Asset Management Plan 2024

Township of Alfred and Plantagenet

September 2024

psdcitywide

This Asset Management Plan was prepared by:

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

Key Statistics

$230m	2023 Replacement Cost of Asset Portfolio
$54k	Replacement Cost of Infrastructure Per Household
80%	Percentage of Assets in Fair or Better Condition
60%	Percentage of Assets with Assessed Condition Data
$4.3m	Annual Capital Infrastructure Deficit
15 Years	Recommended Timeframe for Eliminating Annual Infrastructure Deficit
2.9%	Target Investment Rate
1.1%	Actual Investment Rate

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1. Executive Summary

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

1.1 Scope

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

This AMP include the following asset categories:

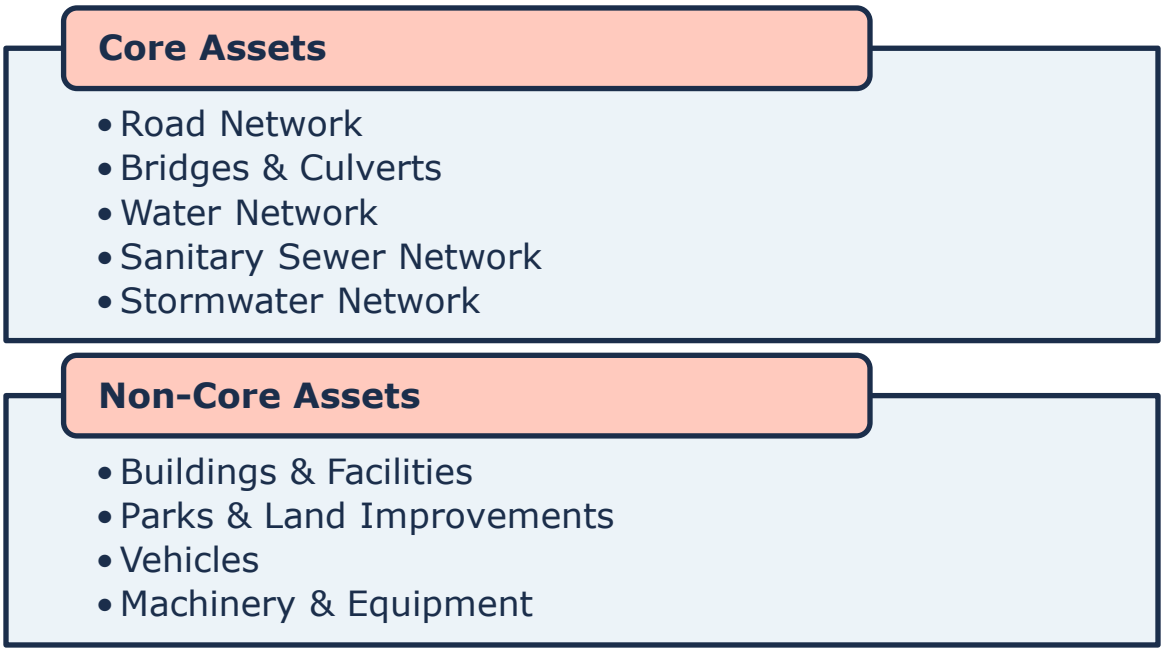


Figure 1 Core and Non-Core Asset Categories

1.2 O. Reg. 588/17 Compliance

With the development of this AMP the Township has achieved compliance with July 1, 2024, requirements under O. Reg. 588/17. This includes requirements for levels of service and inventory reporting for all asset categories. More details on compliance can be found in section *2.5.1 O. Reg. 588/17 Compliance Review*.

1.3 Findings

The overall replacement cost of the asset categories included in this AMP totals $230 million. 80% of all assets analyzed in this AMP are in fair or better condition and assessed condition data was available for 60% of assets. For the remaining 40% of assets, assessed condition data was unavailable, and asset age was used to approximate condition – a data gap that persists in most municipalities. Generally, age misstates the true condition of assets, making assessments essential to accurate asset management planning, and a recurring recommendation in this AMP.

The development of a long-term, sustainable financial plan requires an analysis of whole lifecycle costs. This AMP uses a combination of proactive lifecycle strategies (paved roads) and 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 $6.8 million. Based on a historical analysis of sustainable capital funding sources, the Township is committing approximately $2.5 million towards capital projects or reserves per year. As a result, there is currently an annual funding gap of $4.3 million.

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

1.4 Recommendations

A financial strategy was developed to address the annual capital funding gap. The following graphics shows annual tax/rate change required to eliminate the Township's infrastructure deficit based on a 15-year plan:

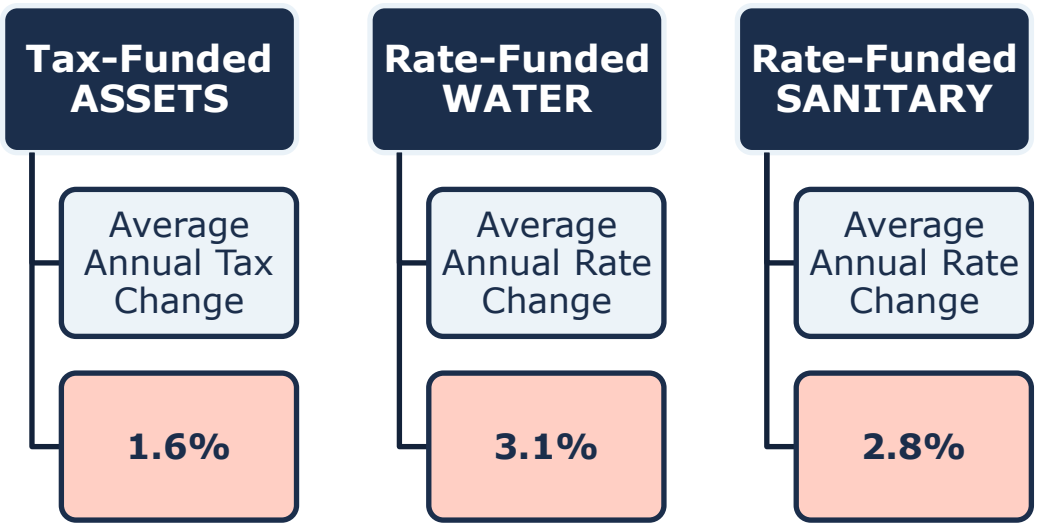


Figure 2 Proposed Tax/Rate Changes

2. Introduction & Context

2.1 Community Profile

Census Characteristic	Township of Alfred and Plantagenet	Ontario
Population 2021	9,949	14,223,942
Population Change 2016-2021	2.8%	5.8%
Total Private Dwellings	4,297	5,929,250
Population Density	25.4/km^2	15.9/km^2
Land Area	391.79km^2	892,411.76 km^2

Table 1 Township of Alfred and Plantagenet Community Profile

The Township of Alfred and Plantagenet is a lower-tier Township and part of the United Counties of Prescott and Russell within eastern Ontario. Alfred and Plantagenet borders the Ottawa River to the north, separating it from the province of Quebec.

The Township of Alfred and Plantagenet was formed in 1997 through the amalgamation of the Township of Alfred and the Township of North Plantagenet. It encompasses several smaller communities and hamlets, each with its own unique character and history. The Township's population is predominantly francophone, reflecting its cultural heritage.

The Township is characterized by its rural landscapes, agricultural lands, and scenic natural features. It offers a peaceful, country lifestyle that is appreciated by both residents and visitors. Historically, agriculture has played a significant role in the Township's economy and way of life. This agricultural heritage is still evident in the rural landscape and lifestyle of its residents. Like many small, rural townships, Alfred and Plantagenet is known for its close-knit community, where local events and gatherings play an important role in social life.

Demand in Alfred and Plantagenet is driven by agricultural needs, including farm equipment, supplies, and services that support the local farming community, given its historical roots in agriculture. The rural and natural setting of the Township offers numerous outdoor activities, such as hiking, fishing, and enjoying the tranquil countryside. Furthermore, as urban areas become more crowded and expensive, people often look to rural communities like Alfred and Plantagenet for more affordable and spacious living options. The demand for housing can be driven by those seeking a quieter, more scenic lifestyle away from city centers.

The Township's infrastructure priorities focus on expanding and upgrading urban infrastructure to support a higher density of population and employment in western parts of the County, while managing rural development in a sustainable manner.

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 Alfred and Plantagenet Climate Profile

The Township of Alfred and Plantagenet is located in eastern Ontario within United Counties of Prescott and Russell County. The Township is expected to experience notable effects of climate change which include higher average annual temperatures, an increase in total annual precipitation, and an increase in the frequency and severity of extreme events. According to Climatedata.ca – a collaboration supported by Environment and Climate Change Canada (ECCC) – the Township of Alfred and Plantagenet may experience the following trends:

Higher Average Annual Temperature:

- Between the years 1971 and 2000 the annual average temperature was 5.6 ºC
- Under a high emissions scenario, the annual average temperatures are projected to increase by 4.7ºC by the year 2050 and over 6.6 ºC by the end of the century.

Increase in Total Annual Precipitation:

- Under a high emissions scenario, Alfred and Plantagenet is projected to experience an 13% increase in precipitation by the year 2051 and a 16% increase by the end of the century.

Increase in Frequency of Extreme Weather Events:

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

2.2.2 Integration of 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.

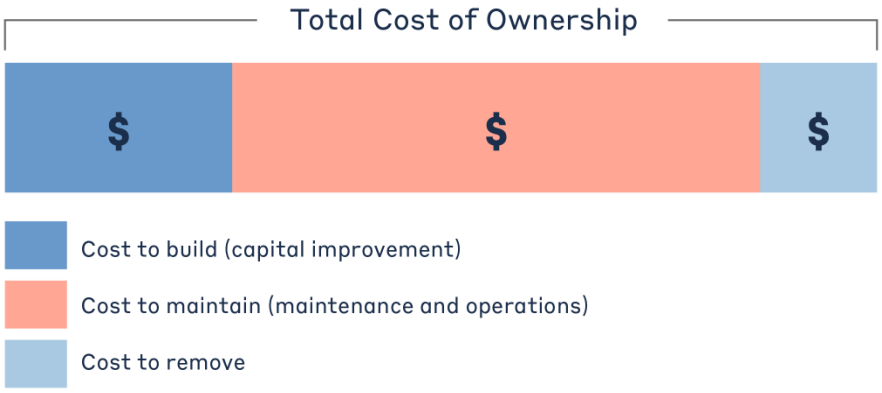


Figure 3 Total Cost of Asset Ownership

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

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

2.3.1 Foundational Asset Management Documentation

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

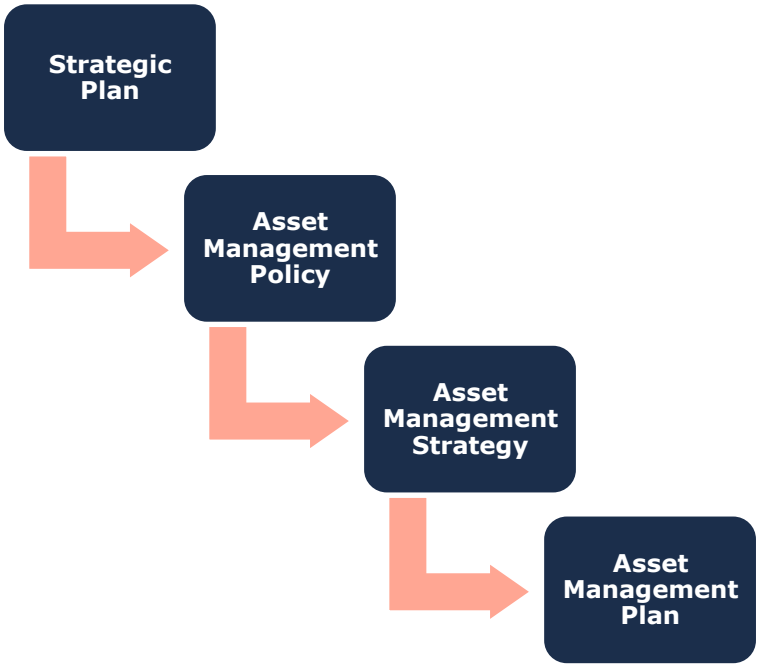


Figure 4 Foundational Asset Management Documents

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

Asset Management Policy

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

The Township adopted their Strategic Asset Management Policy on June 18, 2019 (resolution #2019-334), in accordance with Ontario Regulation 588/17. The policy provides a foundation for the development of an asset management program within the Township. It covers key components that define a comprehensive asset management policy:

- The policy's purpose dictates the use of asset management practices to ensure all assets meet the agreed levels of service in the most efficient and effective manner;

- the policy commits to, where appropriate, incorporating asset management in the Township's other plans;
- there are formally defined roles and responsibilities of internal staff and stakeholders;
- the guiding principles include the use of a cost/benefit analysis in the management of risk; and
- the policy statements are well defined.

Asset Management Strategy

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

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

Asset Management Plan

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

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

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

The Township's last iteration of the AMP was completed in 2021. Since then, the asset inventory has undergone revisions and updates. This document is an AMP that uses the updated asset inventory and has been prepared in accordance with O. Reg. 588/17.

2.3.2 Key Concepts in Asset Management

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

Lifecycle Management Strategies

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

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

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

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

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

Table 2 Lifecycle Management: Typical Lifecycle Interventions

The Township's approach to lifecycle management is described within each asset category outlined in this AMP. Staff will continue to evolve and innovate current practices for developing and implementing proactive lifecycle strategies to determine which activities to

perform on an asset and when they should be performed to maximize useful life at the lowest total cost of ownership.

Risk & Criticality

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

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

Figure 5 Risk Equations

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

Probability of Failure

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

Consequence of Failure

Estimating criticality also requires identifying the types of consequences that the organization and community may face from an asset's failure, and the magnitude of those consequences. Consequences of asset failure will vary across the infrastructure portfolio;

the failure of some assets may result primarily in high direct financial cost but may pose limited risk to the community. Other assets may have a relatively minor financial value, but any downtime may pose significant health and safety hazards to residents.

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

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

Table 3 Risk Analysis: Types of Consequences of Failure

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

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

Levels of Service

A level of service (LOS) is a measure of the services that the Township is providing to the community and the nature and quality of those services. Within each asset category in this

AMP, technical metrics and qualitative descriptions that measure both technical and community levels of service have been established and measured as data is available.

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

Community Levels of Service

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

Technical Levels of Service

Technical levels of service are a measure of key technical attributes of the service being provided to the community. These include mostly quantitative measures and tend to reflect the impact of the Township's asset management strategies on the physical condition of assets or the quality/capacity of the services they provide.

For core asset categories as applicable (Roads, Bridges & Culverts, Water, Sanitary, and Stormwater) the province, through O. Reg. 588/17, has also provided technical metrics that are required to be included in this AMP. For non-core asset categories, each municipality may incorporate technical levels of service they find useful.

Current and Proposed Levels of Service

This AMP focuses on measuring the current level of service provided to the community. Once current levels of service have been measured, the Township plans to establish proposed levels of service over a 10-year period, in accordance with O. Reg. 588/17, as part of the 2025 requirements.

Proposed levels of service should be realistic and achievable within the timeframe outlined by the Township. They should also be determined with consideration of a variety of community expectations, fiscal capacity, regulatory requirements, corporate goals and long-term sustainability. Once proposed levels of service have been established, and prior to July 2025, the Township must identify a lifecycle management and financial strategy which allows these targets to be achieved.

2.4 Scope & Methodology

2.4.1 Asset Categories for this AMP

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

The AMP summarizes the state of the infrastructure for the Township's asset portfolio, establishes current levels of service and the associated technical and customer oriented key metrics, outlines lifecycle strategies for optimal asset management and performance, and provides financial strategies to reach sustainability for the asset categories listed below.

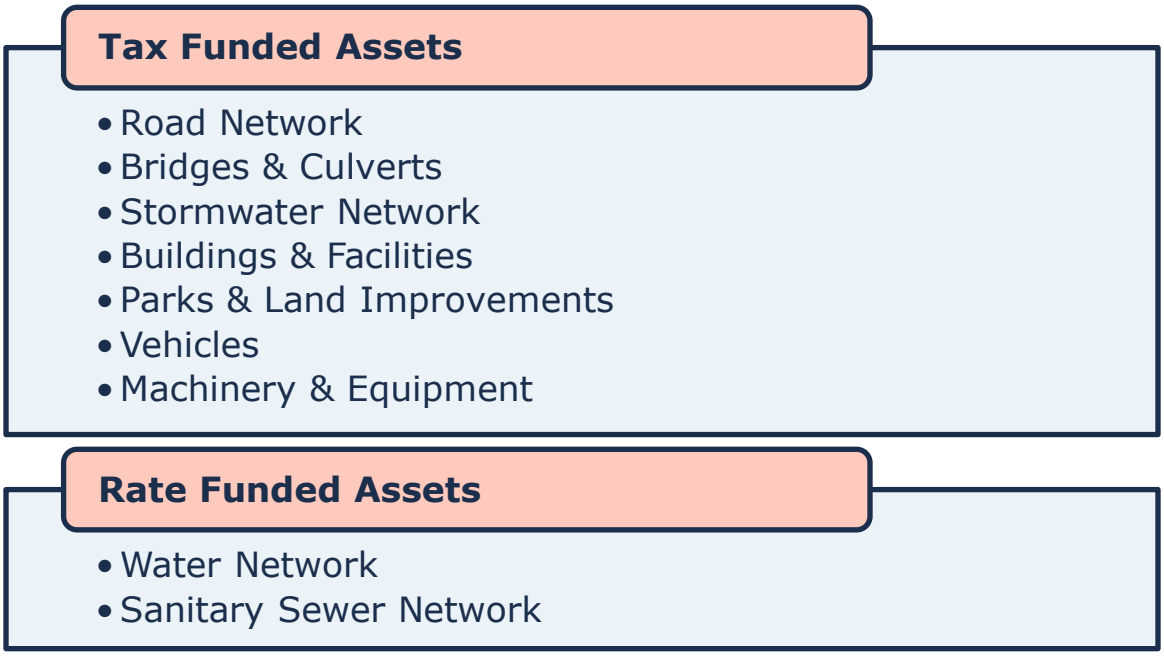


Figure 6 Tax Funded and Rate Funded Asset Categories

2.4.2 Data Effective Date

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

2.4.3 Deriving Replacement Costs

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

User-Defined Cost and Cost Per Unit

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

Cost Inflation / CPI Tables

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

User-defined costs based on reliable sources are a reasonably accurate and reliable way to determine asset replacement costs. Cost inflation is typically used in the absence of reliable replacement cost data. It is a reliable method for recently purchased and/or constructed assets where the total cost is reflective of the actual costs that the Township incurred. As assets age, and new products and technologies become available, cost inflation becomes a less reliable method.

2.4.4 Estimated Service Life & Service Life Remaining

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

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

Figure 7 Service Life Remaining Calculation

2.4.5 Reinvestment Rate

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

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

Figure 8 Target Reinvestment Rate Calculation

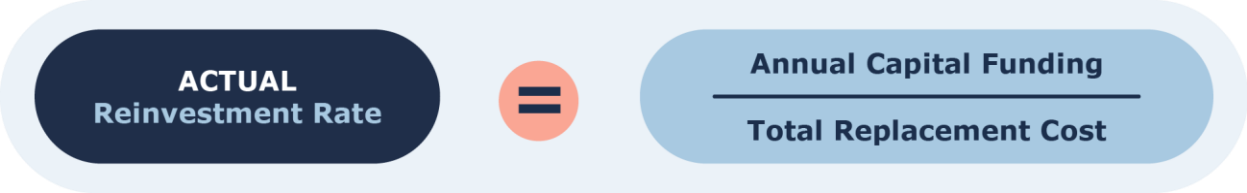


Figure 9 Actual Reinvestment Rate Calculation

2.4.6 Deriving Asset Condition

An incomplete or limited understanding of asset condition can mislead long-term planning and decision-making. Accurate and reliable condition data helps to prevent premature and costly rehabilitation or replacement and ensures that lifecycle activities occur at the right time to maximize asset value and useful life.

A condition assessment rating system provides a standardized descriptive framework that allows comparative benchmarking across the Township's asset portfolio. The table below outlines the condition rating system used in this AMP to determine asset condition. This rating system is aligned with the Canadian Core Public Infrastructure Survey which is used to develop the Canadian Infrastructure Report Card. When assessed condition data is not available, service life remaining is used to approximate asset condition.

Condition	Description	Criteria	Service Life Remaining (%)
Very Good	Fit for the future	Well maintained, good condition, new or recently rehabilitated	80-100
Good	Adequate for now	Acceptable, generally approaching mid-stage of expected service life	60-79
Fair	Requires attention	Signs of deterioration, some elements exhibit significant deficiencies	40-59
Poor	Increasing potential of affecting service	Approaching end of service life, condition below standard, large portion of system exhibits significant deterioration	20-39
Very Poor	Unfit for sustained service	Near or beyond expected service life, widespread signs of advanced deterioration, some assets may be unusable	0-19

Table 4 Standard Condition Rating Scale

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

2.5 Ontario Regulation 588/17

As part of the Infrastructure for Jobs and Prosperity Act, 2015, the Ontario government introduced Regulation 588/17 - Asset Management Planning for Municipal Infrastructure (O. Reg 588/17)[1]. Along with creating better performing organizations, more liveable and sustainable communities, the regulation is a key, mandated driver of asset management planning and reporting. It places substantial emphasis on current and proposed levels of service and the lifecycle costs incurred in delivering them.

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

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

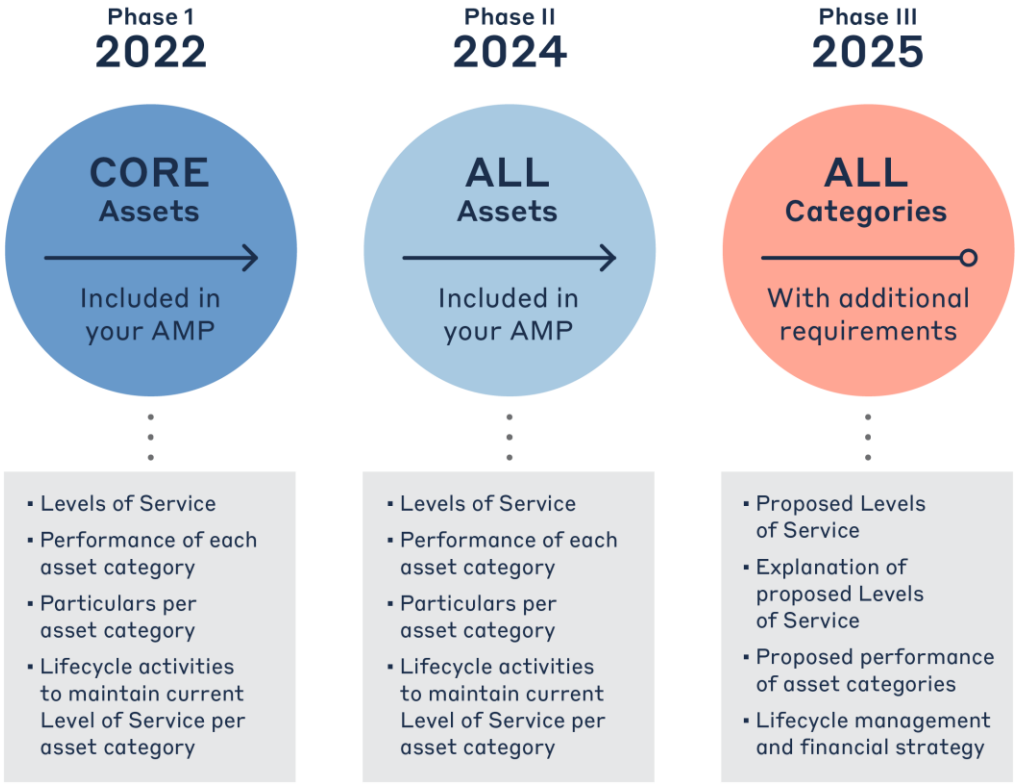


Figure 10 O. Reg. 588/17 Requirements and Reporting Deadlines

2.5.1 O. Reg. 588/17 Compliance Review

Requirement	O. Reg. 588/17 Section	AMP Section Reference	Status
Summary of assets in each category	S.5(2), 3(i)	4.1 – 12.1	Complete
Replacement cost of assets in each category	S.5(2), 3(ii)	4.1 – 12.1	Complete
Average age of assets in each category	S.5(2), 3(iii)	4.3 – 12.3	Complete
Condition of core assets in each category	S.5(2), 3(iv)	4.2 – 12.2	Complete
Description of municipality's approach to assessing the condition of assets in each category	S.5(2), 3(v)	4.4 – 12.4	Complete
Current levels of service in each category	S.5(2), 1(i-ii)	4.7 – 12.7	Complete

Current performance measures in each category	S.5(2), 2	4.7 – 12.7	Complete
Lifecycle activities needed to maintain current levels of service for 10 years	S.5(2), 4	4.4 – 12.4	Complete
Costs of providing lifecycle activities for 10 years	S.5(2), 4	Appendix B	Complete
Growth assumptions	S.5(2), 5(i-ii) S.5(2), 6(i-vi)	13.1 – 13.2	Complete

Table 5 O. Reg. 588/17 Compliance Review

3. Portfolio Overview – State of the Infrastructure

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

3.1 Asset Hierarchy & Data Classification

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

Figure 11 Asset Hierarchy and Data Classification

3.2 Portfolio Overview

3.2.1 Total Replacement Cost of Asset Portfolio

The nine asset categories analyzed in this Asset Management Plan have a total current replacement cost of $230 million. This estimate was calculated using user-defined costing, as well as inflation of historical or original costs to current date. This estimate reflects replacement of historical assets with similar, not necessarily identical, assets available for procurement today. Figure 12 illustrates the replacement cost of each asset category; combined at 53% of the total portfolio, the water and sanitary sewer networks comprise the largest share of the Township's asset portfolio, followed by the road network at 19%.

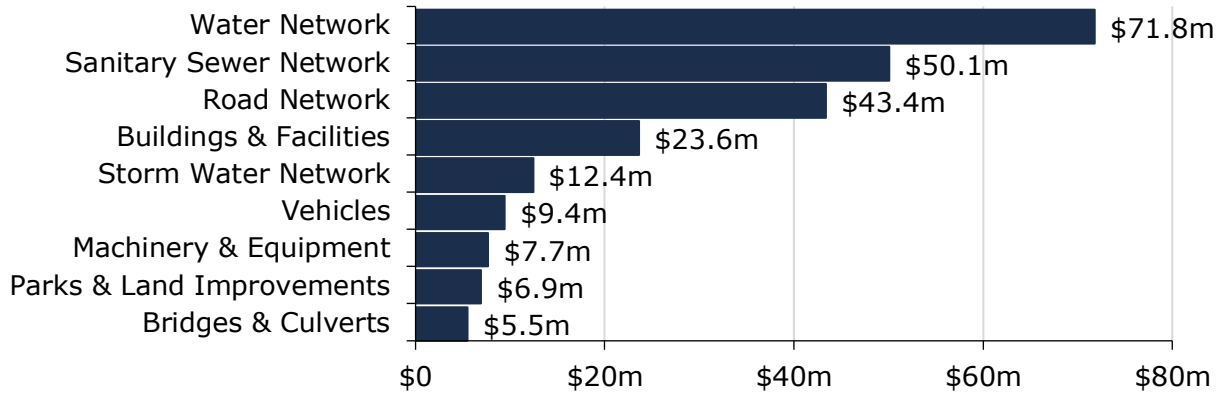


Figure 12 Current Replacement Cost by Asset Category

3.2.2 Target vs. Actual Reinvestment Rate

The graph below depicts funding gaps by comparing the target to the current reinvestment rate. To meet the existing long-term capital requirements, the Township requires an annual capital investment of $6.8 million, for a target portfolio reinvestment rate of 2.95%. Currently, annual investment from sustainable revenue source is $2.5 million, for a current portfolio reinvestment rate of 1.08%. Target and current re-investment rates by asset category are detailed below.

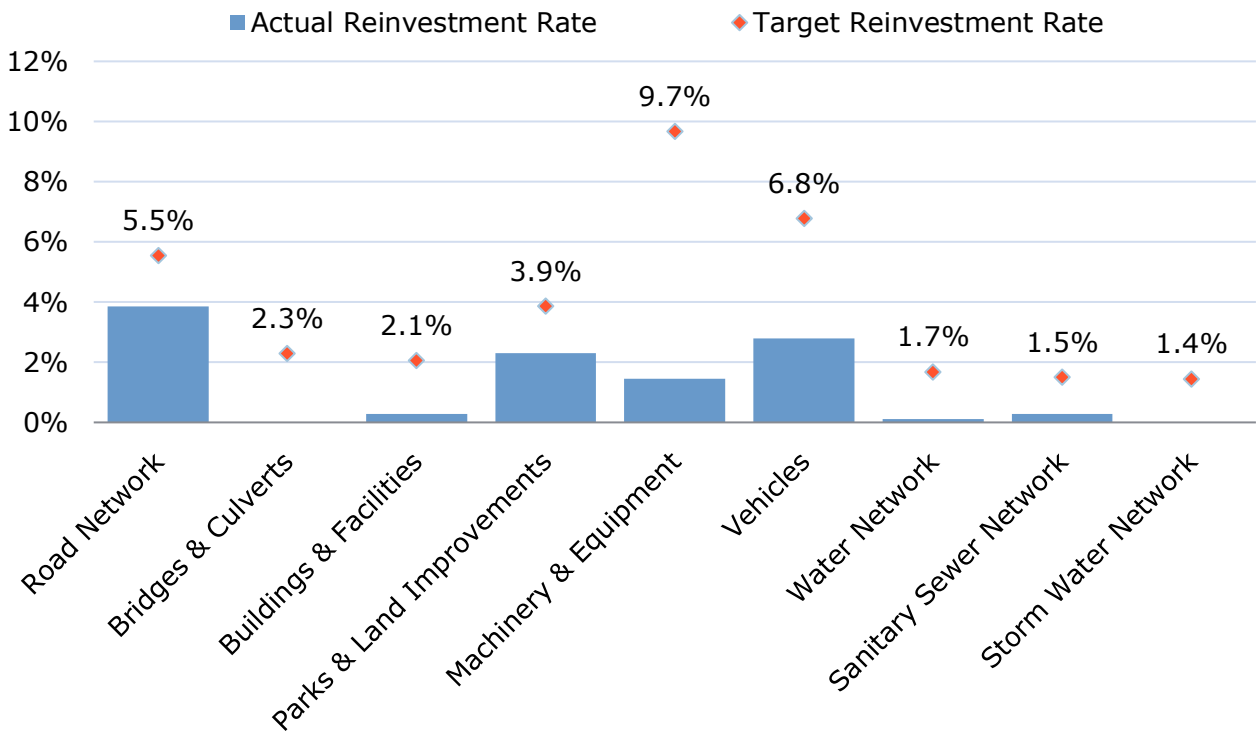


Figure 13 Current Vs. Target Reinvestment Rate

3.2.3 Condition of Asset Portfolio

Figure 14 and Figure 15 summarize asset condition at the portfolio and category levels, respectively. Based on both assessed condition and age-based analysis, 80% of the Township's infrastructure portfolio is in fair or better condition, with the remaining 20% in poor or worse condition. Typically, assets in poor or worse condition may require replacement or major rehabilitation in the immediate or short-term. Targeted condition assessments may help further refine the list of assets that may be candidates for immediate intervention, including potential replacement or reconstruction.

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

Condition data was available for majority of the road network and all bridges. Buildings, parks and land improvements, and approximately half of vehicles and equipment had staff estimated conditions provided. For all remaining assets, including major infrastructure such as storm, water, and sanitary mains, age was used as an approximation of condition for these assets. Age-based condition estimations can skew data and lead to potential under- or overstatement of asset needs.

Further, when assessed condition data was available, it was projected to current year (2023). This 'projected condition' can generate lower condition ratings than those established at the time of the condition assessment. The rate of this deterioration will also depend on lifecycle curves used to project condition over time.

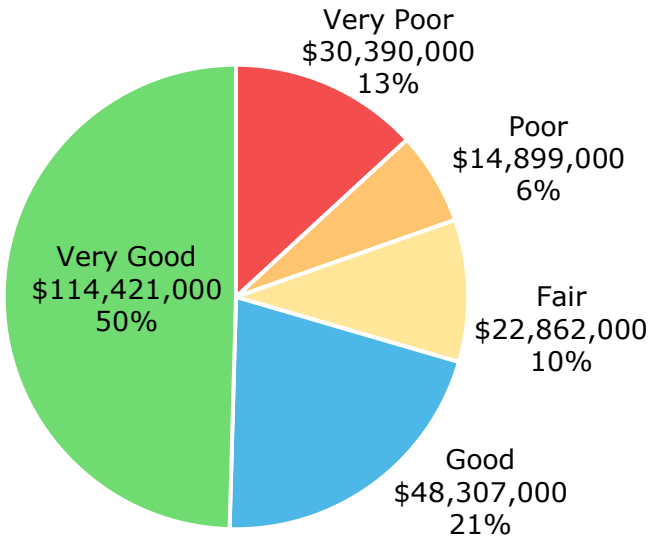


Figure 14 Asset Condition: Portfolio Overview

As further illustrated in Figure 15 at the category level, the majority of major, core infrastructure including roads, bridges, and structural culverts are in fair or better condition, based on in-field condition assessment data. Most vehicles and machinery are poor or worse condition, based on recent condition assessments.

See Table 6 for details on how condition data was derived for each asset segment.

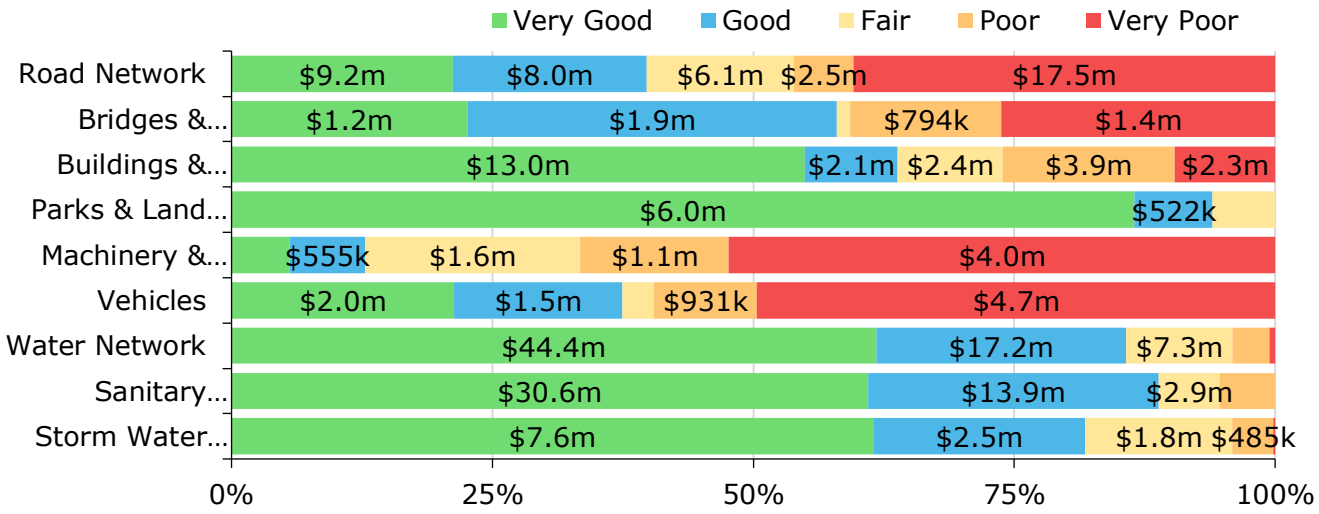


Figure 15 Asset Condition by Asset Category

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

Source of Condition Data

This AMP relies on assessed condition for 60% of assets, based on and weighted by replacement cost. For the remaining assets, age is used as an approximation of condition. Assessed condition data is invaluable in asset management planning as it reflects the true condition of the asset and its ability to perform its functions. 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	Hot Mix Roads Gravel Roads DST Roads	90%	2023 Road Needs Study Report
Bridges & Culverts	Bridges	100%	2023 OSIM Inspections
Water Network	Water Facilities	100%	2020 OCWA Inspection
Sanitary Sewer Network	Sanitary Facilities	100%	2020 OCWA Inspection
Stormwater Network	Mains	3%	2022 Morrison Hershfield Inspection
Buildings & Facilities	All	100%	Staff Assessments
Parks & Land Improvements	All	96%	Staff Assessments
Vehicles	All	49%	Staff Assessments
Machinery & Equipment	All	52%	Staff Assessments

Table 6 Source of Condition Data

3.2.4 Service Life Remaining

Based on asset age, available assessed condition data and estimated useful life, 19% of the Township's assets will require replacement within the next 10 years. More information can be found in Appendix B – 10-Year Capital Requirements. Buildings & Facilities assets were excluded from this analysis due to the nature of the assets. Building and Facilities have multiple components that have a very short service life. However, the buildings themselves are long-lasting.

3.2.5 Risk Analysis

Qualitative Risk

The qualitative risk assessment involves the documentation of risks to the delivery of services that the municipality faces given the current state of the infrastructure and asset management strategies. These risks can be understood as corporate level risks. Township staff provided information related to the following potential risks:

	Risk Type	Description
	Asset Data Confidence	As the Township's asset management program matures, the Township is gaining more confidence in their asset data. A lack of confidence in asset data can result in a lack of confidence in the results of the asset management plan, and subsequently result in uncertainty in funding requirements for the future.
	Lifecycle Management Strategies	In addition to asset level risk, the Township may also face risk associated with not executing key lifecycle activities, including repairs, rehabilitation, and replacement of critical assets. These include: - missed opportunities for cost savings and increases in lifecycle costs; - deferral of vital projects, or further lending and borrowing; - accelerated asset deterioration and premature failure, which may lead to public health and safety hazards, and disruption of services to the Township's residential and commercial base; - a decline in public satisfaction with the Township's service standards and the resulting reputational damage.
	Organizational Cognizance/Capacity	While the Township has confidence in their capacity to engage in asset management practices, on-going training is needed for staff to have the knowledge and capacity to engage in informed asset management practices moving into the future.
	Infrastructure Design/Installation	Concerns with the past design and/or materials used for some types of infrastructure may result in premature deterioration. Project should consider all future impacts during the design process.
	Aging Infrastructure	The Township's current state of infrastructure shows the majority of infrastructure in moderate stages of their estimated useful lives. Ongoing infrastructure replacement should aim to maintain these moderate levels and avoid significant portions of the infrastructure reaching the end of their useful lives at the same time.

	Risk Type	Description
	Climate Change & Extreme Weather Events	Climate and extreme weather events have an impact on infrastructure service life as well as functionality. Examples of these impacts include accelerated degradation of road surfaces due to increase freeze/thaw cycles, minimized capacity in storm systems due to increased intensity in rainfall events, and increased use of salt to combat winter storms resulting in degradation of vehicles and equipment.
	Growth	Community growth is expected to continue in the Township, consistent with the growth trend in the Province of Ontario. It is critical to consider growth when planning long-term infrastructure replacements to ensure infrastructure is not required to be replaced prematurely due to capacity issues.
	Infrastructure Reinvestment	Current levels of investment in infrastructure need to be looked at to ensure they are meeting lifecycle requirements and maintaining a good state of repair. Chronic underfunding of infrastructure replacement may lead to detrimental impacts in the future requiring significant changes to service levels.

Risk Matrix

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

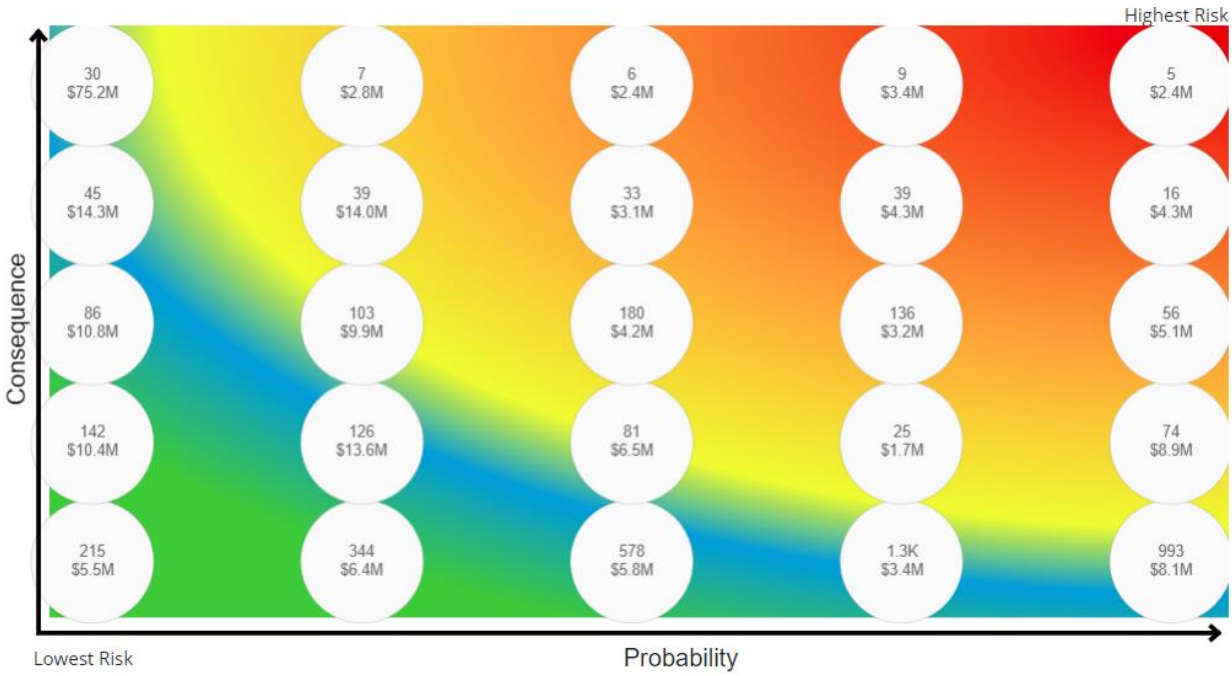


Figure 16 Risk Matrix: All Assets

The analysis shows that based on current risk models, approximately 8% of the Township's assets, with a current replacement cost of approximately $19 million, carry a risk rating of 15 or higher (red) out of 25. Assets in this group may have a high probability of failure based on available condition data and age-based estimates and were considered to be most essential to the Township.

As new asset attribute information and condition assessment data are integrated with the asset register, asset risk ratings will evolve, resulting in a redistribution of assets within the risk matrix. Staff should also continue to calibrate risk models.

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

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

3.2.6 Forecasted Capital Requirements

Aging assets require maintenance, rehabilitation, and replacement. Figure 17 below illustrates the cyclical short-, medium- and long-term infrastructure replacement requirements for all asset categories analyzed in this AMP over an 80-year time horizon. On average, $6.8 million is required each year to remain current with capital replacement needs for the Township's asset portfolio (red dotted line). Although actual spending may fluctuate substantially from year to year, this figure is a useful benchmark for annual capital expenditure targets (or allocations to reserves) to ensure projects are not deferred and replacement needs are met as they arise. This figure relies on age and available condition data.

The chart also illustrates a backlog of more than $8.2 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.

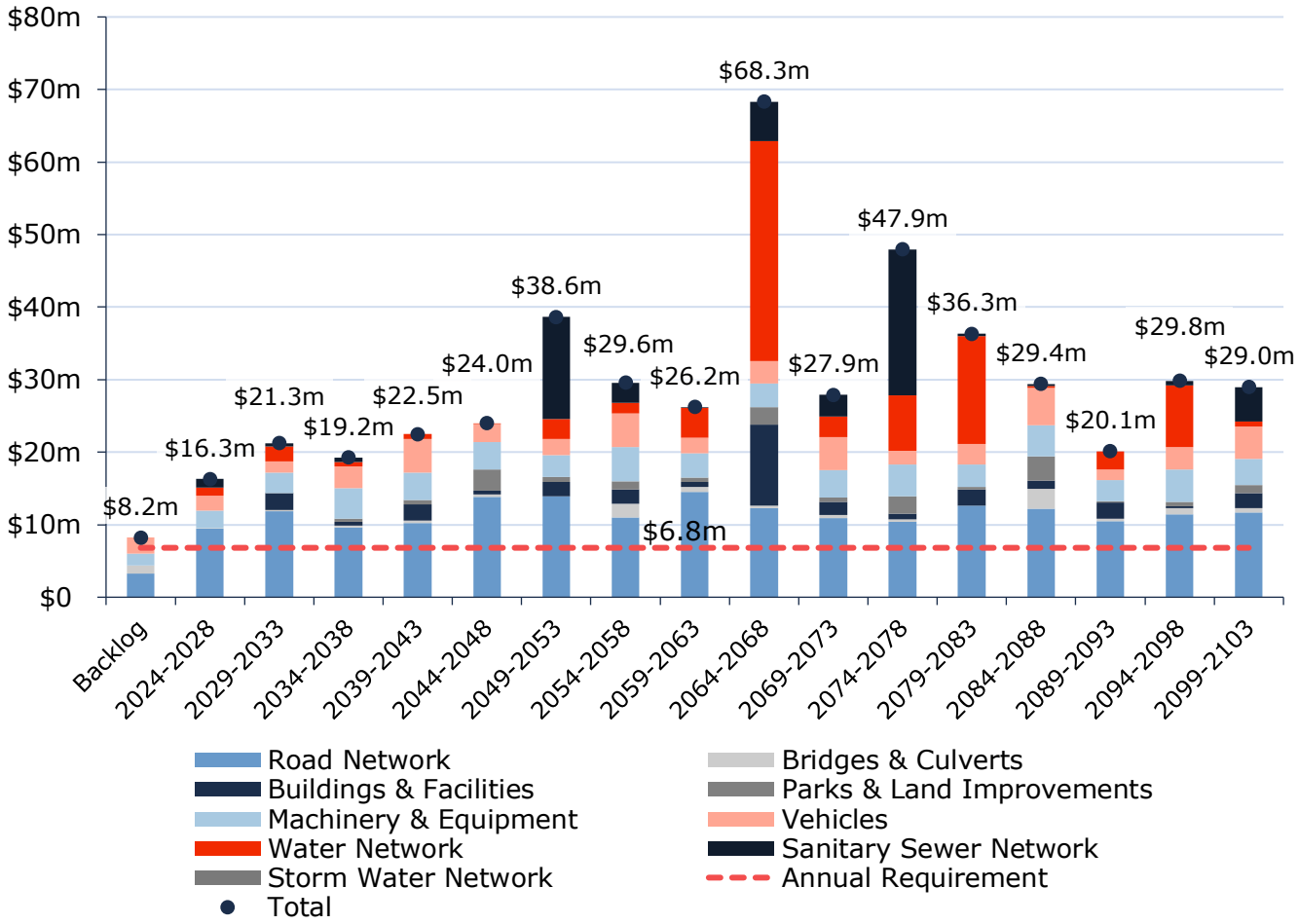


Figure 17 Capital Replacement Needs: Portfolio Overview 2024-2103

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.

Core Assets

Road Network

Bridges & Culverts

Water Network

Sanitary Sewer Network

Stormwater Network

4. Road Network

The Township's road network comprises a large proportion of its infrastructure portfolio, with a current replacement cost of more than $43 million, distributed primarily between paved and DST roads. The Township also owns and manages other supporting infrastructure and capital assets, including sidewalks, curbs, and streetlights.

4.1 Inventory & Valuation

Table 7 summarizes the quantity and current replacement cost of the Township's various road network assets as managed in its primary asset management register, Citywide.

Segment	Quantity	Unit of Measure	Replacement Cost	Primary RC Method
Curbs	9,837	Meters	$1,184,000	Cost/Unit
DST Roads	70,710	Meters	$10,607,000	Cost/Unit
Gravel Roads	103,091	Meters	$4,535,000	Cost/Unit
Hot Mix Roads	123,519	Meters	$21,900,000	Cost/Unit
Roadside Appurtenances	864	Assets	$856,000	CPI
Sidewalks	16,057	Meters	$2,409,000	Cost/Unit
Street Lights & Fixtures	806	Assets	$1,900,000	Cost/Unit
TOTAL			**$43,391,000**	

Table 7 Detailed Asset Inventory: Road Network

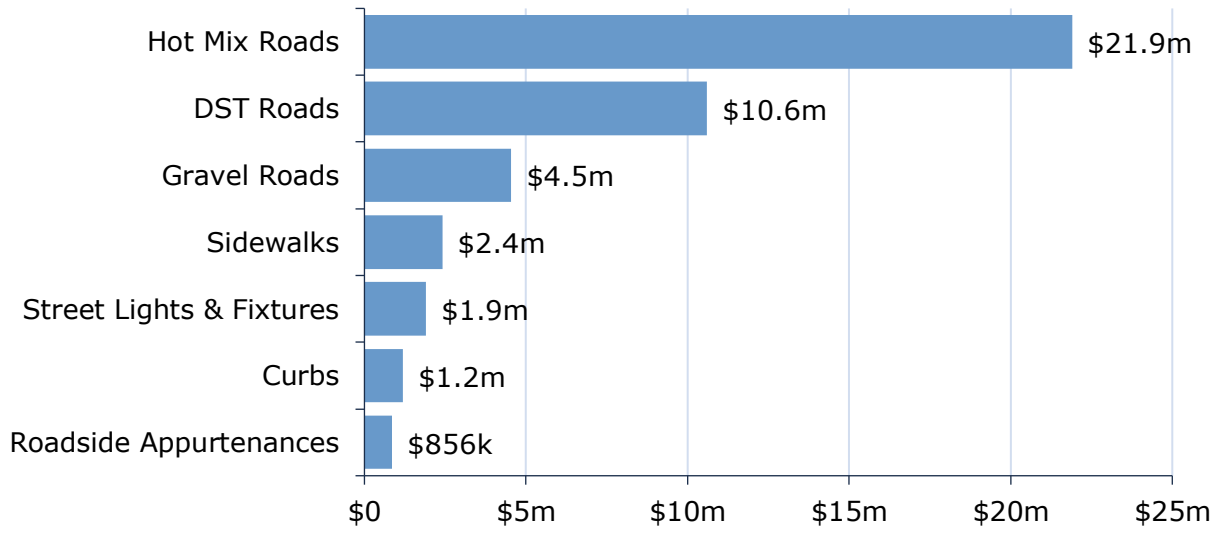


Figure 18 Portfolio Valuation: Road Network

4.2 Asset Condition

Figure 19 summarizes the replacement cost-weighted condition of the Township's road network. Based on a combination of field inspection data and age, 54% of assets are in fair or better condition; the remaining 46% of assets are in poor to very poor condition. Condition assessments were available for 90% of roads based on replacement cost. This condition data was projected from inspection date to current year to estimate their condition today. No condition data was available for the remaining asset types.

Assets in poor or worse condition may be candidates for replacement in the short term; similarly, assets in fair condition may require rehabilitation or replacement in the medium term and should be monitored for further degradation in condition. As illustrated in Figure 19, the majority of the Township's road network assets are in fair or better condition.

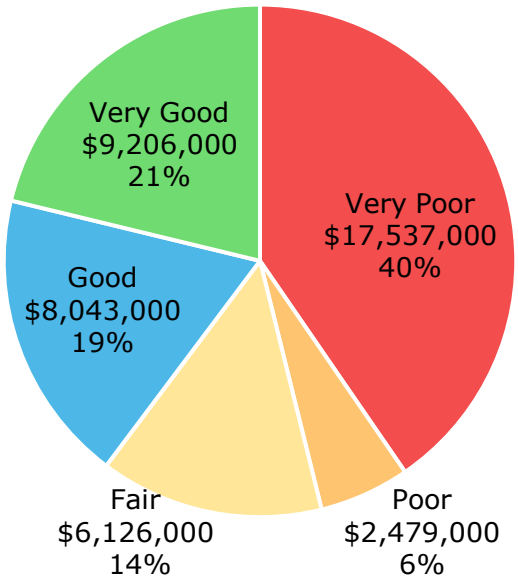


Figure 19 Asset Condition: Road Network Overall

As illustrated in Figure 20, based on condition assessments, the majority of the Township's hot mix roads are in fair or better condition; however, 89% of gravel roads and 76% of DST roads are in poor or worse condition.

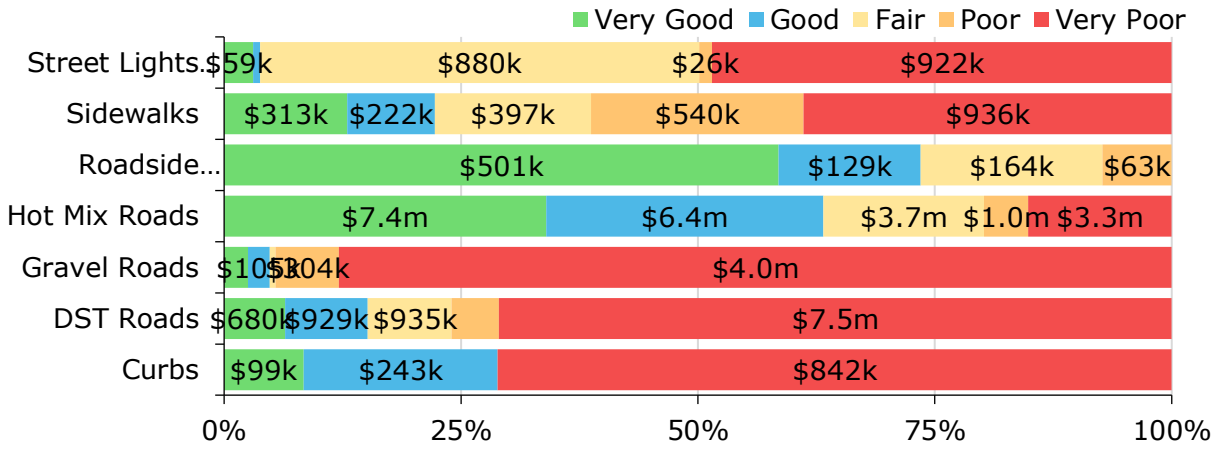


Figure 20 Asset Condition: Road Network by Segment

4.3 Age Profile

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

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

Figure 21 illustrates the average current age of each asset type and its estimated useful life. Both values are weighted by the replacement cost of individual assets.

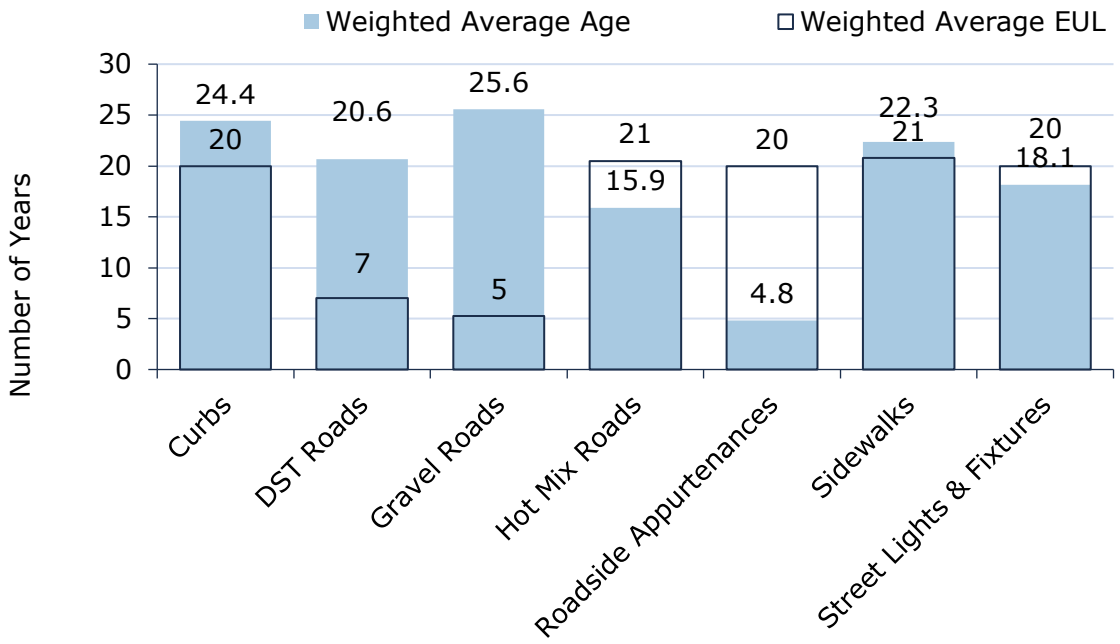


Figure 21 Estimated Useful Life vs. Asset Age: Road Network

Age analysis shows that the majority of paved roads are in moderate stages of their expected useful life, with an average age of 15.9 years against a design life of 33 years. DST roads, gravel roads, and curbs continue to remain in service well beyond their expected useful life, however, gravel roads can be maintained on a perpetual cycle through the operational maintenance budget with a regular roadway granular replacement program.

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

4.4 Current Approach to Lifecycle Management

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

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

Activity Type	Description of Current Strategy
Maintenance	Pothole repairs are completed annually based on deficiencies identified through regular road patrols and feedback from the public.
	Seasonal maintenance activities include asphalt patching, graveling, and tree cutting.

Activity Type	Description of Current Strategy
	Summer maintenance activities include sidewalk repairs, grading, re-gravelling, dust control, ditching, roadside mowing, tree trimming, brush cleanup, road sign installation/maintenance, and line painting.
	Winter maintenance activities include snow plowing, slating, and snow removal.
Rehabilitation	Rehabilitation activities include: pulverize & pave, asphalt overlay, and surface treatments.
Replacement	DST roads are replaced and upgraded to Hot Mix roads.
	Road replacement prioritization is determined by consideration of growth, risk, condition, health and safety, and social impact.
	Road reconstruction projects (that include road base & surface components) are identified based on road condition, risk, and sub-surface asset requirements (water/sanitary/storm water).
Inspection	The most recent Roads Needs Study was prepared in 2023 by LRL Associates Ltd. Road inspections/assessments are conducted annually by internal staff and, generally, a Road Needs Study is conducted by an external consultant every 5 years.
	Supporting infrastructures such as sidewalks and streetlights are assessed approximately every 5 years.

Table 8 Lifecycle Management Strategy: Road Network

The following lifecycle strategies have been developed to formalize the current approach to manage the lifecycle of Hot Mix and Double Surface Treated (DST) 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.

Hot Mix Roads		
Event Name	**Event Class**	**Event Trigger**
Pulverize & Pave	Rehabilitation	Age: 15 Years
Full Reconstruction	Replacement	Condition: 30 - 35

Table 9 Lifecycle Strategy: Hot Mix Roads

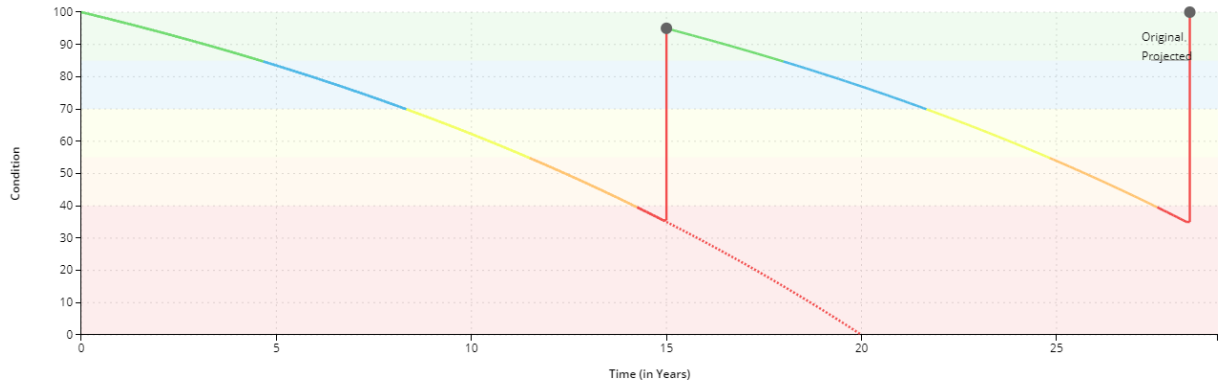


Figure 22 Lifecycle Strategy: Hot Mix Roads

DST Roads		
Event Name	**Event Class**	**Event Trigger**
Double Surface Treatment	Rehabilitation	Every 5 Years
Full Reconstruction and Asset Upgrade	Replacement	Condition: 20[2]

Table 10 Lifecycle Strategy: DST Roads

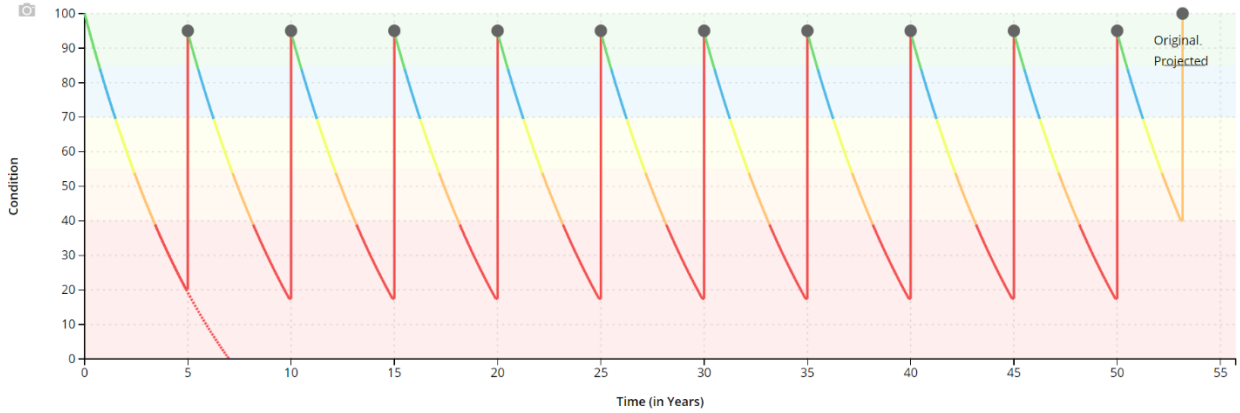


Figure 23 Lifecycle Strategy: DST Roads

4.5 Forecasted Long-Term Replacement Needs

Figure 24 illustrates the cyclical short-, medium- and long-term infrastructure rehabilitation and replacement requirements for the Township's road network. This analysis was run until 2078 to capture at least one iteration of replacement for the longest-lived asset in Citywide Assets, the Township's primary asset management system and asset register. Alfred and Plantagenet's average annual requirements (red dotted line) total $2.1 million for all assets in the road network. Although actual spending may fluctuate substantially from year to year, this figure is a useful benchmark value for annual capital expenditure targets (or

[2] The DST road type is considered to be in a state of perpetual maintenance, until the road asset is considered to be a suitable candidate for a road surface upgrade or the subsurface utilities infrastructure requires attention.

allocations to reserves) to ensure projects are not deferred and replacement needs are met as they arise.

The chart illustrates substantial capital needs through the forecast period. It also shows a backlog $3.3 million, generally equally contributed to by streetlights, sidewalks, gravel roads, and curbs. These projections are based on asset replacement costs, age analysis, and condition data when available, as well as lifecycle modeling (roads only). They are designed to provide a long-term, portfolio-level overview of capital needs and should be used to support improved financial planning over several decades.

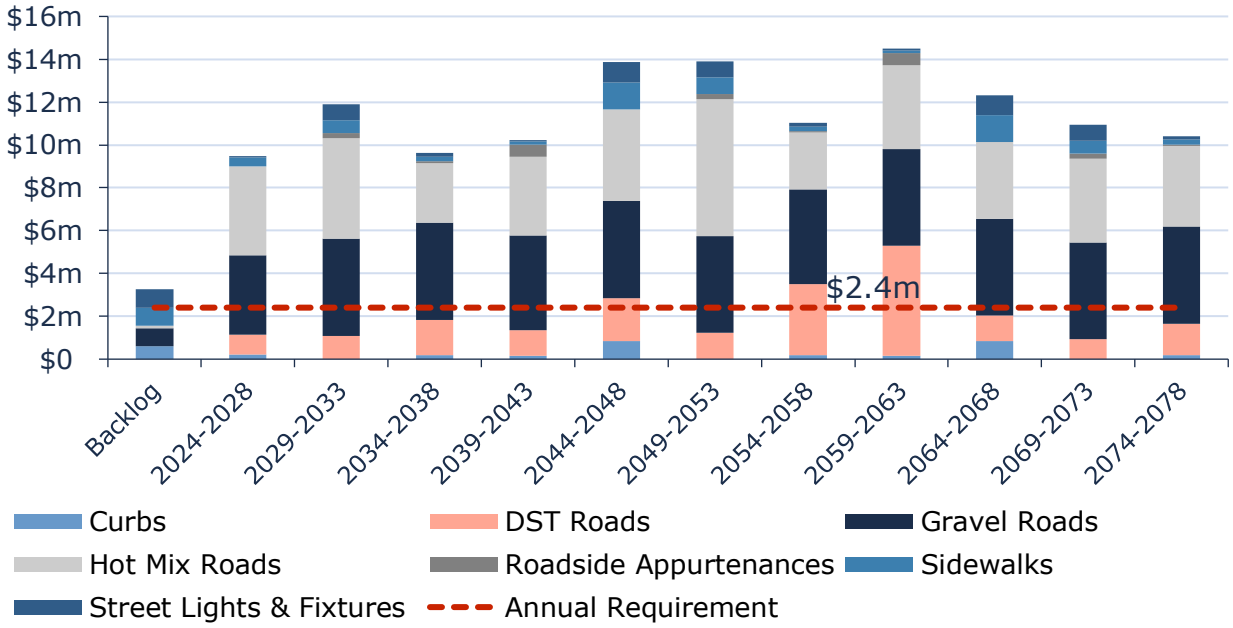


Figure 24 Forecasted Capital Replacement Needs: Road Network 2024-2078

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

Tables summarizing the projected lifecycle activities (rehabilitation and replacements) that may be undertaken in the next 10 years to support current levels of service can be found in Appendix B – 10-Year Capital Requirements.

4.6 Risk Analysis

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

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

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

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

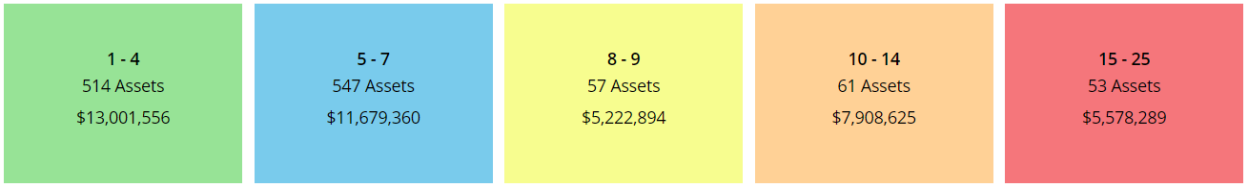


Figure 25 Risk Matrix: Road Network

4.7 Levels of Service

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

4.7.1 Community Levels of Service

Service Attribute	Qualitative Description	Current LOS (2023)
Scope	Description, which may include maps, of the road network in the municipality and its level of connectivity	An approximately 300 km road network spanning over 392 km² of area. Surface material ranging from earth, sand, gravel, double surface treatment to hot mix asphalt. The system mostly consists of local roads with an MMS class of 5 or 6. Arterial roads are mostly owned and operated by the United Counties of Prescott and Russell.
Quality	Description or images that illustrate the different levels of road class pavement condition	See Appendix C – Level of Service Images

Table 11 O. Reg. 588/17 Community Levels of Service: Road Network

4.7.2 Technical Levels of Service

Service Attribute	Technical Metric	Current LOS (2023)
Scope	Lane-km of arterial roads (MMS classes 1 and 2) per land area (km/km^2)	0 km/km^2
	Lane-km of collector roads (MMS classes 3 and 4) per land area (km/km^2)[3]	0.22 km/km^2
	Lane-km of local roads (MMS classes 5 and 6) per land area (km/km^2)[3]	1.30 km/km^2
Quality	Average pavement condition index for paved roads in the Township	Hot Mix Roads: 71%
		DST Roads: 27%
	Average surface condition for unpaved roads in the Township (e.g. excellent, good, fair, poor)	Poor
Performance	Capital reinvestment rate	3.9%
	O&M $/km for unpaved (loose top) roads	$1,940/km

Table 12 O. Reg. 588/17 Technical Levels of Service: Road Network

[3] All roads are assumed to have 2 lanes.

5. Bridges & Culverts

The Township's transportation network also includes bridges and structural culverts, with a current replacement cost of $5 million. Bridges and culverts represent a critical portion of the transportation services provided to the community. The Township is responsible for the maintenance of all bridges and structural culverts (≥3m in span) located across municipal roads with the goal of keeping structures in an adequate state of repair and minimizing service disruptions.

5.1 Inventory & Valuation

Table 13 summarizes the quantity and current replacement cost of bridges and culverts. The Township owns and manages five bridges (one of which is closed and excluded from this AMP) and 24 structural culverts.

Segment	Quantity	Unit of Measure	Replacement Cost	Primary RC Method
Bridges	8	Assets (Components)	$2,908,000	CPI
Structural Culverts	24	Assets	$2,584,000	CPI
TOTAL			**$5,491,000**	

Table 13 Detailed Asset Inventory: Bridges & Culverts

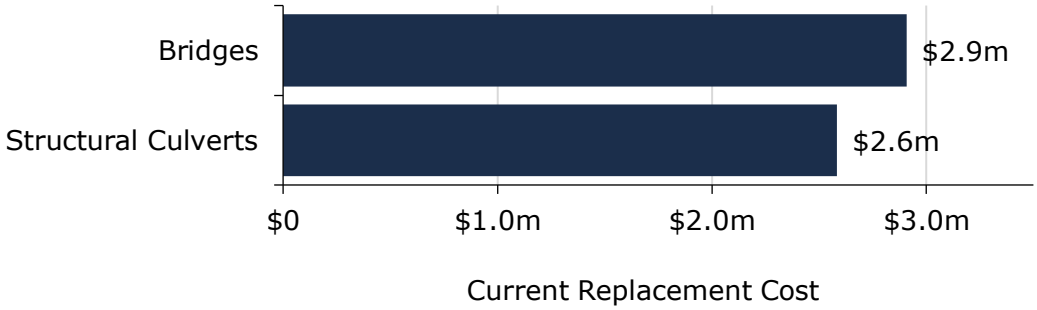


Figure 26 Portfolio Valuation: Bridges & Culverts

5.2 Asset Condition

Figure 27 summarizes the replacement cost-weighted condition of the Township's bridges and culverts. Based on the Township's recent Ontario Structures Inspection Manual (OSIM) assessments, 59% of bridges and culverts are in fair or better condition. Some elements or components of these structures may be candidates for replacement or rehabilitation in the medium term and should be monitored for further degradation in condition. At 41% of the total bridges and culverts portfolio, assets in poor or worse condition may require replacement in the immediate or short term.

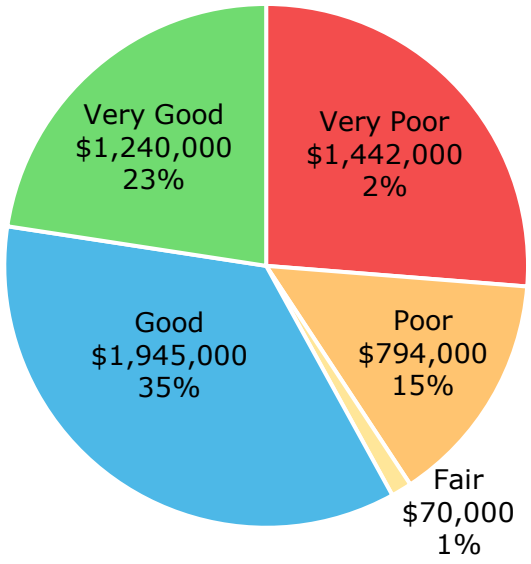


Figure 27 Asset Condition: Bridges & Culverts Overall

As further detailed in Figure 28, based on in-field condition assessments, $794k of bridge assets were assessed as being in poor condition. Similarly, 56% of structural culverts, with a current replacement cost of $1.4 million were identified as poor or worse. Bridges and structures with a poor or worse rating (i.e., a bridge condition index of less than 55) are not necessarily unsafe for regular use. The OSIM ratings are designed to identify repairs needed to elevate condition ratings to a fair or higher.

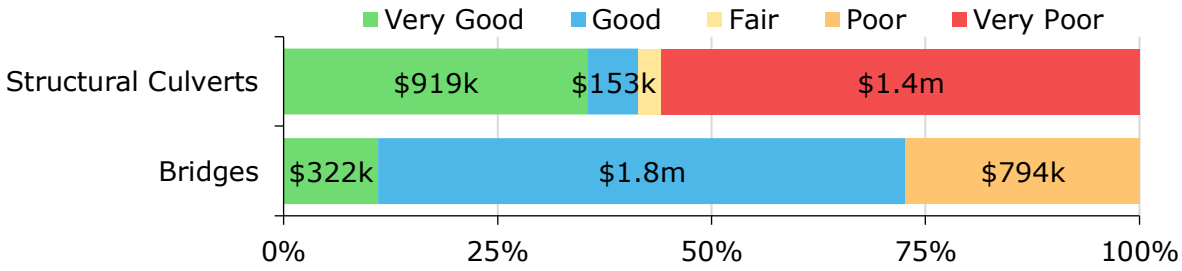


Figure 28 Asset Condition: Bridges & Culverts by Segment

5.3 Age Profile

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

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

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

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

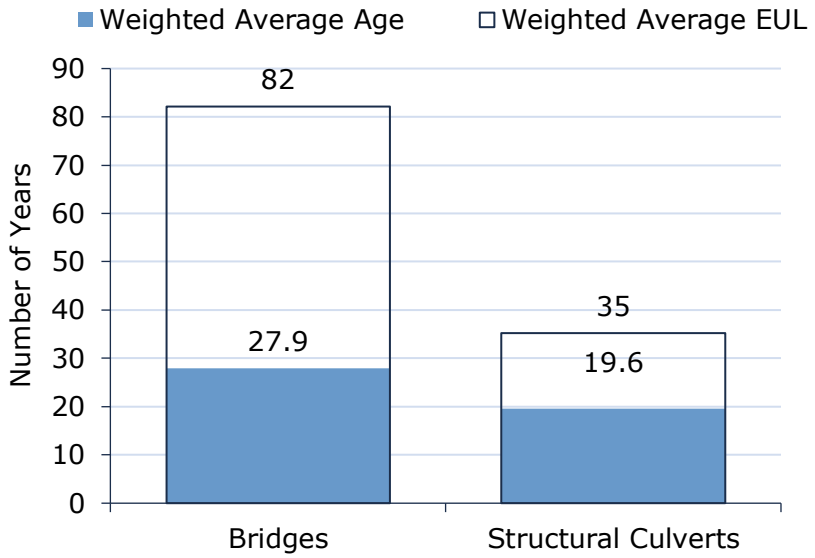


Figure 29 Estimated Useful Life vs. Asset Age: Bridges & Culverts

Age analysis reveals that on average, bridges early to moderate stages of their estimated useful life, with an average age of 27.9 years against an average EUL of 82 years. On average, culverts are also in moderate stages of their lifecycle, with an average age of 19.6 years, against an average EUL of 35 years. OSIM assessments should continue to be used in conjunction with age and asset criticality to prioritize capital and maintenance expenditures.

5.4 Current Approach to Lifecycle Management

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

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

Activity Type	Description of Current Strategy
Maintenance	Typical maintenance includes: • Obstruction removal • Cleaning/sweeping • Erosion control • Brush/tree removal

Activity Type	Description of Current Strategy
	Biennial OSIM inspection reports include a list of recommended maintenance activities that the Township considers and completes according to cost and urgency.
Rehabilitation / Replacement	Biennial OSIM inspection reports include a Capital Needs List identifying recommended rehabilitation and replacement activities with estimated costs.
Inspection	The most recent Bridge and Culvert inspection reports were prepared in 2021 and 2023 by LRL Associates Ltd.

Table 14 Lifecycle Management Strategy: Bridges & Culverts

5.5 Forecasted Long-Term Replacement Needs

Figure 30 illustrates the cyclical short-, medium- and long-term infrastructure rehabilitation and replacement requirements for the Township's bridges and culverts. This analysis was run until 2093 to capture at least one iteration of replacement for the longest-lived asset in Citywide Assets, the Township's primary asset management system and asset register. The Township's average annual requirements (red dotted line) for bridges and culverts total $126,000. Although actual spending may fluctuate substantially from year to year, this figure is a useful benchmark value for annual capital expenditure targets (or allocations to reserves) to ensure projects are not deferred and replacement needs are met as they arise.

Although no major replacement spikes are anticipated for the next 30 years, capital needs will starkly rise between 2054 and 2058 with a peak at $1.8 million as assets reach the end of their useful life. These projections and estimates are based on asset replacement costs, age analysis, and condition data. They are designed to provide a long-term, portfolio-level overview of capital needs and should be used to support improved financial planning over several decades.

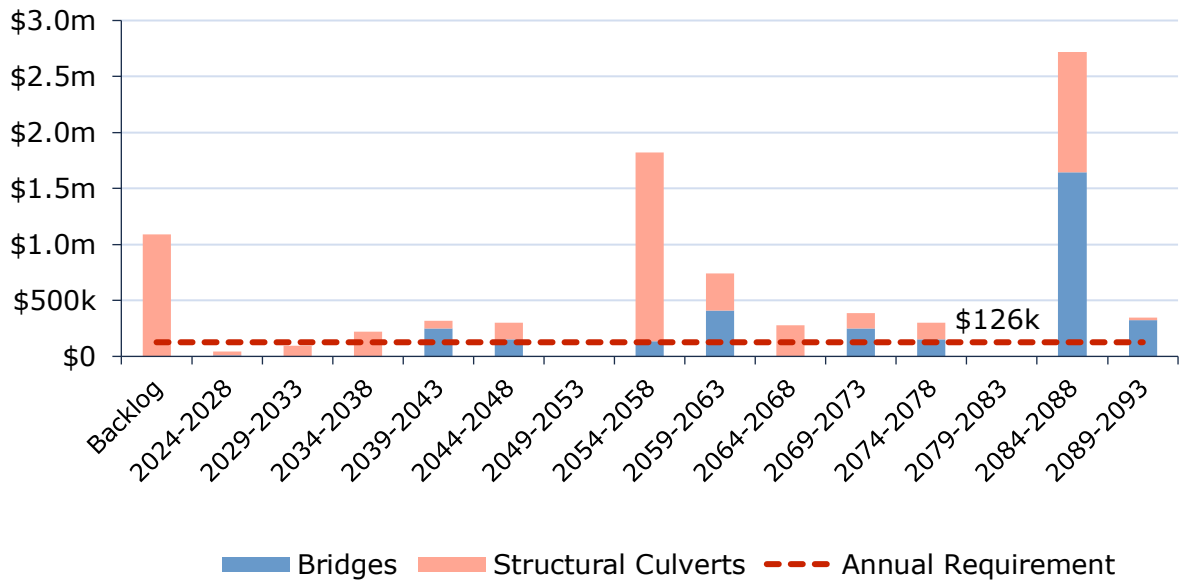


Figure 30 Forecasted Capital Replacement Needs: Bridges & Culverts 2024-2093

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

Tables summarizing the projected lifecycle activities (rehabilitation and replacements) that may be undertaken in the next 10 years to support current levels of service can be found in Appendix B – 10-Year Capital Requirements.

5.6 Risk Analysis

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

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

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

Figure 31 Risk Matrix: Bridges & Culverts

5.7 Levels of Service

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

5.7.1 Community Levels of Service

Service Attribute	Qualitative Description	Current LOS (2023)
Scope	Description of the traffic that is supported by municipal bridges (e.g., heavy transport vehicles, motor vehicles, emergency vehicles, pedestrians, cyclists)	The traffic on bridges and structural culverts is generally light as these are local roads. However, some heavy vehicle traffic, such as agricultural and transport, is common.
Quality	Description or images of the condition of bridges & culverts and how this would affect use of the bridges & culverts	See Appendix C – Level of Service Images

Table 15 O. Reg. 588/17 Community Levels of Service: Bridges & Culverts

5.7.2 Technical Levels of Service

Service Attribute	Technical Metric	Current LOS (2023)
Scope	% of bridges in the Township with loading or dimensional restrictions	0%
Quality	Average bridge condition index value for bridges in the Township	76%[4]
	Average bridge condition index value for structural culverts in the Township	N/A[5]
Performance	Capital reinvestment rate	0.0%

Table 16 O. Reg. 588/17 Technical Levels of Service: Bridges & Culverts

[4] Alfred-Plantagenet has 4 bridges, 1 is closed. This condition score excludes the closed bridge.
[5] Culverts have not been assessed and have projected condition based on age.

6. Water Network

The Township's water network includes water mains, hydrants, and treatment facilities, with a current replacement cost of almost $72 million. Potable water represents a critical portion of the services provided to the community.

6.1 Inventory & Valuation

Table 17 summarizes the quantity and current replacement cost of the Township's various water network assets as managed in its primary asset management register, Citywide.

Segment	Quantity	Unit of Measure	Replacement Cost	Primary RC Method
Hydrants	228	Assets	$2,946,000	CPI
Mains	61,463	Meters	$30,283,000	CPI
Meters	1,928	Assets	$1,513,000	CPI
Water Equipment	5	Assets	$247,000	CPI
Water Facilities	10	Assets	$36,798,000	CPI
TOTAL			**$71,787,000**	

Table 17 Detailed Asset Inventory: Water Network

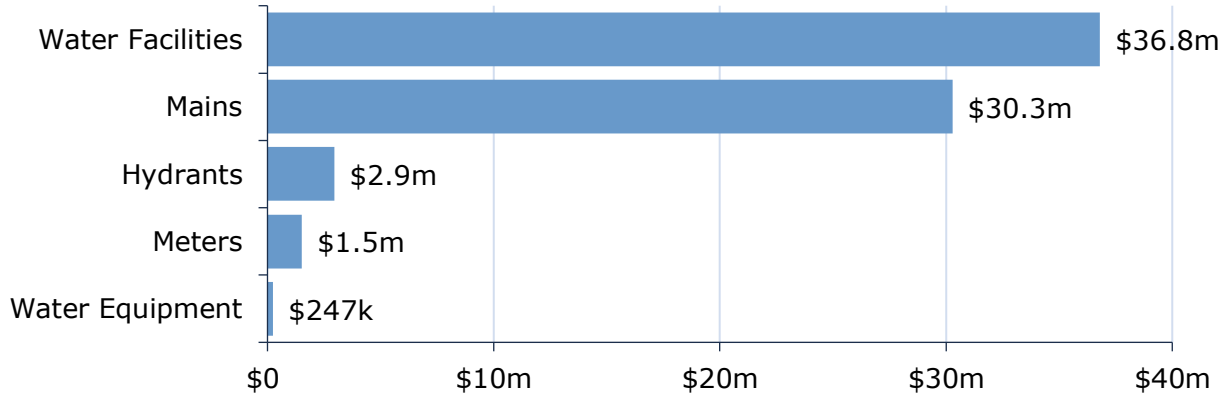


Figure 32 Portfolio Valuation: Water Network

6.2 Asset Condition

Figure 33 summarizes the replacement cost-weighted condition of the Township's water network. Based on a combination of field inspection data and age, 96% of assets are in fair or better condition; the remaining 4% of assets are in poor to very poor condition. Condition assessments were available for 100% of water facilities, but no assessments were available for the other segments included in the water network. This condition data was projected from inspection date to current year to estimate their condition today.

Assets in poor or worse condition may be candidates for replacement in the short term; similarly, assets in fair condition may require rehabilitation or replacement in the medium term and should be monitored for further degradation in condition. As illustrated in Figure 33, the majority of the Township's water network assets are in fair or better condition.

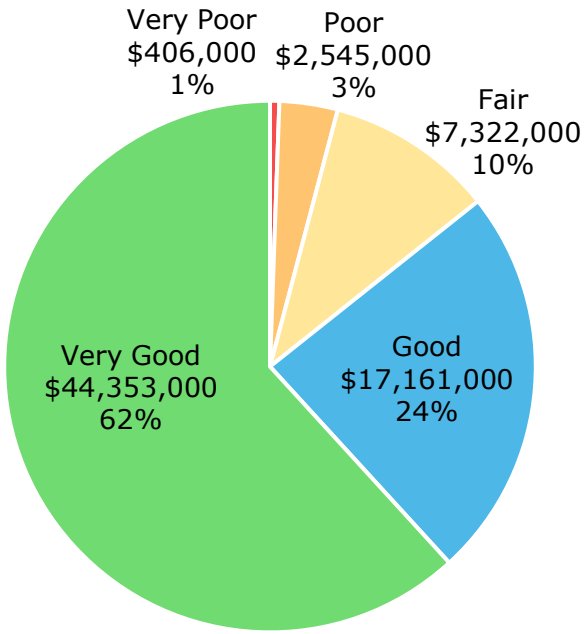


Figure 33 Asset Condition: Water Network Overall

As illustrated in Figure 34, based on condition assessments and age-based conditions, the majority of the Township's water mains and water facilities are in good to very good condition; however, 74% of water meters and 71% of water equipment are in poor or worse condition.

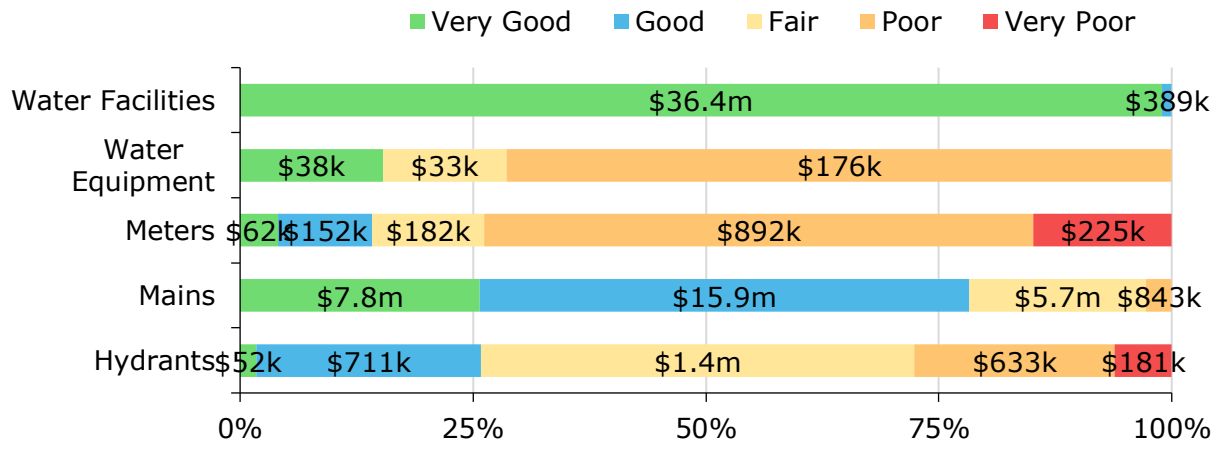


Figure 34 Asset Condition: Water Network by Segment

6.3 Age Profile

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

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

Figure 35 illustrates the average current age of each asset type and its estimated useful life. Both values are weighted by the replacement cost of individual assets.

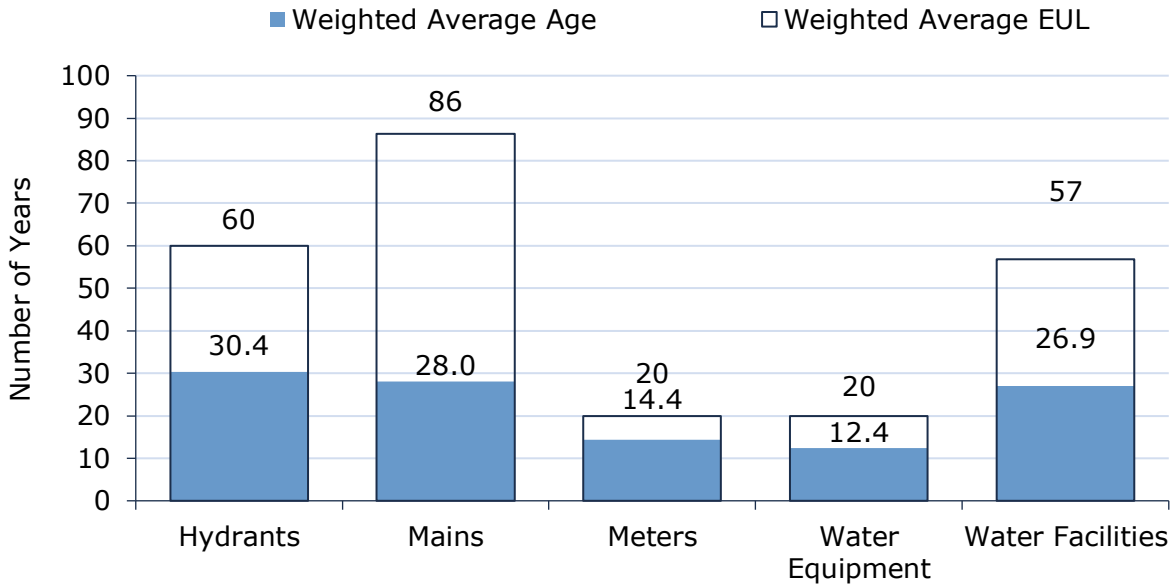


Figure 35 Estimated Useful Life vs. Asset Age: Water Network

Age analysis reveals that on average, water network assets still have over half of their life expectancy remaining. Age profiles and condition assessments will help to identify mains in need of replacements and/or upgrades. Extensions to EULs for mains may also be considered based on performance history to date.

6.4 Current Approach to Lifecycle Management

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

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

Activity Type	Description of Current Strategy
Maintenance	Water main breaks are managed and remediated when they occur. Staff may assist OCWA on site
	Valves undergo annual maintenance as part of preventative maintenance
	Periodic pressure testing to identify deficiencies and potential leaks
	Mains are flushed once per year on the entire network
Rehabilitation/ Replacement	Multi-year forecasts provided by OCWA and further reviewed by Staff
	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
	Other replacement activities are identified based on an analysis of the main break rate, asset functionality and design capacity as well as any issues identified during regular maintenance activities
	When mains are replaced, PVC pipe material is used
	Similar to other sub-surface infrastructure, Staff attempt to coordinate water reconstruction projects with road reconstruction project to produce cost efficiencies

Table 18 Lifecycle Management Strategy: Water Network

The following lifecycle strategy has been documented to formalize the current strategy used to manage the lifecycle of water mains.

Water Mains		
Event Name	**Event Class**	**Event Trigger**
Valve Maintenance	Maintenance	Annually
Water Main Flushing	Maintenance	Annually
Full Reconstruction	Replacement	Condition: 20

Table 19 Lifecycle Strategy: Water Mains

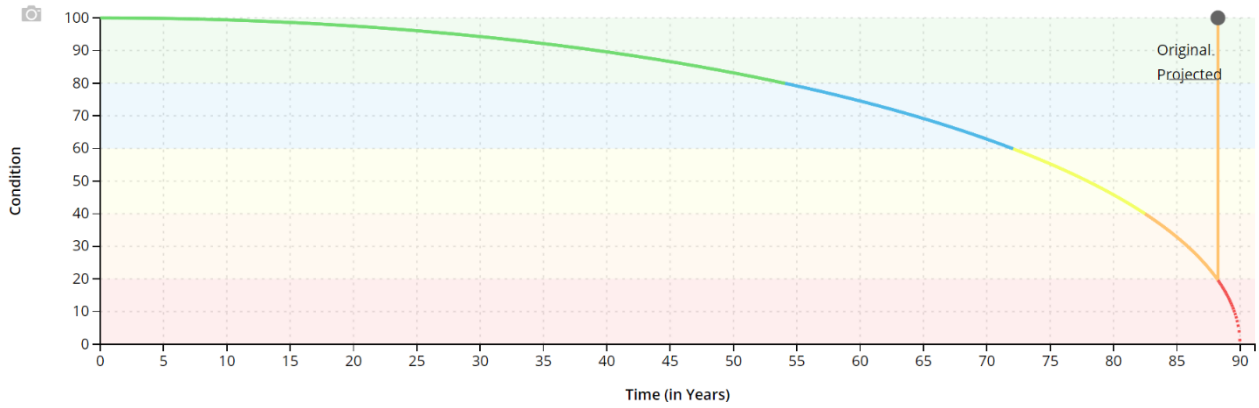


Figure 36 Lifecycle Strategy: Water Mains

6.5 Forecasted Long-Term Replacement Needs

Figure 37 illustrates the cyclical short-, medium- and long-term infrastructure rehabilitation and replacement requirements for the Township's water network. This analysis was run until 2098 to capture at least one iteration of replacement for the longest-lived asset in Citywide Assets, the Township's primary asset management system and asset register. The Township's average annual requirements (red dotted line) total $1.2 million for all assets in the water network. Although actual spending may fluctuate substantially from year to year, this figure is a useful benchmark value for annual capital expenditure targets (or allocations to reserves) to ensure projects are not deferred and replacement needs are met as they arise.

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

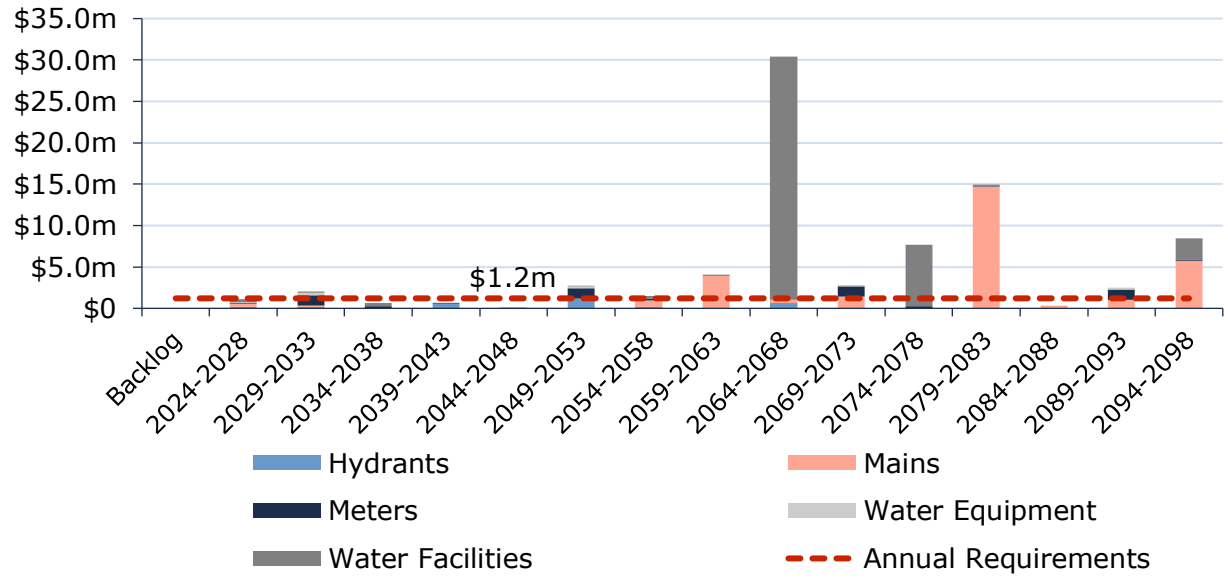


Figure 37 Forecasted Capital Replacement Needs: Water Network 2024-2098

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

Tables summarizing the projected lifecycle activities (rehabilitation and replacements) that may be undertaken in the next 10 years to support current levels of service can be found in Appendix B – 10-Year Capital Requirements.

6.6 Risk Analysis

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

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

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

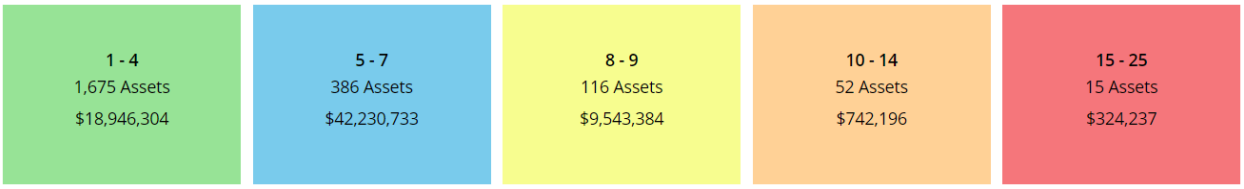


Figure 38 Risk Matrix: Water Network

6.7 Levels of Service

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

6.7.1 Community Levels of Service

Service Attribute	Qualitative Description	Current LOS (2023)
Scope	Description, which may include maps, of the user groups or areas of the municipality that are connected to the municipal water system	Two distinct water systems; Wendover and Lefaivre/Alfred/Plantagenet/St-Isidore. Water in Wendover is sourced from the Ottawa River, pumped and treated at the Township owned treatment plant, stored in an above ground storage tank and distributed within the Village limits via water mains. The Lefaivre system is sourced from the Ottawa River, treated in Lefaivre and pumped to Alfred and Plantagenet. There is an above ground water tank in Alfred. A booster station is located in Plantagenet to feed St-Isidore which is part of a neighbouring Municipality. Water is distributed within the Villages via watermain.
	Description, which may include maps, of the user groups or areas of the municipality that have fire flow	Both systems have hydrants and fire fighting capabilities. Some system ends have been extended with smaller size pipes which do not provide fire fighting capacities.
Reliability	Description of boil water advisories and service interruptions	No instances of boil water advisories have been mentioned in the annual reports dating back to 2016. On occasion, water service interruptions may occur due to unexpected main breaks, maintenance activities, or water infrastructure replacement. Staff make every effort to keep service interruptions to a minimum.

Table 20 O. Reg. 588/17 Community Levels of Service: Water Network

6.7.2 Technical Levels of Service

Service Attribute	Technical Metric	Current LOS (2023)
Scope	% of properties connected to the municipal water system	41%[6]
	% of properties where fire flow is available	36%
Reliability	# of connection-days per year where a boil water advisory notice is in place compared to the total number of properties connected to the municipal water system	0

[6] 2,305 water accounts vs. 5,573 active roll properties.

Service Attribute	Technical Metric	Current LOS (2023)
	# of connection-days per year where water is not available due to water main breaks compared to the total number of properties connected to the municipal water system	0.0001
Performance	Capital reinvestment rate	0.1%

Table 21 O. Reg. 588/17 Technical Levels of Service: Water Network

7. Sanitary Sewer Network

The sanitary sewer network provides the essential service of wastewater collection, disposal, and treatment for the community, and has a current replacement value of over $50 million.

7.1 Inventory & Valuation

Table 22 summarizes the quantity and current replacement cost of the Township's various sanitary sewer network assets as managed in its primary asset management register, Citywide.

Segment	Quantity	Unit of Measure	Replacement Cost	Primary RC Method
Mains	41,923	Meters	$16,531,000	CPI
Manholes	268	Assets	$3,215,000	CPI
Sanitary Equipment	1	Assets	$133,000	CPI
Sanitary Facilities	12	Assets	$27,644,000	CPI
Service Laterals	1,001	Assets	$315,000	CPI
Valves	49	Assets	$2,251,000	CPI
TOTAL			**$50,088,000**	

Table 22 Detailed Asset Inventory: Sanitary Sewer Network

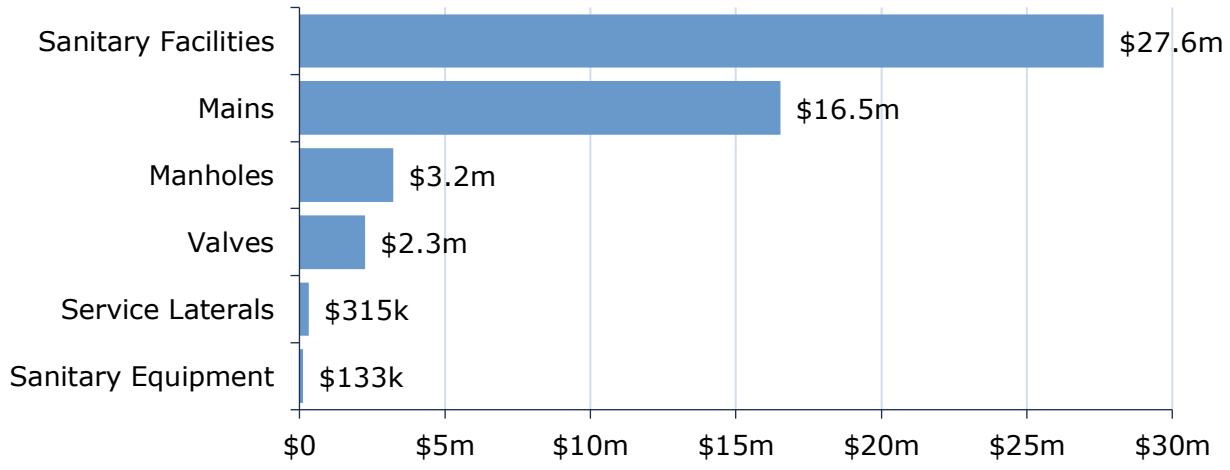


Figure 39 Portfolio Valuation: Sanitary Sewer Network

7.2 Asset Condition

Figure 40 summarizes the replacement cost-weighted condition of the Township's sanitary sewer network. Based on a combination of field inspection data and age, 95% of assets are in fair or better condition; the remaining 5% of assets are in poor to very poor condition. Condition assessments were available for 100% of sanitary buildings, but no assessments were available for the other segments included in the sanitary sewer network. This condition data was projected from inspection date to current year to estimate their condition today.

Assets in poor or worse condition may be candidates for replacement in the short term; similarly, assets in fair condition may require rehabilitation or replacement in the medium term and should be monitored for further degradation in condition. As illustrated in Figure 40 the majority of the Township's sanitary sewer network assets are in fair or better condition.

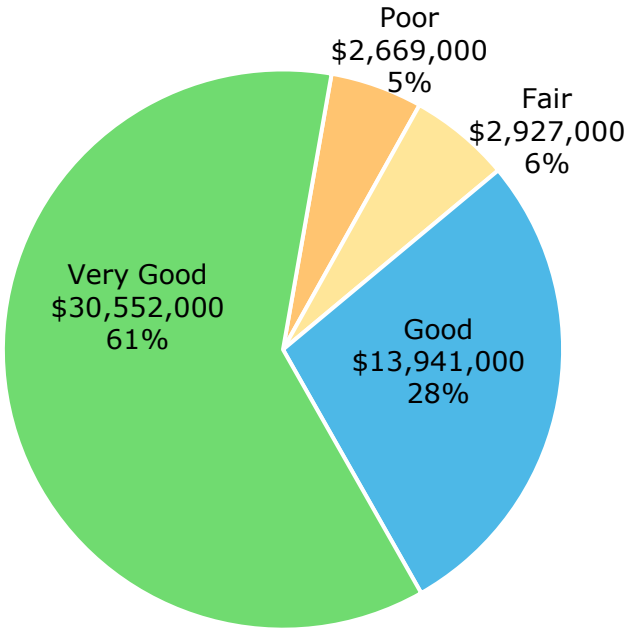


Figure 40 Asset Condition: Sanitary Sewer Network Overall

As illustrated in Figure 41, based on condition assessments and age-based conditions, the majority of the Township's sanitary sewer mains are in good to very good condition however, 78% of manholes and 51% of service laterals are in poor or worse condition.

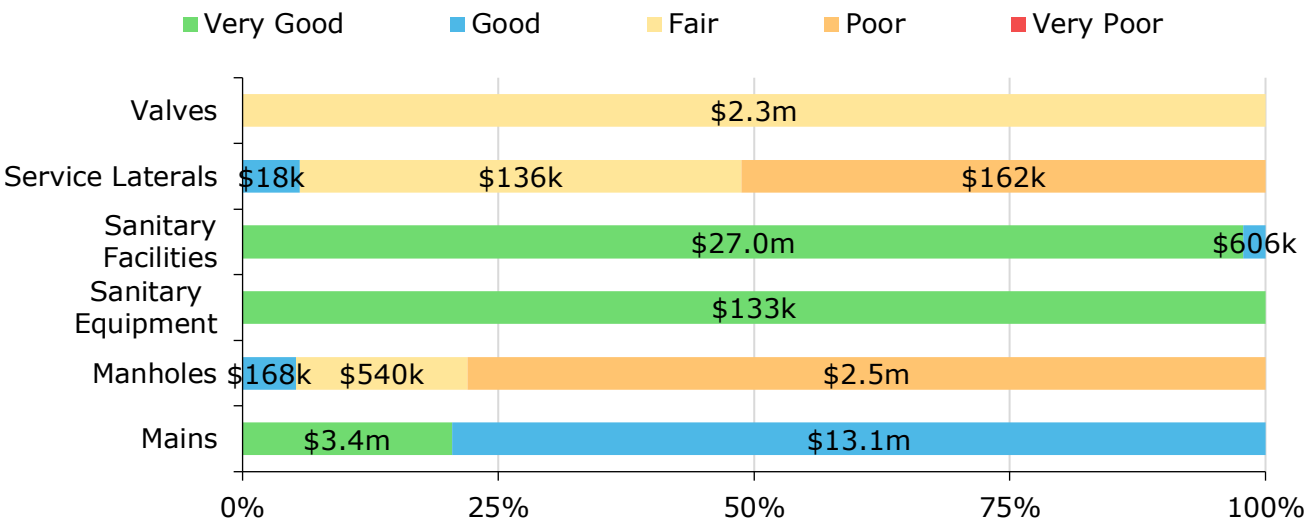


Figure 41 Asset Condition: Sanitary Sewer Network by Segment

7.3 Age Profile

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

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

Figure 42 illustrates the average current age of each asset type and its estimated useful life. Both values are weighted by the replacement cost of individual assets.

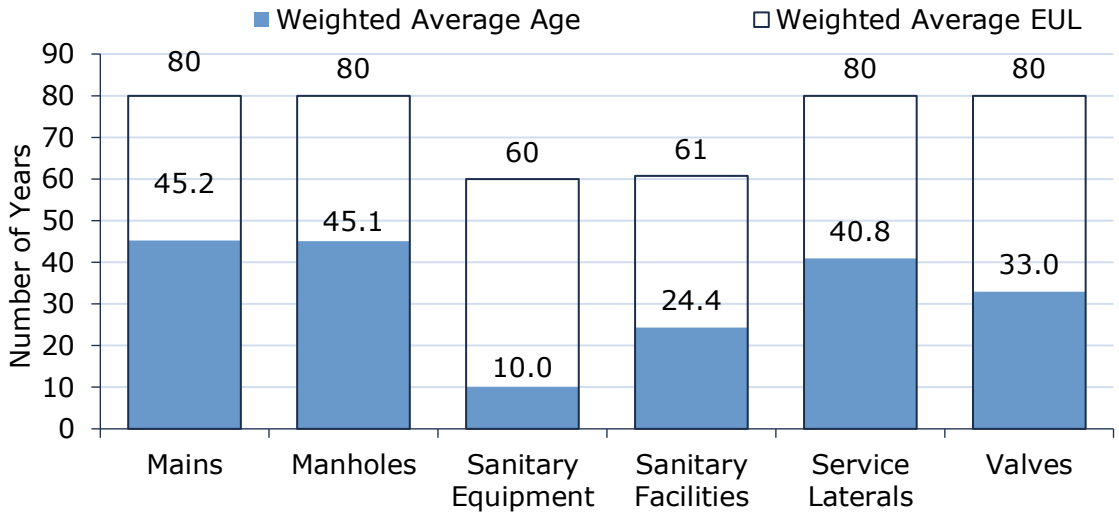


Figure 42 Estimated Useful Life vs. Asset Age: Sanitary Sewer Network

Age analysis reveals that on average, sanitary sewer assets still have over half of their life expectancy remaining. Age profiles and CCTV inspections will help to identify mains in need of replacements and/or upgrades. Extensions to EULs for mains may also be considered based on performance history to date.

7.4 Current Approach to Lifecycle Management

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

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

Activity Type	Description of Current Strategy
Maintenance	CCTV inspections are conducted as necessary
	Annual maintenance of mains that consists of main flushing, rodding and inspections
	Annual maintenance of manholes that consists of manhole inspection, lining and grouting
Rehabilitation/ Replacement	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
	Multi-year forecasts provided by OCWA and further reviewed by Staff

Activity Type	Description of Current Strategy
	Project prioritization is based on CCTV inspections, asset age, material, environmental risks, health and safety risks, and social impact. Additional considerations include asset functionality and design capacity.
	When mains are replaced, PVC pipe material is used
	Similar to other sub-surface infrastructure, Staff coordinate sanitary reconstruction projects with road construction projects to produce cost efficiencies

Table 23 Lifecycle Management Strategy: Sanitary Sewer Network

The following lifecycle strategy has been documented to formalize the current strategy used to manage the lifecycle of sanitary mains.

Sanitary Mains		
Event Name	**Event Class**	**Event Trigger**
CCTV Inspection	Preventative Maintenance	As Needed
Main Flushing, Rodding & Inspections	Maintenance	Annually
Manhole Inspection, Lining & Grouting	Maintenance	Annually
Full Reconstruction	Replacement	Condition: 20

Table 24 Lifecycle Strategy: Sanitary Mains

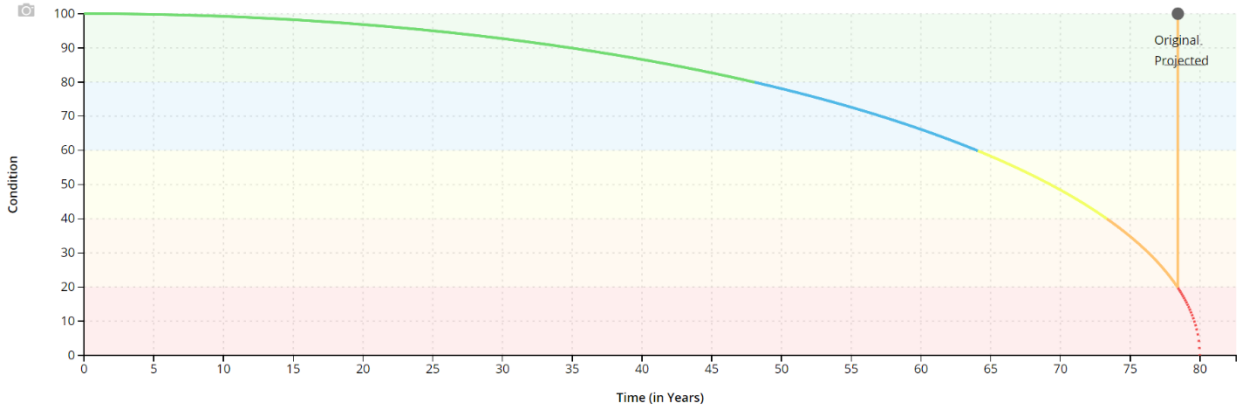


Figure 43 Lifecycle Strategy: Sanitary Mains

7.5 Forecasted Long-Term Replacement Needs

Figure 44 illustrates the cyclical short-, medium- and long-term infrastructure rehabilitation and replacement requirements for the Township's sanitary sewer network. This analysis was run until 2103 to capture at least one iteration of replacement for the longest-lived asset in Citywide Assets, the Township's primary asset management system and asset register. The Township's average annual requirements (red dotted line) total $755,000 for all assets in the sanitary sewer network. Although actual spending may fluctuate substantially from year to year, this figure is a useful benchmark value for annual capital expenditure targets (or allocations to reserves) to ensure projects are not deferred and replacement needs are met as they arise.

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

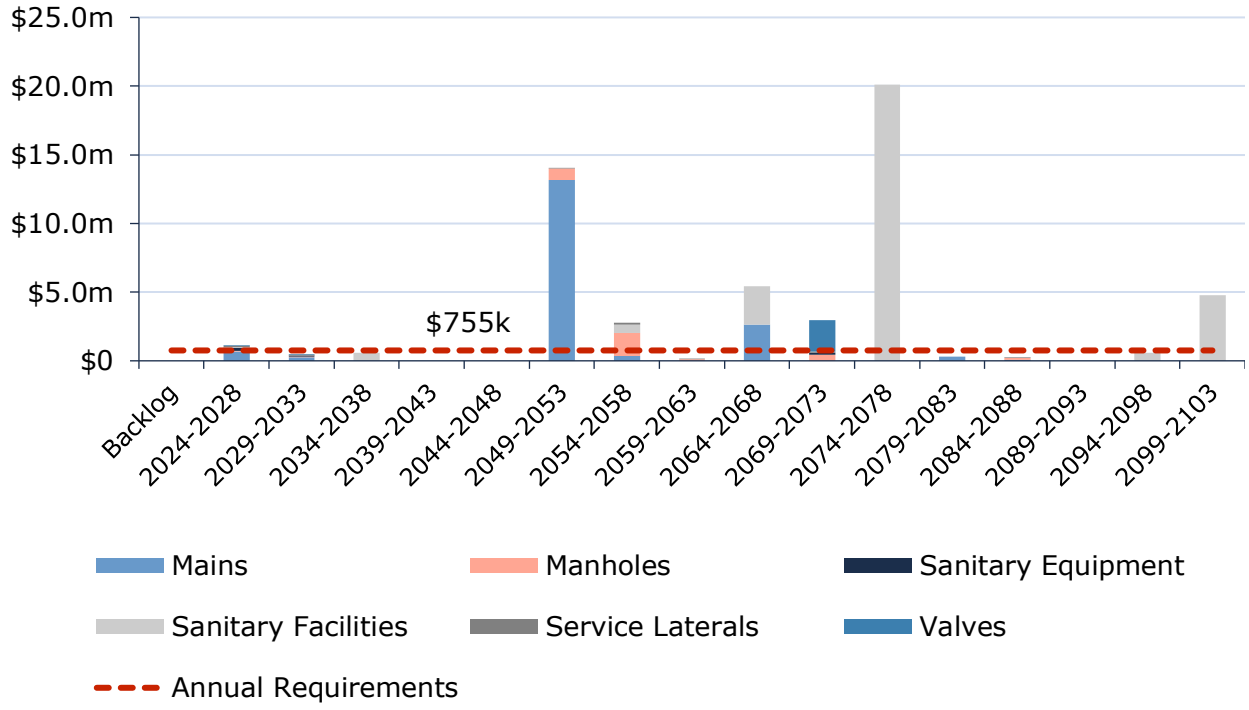


Figure 44 Forecasted Capital Replacement Needs: Sanitary Sewer Network 2024-2103

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

Tables summarizing the projected lifecycle activities (rehabilitation and replacements) that may be undertaken in the next 10 years to support current levels of service can be found in Appendix B – 10-Year Capital Requirements.

7.6 Risk Analysis

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

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

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

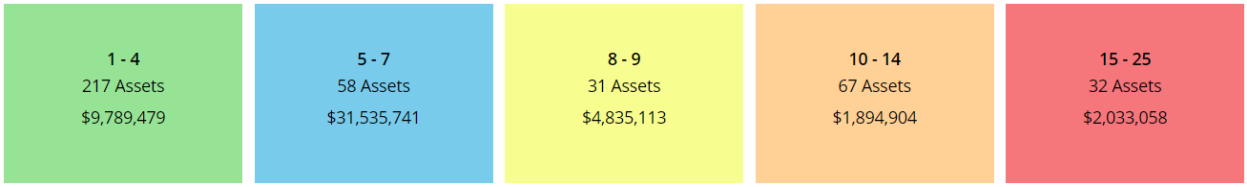


Figure 45 Risk Matrix: Sanitary Sewer Network

7.7 Levels of Service

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

7.7.1 Community Levels of Service

Service Attribute	Qualitative Description	Current LOS (2023)
Scope	Description, which may include maps, of the user groups or areas of the municipality that are connected to the municipal wastewater system	The Township has three distinct municipal wastewater systems: Wendover, Plantagenet and Alfred. Wendover's system includes three STEP systems, gravity pipes and one pumping station. Flow is treated at the mechanical treatment facility and is discharged into the Ottawa River. The Plantagenet system consists of gravity pipes, two pumping stations and one single cell lagoon which treats runoff before discharging into the South Nation River. The Alfred system consists of gravity pipes, one pumping station and one lagoon which treats runoff before discharging into a nearby ditch.

	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	Overflows are present at pumping stations and treatment facilities.
	Description of the frequency and volume of overflows in combined sewers in the municipal wastewater system that occur in habitable areas or beaches	No spills in the last year for all three systems.
Reliability	Description of how stormwater can get into sanitary sewers in the municipal wastewater system, causing sewage to overflow into streets or backup into homes	No backups or overflows recorded in recent years. There are some combined flows due to foundation drain connections and infiltration on all three systems. The full extent is unknown.
	Description of how sanitary sewers in the municipal wastewater system are designed to be resilient to stormwater infiltration	Major facilities such as pumping stations and treatment facilities are equipped with emergency overflows.
	Description of the effluent that is discharged from sewage treatment plants in the municipal wastewater system	All three treatment facilities generally meet all effluent requirements.

Table 25 O. Reg. 588/17 Community Levels of Service: Sanitary Sewer Network

7.7.2 Technical Levels of Service

Service Attribute	Technical Metric	Current LOS (2023)
Scope	% of properties connected to the municipal wastewater system	31%[7]
Reliability	# of events per year where combined sewer flow in the municipal wastewater system exceeds system capacity compared to the total number of properties connected to the municipal wastewater system	2

[7] 1,710 sanitary accounts vs. 5,573 active roll properties.

Service Attribute	Technical Metric	Current LOS (2023)
	# of connection-days per year having wastewater 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	15[8]
Performance	Capital reinvestment rate	0.3%

Table 26 O. Reg. 588/17 Technical Levels of Service: Sanitary Sewer Network

[8] Violations were for target concentrations of specific criteria.

8. Stormwater Network

The Township's Stormwater Network is comprised of sewer mains and other critical supporting capital assets. The total extent of the stormwater system, including inventory of all stormwater mains, is still on-going within the Township and therefore the below section does not reflect a holistic account of the Township's stormwater asset portfolio. While knowingly inaccurate, the current replacement cost of assets accounted for within the asset management system totals approximately $12 million.

8.1 Inventory & Valuation

Table 27 summarizes the quantity and current replacement cost of the Township's various stormwater network assets as managed in its primary asset management register, Citywide.

Segment	Quantity	Unit of Measure	Replacement Cost	Primary RC Method
Catch Basins	385	Assets	$1,927,000	Cost/Unit
Culverts	489	Meters	$1,221,000	User-Defined
Mains	14,814	Meters	$8,098,000	CPI
Manholes	99	Assets	$1,188,000	Cost/Unit
TOTAL			**$12,434,000**	

Table 27 Detailed Asset Inventory: Stormwater Network

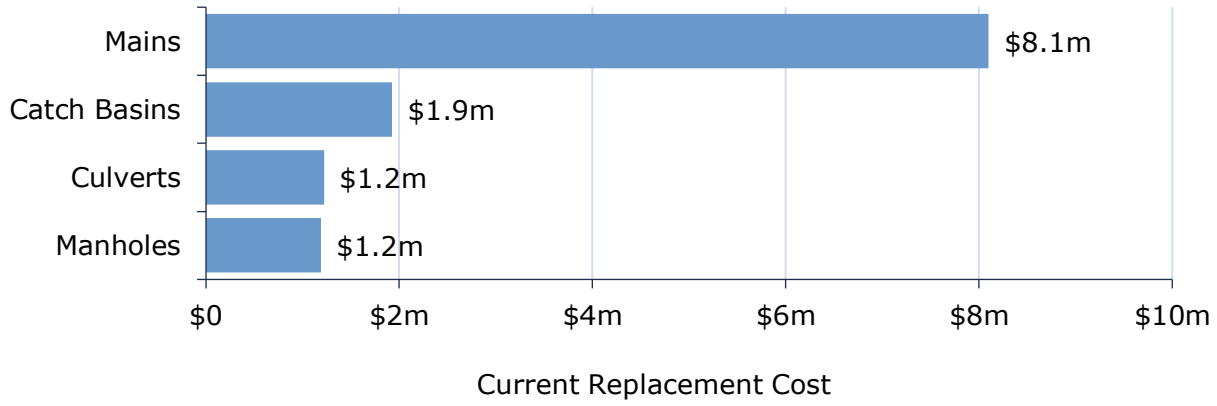


Figure 46 Portfolio Valuation: Stormwater Network

8.2 Asset Condition

Figure 47 summarizes the replacement cost-weighted condition of the Township's stormwater management assets. Based on primarily age data, approximately 4% of assets are in poor to very poor condition. These assets may be candidates for replacement in the short term; similarly, assets in fair condition may require rehabilitation or replacement in the medium term and should be monitored for further degradation in condition.

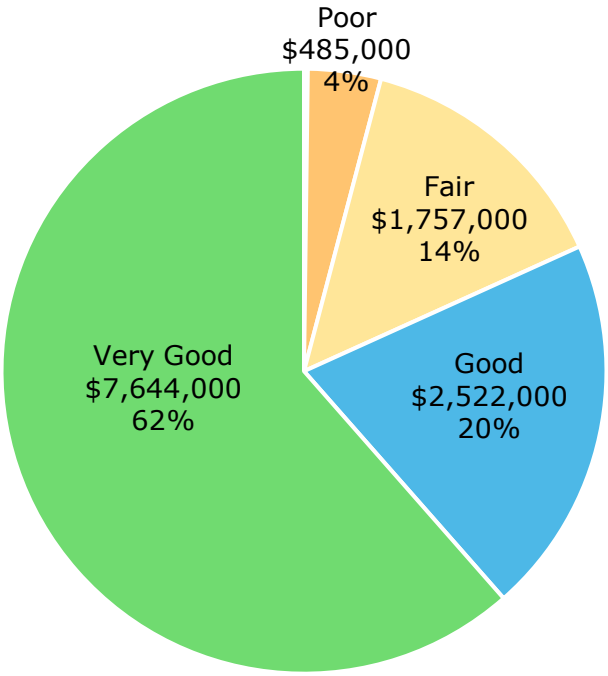


Figure 47 Asset Condition: Stormwater Network Overall

Figure 48 summarizes the mostly age-based condition of stormwater assets. The analysis illustrates that the majority of stormwater mains are in fair or better condition. However, 19% of catch basins and 10% of manholes, with a current replacement cost of $485,000, are in poor or worse condition.

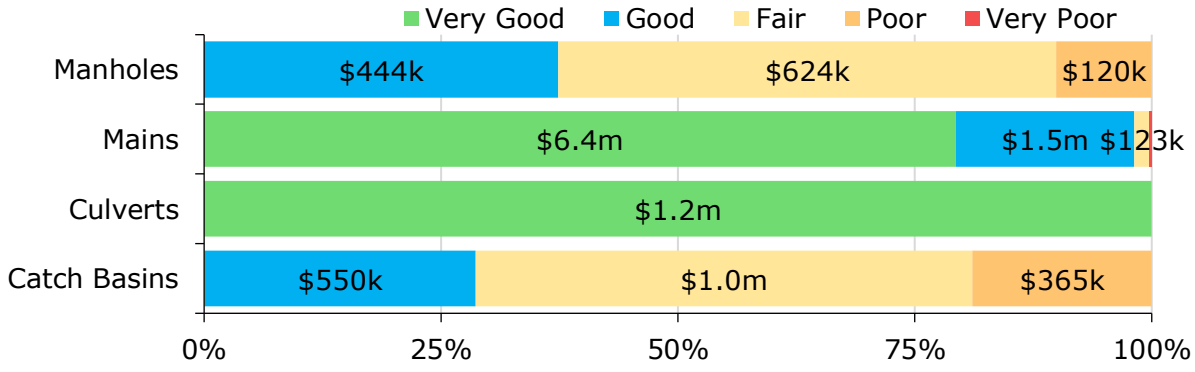


Figure 48 Asset Condition: Stormwater Network by Segment

8.3 Age Profile

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

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

Figure 49 illustrates the average current age of each asset type and its estimated useful life. Both values are weighted by the replacement cost of individual assets.

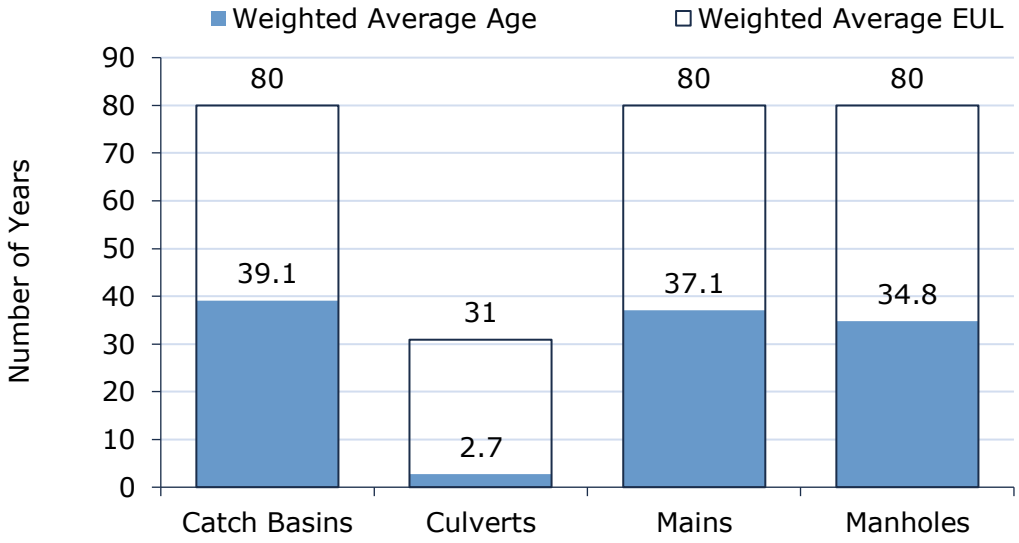


Figure 49 Estimated Useful Life vs. Asset Age: Stormwater Network

Age analysis reveals that on average, stormwater assets still have over half of their life expectancy remaining. Age profiles and CCTV inspections will help to identify mains in need of replacements and/or upgrades. Extensions to EULs for mains may also be considered based on performance history to date.

8.4 Current Approach to Lifecycle Management

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

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

Activity Type	Description of Current Strategy
Maintenance	Catch basins are cleaned annually and outlets are inspected regularly to ensure unobstructed flow
	Flushing activities are usually completed alongside CCTV inspections

Activity Type	Description of Current Strategy
	All other maintenance activities are completed on a reactive basis when operational issues are identified (e.g., blockages, backups), through complaints and service requests
Rehabilitation	Trenchless re-lining has the potential to reduce total lifecycle costs but would require a formal condition assessment program to determine viability
Replacement	Without the availability of up-to-date condition assessment information replacement activities are purely reactive in nature

Table 28 Lifecycle Management Strategy: Stormwater Network

The following lifecycle strategy has been documented to formalize the current strategy used to manage the lifecycle of storm mains.

Stormwater Mains		
Event Name	**Event Class**	**Event Trigger**
Catch Basin Cleaning	Maintenance	Annually
CCTV Inspection	Preventative Maintenance	Reactive
Storm Sewer Flushing	Maintenance	Reactive
Full Reconstruction	Replacement	Condition: 20

Table 29 Lifecycle Strategy: Stormwater Mains

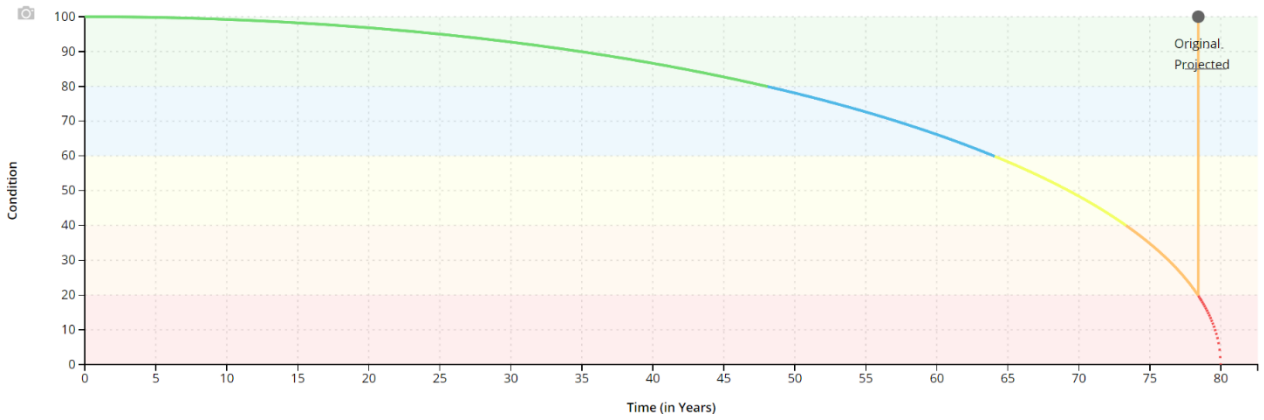


Figure 50 Lifecycle Strategy: Stormwater Mains

8.5 Forecasted Long-Term Replacement Needs

Figure 51 illustrates the cyclical short-, medium- and long-term infrastructure replacement requirements for the Township's storm network assets. This analysis was run until 2103 to capture at least one iteration of replacement for the longest-lived asset in Citywide Assets, the Township's primary asset management system and asset register. The Township's average annual requirements (red dotted line) total $180,000 for all assets in the

stormwater network. Although actual spending may fluctuate substantially from year to year, this figure is a useful benchmark value for annual capital expenditure targets (or allocations to reserves) to ensure projects are not deferred and replacement needs are met as they arise.

The chart illustrates there is no infrastructure backlog. The largest replacement spike of $3.8 million is forecasted in 2059-2063 as mains reach the end of their expected design life. These projections and estimates are based on asset replacement costs and age analysis. They are designed to provide a long-term, portfolio-level overview of capital needs and should be used to support improved financial planning over several decades.

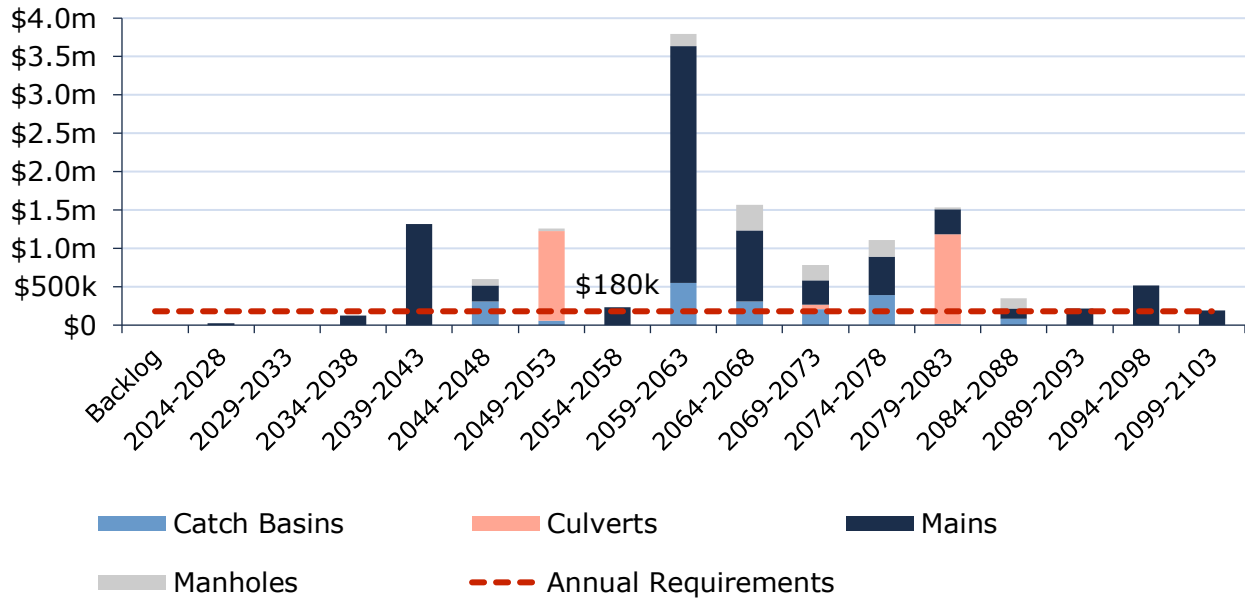


Figure 51 Forecasted Capital Replacement Needs Stormwater Network 2024-2103

Often, the magnitude of replacement needs is substantially higher than most municipalities can afford to fund. In addition, most assets may not need to be replaced. However, quantifying and monitoring these spikes is essential for long-term financial planning, including establishing dedicated reserves. CCTV inspections may reveal a higher or lower backlog. The inspections may also help reduce long-term projections by providing more accurate condition data for mains than age. In addition, a robust risk framework will ensure that high-criticality assets receive proper and timely lifecycle intervention, including replacements.

Tables summarizing the projected lifecycle activities (rehabilitation and replacements) that may be undertaken in the next 10 years to support current levels of service can be found in Appendix B – 10-Year Capital Requirements.

8.6 Risk Analysis

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

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

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

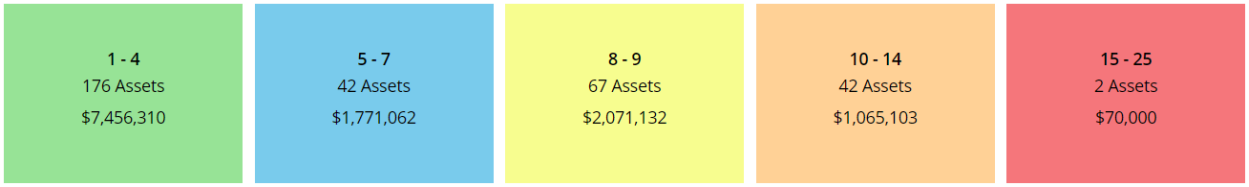


Figure 52 Risk Matrix: Stormwater Network

8.7 Levels of Service

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

8.7.1 Community Levels of Service

Service Attribute	Qualitative Description	Current LOS (2023)
Scope	Description, which may include map, of the user groups or areas of the Township that are protected from flooding, including the extent of protection provided by the municipal storm water network	Most of the municipal storm network precedes modern design guidelines and lacks data, these systems' capacities cannot be confirmed. Recent development such as site plans and subdivisions meet the authorities' guidelines requirements for flood protection and storm sewer sizing.

Table 30 O. Reg. 588/17 Community Levels of Service: Stormwater Network

8.7.2 Technical Levels of Service

Service Attribute	Technical Metric	Current LOS (2023)
Scope	% of properties in municipality designed to be resilient to a 100-year storm	7%

Service Attribute	Technical Metric	Current LOS (2023)
	% of the municipal stormwater management system designed to be resilient to a 5-year storm	<5%[9]
Performance	Capital reinvestment rate	0.0%
	O&M $/km of drainage system	$4,536[10]

Table 31 O. Reg. 588/17 Technical Levels of Service: Stormwater Network

[9] The total extent of the storm network is still being accounted for; however, 3.7 km of the network is known to be resilient, accounting for less than 50% of the expected overall network.
[10] The total extent of the storm network is still being accounted for.

Non-Core Assets

Buildings & Facilities

Parks & Land Improvements

Vehicles

Machinery & Equipment

9. Buildings & Facilities

The Township's buildings portfolio includes fire halls, various administrative and public works facilities, libraries, and recreational assets. The total current replacement of buildings is estimated at more than $23 million.

9.1 Inventory & Valuation

Table 32 summarizes the quantity and current replacement cost of the Township's various building and facilities assets as managed in its primary asset management register, Citywide. Within the asset management database, buildings and facilities are not componentized. The quantity listed represents the number of asset records currently available for each department.

Segment	Quantity	Unit of Measure	Replacement Cost	Primary RC Method
Administration	8	Assets	$6,201,000	User-Defined
Fire	5	Assets	$3,246,000	User-Defined
Landfill	1	Assets	$53,000	User-Defined
Public Works	9	Assets	$3,860,000	User-Defined
Recreational	18	Assets	$10,274,000	User-Defined
TOTAL			**$23,635,000**	

Table 32 Detailed Asset Inventory: Buildings & Facilities

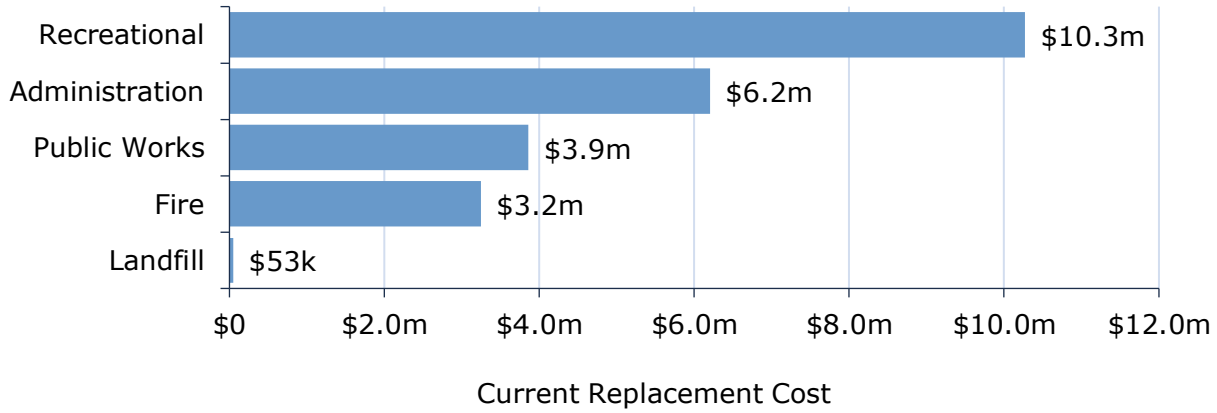


Figure 53 Portfolio Valuation: Buildings & Facilities

9.2 Asset Condition

Figure 59 summarizes the replacement cost-weighted condition of the Township's buildings portfolio. Based on staff assessments, 74% of building assets are in fair or better condition; however, 26%, with a current replacement cost of more than $6 million are in poor or worse

condition. These assets may be candidates for replacement in the short term; similarly, assets in fair condition may require rehabilitation or replacement in the medium term and should be monitored for further degradation in condition. As buildings are not componentized, condition data is presented only at the site level, rather than at the individual element or component level within each building. This drawback is further compounded by the lack of formalized condition data, as opposed to subjective staff estimates.

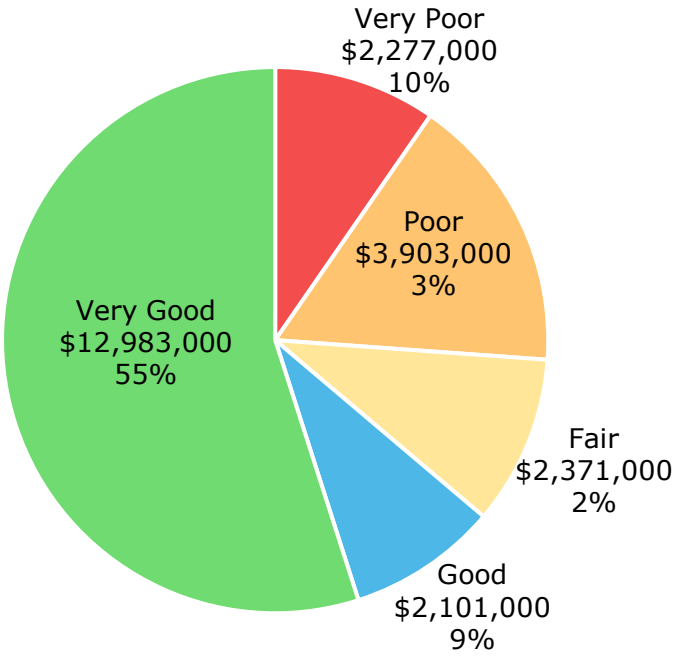


Figure 54 Asset Condition: Buildings & Facilities Overall

Figure 55 summarizes the assessed condition of buildings by each department. A substantial portion of fire assets and the majority of public works assets are in poor to worse condition. However, in the absence of componentization, this data has limited value. Componentization of assets and integration of condition assessments will provide a more accurate and reliable estimation of the condition of various facilities.

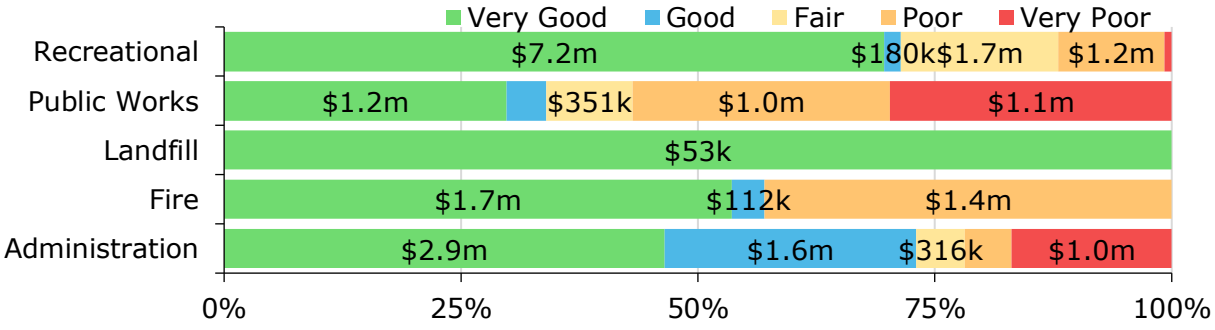


Figure 55 Asset Condition: Buildings & Facilities by Segment

9.3 Age Profile

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

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

Figure 56 illustrates the average current age of each asset type and its estimated useful life. Both values are weighted by the replacement cost of individual assets.

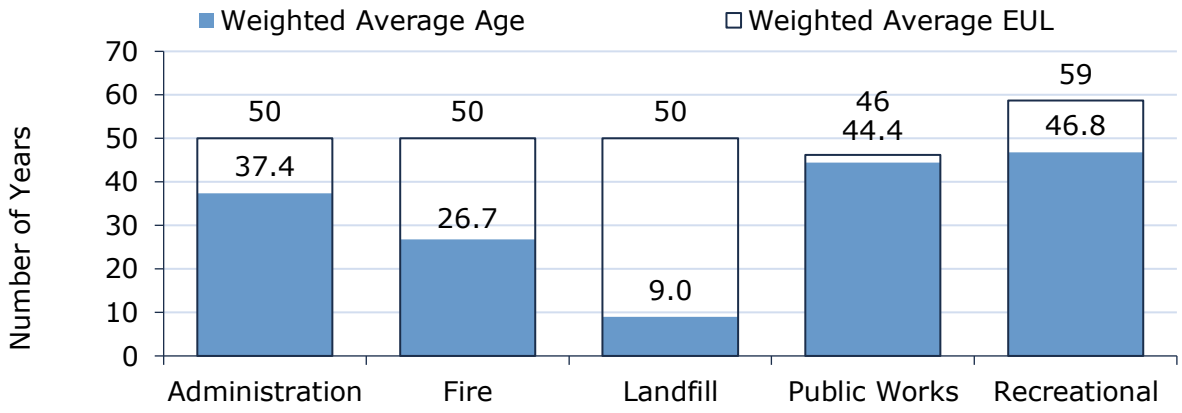


Figure 56 Estimated Useful Life vs. Asset Age: Buildings & Facilities

Age analysis reveals that, on average, buildings assets are in the earlier stages of their serviceable life. However, based on acquisition years, most library and recreation assets have consumed nearly 100% of their established useful life. Once again, this analysis presented only at the site level, rather than at the individual element or component level. Useful and meaningful age analysis for buildings is entirely predicated on effective componentization.

9.4 Current Approach to Lifecycle Management

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

Table 33 outlines the Township's current lifecycle management strategy.

Activity Type	Description of Current Strategy
Maintenance	Maintenance is triggered by inspections idenfifying safety, accessibility, functionality, and structural issues.
	Routine/preventative maintenance is performed on assets such as HVAC equipment.
	All other maintenance activities are completed on a reactive basis when operational issues are identified through complaints and service requests.
Rehabilitation/ Replacement	Rehabilitations such as roof replacements or HVAC component replacements are considered on an as needed basis.
	The primary considerations for asset replacement are asset failure, availability or grant funding, safety issues, and volume of use.
Inspections	All buildings receive a health and safety inspections on an annual basis which involve a building walkthrough to identify defects and safety hazards. Identified defects are forwarded to administration for resolution.

Table 33 Lifecycle Management Strategy: Buildings & Facilities

9.5 Forecasted Long-Term Replacement Needs

Figure 57 illustrates the cyclical short-, medium- and long-term infrastructure replacement requirements for the Township's buildings portfolio. This analysis was run until 2078 to capture at least one iteration of replacement for the longest-lived asset in Citywide Assets, the Township's primary asset management system and asset register. The Township's average annual requirements (red dotted line) total $486,000 for all buildings. Although actual spending may fluctuate substantially from year to year, this figure is a useful benchmark value for annual capital expenditure targets (or allocations to reserves) to ensure projects are not deferred and replacement needs are met as they arise.

Replacement needs are forecasted to remain relatively consistent over the next 40 years, with a significant spike occurring between 2064 and 2068. These projections and estimates are based on current asset records, their replacement costs, and age analysis. They are designed to provide a long-term, portfolio-level overview of capital needs and should be used to support improved financial planning over several decades.

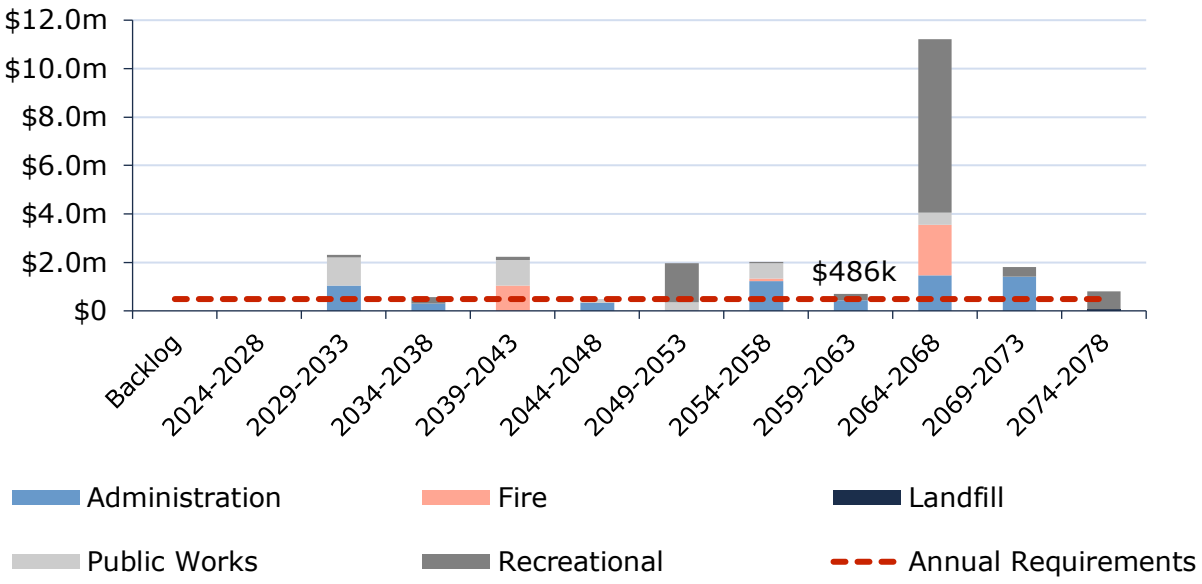


Figure 57 Forecasted Capital Replacement Needs Buildings & Facilities 2024-2078

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

Tables summarizing the projected lifecycle activities (rehabilitation and replacements) that may be undertaken in the next 10 years to support current levels of service can be found in Appendix B – 10-Year Capital Requirements.

9.6 Risk Analysis

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

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

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

Figure 58 Risk Matrix: Buildings & Facilities

9.7 Levels of Service

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

9.7.1 Community Levels of Service

Service Attribute	Qualitative Description	Current LOS (2023)
Scope	Description, which may include maps, of the types of facilities that the municipality operates and maintains	Facilities within Alfred and Plantagenet include those dedicated to administration, such as Town Hall and Libraries. Fire services are supported by multiple fire halls. The landfill is supported by a shelter for equipment. Public works is supported by various equipment garages and salt/sand protection facilities. Recreation provides its services through a variety of facilities such as community centers and park shelters.

Table 34 Community Levels of Service: Buildings & Facilities

9.7.2 Technical Levels of Service

Service Attribute	Technical Metric	Current LOS (2023)
Quality	Average facility condition index value for facilities in the municipality	69%
Performance	Capital reinvestment rate	0.3%

Table 35 Technical Levels of Service: Buildings & Facilities

10. Parks & Land Improvements

The Township's parks and land improvements portfolio includes parking lots, various sports fields and courts, pools and splashpads, and marina assets. The total current replacement of land improvements is estimated at approximately $7 million.

10.1 Inventory & Valuation

Table 36 summarizes the quantity and current replacement cost of the Township's various parks and land improvement assets as managed in its primary asset management register, Citywide. Parks, sport fields and courts account for the largest share of the land improvements asset group.

Segment	Quantity	Unit of Measure	Replacement Cost	Primary RC Method
Marina	129	Assets, Meters	$1,317,000	CPI
Parking Lots	21	Assets	$1,611,000	CPI
Parks, Sport Fields & Courts	411	Assets, Meters	$2,991,000	CPI
Pools & Splashpads	4	Assets	$1,024,000	User-Defined
TOTAL			**$6,942,000**	

Table 36 Detailed Asset Inventory: Parks & Land Improvements

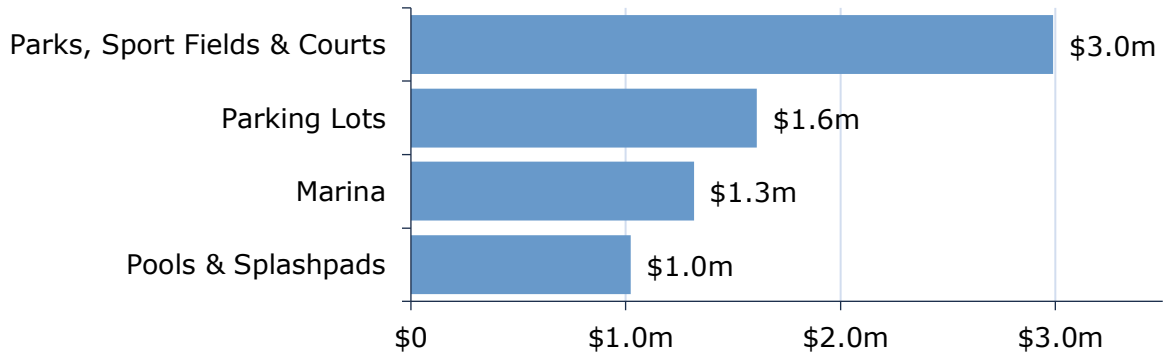


Figure 59 Portfolio Valuation: Parks & Land Improvements

10.2 Asset Condition

Figure 60 summarizes the replacement cost-weighted condition of the Township's parks and land improvement portfolio. Based on staff estimated conditions, 100% of assets are in fair or better condition. As assets deteriorate into poor condition, they may be candidates for replacement in the short term; similarly, assets in fair condition may require rehabilitation or replacement in the medium term and should be monitored for further degradation in condition.

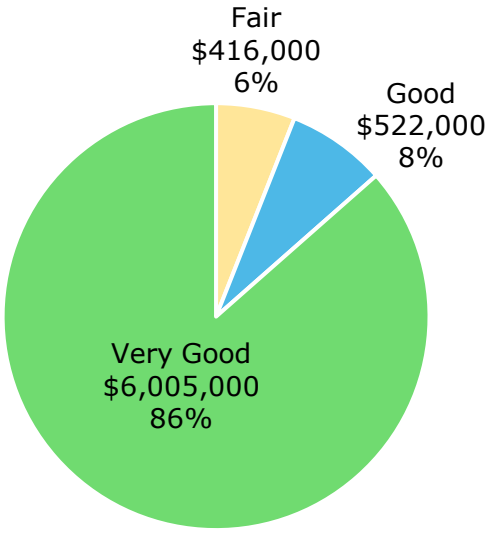


Figure 60 Asset Condition: Parks & Land Improvements Overall

Figure 61 summarizes the condition of land improvements by each department.

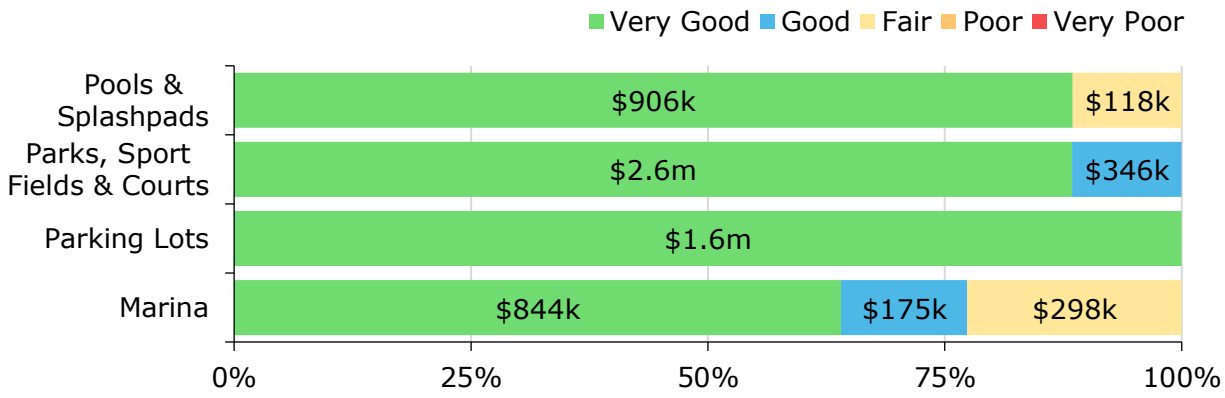


Figure 61 Asset Condition: Parks & Land Improvements by Segment

10.3 Age Profile

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

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

Figure 62 illustrates the average current age of each asset type and its estimated useful life. Both values are weighted by the replacement cost of individual assets.

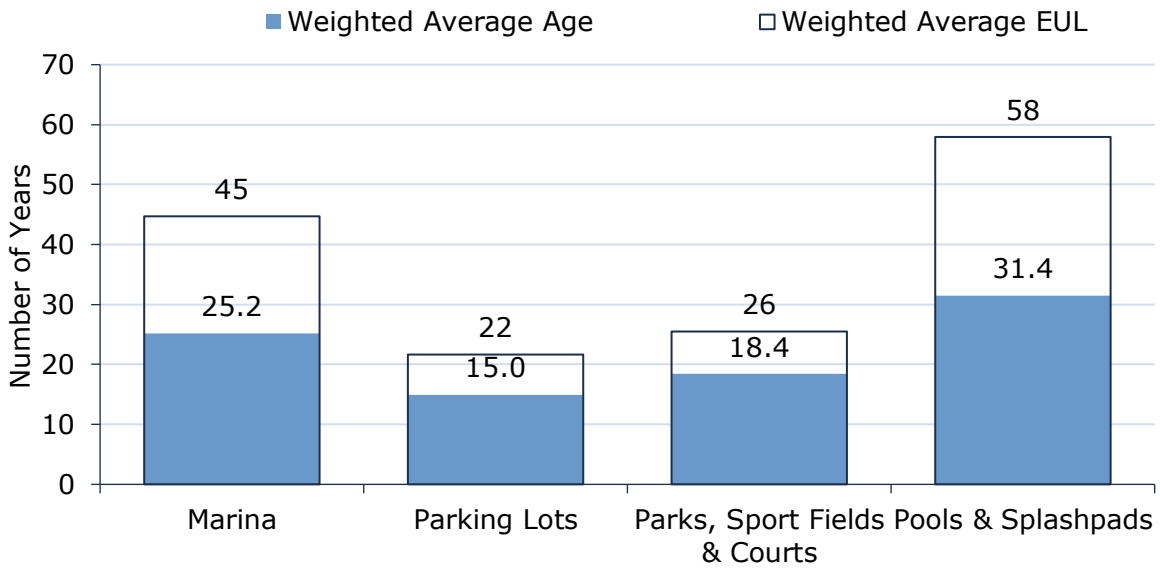


Figure 62 Estimated Useful Life vs. Asset Age: Parks & Land Improvements

Age analysis reveals that, on average, most assets are in moderate to latter stages of their expected life.

10.4 Current Approach to Lifecycle Management

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

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

Activity Type	Description of Current Strategy
Maintenance	Maintenance activities are completed on a reactive basis when operational issues are identified through complaints, service requests, or inspections
	Maintenance activities include cleaning, minor repairs, and vegetation management
Rehabilitation / Replacement	Without the availability of up-to-date condition assessment information replacement activities are purely reactive in nature

Inspections	Land improvement assets are inspected annually by internal Township staff

Table 37 Lifecycle Management Strategy: Parks & Land Improvements

10.5 Forecasted Long-Term Replacement Needs

Figure 63 illustrates the cyclical short-, medium- and long-term infrastructure replacement requirements for the Township's land improvements portfolio. This analysis was run until 2078 to capture at least one iteration of replacement for the longest-lived asset in Citywide Assets, the Township's primary asset management system and asset register. The Township's average annual requirements (red dotted line) total $268,000 for all land improvements. Although actual spending may fluctuate substantially from year to year, this figure is a useful benchmark value for annual capital expenditure targets (or allocations to reserves) to ensure projects are not deferred and replacement needs are met as they arise.

Replacement needs are forecasted to steadily rise over the next 20-year time horizon, and peaking at $2.9 million between 2044 and 2048 as assets reach the end of their useful life. These projections and estimates are based on asset replacement costs and age analysis. They are designed to provide a long-term, portfolio-level overview of capital needs and should be used to support improved financial planning over several decades.

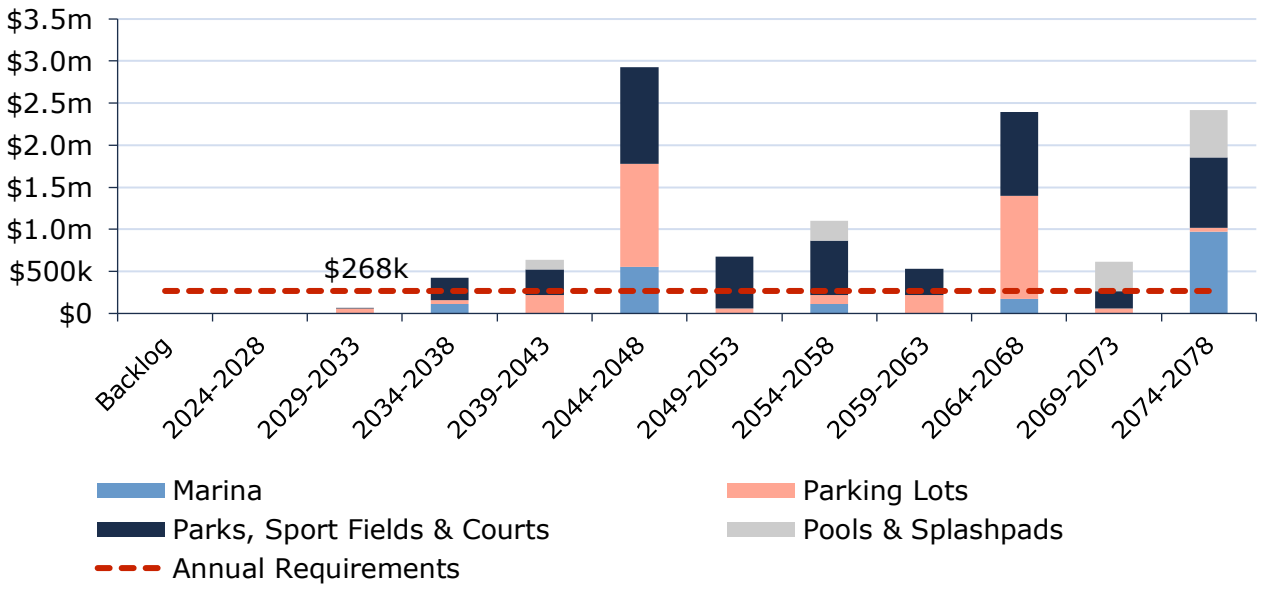


Figure 63 Forecasted Capital Replacement Needs: Parks Land Improvements 2024-2078

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

Tables summarizing the projected lifecycle activities (rehabilitation and replacements) that may be undertaken in the next 10 years to support current levels of service can be found in Appendix B – 10-Year Capital Requirements.

10.6 Risk Analysis

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

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

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

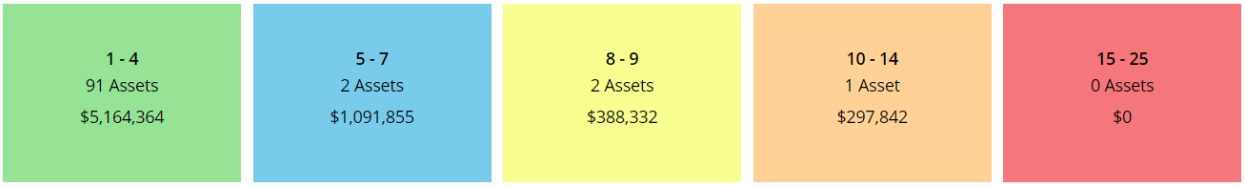


Figure 64 Risk Matrix: Parks & Land Improvements

10.7 Levels of Service

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

10.7.1 Community Levels of Service

Service Attribute	Qualitative Description	Current LOS (2023)
Scope	Description, which may include maps, of the outdoor recreational facilities that the municipality operates and maintains	The Township operates a variety of outdoor pools and splashpads, a marina with boat-launch, playground structures, sports fields, and courts.

Table 38 Community Levels of Service: Parks & Land Improvements

10.7.2 Technical Levels of Service

Service Attribute	Technical Metric	Current LOS (2023)
Quality	Average condition of outdoor recreation facilities and land improvements in the municipality	Very Good
Performance	Capital reinvestment rate	2.3%

Table 39 Technical Levels of Service: Parks & Land Improvements

11. Vehicles

The Township's vehicles portfolio includes 40 assets that support a variety of general and essential services, including public works, administration, recreation, and fire services. The total current replacement of vehicles is estimated at approximately $10 million.

11.1 Inventory & Valuation

Table 40 summarizes the quantity and current replacement cost of the Township's various vehicle assets as managed in its primary asset management register, Citywide. Public works and fire services account for the largest share of the vehicles portfolio.

Segment	Quantity	Unit of Measure	Replacement Cost	Primary RC Method
Administration	3	Assets	$139,000	CPI
Fire	14	Assets	$4,374,000	CPI
Public Works	19	Assets	$4,671,000	User-Defined
Recreational	4	Assets	$241,000	CPI
TOTAL			**$9,425,000**	

Table 40 Detailed Asset Inventory: Vehicles

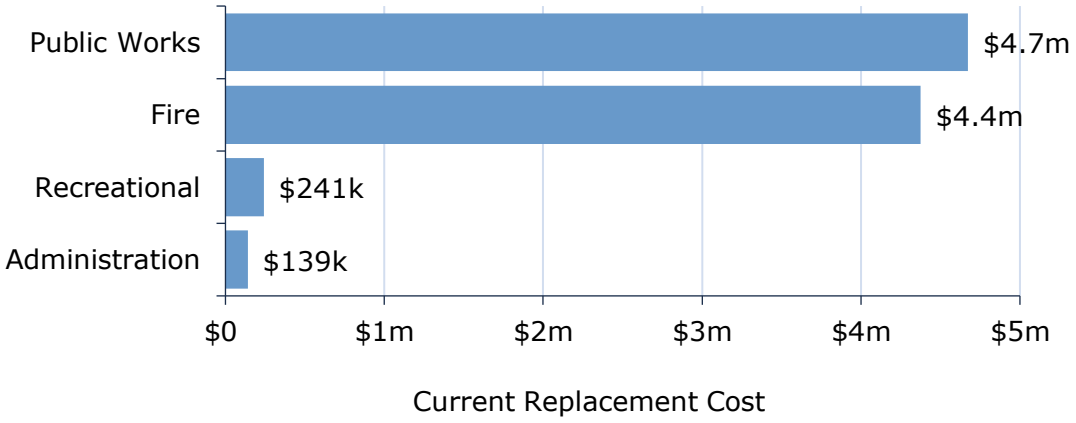


Figure 65 Portfolio Valuation: Vehicles

11.2 Asset Condition

Figure 66 summarizes the replacement cost-weighted condition of the Township's vehicles portfolio. Based on a combination of aged-based and staff estimated assessed condition data, 40% of vehicles are in fair or better condition, with the remaining 60% are in poor or worse condition. These assets may be candidates for replacement in the short term; similarly, assets in fair condition may require rehabilitation or replacement in the medium term and should be monitored for further degradation in condition. Condition data was

available for 49% of vehicles; age was used to estimate condition for the remaining 51% of assets.

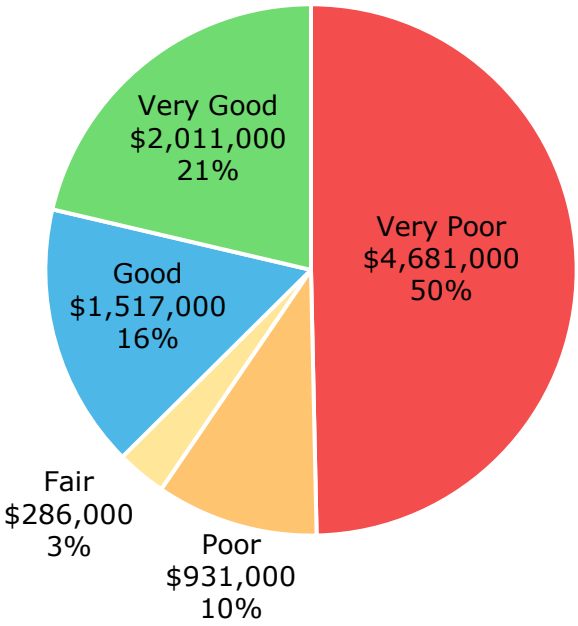


Figure 66 Asset Condition: Vehicles Overall

Figure 67 summarizes the condition of vehicles by each department. The majority of vehicles that support critical services such as fire are in poor or worse condition.

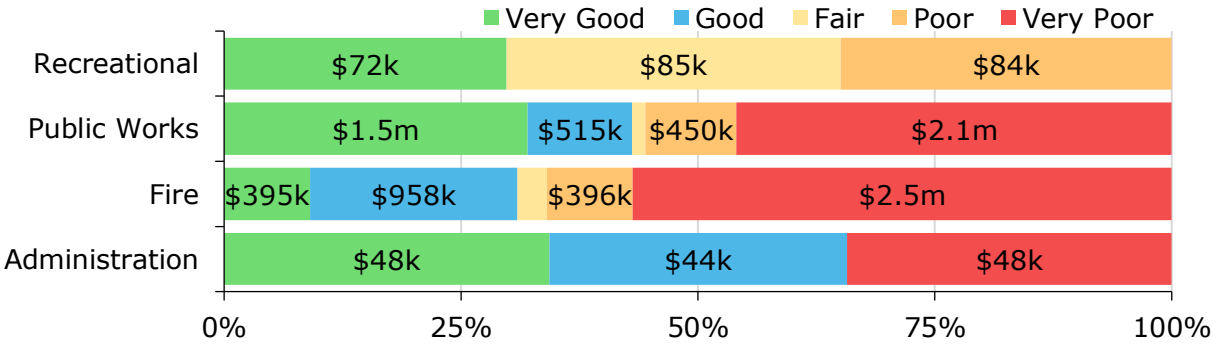


Figure 67 Asset Condition: Vehicles by Segment

11.3 Age Profile

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

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

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

Figure 68 illustrates the average current age of each asset type and its estimated useful life. Both values are weighted by the replacement cost of individual assets.

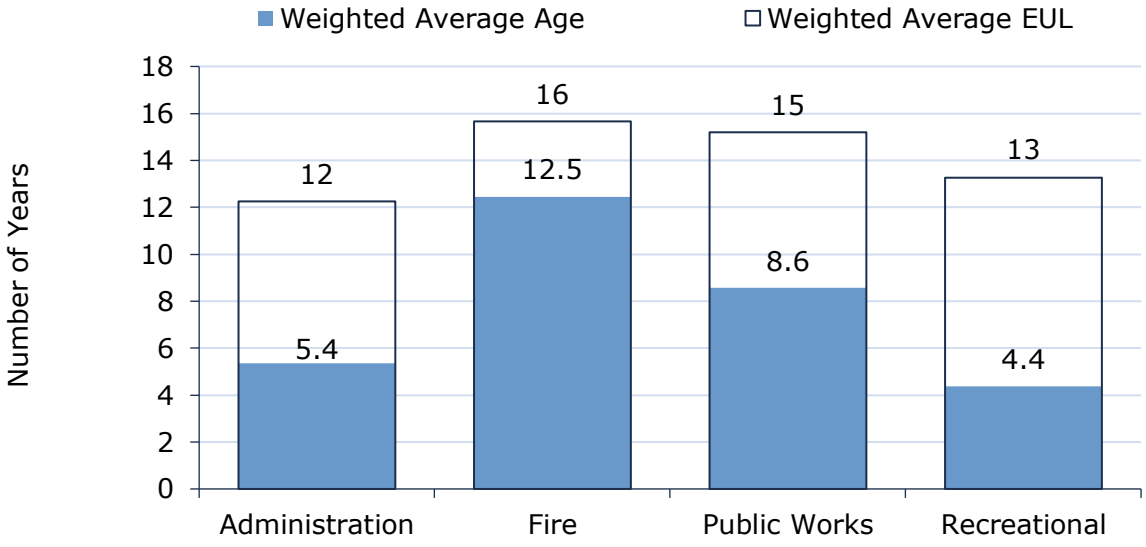


Figure 68 Estimated Useful Life vs. Asset Age: Vehicles

Age analysis reveals that, on average, most vehicles are in moderate stages of their expected life. Vehicles in fire are approaching the end of their expected lives.

11.4 Current Approach to Lifecycle Management

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

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

Activity Type	Description of Current Strategy
Maintenance	Oil changes and routine maintenance is completed as per manufacturer recommendations
	All other maintenance activities are completed on a reactive basis when operational issues are identified (e.g., mechanical breakdown, deficiencies identified during daily inspections)
Replacement	Without the availability of up-to-date condition assessment information replacement activities are purely reactive in nature

Activity Type	Description of Current Strategy
Inspections	Vehicles are inspected by the operator daily before use; however, these inspections identify deficiencies but do not provide overall condition ratings

Table 41 Lifecycle Management Strategy: Vehicles

11.5 Forecasted Long-Term Replacement Needs

Figure 69 illustrates the cyclical short-, medium- and long-term infrastructure replacement requirements for the Township's vehicles portfolio. This analysis was run until 2043 to capture at least one iteration of replacement for the longest-lived asset in Citywide Assets, the Township's primary asset management system and asset register. The Township's average annual requirements (red dotted line) total $638,000 for all vehicles. Although actual spending may fluctuate substantially from year to year, this figure is a useful benchmark value for annual capital expenditure targets (or allocations to reserves) to ensure projects are not deferred and replacement needs are met as they arise.

Replacement needs are forecasted to steadily rise over the next two decades, peaking at $4.7 million between 2039 and 2043 as vehicles reach the end of their useful life. These projections and estimates are based on asset replacement costs and age analysis. They are designed to provide a long-term, portfolio-level overview of capital needs and should be used to support improved financial planning over several decades.

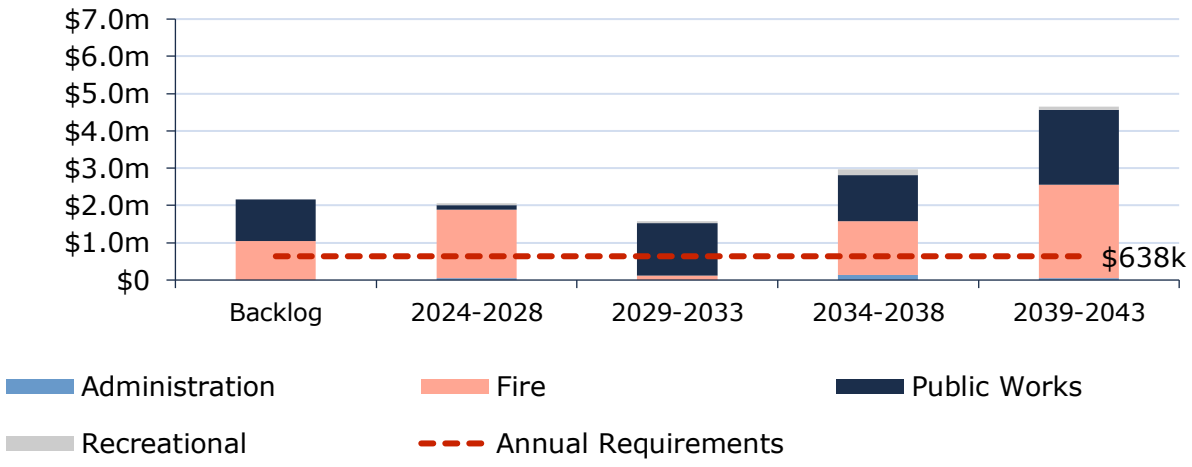


Figure 69 Forecasted Capital Replacement Needs: Vehicles 2024-2043

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

Tables summarizing the projected lifecycle activities (rehabilitation and replacements) that may be undertaken in the next 10 years to support current levels of service can be found in Appendix B – 10-Year Capital Requirements.

11.6 Risk Analysis

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

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

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

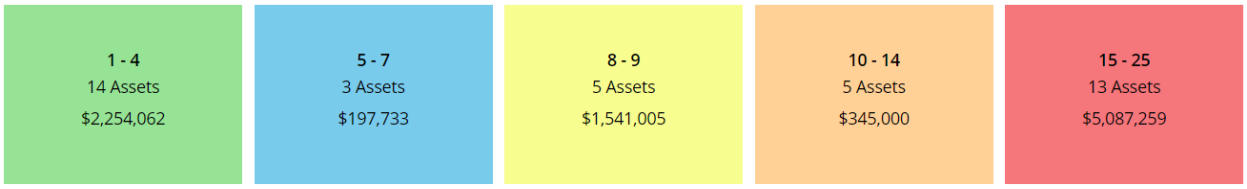


Figure 70 Risk Matrix: Vehicles

11.7 Levels of Service

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

11.7.1 Community Levels of Service

Service Attribute	Qualitative Description	Current LOS (2023)
Scope	Description, which may include images, of the types of vehicles (i.e. light, medium, and heavy duty) that the municipality operates and the services that they help to provide to the community	Fire vehicles include water tankers, pumpers, service trucks, and rescue vans, ensuring readiness for emergency response. Recreation vehicles include light duty vehicles such as pick-up trucks and cargo vans for services such as park maintenance and marina servicing. Public Works vehicles, such as snowplows and pick-up trucks, are vital for ensuring safe road conditions and managing infrastructure during inclement weather and construction projects.

Service Attribute	Qualitative Description	Current LOS (2023)
		Administration vehicles include a pick-up truck, van, and SUV and ensure efficient bylaw enforcement and general transportation (i.e. inspections) can be provided for administrative staff.

Table 42 Community Levels of Service: Vehicles

11.7.2 Technical Levels of Service

Service Attribute	Technical Metric	Current LOS (2023)
Quality	Average condition of vehicles	Fair
Performance	Capital reinvestment rate	2.8%

Table 43 Technical Levels of Service: Vehicles

12. Machinery & Equipment

The Township's Machinery & Equipment portfolio includes that support a variety of general and essential services, including recreation and fire. The total current replacement of vehicles is estimated at approximately $7 million.

12.1 Inventory & Valuation

Table 44 summarizes the quantity and current replacement cost of the Township's various machinery and equipment assets as managed in its primary asset management register, Citywide.

Segment	Quantity	Unit of Measure	Replacement Cost	Primary RC Method
Administration	184	Assets	$1,014,000	CPI
Fire	133	Assets	$680,000	CPI
Landfill	2	Assets	$1,200,000	User-Defined
Library	17,867[11]	Assets	$1,343,000	CPI
Public Works	24	Assets	$2,472,000	User-Defined
Recreational	28	Assets	$976,000	CPI
TOTAL			**$7,685,000**	

Table 44 Detailed Asset Inventory: Machinery & Equipment

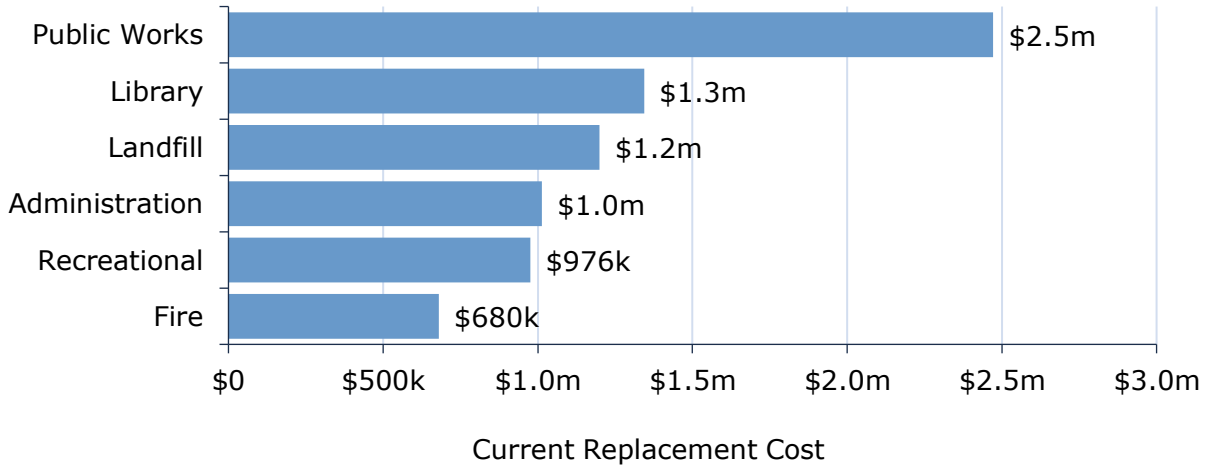


Figure 71 Portfolio Valuation: Machinery & Equipment

[11] Some library assets, such as books, are quantified by individual books while other assets are pooled. This number may not accurately reflect the number of library assets owned.

12.2 Asset Condition

Figure 72 summarizes the replacement cost-weighted condition of the Township's machinery and equipment portfolio. Based partially on age data and partially on staff estimated conditions, 28% of assets are in fair or better condition; the remaining 72% are in poor or worse condition. These assets may be candidates for replacement in the short term; similarly, assets in fair condition may require rehabilitation or replacement in the medium term and should be monitored for further degradation in condition.

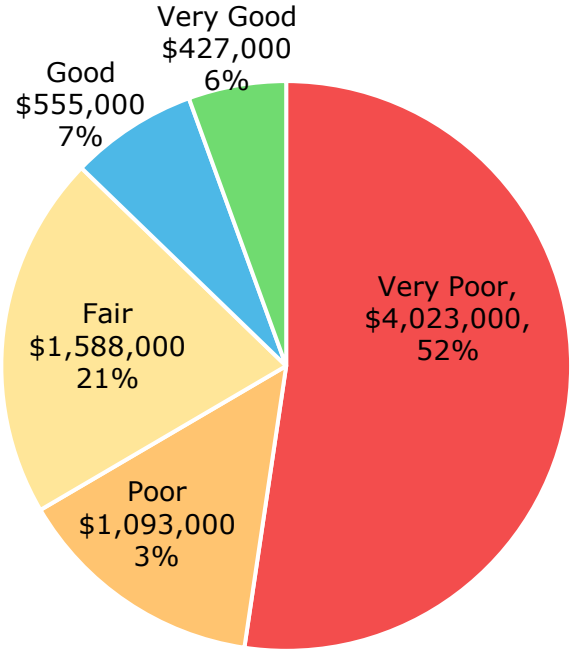


Figure 72 Asset Condition: Machinery & Equipment Overall

Figure 73 summarizes the age-based condition of machinery & equipment by each department. The majority of assets across all departments, with the exception of the landfill, are in poor or worse condition

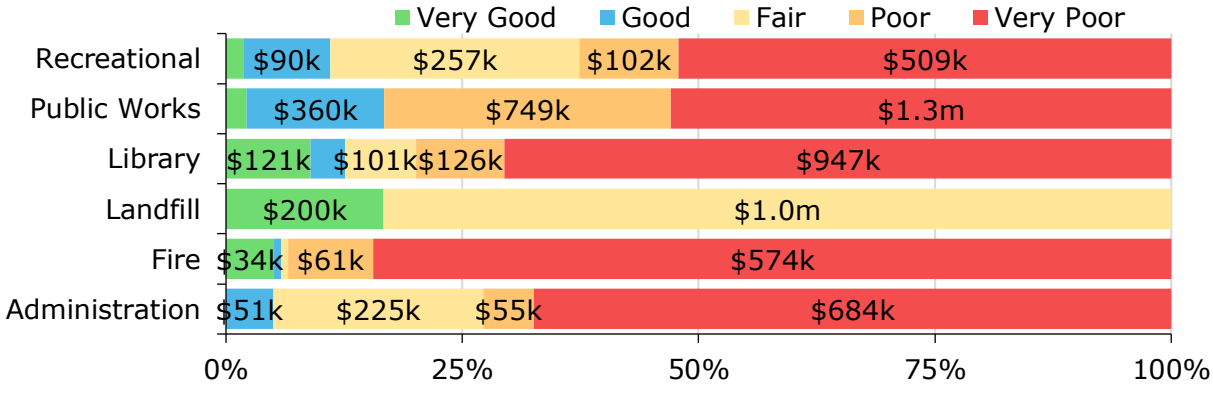


Figure 73 Asset Condition: Machinery & Equipment by Segment

12.3 Age Profile

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

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

Figure 74 illustrates the average current age of each asset type and its estimated useful life. Both values are weighted by the replacement cost of individual assets.

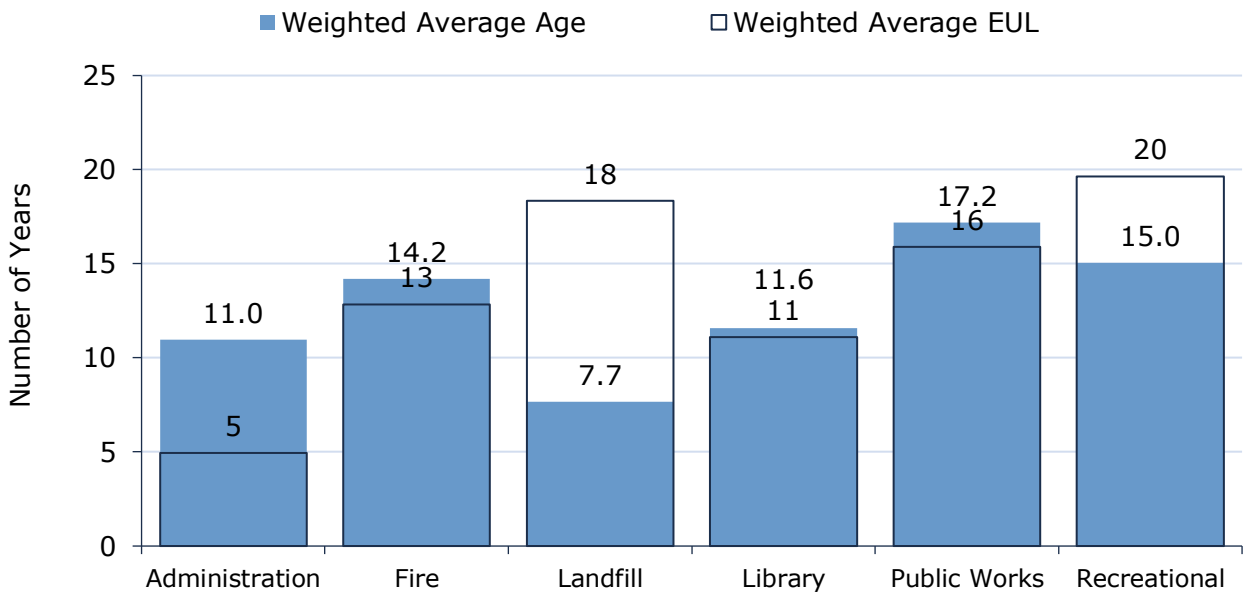


Figure 74 Estimated Useful Life vs. Asset Age: Machinery & Equipment

Age analysis reveals that, on average, with he exception of the landfill, most machinery and equipment assets are in the latter stages of their expected life or have exceeded their expected life.

12.4 Current Approach to Lifecycle Management

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

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

Activity Type	Description of Current Strategy
Maintenance	Oil changes and routine maintenance is completed as per manufacturer recommendations
	All other maintenance activities are completed on a reactive basis when operational issues are identified (e.g., mechanical breakdown, deficiencies identified during daily inspections)
Replacement	Without the availability of up-to-date condition assessment information replacement activities are purely reactive in nature
Inspections	Heavy equipment is inspected by the operator daily before use, however, these inspections identify deficiencies but do not provide overall condition ratings

Table 45 Lifecycle Management Strategy: Machinery & Equipment

12.5 Forecasted Long-Term Replacement Needs

Figure 75 illustrates the cyclical short-, medium- and long-term infrastructure replacement requirements for the Township's machinery and equipment portfolio. This analysis was run until 2073 to capture at least one iteration of replacement for the longest-lived asset in Citywide Assets, the Township's primary asset management system and asset register. The Township's average annual requirements (red dotted line) total $716,000 for all machinery and equipment. Although actual spending may fluctuate substantially from year to year, this figure is a useful benchmark value for annual capital expenditure targets (or allocations to reserves) to ensure projects are not deferred and replacement needs are met as they arise.

Replacement needs are forecasted to remain relatively consistent over the next 50-year projection period, peaking at $4.2 million between 2054 and 2058. 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.

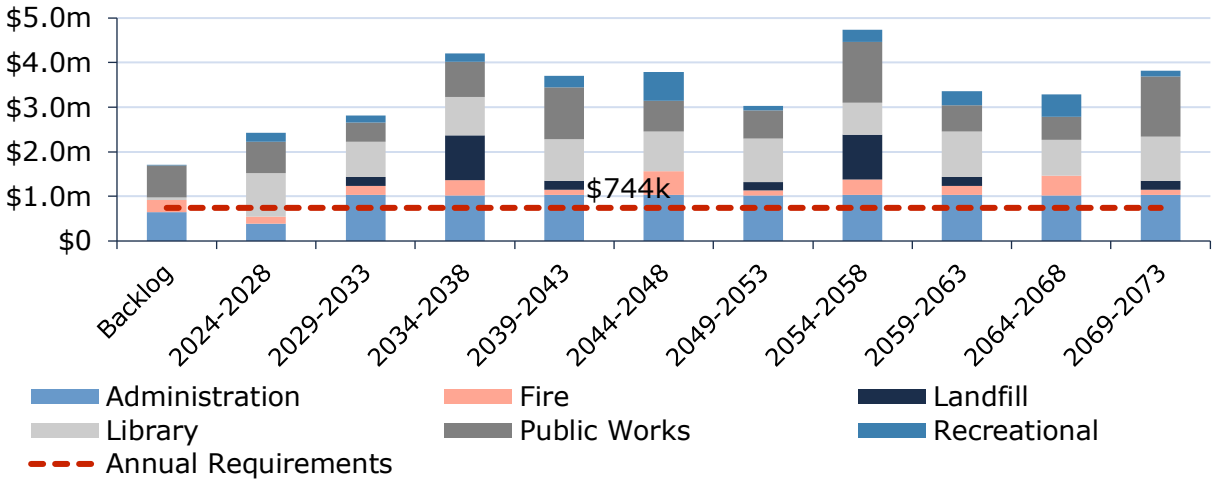


Figure 75 Forecasted Capital Replacement Needs: Machinery & Equipment 2024-2073

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

Tables summarizing the projected lifecycle activities (rehabilitation and replacements) that may be undertaken in the next 10 years to support current levels of service can be found in Appendix B – 10-Year Capital Requirements.

12.6 Risk Analysis

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

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

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

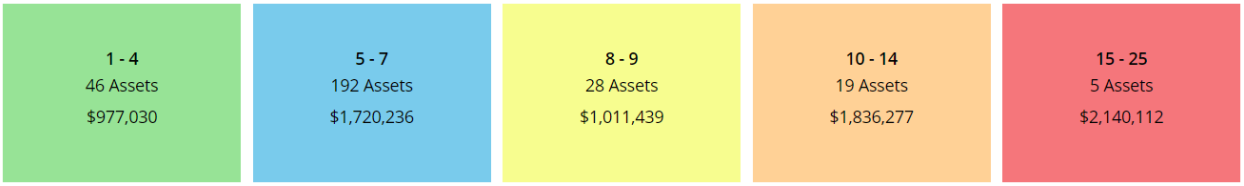


Figure 76 Risk Matrix: Machinery & Equipment

12.7 Levels of Service

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

12.7.1 Community Levels of Service

Service Attribute	Qualitative Description	Current LOS (2023)
Scope	Description, which may include images, of the types of equipment that the municipality operates and the services that they help to provide to the community	Administration is supported by equipment such as computers, monitors, tablets, software, and printers. Fire is supported by equipment such as ice rescue boats, thermal imaging cameras, SCBAs, and bunker suits. The landfill is supported by a single loader/backhoe. The library is supported by books and shelving. Recreation is supported by playground structures, tractors, and computers. Public Works is supported by equipment such as graders, snowblowers, trailers, mowers, and a backhoe.

Table 46 Community Levels of Service: Machinery & Equipment

12.7.2 Technical Levels of Service

Service Attribute	Technical Metric	Current LOS (2023)
Quality	Average condition of equipment	Fair
Performance	Capital reinvestment rate	1.5%

Table 47 Technical Levels of Service: Machinery & Equipment

Strategies

Growth

Financial Strategies

13. Growth

The demand for infrastructure and services will change over time based on a combination of internal and external factors. Understanding the key drivers of growth and demand will allow the Township to plan for new infrastructure more effectively, and the upgrade or disposal of existing infrastructure. Increases or decreases in demand can affect what assets are needed and what level of service meets the needs of the community.

13.1 United Counties of Prescott and Russell Official Plan (November 2018)

The United Counties of Prescott and Russell is the easternmost County in Ontario, located between the City of Ottawa on the west and the Province of Quebec on the east. The County comprises eight local municipalities including: The City of Clarence-Rockland, the Town of Hawkesbury, the Village of Casselman, the Township of Alfred and Plantagenet, the Township of Champlain, the Township of East Hawkesbury, the Nation Municipality, and the Township of Russell.

The goal of the Official Plan is to provide guidance and direction to growth and development, redevelopment, and/or conservation activities in the United Counties. Council adopted a 5 year review on August 2015 and the document was consolidated in November 2018. The Official Plan spans a twenty-year period until 2035.

Table 48 outlines the population, employment, and household forecasts allocated to Alfred-Plantagenet.

Year	2011	2031	2035
Population	9,541	11,546	11,940
Employment	2,668	2,990	3,101
Households	3,730	4,533	4,626

Table 48 Alfred and Plantagenet Population Forecasts

Much of the County's population, employment, and housing growth forecasts are based on December 2012 document by Hemson Consulting titled, "Growth Forecast and Land Needs Analysis – United Counties of Prescott and Russell."

Population is expected to increase throughout the County. An estimate of growth was derived and downscaled to local municipalities based on historic building permits from Statistics Canada, adjusted for expected shifts in the pattern of growth arising form migration patterns. Migration from the City of Ottawa is expected to be a key driver of population growth in the County. The City of Ottawa's growth may further increase development pressure in the surrounding regional market area, particularly in western portions of the County. The local housing forecast reflect the anticipation that Ottawa commuter-based development pressure continues in the coming years.

The Official Plan suggests a housing growth distribution of 85-15 between urban/community and rural for the western portion of the County, including Wendover. In other parts of the County, a 70-30 urban/community and rural split is established. Following this distribution

approach maximizes the development on available infrastructure while the intensification allows future infrastructure expansion to be completed in a more cost-effective manner.

13.2 Impact of Growth on Lifecycle Activities

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

Planning for forecasted population growth may require the expansion of existing infrastructure and services. As growth-related assets are constructed or acquired, they should be integrated into the Township's AMP. While the addition of residential units will add to the existing assessment base and offset some of the costs associated with growth, the Township will need to review the lifecycle costs of growth-related infrastructure. These costs should be considered in long-term funding strategies that are designed to, at a minimum, maintain the current level of service.

14. Financial Strategy

14.1 Financial Strategy Overview

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

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

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

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

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

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

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

14.1.1 Annual Requirements & Capital Funding

Annual Requirements

The annual requirements represent the amount the Township should allocate annually to each asset category to meet replacement needs as they arise, prevent infrastructure backlogs and achieve long-term sustainability. In total, the Township must allocate approximately $6.81 million annually to address capital requirements for the assets included in this AMP.

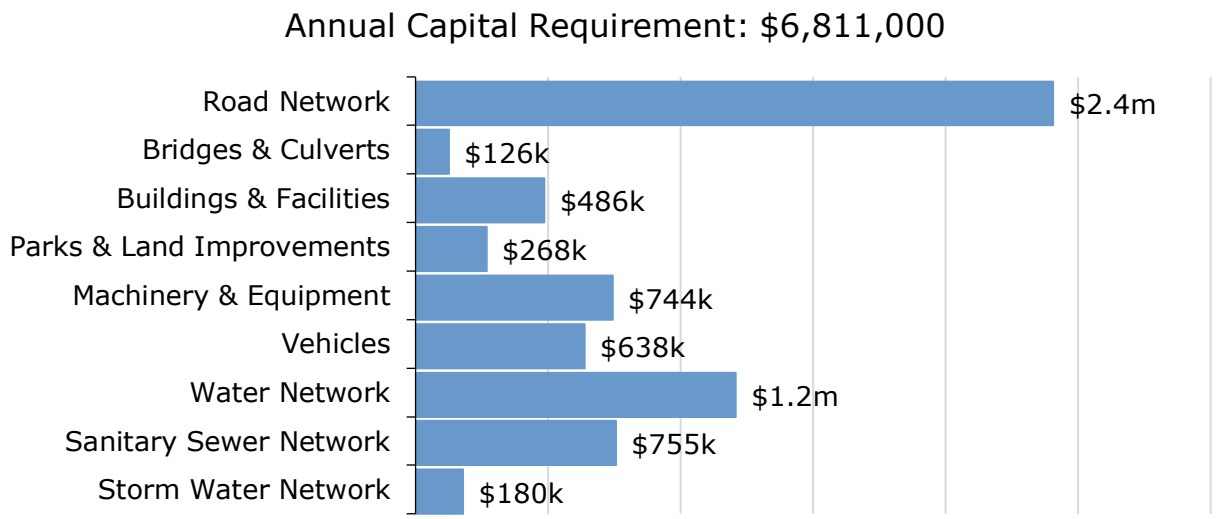


Figure 77 Average Annual Capital Requirements by Asset Category

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

However, for the Road Network, lifecycle management strategies have been developed to identify capital costs that are realized through strategic rehabilitation and renewal of the Township's roads. 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:

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

Asset Category	Annual Requirements (Replacement Only)	Annual Requirements (Lifecycle Strategy)	Difference
Road Network	$3,832,000	$2,406,000	$1,426,000

Table 49 Replacement Only vs. Lifecycle Strategies Cost Savings

The implementation of a proactive lifecycle strategy for roads leads to a potential annual cost avoidance of $1.43 million for the Road Network. This represents an overall reduction of the annual requirements by 37%. As the lifecycle strategy scenario represents the lowest cost option available to the Township, we have used these annual requirements in the development of the financial strategy.

Annual Funding Available

Based on a historical analysis of sustainable capital funding sources, the Township is committing approximately $2.50 million towards capital projects per year. Given the annual capital requirement of $6.81 million, there is currently a funding gap of $4.31 million annually.

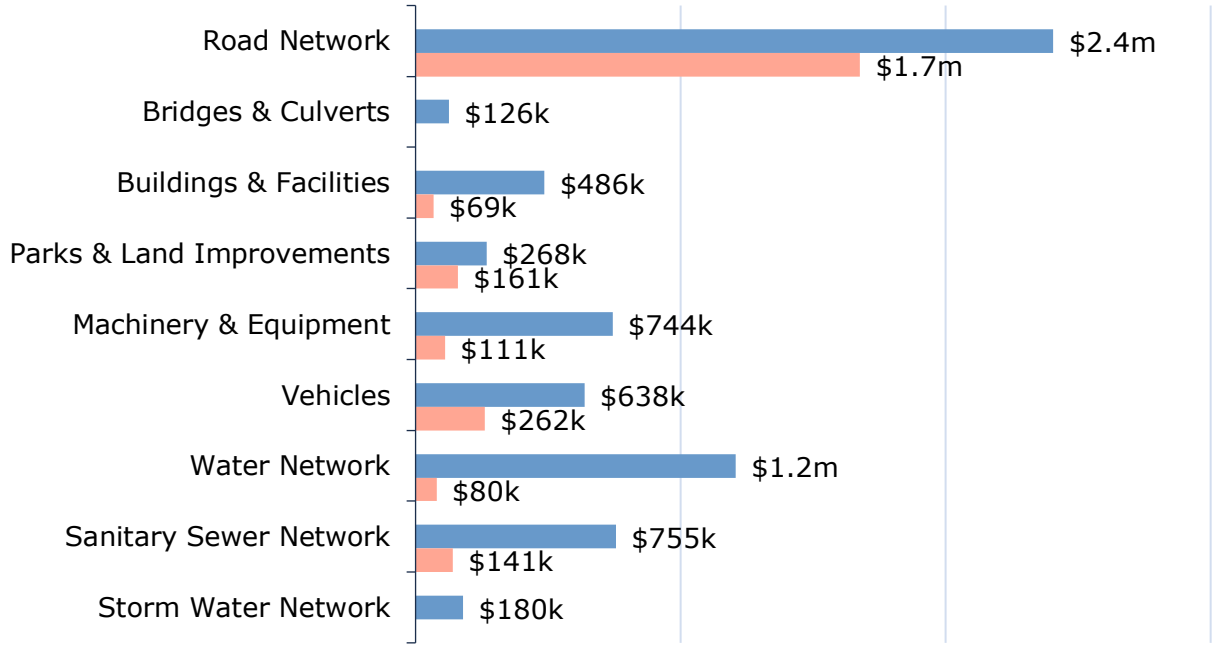


Figure 78 Annual Capital Requirements vs. Available Funding

14.2 Funding Objective

We have developed a scenario that would enable Alfred and Plantagenet to achieve full funding within 1 to 20 years for the following assets:

1. **Tax Funded Assets:** Road Network, Stormwater Network, Bridges & Culverts, Buildings & Facilities, Machinery & Equipment, Parks & Land Improvements, and Vehicles
2. **Rate-Funded Assets:** Water Network, Sanitary Sewer Network

Note: For the purposes of this AMP, we have excluded gravel roads since they are a perpetual maintenance asset and end of life replacement calculations do not normally apply. If gravel roads are maintained properly, they can theoretically have a limitless service life.

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

14.3 Financial Profile: Tax Funded Assets

14.3.1 Current Funding Position

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

Asset Category	Avg. Annual Require-ment	Annual Funding Available					Annual Deficit
		Taxes	CCBF	OCIF	UCPR[12]	Total Available	
Road Network	2,406,000	499,000	320,000	607,000	250,000	1,676,000	729,000
Bridges & Culverts	126,000	0	0	0	0	0	126,000
Stormwater Network	180,000	0	0	0	0	0	180,000
Buildings & Facilities	486,000	69,000	0	0	0	69,000	417,000
Parks & Land Improvements	268,000	161,000	0	0	0	161,000	107,000
Vehicles	638,000	262,000	0	0	0	262,000	376,000
Machinery & Equipment	743,000	111,000	0	0	0	111,000	632,000
Total	**4,848,000**	**1,102,000**	**320,000**	**607,000**	**250,000**	**2,279,000**	**2,569,000**

Table 50 Annual Funding Available for Tax Funded Assets

The average annual investment requirement for the above categories is $4.85 million. Annual revenue currently allocated to these assets for capital purposes is $2.28 million leaving an annual deficit of $2.57 million. Put differently, these infrastructure categories are currently funded at 47% of their long-term requirements.

[12] Government Contribution from the United Counties Prescott Russell.

14.3.2 Full Funding Requirements

In 2023, the Township of Alfred and Plantagenet budgeted annual tax revenues of $8.46 million. As illustrated in the following table, without consideration of any other sources of revenue or cost containment strategies, full funding would require the following tax change over time:

Asset Category	Tax Change Required for Full Funding
Road Network	8.6%
Bridges & Culverts	1.5%
Stormwater Network	2.1%
Buildings & Facilities	4.9%
Parks & Land Improvements	1.3%
Vehicles	4.4%
Machinery & Equipment	7.5%
Total	**30.3%**

Table 51 Full Funding Tax Increases for Tax Funded Categories

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

a) Alfred and Plantagenet's debt payments for these asset categories will be decreasing by $215,000 over the next 5 years, $274,000 over the next 10 years, $326,000 over the next 15 years, and $401,000 over the next 20 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:

	Tax Increases Without Capturing Changes			
	5 Years	**10 Years**	**15 Years**	**20 Years**
Infrastructure Deficit	2,569,000	2,569,000	2,569,000	2,569,000
Change in Debt Costs	N/A	N/A	N/A	N/A
Resulting Infrastructure Deficit:	**2,569,000**	**2,569,000**	**2,569,000**	**2,569,000**
Tax Increase Required	30.4%	30.4%	30.4%	30.4%
Annually:	**5.5%**	**2.7%**	**1.8%**	**1.4%**

Table 52 Annual Tax Increase Requirements without Debt Reallocation

	Tax Increases With Capturing Changes			
	5 Years	**10 Years**	**15 Years**	**20 Years**
Infrastructure Deficit	2,569,000	2,569,000	2,569,000	2,569,000
Change in Debt Costs	**-215,000**	**-274,000**	**-326,000**	**-401,000**
Resulting Infrastructure Deficit:	**2,354,000**	**2,295,000**	**2,243,000**	**2,168,000**
Tax Increase Required	27.8%	27.1%	26.5%	25.6%
Annually:	**5.1%**	**2.5%**	**1.6%**	**1.2%**

Table 53 Annual Tax Increase Requirements with Debt Reallocation

14.3.3 Financial Strategy Recommendations

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

a) when realized, reallocating the debt cost reductions of $326,000 to the infrastructure deficit as outlined above.
b) increasing tax revenues by 1.6% 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.
c) allocating the current CCBF, OCIF and UCPR contributions revenue as outlined previously.
d) increasing existing and future infrastructure budgets by the applicable inflation index on an annual basis in addition to the deficit phase-in.

Notes:

1. As in the past, periodic senior government infrastructure funding will most likely be available during the phase-in period. By Provincial AMP rules, this periodic funding cannot be incorporated into an AMP unless there are firm commitments in place. We have included OCIF formula-based funding, if applicable, since this funding is a multi-year commitment[13].
2. We realize that raising tax revenues by the amounts recommended above for infrastructure purposes will be very difficult to do. However, considering a longer phase-in window may have even greater consequences in terms of infrastructure failure.

Although this option achieves full funding on an annual basis in 15 years and provides financial sustainability over the period modeled, the recommendations do require prioritizing capital projects to fit the resulting annual funding available. Current data shows a pent-up investment demand of $3.3 million for the Road Network, $1.1 million for Bridges & Culverts, $1.7 million for Machinery & Equipment, and $2.2 million for Vehicles.

[13] 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.

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

14.4 Financial Profile: Rate Funded Assets

14.4.1 Current Funding Position

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

Asset Category	Avg. Annual Require-ment	Annual Funding Available				Annual Deficit
		Rates	CCBF	OCIF	Total Available	
Water Network	1,208,000	81,000	0	0	81,000	1,127,000
Sanitary Sewer Network	755,000	141,000	0	0	141,000	614,000
Total	**1,963,000**	**222,000**	**0**	**0**	**222,000**	**1,741,000**

Table 54 Annual Funding Available for Rate Funded Assets

The average annual investment requirement for the above categories is $1.96 million. Annual revenue currently allocated to these assets for capital purposes is $222,000 leaving an annual deficit of $1.74 million. Put differently, these infrastructure categories are currently funded at 11% of their long-term requirements.

14.4.2 Full Funding Requirements

In 2023, Alfred and Plantagenet budgeted annual water revenues of $1.92 million and annual sanitary revenues of $1.22 million. As illustrated in the table below, without consideration of any other sources of revenue, full funding would require the following changes over time:

Asset Category	Rate Change Required for Full Funding
Water Network	58.7%
Sanitary Sewer Network	50.3%

Table 55 Full Funding Rate Increases for Rate Funded Categories

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

Water Network Rate Increases				
	5 Years	**10 Years**	**15 Years**	**20 Years**
Infrastructure Deficit	1,127,000	1,127,000	1,127,000	1,127,000
Decrease in Debt Payments	**0**	**0**	**-18,000**	**-18,000**
Resulting Infrastructure Deficit:	**1,127,000**	**1,127,000**	**1,109,000**	**1,109,000**
Rate Increase Required	58.7%	58.7%	57.8%	57.8%
Annually:	**9.7%**	**4.8%**	**3.1%**	**2.4%**

Table 56 Annual Rate Increase Requirements: Water Network

Sanitary Sewer Network Rate Increases				
	5 Years	**10 Years**	**15 Years**	**20 Years**
Infrastructure Deficit	614,000	614,000	614,000	614,000
Decrease in Debt Payments	0	0	0	0
Resulting Infrastructure Deficit:	**614,000**	**614,000**	**614,000**	**614,000**
Rate Increase Required	50.3%	50.3%	50.3%	50.3%
Annually:	**8.5%**	**4.2%**	**2.8%**	**2.1%**

Table 57 Annual Rate Increase Requirements: Sanitary Sewer Network

14.4.3 Financial Strategy Recommendations

Considering all of the above information, we recommend the 15-year option that includes debt cost reallocations. This involves full funding being achieved over 15 years by:

a) when realized, reallocating the debt cost reductions of $18,000 for water services to the applicable infrastructure deficit.
b) increasing rate revenues by 3.1% for water services and 2.8% for sanitary services 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.
c) 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.

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

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

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:

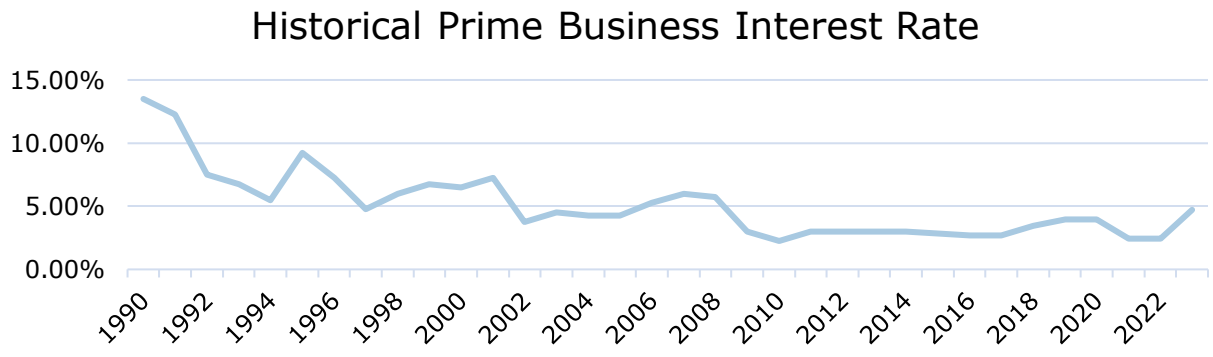


Table 58 Historical Prime Rates

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.

For reference purposes, the following table outlines the premium paid on a project if financed by debt. For example, a $1 million project financed at 3.0%[14] over 15 years would result in a 26% premium or $260,000 of increased costs due to interest payments. For simplicity, the table does not consider the time value of money or the effect of inflation on delayed projects.

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

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

Table 59 Insurance Premiums Paid

The following tables outline how Alfred and Plantagenet has historically used debt for investing in the asset categories as listed. There is currently $4.89 million of debt outstanding for the assets covered by this AMP with corresponding principal and interest payments of $608,000, well within its provincially prescribed maximum of $3.02 million.

Asset Category	Current Debt Outstand-ing	Use of Debt in the Last Five Years				
		2019	2020	2021	2022	2023
Road Network	0	0	0	0	0	0
Bridges & Culverts	0	0	0	0	0	0
Stormwater Network	0	0	0	0	0	0
Buildings & Facilities	1,274,000	0	0	356,000	0	0
Parks & Land Improvements	0	0	0	0	0	0
Vehicles	278,000	285,000	289,000	0	0	0
Machinery & Equipment	169,000	143,000	0	0	0	0
Total Tax Funded:	**1,720,000**	**427,000**	**289,000**	**356,000**	**0**	**0**
Water Network	198,000	0	0	0	0	0
Sanitary Sewer Network	2,970,000	0	0	0	0	0
Total Rate Funded:	**3,167,000**	**0**	**0**	**0**	**0**	**0**

Table 60 Use of Debt 2019-2023

Asset Category	Principal & Interest Payments in the Next Ten Years						
	2023	2024	2025	2026	2027	2028	2033
Road Network	0	0	0	0	0	0	0
Bridges & Culverts	0	0	0	0	0	0	0
Stormwater Network	0	0	0	0	0	0	0
Buildings & Facilities	206,000	206,000	206,000	127,000	127,000	127,000	127,000
Parks & Land Improvements	0	0	0	0	0	0	0
Vehicles	140,000	109,000	46,000	35,000	35,000	35,000	0
Machinery & Equipment	55,000	52,000	24,000	24,000	24,000	24,000	0
Total Tax Funded:	**401,000**	**367,000**	**276,000**	**186,000**	**186,000**	**186,000**	**127,000**
Water Network	18,000	18,000	18,000	18,000	18,000	18,000	18,000
Sanitary Sewer Network	190,000	190,000	190,000	190,000	190,000	190,000	190,000
Total Rate Funded:	**208,000**	**208,000**	**208,000**	**208,000**	**208,000**	**208,000**	**208,000**

Table 61 Summary of Principal and Interest Payments

The revenue options outlined in this plan allows Alfred and Plantagenet to fully fund its long-term infrastructure requirements without further use of debt.

14.6 Use of Reserves

14.6.1 Available Reserves

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

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

By asset category, the table below outlines the details of the reserves currently available to Alfred and Plantagenet.

Asset Category	Balance at December 31, 2023
Road Network	400,000
Bridges & Culverts	21,000
Stormwater Network	30,000
Buildings & Facilities	0
Parks & Land Improvements	157,000[15]
Vehicles	239,000
Machinery & Equipment	0
Total Tax Funded:	**847,000**[16]
Water Network	2,831,000
Sanitary Sewer Network	4,483,000
Total Rate Funded:	**7,314,000**

Table 62 Current Reserves Balances

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

a) breadth of services provided

[15] This balance does not include the $1.375m reserve dedicated to the landfill for remediation post-closure.
[16] This balance does not include the "Working Capital" reserve as it is intended for operational expenses, one-time expenditures, and revenue deficits.

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

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

14.6.2 Recommendation

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

Appendices

Appendix A – Infrastructure Report Card

Appendix B – 10-Year Capital Requirements

Appendix C – Level of Service Images

Appendix D – Risk Rating Criteria

Appendix A – Infrastructure Report Card

Asset Category	Replacement Cost	Asset Condition	Financial Capacity	
Road Network	**$43,391,000**	**Fair (50%)**	Annual Requirement:	$2,406,000
			Funding Available:	$1,676,000
			Annual Deficit:	**$729,000**
Bridges & Culverts	**$5,491,000**	**Good (60%)**	Annual Requirement:	$126,000
			Funding Available:	-
			Annual Deficit:	**$126,000**
Water Network	**$71,787,000**	**Good (74%)**	Annual Requirement:	$1,208,000
			Funding Available:	$80,000
			Annual Deficit:	**$1,127,000**
Sanitary Sewer Network	**$50,088,000**	**Very Good (80%)**	Annual Requirement:	$755,000
			Funding Available:	$141,000
			Annual Deficit:	**$614,000**
Storm Water Network	**$12,434,000**	**Good (77%)**	Annual Requirement:	$180,000
			Funding Available:	-
			Annual Deficit:	**$180,000**
Buildings & Facilities	**$23,635,000**	**Good (66%)**	Annual Requirement:	$486,000
			Funding Available:	$69,000
			Annual Deficit:	**$418,000**
Parks & Land Improvements	**$6,942,000**	**Very Good (85%)**	Annual Requirement:	$268,000
			Funding Available:	$161,000
			Annual Deficit:	**$107,000**
Vehicles	**$9,425,000**	**Poor (38%)**	Annual Requirement:	$638,000
			Funding Available:	$262,000
			Annual Deficit:	**$376,000**
Machinery & Equipment	**$7,685,000**	**Poor (23%)**	Annual Requirement:	$744,000
			Funding Available:	$111,000
			Annual Deficit:	**$632,000**
Overall	**$230,878,000**	**Fair (57%)**	Annual Requirement:	$6,811,000
			Funding Available:	$2,501,000
			Annual Deficit:	**$4,310,000**

Appendix B – 10-Year Capital Requirements

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

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

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

Road Network

Segment	Back-log	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033
Curbs	$615k	$0	$43k	$49k	$135k	$0	$0	$0	$0	$0	$0
DST Roads	$0	$135k	$152k	$335k	$242k	$55k	$135k	$152k	$529k	$242k	$38k
Gravel Roads	$834k	$19k	$23k	$1.9m	$1.5m	$246k	$853k	$23k	$1.6m	$1.8m	$246k
Hot Mix Roads	$102k	$2.5m	$60k	$344k	$76k	$1.2m	$59k	$941k	$486k	$3.1m	$116k
Roadside Appurtenances	$0	$0	$0	$0	$0	$0	$0	$0	$63k	$17k	$147k
Sidewalks	$837k	$10k	$0	$56k	$34k	$321k	$0	$108k	$112k	$150k	$247k
Street Lights & Fixtures	$879k	$2k	$6k	$2k	$34k	$12k	$0	$14k	$0	$0	$710k
Total	**$3.3m**	**$2.6m**	**$283k**	**$2.7m**	**$2.0m**	**$1.8m**	**$1.0m**	**$1.2m**	**$2.8m**	**$5.3m**	**$1.5m**

Table 63 System Generated 10-Year Capital Replacement Forecast: Road Network

Bridges & Culverts

Segment	Back-log	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033
Bridges	$0	$7k	$0	$0	$0	$0	$0	$0	$0	$0	$0
Structural Culverts	$1.1m	$0	$0	$0	$0	$39k	$0	$0	$0	$0	$93k
Total	**$1.1m**	**$7k**	**$0**	**$0**	**$0**	**$39k**	**$0**	**$0**	**$0**	**$0**	**$93k**

Table 64 System Generated 10-Year Capital Replacement Forecast: Bridges & Culverts

Water Network

Segment	Back-log	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033
Hydrants	$0	$38k	$38k	$38k	$38k	$38k	$38k	$38k	$129k	$0	$0
Mains	$0	$69k	$69k	$69k	$69k	$69k	$69k	$69k	$0	$0	$0
Meters	$0	$15k	$15k	$15k	$15k	$15k	$15k	$1.1m	$3k	$58k	$60k
Water Equipment	$0	$15k	$15k	$15k	$15k	$15k	$15k	$192k	$0	$0	$33k
Water Facilities	$0	$92k	$92k	$92k	$92k	$92k	$92k	$92k	$0	$0	$0
Total	**$0**	**$230k**	**$230k**	**$230k**	**$230k**	**$230k**	**$230k**	**$1.5m**	**$132k**	**$58k**	**$92k**

Table 65 System Generated 10-Year Capital Replacement Forecast: Water Network

Sanitary Sewer Network

Segment	Back-log	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033
Mains	$0	$137k	$137k	$137k	$137k	$137k	$137k	$137k	$0	$0	$0
Manholes	$0	$12k	$12k	$12k	$12k	$12k	$12k	$12k	$0	$0	$0
Sanitary Equipment	$0	$44k	$44k	$44k	$44k	$44k	$44k	$44k	$0	$0	$0
Sanitary Facilities	$0	$12k	$12k	$12k	$12k	$12k	$12k	$12k	$0	$0	$0
Service Laterals	$0	$12k	$12k	$12k	$12k	$12k	$12k	$12k	$0	$0	$0
Valves	$0	$12k	$12k	$12k	$12k	$12k	$12k	$12k	$0	$0	$0
Total	**$0**	**$230k**	**$230k**	**$230k**	**$230k**	**$230k**	**$230k**	**$230k**	**$0**	**$0**	**$0**

Table 66 System Generated 10-Year Capital Replacement Forecast: Sanitary Sewer Network

Stormwater Network

Segment	Back-log	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033
Catch Basins	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Culverts	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Mains	$0	$25k	$0	$0	$0	$0	$0	$0	$0	$0	$0
Manholes	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Total	**$0**	**$25k**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**

Table 67 System Generated 10-Year Capital Replacement Forecast: Stormwater Network

Buildings & Facilities

Segment	Back-log	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033
Administration	$0	$0	$0	$0	$0	$0	$0	$1.0m	$0	$0	$0
Fire	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Landfill	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Public Works	$0	$0	$0	$0	$0	$0	$0	$1.1m	$0	$0	$0
Recreational	$0	$0	$0	$0	$0	$0	$0	$0	$40k	$0	$80k
Total	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$2.2m**	**$40k**	**$0**	**$80k**

Table 68 System Generated 10-Year Capital Replacement Forecast: Buildings and Facilities

Note: These projections are generated in Citywide and rely on the data available in the asset register. As assessed condition data was not available for many buildings assets, age was used to determine forthcoming replacement needs. Buildings and facilities often contain thousands of assets, each with its own estimated useful life. Currently, however, as the Township's buildings are not fully componentized, there are only 41 assets in the register. Over time, with improved and effective componentization, the alignment between the system generated expenditure requirements, and the Township's capital expenditure forecasts will also increase.

Parks & Land Improvements

Segment	Back-log	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033
Marina	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Parking Lots	$0	$0	$0	$0	$0	$0	$0	$0	$0	$58k	$0
Parks, Sport Fields & Courts	$0	$0	$0	$0	$0	$0	$0	$0	$0	$9k	$0
Pools & Splashpads	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Total	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$67k**	**$0**

Table 69 System Generated 10-Year Capital Replacement Forecast: Parks & Land Improvements

Vehicles

Segment	Back-log	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033
Administration	$0	$0	$0	$0	$48k	$0	$0	$0	$0	$0	$0
Fire	$1.1m	$967k	$248k	$0	$619k	$0	$0	$0	$0	$119k	$0
Public Works	$1.1m	$0	$65k	$0	$65k	$0	$0	$450k	$900k	$65k	$0
Recreational	$0	$0	$0	$0	$40k	$0	$0	$44k	$0	$0	$0
Total	**$2.2m**	**$967k**	**$313k**	**$0**	**$772k**	**$0**	**$0**	**$494k**	**$900k**	**$184k**	**$0**

Table 70 System Generated 10-Year Capital Replacement Forecast: Vehicles

Machinery & Equipment

Segment	Back-log	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033
Administration	$647k	$37k	$50k	$230k	$69k	$0	$665k	$68k	$230k	$51k	$18k
Fire	$280k	$30k	$43k	$0	$43k	$51k	$73k	$3k	$83k	$23k	$26k
Landfill	$0	$0	$0	$0	$0	$0	$0	$0	$0	$200k	$0
Library	$58k	$147k	$327k	$57k	$202k	$242k	$101k	$99k	$225k	$307k	$57k
Public Works	$707k	$159k	$20k	$289k	$229k	$0	$0	$25k	$45k	$0	$360k
Recreational	$2k	$0	$61k	$31k	$38k	$68k	$2k	$57k	$96k	$0	$0
Total	**$1.7m**	**$373k**	**$501k**	**$606k**	**$582k**	**$361k**	**$841k**	**$252k**	**$678k**	**$581k**	**$462k**

Table 71 System Generated 10-Year Capital Replacement Forecast: Machinery & Equipment

Appendix C – Level of Service Images

Road Network

Hot Mix Roads

Valain Street
Asset ID: 4583
Condition: 100

St-Victor Street
Asset ID: 4556
Condition: 80

St-Mary Street
Asset ID: 4574
Condition: 60

Double Surface Treated (DST) Roads

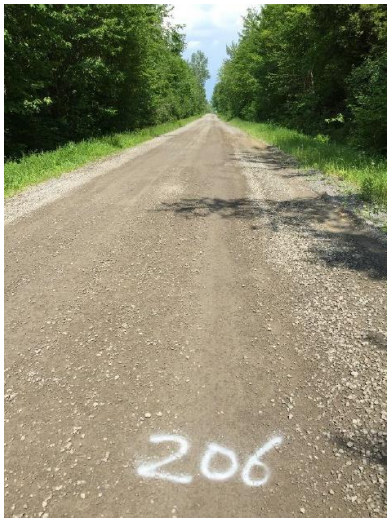
Concession 2 Alfred
Asset ID: 4646
Condition: 80

Concession 7 Plantagenet
Asset ID: 5118
Condition: 60

Concession 4 Alfred
Asset ID: 4688
Condition: 30

Gravel Roads

Concession 9 Plantagenet
Asset ID: 5128
Condition: 60



Concession 7 Plantagenet
Asset ID: 5096
Condition: 40

Concession 5 Alfred
Asset ID: 5077
Condition: 20

Earth Roads

Concession 7 Plantagenet
Asset ID: 5097
Condition: 40

Route 11
Asset ID: 5179
Condition: 20

Concession 8 Alfred
Asset ID: 5109
Condition: 10

Bridges & Culverts

Bridge 001 – Concession 4 & 5, Lot 19 at Atocas Creek

Condition: Poor

Bridge 002 – Concession 3 & 4, Lot 29 at Azatica Creek

Condition: Very Good

Bridge 101 – Concession 1 & 2, Lot 37


Condition: Poor

Bridge 102 – Lefaivre (currently closed and excluded from AMP)


Condition: Very Poor

Bridge XX1 – Pedestrian Bridge in Plantagenet

Condition: Good

Parks & Land Improvements

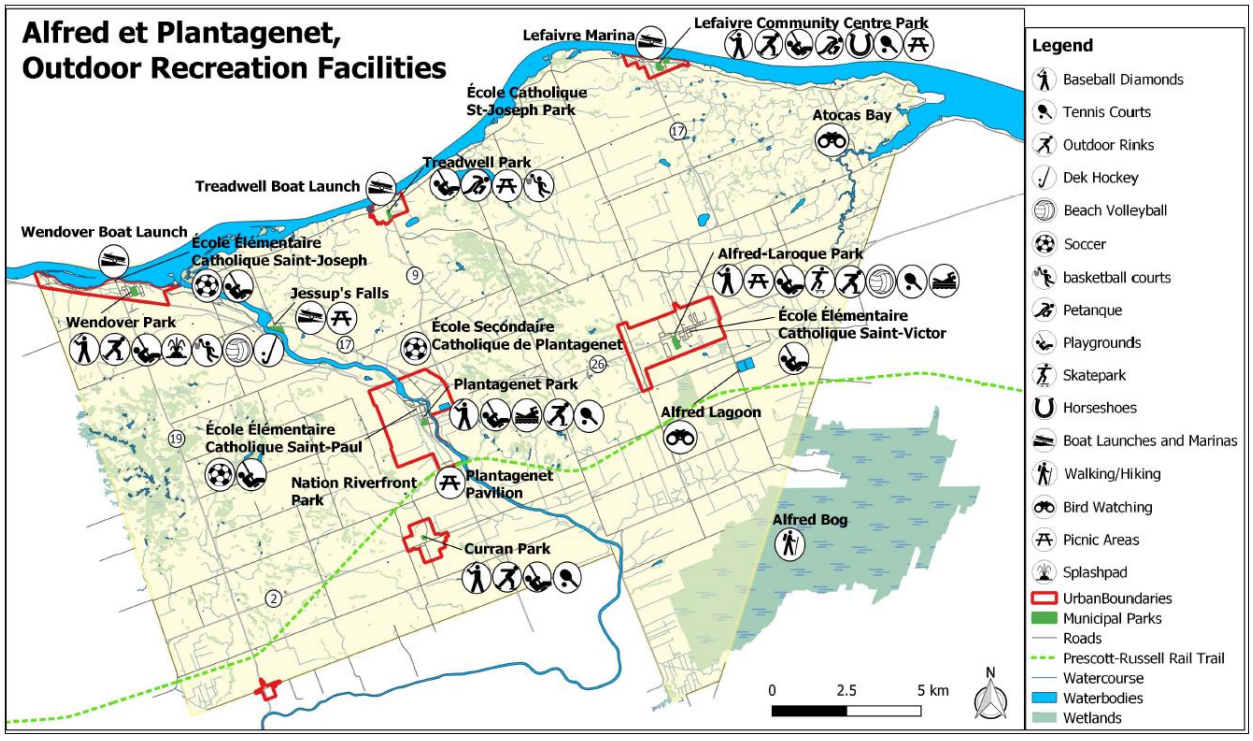


Figure 79 Outdoor Recreation Facilities Map (from 2020 Recreation and Culture Master Plan)

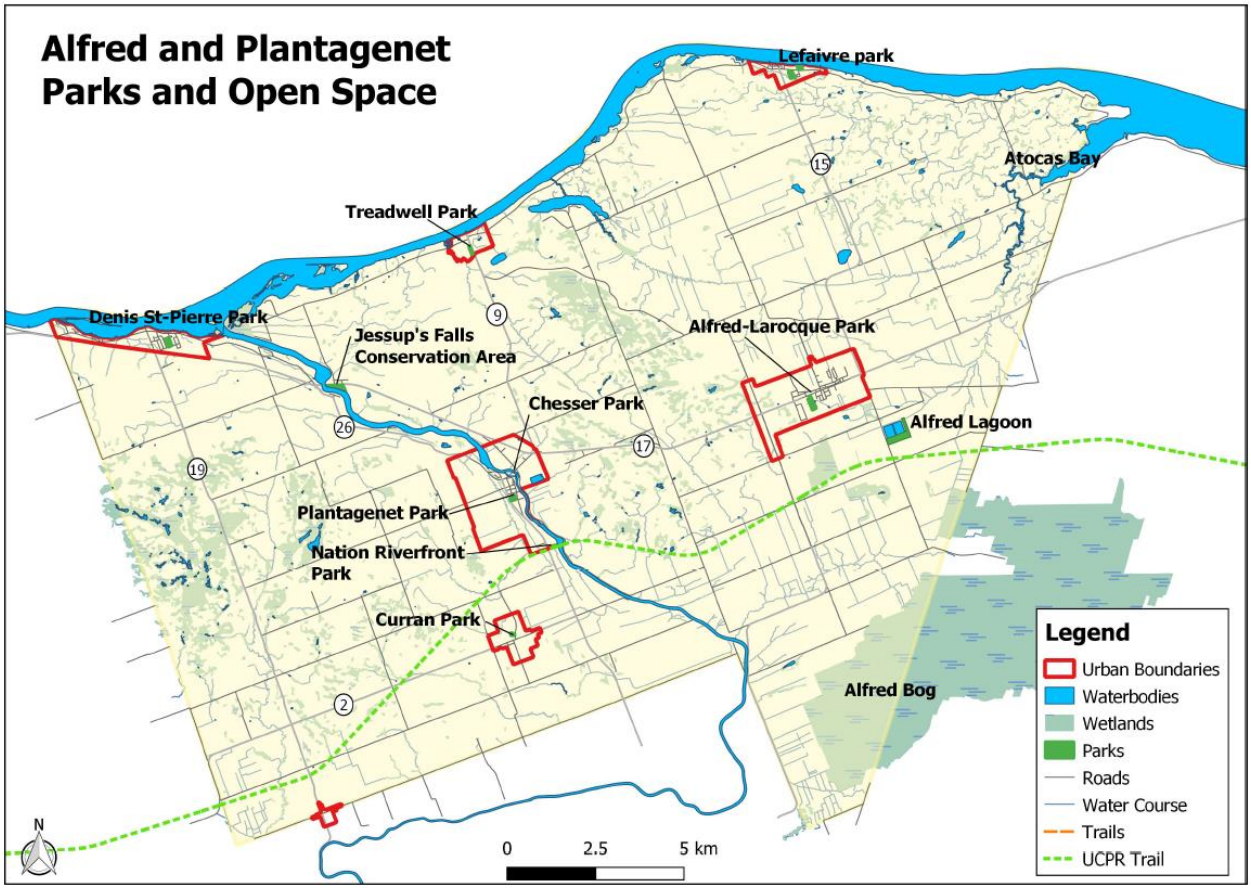


Figure 80 Parks & Open Spaces Map (from 2020 Recreation and Culture Master Plan)

Appendix D – Risk Rating Criteria

Probability of Failure

Asset Category	Risk Criteria	Criteria Weighting	Value/Range	Probability of Failure Score
Road Network (Roads)	Condition	100%	85-100	1
			70-84	2
			55-69	3
			40-54	4
			0-39	5
Road Network (Other Assets) Storm Water Network (Other Assets) Water Network (Other Assets) Sanitary Sewer Network (Other Assets) Vehicles Machinery & Equipment Buildings & Facilities Parks & Land Improvements	Condition	100%	80-100	1
			60-79	2
			40-59	3
			20-39	4
			0-19	5
Bridges & Culverts	Condition	70%	85-100	1
			70-84	2
			55-69	3
			40-54	4
			0-39	5
	Service Life Remaining (%)	20%	80-100	1
			60-79	2
			40-59	3
			20-39	4
			0-19	5
	AADT	10%	0-49	1
			50-199	2
			200-399	3
			400-999	4
			999+	5
Storm Water Network (Mains)	Condition	70%	80-100	1
			60-79	2
			40-59	3
			20-39	4
			0-19	5

Asset Category	Risk Criteria	Criteria Weighting	Value/Range	Probability of Failure Score
Sanitary Sewer Network (Mains)	Pipe Material	30%	PVC	1
			Ultra-Ribbed	1
			Big 'O'	1
			Concrete	3
			CSP	3
			Red Clay	5
	Condition	70%	80-100	1
			60-79	2
			40-59	3
			20-39	4
			0-19	5
	Pipe Material	30%	PVC	2
			Ductile Iron	3
			Asbestos Cement	4
Water Network (Mains)	Condition	70%	80-100	1
			60-79	2
			40-59	3
			20-39	4
			0-19	5
	Pipe Material	30%	PVC	2
			Transite	4
			Asbestos Cement	4

Consequence of Failure

Asset Category	Risk Class-ification	Risk Criteria	Value/ Range	Consequence of Failure Score
Road Network (Roads)	Economic (20%)	Replacement Cost (100%)	$0-$50,000	1
			$50,000-$100,000	2
			$100,000-$250,000	3
			$250,000-$400,000	4
			$400,000+	5
	Operational (30%)	Maintenance Class (100%)	7	1
			5-6	2
			4	3
			1-3	4
	Social (40%)	# of Addresses/ Properties (100%)	0-3	1
			4-10	2
			11-15	3
			16-25	4

			26+	5
	Health & Safety (10%)	Emergency Detour Route (100%)	No	1
			Yes	3
Road Network (Other Assets) Storm Water Network (Other Assets) Water Network (Other Assets) Sanitary Sewer Network (Other Assets) Parks & Land Improvements	Economic (100%)	Replacement Cost (100%)	$0-$50,000	1
			$50,000-$100,000	2
			$100,000-$250,000	3
			$250,000-$400,000	4
			$400,000+	5
Bridges & Culverts	Economic (70%)	Replacement Cost (100%)	$0-$150,000	1
			$150,000-$300,000	2
			$300,000-$450,000	3
			$450,000-$600,000	4
			$600,000+	5
	Social (30%)	Detour Distance (50%)	0-2	1
			2-5	2
			5-8	3
			8-10	4
			10+	5
Storm Water Network (Storm Mains)	Economic (70%)	Replacement Cost (100%)	$0-$10,000	1
			$10,000-$25,000	2
			$25,000-$50,000	3
			$50,000-$100,000	4
			$100,000+	5
	Operational (30%)	Diameter (100%)	0-150mm	1
			151-300mm	2
			301-500mm	3
			501-750mm	4
			751mm+	5
Sanitary Sewer Network (Sanitary Mains)	Economic (70%)	Replacement Cost (100%)	$0-$50,000	1
			$50,000-$150,000	2
			$150,000-$250,000	3
			$250,000-$400,000	4
			$400,000+	5
	Operational (30%)	Pipe Diameter (100%)	0-50mm	1
			51-150mm	2
			151-250mm	3
			251-450mm	4
			451mm+	5
Water Network (Water Mains)	Economic (70%)	Replacement Cost (100%)	$0-$100,000	1
			$100,000-$500,000	2
			$500,000-$1,000,000	3
			$1,000,000-$2,500,000	4

			$2,500,000+	5
	Operational (30%)	Pipe Diameter (100%)	0-50mm	1
			51-150mm	2
			151-250mm	3
			251-400mm	4
			401mm+	5
Vehicles	Economic (70%)	Replacement Cost (100%)	$0-$50,000	1
			$50,000-$150,000	2
			$150,000-$250,000	3
			$250,000-$400,000	4
			$400,000+	5
	Operational (30%)	AMP Segment (100%)	Administration	1
			Recreational	1
			Public Works	2
			Fire	4
Machinery & Equipment	Economic (70%)	Replacement Cost (100%)	$0-$50,000	1
			$50,000-$150,000	2
			$150,000-$250,000	3
			$250,000-$400,000	4
			$400,000+	5
	Operational (30%)	AMP Segment (100%)	Administration	1
			Recreational	1
			Landfill	1
			Public Works	2
			Fire	4
Buildings & Facilities	Economic (70%)	Replacement Cost (100%)	$0-$50,000	1
			$50,000-$150,000	2
			$150,000-$250,000	3
			$250,000-$400,000	4
			$400,000+	5