Asset Management Plan

Township of Otonabee-South Monaghan

July 2025

This Asset Management Program was prepared by:

psdcitywide

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

Key Statistics

$122.2M	Replacement Cost of Asset Portfolio
$40.1K	Replacement Cost of Infrastructure Per Household
86%	Percentage of Assets in Fair or Better Condition
61%	Percentage of Assets with Assessed Condition Data
$2.4M	Annual Capital Infrastructure Deficit
15 Years	Recommended Timeframe to reach Proposed Levels of Service - Taxes
10 Years	Recommended Timeframe to reach Proposed Levels of Service - Rates
3.4%	Target Investment Rate to meet Proposed Levels of Service
1.4%	Actual Investment Rate

Table of Contents

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 Otonabee-South Monaghan can ensure that public infrastructure is managed to support the sustainable delivery of municipal services.

This AMP includes the following asset categories:

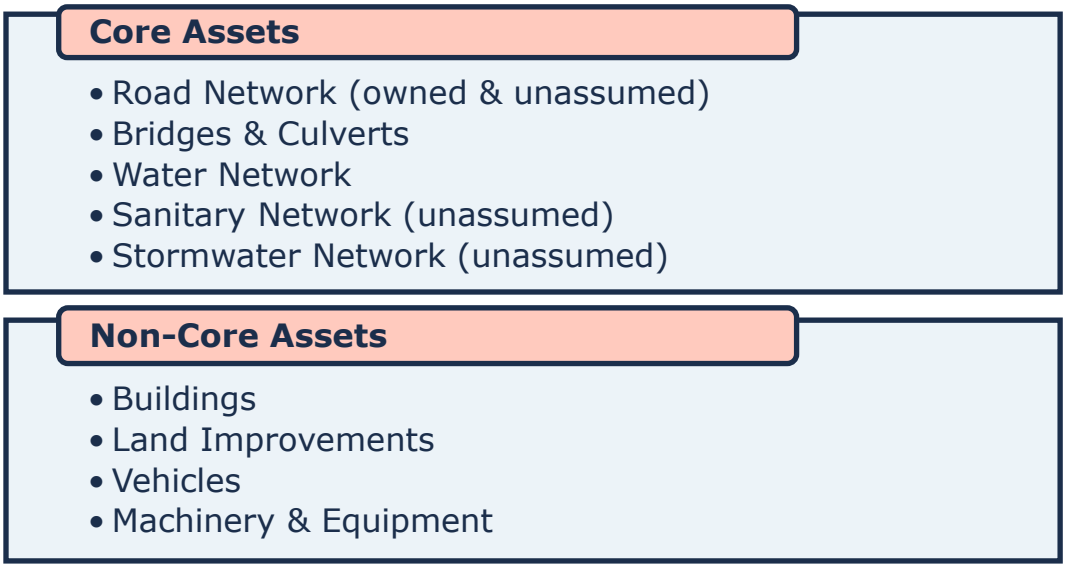


Figure 1: Core and Non-core Asset Categories

Unassumed assets have been included in this analysis due to their relevance to long-term planning and financial forecasting. Although these assets are not yet formally owned by the Township, they are expected to be assumed in early 2026 and are already tied to operational and financial responsibilities, including rate collection and reserve contributions. Including these assets ensures a more accurate reflection of future infrastructure needs and supports proactive lifecycle and funding strategies aligned with anticipated growth.

1.2. Compliance

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

1.3. Findings

The overall replacement cost of the asset categories included in this AMP totals $122.2 million. 86% of all assets analyzed in this AMP are in fair or better condition and assessed condition data was available for 61% of assets. For the remaining assets, assessed condition data was unavailable, and asset age was used to approximate condition – a data gap that persists in most municipalities. Generally, age misstates the true condition of assets, making assessments essential to accurate asset management planning, and a recurring recommendation in this AMP.

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

To meet capital replacement and rehabilitation needs for existing infrastructure, prevent infrastructure backlogs, and achieve long-term sustainability, the Township's average annual capital requirement totals $4.2 million. Based on a historical analysis of sustainable capital funding sources, the Township is committing approximately $1.7 million towards capital projects or reserves per year. As a result, there is currently an annual funding gap of $2.4 million.

The Township has adopted a full funding strategy to support the continued delivery of current service levels, phased over 15 years for tax-supported assets and 10 years for water assets. This approach will help to close the infrastructure funding gap without significant impacts on taxpayers or ratepayers.

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 and to meet the Township's desired proposed levels of service. The following graphic shows annual tax/rate change required to meet the proposed levels of service.

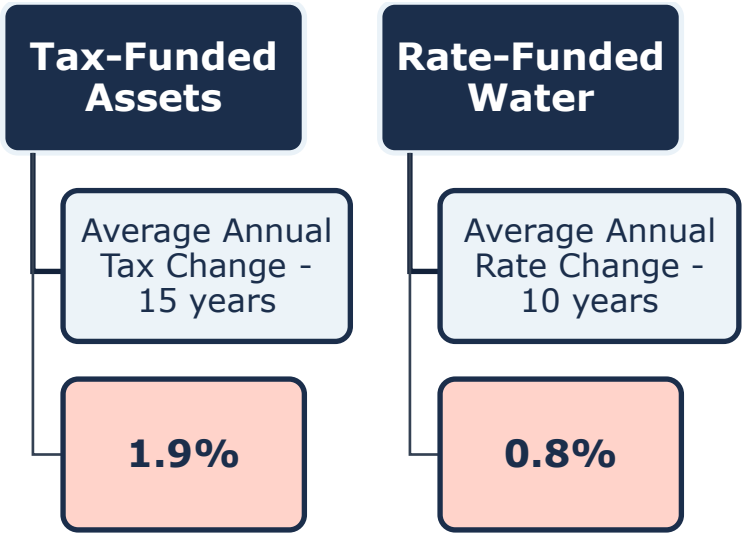


Figure 2: Proposed Tax and Rate Changes

1.5. Limitations and Constraints

The asset management program development required substantial effort by staff, it was developed based on best-available data, and is subject to the following broad limitations, constrains, 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 by in-field assessments.
- 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 asset 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 most of the analysis presented, including condition summaries, age profiles, long-term replacement and rehabilitation forecasts, and shorter term, 10-year forecasts that are generated from Citywide, the Township's primary asset management system.

These challenges are quite common and require long-term commitment and sustained effort by staff. As the Township's asset management program evolves and advances, the quality of future AMPs and other core documents that support asset management will continue to increase.

2. Introduction and Context

2.1. Community Profile

Census Characteristic	Township of Otonabee-South Monaghan	Ontario
Population 2021	7,087	14,223,942
Population Change 2016-2021	+6.3%	5.8%
Total Private Dwellings	3,050	5,929,250
Population Density	20.5/km^2	15.9/km^2
Land Area	346.15 km^2	892,411.76 km^2

Table 1: Township of Otonabee-South Monaghan Community Profile

The Township of Otonabee-South Monaghan is a vibrant single-tier municipality in Peterborough County in Central Ontario. The Township is located along Indian River, near Rice Lake. The Township of Otonabee-South Monaghan includes the communities of Assumption, Bailieboro, Bensfort, Fraserville, Indian River, Keene, Lang, South Monaghan, Stewart Hall, Villiers, and Woodview.

In 1998, the townships of Otonabee and South Monaghan amalgamated into the Township of Otonabee-South Monaghan. The Township has a collection of outdoor recreation amenities and cultural sites. This includes a portion of the Trans-Canada Trail that passes through the Township. The Township borders Hiawatha First Nation reserve to its South.

The Township has an abundance of beautiful natural areas primed for recreation and exploration. The nearby Rice Lake provides ample opportunity for fishing and recreation-based tourism in addition to the other various sites throughout the Township. In addition to tourism, there is also a commitment to the agricultural industry that has been historically employed by the Township.

The Township of Otonabee-South Monaghan has experienced minimal population change over the last 20 years. Around 24% of the population is above the age of 65, this follows in line with the statistics for the overall Peterborough County.

The Township's infrastructure priorities within the municipality include maintaining municipal facilities, recreation and cultural services, and public works.

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. Otonabee-South Monaghan Climate Profile

The Township Otonabee-South Monaghan is located in Central Ontario along Rice Lake. 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 following trends are noted for the Township of Otonabee-South Monaghan:

Higher Average Annual Temperature:

- Between the years 1971 and 2000 the annual average temperature was 6.5 ºC
- Under a high emissions scenario, the annual average temperatures are projected to increase by 2.8ºC by the year 2050 and by over 4.8 ºC by the end of the century.

Increase in Total Annual Precipitation:

- Under a high emissions scenario, Otonabee-South Monaghan is projected to experience a 13% increase in precipitation by the year 2051 and a 18% 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.
- In some areas, extreme weather events will occur with greater frequency and severity than others especially those impacted by Great Lake winds.

2.2.2. Trent-Severn Waterway

The Trent-Severn Waterway is a canal route connecting several large bodies of water in the area. It provides service to the surrounding area through transportation, water management, and tourism. With changes in climate with regards to temperature and precipitation, there can be changes to this natural resource. These changes can lead to the need for mitigations, or adaptations in assets to provide residents with the same level and quality of service.

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

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.

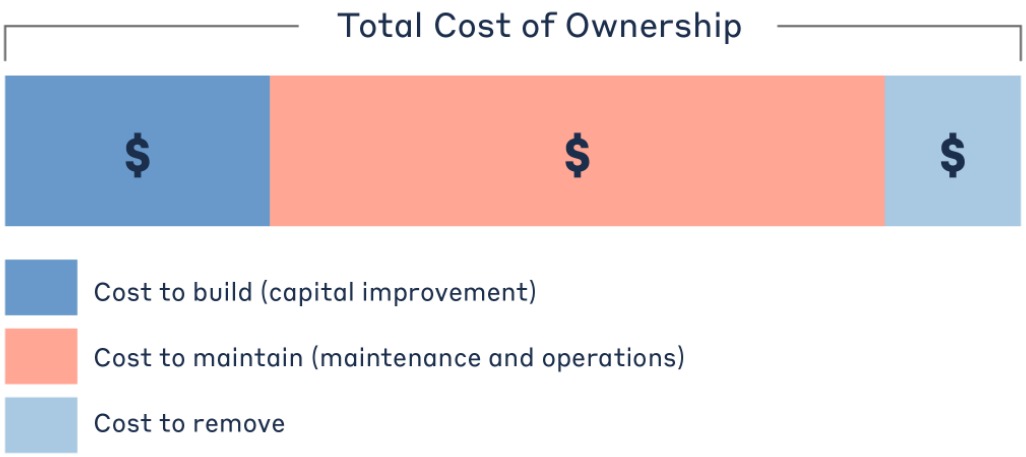


Figure 3: Total Cost of Asset Ownership

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 a broader asset management program.

This industry standard, defined by the Institute of Asset Management (IAM), emphasizes the alignment between the corporate strategic plan and various asset management documents.

2.3.1. Foundational Documents

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.

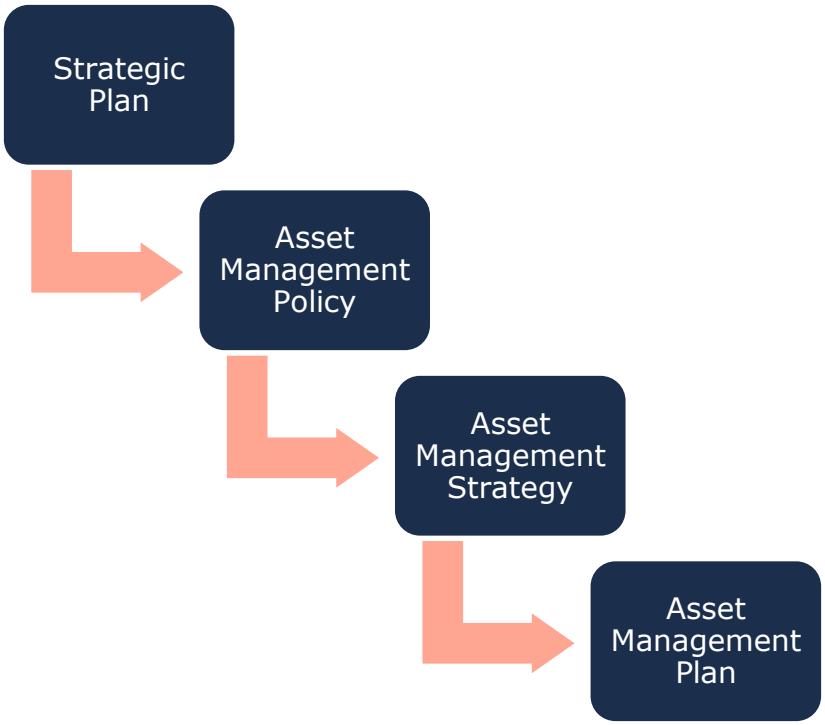


Figure 4: Foundational Asset Management Documents

Strategic Plan

The strategic plan has a direct, and cascading impact on asset management planning and reporting, making it a foundational element. At the beginning of each term, Council holds strategic planning exercises and discussions to identify major initiatives and administrative improvements it wishes to achieve during its tenure. Staff then identify the scope, resources, timing & other logistical matters associated with proposed initiatives.

Asset Management Policy

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

The Township of Otonabee-South Monaghan adopted an Asset Management Policy on June 22, 2020, in accordance with Ontario Regulation 588/17. The Township will implement best practices in asset management in the following ways:

- Prioritizing asset maintenance and replacement
- Using data for decision-making
- Regularly updating the Asset Management Plan
- Ensuring transparency with stakeholders
- Managing infrastructure risk effectively
- Providing ongoing staff training

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

Asset Management Plan

The asset management plan presents the outcomes of the Township of Otonabee-South Monaghan'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 with updates to asset information and financial data. This will allow the Township of Otonabee-South Monaghan to re-evaluate the state of infrastructure and identify how the organization's asset management and financial strategies are progressing.

2.4. 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.

2.4.1. Lifecycle Management Strategies

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

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

There are several field intervention activities that are available to extend the life of an asset. These activities can be generally placed into one of three categories: maintenance, rehabilitation, and replacement. The figure below 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.

Maintenance

- General level of cost is **$**
- All actions necessary for retaining an asset as near as practicable to its original condition, but excluding rehabilitation or renewal. Maintenance does not increase the service potential of the asset
- It slows down deterioration and delays when rehabilitation or replacement is necessary.

Rehabilitation / Renewal

- General level of cost is **$$$**
- Works to rebuild or replace parts or components of an asset, to restore it to a required functional condition and extend its life, which may incorporate some modification.
- Generally involves repairing the asset to deliver its original level of service (i.e. milling and paving of roads) without resorting to significant upgrading or replacement, using available techniques and standards.

Replacement

- General level of cost is **$$$$$**
- The complete replacement of an asset that has reached the end of its life, so as to provide a similar, or agreed alternative, level of service.
- Existing asset disposal is generally included.

Figure 5: Lifecycle Management Typical Lifecycle Interventions

The Township's approach to lifecycle management is described within each asset category. Developing and implementing a proactive lifecycle strategy will help staff 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.

2.4.2. Risk and Criticality

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

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

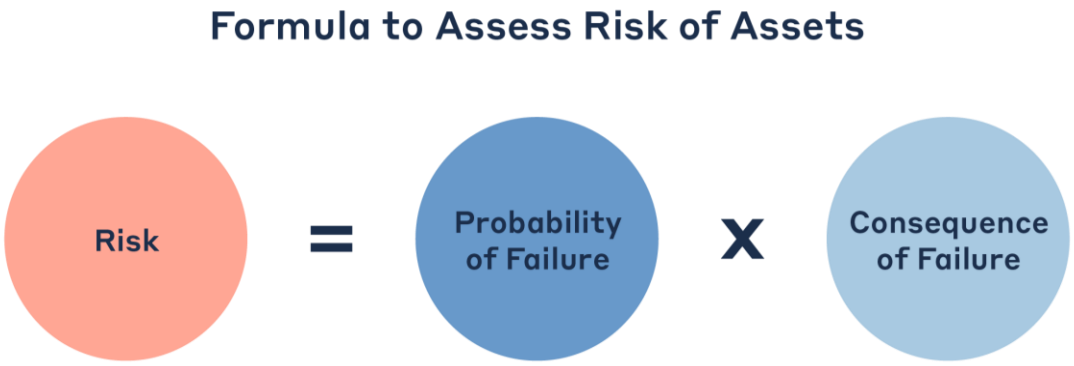


Figure 6: Risk Equations

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. See Appendix D: Risk Rating Criteria for definitions and the developed risk models.

Table 2 illustrates the various types of consequences that can be integrated in developing risk and criticality models for each asset category and segments within. Note that these consequences are common, but not exhaustive.

Type of Consequence	***Description***

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

Table 2: Risk Analysis - Types of Consequences of Failure

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

These models have been built in Citywide for continued review, updates, and refinements.

2.4.3. Levels of Service

A level of service (LOS) is a measure of the services that Otonabee-South Monaghan is providing to the community and the nature and quality of that service. Within each asset category, technical metrics and qualitative descriptions that measure both technical and community levels of service have been established and measured where data is available.

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, the province, through O. Reg. 588/17, has provided qualitative descriptions that are required. For non-core asset categories, the Township has determined the qualitative descriptions that will be used. The metrics can be found in the levels of service subsection within each asset category.

Technical Levels of Service

Technical LOS 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, the province, through O. Reg. 588/17, has provided technical metrics that are required. For non-core asset categories, the Township determined the technical metrics that will be used. The metrics can be found in the levels of service subsection within each asset category.

Current and Proposed Levels of Service

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

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

2.5. Scope and Methodology

2.5.1. Asset Categories for this AMP

This asset management plan for the Township of Otonabee-South Monaghan is produced in compliance with O. Reg. 588/17. The AMP summarizes the state of the infrastructure for Otonabee-South Monaghan'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.

Tax-Funded Assets

- Road Network
- Bridges & Culverts
- Buildings
- Stormwater Network
- Land Improvements
- Vehicles
- Machinery & Equipment

Rate-Funded Assets

- Water Network
- Sanitary Network

Table 3: Tax and Rate-Funded Assets

2.5.2. Data Effective Date

It is important to note that this plan is based on data as of December 31, 2023; 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.

2.5.3. 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. The two methodologies are:

- User-Defined Cost and Cost/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 cost of the asset is 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.

2.5.4. Estimated Useful Life and 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 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 date 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

2.5.5. 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.

Figure 8: Target Reinvestment Rate Calculation

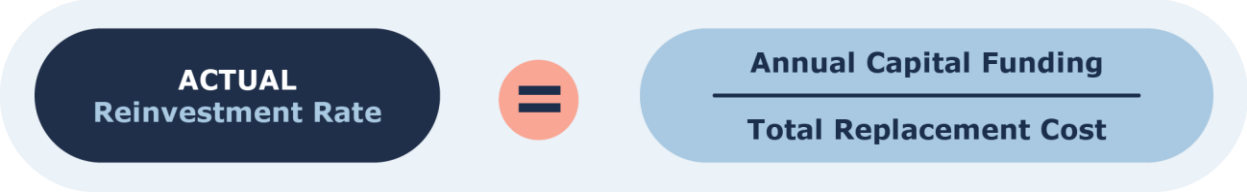


Figure 9: Actual Reinvestment Rate Calculation

2.5.6. Asset Condition

An incomplete or limited understanding of asset condition can mislead long-term planning and decision-making. Accurate and reliable condition data helps to prevent premature 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.

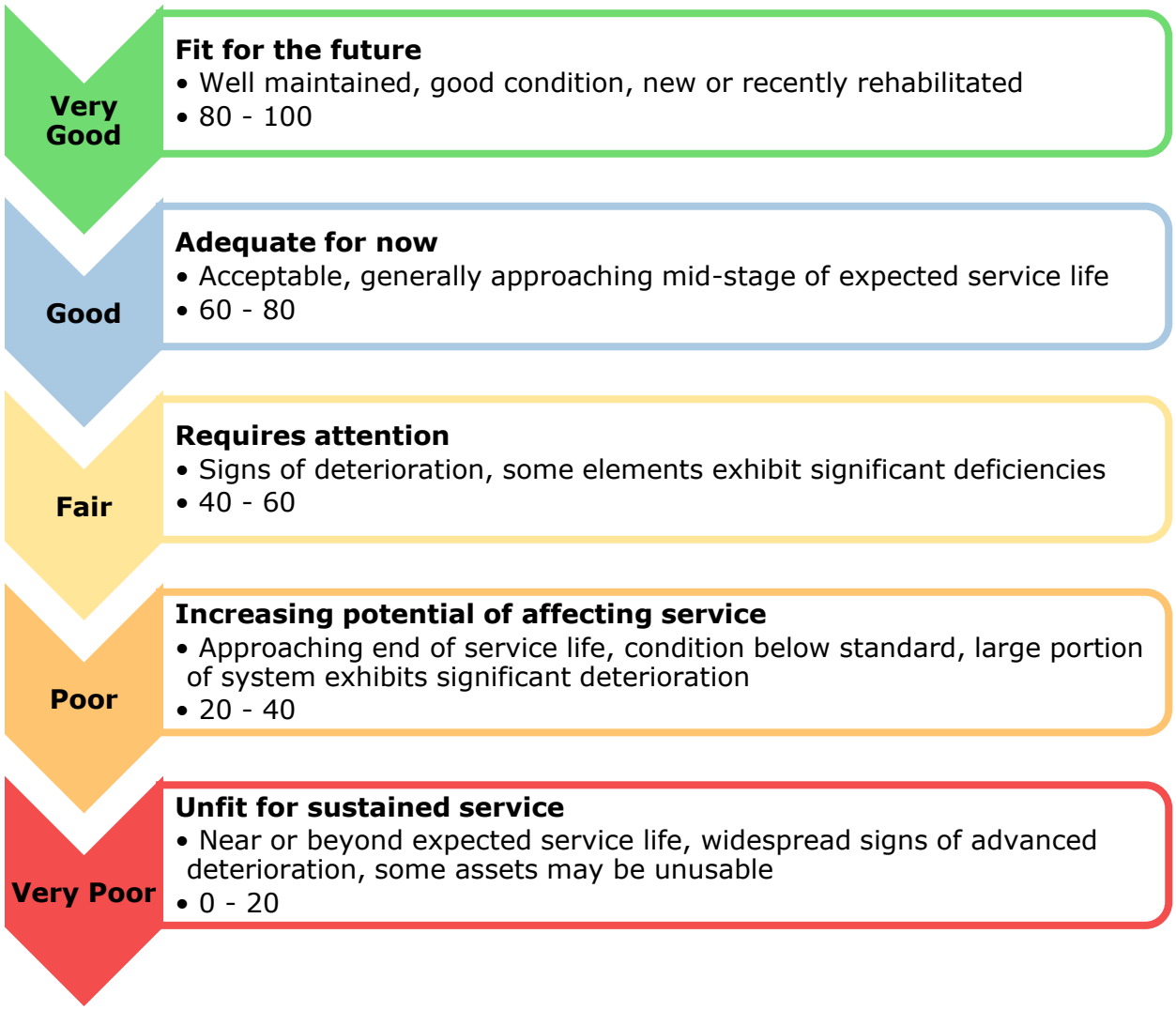


Figure 10: Standard Condition Rating Scale

The analysis 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. Appendix C: Condition Assessment Guidelines includes additional information on the role of asset condition data and provides basic guidelines for the development of a condition assessment program.

2.6. Ontario Regulation 588/17

As part of the Infrastructure for Jobs and Prosperity Act, 2015, the Ontario government introduced Regulation 588/17 - Asset Management Planning for

Municipal Infrastructure (O. Reg 588/17)[1]. Along with creating better performing organizations, more liveable and sustainable communities, the regulation is a key mandated driver of asset management planning and reporting. It places substantial emphasis on current and proposed levels of service and the lifecycle costs incurred in delivering them.

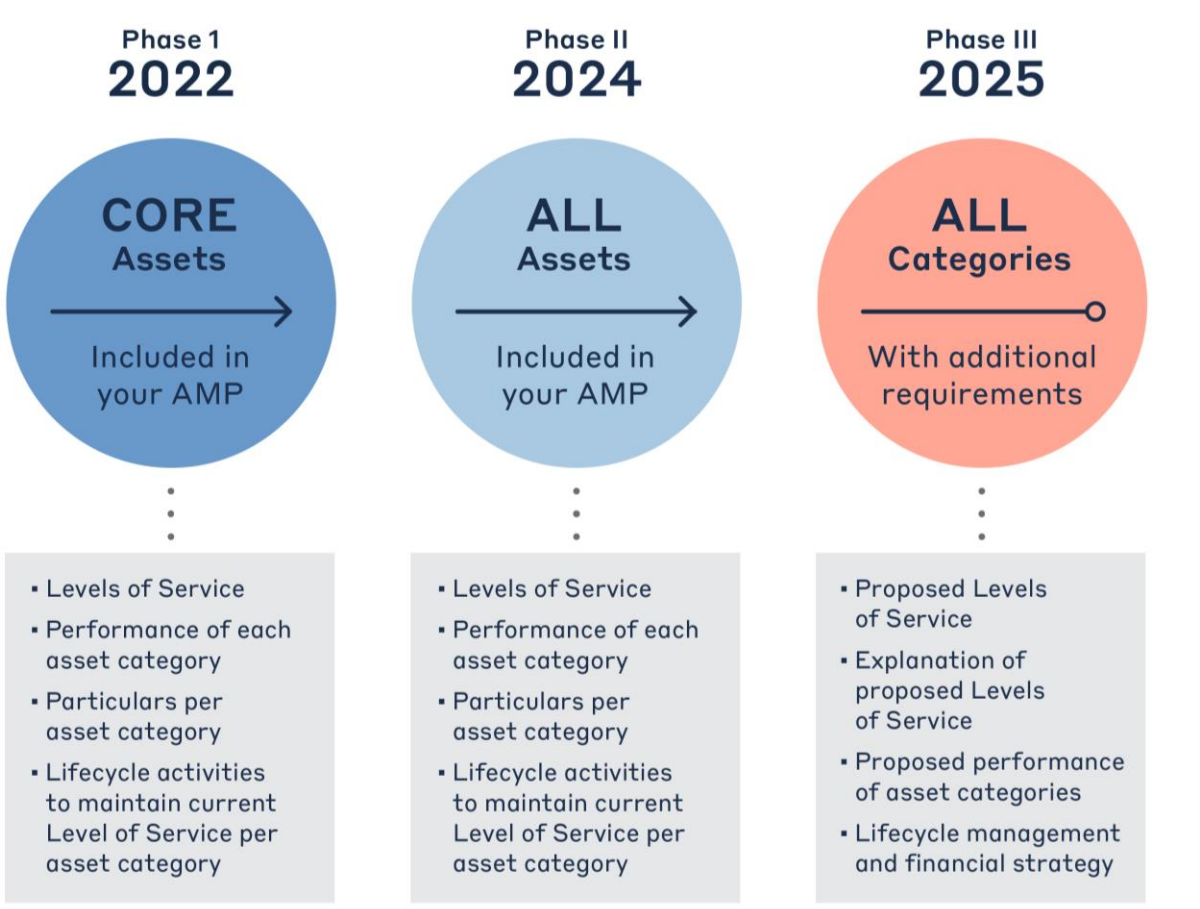


Figure 11: O. Reg. 588/17 Requirements and Reporting Deadlines

2.6.1. O. Reg. 588/17 Compliance Review

Requirement	O. Reg. 588/17 Section	AMP Section Reference	Status
Summary of assets in each category	S.5(2), 3(i)	5.1 – 13.1	Complete
Replacement cost of assets in each category	S.5(2), 3(ii)	5.2 – 13.2	Complete

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

Requirement	O. Reg. 588/17 Section	AMP Section Reference	Status
Average age of assets in each category	S.5(2), 3(iii)	5.3 – 13.3	Complete
Condition of core assets in each category	S.5(2), 3(iv)	5.3 – 13.3	Complete
Description of municipality's approach to assessing the condition of assets in each category	S.5(2), 3(v)	5.3.1 - 13.3.1	Complete
Current levels of service in each category	S.5(2), 1(i-ii)	5.7 – 13.7	Complete
Current performance measures in each category	S.5(2), 2	5.7 – 13.7	Complete
Lifecycle activities needed to maintain current levels of service for 10 years	S.5(2), 4	5.4 – 13.4	Complete
Costs of providing lifecycle activities for 10 years	S.5(2), 4	5.5 – 13.5	Complete
Growth considerations	S.6(1), 5	15.4	Complete
Proposed levels of service for each category for next 10 years	S.6(1), 1(i-ii)	5.7.3 - 13.7.3	Complete
Explanation of appropriateness of proposed levels of service	S.6(1), 2(i-iv)	4.3.1	Complete
Lifecycle management activities for proposed levels of service	S.6(1), 4(i)	4.4.1 – 4.6.1	Complete
10-year capital costs for proposed levels of service	S.6(1), 4(ii)	Appendix A	Complete
Annual funding availability projections	S.6(1), 4(iii)	4.4 – 4.6	Complete

Table 4: O. Reg. 588/17 Compliance Review

Portfolio Overview

3. 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 illustrates 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. Key category details are summarized at the asset segment level.

Figure 12: Asset Hierarchy and Data Classification

3.2. Portfolio Overview

3.2.1. Replacement Cost

All Otonabee-South Monaghan's asset categories have a total replacement cost of $122.2 million based on available inventory data. This total was determined based on a combination of user-defined costs and historical cost inflation. This estimate reflects the replacement of historical assets with similar, not necessarily identical, assets available for procurement today.

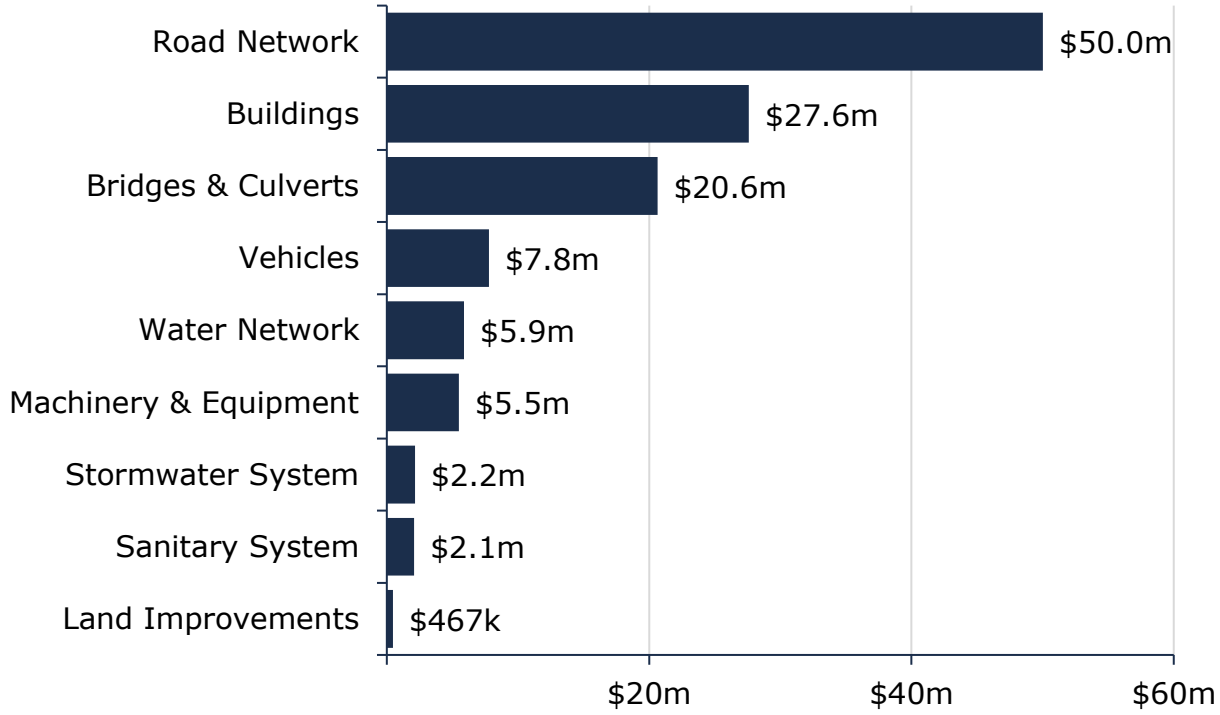


Figure 13: Current Replacement Cost by Asset Category

3.2.2. Target vs. Actual Reinvestment Rate

The graph below depicts funding gaps or surpluses by comparing target vs actual reinvestment rate. To meet the long-term replacement needs, the Township is recommended to be allocating approximately $4.2 million annually, for a target reinvestment rate of 3.4%. Actual annual spending on infrastructure totals approximately $1.7 million, for an actual reinvestment rate of 1.4%.

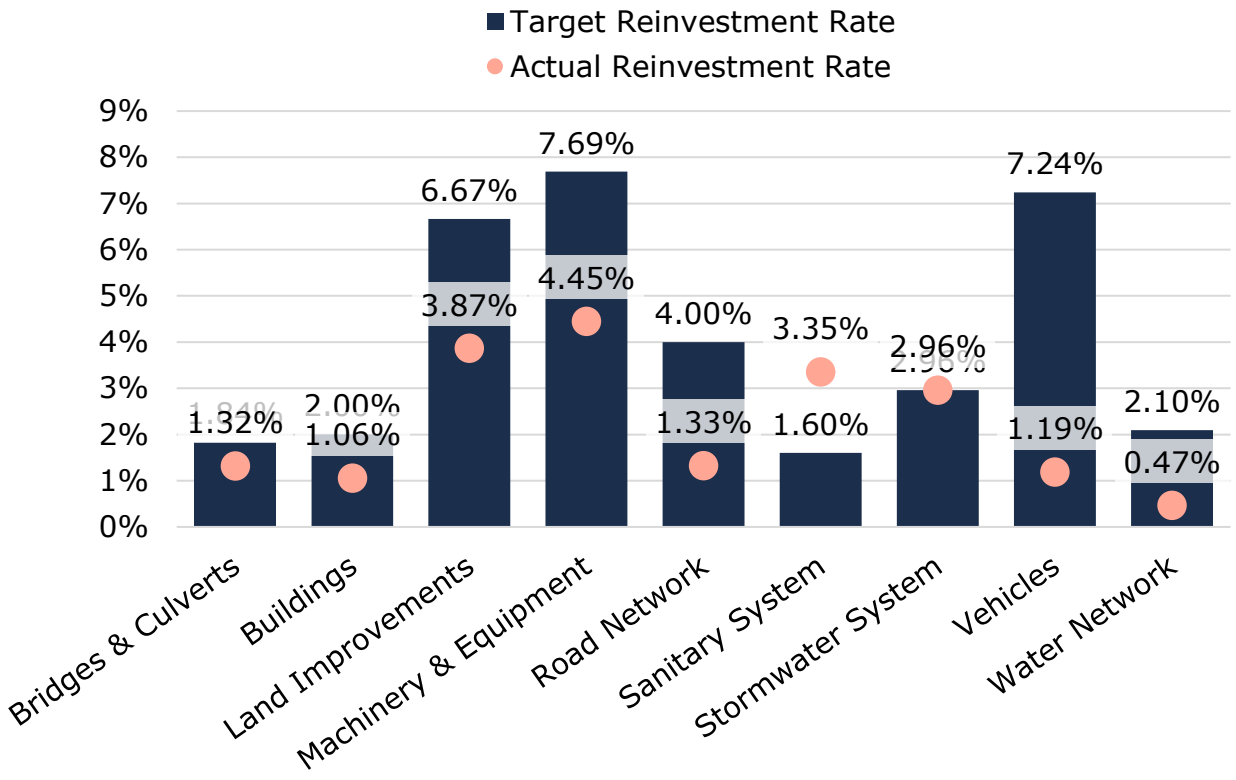


Figure 14: Target vs Actual Reinvestment Rates

3.2.3. Condition of Asset Portfolio

The current condition of the assets is central to all asset management planning. Collectively, 86% of assets in Otonabee-South Monaghan are in fair or better condition. This estimate relies on both age-based and field condition data.

Assessed condition data is available for Assumed HCB and LCB roads, and all bridges and culverts; for the remaining portfolio, 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.

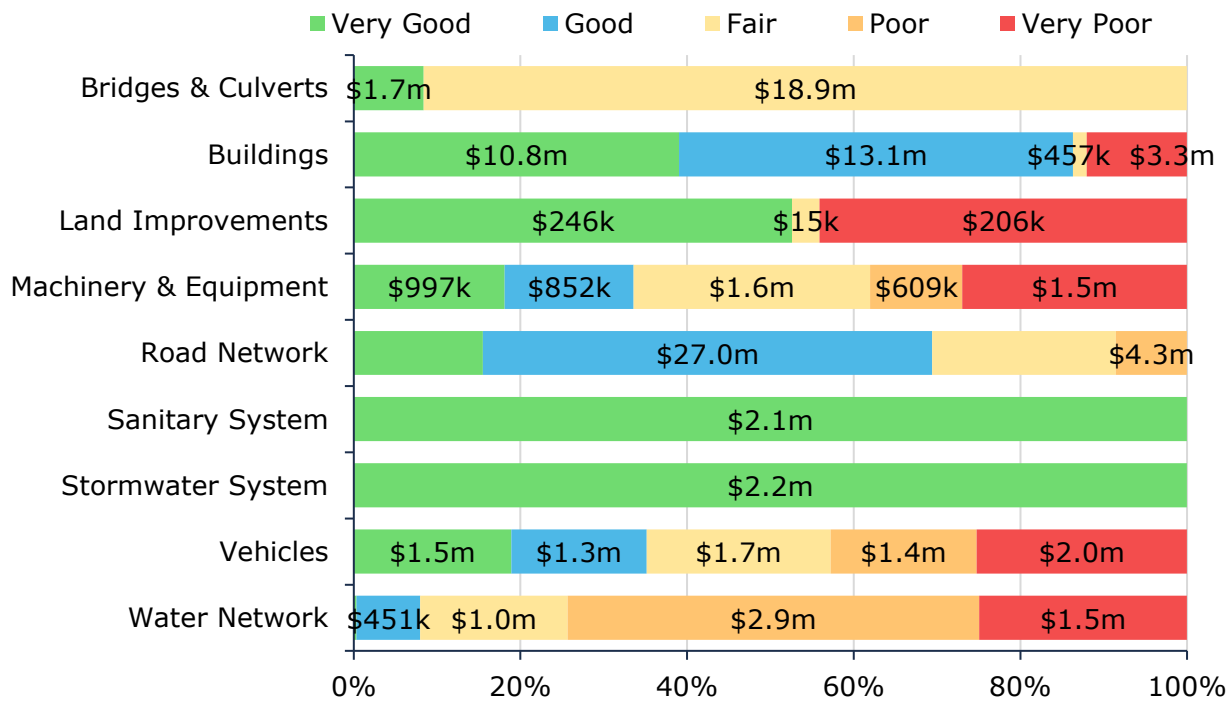


Figure 15: Asset Condition by Asset Category

Source of Condition Data

This AMP relies on assessed condition for 61% of assets, based on and weighted by replacement cost. For the remaining assets, age is used as an approximation of condition. The table 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	Assumed HCB	100%	Engage Engineering Ltd. (2024 RNS)
	Assumed LCB	100%	
Bridges	Bridges	100%	Engage Engineering Ltd. (2024 OSIM)
	Culverts	100%	

Figure 16: Source of Condition Data

3.2.4. Service Life Remaining

Based on asset age, available assessed condition data, and estimated useful life, 16% of the Township's assets will require replacement within the next 10 years. Refer to Appendix B – 10-Year Capital Requirements.

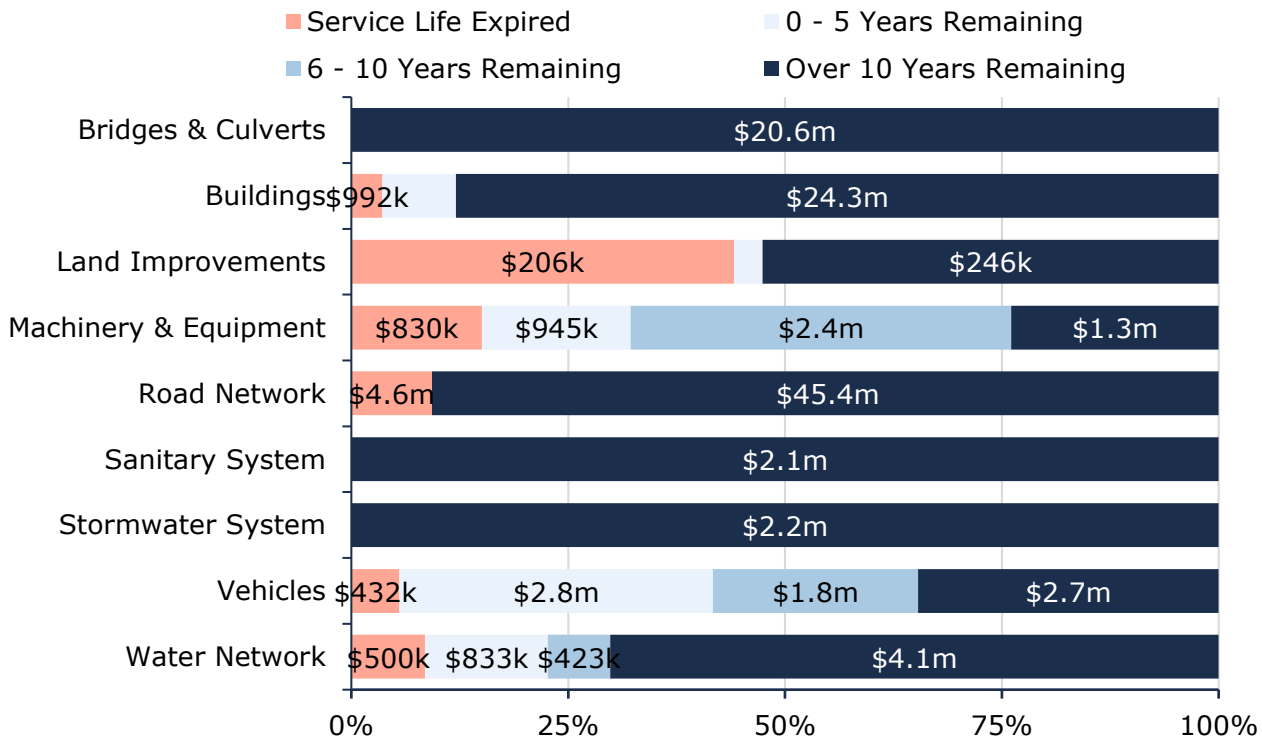


Figure 17: Service Life Remaining by Asset Category

3.2.5. Risk Matrix

Using the risk equation and preliminary risk models, the overall asset risk breakdown for Otonabee-South Monaghan's asset inventory is portrayed in the figure below.

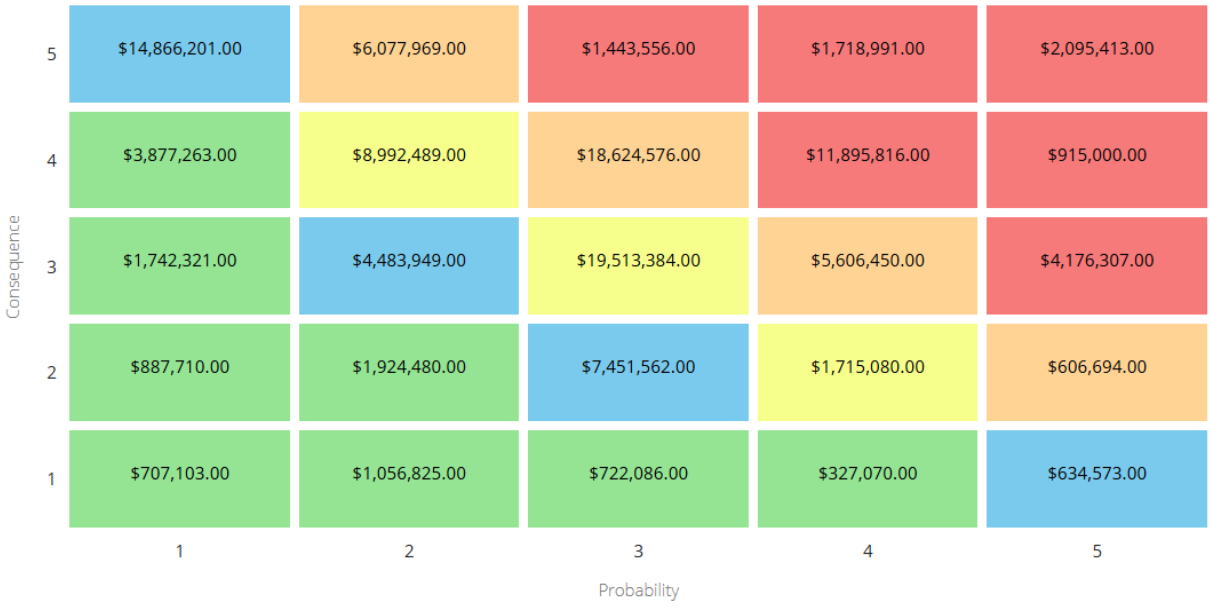


Figure 18: Risk Matrix - All Assets

Reviewing the list of very high-risk assets to evaluate how best to mitigate the level of risk the Township is experiencing will help advance Otonabee-South Monaghan's asset management program.

3.2.6. Forecasted Capital Requirements

Aging assets require maintenance, rehabilitation, and replacement. The figure below illustrates the cyclical short, medium and long-term infrastructure replacement requirements for all asset categories analyzed in this AMP over a 75-year time horizon. On average, $4.2 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.

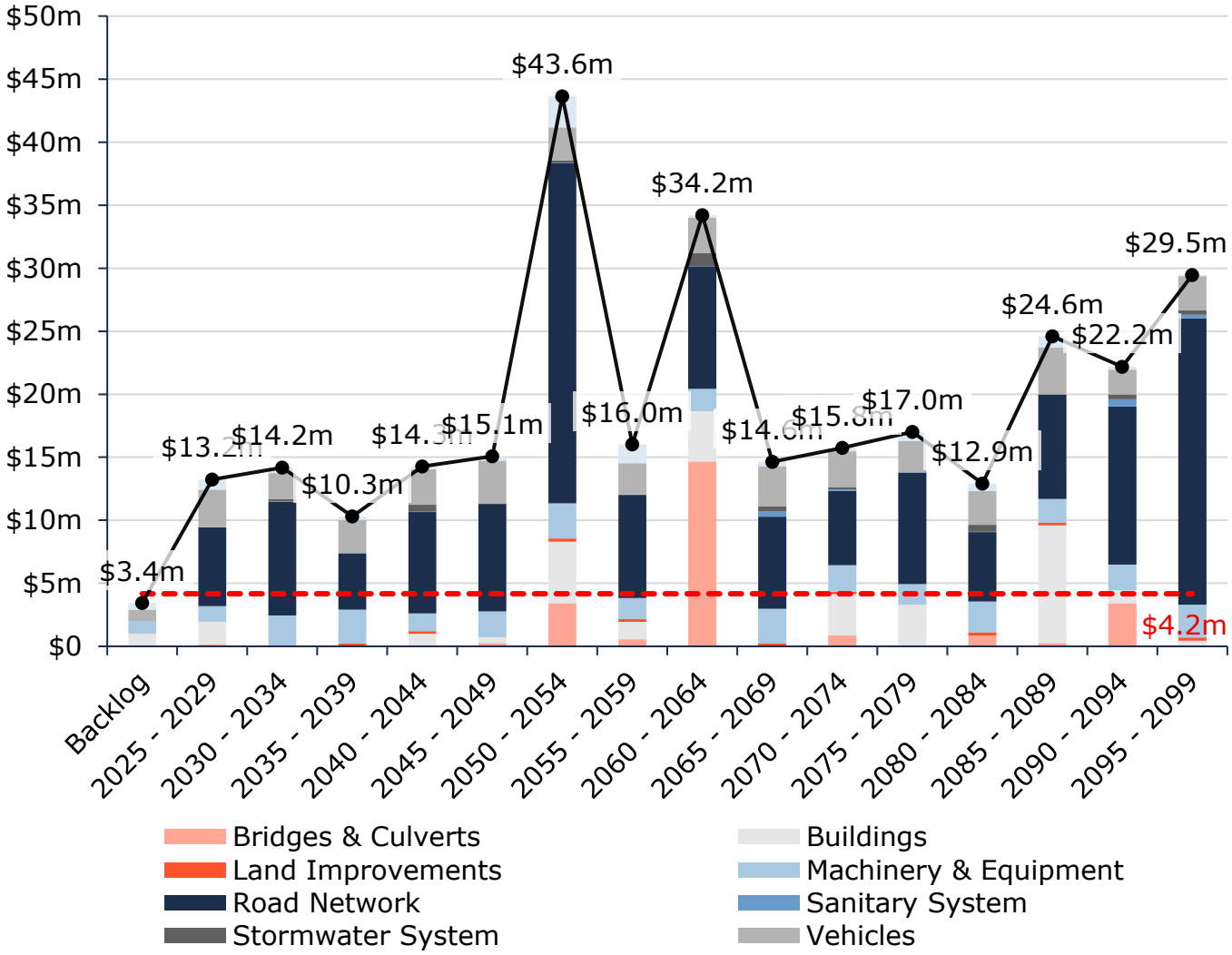


Figure 19: System-Generated Forecasted Capital Requirements

The chart also illustrates a backlog of $3.4 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.

Proposed Levels of Service

4. Proposed Levels of Service

4.1. Scope

4.1.1. Ontario Regulation 588/17 Proposed Levels of Service

The 2025 deadline requires that proposed Levels of Service (LOS) are demonstrated to be appropriate based on an assessment of:

1. Proposed LOS options and the risks associated with these options (i.e., asset reliability, safety, affordability) when considering the long-term sustainability of the municipality.
2. How proposed LOS may differ from current LOS.
3. Whether proposed LOS are achievable.
4. The municipality's ability to afford proposed LOS.

Additionally, a lifecycle management and financial strategy to support these LOS must be identified, covering a 10-year period and including:

1. Identification of lifecycle activities needed to provide the proposed LOS with consideration for:
    - Full lifecycle of assets.
    - Lifecycle activities options available to meet proposed LOS.
    - Risks associated with the options identified in sub-paragraph B, above.
    - Identification of which lifecycle activities identified in sub-paragraph 2 carry the lowest cost.
2. An estimate of the annual cost of meeting proposed LOS for a period of 10 years, separated by capital and operating expense.

4.1.2. Methodology

Target levels of service for the Township have been developed through comprehensive engagement with municipal staff and referencing resident satisfaction surveys. To achieve a target level of service goal, careful consideration of the following should be considered.

Financial Impact Assessment

- Assess historical expenditures/budget patterns to gauge feasibility of increasing budgets to achieve LOS targets
- Consider implications of LOS adjustments on other services, and other infrastructure programs (trade offs)

Infrastructure Condition Assessment

- Regularly assess the condition of critical infrastructure components.
- Use standardized condition indices or metrics to quantify the state of infrastructure.

- Identify non-critical components where maintenance can be deferred without causing severe degradation.
- Adjust condition indices or metrics to reflect the reduced maintenance budget.

Service Metrics

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

Service Impact Assessment

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

Risk Management

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

Service Improvement Metrics

- Analyze the performance of target levels of service regularly and incorporate more ambitious targets based on user satisfaction if required.

Timelines

- Although O. Reg 588/17 requires identification of expenditures for a 10-year period in pursuit of LOS targets, it does not require municipalities to identify the timeframe to achieve them.
- Careful consideration should be given to setting realistic targets for when LOS targets are to be achieved.

4.1.3. General Considerations for All Scenarios

- **Stakeholder Engagement:**
  - Regularly engage with stakeholders to gather feedback and communicate changes transparently.
- **Data-Driven Decision Making:**
  - Use data analytics to inform decision-making processes and identify areas for improvement.
- **Flexibility and Adaptability:**
  - Design the methodology to be flexible, allowing for adjustments based on evolving conditions and priorities.
- **Continuous Improvement:**
  - Establish a process for continuous review and improvement of the LOS methodology itself.

4.2. Community Engagement Survey

As part of the development of the Asset Management Plan for the Township of Otonabee-South Monaghan, a community engagement survey was conducted to assess the current levels of service and gather feedback from residents. The input from the community has played a crucial role in ensuring that the proposed Levels of Service reflect both the needs and expectations of the Township's residents, as well as the Township's long-term goals for infrastructure management.

The survey results indicate that while a majority of residents are satisfied with the quality of services provided, there are notable areas where improvements can be made. For example, 42% of respondents are satisfied with the quality of services provided, while 46% expressed dissatisfaction. Specific services like emergency vehicles and equipment (firetrucks) received high satisfaction ratings, with 88% of respondents either satisfied or highly satisfied. However, services such as roads showed lower satisfaction, with only 26% satisfied with the road network and 67% of respondents dissatisfied with the current state of roads.

The feedback has highlighted key priorities for residents, including maintaining and improving essential infrastructure such as roads, bridges, and water systems, while also protecting the Township's natural environment and fostering local economic development. In terms of infrastructure services, roads, bridges, and water & wastewater systems were ranked highly by respondents, with roads being identified as the most critical service, followed by emergency services and water services. The survey also revealed that the most important priorities for respondents in infrastructure decisions were maintaining Otonabee-South Monaghan's current character and minimizing the impact on the cost to residents.

Incorporating this valuable input into the Township's Asset Management Plan will ensure that future decisions regarding infrastructure investments align with both community expectations and financial sustainability. The survey findings suggest a preference for moderate, phased increases in taxes and rates to fund necessary improvements, with 45% of respondents open to making trade-offs to keep costs down and 17% willing to pay more for better services. By carefully considering both the current state of infrastructure and the evolving needs of residents, the Township of Otonabee-South Monaghan will be positioned to make informed, strategic investments in its infrastructure that support long-term community growth and well-being.

4.3. Proposed Levels of Service Scenarios

The following three scenarios have been considered for establishing target levels of service for all asset categories included in this Asset Management Plan.

While all three scenarios were reviewed, the Township of Otonabee-South Monaghan selected Scenario 1 for all assets as their preferred path forward regarding proposed levels of service, which is reflected in the financial strategy and 10-year capital replacement forecasts.

Scenario 1: Achieving Full Funding in 15 Years

Approach: This scenario assumes phased annual increases of approximately 1.9% for taxation and 0.8% for water rates, with no increases to sanitary rates. It achieves full funding within 15 years for tax-supported assets and 10 years for the water network.

Scenario 2: Achieving 75% Funding in 15 Years

Approach: This scenario assumes a phased annual tax increase of approximately 1.2%, 0.1% for water rates, with no increases to sanitary rates. It achieves 75% of full funding within 15 years for tax-supported assets and 10 years for the water network.

Scenario 3: Achieving 50% Funding in 15 Years

Approach: This scenario assumes a phased annual tax increase of approximately 0.4%, with no increases to water or sanitary rates, reaching 50% funding within 15 years.

This methodology provides a structured approach for managing infrastructure conditions and levels of service under different budget scenarios, emphasizing adaptability and stakeholder communication.

Through a comprehensive assessment, the following levels of service for 7 asset categories have been developed, aligning with the long-term interests of the Township. Achievability is the key consideration, with measures in place to ensure realistic targets. The Township's financial capacity was thoroughly reviewed, confirming its ability to sustain the proposed service levels. Complementing this, a detailed lifecycle management and financial strategy was developed, delineating necessary activities for each asset category. This strategy outlines the full lifecycle of assets, presents viable options for lifecycle activities, evaluates associated risks, and prioritizes cost-effective measures to maintain the proposed service standards.

These funding strategies reflect the Township's consideration of long-term service levels, financial capacity, and the risks of underinvestment, as outlined in Section 6.2 of Ontario Regulation 588/17.

4.3.1. Preferred Level of Service Approach and Rationale

The Township has adopted a full funding strategy to support the continued delivery of current levels of service, with a phased approach based on asset type: 15 years for tax-supported assets and 10 years for water assets. This approach was selected to ensure that infrastructure assets are maintained in a state of good repair, minimizing the risk of service disruptions, emergency repairs, or premature asset failures. By fully funding asset lifecycle needs over time, the Township can continue to provide safe, reliable, and consistent services that meet the expectations of the community.

Implementing full funding over 15 years strikes a balance between long-term sustainability and short-term affordability. It allows the Township to address its annual infrastructure funding deficit in a responsible manner, while avoiding sharp tax increases that could place undue pressure on ratepayers. Spreading the investment over time ensures that the Township can gradually increase its capital contributions without compromising other service areas or operational needs.

This phased approach also supports predictable budgeting and long-range financial planning. It enables staff and Council to incorporate capital needs into the annual budget process with greater confidence and flexibility, while taking advantage of opportunities such as debt retirement or grant funding to offset costs when possible.

Finally, this strategy aligns with Ontario Regulation 588/17 and asset management best practices, which emphasize the importance of proactive planning, full lifecycle costing, and sustainable investment in municipal infrastructure. By committing to this approach, the Township demonstrates leadership in financial stewardship and long-term service reliability for its residents.

4.4. Scenario 1: Achieving Full Funding in 15 Years

This scenario outlines a phased funding approach, with an annual tax increase of approximately 1.0%, along with 0.8% increases in water rates and no increases to sanitary rates, aiming to achieve full funding within 15 years. The approach focuses on ensuring the Township can fully fund its infrastructure needs over a set period.

The following analysis considers the affordability, achievability, and associated risks of this scenario, evaluating how the proposed funding strategy aligns with both community expectations and long-term infrastructure sustainability.

4.4.1. Lifecycle Changes

Increasing capital investment to achieve full funding over 15 years would significantly improve the Township's ability to manage its infrastructure assets. This phased approach would allow for incremental funding increases, enabling proactive maintenance, timely upgrades, and early replacements, which would reduce the need for emergency repairs and extend asset lifecycles. The following lifecycle activities would be undertaken:

- Road Network
    - Full implementation of a proactive lifecycle approach, including a 5-year overlay and micro-surfacing program for surface-treated roads.
    - Increased investment in paved and gravel roads to maintain average PCI to "Good" condition across the network.
    - Address known problem areas like Matchett Line and Burnham Meadows with capital reconstruction.
- Bridges & Culverts
    - Transition from reactive to fully proactive rehabilitation and renewal based on BCI targets.
    - Structural upgrades and load capacity improvements to meet long-term demand.
- Water Network
    - Begin proactive renewal in areas like Keene Heights and extend system upgrades similar to Crystal Springs.
- Land Improvements
    - Fully implement Parks & Community Services Master Plan (2025).
    - Add new amenities and improve accessibility and connectivity.
- Buildings
    - Structural repairs, accessibility improvements, and full AODA compliance program initiated.

- Extend life of aging buildings through proactive renewals.

- Vehicles & Equipment
  - Maintain formal replacement cycles across departments (e.g., pickups at 5 years, other units at 10).
  - Support full fleet reliability and reduce downtime.

4.4.2. Sustainability and Feasibility of Proposed Service Levels

Of the three scenarios analyzed, Scenario 1 requires the highest tax increase. Reaching full funding immediately would require an increase of 32.7% in tax revenue, and a 28.8% increase in water rates. This is not reasonable or realistic to achieve in a short period of time. With the recommended implementation timeframe, tax revenue would be increased gradually from $7.2 million to $9.6 million within 15 years, and water revenue from $348,841 to $381,539 within 10 years, while sanitary rates remain constant at $142,992.

Based on these gradual proposed increases, while maintaining existing sustainable grant funding, the available capital funding over the next 10 years for Scenario 1 is indicated in the table below:

Table 5: Scenario 1 Available Capital Funding Over Next 10 Years

Source	Available Capital Funding									
	2026	**2027**	**2028**	**2029**	**2030**	**2031**	**2032**	**2033**	**2034**	**2035**
Tax Revenue	$1.8m	$1.9m	$2.1m	$2.1m	$2.3m	$2.4m	$2.6m	$2.7m	$2.9m	$3.1m
Water Rates	$99k	$102k	$105k	$108k	$112k	$115k	$118k	$121k	$125k	$128k
Sanitary Rates	$70k	$70k	$70k	$70k	$70k	$70k	$70k	$70k	$70k	$70k

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

4.4.3. Risk Analysis

Evaluating the risks associated with each service level option is essential for balancing infrastructure needs, financial sustainability, and community expectations. By identifying and assessing these risks, the municipality can make informed decisions that support long-term service reliability.

Scenario 1 Risks

- Delayed Improvement: The Township will not see significant improvements in asset conditions or service levels until full funding is reached after 15 years. However, gradual improvements will be made over time as funding increases.
- Infrastructure Backlog: Without immediate funding, there is a risk that the existing infrastructure backlog could continue to grow, potentially leading to higher long-term costs and service disruptions.
- Resource Constraints: Implementing and maintaining this service level option may stretch the Township's operational capacity, particularly if there are limited resources or capacity to handle the expanded scope of work over the long term.
- Public Perception: While these increases are technically achievable, there’s a possibility that residents may not fully support sustained increases over the long term, especially given the preference for moderate tax rates and the general satisfaction with current services.

4.5. Scenario 2: Achieving 75% Funding in 15 Years

This scenario outlines a phased funding approach, with an annual tax increase of approximately 1.2%, and 0.1% increases in water rates, and no increase to sanitary rates aiming to achieve 75% funding within 15 years. This approach represents a more moderate level of funding while still addressing infrastructure needs.

The following analysis considers the affordability, achievability, and associated risks of this scenario, evaluating how the proposed funding strategy aligns with both community expectations and long-term infrastructure sustainability.

4.5.1. Lifecycle Changes

Increasing capital investment to achieve 75% funding would significantly enhance the Township's ability to address its infrastructure needs. This level of funding would allow for more frequent proactive maintenance, timely upgrades, and early replacements across all asset categories. The following lifecycle activities would be undertaken:

- Road Network
  - Partial implementation of overlay and micro-surfacing programs, focusing on high-priority routes.
  - Gradual improvements to PCI, especially on surface-treated roads.
- Bridges & Culverts
  - Begin proactive maintenance for critical structures, with continued use of reserves.
- Water Network
  - Begin proactive renewal in areas like Keene Heights and extend system upgrades similar to Crystal Springs.
- Land Improvements
  - Prioritize high-use parks and essential improvements.
  - Implement selected recommendations from Master Plan over a longer timeline.
- Buildings
  - Prioritize urgent structural repairs and safety upgrades.
  - Defer less critical upgrades like energy retrofits or full-scale modernizations.
- Vehicles & Equipment
  - Continue existing replacement cycles, with some flexibility in non-essential equipment.

4.5.2. Sustainability and Feasibility of Proposed Service Levels

Of the three scenarios analyzed, Scenario 2 requires a moderate tax increase. Reaching 75% of full funding immediately would require an increase of 18.8% in tax revenue and an increase of 19.6% to water rates. This is not reasonable or realistic to achieve in a short period of time. With the recommended implementation timeframe of 15 years, tax revenue would be increased gradually from $7.2 million to $8.7 million, water revenue from $348,841 to $352,345 in 10 years, and sanitary rates would remain constant at $142,992.

Based on these gradual proposed increases, while maintaining existing sustainable grant funding, the available capital funding over the next 10 years for Scenario 2 is indicated in the table below:

Table 6: Available Capital Funding Over Next 10 Years

Source	Available Capital Funding									
	2026	**2027**	**2028**	**2029**	**2030**	**2031**	**2032**	**2033**	**2034**	**2035**
Tax Revenue	$1.7m	$1.8m	$1.9m	$1.9m	$2.0m	$2.1m	$2.2m	$2.3m	$2.4m	$2.5m
Water Rates	$96k	$96k	$97k	$97k	$97k	$98k	$98k	$98k	$99k	$99k
Sanitary Rates	$70k	$70k	$70k	$70k	$70k	$70k	$70k	$70k	$70k	$70k

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

4.5.3. Risk Analysis

Evaluating the risks associated with each service level option is essential for balancing infrastructure needs, financial sustainability, and community expectations. By identifying and assessing these risks, the municipality can make informed decisions that support long-term service reliability.

Scenario 2 Risks

- Delayed Improvement: The Township will not see significant improvements in asset conditions or service levels until 75% funding is reached after 15 years. While some improvements will occur, they may not be as rapid as those seen with a higher funding approach.
- Infrastructure Backlog: This scenario would help address the infrastructure backlog but may still leave some backlog unresolved. The growing demand for infrastructure, particularly aging assets, poses a risk that may lead to higher long-term costs and operational challenges.
- Resource Constraints: Implementing and maintaining this service level option may stretch the Township's operational capacity, particularly if there are limited resources or capacity to handle the expanded scope of work over the long term.
- Reserve Funding: The Township may need to draw on its reserve accounts for unforeseen infrastructure needs, which could deplete the reserve over time. Continued reliance on the reserve may limit the ability to address future infrastructure challenges and achieve long-term asset management goals.

4.6. Scenario 3: Achieving 50% Funding in 15 Years

This scenario involves a phased tax increase of approximately 0.4% annually, along with no increases to water or sanitary rates, aiming to achieve 50% funding within 15 years. The goal of this scenario is to provide a lower tax burden while making incremental progress toward meeting the Township's infrastructure funding needs. The following analysis considers the affordability, achievability, and associated risks of this scenario, evaluating how the proposed funding strategy aligns with both community expectations and long-term infrastructure sustainability.

4.6.1. Lifecycle Changes

Increasing capital investment to achieve 50% funding would result in modest improvements to infrastructure management, but it would not be sufficient to address aging assets or reduce the existing backlog of renewal needs. Since the Township is already funding approximately 42% of its capital requirements, this scenario would essentially maintain the status quo, offering minimal lifecycle improvements.

For the road network, the focus would continue to be on reactive maintenance and emergency repairs, with limited ability to implement lifecycle activities such as overlays or surface treatments. As a result, the PCI, particularly for unpaved roads, would see little to no improvement. Bridge and culvert maintenance would remain reactive, with only critical rehabilitation work funded through reserves. The water system would lack a formal replacement strategy, relying instead on grant funding or emergency interventions. For land improvements, vehicles, and machinery and equipment, the Township would prioritize basic upkeep, with limited capacity for enhancements or timely replacements.

4.6.2. Sustainability and Feasibility of Proposed Service Levels

Scenario 3 requires a conservative tax increase, requiring the lowest increase of the three scenarios analyzed. Reaching 50% of full funding immediately would require an increase of 5% in tax revenue. This is not reasonable or realistic to achieve in a short period of time. With the recommended implementation timeframe of 15 years, tax revenue would be increased gradually from $7.2 million to $7.7 million, water revenue would remain constant at $348,841, and sanitary revenue would remain constant at $142,992. In 2026, $67,981 in water network debt payments will be retired and reallocating this amount toward capital reinvestment will be necessary to support the funding strategy without significantly increasing financial pressure on residents.

Based on these gradual proposed increases, while maintaining existing sustainable grant funding, the available capital funding over the next 10 years for Scenario 3 is indicated in the table below:

Table 7: Available Capital Funding Over Next 10 Years

Source	Available Capital Funding									
	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035
Tax Revenue	$1.7m	$1.7m	$1.7m	$1.7m	$1.7m	$1.7m	$1.8m	$1.8m	$1.8m	$1.9m
Water Rates	$64k	$64k	$64k	$64k	$64k	$64k	$64k	$64k	$64k	$64k
Sanitary Rates	$70k	$70k	$70k	$70k	$70k	$70k	$70k	$70k	$70k	$70k

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

4.6.3. Risk Analysis

Evaluating the risks associated with each service level option is essential for balancing infrastructure needs, financial sustainability, and community expectations. By identifying and assessing these risks, the municipality can make informed decisions that support long-term service reliability.

Scenario 3 Risks

- Slow Improvement: While this investment level will address some maintenance needs, progress may be limited, leading to ongoing challenges in infrastructure management.
- Infrastructure Backlog: This investment level will likely leave a considerable backlog in infrastructure repairs and replacements. While it helps maintain some asset lifecycles, the backlog may continue to grow, leading to increased risks of service disruptions and higher costs over time.
- Public Perception: While the annual increases are the most manageable, it may not provide enough funding to meet future service demands. This scenario may be more acceptable in the short term, but could become unsustainable in the long run if infrastructure needs continue to rise.
- Reserve Funding: The Township may need to draw on its reserve accounts for unforeseen infrastructure needs, which could deplete the reserve over time. Continued reliance on the reserve may limit the ability to address future infrastructure challenges and achieve long-term asset management goals.

Categorical Analysis

5. Road Network

5.1. State of the Infrastructure

Otonabee-South Monaghan's Road Network comprises the largest share of its infrastructure portfolio, with a current replacement cost of $50 million, distributed primarily between paved (HCB) and surface treated (LCB) roads.

The Township's roads and sidewalks are maintained by the Public Works department who is also responsible for winter snow clearing, ice control, snow removal and dust control operations.

As of this Asset Management Plan, road infrastructure within the Burnham Meadows subdivision is not yet under the Township's ownership but are expected to be assumed by 2026. These roads are referenced throughout this section where relevant, with consideration for future capital planning and infrastructure management.

The following summarizes the state of the infrastructure for the road network, and the Township's ability to fund the proposed levels of service:

Replacement Cost	Condition	Financial Capacity	
		Annual Requirement:	$1,999,844
$50,023,809	Good (73%)	Funding Available:	$664,356
		Annual Deficit:	$1,335,488

Table 8: Road Network State of the Infrastructure

5.2. Inventory & Valuation

The table below includes the quantity, replacement cost method and total replacement cost of each asset segment in the Township's Road Network inventory.

Segment	Quantity	Unit of Measure	Primary Replacement Cost Method	Replacement Cost
Assumed HCB	5	Length(km)	CPI	$3,555,556
Assumed LCB	97	Length(km)	CPI	$45,129,998
Retaining Wall	1	Quantity	CPI	$76,672
Sidewalks	1	Quantity	CPI	$28,767
Streetlights	99	Quantity	CPI	$572,547
Unassumed Curb & Gutter	2,060	Length (m)	User-Defined	$167,461
Unassumed HCB	18,060	Area (m2)	User-Defined	$373,229
Unassumed Sidewalks	607	Length (m)	User-Defined	$54,140
Unassumed Streetlights	44	Assets	User-Defined	$65,439
Gravel Roads	195	Length(km)	Not Planned for Replacement	
Total				**$50,023,809**

Table 9: Road Network Inventory

The figure below displays the replacement cost of each asset segment in the Township's road inventory.

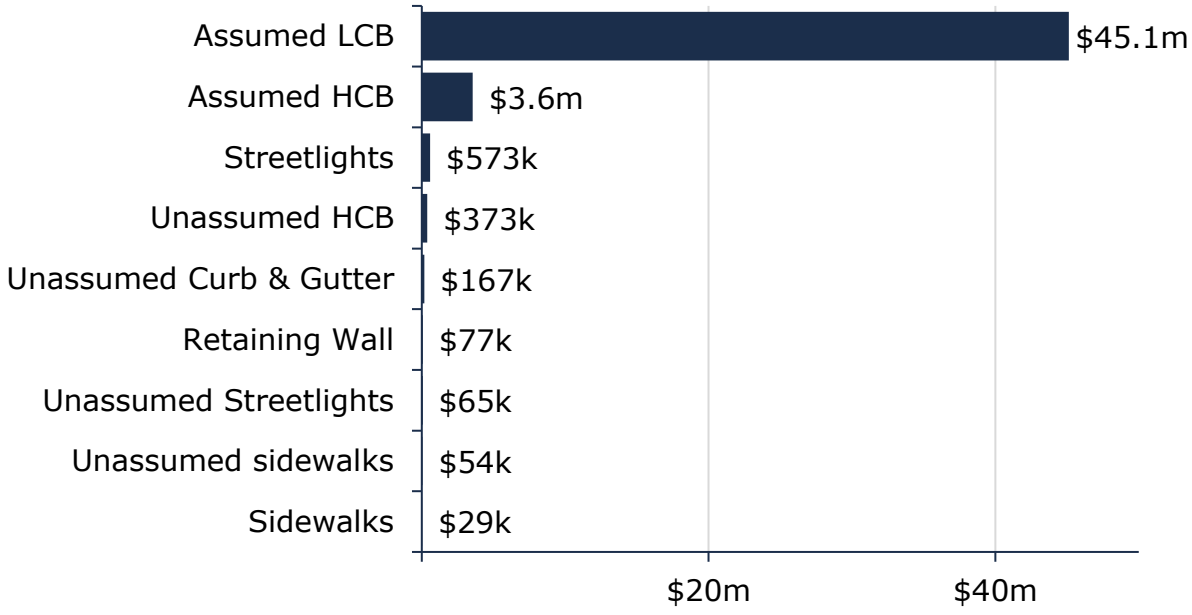


Figure 20: Road Network Replacement Value

Each asset's replacement cost should be reviewed periodically to determine whether adjustments are needed to more accurate represent realistic capital requirements.

5.3. Asset Condition & Age

The graph below identifies the average age, and the estimated useful life for each asset segment[2].

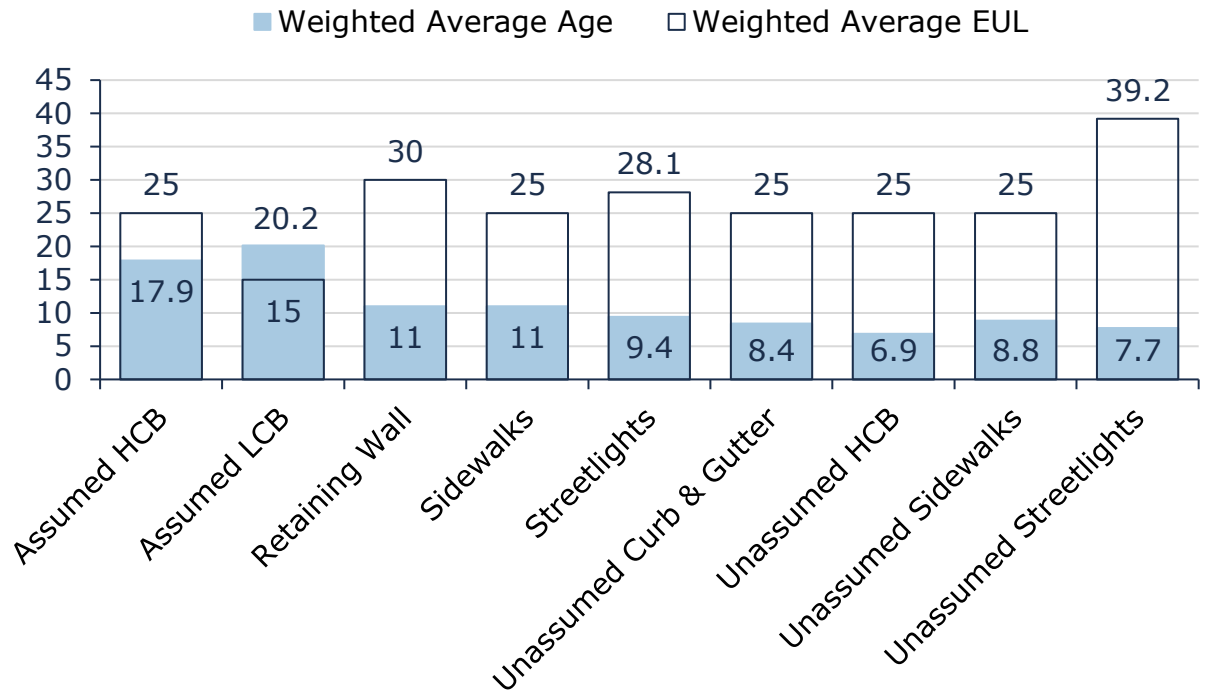


Figure 21: Road Network Average Age vs Average EUL

The analysis shows that, based on in-service dates, roads continue to remain in operation beyond their expected useful life. This is due to the life cycle management strategies currently being utilized.

The graph below visually illustrates the average condition for each asset segment on a very good to very poor scale.

[2] Gravel roads undergo perpetual operating and maintenance activities. If maintained properly, they can theoretically have a limitless service life.

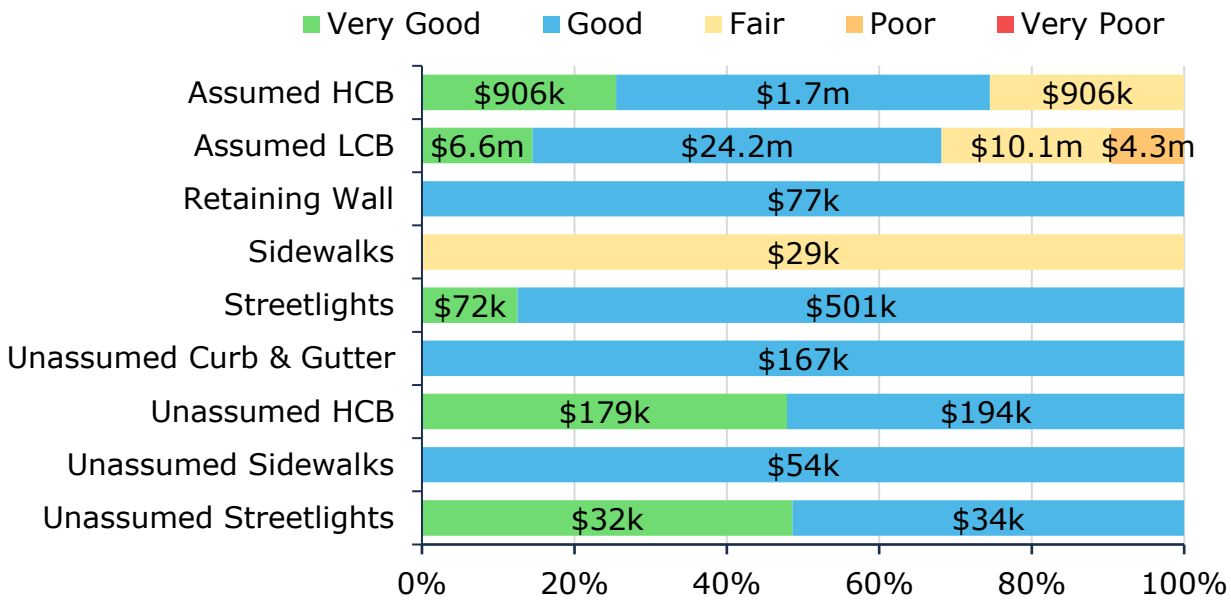


Figure 22: Road Network Condition Breakdown

Each asset's estimated useful life should also be reviewed periodically to determine whether adjustments need to be made to better align with the observed length of service life for each asset type.

5.3.1. Current Approach to Condition Assessment

Accurate and reliable condition data allows staff to determine the remaining service life of assets and identify the most cost-effective approach to managing assets. The following describes the Township's current approach:

- Road patrols are completed by internal staff weekly based on the minimum maintenance standards. However, road condition is not documented as part of this process.
- A Road Needs Study was completed in 2024 that included a detailed assessment of the condition of each road segment
- The Road Needs Study is reviewed every four years by external contractors

5.4. Lifecycle Management Strategy

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

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

HCB Roads		
Event Name	**Event Class**	**Event Trigger**
Mill & Pave	Rehabilitation	10 Years
Pulverize & Pave	Rehabilitation	20 Years
Full Reconstruction	Replacement	40 Condition

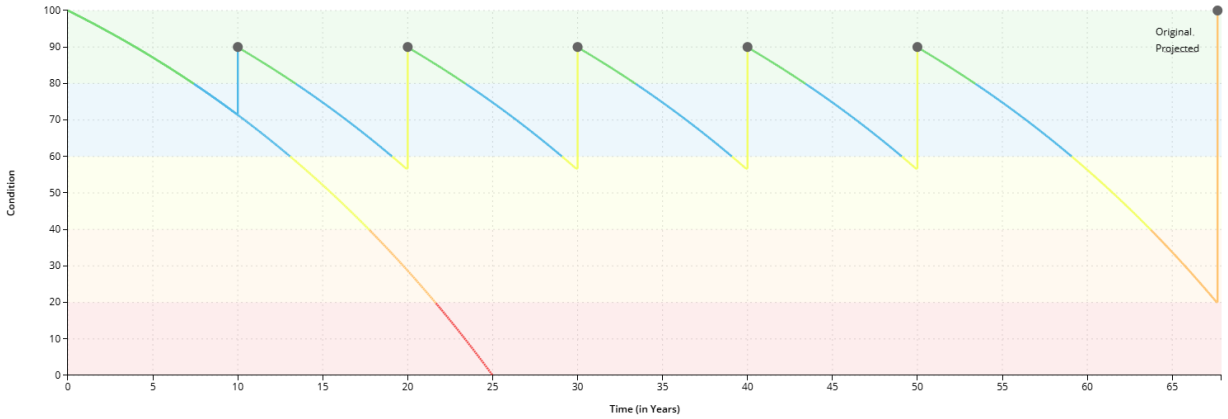


Figure 23: HCB Roads Lifecycle Management Strategy

LCB Roads		
Event Name	**Event Class**	**Event Trigger**
Double Surface Treatment	Rehabilitation	Year 6, 18, 30
Pulverize & Double Surface Treatment	Rehabilitation	Year 12, 24, 36
Full Reconstruction	Replacement	0 Condition

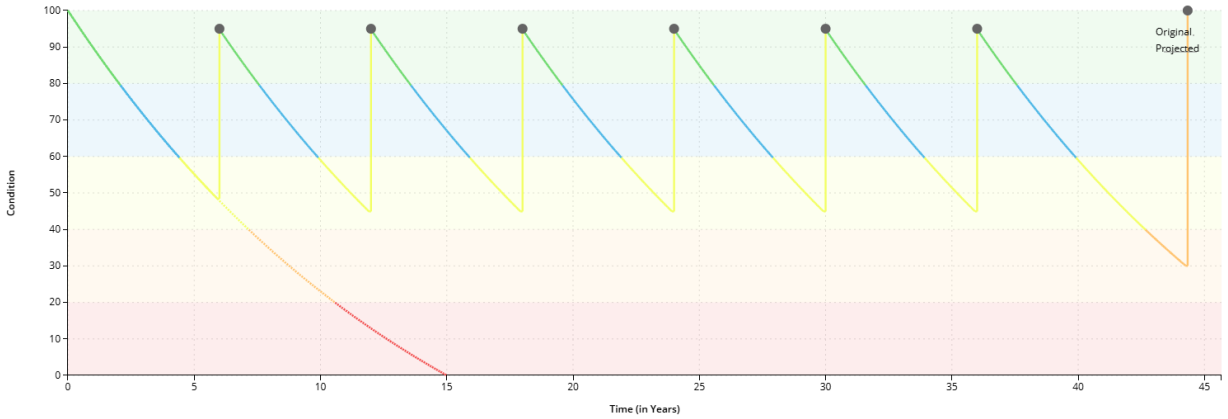


Figure 24: LCB Roads Lifecycle Management Strategy

5.5. Forecasted Capital Requirements

The figure below illustrates the cyclical short, medium and long-term infrastructure rehabilitation and replacement requirements for the Township's road network. Assuming the lifecycle strategies identified above for paved roads and end-of-life for all other assets, the following graph forecasts capital requirements for the road network. This analysis was run until 2069 to capture at least one iteration of replacement for the longest-lived asset in the asset register.

Otonabee-South Monaghan's average annual requirements (red dotted line) total $2.0 million for all assets in the road network. Although actual spending may fluctuate substantially from year to year, this figure is a useful benchmark value for annual capital expenditure targets (or allocations to reserves) to ensure projects are not deferred and replacement needs are met as they arise. The chart illustrates capital needs through the forecast period in 5-year intervals.

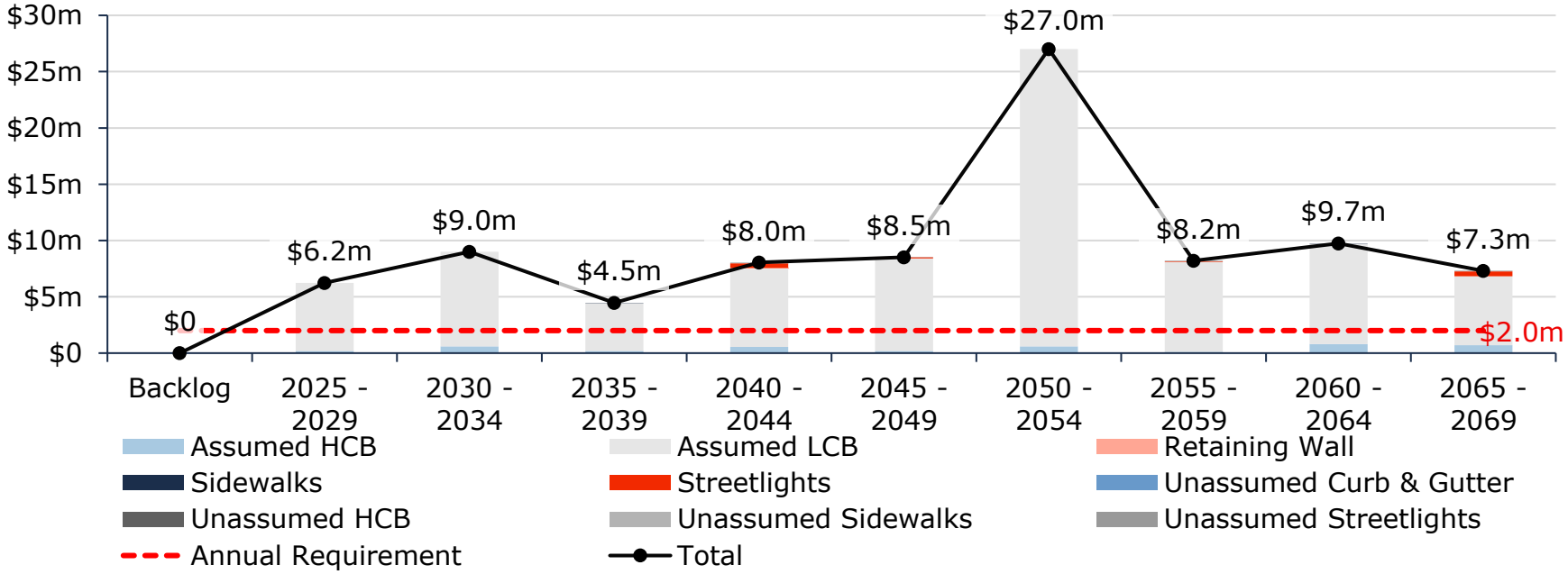


Figure 25: Road Network Forecasted Capital Replacement Requirements

The projections 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. They are based on asset replacement costs, age analysis, and condition data when available, as well as lifecycle modeling (roads only identified above).

The table below summarizes the projected cost of lifecycle activities (rehabilitation and replacement) that may need to 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.

These projections can be different from actual capital forecasts. Consistent data updates, especially condition, will improve the alignment between the system-generated expenditure requirements, and the Township's capital expenditure forecasts.

Segment	Backlog	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034
Assumed HCB	-	$80k	$16k	$112k	$56k	$14k	-	$30k	$488k	-	-
Assumed LCB	-	$807k	$1.6m	$188k	$1.2m	$1.2m	$1.4m	$2.1m	$2.2m	$833k	$2.6m
Retaining Wall	-	-	-	-	-	-	-	-	-	-	-
Sidewalks	-	-	-	-	-	-	-	-	-	-	-
Streetlights	-	-	-	-	-	-	-	-	-	-	-
Unassumed Curb & Gutter	-	-	-	-	-	-	-	-	-	-	-
Unassumed HCB	-	-	-	-	$206k	-	-	-	-	-	-
Unassumed Sidewalks	-	-	-	-	-	-	-	-	-	-	-
Unassumed Streetlights	-	-	-	-	-	-	-	-	-	-	-
Total	**-**	**$887k**	**$1.6m**	**$300k**	**$1.4m**	**$1.2m**	**$1.4m**	**$2.2m**	**$2.7m**	**$833k**	**$2.6m**

Table 10: Road Network System-generated 10-Year Capital Costs

5.6. Risk & Criticality

The following risk matrix provides a visual representation of the relationship between the probability of failure and the consequence of failure for the assets within this asset category based on available inventory data. See Appendix D: Risk Rating Criteria. for the criteria used to determine the risk rating of each asset.

1 - 4 Very Low $2,198,098 (4%)	5 - 7 Low $3,927,381 (8%)	8 - 9 Moderate $6,042,122 (12%)	10 - 14 High $24,656,499 (49%)	15 - 25 Very High $13,199,709 (26%)

Figure 26: Road Network Risk Matrix

This is a high-level model developed by Township staff and it should be reviewed and adjusted to reflect an evolving understanding of both the probability and consequences of asset failure.

The identification of critical assets allows the Township to determine appropriate risk mitigation strategies and treatment options. Risk mitigation may include asset-specific lifecycle strategies, condition assessment strategies, or simply the need to collect better asset data.

5.6.1. Risks to Current Asset Management Strategies

The following section summarizes key trends, challenges, and risks to service delivery that the Township is currently facing:

Climate Change & Extreme Weather Events

The trend of climate change-induced extreme precipitation events is projected to continue. High frequency and intensity of precipitation can cause flooding in poor drainage areas. This accelerates the deterioration of road surfaces and weakening the foundation. An increase in cracking, sinkholes and other damages in freeze/thaw cycles are anticipated because of heavy precipitation. As a result, higher maintenance and rehabilitation requirements are expected to maintain the same level of service. To improve asset resiliency, staff should identify the critical areas and improve drainage through enhanced lifecycle strategies.

5.7. Levels of Service

The following tables identify the Township's metrics to identify their current level of service for the road network.

5.7.1. Community Levels of Service

The following table outlines the qualitative descriptions that determine the community levels of service provided by the road network.

Values	Qualitative Description	Current LOS
Scope	Description, which may include maps, of the road network in the Township and its level of connectivity	See Appendix A.
Quality	Description or images that illustrate the different levels of road class pavement condition	The Township completed a Road Needs Study in 2024, by Engage Engineering. The individual ratings for each of the evaluation criteria are summed to obtain an overall rating for each road section, with a maximum value of 100. The overall rating is a general indicator of the road condition; a higher rating indicates better condition.

Table 11: Road Network Community Levels of Service

5.7.2. Technical Levels of Service

The following table outlines the quantitative metrics that determine the technical level of service provided by the road network.

Service Attribute	Technical Metric	Current LOS
Scope	Lane-km of arterial roads (MMS classes 1 and 2) per land area in the municipality (km/km^2)	0 km/km^2
	Lane-km of collector roads (MMS classes 3 and 4) per land area in the municipality (km/km^2)	0 km/km^2
	Lane-km of local roads (MMS classes 5 and 6) per land area in the municipality (km/km^2)	0.86 km/km^2
Performance	Average pavement condition index for paved roads in the municipality	LCB: 71 HCB: 79

Average surface condition for unpaved roads in the municipality	68

Table 12: Road Network Technical Levels of Service

5.7.3. Proposed Levels of Service

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

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

Scenario	Description
Scenario 1: Achieving Full Funding in 15 Years	This scenario assumes a phased tax increase of approximately 1.9% annually, reaching full funding within 15 years
Scenario 2: Achieving 75% Funding in 15 Years	This scenario assumes a phased tax increase of approximately 1.2% annually, reaching 75% funding within 15 years
Scenario 3: Achieving 50% Funding in 15 Years	This scenario assumes a phased tax increase of approximately 0.4% annually, reaching 50% funding within 15 years

Table 13: Road Network PLOS Scenarios

PLOS Analysis

The following table compares three funding scenarios, illustrating how varying levels of capital investment impact asset condition, risk, and overall performance over time.

Scenario	Technical LOS Outcomes	Initial Value (2025)	10 Year Projection (2035)	25 Year Projection (2050)	Scenario Average
Scenario 1	Average Condition	63.56%	53.84%	54.47%	57.87%
	Average Asset Risk	8.39	10.53	10.26	9.61
	Average Annual Investment		$1,999,844		
	Capital re-investment rate		4.0%		
Scenario 2	Average Condition	63.56%	52.78%	47.13%	49.11%
	Average Asset Risk	8.39	10.67	11.46	11.11
	Average Annual Investment		$1,499,883		

	Capital re-investment rate		3.0%		
Scenario 3	Average Condition	63.92%	50.35%	36.79%	38.89%
	Average Asset Risk	8.3	10.78	13.32	12.84
	Average Annual Investment		$999,922		
	Capital re-investment rate		2.0%		

Table 14: Road Network plows Scenario Analysis

The following figure illustrates the projected condition of the asset category under each of the three investment level scenarios, demonstrating how varying reinvestment strategies impact overall asset condition over time.

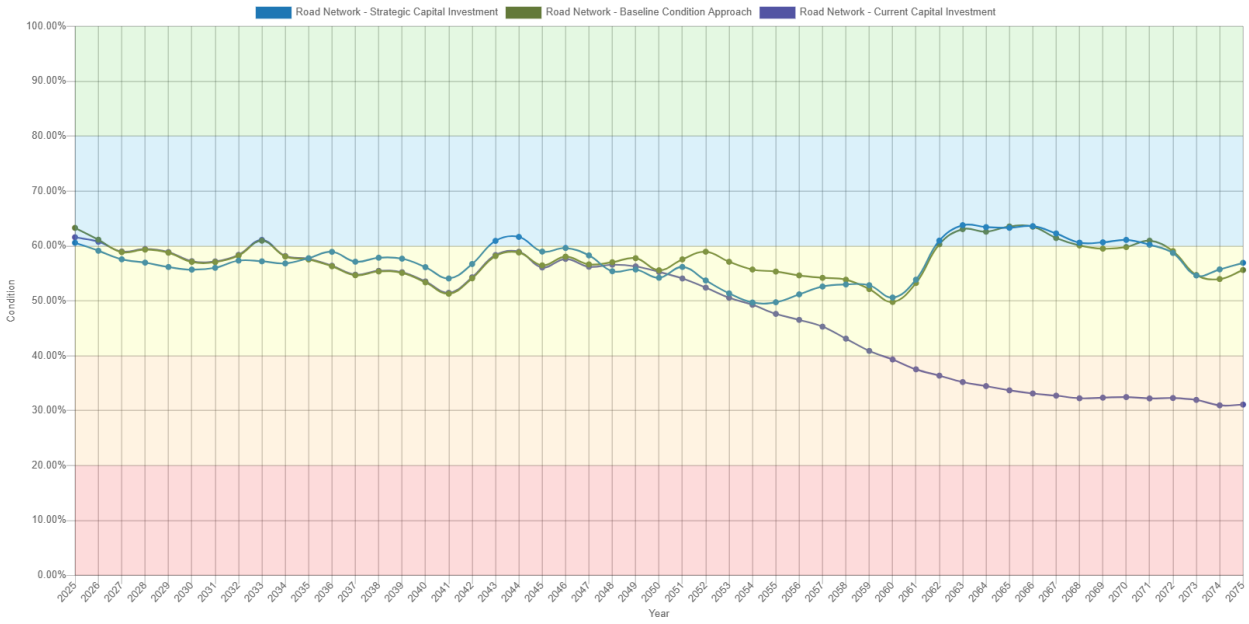


Figure 27: Road Network Scenario Comparison

6. Bridges & Culverts

6.1. State of the Infrastructure

Bridges and culverts (B&C) represent a critical portion of the transportation services provided to the community. The Department of Public Works is responsible for the maintenance of all bridges and culverts located across municipal roads with the goal of keeping structures in an adequate state of repair and minimizing service disruptions.

The following summarizes the state of the infrastructure for bridges and culverts, and the Township's ability to fund the proposed levels of service:

Replacement Cost	Condition	Financial Capacity	
$20,634,801	76% (Fair)	Annual Requirement:	$379,409
		Funding Available:	$272,714
		Annual Deficit:	$106,695

Table 15: Bridges & Culverts State of the Infrastructure

6.2. Inventory & Valuation

The table below includes the quantity, replacement cost method, and total replacement cost of each asset segment in the Bridges & Culverts inventory.

Segment	Quantity	Unit of Measure	Primary Replacement Cost Method	Replacement Cost
Bridges	27	Assets	User-Defined	$16,392,301
Culverts	11	Assets	User-Defined	$4,242,500
Total				**$20,634,801**

Table 16: Bridges & Culverts Inventory

The figure below displays the replacement cost of each asset segment in the Township's bridges and culverts inventory.

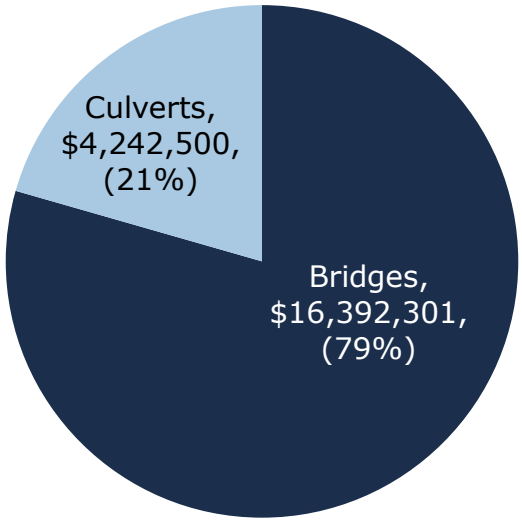


Figure 28: Bridges & Culverts Replacement Cost

Each asset's replacement cost should be reviewed periodically to determine whether adjustments are needed. This can be included in the Ontario Structures Inspection Manual (OSIM) inspections as the replacement cost is part of the calculation for the bridge condition index (BCI).

6.3. Asset Condition & Age

The graph below identifies the average age and the estimated useful life for each asset segment.

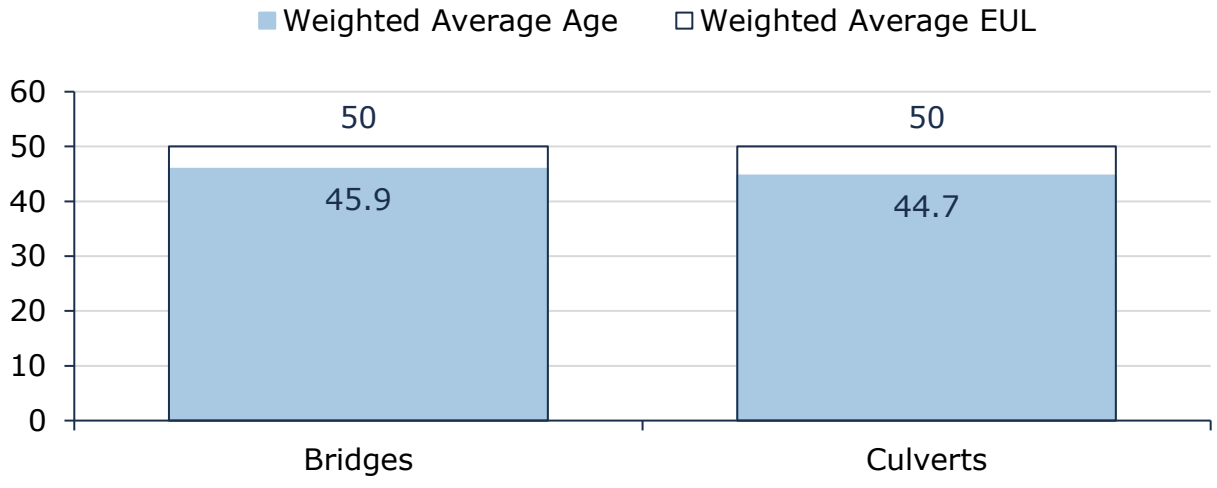


Figure 29: B&C Average Age vs Average EUL

The graph below visually illustrates the average condition for each asset segment on a very good to very poor scale.

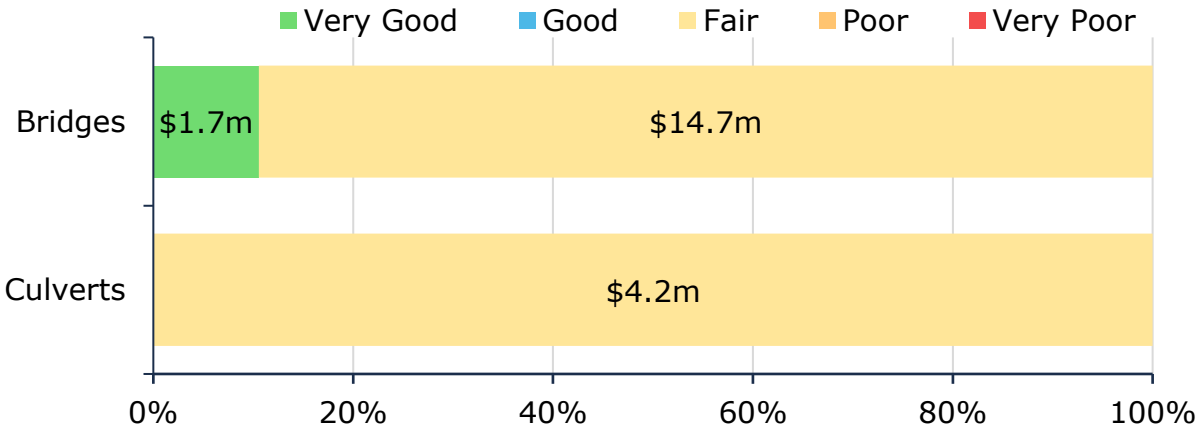


Figure 30: B&C Condition Breakdown

To ensure that the Township's bridges and culverts continue to provide an acceptable level of service, the staff should monitor the average condition of all assets. Each asset's estimated useful life should also be reviewed periodically to determine whether adjustments need to be made to better align with the observed length of service life for each asset type.

6.3.1. Current Approach to Condition Assessment

Accurate and reliable condition data allows staff to determine the remaining service life of assets and identify the most cost-effective approach to managing assets. Otonabee-South Monaghan's current approach is to assess the bridges and structural culverts every 2 years in accordance with the Ontario Structure Inspection Manual (OSIM). The most recent assessment was completed in 2024.

6.4. Lifecycle Management Strategy

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 figure below outlines Otonabee-South Monaghan's current lifecycle management strategy.

Maintenance

- Winter manitenance and sweeping are completed periodically

Rehabilitation / Renewal / Replacement

- All lifecycle activities are driven by the results of mandated structural inspections competed according to the Ontario Structure Inspection Manual (OSIM)

Figure 31: B&C Current Lifecycle Strategy

6.5. Forecasted Capital Requirements

The figure below illustrates the cyclical short, medium and long-term infrastructure rehabilitation and replacement requirements for the Township's bridges and culverts. These projections 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.

The following analysis was run until 2074, and the resulting graph identifies capital requirements over the next 75 years. Otonabee-South Monaghan's average annual requirements (red dotted line) for bridges and culverts total $379 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.

OSIM condition assessments and a robust risk framework will ensure that high-criticality assets receive proper and timely lifecycle intervention, including rehabilitation and replacement activities.

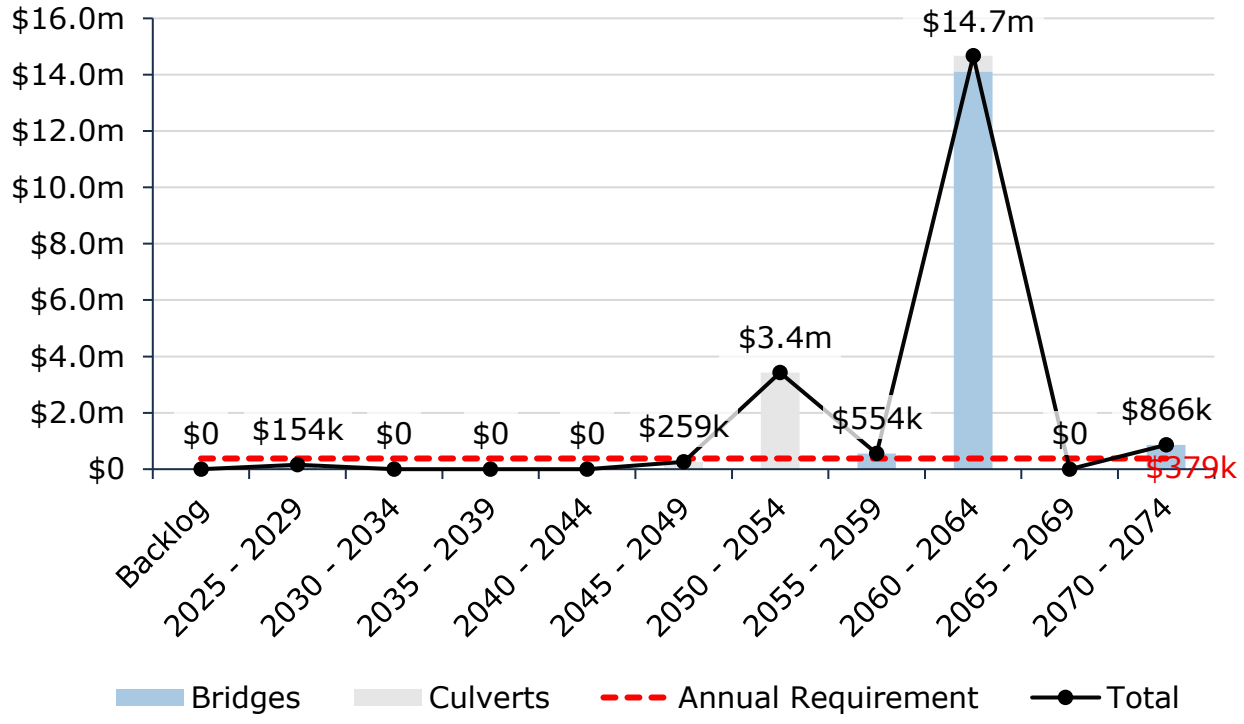


Figure 32: B&C Forecasted Capital Replacement Requirements

The table below summarizes the projected cost of lifecycle activities (as previously described) that may need to be undertaken over the next 10 years to support current levels of service. These are represented at the major asset level.

Segment	Backlog	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034
Bridges	-	$43k	$38k	$49k	-	-	-	-	-	-	-
Culverts	-	-	$24k	-	-	-	-	-	-	-	-
Total	**-**	**$43k**	**$62k**	**$49k**	**-**	**-**	**-**	**-**	**-**	**-**	**-**

Table 17: B&C System-generated 10-Year Capital Costs

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 bridges and structural culverts.

6.6. Risk & Criticality

The risk matrix provides a visual representation of the relationship between the probability of failure and the consequence of failure for the assets within this asset category based on available inventory data. See Appendix D: Risk Rating Criteria for the criteria used to determine the risk rating of each asset.

1 - 4 Very Low	5 - 7 Low	8 - 9 Moderate	10 - 14 High	15 - 25 Very High
- (0%)	$3,479,301 (17%)	$5,597,000 (27%)	$10,900,500 (53%)	$658,000 (3%)

Figure 33: B&C Risk Matrix

This is a high-level model developed by municipal staff and should be reviewed and adjusted to reflect an evolving understanding of both the probability and consequences of asset failure. The identification of critical assets allows the Township to determine appropriate risk mitigation strategies and treatment options. Risk mitigation may include asset-specific lifecycle strategies, condition assessment strategies, or simply the need to collect better asset data.

6.6.1. Risks to Current Asset Management Strategies

The following section summarizes key trends, challenges, and risks to service delivery that the Township is currently facing:

Climate Change & Extreme Weather Events

Flooding and extreme weather causes damage to multiple components of the Township's bridges including the deck, superstructure, substructure, and approaches. The rising levels of freshwater and the increased frequency and intensity of precipitation events are likely to increase the deterioration of bridge components. The Township also should consider prioritizing infrastructure maintenance, rehabilitation, and replacement based on susceptibility to climate impacts.

6.7. Levels of Service

The following tables identify the Township's metrics to identify their current level of service for the bridges and culverts.

6.7.1. Community Levels of Service

The following table outlines the qualitative descriptions that determine the community levels of service provided by bridges and culverts.

Service Attribute	Qualitative Description	Current LOS
Scope	Description of the traffic that is supported by municipal bridges (e.g. heavy transport, motor, emergency vehicles, pedestrians, cyclists)	Bridges and structural culverts are a key component of the municipal transportation network. None of the Township's structures have loading or dimensional restrictions meaning that most types of vehicles, including heavy transport, motor vehicles, emergency vehicles and cyclists can cross them without restriction.
Quality	Description or images of the condition of bridges and culverts and how this would affect use of the bridges and culverts	See Appendix A.

Table 18: B&C Community Levels of Service

6.7.2. Technical Levels of Service

The following table outlines the quantitative metrics that determine the technical level of service provided by bridges and culverts.

Service Attribute	Technical Metric	Current LOS
Scope	% of bridges in the Township with loading or dimensional restrictions	0%
Performance	Average bridge condition index value for bridges in the municipality	76
	Average BCI value for structural culverts in the municipality	75

Table 19: B&C Technical Levels of Service

6.7.3. Proposed Levels of Service

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

The tables and graphs below explain the proposed levels of service scenarios that were analyzed for Bridges & Culverts. Further PLOS analysis at the portfolio level can be found in Proposed Levels of Service Scenario Analysis.

Scenario	Description
Scenario 1: Achieving Full Funding in 15 Years	This scenario assumes a phased tax increase of approximately 1.9% annually, reaching full funding within 15 years
Scenario 2: Achieving 75% Funding in 15 Years	This scenario assumes a phased tax increase of approximately 1.2% annually, reaching 75% funding within 15 years
Scenario 3: Achieving 50% Funding in 15 Years	This scenario assumes a phased tax increase of approximately 0.4% annually, reaching 50% funding within 15 years

Table 20: B&C PLOS Scenarios

PLOS Analysis

The following table compares three funding scenarios, illustrating how varying levels of capital investment impact asset condition, risk, and overall performance over time.

Scenario	Technical LOS Outcomes	Initial Value (2025)	10 Year Projection (2035)	25 Year Projection (2050)	Scenario Average
Scenario 1	Average Condition	74.02%	58.71%	36.76%	55.62%
	Average Asset Risk	10.46	14.18	17.75	13.63
	Average Annual Investment		$379,409		
	Capital re-investment rate		1.8%		
Scenario 2	Average Condition	74.02%	58.71%	36.76%	52.22%
	Average Asset Risk	10.46	14.18	17.75	14.23
	Average Annual Investment		$284,557		
	Capital re-investment rate		1.4%		
Scenario 3	Average Condition	74.02%	58.71%	36.76%	47.80%
	Average Asset Risk	10.46	14.18	17.75	14.94

Average Annual Investment	$189,704
Capital re-investment rate	0.9%

Table 21: B&C PLOS Scenario Analysis

The following figure illustrates the projected condition of the asset category under each of the three investment level scenarios, demonstrating how varying reinvestment strategies impact overall asset condition over time.

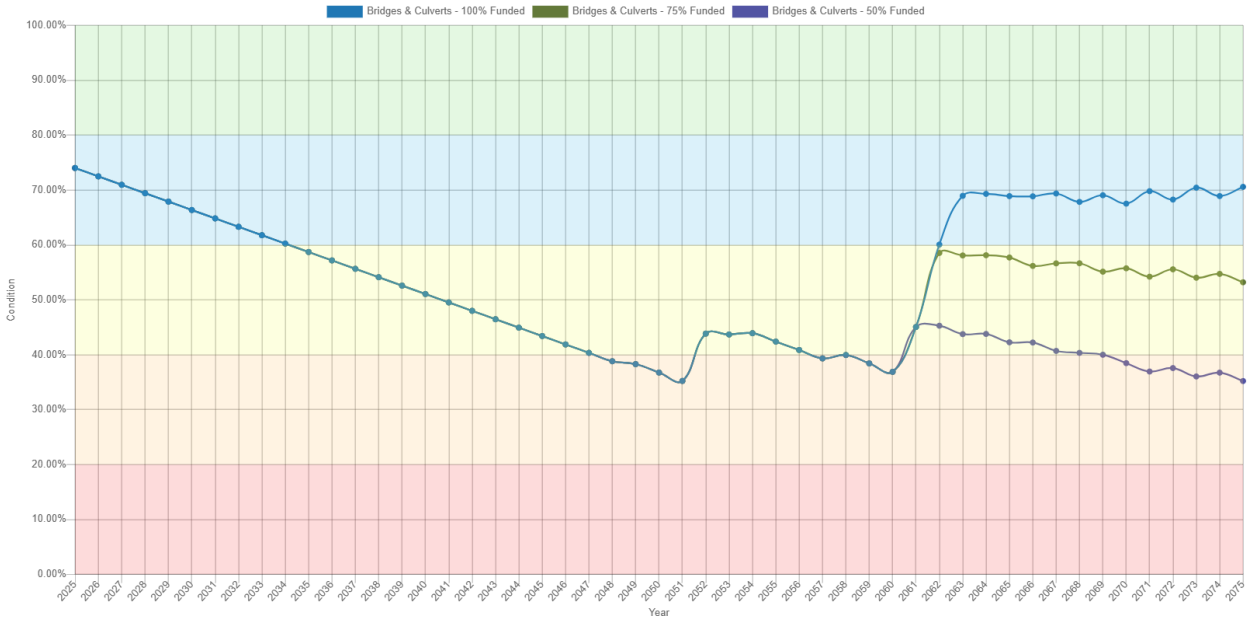


Figure 34: B&C Scenario Comparison

7. Water Network

7.1. State of the Infrastructure

There are two municipal drinking water networks, Elgeti-Crystal Springs in Stewart Hall and Keene Heights in Keene, owned by the Township of Otonabee-South Monaghan and operated by the Ontario Clean Water Agency (OCWA).

The water networks in the Township include the following:

- Water Treatment Plant
- Watermains
- Water Valves, water meters and other Appurtenances

The following summarizes the state of the infrastructure for the water network, and the Township's ability to fund the proposed levels of service:

Replacement Cost	Condition	Financial Capacity	
$5,888,383	35% (Poor)	Annual Requirement:	$123,417
		Funding Available:	$27,577
		Annual Deficit:	$95,841

Table 22: Water Network State of the Infrastructure

7.2. Inventory & Valuation

The table below includes the quantity, replacement cost method, and total replacement cost of each asset segment for the Township's Water Network.

Segment	Quantity	Unit of Measure	Primary Replacement Cost Method	Replacement Cost
Appurtenances	1	Quantity	CPI	$328,767
Service Connections	37	Quantity	CPI	$94,000
Valves	8	Quantity	CPI	$50,000
Water Meters	143	Quantity	CPI	$72,597
Water Treatment Plant	2	Quantity	CPI	$1,979,714
Watermains	4,676	Length	CPI	$3,363,305
Total				**$5,888,383**

Table 23: Water Network Inventory

The graph below displays the total replacement cost of each asset segment in Otonabee-South Monaghan's water network inventory.

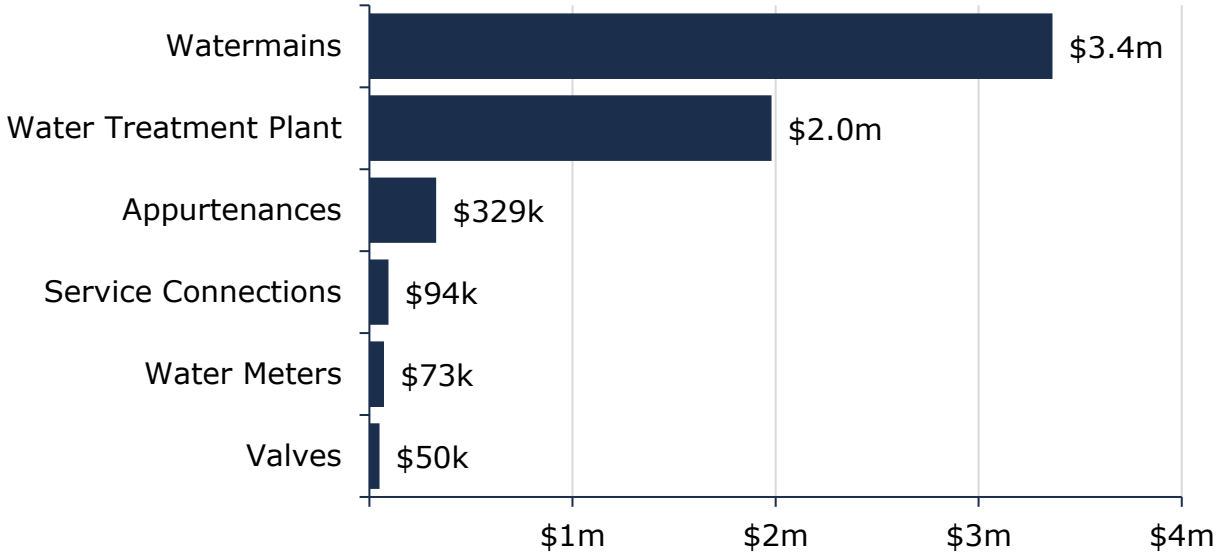


Figure 35: Water Network Replacement Value

Each asset's replacement cost should be reviewed periodically to determine whether adjustments are needed to more accurate represent realistic capital requirements.

7.3. Asset Condition & Age

The table below identifies the average age, and the average estimated useful life for each asset segment.

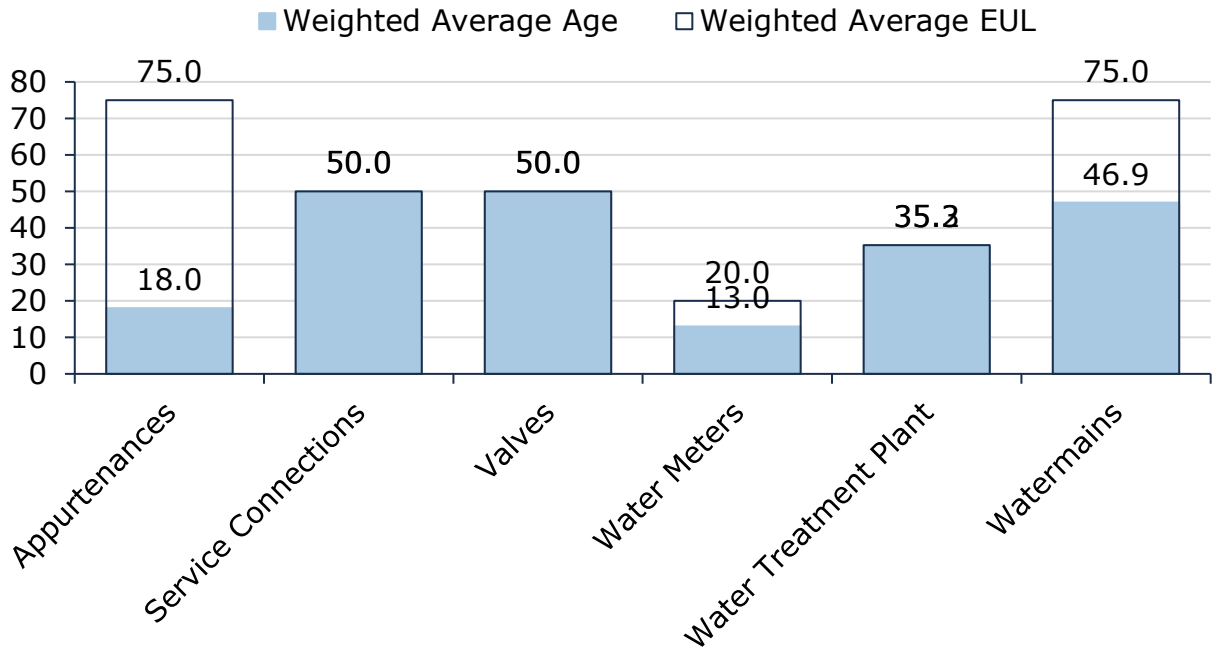


Figure 36: Water Network Average Age vs Average EUL

The graph below visually illustrates the average condition for each asset segment on a very good to very poor.

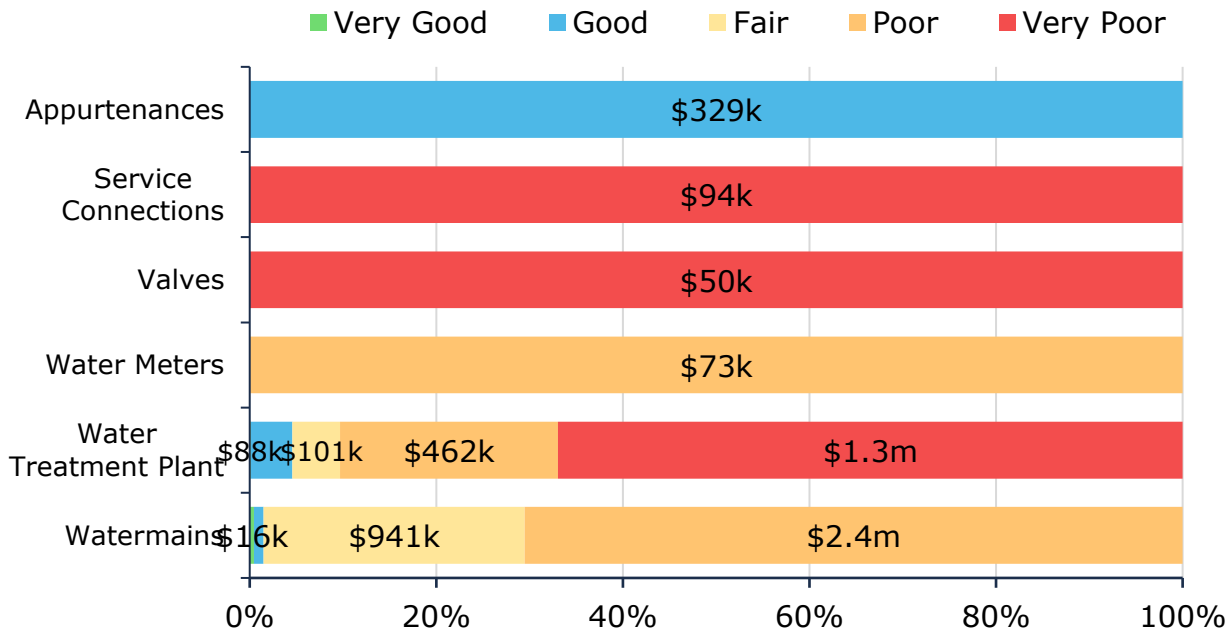


Figure 37: Water Network Condition Breakdown

To ensure that the municipal water network continues to provide an acceptable level of service, the Township should monitor the average condition of all assets. If the average condition declines, staff should re-evaluate their lifecycle management strategy to determine what combination of maintenance, rehabilitation and replacement activities is required to increase the overall condition of the water network.

Each asset's estimated useful life should also be reviewed to determine whether adjustments need to be made to better align with the observed service life.

7.3.1. Current Approach to Condition Assessment

Accurate and reliable condition data allows staff to determine the remaining service life of assets and identify the most cost-effective approach to managing assets. The following describes the Township's current approach:

- The Township owns the water treatment plant, and it is operated by Ontario Clean Water Agency (OCWA)
- Staff primarily rely on the historical break records, water quality, age and material types to determine the projected condition of water mains

7.4. Lifecycle Management Strategy

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.

Maintenance / Rehabilitation / Replacement

- Routine maintenance activities for the Water Network are conducted by the Township's service provider, Ontario Clean Water Agency.
- Main flushing is completed for the whole network twice per year during spring and fall seasons
- OCWA recommends replacements and refurbishments for the treatment plant
- In the absence of mid-lifecycle rehabilitative events, full replacement for most mains is completed once it reaches its end-of-life
- Water network replacement schedule is based on the break records, water quality, ages and material types

Figure 38: Water Network Current Lifecycle Strategy

7.5. Forecasted Capital Requirements

The annual capital requirement represents the average amount per year that Otonabee-South Monaghan should allocate towards funding rehabilitation and replacement needs. The following graph identifies capital requirements over the next 50 years. This projection is used as it ensures that every asset has gone through one full iteration of replacement. The forecasted requirements are aggregated into 5-year bins, and the trend line represents the average capital requirement of $123,417.

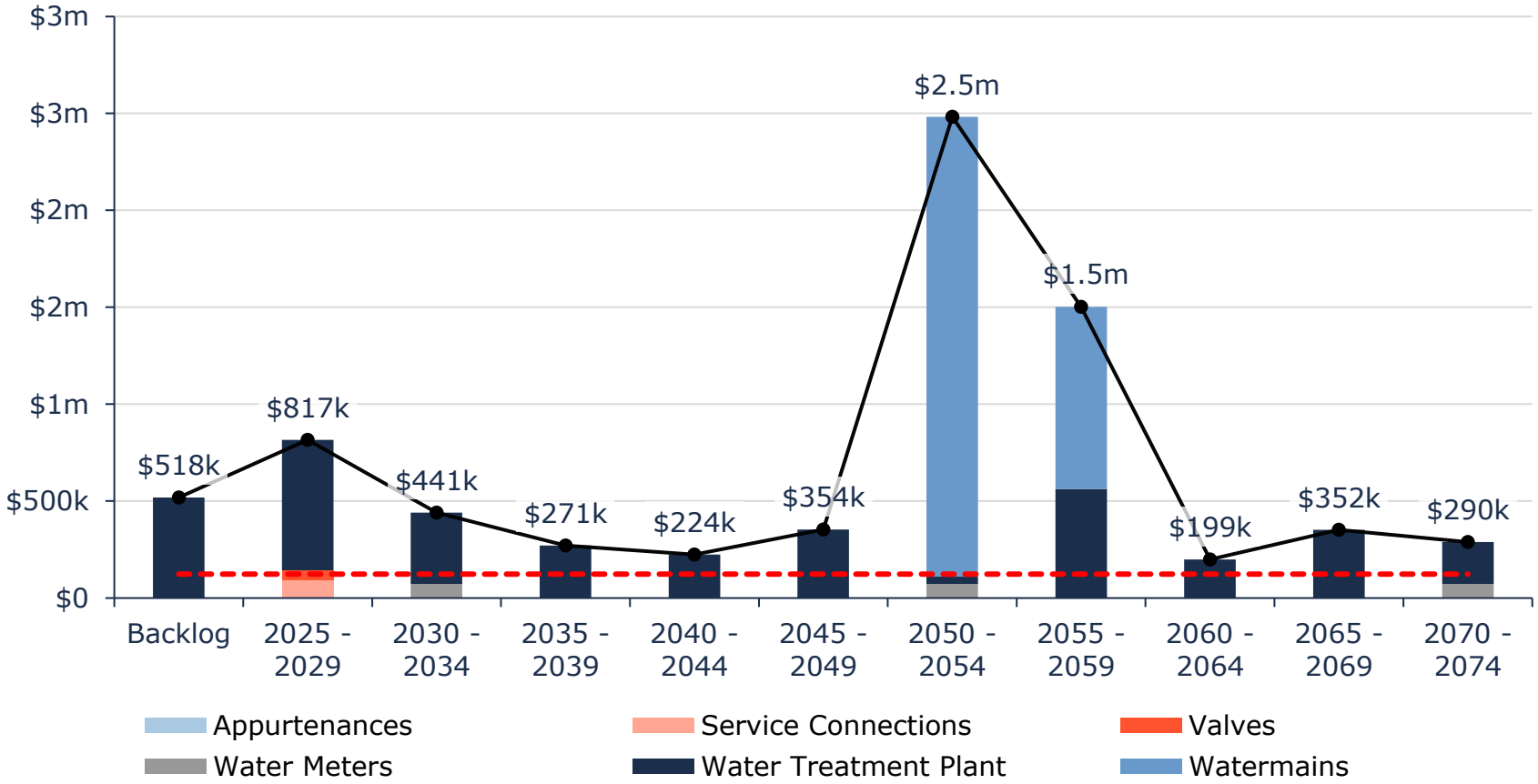


Figure 39: Water Network Forecasted Capital Replacement Requirements

The table below summarizes the projected cost of lifecycle activities (capital activities only) that may need to be undertaken over the next 10 years to support current levels of service.

Segment	Backlog	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034
Appurtenances	-	-	-	-	-	-	-	-	-	-	-
Service Connections	-	$94k	-	-	-	-	-	-	-	-	-
Valves	-	$50k	-	-	-	-	-	-	-	-	-
Water Meters	-	-	-	-	-	-	-	-	-	-	-
Water Treatment Plant	$518k	$649k	$15k	$3k	$1k	$4k	$340k	$1k	-	$15k	$11k
Watermains	-	-	-	-	-	-	-	-	-	-	-
Total	**$518k**	**$793k**	**$15k**	**$3k**	**$1k**	**$4k**	**$340k**	**$1k**	**-**	**$15k**	**$11k**

Table 24: Water Network System-Generated 10-Year Capital Costs

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 water network assets.

7.6. Risk & Criticality

The risk matrix provides a visual representation of the relationship between the probability of failure and the consequence of failure for the assets within this asset category based on available inventory data. See Appendix D: Risk Rating Criteria for the criteria used to determine the risk rating of each asset.

1 - 4 Very Low	5 - 7 Low	8 - 9 Moderate	10 - 14 High	15 - 25 Very High
$376,573 (6%)	$722,549 (12%)	$351,254 (6%)	$1,489,657 (25%)	$2,948,350 (50%)

Figure 40: Water Network Risk Matrix

This is a high-level model that has been developed based on information currently available and should be reviewed and adjusted to reflect an evolving understanding of both the probability and consequences of asset failure.

The identification of critical assets allows the Township to determine appropriate risk mitigation strategies and treatment options. Risk mitigation may include asset-specific lifecycle strategies, condition assessment strategies, or simply the need to collect better asset data.

7.6.1. Risks to Current Asset Management Strategies

The following section summarizes key trends, challenges, and risks to sanitary service delivery that the Township is currently facing:

Lifecycle Management Strategies

The current lifecycle management strategy for water network is considered reactive. Replacement of watermains is dependent on break records, water quality, age and material type. This poses a risk of service disruption when assets failure occurs. An enhanced proactive strategy can help to extend the service life of the assets, reduce dependency on grant funding and minimize the deferral of capital works.

7.7. Levels of Service

The following tables identify the Township's metrics to identify their current level of service for the Water Network. The Township will use this data to set a target level of service and determine proposed levels for the regulation by 2025.

7.7.1. Community Levels of Service

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

Service Attribute	Qualitative Description	Current LOS
Scope	Description, which may include maps, of the user groups or areas of the municipality that are connected to the municipal water system	The Elgeti-Crystal Springs Drinking Water System supplies treated water to the Elgeti and Crystal Springs subdivisions and consists of approximately 107 service connections. The Keene Heights Drinking Water System supplies treated water to the Keene Heights subdivision and consists of approximately 37 connections.
	Description, which may include maps, of the user groups or areas of the municipality that have fire flow.	A network of watermains and hydrants are available for residents in Burnham Meadows, maintained and operated by Peterborough Utilities Group. No hydrants exist outside of this subdivision; however, the remaining Township has tanker shuttle accreditation.
Reliability	Description of boil water advisories and service interruptions	N/A

Table 25: Water Network Community Levels of Service

7.7.2. Technical Levels of Service

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

Service Attribute	Technical Metric	Current LOS
Scope	% of properties connected to the municipal water system	5%

	% of properties where fire flow is available	5%
Performance	# of connection-days per year due to water main breaks compared to the total number of properties connected to the municipal water system	0
	# 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

Table 26: Water Network Technical Levels of Service

7.7.3. Proposed Levels of Service

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

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

Scenario	Description
Scenario 1: Achieving Full Funding in 15 Years	This scenario assumes a phased rate increase of approximately 0.8% annually, reaching full funding within 15 years
Scenario 2: Achieving 75% Funding in 15 Years	This scenario assumes a phased rate increase of approximately 0.1% annually, reaching 75% funding within 15 years
Scenario 3: Achieving 50% Funding in 15 Years	This scenario assumes current funding levels would be maintained

Table 27: Water Network PLOS Scenarios

PLOS Analysis

The following table compares three funding scenarios, illustrating how varying levels of capital investment impact asset condition, risk, and overall performance over time.

Scenario	Technical LOS Outcomes	Initial Value (2025)	10 Year Projection (2035)	25 Year Projection (2050)	Scenario Average
Scenario 1	Average Condition	41.46%	40.32%	40.03%	42.71%
	Average Asset Risk	11.64	13.02	13.08	12.09
	Average Annual Investment		$123,417		

	Capital re-investment rate		2.0%		
Scenario 2	Average Condition	41.46%	39.22%	30.62%	32.69%
	Average Asset Risk	11.64	13.18	13.84	13.36
	Average Annual Investment		$95,969		
	Capital re-investment rate		1.6%		
Scenario 3	Average Condition	41.46%	34.35%	23.01%	22.51%
	Average Asset Risk	11.64	13.78	14.58	14.89
	Average Annual Investment		$63,979		
	Capital re-investment rate		1.0%		

Table 28: Water Network pLOS Scenario Analysis

The following figure illustrates the projected condition of the asset category under each of the three investment level scenarios, demonstrating how varying reinvestment strategies impact overall asset condition over time.

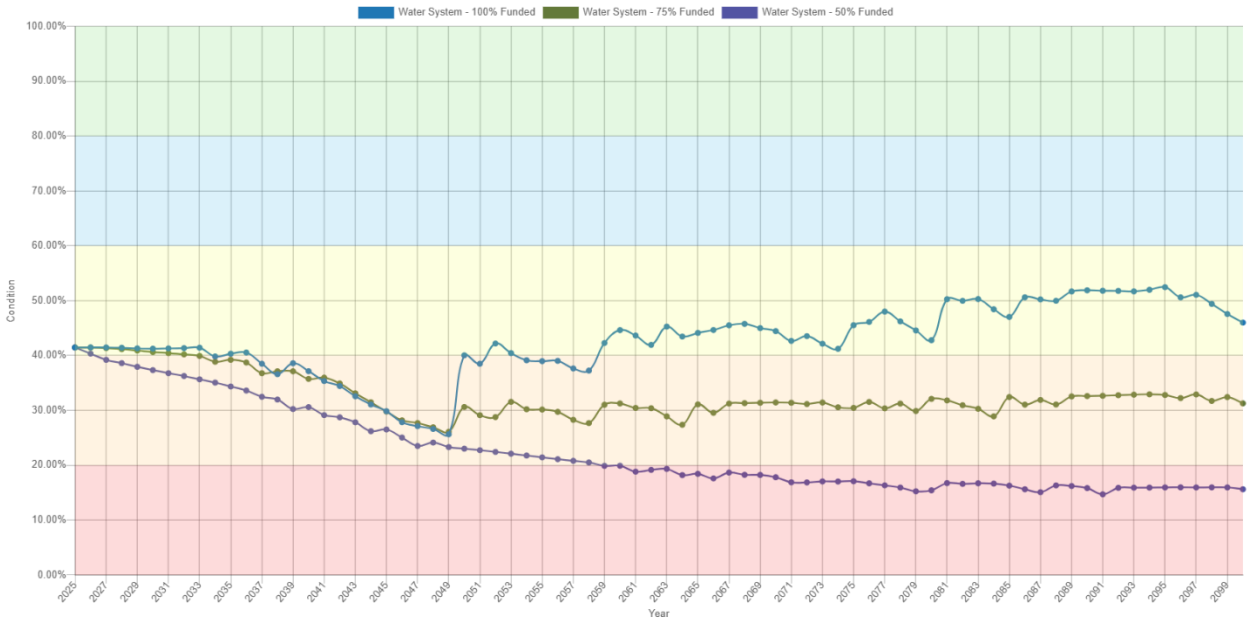


Figure 41: Water Network Scenario Comparison

8. Sanitary System (unassumed)

8.1. State of the Infrastructure

Burnham Meadows is currently the only area in the Township with access to municipal sanitary services. This system is fully serviced by municipal sewage infrastructure extending from the City of Peterborough. Although the infrastructure within the subdivision is expected to be assumed by the Township around 2026, it remains unassumed at this time and is currently operated and maintained by the City of Peterborough.

The sanitary system in Burnham Meadows includes the following:

- Manholes
- Sanitary Laterals
- Sewer mains

The following summarizes the state of the infrastructure for the sanitary network, and the Township's ability to fund the proposed levels of service:

Replacement Cost	Condition	Financial Capacity	
$2,081,879	94% (Very Good)	Annual Requirement:	$33,387
		Funding Available:	$69,821
		Annual Deficit:	($36,434)

Table 29: Sanitary System State of the Infrastructure

8.2. Inventory & Valuation

The table below includes the quantity, replacement cost method and total replacement cost of each asset segment for the Township's Sanitary System.

Segment	Quantity	Unit of Measure	Primary Replacement Cost Method	Replacement Cost
Forcemain	2,211	Length (m)	User-Defined	$276,375
Manholes	35	Quantity	User-Defined	$234,917
Sanitary Laterals	208	Quantity	User-Defined	$345,767
Sanitary manholes	9	Quantity	User-Defined	$40,500
Sewage Pumping Station	1	Quantity	User-Defined	$750,000
Sewer Mains	2,670	Length (m)	User-Defined	$434,320
Total		**Assets**		**$2,081,879**

Table 30: Sanitary System Inventory

The graph below displays the total replacement cost of each asset segment in Otonabee-South Monaghan's Sanitary network inventory.

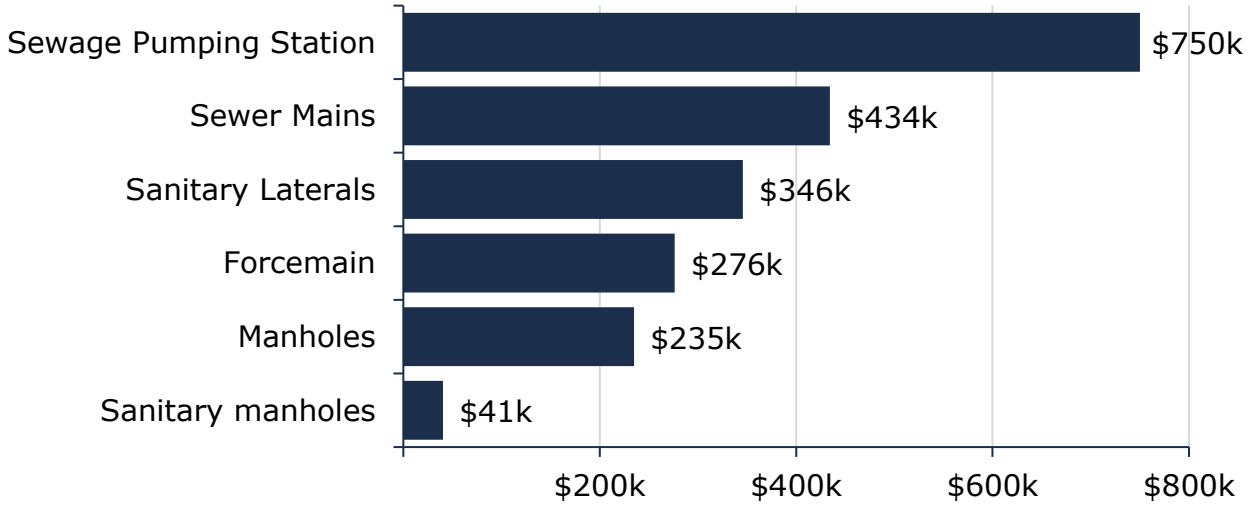


Figure 42: Sanitary System Replacement Cost

Each asset's replacement cost should be reviewed periodically to determine whether adjustments are needed to more accurate represent realistic capital requirements.

8.3. Asset Condition & Age

The table below identifies the average age and the average estimated useful life for each asset segment.

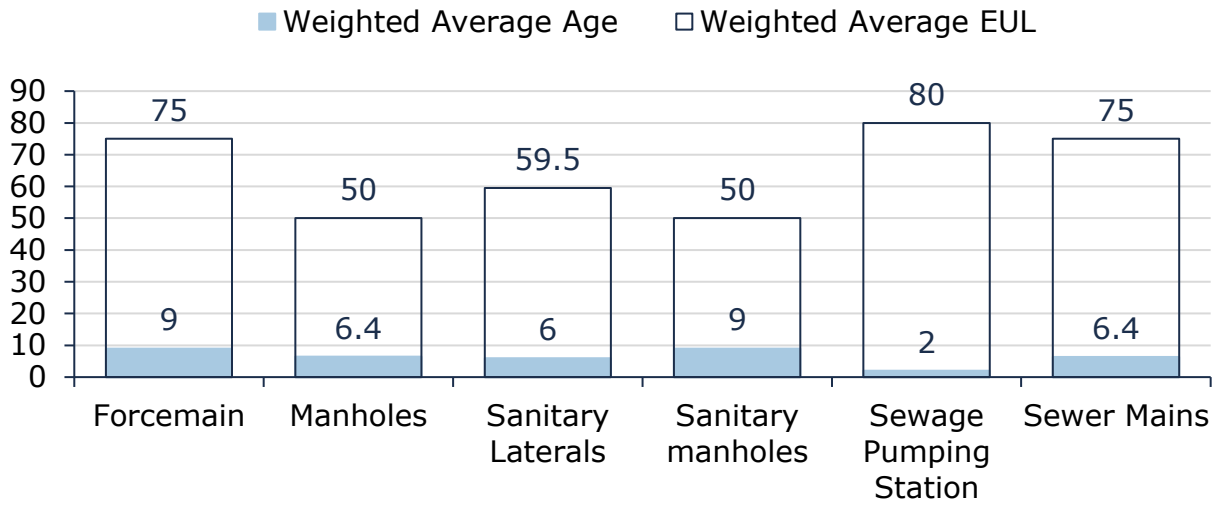


Figure 43: Sanitary System Average Age vs Average EUL

The graph below visually illustrates the average condition for each asset segment on a very good to very poor.

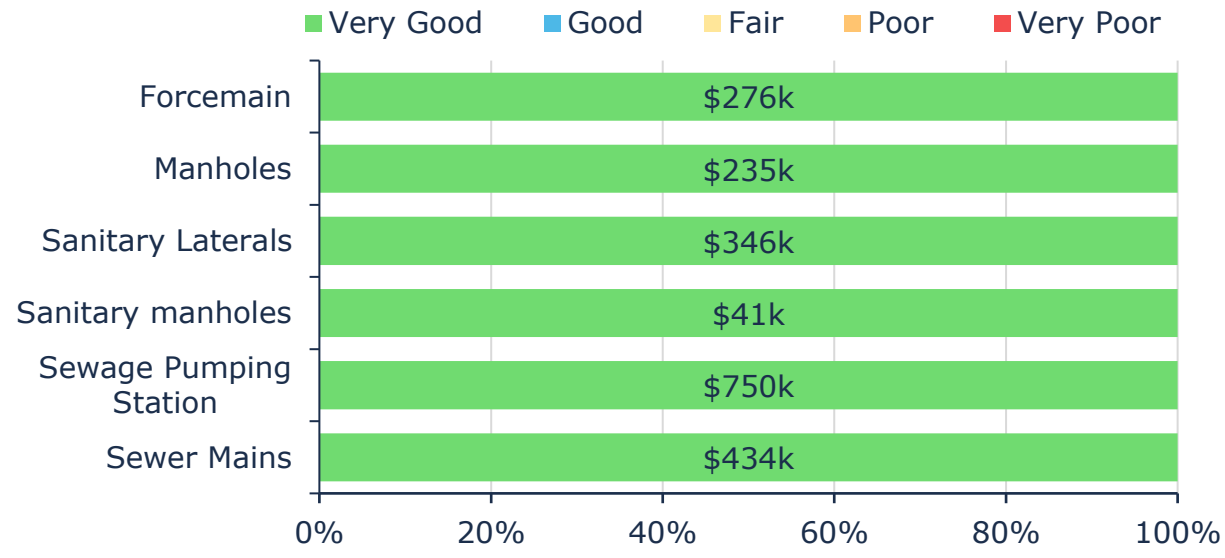


Figure 44: Sanitary System Condition Breakdown

To ensure that the municipal sanitary system continues to provide an acceptable level of service, the Township should monitor the average condition of all assets. If the average condition declines, staff should re-evaluate their lifecycle management strategy to determine what combination of maintenance, rehabilitation and replacement activities is required to increase the overall condition of the Sanitary network.

Each asset's estimated useful life should also be reviewed to determine whether adjustments need to be made to better align with the observed service life.

8.3.1. Current Approach to Condition Assessment

Accurate and reliable condition data allows staff to determine the remaining service life of assets and identify the most cost-effective approach to managing assets. CCTV inspections and pumping of the sanitary system is completed for sanitary mains by the City of Peterborough.

8.4. Lifecycle Management Strategy

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.

Maintenance / Rehabilitation / Replacement

- Main flushing is completed on an as-needed basis by The City of Peterborough
- Periodic CCTV testing may be employed by The City of Peterborough to identify deficiencies and potential leaks.
- In the absence of mid-lifecycle rehabilitative events, most mains are simply maintained with the goal of full replacement once it reaches its end-of-life.
- Replacement activities are identified based on an analysis of the main break rate as well as any issues identified during regular maintenance activities.

Figure 45: Sanitary System Current Lifecycle Strategy

8.5. Forecasted Capital Requirements

The annual capital requirement represents the average amount per year that Otonabee-South Monaghan should allocate towards funding rehabilitation and replacement needs. The following graph identifies capital requirements over the next 50 years. This projection is used as it ensures that every asset has gone through one full iteration of replacement. The forecasted requirements are aggregated into 5-year bins, and the trend line represents the average capital requirements at $33,000.

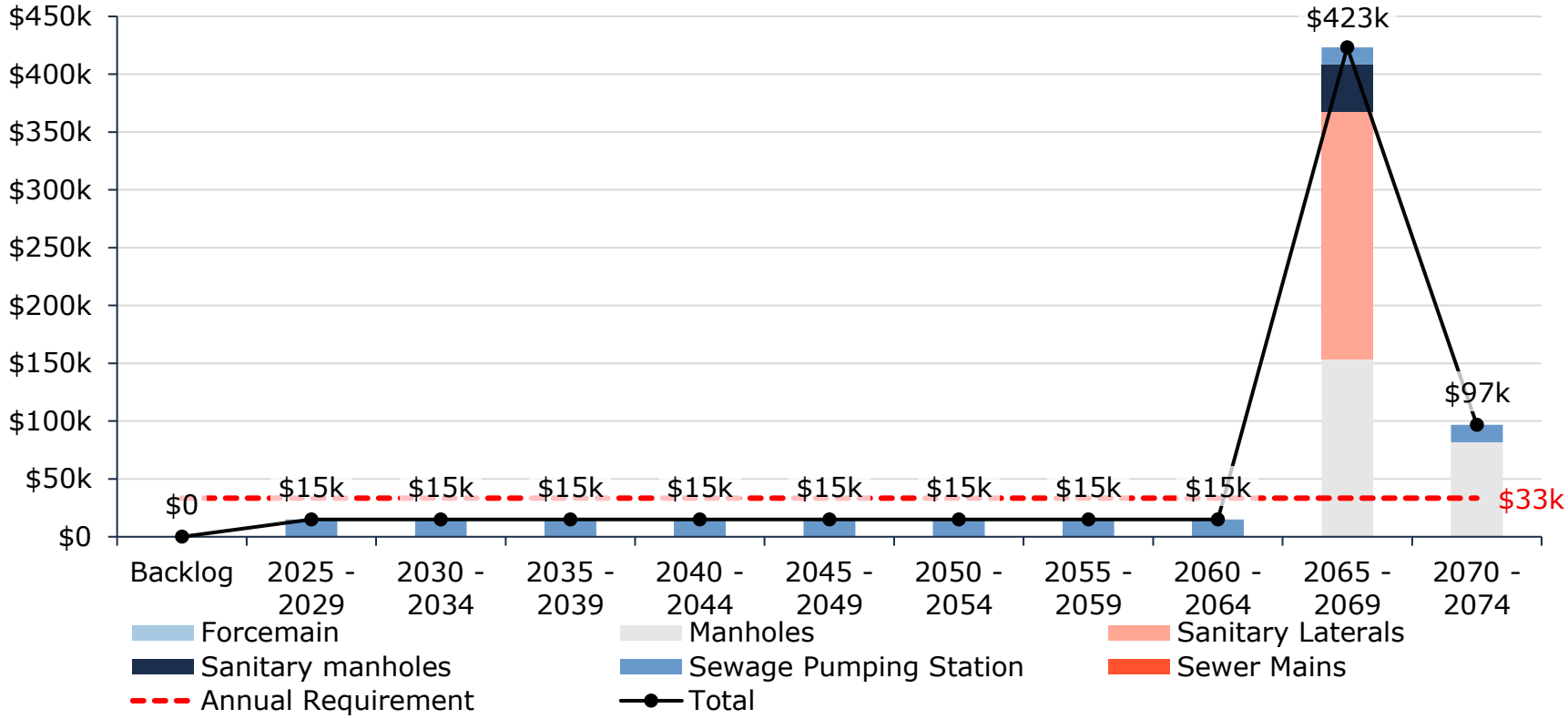


Figure 46: Sanitary network Forecasted Capital Replacement Requirements

The Table below summarizes the projected cost of lifecycle activities (capital activities only) that may need to be undertaken over the next 10 years to support current levels of service.

Segment	Backlog	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034
Forcemain	-	-	-	-	-	-	-	-	-	-	-
Manholes	-	-	-	-	-	-	-	-	-	-	-
Sanitary Laterals	-	-	-	-	-	-	-	-	-	-	-
Sanitary manholes	-	-	-	-	-	-	-	-	-	-	-
Sewage Pumping Station	-	-	-	-	$15k	-	-	-	-	$15k	-
Sewer Mains	-	-	-	-	-	-	-	-	-	-	-
Total	**-**	**-**	**-**	**-**	**$15k**	**-**	**-**	**-**	**-**	**$15k**	**-**

Table 31: Sanitary System System-Generated 10-Year Capital Costs

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 sanitary network assets.

8.6. Risk & Criticality

The risk matrix provides a visual representation of the relationship between the probability of failure and the consequence of failure for the assets within this asset category based on available inventory data. See Appendix D: Risk Rating Criteria for the criteria used to determine the risk rating of each asset.

1 - 4 Very Low	5 - 7 Low	8 - 9 Moderate	10 - 14 High	15 - 25 Very High
$951,999 (46%)	$1,103,819 (53%)	$26,061 (1%)	- (0%)	- (0%)

Figure 47: Sanitary System Risk Matrix

This is a high-level model that has been developed based on information currently available and should be reviewed and adjusted to reflect an evolving understanding of both the probability and consequences of asset failure. The identification of critical assets allows the Township to determine appropriate risk mitigation strategies and treatment

options. Risk mitigation may include asset-specific lifecycle strategies, condition assessment strategies, or simply the need to collect better asset data.

8.6.1. Risks to Current Asset Management Strategies

The following section summarizes key trends, challenges, and risks to sanitary service delivery that the Township is currently facing:

Growth

The population growth in the Township is expected to continue. Population and employment growth will increase the demand on municipal services and potentially decrease the lifecycle of certain assets. Currently, the sewage services are only available at Burnham Meadows, and it is operated and maintained by the City of Peterborough. As the population continues to grow, the Township must prioritize expanding its capacity to serve a larger population. Staff are working towards developing a comprehensive long-term capital plan with considerations for growth.

8.7. Levels of Service

The following tables identify the Township's metrics to identify their current level of service for the Sanitary System.

8.7.1. Community Levels of Service

The following table outlines the qualitative descriptions that determine the community levels of service provided by the Sanitary System.

Values	Qualitative Description	Current LOS
Scope	Description, which may include maps, areas of the municipality that are connected to the municipal wastewater system	Only the Burnham Meadows subdivision has access to a piped wastewater network, consisting of sewer mains, laterals, and manholes. This represents approximately 5% of the Township.
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.	The Township does not own any combined sewers.
	Description of the frequency and volume of overflows in combined sewers in the municipal wastewater system that occur in habitable areas or beaches.	
	Description of how stormwater can get into sanitary sewers in the municipal wastewater system, causing sewage to overflow into streets or backup into homes.	The sewer system is relatively new, and does not at this point in time have any inflow and infiltration issues identified. As the system ages it is expected that water can infiltrated through cracks in the joints and through manholes.
	Description of how sanitary sewers in the municipal wastewater system are designed to be resilient to avoid stormwater infiltration	The sewer system is designed to be water tight, minimizing infiltration. However, there is no program in place to prevent private connections.
	Description of the effluent that is discharged from sewage treatment plants in the municipal wastewater system.	All wastewater treatment is managed by the Peterborough Utilities Group.

Table 32: Sanitary System Community Levels of Service

8.7.2. Technical Levels of Service

The following table outlines the quantitative metrics that determine the technical level of service provided by the Sanitary System.

Values	Technical Metric	Current LOS
Scope	% of properties connected to the municipal wastewater systems	5%
Performance	# 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 with sanitary main backups compared to the total number of properties connected to the municipal wastewater system	0
	# of effluent violations per year due to wastewater discharge compared to the total number of properties connected to the municipal wastewater system	0

Table 33: Sanitary System Technical Levels of Service

8.7.3. Proposed Levels of Service

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

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

Scenario	Description
Scenario 1: Achieving Full Funding in 15 Years	This scenario models the impact of maintaining current rates, projecting current funding levels over 15 years.
Scenario 2: Achieving 75% Funding in 15 Years	This scenario models the impact of maintaining current rates, projecting a funding level of 75% over 15 years. It is a theoretical exercise only, as the Township's sanitary system is currently fully funded, and no reductions to rates are planned.
Scenario 3: Achieving 50% Funding in 15 Years	This scenario models the impact of maintaining current rates, projecting a funding level of 50% over 15 years. It is a theoretical exercise only, as the Township's sanitary system is currently fully funded, and no reductions to rates are planned.

Table 34: Sanitary System PLOS Scenarios

PLOS Analysis

The following table compares three funding scenarios, illustrating how varying levels of capital investment impact asset condition, risk, and overall performance over time.

Scenario	Technical LOS Outcomes	Initial Value (2025)	10 Year Projection (2035)	25 Year Projection (2050)	Scenario Average
Scenario 1	Average Condition	91.54%	76.94%	55.04%	51.17%
	Average Asset Risk	4.43	5.85	10.03	11.51
	Average Annual Investment		$33,387		
	Capital re-investment rate		1.6%		
Scenario 2	Average Condition	91.54%	76.94%	55.04%	51.17%
	Average Asset Risk	4.43	5.85	10.03	11.51
	Average Annual Investment		$25,041		
	Capital re-investment rate		1.2%		
Scenario 3	Average Condition	91.54%	76.94%	55.04%	50.93%
	Average Asset Risk	4.43	5.85	10.03	11.55
	Average Annual Investment		$16,694		
	Capital re-investment rate		0.8%		

Table 35: Sanitary System PLOS Scenario Analysis

The following figure illustrates the projected condition of the asset category under each of the three investment level scenarios, demonstrating how varying reinvestment strategies impact overall asset condition over time.

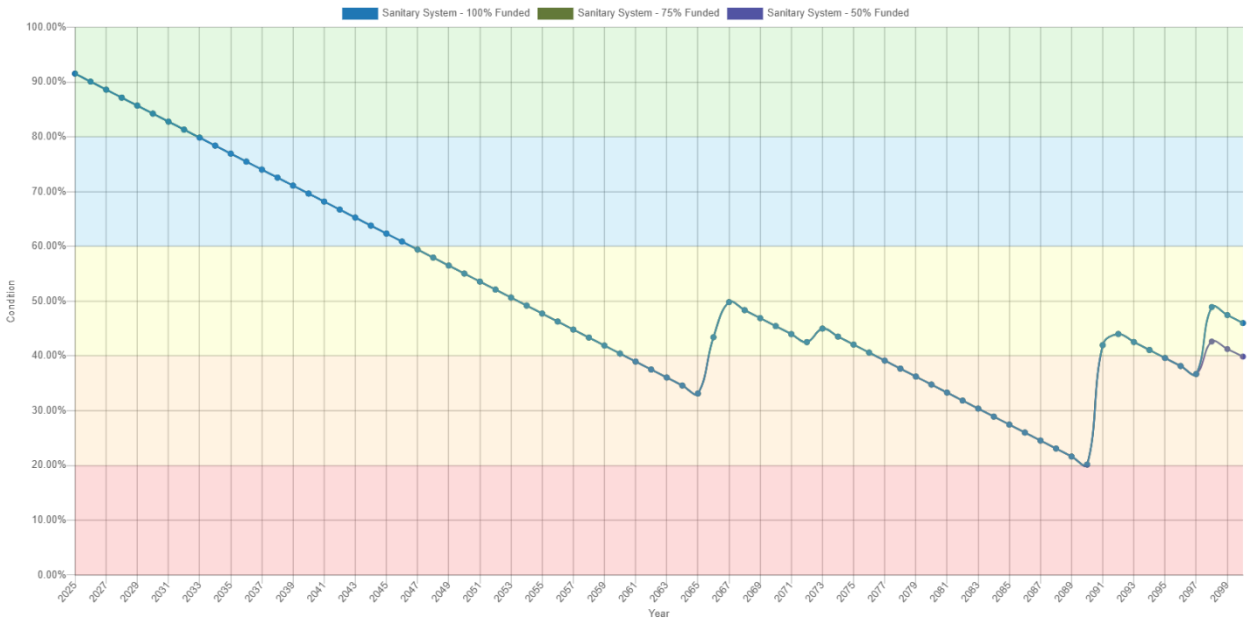


Figure 48: Sanitary System Scenario Comparison

9. Storm Network (unassumed)

9.1. State of the Infrastructure

Burnham Meadows is currently the only area in the Township with access to municipal stormwater services. Although the infrastructure within the subdivision is expected to be assumed by the Township around 2026, it remains unassumed at this time and is currently operated and maintained by the Peterborough Utilities Group.

The stormwater system in Burnham Meadows includes the following:

- Catch Basins and manholes
- Storm mains and laterals
- Stormwater Management Facility and stormwater management pond

The following summarizes the state of the infrastructure for the storm network, and the Township's ability to fund the proposed levels of service:

Replacement Cost	Condition	Financial Capacity	
$2,156,753	95% (Very Good)	Annual Requirement:	$63,846
		Funding Available:	$63,901
		Annual Deficit:	($55)

Table 36: Storm Network State of the Infrastructure

9.2. Inventory & Valuation

The table below includes the quantity, replacement cost method and total replacement cost of each asset segment for the Township's Storm Network.

Segment	Quantity	Unit of Measure	Primary Replacement Cost Method	Replacement Cost
Catch Basins	59	Quantity	User-Defined	$219,612
Manholes	40	Quantity	User-Defined	$231,782
Storm Laterals	208	Quantity	User-Defined	$359,160
Storm Mains	2,181	Length (m)	User-Defined	$596,199
SWM Facility	1	Quantity	User-Defined	$750,000
Total				**$2,156,753**

Table 37: Storm Network Inventory

The graph below displays the total replacement cost of each asset segment in Otonabee-South Monaghan's Storm Network inventory.

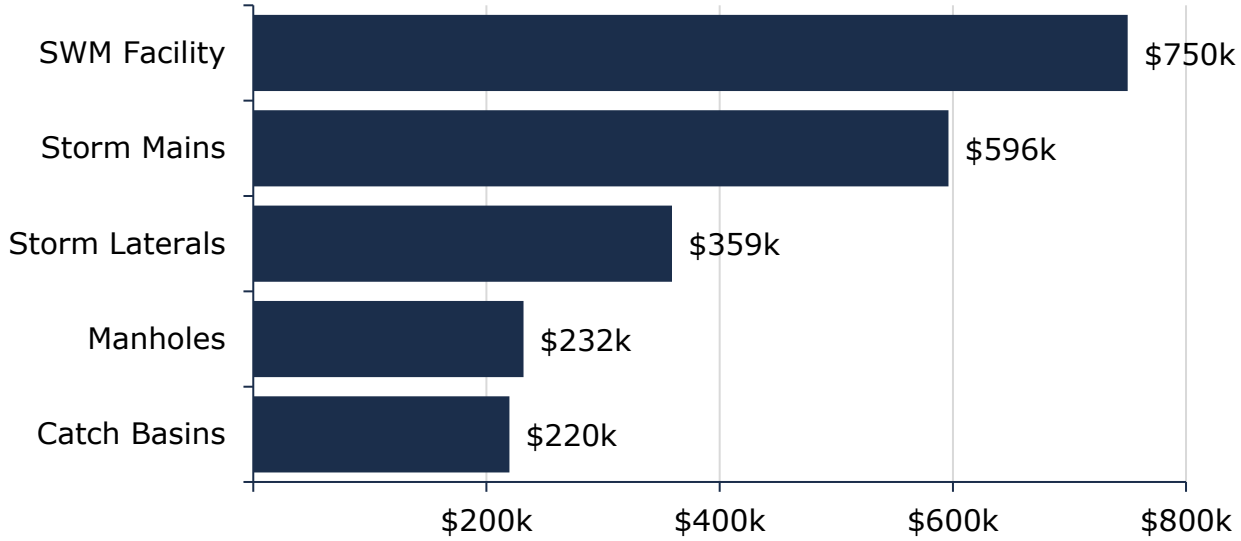


Figure 49: Storm Network Replacement Cost

Each asset's replacement cost should be reviewed periodically to determine whether adjustments are needed to more accurate represent realistic capital requirements.

9.3. Asset Condition & Age

The table below identifies the average age, and the average estimated useful life for each asset segment.

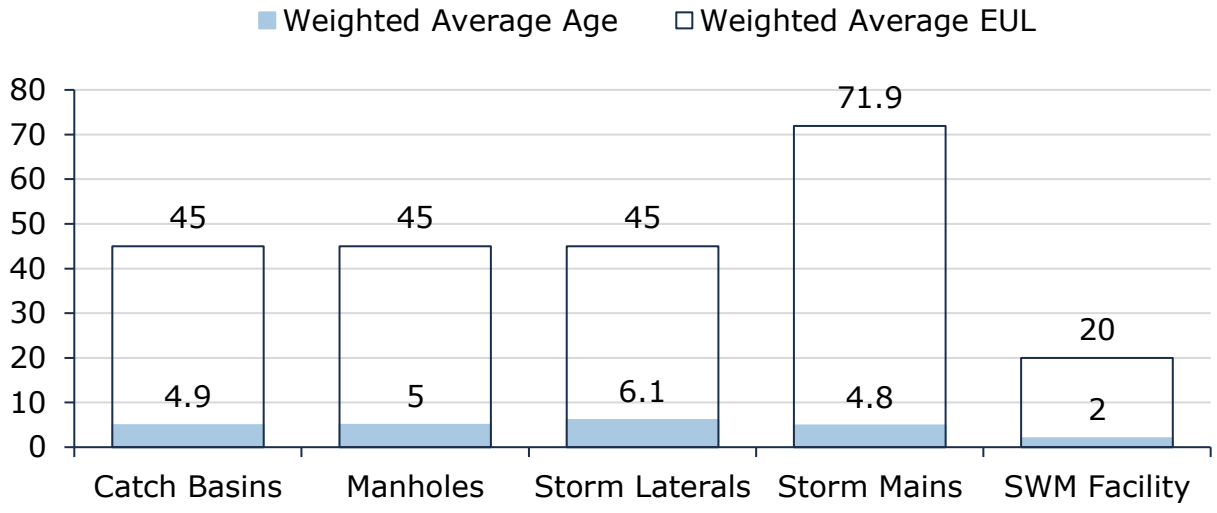


Figure 50: Storm Network Average Age vs Average EUL

The graph below visually illustrates the average condition for each asset segment on a very good to very poor.

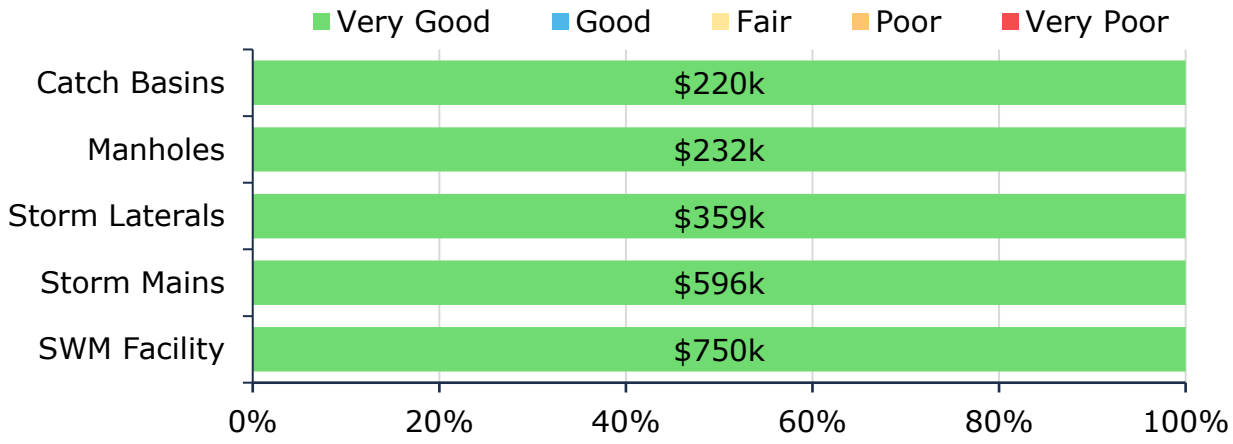


Figure 51: Storm Network Condition Breakdown

To ensure that the municipal Storm Network continues to provide an acceptable level of service, the Township should monitor the average condition of all assets. If the average condition declines, staff should re-evaluate their lifecycle management strategy to determine what combination of maintenance, rehabilitation and replacement activities is required to increase the overall condition of the Storm Network.

Each asset's estimated useful life should also be reviewed to determine whether adjustments need to be made to better align with the observed service life.

9.3.1. Current Approach to Condition Assessment

Accurate and reliable condition data allows staff to determine the remaining service life of assets and identify the most cost-effective approach to managing assets.

- There are no formal condition assessment programs in place for the storm network
- As the Township refines the available asset inventory for the storm network, a regular assessment cycle should be established

9.4. Lifecycle Management Strategy

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.

Maintenance / Rehabilitation / Replacement

- Catch basin and flushing occur reactively on an as-needed basis
- At this time, a regular maintenance program has not been established, as the infrastructure has not yet been transferred to the Township.
- Full replacement will be undertaken once assets reach end-of-life

Figure 52: Storm Network Current Lifecycle Strategy

9.5. Forecasted Capital Requirements

The annual capital requirement represents the average amount per year that Otonabee-South Monaghan should allocate towards funding rehabilitation and replacement needs. The following graph identifies capital requirements over the next 50 years. This projection is used as it ensures that every asset has gone through one full iteration of replacement. The forecasted requirements are aggregated into 5-year bins, and the trend line represents the average capital requirements at $64,000.

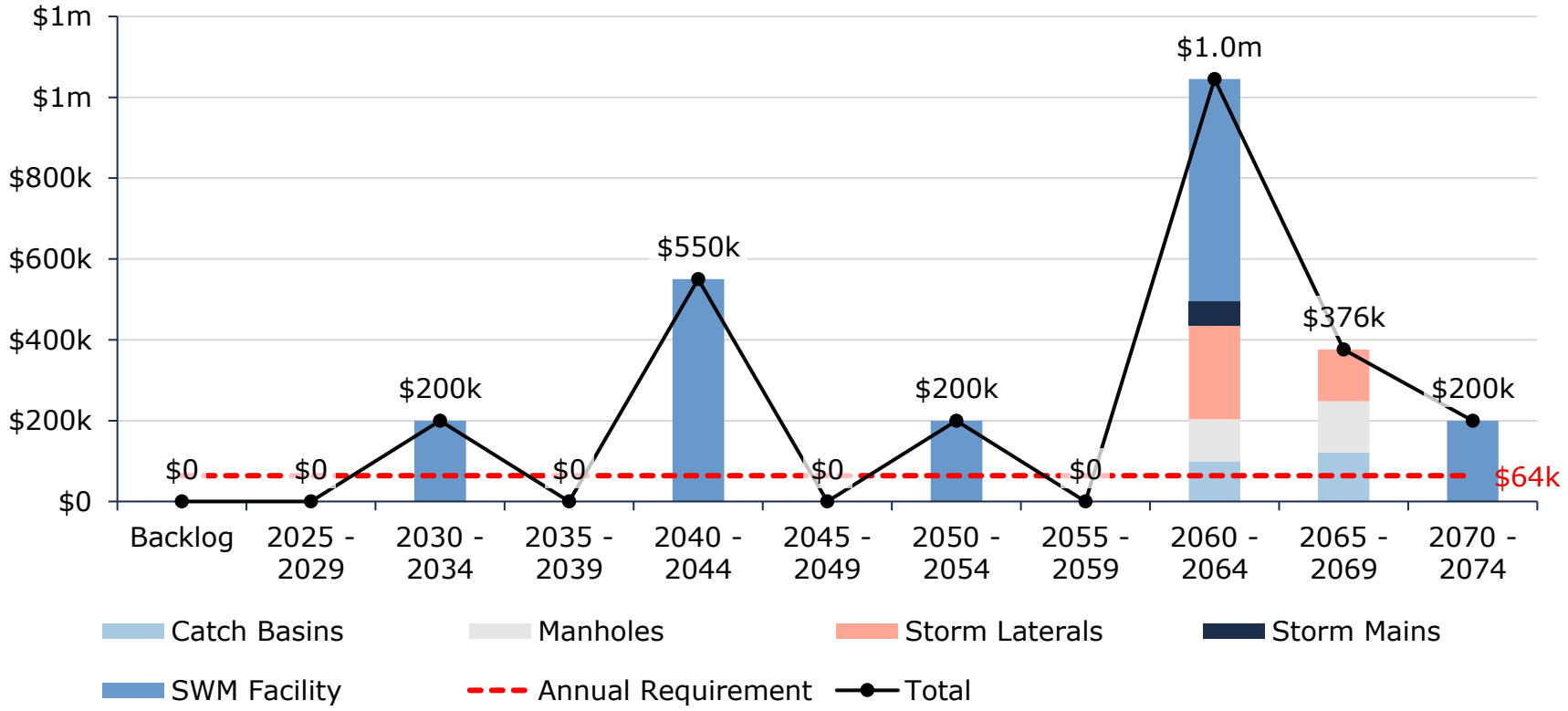


Figure 53: Storm Network Forecasted Capital Replacement Requirements

The Table below summarizes the projected cost of lifecycle activities (capital activities only) that may need to be undertaken over the next 10 years to support current levels of service.

Segment	Backlog	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034
Catch Basins	-	-	-	-	-	-	-	-	-	-	-
Manholes	-	-	-	-	-	-	-	-	-	-	-
Storm Laterals	-	-	-	-	-	-	-	-	-	-	-
Storm Mains	-	-	-	-	-	-	-	-	-	-	-
SWM Facility	-	-	-	-	-	-	$20k	-	-	-	-
Total	**-**	**-**	**-**	**-**	**-**	**-**	**$20k**	**-**	**-**	**-**	**-**

Table 38: Storm Network System-Generated 10-Year Capital Costs

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 storm sewer lines assets.

9.6. Risk & Criticality

The risk matrix provides a visual representation of the relationship between the probability of failure and the consequence of failure for the assets within this asset category based on available inventory data. See Appendix D: Risk Rating Criteria for the criteria used to determine the risk rating of each asset.

1 - 4 Very Low	5 - 7 Low	8 - 9 Moderate	10 - 14 High	15 - 25 Very High
$954,652 (44%)	$1,202,101 (56%)	- (0%)	- (0%)	- (0%)

Figure 54: Storm Network Risk Matrix

This is a high-level model developed by Township staff and it should be reviewed and adjusted to reflect an evolving understanding of both the probability and consequences of asset failure. The identification of critical assets allows the Township to determine appropriate risk mitigation strategies and treatment options. Risk mitigation may include asset-specific lifecycle strategies, condition assessment strategies, or simply the need to collect better asset data.

9.7. Levels of Service

The following tables identify the Township's metrics to identify their current level of service for the Storm Network.

9.7.1. Community Levels of Service

The following table outlines the qualitative descriptions that determine the community levels of service provided by the Storm Network.

Values	Qualitative Description	Current LOS
Scope	Description, which may include map, of the user groups or areas of the municipality that are protected from flooding, including the extent of protection provided by the municipal stormwater system	A piped drainage system is present in the Burnham Meadows subdivision. All other areas of the Township rely on ditch drainage. Stormwater protection in the Burnham Meadows subdivision is more reliable, and new properties developed here can expect to receive better drainage.

Table 39: Storm Network Community Levels of Service

9.7.2. Technical Levels of Service

The following table outlines the quantitative metrics that determine the technical level of service provided by the Storm Network.

Values	Technical Metric	Current LOS
Scope	% of properties in municipality resilient to a 100-year storm.	5%[3]
	% of the municipal stormwater management system resilient to a 5-year storm	50%[4]

Table 40: Storm Network Technical Levels of Service

[3] Data is not presently available to conclusively determine the percent of properties in the Township resilient to a 100-year storm. Staff are working to identify this metric in future AMP iterations.
[4] The calculations presented in this report are based on the assumption that the infrastructure is fit for purpose and designed to withstand a 5-year storm event. It is important to note that actual resilience may vary depending on factors such as maintenance, construction quality, and environmental changes.

9.7.3. Proposed Levels of Service

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

The tables and graphs below explain the proposed levels of service scenarios that were analyzed for Storm Network assets. Further PLOS analysis at the portfolio level can be found in Proposed Levels of Service Scenario Analysis.

Scenario	Description
Scenario 1: Achieving Full Funding in 15 Years	This scenario assumes a phased tax increase of approximately 1.9% annually, reaching full funding within 15 years
Scenario 2: Achieving 75% Funding in 15 Years	This scenario assumes a phased tax increase of approximately 1.2% annually, reaching 75% funding within 15 years
Scenario 3: Achieving 50% Funding in 15 Years	This scenario assumes a phased tax increase of approximately 0.4% annually, reaching 50% funding within 15 years

Table 41: Storm Network PLOS Scenarios

PLOS Analysis

The following table compares three funding scenarios, illustrating how varying levels of capital investment impact asset condition, risk, and overall performance over time.

Scenario	Technical LOS Outcomes	Initial Value (2025)	10 Year Projection (2035)	25 Year Projection (2050)	Scenario Average
Scenario 1	Average Condition	89.45%	64.40%	46.76%	51.51%
	Average Asset Risk	4.21	9.74	11.51	11.2
	Average Annual Investment		$63,846		
	Capital re-investment rate		3.0%		
Scenario 2	Average Condition	89.45%	64.40%	46.76%	51.51%
	Average Asset Risk	4.21	9.74	11.51	11.2
	Average Annual Investment		$47,885		
	Capital re-investment rate		2.2%		
Scenario 3	Average Condition	89.45%	64.40%	46.76%	50.70%
	Average Asset Risk	4.21	9.74	11.51	11.29

Average Annual Investment	$31,923
Capital re-investment rate	1.5%

Table 42: Storm Network pLOS Scenario Analysis

The following figure illustrates the projected condition of the asset category under each of the three investment level scenarios, demonstrating how varying reinvestment strategies impact overall asset condition over time.

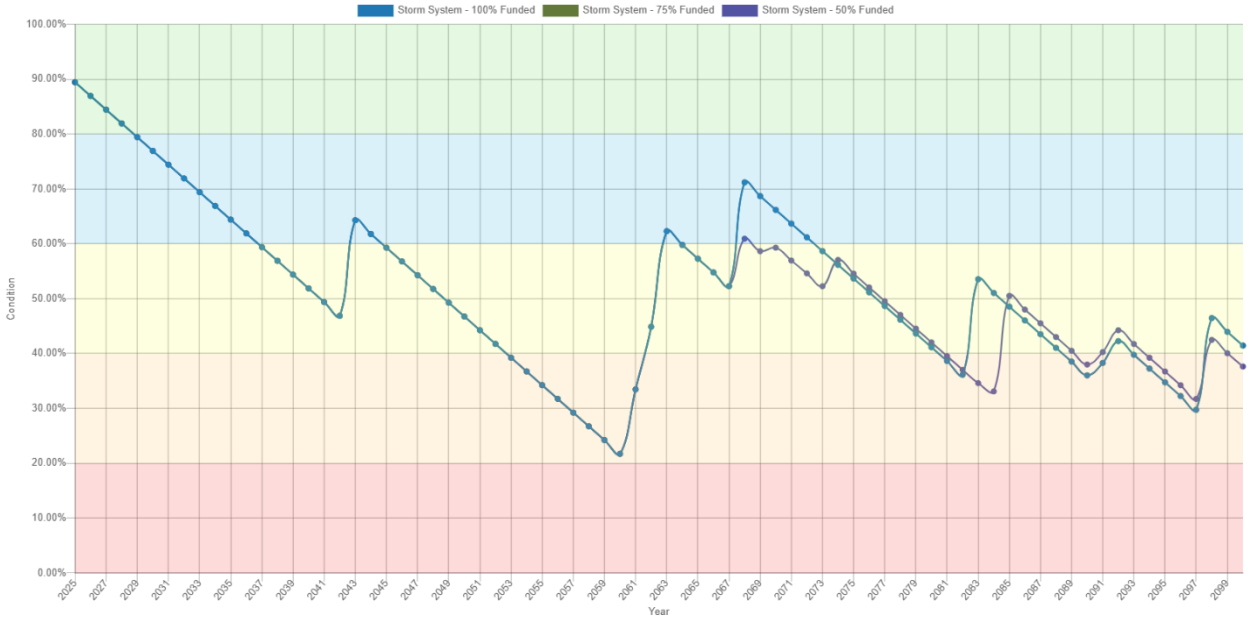


Figure 55: Storm Network Scenario Comparison

10. Buildings

10.1. State of the Infrastructure

Otonabee-South Monaghan owns and maintains several facilities that provide key services to the community. These include:

- Municipal Office
- Medical Centre
- Villiers Community Centre
- Public libraries in Keene and Bailieboro
- Fire stations
- Storage buildings and equipment garage

The following summarizes the state of the infrastructure for municipal buildings, and the Township's ability to fund the proposed levels of service:

Replacement Cost	Condition	Financial Capacity	
$27,610,852	67% (Good)	Annual Requirement:	$552,782
		Funding Available:	$292,272
		Annual Deficit:	$260,510

Table 43: Buildings State of the Infrastructure

10.2. Inventory & Valuation

The table below includes the quantity, replacement cost method and total replacement cost of each asset segment in the Township's Buildings inventory.

Segment	Quantity	Unit of Measure	Primary Replacement Cost Method	Replacement Cost
Fire	3	Assets	CPI	$5,206,129
General Government	3	Assets	CPI	$4,154,083
Library	2	Assets	CPI	$3,228,241
Paved Roads	7	Assets	CPI	$3,126,772
Public Health	1	Assets	CPI	$990,512
Recreation	5	Assets	CPI	$10,905,115
Total		**Assets**		**$27,610,852**

Table 44: Buildings Inventory

The graph below displays the total replacement cost of each asset segment in Otonabee-South Monaghan's Buildings inventory.

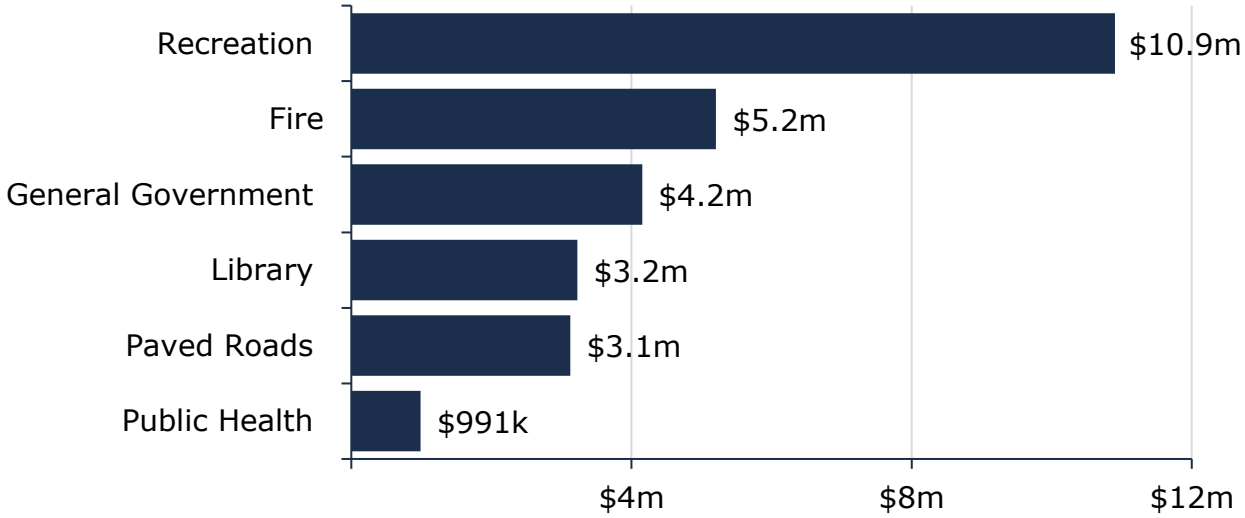


Figure 56: Buildings Replacement Cost

10.3. Asset Condition & Age

The graph below identifies the average age, and the estimated useful life for each asset segment. The values are weighted based on replacement cost.

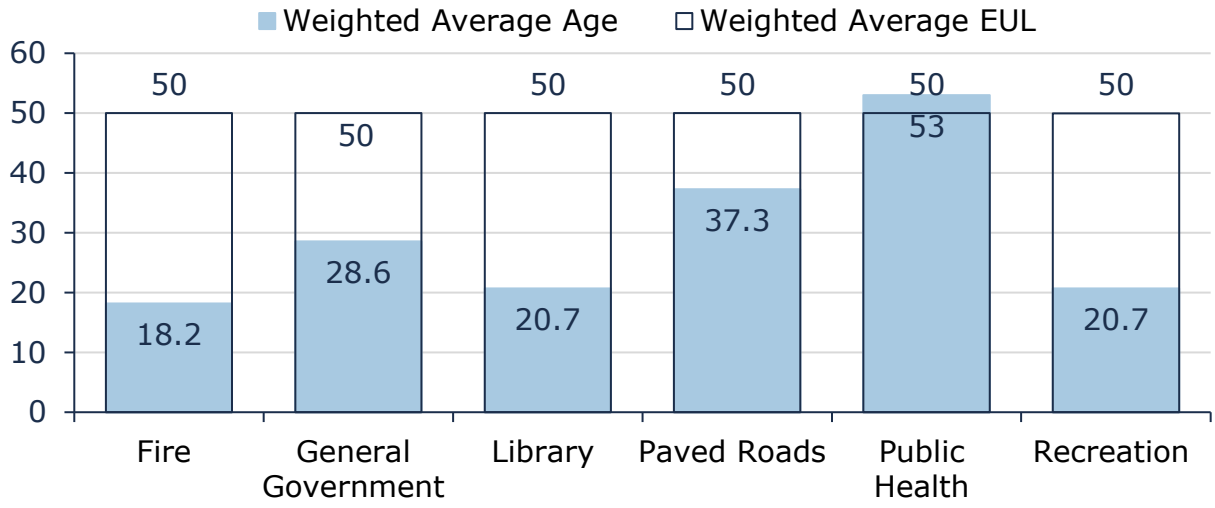


Figure 57: Buildings Average Age vs Average EUL

The graph below visually illustrates the average condition for each asset segment on a very good to very poor.

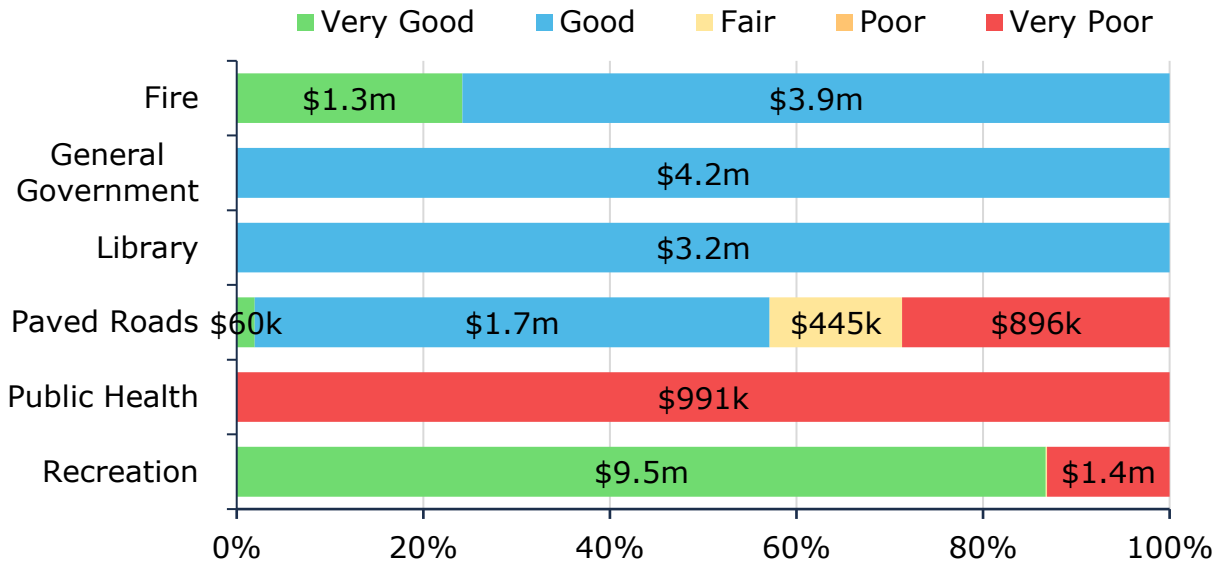


Figure 58: Buildings Condition Breakdown

To ensure that the municipal buildings continue to provide an acceptable level of service, the Township should monitor the average condition of all assets. If the average condition declines, staff should re-evaluate their lifecycle management strategy to determine what combination of maintenance, rehabilitation and replacement activities is required to increase the overall condition of the buildings.

Each asset's estimated useful life should also be reviewed to determine whether adjustments need to be made to better align with the observed service life.

10.3.1. Current Approach to Condition Assessment

Accurate and reliable condition data allows staff to determine the remaining service life of assets and identify the most cost-effective approach to managing assets.

- Health and safety inspection by internal staff is completed regularly
- Annual inspections for HVAC are completed by municipal staff

10.4. Lifecycle Management Strategy

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.

Maintenance / Rehabilitation / Replacement

- Municipal buildings are subject to regular inspections for health & safety requirements
- Currently no formal condition structural assessment for municipal building assets in place
- Critical buildings (Fire Stations etc.) have a regular inspection, maintenance and rehabilitation schedule
- Minor buildings, plumbing and electrical deficiencies are repaired by internal staff while major rehabilitation are conducted by external contractors

Figure 59: Buildings Current Lifecycle Strategy

10.5. Forecasted Capital Requirements

The annual capital requirement represents the average amount per year that Otonabee-South Monaghan should allocate towards funding rehabilitation and replacement needs. The following graph identifies capital requirements over the next 50 years. This projection is used as it ensures that every asset has gone through one full iteration of replacement. The forecasted requirements are aggregated into 5-year bins, and the trend line represents the average capital requirements at $553,000.

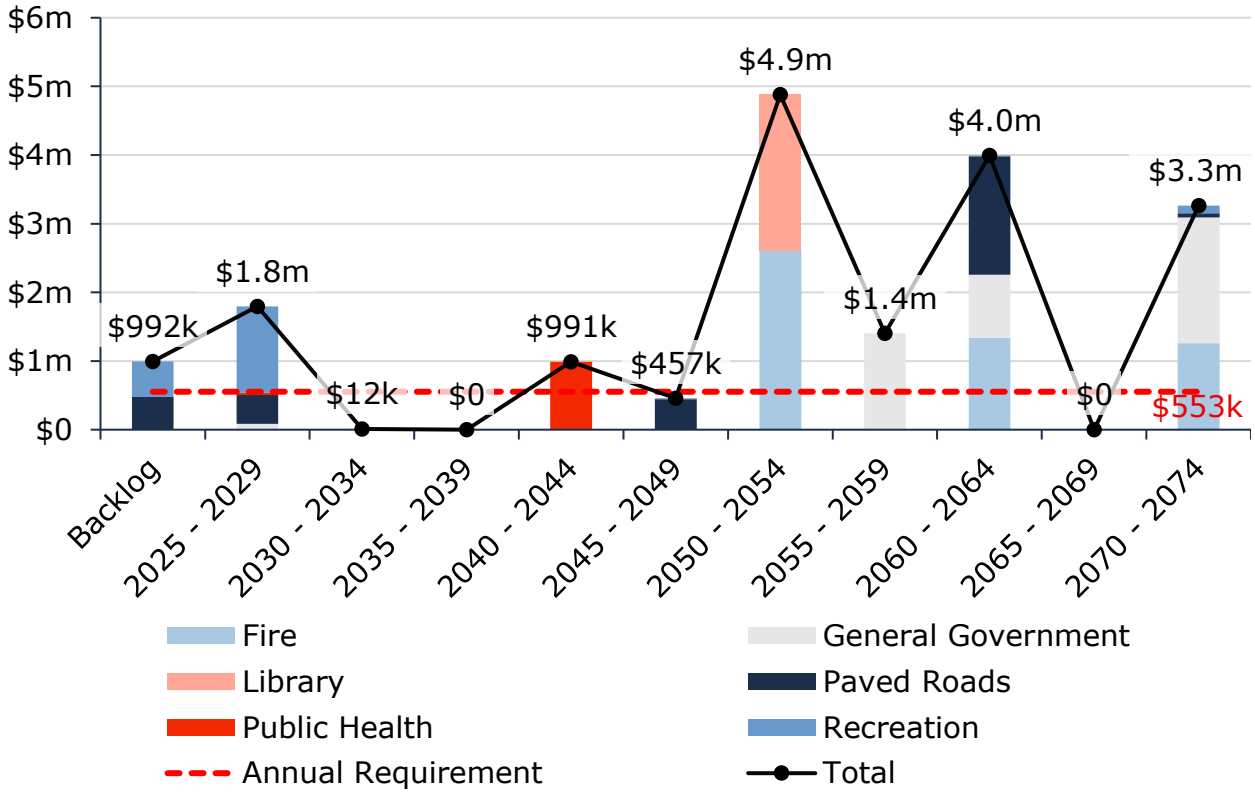


Figure 60: Buildings Forecasted Capital Replacement Requirements

The table below summarizes the projected cost of lifecycle activities (capital activities only) that may need to be undertaken over the next 10 years to support current levels of service.

Segment	Backlog	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034
Fire	-										
General Government	-	$10k	-	$75k	-	-	-	-	-	-	-
Library	-										
Paved Roads	$476k	-	-	-	$420k	-	-	-	-	-	-
Public Health	-	$30k	-	-	-	-	-	-	-	-	-
Total	**$992k**	**$999k**	**-**	**$75k**	**$720k**	**-**	**$12k**	**-**	**-**	**-**	**-**

Table 45: Buildings System-Generated 10-Year Capital Costs

These projections are generated in Citywide and rely on the data available in the asset register, which was limited to asset age, replacement cost, and useful life.

10.6. Risk & Criticality

The risk matrix provides a visual representation of the relationship between the probability of failure and the consequence of failure for the assets within this asset category based on available inventory data. See Appendix D: Risk Rating Criteria for the criteria used to determine the risk rating of each asset.

1 - 4 Very Low $1,473,727 (5%)	5 - 7 Low $11,285,936 (41%)	8 - 9 Moderate $6,712,766 (24%)	10 - 14 High $4,878,782 (18%)	15 - 25 Very High $3,259,641 (12%)

Figure 61: Buildings Risk Matrix

This is a high-level model developed by Township staff and it should be reviewed and adjusted to reflect an evolving understanding of both the probability and consequences of asset failure. The identification of critical assets allows the Township to determine appropriate risk mitigation strategies and treatment options. Risk mitigation may include asset-specific lifecycle strategies, condition assessment strategies, or simply the need to collect better asset data.

10.6.1. Risks to Current Asset Management Strategies

The following section summarizes key trends, challenges, and risks to service delivery that the Township is currently facing:

Growth

As the population continues to grow, the Township must prioritize expanding its capacity to serve a larger population. Population and employment growth increases the demand, and the community expectation becomes higher on buildings and facilities. Developing a comprehensive long-term capital plan with considerations for growth and proactive lifecycle strategy can be helpful to minimize dependency on grant funding and increase the capacity.

10.7. Levels of Service

The following tables identify Otonabee-South Monaghan's metrics to identify the current level of service for municipal buildings. By comparing the cost, performance (average condition) and risk year-over-year, the Township will be able to evaluate how their services/assets are trending.

10.7.1. Community Levels of Service

The following table outlines the qualitative descriptions that determine the community levels of service provided by municipal buildings.

Values	Technical Metric	Current LOS
Scope	Description of municipal buildings and their proximity to the surrounding community	The Township owns and operates several municipal buildings that deliver essential services across the community. These include the Township Office in Keene, three fire halls located in Keene, Bailieboro, and Stewart Hall, as well as the Keene Arena and other recreation facilities. Additionally, the Township coordinates emergency response coverage through a fire hall located within Hiawatha First Nation, supporting mutual service delivery and enhancing public safety in the region. The distribution of these facilities ensures that residents in both rural and settlement areas have accessible and timely access to municipal services, contributing to strong community connections and responsive service provision.

Table 46: Buildings Community Levels of Service

10.7.2. Technical Levels of Service

The following table outlines the qualitative descriptions that determine the technical levels of service provided by municipal buildings.

Values	Technical Metric	Current LOS
Scope	Average Condition Rating	67% (Good)
	Average Risk Rating	7.81 (Low)
Performance	Capital Reinvestment Rate	1.0%

Table 47: Buildings Technical Levels of Service

10.7.3. Proposed Levels of Service

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

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

Scenario	Description
Scenario 1: Achieving Full Funding in 15 Years	This scenario assumes a phased tax increase of approximately 1.9% annually, reaching full funding within 15 years
Scenario 2: Achieving 75% Funding in 15 Years	This scenario assumes a phased tax increase of approximately 1.2% annually, reaching 75% funding within 15 years
Scenario 3: Achieving 50% Funding in 15 Years	This scenario assumes a phased tax increase of approximately 0.4% annually, reaching 50% funding within 15 years

Table 48: Buildings PLOS Scenarios

PLOS Analysis

The following table compares three funding scenarios, illustrating how varying levels of capital investment impact asset condition, risk, and overall performance over time.

Scenario	Technical LOS Outcomes	Initial Value (2025)	10 Year Projection (2035)	25 Year Projection (2050)	Scenario Average
Scenario 1	Average Condition	64.67%	67.80%	40.82%	51.72%
	Average Asset Risk	8.58	9.14	14.15	12.42
	Average Annual Investment		$552,782		
	Capital re-investment rate		2.0%		
Scenario 2	Average Condition	64.67%	64.59%	40.95%	46.32%
	Average Asset Risk	8.58	9.54	14.15	13.59
	Average Annual Investment		$414,587		
	Capital re-investment rate		1.5%		
Scenario 3	Average Condition	64.67%	64.45%	41.21%	41.53%
	Average Asset Risk	8.58	9.57	14.09	14.37

Average Annual Investment	$276,391
Capital re-investment rate	1.0%

Table 49: Buildings PLOS Scenario Analysis

The following figure illustrates the projected condition of the asset category under each of the three investment level scenarios, demonstrating how varying reinvestment strategies impact overall asset condition over time.

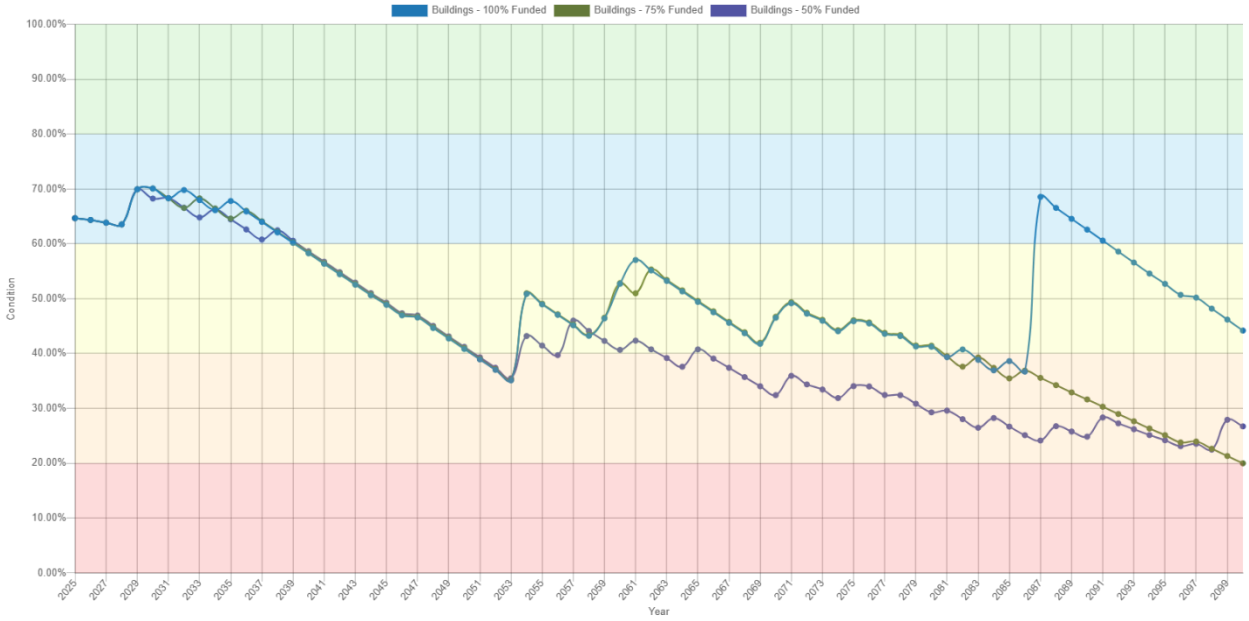


Figure 62: Buildings Scenario Comparison

11. Land Improvements

11.1. State of the Infrastructure

Otonabee-South Monaghan's land improvement infrastructure is managed by the Recreation, Parks & Facilities Department.

- Baseball Diamonds in Lang and Keene
- Playgrounds in Crystal Springs, Elgeti, and Keene

The following summarizes the state of the infrastructure for land improvement assets, and the Township's ability to fund the proposed levels of service:

Replacement Cost	Condition	Financial Capacity	
$467,358	63% (Good)	Annual Requirement:	$31,157
		Funding Available:	$18,067
		Annual Deficit:	$13,090

Table 50: Land Improvements State of the Infrastructure

11.2. Asset Inventory & Valuation

The table below includes the quantity, replacement cost method and total replacement cost of each asset segment for the Township's Land Improvements.

Segment	Quantity	Unit of Measure	Primary Replacement Cost Method	Replacement Cost
Outdoor Structures	4	Assets	CPI	$227,940
Play Structures	4	Assets	CPI	$239,418
Total				**$467,358**

Table 51: Land Improvements Inventory

The graph below displays the replacement cost of each asset segment in the Township's land improvement inventory.

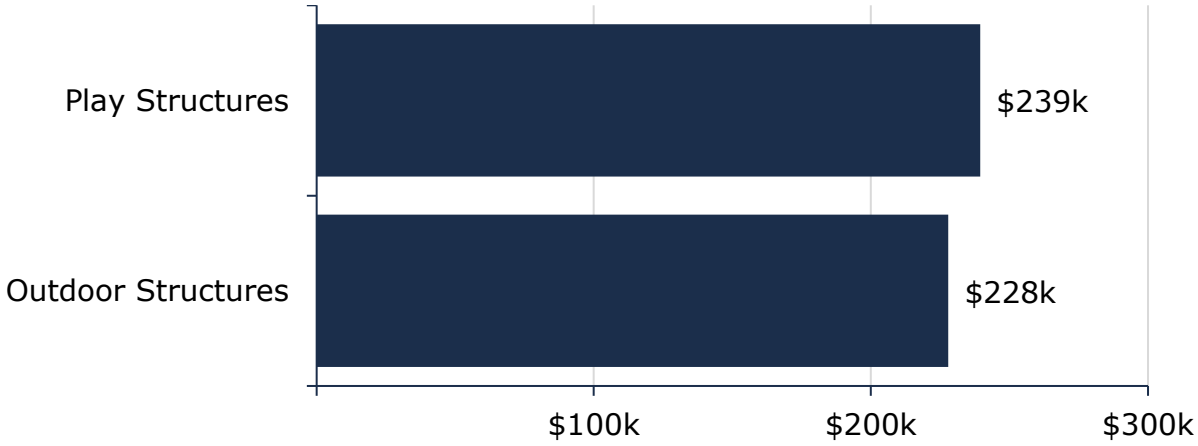


Figure 63: Land Improvements Replacement Cost

Each asset's replacement cost should be reviewed periodically to determine whether adjustments are needed to represent capital requirements more accurately.

11.3. Asset Condition & Age

The graph below identifies the average age, and the estimated useful life for each asset segment. The values are weighted based on replacement cost.

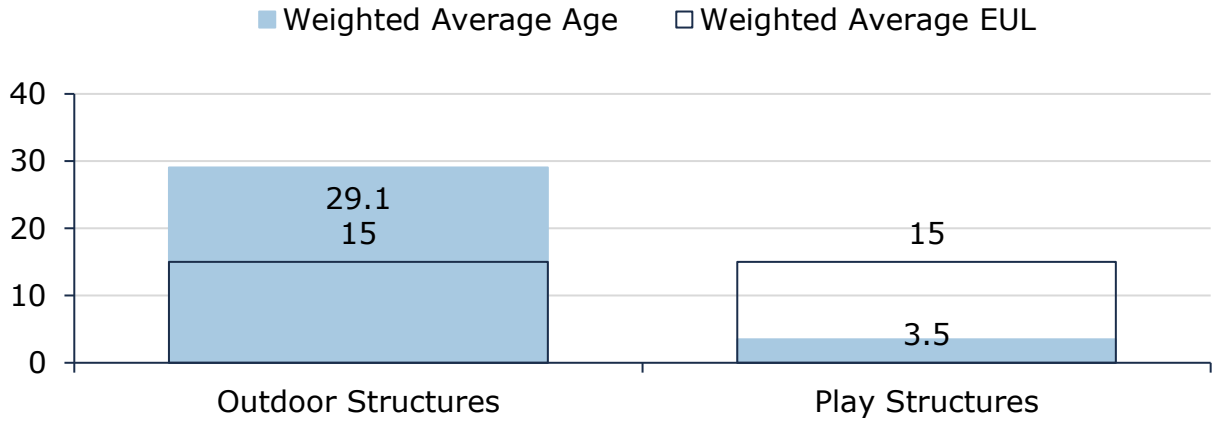


Figure 64: Land Improvements Average Age vs Average EUL

Each asset's estimated useful life should also be reviewed periodically to determine whether adjustments need to be made to better align with the observed length of service life for each asset type.

The graph below visually illustrates the average condition for each asset segment on a very good to very poor scale.

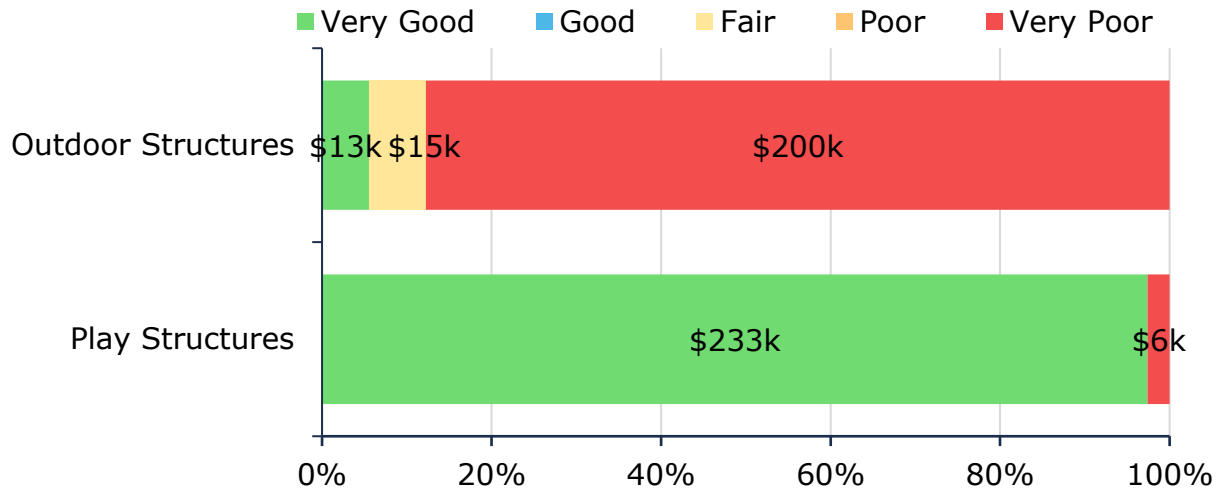


Figure 65: Land Improvement Condition Breakdown

To ensure that the Township's land improvements continue to provide an acceptable level of service, the Township should monitor the average condition of all assets. If the average condition declines, staff should re-evaluate their lifecycle management strategy to determine what combination activities is required to increase the overall condition of the land improvements.

11.3.1. Current Approach to Condition Assessment

Accurate and reliable condition data allows staff to determine the remaining service life of assets and identify the most cost-effective approach to managing assets.

The Township does not currently conduct formal condition assessments for its parks, playgrounds, and outdoor amenities. Instead, asset renewal and improvements have historically been based on visual inspections and operational knowledge. However, this approach is expected to evolve as the Township finalizes its Parks & Community Services Master Plan by June 2025. The Master Plan will provide a more structured framework for evaluating the condition and functionality of recreational assets. It will also include community input, service level definitions, and recommendations for future programming and facility upgrades—allowing the Township to move toward a more strategic and data-informed asset management approach.

11.4. Lifecycle Management Strategy

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 figures outline Otonabee-South Monaghan's current lifecycle management strategy.

Maintenance / Rehabilitation / Replacement

- The Township's current lifecycle management strategy for parks and outdoor recreation assets primarily involves maintaining facilities as needed and replacing them at the end of their useful life.
- With the completion of the Parks & Community Services Master Plan expected in June 2025, the Township anticipates receiving recommendations that will support a more proactive and structured approach to lifecycle management.

Figure 66: Land Improvements Current Lifecycle Strategy

11.5. Forecasted Capital Requirements

The figure below illustrates the cyclical short, medium and long-term infrastructure replacement requirements for the Township's land improvement infrastructure. This analysis was run until 2044 to capture at least one iteration of replacement for the longest-lived asset in the asset register. Otonabee-South Monaghan's average annual requirements (red dotted line) total $31,000 for all land improvement assets. Although actual spending may fluctuate substantially from year to year, this figure is a useful benchmark value for annual capital expenditure targets (or allocations to reserves) to ensure projects are not deferred and replacement needs are met as they arise.

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

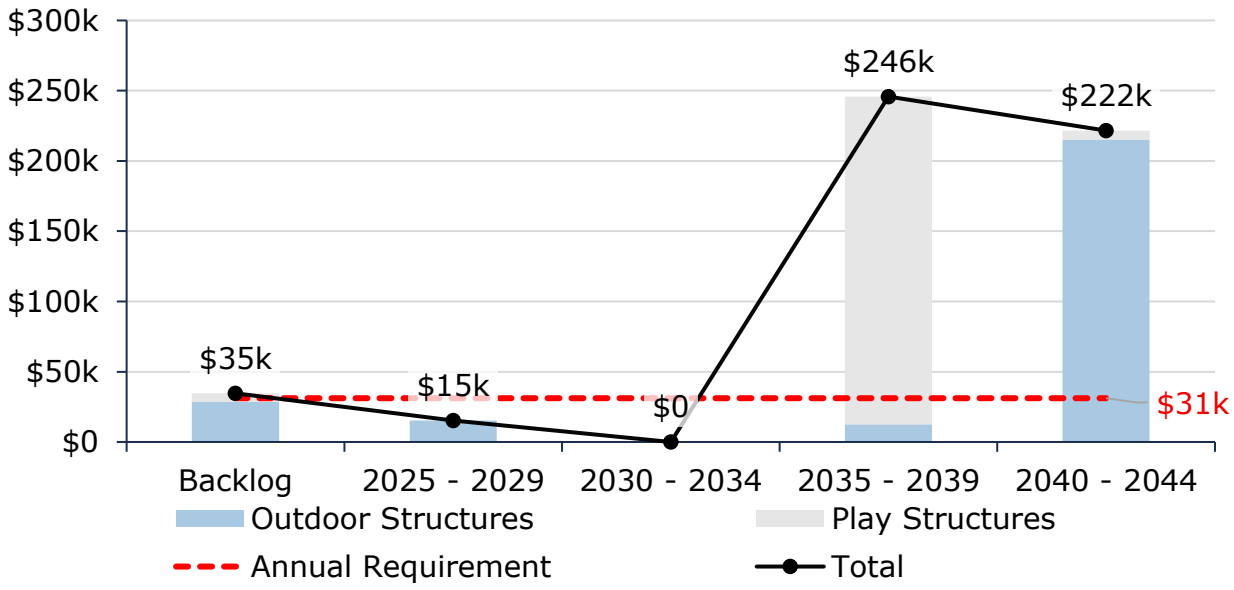


Figure 67: Land Improvements Forecasted Capital Replacement Requirements

It is unlikely that all land improvements will need to be replaced as forecasted. Coordinated projects may help drive replacements and rehabilitations.

The table below summarizes the projected cost of lifecycle activities (capital replacement only) that will need to 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, which was limited to asset age, replacement cost, and useful life.

Segment	Backlog	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034
Outdoor Structures	$29k	-	-	-	-	-	-	-	$13k	-	-
Play Structures	$6k	-	$260k	$20k	$5k	-	-	-	-	-	-
Total	**$35k**	**-**	**$260k**	**$20k**	**$5k**	**-**	**-**	**-**	**$13k**	**-**	**-**

Table 52: Land Improvements System-Generated 10-Year Capital Costs

Consistent data updates, especially condition, will improve the alignment between the system-generated expenditure requirements, and the Township's capital expenditure forecasts.

11.6. Risk & Criticality

The following risk matrix provides a visual representation of the relationship between the probability of failure and the consequence of failure for the assets within this asset category based on available inventory data. See Appendix D: Risk Rating Criteria for the criteria used to determine the risk rating of each asset.

1 - 4 Very Low	5 - 7 Low	8 - 9 Moderate	10 - 14 High	15 - 25 Very High
$101,331 (22%)	$159,809 (34%)	- (0%)	$6,218 (1%)	$200,000 (43%)

Figure 68: Land Improvement Risk Matrix

This is a high-level model developed by Township staff and it should be reviewed and adjusted to reflect an evolving understanding of both the probability and consequences of asset failure. The identification of critical assets allows the Township to determine appropriate risk mitigation strategies and treatment options. Risk mitigation may include asset-specific lifecycle strategies, condition assessment strategies, or simply the need to collect better asset data.

11.7. Levels of Service

The following tables identify Otonabee-South Monaghan's metrics to identify the current level of service for land improvement assets. By comparing the cost, performance (average condition) and risk year-over-year the Township will be able to evaluate how their services/assets are trending.

11.7.1. Community Levels of Service

The following table outlines the quantitative metrics that determine the community level of service provided by the municipal Land Improvements.

Values	Technical Metric	Current LOS
Scope	Description of land improvement assets and their proximity to the surrounding community	The Township maintains a range of parks, playgrounds, sports fields, and outdoor structures that support recreational access across both rural and settlement areas. Key park sites are located in Keene, Bailieboro, Stewart Hall, and other hamlets, offering amenities such as baseball diamonds, playground equipment, open green spaces, and walking trails. These spaces are well-distributed throughout the Township. The variety and location of these amenities reflect the Township's commitment to community well-being, healthy lifestyles, and inclusive, family-friendly spaces.

Table 53: Land Improvements Community Levels of Service

11.7.2. Technical Levels of Service

The following table outlines the quantitative metrics that determine the technical level of service provided by the municipal Land Improvements.

Values	Technical Metric	Current LOS
Scope	Average Condition Rating	63% (Good)
	Average Risk Rating	11.06 (High)
Performance	Capital Reinvestment Rate	3.9%

Table 54: Land Improvements Technical Levels of Service

11.7.3. Proposed Levels of Service

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

The tables and graphs below explain the proposed levels of service scenarios that were analyzed for Land Improvement assets. Further PLOS analysis at the portfolio level can be found in Proposed Levels of Service Scenario Analysis.

Scenario	Description
Scenario 1: Achieving Full Funding in 15 Years	This scenario assumes a phased tax increase of approximately 1.9% annually, reaching full funding within 15 years
Scenario 2: Achieving 75% Funding in 15 Years	This scenario assumes a phased tax increase of approximately 1.2% annually, reaching 75% funding within 15 years
Scenario 3: Achieving 50% Funding in 15 Years	This scenario assumes a phased tax increase of approximately 0.4% annually, reaching 50% funding within 15 years

Table 55: Land Improvements PLOS Scenarios

PLOS Analysis

The following table compares three funding scenarios, illustrating how varying levels of capital investment impact asset condition, risk, and overall performance over time.

Scenario	Technical LOS Outcomes	Initial Value (2025)	10 Year Projection (2035)	25 Year Projection (2050)	Scenario Average
Scenario 1	Average Condition	66.22%	70.48%	83.78%	62.55%
	Average Asset Risk	9.31	9.06	5.35	9.73
	Average Annual Investment		$31,157		
	Capital re-investment rate		6.7%		
Scenario 2	Average Condition	66.22%	49.13%	33.72%	53.18%
	Average Asset Risk	9.31	12.48	15.25	11.62
	Average Annual Investment		$23,368		
	Capital re-investment rate		5.0%		
Scenario 3	Average Condition	66.22%	49.58%	31.14%	44.70%
	Average Asset Risk	9.31	12.48	15.73	13.1

Average Annual Investment	$15,579
Capital re-investment rate	3.3%

Table 56: Land Improvements PLOS Scenario Analysis

The following figure illustrates the projected condition of the asset category under each of the three investment level scenarios, demonstrating how varying reinvestment strategies impact overall asset condition over time.

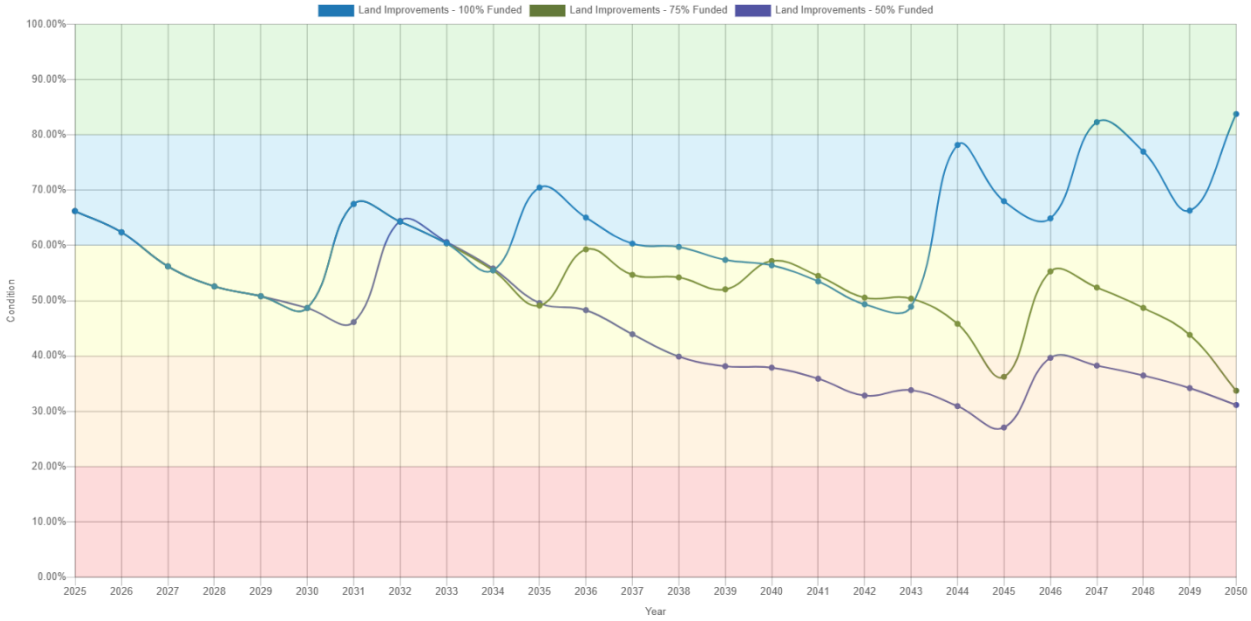


Figure 69: Land Improvements Scenario Comparison

12. Machinery & Equipment

12.1. State of the Infrastructure

To maintain the quality stewardship of Otonabee-South Monaghan's infrastructure and support the delivery of services, municipal staff own and employ various types of equipment. This includes:

- Park equipment to maintain public parks
- Arena equipment to maintain recreation services
- Fire equipment to support the delivery of emergency services
- Roads and Bridges equipment to provide winter control activities
- General government equipment to support administration services
- Library books

The following summarizes the state of the infrastructure for machinery & equipment, and the Township's ability to fund the proposed levels of service:

Replacement Cost	Condition	Financial Capacity	
$5,506,086	62% (Good)	Annual Requirement:	$423,319
		Funding Available:	$244,932
		Annual Deficit:	$178,387

Table 57: Machinery & Equipment State of the Infrastructure

12.2. Inventory & Valuation

The table below includes the quantity, replacement cost method and total replacement cost of each asset segment in the Township's Machinery & Equipment inventory.

Segment	Quantity	Unit of Measure	Primary Replacement Cost Method	Replacement Cost
Arena Equipment	258	Assets	CPI	$432,974
Fire Equipment	32	Assets	CPI	$1,375,454
General Government	9	Assets	CPI	$294,327
Library Equipment	9	Assets	CPI	$251,308
Parks Equipment	3	Assets	CPI	$51,705
Roads Equipment	23	Assets	CPI	$3,100,318
Total		**Assets**		**$5,506,086**

Table 58: Machinery & Equipment Inventory

The graph below displays the total replacement cost of each asset segment in the Otonabee-South Monaghan's Machinery & Equipment inventory.

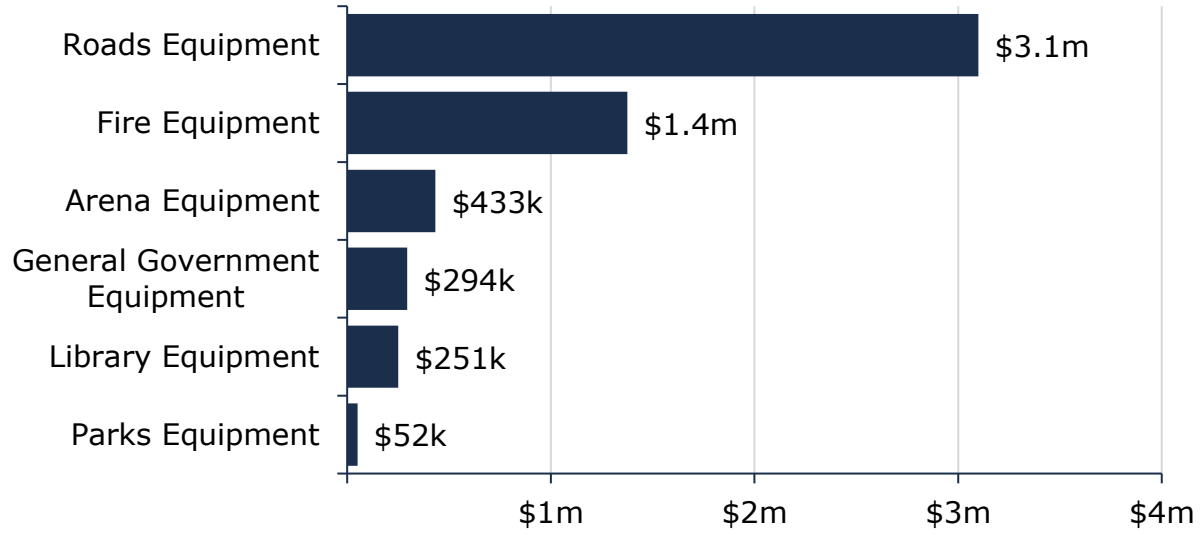


Figure 70: Machinery & Equipment Replacement Costs

Each asset's replacement cost should be reviewed periodically to determine whether adjustments are needed to more accurate represent capital requirements.

12.3. Asset Condition & Age

The graph below identifies the average age and the estimated useful life for each asset segment. The values are weighted based on replacement cost.

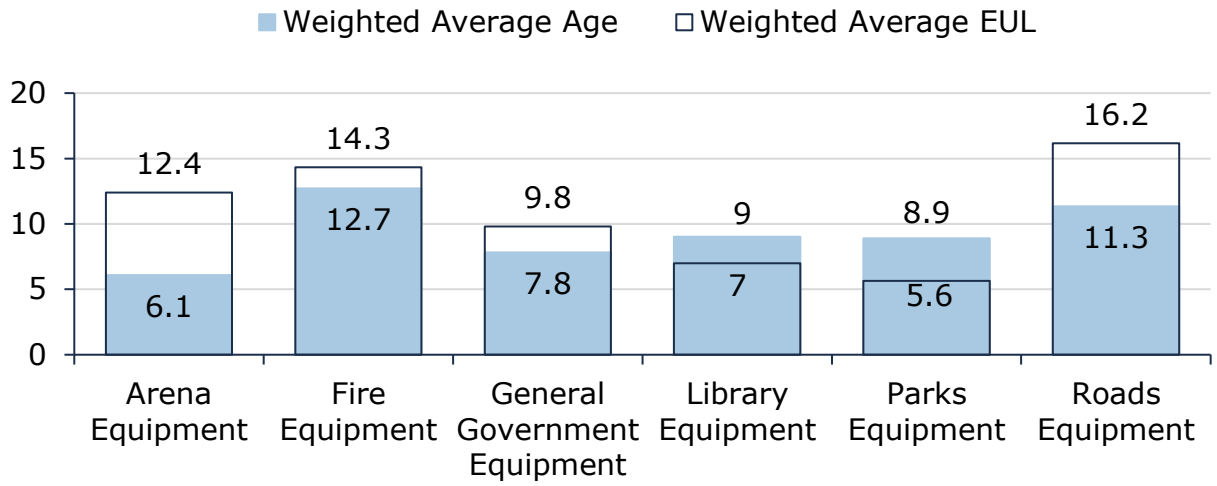


Figure 71: Machinery & Equipment Average Age vs Average EUL

Each asset's estimated useful life should also be reviewed periodically to determine whether adjustments need to be made to better align with the observed length of service life for each asset type.

The graph below visually illustrates the average condition for each asset segment on a very good to very poor scale.

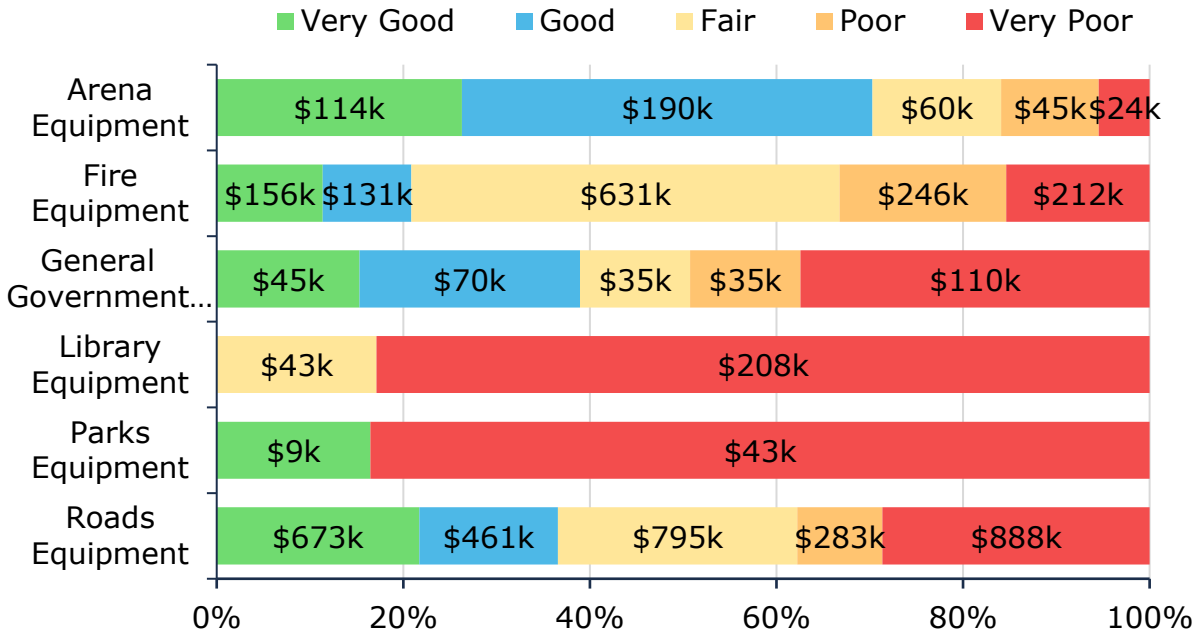


Figure 72: Machinery & Equipment Condition Breakdown

To ensure that the Township's equipment continues to provide an acceptable level of service, Otonabee-South Monaghan should continue to monitor the average

condition. If the average condition declines, staff should re-evaluate their lifecycle management strategy to determine what combination of maintenance, rehabilitation and replacement activities is required to increase the overall condition.

12.3.1. Current Approach to Condition Assessment

Accurate and reliable condition data allows staff to determine the remaining service life of assets and identify the most cost-effective approach to managing assets. The current approach consists of:

- Regular visual inspections of machinery & equipment are completed by staff to ensure they are in state of adequate repair
- Annual inspections and cleaning of equipment are completed to follow the regulatory requirements
- Annual testing of pumps and ladders is completed by third party mechanician, other fire equipment is inspected regularly by staff

12.4. Lifecycle Management Strategy

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

Maintenance / Rehabilitation / Replacement

- Maintenance program varies by department
- Annual inspections and cleaning for equipment are completed
- Machinery and equipment is maintained according to manufacturer recommended actions and supplemented by the expertise of municipal staff
- The replacement of machinery and equipment depends on its expected useful life, usage and deficiencies identified by mechanics
- Bunker gear is replaced on a 10-year cycle, as per manufacturer recommendations

Figure 73: Machinery & Equipment Current Lifecycle Strategy

12.5. Forecasted Capital Requirements

The following graph identifies capital requirements over the next 25 years. This projection is used as it ensures that every asset has gone through one full iteration of replacement. The forecasted requirements are aggregated into 5-year bins, and the trend line represents the average annual capital requirements at $423,000.

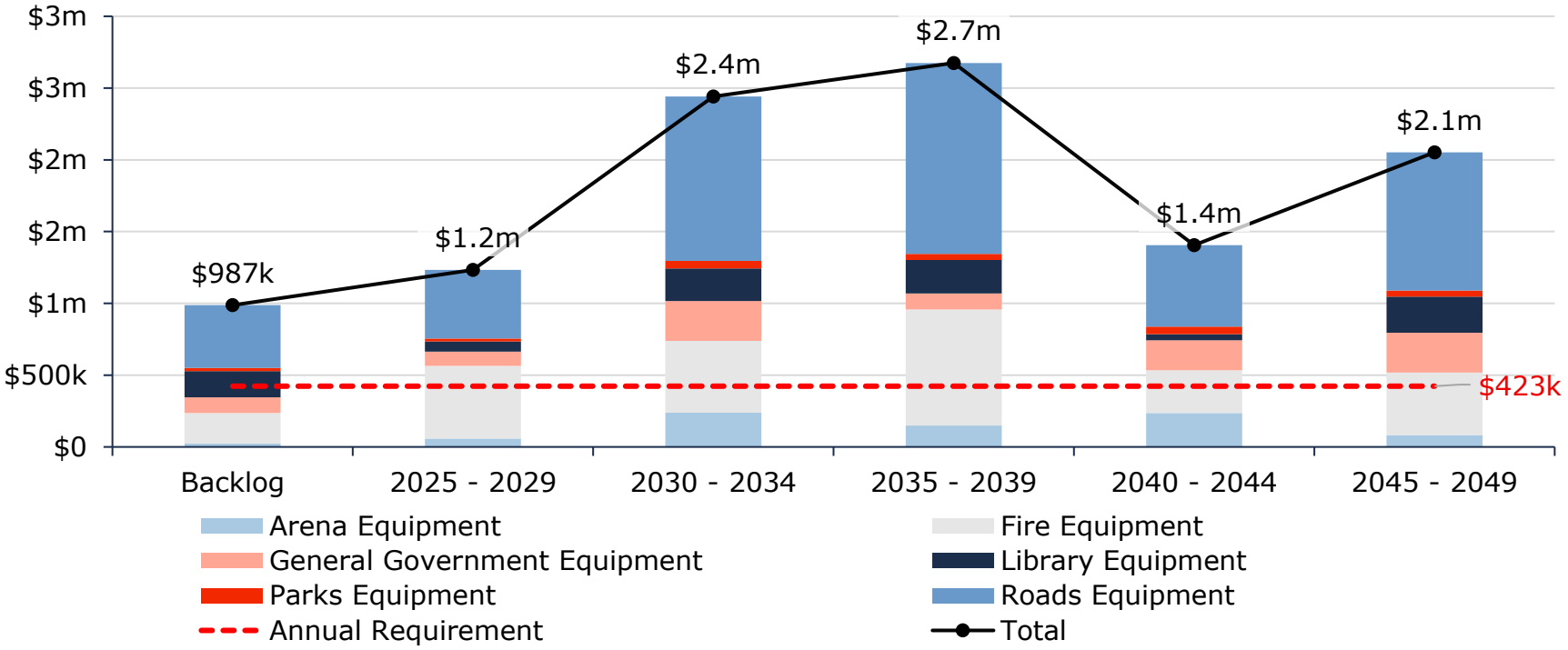


Figure 74: Machinery & Equipment Forecasted Capital Replacement Requirements

The table below summarizes the projected cost of lifecycle activities (capital replacement only) that may need to 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.

Segment	Backlog	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034
Arena Equipment	$24k	-	-	-	-	-	$57k	$187k	$51k	-	-
Fire Equipment	$86k	$523k	$68k	$136k	$73k	$95k	$154k	$123k	$107k	$127k	$132k
General Government Equipment	$110k	-	-	-	$64k	-	$35k	$99k	-	-	$109k
Library Equipment	$150k	$30k	$28k	-	$18k	$25k	-	-	$180k	$28k	-

Parks Equipment	$23k	-	$20k	-	-	-	$23k	$20k	-	$9k	-
Roads Equipment	$437k	-	$12k	-	$468k	-	-	-	$232k	$818k	$96k
Total	**$830k**	**$554k**	**$128k**	**$136k**	**$623k**	**$120k**	**$269k**	**$430k**	**$571k**	**$981k**	**$338k**

Table 59: Machinery & Equipment System-Generated 10-Year Capital Costs

As no assessed condition data was available for the equipment, only age was used to determine forthcoming replacement needs. These projections can be different from actual capital forecasts. Consistent data updates, especially condition, will improve the alignment between the system-generated expenditure requirements, and the Township's capital expenditure forecasts.

12.6. Risk & Criticality

The risk matrix provides a visual representation of the relationship between the probability of failure and the consequence of failure for the assets within this asset category based on available inventory data. See Appendix D: Risk Rating Criteria for the criteria used to determine the risk rating of each asset.

1 - 4 Very Low	5 - 7 Low	8 - 9 Moderate	10 - 14 High	15 - 25 Very High
$1,813,523 (33%)	$1,335,606 (24%)	$402,145 (7%)	$103,371 (2%)	$1,851,441 (34%)

Figure 75: Machinery & Equipment Risk Matrix

This is a high-level model developed by Township staff and it should be reviewed and adjusted to reflect an evolving understanding of both the probability and consequences of asset failure. The identification of critical assets allows the Township to determine appropriate risk mitigation strategies and treatment options. Risk mitigation may include asset-specific lifecycle strategies, condition assessment strategies, or simply the need to collect better asset data.

12.6.1. Risks to Current Asset Management Strategies

The following section summarizes key trends, challenges, and risks to service delivery that the Township is currently facing:

Supply Chain Uncertainty

Due to supply chain uncertainty, there are extended wait times to receive replacement equipment. This can lead to the Township using equipment beyond their useful life, rather than disposing and acquiring new equipment.

Aging Infrastructure & Funding Strategies

As machines and equipment age, they will require increasing O&M costs to function adequately. As capital budgets become more constrained, more maintenance will be postponed, which will further amplify this risk. Replacement and major rehabilitation of the machinery and equipment are entirely dependant on the availability of reserve funds. When funds are not available, it will cause the deferral for vehicles renewal or vehicles purchase. Commit to a dedicated vehicle reserve contribution can help prevent deferral of capital works.

12.7. Levels of Service

The following tables identify Otonabee-South Monaghan's metrics to identify the current level of service for machinery & equipment. By comparing the cost, performance (average condition) and risk year-over-year, Otonabee-South Monaghan will be able to evaluate how their services/assets are trending.

12.7.1. Community Levels of Service

The following table outlines the qualitative metrics that determine the community level of service provided by equipment.

Values	Technical Metric	Current LOS
Scope	Description of the current condition of municipal machinery & equipment and the plans that are in place to maintain or improve the provided level of service	Municipal machinery and equipment are currently in good condition (62%) and maintained through annual inspections and manufacturer-recommended servicing. Replacement is based on useful life, usage, and mechanic assessments, with bunker gear replaced every 10 years. This practical approach supports current service levels and will continue to guide maintenance and replacement decisions.

Table 60: Machinery & Equipment Community Levels of Service

12.7.2. Technical Levels of Service

The following table outlines the quantitative metrics that determine the technical level of service provided by equipment.

Values	Technical Metric	Current LOS
Scope	Average Condition Rating	62% (Good)
	Average Risk Rating	9.59 (Moderate)
Performance	Capital Reinvestment Rate	4.5%

Table 61: Machinery & Equipment Technical Levels of Service

12.7.3. Proposed Levels of Service

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

The tables and graphs below explain the proposed levels of service scenarios that were analyzed for Machinery & Equipment assets. Further PLOS analysis at the portfolio level can be found in Proposed Levels of Service Scenario Analysis.

Scenario	Description
Scenario 1: Achieving Full Funding in 15 Years	This scenario assumes a phased tax increase of approximately 1.9% annually, reaching full funding within 15 years
Scenario 2: Achieving 75% Funding in 15 Years	This scenario assumes a phased tax increase of approximately 1.2% annually, reaching 75% funding within 15 years
Scenario 3: Achieving 50% Funding in 15 Years	This scenario assumes a phased tax increase of approximately 0.4% annually, reaching 50% funding within 15 years

Table 62: Machinery & Equipment PLOS Scenarios

PLOS Analysis

The following table compares three funding scenarios, illustrating how varying levels of capital investment impact asset condition, risk, and overall performance over time.

Scenario	Technical LOS Outcomes	Initial Value (2025)	10 Year Projection (2035)	25 Year Projection (2050)	Scenario Average
Scenario 1	Average Condition	55.75%	49.66%	64.43%	56.31%
	Average Asset Risk	10.99	12.33	9.56	10.99
	Average Annual Investment		$423,319		
	Capital re-investment rate		7.7%		
Scenario 2	Average Condition	55.75%	43.49%	55.83%	49.42%
	Average Asset Risk	10.99	13.75	11.21	12.45
	Average Annual Investment		$317,490		
	Capital re-investment rate		5.8%		
Scenario 3	Average Condition	55.17%	34.35%	32.87%	38.00%
	Average Asset Risk	11.06	15.23	15.29	14.44

Average Annual Investment	$211,660
Capital re-investment rate	3.8%

Table 63: Machinery & Equipment pLOS Scenario Analysis

The following figure illustrates the projected condition of the asset category under each of the three investment level scenarios, demonstrating how varying reinvestment strategies impact overall asset condition over time.

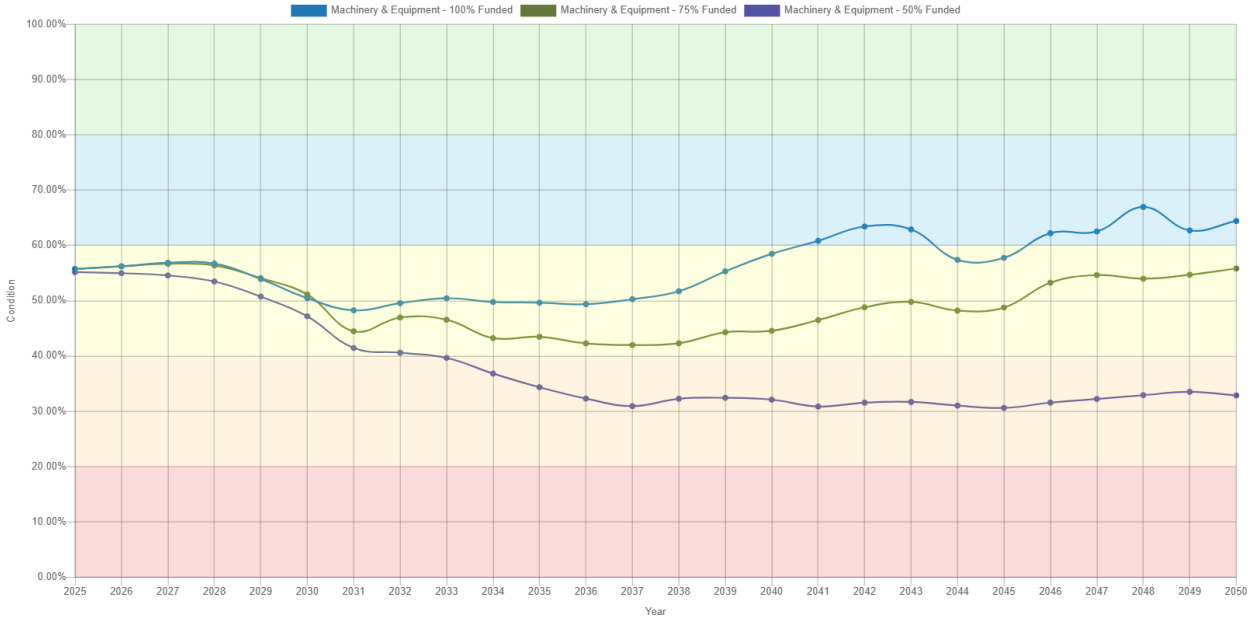


Figure 76: Machinery & Equipment Scenario Comparison

13. Vehicles

13.1. State of the Infrastructure

Vehicles allow staff to efficiently deliver municipal services and personnel. Municipal vehicles are used to support several service areas, including:

- Winter control vehicles for winter control activities
- Fire vehicles to provide emergency services
- Parks vehicles to address service requests for Environmental Services and Parks & Recreation
- Roads vehicles to support the maintenance of the transportation network
- Parks vehicles to support the maintenance of the buildings and facilities

The following summarizes the state of the infrastructure for municipal vehicles, and the Township's ability to fund the proposed levels of service:

Replacement Cost	Condition	Financial Capacity	
$7,784,201	47% (Fair)	Annual Requirement:	$563,881
		Funding Available:	$92,342
		Annual Deficit:	$471,539

Table 64: Vehicles State of the Infrastructure

13.2. Inventory & Valuation

The table below includes the quantity, replacement cost method and total replacement cost of each asset segment in the Township's Vehicles inventory.

Segment	Quantity	Unit of Measure	Primary Replacement Cost Method	Replacement Cost
Building Vehicles	2	Assets	User-Defined	$90,000
Fire Vehicles	16	Assets	CPI	$5,152,134
Parks Vehicles	1	Assets	CPI	$48,048
Roads Vehicles	5	Assets	CPI	$327,159
Winter Control Vehicles	7	Assets	CPI	$2,166,860
Total				**$7,784,201**

Table 65: Vehicles Inventory

The graph below displays the total replacement cost of each asset segment in the vehicle inventory.

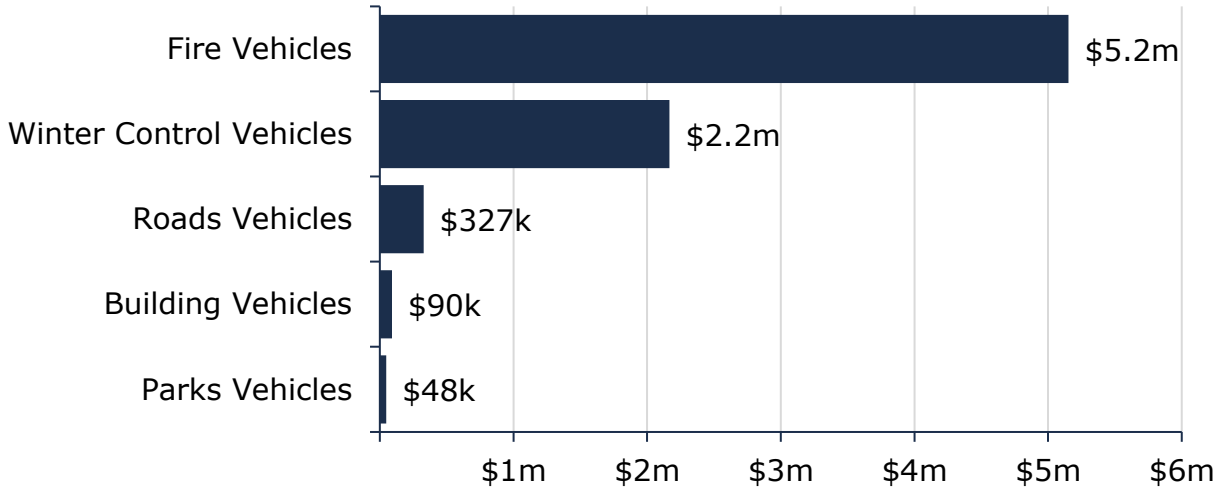


Figure 77: Vehicle Replacement Costs

Each asset's replacement cost should be reviewed periodically to determine whether adjustments are needed to represent capital requirements more accurately.

13.3. Asset Condition & Age

The graph below identifies the average age and the estimated useful life for each asset segment.

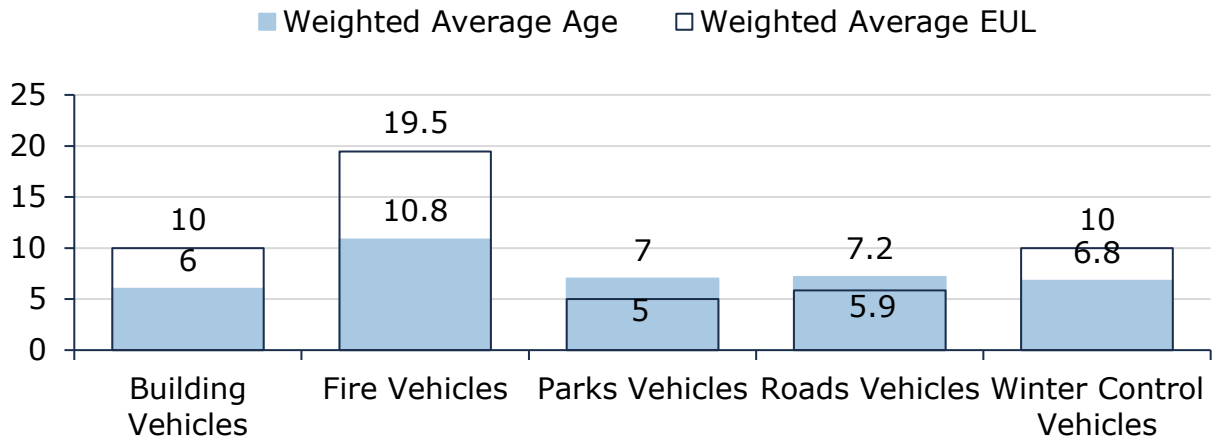


Figure 78: Vehicles Average Age vs Average EUL

Each asset's estimated useful life should also be reviewed periodically to determine whether adjustments need to be made to better align with the observed length of service life for each asset type.

The graph below visually illustrates the average condition for each asset segment on a very good to very poor scale.

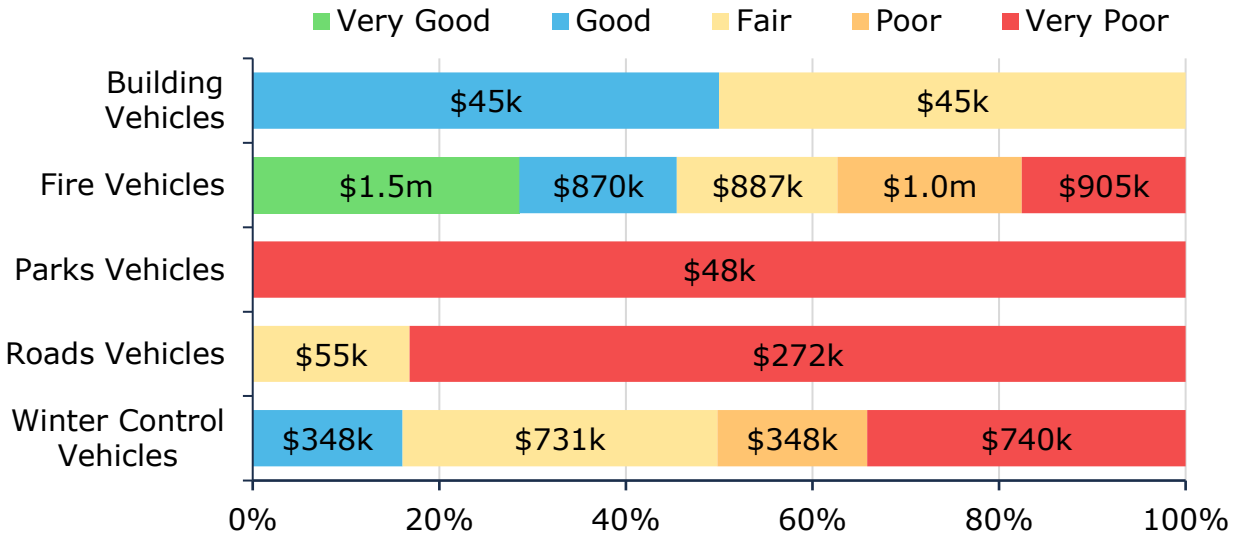


Figure 79: Vehicles Condition Breakdown

To ensure that the Township's vehicles continue to provide an acceptable level of service, the Township should monitor the average condition of all assets. If the average condition declines, staff should re-evaluate their lifecycle management strategy to determine what combination of maintenance, rehabilitation and replacement activities is required to increase the overall condition of the vehicles.

13.3.1. Current Approach to Condition Assessment

Accurate and reliable condition data allows staff to determine the remaining service life of assets and identify the most cost-effective approach to managing assets. The following describes the Township's current approach:

- Staff complete regular daily inspections of vehicles to ensure they are in state of adequate repair prior to operation
- Pump tests and mechanical Assessment are completed annually by third party contractors
- Annual testing for fire vehicles is completed to ensure they are in a state of adequate repair and meets the Nation Fire Protection Agency (NFPA) standards
- The age of vehicles is used as a proxy to determine remaining useful life and relative vehicle condition except for the Fire Department

13.4. Lifecycle Management Strategy

The condition or performance of assets will deteriorate over time. To ensure vehicles are performing as expected, it is important to establish a lifecycle management strategy to proactively manage asset deterioration.

Maintenance / Rehabilitation / Replacement

- Visual inspections completed and documented daily
- Pump test and mechanic assessement completed annually
- Testing for fire vehicles are completed annually and certification for fire vehicles are maintened annually through CVOR
- Replacement and maintenance costs for vehicles are forecasted for the next 10 years
- Some fire vehicles in good condition may be transferred to other departments after retirement
- Vehicle age, kilometres and annual O&M costs are taken into consideration when determining appropriate treatment options

Figure 80: Vehicles Current Lifecycle Strategy

13.5. Forecasted Capital Requirements

The annual capital requirement represents the average amount per year that the Township should allocate towards funding rehabilitation and replacement needs. The following graph identifies capital requirements over the next 25 years. This projection is used as it ensures that every asset has gone through one full iteration of replacement. The forecasted requirements are aggregated into 5-year bins, and the trend line represents the average annual capital requirements at $563,881.

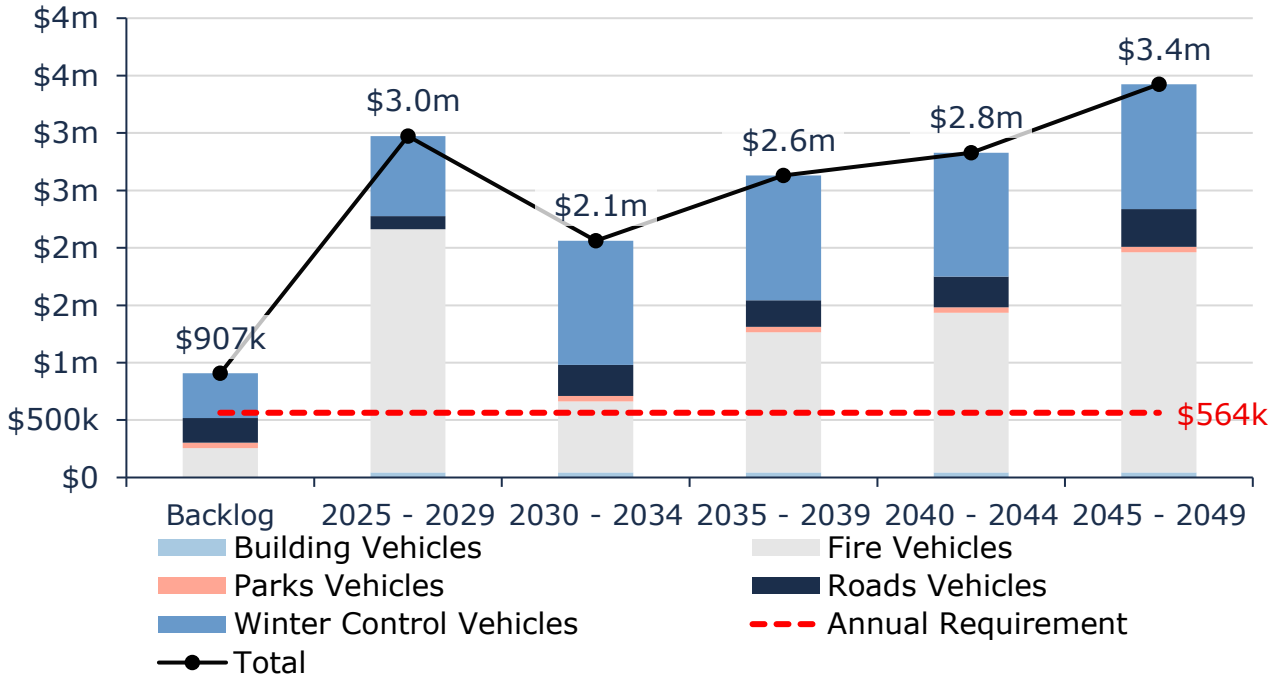


Figure 81: Vehicle Forecasted Capital Replacement Requirements

The table below summarizes the projected cost of lifecycle activities (capital replacement only) that may need to 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.

Segment	Backlog	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034
Building Vehicles	-	-	-	$45k	-	-	-	-	$45k	-	-
Fire Vehicles	$255k	$85k	-	-	$1.1m	$834k	$269k	-	$184k	-	$348k
Parks Vehicles	$48k	-	-	-	-	-	$48k	-	-	-	-
Roads Vehicles	$214k	-	$58k	-	-	$55k	$60k	$58k	$59k	$95k	-
Winter Control Vehicles	$390k	-	$740k	-	-	$348k	-	$731k	-	-	-
Total	**$907k**	**$85k**	**$798k**	**$45k**	**$1.1m**	**$1.2m**	**$377k**	**$789k**	**$288k**	**$95k**	**$348k**

Table 66: Vehicles System-Generated 10-Year Capital Costs

As no assessed condition data was available for the vehicles, only age was used to determine forthcoming replacement needs. These projections can be different from actual capital forecasts. Consistent data updates, especially condition, will improve the alignment between the system-generated expenditure requirements, and the Township's capital expenditure forecasts.

13.6. Risk & Criticality

The risk matrix provides a visual representation of the relationship between the probability of failure and the consequence of failure for the assets within this asset category based on available inventory data. See Appendix D: Risk Rating Criteria for the criteria used to determine the risk rating of each asset.

1 - 4 Very Low	5 - 7 Low	8 - 9 Moderate	10 - 14 High	15 - 25 Very High
$1,178,675 (15%)	$870,166 (11%)	$695,652 (9%)	$2,474,289 (32%)	$2,565,419 (33%)

Figure 82: Vehicles Risk Matrix

This is a high-level model developed by Township staff and it should be reviewed and adjusted to reflect an evolving understanding of both the probability and consequences of asset failure. The identification of critical assets allows the Township to determine appropriate risk mitigation strategies and treatment options. Risk mitigation may include asset-specific lifecycle strategies, condition assessment strategies, or simply the need to collect better asset data.

13.6.1. Risks to Current Asset Management Strategies

The following section summarizes key trends, challenges, and risks to service delivery that the Township is currently facing:

Supply Chain Uncertainty

When repairing some aged vehicles, the supply chain uncertainty presents difficulties to order replacement parts. The Township needs to take longer periods or higher costs to get these parts. If the critical parts are discontinued, the vehicles may need to be disposed or renewed earlier than their estimated useful lives.

Aging Infrastructure & Funding Strategies

Several vehicles within the Township are approaching or have exceeded their estimated useful life. As vehicles age, they will require exponentially increasing O&M costs to ensure compliance with MTO standards and to function adequately. As capital budgets become more constrained, more maintenance will be postponed, which will further amplify this risk. Replacement and major rehabilitation of the vehicles are entirely dependant on the availability of reserve fund. When funds are not available, it will cause the deferral for vehicles renewal or vehicles purchase. Commit to a dedicated vehicle reserve contribution can help prevent deferral of capital works.

13.7. Levels of Service

The following tables identify Otonabee-South Monaghan's metrics to identify the current level of service for municipal vehicles. By comparing the cost, performance (average condition) and risk year-over-year, the Township will be able to evaluate how their services/assets are trending.

13.7.1. Community Levels of Service

The qualitative descriptions that determine the community levels of service provided by municipal vehicles are based on the service usage outlined below:

Values	Technical Metric	Current LOS
Scope	Description of the current condition of municipal vehicles and the plans that are in place to maintain or improve the provided level of service	Municipal vehicles have a formal replacement strategy; however, budget constraints sometimes require extending their use beyond estimated useful life. An in-house mechanic performs basic repairs to help maintain service levels. The Township aims to adhere to the replacement plan as funding allows to ensure reliable vehicle operation.

Table 67: Vehicles Community Levels of Service

13.7.2. Technical Levels of Service

The following table outlines the quantitative metrics that determine the technical level of service provided by vehicles.

Values	Technical Metric	Current LOS
Scope	Average Condition Rating	47% (Fair)
	Average Risk Rating	12.16 (High)
Performance	Capital Reinvestment Rate	1.2%

Table 68: Vehicles Technical Levels of Service

13.7.3. Proposed Levels of Service

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

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

Scenario	Description
Scenario 1: Achieving Full Funding in 15 Years	This scenario assumes a phased tax increase of approximately 1.9% annually, reaching full funding within 15 years
Scenario 2: Achieving 75% Funding in 15 Years	This scenario assumes a phased tax increase of approximately 1.2% annually, reaching 75% funding within 15 years
Scenario 3: Achieving 50% Funding in 15 Years	This scenario assumes a phased tax increase of approximately 0.4% annually, reaching 50% funding within 15 years

Table 69: Vehicles PLOS Scenarios

PLOS Analysis

The following table compares three funding scenarios, illustrating how varying levels of capital investment impact asset condition, risk, and overall performance over time.

Scenario	Technical LOS Outcomes	Initial Value (2025)	10 Year Projection (2035)	25 Year Projection (2050)	Scenario Average
Scenario 1	Average Condition	45.81%	22.89%	43.19%	32.09%
	Average Asset Risk	12.87	17.49	12.8	15.47
	Average Annual Investment		$563,881		
	Capital re-investment rate		7.2%		
Scenario 2	Average Condition	45.81%	19.19%	28.08%	26.21%
	Average Asset Risk	12.87	18.42	15.79	16.61
	Average Annual Investment		$422,911		
	Capital re-investment rate		5.4%		
Scenario 3	Average Condition	46.43%	18.37%	18.15%	22.13%
	Average Asset Risk	12.8	18.5	18.51	17.53

Average Annual Investment	$281,941
Capital re-investment rate	3.6%

Table 70: Vehicles PLOS Scenario Analysis

The following figure illustrates the projected condition of the asset category under each of the three investment level scenarios, demonstrating how varying reinvestment strategies impact overall asset condition over time.

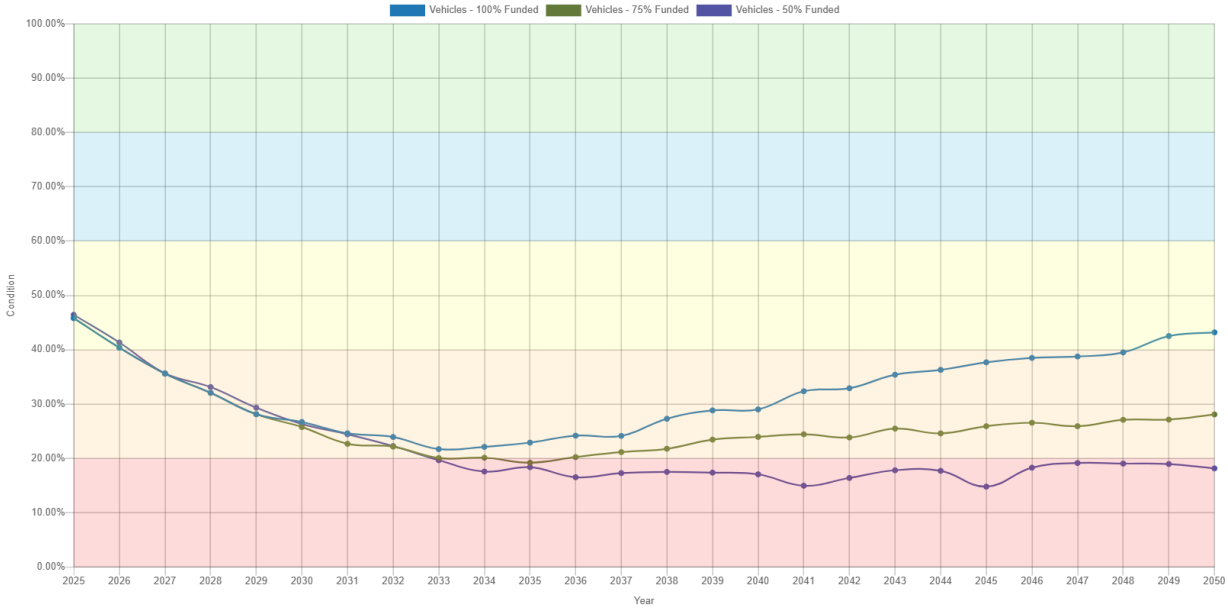


Figure 83: Vehicles Scenario Comparison

Strategies

14. Financial Strategy

14.1. Financial Strategy Overview

Each year, the Township of Otonabee-South Monaghan makes important investments in its infrastructure's maintenance, renewal, rehabilitation, and replacement to ensure assets remain in a state of good repair. However, spending needs typically exceed fiscal capacity. In fact, most municipalities continue to struggle with annual infrastructure deficits. Achieving full-funding for infrastructure programs will take many years and should be phased-in gradually to reduce burden on the community.

This plan identifies the financial requirements necessary to meet the identified proposed levels of service. These requirements are based on the financial requirements for existing assets as of December 31, 2023. However, the required funding is based on meeting the proposed levels of service, with consideration for any additional financial impacts from economic and population growth. The financial plan considers and accounts for traditional and non-traditional sources of municipal funding.

The annual funding typically available is determined by averaging historical capital expenditures on infrastructure, inclusive of any allocations to reserves for capital purposes. For Otonabee-South Monaghan, the averaged spending of 2022-2024 values were used to project available funding.

Only reliable and predictable sources of capital funding are used to benchmark funds that may be available on any given year. The funding sources include:

- Revenue from taxation allocated to reserves for capital purposes
- Revenue from water and wastewater rates allocated to capital reserves
- The Canada Community Benefits Fund (CCBF), formerly the Federal Gas Tax Fund
- The Ontario Community Infrastructure Fund (OCIF)

Although provincial and federal infrastructure programs can change with evolving policy, CCBF, and OCIF are considered as permanent and predictable.

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

However, for the road network and buildings, lifecycle management strategies have been developed to identify capital costs that are realized through strategic rehabilitation and renewal. The development of these strategies allows for a comparison of potential cost avoidance if the strategies were to be implemented.

The following table compares two scenarios for the road network:

- **Replacement Only Scenario:** Based on the assumption that assets deteriorate and – without regularly scheduled maintenance and rehabilitation – are replaced at the end of their service life.
- **Lifecycle Strategy Scenario:** Based on the assumption that lifecycle activities are performed at strategic intervals to extend the service life of assets until replacement is required.

Asset Category	Annual Requirements (Replacement Only)	Annual Requirements (Lifecycle Strategy)	Difference
Road Network	$3,236,737	$1,999,844	$1,236,893

Table 71: Annual Requirement Comparison

The implementation of a proactive lifecycle strategy for roads leads to a potential annual cost avoidance of approximately $1.2 million for the road network. This represents an overall reduction of the annual requirements by 38%.

As the lifecycle strategy scenario represents the lowest cost option available to the Township, we have used this annual requirement in the development of the financial strategy.

The table below outlines the total average annual capital requirements for existing assets in each asset category. Based on a replacement cost of $122.2 million, annual capital requirements total more than $4.2 million for all the asset categories analysed.

The table also illustrates the system-generated, equivalent target reinvestment rate (TRR), calculated by dividing the annual capital requirements by the total replacement cost of each category. The cumulative target reinvestment for these categories is estimated at 3.4%.

Asset Category	Replacement Cost	Annual Capital Requirements	Target Reinvestment Rate
Road Network	$50,023,809	$1,999,844	4.0%
Bridges & Culverts	$20,634,801	$379,409	1.8%
Buildings	$27,610,852	$552,782	2.0%
Stormwater System	$2,156,753	$63,846	3.0%
Land Improvements	$467,358	$31,157	6.7%
Machinery & Equipment	$5,506,086	$423,319	7.7%
Vehicles	$7,784,201	$563,881	7.2%
Water Network	$6,197,129	$123,417	2.0%
Sanitary System	$2,081,879	$33,387	1.6%
Total	**$122,154,122**	**$4,171,043**	**3.4%**

Table 72: Average Annual Capital Requirements

Although there is no industry standard guide on optimal annual investment in infrastructure, the TRRs above provide a useful benchmark for organizations. In 2016, the Canadian Infrastructure Report Card (CIRC) produced an assessment of the health of municipal infrastructure as reported by cities and communities across Canada. The CIRC remains a joint project produced by several organizations, including the Federation of Canadian Municipalities (FCM), the Canadian Society of Civil Engineers (CSCE), the Canadian Network of Asset Managers (CNAM), and the Canadian Public Works Association (CPWA).

The 2016 version of the report card also contained recommended reinvestment rates that can also serve as benchmarks for municipalities. The CIRC suggest that, if increased, these reinvestment rates can "stop the deterioration of municipal infrastructure." The report card contains both a range for reinvestment rates that outlines the lower and upper recommended levels, as well as current municipal averages.

14.2. Portfolio: Current Funding Levels

The table below shows how current funding levels compare with the funding required for each asset category. At existing levels, the Township is funding 41.9% of its annual capital requirements for all infrastructure analyzed. This creates a total annual funding deficit of $2.4 million.

Asset Category	Annual Capital Requirements	Annual Funding Available	Annual Infrastructure Deficit	Funding Level
Road Network	$1,999,844	$664,356	$1,335,488	33.2%
Bridges & Culverts	$379,409	$272,714	$106,695	71.9%
Buildings	$552,782	$292,272	$260,510	52.9%
Stormwater System	$63,846	$63,901	($55)	100.1%
Land Improvements	$31,157	$18,067	$13,090	58.0%
Machinery & Equipment	$423,319	$244,932	$178,387	57.9%
Vehicles	$563,881	$92,342	$471,539	16.4%
Water Network	$123,417	$27,577	$95,841	22.3%
Sanitary System	$33,387	$69,821	($36,434)	209.1%
Total	**$4,171,043**	**$1,745,982**	**$2,425,061**	**41.9%**

Table 73: Current Funding Position vs Required Funding

14.3. Financial Profile: Tax Funded Assets

The average annual investment requirement for the proposed levels of service is $4,014,239. Annual revenue currently allocated to these assets for capital purposes is $1,648,585 leaving an annual deficit of $2,365,654. Put differently, tax-supported infrastructure categories are currently funded at 41.1% of their long-term requirements.

Asset Category	Avg. Annual Requirement	Annual Funding Available				Annual Deficit
		Taxes	CCBF	OCIF	Total Available	
Road Network	$1,999,844	$388,984	$156,274	$119,098	$664,356	$1,335,488
Bridges & Culverts	$379,409	$159,123	$64,463	$49,128	$272,714	$106,695
Buildings	$552,782	$292,272			$292,272	$260,510
Stormwater System	$63,846	$63,901			$63,901	($55)
Land Improvements	$31,157	$18,067			$18,067	$13,090
Machinery & Equipment	$423,319	$244,932			$244,932	$178,387
Vehicles	$563,881	$92,342			$92,342	$471,539
	$4,014,239	**$1,259,622**	**$220,737**	**$168,226**	**$1,648,585**	**$2,365,654**

Table 74: Taxes: Required Funding vs Current Funding Position

14.3.1. Closing the Gap

Eliminating annual infrastructure funding shortfalls is a difficult and long-term endeavor for municipalities. Given the Township's current financial position, achieving full funding to support the proposed levels of service will take a number of years.

This section outlines how the Township of Otonabee-South Monaghan can close the annual funding deficits using own-source revenue streams, i.e., property taxation and utility rates, and without the use of additional debt for existing assets.

Full Funding Requirements Tax Revenues

In 2024, Otonabee-South Monaghan had an annual tax revenue of $7,239,352. As illustrated in the following table, without consideration of any other sources of revenue or cost containment strategies, achieving full funding would require a 32.7% tax change over time.

To achieve this increase, several scenarios have been developed using phase-in periods ranging from five to twenty years. Shorter phase-in periods may place too high a burden on taxpayers, whereas a phase-in period beyond 20 years may see a continued deterioration of infrastructure, leading to larger backlogs.

Asset Category	Tax Change Required for Full Funding
Road Network	18.4%
Stormwater Network	No increase required
Bridges & Culverts	1.5%
Buildings	3.6%
Machinery & Equipment	2.5%
Land Improvements	0.2%
Vehicles	6.5%

Table 75: Phasing in Annual Tax Increases

Funding 100% of annual capital requirements ensures that major capital events, including replacements, are completed as required. Under this scenario, projects are unlikely to be deferred to future years. This delivers the highest asset performance and customer levels of service.

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

- Otonabee-South Monaghan's debt payments for these asset categories will be decreasing by $10,146 over the next 15 years.

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

	Phase-in Period			
	5 Years	**10 Years**	**15 Years**	**20 Years**
Infrastructure Deficit	$2,365,654	$2,365,654	$2,365,654	$2,365,654
Change in Debt Costs	$77,837	$77,837	($10,146)	($10,146)
Resulting Infrastructure Deficit:	**$2,443,491**	**$2,443,491**	**$2,355,508**	**$2,355,508**
Tax Increase Required	33.8%	33.8%	32.5%	32.5%

Annually:	**6.0%**	**3.0%**	**1.9%**	**1.5%**

Table 76: Phasing in Taxes

Proposed levels of service play a role in the development of the Annual Average Requirement discussed above. For comparison, the taxation impact for achieving each service level option is provided below:

Annual Impact on Taxation				
Change in Levels of Service	**5 Year**	**10 Year**	**15 Year**	**20 Year**
Full Funding	6.0%	3.0%	1.9%	1.5%
75% Funding	3.7%	1.9%	1.2%	0.9%
50% Funding	1.2%	0.6%	0.4%	0.3%
Recommended	6.0%	3.0%	1.9%	1.5%

Table 77: Scenarios Annual Impact on Taxation

Financial Strategy Recommendations

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

a) Increasing tax revenues by 1.9% 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.
b) Allocating the current Canada Community-Building Fund (Formerly known as Gas Tax Fund) and OCIF revenue as outlined previously.
c) Allocating the scheduled OCIF grant increases to the infrastructure deficit as they occur.

Notes:

1. As in the past, periodic senior government infrastructure funding will most likely be available during the phase-in period. By Provincial AMP rules, this periodic funding cannot be incorporated into an AMP unless there are firm commitments in place. We have included OCIF formula-based funding, if applicable, since this funding is a multi-year commitment[5].
2. We realize that raising tax revenues by the amounts recommended above for infrastructure purposes will be very difficult to do. However, considering a

[5] 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.

longer phase-in window may have even greater consequences in terms of infrastructure failure.

The Township is currently allocating funding to reserves for stormwater and roads infrastructure that, while not yet assumed, are expected to become the Township's responsibility in the upcoming year. These proactive contributions reflect the Township's commitment to preparing for future ownership and ensuring financial sustainability as new assets are assumed.

Most of the assets expected to be assumed have been incorporated into this Asset Management Plan to the extent that reliable data was available. However, some data gaps may remain due to the timing of assumptions and asset information availability. These will be addressed and refined in future updates to the plan, once full ownership and complete asset data are confirmed.

14.4. Financial Profile: Rate Funded Assets

14.4.1. Current Funding Levels

The table below summarizes how current funding levels compare with funding required for the proposed levels of service.

Asset Category	Avg. Annual Requirement	Annual Funding Available			Annual Deficit
		Reserves	OCIF	Total Available	
Water Network	$123,417	$27,577		$27,577	$95,841
Sanitary Sewer Network	$33,387	$69,821		$69,821	($36,434)
	$156,805	**$97,398**		**$97,398**	**$59,407**

Table 78: Rates - Required Funding vs Current Funding Position

The average annual investment requirement for the above categories is $156,805. Annual revenue currently allocated to these assets for capital purposes is $97,398 leaving an annual deficit of $59,407. Put differently, these infrastructure categories are currently funded at 62.1% of their long-term requirements.

Full Funding Requirements Utility Rate Revenues

In 2024, Otonabee-South Monaghan's water rate revenues total $348,841. Annual capital requirements for the water network total $123,417, against available funding of $27,577. This creates a funding deficit of $95,841. To close this annual gap, the Township's water revenues would need to increase by 27.5%.

Similarly, sanitary rate revenues totalled $142,992 in 2024. Average annual requirements for Otonabee-South Monaghan's sanitary assets total $33,387, against available funding of $69,821, creating an estimated annual surplus of $36,434. This surplus reflects the Township's strong current funding position for sanitary infrastructure. However, it is important to note that this figure is based on

the assets currently included in the asset inventory. As the Burnham Meadows subdivision is assumed by the Township and additional data is collected and audited, the annual investment requirements may change. Future updates to the asset management plan will reflect these changes and provide a clearer picture of long-term funding needs.

To achieve the proposed levels of service, several scenarios have been developed using phase-in periods ranging from five to twenty years. As with tax revenues, short phase-in periods may require excessive rate increases, whereas more extended timeframes may lead to larger backlogs and more unpredictable spending on emergency repairs and replacements.

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

- Otonabee-South Monaghan's debt payments for the water network will be decreasing by $67,981 over the next 15 years.

	Water Network				Sanitary System			
	5 Years	**10 Years**	**15 Years**	**20 Years**	**5 Years**	**10 Years**	**15 Years**	**20 Years**
Infrastructure Deficit:	$96k	$96k	$96k	$96k	($36k)	($36k)	($36k)	($36k)
Change in Debt Costs	-67,981	-67,981	-67,981	-67,981	N/A	N/A	N/A	N/A
Resulting Infrastructure Deficit:	**$28k**	**$28k**	**$28k**	**$28k**	**($36k)**	**($36k)**	**($36k)**	**($36k)**
Rate Increase Required	8.0%	8.0%	8.0%	8.0%	0%	0%	0%	0%
Annually:	**1.6%**	**0.8%**	**0.6%**	**0.4%**	**0%**	**0%**	**0%**	**0%**

Table 79: Phasing in Rate Increases

Funding 100% of annual capital requirements ensures that major capital events, including replacements, are completed as required. Under this scenario, projects are unlikely to be deferred to future years. This delivers the highest asset performance and customer levels of service.

Similarly to the Tax Funded asset, the proposed levels of service play a role in the development of the Annual Average Requirement discussed above. For comparison, the taxation impact for achieving each service level option is provided below:

Annual Impact on Rates					
Water	**Changes in Levels of Service**	**5 year**	**10 Year**	**15 Year**	**20 Year**
	Full Funding	1.6%	0.8%	0.6%	0.4%

	75% Funding	0.1%	0.1%	0.1%	0.1%
	50% Funding	0%	0%	0%	0%
	Recommended	1.6%	0.8%	0.6%	0.4%
Sanitary	**Changes in Levels of Service**	**5 year**	**10 Year**	**15 Year**	**20 Year**
	Full Funding	0%	0%	0%	0%
	75% Funding	0%	0%	0%	0%
	50% Funding	0%	0%	0%	0%
	Recommended	0%	0%	0%	0%

Table 80: Scenarios Annual Impact on Rates

Financial Strategy Recommendations

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

a) increasing rate revenues by 0.8% for water services and each year for the next 10 years solely for the purpose of phasing in full funding to support the proposed levels of service.
b) increasing existing and future infrastructure budgets by the applicable inflation index on an annual basis in addition to the deficit phase-in.

Notes:

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

The Township is currently allocating funding to reserves for water and sanitary infrastructure that, while not yet assumed, are expected to become the Township's responsibility in the upcoming year. These proactive contributions reflect the Township's commitment to preparing for future ownership and ensuring financial sustainability as new assets are assumed.

Most of the assets expected to be assumed have been incorporated into this Asset Management Plan to the extent that reliable data was available. However, some data gaps may remain due to the timing of assumptions and asset information availability. These will be addressed and refined in future updates to the plan, once full ownership and complete asset data are confirmed.

14.5. Use of Debt

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

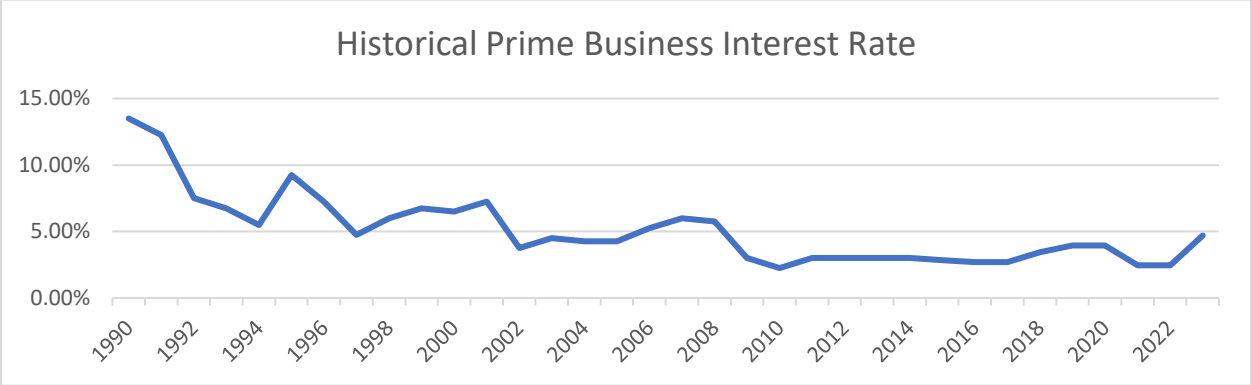
a) the ability to stabilize tax & user rates when dealing with variable and sometimes uncontrollable factors

b) equitable distribution of the cost/benefits of infrastructure over its useful life

c) a secure source of funding

d) flexibility in cash flow management

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



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

The following tables outline how Otonabee-South Monaghan has historically used debt for investing in the asset categories as listed. There is currently $1,282,208 of debt outstanding for the assets covered by this AMP with corresponding principal and interest payments of $406,934. This amount is well within the Township's provincially prescribed maximum of $155,964, which is a limit set by the province to ensure that municipalities maintain a responsible level of debt in relation to their financial capacity.

Asset Category	Current Debt Outstanding	Use of Debt in the Last Five Years				
		2019	2020	2021	2022	2023
Road Network						
Bridges & Culverts						

Stormwater System						
Buildings	$1,012,961					
Land Improvements						
Machinery & Equipment						
Vehicles						
Total Tax Funded:	**$1,012,961**					
Water Network	$269,247					
Sanitary System						
Total Rate Funded:	**$269,247**	**$**	**$**	**$**	**$**	**$**

Table 81: Use of Debt in the last Five Years

Asset Category	Principal & Interest Payments in the Next Ten Years						
	2025	**2026**	**2027**	**2028**	**2029**	**2030**	**2035**
Road Network	$166k	$166k	$166k	$166k	$166k	$166k	$166k
Stormwater System							
Bridges & Culverts							
Buildings							
Machinery & Equipment							
Land Improvements							
Vehicles							
Total Tax Funded:	**$166k**	**$166k**	**$166k**	**$166k**	**$166k**	**$166k**	**$166k**
Water Network	$68k						
Sanitary System							
Total Rate Funded:	**$68k**						

Table 82: Principal & Interest Payments in the Next Ten Years

14.6. Use of Reserves

14.4.2. Available Reserves

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

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

The table below outlines the details of the reserves currently available to the Township.

Reserve Name	Balance at December 31, 2024
Arena	($436,548)
Building Department	$1,220,630
Fire	$1,524,899
General Government	$1,488,712
Nelson Landfill	$194,023
Parks	$127,208
Planning	$289,256
Police	$173,137
Public Property	$540,372
Roads	$852,840
Roads Construction	$206,994
Sewer	$42,759
Streetlights	$17,075
Waste Management/Recycling	$1,516,704
Water	$89,121
Working Funds	$217,384
Total:	**$8,064,566**

Table 83: Reserve Balances

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

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

These reserves are available for use by applicable asset categories during the phase-in period toward achieving full funding to support the proposed levels of service. This 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.

15. Growth

15.1. Description of Growth Assumptions

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 Town to more effectively plan for new infrastructure, and the upgrade or disposal of existing infrastructure. Increases or decreases in demand can affect what assets are needed and what level of service meets the needs of the community.

15.2. OSM Official Plan (2017)

The goal of the Township Official Plan was created to communicate the long-term goals and direction of the township, in alignment with the Peterborough County Official plans predictions. The Township of Otonabee-South Monaghan's Official Plan states that their goal is to foster healthy change and growth of the community. This goal of growth must also align with the Townships commitment to environmentally sustainability. The document covers a 20-year planning period from its original inception, covering it to the year 2023. The Township will continue to sustain the growth of a strong agricultural community, seek opportunities for expansion of the tourism industry as well as strengthen commercial and industrial growth based on sound environmental and land use planning practices. The Township focuses on directing the population growth and development primarily to the designated Hamlet settlement areas while not increasing the number of hamlets in the Township. By directing growth into these locations, the Township can take advantage of the service delivery in these areas to lower the economic burden of growth while still provided quality levels of service. Throughout this process there will be measured steps taken to protect the Township's agriculture industry and community.

The permanent population of the Township is projected to increase to approximately 8,308 persons over the life of this Official Plan. In context, the Peterborough County Official Plan (2022) has identified the Township to attribute 9% of the County's growth. The Township is intended to promote the designation and development of central nodes of Employment Lands as a focus for new and expanding industrial and commercial land uses. The following table outlines population changes to the Township between 2011-2021 from Statistics Canada, for which the Township will be required to provide services.

Historical Figures	1996	2001	2006	2011	2016	2021
Population	6,749	6,669	6,934	6,660	6,670	7,087
Population Change	N/A	-1%	+4%	-4%	0.2%	+6.2%

15.3. Peterborough County Official Plan (2022)

The Peterborough County Official Plan, adopted in 2022, outlines a long-term planning framework to manage growth across the County through to 2051. As required under the Planning Act, the Plan integrates provincial direction from the Provincial Policy Statement and the Growth Plan for the Greater Golden Horseshoe, and provides a regional vision for land use, infrastructure investment, and development. While local municipalities, including Otonabee-South Monaghan, remain responsible for managing development approvals, the County Plan establishes the overarching policy context and growth allocations.

Based on the Growth Analysis and Land Needs Assessment conducted by the County, Otonabee-South Monaghan is expected to accommodate 820 new housing units between 2021 and 2051, representing 8.5% of the County's total housing growth over that period. While this is a more modest share compared to higher-growth municipalities such as Cavan Monaghan or Selwyn, it signals steady residential development pressure that the Township will need to plan across its infrastructure portfolio.

Municipality	2021	2051	2021-51	2021-51
Otonabee-South Monaghan	2,730	3,550	820	8.5%

Table 84: Summary of Housing Allocation

Source 1: Hemson Consulting

In preparation for this anticipated growth, the County and Otonabee-South Monaghan will continue to coordinate planning efforts to ensure that infrastructure, services, and community facilities are available to support new development. Although the Township is expected to absorb a smaller share of overall County growth, the forward-looking nature of the Official Plan ensures that necessary infrastructure planning and lifecycle strategies will align with future population and employment needs.

15.4. Impact of Growth on Lifecycle Activities

In accordance with O. Reg. 588/17, the assumptions regarding anticipated future population and economic growth, as outlined in Section 5 (2) 5 (i), have been incorporated into both the lifecycle management strategy and financial strategy. Growth forecasts from the County of Peterborough's Official Plan project the development of approximately 820 new housing units in Otonabee-South Monaghan by 2051.

The Township will ensure that sewage treatment, waste disposal services, water supply, stormwater management, transport pathways, utilities, and emergency services are planned and developed in alignment with the growth targets identified in the Official Plan. These services will be expanded in a manner that maintains or enhances the Township's natural environment and existing assets.

As growth-related infrastructure is constructed or acquired, it should be integrated into the Township's asset management program. While new development will increase the tax base and user rate revenues, the Township must continue to assess the full lifecycle costs associated with servicing new growth. These costs, including operations, maintenance, rehabilitation, and eventual replacement, must be incorporated into long-term funding strategies to ensure that the current level of service can be sustained.

In support of these growth objectives, the Township has adopted a measured approach to incorporating unassumed infrastructure into its asset management planning. At this time, stormwater, water, and sanitary infrastructure located within unassumed subdivisions has not been included in the Asset Management Plan, capital forecasts, or financial strategy. This decision reflects both the absence of complete asset data and the fact that these assets are not yet under municipal ownership. However, to ensure long-term financial preparedness, the Township is allocating funds from taxation and user rates into reserve accounts to support future obligations when these assets are assumed.

Select unassumed assets have been included where appropriate. Specifically, certain sanitary, stormwater, and road infrastructure installed since 2016 within the Burnham Meadows subdivision has been incorporated into the Asset Management Plan. These assets are expected to be assumed by the Township in 2026. In anticipation of this, funding is already being allocated to support their future lifecycle needs. This proactive approach reflects the Township's commitment to sustainable growth, financial responsibility, and readiness to manage future infrastructure demands.

16. Recommendations

16.1. Financial Strategies

1. Review the feasibility of adopting the funding required to meet the proposed levels of service for the asset categories analyzed. This includes:
    a. Increasing taxes by 1.9% per year over a period of 15 years;
    b. Increasing water rates by 0.8% per year over a period of 10 years; and
2. Continued allocation of OCIF and CCBF funding as previously outlined.
3. Reallocating appropriate revenue from categories in a surplus position to those in a deficit position.
4. Increasing existing and future infrastructure budgets by the applicable inflation index on an annual basis in addition to the deficit phase-in.
5. Continue to apply for project specific grant funding to supplement sustainable funding sources
6. Continue to review the contributions to reserves for infrastructure in Burnham Meadows subdivision as infrastructure is commissioned and assumed and asset data becomes available.

16.2. Asset Data

1. It is recommended that asset data related to unassumed infrastructure, including stormwater, sanitary, water, and roads, be continuously refined, validated, and audited as ownership is transferred to the Township. As new subdivisions and developments are constructed, infrastructure often remains under the responsibility of developers until formally assumed by the municipality. During this period, there may be gaps or inconsistencies in the data related to asset location, size, material type, installation year, or condition. To ensure a smooth transition into the Township's asset registry and lifecycle models, staff should implement a structured process for collecting, reviewing, and integrating as-built information as each asset becomes municipally owned. This will help maintain data accuracy and integrity, support effective capital planning, and ensure compliance with regulatory requirements under O. Reg. 588/17.
2. Continuously review, refine, and calibrate lifecycle and risk profiles to better reflect actual practices and improve capital projections. In particular:
    a. the timing of various lifecycle events, the triggers for treatment, anticipated impacts of each treatment, and costs
    b. the various attributes used to estimate the likelihood and consequence of asset failures, and their respective weightings

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

16.3. Risk & Levels of Service

1. Risk models and matrices can play an important role in identifying high-value assets, and developing an action plan which may include repair, rehabilitation, replacement, or further evaluation through condition assessments. As a result, project selection and the development of multi-year capital plans can become more strategic and objective. Initial models have been built into Citywide for all asset groups. These models reflect current data, which was limited. As the data evolves and new attribute information is obtained, these models should also be refined and updated.
2. Available data on current performance should be centralized and tracked to support any calibration of service levels for long-term tracking of O. Reg. 588's requirements on proposed levels of service.
3. Staff should monitor evolving local, regional, and environmental trends to identify factors that may shape the demand and delivery of infrastructure programs. These can include population growth, and the nature of population growth; climate change and extreme weather events; and economic conditions and the local tax base. This data can also be used to review service level targets.

Appendices

Appendix A: Proposed LOS 10-Year Capital Requirements

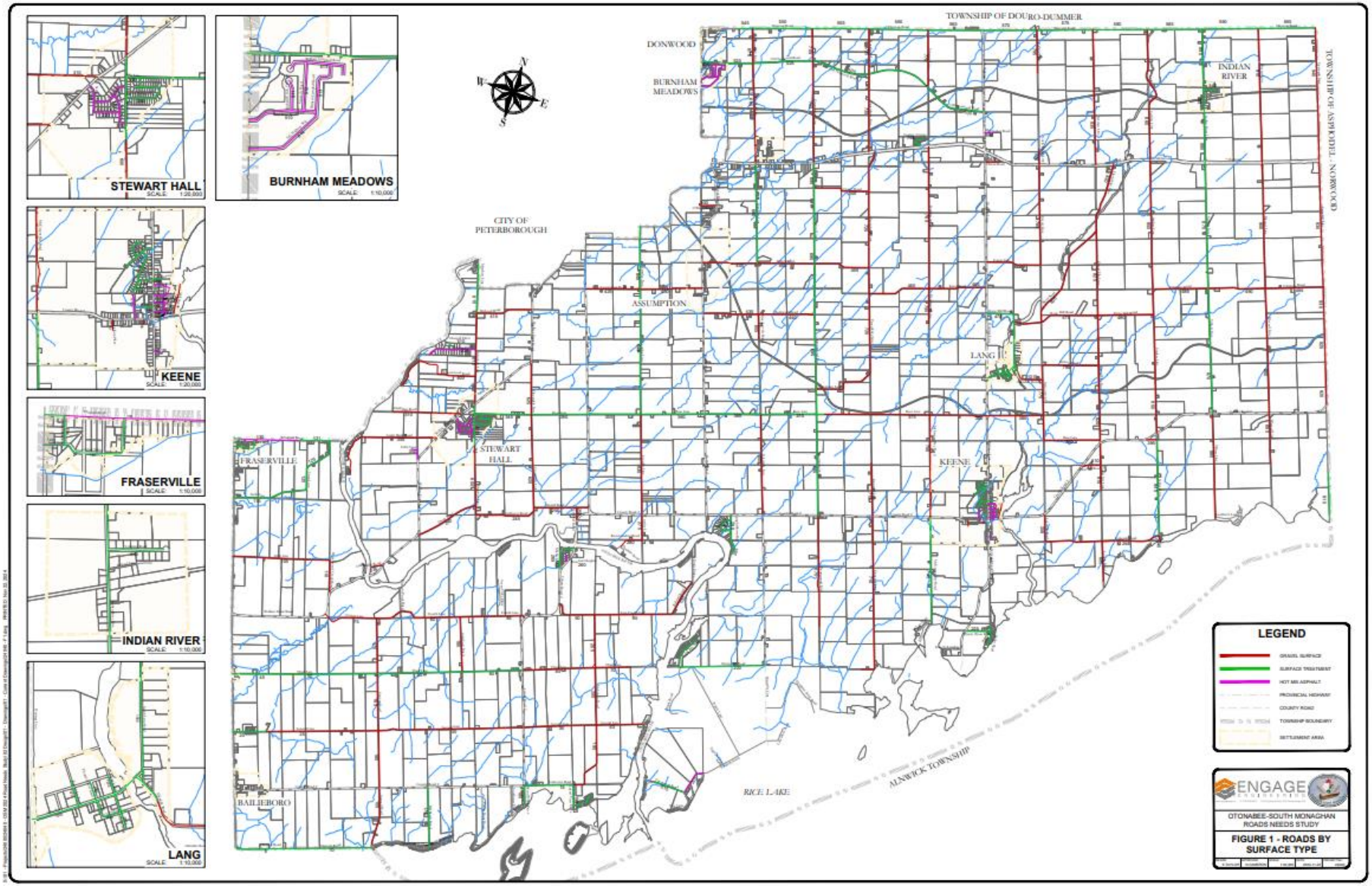
The table below outlines the capital cost requirements for recommended lifecycle activities, as generated through the Township's asset management software. These projections are based on annual budgets that start at current funding levels and gradually increase over a 15-year period to reach a full funding level, using Scenario 1 for all assets, as outlined in Section 4: Proposed Levels of Service. For more information, please refer to Section 14: Financial Strategy.

Asset Category	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034
Road Network	$660k	$699k	$880k	$872k	$988k	$971k	$1.4m	$1.3m	$1.3m	$1.5m
Bridges & Culverts	-	-	-	$43k	$62k	$49k	-	-	-	-
Buildings	$72k	$414k	$75k	$420k	$300k	$528k	-	$919k	-	-
Stormwater System	-	-	-	-	-	$20k	-	-	-	-
Land Improvements	$6k	-	-	$15k	-	-	$100k	-	-	-
Machinery & Equipment	$223k	$247k	$274k	$270k	$216k	$260k	$396k	$302k	$332k	$328k
Vehicles	$59k	$95k	$145k	$184k	$148k	$264k	$228k	$299k	$184k	$396k
Water Network	$27k	$98k	$102k	$105k	$107k	$111k	$115k	$117k	$123k	$20k
Sanitary System	-	-	-	$15k	-	-	-	-	$15k	-
TOTAL	**$1.0m**	**$1.6m**	**$1.5m**	**$1.9m**	**$1.8m**	**$2.2m**	**$2.2m**	**$2.9m**	**$2.0m**	**$2.3m**

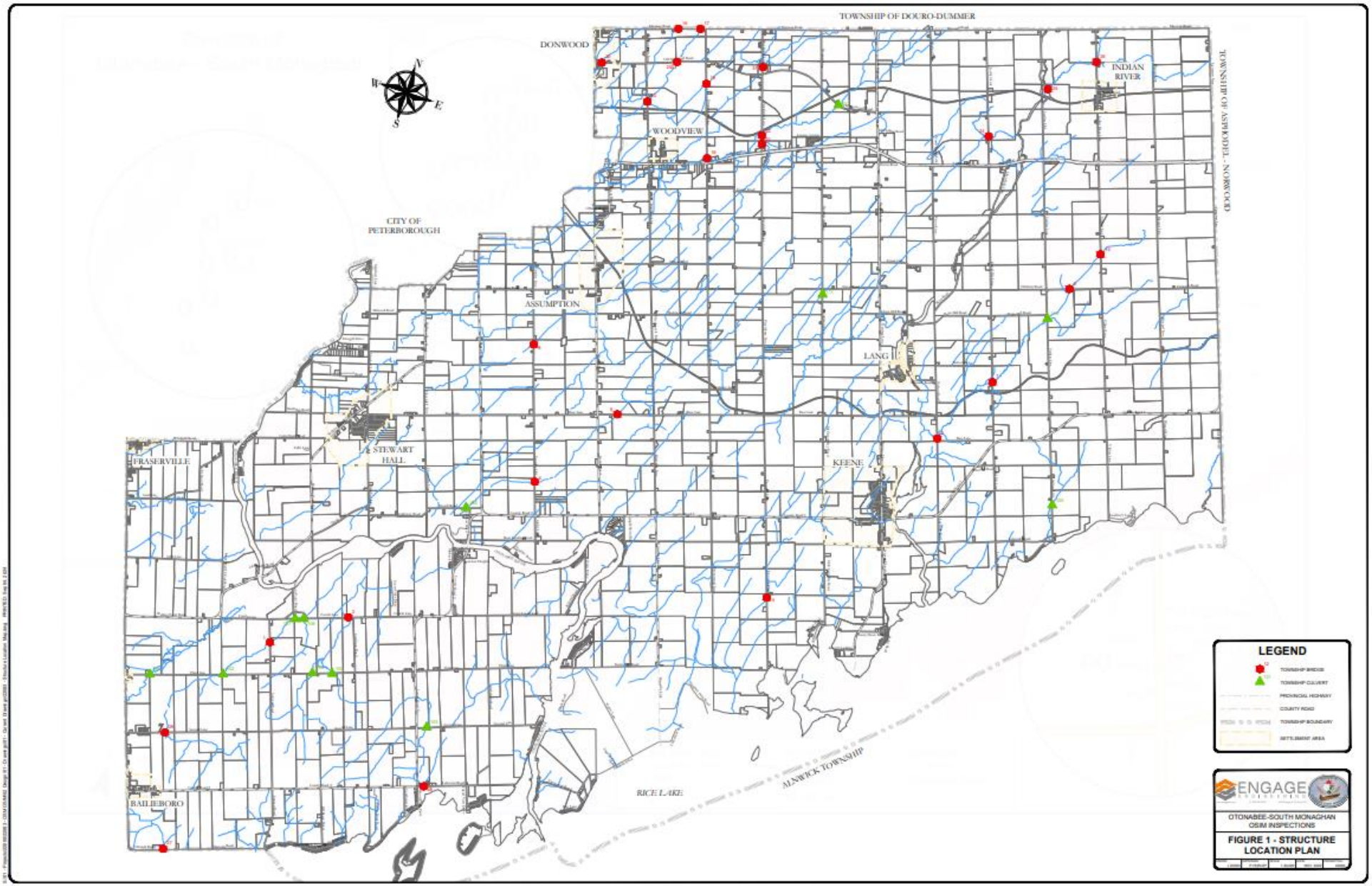
Table 85: Scenario 2 System-Generated 10-Year Capital Requirements

Appendix B: Levels of Service Maps

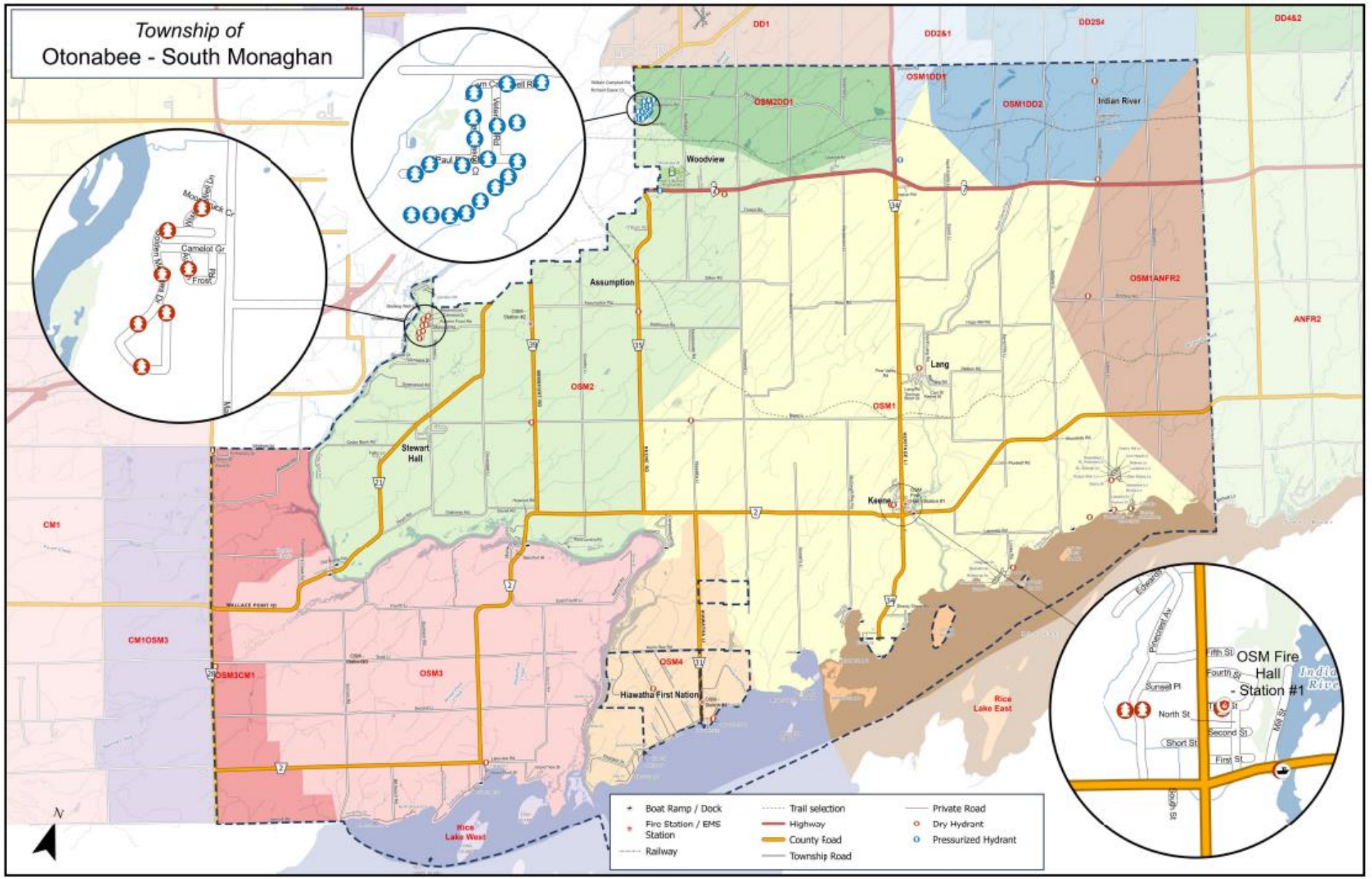
Road Network Map



Bridges & Culverts Map



Fire Hydrant Map



Appendix C: 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 condition.

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

Appendix D: Risk Rating Criteria

Risk Definitions

Risk	Integrating a risk management framework into your asset management program requires the translation of risk potential into a quantifiable format. This will allow you to compare and analyze individual assets across your entire asset portfolio. Asset risk is typically defined using the following formula: **Risk = Probability of Failure (POF) x Consequence of Failure (COF)**
Probability of Failure (POF)	The probability of failure relates to the likelihood that an asset will fail at a given time. The current physical condition and service life remaining are two commonly used risk parameters in determining this likelihood.
POF - Structural	The likelihood of asset failure due to aspects of an asset such as load carrying capacity, condition, or breaks
POF - Functional	The likelihood of asset failure due to its performance
POF - Range	**1 - Rare 2 - Unlikely 3 - Possible 4 - Likely 5 - Almost Certain**
Consequences of Failure (COF)	The consequence of failure describes the overall effect that an asset's failure will have on an organization's asset management goals. Consequences of failure can range from non-eventful to impactful: a small diameter water main break in a subdivision may cause several rate payers to be without water service for a short time. However, a larger trunk water main may break outside a hospital, leading to significantly higher consequences.
COF - Financial	The monetary consequences of asset failure for the organization and its customers
COF - Social	The consequences of asset failure on the social dimensions of the community
COF - Environmental	The consequence of asset failure on an asset's surrounding environment
COF - Operational	The consequence of asset failure on the Town's day-to-day operations
COF - Health & safety	The consequence of asset failure on the health and well-being of the community
COF - Economic	The consequence of asset failure on strategic planning
COF - Range	**1 - Insignificant 2 - Minor 3 - Moderate 4 - Major 5 - Severe**

Risk Frameworks

Road Network – HCB/LCB Roads

Probability of Failure			
Criteria	**Sub-Criteria**	**Value/ Range**	**Score**
Performance	Asset Condition	0-29	5 - Almost Certain
		30-49	4 - Likely
		50-74	3 - Possible
		75-84	2 - Unlikely
		85-100	1 - Rare
Consequence of Failure			
Criteria	**Sub-Criteria**	**Value/Range**	**Score**
Financial (50%)	Replacement Cost ($)	>$1,000,001	5 – Severe
		$1,000,000	4 – Major
		$500,000	3 - Moderate
		$150,000	2 – Minor
		<$75,000	1 – Insignificant
Social (25%)	Average Annual Daily Traffic (AADT)	>1,001	5 – Severe
		1,000	4 – Major
		600	3 – Moderate
		200	2 – Minor
		50	1 – Insignificant
Health & Safety (15%)	Speed Limit	>80	5 – Severe
		70	4 – Major
		60	3 – Moderate
		50	2 – Minor
		<40	1 – Insignificant

Bridges & Culverts

Probability of Failure			
Criteria	**Sub-Criteria**	**Value/ Range**	**Score**
Performance	Asset Condition	0-29	5 - Almost Certain
		30-49	4 - Likely
		50-74	3 - Possible
		75-84	2 - Unlikely
		85-100	1 - Rare
Consequence of Failure			
Criteria	**Sub-Criteria**	**Value/Range**	**Score**
Financial (70%)	Replacement Cost ($)	>$800,000	5 – Severe
		$750,000	4 – Major
		$500,000	3 - Moderate
		$150,000	2 – Minor
		<$75,000	1 – Insignificant
Social (30%)	Traffic Volume	>501	5 – Severe
		500	4 – Major
		300	3 – Moderate
		200	2 – Minor
		100	1 – Insignificant
	Special Route	Truck Route	5 – Severe
		None	1 – Insignificant

Water Network – Watermains

Probability of Failure			
Criteria	**Sub-Criteria**	**Value/Range**	**Score**
Performance	Asset Condition (50%)	0	5 - Almost Certain
		30	4 - Likely
		50	3 - Possible
		70	2 - Unlikely
		90	1 - Rare
	Material (50%)	Ductile Iron	3 - Possible
		PVC	1 - Rare
Consequence of Failure			
Criteria	**Sub-Criteria**	**Value/Range**	**Score**
Financial 70%	Replacement Cost	>$50,000	5 - Severe
		$40,000	4 - Major
		$30,000	3 - Moderate
		$20,000	2 - Minor
		<$10,000	1 - Insignificant
Social 30%	Pipe Diameter	>400mm	5 - Severe
		350mm	4 - Major
		250mm	3 - Moderate
		150mm	2 - Minor
		<100mm	1 - Insignificant

Wastewater System – Sanitary Mains

Probability of Failure			
Criteria	**Sub-Criteria**	**Value/Range**	**Score**
Performance	Asset Condition (50%)	0	5 - Almost Certain
		30	4 - Likely
		50	3 - Possible
		70	2 - Unlikely
		90	1 - Rare
	Material (50%)	CP	4 - Likely
		HDPE	2 - Unlikely
		PVC	1 - Rare
Consequence of Failure			
Criteria	**Sub-Criteria**	**Value/Range**	**Score**
Financial 60%	Replacement Cost	>$50,000	5 - Severe
		$40,000	4 - Major
		$30,000	3 - Moderate
		$20,000	2 - Minor
		<$10,000	1 - Insignificant
Environmental 20%	Segment	Forcemains	5 - Severe
		Sewer Mains	3 - Moderate
Health & Safety 20%	Sanitary Pipe Diameter	>600mm	5 - Severe
		500mm	4 - Major
		400mm	3 - Moderate
		250mm	2 - Minor
		<150mm	1 - Insignificant

Storm Network – Storm Sewer Mains

Probability of Failure			
Criteria	**Sub-Criteria**	**Value/Range**	**Score**
Performance	Asset Condition (50%)	0	5 - Almost Certain
		30	4 - Likely
		50	3 - Possible
		70	2 - Unlikely
		90	1 - Rare
	Material (50%)	Concrete	4 - Likely
		CSP	4 - Likely
		CP	4 - Likely
		HDPE	2 - Unlikely
		PVC	1 - Rare

Consequence of Failure			
Criteria	**Sub-Criteria**	**Value/Range**	**Score**
Financial 80%	Replacement Cost	>$50,000	5 - Severe
		$40,000	4 - Major
		$30,000	3 - Moderate
		$20,000	2 - Minor
		<$10,000	1 - Insignificant
Operational 20%	Storm Pipe Diameter	>900mm	5 - Severe
		650mm	4 - Major
		400mm	3 - Moderate
		250mm	2 - Minor
		<300mm	1 - Insignificant

Land Improvements

Probability of Failure			
Criteria	**Sub-Criteria**	**Value/Range**	**Score**
Performance	Asset Condition	0	5 - Almost Certain
		20	4 - Likely
		40	3 - Possible
		60	2 - Unlikely
		80	1 - Rare
Consequence of Failure			
Criteria	**Sub-Criteria**	**Value/Range**	**Score**
Financial	Replacement Cost	>$200,000	5 - Severe
		$100,000	4 - Major
		$50,000	3 - Moderate
		$20,000	2 - Minor
		<$10,000	1 - Insignificant

Buildings

Probability of Failure			
Criteria	**Sub-Criteria**	**Value/Range**	**Score**
Performance	Asset Condition	0	5 - Almost Certain
		20	4 - Likely
		40	3 - Possible
		60	2 - Unlikely
		80	1 - Rare
Consequence of Failure			
Criteria	**Sub-Criteria**	**Value/Range**	**Score**
Financial 70%	Replacement Cost	>$1,500,001	5 - Severe
		$1,500,000	4 - Major
		$500,000	3 - Moderate

		$250,000	2 - Minor
		<$100,000	1 - Insignificant
Operational 30%	Segment	Fire Buildings	5 - Severe
		General Government	5 - Severe
		Recreation Buildings	3 - Moderate
		Public Health Buildings	3 - Moderate
		Paved Roads Buildings	3 - Moderate
		Library Buildings	2 - Minor

Vehicles

Probability of Failure			
Criteria	**Sub-Criteria**	**Value/Range**	**Score**
Performance	Asset Condition	0	5 - Almost Certain
		20	4 - Likely
		40	3 - Possible
		60	2 - Unlikely
		80	1 - Rare

Consequence of Failure			
Criteria	**Sub-Criteria**	**Value/Range**	**Score**
Financial 80%	Replacement Cost	>$350,000	5 - Severe
		$300,000	4 - Major
		$100,000	3 - Moderate
		$75,000	2 - Minor
		>$50,000	1 - Insignificant
Social 20%	Segment	Fire Vehicles	5 - Severe
		Winter Control Vehicles	4 - Major
		Roads Vehicles	4 - Major
		Building Vehicles	2 - Minor
		Parks Vehicles	2 - Minor

Machinery & Equipment

Probability of Failure			
Criteria	**Sub-Criteria**	**Value/Range**	**Score**
Performance	Asset Condition	0	5 - Almost Certain
		20	4 - Likely
		40	3 - Possible
		60	2 - Unlikely
		80	1 - Rare

Consequence of Failure			
Criteria	**Sub-Criteria**	**Value/Range**	**Score**
Financial 80%	Replacement Cost	>$300,000	5 - Severe
		$200,000	4 - Major
		$100,000	3 - Moderate
		$50,000	2 - Minor
		$20,000	1 - Insignificant
Social 20%	Department	Fire Equipment	5 - Severe
		Roads & Bridges Equip	4 - Major
		General Government	4 - Major
		Arena Equipment	2 - Minor
		Parks Equipment	1 - Insignificant