Town of / Ville de
Penetanguishene

ASSET MANAGEMENT PLAN

2024

This Asset Management Program was prepared by:

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

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Executive Summary

Municipal infrastructure provides the foundation for the economic, social, and environmental health and growth of a community through the delivery of services. The goal of asset management is to balance delivering critical services in a cost-effective manner. This involves the development and implementation of asset management strategies and long-term financial planning.

The overall replacement cost of the asset categories owned by Penetanguishene total $411 million. 80% of all assets analysed are in fair or better condition. Assessed condition data was available for all road assets, some facilities as well as machinery and equipment and some water network assets, for the remaining assets, assessed condition data was unavailable, and asset age was used to approximate condition. Generally, age misstates the true condition of assets, making assessments essential to accurate asset management planning, and a recurring recommendation.

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

To meet capital replacement and rehabilitation needs for existing infrastructure, prevent future infrastructure backlogs, and achieve long-term sustainability, the Town's average annual capital requirement totals $9 million.

Addressing annual infrastructure funding shortfalls is a difficult and long-term endeavour for municipalities. It will require many years to reach full funding for current assets. Short phase-in periods to meet these funding targets may place too high a burden on taxpayers too quickly, whereas a phase-in period beyond 20 years may see a continued deterioration of infrastructure, leading to larger backlogs.

In addition to annual needs, there is also an infrastructure backlog of $45.8 million, comprising assets that remain in service beyond their estimated useful life. It is highly unlikely that all such assets are in a state of disrepair, requiring immediate replacements or full reconstruction. This makes targeted and consistent condition assessments integral to refining long-term replacement and backlog estimates.

Risk frameworks and levels of service targets can then be used to prioritize projects and help select the right lifecycle intervention for the right asset at the right time—including replacement or full reconstruction. The Town has developed preliminary risk models which are integrated with its asset register. These models can produce risk matrices that classify assets based on their risk profiles.

Most municipalities in Ontario, and across Canada, continue to struggle with meeting infrastructure demands. This challenge was created over many decades and will take many years to overcome. To this end, several recommendations should be considered, including:

- Continuous and dedicated improvement to the Town's infrastructure datasets, which form the foundation for all analysis, including financial projections and needs.
- Continuous refinements to the risk and lifecycle models as additional data becomes available. This will aid in prioritizing projects and creating more strategic long-term capital budgets.
- Development of key performance indicators for all infrastructure programs to establish benchmark data to calibrate levels of service targets for 2025 regulatory requirements.
- Continue conducting network-wide assessments to ensure condition information remains reliable.

The Town has taken important steps in building its asset management program, including developing a more complete and accurate asset register—a substantial initiative. Continuous improvement to this inventory will be essential in maintaining momentum, supporting long-term financial planning, and delivering affordable service levels to the community.

About this Document

The Penetanguishene Asset Management Plan was developed in accordance with Ontario Regulation 588/17 ("O. Reg 588/17"). It contains a comprehensive analysis of Penetanguishene's infrastructure portfolio. This is a living document that should be updated regularly as additional asset and financial data becomes available.

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. Along with creating better performing organizations, more livable 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.

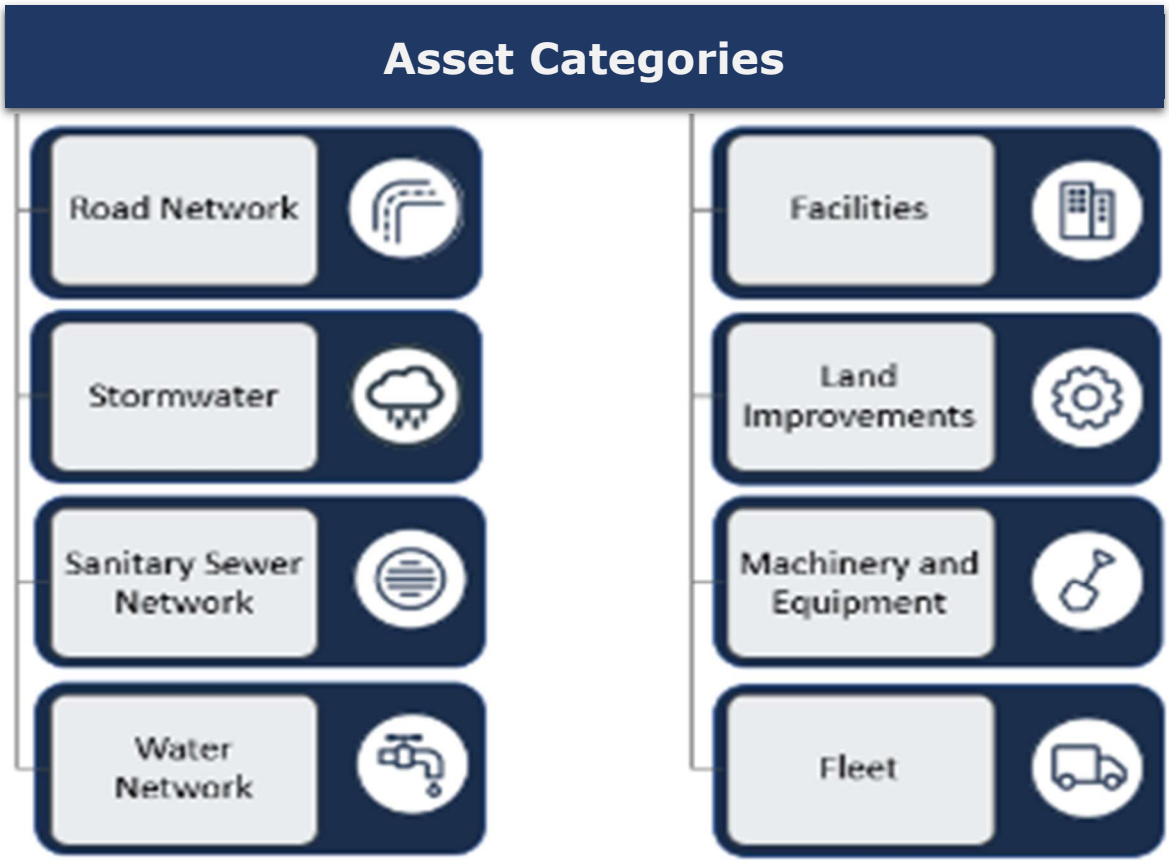
Table 1 Ontario Regulation 588/17 Requirements and Reporting Deadlines

Requirement	2019	2022	2024	2025
1. Asset Management Policy	●		●	
2. Asset Management Plans		●	●	●
State of infrastructure for core assets		●		
State of infrastructure for all assets			●	●
Current levels of service for core assets		●		
Current levels of service for all assets			●	
Proposed levels of service for all assets				●
Lifecycle costs associated with current levels of service		●	●	
Lifecycle costs associated with proposed levels of service				●
Growth impacts		●	●	●
Financial strategy				●

Scope

The scope of this document is to identify the current practices and strategies that are in place to manage the public infrastructure and to make recommendations where they can be further refined. Through the implementation of sound asset management strategies, the Town can ensure that public infrastructure is managed to support the sustainable delivery of services.

The following asset categories are addressed in further detail in the Appendix.



Limitations and Constraints

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

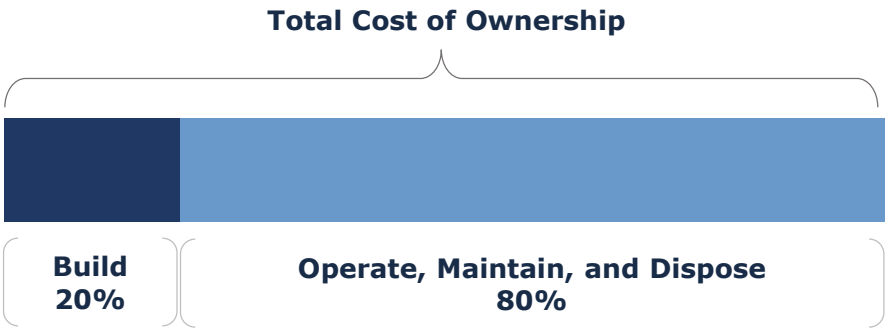
- The analysis is highly sensitive to several critical data fields, including an asset's estimated useful life, replacement cost, quantity, and in-service date. Inaccuracies or imprecisions in any of these fields can have substantial and cascading impacts on all reporting and analytics.
- User-defined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

These limitations have a direct impact on most of the analysis presented, including condition summaries, age profiles, long-term replacement and rehabilitation forecasts, and shorter term, 10-year forecasts that are generated from Citywide, the Town's primary asset management system.

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

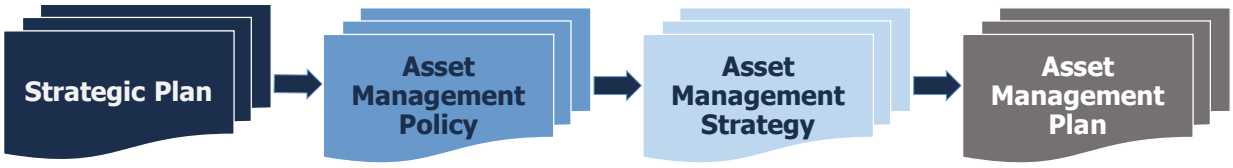
An Overview of Asset Management

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



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 diagram below depicts an industry standard approach and sequence developing a practical asset management program. Beginning 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.

Foundational Documents

In the municipal sector, 'asset management strategy' and 'asset management plan' are often used interchangeably. Other concepts such as 'asset management framework', 'asset management system', and 'strategic asset management plan' further add to the confusion; lack of consistency in the industry on the purpose and definition of these elements offers little clarity. To make a clear distinction between the policy, strategy, and the plan see the following sections for detailed descriptions of the document types.

Strategic Plan

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

Asset Management Policy

An asset management policy represents a statement of the principles guiding the Town'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 Town of Penetanguishene's "Strategic Asset Management Policy" was approved by Council as Policy No. 012-2019 on June 26th, 2019 in accordance with Ontario Regulation 588/17. It was revised in 2024 and will be going forward to Council for approval June 2024.

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

- The policy's statements dictate the use of asset management practices to ensure all assets meet the agreed levels of service in the most efficient and effective manner;
- the policy commits to, where appropriate, incorporating asset management in the Town's other plans;
- there are formally defined roles and responsibilities of internal staff and stakeholders;
- the guiding principles include the use of a long-term view and effective prioritization in the management of infrastructure; and
- the policy statements are well defined.

As per Ontario Regulation 588/17, the Town will be required to review and update its Strategic Asset Management Policy in 2024.

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 Town plans to achieve asset management objectives through planned activities and decision-making criteria.

While not a static document, the strategy should not evolve and change frequently—unlike the asset management plan. The strategy provides a long-term outlook on the overall asset management program development and strengthening key elements of its framework.

The Town's Strategic 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 AMP presents the outcomes of the Town'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 Town to re-evaluate the state of infrastructure and identify how the organization's asset management and financial strategies are progressing.

The Town's last iteration of the AMP was completed in 2022. Since then, the asset inventory has been consolidated with critical asset data updates and undergone revisions for core assets. This document is an AMP that uses the updated asset inventory and has been prepared in accordance with O. Reg. 588/17.

Key Technical Concepts

Effective asset management integrates several key components, including data management, lifecycle management, risk management, and levels of service.

Asset Hierarchy and Data Classification

Asset hierarchy illustrates the relationship between individual assets and their components, and a wider, more expansive network and system. How assets are grouped in a hierarchy structure can impact how data is interpreted. Key category details are summarized at the asset segment level.

Table 2 Asset Hierarchy

CLASS	AM CATEGORY	AM SEGMENT
Infrastructure	Facilities	Environmental Services Transportation Services
	Land Improvements	Transportation Services
	Road Network	Arterial Roads Collector Roads Local Roads Gravel Roads Sidewalks Guardrails Streetlights
	Stormwater Network	Catch Basins Headwalls Mains Maintenance Holes Stormwater Management Ponds
	Sanitary Sewer Network	Lift Stations Mains Maintenance Holes Sanitary Sewer Treatment
	Water Network	Curb stops and Services Hydrants Mains Meters Valves Water Storage Water Treatment Wells
General Capital	Facilities	Corporate Services Emergency Services Recreation and Community Services
	Land Improvements	Recreation and Community Services
	Machinery and Equipment	Corporate Services Emergency Services Environmental Services Recreation and Community Services Transportation Services
	Fleet	Corporate Services Emergency Services Recreation and Community Services Environmental Services Transportation Services

Replacement Costs

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

- User-Defined Cost and Cost/Unit: Based on costs provided by municipal staff which could include average costs from recent contracts; data from engineering reports and assessments; staff estimates based on knowledge and experience
- Cost Inflation/CPI Tables: Historical cost of the asset is inflated based on Consumer Price Index or Non-Residential Building Construction Price Index

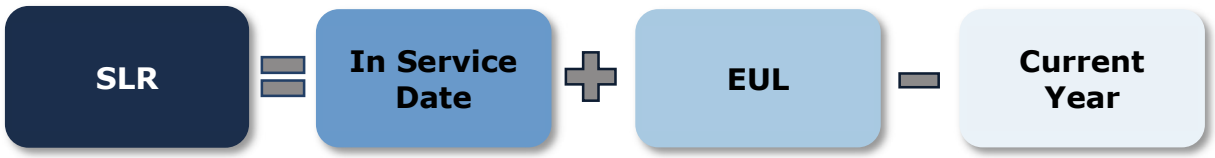
User-defined costs based on reliable sources are a reasonably accurate and reliable way to determine asset replacement costs. Cost inflation is typically used in the absence of reliable replacement cost data. It is a reliable method for recently purchased and/or constructed assets where the total cost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

Estimated Useful Life and Service Life Remaining

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

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

Figure 1: Service Life Remaining Calculation



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 Town's asset portfolio. The figures below outline the condition rating system used to determine asset condition for road assets and for all other assets in Penetanguishene.

Figure 2: Road Condition Rating

Very Good	**Fit for the future**	**85 - 100**
•No major distresses. Possibly some crack seal in place.		
Good	**Adequate for now**	**70 - 85**
•Recent crack seal starting to fail, longitudinal + transverse cracks, some recent and clean patches.		
Fair	**Requires attention**	**55 - 70**
•Moderate to severe block cracking, alligator cracking, potholes, and aging patches.		
Poor	**Increased potential of affecting service**	**40 - 55**
•Increased quantity of alligator cracking, block cracking, potholes, and patches.		
Very Poor	**Unfit for sustained service**	**0 - 40**
•Severe alligator cracking. Failed patches, large quantity of deep and/or wide potholes. • Ride quality is severely affected by deep and dense potholes, failed patches, and alligator cracking.		

Figure 3: Standard Condition Rating Scale

Very Good	**Fit for the future**	**80 - 100**
•Well maintained, good condition, new or recently rehabilitated		
Good	**Adequate for now**	**60 - 80**
•Acceptable, generally approaching mid-stage of expected service life		
Fair	**Requires attention**	**40 - 60**
•Signs of deterioration, some elements exhibit significant deficiencies		
Poor	**Increased potential of affecting service**	**20 - 40**
•Approaching end of service life, large portion of system exhibits deficiencies		
Very Poor	**Unfit for sustained service**	**0 - 20**
• Near or beyond expected service life, widespread signs of advanced deterioration		

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

Lifecycle Management

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

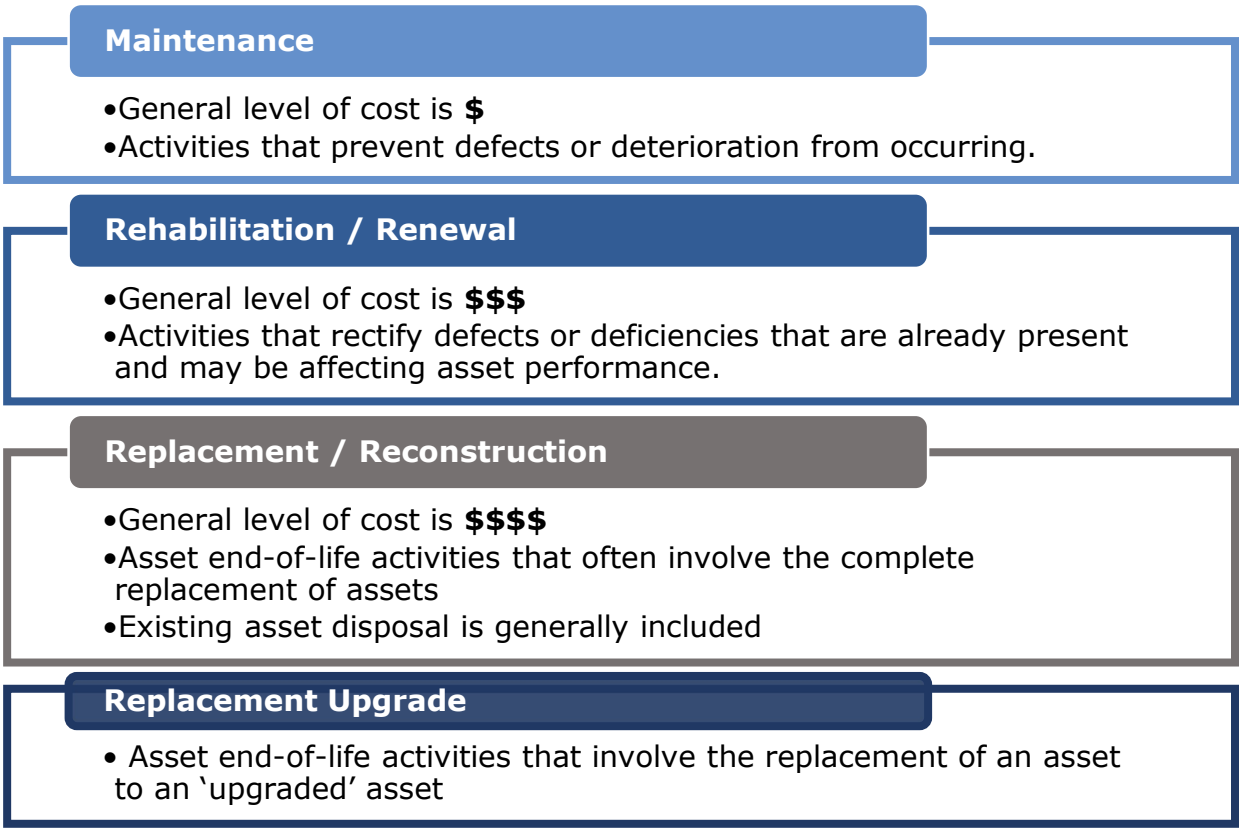
To ensure that municipal assets are performing as expected and meeting the needs of customers, it is important to establish a lifecycle management strategy to proactively manage asset deterioration.

There are several field intervention activities that are available to extend the life of an asset. These activities can be generally placed into one of three categories: maintenance, rehabilitation, and replacement. The Figure 4 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.

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

Figure 4: Lifecyle Management Typical Interventions



Risk Management

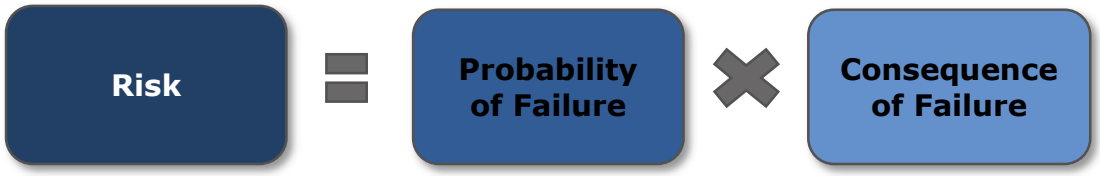
Municipalities generally take a 'worst-first' approach to infrastructure spending. Rather than prioritizing assets based on their importance to service delivery, assets in the worst condition are fixed first, regardless of their criticality. However, not all assets are created equal. Some are more important than others, and their failure or disrepair poses more risk to the community. For example, a road with a high volume of traffic that provides access to critical services poses a higher risk than a low volume rural road. These high-value assets should receive funding before others.

By identifying the various impacts of asset failure and the likelihood that it will fail, risk management strategies can identify critical assets, and determine where maintenance efforts, and spending, should be focused.

A high-level evaluation of asset risk and criticality was performed. 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.

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, (low, medium, high) or quantitative measurement (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 Equation



Probability of Failure

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

Consequence of Failure

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

Levels of Service

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

Community Levels of Service

Community LOS are a simple, plain language description or measure of the service that the community receives. For core asset categories, the Province through O. Reg. 588/17, has provided qualitative descriptions that are required. For non-core asset categories, the Town determined the qualitative descriptions that will be used. The community LOS can be found in the Levels of Service subsection within each asset category section.

Technical Levels of Service

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

For core asset categories, the Province through O. Reg. 588/17, has provided technical metrics that are required. For non-core asset categories, the Town determined the technical metrics that will be used. There are 3 measures that are used for every asset category, and they are:

- Financial –targeted reinvestment rate compared to the actual current reinvestment rate.
- Performance – this is the average condition for the asset category.
- Risk – this is the average risk for the asset category.

All the metrics can be found in the LOS subsection within each asset category.

Current and Proposed Levels of Service

Penetanguishene is focused on measuring the current LOS provided to the community. Once current LOS have been measured and trended the Town plans to establish their proposed LOS over a 10-year period, in accordance with O. Reg. 588/17.

Proposed levels of service should be realistic and achievable within the timeframe outlined by the Town. 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 LOS have been established, and prior to July 2025, the Town must identify lifecycle management and financial strategies which allow these targets to be achieved.

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.

Integration Climate Change and Asset Management

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

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.

Since 2018, the Town has been involved with the development of a Local Climate Change Action Plan (LCCAP) through the Sustainable Severn Sound (SSS) regional sustainability program, which is supported by seven municipalities within the County of Simcoe and the District Municipality of Muskoka.

In February 2018, Council approved a model resolution to join the Federation of Canadian Municipalities (FCM) Partners for Climate Protection (PCP) program. The PCP program provides a comprehensive framework to take action on climate change by reducing emissions within the community.

In June 2018, the SSS released the first LLCAP which outlined the following:

- A corporate and community inventory of Greenhouse Gas (GHG) emissions for each municipal partner
- Regional GHG reduction targets to be achieved by 2028
- 18 high-level actions to reduce municipal and community contributions to climate change

In July 2018, the Town successfully achieved milestone 1 of the PCP program and through the adoption of the GHG reduction targets outlined in the LLCAP, will achieve milestones 2 and 3.

Impacts of Growth

The demand for infrastructure and services will change over time based on a combination of internal and external factors. Understanding the key drivers of growth and demand will allow the Town 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.

Impact of Growth on Lifecycle Activities

By July 1, 2025, the Town'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.

As the municipality's population is expected to remain the same with potential moderate increases and declines in the coming years, demand will evolve, and it is likely that funding will need to be reprioritized. As growth-related assets are constructed, retired, or acquired, they should be integrated into the AMP. Furthermore, the municipality will need to review the lifecycle costs of growth-related infrastructure. These costs should be considered in long-term funding strategies that are designed, at a minimum, to maintain the current level of service.

Annual Capital Requirements

The annual requirements represent the amount the Town should allocate annually to each asset category to meet replacement needs as they arise, prevent infrastructure backlogs, and achieve long-term sustainability. This is calculated using each assets replacement cost and estimated useful life.

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 Town can determine the extent of any existing funding gap.

Portfolio Overview

Community Profile

The Town of Penetanguishene (meaning "the place of the rolling white sands" in Abinaki) is located on the southeasterly tip of Georgian Bay, within Simcoe County in Central Ontario. It has a unique urban form oriented towards the water with rolling hills, woodlands and wetlands. Incorporated in 1882, the Town takes pride in its 400 years of history and the influence of four founding cultures.

There is a significant concentration of Franco-Ontarians within the Town which makes it one of only three municipalities in Central and Southwestern Ontario where the francophone population exceeds the provincial average. The Town is also home to a sizeable population of the Metis community that exceeds the provincial average.

Based on the 2021 Census, the Town's thriving community has grown to approximately 10,077 residents, indicating a 12% increase over the 2016 population and closer to the 11,000 population projection in 2031 that has been forecasted in previous official documents.

The Town is located just 90 minutes north of Toronto and benefits from the region's proximity to major urban markets. The Town's economy is primarily composed of tourism and service-based businesses.

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

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

Table 3 Penetanguishene & Ontario Census Information

Census Characteristic	Penetanguishene	Ontario
Population 2021	10,077	14,223,942
Population Change 2016-2021	12.4%	5.8%
Total Private Dwellings	4,357	5,929,250
Population Density	396.4/km2	15.9/km^2
Land Area	25.42 km2	892,411.76 km^2

State of the Infrastructure

Table 4 Penetanguishene State of the Infrastructure

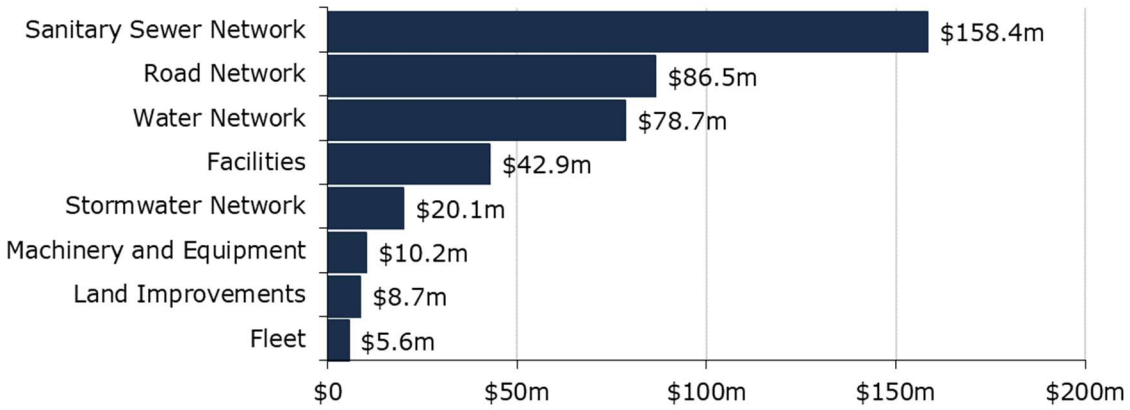
Asset Category	Replacement Cost	Asset Condition	Annual Requirement
Road Network	$86,476,917	Good (62%)	$1,841,263
Stormwater Network	$20,078,281	Very Good (86%)	$250,979
Facilities	$42,901,820	Good (64%)	$1,016,261
Land Improvements	$8,677,806	Very Good (82%)	$380,343
Fleet	$5,588,748	Good (66%)	$376,318
Machinery and Equipment	$10,163,488	Fair (42%)	$829,170
Water Network	$78,680,526	Good (74%)	$1,218,550
Sanitary Sewer Network	$158,403,325	Very Good (81%)	$3,156,452
Overall	**$410,970,911**	**Good (73%)**	**$9,069,334**

Replacement Cost

All Penetanguishene's asset categories have a total replacement cost of $411 million based on available inventory data. This total was determined based on a combination of user-defined costs and historical cost inflation. This estimate reflects replacement of historical assets with similar, not necessarily identical, assets available for procurement today.

The replacement cost for each asset should be reviewed periodically to determine whether adjustments are needed for greater accuracy.

Figure 6: Portfolio Replacement Value

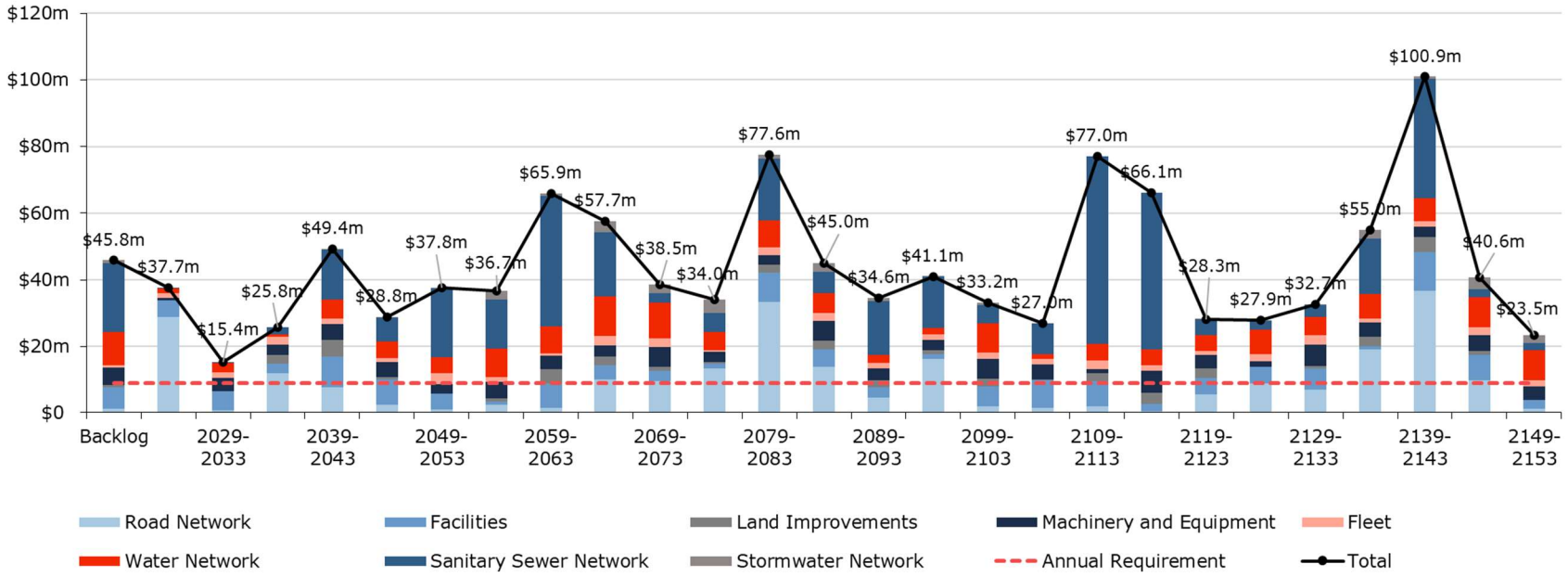


Forecasted Capital Requirements

Aging assets require maintenance, rehabilitation, and replacement. Figure 7 below illustrates the cyclical short-, medium- and long-term infrastructure replacement requirements for all asset categories analyzed. On average, $9 million is required each year to remain current with capital replacement needs for Penetanguishene'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. Based on the current replacement cost of the portfolio, estimated at $411 million, this represents an annual target reinvestment rate of 2.2%.

Figure 7: Forecasted Capital Requirements



The chart also illustrates a backlog of $45.8 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 or major renewals. This makes targeted and consistent condition assessments integral.

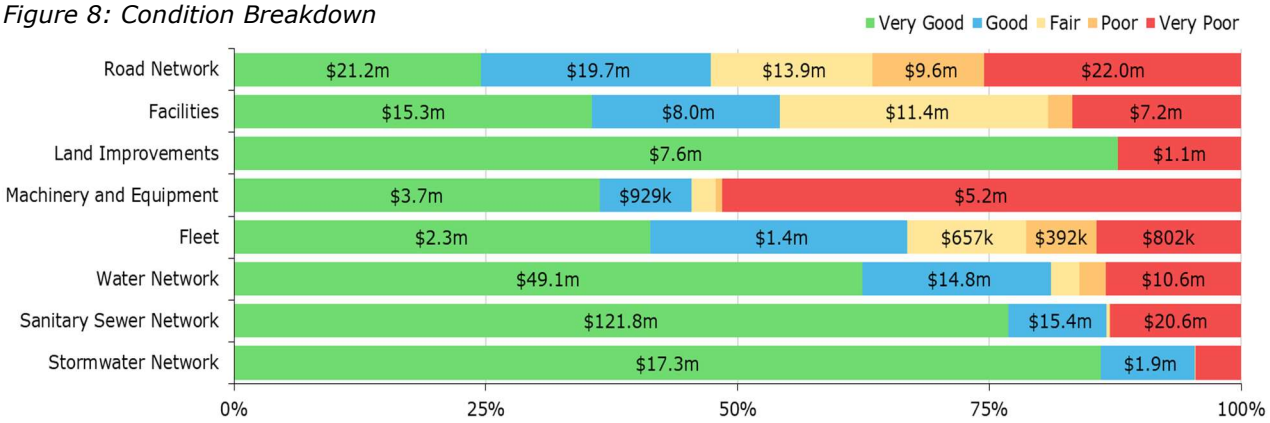
Risk frameworks, proactive lifecycle strategies, and levels of service targets can then be used to prioritize projects, continuously refine estimates for both backlogs and ongoing capital needs and help select the right treatment for each asset.

Condition of Asset Portfolio

The current condition of the assets is central to all asset management planning. Collectively, 80% of assets in Penetanguishene are in fair or better condition. This estimate relies on both age-based and field condition data.

Assessed condition data is available for the road network, facilities as well as some machinery and equipment; for the remaining portfolio, age is used as an approximation of condition. Assessed condition data is invaluable in asset management planning as it reflects the true condition of the asset and its ability to perform its functions. The chart below shows the breakdown of the overall asset portfolio's average condition.

Figure 8: Condition Breakdown



Service Life Remaining

Based on asset age, available assessed condition data and estimated useful life, 24% of the Town's assets will require rehabilitation / replacement within the next 10 years. Details of the capital requirements are identified in each asset section.

Risk & Criticality

Penetanguishene has noted key trends, challenges, and risks to service delivery that they are currently facing:

Asset Data and Information

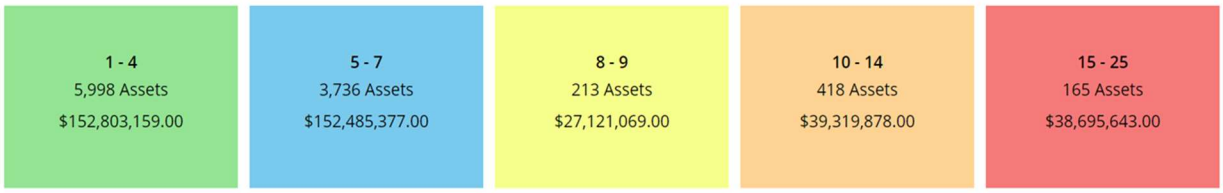
There has been a lack of confidence in the available inventory data for infrastructure. This poses a significant risk when trying to manage assets and planning future work. Staff have been working on the data and inventory to address this concern.

Capital Funding Strategies

Partially owing to the completeness of the asset data historically, operations tend to be reactive rather than proactive. Problems are generally only known when issues arise, and complaints are made.

The overall asset risk breakdown for Penetanguishene's asset inventory is portrayed in the figure below.

Figure 9: Overall Asset Risk Breakdown



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

Levels of Service

Levels of service are a measure of the quality and scope of the services that municipal infrastructure provides to the community. Both quantitative and qualitative metrics are used to measure the current level of service.

Strategic Plan Line of Site

The strategic plan has a direct, and cascading impact on asset management planning and reporting, making it a foundational element. To accomplish its goals, a 20 Year Community-Based Strategic Plan has been developed by the Town which is intended to help drive community success, growth, and investment.

The purpose of this Community-Based Strategic Plan is to guide decision making and community engagement and encourage sustainable growth. The 2023 strategic plan is designed to be in effect for 20 years and to provide accountability and transparency to the Town's residents.

Town of Penetanguishene's mission is: The Town provides its residents and businesses with high quality services and sustainable infrastructure in a financially responsible manner, fostering an engaged community and a diversified economy, while preserving our distinct heritage and natural environment.

The Town's vision is: Our waterfront community is a destination and a starting point, respectful of its history and natural environment, offering a rich culture, active lifestyle, well-planned growth, employment opportunities and a wonderful opportunity to live one's dream.

The strategic planning sessions developed 6 themes that all the objectives in the plan were build with them in mind and they are:

Penetanguishene Climate Profile

The Town of Penetanguishene 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 Town of Penetanguishene will likely experience the following trends:

Higher Average Annual Temperature:

- Between the years 1981 to 2010 the annual average temperature was 6.9 ºC
- Under a high emissions scenario, the annual average temperatures are projected to be 8.8 ºC by the year 2050 and around 12.2 ºC by the end of the century.

Increase in Average Annual Precipitation:

- Under a high emissions scenario, Penetanguishene is projected to experience a 7% increase in precipitation by 2050 and a 15% increase by the end of the century.

Increase in Frequency of Extreme Weather Events:

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

Reinvestment Rate

To meet the long-term replacement needs, the Town is recommended to be allocating approximately $9 million annually, for a target reinvestment rate of 2.2%.

Impacts of Growth

Understanding the key drivers of growth and demand will allow the Town 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.

Penetanguishene Official Plan (August 2020)

The Town of Penetanguishene adopted an Official Plan to provide a legislative basis to direct future growth, development and change within the Town and to create a more sustainable community. The policies included in the Plan are consistent with the Provincial Policy Statement and conform with the County of Simcoe Official Plan, and the Growth Plan for the Greater Golden Horseshoe. Such policies are intended to provide the direction for managing long term development to achieve social, economic, and environmental objectives of the Town's vision.

The Town's new Official Plan came into effect on January 9th, 2020.

The Town of Penetanguishene is noted for its small-town character and diverse natural landscape. The Official Plan considers the desire to preserve the natural environment of the Town, while encouraging balanced and diversified growth.

All lands within Penetanguishene's municipal limits are considered "Settlement Area" as identified in the Growth Plan and County OP mapping. Most of the growth is directed to the Town's urban serviced area where municipal water and sewer services are available. Developed urban areas are the target for 40% of all new residential development.

New development of existing designated greenfield areas is also a primary focus of growth in the Town. These are settlement areas outside of the developed urban areas, which have been designated for development and are required to accommodate forecasted growth to the year 2031. In accordance with Town Policy, the Town will aim to achieve a minimum density target of 50 people and jobs combined per hectare across Designated Greenfield Areas.

Development Charges Background Study (2019)

In 2019, the Town of Penetanguishene retained Hemson Consulting Ltd. to undertake the D.C. study process and prepare a Development Charges Background Study, pursuant to Section 10 of the Development Charges Act, 1007 (DCA).

The following tables summarize the historical and forecasted population and employment figures allocated to the Town in the study:

Total Population Forecast from 2011 to 2031			
	2011	**2021**	**2031**
Town of Penetanguishene	9,111	9,598[1]	10,850

[1] The 2021 Census states the actual total population to be at 10,077.

Total Employment Forecast from 2016 to 2031			
	2016	**2021**	**2031**
Town of Penetanguishene	4,704	5,141	6,000

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

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

Official Plan of the County of Simcoe (2023)

The Official Plan of the County of Simcoe serves as the upper tier Official Plan for the county, used to guide policy planning and physical planning of local municipalities. The Growth Management section is intended to help guide new development across the County based on Growth Projections for population and employment until 2031.

The population of the County is forecasted to increase from 272,200 in 2006, to 416,000 in 2031 in accordance with the Growth Plan for the Greater Golden Horseshoe, 2006 as amended. The Town of Penetanguishene is allocated 2.6% of this forecasted growth.

Financial Strategy

Financial Strategy Overview

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

This financial strategy is designed for the Town's existing asset portfolio and is premised on two key inputs: the average annual capital requirements and the average annual funding typically available for capital purposes. The annual requirements are based on the replacement cost of assets and their serviceable life, and where available, lifecycle modeling. This figure is calculated for each individual asset and aggregated to develop category-level values.

The annual funding typically available is determined by averaging historical capital expenditures on infrastructure, inclusive of any allocations to reserves for capital purposes.

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

- Revenue from taxation allocated to reserves for capital purposes
- The Canada Community Benefits Fund (CCBF)
- The Ontario Community Infrastructure Fund (OCIF)

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

Annual Capital Requirements

The annual requirements represent the amount the Town should allocate annually to each asset category to meet replacement needs as they arise, prevent infrastructure backlogs, and achieve long-term sustainability. For most asset categories the annual requirement has been calculated based on a "replacement only" scenario, in which capital costs are only incurred at the construction and replacement of each asset.

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

The following table compares two scenarios:

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

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

Table 5 Road Network Annual Capital Requirement Comparison

Asset Segment	Annual Requirements (Replacement Only)	Annual Requirements (Lifecycle Strategy)	Difference
Arterial Roads	$627,610	$207,346	$420,264
Collector Roads	$902,300	$298,097	$604,203
Guardrails	$3,360	$3,360	$0
Local Roads	$3,477,147	$1,035,820	$2,441,327
Sidewalks	$189,431	$189,431	$0
Streetlights	$84,499	$84,499	$0
	$5,284,347	**$1,818,553**	**$3,465,739**

The implementation of a proactive lifecycle strategy for paved roads (asphalt and surface treatment), leads to a potential annual cost avoidance of approximately $3.5 million. This represents a reduction of the annual capital requirement for paved roads by 66%.

Gravel roads lifecycle costs are not considered capital and gravel roads are not planned for replacement. As the lifecycle strategy scenario represents the lowest cost option available to the Town, this annual capital requirement was used in the development of the financial strategy.

Table 6 outlines the total average annual capital requirements for existing assets in each asset category. Based on a replacement cost of $411 million, annual capital requirements total approximately $9 million for all the asset categories analysed.

The table also illustrates the system-generated, equivalent target reinvestment rate (TRR), calculated by dividing the annual capital requirements by the total replacement cost of each category. The cumulative target reinvestment for these categories is estimated at 2.2%.

Table 6 Average Annual Capital Requirements

Asset Category	Replacement Cost	Annual Capital Requirements	Target Reinvestment Rate
Road Network	$86,476,917	$1,818,553	2.1%
Facilities	$42,901,820	$1,016,261	2.4%
Land Improvements	$8,677,806	$380,343	4.4%
Machinery and Equipment	$10,163,488	$829,170	8.2%
Fleet	$5,588,748	$376,318	6.7%
Water Network	$78,680,526	$1,218,550	1.5%
Sanitary Sewer Network	$158,403,325	$3,156,452	2.0%
Stormwater Network	$20,078,281	$250,979	1.3%
Total	**$410,970,911**	**$9,046,625**	**2.2%**

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

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

Closing the Gap

Eliminating annual infrastructure funding shortfalls is a difficult and long-term endeavor for municipalities. Considering the Town's current funding position, it will require many years to reach full funding for current assets.

Recommendations and Key Considerations

Asset Inventory

- Continue to refine and consolidate asset infrastructure data into the Town's centralized asset inventory to ensure all critical assets are accounted for and support accurate capital forecasting.
- Review and revise replacement costs and critical attribute data on a specified cycle.

Condition Assessment Strategies

- Identify condition assessment strategies for high value and high-risk assets.

Risk Management Strategies

- Implement risk-based decision-making as part of asset management planning and budgeting processes. This should include the regular review of high-risk assets to determine appropriate risk mitigation strategies.
- Review risk models on a regular basis and adjust according to an evolving understanding of the probability and consequences of asset failure.

Levels of Service

- Continue to measure current levels of service in accordance with the metrics that the Town has established. Additional metrics can be established as they are determined to provide meaningful and reliable inputs into asset management planning.
- Work towards identifying proposed levels of service as per O. Reg. 588/17 and identify the strategies that are required to close any gaps between current and proposed levels of service.

Appendix A: Road Network

State of the Infrastructure

Penetanguishene's road network comprises the second largest share of its infrastructure portfolio, with a current replacement cost of $86.5 million, distributed primarily between asphalt, surface treated and gravel roads.

The Town also owns and manages other supporting infrastructure and capital assets, including guardrails, sidewalks and streetlights.

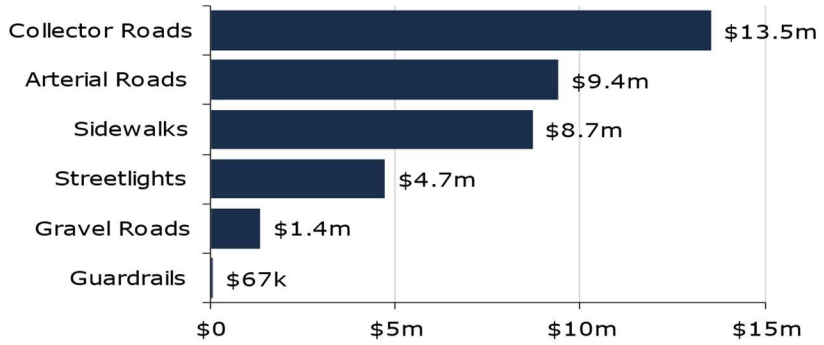
The state of the infrastructure for the road network is summarized below.

Replacement Cost	Condition	Financial Capacity	
$86,476,917	Good (62%)	Annual Requirement:	$1,818,553

Inventory & Valuation

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

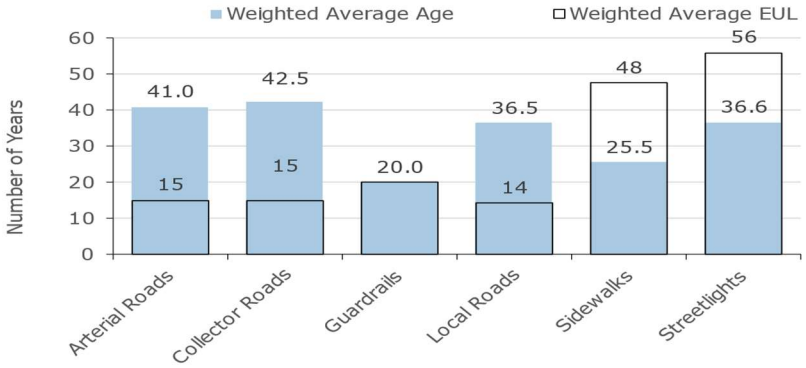
Figure 10: Road Network Replacement Value



Asset Condition & Age

The graph below identifies the average age, and the estimated useful life for each asset segment. It is all weighted by replacement cost.

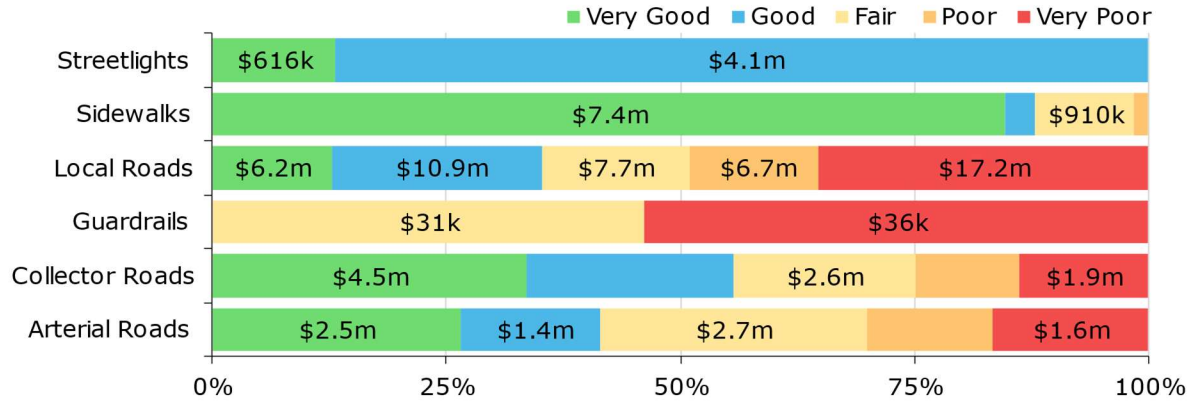
Figure 11: Road Network Average Age vs Average EUL



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

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

Figure 12: Road Network Condition Breakdown



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

Current Approach to Condition Assessment

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

- A road needs study, through an external consultant, is conducted every 5 years. The most recent road needs study was prepared by Streetscan in 2023. Staff intend to reduce the assessment interval from 5 to 3 years by ensuring that internal staff assessments are conducted on a regular basis
- Routine road patrols are undertaken weekly, in compliance with the Minimum Maintenance Standards (MMS)
- Granular roads are visually inspected during grading activities and throughout the year
- Other roads and roadside assets are inspected as per O. Reg. 239/02

Lifecycle Management Strategy

The condition or performance of most assets will deteriorate over time. This process is affected by a range of factors including an asset's characteristics, location, utilization, maintenance history and environment. The following lifecycle strategies shown in Figure 13 have been developed as a proactive approach to

managing the lifecycle of municipally owned 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.

PCI scores, staff judgment, traffic loads, and opportunity to bundle projects help inform the optimal lifecycle intervention, ranging from pothole repairs to overlays and potential replacements. Lifecycle models used to estimate the savings to annual capital requirement are shown below in Figure 14 for Surface Treated (LCB) roads and Figure 15 for Asphalt (HCB) Roads.

Figure 13: Road Network Current Lifecycle Strategy

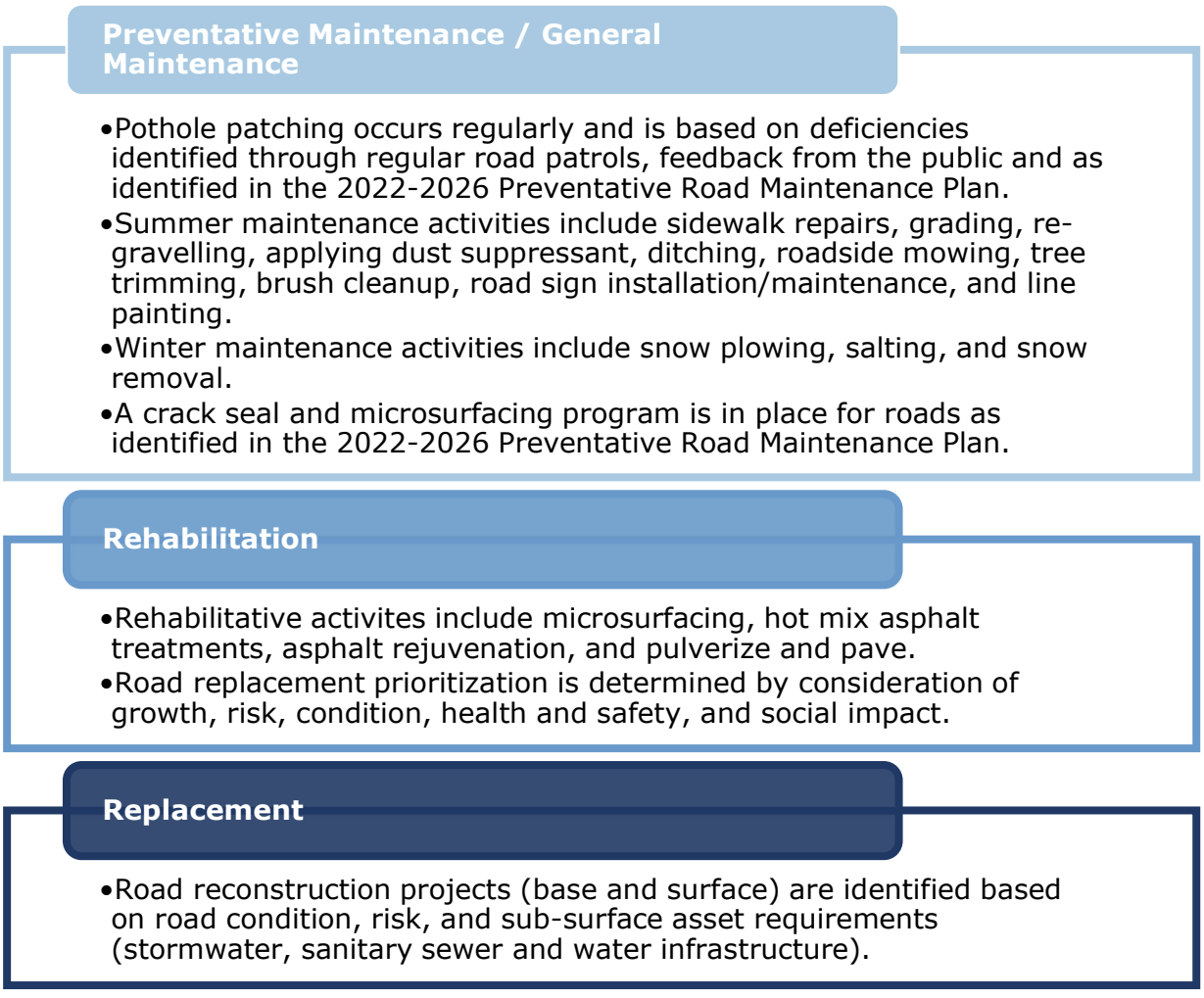


Figure 14: Surface Treated Roads (LCB) Road Lifecycle Model

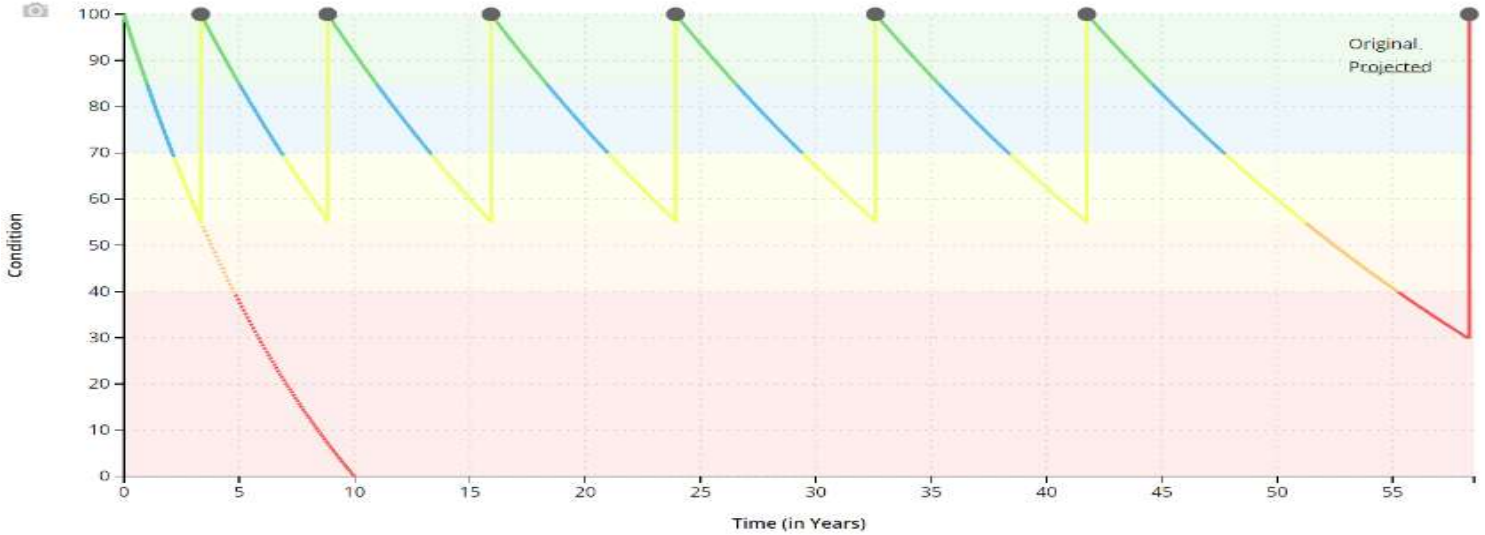
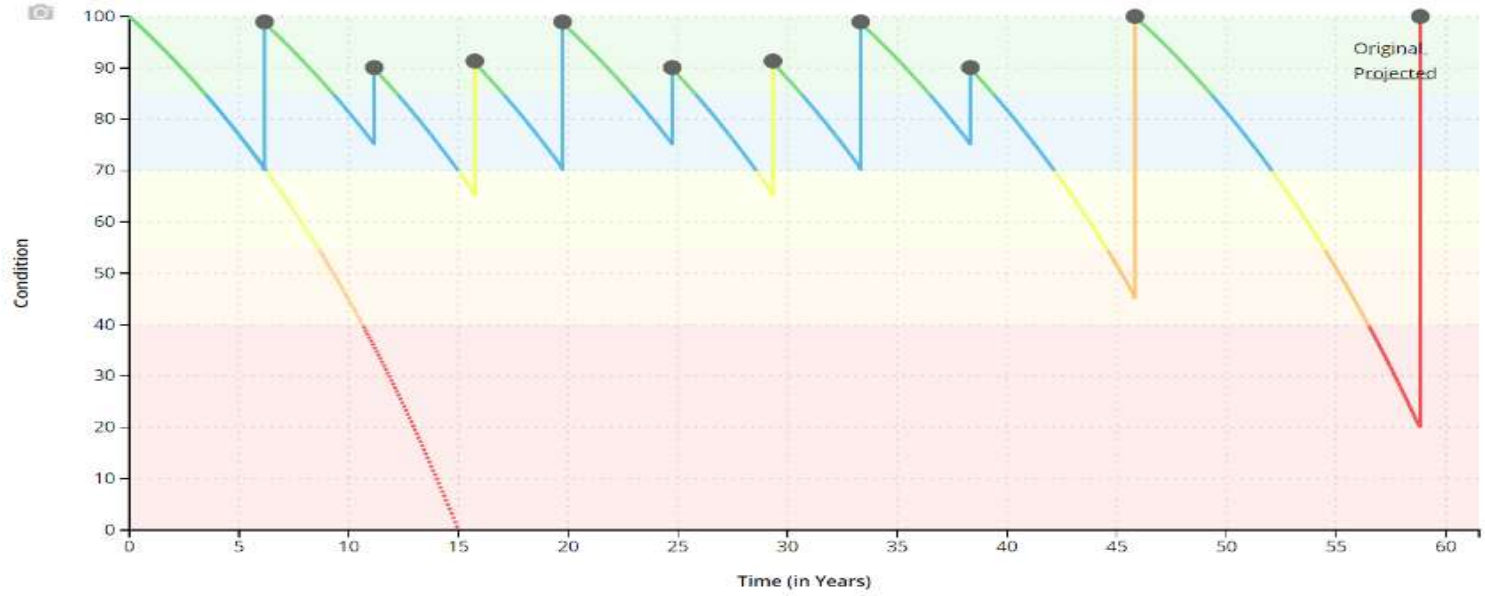


Figure 15: Asphalt Roads (HCB) Road Lifecycle Model



Forecasted Capital Requirements

Figure 16 illustrates the cyclical short-, medium- and long-term infrastructure rehabilitation and replacement requirements for the Town's road network. Based on the lifecycle strategies identified previously for HCB and LCB roads, and assuming the end-of-life replacement of all other assets in this category, the following graph forecasts capital requirements for the road network. This analysis was run until 2083 to capture at least one iteration of replacement for the longest-lived asset in the asset register.

Penetanguishene's average annual requirements (red dotted line) total $1.8 million for all assets in the road network. Although actual spending may fluctuate substantially from year to year, this figure is a useful benchmark value for annual capital expenditure targets (or allocations to reserves) to ensure projects are not deferred and replacement needs are met as they arise. The chart illustrates capital needs through the forecast period in 5-year intervals.

The projections are designed to provide a long-term, portfolio-level overview of capital needs and should be used to support improved financial planning over several decades. They are based on asset replacement costs, age analysis, and condition data when available, as well as lifecycle modeling (roads only identified above).

Figure 16: Road Network Forecasted Capital Replacement Requirements

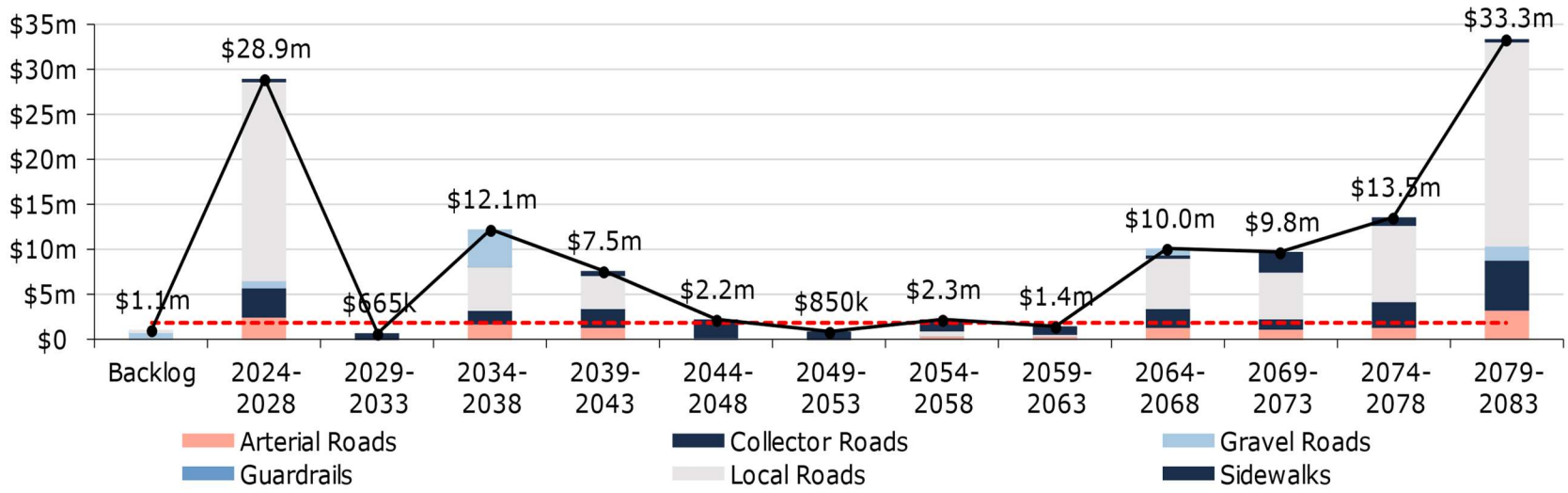


Table 7 below summarizes the projected cost of lifecycle activities (rehabilitation and replacement) that may need to be undertaken over the next 10 years to support current levels of service. These projections are generated in Citywide and rely on the data available in the asset register.

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

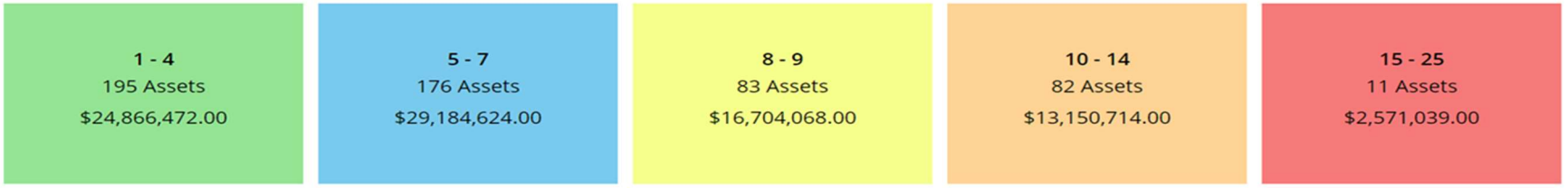
Table 7 Road Network System-generated 10-Year Capital Costs

Segment	Total	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033
Arterial Roads	**$2.4m**	$459k	$1.6m	$373k	$0	$0	$0	$0	$0	$0	$0
Collector Roads	**$3.2m**	$974k	$1.2m	$851k	$247k	$0	$0	$0	$0	$0	$0
Guardrails	**$31k**	$0	$0	$16k	$15k	$0	$0	$0	$0	$0	$0
Local Roads	**$22.1m**	$10.9m	$6.6m	$3.9m	$599k	$0	$0	$0	$0	$0	$0
Sidewalks	**$1.1m**	$0	$48k	$93k	$100k	$172k	$333k	$0	$233k	$73k	$27k
Streetlights	**$0**	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Total	**$28.9m**	$12.4m	$9.4m	$5.3m	$961k	$172k	$333k	$0	$233k	$73k	$27k

Risk & Criticality

The following risk matrix provides a visual representation of the relationship between the probability of failure and the consequence of failure for the assets within this asset category based on available inventory data.

Figure 17: Road Network Risk Matrix



This is a high-level model developed by municipal staff and it should be reviewed and adjusted to reflect an evolving understanding of both the probability and consequences of asset failure. The asset-specific attributes that municipal staff utilize to define and prioritize the criticality of the road network are documented below:

Probability of Failure (POF)	Consequence of Failure (COF)
Condition (Performance 80%)	Functional Class (80% Financial)
Service Life Remaining (Operational 20%)	AADT (Operational 50%)
	Speed Limit (km/h) (Operational 50%)

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

Levels of Service

The following tables identify the Town's metrics to identify their current level of service for the roads. By comparing the cost, performance (average condition) and risk year-over-year, Penetanguishene will be able to evaluate how their services/assets are trending. The Town will use this data to set a target level of service and determine proposed levels for the regulation by 2025. The tables that follow summarize Penetanguishene's current levels of service.

Community Levels of Service

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

Table 8 Road Network Community Levels of Service

Values	Qualitative Description	Current LOS
Scope	Description, which may include maps, of the road network in the Town and its level of connectivity	The Town's road network spans a total of 93 km primarily within a rural setting, with areas of urban development. See Figure 18
Quality	Description or images that illustrate the different levels of road class pavement condition	See Figure 2: Road Condition Rating for the description of road condition

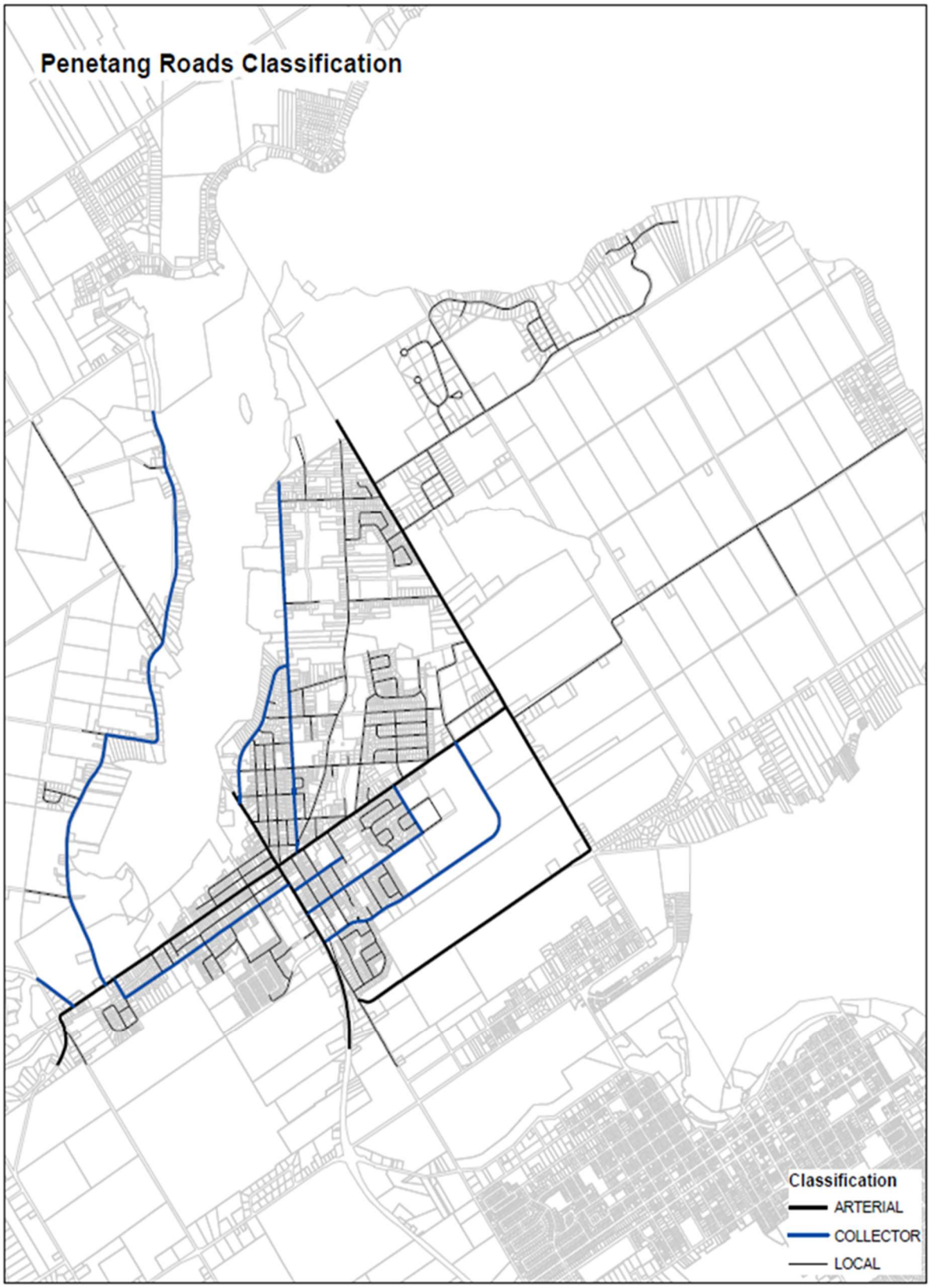
Technical Levels of Service

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

Table 9 Road Network Technical Levels of Service

Service Attribute	Technical Metric	Current LOS
Scope	Lane-km of arterial roads (MMS classes 1 and 2) per land area (km/km^2)	1.35 km/km^2
	Lane-km of collector roads (MMS classes 3 and 4) per land area (km/km^2)	1.17 km/km^2
	Lane-km of local roads (MMS classes 5 and 6) per land area (km/km^2)	5.14 km/km^2
Quality	Average pavement condition index for paved roads in the municipality	61% - Fair
	Average surface condition for unpaved roads in the municipality (e.g., excellent, good, fair, poor)	Very Poor
	Average Condition Rating	62%
Performance	Average Asset Risk	6.61 (Low)
	Target reinvestment rate	2.1%

Figure 18: Map of Roads



Appendix B: Stormwater Network

State of the Infrastructure

The Town is responsible for owning and maintaining a stormwater infrastructure of around 24 km of storm mains, 563 catch basins, 281 maintenance holes, approximately 41,025 m2 of land designated as Stormwater Management Ponds (SWMPs) and supporting assets like headwalls and non-structural culverts.

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

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

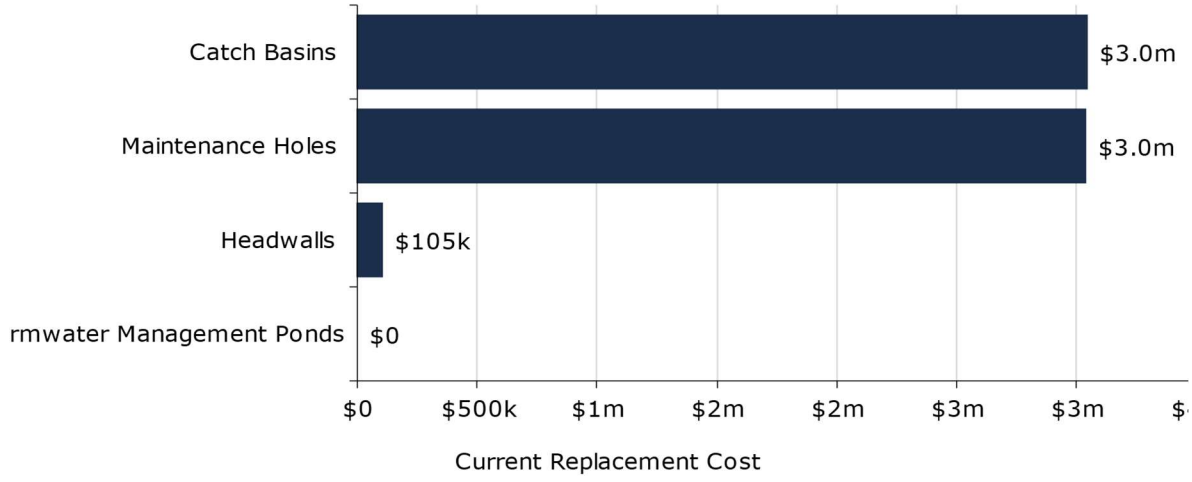
It is important to recognize that the current stormwater inventory is incomplete, and the resulting output values will be revised. The state of the infrastructure for the stormwater network is summarized in the following table.

Replacement Cost	Condition	Financial Capacity	
$20,078,281	Very Good (86%)	Annual Requirement:	$250,979

Inventory & Valuation

Figure 19 below displays the replacement cost of each asset segment in the Town's stormwater network inventory.

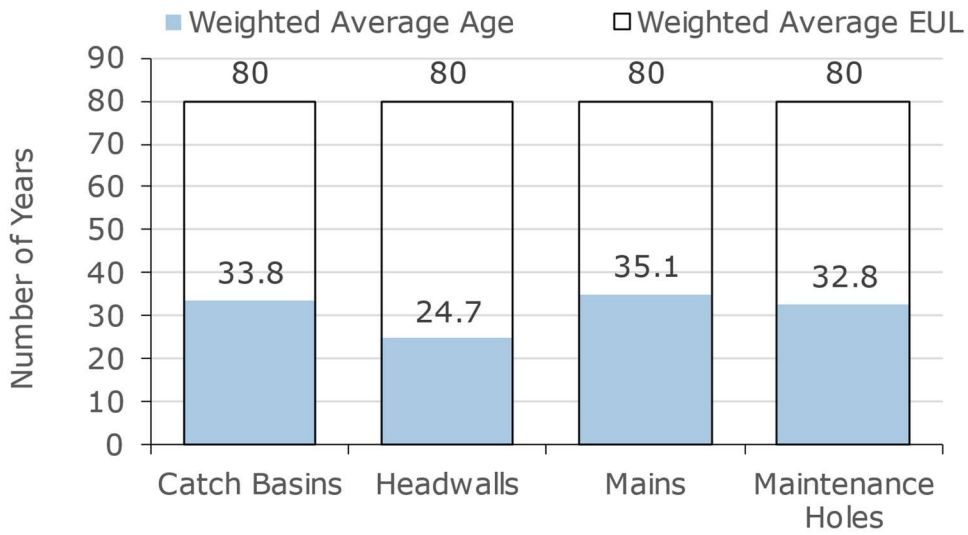
Figure 19 Stormwater Network Replacement Cost



Asset Condition & Age

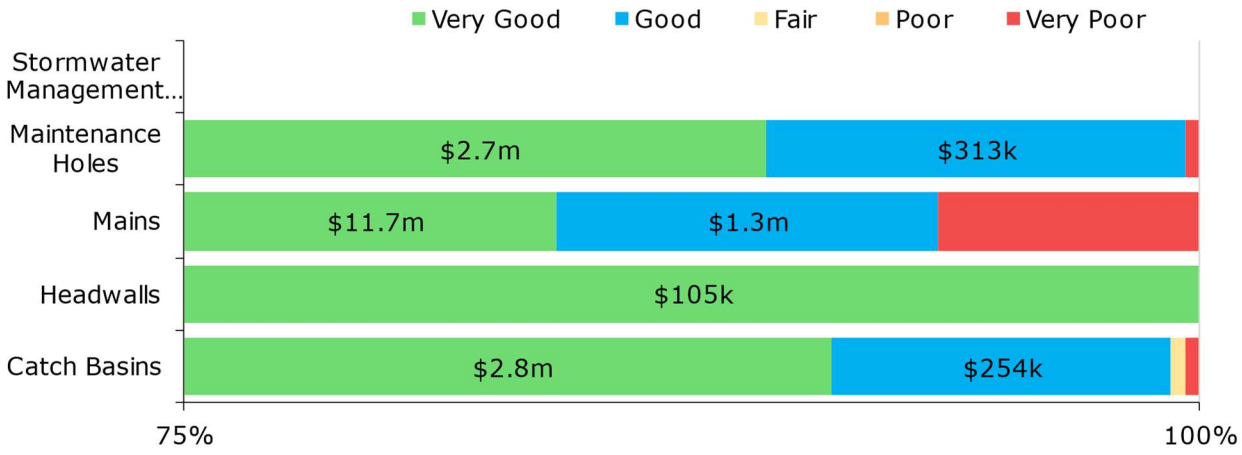
The graph below identifies the average age and the estimated useful life for each asset segment. The values are weighted based on replacement cost.

Figure 20: Stormwater Network Average Age vs Average EUL



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

Figure 21: Stormwater Network Condition Breakdown



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

Current Approach to Condition Assessment

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

- There are no formal condition assessment programs in place for stormwater infrastructure although catch basins, maintenance holes and SWMPs are visually inspected during maintenance activities
- CCTV inspections are reactive in nature and based on complaints by residents or as identified by staff
- Current approach to determining asset condition includes considering the age of the asset, pipe material and asset location
- As the Town continues to refine the available asset inventory for stormwater infrastructure, an industry best practice assessment cycle should be established

Lifecycle Management Strategy

The condition or performance of most assets will deteriorate over time. To ensure that municipal assets are performing as expected and meeting the needs of customers, it is important to establish a lifecycle management strategy to proactively manage asset deterioration. Figure 22 outlines Penetanguishene's current lifecycle management strategy.

Figure 22: Stormwater Network Current Lifecycle Strategy

Maintenance

- Catch basin cleaning is conducted annually on a rotating basis, covering the entire catch basin network on a 4-year cycle
- Maintenance holes are cleaned annually, SWMPs are inspected and undergo general maintenance on a rotating basis and oil grit seperators are cleaned occasionally
- All other maintenance activities are completed on a reactive basis when operational issues are identified (e.g., blockages, backups). Staff are aware of limitations to the infrastructure and sensitive areas.
- Staff are currently refining the stormwater inventory to ensure the data maturity and reliability before developing maintenance strategies

Rehabilitation

- Storm sewer rehabilitation (e.g., trenchless re-lining) is not common and most capital projects are end-of-life replacement.

Replacement

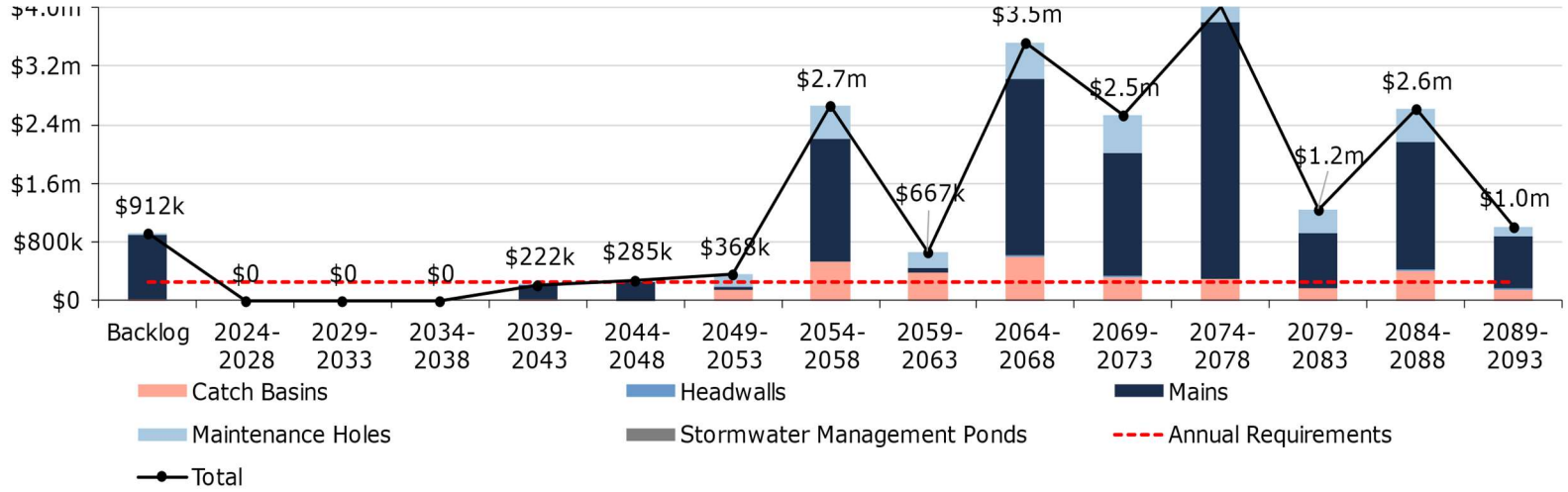
- Without the availability of up-to-date condition assessment information replacement activities are purely reactive in nature
- Stormwater replacement is generally aligned with road reconstruction priorities, but also takes into account the asset location, age, pipe material and diameter when determining and prioritizing capital works

Forecasted Capital Requirements

Figure 23 illustrates the cyclical short-, medium- and long-term infrastructure rehabilitation and replacement requirements for the Town's stormwater network. These projections are based on asset replacement costs, age analysis, and condition data. They are designed to provide a long-term, portfolio-level overview of capital needs and should be used to support improved financial planning over several decades.

The analysis was run until 2093 to capture at least one iteration of replacement for the longest-lived asset in the asset register. Penetanguishene's average annual requirements (red dotted line) for stormwater network total $251 thousand. Although actual spending may fluctuate substantially from year to year, this figure is a useful benchmark value for annual capital expenditure targets (or allocations to reserves) to ensure projects are not deferred and replacement needs are met as they arise.

Figure 23: Stormwater Network Forecasted Capital Replacement Requirements



The projected cost of lifecycle activities (as previously described) that may need to be undertaken over the next 10 years to support current levels of service. These are represented at the major asset level, 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 stormwater. There are no capital costs in the next 15-years identified for the stormwater network.

Risk & Criticality

The risk matrix provides a visual representation of the relationship between the probability of failure and the consequence of failure for the assets within this asset category based on available inventory data.

Figure 24: Stormwater Network Risk Matrix

This is a high-level model developed by municipal staff and should be reviewed and adjusted to reflect an evolving understanding of both the probability and consequences of asset failure. The asset-specific attributes that municipal staff utilize to define and prioritize the criticality of stormwater mains are documented below:

Probability of Failure (POF)	Consequence of Failure (COF)
Condition (Performance 60%)	Pipe Diameter (Financial 100%)
Service Life Remaining % (Operational 40%)	

The asset-specific attributes that municipal staff utilize to define and prioritize the criticality of the rest of the stormwater network are documented below:

Probability of Failure (POF)	Consequence of Failure (COF)
Condition (Performance 60%)	Replacement Cost (80% Financial)
Service Life Remaining % (Operational 40%)	AMP Segment (20% Operational)

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

Levels of Service

The following tables identify the Town's metrics to identify their current level of service for the stormwater network. By comparing the cost, performance (average condition) and risk year-over-year Penetanguishene will be able to evaluate how their services/assets are trending. The Town will use this data to set a target level of service and determine proposed levels for the regulation by 2025.

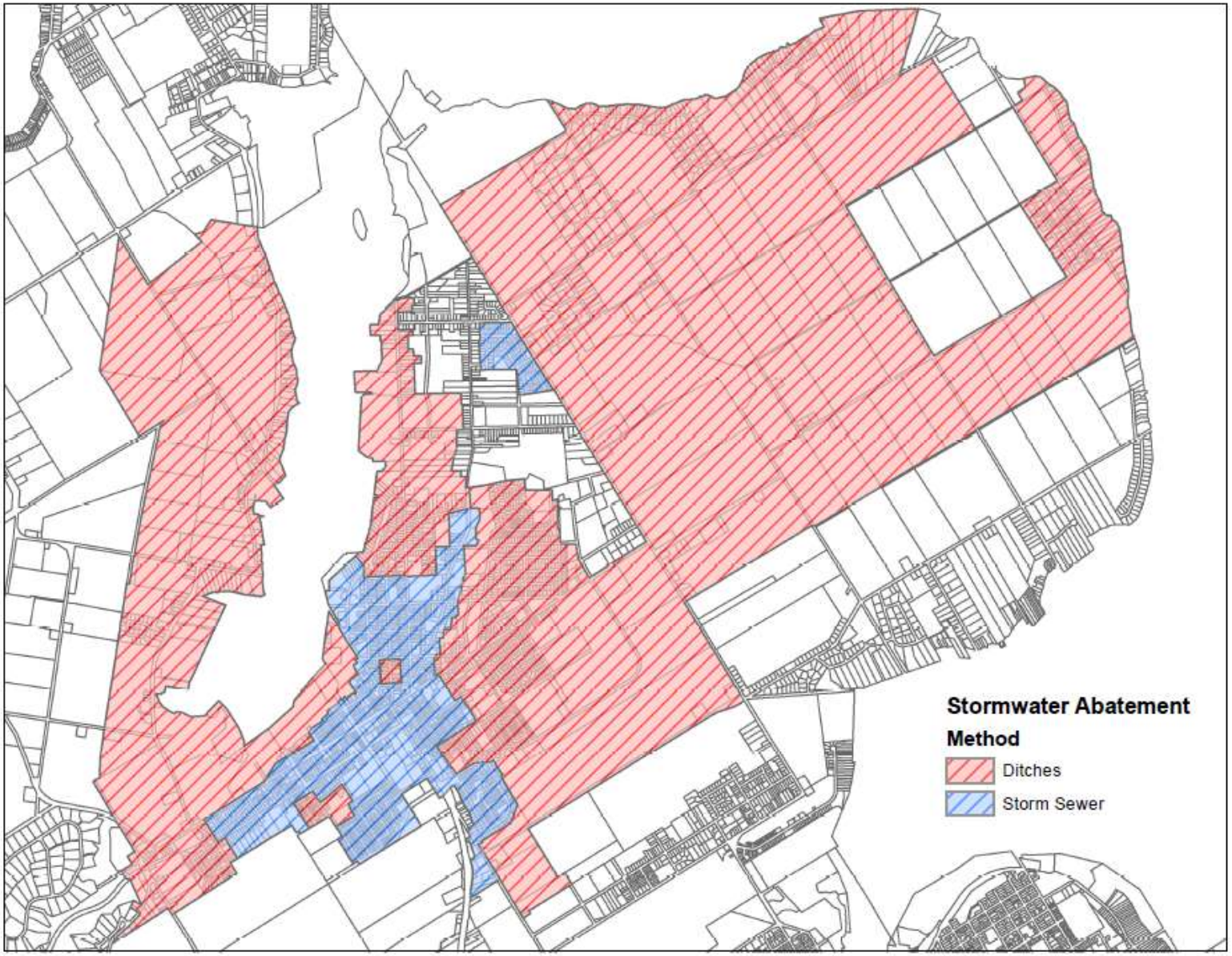
Community Levels of Service

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

Table 10 Community Levels of Service

Values	Qualitative Description	Current LOS
Scope	Description, which may include map, of the relevant areas of the municipality that are protected from flooding, including the extent of protection provided by the municipal stormwater system	See Figure 25: Stormwater Flood Map for a map that identifies the areas of the Town that are protected from flooding.

Figure 25: Stormwater Flood Map



Technical Levels of Service

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

Table 11 Stormwater Network Technical Levels of Service

Service Attribute	Technical Metric	Current LOS
Scope	% of properties in municipality resilient to a 100-year storm	70%
	% of the municipal stormwater management system resilient to a 5-year storm	90%
Quality	Average Condition Rating	86%
Performance	Average Asset Risk	3.58 (Very Low)
	Target reinvestment rate	1.3%

Appendix C: Water Network

State of the Infrastructure

The Town is responsible for providing water services to residents through the collection, storage, and distribution of water.

Water infrastructure is managed by the Water Division and comprises 2 groundwater-based water systems. Staff continue to consolidate critical asset attribute data into the Town's primary central asset inventory, which is managed in Citywide.

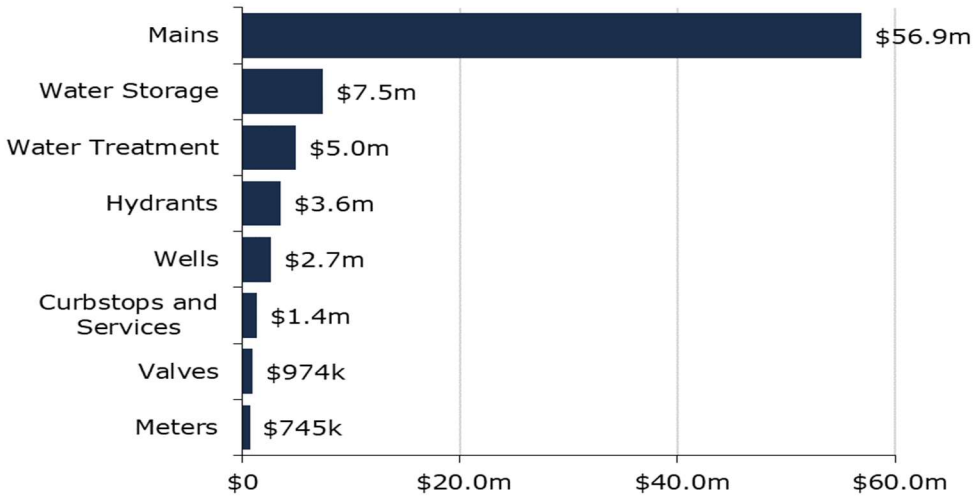
The state of the infrastructure for the water network is summarized in the following table:

Replacement Cost	Condition	Financial Capacity	
$78,680,526	Good (74%)	Annual Requirement:	$1,218,550

Inventory & Valuation

The graph below displays the total replacement cost of each asset segment in Penetanguishene's water network inventory.

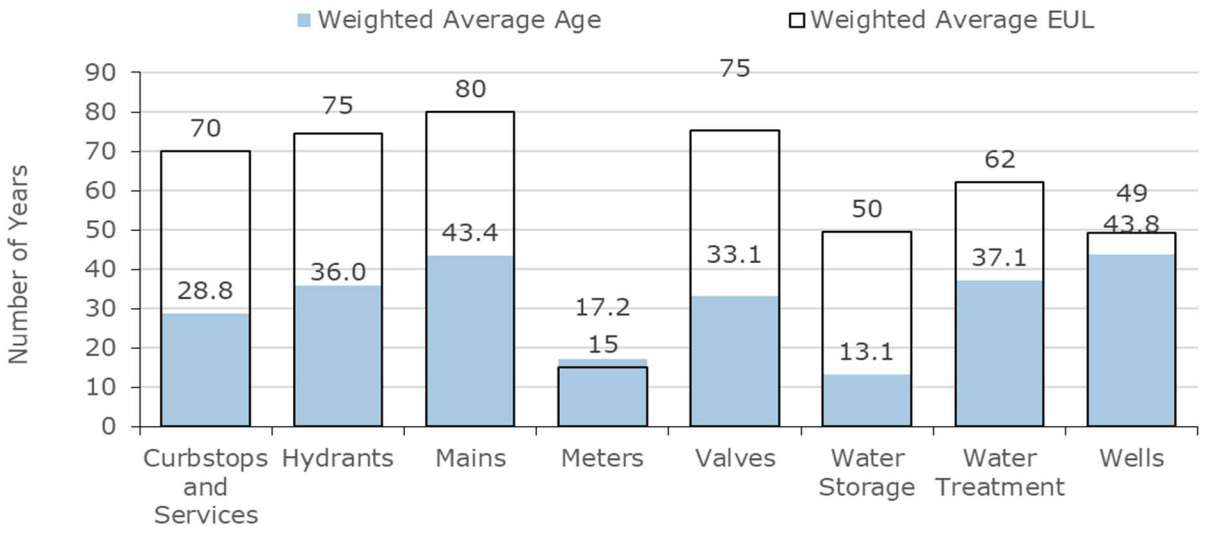
Figure 26: Water Network Replacement Cost



Asset Condition & Age

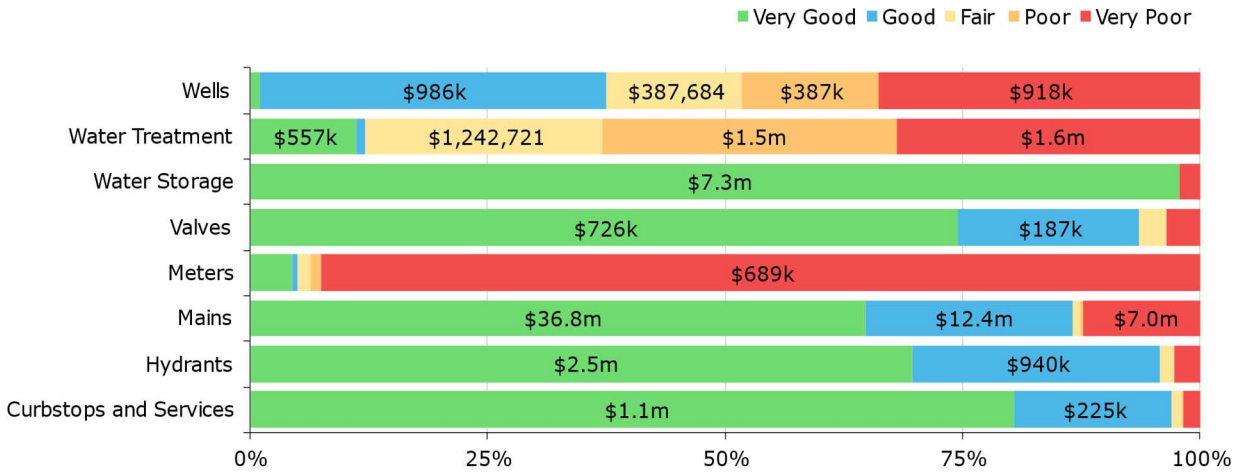
The table below identifies the current average condition, the average age, and the estimated useful life for each asset segment. The average condition (%) is a weighted value based on replacement cost.

Figure 27: Water Network Average Age vs Average EUL



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

Figure 28: Water Network Condition Breakdown



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

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

Current Approach to Condition Assessment

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

- Inspections as required under O. Reg. 170/3: Drinking Water Systems are conducted.
- Staff rely on a variety of metrics including age, pipe material and diameter, location.

Lifecycle Management Strategy

To ensure that municipal assets are performing as expected and meeting the needs of customers, it is important to establish a lifecycle management strategy to proactively manage asset deterioration. The following table outlines the Town's current lifecycle management strategy.

Figure 29: Water Network Current Lifecycle Strategy

Maintenance / Rehabilitation / Replacement

- Hydrants and valves undergo annual maintenance
- Pumphouses are inspected and undergo maintenance under a formal schedule
- Main flushing of the entire network is conducted twice a year
- Periodic pressure testing occurs in order to identify deficiencies and potential leaks

Rehabilitation / Replacement

- In the absence of mid-lifecycle rehabilitative activities, most mains are simply maintained with the goal of full replacement once service life is exceeded
- Water main replacement is prioritized based on an analysis of the main break rate, asset functionality and design capacity as well as any issues identified during maintenance activities
- Similar to other sub-surface infrastructure, Staff coordinate water replacement projects with road reconstruction projects in order to produce cost efficiencies

Forecasted Capital Requirements

The annual capital requirement represents the average amount per year that Penetanguishene should allocate towards funding rehabilitation and replacement needs. The following graph identifies capital requirements over the next 80 years. This projection is used as it ensures that every asset has gone through one full iteration of replacement. The forecasted requirements are aggregated into 5-year bins and the trend line represents the average capital requirements at $1.2 million.

Figure 30: Water Network Forecasted Capital Replacement Requirements

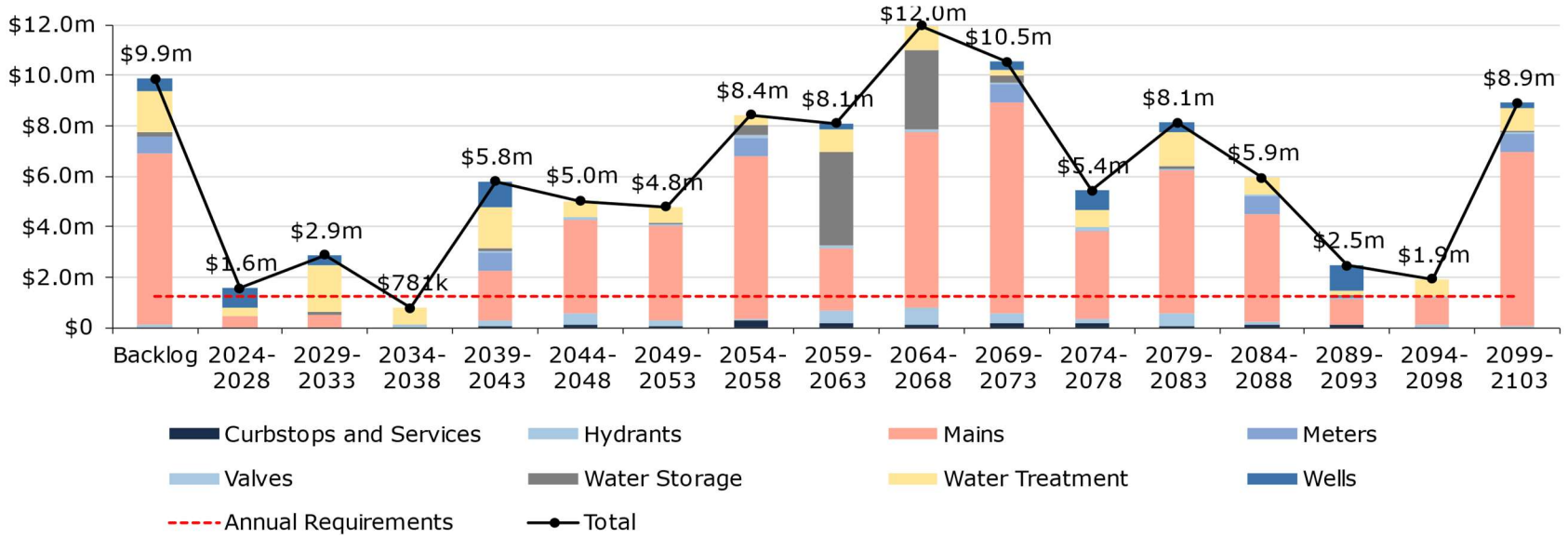


Table 12 below summarizes the projected cost of lifecycle activities (capital activities only) that may need to be undertaken over the next 10 years to support current levels of service.

Table 12 Water Network System-Generated 10-Year Capital Costs

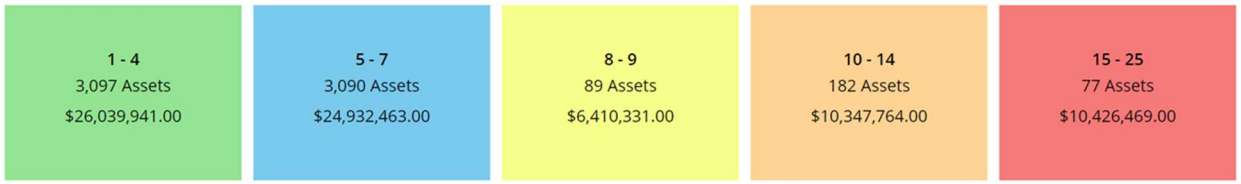
Segment	Total	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033
Curb stops and Services	$681	$0	$0	$0	$0	$681	$0	$0	$0	$0	$0
Hydrants	$22k	$0	$0	$0	$0	$0	$0	$22k	$0	$0	$0
Mains	$907k	$295k	$149k	$0	$0	$0	$0	$104k	$0	$359k	$0
Meters	$35k	$8k	$9k	$2k	$2k	$1k	$952	$0	$476	$5k	$6k
Valves	$9k	$0	$0	$0	$0	$0	$0	$2k	$0	$5k	$3k
Water Storage	$93k	$0	$0	$0	$0	$0	$0	$0	$0	$93k	$0
Water Treatment	$2.2m	$258k	$0	$2k	$39k	$0	$1.3m	$455k	$0	$158k	$0
Wells	$1.2m	$399k	$387k	$0	$0	$0	$25k	$0	$363k	$0	$0

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

Risk & Criticality

The risk matrix provides a visual representation of the relationship between the probability of failure and the consequence of failure for the assets within this asset category based on available inventory data.

Figure 31: Water Network Risk Matrix



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

The asset-specific attributes that municipal staff utilize to define and prioritize the criticality of water mains are documented below:

Probability of Failure (POF)	Consequence of Failure (COF)
Condition (Performance 60%)	Pipe Material (Financial 50%)
Service Life Remaining % (Operational 40%)	Pipe Diameter (50% Operational)

The asset-specific attributes that municipal staff utilize to define and prioritize the criticality of the rest of the water network are documented below:

Probability of Failure (POF)	Consequence of Failure (COF)
Condition (Performance 60%)	Replacement Cost (80% Financial)
Service Life Remaining % (Operational 40%)	AMP Segment (20% Operational)

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

Levels of Service

By comparing the cost, performance (average condition) and risk year-over-year, the Town will be able to evaluate how their services/assets are trending. The Town will use this data to set a target level of service and determine proposed levels for the regulation by 2025.

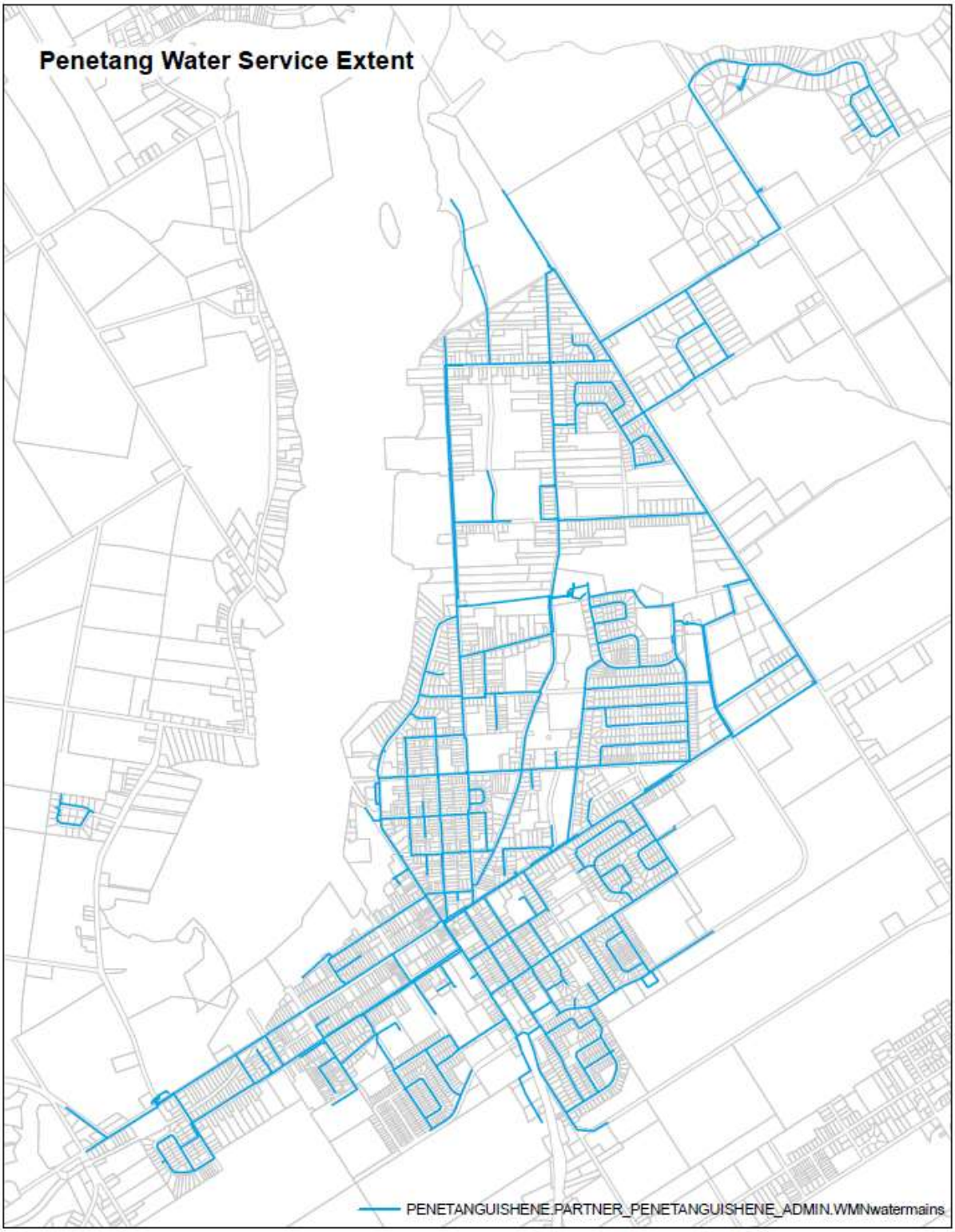
Community Levels of Service

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

Table 13 Water Network Community Levels of Service

Service Attribute	Qualitative Description	Current LOS
Scope	Description, which may include maps, of the user groups or areas of the municipality that are connected to the municipal water system	See Figure 32 for a map that identifies the areas of the Town that are connected to the municipal water system.
	Description, which may include maps, of the user groups or areas of the municipality that have fire flow	Two sections of the Town do not have fire flow. These neighbourhoods are as follows: Lepage Drive Neighbourhood & Lower section of Gilwood Park Drive.
Reliability	Description of boil water advisories and service interruptions	All service interruptions in 2020 were a result of emergency repairs of which there were 5 watermain breaks. One of these water main breaks caused a BWA because of an observation of potential contamination which made it a Category 2 watermain break and this requires an adverse notification to SAC and the Medical Officer of Health. There were only three homes affected by the BWA in this case for 2 days.

Figure 32: Water Network Map



Technical Levels of Service

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

Table 14 Water Network Technical Levels of Service

Values	Technical Metric	Current LOS
Scope	% of properties connected to the municipal water system	72%
	% of properties where fire flow is available	69%
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	0.002
	# 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	0.027
Quality	Average Condition Rating	74%
Performance	Average Asset Risk	8.29 (Moderate)
	Target reinvestment rate	1.50%

Appendix D: Sanitary Sewer Network

State of the Infrastructure

The Town is responsible for providing sanitary sewer services to residents through the collection, storage, and treatment of sanitary sewage. Sanitary sewer infrastructure is managed by the Public Works Department.

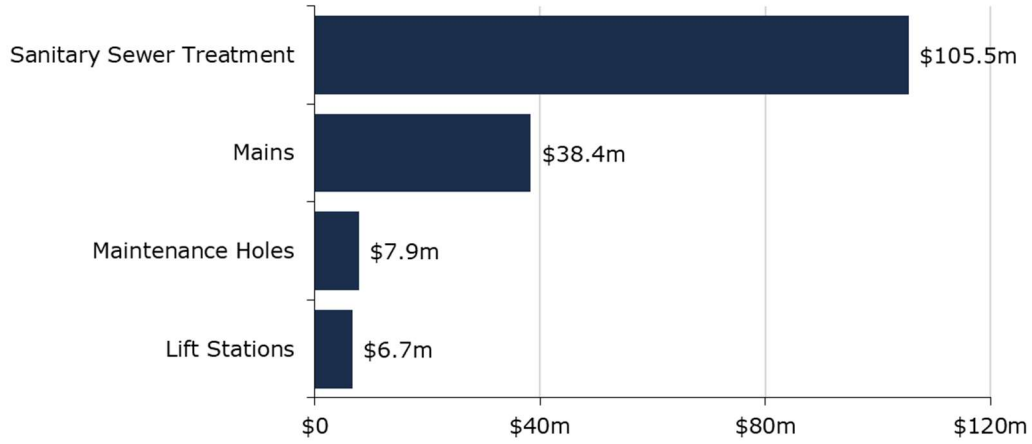
Staff continue to consolidate critical asset attribute data into the Town's primary central asset inventory, which is managed in Citywide. The state of the infrastructure for the sanitary sewer network is summarized in the following table:

Replacement Cost	Condition	Financial Capacity	
$158,403,325	Very Good (81%)	Annual Requirement:	$3,156,452

Inventory & Valuation

The graph below displays the total replacement cost of each asset segment in Penetanguishene's sanitary sewer network inventory.

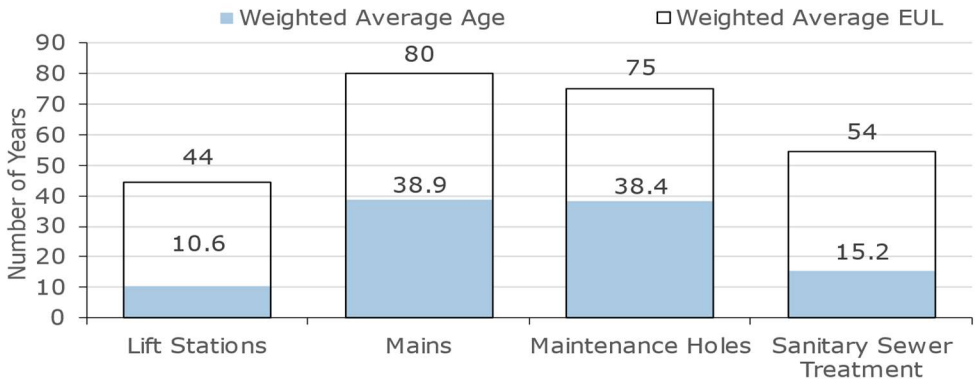
Figure 33: Sanitary sewer Network Replacement Cost



Asset Condition & Age

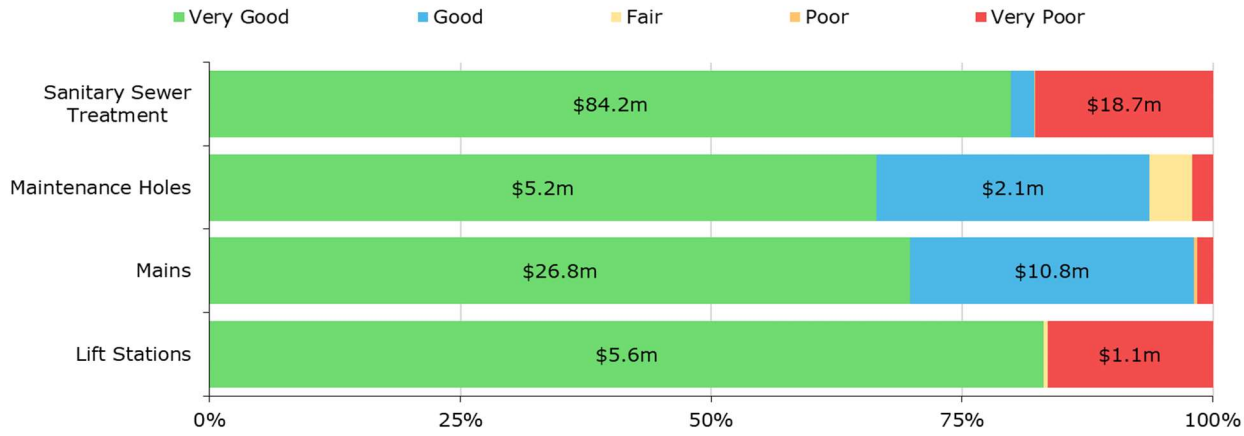
The table below identifies the current average condition, the average age, and the estimated useful life for each asset segment. The average condition (%) is a weighted value based on replacement cost.

Figure 34: Sanitary sewer Network Average Age vs Average EUL



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

Figure 35: Sanitary sewer Network Condition Breakdown



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

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

Current Approach to Condition Assessment

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

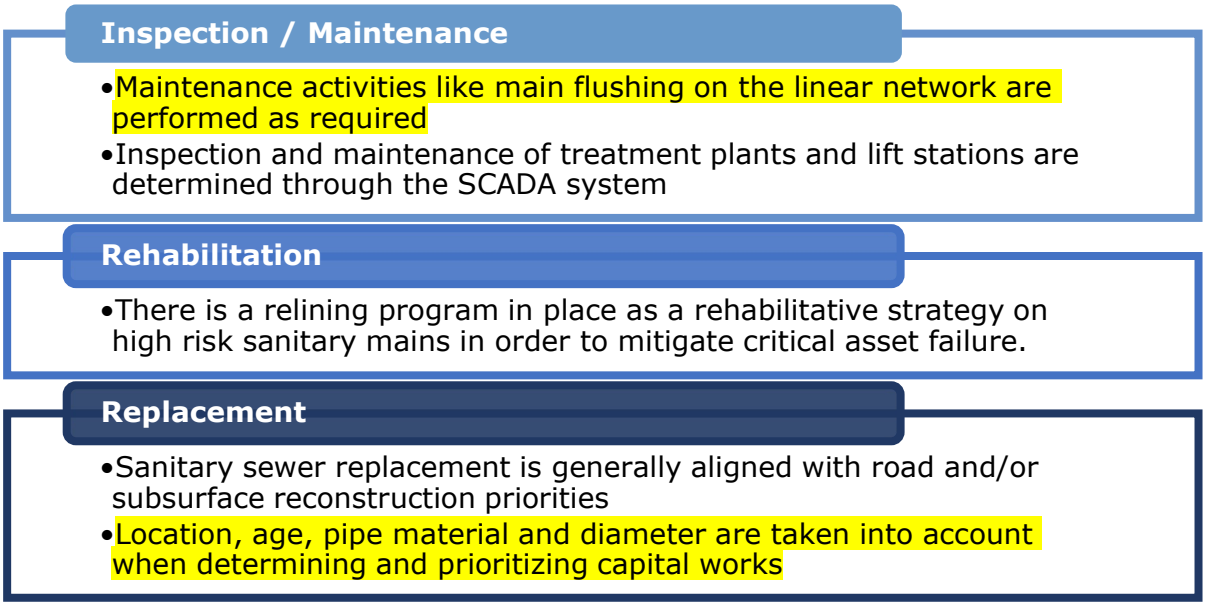
- CCTV inspections are conducted on an as-needed basis, during main flushing and in coordination with construction projects.
- Sanitary facilities are inspected under an established schedule.

- Staff rely on a variety of metrics including age, pipe material and diameter, location, and available CCTV assessments to determine the projected condition of linear assets.

Lifecycle Management Strategy

To ensure that municipal assets are performing as expected and meeting the needs of customers, it is important to establish a lifecycle management strategy to proactively manage asset deterioration. The following table outlines the Town's current lifecycle management strategy.

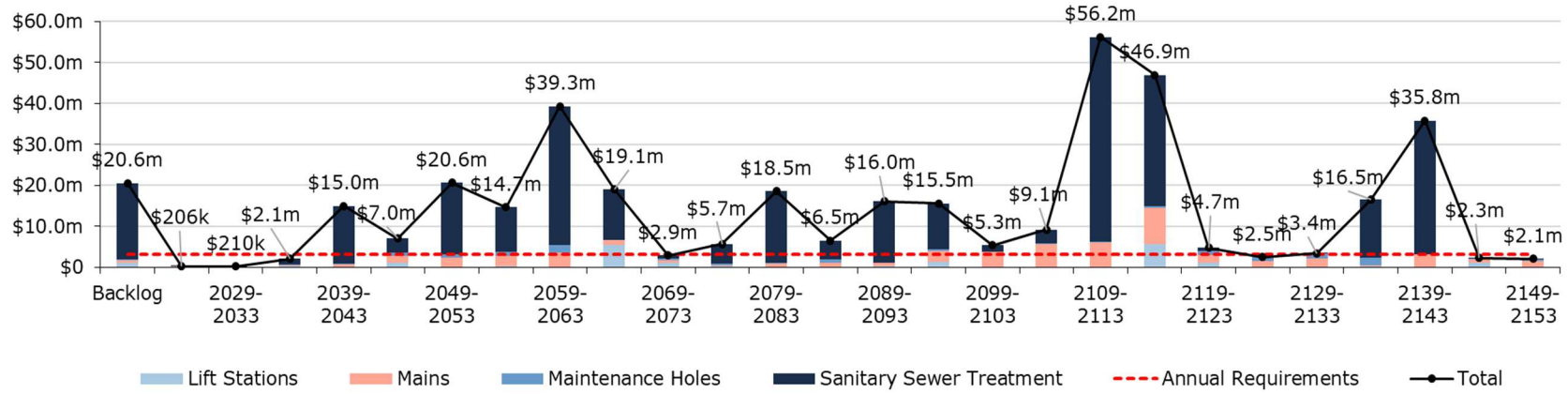
Figure 36: Sanitary sewer Network Current Lifecycle Strategy



Forecasted Capital Requirements

The annual capital requirement represents the average amount per year that Penetanguishene should allocate towards funding rehabilitation and replacement needs. The following graph identifies capital requirements over the next 120 years. This projection is used as it ensures that every asset has gone through one full iteration of replacement. The forecasted requirements are aggregated into 5-year bins and the trend line represents the average capital requirements at $3.2 million.

Figure 37: Sanitary sewer Network Forecasted Capital Replacement Requirements



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

Table 15 Sanitary sewer network System-Generated 10-Year Capital Costs

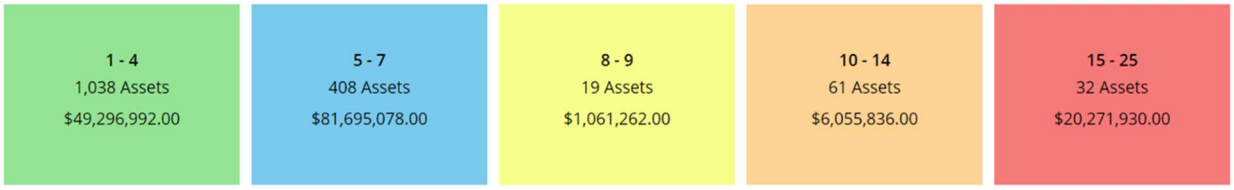
Segment	Total	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033
Lift Stations	$75k	$0	$0	$0	$0	$0	$0	$28k	$0	$47k	$0
Mains	$145k	$0	$145k	$0	$0	$0	$0	$0	$0	$0	$0
Maintenance Holes	$11k	$0	$0	$0	$0	$0	$0	$0	$0	$11k	$0
Sanitary Sewer Treatment	$184k	$46k	$14k	$0	$0	$0	$0	$7k	$105k	$12k	$0

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

Risk & Criticality

The risk matrix provides a visual representation of the relationship between the probability of failure and the consequence of failure for the assets within this asset category based on available inventory data.

Figure 38: Sanitary sewer network Risk Matrix



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

The asset-specific attributes that municipal staff utilize to define and prioritize the criticality of sanitary sewer mains are documented below:

Probability of Failure (POF)	Consequence of Failure (COF)
Condition (Performance 60%)	Pipe Material (Financial 50%)
Service Life Remaining % (Operational 40%)	Pipe Diameter (50% Operational)

The asset-specific attributes that municipal staff utilize to define and prioritize the criticality of the rest of the sanitary sewer network are documented below:

Probability of Failure (POF)	Consequence of Failure (COF)
Condition (Performance 60%)	Replacement Cost (80% Financial)
Service Life Remaining % (Operational 40%)	AMP Segment (20% Operational)

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

Levels of Service

By comparing the cost, performance (average condition) and risk year-over-year, the Town will be able to evaluate how their services/assets are trending. The Town will use this data to set a target level of service and determine proposed levels for the regulation by 2025.

Community Levels of Service

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

Table 16 Sanitary Sewer Network Technical Levels of Service

Service Attribute	Qualitative Description	Current LOS
Scope	Description, which may include maps, of the user groups or areas of the municipality that are connected to the municipal wastewater system	See Appendix C for a map that identifies the areas of the Town that are connected to the municipal wastewater system.
Reliability	Description of how combined sewers in the municipal wastewater system are designed with overflow structures in place which allow overflow during storm events to prevent backups into homes	Philip H. Jones PCP (Main Street STP) Sanitary Sewer Collection System - There are a limited number of combined sewers within the collection system. The removal of these storm sewer cross connections is a priority within the Capital Plan and these will be removed over time. The Equalization storage tanks at the Main Street STP provide on-site storage of the extraneous flows (inflow and infiltration) that are received at the STP during storm or melt events. This on-site storage helps prevent treatment units within the plant from being overwhelmed resulting in by-pass events (Primary, Secondary and Tertiary). Fox Street PCP Sanitary Collection System - There are a limited number of combined sewers within the collection system. The removal of these storm sewer cross connections is a priority within the Capital Plan, and these will be removed over time. There is no on-site equalization storage at the Fox Street STP.
	Description of the frequency and volume of overflows in combined sewers in the municipal wastewater system that occur in habitable areas or beaches	There is a limited number of combined sewers within the collection systems. The collection systems discharge into our Pollution Control Plants where the wastewater is treated in accordance with our Environmental Compliance Approvals, issued by the MECP. There has been one by-pass event at the Fox Street PCP in 2021, no by-pass events at the Main Street STP.

Service Attribute	Qualitative Description	Current LOS
	Description of how stormwater can get into sanitary sewers in the municipal wastewater system, causing sewage to overflow into streets or backup into homes	Stormwater can enter sanitary sewers due to damaged sanitary mains or through indirect connections (e.g., weeping tiles). In the case of heavy rainfall events, sanitary sewers may experience a volume of water and sewage that exceeds its designed capacity. In some cases, this can cause water and/or sewage to backup into homes. The disconnection of weeping tiles from sanitary mains and the use of sump pumps and pits directing storm water to the storm drain system can help to reduce the chance of this occurring. The Town follows a series of design standards that integrate servicing requirements and land use considerations when constructing or replacing sanitary sewers. These standards have been determined with consideration of the minimization of sewage overflows and backups. Staff have also indicated that there is a possibility that some of the sump pumps connected to the sanitary network could lead to overflow. As part of the Town's relining program, Staff will be addressing this vulnerability.
	Description of how sanitary sewers in the municipal wastewater system are designed to be resilient to stormwater infiltration	The Public Works Capital Program has put a priority on the elimination of inflow/infiltration within the sanitary sewer system through the physical separation of the sanitary and storm sewers within the Town's Reconstruction Program. The design and construction of sanitary and storm sewers is in accordance with the latest design standards issued by the MECP to eliminate or minimize inflow and infiltration within the sanitary sewer system.
	Description of the effluent that is discharged from sewage treatment plants in the municipal wastewater system	Effluent refers to water pollution that is discharged from a wastewater treatment plant, and may include suspended solids, total phosphorous and biological oxygen demand. The Environmental Compliance Approval (ECA) identifies the effluent criteria for municipal wastewater treatment plants.

Technical Levels of Service

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

Table 17 Sanitary sewer network Technical Levels of Service

Service Attribute	Technical Metric	Current LOS
Scope	% of properties connected to the municipal wastewater system	67%
Reliability	# of events per year where combined sewer flow in the municipal wastewater system exceeds system capacity compared to the total number of properties connected to the municipal wastewater system	0
	# of connection-days per year having wastewater backups compared to the total number of properties connected to the municipal wastewater system	0.0024
	# of effluent violations per year due to wastewater discharge compared to the total number of properties connected to the municipal wastewater system	0.00069
Quality	Average Condition Rating	81%
Performance	Average Asset Risk	6.66 (Low)
	Target reinvestment rate	2.0%

Appendix E: Facilities

State of the Infrastructure

Penetanguishene owns and maintains several facilities that provide key services to the community. These include:

- administrative offices
- library, museum, and community centre
- fire halls and associated offices and facilities
- public works garages and storage sheds

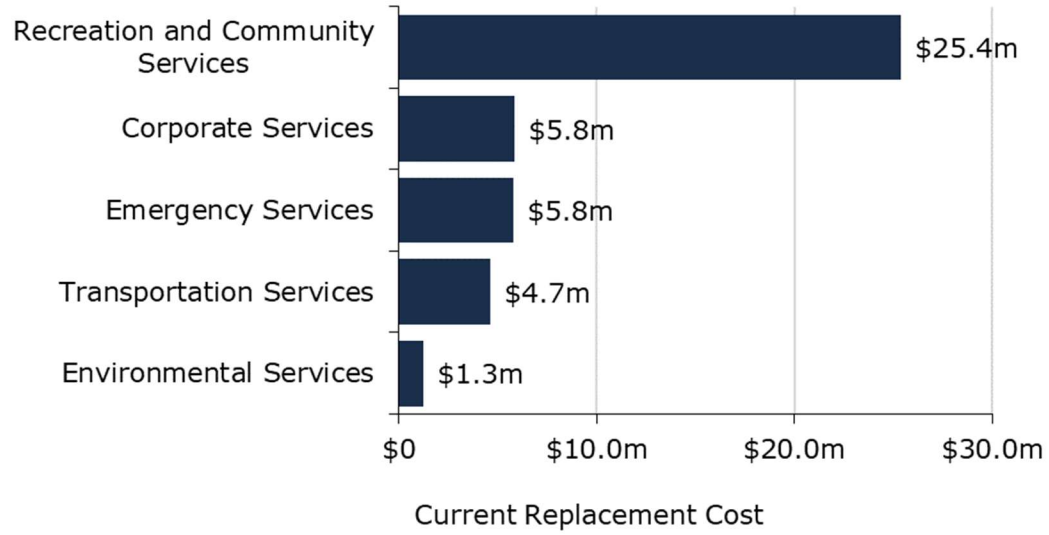
The state of the infrastructure for the facilities is summarized in the following table.

Replacement Cost	Condition	Financial Capacity	
$42,901,820	Good (64%)	Annual Requirement:	$1,016,261

Inventory & Valuation

The graph below displays the total replacement cost of each asset segment in Penetanguishene's facilities inventory.

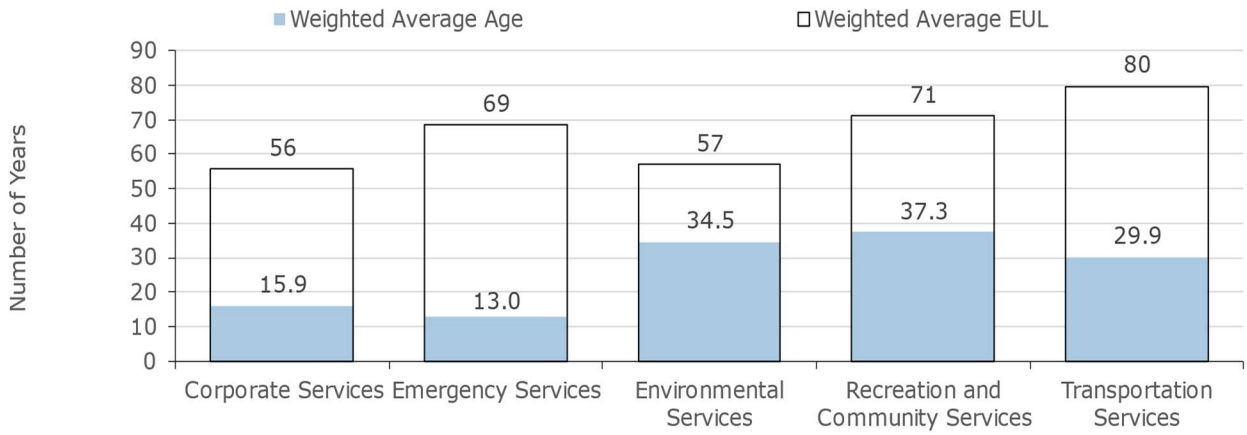
Figure 39: Facilities Replacement Cost



Asset Condition & Age

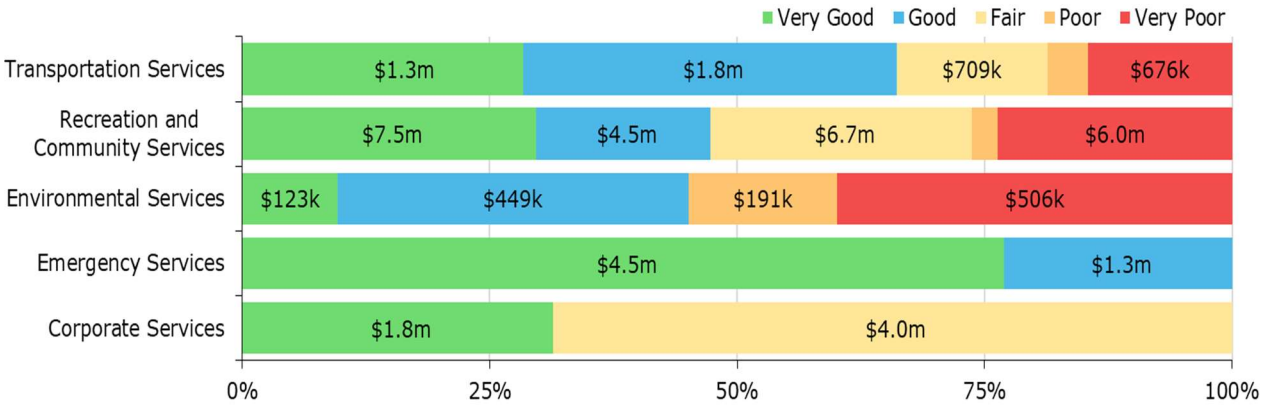
The graph below identifies the average age, and the estimated useful life for each asset segment. The values are weighted based on replacement cost.

Figure 40: Facilities Average Age vs Average EUL



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

Figure 41: Facilities Condition Breakdown



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

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

Current Approach to Condition Assessment

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

- Building Condition Assessments (BCAs) were conducted in 2019 by GHD on 18 of the Town's facilities

- Formal workplace inspections are conducted every year through the Town's health and safety program.
- High-level assessments by internal staff are performed annually to determine the condition of facilities and identify deficiencies.

Lifecycle Management Strategy

To ensure that municipal assets are performing as expected and meeting the needs of customers, it is important to establish a lifecycle management strategy to proactively manage asset deterioration. The following table outlines the Town's current lifecycle management strategy.

Figure 42: Facilities Current Lifecycle Strategy

Maintenance / Rehabilitation / Replacement

- Staff identify building maintenance needs in reaction to breakdowns
- The building condition assessment is used to budget based on the 20-year projection created

Forecasted Capital Requirements

The annual capital requirement represents the average amount per year that Penetanguishene should allocate towards funding rehabilitation and replacement needs. The following graph identifies capital requirements over the next 100 years. This projection is used as it ensures that every asset has gone through one full iteration of replacement. The forecasted requirements are aggregated into 5-year bins and the trend line represents the average capital requirements at $1 million.

Figure 43: Facilities Forecasted Capital Replacement Requirements

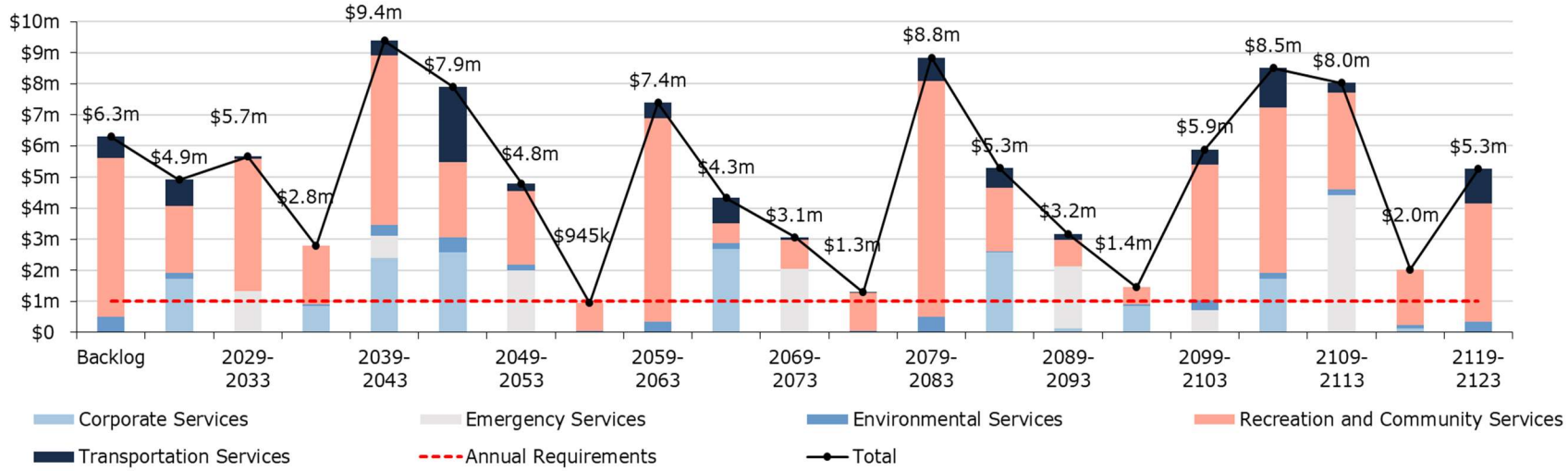


Table 18 below summarizes the projected cost of lifecycle activities (capital activities only) that may need to be undertaken over the next 10 years to support current levels of service.

Table 18 Facilities System-Generated 10-Year Capital Costs

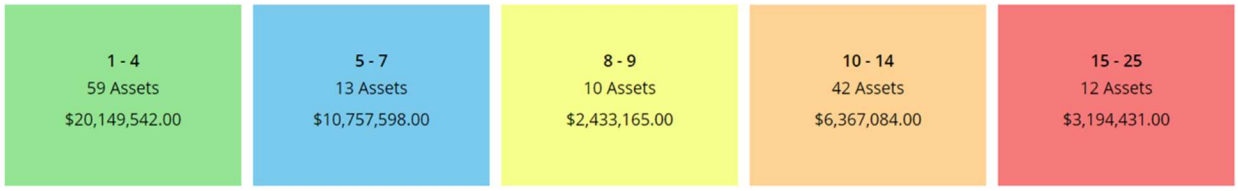
Segment	Total	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033
Corporate Services	$1.7m	$0	$0	$0	$1.7m	$0	$0	$0	$0	$0	$0
Emergency Services	$1.3m	$0	$0	$0	$0	$0	$0	$1.3m	$0	$0	$0
Environmental Services	$191k	$0	$191k	$0	$0	$0	$0	$0	$0	$0	$0
Recreation and Community Services	$6.4m	$892k	$649k	$562k	$72k	$0	$369k	$244k	$0	$93k	$3.5m
Transportation Services	$899k	$0	$190k	$639k	$0	$0	$0	$70k	$0	$0	$0

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

Risk & Criticality

The risk matrix provides a visual representation of the relationship between the probability of failure and the consequence of failure for the assets within this asset category based on available inventory data.

Figure 44: Facilities Risk Matrix



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

The asset-specific attributes that municipal staff utilize to define and prioritize the criticality of the facilities are documented below:

Probability of Failure (POF)	Consequence of Failure (COF)
Condition (Performance 60%)	Replacement Cost (80% Financial)
Service Life Remaining % (Operational 40%)	AMP Segment (20% Operational)

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

Levels of Service

By comparing the cost, performance (average condition) and risk year-over-year, the Town will be able to evaluate how their services/assets are trending. The Town will use this data to set a target level of service and determine proposed levels for the regulation by 2025.

Community Levels of Service

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

- administrative offices
- library, museum, and community centre
- fire halls and associated offices and facilities
- public works garages and storage sheds

Technical Levels of Service

The quantitative metrics that determine the technical level of service provided by the facilities in Penetanguishene are going to be the analysis of target reinvestment rate, asset performance (average condition) and average asset risk.

Table 19 Facilities Technical Levels of Service

Service Attribute	Technical Metric	Current LOS
Scope	Average Asset Risk	6.71 (Low)
Quality	Average Condition Rating	64%
Performance	Target Reinvestment Rate	2.4%

Appendix F: Land Improvements

State of the Infrastructure

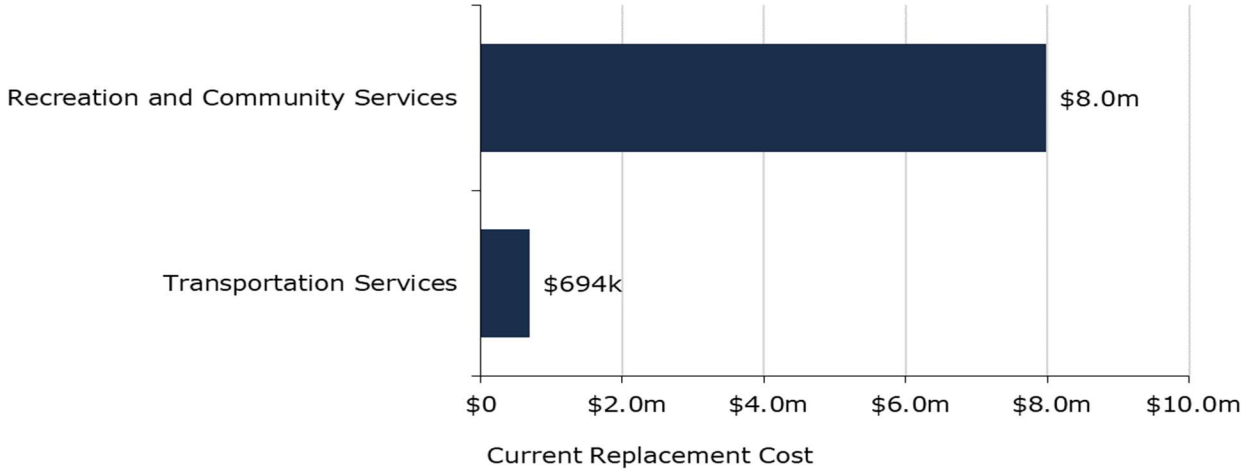
The Town of Penetanguishene owns several assets that are grouped under the parks and land improvements category and assist in providing the Town with community recreation, marina and natural outdoor space. The Town's land improvements inventory is managed in Citywide. The state of the infrastructure for the land improvements is summarized in the following table.

Replacement Cost	Condition	Financial Capacity	
$8,677,806	Very Good (82%)	Annual Requirement:	$380,343

Asset Inventory & Valuation

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

Figure 45: Land Improvements Replacement Cost

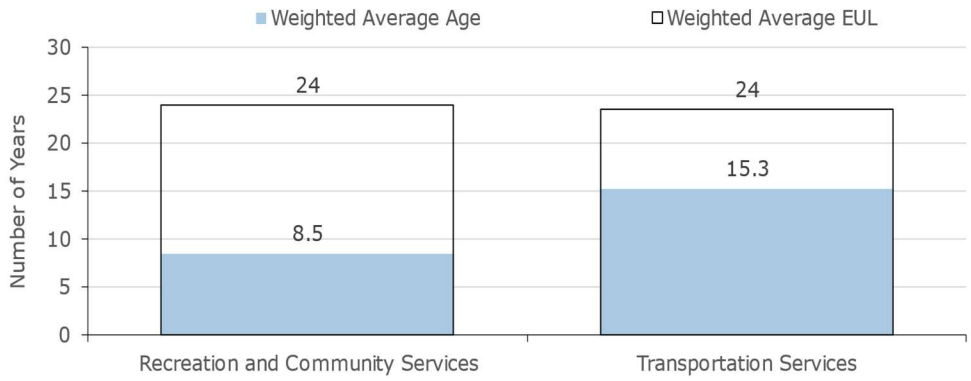


Asset Condition & Age

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

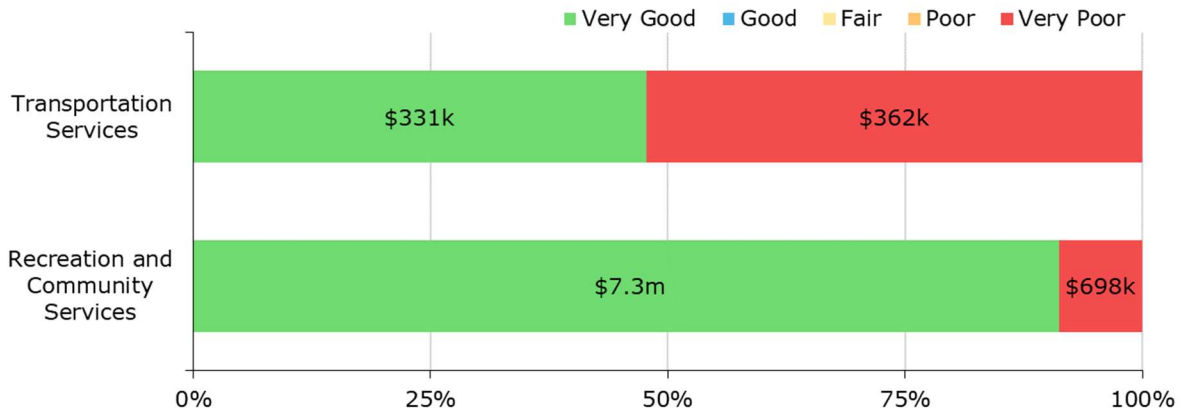
Each asset's estimated useful life should also be reviewed periodically to determine whether adjustments need to be made to better align with the observed length of service life for each asset type

Figure 46: Land Improvements Average Age vs Average EUL



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

Figure 47: Land Improvement Condition Breakdown



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

Current Approach to Condition Assessment

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

- Staff complete regular visual inspections of land improvements assets to ensure they are in state of adequate repair
- Staff conduct formal inspections of outdoor play space, fixed play structures and surfacing in accordance with CAN/CSA-Z614 and required as per O. Reg. 137/15
- There are no other formal condition assessment programs in place for other land improvements assets

Lifecycle Management Strategy

To ensure that municipal assets are performing as expected and meeting the needs of customers, it is important to establish a lifecycle management strategy to proactively manage asset deterioration. The following figures outline Penetanguishene's current lifecycle management strategy.

Figure 48: Land Improvements Current Lifecycle Strategy

Maintenance / Rehabilitation / Replacement

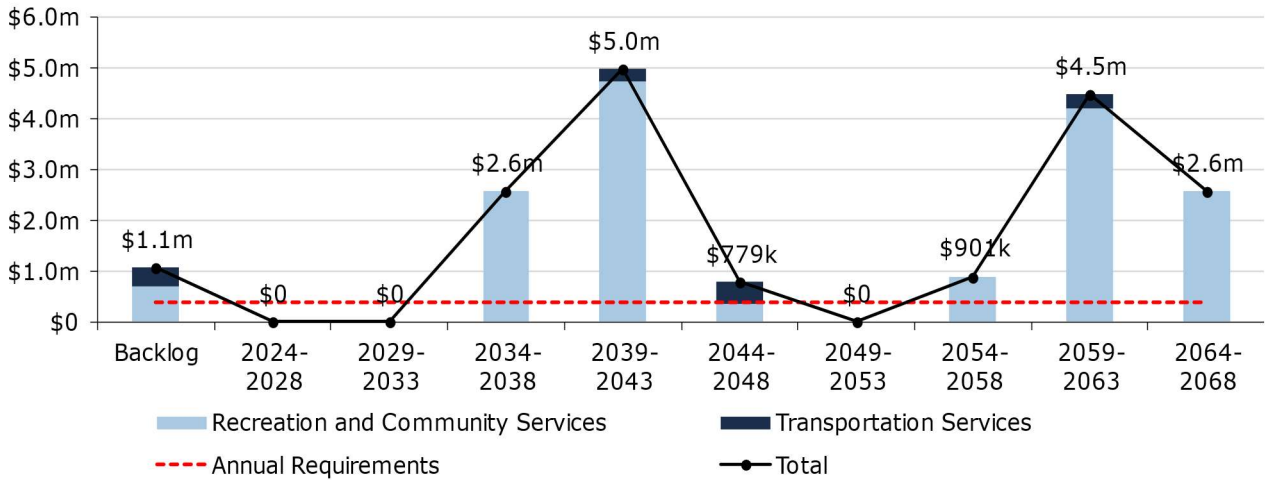
- Staff regularly review outdoor play space otherwise it is through reactive complaint or asset failure.

Forecasted Capital Requirements

Figure 49 illustrates the cyclical short-, medium- and long-term infrastructure replacement requirements for the Town's land improvement infrastructure. This analysis was run until 2063 to capture at least one iteration of replacement for the longest-lived asset in the asset register. Penetanguishene's average annual requirements (red dotted line) total $380 thousand for all land improvement assets. Although actual spending may fluctuate substantially from year to year, this figure is a useful benchmark value for annual capital expenditure targets (or allocations to reserves) to ensure projects are not deferred and replacement needs are met as they arise.

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

Figure 49: Land Improvements Forecasted Capital Replacement Requirements



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

The projected cost of lifecycle activities (capital replacement only) that will need to be undertaken over the next 10 years to support current levels of service are currently at $0. These projections are generated in Citywide and rely on the data available in the asset register, which was limited to asset age, replacement cost, and useful life.

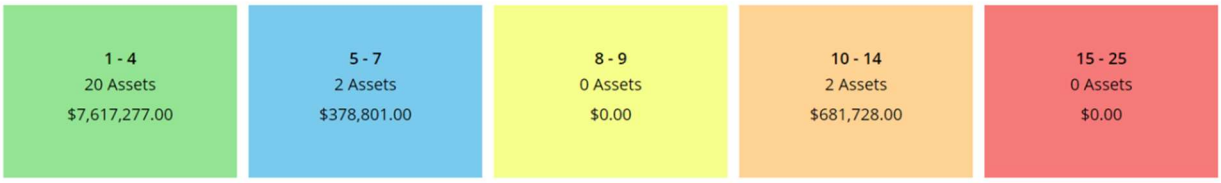
Consistent data updates, especially condition, will improve the alignment between the system-generated expenditure requirements, and the Town's capital expenditure forecasts.

There is a backlog identified of $1.1 million which does not mean that these assets are in disrepair, just that they are still in service past their identified useful life. Assessment of these assets to plan for their replacement should be looked at by staff.

Risk & Criticality

The risk matrix provides a visual representation of the relationship between the probability of failure and the consequence of failure for the assets within this asset category based on available inventory data.

Figure 50: Land Improvements Risk Matrix



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

The asset-specific attributes that municipal staff utilize to define and prioritize the criticality of the land improvement assets are documented below:

Probability of Failure (POF)	Consequence of Failure (COF)
Condition (Performance 60%)	Replacement Cost (80% Financial)
Service Life Remaining % (Operational 40%)	AMP Segment (20% Operational)

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

Levels of Service

The following tables identify Penetanguishene's metrics to identify the current level of service for the land improvement assets. By comparing the cost, performance (average condition) and risk year-over-year the Town will be able to evaluate how their services/assets are trending. Penetanguishene will use this data to set a target level of service and determine proposed levels for the regulation by 2025.

Community Levels of Service

The qualitative descriptions that determine the community levels of service provided by municipal land improvements are based on the types of land improvements outlined below:

- Community recreation
- Transportation services parking lots and fences
- Marinas and natural outdoor space

Technical Levels of Service

The quantitative metrics that determine the technical level of service provided by the facilities in Penetanguishene are going to be the analysis of target reinvestment rate, asset performance (average condition) and average asset risk.

Table 20 Land Improvements Technical Levels of Service

Service Attribute	Technical Metric	Current LOS
Scope	Average Asset Risk	3.99 (Very Low)
Quality	Average Condition Rating	82%
Performance	Target Reinvestment Rate	4.4%

Appendix G: Machinery & Equipment

State of the Infrastructure

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

- Machinery and equipment to maintain parks and recreational facilities
- Specialized machinery and equipment to support the public works department
- Emergency services equipment to support first responders and emergency services
- IT equipment for communication and data management to support corporate and administrative services

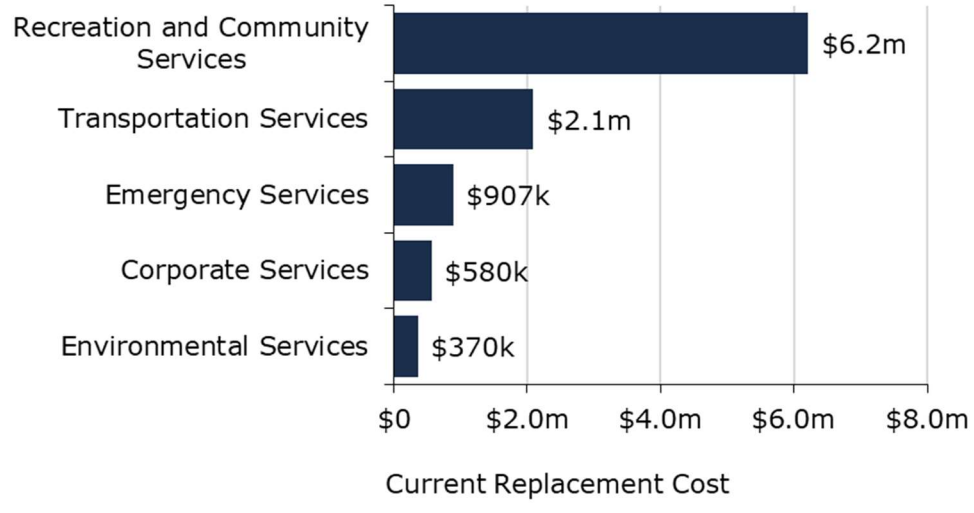
The state of the infrastructure for equipment is summarized in the following table.

Replacement Cost	Condition	Financial Capacity	
$10,163,488	Fair (42%)	Annual Requirement:	$879,170

Inventory & Valuation

The graph below displays the total replacement cost of each asset segment in the Penetanguishene's machinery and equipment inventory.

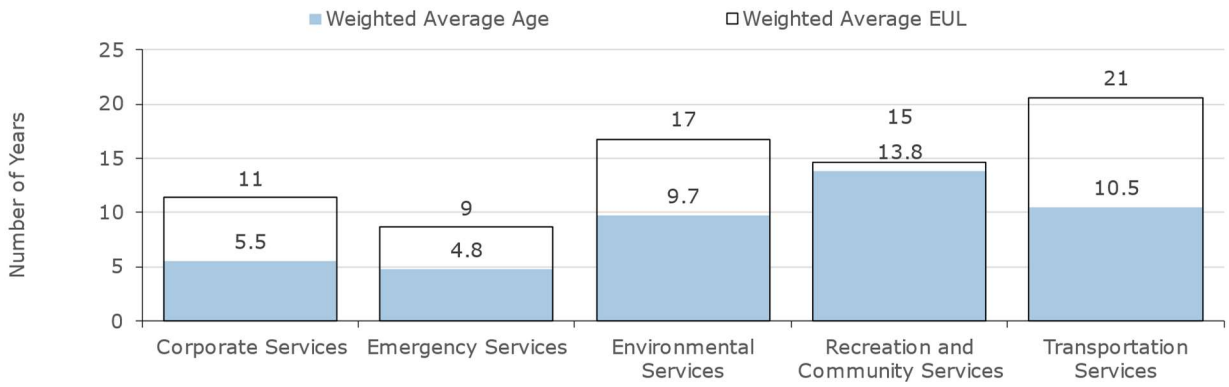
Figure 51: Machinery & Equipment Replacement Costs



Asset Condition & Age

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

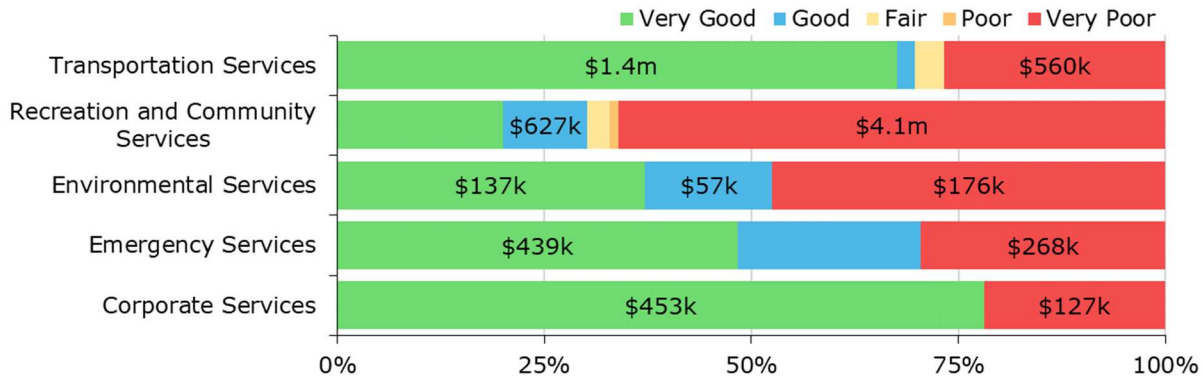
Figure 52: Machinery & Equipment Average Age vs Average EUL



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

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

Figure 53: Machinery & Equipment Condition Breakdown



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

Current Approach to Condition Assessment

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

- Staff complete regular visual inspections of machinery and equipment assets to ensure they are structurally and functionally sound. Assets typically stay true to their estimated useful life and are replaced at end of life.

- Condition assessments are conducted on fire and emergency assets in accordance with regulations for health and safety regulations including National Fire Protection Association (NFPA) codes and standards for fire service-related machinery and equipment assets.

Lifecycle Management Strategy

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

Figure 54: Machinery & Equipment Current Lifecycle Strategy

Maintenance / Rehabilitation / Replacement

- Lifecycle activities are tailored to the specific characteristics, needs and priorities of each equipment type and department.

Forecasted Capital Requirements

The following graph identifies capital requirements over the next 25 years. This projection is used as it ensures that every asset has gone through one full iteration of replacement. The forecasted requirements are aggregated into 5-year bins and the trend line represents the average annual capital requirements at $829 thousand.

Figure 55: Machinery & Equipment Forecasted Capital Replacement Requirements

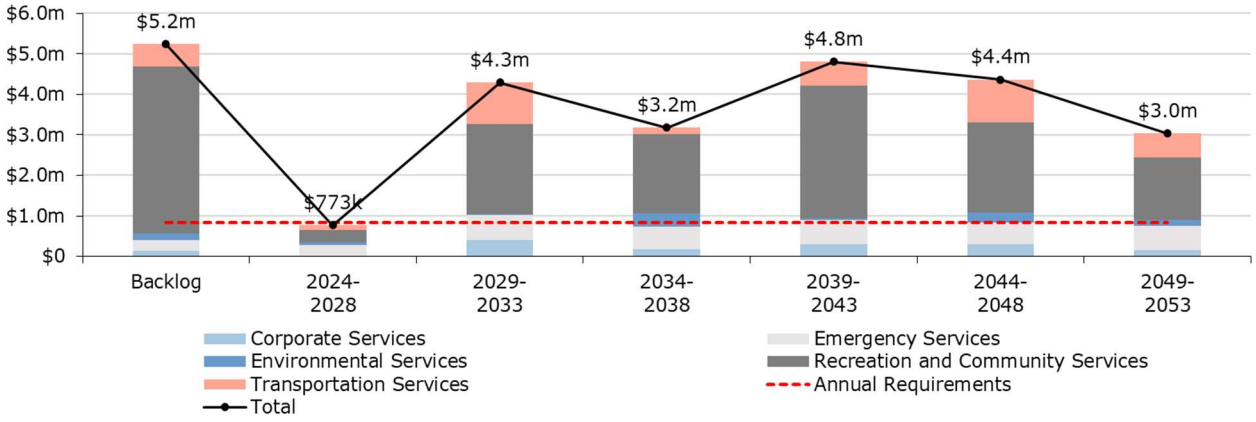


Table 21 below summarizes the projected cost of lifecycle activities (capital replacement only) that may need to be undertaken over the next 10 years to support current levels of service. These projections are generated in Citywide and rely on the data available in the asset register.

Table 21 Machinery & Equipment System-Generated 10-Year Capital Costs

Segment	Total	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033
Corporate Services	$409k	$0	$0	$0	$0	$0	$11k	$89k	$201k	$64k	$44k
Emergency Services	$887k	$0	$103k	$96k	$48k	$35k	$97k	$103k	$337k	$67k	$0
Environmental Services	$92k	$0	$0	$57k	$0	$0	$0	$14k	$22k	$0	$0
Recreation and Community Services	$2.5m	$68k	$169k	$0	$38k	$42k	$443k	$0	$1.5m	$105k	$211k
Transportation Services	$1.1m	$72k	$0	$0	$45k	$0	$59k	$0	$316k	$412k	$228k

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

Risk & Criticality

The risk matrix provides a visual representation of the relationship between the probability of failure and the consequence of failure for the assets within this asset category based on available inventory data.

Figure 56: Machinery and Equipment Risk Matrix

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

The asset-specific attributes that municipal staff utilize to define and prioritize the criticality of the machinery and equipment assets are documented below:

Probability of Failure (POF)	Consequence of Failure (COF)
Condition (Performance 60%)	Replacement Cost (80% Financial)
Service Life Remaining % (Operational 40%)	AMP Segment (20% Operational)

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

Levels of Service

By comparing the cost, performance (average condition) and risk year-over-year, Penetanguishene will be able to evaluate how their services/assets are trending. The Town will use this data to set a target level of service and determine proposed levels for the regulation by 2025.

Community Levels of Service

The qualitative descriptions that determine the community levels of service provided by municipal machinery & equipment are based on the types of equipment outlined below:

- Equipment to maintain parks and recreational facilities
- Machinery and equipment to support emergency services
- IT equipment
- Equipment to maintain transportation services

Technical Levels of Service

The quantitative metrics that determine the technical level of service provided by the machinery and equipment owned by Penetanguishene are going to be the analysis of target reinvestment rate, asset performance (average condition) and average asset risk.

Table 22 Machinery and Equipment Technical Levels of Service

Service Attribute	Technical Metric	Current LOS
Scope	Average Asset Risk	5.42 (Low)
Quality	Average Condition Rating	42%
Performance	Target Reinvestment Rate	8.2%

Appendix H: Fleet

State of the Infrastructure

Fleet assets allow staff to efficiently deliver municipal services and personnel. Municipal fleet is used to support several service areas, including:

- Light-duty and heavy-duty vehicles to support the maintenance of municipal infrastructure and address service requests
- Emergency service vehicles and equipment to support first responders
- Vehicles dedicated to supporting recreational and cultural services

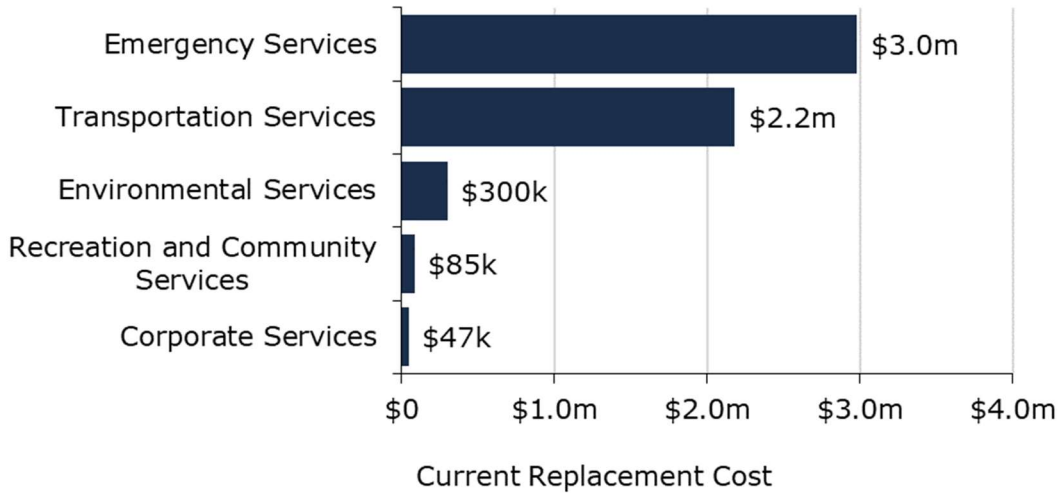
The Town's fleet inventory is managed in Citywide. The Town are replacing light vehicles (except emergency services) with leased vehicles which are not include in the capital inventory. The state of the infrastructure for the fleet is summarized in the following table.

Replacement Cost	Condition	Financial Capacity	
$5,588,748	Good (66%)	Annual Requirement:	$376,318

Inventory & Valuation

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

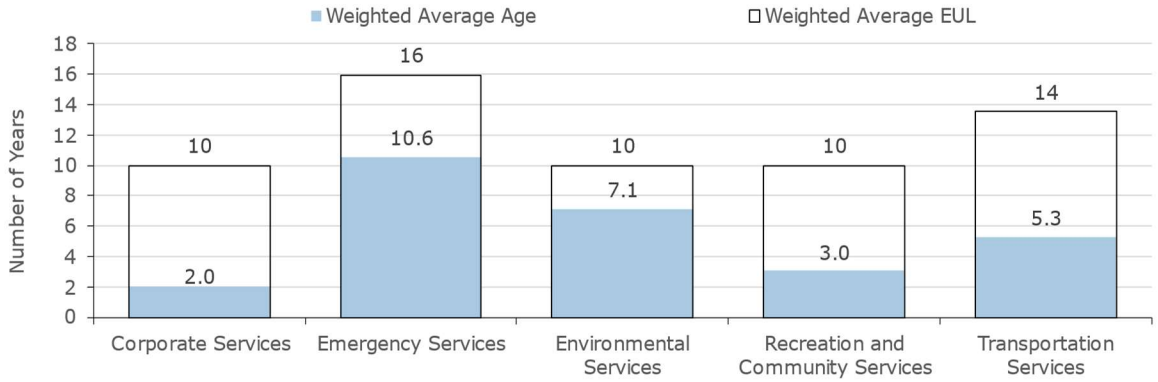
Figure 57: Vehicle Replacement Costs



Asset Condition & Age

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

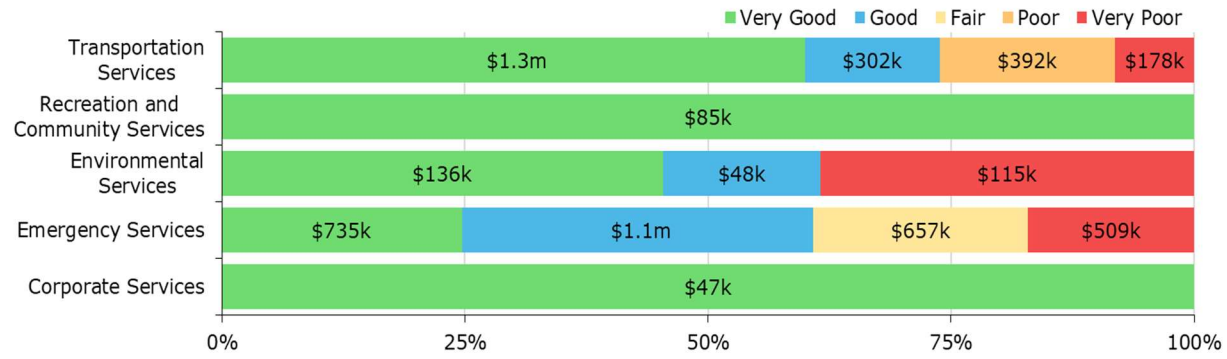
Figure 58: Fleet Average Age vs Average EUL



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

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

Figure 59: Fleet Condition Breakdown



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

Current Approach to Condition Assessment

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

- Staff complete regular visual inspections of fleet assets to ensure they are in state of adequate repair prior to operation
- The mileage of vehicles is used as a proxy to determine remaining useful life and relative vehicle condition
- Condition assessments are conducted on fire and emergency vehicle assets in accordance with regulations for health and safety regulations

including National Fire Protection Association (NFPA) codes and standards for fire service-related vehicle assets

Lifecycle Management Strategy

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

Figure 60: Fleet Current Lifecycle Strategy

Maintenance / Rehabilitation / Replacement

- operations and maintenance is completed by internal staff
- replacements are completed based on useful life estimates

Forecasted Capital Requirements

The annual capital requirement represents the average amount per year that the Town should allocate towards funding rehabilitation and replacement needs. The following graph identifies capital requirements over the next 25 years. This projection is used as it ensures that every asset has gone through one full iteration of replacement. The forecasted requirements are aggregated into 5-year bins and the trend line represents the average annual capital requirements at $226 thousand.

Figure 61: Fleet Forecasted Capital Replacement Requirements

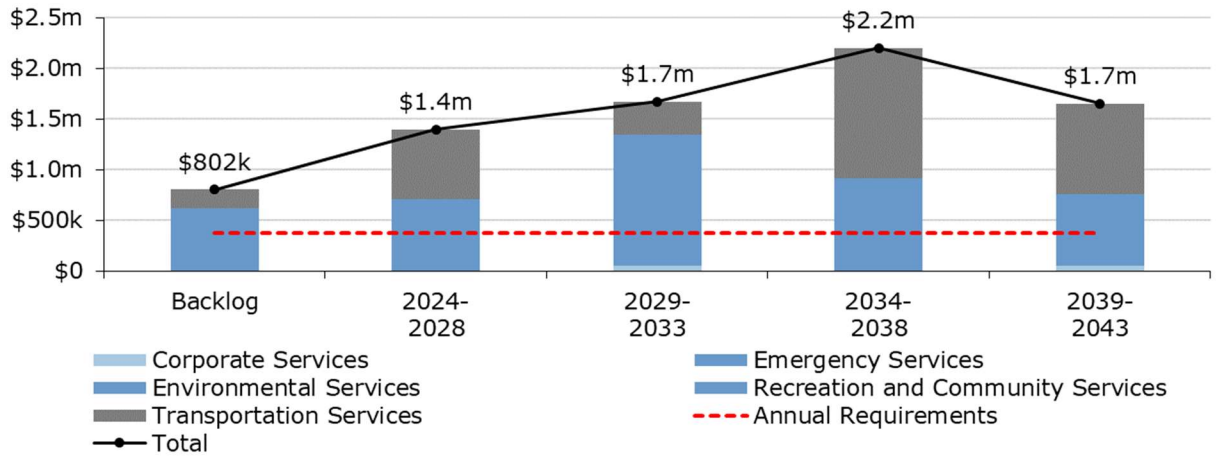


Table 23 below summarizes the projected cost of lifecycle activities (capital replacement only) that may need to be undertaken over the next 10 years to support current levels of service. These projections are generated in Citywide and rely on the data available in the asset register.

Table 23 Fleet System-Generated 10-Year Capital Costs

Segment	Total	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033
Corporate Services	$47k	$0	$0	$0	$0	$0	$0	$0	$47k	$0	$0
Emergency Services	$1.7m	$0	$657k	$0	$0	$0	$1.1m	$0	$0	$0	$0
Environmental Services	$185k	$0	$0	$0	$48k	$0	$46k	$91k	$0	$0	$0
Recreation and Community Services	$85k	$0	$0	$0	$0	$0	$44k	$0	$40k	$0	$0
Transportation Services	$1.0m	$0	$392k	$0	$302k	$0	$0	$153k	$176k	$0	$0

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

Risk & Criticality

The risk matrix provides a visual representation of the relationship between the probability of failure and the consequence of failure for the assets within this asset category based on available inventory data.

Figure 62: Fleet Risk Matrix

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

The asset-specific attributes that municipal staff utilize to define and prioritize the criticality of the fleet assets are documented below:

Probability of Failure (POF)	Consequence of Failure (COF)
Condition (Performance 60%)	Replacement Cost (80% Financial)
Service Life Remaining % (Operational 40%)	AMP Segment (20% Operational)

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

Levels of Service

By comparing the cost, performance (average condition) and risk year-over-year, the Town will be able to evaluate how their services/assets are trending. The Town will use this data to set a target level of service and determine proposed levels for the regulation by 2025.

Community Levels of Service

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

- Light-duty and heavy-duty vehicles to support the maintenance of municipal infrastructure and address service requests
- Emergency service vehicles and equipment to support first responders
- Vehicles dedicated to supporting recreational and cultural services

Technical Levels of Service

The quantitative metrics that determine the technical level of service provided by the Fleet in Penetanguishene are going to be the analysis of target reinvestment rate, asset performance (average condition) and average asset risk.

Table 24 Fleet Technical Levels of Service

Service Attribute	Technical Metric	Current LOS
Scope	Average Asset Risk	10.9 (High)
Quality	Average Condition Rating	66%
Performance	Target Reinvestment Rate	6.7%