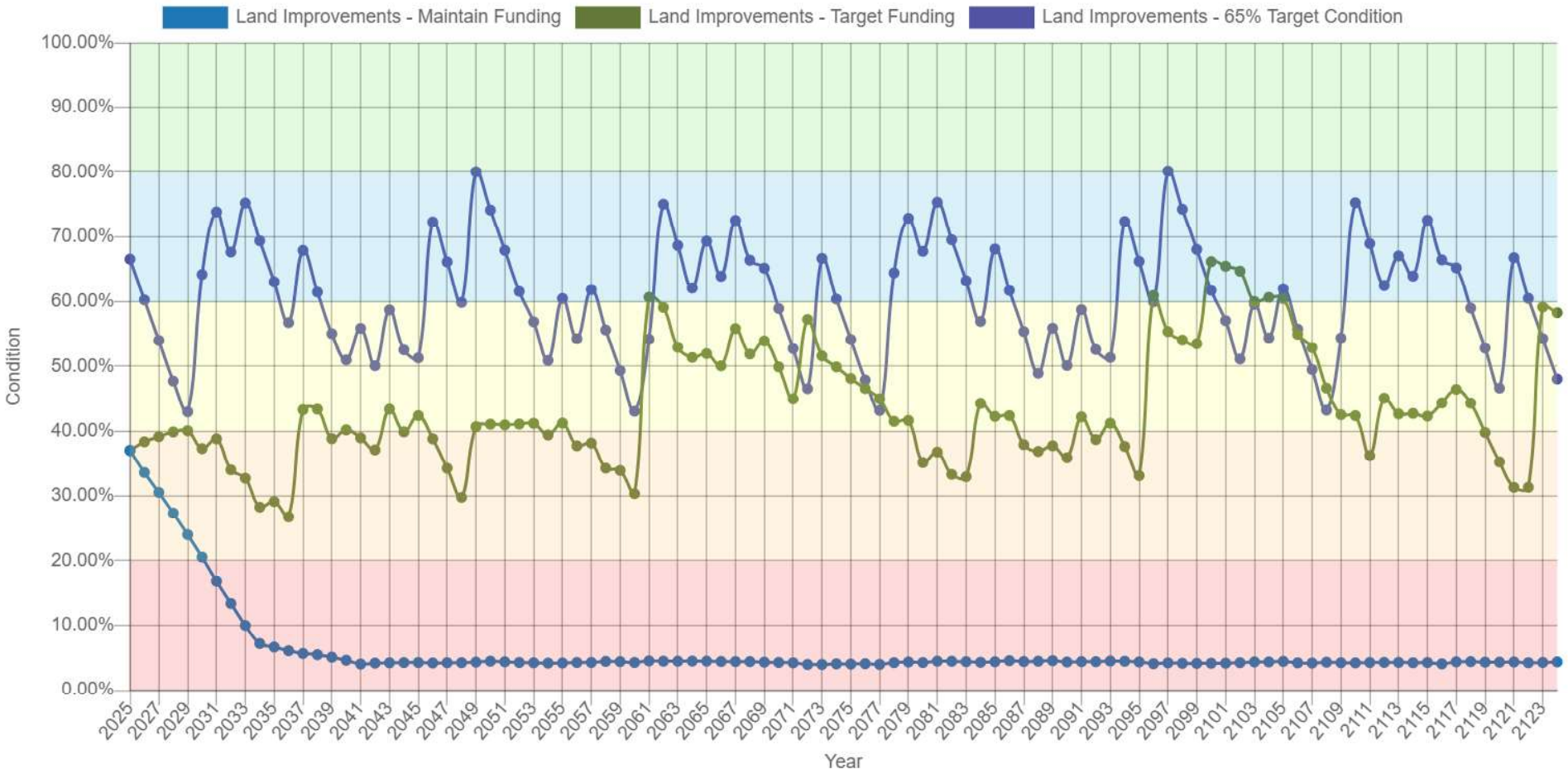

Figure 53 Land Improvements PLOS Scenario Condition Results

11. Fleet

The Township's fleet portfolio includes vehicles that allow staff to efficiently deliver municipal services and personnel. These assets include:

- Light-duty and heavy-duty vehicles to support the maintenance of municipal infrastructure and address service requests
- Emergency service vehicles to support first responders

11.1 Inventory & Valuation

Table 42 summarizes the quantity and current replacement cost of all fleet assets available in the Township's asset register.

Segment	Quantity	Unit of Measure	Replacement Cost	Primary RC Method
Fire Vehicles	21	Quantity	$2,526,000	CPI
Heavy Duty Vehicles	14	Quantity	$3,686,000	CPI
Light Duty Vehicles	30	Quantity	$1,661,000	CPI
TOTAL			**$7,873,000**	

Table 42 Detailed Asset Inventory: Fleet

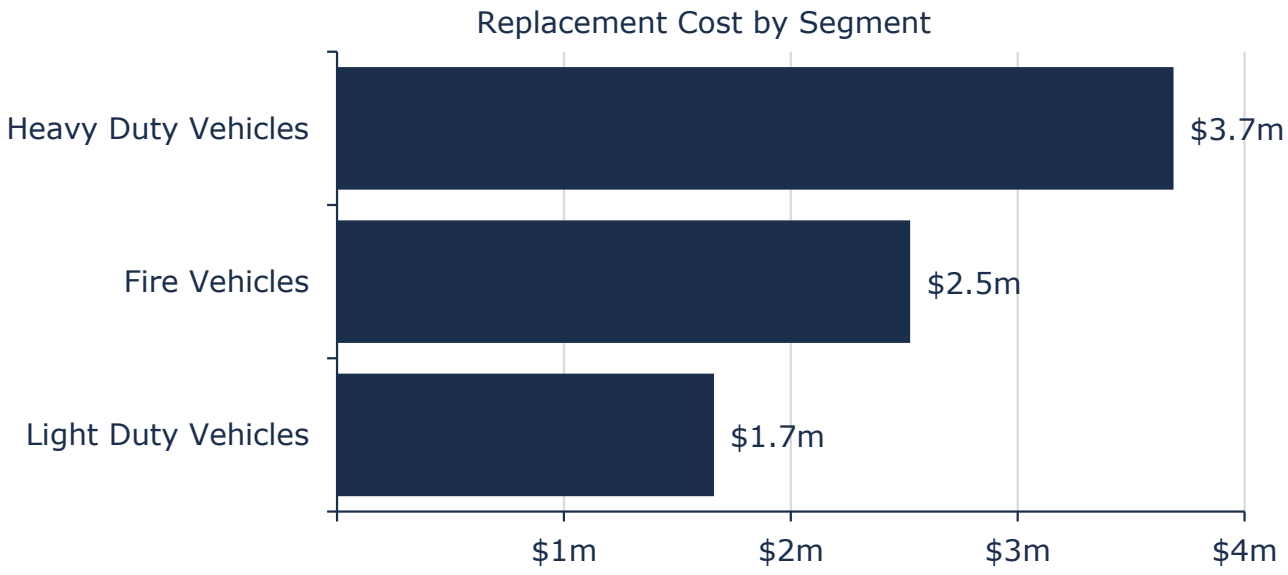

Figure 54 Portfolio Valuation: Fleet

11.2 Asset Condition

Figure 55 summarizes the replacement cost-weighted condition of the Township's fleet portfolio. Based solely on age, 67% of fleet are in fair or better condition, with the remaining 33% are in poor or worse condition. These assets may be candidates for replacement in the short term; similarly, assets in fair condition may require rehabilitation or replacement in the medium term and should be monitored for further degradation in condition.

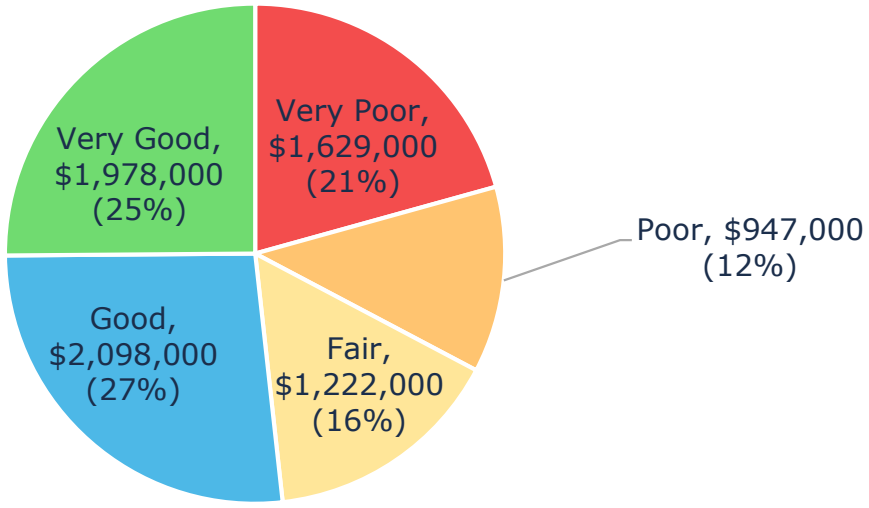

Figure 55 Asset Condition: Fleet Overall

Figure 56 summarizes the condition of fleet by each department. The majority of vehicles are in fair or better condition.

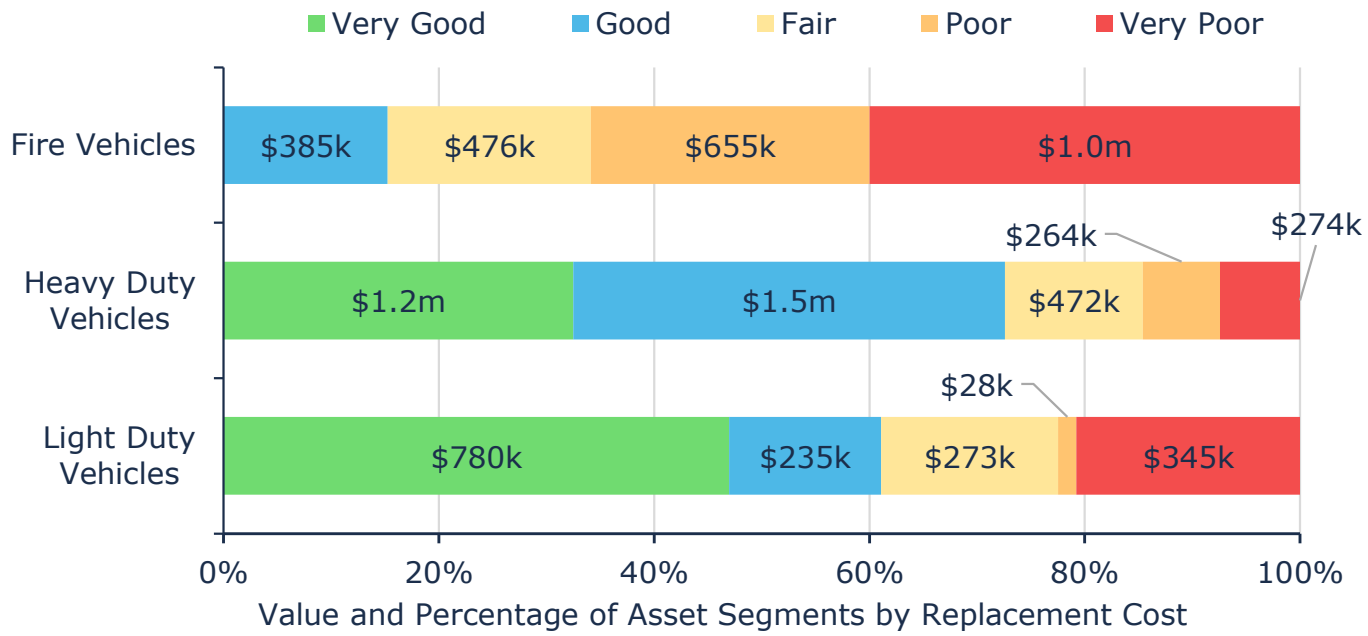

Figure 56 Asset Condition: Fleet by Segment

11.3 Age Profile

An asset's age profile comprises two key values: estimated useful life (EUL), or design life; and the percentage of EUL consumed. The EUL is the serviceable lifespan of an asset during which it can continue to fulfil its intended purpose and provide value to users, safely and efficiently. As assets age, their performance diminishes, often more rapidly as they approach the end of their design life.

In conjunction with condition data, an asset's age profile provides a more complete summary of the state of infrastructure. It can help identify assets that may be candidates for further review through condition assessment programs; inform the selection of optimal lifecycle strategies; and improve planning for potential replacement spikes.

Figure 57 illustrates the average current age of each asset type and its estimated useful life. Both values are weighted by the replacement cost of individual assets.

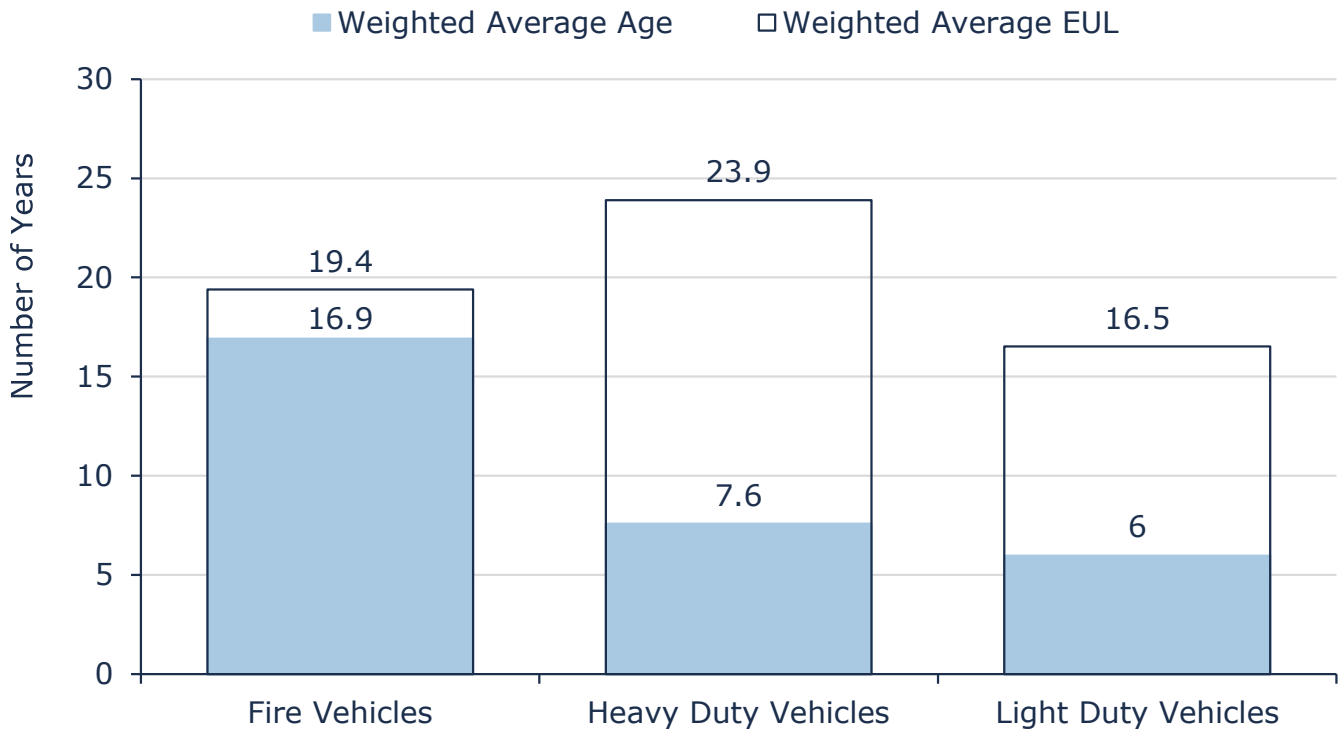

Figure 57 Estimated Useful Life vs. Asset Age: Fleet

11.4 Current Approach to Lifecycle Management

The condition or performance of most assets will deteriorate over time. To ensure that municipal assets are performing as expected and meeting the needs of customers, it is important to establish a lifecycle management strategy to proactively manage asset deterioration.

The following table outlines the Township's current lifecycle management strategy.

Activity Type	Description of Current Strategy
Maintenance / Rehabilitation	Maintenance program varies by department
	Visual inspections on some fleet assets completed and documented daily; fluids inspected at every fuel stop; tires inspected monthly
	Annual preventative maintenance activities include system components check and additional detailed inspections
Replacement/ Inspection	Age, kilometres and annual repair costs are taken into consideration when determining appropriate treatment options for vehicle assets
	Vehicles are inspected by the operator daily before use, however, these inspections identify deficiencies but do not provide overall condition ratings
	Condition assessments are conducted on Fire & Emergency fleet assets in accordance with regulations for health and safety regulations including National Fire Protection Association (NFPA) codes and standards for fire service-related fleet assets

Table 43 Lifecycle Management Strategy: Fleet

11.5 Forecasted Long-Term Replacement Needs

Figure 58 illustrates the cyclical short-, medium- and long-term infrastructure replacement requirements for the Township's fleet portfolio. The Township's average annual requirements (red dotted line) total $410,000 for all vehicles. Although actual spending may fluctuate substantially from year to year, this figure is a useful benchmark value for annual capital expenditure targets (or allocations to reserves) to ensure projects are not deferred and replacement needs are met as they arise.

These projections and estimates are based on asset replacement costs and age analysis. They are designed to provide a long-term, portfolio-level overview of capital needs and should be used to support improved financial planning over several decades.

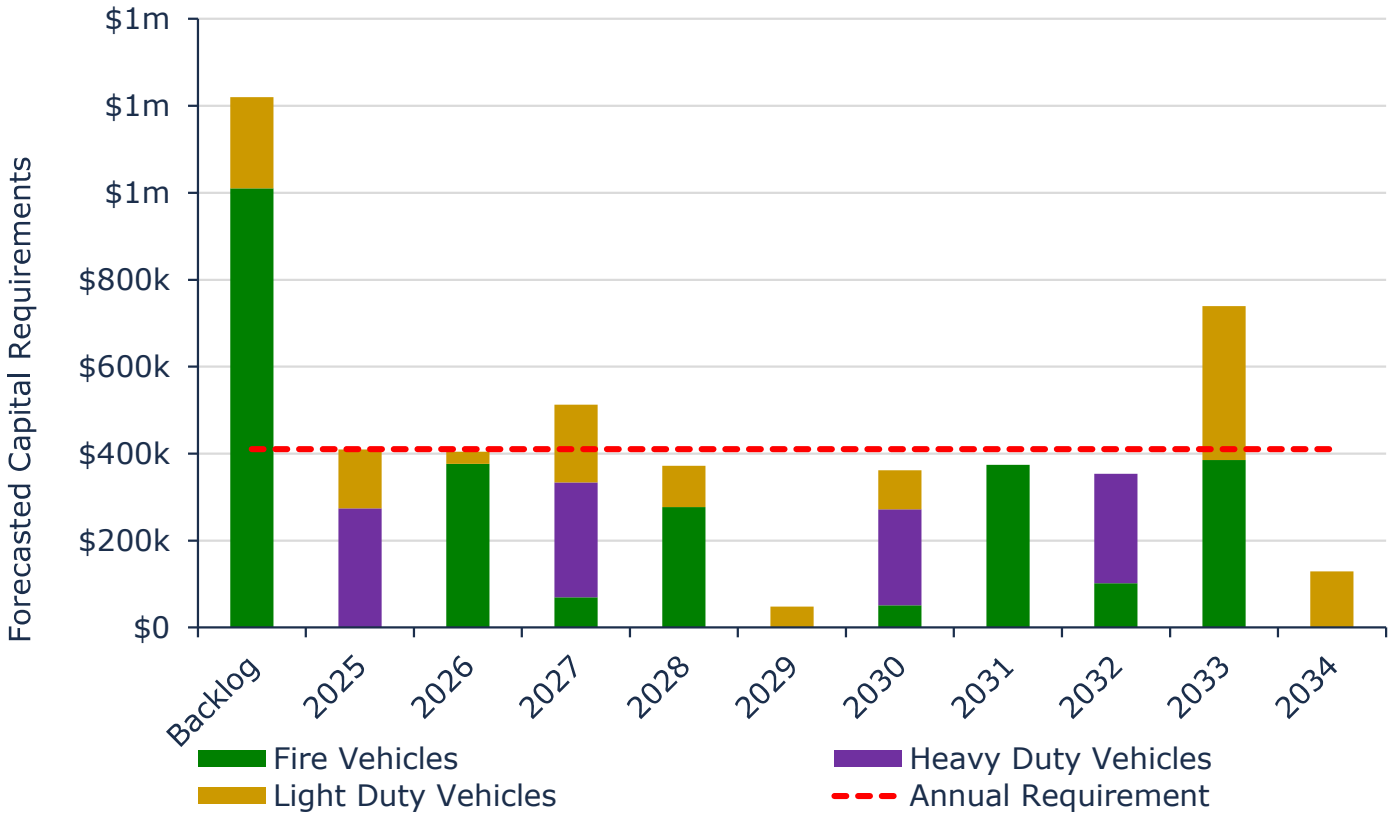

Figure 58 Forecasted Capital Replacement Needs: Fleet 2025-2035

Often, the magnitude of replacement needs is substantially higher than most municipalities can afford to fund. In addition, most assets may not need to be replaced. However, quantifying and monitoring these spikes is essential for long-term financial planning, including establishing dedicated reserves. In addition, a robust risk framework will ensure that high-criticality assets receive proper and timely lifecycle intervention, including replacements.

A summary of the 10-year replacement forecast can be found in Appendix B – 10-Year Capital Requirements.

11.6 Risk Analysis

The risk matrix below is generated using available asset data, including condition, service life remaining, replacement costs, and fleet asset function. The risk ratings for assets without useful attribute data were calculated using only condition and their replacement costs.

The matrix stratifies assets based on their individual probability and consequence of failure, each scored from 1 to 5. Their product generates a risk index ranging from 1-25. Assets with the highest criticality and likelihood of failure receive a risk rating of 25; those with lowest probability of failure and lowest criticality carry a risk rating of 1. As new data and information is gathered, the Township may consider integrating relevant information that improves confidence in the criteria used to assess asset risk and criticality.

These risk models have been built into the Township's Asset Management Database (Citywide Assets). See *Risk & Criticality* section for further details on approach used to determine asset risk ratings and classifications.

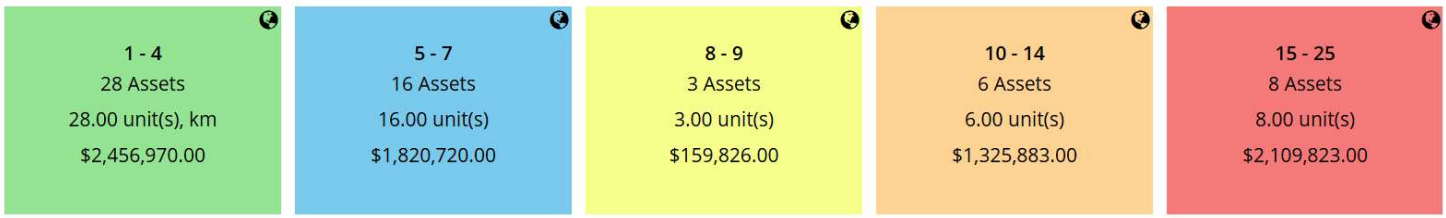

Figure 59 Risk Matrix: Fleet

11.7 Levels of Service

The tables that follow summarize the Township's current levels of service. There are no specifically prescribed KPIs under Ontario Regulation 588/17 for non-core assets, therefore the KPIs below represent performance measures that the Township has selected for this AMP.

11.7.1 Community Levels of Service

Service Attribute	Qualitative Description	Current LOS (2024)
Scope	Description of annual vehicle inspection process	Vehicle safety checks are performed daily. An external mechanic completes scheduled inspections and maintenance on vehicles.

Table 44 Community Levels of Service: Fleet

11.7.2 Technical Levels of Service

Service Attribute	Technical Metric	Current LOS (2024)
Safety & Regulatory Compliance	% of fleet undergoing annual safety inspections	100%
Reliability	Average condition of Fire Fleet	27%
	Average condition of heavy duty vehicles	70%
	Average condition of light duty vehicles	56%
	Number of days frontline fire vehicles are out of service	10
Affordability	Average Annual Reinvestment Rate	3.55%

Table 45 Technical Levels of Service: Fleet

11.8 Proposed Levels of Service

As per O. Reg. 588/17, by July 1, 2025, municipalities are required to consider proposed levels of service (PLOS), discuss the associated risks and long-term sustainability of these service levels, and explain the Township's ability to afford the PLOS.

The below tables and graphs explain the proposed levels of service scenarios that were analyzed for fleet. Further PLOS analysis at the portfolio level can be found in section *5. Proposed Levels of Service Analysis.*

11.8.1 PLOS Scenarios Analyzed

Scenario	Description
Scenario 1: Maintain Current Funding Level	This scenario maintains existing capital funding levels for those categories that are underfunded. ♦ Fleet capital funding maintained at $280,000/year
Scenario 2: Achieving 100% Target Funding in 10 Years	This scenario assumes gradual tax increases of ~1.0%/year, stabilizing at 100% funding across all asset categories in 10 years. ♦ Fleet capital funding increases from $280,000/year to $410,000/year.

Table 46 Fleet PLOS Scenario Descriptions

11.8.2 PLOS Analysis Results

Scenario	Technical LOS Outcomes	Initial Value (2025)	15 Year Projection (2039)	30 Year Projection (2054)	Comments
Scenario 1	Average Condition	57%	33%	29%	
	Average Asset Risk	10.1	13.3	13.5	
	Annual Investment Required		$280,000		This is the maintained parameter in this scenario
	Capital Reinvestment Rate		3.55%		
Scenario 2	Average Condition	57%	44%	41%	
	Average Asset Risk	10.1	11.1	11.7	
	Annual Investment Required		$410,000		This parameter was increased from $280,000/year to $410,000/year gradually over 10 years.
	Capital Reinvestment Rate		5.21%		

Table 47 Fleet PLOS Scenario Analysis

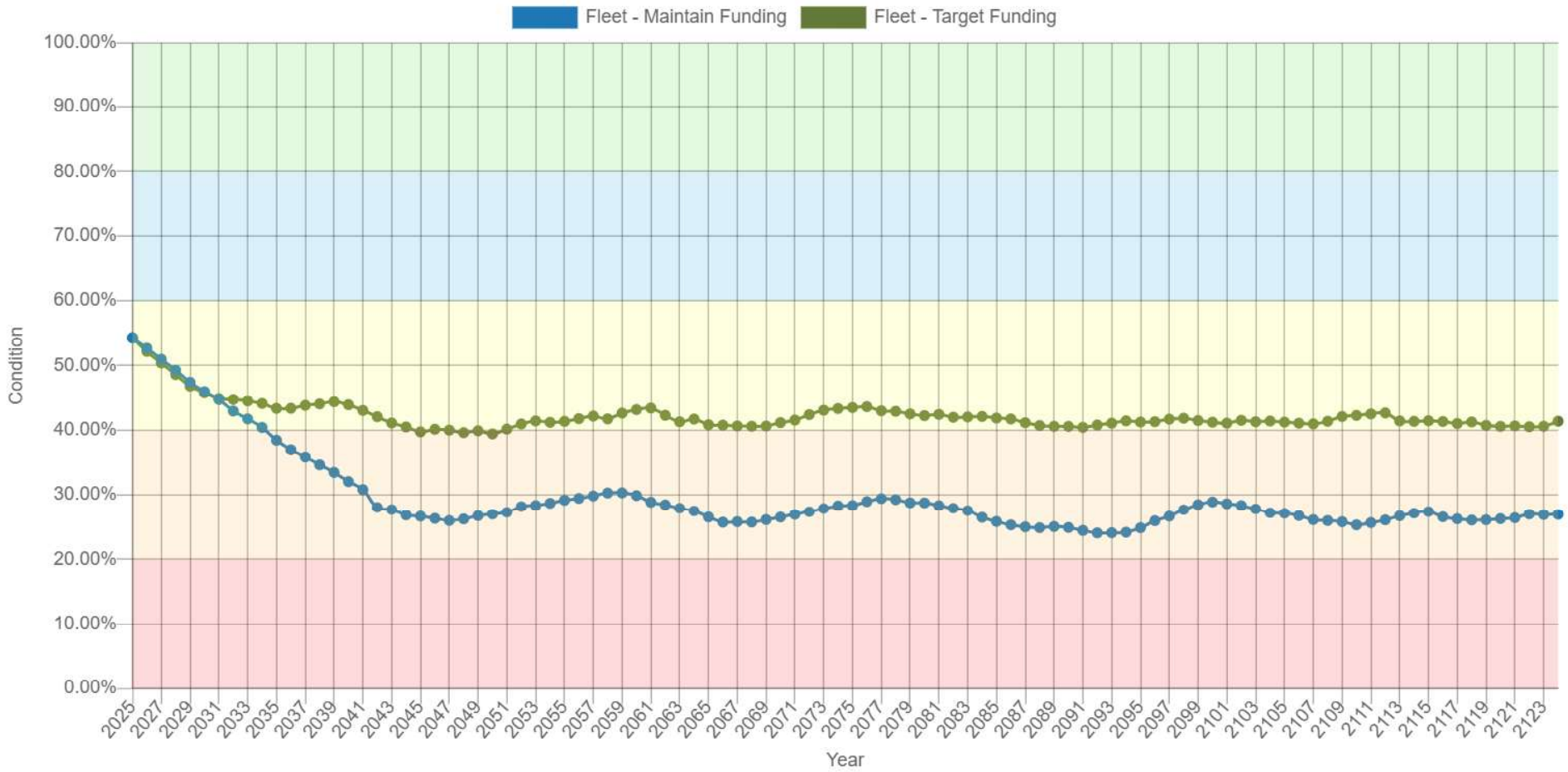

Figure 60 Fleet PLOS Scenario Condition Results

12. Equipment

The Township's equipment portfolio includes:

- Emergency services equipment to support first responders
- IT equipment for communication, entertainment and data management
- Furniture and fixtures for facilities, offices and buildings
- Recreation equipment for parks and recreational spaces
- Tools, shop, and garage machinery equipment to ensure proper maintenance of vehicles and machinery

12.1 Inventory & Valuation

Figure 61 summarizes the quantity and current replacement cost of all equipment assets available in the Township's asset register.

Segment	Quantity	Unit of Measure	Replacement Cost	Primary RC Method
Fire	132	Quantity	$1,125,000	CPI
General Government	164	Quantity	$1,205,000	CPI
Parks & Facilities	47	Quantity	$1,210,000	CPI
Transportation	29	Quantity	$448,000	CPI
Water & Wastewater	11	Quantity	$294,000	CPI
TOTAL			**$4,283,000**	

Table 48 Detailed Asset Inventory: Equipment

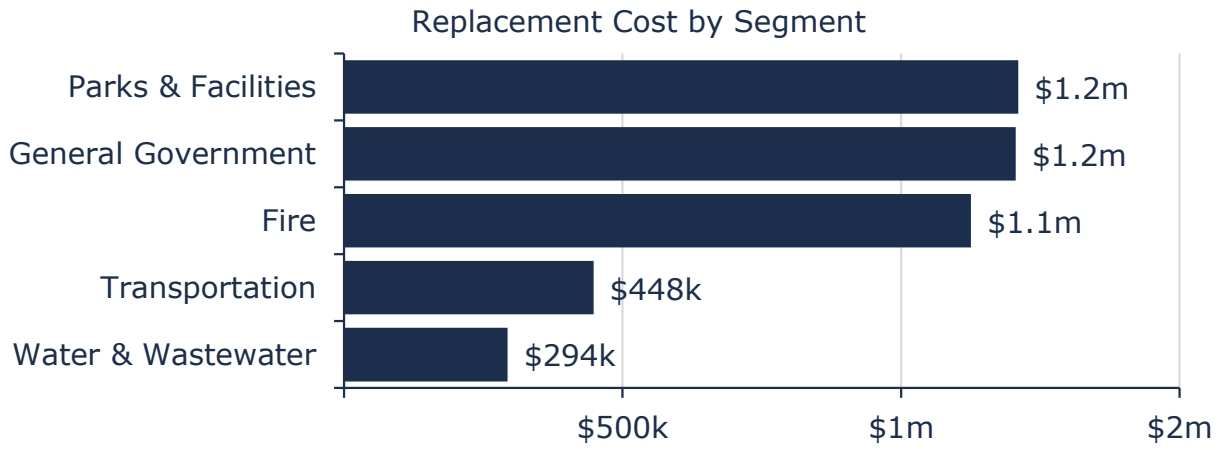

Figure 61 Portfolio Valuation: Equipment

12.2 Asset Condition

Figure 62 summarizes the replacement cost-weighted condition of the Township's equipment portfolio. Based only on age data, 60% of assets are in fair or better condition; the remaining 40% are in poor or worse condition. These assets may be candidates for replacement in the short term; similarly, assets in fair condition may require rehabilitation or replacement in the medium term and should be monitored for further degradation in condition.

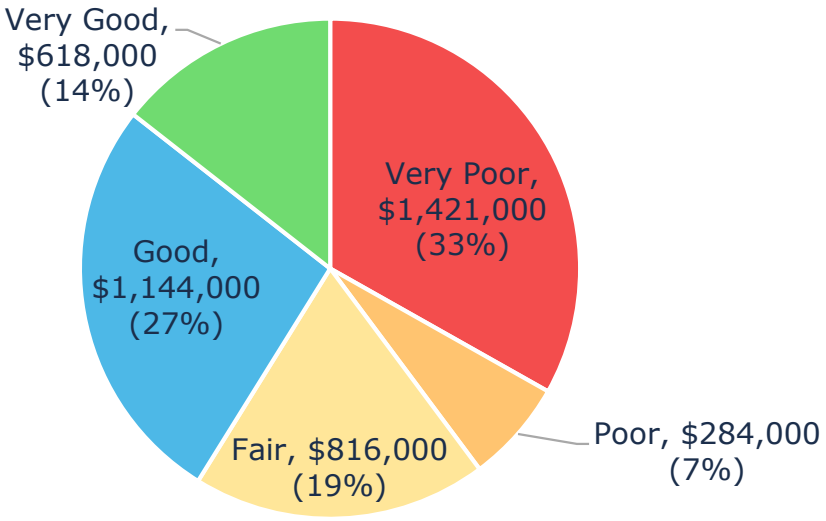

Figure 62 Asset Condition: Equipment Overall

Figure 63 summarizes the age-based condition of equipment by each segment. Assets in poor or worse condition are concentrated primarily in transportation.

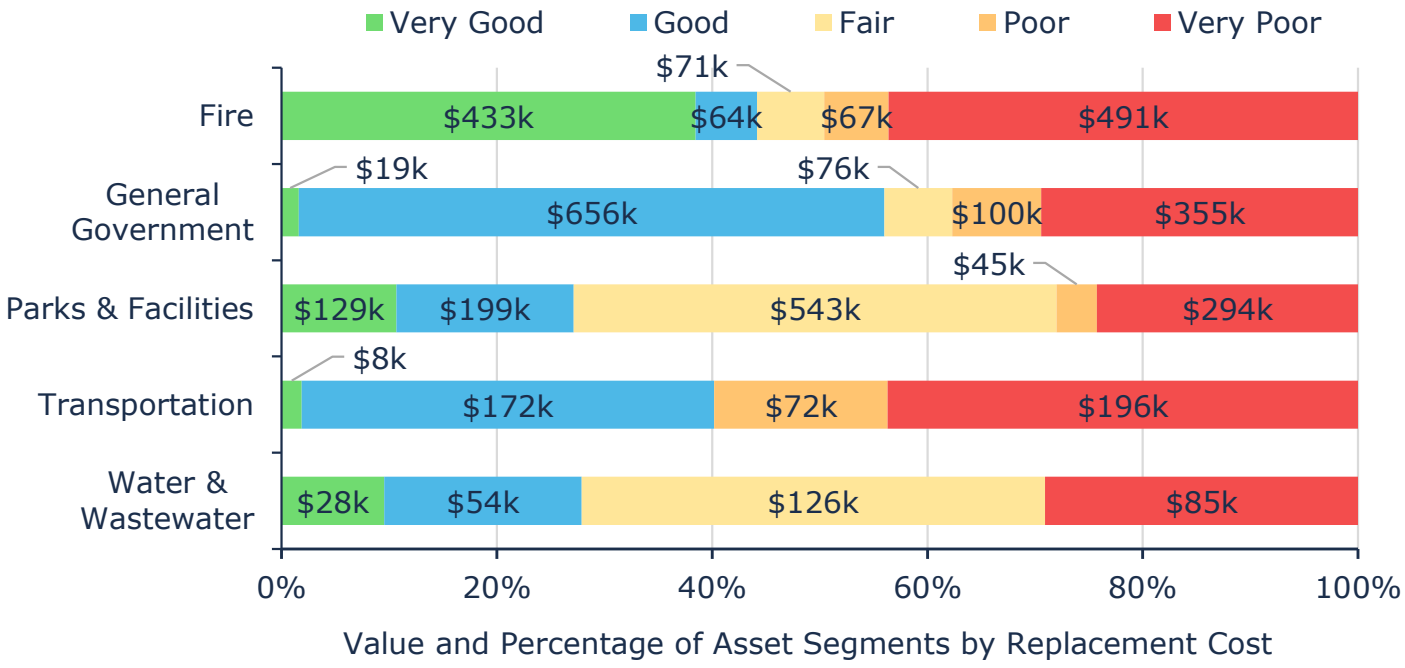

Figure 63 Asset Condition: Equipment by Segment

12.3 Age Profile

An asset's age profile comprises two key values: estimated useful life (EUL), or design life; and the percentage of EUL consumed. The EUL is the serviceable lifespan of an asset during which it can continue to fulfil its intended purpose and provide value to users, safely and efficiently. As assets age, their performance diminishes, often more rapidly as they approach the end of their design life.

In conjunction with condition data, an asset's age profile provides a more complete summary of the state of infrastructure. It can help identify assets that may be candidates for further review through condition assessment programs; inform the selection of optimal lifecycle strategies; and improve planning for potential replacement spikes.

Figure 64 illustrates the average current age of each asset type and its estimated useful life. Both values are weighted by the replacement cost of individual assets.

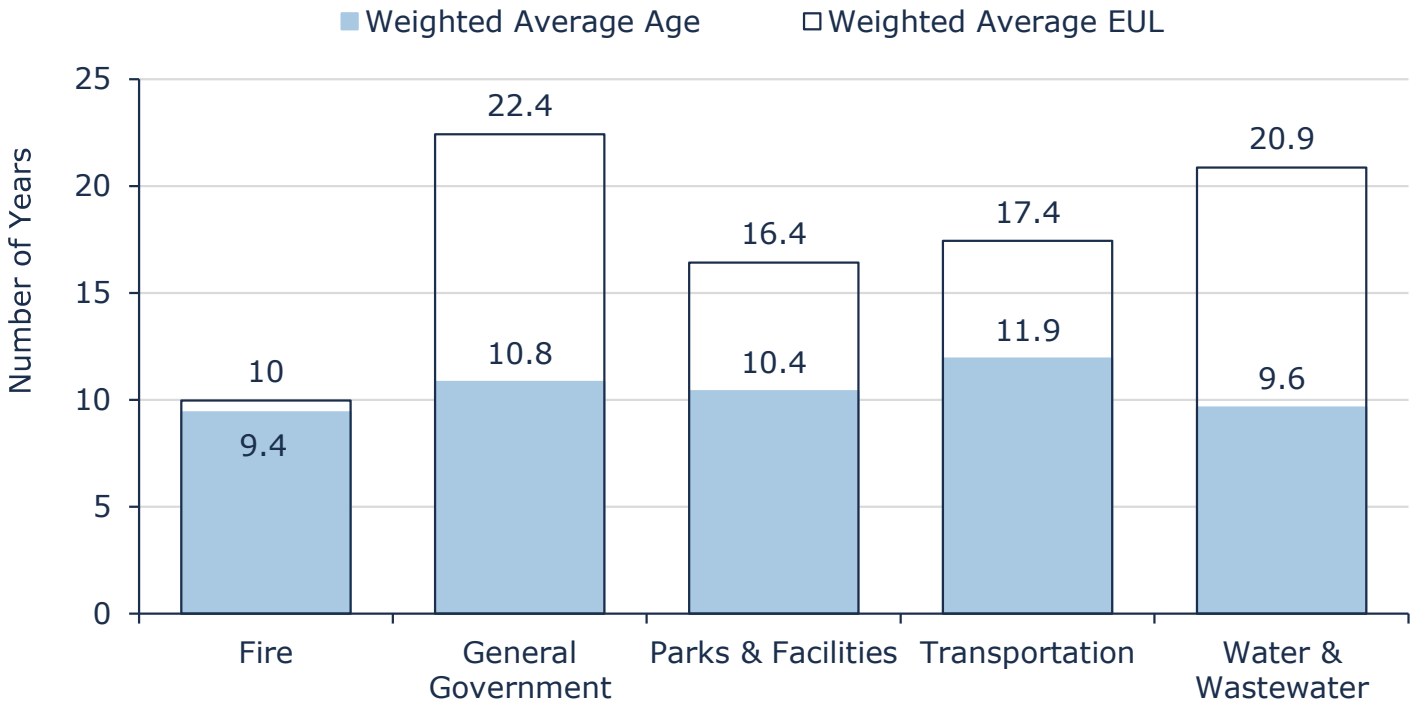

Figure 64 Estimated Useful Life vs. Asset Age: Equipment

Age analysis reveals that, on average, with the exception of fire services, most machinery and equipment assets are in the latter stages of their expected life.

12.4 Current Approach to Lifecycle Management

The condition or performance of most assets will deteriorate over time. To ensure that municipal assets are performing as expected and meeting the needs of customers, it is important to establish a lifecycle management strategy to proactively manage asset deterioration.

The following table outlines the Township's current lifecycle management strategy.

Activity Type	Description of Current Strategy
Maintenance	Maintenance programs vary by department
	Annual preventative maintenance activities include system components check and additional detailed inspections
Replacement	The replacement of machinery and equipment assets depends on deficiencies identified by operators that may impact their ability to complete required tasks
Inspections	Heavy equipment is inspected by the operator daily before use, however, these inspections identify deficiencies but do not provide overall condition ratings
	A maintenance program is being implemented for water and wastewater equipment. This will include a process for having the condition of assets assessed appropriately

Table 49 Lifecycle Management Strategy: Equipment

12.5 Forecasted Long-Term Replacement Needs

Figure 65 illustrates the cyclical short-, medium- and long-term infrastructure replacement requirements for the Township's equipment portfolio. The Township's average annual requirements (red dotted line) total $367,000 for all equipment. Although actual spending may fluctuate substantially from year to year, this figure is a useful benchmark value for annual capital expenditure targets (or allocations to reserves) to ensure projects are not deferred and replacement needs are met as they arise.

These projections and estimates are based on asset replacement costs and age analysis. They are designed to provide a long-term, portfolio-level overview of capital needs and should be used to support improved financial planning over several decades.

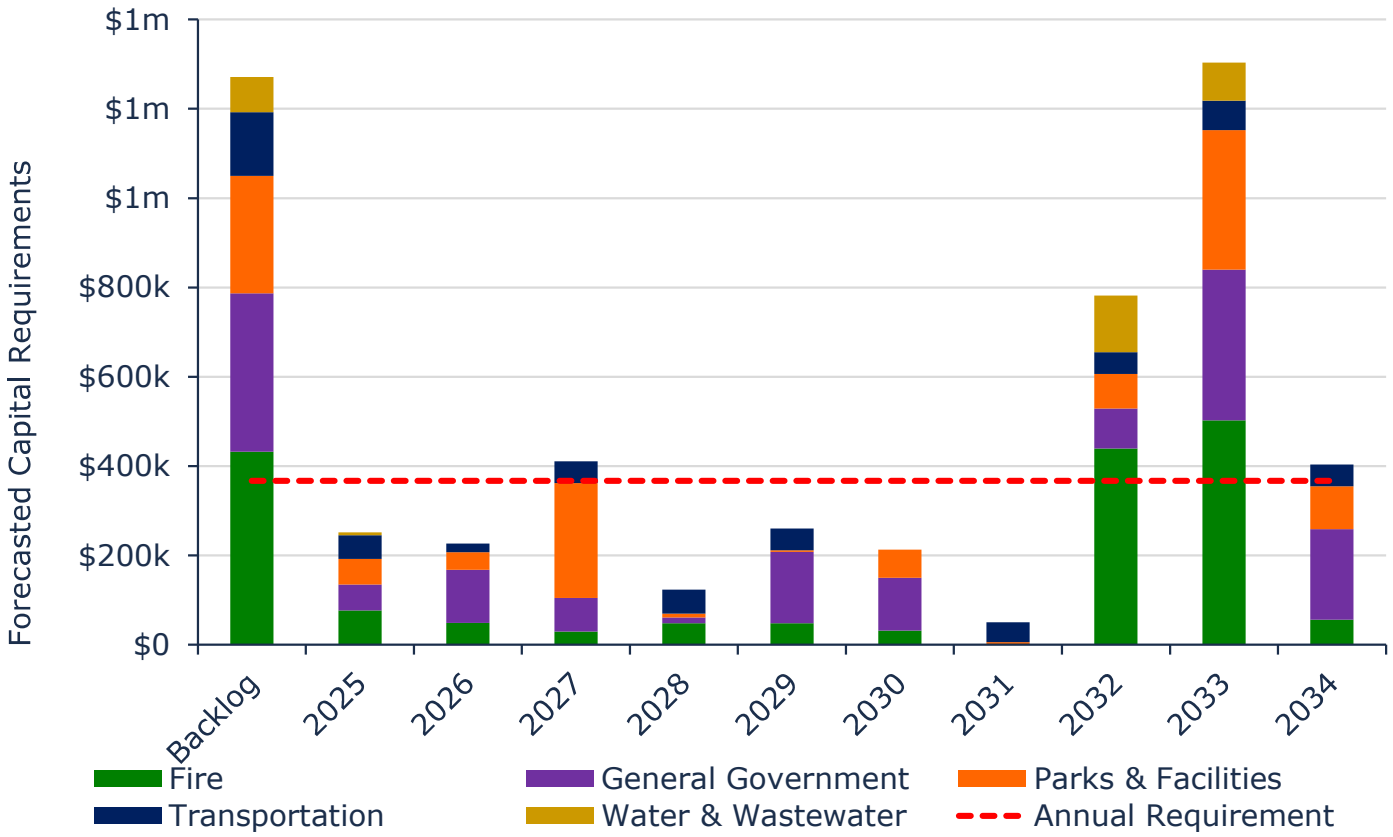

Figure 65 Forecasted Capital Replacement Needs: Equipment 2025-2034

Often, the magnitude of replacement needs is substantially higher than most municipalities can afford to fund. In addition, most assets may not need to be replaced. However, quantifying and monitoring these spikes is essential for long-term financial planning, including establishing dedicated reserves. In addition, a robust risk framework will ensure that high-criticality assets receive proper and timely lifecycle intervention, including replacements.

A summary of the 10-year replacement forecast can be found in Appendix B – 10-Year Capital Requirements.

12.6 Risk Analysis

The risk matrix below is generated using available asset data, including condition, service life remaining, and replacement costs.

The matrix stratifies assets based on their individual probability and consequence of failure, each scored from 1 to 5. Their product generates a risk index ranging from 1-25. Assets with the highest criticality and likelihood of failure receive a risk rating of 25; those with lowest probability of failure and lowest criticality carry a risk rating of 1. As new data and information is gathered, the Township may consider integrating relevant information that improves confidence in the criteria used to assess asset risk and criticality.

These risk models have been built into the Township's Asset Management Database (Citywide Assets). See *Risk & Criticality* section for further details on approach used to determine asset risk ratings and classifications.

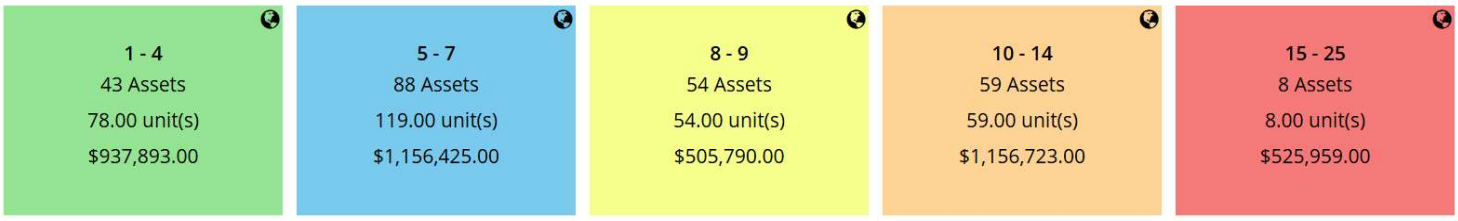

Figure 66 Risk Matrix: Equipment

12.7 Levels of Service

The tables that follow summarize the Township's current levels of service. There are no specifically prescribed KPIs under Ontario Regulation 588/17 for non-core assets, therefore the KPIs below represent performance measures that the Township has selected for this AMP.

12.7.1 Community Levels of Service

Service Attribute	Qualitative Description	Current LOS (2024)
Reliability	Description of redundancy measures in place	Several pumper and tanker trucks are available for service at any given time, to ensure redundancy in the case of an outage. Multiple trucks and routes are available for snow removal, which provides a degree of redundancy.

Table 50 Community Levels of Service: Equipment

12.7.2 Technical Levels of Service

Service Attribute	Technical Metric	Current LOS (2024)
Safety and Regulatory Compliance	% of regulated MTO inspections complete – CVOR	100%
Reliability	% of annual equipment tests completed	100%
Affordability	O&M expenditure per household	$137
	Average Annual Reinvestment Rate	4.21%

Table 51 Technical Levels of Service: Equipment

12.8 Proposed Levels of Service

As per O. Reg. 588/17, by July 1, 2025, municipalities are required to consider proposed levels of service (PLOS), discuss the associated risks and long-term sustainability of these service levels, and explain the Township's ability to afford the PLOS.

The below tables and graphs explain the proposed levels of service scenarios that were analyzed for equipment. Further PLOS analysis at the portfolio level can be found in Section *5. Proposed Levels of Service Analysis.*

12.8.1 PLOS Scenarios Analyzed

Scenario	Description
Scenario 1: Maintain Current Funding Level	This scenario maintains existing capital funding levels for those categories that are underfunded. ♦ Equipment capital funding maintained at $180,000/year
Scenario 2: Achieving 100% Target Funding in 10 Years	This scenario assumes gradual tax increases of ~1.0%/year, stabilizing at 100% funding across all asset categories in 10 years. ♦ Equipment capital funding increases from $180,000/year to $367,000/year.

Table 52 Equipment PLOS Scenario Descriptions

12.8.2 PLOS Analysis Results

Scenario	Technical LOS Outcomes	Initial Value (2025)	15 Year Projection (2039)	30 Year Projection (2054)	Comments
Scenario 1	Average Condition	51%	22%	20%	
	Average Asset Risk	8.5	12.7	12.6	
	Annual Investment Required		$180,000		This is the maintained parameter in this scenario
	Capital Reinvestment Rate		4.2%		
Scenario 2	Average Condition	51%	49%	37%	
	Average Asset Risk	8.5	10.8	10.1	
	Annual Investment Required		$367,000		This parameter was increased from $180,000/year to $367,000/year gradually over 10 years.
	Capital Reinvestment Rate		8.6%		

Table 53 Equipment PLOS Scenario Analysis

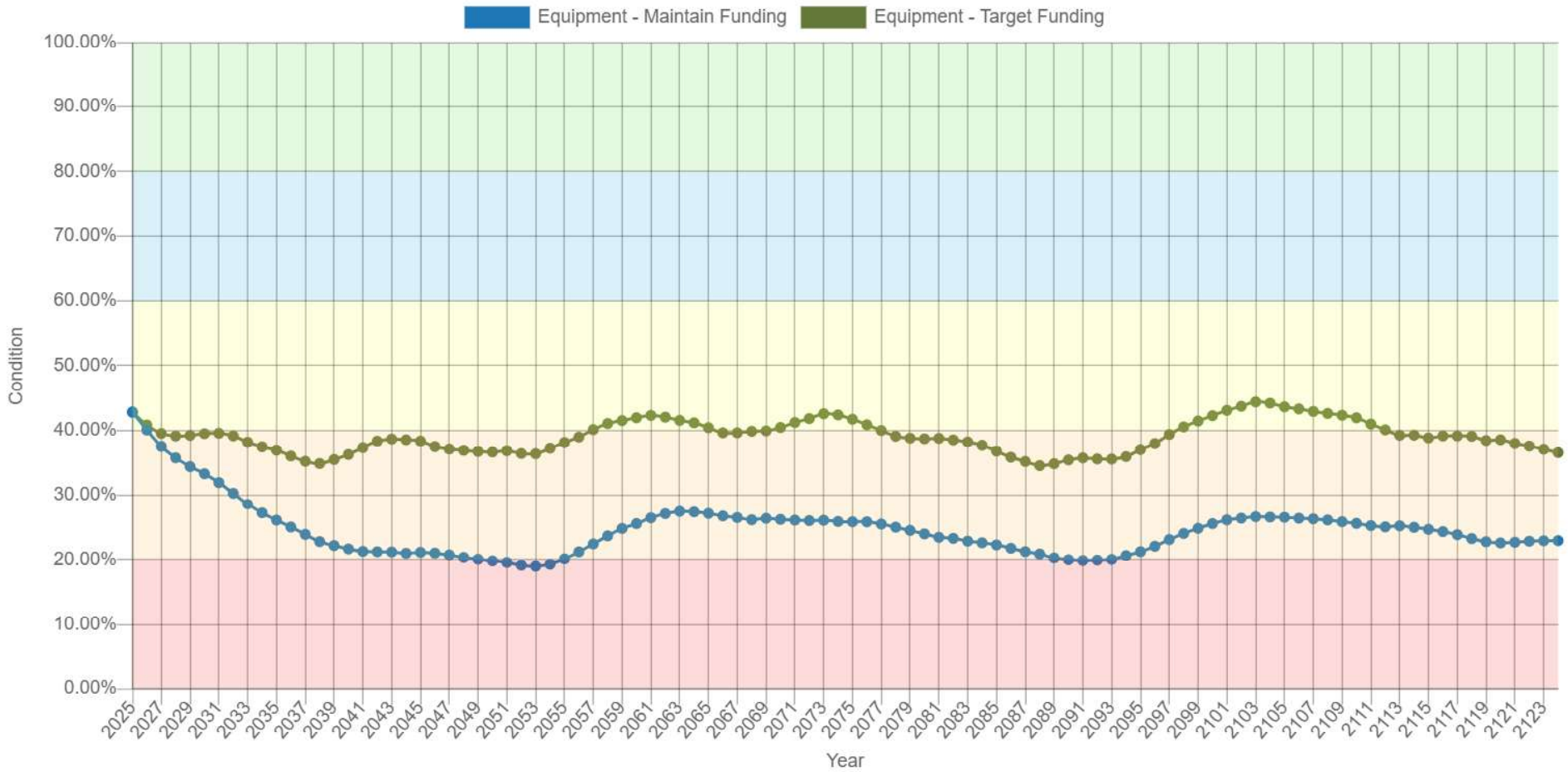

Figure 67 Equipment PLOS Scenario Condition Results

Category Analysis: Rate Funded Assets

13. Water

Water services are provided to residents in the Township through either the water system in the Millbrook Ward or by private wells in the Cavan and North Monaghan Wards. Along with coordination from the current service provider – the City of Peterborough, the Township is responsible for managing the following assets:

- 19 km of water mains
- 137 hydrants
- 1,029 water meters
- Various buildings and facilities such as a booster pumping station, bulk water stations, water wells and a treatment plant
- Specialized machinery and equipment for the treatment and storage of water

13.1 Inventory & Valuation

Table 54 summarizes the quantity and current replacement cost of the Township's various water network assets as managed in its primary asset management register, Citywide Assets.

Segment	Quantity (# of components)	Unit of Measure	Replacement Cost	Primary RC Method
Booster Pumping Station	1 (4)	Quantity	$524,000	CPI
Bulk Water Stations	1 (6)	Quantity	$133,000	CPI
Curbstops & Valves	1,269	Quantity	$3,268,000	User-Defined
Hydrants	137	Quantity	$1,467,000	User-Defined
Machinery & Equipment	65	Quantity	$381,000	CPI
Mains	19,245	m	$15,416,000	CPI
Meters	1,029	Quantity	$354,000	Cost/Unit
Treatment & Storage	1 (72)	Quantity	$5,244,000	CPI
TOTAL			**$26,787,000**	

Table 54 Detailed Asset Inventory: Water

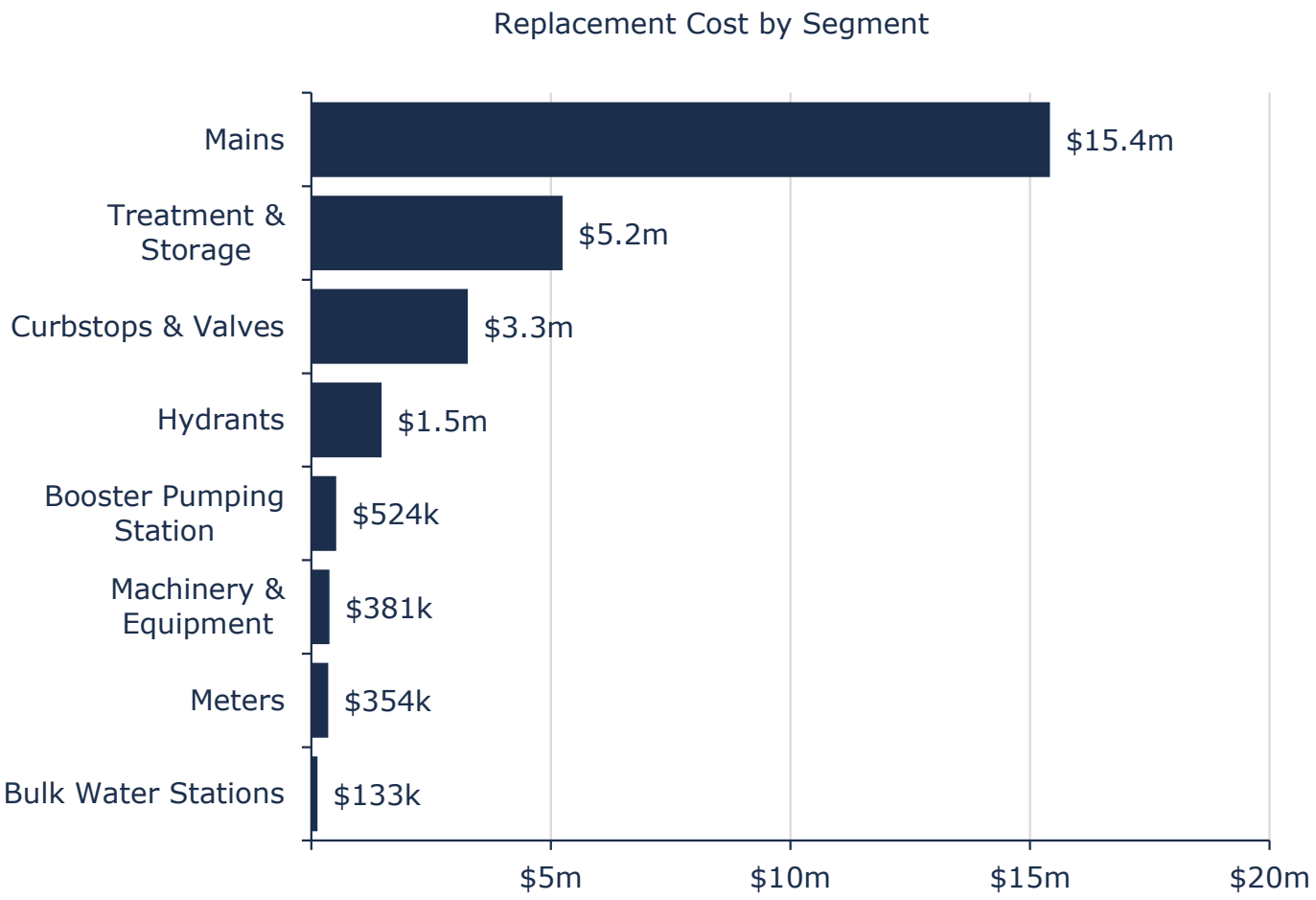

Figure 68 Portfolio Valuation: Water

13.2 Asset Condition

Figure 69 summarizes the replacement cost-weighted condition of the Township's water network. Based on a combination of field inspection data and age, 76% of assets are in fair or better condition; the remaining 24% of assets are in poor to very poor condition. Condition assessments were available for 35% of the water network, based on replacement cost. This condition data was projected from inspection date to current year to estimate their condition today.

Assets in poor or worse condition may be candidates for replacement in the short term; similarly, assets in fair condition may require rehabilitation or replacement in the medium term and should be monitored for further degradation in condition. As illustrated in Figure 69, the majority of the Township's water network assets are in fair or better condition.

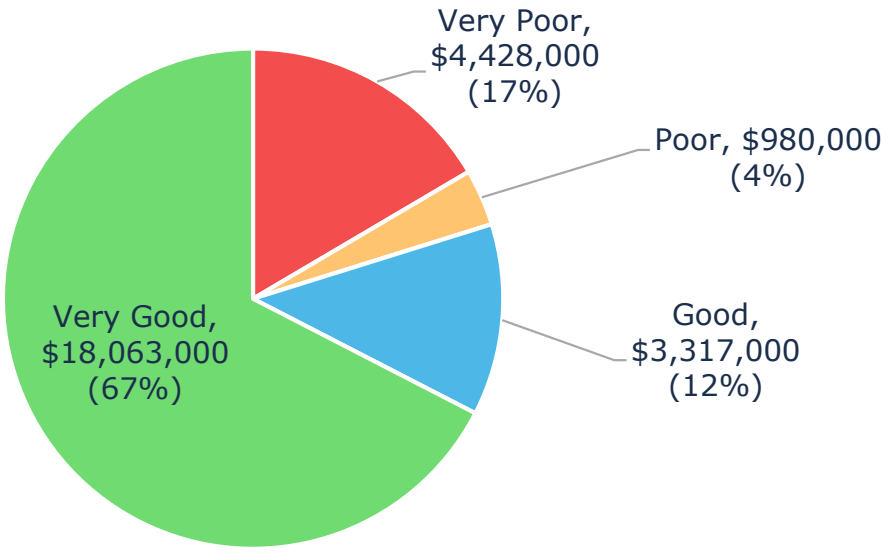

Figure 69 Asset Condition: Water Overall

As illustrated in Figure 70, based on condition assessments and age-based conditions, the majority of the Township's water mains is in very good condition.

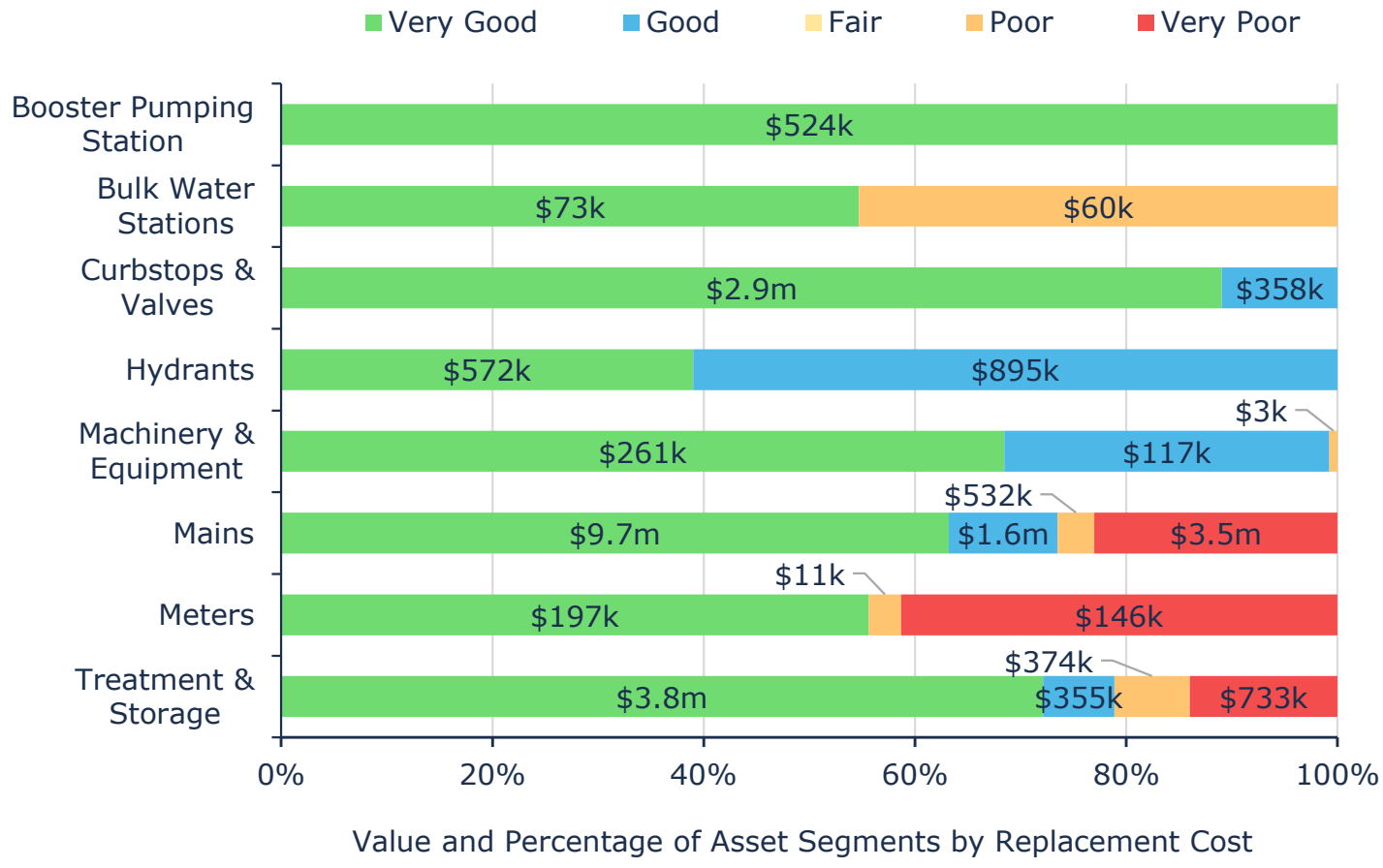

Figure 70 Asset Condition: Water by Segment

13.3 Age Profile

An asset's age profile comprises two key values: estimated useful life (EUL), or design life; and the percentage of EUL consumed. The EUL is the serviceable lifespan of an asset during which it can continue to fulfil its intended purpose and provide value to users, safely and efficiently. As assets age, their performance diminishes, often more rapidly as they approach the end of their design life.

In conjunction with condition data, an asset's age profile provides a more complete summary of the state of infrastructure. It can help identify assets that may be candidates for further review through condition assessment programs; inform the selection of optimal lifecycle strategies; and improve planning for potential long-term replacement spikes.

Figure 71 illustrates the average current age of each asset type and its estimated useful life. Both values are weighted by the replacement cost of individual assets.

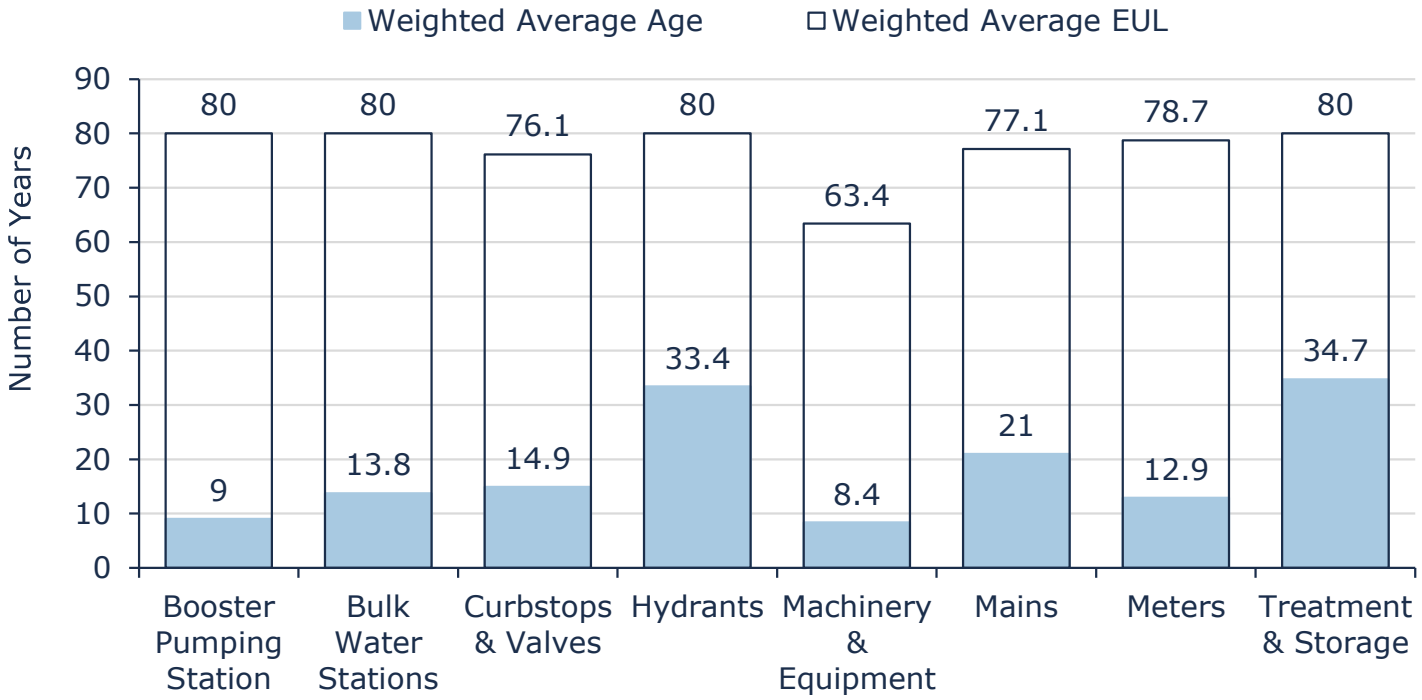

Figure 71 Estimated Useful Life vs. Asset Age: Water

13.4 Current Approach to Lifecycle Management

The condition or performance of most assets will deteriorate over time. To ensure that municipal assets are performing as expected and meeting the needs of customers, it is important to establish a lifecycle management strategy to proactively manage asset deterioration.

The following table outlines the Township's current lifecycle management strategy.

Activity Type	Description of Current Strategy
Maintenance	Annual maintenance program includes: • Valve exercising • Water main flushing • Hydrant inspections • Air relief valve and chamber inspections
Rehabilitation/ Replacement	Multi-year capital forecasts are provided by the current service provider and further reviewed by staff and consultants
	Replacement activities are identified based on an analysis of the main break rate as well as any issues identified during regular maintenance activities
	Similar to other sub-surface infrastructure staff attempt to coordinate water reconstruction projects with road reconstruction projects to produce cost efficiencies
Inspection	Staff primarily rely on the age and material of water mains to determine the projected condition of water mains
	Pumps are assessed weekly. Water storage tanks are inspected every 2-3 years by municipal staff and every 5 years by an external contractor
	Aside from the inspections required under O.Reg 170/3 and multiyear forecasts provided by the City of Peterborough, there are no formal condition assessment programs in place for water assets.

Table 55 Lifecycle Management Strategy: Water

The following lifecycle strategies have been developed as a proactive approach to managing the lifecycle of watermains. Instead of allowing the roads to deteriorate until replacement is required, strategic rehabilitation is expected to extend the service life of roads at a lower total cost.

Water Mains		
Event Name	**Event Class**	**Event Trigger**
Annual hydrant flushing	Maintenance	Annual
Valve exercising	Maintenance	Annual
Asset Replacement	Replacement	Condition:20

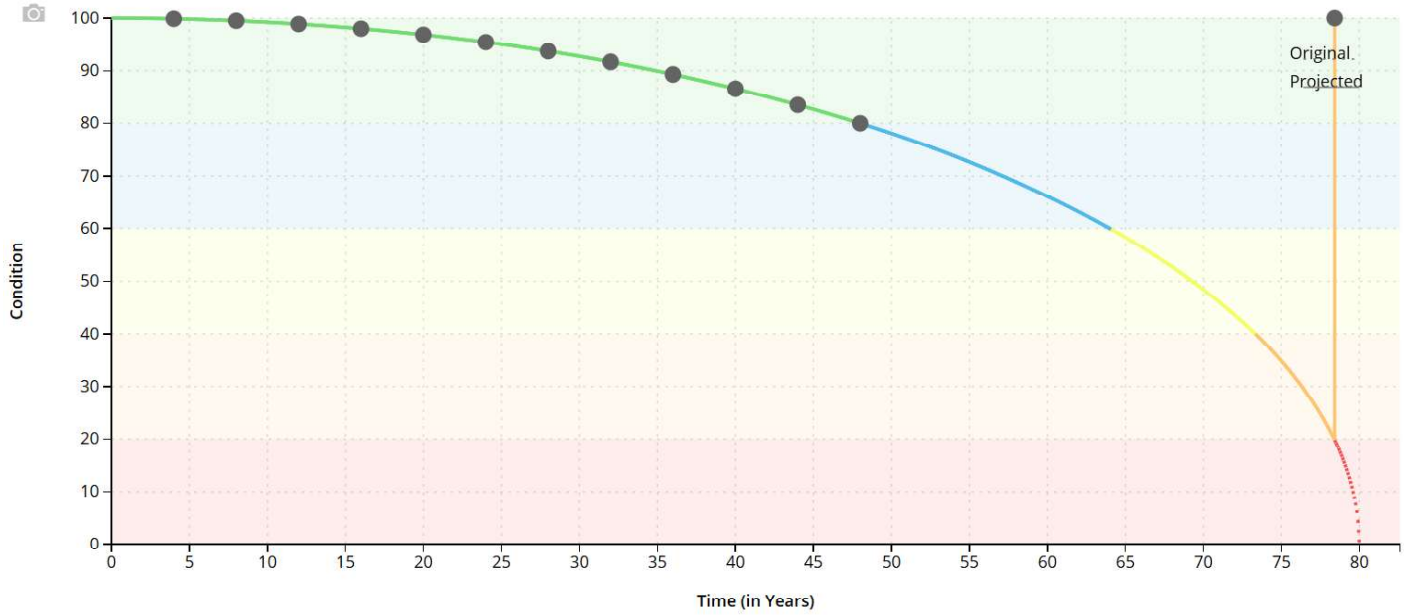

Table 56 Lifecycle Management Strategy: Watermains

13.5 Forecasted Long-Term Replacement Needs

Figure 72 illustrates the cyclical short-, medium- and long-term infrastructure rehabilitation and replacement requirements for the Township's water network. The Township's average annual requirements (red dotted line) total $381,000 for all assets in the water network. Although actual spending may fluctuate substantially from year to year, this figure is a useful benchmark value for annual capital expenditure targets (or allocations to reserves) to ensure projects are not deferred and replacement needs are met as they arise.

These projections are based on asset replacement costs, age analysis, and condition data when available. They are designed to provide a long-term, portfolio-level overview of capital needs and should be used to support improved financial planning over several decades.

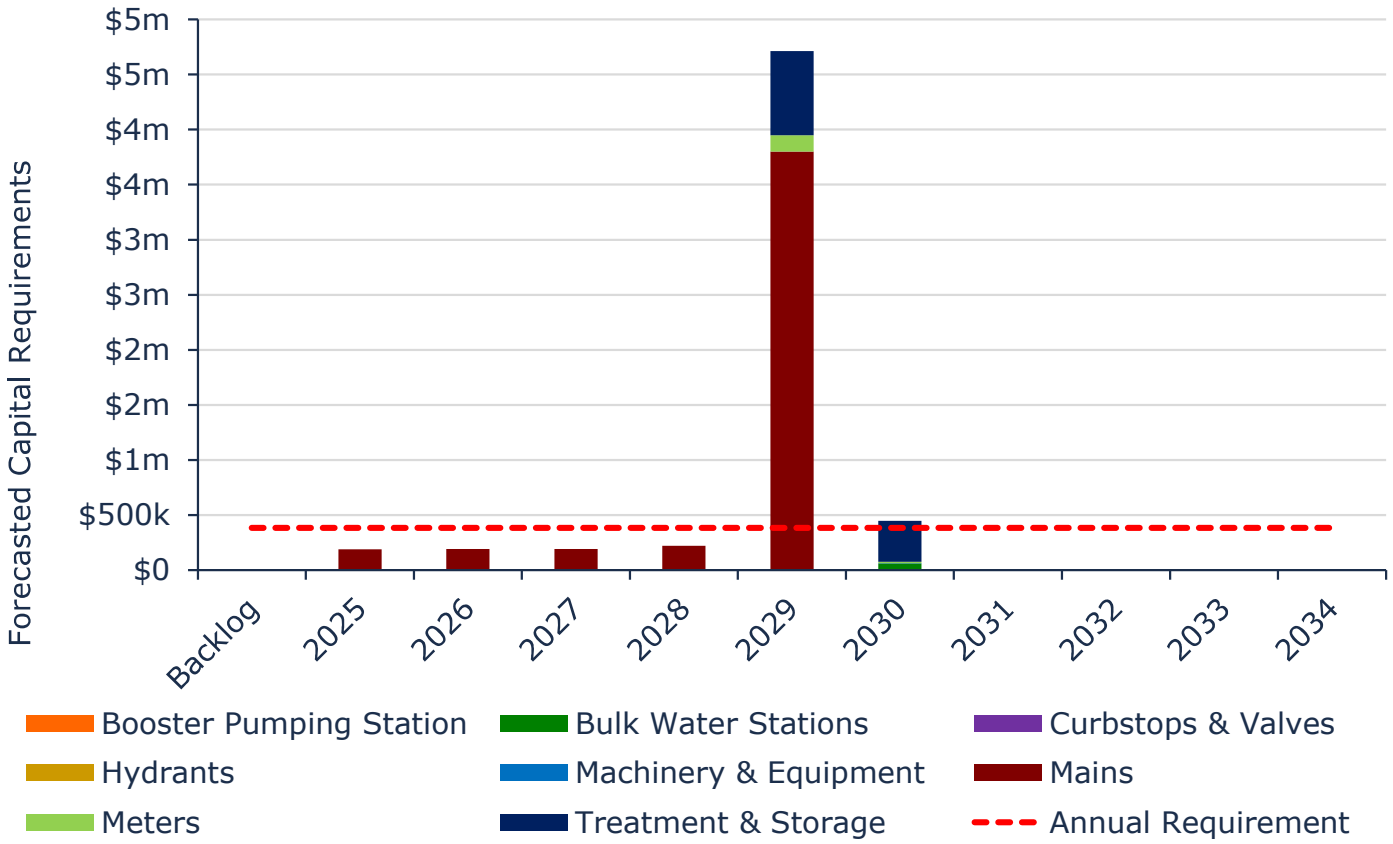

Figure 72 Forecasted Capital Replacement Needs: Water 2025-2034

Often, the magnitude of replacement needs is substantially higher than most municipalities can afford to fund. In addition, most assets may not need to be replaced. However, quantifying and monitoring these spikes is essential for long-term financial planning, including establishing dedicated reserves. Regular condition assessments and a robust risk framework will ensure that high-criticality assets receive proper and timely lifecycle intervention, including replacements.

A summary of the 10-year replacement forecast can be found in Appendix B – 10-Year Capital Requirements.

13.6 Risk Analysis

The risk matrix below is generated using available asset data, including condition, service life remaining, replacement costs, pipe material, pipe diameter and asset type. The risk ratings for assets without useful attribute data were calculated using only condition and their replacement costs.

The matrix stratifies assets based on their individual probability and consequence of failure, each scored from 1 to 5. Their product generates a risk index ranging from 1-25. Assets with the highest criticality and likelihood of failure receive a risk rating of 25; those with lowest probability of failure and lowest criticality carry a risk rating of 1. As new data and information is gathered, the Township may consider integrating relevant information that improves confidence in the criteria used to assess asset risk and criticality.

These risk models have been built into the Township's Asset Management Database (Citywide Assets). See *Risk & Criticality* section for further details on approach used to determine asset risk ratings and classifications.

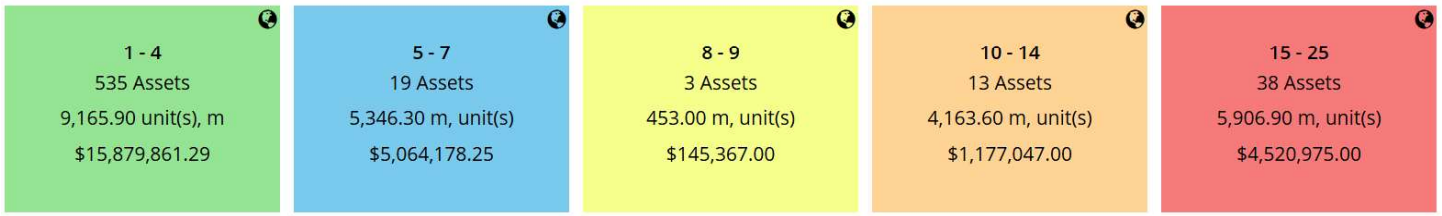

Figure 73 Risk Matrix: Water

13.7 Levels of Service

The tables that follow summarize the Township's current levels of service with respect to prescribed KPIs under Ontario Regulation 588/17 as well as any additional performance measures that the Township has selected for this AMP.

13.7.1 Community Levels of Service

Service Attribute	Qualitative Description	Current LOS (2024)
Scope	Description, which may include maps, of the user groups or areas of the municipality that are connected to the municipal water system	The current water network is limited to the Millbrook Ward area, all households and businesses are connected to the network. The network comprises of 19 km of water mains, 1,029 water meters and various facilities for treatment and distribution.
	Description, which may include maps, of the user groups or areas of the municipality that have fire flow	The current water network located in the Millbrook Ward area has fire flow.
Reliability	Description of boil water advisories and service interruptions	The Township has not experienced any recent boil water advisories
Affordability	Description of measures in place to improve service cost effectiveness	Curren measures in place include: 1. Toilet Rebate Program to encourage water usage savings 2. Water Meter Replacement Program to reduce inaccurate usage readings 3. Annual capital projects to replace aging infrastructure

Service Attribute	Qualitative Description	Current LOS (2024)
		4. Various Preventative Maintenance Programs; including Hydrant Flushing and Winterization and Valve Exercising Program 5. Automated Remote Monitoring programs, such as SCADA for operational control and monitoring improving overall treatment efficiency 6. Completed a Master Servicing Plan for Millbrook and area, to determine the future demands 7. Review of the Water and Sewer billing rates completed every 5 years to ensure operational and capital costs are properly accounted for

Table 57 O. Reg. 588/17 Community Levels of Service: Water

13.7.2 Technical Levels of Service

Service Attribute	Technical Metric	Current LOS (2024)
Scope	% of properties connected to the municipal water system	28%[5]
	% of properties where fire flow is available	28%[4]
Reliability	# of connection-days per year where a boil water advisory notice is in place compared to the total number of properties connected to the municipal water system	0
	# of connection-days per year where water is not available due to water main breaks compared to the total number of properties connected to the municipal water system	0
	Kms of watermains flushed annually	10 kms
	Number of water samples taken annually	52
Affordability	Bi-monthly O&M expenditure per household	$69.35
Performance	Target reinvestment rate	1.42%
	Capital reinvestment rate	2.18%

Table 58 O. Reg. 588/17 Technical Levels of Service: Water

[5] 72% of the Township population is rural and not located on the municipal water services.

13.8 Proposed Levels of Service

As per O. Reg. 588/17, by July 1, 2025, municipalities are required to consider proposed levels of service (PLOS), discuss the associated risks and long-term sustainability of these service levels, and explain the Township's ability to afford the PLOS.

The below tables and graphs explain the proposed levels of service scenarios that were analyzed for the water network. Further PLOS analysis at the portfolio level can be found in section *5. Proposed Levels of Service Analysis.*

13.8.1 PLOS Scenarios Analyzed

Scenario	Description
Scenario 1: Maintain Current Funding Level	This scenario maintains existing capital funding levels for those categories that are underfunded. ♦ Water Network capital funding maintained at $585,000/year
Scenario 2: Achieving 100% Target Funding	This scenario assumes a decrease in capital spending for the water network to achieve the target reinvestment rate. ♦ Water network capital funding decreases from $585,000/year to $381,000/year

Table 59 Water Network PLOS Scenario Descriptions

13.8.2 PLOS Analysis Results

Scenario	Technical LOS Outcomes	Initial Value (2025)	15 Year Projection (2039)	30 Year Projection (2054)	Comments
Scenario 1	Average Condition	73%	85%	84%	
	Average Asset Risk	6.6	4.9	5.0	
	Annual Investment Required		$585,000		This is the maintained parameter in this scenario
	Capital Reinvestment Rate		2.2%		
Scenario 2	Average Condition	73%	84%	84%	
	Average Asset Risk	6.6	5.2	5.0	
	Annual Investment Required		$381,000		This parameter is based on water capital funding decreasing to achieve the target level of service
	Capital Reinvestment Rate		1.4%		

Table 60 Water Network PLOS Scenario Analysis

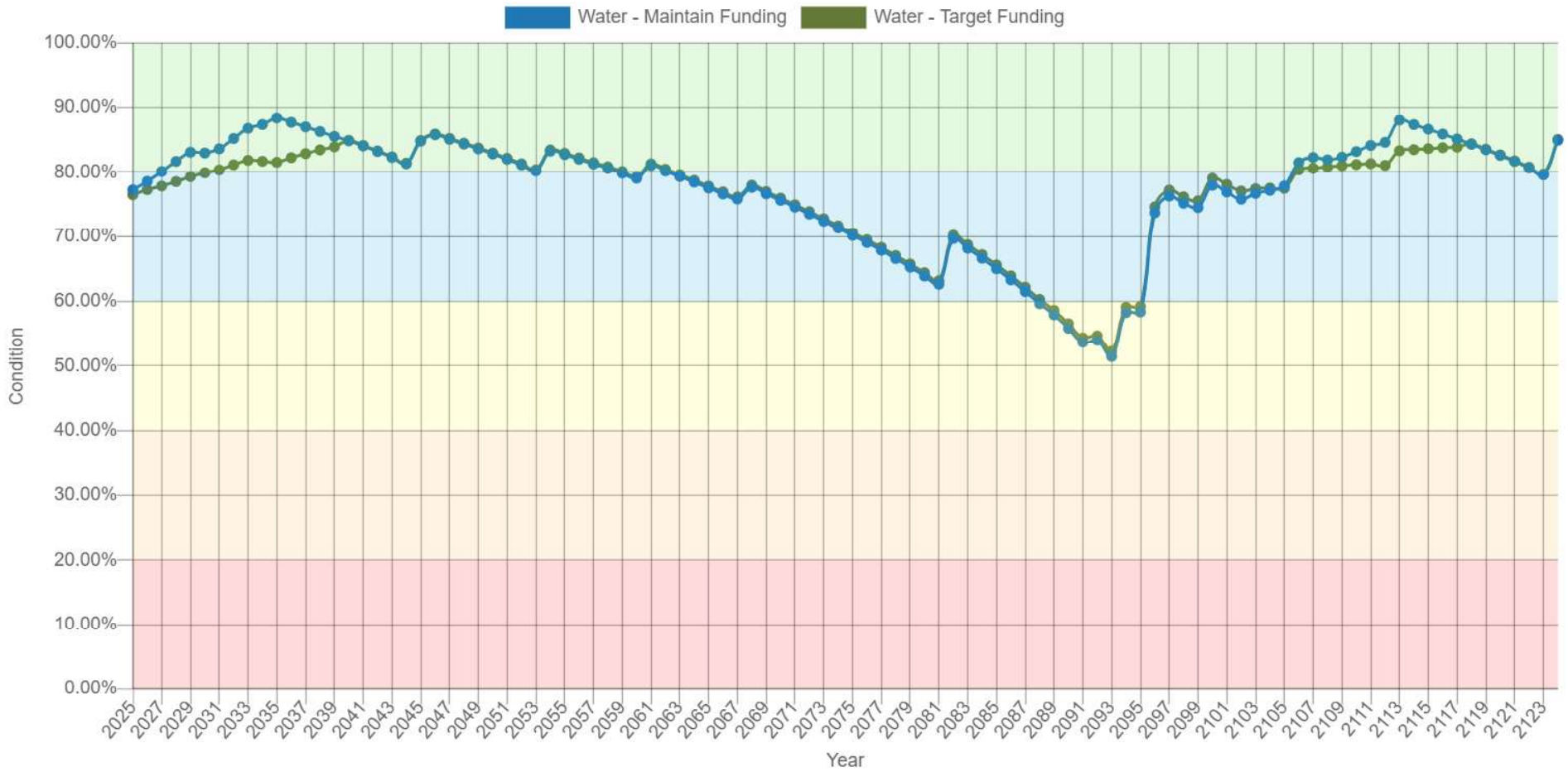

Figure 74 Water Network PLOS Scenario Condition Results

14. Wastewater

Sanitary services are provided to residents in the Township through either the sanitary system in the Millbrook Ward or by septic systems in the Cavan and North Monaghan Wards. Along with coordination from the current service provider – the City of Peterborough, the Township is responsible for managing the following assets:

- 15 km of sanitary mains
- 63 maintenance holes
- Facilities such as a pumping station and various facilities associated with treatment and disposal
- Specialized machinery and equipment for the treatment and disposal of sanitary waste

14.1 Inventory & Valuation

Table 61 summarizes the quantity and current replacement cost of the Township's various wastewater network assets as managed in its primary asset management register, Citywide Assets.

Segment	Quantity (# of components)	Unit of Measure	Replacement Cost	Primary RC Method
Mains	15,408	m	$13,374,000	Cost/Unit
Manholes	63	Quantity	$801,000	User-Defined
Pump Station	1 (6)	Quantity	$3,142,000	CPI
Treatment & Disposal	1 (336)	Quantity	$25,886,000	CPI
TOTAL			**$43,203,000**	

Table 61 Detailed Asset Inventory: Wastewater

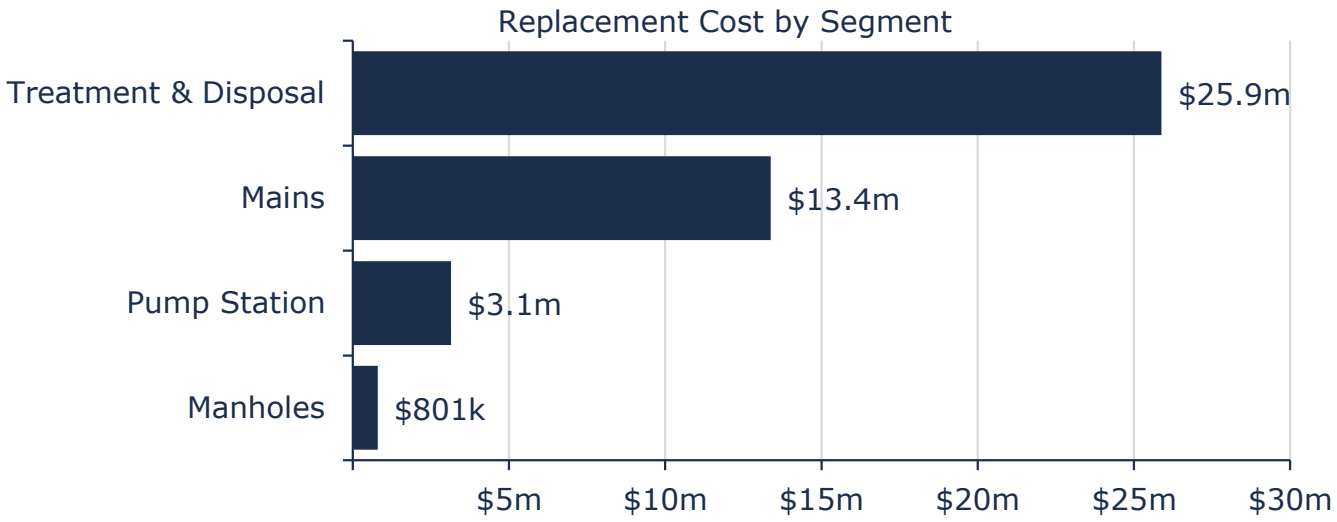

Figure 75 Portfolio Valuation: Wastewater

14.2 Asset Condition

Figure 76 summarizes the replacement cost-weighted condition of the Township's wastewater network. Based on a combination of field inspection data and age, 80% of assets are in fair or better condition; the remaining 20% of assets are in poor to very poor condition. Condition assessments were available for 20% of the wastewater network, based on replacement cost. This condition data was projected from inspection date to current year to estimate their condition today. No condition data was available for sanitary equipment.

Assets in poor or worse condition may be candidates for replacement in the short term; similarly, assets in fair condition may require rehabilitation or replacement in the medium term and should be monitored for further degradation in condition. As illustrated in Figure 76 the majority of the Township's wastewater network assets are in fair or better condition.

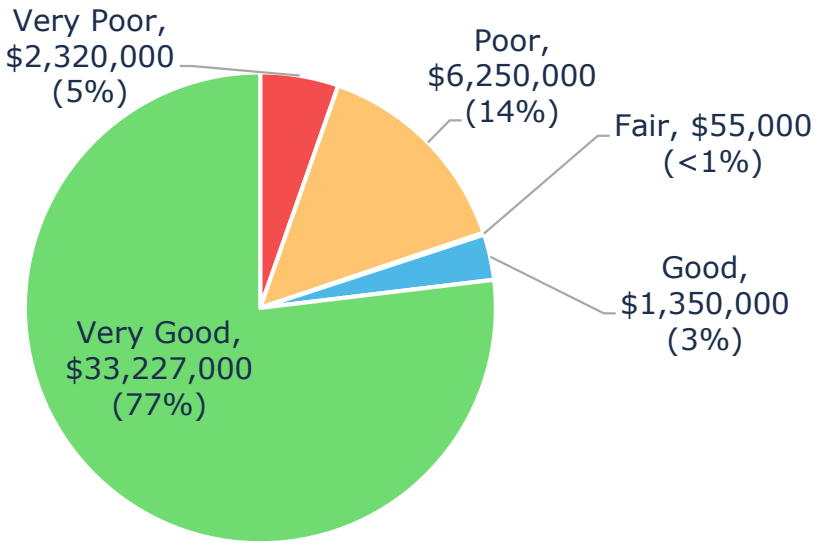

Figure 76 Asset Condition: Wastewater Overall

As illustrated in Figure 77, based on condition assessments and age-based conditions, the majority of the Township's sanitary sewer mains are in very good condition however, 70% of pump station assets are in poor or worse condition.

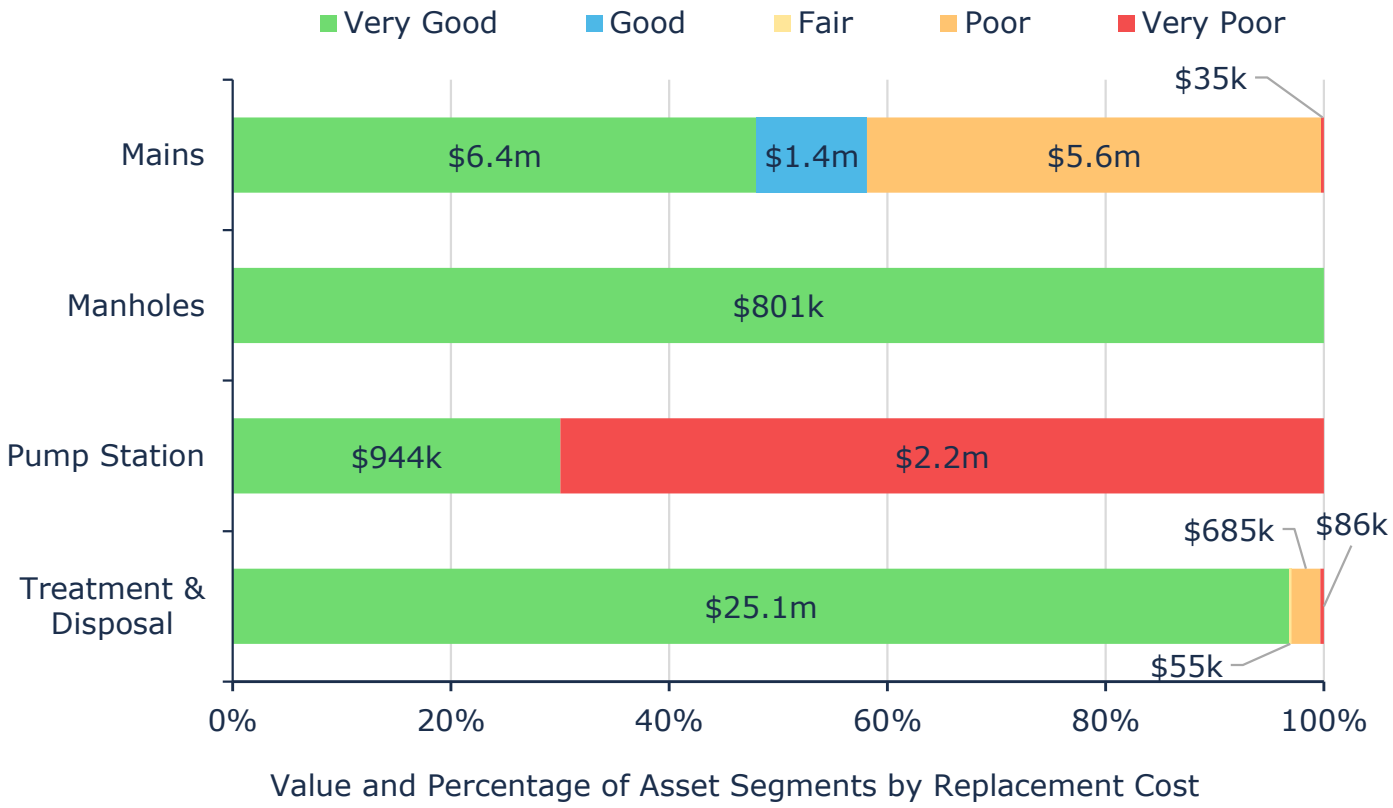

Figure 77 Asset Condition: Wastewater by Segment

14.3 Age Profile

An asset's age profile comprises two key values: estimated useful life (EUL), or design life; and the percentage of EUL consumed. The EUL is the serviceable lifespan of an asset during which it can continue to fulfil its intended purpose and provide value to users, safely and efficiently. As assets age, their performance diminishes, often more rapidly as they approach the end of their design life.

In conjunction with condition data, an asset's age profile provides a more complete summary of the state of infrastructure. It can help identify assets that may be candidates for further review through condition assessment programs; inform the selection of optimal lifecycle strategies; and improve planning for potential long-term replacement spikes.

Figure 78 illustrates the average current age of each asset type and its estimated useful life. Both values are weighted by the replacement cost of individual assets.

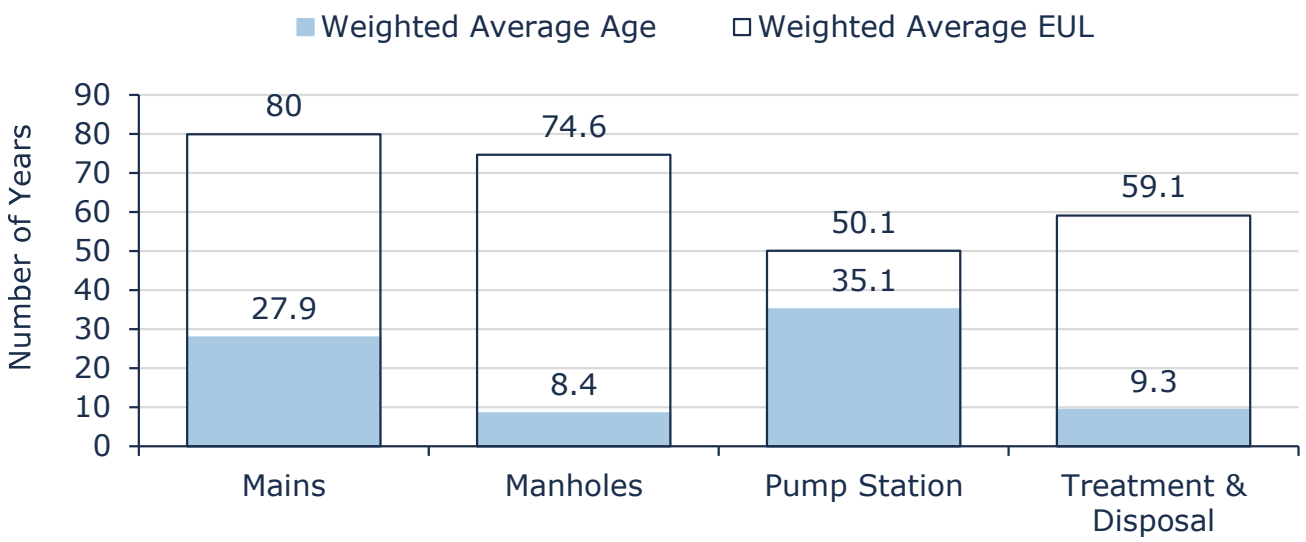

Figure 78 Estimated Useful Life vs. Asset Age: Wastewater

14.4 Current Approach to Lifecycle Management

The condition or performance of most assets will deteriorate over time. To ensure that municipal assets are performing as expected and meeting the needs of customers, it is important to establish a lifecycle management strategy to proactively manage asset deterioration.

The following table outlines the Township's current lifecycle management strategy.

Activity Type	Description of Current Strategy
Maintenance	Annual maintenance of mains consists of main flushing, rodidng and inspections
	Annual maintenance of manholes consists of manhole inspections, lid repelacement, lining and grouting
Rehabilitation	There is a sanitary relining program in place and significant relining has been undertaken the past 4 years. Staff have also observed a reduction on inflow and infiltration (I/I) issues as a result of this rehabilitative activity
Replacement	Multi-year capital forecasts are provided by the current service provider and further reviewed by Staff and Consultants
	Similar to other sub-surface infrastructure staff attempt to coordinate sanitary reconstruction projects with road reconstruction programs to produce cost efficiencies
Inspection	CCTV inspections are conducted on an as-needed basis as well as in coordination with main relining and/or road construction projects

Activity Type	Description of Current Strategy
	Sanitary facilities are inspected under an established schedule and deficiencies are tracked through the Supervisory Control and Data Acquisition (SCADA) system
	Staff rely on a variety of metrics including age, pipe diameter, material, location, and available CCTV assessments to determine the projected condition of linear assets
	Multi-year forecasts form the City of Peterborough also help Staff and Consultants in identifying assets in need of repair

Table 62 Lifecycle Management Strategy: Wastewater

The following lifecycle strategies have been developed to formalize the current approach to managing the lifecycle of sanitary mains.

Instead of allowing the sanitary mains to deteriorate until replacement is required, strategic preventative maintenance and rehabilitation is expected to identify deficiencies and defects and also extend the service life of mains at a lower total cost

Sanitary Mains		
Event Name	**Event Class**	**Event Trigger**
Main flushing, rodding and inspections	Maintenance	Annually
Maintenance Hole inspection	Maintenance	Annually
CCTV inspection	Preventative Maintenance	As needed
Sewer Relining	Rehabilitation	Condition: 30-40
Asset Replacement	Replacement	Condition:20

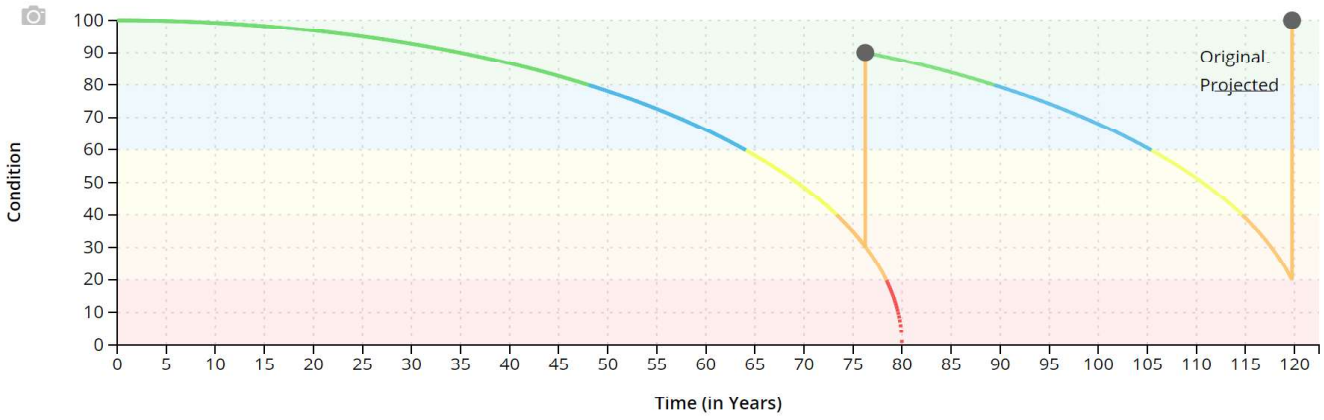

Table 63: Lifecycle Management Strategy: Sanitary Mains

14.5 Forecasted Long-Term Replacement Needs

Figure 79 illustrates the cyclical short-, medium- and long-term infrastructure rehabilitation and replacement requirements for the Township's wastewater network. The Township's average annual requirements (red dotted line) total $741,000 for all assets in the wastewater network. Although actual spending may fluctuate substantially from year to year, this figure is a useful benchmark value for annual capital expenditure targets (or allocations to reserves) to ensure projects are not deferred and replacement needs are met as they arise.

The chart illustrates substantial capital needs throughout the forecast period. It also shows a backlog of $2.3 million. These projections are based on asset replacement costs, age analysis, and condition data when available. They are designed to provide a long-term, portfolio-level overview of capital needs and should be used to support improved financial planning over several decades.

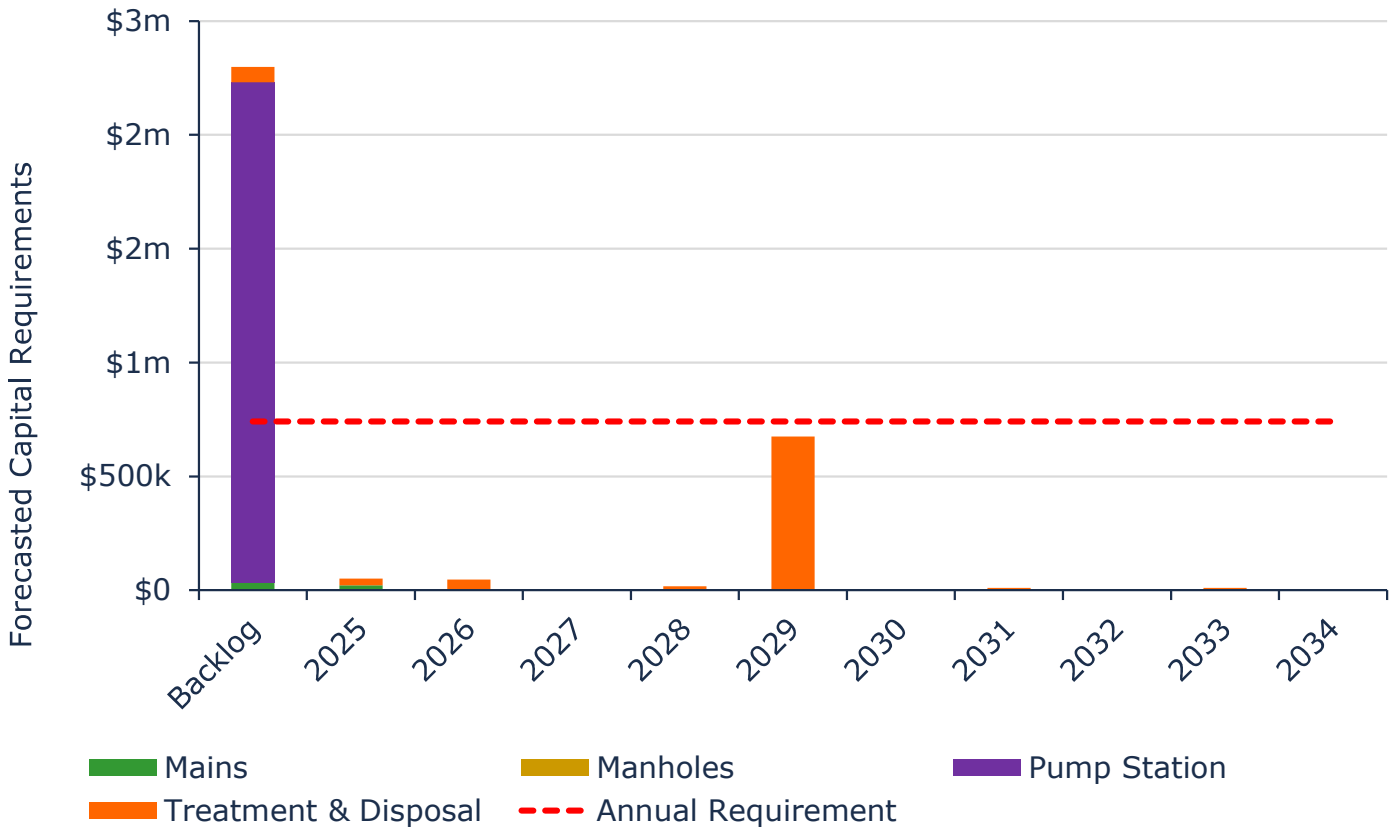

Figure 79 Forecasted Capital Replacement Needs: Wastewater 2025-2034

Often, the magnitude of replacement needs is substantially higher than most municipalities can afford to fund. In addition, most assets may not need to be replaced. However, quantifying and monitoring these spikes is essential for long-term financial planning, including establishing dedicated reserves. Regular condition assessments and a robust risk framework will ensure that high-criticality assets receive proper and timely lifecycle intervention, including replacements.

A summary of the 10-year replacement forecast can be found in Appendix B – 10-Year Capital Requirements.

14.6 Risk Analysis

The risk matrix below is generated using available asset data, including condition, service life remaining, replacement costs, pipe material, pipe diameter and asset type. The risk ratings for assets without useful attribute data were calculated using only condition and their replacement costs.

The matrix stratifies assets based on their individual probability and consequence of failure, each scored from 1 to 5. Their product generates a risk index ranging from 1-25. Assets with the highest criticality and likelihood of failure receive a risk rating of 25; those with lowest probability of failure and lowest criticality carry a risk rating of 1. As new data and information is gathered, the Township may consider integrating relevant information that improves confidence in the criteria used to assess asset risk and criticality.

These risk models have been built into the Township's Asset Management Database (Citywide Assets). See *Risk & Criticality* section for further details on approach used to determine asset risk ratings and classifications.

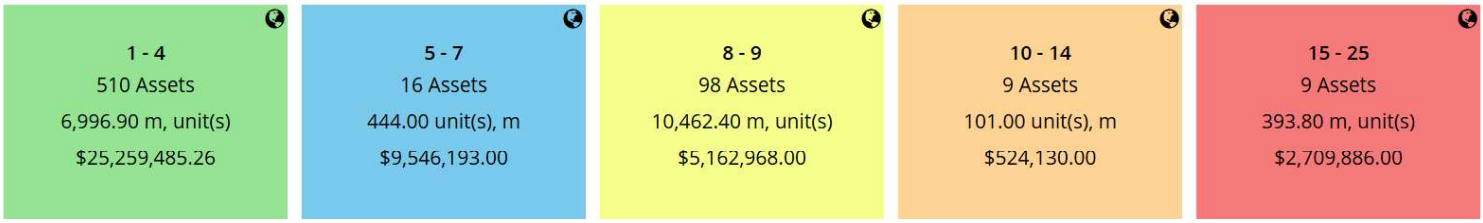

Figure 80 Risk Matrix: Wastewater

14.7 Levels of Service

The tables that follow summarize the Township's current levels of service with respect to prescribed KPIs under Ontario Regulation 588/17 as well as any additional performance measures that the Township has selected for this AMP.

14.7.1 Community Levels of Service

Service Attribute	Qualitative Description	Current LOS (2024)
Scope	Description, which may include maps, of the user groups or areas of the municipality that are connected to the municipal wastewater system	The current sanitary network is limited to the Millbrook Ward area, all households and businesses are connected to the network. The network comprises of 15 km of sanitary mains, 63 maintenance holes, and various facilities for treatment and disposal.

Service Attribute	Qualitative Description	Current LOS (2024)
Reliability	Description of how combined sewers in the municipal wastewater system are designed with overflow structures in place which allow overflow during storm events to prevent backups into homes	There are no combined sewers within the Township
	Description of the frequency and volume of overflows in combined sewers in the municipal wastewater system that occur in habitable areas or beaches	There are no combined sewers within the Township
	Description of how stormwater can get into sanitary sewers in the municipal wastewater system, causing sewage to overflow into streets or backup into homes	Stormwater can enter into sanitary sewers due to damaged sanitary mains or through indirect connections (e.g., weeping tiles). In the case of heavy rainfall events, sanitary sewers may experience a volume of water and sewage that exceeds its designed capacity. In some cases, this can cause water and/or sewage to overflow backup into homes. the disconnection of weeping tiles from sanitary mains and the use of sump pumps and pits directing storm water to the storm drain system can help to reduce the chance of this occurring.
	Description of how sanitary sewers in the municipal wastewater system are designed to be resilient to stormwater infiltration	The Township follows a series of design standards that integrate servicing requirements and land use considerations when constructing or replacing sanitary sewers. These standards have been determined with consideration of the minimization of sewage overflows and backups. Staff have also indicated that there is a possibility that some of the sump pumps connected to the sanitary network could lead to overflow. As part of the Township's relining program, Staff will be addressing this vulnerability. The Township has experienced localized infiltration in the past that has been

Service Attribute	Qualitative Description	Current LOS (2024)
		addressed through a robust sewer relining program.
	Description of the effluent that is discharged from sewage treatment plants in the municipal wastewater system	Effluent refers to water pollution that is discharged from a wastewater treatment plant, and may include suspended solids, total phosphorous and biological oxygen demand. The Environmental Compliance Approval (ECA) identifies the effluent criteria for municipal wastewater treatment plants.
Affordability	Description of measures in place to improve service cost effectiveness	Current measures in place: 1. Development of a Sump Pump Program to disconnect unauthorized sump pump discharges to improve capacity at the treatment plant 2. By 2021 the Township completed a multi-year Sewer Relining project that greatly reduced I&I 3. Annual capital projects to replace aging infrastructure 4. Automated Remote Monitoring programs, such as SCADA for operational control and monitoring, improving overall treatment efficiency 5. Completed a Master Servicing Plan for Millbrook and area, to determine the future demands 6. Review of the Water and Sewer Billing rates completed every 5 years to ensure operational and capital costs are properly accounted for

Table 64 O. Reg. 588/17 Community Levels of Service: Wastewater

14.7.2 Technical Levels of Service

Service Attribute	Technical Metric	Current LOS (2024)
Scope	% of properties connected to the municipal wastewater system	28%[6]
Reliability	# 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
	# of connection-days per year having wastewater backups compared to the total number of properties connected to the municipal wastewater system	0.002
	# of effluent violations per year due to wastewater discharge compared to the total number of properties connected to the municipal wastewater system	0.002
	% of sewer system relined to address I&I issues	80%
Affordability	Bi-monthly O&M expenditure per household	$128.36
Performance	Target reinvestment rate	1.7%
	Capital reinvestment rate	0.8%

Table 65 O. Reg. 588/17 Technical Levels of Service: Wastewater

14.8 Proposed Levels of Service

As per O. Reg. 588/17, by July 1, 2025, municipalities are required to consider proposed levels of service (PLOS), discuss the associated risks and long-term sustainability of these service levels, and explain the Township's ability to afford the PLOS.

The below tables and graphs explain the proposed levels of service scenarios that were analyzed for the wastewater network. Further PLOS analysis at the portfolio level can be found in Section *5. Proposed Levels of Service Analysis.*

[6] 72% of the Township population is rural and not located on municipal wastewater services.

14.8.1 PLOS Scenarios Analyzed

Scenario	Description
Scenario 1: Maintain Current Funding Level	This scenario maintains existing capital funding levels for those categories that are underfunded. ♦ Sanitary network capital funding maintained at $357,000/year
Scenario 2: Achieving 100% Target Funding in 20 Years	This scenario assumes gradual sanitary rate increases stabilizing at 100% funding in 20 years. ♦ Sanitary sewer network capital funding gradually increases from $357,000/year to $741,000/year over a span of 20 years

Table 66 Wastewater Network PLOS Scenario Descriptions

14.8.2 PLOS Analysis Results

Scenario	Technical LOS Outcomes	Initial Value (2025)	15 Year Projection (2039)	30 Year Projection (2054)	Comments
Scenario 1	Average Condition	62%	54%	50%	
	Average Asset Risk	10.7	12.0	12.1	
	Annual Investment Required		$357,000		This is the maintained parameter in this scenario
	Capital Reinvestment Rate		0.8%		
Scenario 2	Average Condition	62%	54%	51%	
	Average Asset Risk	10.7	12.0	12.0	
	Annual Investment Required		$741,000		This parameter is based on sanitary rates gradually increasing from $357,000 to $741,000 over 20 years
	Capital Reinvestment Rate		1.7%		

Table 67 Wastewater Network PLOS Scenario Analysis

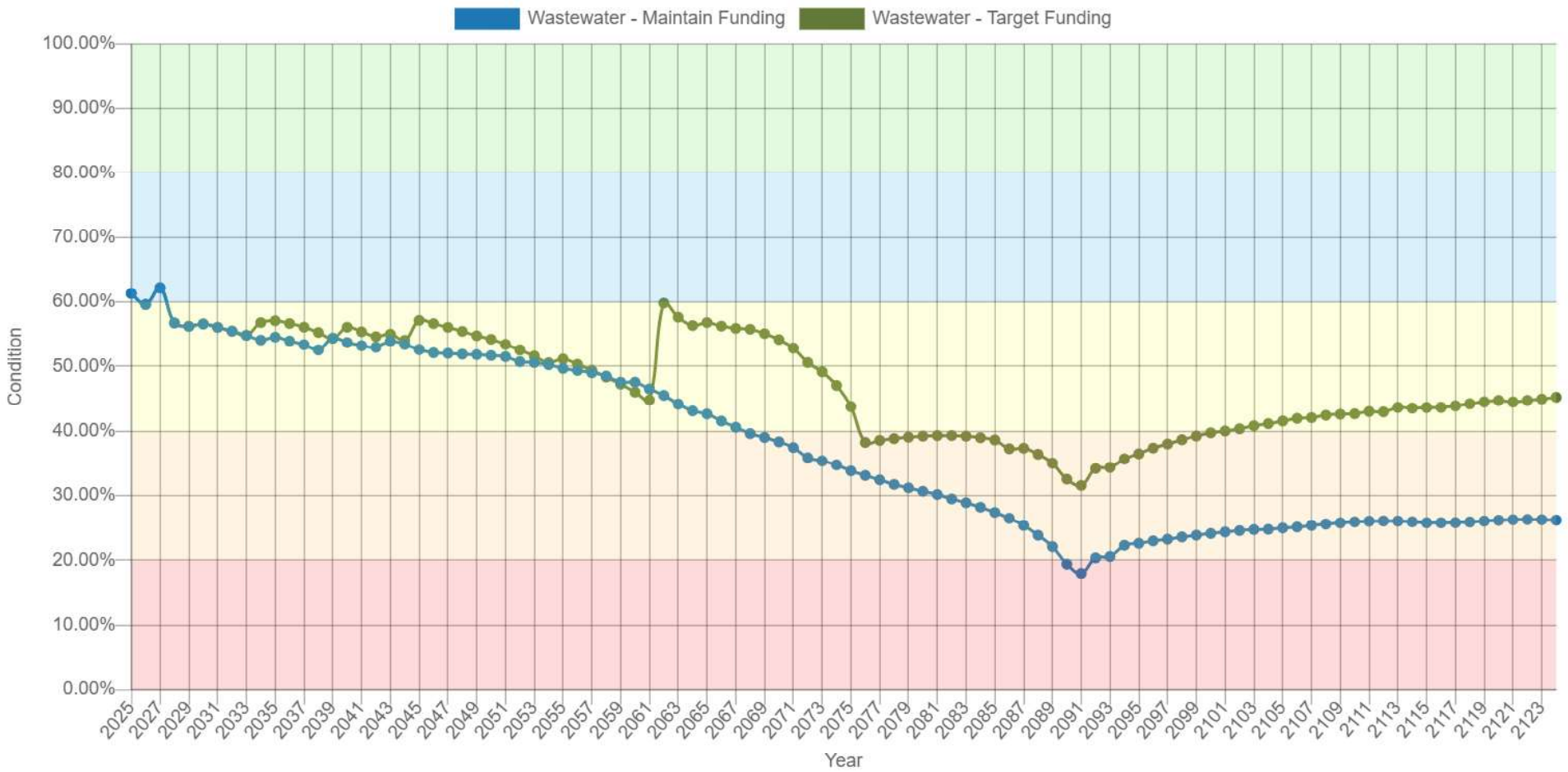

Figure 81 Wastewater Network PLOS Scenario Condition Results

Strategies

15. 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 Township to plan for new infrastructure more effectively, and the upgrade or disposal 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.

15.1 Description of Growth Assumptions

Cavan Monaghan Official Plan (2012)

Township adopted the Official Plan in 2012. The Official Plan was then approved by the County of Peterborough in 2013, followed by approvals from the Ontario Municipal Board (OMB) in 2015.

The Plan also incorporates local land use directions and required Provincial policies, including the Oak Ridges Moraine Conservation Plan, the Provincial Policy Statement, the 2005 Growth Plan for the Greater Golden Horseshoe and recent amendments to the County of Peterborough Official Plan.

The most recent consolidation of the plan occurred in October of 2021.

The Official Plan is a planning document that contains detailed policies regarding general development, the designation of land uses, the provision of community services, road class designation, infrastructure development and management. The Plan also establishes goals, actions and policies to shape, guide and direct the physical growth and composition of the urban and rural areas of the Township.

The Plan is intended to serve as the basis for managing change in the Township and as a major policy document to the year 2031. The provincial policy also requires that the Township's Official Plan be updated to the year of 2051 and to be completed by the Township.

The Settlement Area policies apply to the Township's Millbrook Urban Area and the designated Hamlets. The Settlement Policy Area designation is intended to be the areas of the Township where growth will be focused in order to optimize the use of public services and infrastructure, and to minimize outward sprawl of development into areas of natural resources and natural heritage.

According to the Official Plan, the Township's population is forecasted to reach 11,560 by the year 2031. This growth represents approximately 2,730 persons between 2006 and 2031. In terms of employment opportunities, the Township will establish a target of one new job for each three new residents over the planning period to 2031. This full-time employment growth represents approximately 900 new jobs between 2006 and 2031.

County of Peterborough Official Plan (1994)

In 1994, the County of Peterborough adopted the Official Plan in order to direct and guide the actions of local municipalities and the County in policy development and physical planning on a very broad basis.

For the Township of Cavan Monaghan, the Official Plan serves as the upper tier Official Plan for the County. It establishes a vision in which planning and stewardship protect and enhance a diverse landscape, lifecycle and a sense of community for the County.

The County is responsible for the allocation of growth to the local municipalities, which is based on a combination of local factors including: local planning policy; historic and recent growth trends; market demand; and the capacity to accommodate growth from land supply and servicing perspectives.

The Official Plan also directs conformance with required Provincial policies such as the 2005 Growth Plan for the Grater Golden Horseshoe.

The most recent consolidation of the plan occurred in March of 2020.

Development Charges Background Study (2022)

The Township of Cavan Monaghan prepared a Development Charges Background Study in 2022, pursuant to Section 10 of the Development Charges Act, 1007 (DCA).

The following tables outline the population and employment forecasts allocated to the Township in the study:

Population Forecast from 2016 to 2032			
Municipality	**2016**	**2022**	**2032**
Cavan Monaghan	9,050	10,480	13,330

Employment Forecast from 2016 to 2032			
Municipality	**2016**	**2022**	**2032**
Cavan Monaghan	3,417	4,084	5,910

As a requirement of the Development Charges Act under subsection 10(2)(c), an analysis must be undertaken to assess the long-term capital and operating cost impacts for the capital infrastructure projects identified within the Development Charges.

The background study must also include an asset management plan that deals with all assets proposed to be funded, in whole or in part, by D.C.s. The asset management plan must show that the assets are financially sustainable over their full lifecycle.

The Township is currently in the process of completing an updated Development Charges Study which can be used to inform future iterations of the AMP.

15.2 Impact of Growth on Lifecycle Activities

Planning for forecasted population growth may require the expansion of existing infrastructure and services. As growth-related assets are constructed or acquired, they should be integrated

into the Township's AMP. While the addition of residential units will add to the existing assessment base and offset some of the costs associated with growth, the Township will need to review the lifecycle costs of growth-related infrastructure. These costs should be considered in long-term funding strategies that are designed to, at a minimum, maintain the current level of service.

For the near- to mid-term, the projected population growth in Cavan Monaghan is not expected to significantly impact the current portfolio of assets required by the Township to maintain acceptable service levels.

16. Financial Strategy

For an asset management plan to be effective and meaningful, it must be integrated with financial planning and long-term budgeting. The development of a comprehensive financial plan will allow the Township of Cavan Monaghan to identify the financial resources required for sustainable asset management based on existing asset inventories, desired levels of service, and projected growth requirements.

This report develops such a financial plan by presenting several scenarios for consideration and culminating with final recommendations. As outlined below, the scenarios presented model different combinations of the following components:

1. The financial requirements for:
    a. Existing assets
    b. Existing service levels
    c. Requirements of contemplated changes in service levels (none identified for this plan)
    d. Requirements of anticipated growth (none identified for this plan)
2. Use of traditional sources of municipal funds:
    a. Tax levies
    b. User fees
    c. Debt
    d. Development charges
3. Use of non-traditional sources of municipal funds:
    a. Reallocated budgets
    b. Partnerships
    c. Procurement methods
4. Use of Senior Government Funds:
    a. Canada Community-Building Fund (CCBF)
    b. Annual grants

Note: Periodic grants are normally not included due to Provincial requirements for firm commitments. However, if moving a specific project forward is wholly dependent on receiving a one-time grant, the replacement cost included in the financial strategy is the net of such grant being received.

If the financial plan component results in a funding shortfall, the Province requires the inclusion of a specific plan as to how the impact of the shortfall will be managed. In determining the legitimacy of a funding shortfall, the Province may evaluate a Township's approach to the following:

1. In order to reduce financial requirements, consideration has been given to revising service levels downward.
2. All asset management and financial strategies have been considered. For example:
    a. If a zero-debt policy is in place, is it warranted? If not the use of debt should be considered.
    b. Do user fees reflect the cost of the applicable service? If not, increased user fees should be considered.

16.1 Annual Requirements & Capital Funding

16.1.1 Annual Requirements

The annual requirements represent the amount the Township should allocate annually to each asset category to meet replacement needs as they arise, prevent infrastructure backlogs and achieve long-term sustainability. In total, the Township must allocate approximately $4.3 million annually to address capital requirements for the assets included in this AMP.

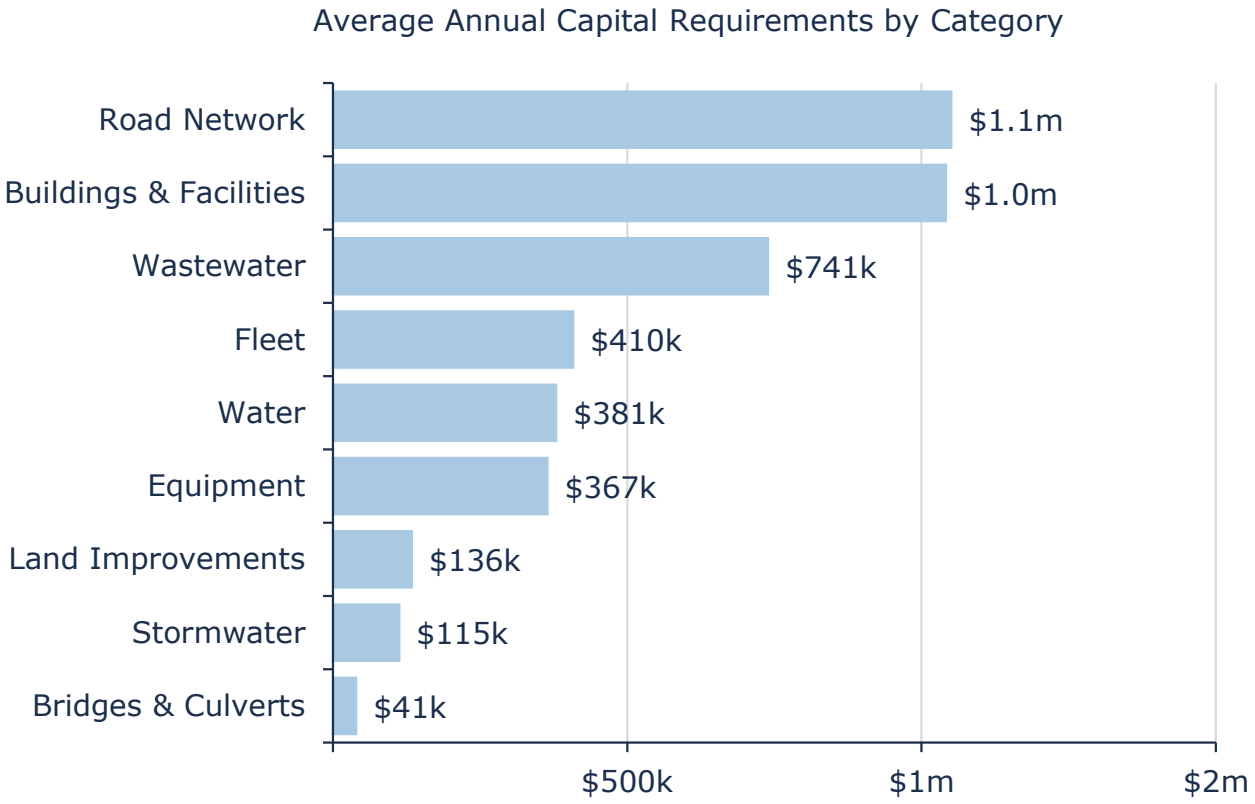

Figure 82 Annual Capital Funding Requirements by Asset Category

For most asset categories the annual requirement has been calculated based on a "replacement only" scenario, in which capital costs are only incurred at the construction and replacement of each asset.

However, for the Road Network, Water Network, and Wastewater Network, lifecycle management strategies have been developed to identify capital costs that are realized through strategic rehabilitation and renewal of the Township's roads, water mains, and sanitary sewer mains respectively. The development of these strategies allows for a comparison of potential cost avoidance if the strategies were to be implemented. The following definitions compares the two scenarios:

1. **Replacement Only Scenario**: Based on the assumption that assets deteriorate and – without regularly scheduled maintenance and rehabilitation – are replaced at the end of their service life.

2. **Lifecycle Strategy Scenario**: Based on the assumption that lifecycle activities are performed at strategic intervals to extend the service life of assets until replacement is required.

16.1.2 Annual Funding Available

Based on a historical analysis of sustainable capital funding sources, the Township is committing approximately $2.8 million towards capital projects per year, excluding any transfers to the Asset Replacement Reserve (ARR). Given the annual capital requirement of $4.3 million, there is currently a funding gap of $1.5 million annually.

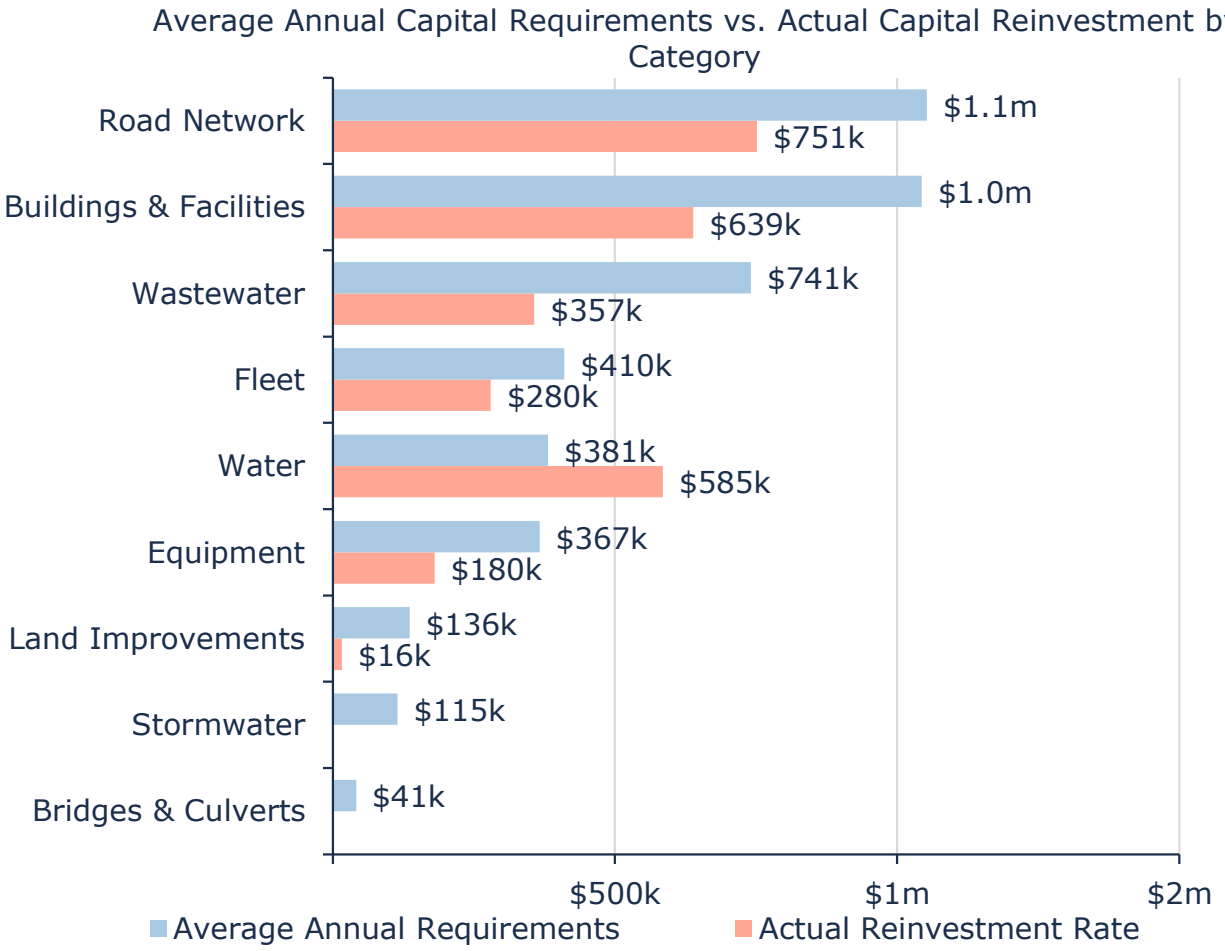

Figure 83 Annual Requirements vs. Capital Funding Available

16.2 Funding Objective

We have developed a scenario that would enable the Township of Cavan Monaghan to achieve full funding within 10 years for the following assets:

1. **Tax Funded Assets:** Road Network, Stormwater Network, Bridges & Culverts, Buildings & Facilities, Equipment, Land Improvements, Fleet

For the purposes of this AMP, the Township has chosen to continue to maintain current funding levels for the water and wastewater network, therefore no rate increases have been noted. The Township will be performing a rate study to determine the rate increase that should be implemented in order to continue to provide the current level of service.

Note: We have excluded gravel roads in our analysis since they are a perpetual maintenance asset and end of life replacement calculations do not normally apply. If gravel roads are maintained properly, they can theoretically have a limitless service life.

For each scenario developed we have included strategies, where applicable, regarding the use of cost containment and funding opportunities.

16.3 Financial Profile: Tax Funded Assets

16.3.1 Current Funding Position

The following tables show, by asset category, Cavan Monaghan's average annual asset investment requirements, current funding positions, and funding increases required to achieve full funding on assets funded by taxes.

Asset Category	Avg. Annual Require-ment	Annual Funding Available					Annual Deficit
		Taxes	CCBF	OCIF	Other	Total Available	
Road Network	1,053,000	109,231	328,025	314,191		751,447	301,553
Stormwater Network	115,000					0	115,000
Bridges & Culverts	41,000					0	41,000
Buildings & Facilities	1,044,000	638,949				638,949	405,051
Equipment	367,000	180,298				180,298	186,702
Land Improvements	136,000	16,000				16,000	120,000
Fleet	410,000	279,568				279,568	130,432
Total	**3,166,000**	**1,224,046**	**328,025**	**314,191**	**0**	**1,866,262**	**1,299,738**

Table 68 Annual Available Funding for Tax Funded Assets

The average annual investment requirement for the above categories is $3.2 million. Annual revenue currently allocated to these assets for capital purposes, excluding transfer to the ARR, is $1.9 million, leaving an annual deficit of $1.3 million. Put differently, these infrastructure categories are currently funded at 59% of their long-term requirements.

16.3.2 Full Funding Requirements

In 2024, the Township of Cavan Monaghan had budgeted annual tax revenues of approximately $12.5 million. As illustrated in the following table, without consideration of any other sources of revenue or cost containment strategies, full funding would require the following tax change over time:

Asset Category	Tax Change Required for Full Funding
Road Network	2.4%
Stormwater Network	0.9%
Bridges & Culverts	0.3%
Buildings & Facilities	3.2%
Equipment	1.5%
Land Improvements	1.0%
Fleet	1.0%
Total	**10.3%**

Table 69 Tax Increase Requirements for Full Funding

Our scenario modeling include capturing the above changes and allocating them to the infrastructure deficit outlined above. The table below outlines this concept and presents several options:

	5 Years	10 Years	15 Years	20 Years
Infrastructure Deficit	1,299,738	1,299,738	1,299,738	1,299,738
Change in Debt Costs	0	0	0	0
Resulting Infrastructure Deficit:	**1,299,738**	**1,299,738**	**1,299,738**	**1,299,738**
Tax Increase Required	10.4%	10.4%	10.4%	10.4%
Annually:	**2.0%**	**1.0%**	**0.7%**	**0.5%**

Table 70 Tax Increase Options 5-20 Years

16.3.3 Financial Strategy Recommendations

Considering all the above information, we recommend the 10-year option. This involves full funding being achieved over 10 years by:

a) increasing tax revenues by 1.0% each year for the next 10 years solely for the purpose of phasing in full funding to the asset categories covered in this section of the AMP.

b) allocating the current CCBF and OCIF revenue as outlined previously.
c) reallocating appropriate revenue from categories in a surplus position to those in a deficit position.
d) increasing existing and future infrastructure budgets by the applicable inflation index on an annual basis in addition to the deficit phase-in.

Notes:

1. As in the past, periodic senior government infrastructure funding will most likely be available during the phase-in period. By Provincial AMP rules, this periodic funding cannot be incorporated into an AMP unless there are firm commitments in place. We have included OCIF formula-based funding, if applicable, since this funding is a multi-year commitment[7].
2. We realize that raising tax revenues by the amounts recommended above for infrastructure purposes will be very difficult to do. However, considering a longer phase-in window may have even greater consequences in terms of infrastructure failure.

Although this option achieves full funding on an annual basis in 10 years and provides financial sustainability over the period modeled, the recommendations do require prioritizing capital projects to fit the resulting annual funding available. Current data shows a pent-up investment demand of $265,000 for the Road Network, $1.4 million for Buildings & Facilities, $636,000 for Land Improvements, $1.3 million for Equipment, and $1.2 million for Vehicles.

Prioritizing future projects will require the current data to be replaced by condition-based data. Although our recommendations include no further use of debt, the results of the condition-based analysis may require otherwise.

[7] The Township should take advantage of all available grant funding programs and transfers from other levels of government. While OCIF has historically been considered a sustainable source of funding, the program is currently undergoing review by the provincial government. Depending on the outcome of this review, there may be changes that impact its availability.

16.4 Financial Profile: Rate Funded Assets

16.4.1 Current Funding Position

The following tables show, by asset category, Cavan Monaghan's average annual asset investment requirements, current funding positions, and funding increases required to achieve full funding on assets funded by rates.

Asset Category	Avg. Annual Require-ment	Annual Funding Available				Annual Deficit
		Rates	To Operation	To Debt	Total Available	
Water Network	381,000	731,416	-56,416	-90,000	585,000	-204,000
Wastewater Network	741,000	1,150,675	-703,675	-90,000	357,000	384,000
Total	**1,122,000**	**1,882,091**	**-760,091**	**-180,000**	**942,000**	**180,000**

Table 71 Annual Available Funding for Rate Funded Assets

The average annual investment requirement for the above categories is $1.1 million. Annual revenue currently allocated to these assets for capital purposes is $942,000 leaving an annual deficit of $180,000. Put differently, these infrastructure categories are currently funded at 84% of their long-term requirements.

16.4.2 Full Funding Requirements

In 2024, Cavan Managhan had annual sanitary revenues of $1.2 million and annual water revenues of $731,000. As illustrated in the table below, without consideration of any other sources of revenue, full funding would require the following changes over time:

Asset Category	Rate Allocation Change Required for Full Funding
Water Network	0%
Wastewater Network	33.4%

Table 72 Rate Increase Requirements for Full Funding

As Citywide capital forecasting for the water and wastewater networks relies heavily on age-based data, the Township has opted to undertake an external rate study to determine the rate increases that should be implemented annually in order to maintain the current level of service. Due to this, the Township has chosen to maintain current funding levels for the water and wastewater network pending the recommendations of the rate study.

16.4.3 Financial Strategy Recommendations

Considering all of the above information, we recommend maintaining current funding levels for the water and wastewater network. This involves:

a) Maintaining current funding levels for the purpose of achieving the proposed level of service for the asset categories covered in this section of the AMP.
b) increasing existing and future infrastructure budgets by the applicable annual increases recommended by the rate study

Notes:

1. As in the past, periodic senior government infrastructure funding will most likely be available during the phase-in period. This periodic funding should not be incorporated into an AMP unless there are firm commitments in place.
2. We realize that raising rate revenues for infrastructure purposes will be very difficult to do. However, considering a longer phase-in window may have even greater consequences in terms of infrastructure failure.
3. Any increase in rates required for operations would be in addition to the above recommendations.
4. A rate study is being completed for the water and wastewater rates and any adjustments to rates should be supplemented with recommendations from this study.

The recommendations above do require prioritizing capital projects to fit the resulting annual funding available. Current data shows a pent-up investment demand of $533,000 Wastewater Network.

Prioritizing future projects will require the current data to be replaced by condition-based data. Although our recommendations include no further use of debt, the results of the condition-based analysis may require otherwise.

16.5 Use of Debt

Debt can be strategically utilized as a funding source with in the long-term financial plan. The benefits of leveraging debt for infrastructure planning include:

a) the ability to stabilize tax & user rates when dealing with variable and sometimes uncontrollable factors
b) equitable distribution of the cost/benefits of infrastructure over its useful life
c) a secure source of funding
d) flexibility in cash flow management

Debt management policies and procedures with limitations and monitoring practices should be considered when reviewing debt as a funding option. In efforts to mitigate increasing commodity prices and inflation, interest rates have been rising. Sustainable funding models that include debt need to incorporate the now current realized risk of rising interest rates. The following graph shows the historical changes to the lending rates:

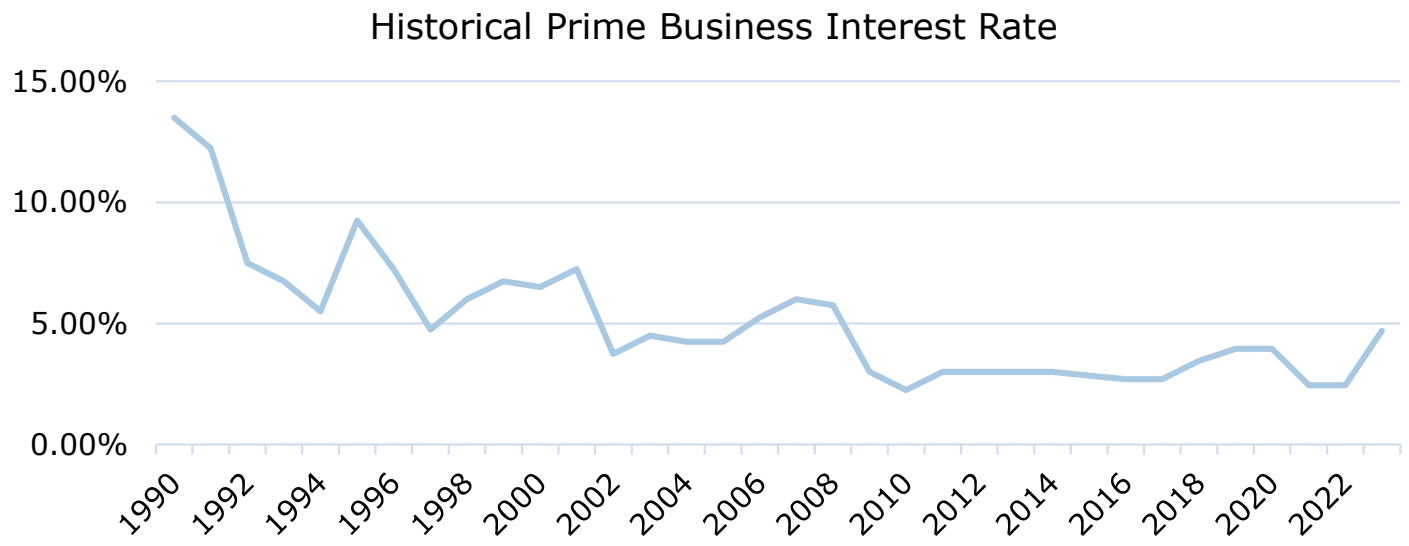

Figure 84 Historical Prime Rate

A change in 15-year rates from 5% to 7% would change the premium from 45% to 65%. Such a change would have a significant impact on a financial plan.

For reference purposes, the following table outlines the premium paid on a project if financed by debt. For example, a $1 million project financed at 3.0%[8] over 15 years would result in a 26% premium or $260 thousand of increased costs due to interest payments. For simplicity, the table does not consider the time value of money or the effect of inflation on delayed projects.

[8] Current municipal Infrastructure Ontario rates for 15-year money is 4.03%.

Interest Rate	Number of Years Financed					
	5	10	15	20	25	30
7.0%	22%	42%	65%	89%	115%	142%
6.5%	20%	39%	60%	82%	105%	130%
6.0%	19%	36%	54%	74%	96%	118%
5.5%	17%	33%	49%	67%	86%	106%
5.0%	15%	30%	45%	60%	77%	95%
4.5%	14%	26%	40%	54%	69%	84%
4.0%	12%	23%	35%	47%	60%	73%
3.5%	11%	20%	30%	41%	52%	63%
3.0%	9%	17%	26%	34%	44%	53%
2.5%	8%	14%	21%	28%	36%	43%
2.0%	6%	11%	17%	22%	28%	34%
1.5%	5%	8%	12%	16%	21%	25%
1.0%	3%	6%	8%	11%	14%	16%
0.5%	2%	3%	4%	5%	7%	8%
0.0%	0%	0%	0%	0%	0%	0%

Table 73 Interest Premiums Paid

The following tables outline how Cavan Monaghan has historically used debt for investing in the asset categories as listed. As of year-end 2024, there is currently $6.4 million of debt outstanding for the assets covered by this AMP with corresponding principal and interest payments of $506,000, well within its provincially prescribed maximum of $3.7 million.

Asset Category	Current Debt Outstanding	Use of Debt in the Last Five Years				
		2019	2020	2021	2022	2023
Road Network	0	0	0	0	0	0
Stormwater Network	0	0	0	0	0	0
Bridges & Culverts	0	0	0	0	0	0
Buildings& Facilities	0	0	0	0	0	0
Equipment	0	0	0	0	0	0
Land Improvements	0	0	0	0	0	0
Fleet	0	0	0	0	0	0
Total Tax Funded	**0**	**0**	**0**	**0**	**0**	**0**
Water Network	6,359,871	506,102	506,102	506,102	506,102	506,102
Wastewater Network	0	0	0	0	0	0
Total Rate Funded	**6,359,871**	**0**	**0**	**0**	**0**	**0**

Table 74 Cavan Monaghan Use of Debt 2019-2023

Asset Category	Principal & Interest Payments in the Next Ten Years						
	2025	2026	2027	2028	2029	2030	2035
Road Network	0	0	0	0	0	0	0
Stormwater Network	0	0	0	0	0	0	0
Bridges & Culverts	0	0	0	0	0	0	0
Buildings & Facilities	0	0	0	0	0	0	0
Equipment	0	0	0	0	0	0	0
Land Improvements	0	0	0	0	0	0	0
Fleet	0	0	0	0	0	0	0
Total Tax Funded	**0**	**0**	**0**	**0**	**0**	**0**	**0**
Water Network	506,102	504,004	503,933	506,102	506,102	506,102	506,102
Wastewater Network	0	0	0	0	0	0	0
Total Rate Funded	**506,102**	**504,004**	**503,933**	**506,102**	**506,102**	**506,102**	**506,102**

Table 75 Cavan Monaghan Principal and Interest Payments

The revenue options outlined in this plan allow the Township of Cavan Monaghan to fully fund its long-term infrastructure requirements without further use of debt.

16.6 Use of Reserves

16.6.1 Available Reserves

Reserves play a critical role in long-term financial planning. The benefits of having reserves available for infrastructure planning include:

a) the ability to stabilize tax rates when dealing with variable and sometimes uncontrollable factors
b) financing one-time or short-term investments
c) accumulating the funding for significant future infrastructure investments
d) managing the use of debt
e) normalizing infrastructure funding requirement

There is considerable debate in the municipal sector as to the appropriate level of reserves that a Township should have on hand. There is no clear guideline that has gained wide acceptance. Factors that municipalities should take into account when determining their capital reserve requirements include:

a) breadth of services provided
b) age and condition of infrastructure
c) use and level of debt
d) economic conditions and outlook
e) internal reserve and debt policies.

These reserves are available for use by applicable asset categories during the phase-in period to full funding. This coupled with Cavan Monaghan's judicious use of debt in the past, allows the scenarios to assume that, if required, available reserves and debt capacity can be used for high priority and emergency infrastructure investments in the short- to medium-term.

16.6.2 Recommendation

In 2025, Ontario Regulation 588/17 required Cavan Monaghan to integrate proposed levels of service for all asset categories in its asset management plan update. We recommend that future planning should reflect adjustments to service levels and their impacts on reserve balances.

17. Recommendations & Key Considerations

17.1 Financial Strategies

1. Review the feasibility of adopting a full-funding scenario to achieve 100% of average annual funding requirement for the asset categories analyzed. This includes:
    a. Increasing taxes by 1.0% per year over a period of 10 years;

2. Continued allocation of OCIF and CCBF funding as previously outlined.

3. Reallocating appropriate revenue from categories in a surplus position to those in a deficit position.

4. Increasing existing and future infrastructure budgets by the applicable inflation index on an annual basis in addition to the deficit phase-in and based on the amounts recommended by the rate study.

5. Continue to apply for project specific grant funding to supplement sustainable funding sources.

17.2 Asset Data

1. Continuously review, refine, and calibrate lifecycle and risk profiles to better reflect actual practices and improve capital projections. In particular:
    a. the timing of various lifecycle events, the triggers for treatment, anticipated impacts of each treatment, and costs
    b. the various attributes used to estimate the likelihood and consequence of asset failures, and their respective weightings

2. Asset management planning is highly sensitive to replacement costs. Periodically update replacement costs based on recent projects, invoices, or estimates, as well as condition assessments, or any other technical reports and studies. Material and labour costs can fluctuate due to local, regional, and broader market trends, and substantially so during major world events. Accurately estimating the replacement cost of like-for-like assets can be challenging. Ideally, several recent projects over multiple years should be used. Staff judgement and historical data can help attenuate extreme and temporary fluctuations in cost estimates and keep them realistic.

3. Like replacement costs, an asset's established serviceable life can have dramatic impacts on all projections and analyses, including condition, long-range forecasting, and financial recommendations. Periodically reviewing and updating these values to better reflect in-field performance and staff judgement is recommended.

17.3 Risk & Levels of Service

1. Risk models and matrices can play an important role in identifying high-value assets, and developing an action plan which may include repair, rehabilitation, replacement, or further evaluation through condition assessments. As a result, project selection and the

development of multi-year capital plans can become more strategic and objective. Initial models have been built into Citywide for all asset groups. These models reflect current data, which was limited. As the data evolves and new attribute information is obtained, these models should also be refined and updated.

2. Available data on current performance should be centralized and tracked to support any calibration of service levels ahead of O. Reg. 588's 2025 requirements on proposed levels of service.

3. Staff should monitor evolving local, regional, and environmental trends to identify factors that may shape the demand and delivery of infrastructure programs. These can include population growth, and the nature of population growth; climate change and extreme weather events; and economic conditions and the local tax base. This data can also be used to review service level targets.

Appendices

Appendix A – Infrastructure Report Card

Asset Category	Replacement Cost	Average Condition	Financial Capacity		% Funded
Road Network	**$24.1 m**	**Good**	Annual Requirement:	$1,053,000	71%
			Funding Available:	$751,000	
			Annual Deficit:	**$302,000**	
Bridges & Culverts	**$1.1 m**	**Good**	Annual Requirement:	$41,000	0%
			Funding Available:	$0	
			Annual Deficit:	**$41,000**	
Water	**$26.8 m**	**Good**	Annual Requirement:	$381,000	154%
			Funding Available:	$585,000	
			Annual Deficit:	**($204,000)**	
Wastewater	**$43.2 m**	**Very Good**	Annual Requirement:	$741,000	48%
			Funding Available:	$357,000	
			Annual Deficit:	**$384,000**	
Stormwater	**$7.0 m**	**Very Good**	Annual Requirement:	$115,000	0%
			Funding Available:	$0	
			Annual Deficit:	**$115,000**	
Buildings & Facilities	**$38.7 m**	**Good**	Annual Requirement:	$1,044,000	61%
			Funding Available:	$639,000	
			Annual Deficit:	**$405,000**	
Land Improvements	**$2.2 m**	**Fair**	Annual Requirement:	$136,000	12%
			Funding Available:	$16,000	
			Annual Deficit:	**$120,000**	
Fleet	**$7.9 m**	**Fair**	Annual Requirement:	$410,000	68%
			Funding Available:	$280,000	
			Annual Deficit:	**$130,000**	
Equipment	**$4.3 m**	**Fair**	Annual Requirement:	$367,000	49%
			Funding Available:	$180,000	
			Annual Deficit:	**$187,000**	

Appendix B – 10-Year Capital Requirements

Current Levels of Service (No consideration of available capital funding)

Road Network

Segment	Back-log	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034
HCB Roads	-	$399k	$513k	$153k	-	$79k	$377k	$160k	-	$671k	-
LCB Roads	-	$69k	$524k	$524k	$1.1m	$2.2m	$1.1m	$1.2m	$1.3m	$1.7m	$1.9m
Pedestrian Crossing	-	-	-	-	-	-	-	-	-	-	-
Sidewalks	$265k	-	-	-	-	-	-	506k	-	-	-
Streetlights	-	-	-	-	-	-	-	-	-	-	-
Total	**$265k**	**$468k**	**$1.0m**	**$1.0m**	**$1.1m**	**$2.2m**	**$1.5m**	**$1.8m**	**$1.3m**	**$2.4m**	**$1.9m**

Table 76 System Generated 10-Year Capital Replacement Forecast: Road Network

Bridges & Culverts

Segment	Back-log	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034
Structural Culverts	-	$142k	$300k	$189k	-	-	-	-	-	-	-
Total	**-**	**$142k**	**$300k**	**$189k**	**-**	**-**	**-**	**-**	**-**	**-**	**-**

Table 77 System Generated 10-Year Capital Replacement Forecast: Bridges & Culverts

Water Network

Segment	Back-log	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034
Booster Pumping Station	-	-	-	-	-	$1k	-	-	-	-	-
Bulk Water Stations	-	-	-	-	-	-	$60k	-	-	-	-
Curbstops & Valves	-	-	-	-	-	-	-	-	-	-	-
Hydrants	-	-	-	-	-	-	-	-	-	-	-
Machinery & Equipment	-	-	-	-	-	-	$3k	-	-	-	-
Mains	-	$189k	$192k	$192k	$219k	$3.8m	-	-	-	-	-
Meters	-	-	-	-	-	$147k	$11k	-	-	-	-
Treatment & Storage	-	-	-	-	-	$765k	$374k	-	-	-	-
Total	**-**	**$189k**	**$192k**	**$192k**	**$219k**	**$4.7m**	**$448k**	**-**	**-**	**-**	**-**

Table 78 System Generated 10-Year Capital Replacement Forecast: Water Network

Wastewater Network

Segment	Back-log	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034
Mains	$33k	$21k	-	-	-	-	-	-	-	-	-
Manholes	-	-	-	-	-	-	-	-	-	-	-
Pump Station	$2.2m	-	-	-	-	-	-	-	-	-	-
Treatment & Disposal	$66k	$29k	$47k	-	$18k	$675k	-	$10k	-	$10k	-
Total	**$2.3m**	**$51k**	**$47k**	**-**	**$18k**	**$675k**	**-**	**$10k**	**-**	**$10k**	**-**

Table 79 System Generated 10-Year Capital Replacement Forecast: Sanitary Sewer Network

Stormwater Network

Segment	Back-log	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034
Catch Basins	-	-	-	-	-	$46k	-	-	-	-	$3k
Culverts	-	$40k	$40k	-	-	-	-	-	-	-	-
Mains	-	$194k	-	-	-	-	$62k	-	-	-	-
Manhole Storm	-	-	-	-	-	-	-	-	-	-	-
SWM Ponds	-	-	-	-	-	-	-	-	-	-	-
Total	**-**	**$234k**	**$40k**	**-**	**-**	**$46k**	**$62k**	**-**	**-**	**-**	**$3k**

Table 80 System Generated 10-Year Capital Replacement Forecast: Stormwater Network

Buildings & Facilities

Segment	Back-log	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034
Administrative	$446k	$157k	-	-	-	-	-	-	$29k	-	$16k
Arenas & Community Center	-	-	-	-	-	-	-	-	-	-	-
Fire Halls	$72k	-	-	-	-	-	-	-	-	$279k	-
Park Shelters & Structures	-	-	-	-	-	-	-	-	-	-	-
Public Works Facilities	$343k	-	-	-	-	$146k	-	-	-	-	-
Schools & Libraries	$552k	$929k	-	-	-	$16k	$15k	-	-	$1.2m	-
Total	**$1.4m**	**$1.1m**	**-**	**-**	**-**	**$162k**	**$15k**	**-**	**$29k**	**$1.5m**	**$16k**

Table 81 System Generated 10-Year Capital Replacement Forecast: Buildings & Facilities

Land Improvements

Segment	Back-log	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034
Paving & Parking Lots	$420k	$25k	-	-	-	$43k	$10k	$399k	-	$228k	-
Playspace	$43k	-	-	-	-	-	-	-	-	-	-
Signs	$83k	$49k	-	-	-	-	-	-	-	$132k	$11k
Sport Fields & Courts	$89k	-	-	-	-	-	$733k	$32k	-	$12k	-
Total	**$636k**	**$74k**	**-**	**-**	**-**	**$43k**	**$743k**	**$431k**	**-**	**$373k**	**$11k**

Table 82 System Generated 10-Year Capital Replacement Forecast: Land Improvements

Fleet

Segment	Back-log	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034
Fire Vehicles	$1.0m	-	$376k	$70k	$277k	-	$51k	$374k	$102k	$385k	-
Heavy Duty Vehicles	-	$274k	-	$264k	-	-	$221k	-	$251k	-	-
Light Duty Vehicles	$209k	$136k	$28k	$178k	$95k	$48k	$90k	-	-	$354k	$129k
Total	**$1.2m**	**$409k**	**$404k**	**$512k**	**$372k**	**$48k**	**$362k**	**$374k**	**$353k**	**$739k**	**$129k**

Table 83 System Generated 10-Year Capital Replacement Forecast: Vehicles

Equipment

Segment	Back-log	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034
Fire	$432k	$77k	$49k	$29k	$48k	$48k	$32k	-	$440k	$502k	$56k
General Government	$355k	$58k	$118k	$75k	$13k	$160k	$118k	-	$89k	$338k	$203k
Parks & Facilities	$263k	$57k	$40k	$257k	$9k	$4k	$63k	$6k	$77k	$313k	$96k
Transportation	$143k	$53k	$19k	$49k	$53k	$49k	-	$45k	$49k	$65k	$49k
Water & Wastewater	$79k	$7k	-	-	-	-	-	-	$126k	$85k	-
Total	**$1.3m**	**$252k**	**$226k**	**$410k**	**$123k**	**$260k**	**$213k**	**$50k**	**$782k**	**$1.3m**	**$404k**

Table 84 System Generated 10-Year Capital Replacement Forecast: Machinery & Equipment

Proposed Levels of Service (Based on available capital funding, following recommended financial strategy)

Categories	Available Capital Funding									
	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035
Tax-Funded	$1.97m	$2.10m	$2.23m	$2.36m	$2.49m	$2.62m	$2.75m	$2.88m	$3.02m	$3.16m
Rate-Funded (Water)	$585k	$585k	$585k	$585k	$585k	$585k	$585k	$585k	$585k	$585k
Rate-Funded (Sanitary)	$357k	$357k	$357k	$357k	$357k	$357k	$357k	$357k	$357k	$357k

Table 85 Proposed Level of Service 10-Year Capital Funding Available

Appendix C – Level of Service Maps & Photos

Culverts – Condition Photos

Brackenridge Drive Culvert – Very Good Condition


Elgar Drive Culvert – Good Condition


Sharp Line Culvert – Fair Condition


Parks and Publicly Available Open Space Map