



Asset Management Plan 2024

Township of Emo

March 2026



This Asset Management Plan was prepared by:



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

Key Statistics

\$33.5 m 2022 Replacement Cost of Asset Portfolio

\$27.9 k Replacement Cost of Infrastructure Per Household

74% Percentage of Assets in Fair or Better Condition

74% Percentage of Assets with Assessed Condition Data

\$980 k Annual Capital Infrastructure Deficit

3.66% Target Investment Rate

0.73% Actual Investment Rate

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1. 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.

1.1 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 Emo can ensure that public infrastructure is managed to support the sustainable delivery of municipal services.

This AMP include the following asset categories:

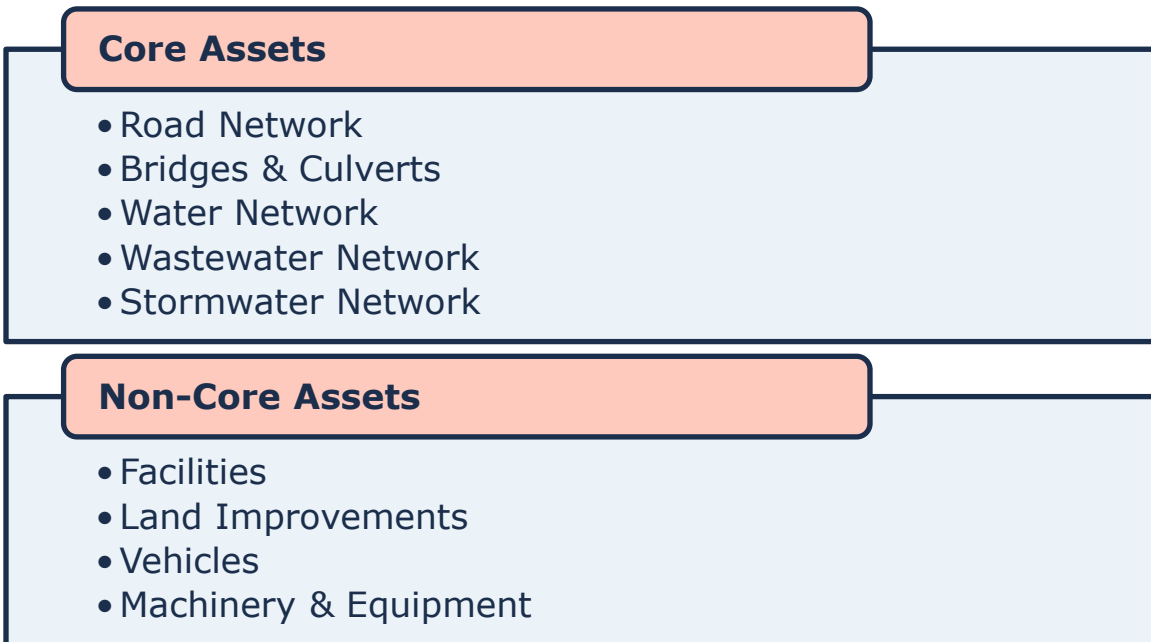


Figure 1 Core and Non-Core Asset Categories

1.2 Compliance

With the development of this AMP the Township of Emo has achieved compliance with July 1, 2024, requirements under O. Reg. 588/17. This includes requirements for levels of service and inventory reporting for all asset categories.

1.3 Findings

The overall replacement cost of the asset categories included in this AMP totals \$33.5 million. 88% of all assets analyzed in this AMP are in fair or better condition and assessed condition data was available for 91% of assets. For the remaining 13% 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.

To meet capital replacement and rehabilitation needs for existing infrastructure, prevent infrastructure backlogs, and achieve long-term sustainability, the Township's average annual capital requirement totals \$1.225 million. Based on a historical analysis of sustainable capital funding sources, the Township is committing approximately \$245 thousand towards capital projects or reserves per year. As a result, there is currently an annual funding gap of \$980 thousand.

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.

1.4 Recommendations

A financial strategy was developed to address the annual capital funding gap. The following graphics shows annual tax/rate change required to eliminate the Township's infrastructure deficit based on a 15-year plan for tax-funded assets, 5-year plan for water network assets (rate-funded), and 10-year plan for wastewater network assets (rate-funded):

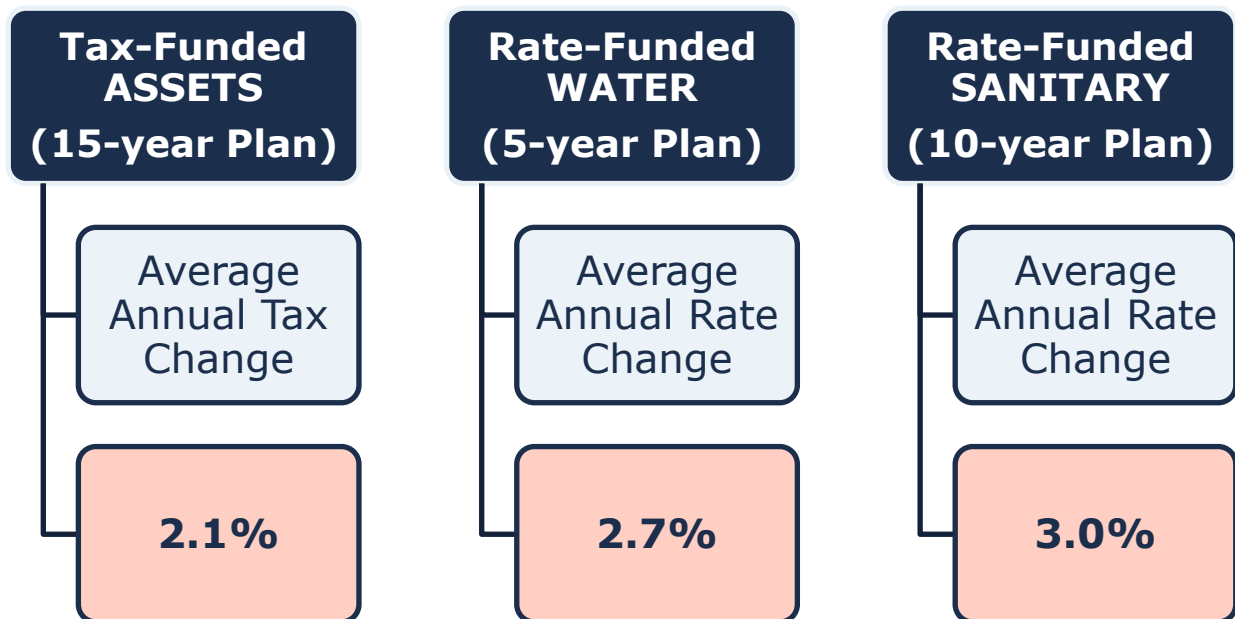


Figure 2 Proposed Tax/Rate Changes

2. Introduction & Context

2.1 Community Profile

Table 1 Township of Emo Community Profile

Census Characteristic	Township of Emo	Ontario
Population 2021	1,204	14,223,942
Population Change 2016-2021	-9.7%	5.8%
Total Private Dwellings	521	5,929,250
Population Density	6.0/km ²	15.9/km ²
Land Area	202.28 km ²	892,411.76 km ²

The Township of Emo is a single-tier municipality and part of the Rainy River District which is located in the southern side northwestern Ontario. Emo is positioned west of the Town of Fort Frances.

The Township was incorporated in 1899 and marked its official recognition as a Township, laying the groundwork for its governance, development, and community organization. Emo has maintained its rural character while evolving to meet the needs of its residents. It has a rich history of community and resilience, with families that have deep roots in the area.

Emo is surrounded by natural landscapes, marked by the Rainy River, agricultural lands, and dense forests. This scenic environment attracts outdoor enthusiasts seeking a quieter, rural lifestyle. The river is especially popular for fishing and boating, providing outdoor recreational activities for residents. The agricultural setting outlines Emo's agricultural heritage with a strong sense of community. This unique combination draws individuals seeking a slower-paced life in a rural atmosphere.

The Township's demand is driven by its recreational activities and strategic location, acting as a gateway to Northwestern Ontario and the US, which boosts its economy through agriculture and tourism. This mix attracts both residents and visitors, creating a vibrant community atmosphere. People looking for a balance between work and leisure, with the added bonus of cultural events and markets, will find Emo an appealing place to live or visit.

The Township of Emo prioritizes infrastructure development to preserve rural life, adapt to changes, and ensure resident safety and resource management. Focus areas include maintaining essential services like water and sewage, road upkeep, and land use control to avoid unwanted expansion. The Official Plan emphasizes sustainable growth, environmental protection, and economic diversification, aiming to meet current and future community needs within a framework that values the Township's unique rural identity.

2.2 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.

2.2.1 Emo Climate Profile

The Township of Emo is located in northwestern Ontario within the Rainy River District. 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 Emo may experience the following trends:

Higher Average Annual Temperature:

- Between the years 1971 and 2000 the annual average temperature was 2.9 °C
- Under a high emissions scenario, the annual average temperatures are projected to increase by 4.7 °C by the year 2050 and over 6.8 °C by the end of the century.

Increase in Total Annual Precipitation:

- Under a high emissions scenario, Emo is projected to experience an 8% increase in precipitation by the year 2051 and a 12% increase by the end of the century.

Increase in Frequency of Extreme Weather Events:

- It is expected that the frequency and severity of extreme weather events will change.

2.2.2 Integration Climate change and 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 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.

2.3 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.

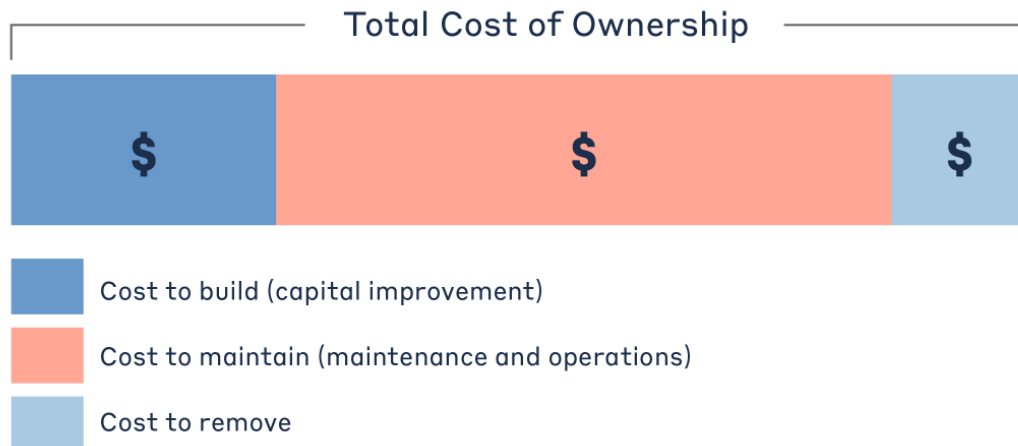


Figure 3 Total Cost of Asset Ownership

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.

2.3.1 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.

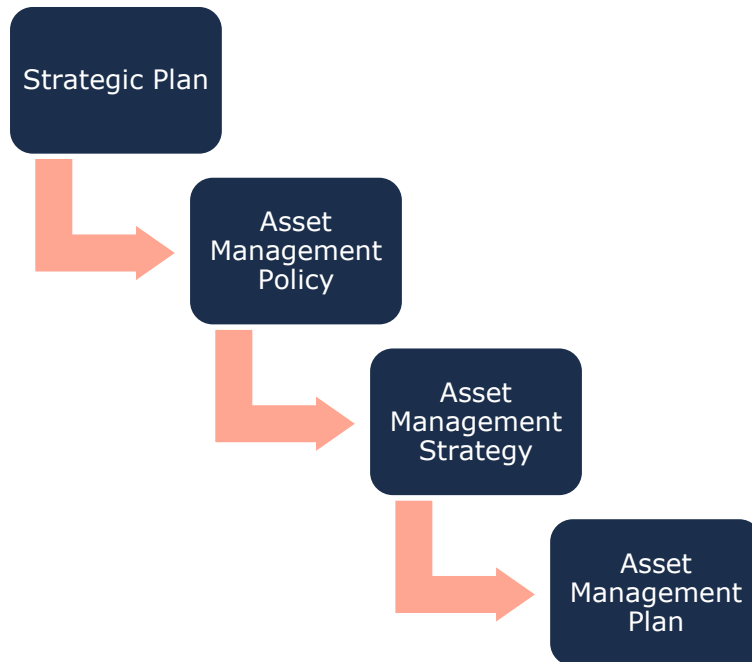


Figure 4 Foundational Asset Management Documents

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.

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 on 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.

2.3.2 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 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.

Table 2 Lifecycle Management: Typical Lifecycle Interventions

Lifecycle Activity	Cost	Typical Associated Risks
<p>Maintenance</p> <p>Activities that prevent defects or deteriorations from occurring</p>	\$	<ul style="list-style-type: none"> ◆ 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;
<p>Rehabilitation/ Renewal</p> <p>Activities that rectify defects or deficiencies that are already present and may be affecting asset performance</p>	\$\$\$	<ul style="list-style-type: none"> ◆ 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;
<p>Replacement/ Reconstruction</p> <p>Asset end-of-life activities that often involve the complete replacement of assets</p>	\$\$\$\$\$	<ul style="list-style-type: none"> ◆ 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;

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.

Formula to Assess Risk of Assets

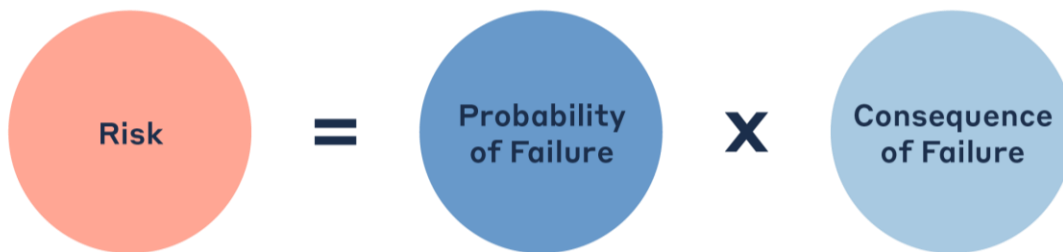


Figure 5 Risk Equations

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.

Table 3 Risk Analysis: Types of Consequences of Failure

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.

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. At this stage, only those LOS that are required under O. Reg are included.

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

This AMP focuses on measuring the current level of service provided to the community. Once current levels of service have been measured, the Township plans to establish proposed levels of service over a 10-year period, in accordance with O. Reg. 588/17.

Proposed levels of service should be realistic and achievable within the timeframe outlined by the Township. They should also be determined with consideration of a variety of community expectations, fiscal capacity, regulatory requirements, corporate goals and long-term sustainability. Once proposed levels of service have been established, the Township must identify a lifecycle management and financial strategy which allows these targets to be achieved.

2.4 Scope & Methodology

2.4.1 Asset Categories for this AMP

This asset management plan for the Township of Emo is produced in compliance with O. Reg. 588/17. The July 2024 deadline under the regulation—the second of three AMPs—requires analysis of core and non-core asset categories.

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

2.4.2 Data Effective Date

It is important to note that this plan is based on data as of **December 2022**¹; 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.

2.4.3 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.

2.4.4 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

¹ At the time of preparing this Asset Management Plan, 2022 represented the most recent complete dataset available. The Township is currently undertaking initiatives to enhance data quality through comprehensive reviews of asset inventory, replacement costs, and lifecycle and risk models. As these improvements are implemented, the accuracy and reliability of analysis and projections are expected to increase.

2.4.5 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

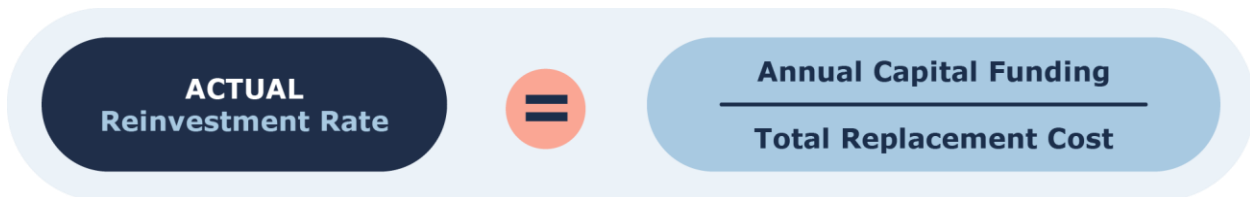


Figure 9 Actual Reinvestment Rate Calculation

2.4.6 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.

Table 4 Standard Condition Rating Scale

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

Condition	Description	Criteria	Service Life Remaining (%)
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

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.

2.5 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)². Along with creating better performing organizations, more livable and sustainable communities, 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.

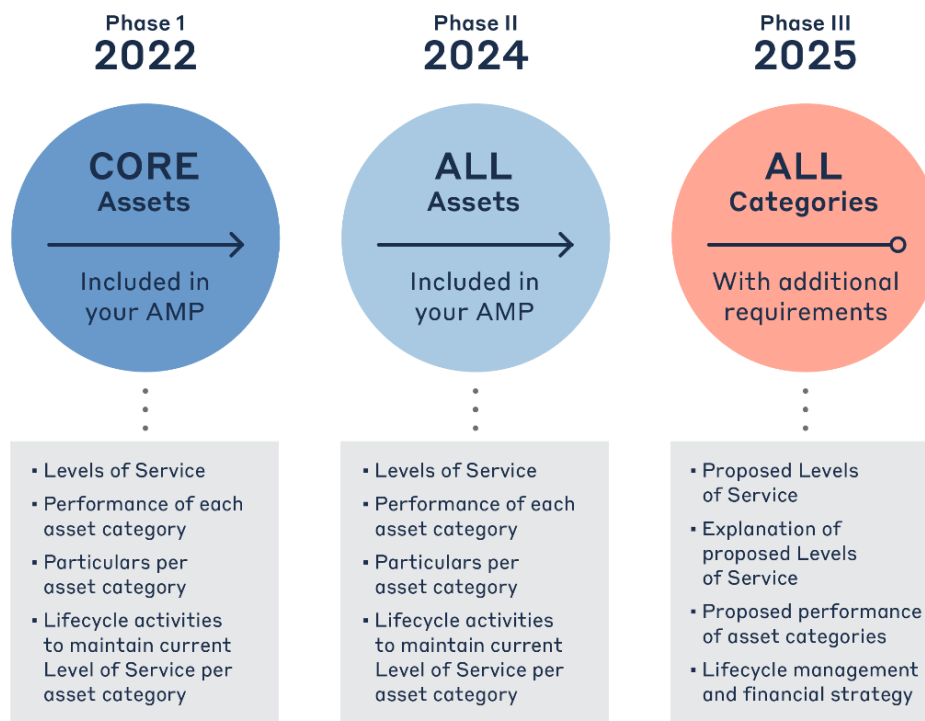


Figure 10 O. Reg. 588/17 Requirements and Reporting Deadlines

² O. Reg. 588/17: Asset Management Planning for Municipal Infrastructure <https://www.ontario.ca/laws/regulation/170588>

2.5.1 O. Reg. 588/17 Compliance Review

Table 5 below outlines key reporting requirements under O. Reg 588/17 and the associated timelines.

Table 5 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)	Appendix A.1 – Appendix I.1	Complete
Replacement cost of assets in each category	S.5(2), 3(ii)	Appendix A.1 – Appendix I.1	Complete
Average age of assets in each category	S.5(2), 3(iii)	Appendix A.3 – Appendix I.3	Complete
Condition of core assets & non-core assets in each category	S.5(2), 3(iv)	Appendix A.2 – Appendix I.2	Complete
Description of municipality’s approach to assessing the condition of assets in each category	S.5(2), 3(v)	Appendix A.4 – Appendix I.4	Complete
Current levels of service in each category	S.5(2), 1(i-ii)	Appendix A.7 – Appendix I.7	Complete
Lifecycle activities needed to maintain current levels of service for 10 years	S.5(2), 4	Appendix A.4 – Appendix I.4	Complete
Costs of providing lifecycle activities for 10 years	S.5(2), 4	Appendix A.5 – Appendix I.5	Complete
Growth considerations	S.6(1), 5	Section 4	Complete

3. Portfolio Overview – 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.

3.1 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

3.2 Portfolio Overview

3.2.1 Total Replacement Cost of Asset Portfolio

The nine asset categories analyzed in this Asset Management Plan have a total current replacement cost of \$33.5 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. Figure 12 illustrates the replacement cost of each asset category; at 27% of the total portfolio, facilities form the largest share of the Township's asset portfolio, followed by water network at 17%.

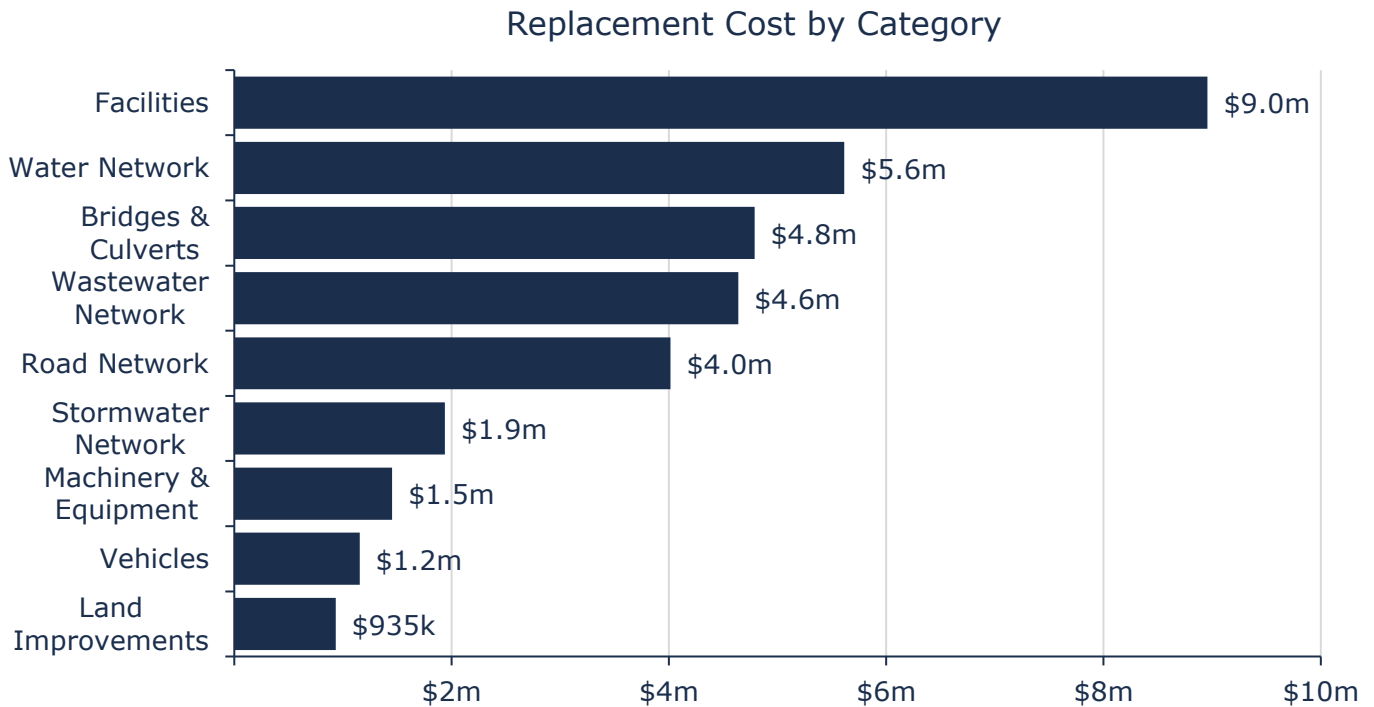


Figure 12 Current Replacement Cost by Asset Category

3.2.2 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, the Township requires an annual capital investment of \$1.22 million, for a target portfolio reinvestment rate of 3.66%. Currently, annual investment from sustainable revenue source is \$245 thousand, for a current portfolio reinvestment rate of 0.73%. Target and current re-investment rates by asset category are detailed below.

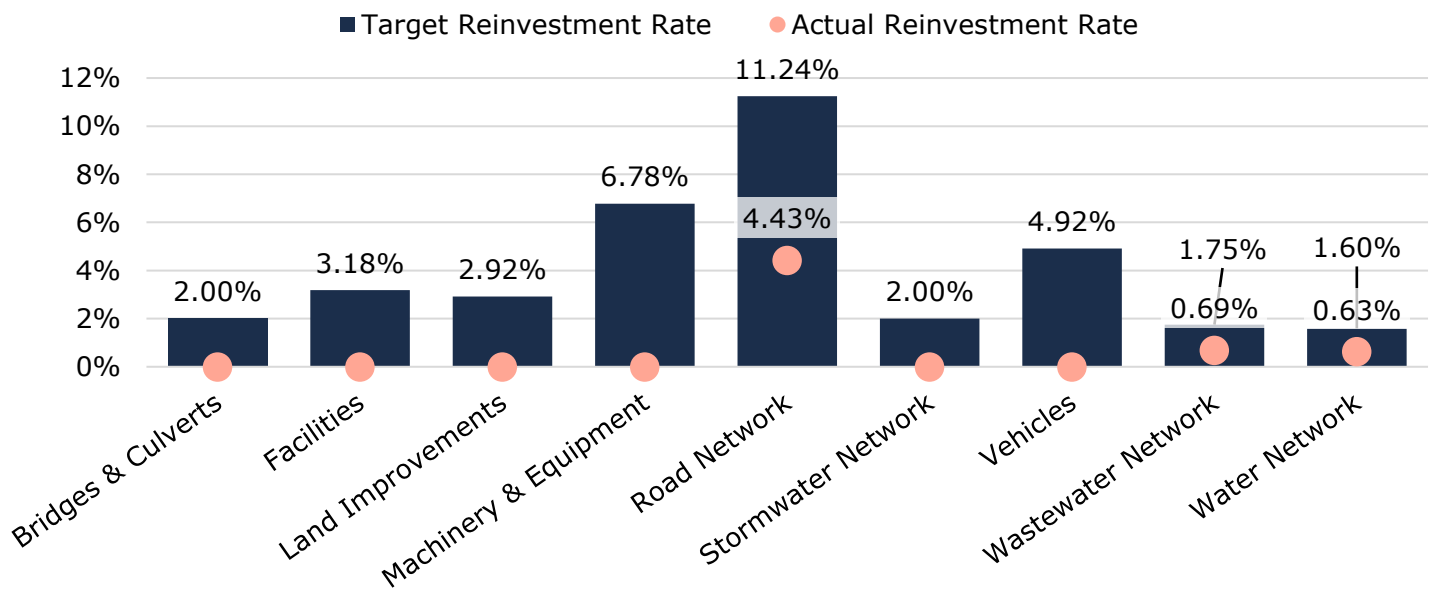


Figure 13 Current Vs. Target Reinvestment Rate

3.2.3 Condition of Asset Portfolio

Figure 14 and Figure 15 summarize asset condition at the portfolio and category levels, respectively. Based on both assessed condition and age-based analysis, 74% of the Township’s infrastructure portfolio is in fair or better condition, with the remaining 26% 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.

Condition data was available for majority of the asset categories except for water network, stormwater network, and machinery & equipment. Further, when assessed condition data was available, it was projected to current year-end (2022). This ‘projected condition’ can generate lower condition ratings than those established at the time of the condition assessment. The rate of this deterioration will also depend on lifecycle curves used to project condition over time.

Age-based condition estimations can skew data and lead to potential under- or overstatement of asset needs.

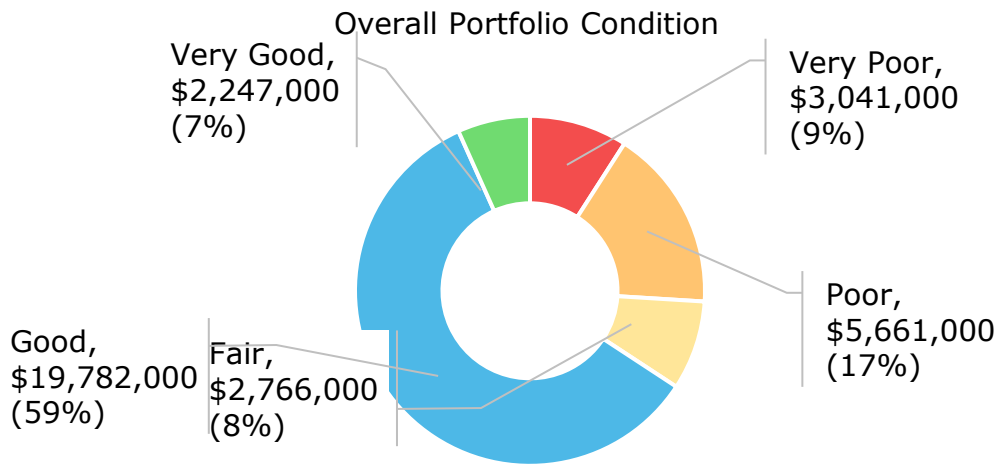
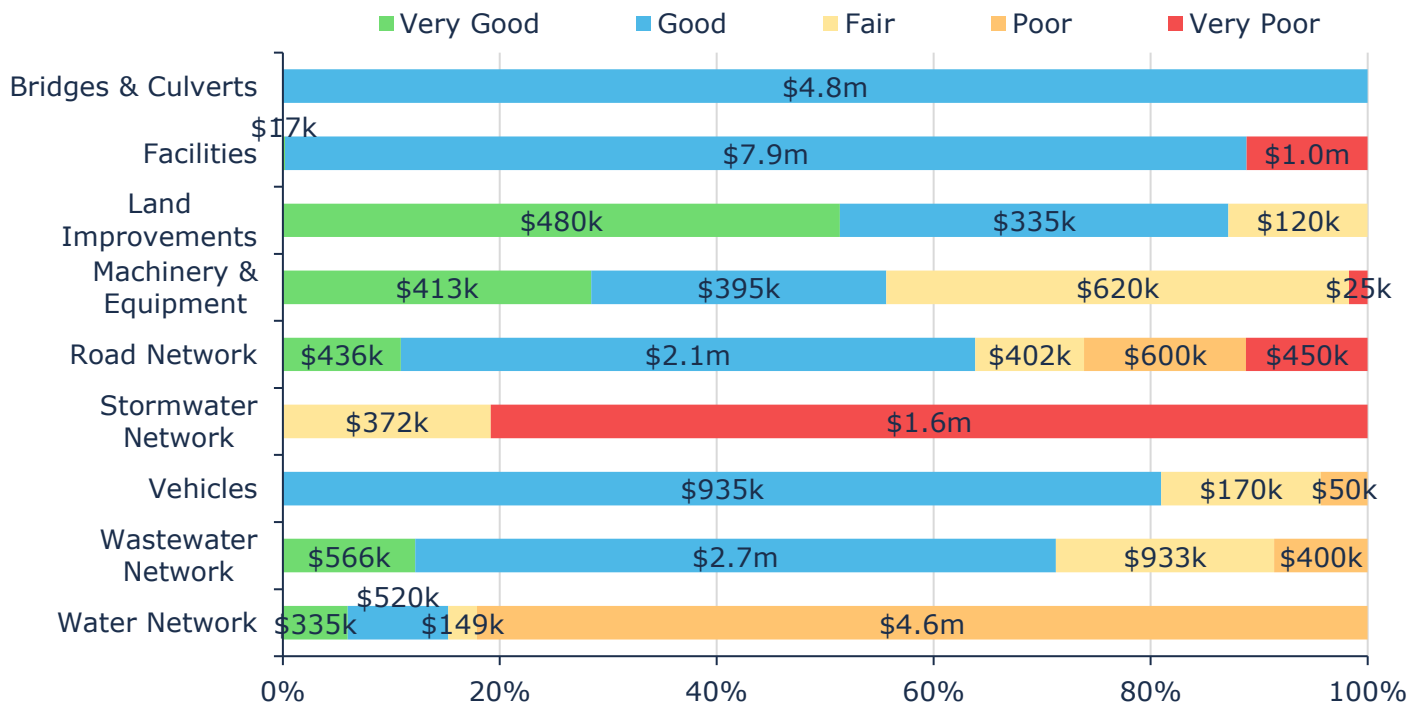


Figure 14 Asset Condition: Portfolio Overview

As further illustrated in Figure 15 most categories, including road network, and bridges & culverts are in fair or better conditions. However, majority of water network & stormwater network portfolio is in poor and very poor condition. See Table 6 for details on how condition data was derived for each asset segment.



Value and Percentage of Asset Segments by Replacement Cost

Figure 15 Asset Condition by Asset Category

As outlined previously, buildings and facilities are not componentized into their individual major elements and components. This limits the validity of current condition estimates as they are presented only at the 'parent' asset level, such as 'Arena', or 'Public Library'.

Source of Condition Data

This AMP relies on assessed condition for 88% of assets, based on and weighted by replacement cost. For the remaining assets, age is used as an approximation of condition. 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	100%	2022 staff assessments
	Paved Roads - LCB	100%	
	Streetlights	0%	Age-based
Bridges & Culverts	Bridges Structural Culverts	100%	2025 OSIM Report
Water Network	All	0%	Age-based
Wastewater Network	All	100%	2022 staff assessments
Stormwater Network	All	0%	Age-based
Facilities	All	100%	2022 staff assessments
Land Improvements	All	100%	2022 staff assessments
Vehicles	All	100%	2022 staff assessments
Machinery & Equipment	All	100%	2022 staff assessments

Table 6 Source of Condition Data

3.2.4 Portfolio Risk

Quantitative Risk

Using the risk equation and preliminary risk models, Figure 16 shows how assets across the different asset categories are stratified within a risk matrix.

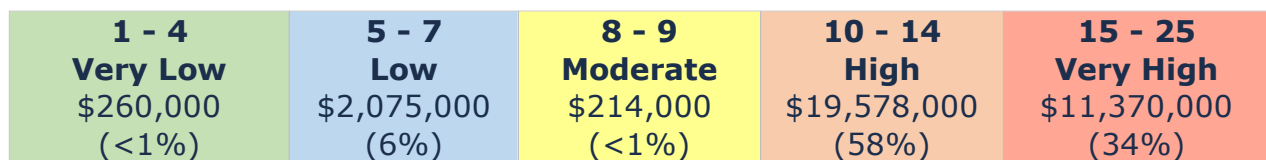


Figure 16 Risk Matrix: All Assets

The analysis shows that based on current risk models, approximately 20% of the Township's assets, with a current replacement cost of approximately \$11.3 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 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.

Qualitative Risk

- **Asset Data Confidence:** Confidence is limited by a lack of formal documentation and digital records across most asset classes. Much of the system knowledge is held internally by staff rather than in a formal database.
- **Lifecycle Management Strategies:** Current strategies are primarily reactive rather than proactive. Maintenance and replacements are often driven by immediate failure or the availability of grants rather than optimized lifecycle planning.
- **Organizational Capacity:** The township faces significant capacity risks with only three staff members to manage multiple infrastructure categories. The fire department is operating at 40% of its volunteer target, which has forced a downgrade in service levels.
- **Infrastructure Design and Installation:** Past design choices create ongoing risks, such as the use of "homemade" catch basins and materials in the water plant that degrade when exposed to treatment chemicals. Relining is considered unfeasible for several networks due to shallow burial depths.
- **Aging Infrastructure:** A significant portion of the portfolio is deteriorating, including water lines that have restricted flow due to buildup and buildings from the 1960s reaching the end of their utility.
- **Climate Change and Extreme Weather Events:** Aggressive weather, including heavy rains and flooding, is accelerating the destruction of assets. Culverts designed to last 40 years are failing in as little as 10 years due to environmental pressures.
- **Growth:** Community growth from regional mining activity is putting higher-than-anticipated wear on roads. Current municipal buildings lack the square footage and workable space required to support the increasing population.
- **Infrastructure Reinvestment:** Investment levels are insufficient to maintain a good state of repair, leading to a reliance on "borrowing from Peter to pay Paul" to fund projects. Major capital works are almost entirely dependent on successfully securing grants.

- **Other Risks (Legislative and Public Expectations):** The township struggles to meet legislative standards for fire response and accessibility due to staffing and design hurdles. Public expectations for services like snow removal and recreation quality often exceed the Township's financial and operational reach.

3.2.5 Forecasted Capital Requirements

Aging assets require maintenance, rehabilitation, and replacement. Figure 17 below illustrates the cyclical short-, medium- and long-term infrastructure replacement requirements for all asset categories analyzed in this AMP over a 70-year time horizon. On average, \$1.22 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 \$2.6 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.

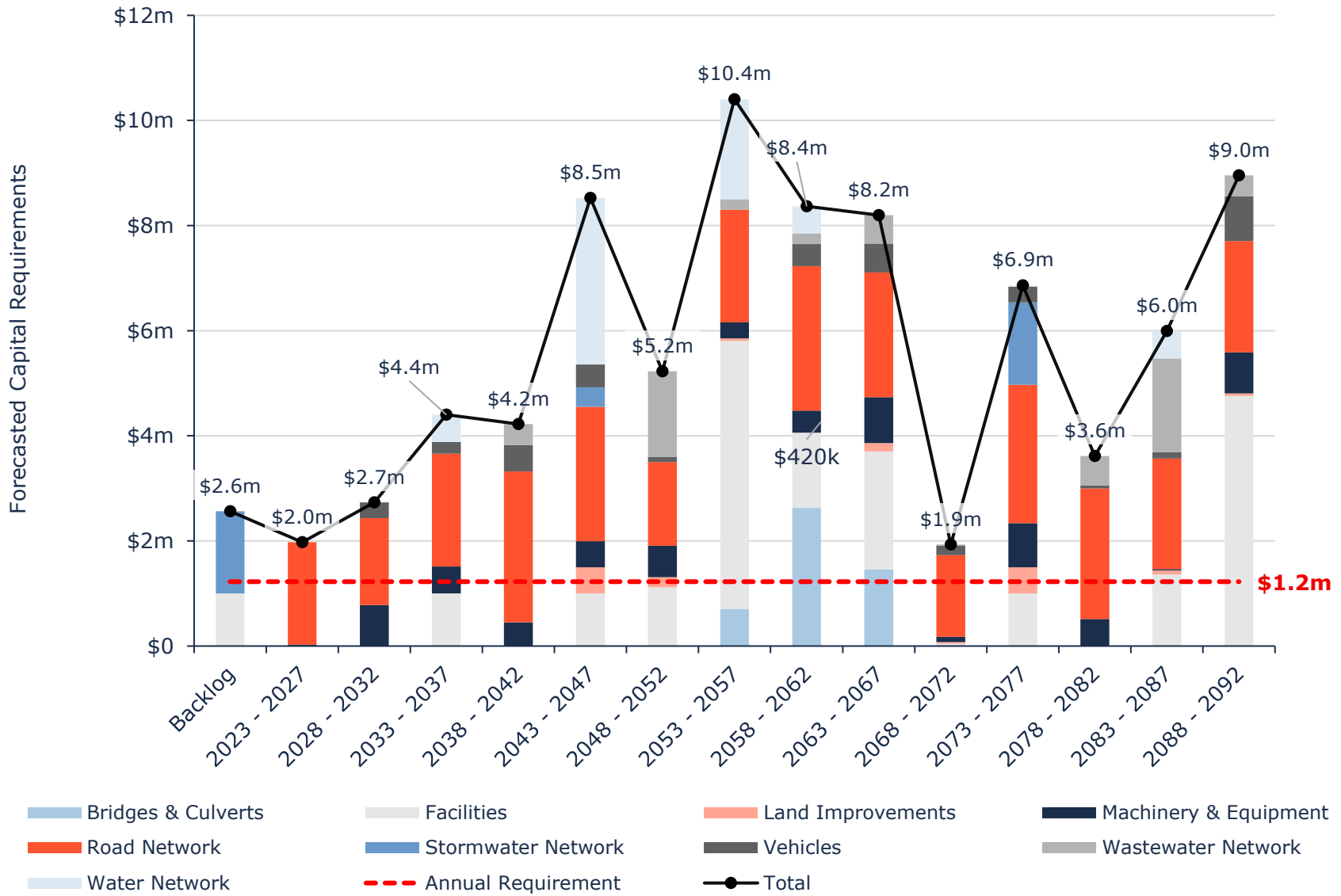


Figure 17 Capital Replacement Needs: Portfolio Overview 2025-2092

Strategies

4. 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.

4.1 Growth Assumptions

4.1.1 Emo Official Plan (2013)

The Township of Emo adopted an Official Plan in 2013 which outlines a vision, guiding principles, objectives, and policies for overseeing physical growth and addressing the impacts of changes on the social, cultural, economic, and natural environments over a 20-year planning period, up to the year 2031.

The goals of the Official Plan aim to improve the quality of life and ensure the safety and welfare of residents. The plan also focuses on rational resource use and protecting natural and cultural heritage, alongside expanding and diversifying the local economy. Additionally, it aims to promote environmentally sustainable development and keep residents informed about land development policies. Finally, it provides a framework for implementing by-laws and guides local authority decisions, ensuring policies are consistent with the Provincial Policy Statement and reflect local conditions.

The Township of Emo designates the Village of Emo as its primary settlement area, focusing on growth and development within this region. The village, equipped with municipal water and sewage services, accommodates a mix of residential, commercial, institutional, industrial, and recreational activities. It hosts essential commercial facilities like a bank and a grocery store and serves as a key service center for the Township and neighboring areas. Emo is projected to be a hub for new residential projects, particularly those with these services within the planning horizon.

Development efforts in the Village of Emo will focus on revitalizing the area, with boundary adjustments considered only during detailed plan reviews. Expansion outside the village is possible if environmentally suitable and approved by the council. The plan encourages institutional developments within the village, with allowances for external locations if needed.

Emphasizing infill and densification, the aim is to direct 80% of new residential projects to the village to support compact growth and affordable housing. Job increases from the Rainy River Resources Mine are expected to necessitate 186 new homes over 20 years, with the bulk of this development planned as lower-density housing within the Village of Emo Settlement Area, which has been earmarked for such expansion.

The following tables outline the recorded population and private dwellings for Emo, based on 2021 Census data. The table indicates recent changes in both population and the number of private dwellings, implying that the Township's growth may not be meeting the Official Plan's initial projections.

Table 7: Historical Population Forecast: Township of Emo

Historical Figures	1996	2001	2006	2011	2016	2021
Population	1,366	1,331	1,305	1,252	1,333	1,204
Population Change	N/A	-2.6%	-2.0%	-4.1	6.5%	-9.7%
Private Dwellings	N/A	537	543	483	554	521

4.1.2 Regional Growth

In 2021 the Come North Conference Report was produced by FedNor and Government of Canada. The document describes short, medium, and long-term objectives for all communities in Northern Ontario as it relates to population growth.

According to the report all 11 Census Districts in Northern Ontario (Nipissing, Parry Sound, Manitoulin, Sudbury, Greater Sudbury, Timiskaming, Cochrane, Algoma, Thunder Bay, Rainy River, Kenora) are currently experiencing the following trends: population decline, population aging, or labor shortages. The report highlights a risk of these communities becoming economically unsustainable unless population retention and attraction numbers improve. The risk is the result of the dependency ratio increasing. The dependency ratio is the ratio of people unable to support themselves without assistance; people between the ages of 0 and 14 and 64 and older.

The goal is to achieve a dependency ratio of 0.5. In 1996, every Census District was at or near the goal but by 2016, none were below and more than half had a ratio in excess of 0.6. The following graph displays the dependency ratio for each Census District in 1996 and 2016 along with a projected ratio for the year 2036.

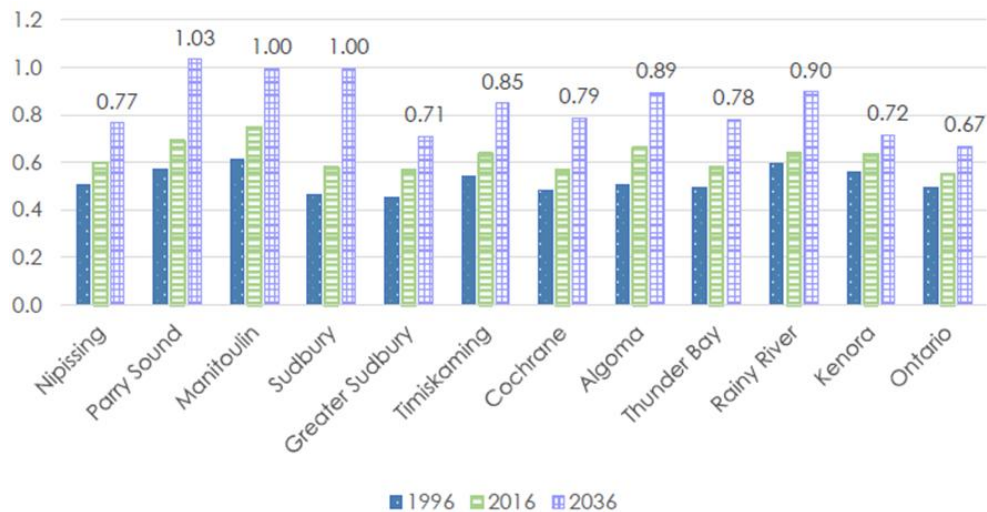


Figure 18: Comparison of Dependency Ratios

The Township of Emo is found in the Rainy River district, which is expected to reach a dependency ratio of 0.90.

The population trends overall in Northwestern Ontario are in decline. The following graph from the 2019 Rainy River district report by the Northern Policy Institute, displays the population trends from 1991 to 2016.

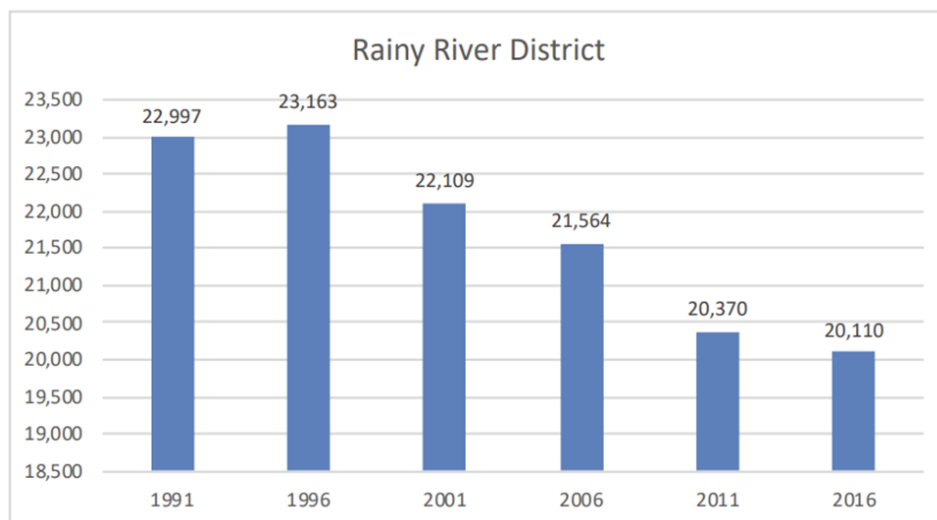


Figure 19: Rainy River District – Population Trends

The following table, found in the same report, shows population projections in Northwestern Ontario for the years 2021 to 2041.

Table 8: Northwestern Ontario Population Projections: 2021 to 2041

Year	Ages 0-19	Ages 20-64	Ages 65+	Total
2021	4,504	10,789	4,440	19,733
2026	4,272	9,769	5,090	19,131
2031	4,093	8,966	5,487	18,546
2036	3,924	8,457	5,580	17,961
2041	3,757	8,081	5,542	17,380

The most recent census data from 2021, shows a slight decrease in the population, reaching a total of 19,437, but is below the projected population from the study. A significant portion of population decrease is within the 20-to-64-year age group, while there is an increase in population for the age of 65 years and over; thus further increasing the dependency ratio.

4.2 Impact of Growth on Lifecycle Activities

By July 1, 2025, the Township’s asset management plan must include a discussion of how the assumptions regarding future changes in population and economic activity informed the preparation of the lifecycle management and financial strategy.

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.

5. 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 Emo 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:
 - Existing assets
 - Existing service levels
 - Requirements of contemplated changes in service levels (none identified for this plan)
 - Requirements of anticipated growth (none identified for this plan)
2. Use of traditional sources of municipal funds:
 - Tax levies
 - User fees
 - Debt
 - Development charges
3. Use of non-traditional sources of municipal funds:
 - Reallocated budgets
 - Partnerships
 - Procurement methods
4. Use of Senior Government Funds:
 - Canada Community-Building Fund (CCBF)
 - 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:
 - If a zero-debt policy is in place, is it warranted? If not the use of debt should be considered.

- Do user fees reflect the cost of the applicable service? If not, increased user fees should be considered.

5.1 Annual Requirements & Capital Funding

5.1.1 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 \$1.22 million annually to address capital requirements for the assets included in this AMP.

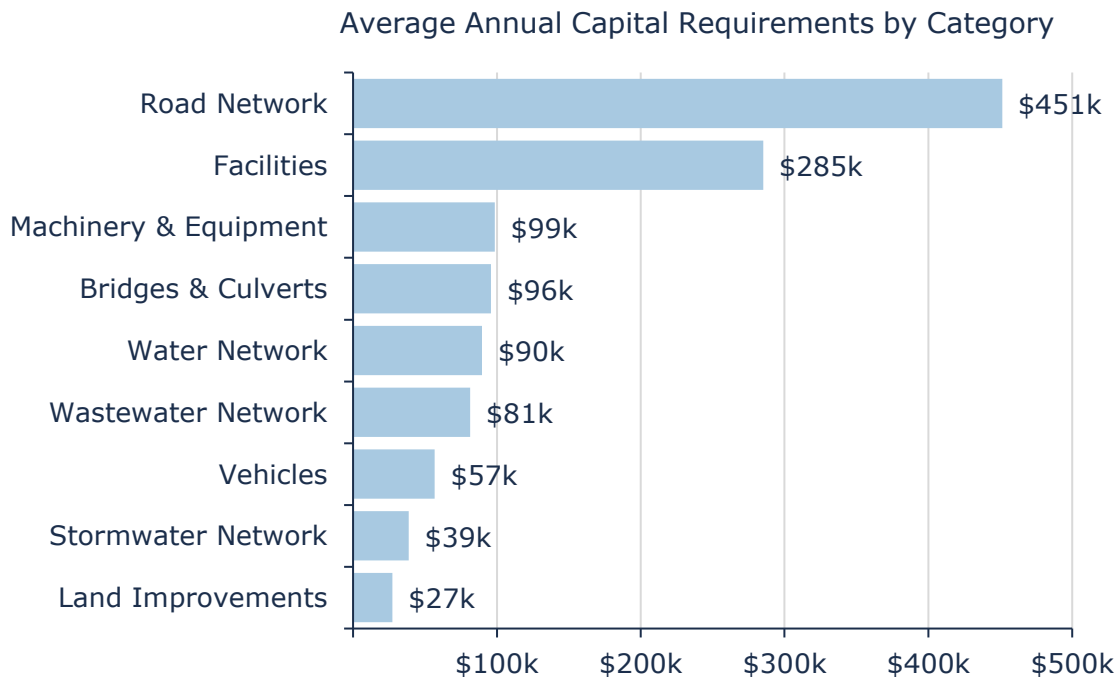


Figure 20 Annual Capital Funding Requirements by Asset Category

For all 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. This is based on the assumption that assets deteriorate and – without regularly scheduled maintenance and rehabilitation – are replaced at the end of their service life.

The table below presents the system-generated average annual capital requirements for existing assets across each asset category. These figures are based on a total replacement value of \$33.5 million, resulting in an estimated annual capital need of approximately \$1.22 million for all analyzed assets.

Table 9 Lifecycle Strategies Annual Savings

Asset Category	Replacement Cost	Annual Capital Requirements	Target Reinvestment Rate
Bridges & Culverts	\$4,789,029	\$95,781	2.00%
Facilities	\$8,957,600	\$285,184	3.18%
Land Improvements	\$935,000	\$27,310	2.92%
Machinery & Equipment	\$1,453,000	\$98,519	6.78%
Road Network	\$4,015,000	\$451,337	11.24%
Stormwater Network	\$1,938,150	\$38,763	2.00%
Vehicles	\$1,155,000	\$56,791	4.92%
Wastewater Network	\$4,638,184	\$81,397	1.75%
Water Network	\$5,615,018	\$89,605	1.60%
Total	\$33,495,981	\$1,224,686	3.66%

5.1.2 Annual Funding Available

Based on a historical analysis of sustainable capital funding sources, the Township is committing approximately \$245 thousand towards capital projects per year. Given the annual capital requirement of \$1.22 million, there is currently a funding gap of \$980 thousand annually.

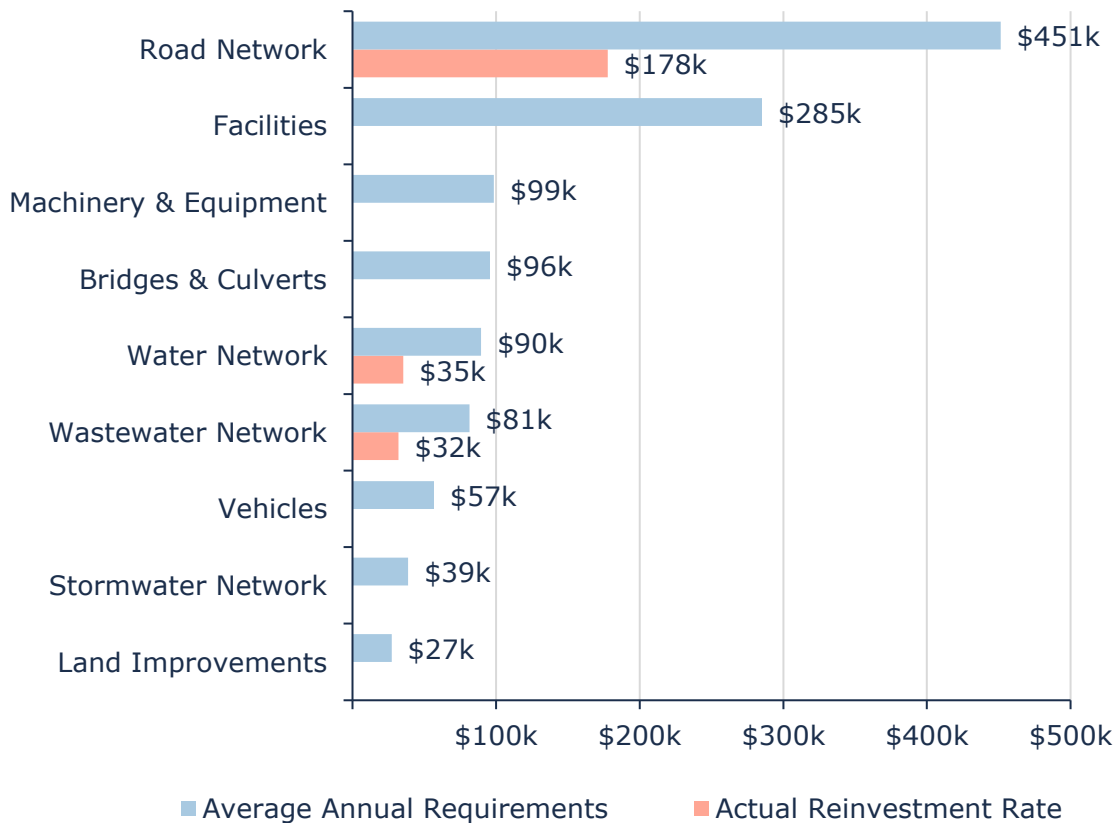


Figure 21 Annual Requirements vs. Capital Funding Available

5.2 Funding Objective

We have developed a scenario that would enable Township of Emo to achieve full funding within 1 to 20 for the following assets:

1. **Tax Funded Assets:** Road Network, Storm Network, Bridges & Culverts, Facilities, Machinery & Equipment, Land Improvements, Vehicles
2. **Rate-Funded Assets:** Water Network, Wastewater Network

Note: For the purposes of this AMP, we have excluded gravel roads 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.

5.3 Financial Profile: Tax Funded Assets

5.3.1 Current Funding Position

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

Table 10 Annual Available Funding for Tax Funded Assets

Asset Category	Avg. Annual Requirement	Annual Funding Available			Annual Deficit
		CCBF	OCIF	Total Available	
Bridges & Culverts	\$95,781				\$95,781
Facilities	\$285,184				\$285,184
Land Improvements	\$27,310				\$27,310
Machinery & Equipment	\$98,159				\$98,519
Road Network	\$451,337	\$113,778	\$63,986	\$177,764	\$273,573
Stormwater Network	\$38,763				\$38,763
Vehicles	\$56,791				\$56,791
Total	\$1,053,684	\$113,778	\$63,986	\$177,764	\$875,920

The average annual investment requirement for the above categories is \$1.05 million. Annual revenue currently allocated to these assets for capital purposes is \$178 thousand leaving an annual deficit of \$875 thousand. Put differently, these infrastructure categories are currently funded at 16.9% of their long-term requirements.

5.3.2 Full Funding Requirements

In 2023, the Township of Emo had budgeted annual tax revenues of approximately \$2.02 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:

Table 11 Tax Increase Requirements for Full Funding

Asset Category	Tax Change Required for Full Funding
Bridges & Culverts	4.7%
Facilities	14.1%
Land Improvements	1.4%
Machinery & Equipment	4.9%
Road Network	13.5%
Stormwater Network	1.9%
Vehicles	2.8%
Total	40.6%

The following changes in costs and/or revenues over the next number of years should also be considered in the financial strategy:

- Emo’s debt payments for these asset categories will be decreasing by \$125,000 over the next 5 to 10 years.

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:

Table 12 Tax Increase Options 5-20 Years

	Without Capturing Changes				With Capturing Changes			
	5 Years	10 Years	15 Years	20 Years	5 Years	10 Years	15 Years	20 Years
Infrastructure Deficit	875,920	875,920	875,920	875,920	875,920	875,920	875,920	875,920
Change in Debt Costs	N/A	N/A	N/A	N/A	N/A	-150,000	-150,000	-150,000
Resulting Infrastructure Deficit:	875,920	875,920	875,920	875,920	875,920	725,920	725,920	725,920
Tax Increase Required	43.4%	43.4%	43.4%	43.4%	43.4%	35.9%	35.9%	35.9%
Annually:	7.5%	3.7%	2.5%	1.9%	7.5%	3.2%	2.1%	1.6%

5.3.3 Financial Strategy Recommendations

Considering all the above information, we recommend the 15-year option. This involves full funding being achieved over 15 years by:

- When realized, reallocating the debt cost reductions of \$150,000 to the infrastructure deficit as outlined above.
- Increasing tax revenues by 2.1% each year for the next 15 years solely for the purpose of phasing in full funding to the asset categories covered in this section of the AMP.
- Allocating the current Canada Community-Building Fund (Formerly known as Gas Tax Fund) and OCIF revenue as outlined previously.
- Increasing existing and future infrastructure budgets by the applicable inflation index on an annual basis in addition to the deficit phase-in.

Notes:

- Any increase in property tax rates required for future operations would be in addition to the above recommendations.
- 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 commitment³.

Although this option achieves full funding on an annual basis and provides financial sustainability over the next 15 years, the recommendations do require prioritizing capital projects to fit the resulting annual funding available.

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.

5.4 Financial Profile: Rate Funded Assets

5.4.1 Current Funding Position

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

³ 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.

Table 13 Annual Available Funding for Rate Funded Assets

Asset Category	Avg. Annual Requirement	Annual Funding Available			Annual Deficit
		CCBF	OCIF	Total Available	
Water Network	\$89,605	\$22,589	\$12,703	\$35,292	\$54,313
Wastewater Network	\$81,397	\$20,519	\$11,540	\$32,059	\$49,338
Total	\$171,002	\$43,108	\$24,243	\$67,351	\$103,651

The average annual investment requirement for the above categories is \$171,002. Annual revenue currently allocated to these assets for capital purposes is \$67,351, leaving an annual deficit of \$103,651. Put differently, these infrastructure categories are currently funded at 39.4% of their long-term requirements.

5.4.2 Full Funding Requirements

In 2023, Emo had annual water revenues of \$381 thousand and annual wastewater revenues of \$146 thousand. As illustrated in the table below, without consideration of any other sources of revenue, full funding would require the following changes over time:

Table 14 Rate Increase Requirements for Full Funding

Asset Category	Rate Change Required for Full Funding
Water Network	14.3%
Wastewater Network	33.9%

In the following tables, we have expanded the above scenario to present multiple options. Due to the significant increases required, we have provided phase-in options of up to 20 years:

Table 15 Phasing in annual rate increases: Water & Wastewater: 5-20 years

	Water Network				Wastewater Network			
	5 Years	10 Years	15 Years	20 Years	5 Years	10 Years	15 Years	20 Years
Infrastructure Deficit:	54,313	54,313	54,313	54,313	49,338	49,338	49,338	49,338
Rate Increase Required	14.3%	14.3%	14.3%	14.3%	33.9%	33.9%	33.9%	33.9%
Annually:	2.7%	1.3%	0.9%	0.7%	6.0%	3.0%	2.0%	1.5%

5.4.3 Financial Strategy Recommendations

Considering all of the above information, we recommend the 5-year option for the water network and the 10-year option for the wastewater network. This involves full funding being achieved over 5 and 10 years, respectively, by:

- increasing rate revenues by 2.7% for water services each year for the next 5 years and 3.0% for sanitary services 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.
- increasing existing and future infrastructure budgets by the applicable inflation index on an annual basis in addition to the deficit phase-in.

Notes:

- 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.
- 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.
- Any increase in rates required for operations would be in addition to the above recommendations.

Although this option achieves full funding on an annual basis in 5 years for the water network and 10 years for the wastewater network and provides financial sustainability over the period modeled, the recommendations do require prioritizing capital projects to fit the resulting annual funding available.

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.

5.5 Use of Debt

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

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

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

5.6 Use of Reserves

5.6.1 Available Reserves

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

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

By asset category, the table below outlines the details of the reserves currently available to Emo.

Table 16 Emo Reserve Balances

Asset Category	Balance at December 31, 2023
Facilities & Buildings	\$926,658
Land Improvements	\$317,074
Machinery & Equipment	\$563,425
Other	\$218,580
Total Rate Funded:	\$2,025,737

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 consider when determining their capital reserve requirements include:

- breadth of services provided
- age and condition of infrastructure
- use and level of debt
- economic conditions and outlook
- 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 Emo'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.

6. Limitations and Recommendations

6.1 Limitations

The development of this asset management plan required substantial effort by staff and was developed based on best-available data and provided by the Township, and is subject to the following broad limitations, constraints, and assumptions:

- The analysis is highly sensitive to several critical data fields, including an asset's estimated useful life, replacement cost, quantity, and in-service date. Inaccuracies or imprecisions in any of these fields can have substantial and cascading impacts on all reporting and analytics.
- User-defined and unit cost estimates, based typically on staff judgment, recent projects, or established through completion of technical studies, offer the most precise approximations of current replacement costs. When this isn't possible, historical costs incurred at the time of asset acquisition or construction can be inflated to present day. This approach, while sometimes necessary, can produce inaccurate estimates.
- In the absence of condition assessment data, age was used to estimate asset condition ratings. This approach can result in an over or understatement of asset needs. As a result, financial requirements generated through this approach can differ from those produced with supporting in-field condition assessments that indicate actual performance.
- The risk models are designed to support objective project prioritization and selection. However, in addition to the inherent limitations that all models face, they also require availability of important attribute data to ensure that asset risk ratings are valid, and assets are properly stratified within the risk matrix. Missing attribute data can misclassify assets.

These limitations have a direct impact on the analysis presented in this Asset Management Plan, including condition summaries, age profiles, and both long-term and 10-year replacement and rehabilitation forecasts generated from the Township's asset management system. Where complete or current data is unavailable, assumptions are required, which introduces uncertainty into the timing and magnitude of forecasted capital needs.

These challenges are common and addressing them requires a long-term commitment supported by sustained resourcing. As the Township's asset management program evolves, continued financial investment will be required to support regular condition assessments, data collection, and system improvements. In parallel, dedicated staff time and capacity are needed to collect, validate, and maintain asset and financial data and to integrate this information into capital planning and forecasting processes.

Sustained investment in condition data practices and ongoing staff involvement over time are essential to keeping asset information current and relevant to continuously increasing confidence in the data that will form the foundation for decisions on infrastructure investments. With continued commitment and investment in financial, staff, and time resources, the Township's asset management program will continue to mature, resulting in improved accuracy, reliability, and defensibility of future Asset Management Plans and other core asset management documents.

6.2 Recommendations

6.2.1 Financial Strategies

- Review the feasibility of adopting a full-funding scenario to achieve 100% of average annual funding requirement for the asset categories analyzed. This includes:
 - Increasing taxes by 2.1% per year over a period of 15 years.
 - Increasing wastewater rates by 3.0% per year over a period of 10 years; and
 - Increasing water rates by 2.7% per year over a period of 5 years.
- Continued allocation of OCIF and CCBF funding as previously outlined.
- Reallocating appropriate revenue from categories in a surplus position to those in a deficit position.
- Increasing existing and future infrastructure budgets by the applicable inflation index on an annual basis in addition to the deficit phase-in.
- Continue to apply for project specific grant funding to supplement sustainable funding sources.
- In 2025, Ontario Regulation 588/17 will require Emo 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.

6.2.2 Asset Data

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

6.2.3 Risk & Levels of Service

- 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.

- 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.
- 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; economic conditions and the local tax base. This data can also be used to review service level targets.

Appendices

Appendix A - Road Network

The Township’s road network comprises of the 12% of the infrastructure portfolio, with a current replacement cost of more than \$4 million, distributed primarily between paved and unpaved roads. The Township also owns and manages other supporting infrastructure and capital assets, such as streetlights.

1. Inventory & Valuation

Table 17 and Figure 22 summarize the quantity and current replacement cost of the Township’s various road network assets as managed in its primary asset management register, Citywide.

Table 17 Detailed Asset Inventory: Road Network

Segment	Quantity	Unit of Measure	Replacement Cost	Primary RC Method
Gravel	103	Kilometers	Not Planned for Replacement	User-Defined
Paved Roads - HCB	8	Kilometers	\$2,040,000	User-Defined
Paved Roads - LCB	3	Kilometers	\$955,000	User-Defined
Streetlights	136	Assets	\$1,020,000	Cost per Unit
TOTAL			\$4,015,000	

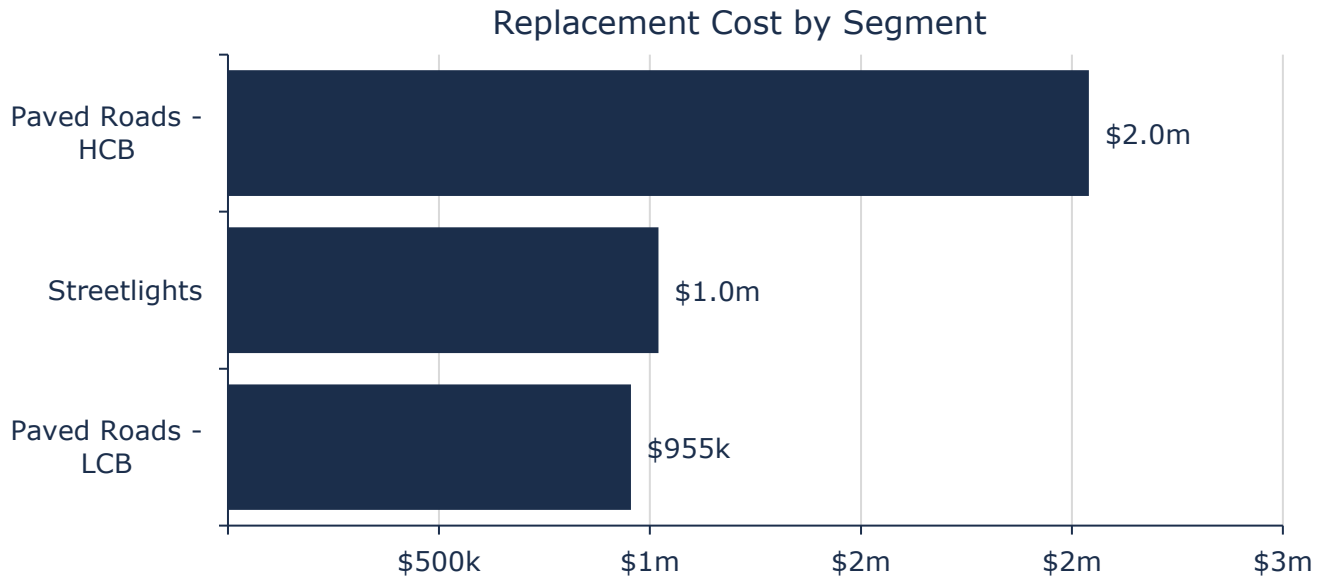


Figure 22 Portfolio Valuation: Road Network

2. Asset Condition

Figure 23 summarizes the replacement cost-weighted condition of the Township’s road network.

Based on a combination of field assessments, 74% of assets are in fair or better condition; the remaining 26% of assets are in poor to very poor condition. Condition assessments were available for 100% of paved roads. This condition data was projected from inspection date to current year to estimate their condition today. No condition data was available for streetlights.

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 23, the majority of the Township’s road network assets are in fair or better condition.

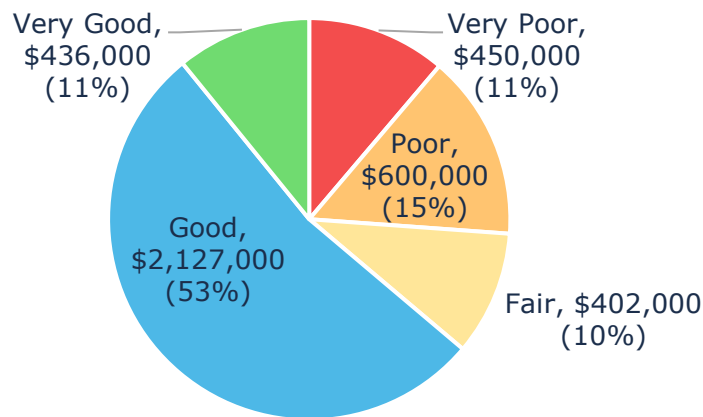


Figure 23 Asset Condition: Road Network Overall

As illustrated in Figure 24, based on condition assessments, the majority of the HCB roads, and streetlights are in fair or better condition; however, approximately 50% of LCB roads are in poor or worse condition.

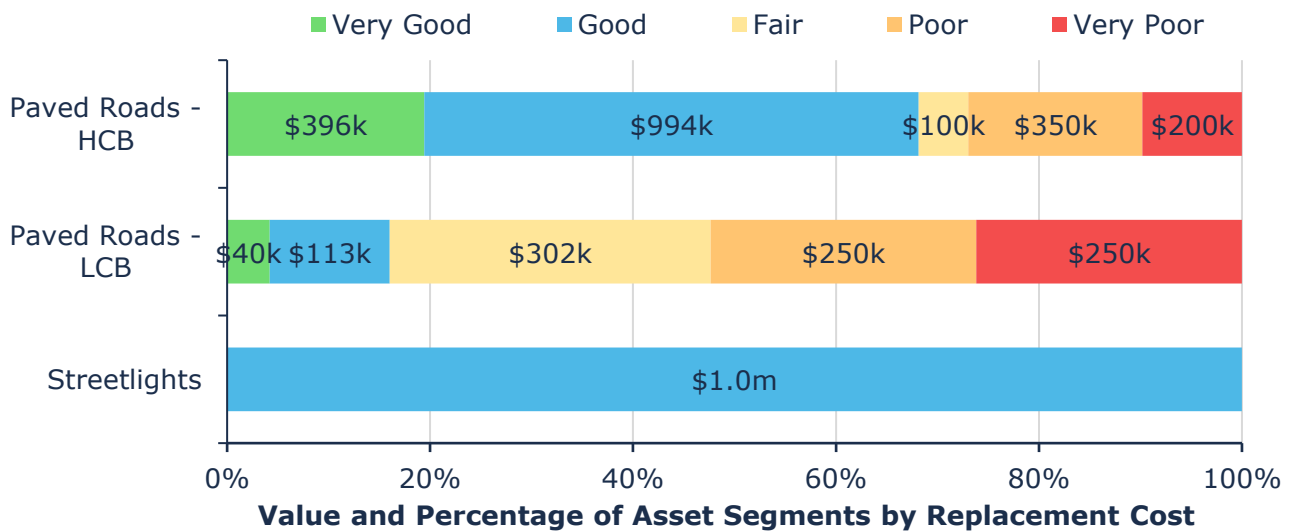


Figure 24 Asset Condition: Road Network by Segment

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 25 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.

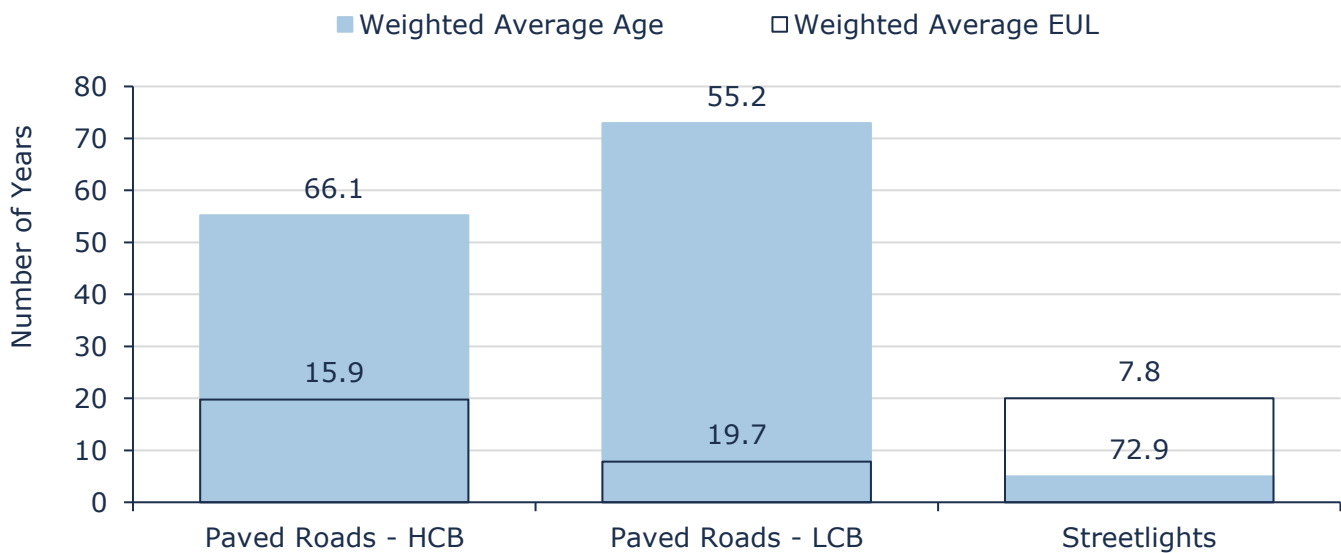


Figure 25 Estimated Useful Life vs. Asset Age: Road Network

Age analysis shows that the majority of paved roads have exceeded their expected useful life. Streetlights are in the early stages of their expected useful lives. Please note that Gravel roads can be maintained on a perpetual cycle through the operational maintenance budget with a regular roadway granular replacement program.

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.

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 asset’s characteristics, location, utilization, maintenance history and environment.

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

Table 18 Lifecycle Management Strategy: Road Network

Activity Type	Description of Current Strategy
Maintenance	<ul style="list-style-type: none"> • Maintenance is largely reactive. • Strategies include applying 10,000 yards of gravel every two years , applying calcium for dust control annually , and performing shouldering once a year in the spring. • Cold patching for potholes is done monthly as needed
Rehabilitation	<ul style="list-style-type: none"> • Crack sealing is done on an as-needed basis. It was done approximately twice in a 12-year span. • Surface-treated roads are patched as potholes occur.
Replacement	<ul style="list-style-type: none"> • Paving and road updates are generally only performed when underground water infrastructure projects are completed. • Due to funding issues, some surface-treated streets have been returned to gravel because they cheaper to maintain.
Inspection	<ul style="list-style-type: none"> • Drive-through inspections are conducted more than once a week. • There is no formal documentation for condition assessment; instead, issues are tracked internally as they are noticed. • Country roads are assessed by the grader operator to determine gravel and calcium needs.

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. This analysis was run until 2057 to capture at least one iteration of replacement for the longest-lived asset in Citywide Assets, the Township’s primary asset management system and asset register. The Township’s average annual requirements (red dotted line) total \$451 thousand 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, peaking at \$2.9 million between 2038-2042. 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.

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 J – 10-Year Capital Requirements.

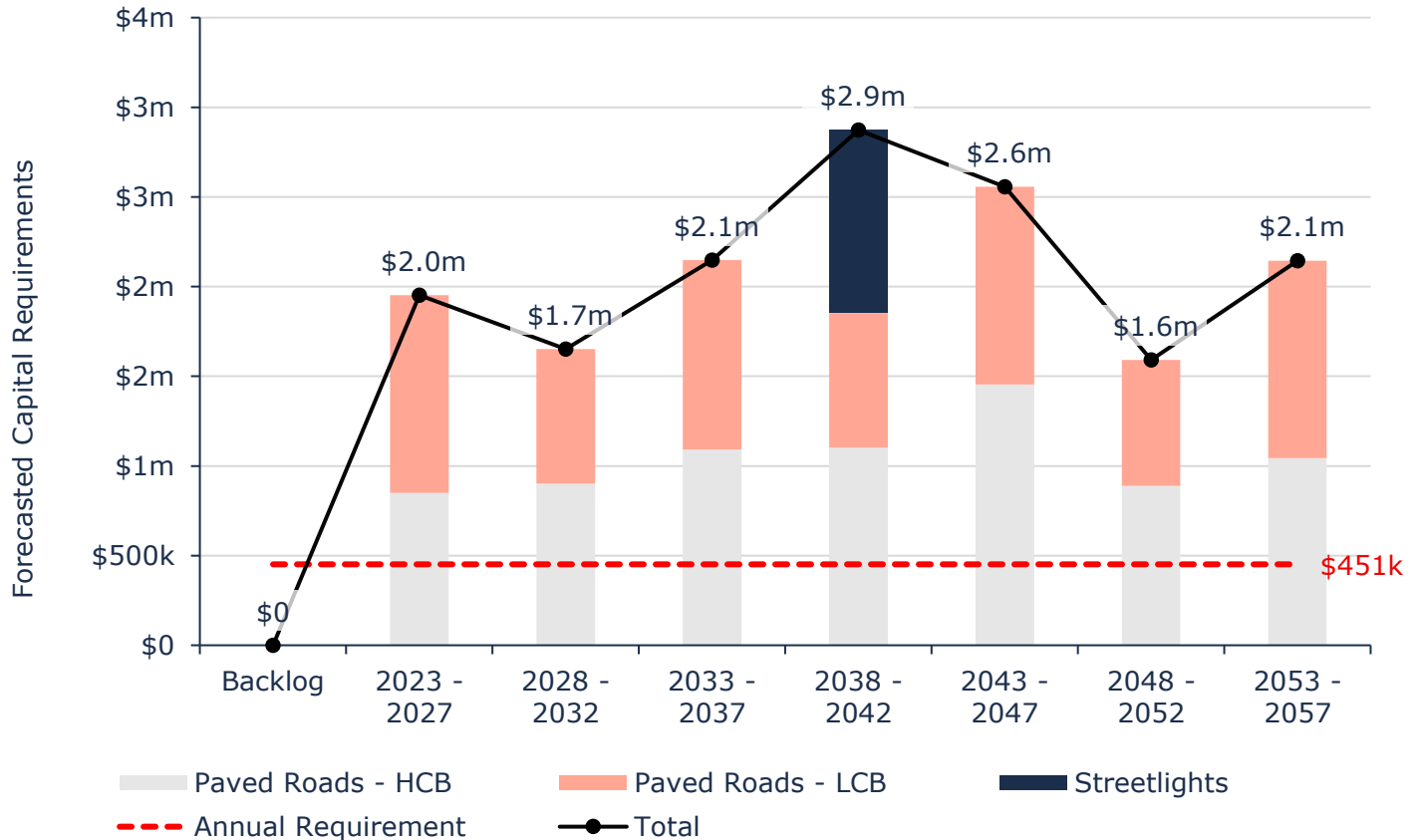


Figure 26 Forecasted Capital Replacement Needs: Road Network 2025-2057

6. Risk Analysis

The risk matrix below is generated using available asset data, including condition 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 Appendix L – Risk Rating Criteria **Error! Reference source not found.** for further details on approach used to determine asset risk ratings and classifications.

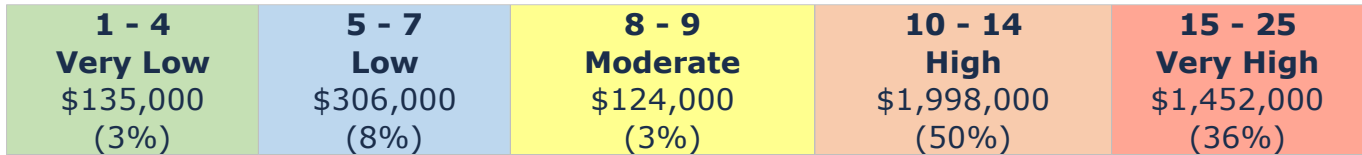


Figure 27 Risk Matrix: Road Network

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.

Community Levels of Service

Table 19 O. Reg. 588/17 Community Levels of Service: Road Network

Service Attribute	Qualitative Description	Current LOS (2022)
Scope	Description, which may include maps, of the road network in the municipality and its level of connectivity	An approximately 114 km road network spanning over 202.28 km ² of area. Surface material ranging from earth, sand, gravel, double surface treatment to hot mix asphalt. The system mostly consists of local roads with an MMS class of 5 or 6.
Quality	Description or images that illustrate the different levels of road class pavement condition	For asphalt roads, the following descriptive scale is used for assessing road surfaces: <ul style="list-style-type: none"> • Excellent: A very smooth ride. Pavement is in excellent condition with few cracks. • Good: A smooth ride with just a few bumps or depressions. The pavement is in good condition with frequent very slight or slight cracking. • Fair: A comfortable ride with intermittent bumps or depressions. The pavement is in fair condition with intermittent moderate and frequent slight cracking, and with intermittent slight or moderate alligating and distortion. • Poor: An uncomfortable ride with frequent to extensive bumps or depressions. Cannot maintain the posted speed at the lower end of the scale. The pavement is in poor to fair condition with frequent moderate cracking and distortion, and intermittent moderate alligating. • Very Poor: A very uncomfortable ride with constant jarring bumps and depressions. Cannot

Service Attribute	Qualitative Description	Current LOS (2022)
		<p>maintain the posted speed and must steer constantly to avoid bumps and depressions. The pavement is in very poor condition with moderate alligating and extensive severe cracking and distortion.</p> <p>For gravel roads, the following descriptive scale is used for assessing road surfaces:</p> <ul style="list-style-type: none"> • Good: Good drainage, minor potholes present on less than 20% of road surface, gravel thickness of 150mm or more, continue with routine maintenance. • Fair: Some drainage improvements needed, potholes present on 20-50% of road surface, additional gravel needed, routine maintenance required. • Poor: Major drainage improvements needed, potholes present on more than 50% of road surface, gravel resurfacing required.

Technical Levels of Service

Table 20 O. Reg. 588/17 Technical Levels of Service: Road Network

Service Attribute	Technical Metric	Current LOS (2022)
Scope	Lane-km of arterial roads (MMS classes 1 and 2) per land area (km/km ²)	N/A
	Lane-km of collector roads (MMS classes 3 and 4) per land area (km/km ²)	N/A
	Lane-km of local roads (MMS classes 5 and 6) per land area (km/km ²)	0.56 km/km ²
Quality	Average pavement condition index for paved roads in the Township	HCB: 60%
		LCB: 34%
	Average surface condition for unpaved roads in the Township (e.g. excellent, good, fair, poor)	Good
Performance	Capital reinvestment rate	4.43%

Appendix B - Bridges & Culverts

The Township's transportation network also includes a bridge and structural culverts, with a current replacement cost of \$4.78 million.

1. Inventory & Valuation

Table 21 and Figure 28 summarize the quantity and current replacement cost of bridges and culverts. The Township owns and manages one bridge and twelve structural culverts.

Table 21 Detailed Asset Inventory: Bridges & Culverts

Segment	Quantity	Unit of Measure	Replacement Cost	Primary RC Method
Bridges	1	Assets	\$188,160	User-Defined
Culverts	12	Assets	\$4,600,869	User-Defined
TOTAL			\$4,789,029	

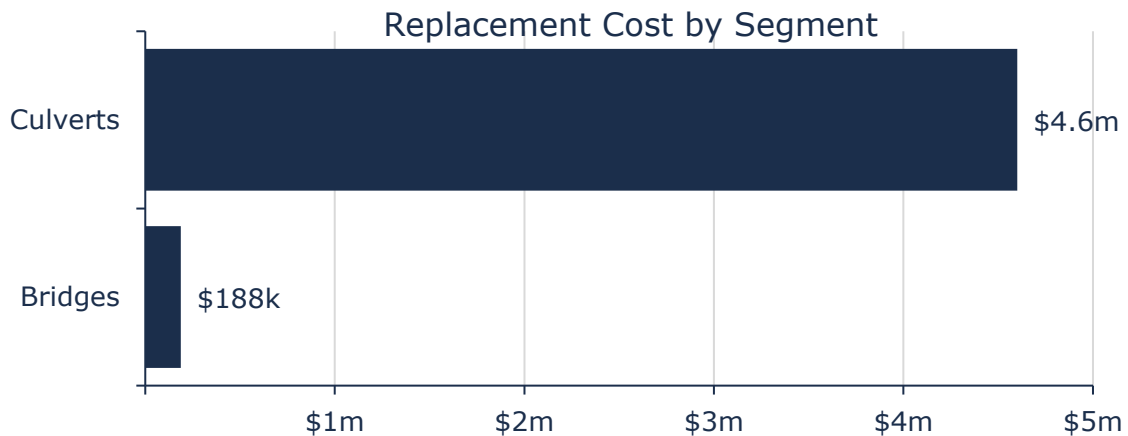


Figure 28 Portfolio Valuation: Bridges & Culverts

2. Asset Condition

Figure 29 and Figure 30 summarize the replacement cost-weighted condition of the Township's bridges and culverts. Based on the Township's recent Ontario Structures Inspection Manual (OSIM) assessments, all of bridges and culverts are in good. 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.

The OSIM ratings are designed to identify repairs needed to elevate condition ratings to a fair or higher.

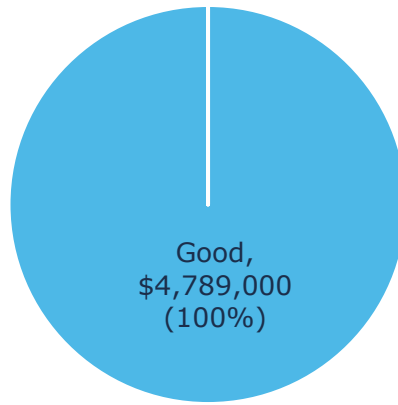
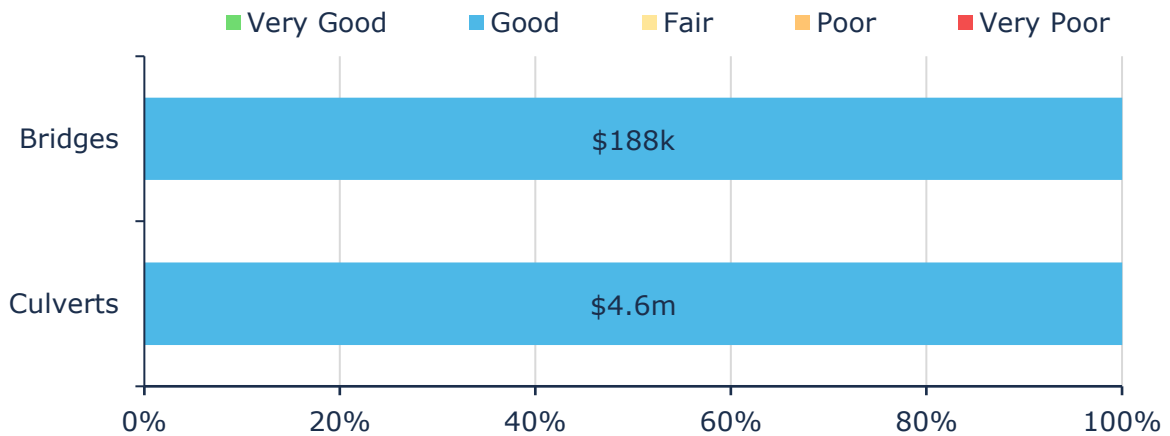


Figure 29 Asset Condition: Bridges & Culverts Overall



Value and Percentage of Asset Segments by Replacement Cost

Figure 30 Asset Condition: Bridges & Culverts by Segment

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 31 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.

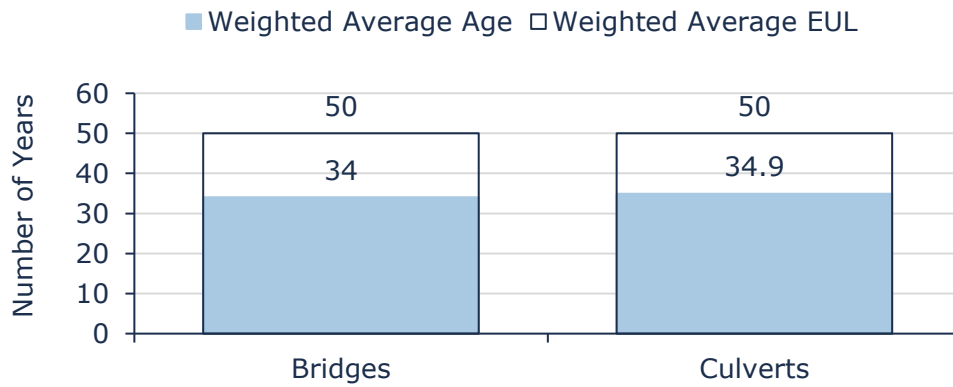


Figure 31 Estimated Useful Life vs. Asset Age: Bridges & Culverts

Age analysis reveals that both bridges and culverts are well within their estimated useful lives. OSIM assessments should continue to be used in conjunction with age and asset criticality to prioritize capital and maintenance expenditures.

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.

Table 22 Lifecycle Management Strategy: Bridges & Culverts

Activity Type	Description of Current Strategy
Maintenance	<ul style="list-style-type: none"> The township attempts to follow OSIM recommendations where the budget allows. However, current maintenance is described as reactive rather than proactive due to budget constraints.
Rehabilitation / Replacement	<ul style="list-style-type: none"> Biennial OSIM inspection reports include a Capital Needs List identifying recommended rehabilitation and replacement activities with estimated costs. Strategies for rehabilitation are currently limited by a lack of dedicated funding in the budget. Major replacements are highly dependent on successfully securing grants.
Inspection	The most recent Bridge and Culvert inspection reports were prepared in 2025 by Structura Engineering Inc.

5. Forecasted Long-Term Replacement Needs

Figure 32 illustrates the cyclical short-, medium- and long-term infrastructure rehabilitation and replacement requirements for the Township’s bridges and culverts. This analysis was run until 2067 to capture at least one iteration of replacement for the longest-lived asset in Citywide Assets, the Township’s primary asset management system and asset register. The Township’s average annual requirements (red dotted line) for bridges and culverts total \$96 thousand. 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.

Although no major replacement spikes are anticipated for the next 25 years, capital needs will peak at \$2.6 million between 2058 and 2062 as assets reach the end of their useful life. 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.

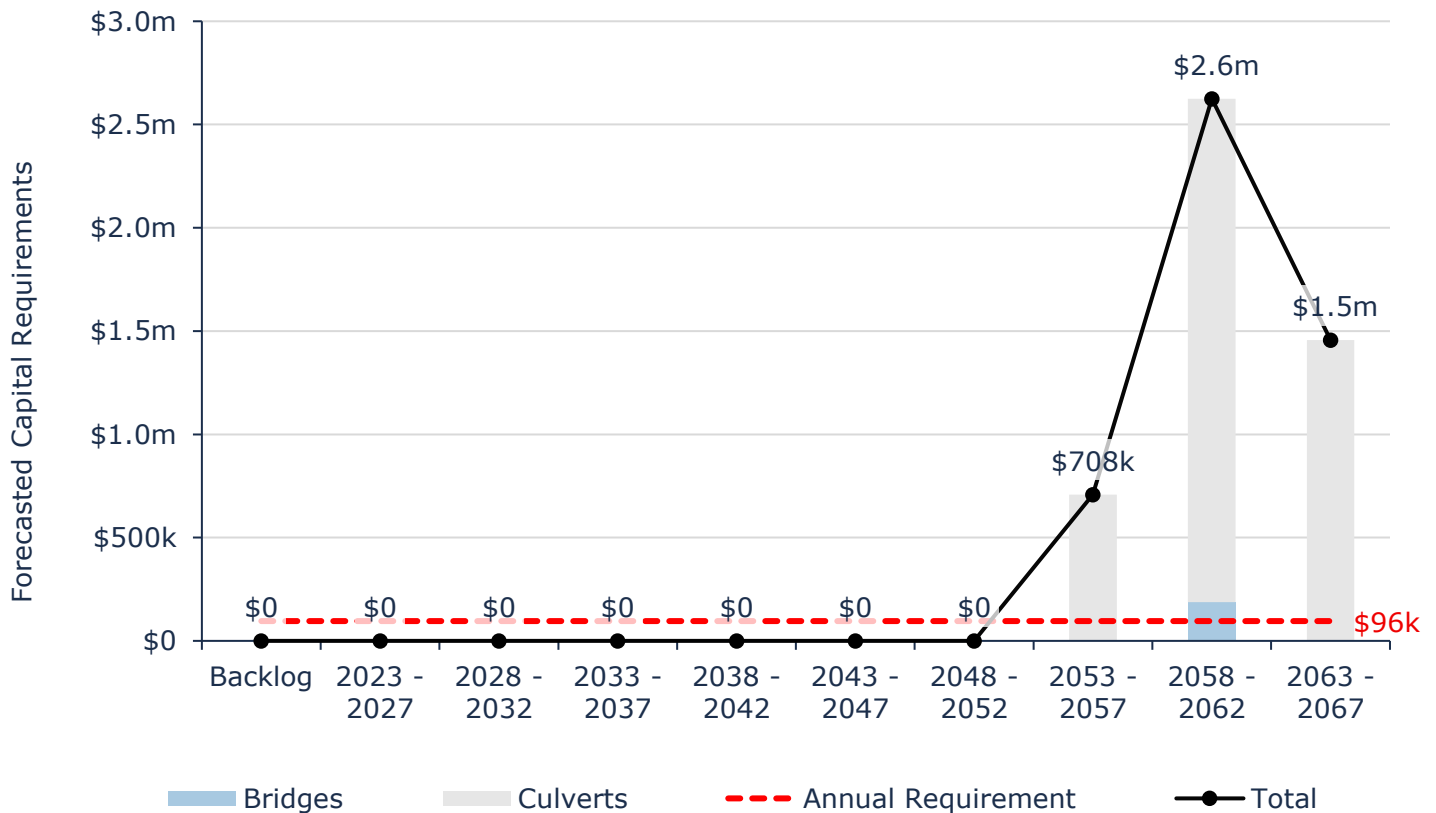


Figure 32 Forecasted Capital Replacement Needs: Bridges & Culverts 2025-2067

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 J – 10-Year Capital Requirements.

6. Risk Analysis

The risk matrix below is generated using available asset data, including condition 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 Appendix L – Risk Rating Criteria for further details on approach used to determine asset risk ratings and classifications.

1 - 4 Very Low - (0%)	5 - 7 Low - (0%)	8 - 9 Moderate - (0%)	10 - 14 High \$4,789,000 (100%)	15 - 25 Very High - (0%)
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Figure 33 Risk Matrix: Bridges & Culverts

In addition to asset level risk, the Township may also face risk associated with not executing key lifecycle activities, including repairs, rehabilitation, and replacement of critical assets. These include:

- missed opportunities for cost savings and increases in lifecycle costs.
- deferral of vital projects, or further lending and borrowing.
- accelerated asset deterioration and premature failure, which may lead to public health and safety hazards, and disruption of services to the Township's residential and commercial base.
- a decline in public satisfaction with the Township's service standards and the resulting reputational damage.
- Bridges are inherently vital to the Township's transportation infrastructure, and their failures can disconnect communities, lead to public health and safety incidents, and can impede the efficient flow of residential and commercial traffic.

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. 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.

Community Levels of Service

Table 23 O. Reg. 588/17 Community Levels of Service: Bridges & Culverts

Service Attribute	Qualitative Description	Current LOS (2022)
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 bridges and structural culverts is generally light as these are local roads.
Quality	Description or images of the condition of bridges & culverts and how this would affect use of the bridges & culverts	See Appendix K – Level of Service Maps & Photos

Technical Levels of Service

Table 24 O. Reg. 588/17 Technical Levels of Service: Bridges & Culverts

Service Attribute	Technical Metric	Current LOS (2022)
Scope	% of bridges in the Township with loading or dimensional restrictions	0%
Quality	Average bridge condition index value for bridges in the Township	70%
	Average bridge condition index value for structural culverts in the Township	70%
Performance	Capital reinvestment rate	0%

Appendix C - Water Network

The Township's water network portfolio has a total current replacement cost of approximately \$5.6 million. The township is responsible for the following:

- Approximately 14 kilometers of water distribution network
- Water Treatment Plant

1. Inventory & Valuation

Table 25 and Figure 34 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.

Table 25 Detailed Asset Inventory: Water Network

Segment	Quantity	Unit of Measure	Replacement Cost	Primary RC Method
Water Mains	13,853	Meters	\$4,986,918	Cost per Unit
Water Treatment System	1	Assets	\$628,100	User-Defined
TOTAL			\$5,615,018	

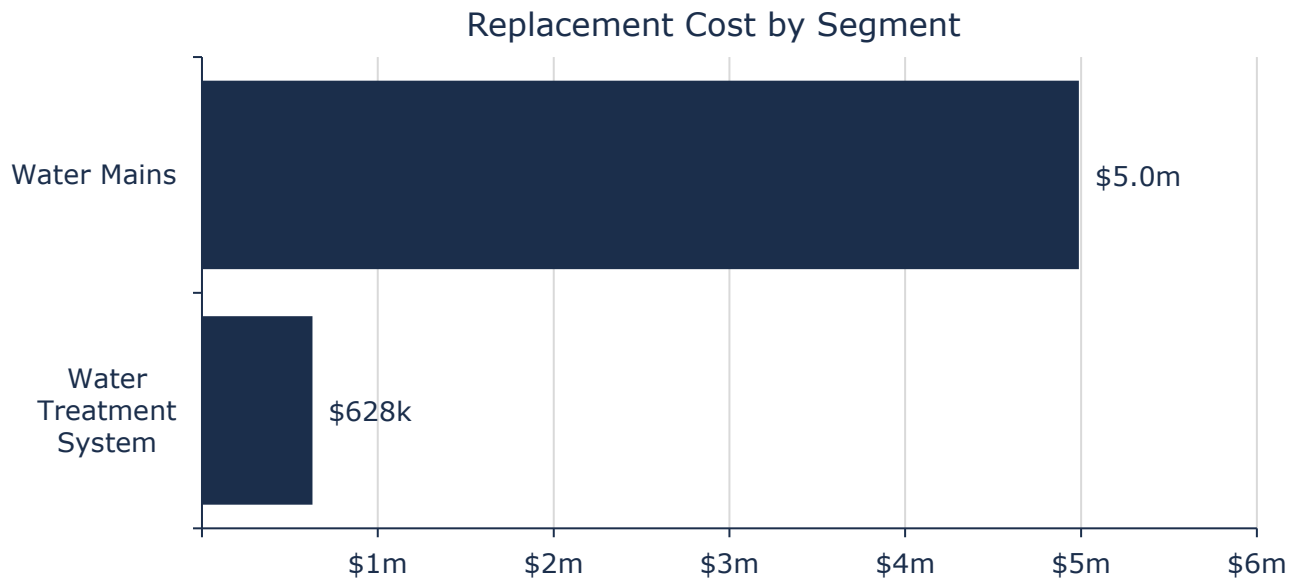


Figure 34 Portfolio Valuation: Water Network

2. Asset Condition

Figure 35 and Figure 36 summarize the replacement cost-weighted condition of the Township's water network. Age-based data reveals that majority of water network assets are in poor condition.

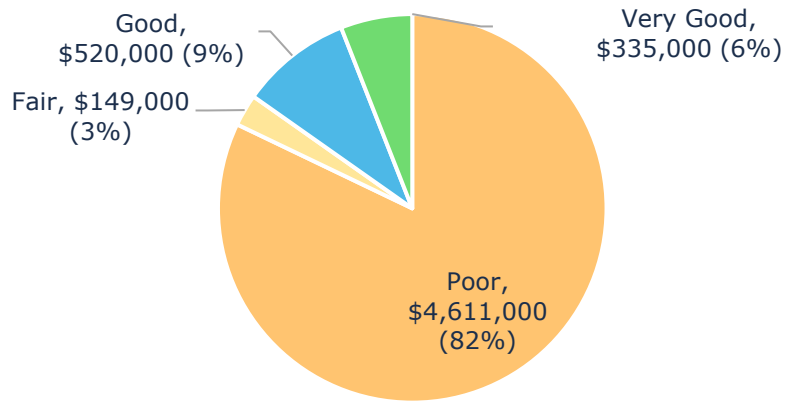


Figure 35 Asset Condition: Water Network Overall

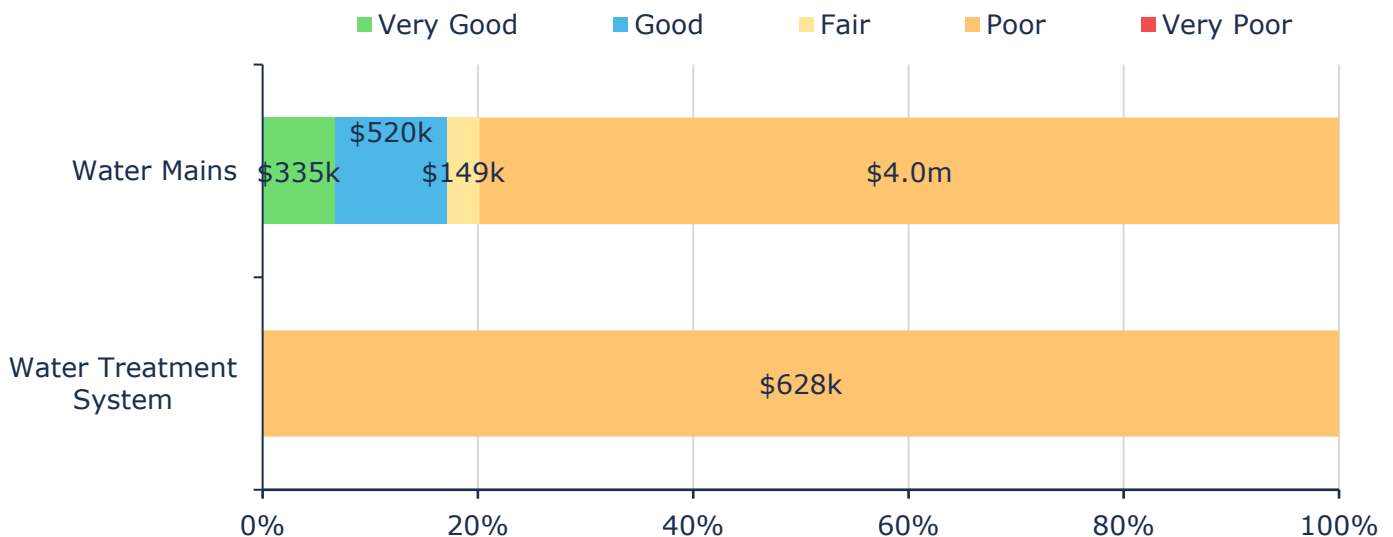


Figure 36 Asset Condition: Water Network by Segment

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 37 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.

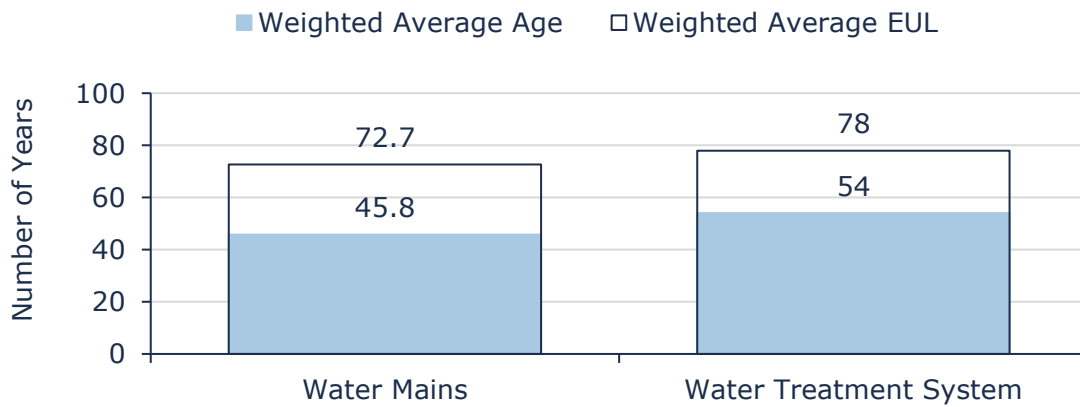


Figure 37 Estimated Useful Life vs. Asset Age: Water Network

Age analysis reveals that all water network assets are in the early stages of their expected useful life.

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.

Table 26 Lifecycle Management Strategy: Water Network

Activity Type	Description of Current Strategy
Inspection	No formal assessment program is currently in place. The Ontario Clean Water Agency (OCWA) handles the distribution side.
Maintenance	Operational maintenance is managed by OCWA. Current challenges include 6-inch pipes deteriorating and narrowing to 2-inch due to buildup.
Rehabilitation	Not explicitly detailed, though repairs occur when failure happens
Replacement	The Township replaces old parts of the system moving outward from the water plant as grants become available every 3 to 4 years.

5. Forecasted Long-Term Replacement Needs

Figure 38 illustrates the cyclical short-, medium- and long-term infrastructure rehabilitation and replacement requirements for the Township’s water network. This analysis was run until 2102 to capture at least one iteration of replacement for the longest-lived asset in Citywide Assets, the Township’s primary asset management system and asset register. The Township’s average annual requirements (red dotted line) total \$90 thousand 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.

Capital needs fluctuate throughout the forecast period, peaking at \$3.2 million between 2043-2047. 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.

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 J – 10-Year Capital Requirements.

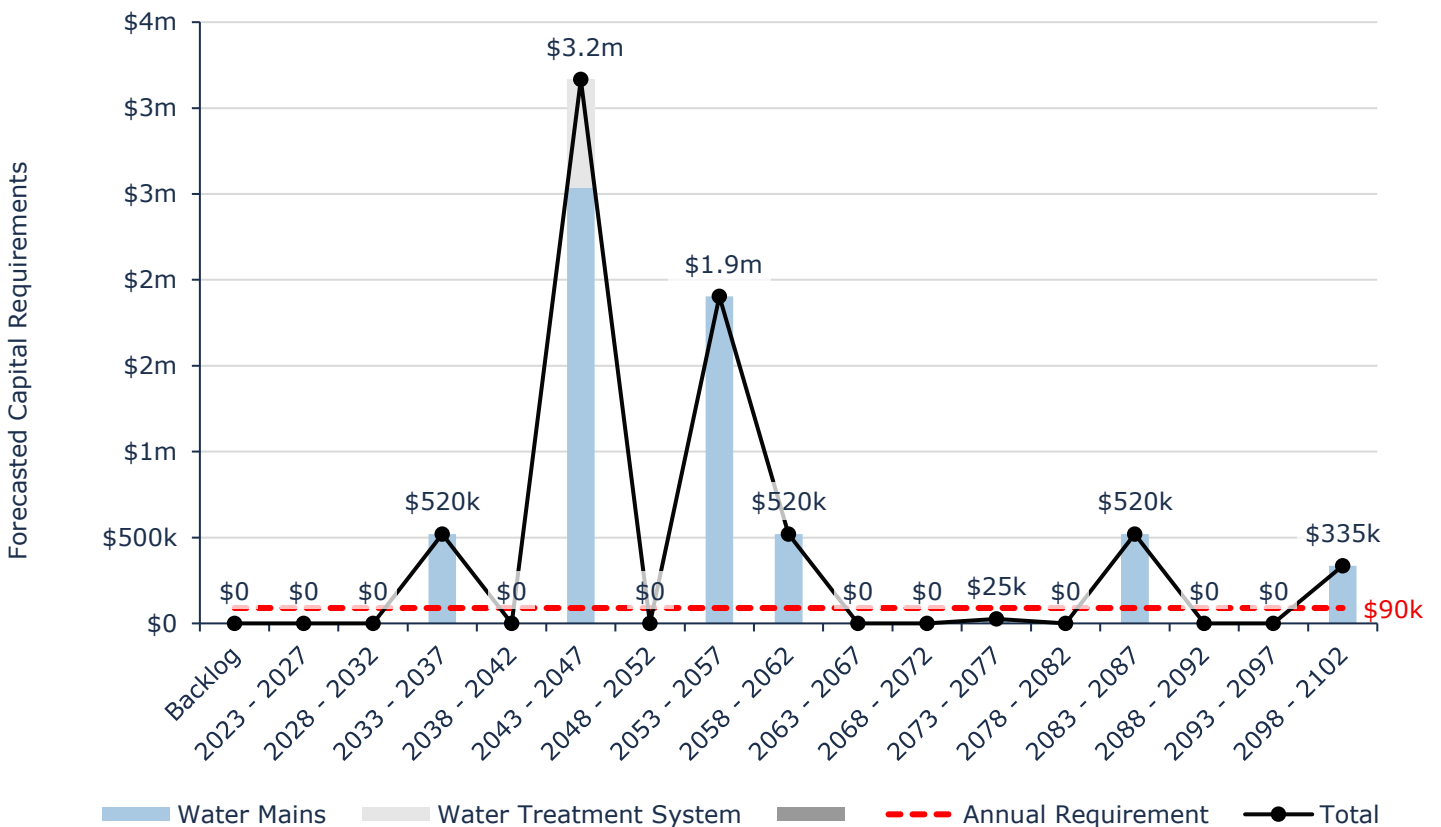


Figure 38 Forecasted Capital Replacement Needs: Water Network 2023-2102

6. Risk Analysis

The risk matrix below is generated using available asset data, including condition 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 Appendix L – Risk Rating Criteria for further details on approach used to determine asset risk ratings and classifications.

1 - 4 Very Low	5 - 7 Low	8 - 9 Moderate	10 - 14 High	15 - 25 Very High
- (0%)	\$23,000 (<1%)	\$25,000 (<1%)	\$5,567,000 (99%)	- (0%)

Figure 39 Risk Matrix: Water Network

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.

Community Levels of Service

Table 27 O. Reg. 588/17 Community Levels of Service: Water Network

Service Attribute	Qualitative Description	Current LOS (2022)
Scope	Description, which may include maps, of the user groups or areas of the municipality that are connected to the municipal water system	In the Township of Emo, the Urban Settlement Area of Emo is integrated into the municipal water system, encompassing approximately 75.5% of the population
	Description, which may include maps, of the user groups or areas of the municipality that have fire flow	In the Township of Emo, fire flow protection is provided through the municipal water system within the Urban Settlement Area of Barwick, serving approximately 75.5% of the population.
Reliability	Description of boil water advisories and service interruptions	On December 3, 2022, a watermain break impacted 40 residential properties and 7 commercial sites. Immediate response measures were implemented, including a boil water advisory. The advisory remained in place until two sets of bacteriological samples, collected 24 hours apart from three locations (both ends of the affected

Service Attribute	Qualitative Description	Current LOS (2022)
		main and one midpoint), confirmed water safety. The boil water advisory was lifted on December 9, 2022.

Technical Levels of Service

Service Attribute	Technical Metric	Current LOS (2022)
Scope	% of properties connected to the municipal water system	75.5% (355 out of 470)
	% of properties where fire flow is available	75.5% (355 out of 470)
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	0.254% (In 2022, a 7-day boil water advisory affected 47 connections (40 residential and 7 commercial), representing 329 connection-days out of a total 129,575 annual connection-days for the 355 municipal water connections.)
	# 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	0.254% (In 2022, a 7-day boil water advisory affected 47 connections (40 residential and 7 commercial), representing 329 connection-days out of a total 129,575 annual connection-days for the 355 municipal water connections.)
Performance	Capital reinvestment rate	0.63%

Table 28 O. Reg. 588/17 Technical Levels of Service: Water Network

Appendix D - Wastewater Network

The wastewater network provides the essential service of wastewater collection, disposal, and treatment for the community, and has a current replacement value of over \$4.6 million.

1. Inventory & Valuation

Table 29 and Figure 40 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.

Table 29 Detailed Asset Inventory: Wastewater Network

Segment	Quantity	Unit of Measure	Replacement Cost	Primary RC Method
Forcemains	2,764	Meters	\$1,105,640	Cost per Unit
Lagoons	1	Assets	\$18,000	User-Defined
Lift Stations	4	Assets	\$800,000	User-Defined
Sanitary Mains	10,645	Meters	\$2,714,544	Cost per Unit
TOTAL			\$4,638,184	

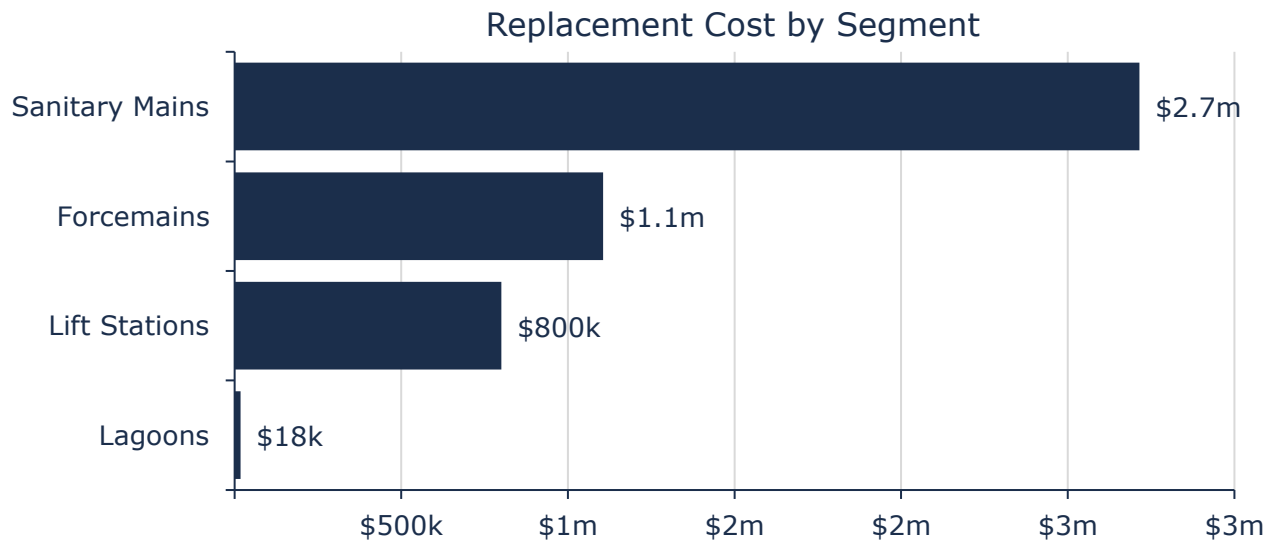


Figure 40 Portfolio Valuation: Wastewater Network

2. Asset Condition

Figure 41 summarizes the replacement cost-weighted condition of the Township's wastewater network. Based on a combination of field inspection data and age, 91% of assets are in fair or better condition; the remaining 9% of assets are in poor to very poor condition.

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 41 the majority of the Township’s wastewater network assets are in fair or better condition.

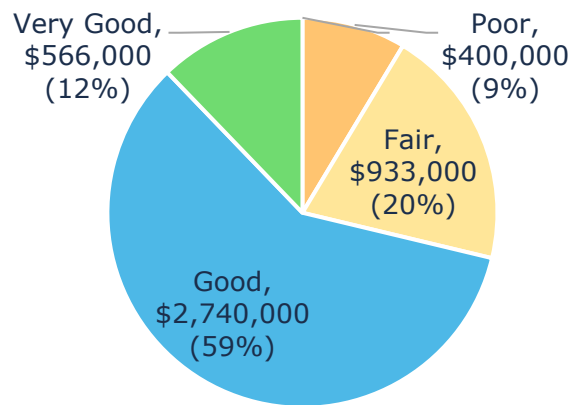


Figure 41 Asset Condition: Wastewater Network Overall

As illustrated in Figure 42, approximately 50% of lift stations with replacement cost of \$400 thousand are in poor condition.

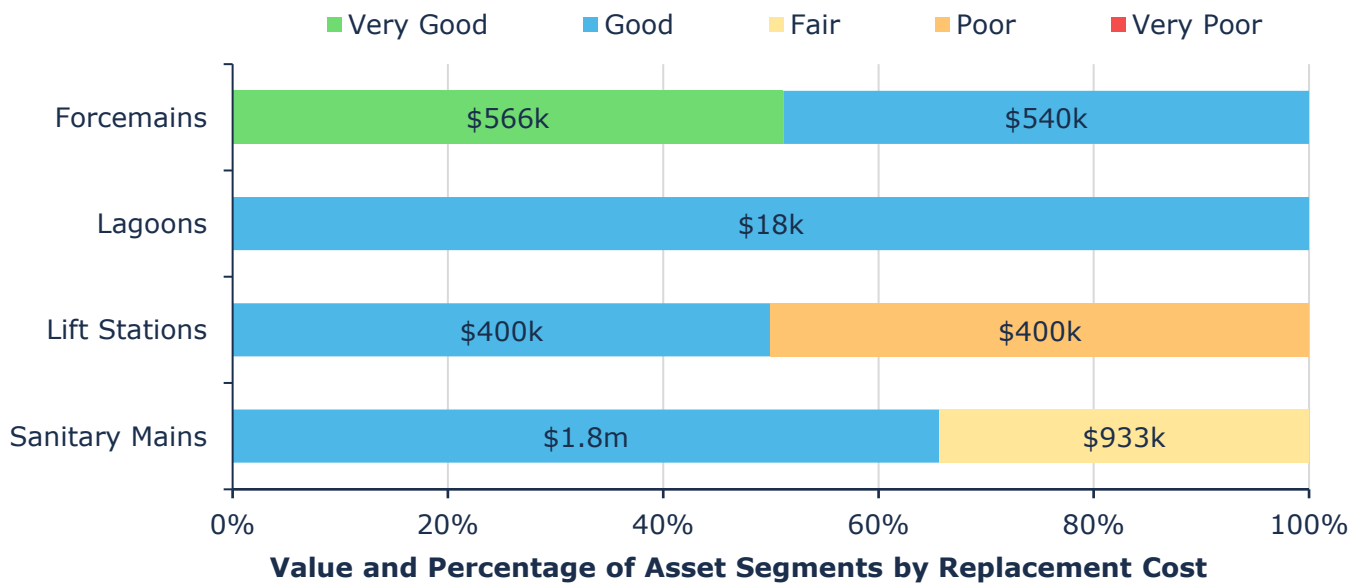


Figure 42 Asset Condition: Wastewater Network by Segment

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 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.

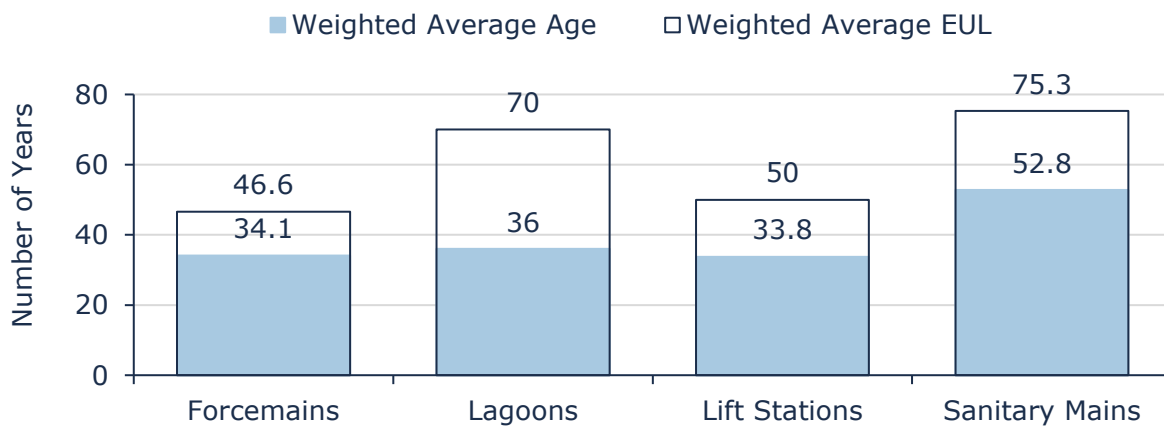


Figure 43 Estimated Useful Life vs. Asset Age: Wastewater Network

Age analysis reveals that all wastewater network assets are well within their designed service life.

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.

Table 30 Lifecycle Management Strategy: Wastewater Network

Activity Type	Description of Current Strategy
Inspections	No formal assessment program or CCTV inspections are currently in place.
Maintenance	Maintenance is focused on cleaning plugs once a year to mitigate issues. Hydrants are flushed into the sanitary system.

Activity Type	Description of Current Strategy
Rehabilitation	Re-lining is not considered feasible for wastewater assets due to the material and the shallow depth of the infrastructure.
Replacement	Replacement only occurs upon failure; no replacements have been recorded under current management.

5. Forecasted Long-Term Replacement Needs

Figure 44 illustrates the cyclical short-, medium- and long-term infrastructure rehabilitation and replacement requirements for the Township’s wastewater network. This analysis was run until 2087 to capture at least one iteration of replacement for the longest-lived asset in Citywide Assets, the Township’s primary asset management system and asset register.

The Township’s average annual requirements (red dotted line) total \$81 thousand 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 fluctuating capital needs throughout the forecast period, peaking at \$1.8 million between 2083-2087. 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.

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 J – 10-Year Capital Requirements.

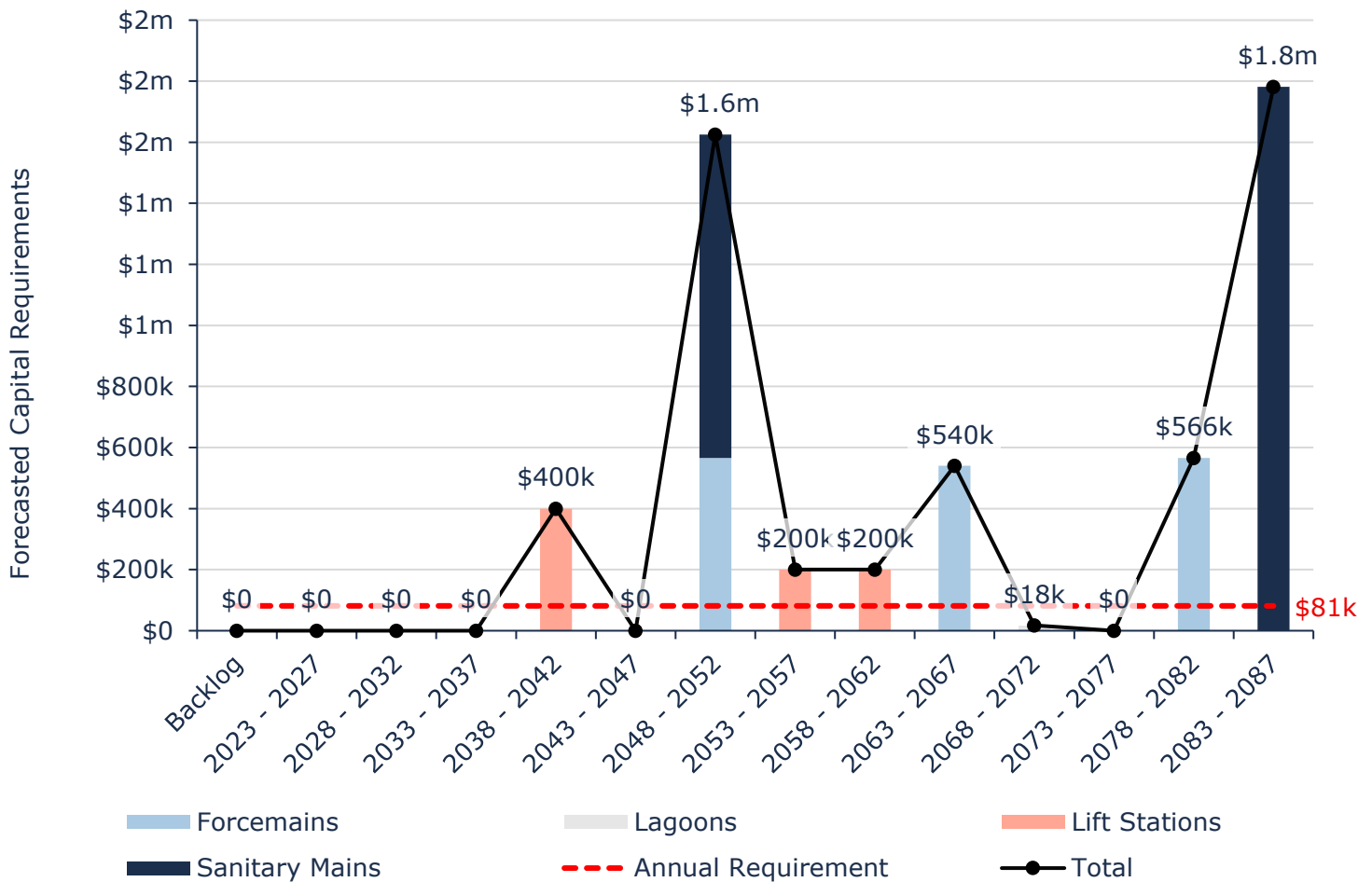


Figure 44 Forecasted Capital Replacement Needs: Wastewater Network 2023-2087

6. Risk Analysis

The risk matrix below is generated using available asset data, including condition and replacement costs. 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 Appendix L – Risk Rating Criteria for further details on approach used to determine asset risk ratings and classifications.

1 - 4 Very Low - (0%)	5 - 7 Low \$584,000 (13%)	8 - 9 Moderate - (0%)	10 - 14 High \$2,722,000 (59%)	15 - 25 Very High \$1,333,000 (29%)
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Figure 45 Risk Matrix: Wastewater Network

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.

Community Levels of Service

Service Attribute	Qualitative Description	Current LOS (2022)
Scope	Description, which may include maps, of the user groups or areas of the municipality that are connected to the municipal wastewater system	In the Township of Emo, the Urban Settlement Area of Barwick is integrated into the municipal water system, encompassing approximately 75% of the population.
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	N/A
	Description of the frequency and volume of overflows in combined sewers in the municipal wastewater system that occur in habitable areas or beaches	N/A
	Description of how stormwater can get into wastewaters in the municipal wastewater system, causing sewage to overflow into streets or back up into homes	Stormwater can enter into sanitary sewers due to cracks in 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 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 stormwater to the storm drain system help to reduce the chance of overflow.
	Description of how wastewaters in the municipal wastewater system are designed to be resilient to stormwater infiltration	The municipality adheres to design standards that incorporate appropriate overflows when constructing or replacing sanitary sewers. These standards have been determined with consideration of the minimization of sewage overflows and backups.
	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.

Table 31 O. Reg. 588/17 Community Levels of Service: Wastewater Network

Technical Levels of Service

Service Attribute	Technical Metric	Current LOS (2022)
Scope	% of properties connected to the municipal wastewater system	75%
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	N/A
	# of connection-days per year having wastewater backups compared to the total number of properties connected to the municipal wastewater system	1.095% (4 complaints per 470 household connections)
	# of effluent violations per year due to wastewater discharge compared to the total number of properties connected to the municipal wastewater system	0
Performance	Capital reinvestment rate	0.69%

Table 32 O. Reg. 588/17 Technical Levels of Service: Wastewater Network

Appendix E - Stormwater Network

The Township’s stormwater network comprises sewer mains and other critical supporting capital assets with a total current replacement cost of approximately \$1.93 million.

1. Inventory & Valuation

Table 33 and Figure 46 summarize the quantity and current replacement cost of all stormwater network assets available in the Township’s asset register.

Table 33 Detailed Asset Inventory: Stormwater Network

Segment	Quantity	Unit of Measure	Replacement Cost	Primary RC Method
Catch Basins	2	Assets	\$205,266	CPI
Storm Sewer Mains	14	Assets	\$1,732,884	CPI
TOTAL			\$1,938,150	

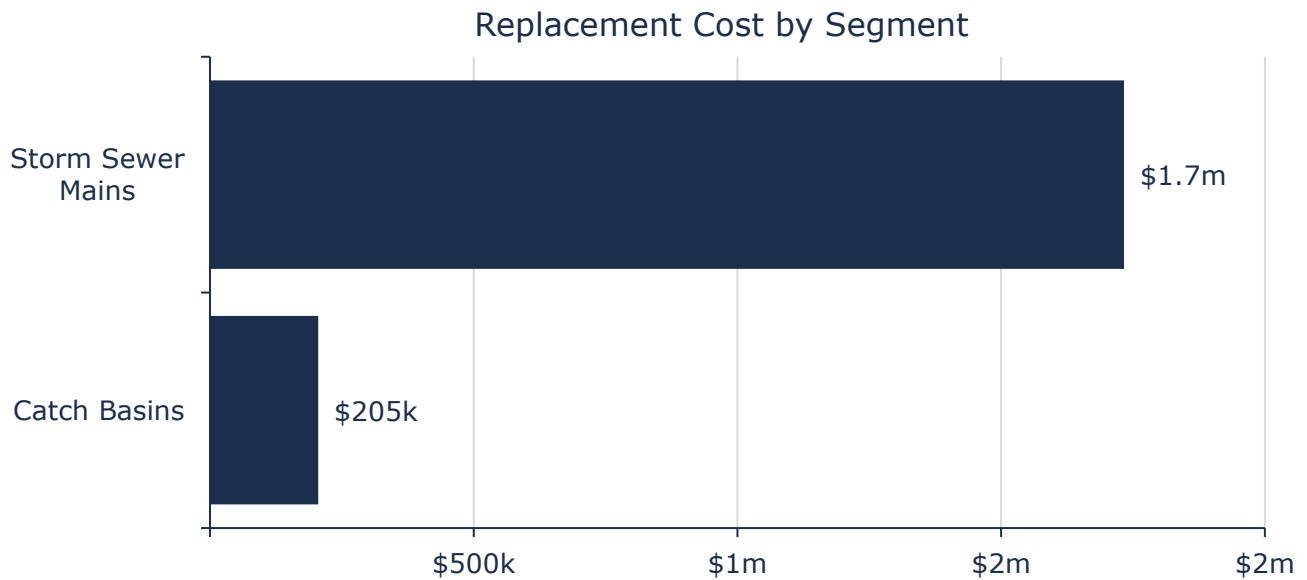


Figure 46 Portfolio Valuation: Stormwater Network

2. Asset Condition

Figure 47 summarizes the replacement cost-weighted condition of the Township’s stormwater network assets. Based on age data only, approximately 81% of assets are in 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.

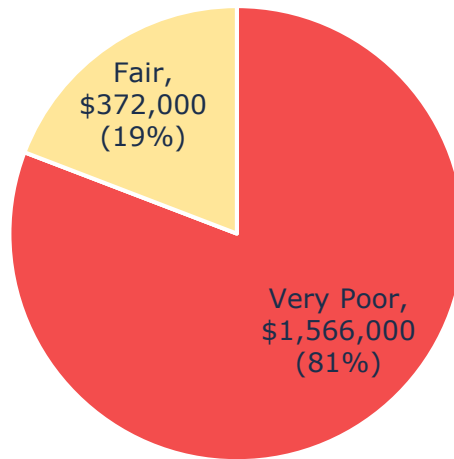


Figure 47 Asset Condition: Stormwater Network Overall

Figure 48 summarizes the age-based condition of stormwater network assets. The analysis illustrates that the majority of stormwater mains and catch basins are in very poor condition.

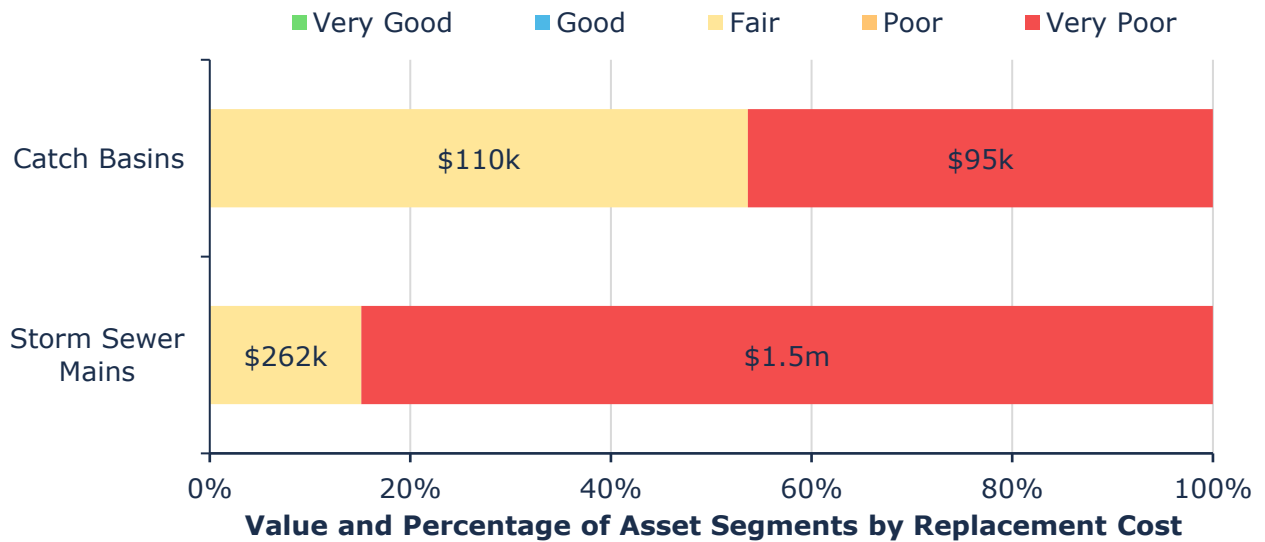


Figure 48 Asset Condition: Stormwater Network by Segment

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 49 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.

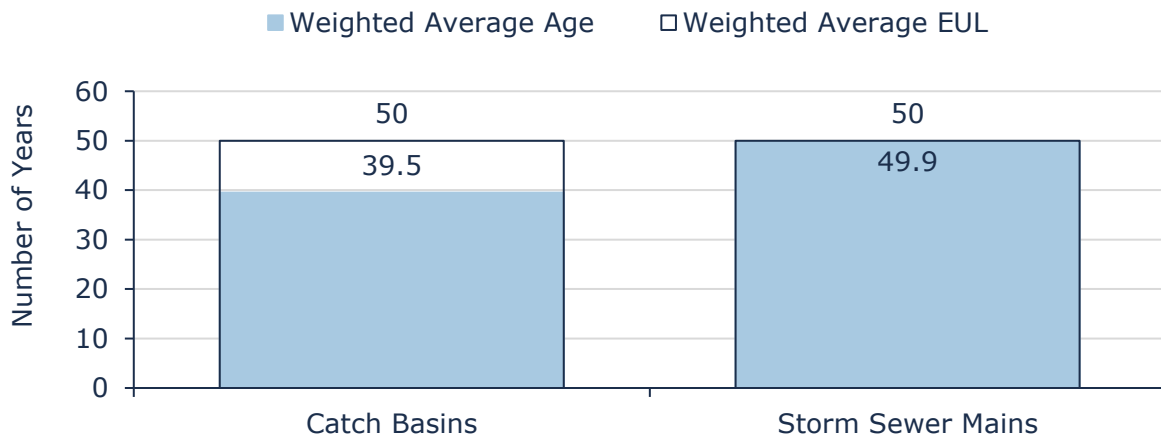


Figure 49 Estimated Useful Life vs. Asset Age: Stormwater Network

Age analysis reveals that on average, storm mains have approached their estimated useful life. Age profiles and CCTV inspections will help to identify mains in need of replacements and/or upgrades. Extensions to EULs for mains may also be considered based on performance history to date.

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.

Table 34 Lifecycle Management Strategy: Stormwater Network

Activity Type	Description of Current Strategy
Inspections	Catch basins receive an internal visual assessment once a year to determine if they need to be pumped out. There is no current assessment for underground infrastructure.
Maintenance	Ditching is cleaned as needed, though this is often cut from the budget due to funding constraints.
Rehabilitation	Re-lining is considered unfeasible for the storm network because of the materials used and the ease of performing shallow digs for replacement.
Replacement	Replacement is reactive. Most rural culverts were replaced in the last five years.

5. Forecasted Long-Term Replacement Needs

Figure 50 illustrates the cyclical short-, medium- and long-term infrastructure replacement requirements for the Township’s stormwater network assets. This analysis was run until 2071 to capture at least one iteration of replacement for the longest-lived asset in Citywide Assets, the Township’s primary asset management system and asset register. The Township’s average annual requirements (red dotted line) total \$39,000 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.

The chart illustrates an age-based backlog of \$1.6 million, dominated by storm sewer mains. 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.

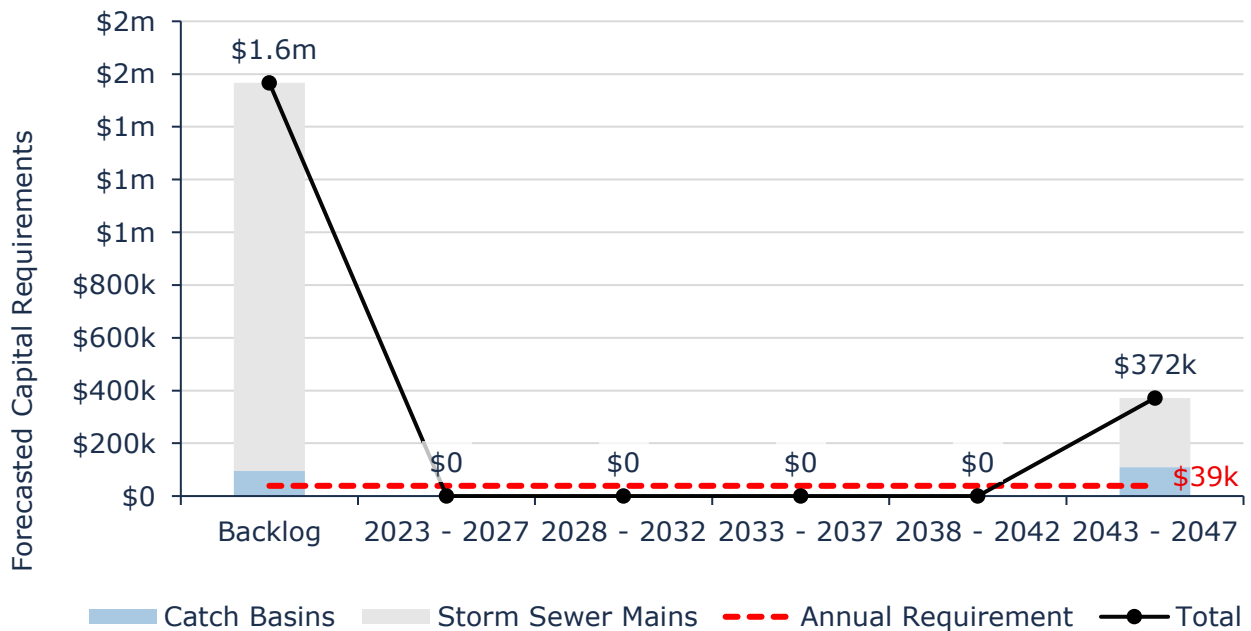


Figure 50 Forecasted Capital Replacement Needs Stormwater Network 2023-2047

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.

Conducting CCTV inspections may reveal a higher or lower backlog. The inspections may also help reduce long-term projections by providing more accurate condition data for mains than age. 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 J – 10-Year Capital Requirements.

6. Risk Analysis

The risk matrix below is generated using available asset data, including condition, and replacement costs. As no attribute data was available for storm assets, the risk ratings for assets were calculated using only these required, minimum asset fields.

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 Appendix L – Risk Rating Criteria for further details on approach used to determine asset risk ratings and classifications.

<p style="text-align: center;">1 - 4 Very Low - (0%)</p>	<p style="text-align: center;">5 - 7 Low - (0%)</p>	<p style="text-align: center;">8 - 9 Moderate - (0%)</p>	<p style="text-align: center;">10 - 14 High - (0%)</p>	<p style="text-align: center;">15 - 25 Very High \$1,938,000 (100%)</p>
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Figure 51 Risk Matrix: Stormwater Network

In addition to asset level risk, the Township may also face risk associated with not executing key lifecycle activities, including repairs, rehabilitation, and replacement of critical assets. These include:

- missed opportunities for cost savings and increases in lifecycle costs associated with more frequent asset maintenance.
- deferral of vital projects, or further lending and borrowing.
- accelerated asset deterioration and premature failure, which may lead to public health and safety hazards, and disruption of services to the Township’s residential and commercial base.
- a decline in public satisfaction with the Township’s service standards and the resulting reputational damage.
- Failure of stormwater assets can be particularly detrimental, causing excessive flooding, erosion, backups, road and bridge closures, environmental damage, and substantial property damage. Water quality may also be jeopardized, further exacerbating public health and safety challenges.

These changes in climate will lead to costlier lifecycle programs, including the need for more frequent condition assessments, increased maintenance, renewals, and replacements, and potential capacity upgrades of stormwater conveyance systems. Urban flood risks are also expected to increase. When relevant asset attribute is available to describe some of these vulnerabilities and asset characteristics, the data should be integrated with existing models.

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.

Community Levels of Service

Table 35 O. Reg. 588/17 Community Levels of Service: Stormwater Network

Service Attribute	Qualitative Description	Current LOS (2022)
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	The Township's protection against flooding extends to various user groups residing in settlement areas, facilitated by the placement of underground linear stormwater assets and associated structures along roadways. Additionally, the inclusion of minor culverts across the township's road network aids in effectively managing stormwater runoff from properties and roadways.

Technical Levels of Service

Table 36 O. Reg. 588/17 Technical Levels of Service: Stormwater Network

Service Attribute	Technical Metric	Current LOS (2022)
Scope	% of properties in municipality designed to be resilient to a 100-year storm	TBD
	% of the municipal stormwater management system designed to be resilient to a 5-year storm	TBD
Performance	Capital reinvestment rate	0%

Appendix F - Facilities

The Township's facilities portfolio includes fire hall, various administrative and public works facilities, as well as a public library and recreational assets. The total current replacement of facilities is estimated at more than \$8.9 million.

1. Inventory & Valuation

Table 37 and Figure 52 summarize the quantity and current replacement cost of all buildings assets available in the Township's asset register. Facilities are not componentized. The quantity listed represents the number of asset records currently available for each department.

Table 37 Detailed Asset Inventory: Facilities

Segment	Quantity	Unit of Measure	Replacement Cost	Primary RC Method
General Government	10	Assets	\$2,552,000	User-Defined
Parks Buildings	3	Assets	\$449,000	User-Defined
Public Works Buildings	5	Assets	\$4,206,000	User-Defined
Recreation Buildings	3	Assets	\$1,750,600	User-Defined
TOTAL			\$8,957,600	

Replacement Cost by Segment

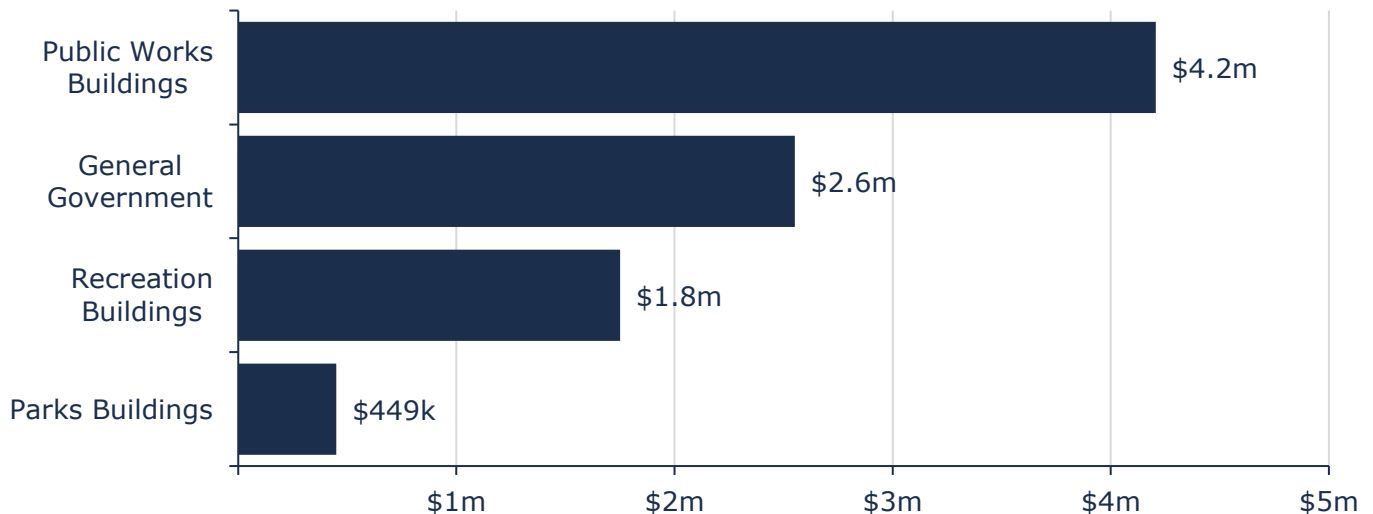


Figure 52 Portfolio Valuation: Facilities

2. Asset Condition

Figure 58 summarizes the replacement cost-weighted condition of the Township’s facilities portfolio. Based on staff assessments 89% of facilities assets are in good condition. Remaining 11% assets with replacement cost of \$1 million are in 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. As facilities are not componentized, condition data is presented only at the site level, rather than at the individual element or component level within each building. This drawback is further compounded by the lack of assessed condition data, requiring the use of age-based estimates only.

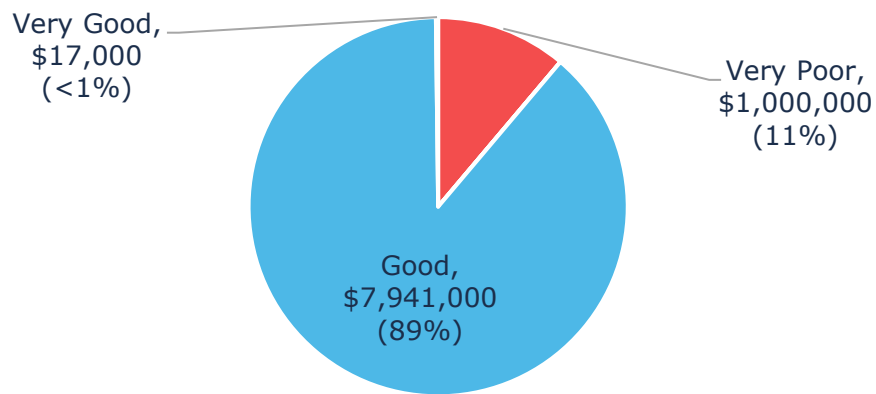


Figure 53 Asset Condition: Facilities Overall

Figure 54 summarizes the age-based condition of facilities by each department. More than 50% of recreation buildings are in very poor condition. 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.

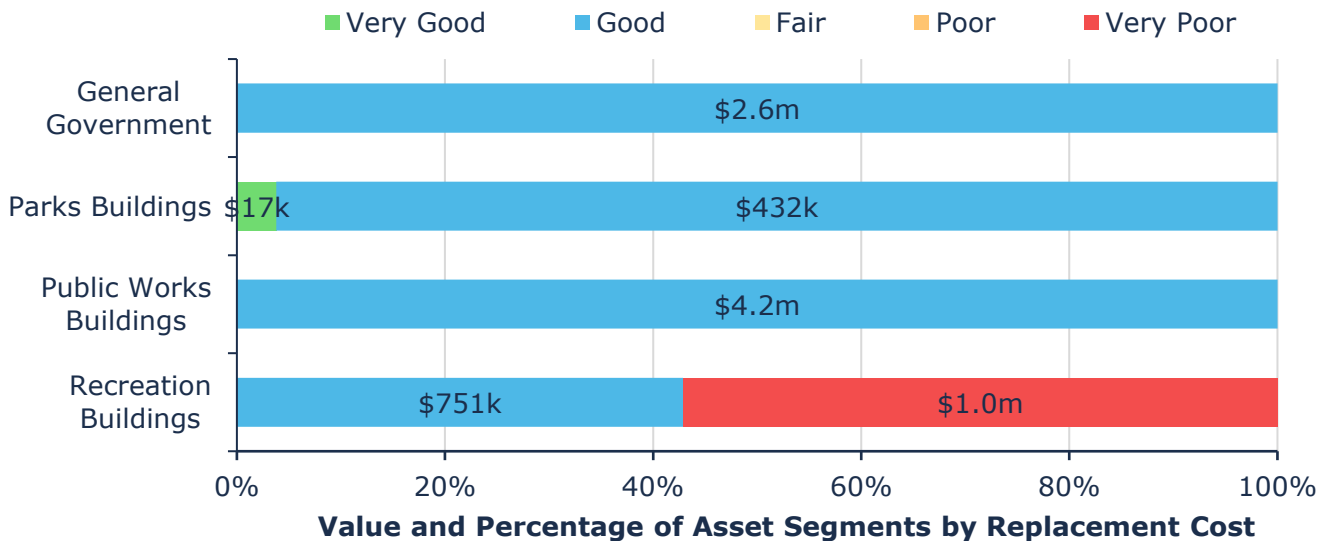


Figure 54 Asset Condition: Facilities by Segment

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 55 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.

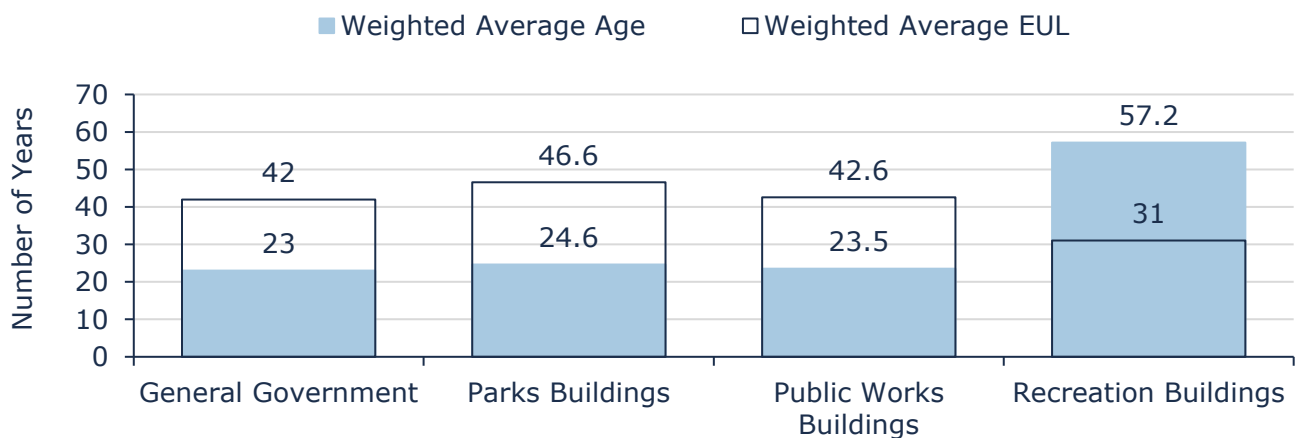


Figure 55 Estimated Useful Life vs. Asset Age: Facilities

Age analysis reveals that, on average, facilities assets are in the earlier stages of their serviceable life. However, based on acquisition years, most recreation assets have exceeded their estimated useful life. Once again, this analysis presented only at the site level, rather than at the individual element or component level. Useful and meaningful age analysis for buildings is entirely predicated on effective componentization.

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 38 outlines the Township’s current lifecycle management strategy.

Table 38 Lifecycle Management Strategy: Facilities

Activity Type	Description of Current Strategy
Maintenance	<ul style="list-style-type: none"> • General maintenance is minimal (e.g., cleaning gutters). • Arena staff perform minor upkeep like painting and tightening screws. • Overhead doors are repaired internally as issues arise.
Rehabilitation	No Formal Strategies in place. The arena roof was recently redone following hail damage through an insurance claim.
Replacement	Replacement of building components is reactive. There are no current plans for full building replacements, though one building is condemned and may be deemed surplus
Inspections	No formal building condition assessments (BCAs) have been performed. The Fire Hall receives monthly safety inspections.

5. Forecasted Long-Term Replacement Needs

Figure 56 illustrates the cyclical short-, medium- and long-term infrastructure replacement requirements for the Township’s facilities portfolio. This analysis was run until 2067 to capture at least one iteration of replacement for the longest-lived asset in Citywide Assets, the Township’s primary asset management system and asset register. The Township’s average annual requirements (red dotted line) total \$285 thousand for all 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.

Replacement needs are forecasted to fluctuate over next 30 years, reaching \$5.1 million between 2053 and 2057. The chart also illustrates a backlog of \$1 million, dominated by recreation facilities, and 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.

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 J – 10-Year Capital Requirements.

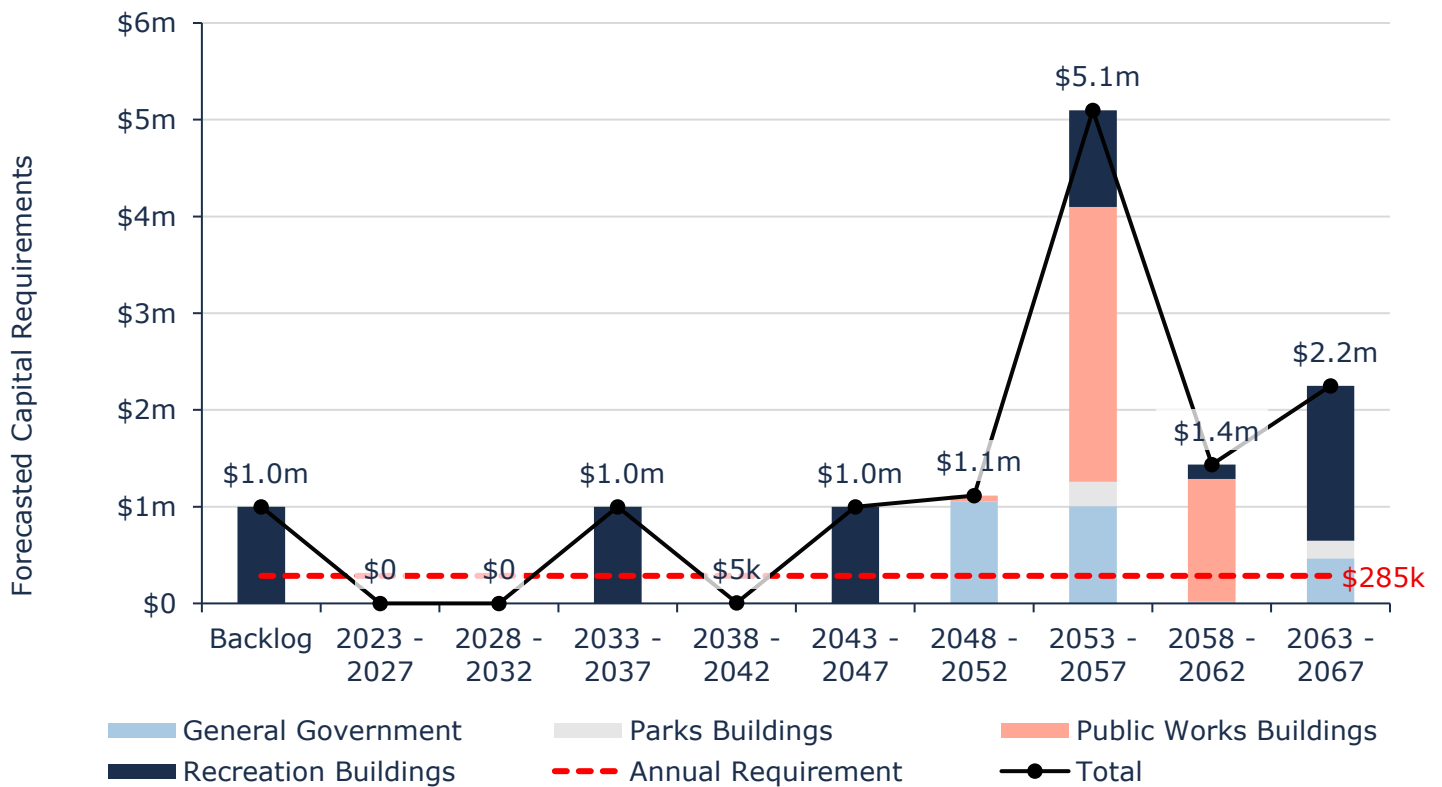


Figure 56 Forecasted Capital Replacement Needs Facilities 2023-2067

6. Risk Analysis

The risk matrix below is generated using available asset data, including condition, and replacement costs. The risk ratings for assets without useful attribute data were calculated using only age, service life remaining, 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 Appendix L – Risk Rating Criteria section for further details on approach used to determine asset risk ratings and classifications.

1 - 4 Very Low \$22,000 (<1%)	5 - 7 Low \$20,000 (<1%)	8 - 9 Moderate \$40,000 (<1%)	10 - 14 High \$7,876,000 (88%)	15 - 25 Very High \$1,000,000 (11%)
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Figure 57 Risk Matrix: Facilities

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.

Community Levels of Service

Table 39 Community Levels of Service: Facilities

Service Attribute	Qualitative Description	Current LOS (2022)
Scope	Description, which may include maps, of the types of facilities that the municipality operates and maintains	<ul style="list-style-type: none"> • Administration is supported by a Municipal Office. • Public works is supported by Maintenance Garage and a Generator Building • Fire services are supported by a fire hall • Recreation is supported by facilities such as Arena and a curling club building

Technical Levels of Service

Table 40 Technical Levels of Service: Facilities

Service Attribute	Technical Metric	Current LOS (2022)
Quality	Average facility condition index value for facilities in the municipality	68%
Performance	Capital reinvestment rate	0%

Appendix G - Land Improvements

The Township’s land improvements portfolio includes parks, sports fields, courts, and green spaces. The total current replacement of land improvements is estimated at approximately \$935 thousand.

1. Inventory & Valuation

Table 41 and Figure 58 summarize the quantity and current replacement cost of all land improvements assets available in the Township’s asset register. Athletic fields and playgrounds account for the largest share of the land improvements asset group.

Table 41 Detailed Asset Inventory: Land Improvements

Segment	Quantity	Unit of Measure	Replacement Cost	Primary RC Method
Athletic Fields & Playgrounds	95,219	Square Meters	\$575,000	User-Defined
Park Fixtures	310	Square Meters	\$240,000	User-Defined
Parking Lots	1,248	Square Meters	\$120,000	User-Defined
TOTAL			\$935,000	

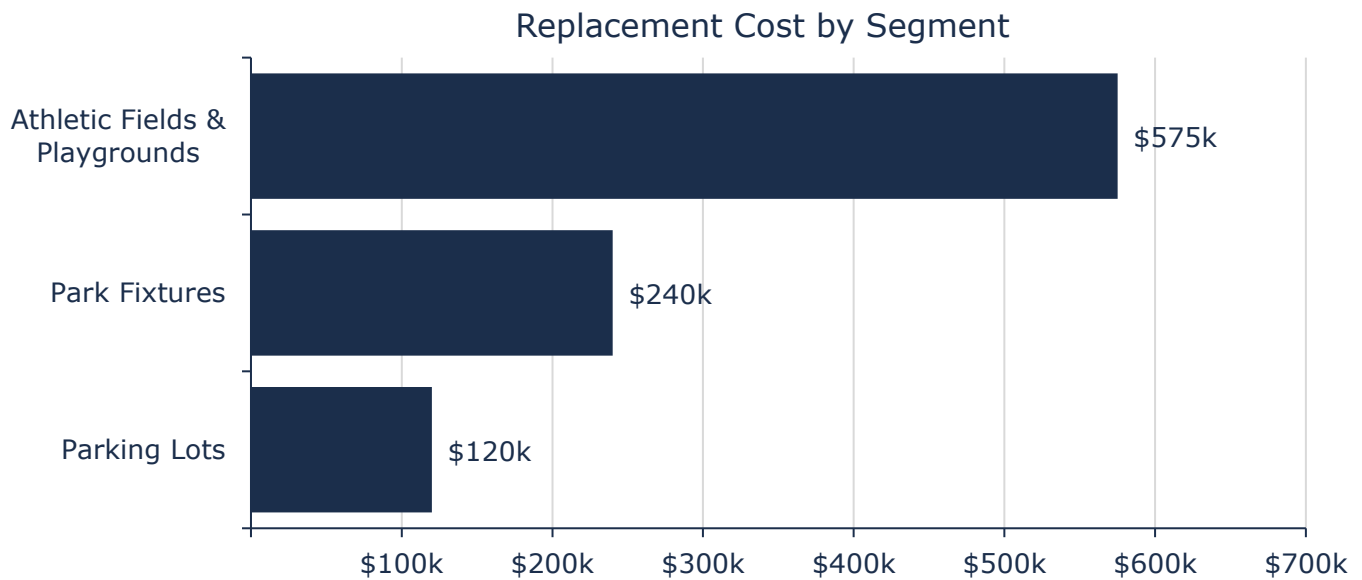


Figure 58 Portfolio Valuation: Land Improvements

2. Asset Condition

Figure 59 summarizes the replacement cost-weighted condition of the Township’s land improvements portfolio. Based on staff assessments, all assets are in fair or better condition.

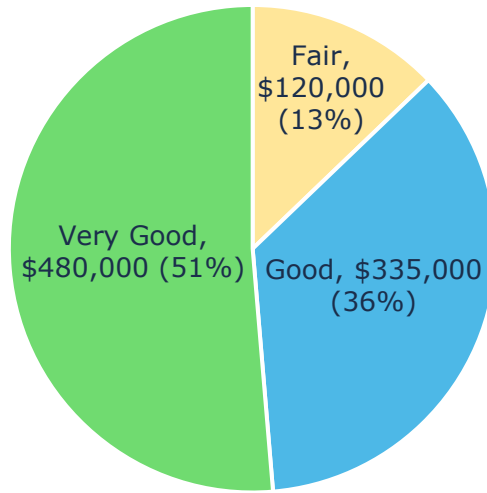


Figure 59 Asset Condition: Land Improvements Overall

Figure 60 provides a further breakdown of conditions by segments. All parking lots are in fair condition and should be monitored over the next few years.

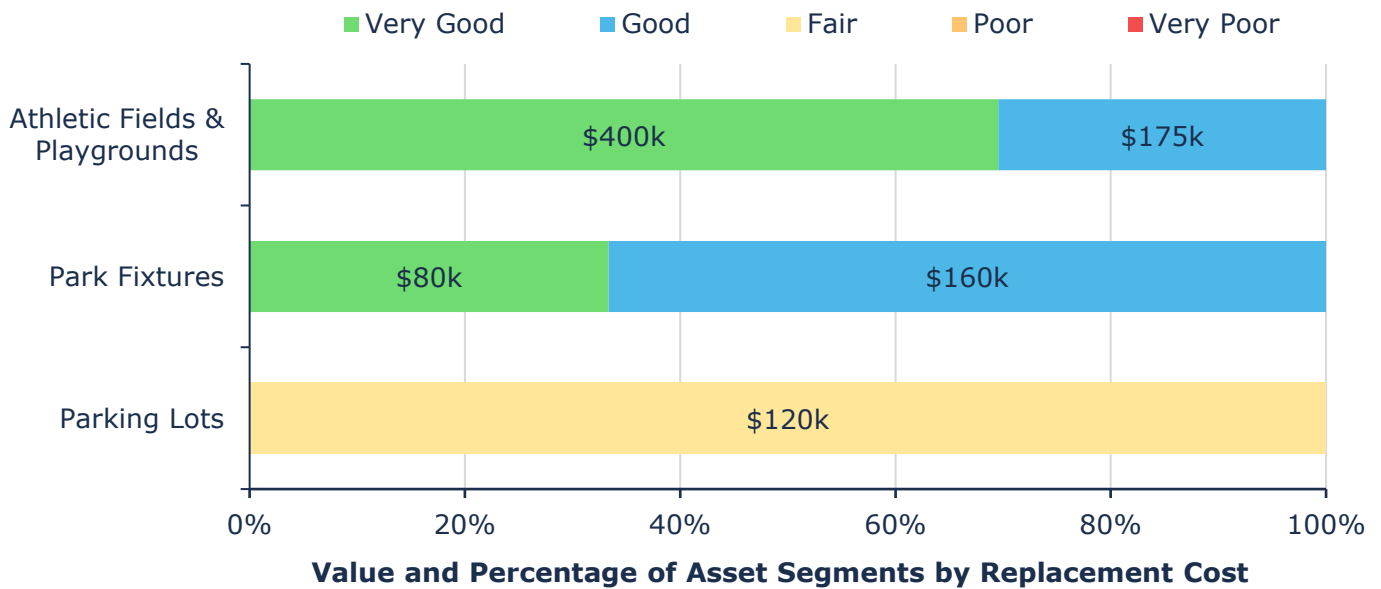


Figure 60 Asset Condition: Land Improvements by Segment

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 61 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.

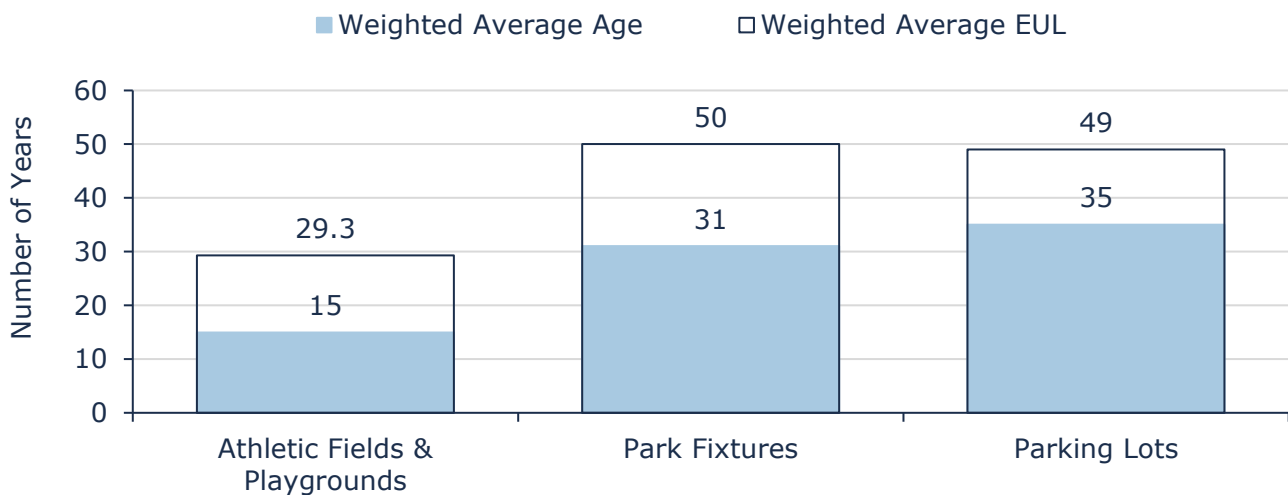


Figure 61 Estimated Useful Life vs. Asset Age: Land Improvements

Age analysis reveals that, all land improvements assets are well within their expected useful lives.

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 42 outlines the Township’s current lifecycle management strategy.

Table 42 Lifecycle Management Strategy: Land Improvements

Activity Type	Description of Current Strategy
Maintenance	<ul style="list-style-type: none"> • Maintenance activities are completed on a reactive basis when operational issues are identified, through complaints, service requests, or ad-hoc inspections • Playgrounds are maintained by tilling sand twice a year, and lawn maintenance is done weekly.
Rehabilitation / Replacement	<ul style="list-style-type: none"> • Without the availability of up-to-date condition assessment information replacement activities are purely reactive in nature • Soccer fields were leveled, re-sloped, and re-seeded in 2021. Baseball diamonds were grass-scrapped during the pandemic.
Inspections	Inspections are conducted on an ad-hoc basis

5. Forecasted Long-Term Replacement Needs

Figure 62 illustrates the cyclical short-, medium- and long-term infrastructure replacement requirements for the Township’s land improvements portfolio. This analysis was run until 2072 to capture at least one iteration of replacement for the longest-lived asset in Citywide Assets, the Township’s primary asset management system and asset register. The Township’s average annual requirements (red dotted line) total \$27 thousand 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.

Replacement needs are forecasted to fluctuate over the 20-year time horizon, totaling nearly \$500 thousand between 2043 and 2047 as assets reach the end of their useful life. 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.

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 J – 10-Year Capital Requirements.

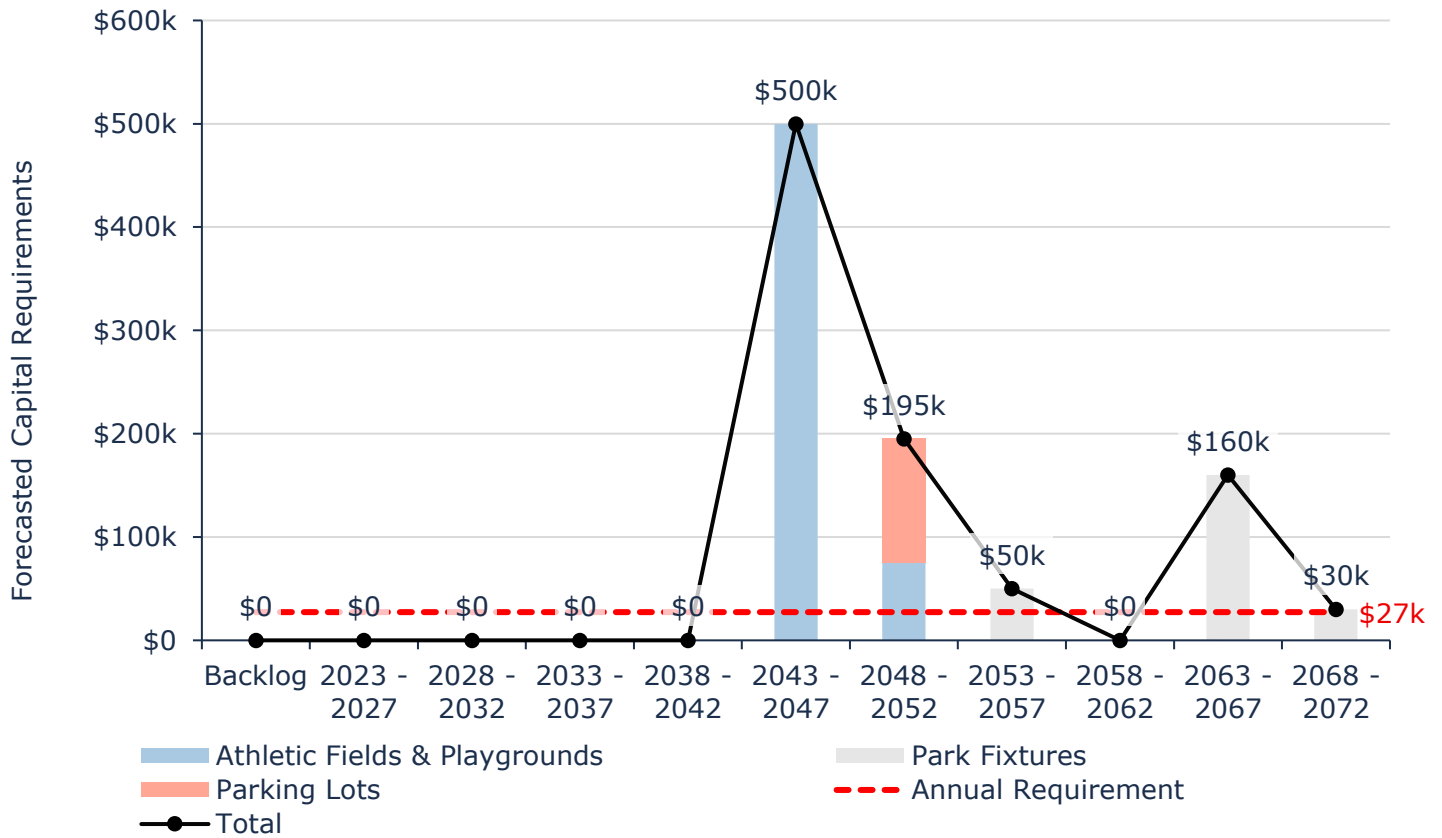


Figure 62 Forecasted Capital Replacement Needs: Land Improvements 2023-2072

6. Risk Analysis

The risk matrix below is generated using available asset data, including condition and replacement costs. 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 Appendix L – Risk Rating Criteria section for further details on approach used to determine asset risk ratings and classifications.

1 - 4 Very Low \$80,000 (9%)	5 - 7 Low \$440,000 (47%)	8 - 9 Moderate - (0%)	10 - 14 High \$295,000 (32%)	15 - 25 Very High \$120,000 (13%)
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Figure 63 Risk Matrix: Land Improvements

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.

Community Levels of Service

Table 43 Community Levels of Service: Land Improvements

Service Attribute	Qualitative Description	Current LOS (2022)
Scope	Description, which may include maps, of the outdoor recreational facilities that the municipality operates and maintains	The Township operates a variety of playgrounds, parks, splash pads, and courts.

Technical Levels of Service

Table 44 Technical Levels of Service: Land Improvements

Service Attribute	Technical Metric	Current LOS (2022)
Quality	Average condition of land improvements in the municipality	79%
Performance	Capital reinvestment rate	0%

Appendix H - Vehicles

The Township's vehicles portfolio includes 7 assets that support a variety of general and essential services, including public works, and fire. The total current replacement of vehicles is estimated at approximately \$1.15 million.

1. Inventory & Valuation

Table 45 summarizes the quantity and current replacement cost of all vehicles assets available in the Township's asset register. Fire vehicles account for the largest share of the vehicles portfolio.

Table 45 Detailed Asset Inventory: Vehicles

Segment	Quantity	Unit of Measure	Replacement Cost	Primary RC Method
Fire Vehicles	3	Assets	\$885,000	User-Defined
Public Works	4	Assets	\$270,000	User-Defined
TOTAL			\$1,155,000	

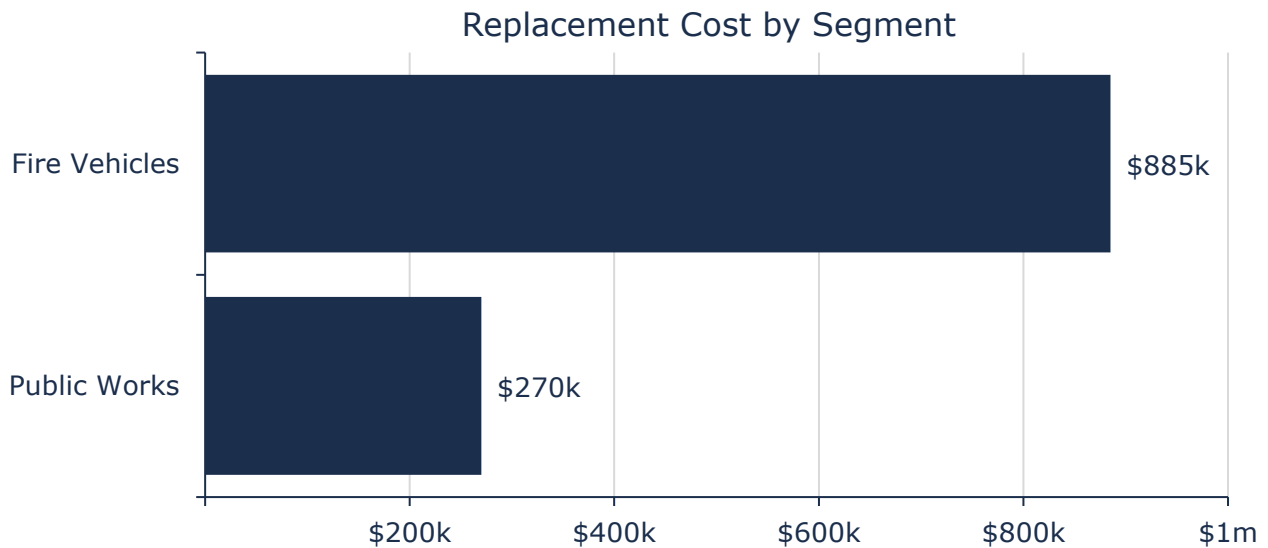


Figure 64 Portfolio Valuation: Vehicles

2. Asset Condition

Figure 65 summarizes the replacement cost-weighted condition of the Township's vehicles portfolio. Based primarily on staff assessments, 96% of vehicles are in fair or better condition, with the remaining 4% 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.

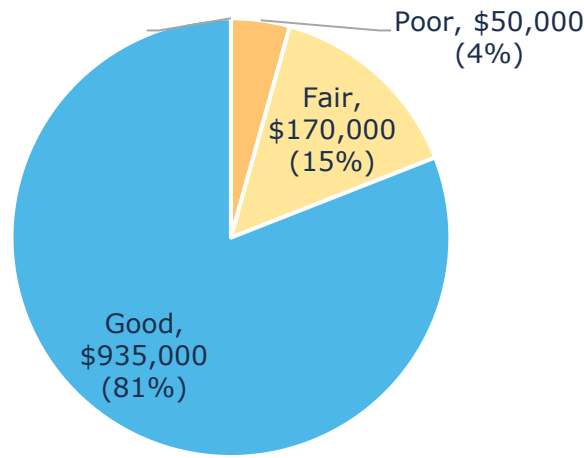


Figure 65 Asset Condition: Vehicles Overall

Figure 66 summarizes the condition of vehicles by each department. The vast majority of vehicles that support critical services such as fire are in good condition. Approximately 20% of public works vehicles with replacement cost of \$50 thousand are in poor condition.

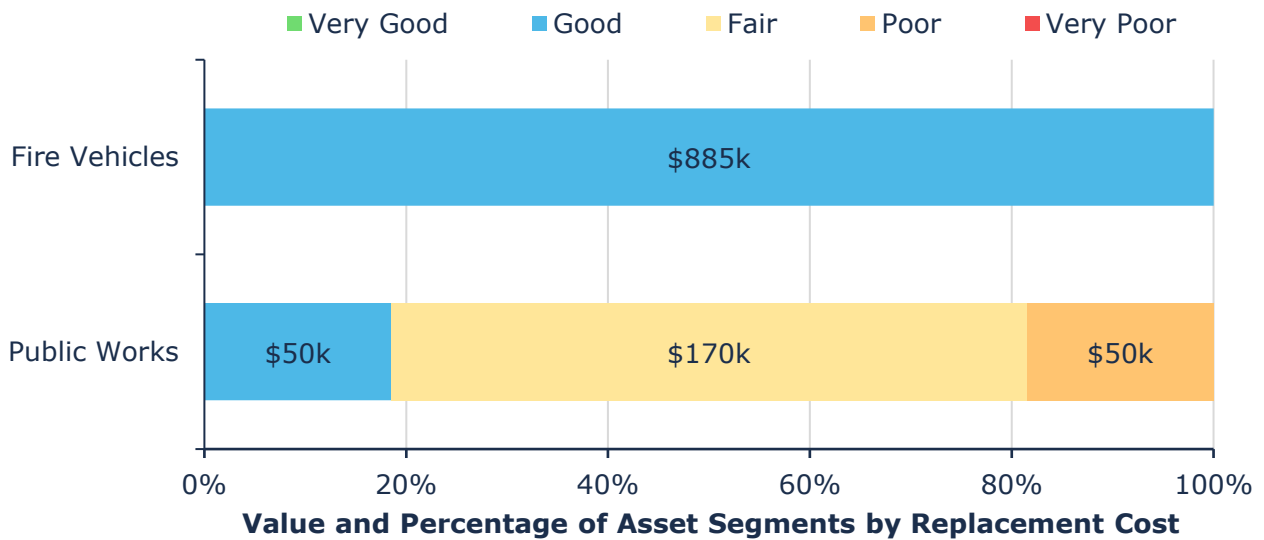


Figure 66 Asset Condition: Vehicles by Segment

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 67 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.

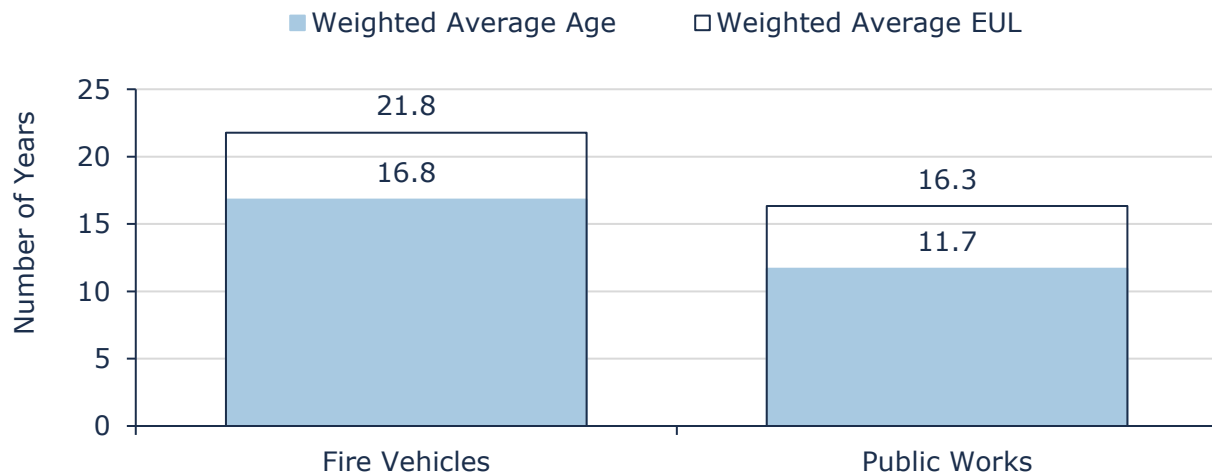


Figure 67 Estimated Useful Life vs. Asset Age: Vehicles

Age analysis reveals that, on average, most vehicles are in the latter stages of their expected life.

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.

Table 46 Lifecycle Management Strategy: Vehicles

Activity Type	Description of Current Strategy
Maintenance	<ul style="list-style-type: none"> Regular maintenance (grease and oil) is performed based on kilometers or annually if mileage is low. Small engines in fire trucks receive annual oil changes
Rehabilitation/ Replacement	<ul style="list-style-type: none"> Internal body work is performed, but engine rebuilds are rare due to low kilometers. Decision-making is reactive, based on age, condition, and rising repair costs. Fire truck replacement is condition-based, using the NFPA 15-year guideline as a reference.
Inspections	<ul style="list-style-type: none"> Inspections are visual and informal rather than documented. Fire trucks undergo bi-weekly inspections and annual safety inspections/testing.

5. Forecasted Long-Term Replacement Needs

Figure 68 illustrates the cyclical short-, medium- and long-term infrastructure replacement requirements for the Township’s vehicles portfolio. This analysis was run until 2047 to capture at least one iteration of replacement for the longest-lived asset in Citywide Assets, the Township’s primary asset management system and asset register. The Township’s average annual requirements (red dotted line) total \$57 thousand 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.

Replacement needs are forecasted to rise considerably in the current decade, peaking at \$500 thousand by 2038 as vehicles reach the end of their useful life. 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.

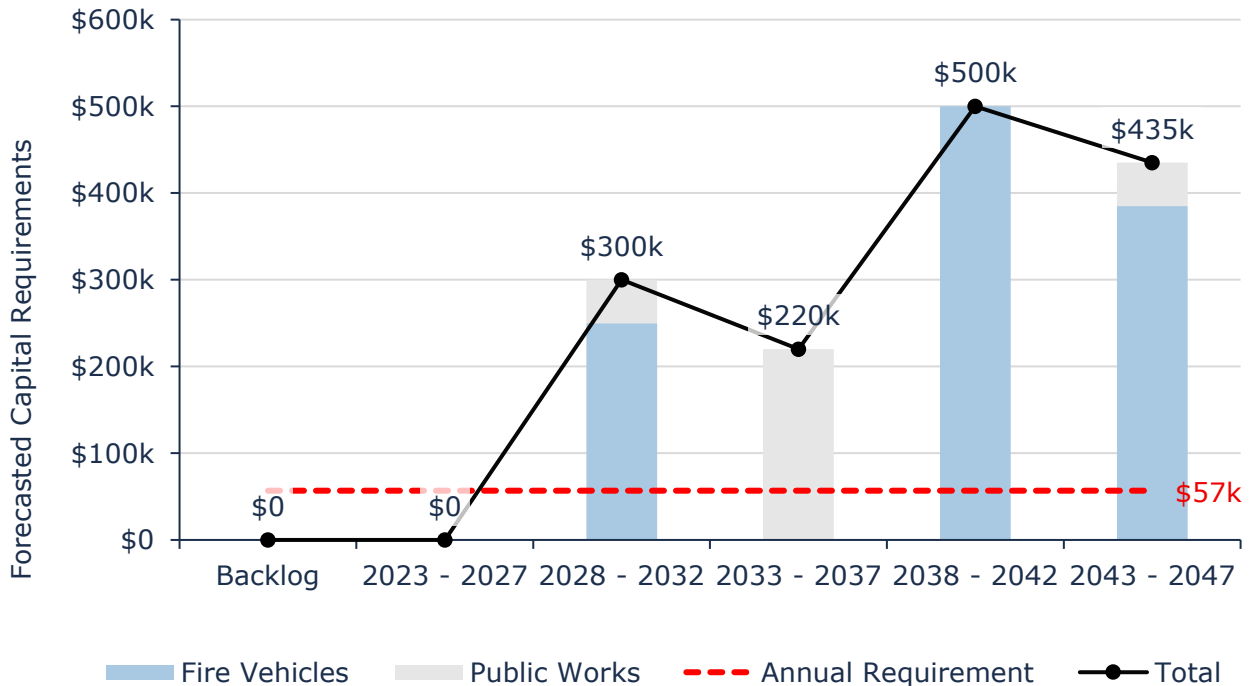


Figure 68 Forecasted Capital Replacement Needs: Vehicles 2023-2047

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 J – 10-Year Capital Requirements.

6. Risk Analysis

The risk matrix below is generated using available asset data, including condition and replacement costs. 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 Appendix L – Risk Rating Criteria for further details on approach used to determine asset risk ratings and classifications.

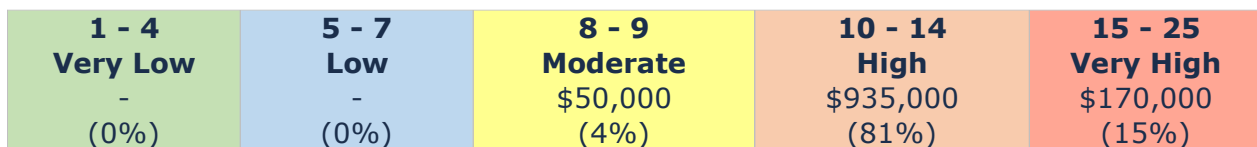


Figure 69 Risk Matrix: Vehicles

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.

Community Levels of Service

Table 47 Community Levels of Service: Vehicles

Service Attribute	Qualitative Description	Current LOS (2022)
Scope	Description, which may include images, of the types of vehicles (i.e. light, medium, and heavy duty) that the municipality operates and the services that they help to provide to the community	<ul style="list-style-type: none"> • Fire vehicles include a fire truck, tanker, and a rescue vehicle. • Public Works vehicles are vital for ensuring safe road conditions and managing infrastructure during inclement weather and construction projects.

Technical Levels of Service

Table 48 Technical Levels of Service: Vehicles

Service Attribute	Technical Metric	Current LOS (2022)
Quality	Average condition of vehicles	69%
Performance	Capital reinvestment rate	0%

Appendix I - Machinery & Equipment

The Township’s machinery and equipment portfolio includes 10 assets that support a variety of general and essential services, including recreation and fire. The total current replacement of machinery and equipment is estimated at approximately \$1.45 million.

1. Inventory & Valuation

Table 49 and Figure 70 summarizes the quantity and current replacement cost of all machinery and equipment assets available in the Township’s asset register.

Table 49 Detailed Asset Inventory: Machinery & Equipment

Segment	Quantity	Unit of Measure	Replacement Cost	Primary RC Method
Heavy Equipment	5	Assets	\$1,145,000	User-Defined
Medium Equipment	3	Assets	\$260,000	User-Defined
Smaller Equipment	2	Assets	\$48,000	User-Defined
TOTAL			\$1,453,000	

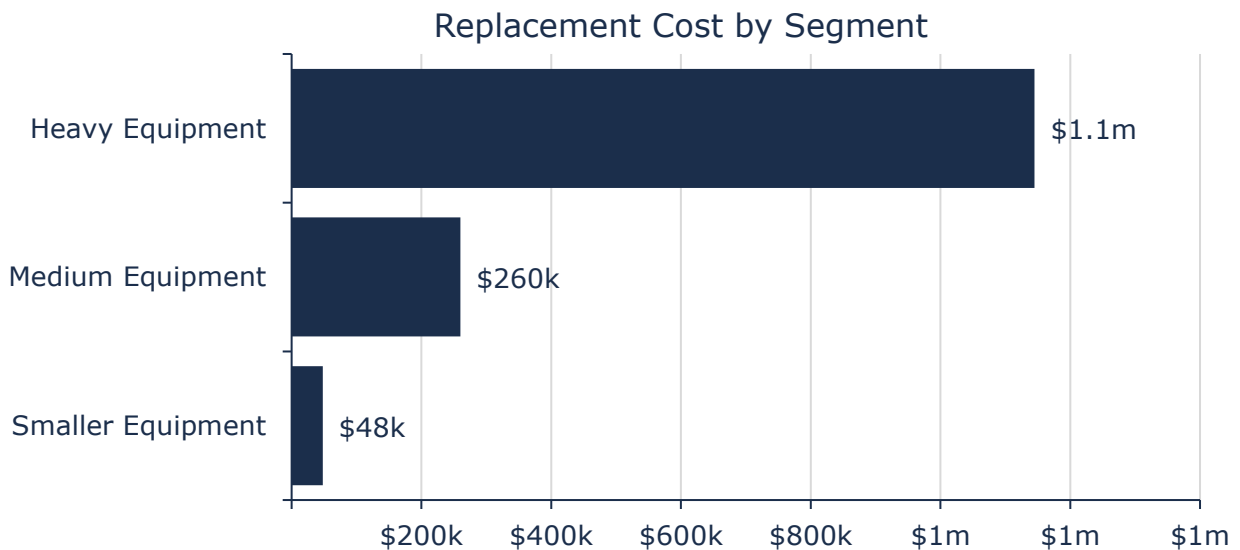


Figure 70 Portfolio Valuation: Machinery & Equipment

2. Asset Condition

Figure 71 summarizes the replacement cost-weighted condition of the Township’s machinery and equipment portfolio. Based only on desktop assessments, 98% of assets are in fair or better condition; the remaining 2% are in poor or worse condition.

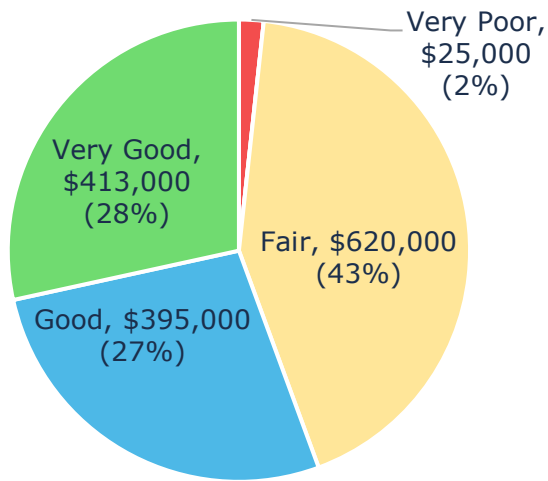


Figure 71 Asset Condition: Machinery & Equipment Overall

Figure 72 summarizes the age-based condition of machinery and equipment by each department. More than 50% of smaller equipment with a replacement cost of \$25 thousand are in very poor condition.

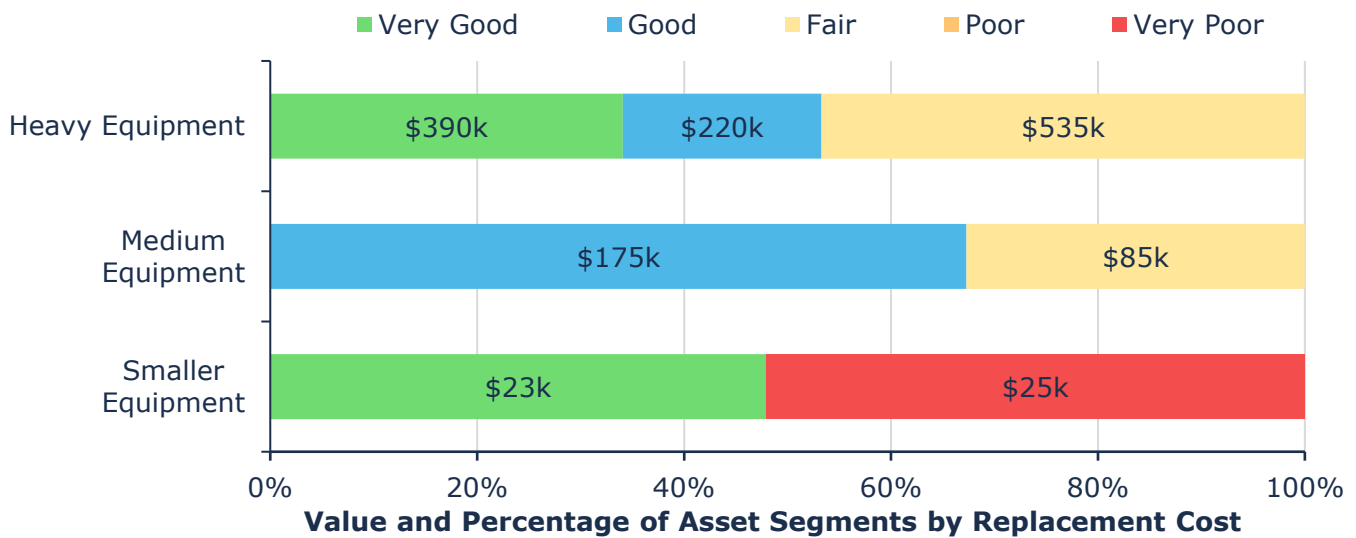


Figure 72 Asset Condition: Machinery & Equipment by Segment

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 73 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.

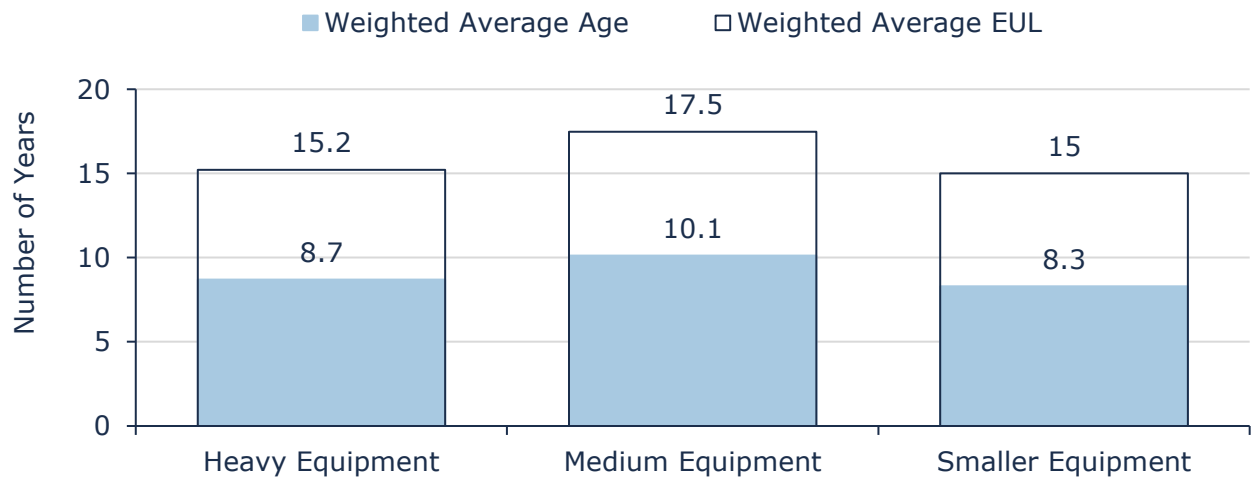


Figure 73 Estimated Useful Life vs. Asset Age: Machinery & Equipment

Age analysis reveals that, on average, most machinery and equipment assets are well within their expected useful life.

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.

Table 50 Lifecycle Management Strategy: Machinery & Equipment

Activity Type	Description of Current Strategy
Maintenance	Maintenance follows manufacturer guidelines or better.
Rehabilitation	Reaping/rehabbing is often preferred over replacement to avoid costs and complications related to new emission standards.
Replacement	Replacement occurs when the yearly cost of repairs becomes too high based on age and condition.
Inspections	Assessments and repairs are done internally by staff with heavy equipment backgrounds. Issues are identified during daily inspections or annual safety checks.

5. Forecasted Long-Term Replacement Needs

Figure 74 illustrates the cyclical short-, medium- and long-term infrastructure replacement requirements for the Township’s machinery and equipment portfolio. This analysis was run until 2047 to capture at least one iteration of replacement for the longest-lived asset in Citywide Assets, the Township’s primary asset management system and asset register. The Township’s average annual requirements (red dotted line) total \$99 thousand for all machinery and 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.

Replacement needs are forecasted to remain consistent over the entire forecast period, peaking at \$780 thousand in the next five years. 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.

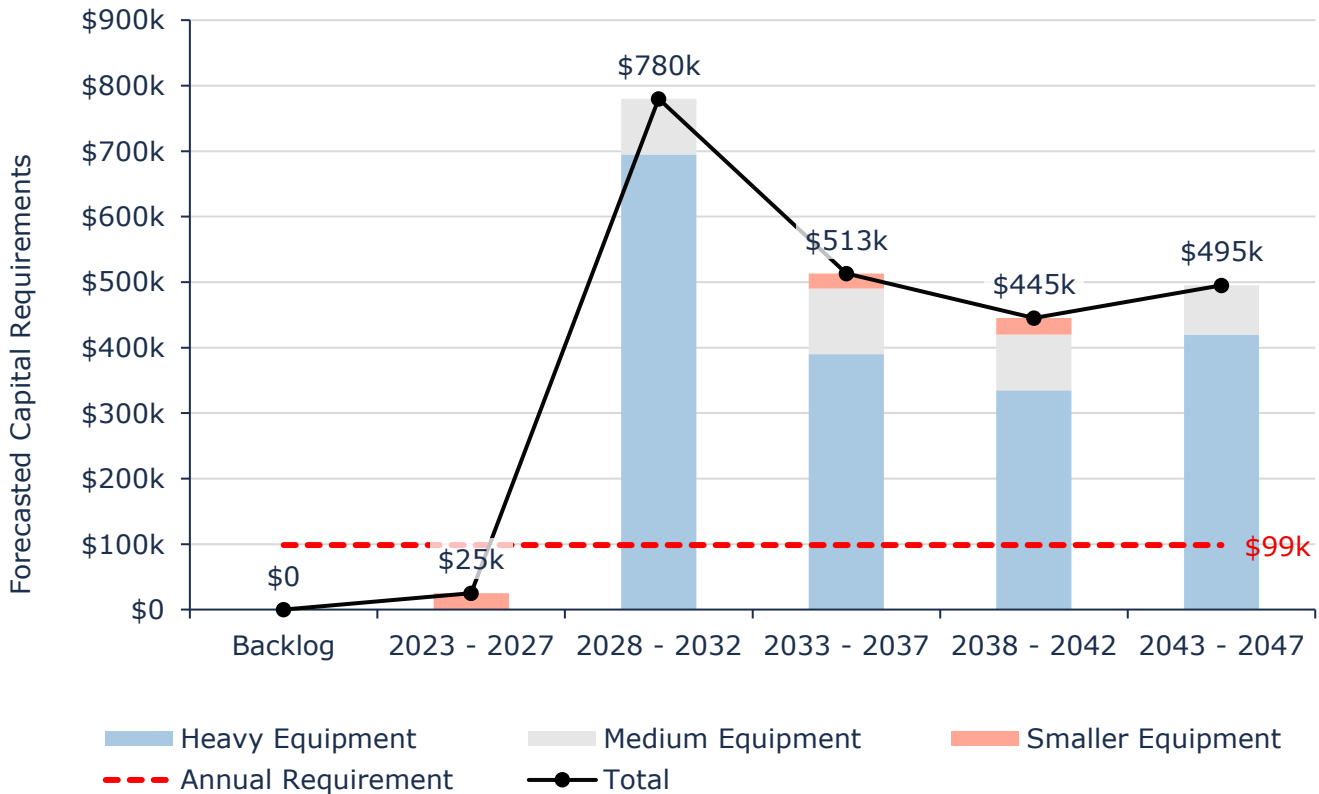


Figure 74 Forecasted Capital Replacement Needs: Machinery & Equipment 2023-2047

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 J – 10-Year Capital Requirements.

6. Risk Analysis

The risk matrix below is generated using available asset data, including condition and replacement cost. 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 Appendix L – Risk Rating Criteria section for further details on approach used to determine asset risk ratings and classifications.

1 - 4 Very Low \$23,000 (2%)	5 - 7 Low \$390,000 (27%)	8 - 9 Moderate - (0%)	10 - 14 High \$395,000 (27%)	15 - 25 Very High \$645,000 (44%)
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Figure 75 Risk Matrix: Machinery & Equipment

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.

Community Levels of Service

Table 51 Community Levels of Service: Machinery & Equipment

Service Attribute	Qualitative Description	Current LOS (2022)
Scope	Description, which may include images, of the types of equipment that the municipality operates and the services that they help to provide to the community	The Township has a range of heavy, medium and small equipment such as Excavator, Zamboni, Tractors, and Mowers to support various maintenance and rehabilitation activities.

Technical Levels of Service

Table 52: Technical Levels of Service: Machinery & Equipment

Service Attribute	Technical Metric	Current LOS (2022)
Quality	Average condition of equipment	70%
Performance	Capital reinvestment rate	0%

Appendix J – 10-Year Capital Requirements

The tables below summarize the projected cost of lifecycle activities (rehabilitation and replacements) that may be undertaken over the next 10 years to support current levels of service.

These projections are generated in Citywide and rely on the data available in the asset register. Assessed condition data and replacement costs were used to assist in forecasting replacement needs for roads. For all remaining assets, only age was used to determine forthcoming replacement needs.

The projections can be different from actual capital forecasts. Consistent data updates, particularly condition, replacement costs, and regular upkeep of lifecycle models, will improve the alignment between the system generated expenditure requirements, and the Township’s capital expenditure forecasts.

Road Network

Table 53 System Generated 10-Year Capital Replacement Forecast: Road Network

Segment	Backlog	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032
Paved Roads (HCB)	-	\$200k	\$350k	\$150k	-	\$150k	\$50k	\$500k	-	\$150k	\$202k
Paved Roads (LCB)	-	\$250k	\$250k	\$50k	\$200k	\$352k	-	\$500k	-	\$50k	\$200k
Streetlights	-	-	-	-	-	-	-	-	-	-	-
Total	-	\$450k	\$600k	\$200k	\$200k	\$502k	\$50k	\$1.0m	-	\$200k	\$402k

Stormwater Network

Table 54 System Generated 10-Year Capital Replacement Forecast: Road Network

Segment	Backlog	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032
Catch Basins	\$95k	-	-	-	-	-	-	-	-	-	-
Storm Sewer Mains	\$1.5m	-	-	-	-	-	-	-	-	-	-
Total	\$1.6 m	-	-	-	-	-	-	-	-	-	-

Facilities

Table 55 System Generated 10-Year Capital Replacement Forecast: Road Network

Segment	Backlog	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032
General Government	-	-	-	-	-	-	-	-	-	-	-
Parks Buildings	-	-	-	-	-	-	-	-	-	-	-
Public Works Buildings	-	-	-	-	-	-	-	-	-	-	-
Recreation Buildings	\$1.0m	-	-	-	-	-	-	-	-	-	-
Total	\$1.0m	-	-	-	-	-	-	-	-	-	-

Vehicles

Table 56 System Generated 10-Year Capital Replacement Forecast: Road Network

Segment	Backlog	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032
Fire	-	-	-	-	-	-	-	-	-	-	\$250k
Public Works	-	-	-	-	-	-	\$50k	-	-	-	-
Total	-	-	-	-	-	-	\$50k	-	-	-	\$250k

Machinery & Equipment

Table 57 System Generated 10-Year Capital Replacement Forecast: Road Network

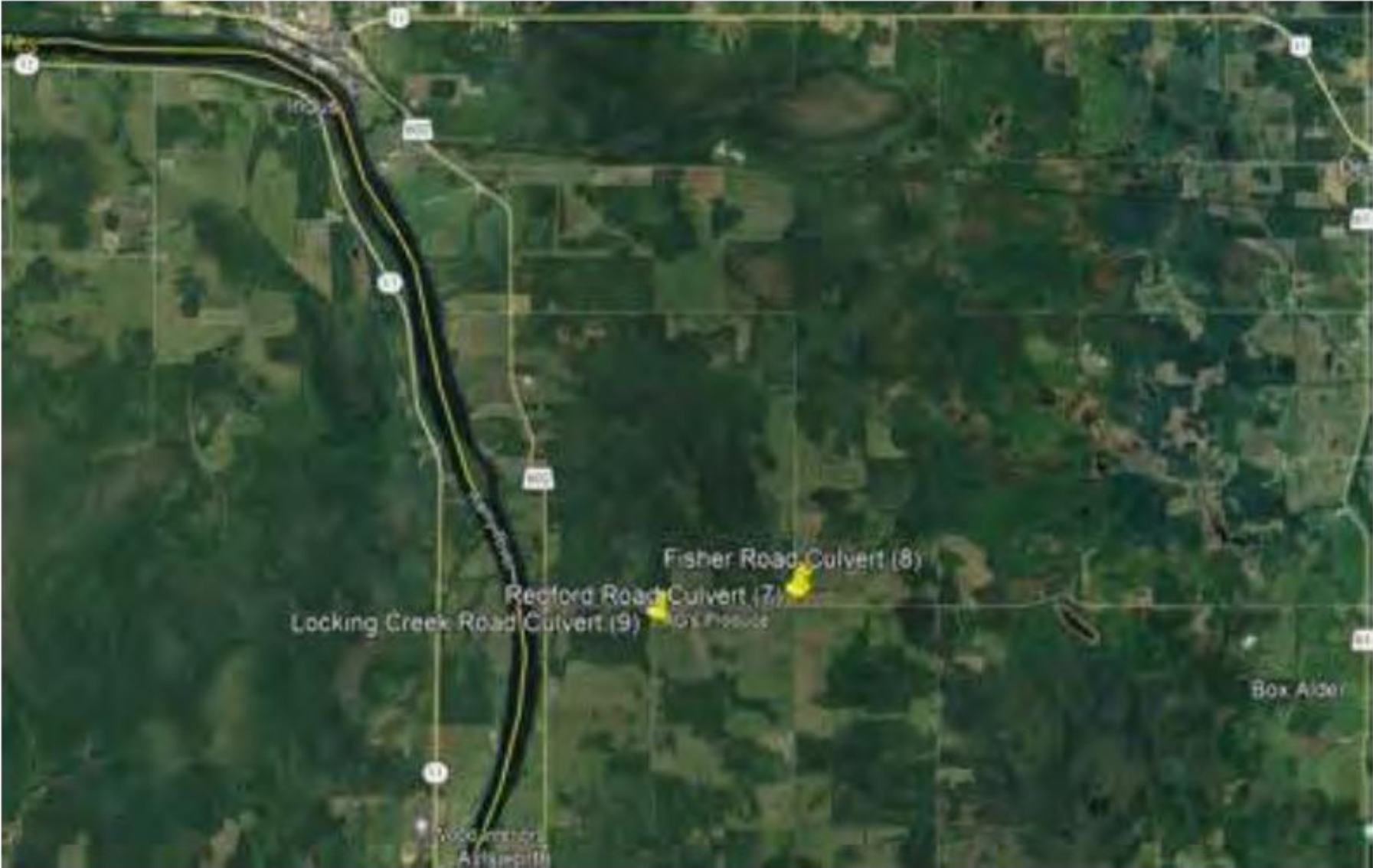
Segment	Backlog	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032
Heavy Equipment	-	-	-	-	-	-	-	\$275k	-	\$200k	\$220k
Medium Equipment	-	-	-	-	-	-	\$85k	-	-	-	-
Smaller Equipment	-	-	-	\$25k	-	-	-	-	-	-	-
Total	-	-	-	\$25k	-	-	\$85k	\$275k	-	\$200k	\$220k

Appendix K – Level of Service Maps & Photos

Location of Bridges & Culverts – North of Highway 11 (1/2)



Location of Bridges & Culverts – North of Highway 11 (2/2)



Example of a bridge in good condition – Stewart Road Bridge – BCI: 70



East Approach



West Approach



Guardrail Damage - NE



Typical Surface Wearing



SE Embankment



Bearing Timber - SE

Example of a culvert in good condition – Stewart Road Bridge – BCI: 75



North Approach



View - East



Barrel Looking West



West Elevation



Barrel Looking East



View - West

Appendix L – Risk Rating Criteria

Probability of Failure (PoF)

Table 58 Probability of Failure Risk Scores

Asset Category	Risk Criteria	Criteria Weighting	Value/Range	PoF Score
All Assets	Condition	100%	80-100	1
			60-79	2
			40-59	3
			20-39	4
			0-19	5

Consequence of Failure (CoF)

Table 59 Consequence of Failure Risk Scores

Asset Category	Risk Classification	Risk Criteria	Value/Range	Consequence of Failure Score
All assets	Economic (100%)	Replacement Cost (100%)	\$500 and below	1
			\$5000 and below	2
			\$25000 and below	3
			\$50000 and below	4
			\$60000 and below	5

Appendix M – Condition Assessment Guidelines

The foundation of good asset management practice is accurate and reliable data on the current condition of infrastructure. Assessing the condition of an asset at a single point in time allows staff to have a better understanding of the probability of asset failure due to deteriorating conditions.

Condition data is vital to the development of data-driven asset management strategies. Without accurate and reliable asset data, there may be little confidence in asset management decision-making which can lead to premature asset failure, service disruption and suboptimal investment strategies. To prevent these outcomes, the Township's condition assessment strategy should outline several key considerations, including:

- The role of asset condition data in decision-making
- Guidelines for the collection of asset condition data
- A schedule for how regularly asset condition data should be collected

Role of Asset Condition Data

The goal of collecting asset condition data is to ensure that data is available to inform maintenance and renewal programs required to meet the desired level of service. Accurate and reliable condition data allows municipal staff to determine the remaining service life of assets, and identify the most cost-effective approach to deterioration, whether it involves extending the life of the asset through remedial efforts or determining that replacement is required to avoid asset failure.

In addition to the optimization of lifecycle management strategies, asset condition data also impacts the Township's risk management and financial strategies. Assessed condition is a key variable in the determination of an asset's probability of failure. With a strong understanding of the probability of failure across the entire asset portfolio, the Township can develop strategies to mitigate both the probability and consequences of asset failure and service disruption. Furthermore, with condition-based determinations of future capital expenditures, the Township can develop long-term financial strategies with higher accuracy and reliability.

Guidelines for Condition Assessment

Whether completed by external consultants or internal staff, condition assessments should be completed in a structured and repeatable fashion, according to consistent and objective assessment criteria. Without proper guidelines for the completion of condition assessments there can be little confidence in the validity of condition data and asset management strategies based on this data.

Condition assessments must include a quantitative or qualitative assessment of the current condition of the asset, collected according to specified condition rating criteria, in a format that can be used for asset management decision-making. As a result, it is important that staff adequately define the condition rating criteria that should be used and the assets that require a discrete condition rating. When engaging with external consultants to complete condition assessments, it is critical that these details are communicated as part of the contractual terms of the project.

There are many options available to the Township to complete condition assessments. In some cases, external consultants may need to be engaged to complete detailed technical assessments of infrastructure. In other cases, internal staff may have sufficient expertise or training to complete condition assessments.

Developing a Condition Assessment Schedule

Condition assessments and general data collection can be both time-consuming and resource intensive. It is not necessarily an effective strategy to collect assessed condition data across the entire asset inventory. Instead, the Township should prioritize the collection of assessed condition data based on the anticipated value of this data in decision-making. The International Infrastructure Management Manual (IIMM) identifies four key criteria to consider when making this determination:

- **Relevance:** every data item must have a direct influence on the output that is required
- **Appropriateness:** the volume of data and the frequency of updating should align with the stage in the assets life and the service being provided
- **Reliability:** the data should be sufficiently accurate, have sufficient spatial coverage and be appropriately complete and current
- **Affordability:** the data should be affordable to collect and maintain