Asset Management Plan

Township of Leeds and the Thousand Islands

2020

This Asset Management Program was prepared by:

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

Key Statistics

Replacement cost of asset portfolio
$209.4 million

Replacement cost of infrastructure per household
$54,254 (2016)

Percentage of assets in fair or better condition
78%

Percentage of assets with assessed condition data
75%

Annual capital infrastructure deficit
$1.81 million

Recommended timeframe for eliminating annual infrastructure deficit
15 Years for Tax-Funded
20 Years for Water-Funded
5 Years for Sanitary Funded

Target reinvestment rate
1.91%

Actual reinvestment rate
1.04%

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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 critical services. The goal of asset management is to deliver an adequate level of service in the most cost-effective manner. This involves the development and implementation of asset management strategies and long-term financial planning.

Scope

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

This AMP includes the following asset categories:

With the development of this AMP the Township has achieved compliance with O. Reg. 588/17 to the extent of the requirements that must be completed by July 1, 2022. There are additional requirements concerning proposed levels of service and growth that must be met by July 1, 2024 and 2025.

Findings

The overall replacement cost of the asset categories included in this AMP totals $209.4 million. 78% of all assets analysed in this AMP are in fair or better condition and assessed condition data was available for 75% of assets. For the remaining 25% of assets, assessed condition data was unavailable, and asset age was used to approximate condition – a data gap that persists in most municipalities. Generally, age misstates the true condition of assets, making assessments essential to accurate asset management planning, and a recurring recommendation in this AMP.

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

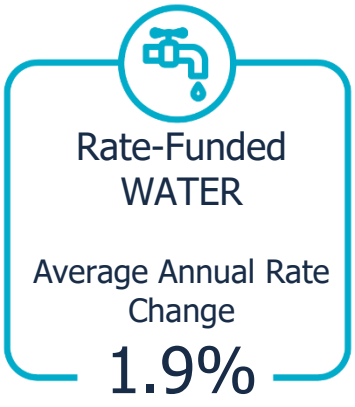
To meet capital replacement and rehabilitation needs for existing infrastructure, prevent infrastructure backlogs, and achieve long-term sustainability, the Township's average annual capital requirement totals $3.99 million. Based on a historical analysis of sustainable capital funding sources, the Township is committing approximately $2.18 million towards capital projects or reserves per year. As a result, there is currently an annual funding gap of $1.81 million.

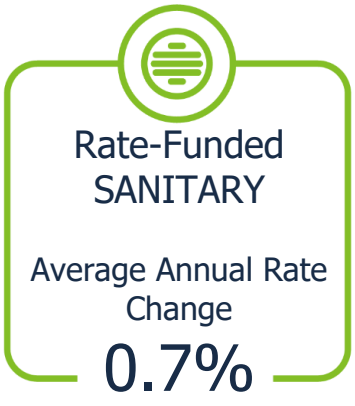
It is important to note that this AMP represents a snapshot in time and is based on the best available processes, data, and information at the Township. Strategic asset management planning is an ongoing and dynamic process that requires continuous improvement and dedicated resources.

Annual Increase
Per Household

Recommendations

A financial strategy was developed to address the annual capital funding gap. The following graphics shows annual tax/rate change required to eliminate the Township's infrastructure deficit based on a 15-year plan for tax-funded assets, a 20-year plan for water rate-funded assets and a 5-year plan for sanitary rate-funded assets:





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

- Review and consolidate infrastructure data to update and maintain a centralized and accurate asset inventory
- Develop a condition assessment strategy with a regular schedule
- Review and update lifecycle management strategies
- Develop and regularly review short- and long-term plans to meet capital requirements
- Gather and measure the metrics required for the remaining current levels of service and identify sustainable proposed levels of service

1 Introduction & Context

Key Insights

- The goal of asset management is to minimize the lifecycle costs of delivering infrastructure services, manage the associated risks, while maximizing the value ratepayers receive from the asset portfolio

- The Township's asset management policy provides clear direction to staff on their roles and responsibilities regarding asset management

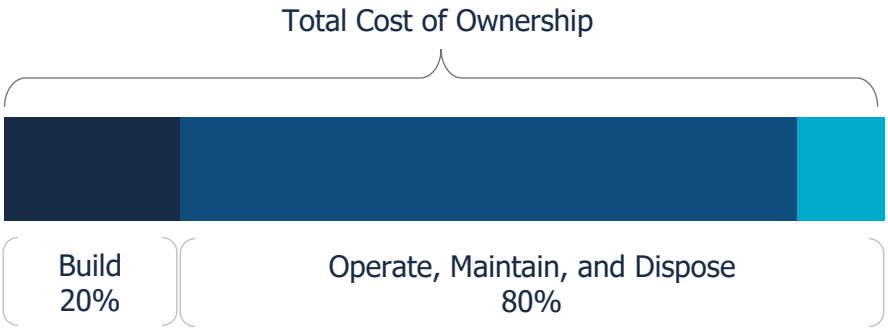
- An asset management plan is a living document that should be updated regularly to inform long-term planning

- Ontario Regulation 588/17 outlines several key milestone and requirements for asset management plans in Ontario between July 1, 2022 and 2025

An Overview of Asset Management

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

The acquisition of capital assets accounts for only 10-20% of their total cost of ownership. The remaining 80-90% 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 industry-standard approach and sequence to developing a practical asset management program begins with a Strategic Plan, followed by an Asset Management Policy and an Asset Management Strategy, concluding with an Asset Management Plan.

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

1.1.1 Asset Management Policy

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

The Township adopted By-law No. 19-011 "A By-law to establish a Strategic Asset Management Policy" on February 11th, 2019 in accordance with Ontario Regulation 588/17.

The objectives of the policy include:

- Provide a framework for implement Asset Management
- Delivery of Services/Programs
- Public Input/Council Direction
- Risk/Budgets

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

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

1.1.3 Asset Management Plan

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

Key Concepts in Asset Management

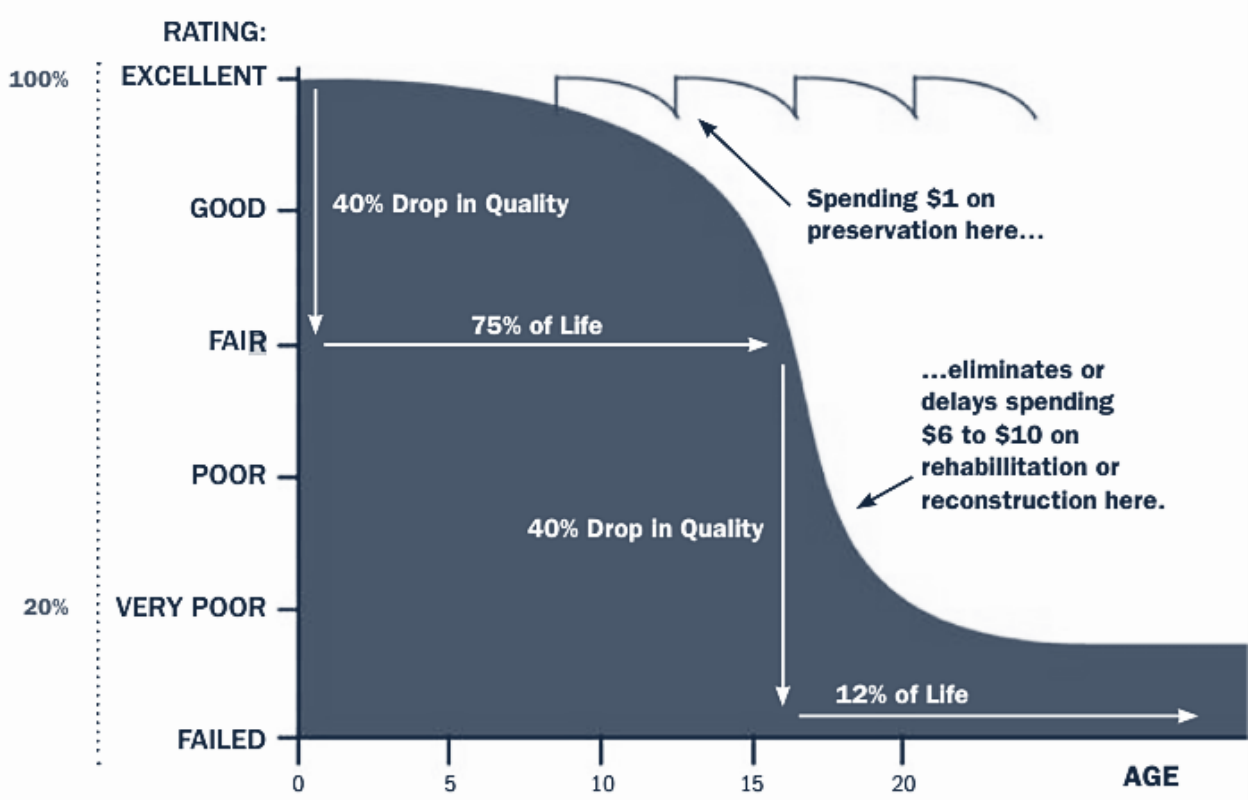
Effective asset management integrates several key components, including lifecycle management, risk management, and levels of service. These concepts are applied throughout this asset management plan and are described below in greater detail.

1.1.4 Lifecycle Management Strategies

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

To ensure that municipal assets are performing as expected and meeting the needs of customers, it is important to establish a lifecycle management strategy to proactively manage asset deterioration. Since costs to rehabilitate tend to increase towards the end-of-life of an asset, proactive and timely intervention will lead to lower total lifecycle costs.

This concept is further illustrated by the following graph, highlighting the cost impact of a maintenance activity contrasted by the cost impact of a rehabilitative activity later in the life of the asset.



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

Lifecycle Activity	Description	Example (Roads)	Cost
Maintenance	Activities that prevent defects or deteriorations from occurring	Crack Seal	$
Rehabilitation/ Renewal	Activities that rectify defects or deficiencies that are already present and may be affecting asset performance	Mill & Re-surface	$$
Replacement/ Reconstruction	Asset end-of-life activities that often involve the complete replacement of assets	Full Reconstruction	$$$

Depending on initial lifecycle management strategies, asset performance can be sustained through a combination of maintenance and rehabilitation activities, 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 Township's approach to lifecycle management is described within each asset category outlined in this AMP. 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.

1.1.5 Risk Management Strategies

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 than that of others. 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.

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

1.1.6 Levels of Service

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

These measures include a combination of those that have been outlined in O. Reg. 588/17 in addition to performance measures identified by the Township as worth measuring and evaluating. The Township measures the level of service provided at two levels: Community Levels of Service, and Technical Levels of Service.

Community Levels of Service

Community levels of service are a simple, plain language description or measure of the service that the community receives.

For core asset categories (Roads, Bridges & Culverts, Water, Wastewater, Stormwater) the Province, through O. Reg. 588/17, has provided qualitative descriptions that are required to be included in this AMP.

For non-core asset categories, the Township will determine the community levels of service provided by the July 2024 deadline.

Technical Levels of Service

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

For core asset categories (Roads, Bridges & Culverts, Water, Wastewater, Stormwater) the Province, through O. Reg. 588/17, has provided technical metrics that are required to be included in this AMP.

For non-core asset categories, the Township will determine the technical level of service provided by the July 2024 deadline.

Current and Proposed Levels of Service

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

Proposed levels of service should be realistic and achievable within the timeframe outlined by the Township. They should also be determined with consideration of a variety of community expectations, fiscal capacity, regulatory requirements, corporate goals and long-term sustainability.

Once proposed levels of service have been established, and prior to July 2025, the Township must identify a lifecycle management and financial strategy which allows these targets to be achieved.

Ontario Regulation 588/17

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

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

2019

Strategic Asset Management Policy

2022

Asset Management Plan for Core Assets with the following components:

1. Current levels of service
2. Inventory analysis
3. Lifecycle activities to sustain LOS
4. Cost of lifecycle activities
5. Population and employment forecasts
6. Discussion of growth impacts

2024

Asset Management Plan for Core and Non-Core Assets

2025

Asset Management Policy Update and an Asset Management Plan for All Assets with the following additional components:

1. Proposed levels of service for next 10 years
2. Updated inventory analysis
3. Lifecycle management strategy
4. Financial strategy and addressing shortfalls
5. Discussion of how growth assumptions impacted lifecycle and financial

1.1.7 O. Reg. 588/17 Compliance Review

The following table identifies the requirements outlined in Ontario Regulation 588/17 for municipalities to meet by July 1, 2022. Next to each requirement a page or section reference is included in addition to any necessary commentary.

Requirement	O. Reg. Section	AMP Section Reference	Status
Summary of assets in each category	S.5(2), 3(i)	4.1.1 - 5.2.1	Complete
Replacement cost of assets in each category	S.5(2), 3(ii)	4.1.1 - 5.2.1	Complete
Average age of assets in each category	S.5(2), 3(iii)	4.1.3 - 5.2.3	Complete
Condition of core assets in each category	S.5(2), 3(iv)	4.1.2 – 5.2.2	Complete
Description of municipality's approach to assessing the condition of assets in each category	S.5(2), 3(v)	4.1.2 – 5.2.2	Complete
Current levels of service in each category	S.5(2), 1(i-ii)	4.1.6 - 5.2.6	Complete for Core Assets Only
Current performance measures in each category	S.5(2), 2	4.1.6 - 5.2.6	Complete for Core Assets Only
Lifecycle activities needed to maintain current levels of service for 10 years	S.5(2), 4	4.1.4 - 5.2.4	Complete
Costs of providing lifecycle activities for 10 years	S.5(2), 4	Appendix A	Complete
Growth assumptions	S.5(2), 5(i-ii) S.5(2), 6(i-vi)	6.1-6.2	Complete

2 Scope and Methodology

Key Insights

- This asset management plan includes 9 asset categories and is divided between tax-funded and rate-funded categories

- Infrastructure asset data from various data sources was consolidated into the Township's tangible capital asset inventory as a starting point to developing a centralized asset inventory

- The source and recency of replacement costs impacts the accuracy and reliability of asset portfolio valuation

- 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

Asset categories included in this AMP

This asset management plan for the Township of Leeds and the Thousand Islands is produced in compliance with Ontario Regulation 588/17. The July 2022 deadline under the regulation—the first of three AMPs—requires analysis of only core assets (roads, bridges & culverts, water, sanitary, and storm sewer).

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

Asset Category	Source of Funding
Road Network	Tax Levy
Bridges & Culverts	
Storm Sewer System	
Buildings & Facilities	
Machinery & Equipment	
Fleet	
Parks & Land Improvements	
Water System	User Rates
Sanitary Sewer System	

The Asset Inventory

The asset information presented in this AMP is primarily based on the CityWide Asset Manager Inventory, which originates from the Township's tangible capital assets inventory. Throughout the development of the AMP, this asset inventory was consolidated with additional asset data from the following data sources:

- 2019 OSIM Inspections
- 2020 Road Needs Study
- Township's financial software
- Inventory updates provided by Staff
- GIS

The asset inventory was also restructured and refined to establish an asset hierarchy, a standardization of key fields and asset attribute data.

Deriving Replacement Costs

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

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

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

Estimated Useful Life and Service Life Remaining

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

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

$$Service\ Life\ Remaining\ (SLR) = (In\ Service\ Date + Estimated\ Useful\ Life(EUL) + Asset\ Condition) - Current\ Year$$

Reinvestment Rate

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

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

$$Target\ Reinvestment\ Rate = \frac{Annual\ Capital\ Requirement}{Total\ Replacement\ Cost}$$

$$Actual\ Reinvestment\ Rate = \frac{Annual\ Capital\ Funding}{Total\ Replacement\ Cost}$$

Deriving Asset Condition

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

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

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

In this AMP, the overall condition rating of a segment is derived from the condition of the assets within that asset segment and weighted based on the asset replacement value. Asset condition is based on assessed condition data only as available. In the absence of assessed condition data, asset age is used as a proxy to determine asset condition.

Appendix D includes additional information on the role of asset condition data and provides basic guidelines for the development of a condition assessment program.

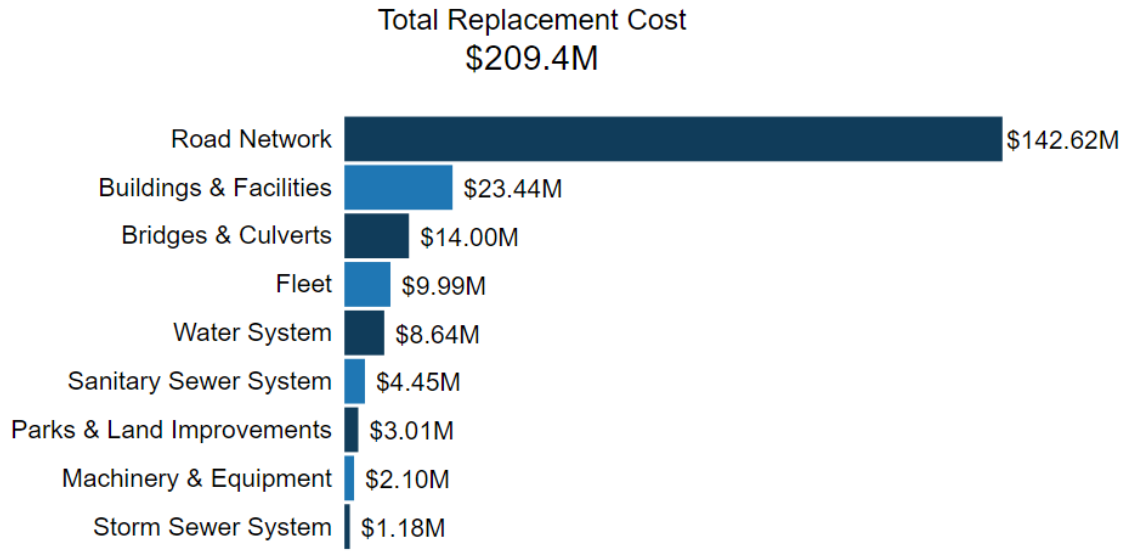
3 Portfolio Overview

Key Insights

- The total replacement cost of the Township's asset portfolio is $209.4 million
- The Township's target re-investment rate is 1.91%, and the actual re-investment rate is 1.04%, contributing to an expanding infrastructure deficit
- 78% of all assets are in fair or better condition
- 10% of assets are projected to require replacement in the next 10 years
- Average annual capital requirements total $3.99 million per year across all assets

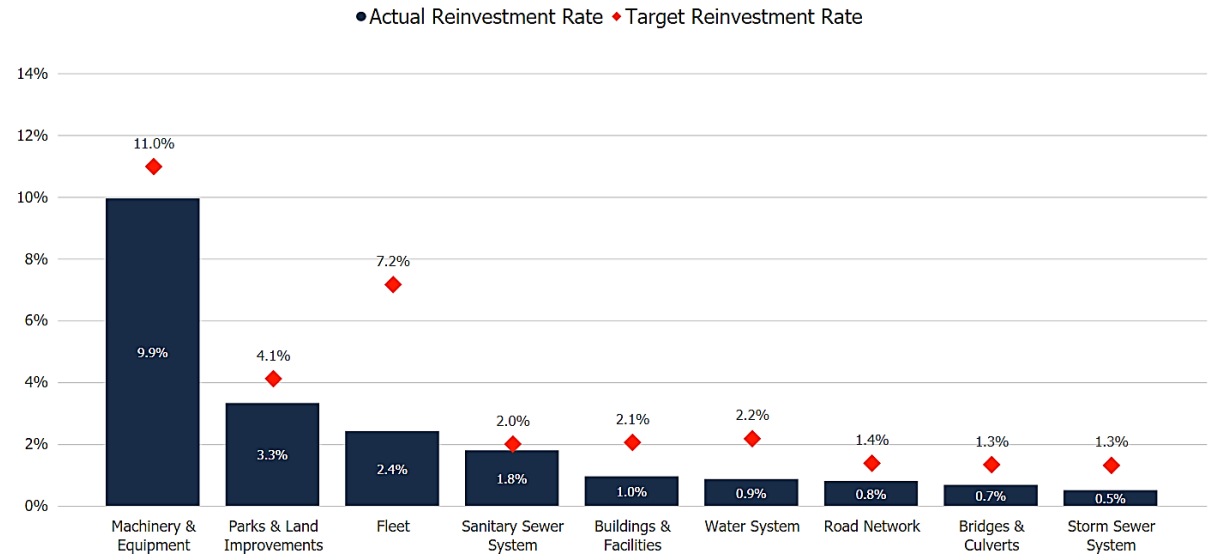
Total Replacement Cost of Asset Portfolio

The asset categories analyzed in this AMP have a total replacement cost of $209 million based on asset inventory data from 2020. 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.



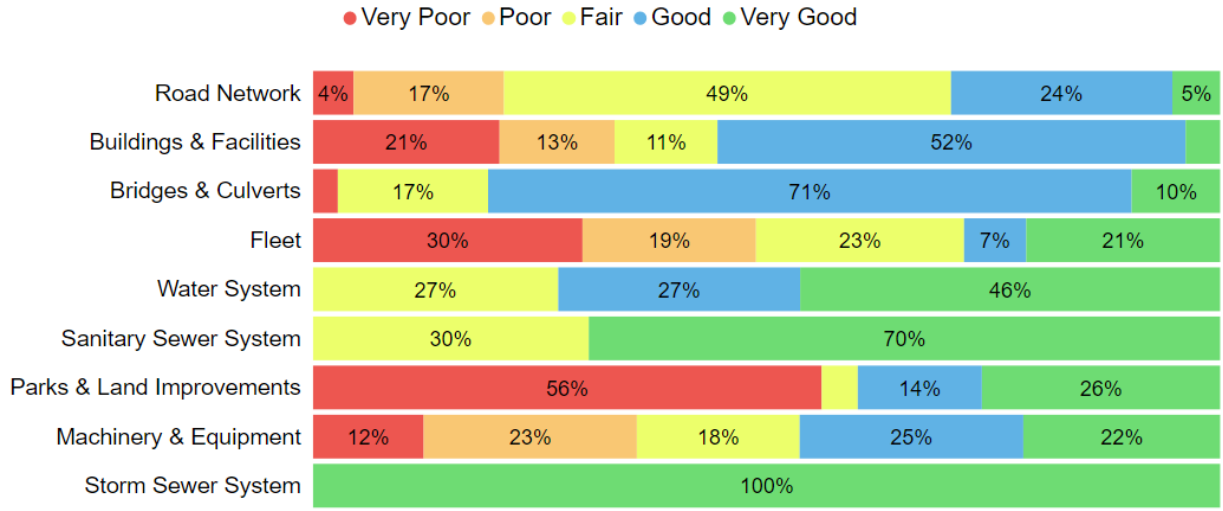
Target vs. Actual Reinvestment Rate

The graph below depicts funding gaps or surpluses by comparing target vs actual reinvestment rate. To meet the long-term replacement needs, the Township should be allocating approximately $3.99 million annually, for a target reinvestment rate of 1.91%. Actual annual spending on infrastructure totals approximately $2.2 million, for an actual reinvestment rate of 1.04%.



Condition of Asset Portfolio

The current condition of the assets is central to all asset management planning. Collectively, 78% of assets of the Township are in fair or better condition. This estimate relies on both age-based and field condition data.

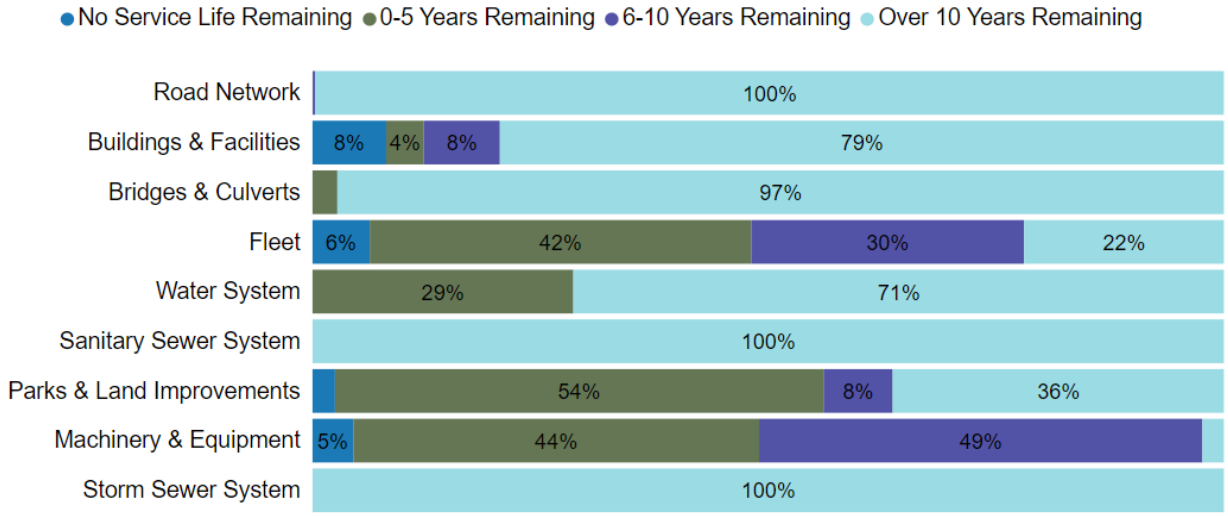


This AMP relies on assessed condition data for 75% of assets; for the remaining portfolio, age is used as an approximation of condition. Assessed condition data is invaluable in asset management planning as it reflects the true condition of the asset and its ability to perform its functions. The table below identifies the source of condition data used throughout this AMP.

Asset Category	Asset Segment	% of Assets with Assessed Condition	Source of Condition Data
Road Network	Gravel Roads	100%	2020 Road Needs Study
	HCB Roads	100%	2020 Road Needs Study
	LCB Roads	100%	2020 Road Needs Study
Bridges & Culverts	Bridges	100%	2019 OSIM Report
	Structural Culverts	100%	2019 OSIM Report
Storm Sewer System	All	0%	N/A
Buildings & Facilities	All	0%	N/A
Parks & Land Improvements	All	0%	N/A
Machinery & Equipment	All	0%	N/A
Fleet	All	3%	Staff Assessments
Water System	All	0%	N/A
Sanitary Sewer System	All	0%	N/A

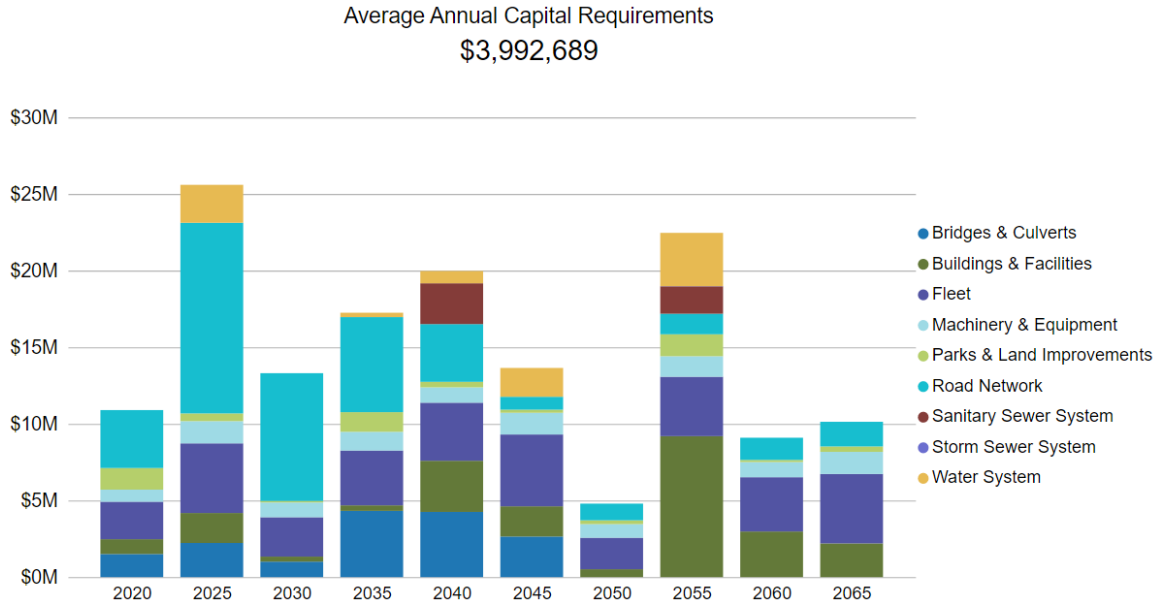
Service Life Remaining

Based on asset age, available assessed condition data and estimated useful life, 10% of the Township's assets will require replacement within the next 10 years. Capital requirements over the next 10 years are identified in Appendix A.



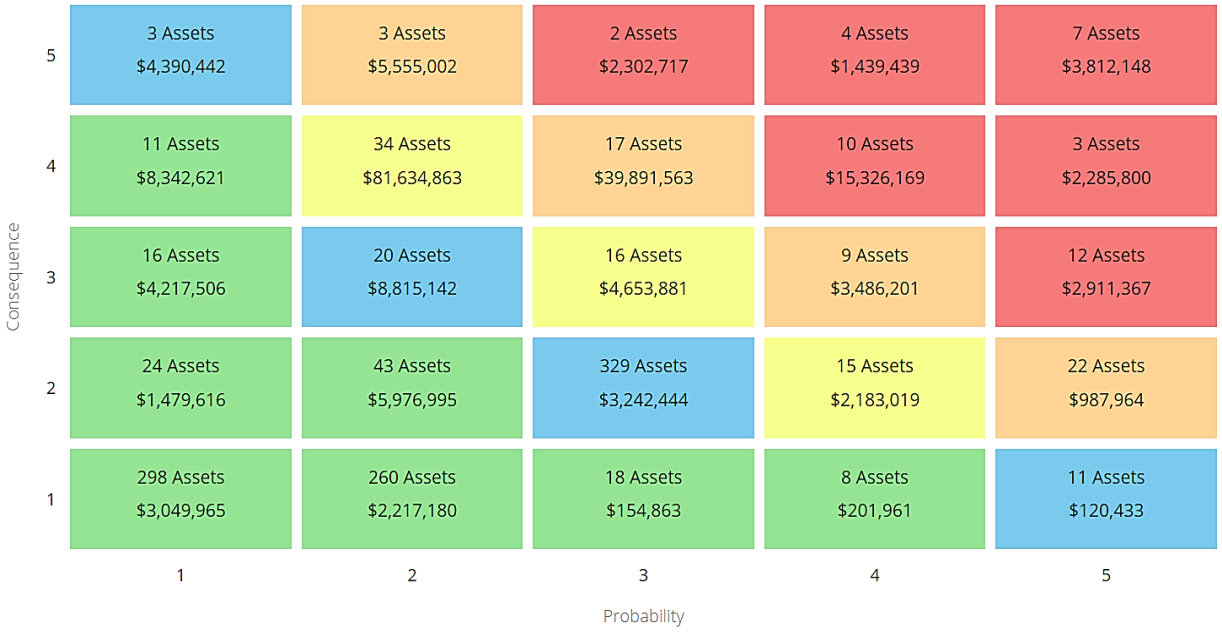
Forecasted Capital Requirements

The development of a long-term capital forecast should include both asset rehabilitation and replacement requirements. With the development of asset-specific lifecycle strategies that include the timing and cost of future capital events, the Township can produce an accurate long-term capital forecast. The following graph identifies capital requirements over the next 50 years based on the Township's asset inventory as of 2020 and does not include assets that will be required due to growth.



Risk & Criticality

Advanced risk models for core linear assets and high-level risk models for all other assets were developed as part of this asset management plan. The following risk matrix provides a visual representation of the relationship between the probability of failure and the consequence of failure for the asset portfolio based on 2020 inventory data.



Municipal staff also identified and grouped assets based on service areas, including those that support the delivery of fire and emergency services, with a higher risk rating attribute to ensure that a prioritization process is in place.

See Appendix C for the criteria used to determine the risk rating of each asset.

4 Analysis of Tax-funded Assets

Key Insights

- Tax-funded assets are valued at $196 million
- 77% of tax-funded assets are in fair or better condition
- The average annual capital requirement to sustain the current level of service for tax-funded assets is approximately $3.7 million
- To reach sustainability, tax revenues need to be increased by 1.1% annually for the next 15 years to eliminate annual deficits.

Road Network

The Road Network is a critical component of the provision of safe and efficient transportation services and represents the highest value asset category in the Township's asset portfolio. It includes all municipally owned and maintained roadways in addition to supporting roadside infrastructure including guiderails, streetlights, signs, and sidewalks located in the Villages.

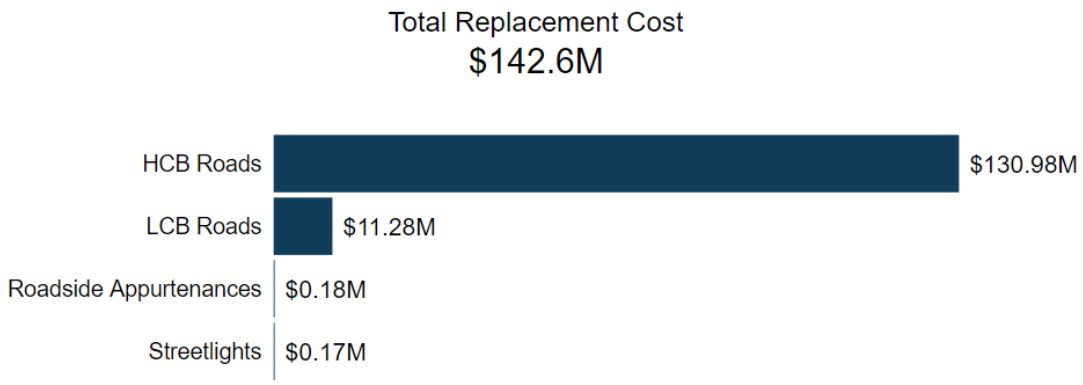
The Township's roads and sidewalks are maintained by the Public Works crew, who are also responsible for winter snow clearing, ice control and snow removal operations.

For this AMP, the current asset inventory for roads was refined and consolidated with asset data from the 2020 Road Needs Study to produce a centralized road inventory for the Township.

4.1.1 Asset Inventory & Replacement Cost

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

Asset Segment	Quantity	Replacement Cost Method	Total Replacement Cost
Gravel Roads	149 km	Not Planned for Replacement[1]	
HCB Roads	87 km	Cost per unit	$130,980,000
LCB Roads	75 km	Cost per unit	$11,284,500
Roadside Appurtenances	3	Historical cost inflation	$176,860
Streetlights	170	Historical cost inflation	$174,449
			$142,615,810

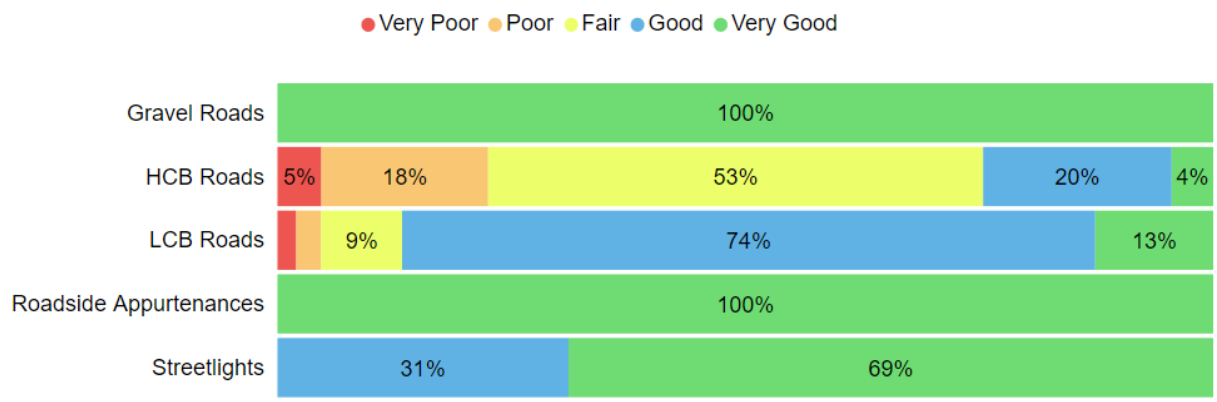


[1] Gravel roads have been included as they comprise a significant portion of the Township's road network. However, the lifecycle management strategies for these assets consist of perpetual maintenance activities and do not require capital costs for rehabilitation or replacement. The exceptions are gravel roads that have been identified as candidates for a surface upgrade.

4.1.2 Asset Condition

The table below identifies the current average condition and source of available condition data for each asset segment. The Average Condition (%) is a weighted value based on replacement cost.

Asset Segment	Average Condition (%)	Average Condition Rating	Condition Source
Gravel Roads	85%	Very Good	99% Assessed
HCB Roads	63%	Good	100% Assessed
LCB Roads	75%	Good	100% Assessed
Roadside Appurtenances	86%	Very Good	Age-based
Streetlights	88%	Very Good	Age-based
	64%	**Good**	



Current Approach to Condition Assessment

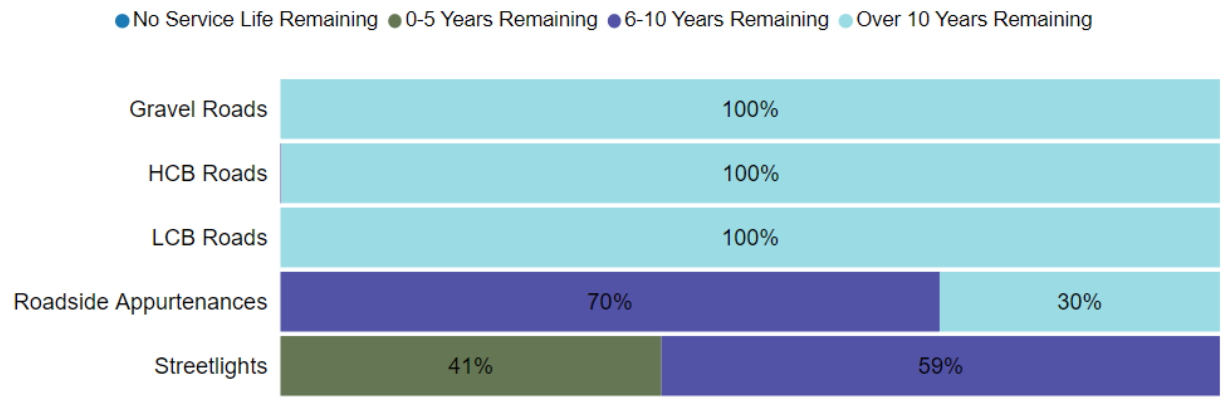
Accurate and reliable condition data allows staff to more confidently determine the remaining service life of assets and identify the most cost-effective approach to managing assets. The following describes the Township's current approach:

- A Road Needs Study was completed in 2020 that included a detailed assessment of the condition of each road segment
- Hard surface roads are inspected in the fall, and gravel roads in the summer
- Network-wide condition assessments are expected to be completed every two years internally moving forward
- Road network assets are inspected as per O. Reg. 239/02: Minimum Maintenance Standards for Municipal Highways

4.1.3 Estimated Useful Life & Average Age

The Estimated Useful Life for Road Network assets has been assigned according to a combination of established industry standards and staff knowledge. The Average Age of each asset is based on the number of years each asset has been in-service. Finally, the Average Service Life Remaining represents the difference between the Estimated Useful Life and the Average Age, except when an asset has been assigned an assessed condition rating. Assessed condition may increase or decrease the average service life remaining.

Asset Segment	Estimated Useful Life (Years)	Average Age (Years)	Average Service Life Remaining (Years)
Gravel Roads	40	28.9	37.3
HCB Roads	40	36.0	27.9
LCB Roads	40	30.1	50.9
Roadside Appurtenances	20-40	4.9	21.8
Streetlights	10	4.5	5.5
		31.2	**35.1**



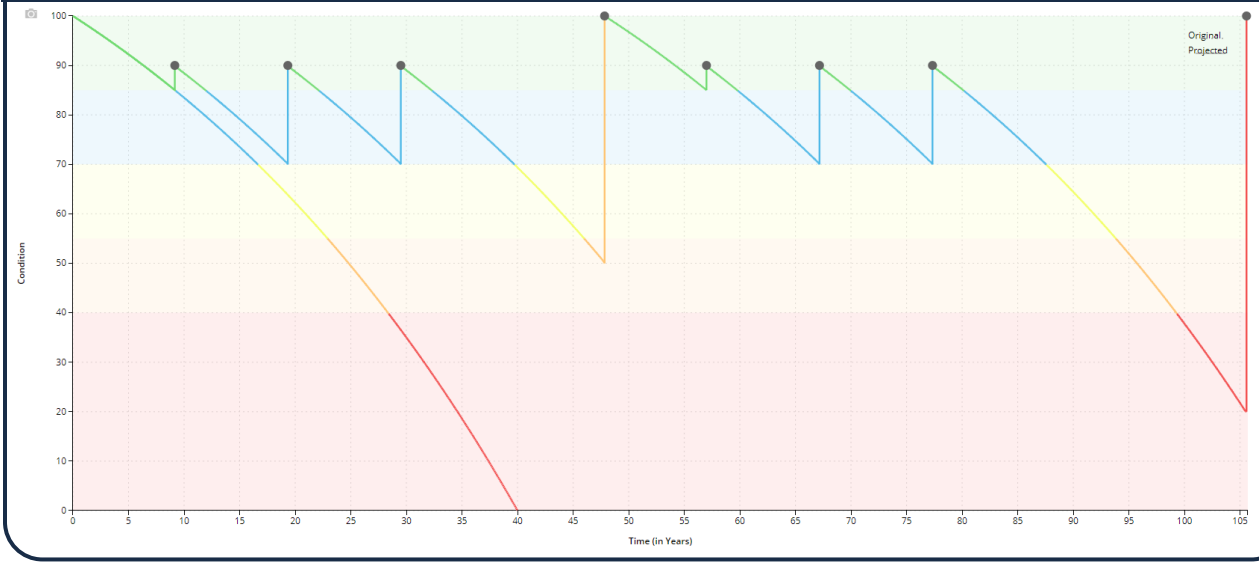
Each asset's Estimated Useful Life should be reviewed periodically to determine whether adjustments need to be made to better align with the observed length of service life for each asset type.

4.1.4 Lifecycle Management Strategy

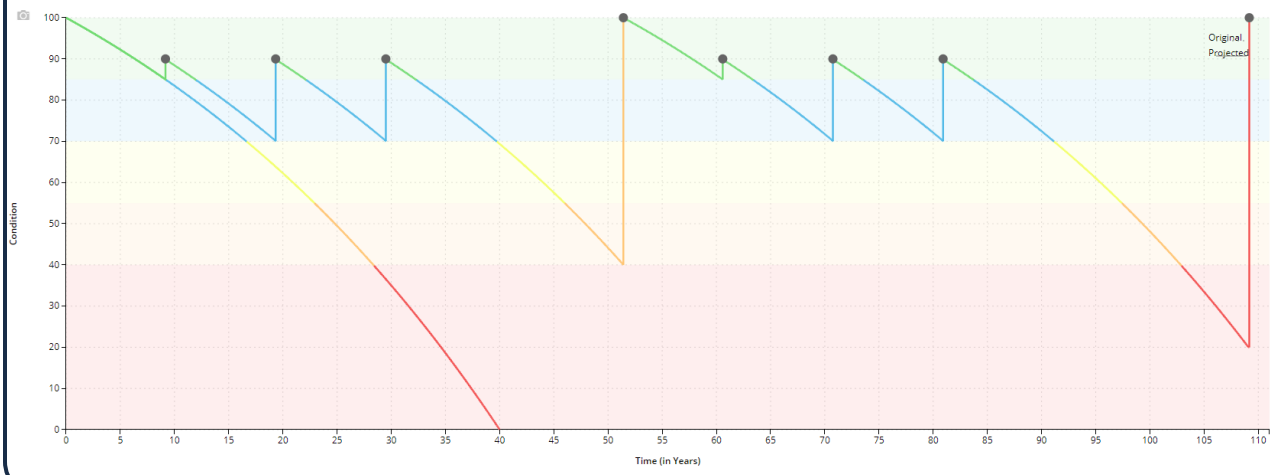
The condition or performance of most assets will deteriorate over time. This process is affected by a range of factors including an asset's characteristics, location, utilization, maintenance history and environment.

The following lifecycle strategies have been developed as a proactive approach to managing the lifecycle of HCB, LCB & Gravel 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.

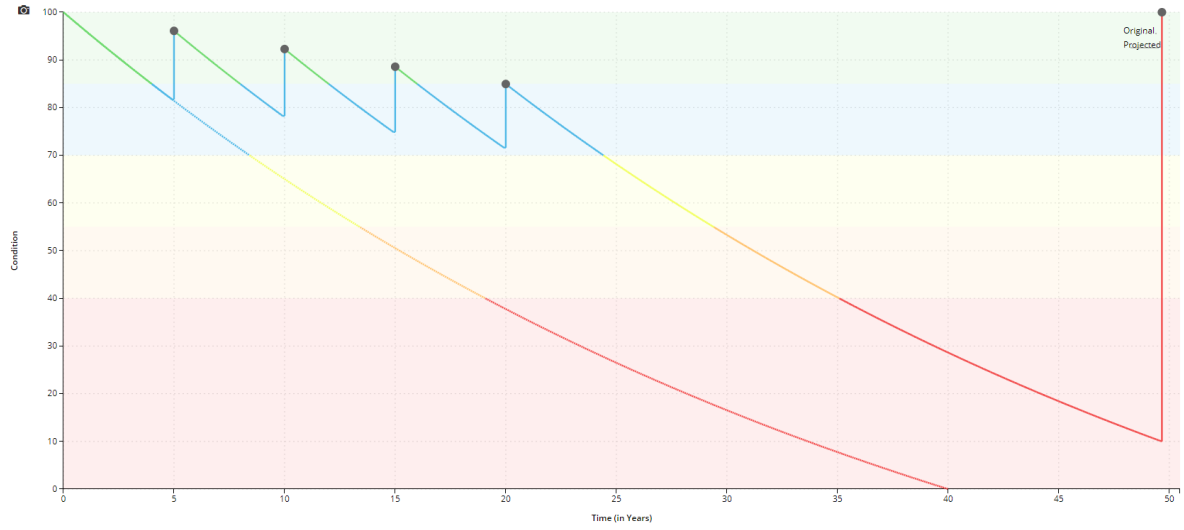
Urban Roads (HCB)		
Event Name	**Event Class**	**Event Trigger**
Crack Sealing (6 Treatments)	Preventative Maintenance	At 85 Condition
Microsurface (4 Treatments)	Rehabilitation	At 70 Condition
Mill & Pave	Rehabilitation	At 50 Condition
Full Reconstruction	Replacement	At 20 Condition



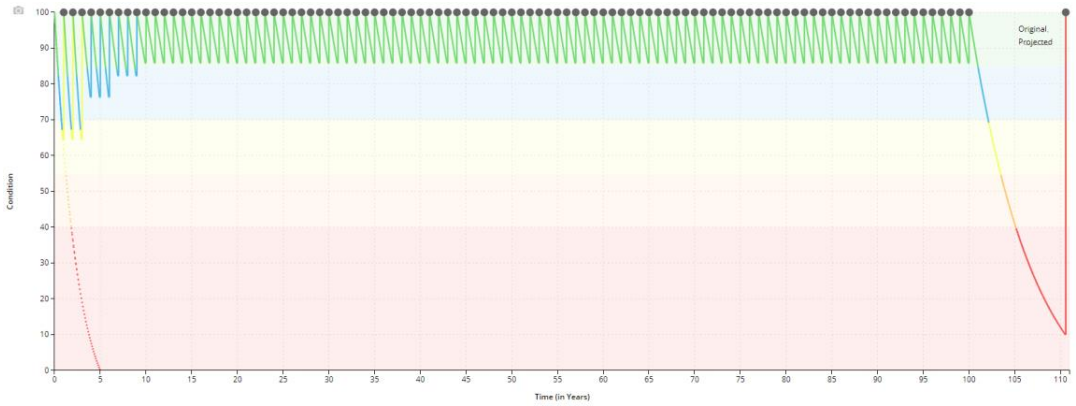
Rural & Semi-Urban Roads (HCB)		
Event Name	**Event Class**	**Event Trigger**
Crack Sealing (6 Treatments)	Preventative Maintenance	At 85 Condition
Microsurface (4 Treatments)	Rehabilitation	At 70 Condition
Full Depth Reclamation	Rehabilitation	At 40 Condition
Full Reconstruction	Replacement	At 20 Condition



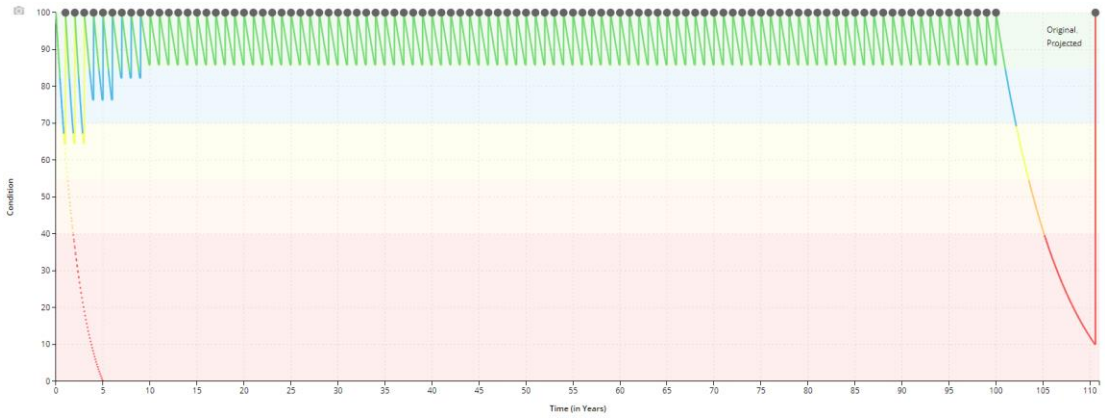
Rural Roads (LCB)		
Event Name	**Event Class**	**Event Trigger**
Seal Coat (4 Treatments)	Maintenance	Every 5 years
Full Reconstruction	Replacement	At 10 Condition



Gravel Roads		
Event Name	**Event Class**	**Event Trigger**
Dust Suppressant, Grading and Mowing	Maintenance	Annually
Brushing (10 Treatments)	Maintenance	Every 3 years
Gravelling (3 Treatments)	Preventative Maintenance	Every 3 years
Ditching (10 Treatments)	Maintenance	Every 10 years
Full Reconstruction	Replacement	At 10 Condition



Gravel Roads – AADT 201+ (candidates for surface upgrade)		
Event Name	**Event Class**	**Event Trigger**
Dust Suppressant, Grading and Mowing	Maintenance	Annually
Brushing (10 Treatments)	Maintenance	Every 3 years
Gravelling (3 Treatments)	Preventative Maintenance	Every 3 years
Ditching (10 Treatments)	Maintenance	Every 10 years
Full Reconstruction	Replacement	At 10 Condition



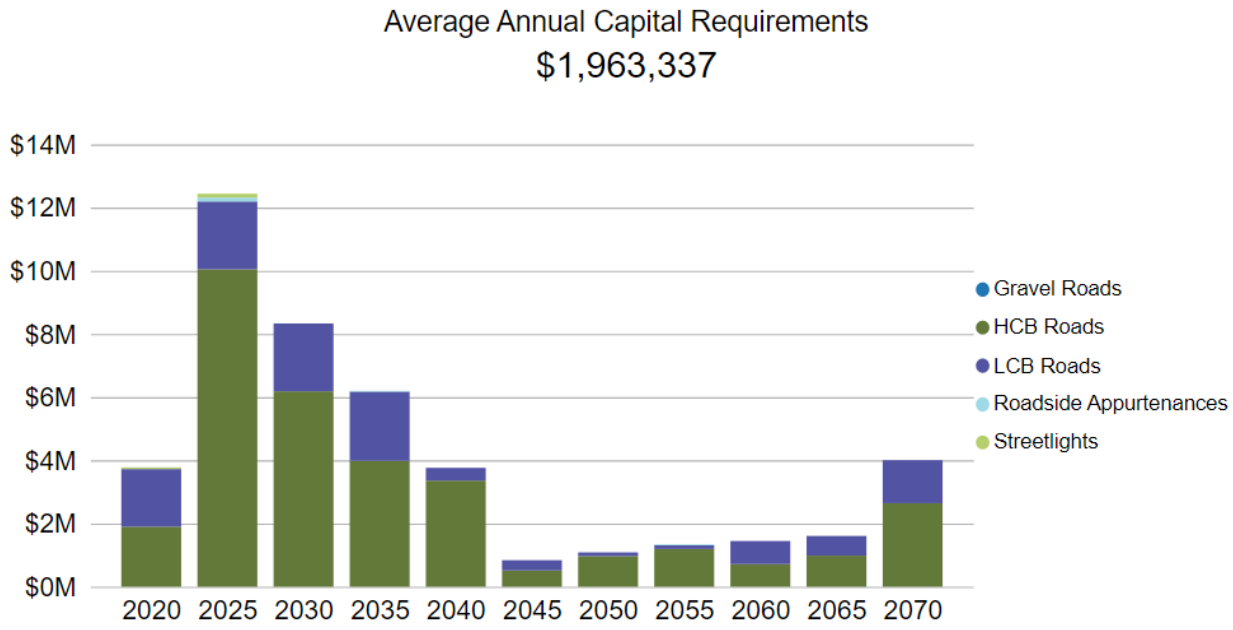
A formalized lifecycle framework allows Staff to determine the benefit and impact of timely interventions on the useful life and condition of the assets. The following table illustrates the cost-benefits of applying a proactive lifecycle management strategy relative to the annual capital costs associated with just replacing the asset at the end-of-life.

	Annual Requirements (Replacement Only Scenario)	Annual Requirements (Lifecycle Strategy Scenario)	Cost Difference
Paved Roads	**$3,556,613**	**$1,958,294**	**$1,598,318**

Forecasted Capital Requirements

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.

The annual capital requirement represents the average amount per year that the Township should allocate towards funding rehabilitation and replacement needs to meet future capital needs.

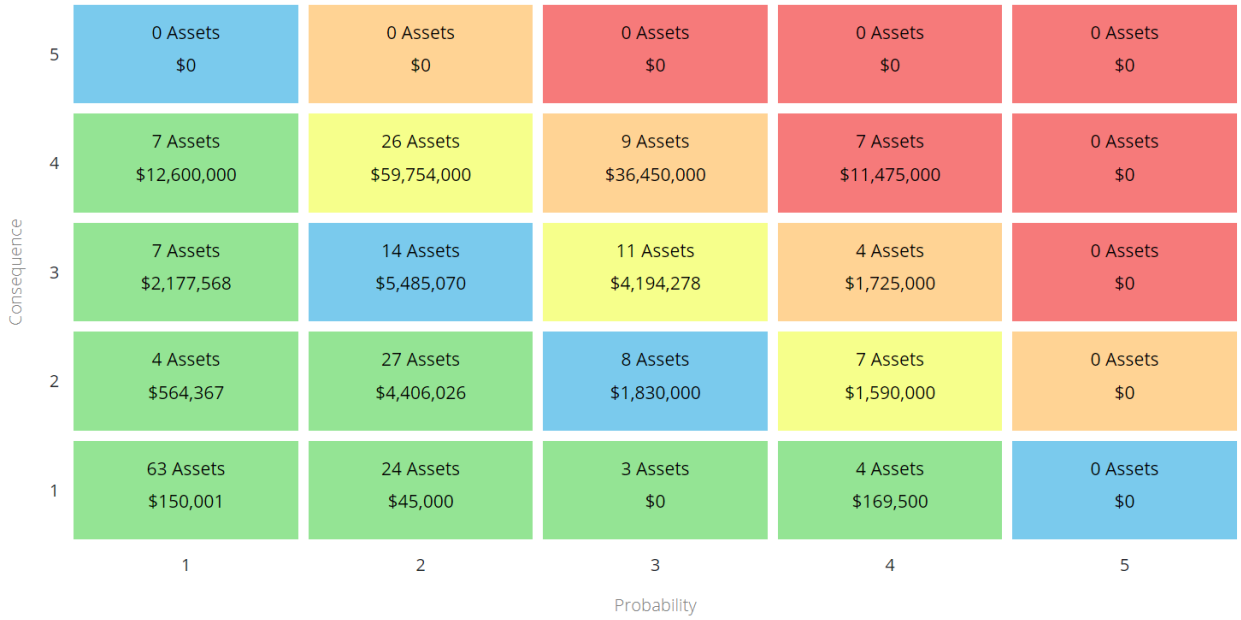


The projected cost of lifecycle activities that will need to be undertaken over the next 10 years to maintain the current level of service can be found in Appendix A.

4.1.5 Risk & Criticality

Risk Matrix

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 2020 inventory data. See Appendix C for the criteria used to determine the risk rating of each asset.



This risk matrix is based on an advanced risk model for roads and a high-level risk model for all other assets that were developed for the purposes of this AMP. Municipal staff should review and adjust the risk models to reflect the availability of asset data as well as an evolving understanding of both the probability and consequences of asset failure.

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

4.1.6 Levels of Service

The following tables identify the Township's current level of service for the Road Network. These metrics include the technical and community level of service metrics that are required as part of O. Reg. 588/17 as well as any additional performance measures that the Township has selected for this AMP.

Community Levels of Service

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

Service Attribute	Qualitative Description	Current LOS (2020)
Scope	Description, which may include maps, of the road network in the municipality and its level of connectivity	The Township's transportation network comprises of 311 centreline km of road, of which 149 km are gravel roads and 162 km are paved roads. The network mostly consists of roads with MMS classes of 4, 5 and 6. The network also consists of about 170 streetlight assets, and other roadside appurtenances.
Quality	Description or images that illustrate the different levels of road class pavement condition	Every road section receives a pavement quality index (PQI) rating (0-100). The rating incorporates pavement roughness measurements and surface distresses (type, quantity, severity). Ratings are categorized into 5 general qualitative descriptors as detailed below: 0-29 – Failed 30-49 – Poor 50-69 – Fair 70-89 – Good 90-100 – Excellent

Technical Levels of Service

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

Service Attribute	Technical Metric	Current LOS (2020)
Scope	Lane-km of arterial roads (MMS classes 1 and 2) per land area (km/km^2)	0
	Lane-km of collector roads (MMS classes 3 and 4) per land area (km/km^2)	0.35 km/km^2
	Lane-km of local roads (MMS classes 5 and 6) per land area (km/km^2)	0.67 km/km^2
Quality	Average pavement condition index for paved roads in the municipality	68%
	Average surface condition for unpaved roads in the municipality (e.g., excellent, good, fair, poor)	Good
Performance	Capital reinvestment rate	0.81%
	Operating costs for unpaved (loose top) roads per lane kilometre	$1,150

4.1.7 Recommendations

Asset Inventory

- Review sidewalk and roadside appurtenance assets in other data sources to determine whether all municipal assets have been accounted for in the Township's central asset inventory.
- The streetlight inventory includes several pooled assets that should be disaggregated into individual assets to allow for detailed planning and analysis.

Lifecycle Management Strategies

- Evaluate the efficacy of the Township's lifecycle management strategies at regular intervals to determine the impact on cost, performance and risk.

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 identified in O. Reg. 588/17 and those metrics that the Township believes 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.

Bridges & Culverts

Bridges & Culverts represents a critical portion of the transportation services provided to the community. The Operations & Infrastructure department is responsible for the maintenance of all bridges and structural culverts located across municipal roads with the goal of keeping structures in an adequate state of repair and minimizing service disruptions.

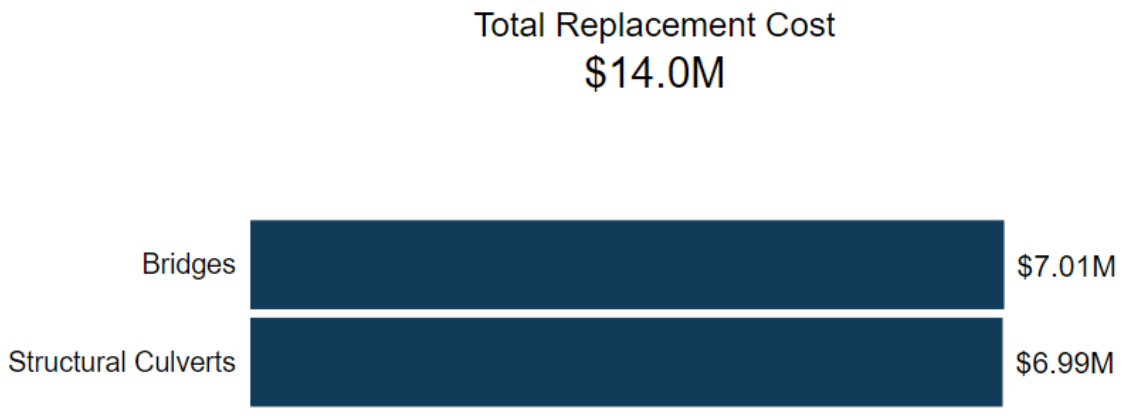
For this AMP, the current asset inventory for bridges and structural culverts was refined and consolidated with asset data from the 2019 OSIM inspections.

The most recent OSIM inspections were completed in 2021 but were not received in time to be incorporated into this AMP, as such, the information below is based on the 2019 OSIM inspections. The next iteration of the AMP will include these assessments and a componentized inventory.

4.1.8 Asset Inventory & Replacement Cost

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

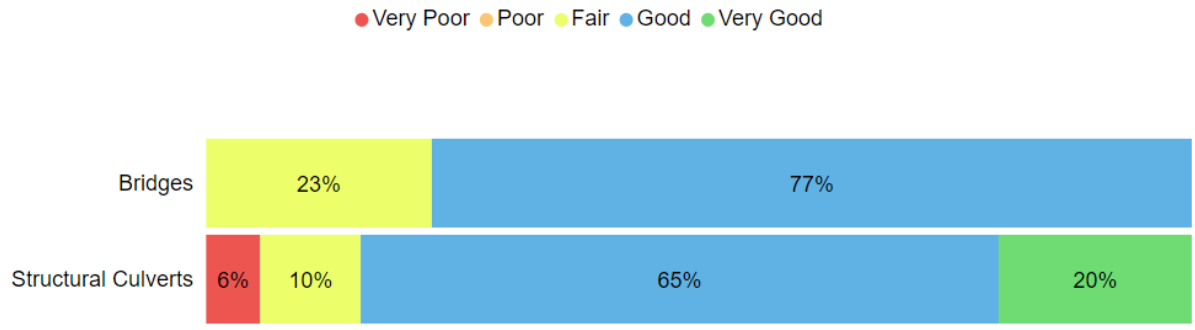
Asset Segment	Quantity	Replacement Cost Method	Total Replacement Cost
Bridges	6	User-Defined Cost	$7,005,049
Structural Culverts	8	User-Defined Cost	$6,990,370
			$13,995,419



4.1.9 Asset Condition

The table below identifies the current average condition and source of available condition data for each asset segment. The Average Condition (%) is a weighted value based on replacement cost.

Asset Segment	Average Condition (%)	Average Condition Rating	Condition Source
Bridges	67%	Good	100% Assessed
Structural Culverts	72%	Good	100% Assessed
	70%	**Good**	**100% Assessed**



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

Current Approach to Condition Assessment

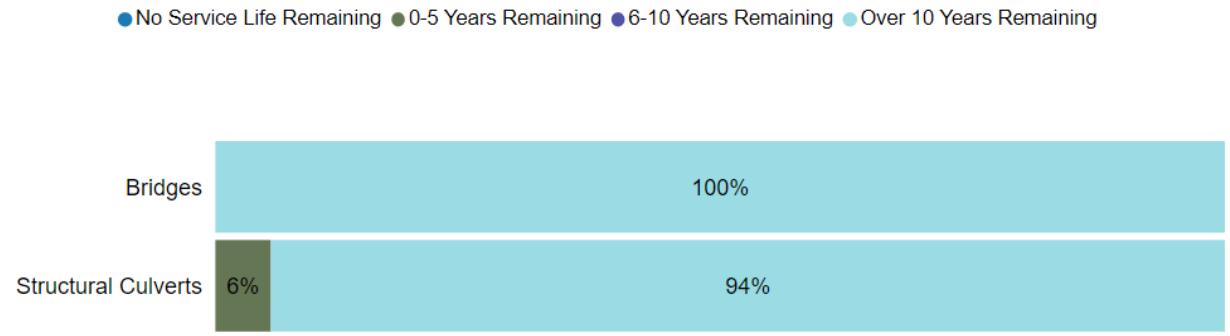
Accurate and reliable condition data allows staff to more confidently determine the remaining service life of assets and identify the most cost-effective approach to managing assets. The following describes the municipality's current approach:

- Condition assessments of all bridges and culverts with a span greater than or equal to 3 meters are completed every 2 years in accordance with the Ontario Structure Inspection Manual (OSIM)
- Assessed condition data from 2019 OSIM report by TSI Inc. was used for this AMP

4.1.10 Estimated Useful Life & Average Age

The Estimated Useful Life for Bridges & Culverts assets has been assigned according to a combination of established industry standards and staff knowledge. The Average Age of each asset is based on the number of years each asset has been in-service. Finally, the Average Service Life Remaining represents the difference between the Estimated Useful Life and the Average Age, except when an asset has been assigned an assessed condition rating. Assessed condition may increase or decrease the average service life remaining.

Asset Segment	Estimated Useful Life (Years)	Average Age (Years)	Average Service Life Remaining (Years)
Bridges	75 Years	25.5	17.9
Structural Culverts	75 Years	27.2	24.1
		26.4	**21.4**



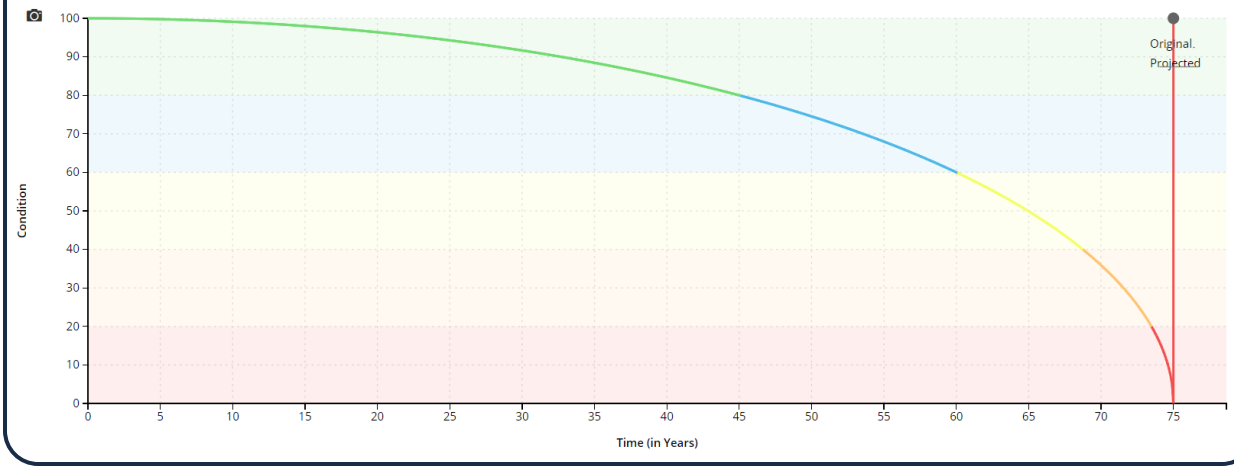
Each asset's Estimated Useful Life should be reviewed periodically to determine whether adjustments need to be made to better align with the observed length of service life for each asset type.

4.1.11 Lifecycle Management Strategy

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

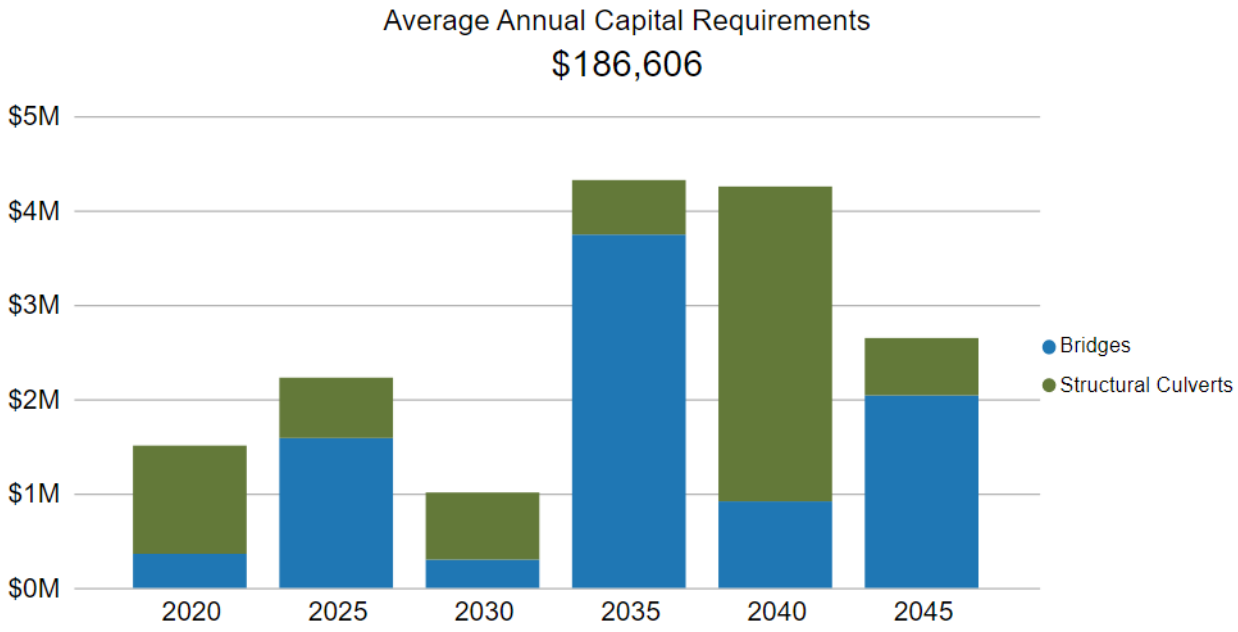
The following table outlines the Township's current lifecycle management strategy.

Activity Type	Description of Current Strategy
Maintenance, Rehabilitation and Replacement	All lifecycle activities are driven by the results of mandated structural inspections competed according to the Ontario Structure Inspection Manual (OSIM). These are included in the capital forecasts for this asset category.
	Bridge cleaning happens once a year
Inspection	The most recent inspection report was completed in 2019 by TSI Inc.



Forecasted Capital Requirements

The following graph forecasts long-term capital requirements. The annual capital requirement represents the average amount per year that the Township should allocate towards funding rehabilitation and replacement needs.



The projected cost of lifecycle activities that will need to be undertaken over the next 10 years to maintain the current level of service can be found in Appendix A.

4.1.12 Risk & Criticality

Risk Matrix

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 2020 inventory data. See Appendix C for the criteria used to determine the risk rating of each asset.

This risk matrix is based on an advanced risk model developed for the purposes of this AMP. Municipal staff should review and adjust the risk model to reflect the availability of asset data as well as an evolving understanding of both the probability and consequences of asset failure.

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

4.1.13 Levels of Service

The following tables identify the Township's current level of service for Bridges & Culverts. These metrics include the technical and community level of service metrics that are required as part of O. Reg. 588/17 as well as any additional performance measures that the Township has selected for this AMP.

Community Levels of Service

The following table outlines the qualitative descriptions that determine the community levels of service provided by Bridges & Culverts.

Service Attribute	Qualitative Description	Current LOS (2020)
Scope	Description of the traffic that is supported by municipal bridges (e.g., heavy transport vehicles, motor vehicles, emergency vehicles, pedestrians, cyclists)	Bridges and structural culverts are a key component of the municipal transportation network. None of the municipality's structures have loading or dimensional restrictions meaning that most types of vehicles, including heavy transport, motor vehicles, emergency vehicles and cyclists can cross them without restriction.
Quality	Description or images of the condition of bridges & culverts and how this would affect use of the bridges & culverts	See Appendix B

Technical Levels of Service

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

Service Attribute	Technical Metric	Current LOS (2020)
Scope	% of bridges in the Township with loading or dimensional restrictions	0%
Quality	Average bridge condition index value for bridges in the Township	67%
	Average bridge condition index value for structural culverts in the Township	72%
Performance	Capital re-investment rate	0.68%
	Average duration of unplanned bridge closure	[TBD]

4.1.14 Recommendations

Data Review/Validation

- Continue to review and validate inventory data, assessed condition data and replacement costs for all bridges and structural culverts upon the completion of OSIM inspections every 2 years.

Lifecycle Management Strategies

- Continue to review and incorporate the capital forecasts and the engineer recommended lifecycle activities from the OSIM inspections into the Township's central asset inventory

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 identified in O. Reg. 588/17 and those metrics that the Township believe 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.

Storm Sewer System

The Storm Sewer system is designed to manage the flow of stormwater. The Operations & Infrastructure department is responsible for the maintenance of storm sewer system. In recent years, this asset category has become increasingly relevant due to the increasing intensity and frequency of extreme weather events and climate change.

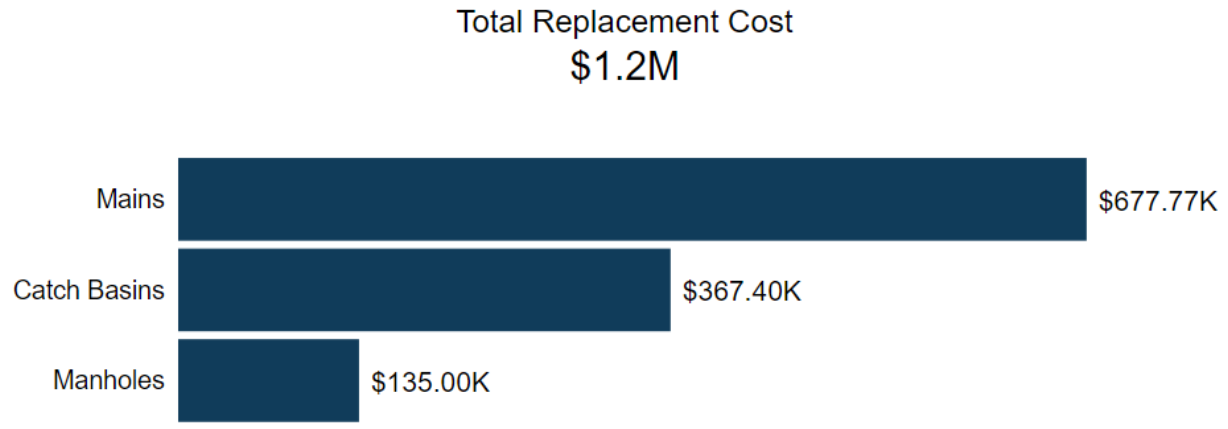
Asset data from GIS data sources was gathered and consolidated into the Township's current asset inventory as a starting point to develop a centralized storm sewer asset inventory.

Staff are working towards improving the accuracy and reliability of their storm sewer system inventory to assist with long-term asset management planning.

4.1.15 Asset Inventory & Replacement Cost

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

Asset Segment	Quantity[2]	Replacement Cost Method	Total Replacement Cost
Storm Mains	2.2 km	Cost per Unit	$677,772
Storm Manholes	18	Cost per Unit	$135,000
Catch Basins	90	Cost per Unit	$367,403
			$1,180,175

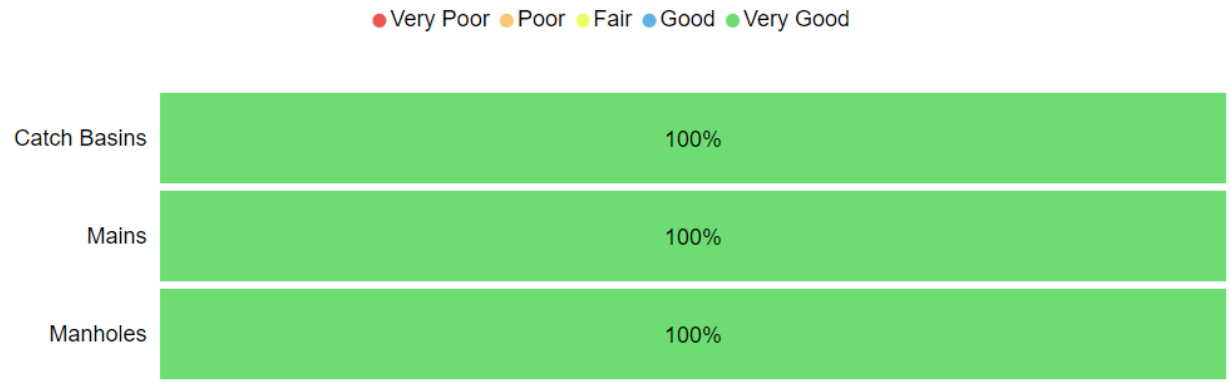


[2] Staff have acknowledged data gaps in the asset information, as a result the total quantities may be inaccurate. Staff are working to improve the accuracy and validity of the storm sewer inventory.

4.1.16 Asset Condition

The table below identifies the current average condition and source of available condition data for each asset segment. The Average Condition (%) is a weighted value based on replacement cost.

Asset Segment	Average Condition (%)	Average Condition Rating	Condition Source
Storm Mains	99%	Very Good	Age-based
Storm Manholes	99%	Very Good	Age-based
Catch Basins	99%	Very Good	Age-based
	99%	**Very Good**	



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

Current Approach to Condition Assessment

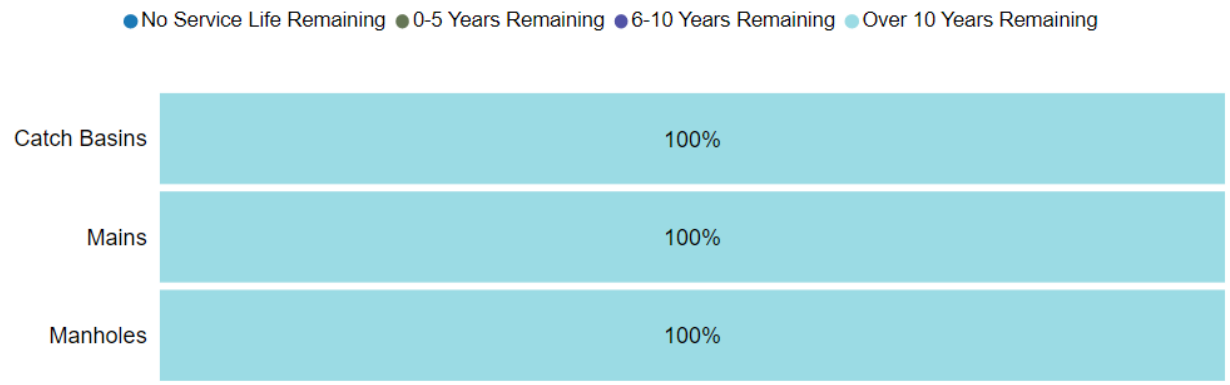
Accurate and reliable condition data allows staff to more confidently determine the remaining service life of assets and identify the most cost-effective approach to managing assets. The following describes the municipality's current approach:

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

4.1.17 Estimated Useful Life & Average Age

The Estimated Useful Life for Storm Sewer System assets has been assigned according to a combination of established industry standards and staff knowledge. The Average Age of each asset is based on the number of years each asset has been in-service. Finally, the Average Service Life Remaining represents the difference between the Estimated Useful Life and the Average Age, except when an asset has been assigned an assessed condition rating. Assessed condition may increase or decrease the average service life remaining.

Asset Segment	Estimated Useful Life (Years)	Average Age (Years)	Average Service Life Remaining (Years)
Storm Mains	75	10.3	69.2
Storm Manholes	80	9.9	86.6
Catch Basins	40 - 80	10.9	69.0
		10.3	**74.3**



Each asset's Estimated Useful Life should 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.

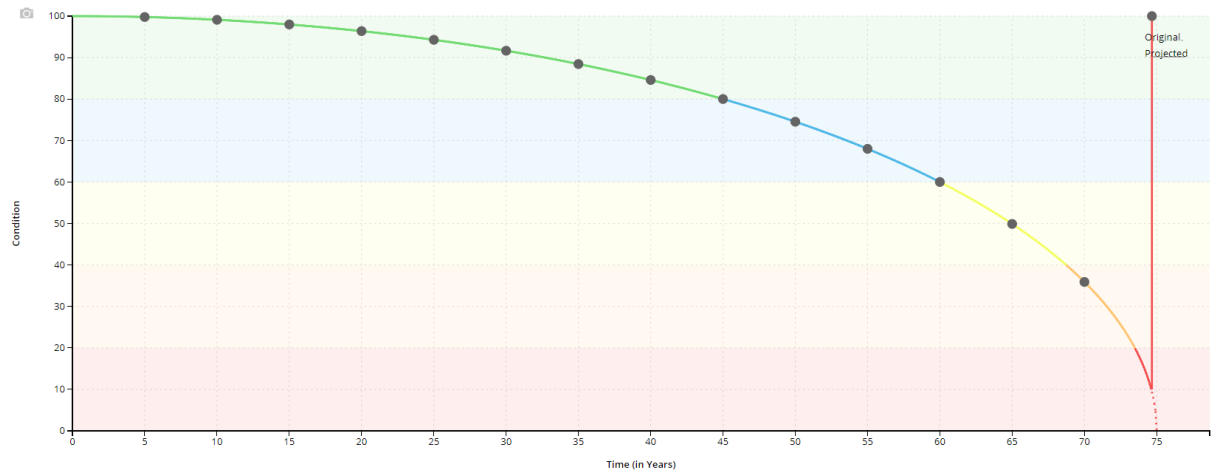
4.1.18 Lifecycle Management Strategy

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

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

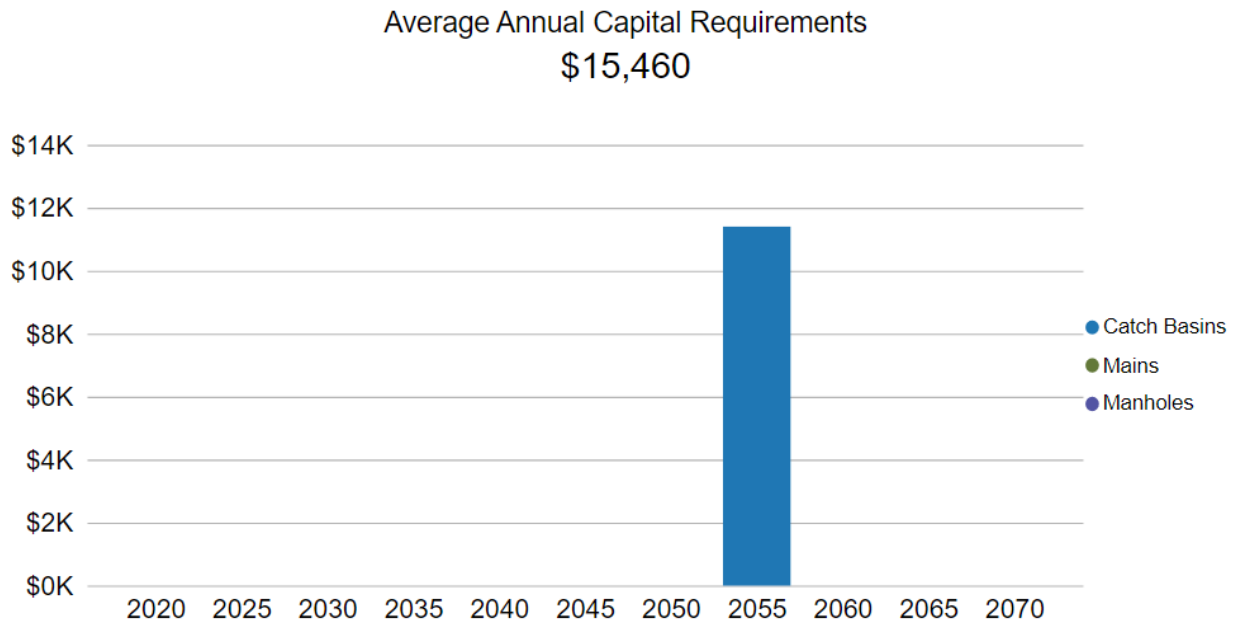
Activity Type	Description of Current Strategy
Maintenance	Storm sewer flushing is completed annually
	Catch Basins and outfalls are cleaned annually to clear blockages and ensure stormwater runoff is efficiently conveyed through the storm sewer system
	CCTV inspections and cleaning is completed as budget becomes available and this information will be used to drive forward rehabilitation and replacement plans
Rehabilitation	The general age of the storm infrastructure is fairly new, as such there are no renewal strategies currently in place
	Trenchless re-lining has the potential to reduce total lifecycle costs but would require a formal condition assessment program to determine viability
Replacement	Without the availability of up-to-date condition assessment information replacement activities are purely reactive in nature

Storm Mains		
Event Name	**Event Class**	**Event Trigger**
Storm Flushing (20% of network annually)	Maintenance	Every 5 Years
Catch Basin Cleaning	Maintenance	Annual
Outfall Cleaning	Maintenance	Annual
Full Reconstruction	Replacement	At 10-20 Condition



Forecasted Capital Requirements

The following graph forecasts long-term capital requirements. The annual capital requirement represents the average amount per year that the Township should allocate towards funding rehabilitation and replacement needs.



The projected cost of lifecycle activities that will need to be undertaken over the next 10 years to maintain the current level of service can be found in Appendix A.

4.1.19 Risk & Criticality

Risk Matrix

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 2020 inventory data. See Appendix C for the criteria used to determine the risk rating of each asset.

This risk matrix is based on an advanced risk model for linear storm assets and a high-level risk model for all other storm assets that were developed for the purposes of this AMP. Municipal staff should review and adjust the risk models to reflect the availability of asset data as well as an evolving understanding of both the probability and consequences of asset failure.

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

4.1.20 Levels of Service

The following tables identify the Township's current level of service for Storm Sewer System. These metrics include the technical and community level of service metrics that are required as part of O. Reg. 588/17 as well as any additional performance measures that the Township has selected for this AMP.

Community Levels of Service

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

Service Attribute	Qualitative Description	Current LOS (2020)
Scope	Description, which may include map, of the user groups or areas of the municipality that are protected from flooding, including the extent of protection provided by the municipal stormwater system	No mapping available at this time; staff will have this ready for the next iteration of the AMP.

Technical Levels of Service

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

Service Attribute	Technical Metric	Current LOS (2020)
Scope	% of properties in municipality resilient to a 100-year storm	Relevant information not available at this time; staff will have this ready for the next iteration of the AMP.
	% of the municipal stormwater management system resilient to a 5-year storm	
Performance	Capital reinvestment rate	0.51%

4.1.21 Recommendations

Asset Inventory

- Continue to refine the asset inventory to ensure all relevant asset types are captured in the Township's central asset inventory, including the consolidation and refinement of key asset types
- Review and revise replacement costs and critical attribute data on a regular basis

Condition Assessment Strategies

- The development of a comprehensive inventory should be accompanied by a system-wide assessment of the condition of all assets in the Storm Sewer System through CCTV inspections.
- 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.

Lifecycle Management Strategies

- Document and review lifecycle management strategies for the Storm Sewer System on a regular basis to achieve the lowest total cost of ownership while maintaining adequate service levels.

Levels of Service

- Gather and measure current levels of service in accordance with the metrics that the Township has established in this AMP. 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.

Buildings & Facilities

The Township owns and maintains several facilities and recreation centres that provide key service to the community. These include:

- Municipal offices and public libraries
- Fire stations and associated offices and facilities
- Community halls and recreational facilities
- Public works garages, equipment depot and storage sheds

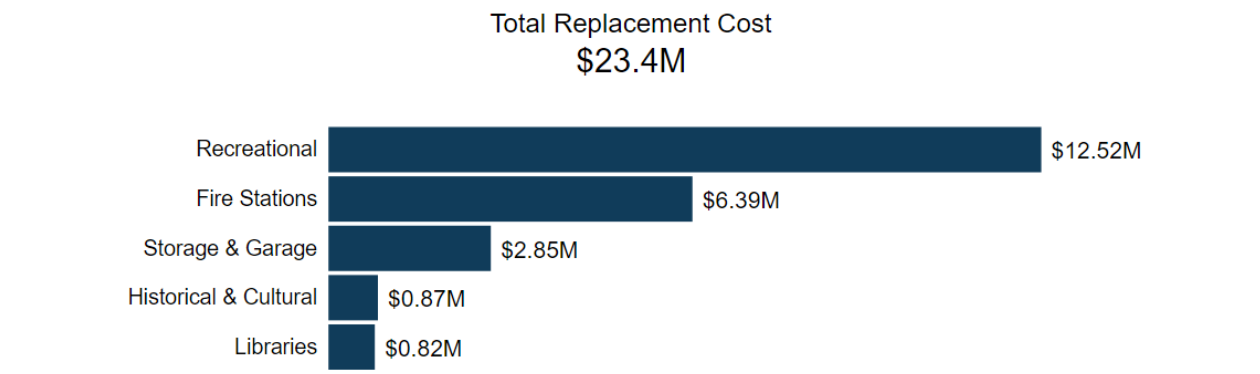
A Building Condition Assessment (BCA) of the Township's facilities was conducted in 2021 which provided a condition assessment of the facilities, a componentized breakdown of assets, and capital forecasting.

Unfortunately, the building condition assessments were not received in time to be incorporated into this AMP, as such, the information below is based on a pooled inventory and age-based condition. The next iteration of the AMP will incorporate these assessments into the lifecycle planning.

4.1.22 Asset Inventory & Replacement Cost

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

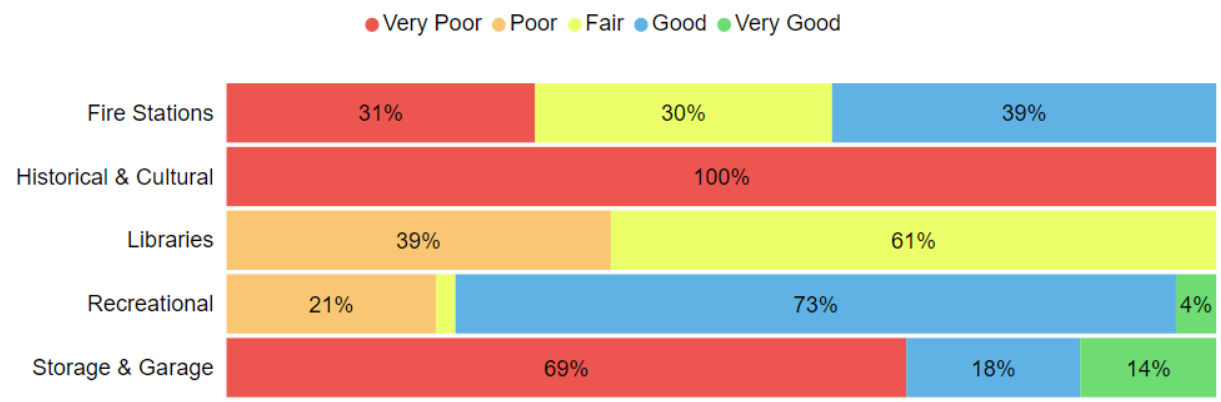
Asset Segment	Quantity	Replacement Cost Method	Total Replacement Cost
Fire Stations	4	User-Defined/Historical Cost Inflation	$6,391,300
Historical & Cultural	1	User-Defined/Historical Cost Inflation	$870,100
Libraries	2	User-Defined/Historical Cost Inflation	$815,688
Recreational	12	User-Defined/Historical Cost Inflation	$12,515,093
Storage & Garage	9	User-Defined/Historical Cost Inflation	$2,852,031
			$23,444,212



4.1.23 Asset Condition

The table below identifies the current average condition and source of available condition data for each asset segment. The Average Condition (%) is a weighted value based on replacement cost.

Asset Segment	Average Condition (%)	Average Condition Rating	Condition Source
Fire Stations	45%	Fair	Age-based
Historical & Cultural	17%	Very Poor	Age-based
Libraries	38%	Poor	Age-based
Recreational	69%	Good	Age-based
Storage & Garage	31%	Poor	Age-based
	55%	**Fair**	



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

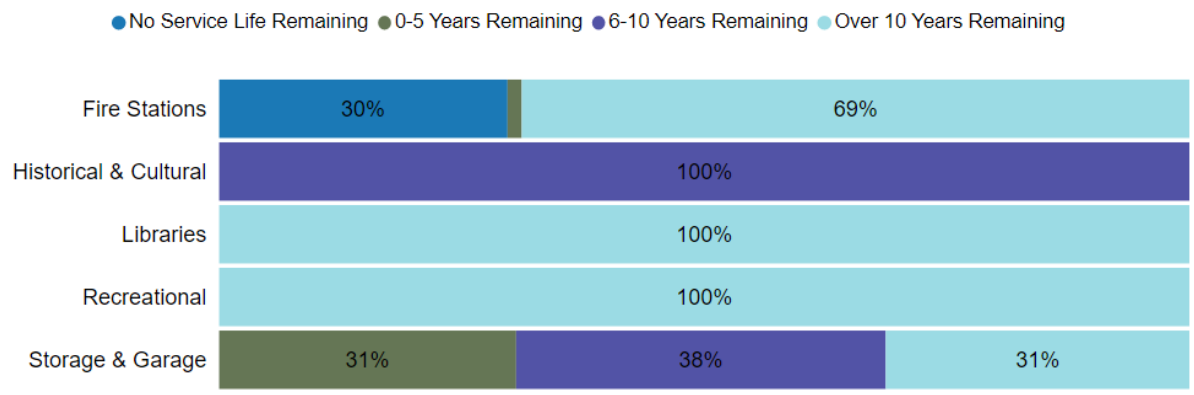
Current Approach to Condition Assessment

The Township has recently completed building condition assessments that have not been included in this AMP. Since the inventory used for this AMP originates from a pooled, finance-based inventory, the facility condition assessments will have a more accurate output on condition, capital forecasting, general lifecycle management and can be used to develop a more accurate asset inventory for Buildings & Facilities. The information gathered from these assessments should be consolidated into the Township's centralized asset inventory.

4.1.24 Estimated Useful Life & Average Age

The Estimated Useful Life for Buildings & Facilities has been assigned according to a combination of established industry standards and staff knowledge. The Average Age of each asset is based on the number of years each asset has been in-service. Finally, the Average Service Life Remaining represents the difference between the Estimated Useful Life and the Average Age, except when an asset has been assigned an assessed condition rating. Assessed condition may increase or decrease the average service life remaining.

Asset Segment	Estimated Useful Life (Years)	Average Age (Years)	Average Service Life Remaining (Years)
Fire Stations	50	34.2	15.8
Historical & Cultural	50	41.4	8.6
Libraries	50	32.0	18.0
Recreational	20 – 50	11.4	27.0
Storage & Garage	20 – 50	14.7	24.2
		18.0	**23.3**

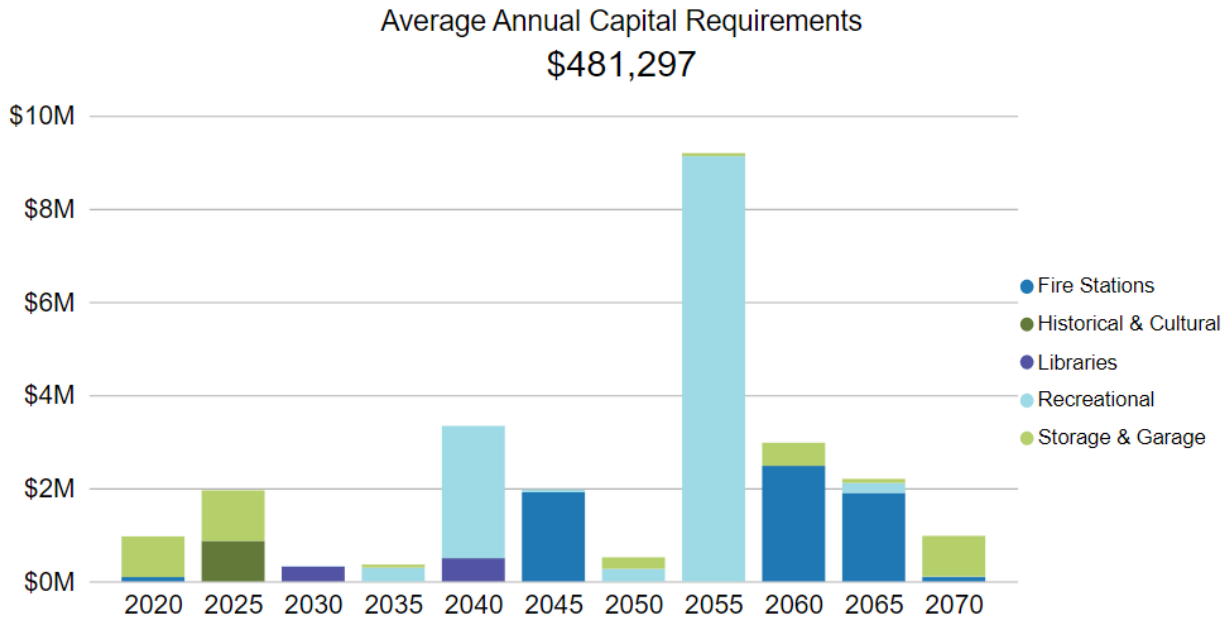


Each asset's Estimated Useful Life should be reviewed periodically to determine whether adjustments need to be made to better align with the observed length of service life for each asset type.

4.1.25 Forecasted Capital Requirements

Asset Segment	Annual Capital Requirements
Fire Stations	$127,826
Historical & Cultural	$17,402
Libraries	$16,314
Recreational	$259,515
Storage & Garage	$60,241
	$481,297

The following graph forecasts long-term capital requirements. The annual capital requirement represents the average amount per year that the Township should allocate towards funding rehabilitation and replacement needs.



The projected cost of lifecycle activities that will need to be undertaken over the next 10 years to maintain the current level of service can be found in Appendix A.

4.1.26 Risk & Criticality

Risk Matrix

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 2020 inventory data. See Appendix C for the criteria used to determine the risk rating of each asset.

This risk matrix is based on a high-level model developed for the purposes of this AMP and Municipal staff should review and adjust the risk model to reflect the availability of asset data as well as an evolving understanding of both the probability and consequences of asset failure.

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

4.1.27 Levels of Service

Buildings & Facilities is considered a non-core asset category. As such, the Township has until July 1, 2024 to determine the qualitative descriptions and technical metrics that measure the current level of service provided.

Parks & Land Improvements

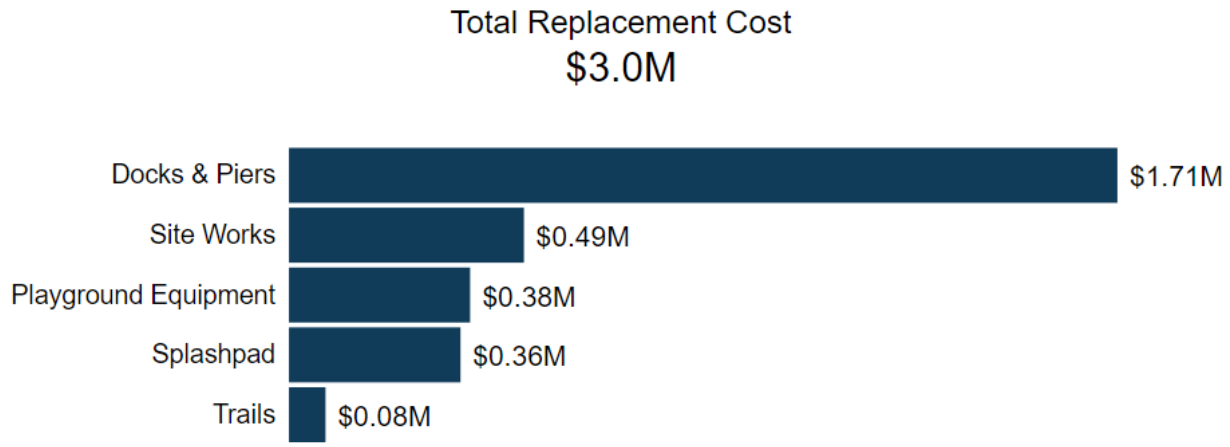
The Township owns and operates a number of assets that are categorized under the Parks & Land Improvements category and assist in providing the Township with community recreation and natural outdoor space. This includes:

- marina facilities
- playground equipment and splashpad
- parklands and trails
- parking lots for municipal facilities

4.1.28 Asset Inventory & Replacement Cost

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

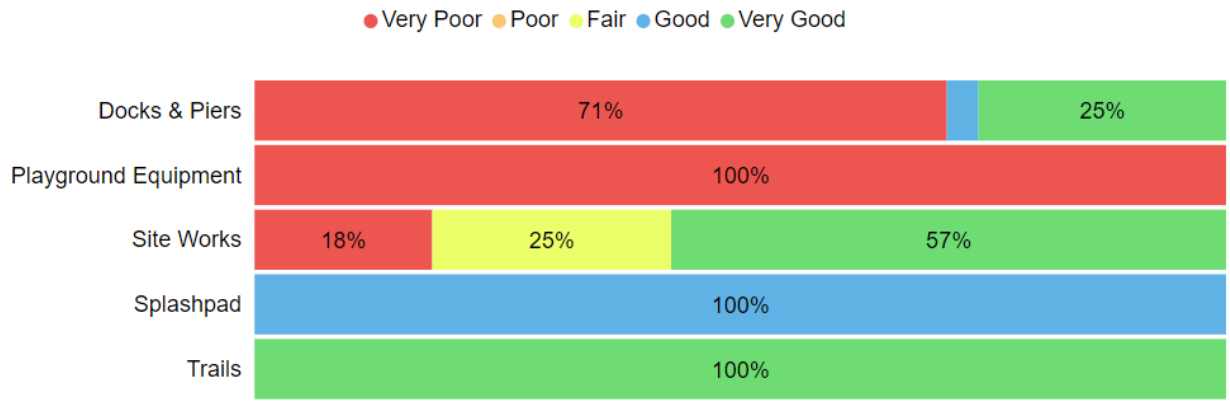
Asset Segment	Quantity	Replacement Cost Method	Total Replacement Cost
Docks & Piers	9	User-Defined/Historical Cost Inflation	$1,714,597
Playground Equipment	5	User-Defined/Historical Cost Inflation	$375,000
Site Works	11	User-Defined/Historical Cost Inflation	$486,327
Splashpad	1	User-Defined/Historical Cost Inflation	$355,081
Trails	1	User-Defined/Historical Cost Inflation	$75,715
			$3,006,720



4.1.29 Asset Condition

The table below identifies the current average condition and source of available condition data for each asset segment. The Average Condition (%) is a weighted value based on replacement cost.

Asset Segment	Average Condition (%)	Average Condition Rating	Condition Source
Docks & Piers	26%	Poor	Age-based
Playground Equipment	0%	Very Poor	Age-based
Site Works	65%	Good	Age-based
Splashpad	70%	Good	Age-based
Trails	88%	Very Good	Age-based
	36%	**Poor**	



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

Current Approach to Condition Assessment

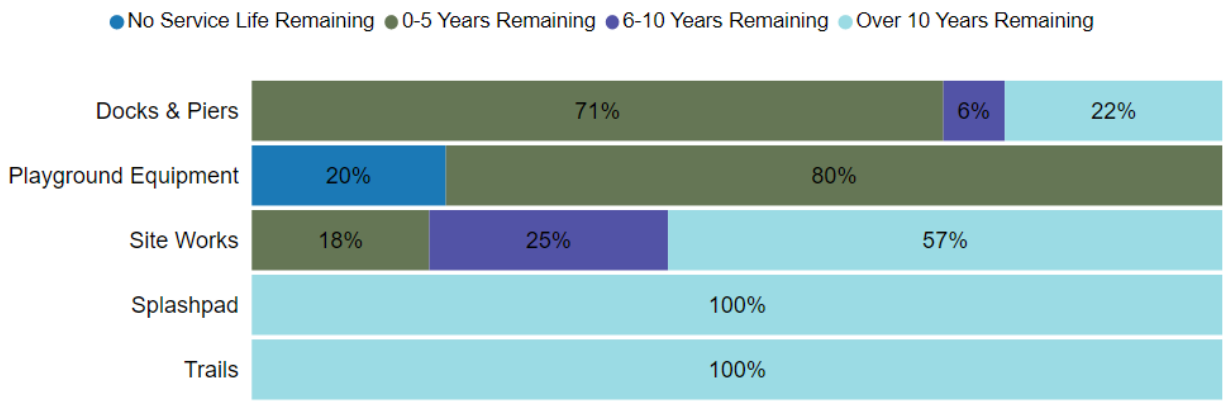
Accurate and reliable condition data allows staff to more confidently determine the remaining service life of assets and identify the most cost-effective approach to managing assets. The following describes the municipality's current approach:

- Staff complete regular visual inspections on park and land improvement assets to ensure they are in state of adequate repair. Playgrounds are inspected according to CSA standards.

4.1.30 Estimated Useful Life & Average Age

The Estimated Useful Life for Park & Land Improvement assets has been assigned according to a combination of established industry standards and staff knowledge. The Average Age of each asset is based on the number of years each asset has been in-service. Finally, the Average Service Life Remaining represents the difference between the Estimated Useful Life and the Average Age, except when an asset has been assigned an assessed condition rating. Assessed condition may increase or decrease the average service life remaining.

Asset Segment	Estimated Useful Life (Years)	Average Age (Years)	Average Service Life Remaining (Years)
Docks & Piers	10 – 50	15.2	13.4
Playground Equipment	15	15.8	-0.2
Site Works	10 – 20	7.4	8.0
Splashpad	20	6.0	13.9
Trails	20	2.5	17.5
		12.3	**9.3**

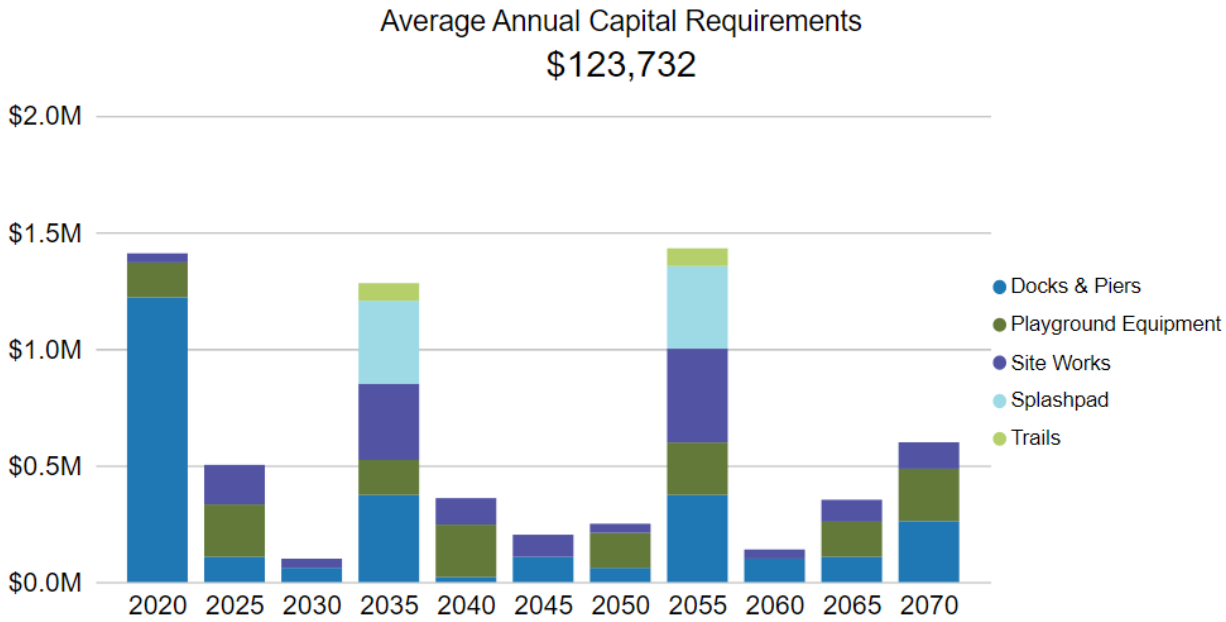


Each asset's Estimated Useful Life should be reviewed periodically to determine whether adjustments need to be made to better align with the observed length of service life for each asset type.

4.1.31 Forecasted Capital Requirements

Asset Segment	Annual Capital Requirements
Docks & Piers	$47,181
Playground Equipment	$25,000
Site Works	$30,011
Splashpad	$17,754
Trails	$3,786
	$123,732

The following graph forecasts long-term capital requirements. The annual capital requirement represents the average amount per year that the Township should allocate towards funding rehabilitation and replacement needs.



The projected cost of lifecycle activities that will need to be undertaken over the next 10 years to maintain the current level of service can be found in Appendix A.

4.1.32 Risk & Criticality

Risk Matrix

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 2020 inventory data. See Appendix C for the criteria used to determine the risk rating of each asset.

This risk matrix is based on a high-level model developed for the purposes of this AMP and Municipal staff should review and adjust the risk model to reflect the availability of asset data as well as an evolving understanding of both the probability and consequences of asset failure.

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

4.1.33 Levels of Service

Parks & Land Improvements is considered a non-core asset category. As such, the Township has until July 1, 2024 to determine the qualitative descriptions and technical metrics that measure the current level of service provided.

Machinery & Equipment

In order to maintain the high quality of public infrastructure and support the delivery of core services, municipal staff own and operate various types of machinery and equipment. This includes:

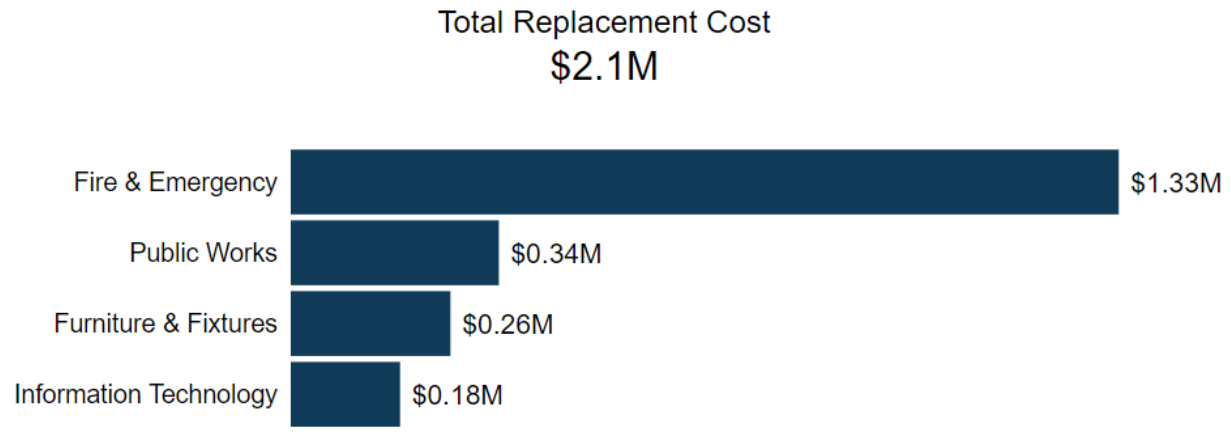
- emergency services equipment to support first responders,
- furniture & fixtures for facilities, offices, and buildings,
- IT equipment for communication, data management, and
- tools, shop & garage machinery equipment to ensure proper maintenance of vehicles and machinery.

Keeping machinery and equipment assets in an adequate state of repair is important to support staff in the delivery of core services.

4.1.34 Asset Inventory & Replacement Cost

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

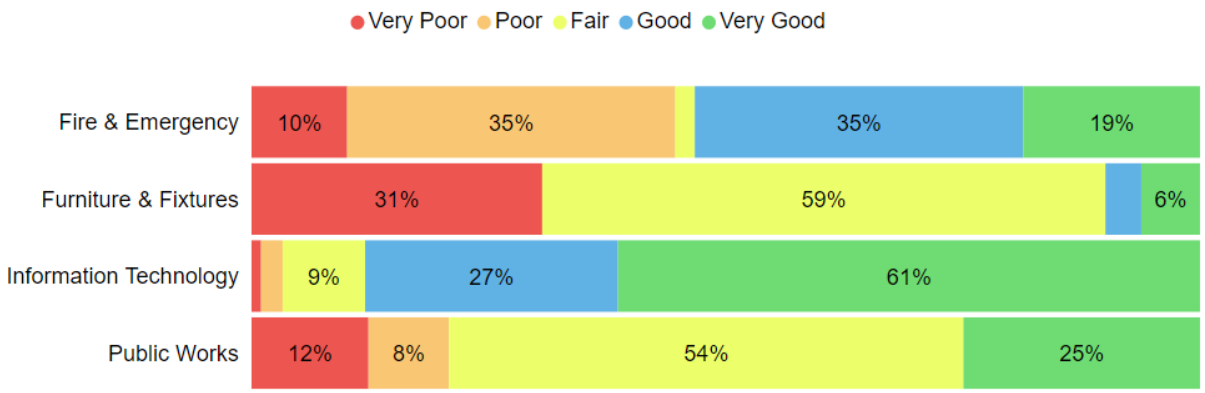
Asset Segment	Quantity	Replacement Cost Method	Total Replacement Cost
Fire & Emergency	15	User-Defined/Historical Cost Inflation	$1,332,590
Furniture & Fixtures	6	Historical Cost Inflation	$257,090
Information Technology	49	User-Defined/Historical Cost Inflation	$176,002
Public Works	12	User-Defined/Historical Cost Inflation	$335,010
			$ $2,100,692



4.1.35 Asset Condition

The table below identifies the current average condition and source of available condition data for each asset segment. The Average Condition (%) is a weighted value based on replacement cost.

Asset Segment	Average Condition (%)	Average Condition Rating	Condition Source
Fire & Emergency	51%	Fair	1% Assessed
Furniture & Fixtures	40%	Fair	Age-based
Information Technology	79%	Good	Age-based
Public Works	48%	Fair	Age-based
	52%	**Fair**	



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

Current Approach to Condition Assessment

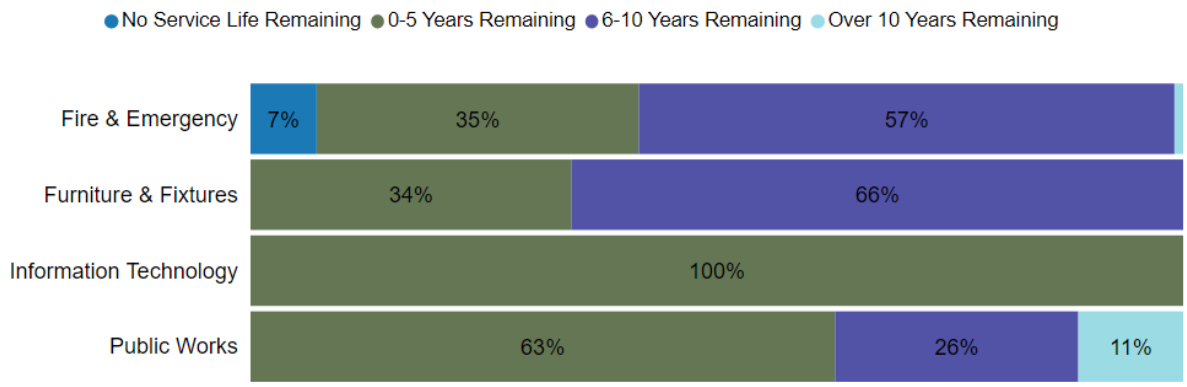
Accurate and reliable condition data allows staff to more confidently determine the remaining service life of assets and identify the most cost-effective approach to managing assets. The following describes the municipality's current approach:

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

4.1.36 Estimated Useful Life & Average Age

The Estimated Useful Life for machinery & equipment assets has been assigned according to a combination of established industry standards and staff knowledge. The Average Age of each asset is based on the number of years each asset has been in-service. Finally, the Average Service Life Remaining represents the difference between the Estimated Useful Life and the Average Age, except when an asset has been assigned an assessed condition rating. Assessed condition may increase or decrease the average service life remaining.

Asset Segment	Estimated Useful Life (Years)	Average Age (Years)	Average Service Life Remaining (Years)
Fire & Emergency	7 – 20	5.0	5.8
Furniture & Fixtures	5 – 20	6.0	4.3
Information Technology	4 – 5	1.4	2.7
Public Works	7 – 20	7.0	5.9
		3.3	**3.9**

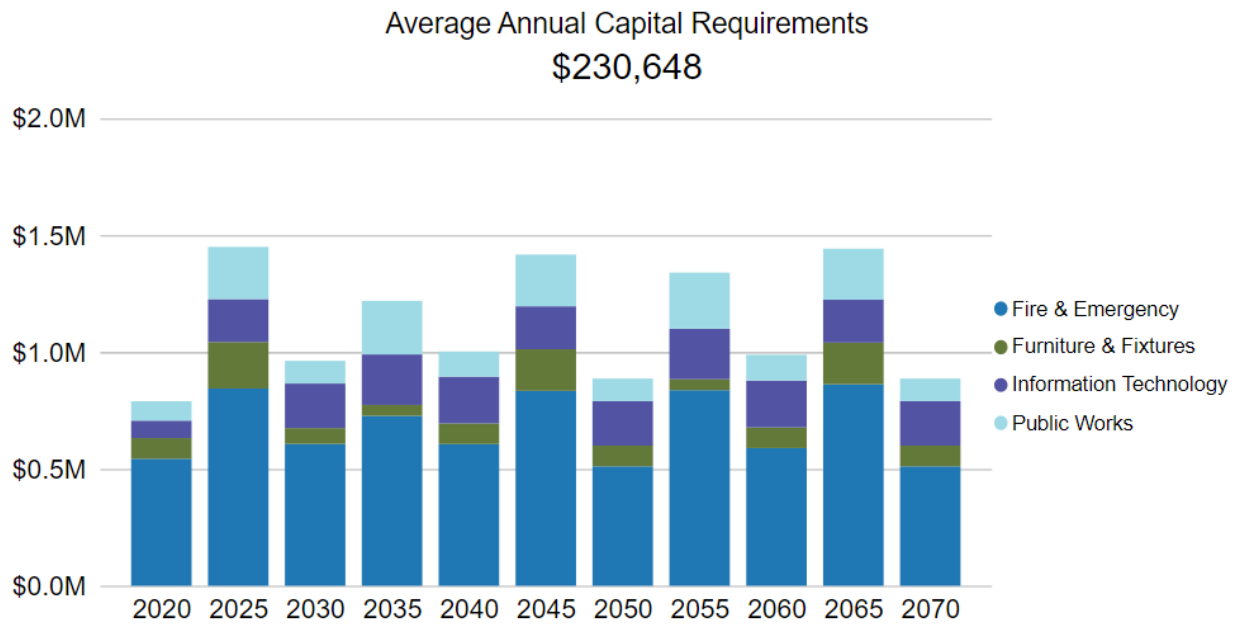


Each asset's Estimated Useful Life should be reviewed periodically to determine whether adjustments need to be made to better align with the observed length of service life for each asset type.

4.1.37 Forecasted Capital Requirements

Asset Segment	Annual Capital Requirements
Fire & Emergency	$138,611
Furniture & Fixtures	$19,944
Information Technology	$38,939
Public Works	$33,154
	$230,648

The following graph forecasts long-term capital requirements. The annual capital requirement represents the average amount per year that the Township should allocate towards funding rehabilitation and replacement needs.



The projected cost of lifecycle activities that will need to be undertaken over the next 10 years to maintain the current level of service can be found in Appendix A.

4.1.38 Risk & Criticality

Risk Matrix

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 2020 inventory data. See Appendix C for the criteria used to determine the risk rating of each asset.

This risk matrix is based on a high-level model developed for the purposes of this AMP and Municipal staff should review and adjust the risk model to reflect the availability of asset data as well as an evolving understanding of both the probability and consequences of asset failure.

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

4.1.39 Levels of Service

Machinery & Equipment is considered a non-core asset category. As such, the Township has until July 1, 2024 to determine the qualitative descriptions and technical metrics that measure the current level of service provided.

Fleet

Like machinery & equipment, fleet assets assist staff in maintaining the high quality of public infrastructure and support in the delivery of core services. This includes:

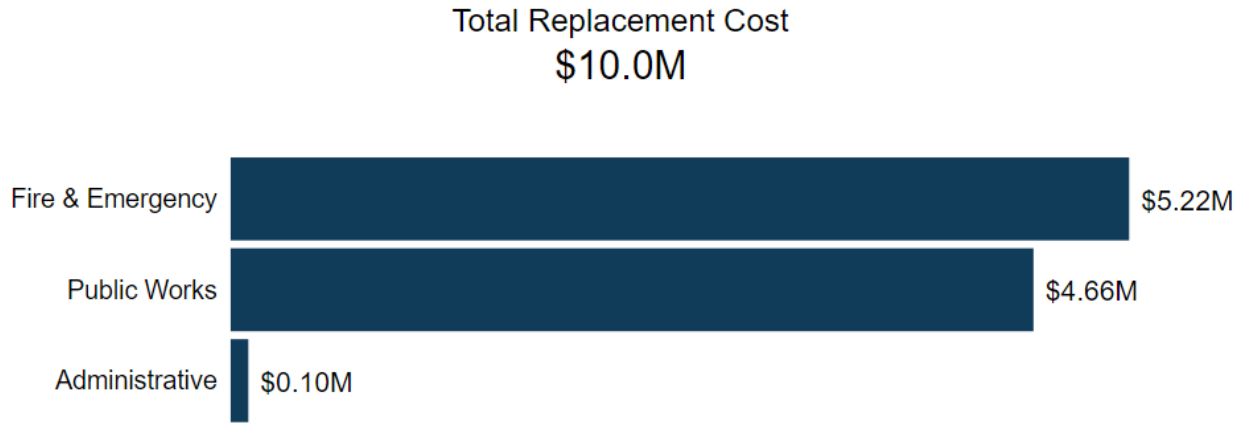
- Light-duty, medium-duty, & heavy-duty vehicles to support the maintenance of municipal infrastructure, delivery of administrative services, and address service requests,
- fire rescue vehicles that support emergency services, and
- heavy-duty machinery to support the construction and rehabilitation of vital infrastructure, and removal of critical infrastructure.

Keeping fleet assets in an adequate state of repair and readiness is important to support staff in the delivery of core services.

4.1.40 Asset Inventory & Replacement Cost

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

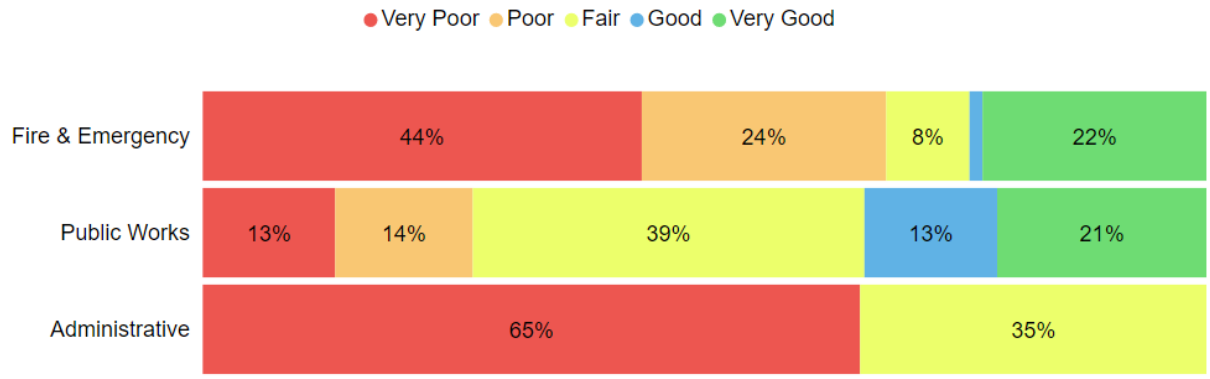
Asset Segment	Quantity	Replacement Cost Method	Total Replacement Cost
Administrative	3	Historical Cost Inflation	$104,340
Fire & Emergency	24	User-Defined/Historical Cost Inflation	$5,220,013
Public Works	35	User-Defined/Historical Cost Inflation	$4,664,349
			$9,988,702



4.1.41 Asset Condition

The table below identifies the current average condition and source of available condition data for each asset segment. The Average Condition (%) is a weighted value based on replacement cost.

Asset Segment	Average Condition (%)	Average Condition Rating	Condition Source
Administrative	23%	Poor	Age-based
Fire & Emergency	36%	Poor	3% Assessed
Public Works	52%	Fair	Age-based
	43%	**Fair**	



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

Current Approach to Condition Assessment

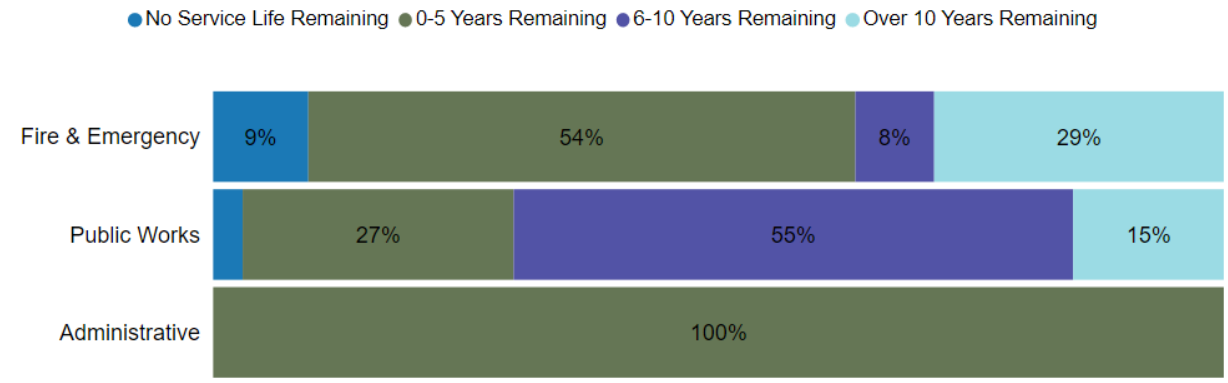
Accurate and reliable condition data allows staff to more confidently determine the remaining service life of assets and identify the most cost-effective approach to managing assets. The following describes the municipality's current approach:

- Staff complete regular visual inspections of vehicles to ensure they are in state of adequate repair prior to operation
- Condition assessments are conducted on vehicles in accordance with regulations for health and safety regulations including National Fire Protection Association (NFPA) codes and standards for fire service-related vehicles.

4.1.42 Estimated Useful Life & Average Age

The Estimated Useful Life for Fleet assets has been assigned according to a combination of established industry standards and staff knowledge. The Average Age of each asset is based on the number of years each asset has been in-service. Finally, the Average Service Life Remaining represents the difference between the Estimated Useful Life and the Average Age, except when an asset has been assigned an assessed condition rating. Assessed condition may increase or decrease the average service life remaining.

Asset Segment	Estimated Useful Life (Years)	Average Age (Years)	Average Service Life Remaining (Years)
Administrative	7 – 10	8.0	2.0
Fire & Emergency	7 – 20	15.9	4.6
Public Works	7 – 20	12.0	4.8
		13.4	**4.5**

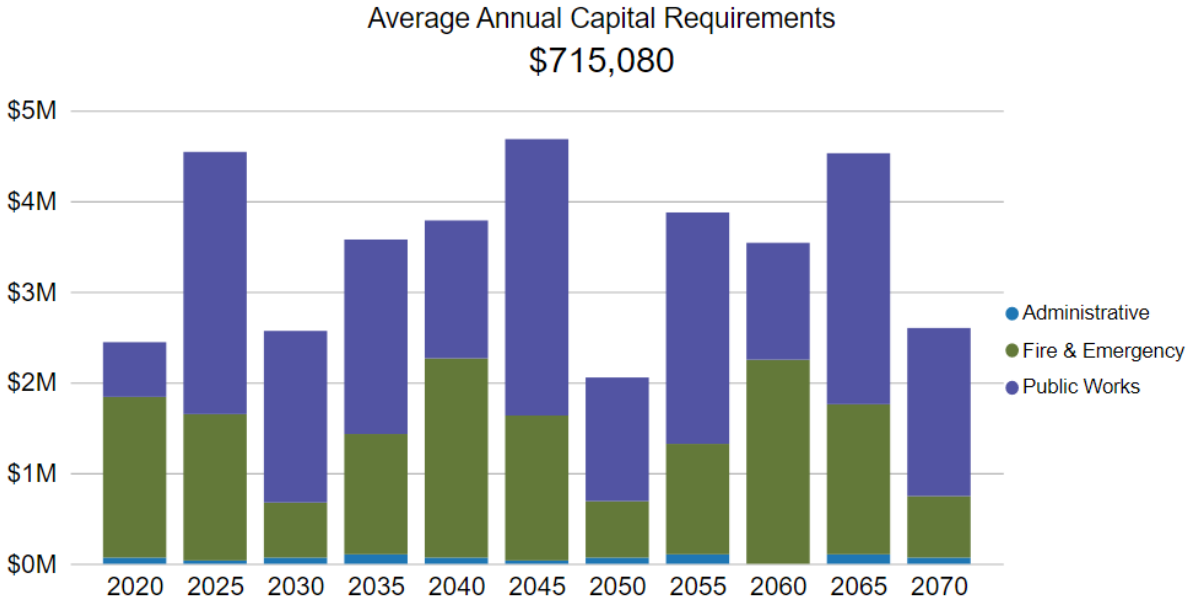


Each asset's Estimated Useful Life should be reviewed periodically to determine whether adjustments need to be made to better align with the observed length of service life for each asset type.

4.1.43 Forecasted Capital Requirements

Asset Segment	Annual Capital Requirements
Administrative	$13,462
Fire & Emergency	$286,291
Public Works	$415,427
	$ 715,080

The following graph forecasts long-term capital requirements. The annual capital requirement represents the average amount per year that the Township should allocate towards funding rehabilitation and replacement needs.



The projected cost of lifecycle activities that will need to be undertaken over the next 10 years to maintain the current level of service can be found in Appendix A.

4.1.44 Risk & Criticality

Risk Matrix

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 2020 inventory data. See Appendix C for the criteria used to determine the risk rating of each asset.

This risk matrix is based on a high-level model developed for the purposes of this AMP and Municipal staff should review and adjust the risk model to reflect the availability of asset data as well as an evolving understanding of both the probability and consequences of asset failure.

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

4.1.45 Levels of Service

Fleet is considered a non-core asset category. As such, the Township has until July 1, 2024 to determine the qualitative descriptions and technical metrics that measure the current level of service provided.

5 Analysis of Rate-funded Assets

Key Insights

- Rate-funded assets are valued at $13 million
- 99% of rate-funded assets are in fair or better condition
- The average annual capital requirement to sustain the current level of service for rate-funded assets is approximately $0.3 million
- Critical assets should be evaluated to determine appropriate risk mitigation activities and treatment options
- Township conducted a water and wastewater rate study in 2021 which formed the basis for the financial plan required under O. Reg. 453/07
- Discrepancies in the capital forecasts between the Township's asset inventory and the financial plans differ due to the source of the asset inventory and the information used in for the financial plans

Water System

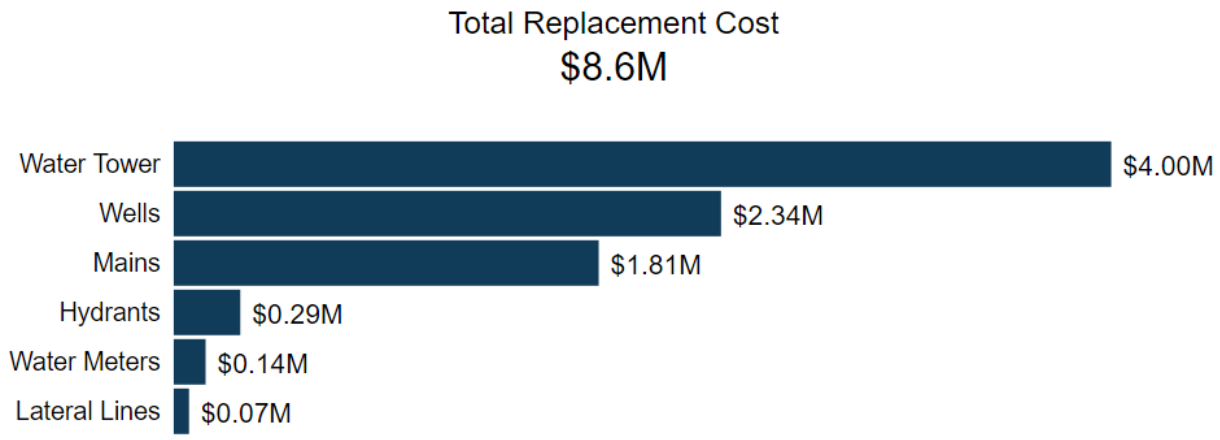
Water in the Lansdowne's water system is drawn from two groundwater production wells. The Township is responsible for water distribution to the end users, consumer metering, and billing. The management of the water system is coordinated between the Ontario Water Clean Agency (OCWA) and the Township's Operations and Infrastructure Department.

Asset data from GIS data sources and the Township's financial software was gathered and consolidated into the Township's current asset inventory as a starting point to develop a centralized water system asset inventory.

5.1.1 Asset Inventory & Replacement Cost

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

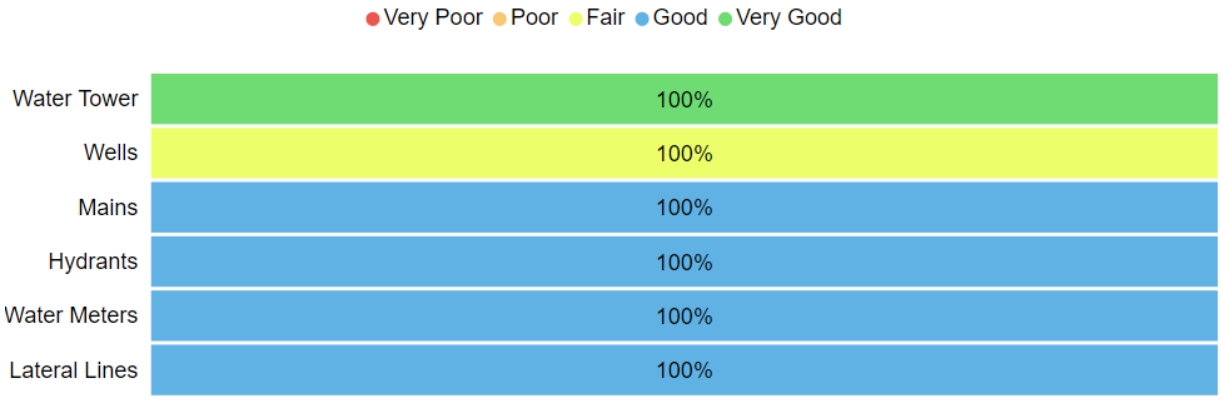
Asset Segment	Quantity	Replacement Cost Method	Total Replacement Cost
Hydrants	38	Cost per unit	$285,000
Lateral Lines	0.22 km	Cost per unit	$66,228
Mains	5.3 km	Cost per unit	$1,813,867
Water Meters	274	Cost per unit	$137,000
Water Tower	2	User-Defined	$4,000,000
Wells	2	User-Defined	$2,335,585
			$8,637,680



5.1.2 Asset Condition

The table below identifies the current average condition and source of available condition data for each asset segment. The Average Condition (%) is a weighted value based on replacement cost.

Asset Segment	Average Condition (%)	Average Condition Rating	Condition Source
Hydrants	77%	Good	Age-based
Lateral Lines	66%	Good	Age-based
Mains	77%	Good	Age-based
Water Meters	71%	Good	Age-based
Water Tower	98%	Very Good	Age-based
Wells	41%	Fair	Age-based
	77%	**Good**	



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

Current Approach to Condition Assessment

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

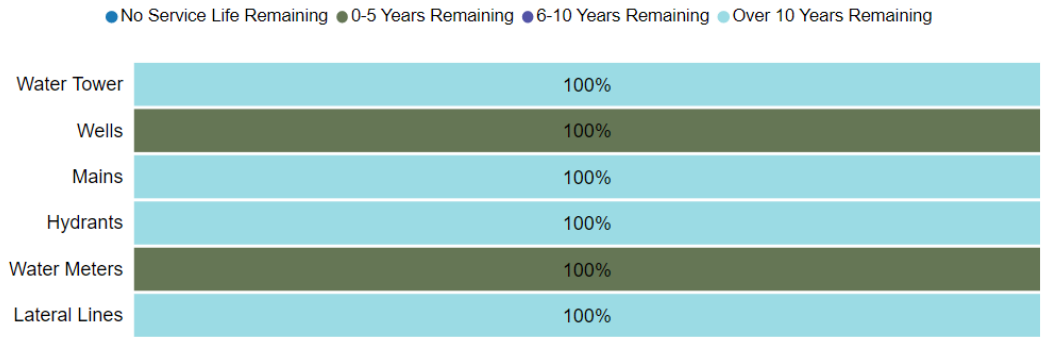
- Staff primarily rely on the age and material of water mains to determine the projected condition of water mains

- While the age-based condition of the water meters is considered good, Staff have identified a significant portion of water meters that are not operating properly. A replacement program is in place to address the malfunctioning water meters. Going forward, Staff are also working on incorporating the assessed condition data of water meters, gathered through and based on actual operations of the water meters, into the asset management program in order to generate a more accurate condition.
- Aside from the inspections required under O. Reg. 170/3 and multi-year forecasts from OCWA, there are no formal condition assessment programs in place in for the water system

5.1.3 Estimated Useful Life & Average Age

The Estimated Useful Life for Water System assets has been assigned according to a combination of established industry standards and staff knowledge. The Average Age of each asset is based on the number of years each asset has been in-service. Finally, the Average Service Life Remaining represents the difference between the Estimated Useful Life and the Average Age, except when an asset has been assigned an assessed condition rating. Assessed condition may increase or decrease the average service life remaining.

Asset Segment	Estimated Useful Life (Years)	Average Age (Years)	Average Service Life Remaining (Years)
Hydrants	60	45.0	15.0
Lateral Lines	70	45.0	25.0
Mains	70	45.0	25.0
Water Meters	15	10.5	4.5
Water Tower	40	9.5	30.5
Wells	50	45.5	4.5
		24.4	**12.0**



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

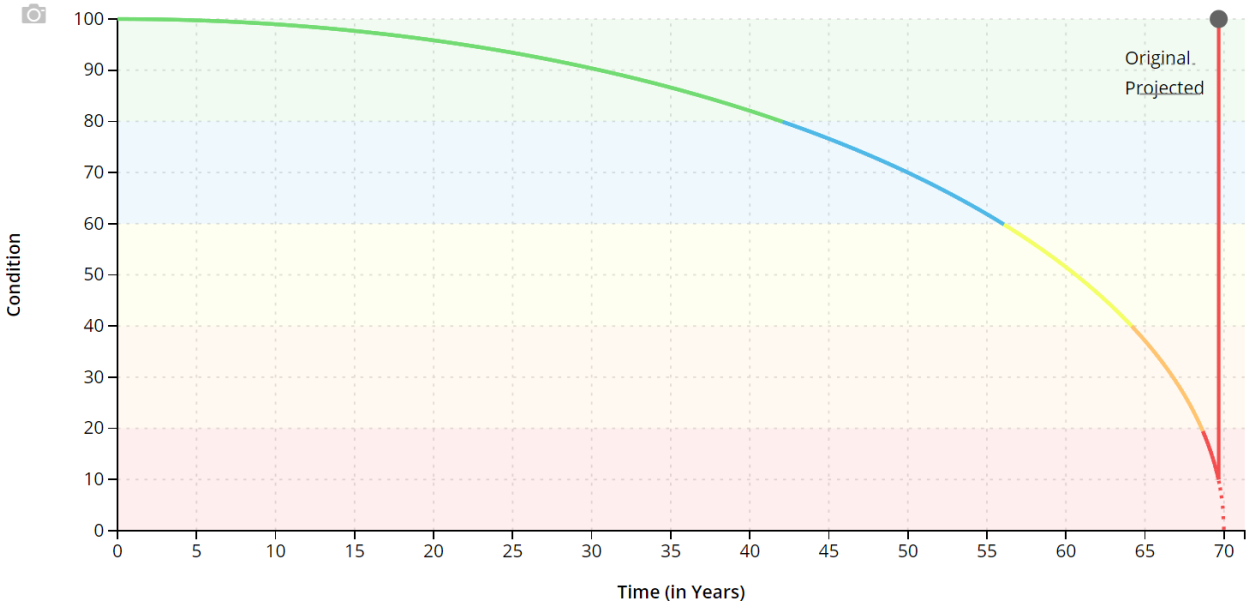
5.1.4 Lifecycle Management Strategy

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

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

Activity Type	Description of Current Strategy
Maintenance	Annual maintenance program includes: • valve exercising • water main flushing • hydrant inspections • air relief valve and chamber inspections
Rehabilitation/ Replacement	Multi-year capital forecasts are provided by OCWA and further reviewed by municipal staff
	Replacement activities are identified based on an analysis of the main break rate as well as any issues identified during regular maintenance activities
	Reconstruction efforts have focused on older watermains and rely on an age-based assessment of current condition
	Similar to other sub-surface infrastructure staff attempt to coordinate water reconstruction projects with road reconstruction projects to produce cost efficiencies

Water Mains		
Event Name	**Event Class**	**Event Trigger**
Valve Exercising	Preventative Maintenance	Annual
Watermain Flushing	Preventative Maintenance	Annual
Hydrant Inspections	Preventative Maintenance	Annual
Air relief valve and chamber inspections	Preventative Maintenance	Annual
Full Reconstruction	Replacement	At 20 Condition

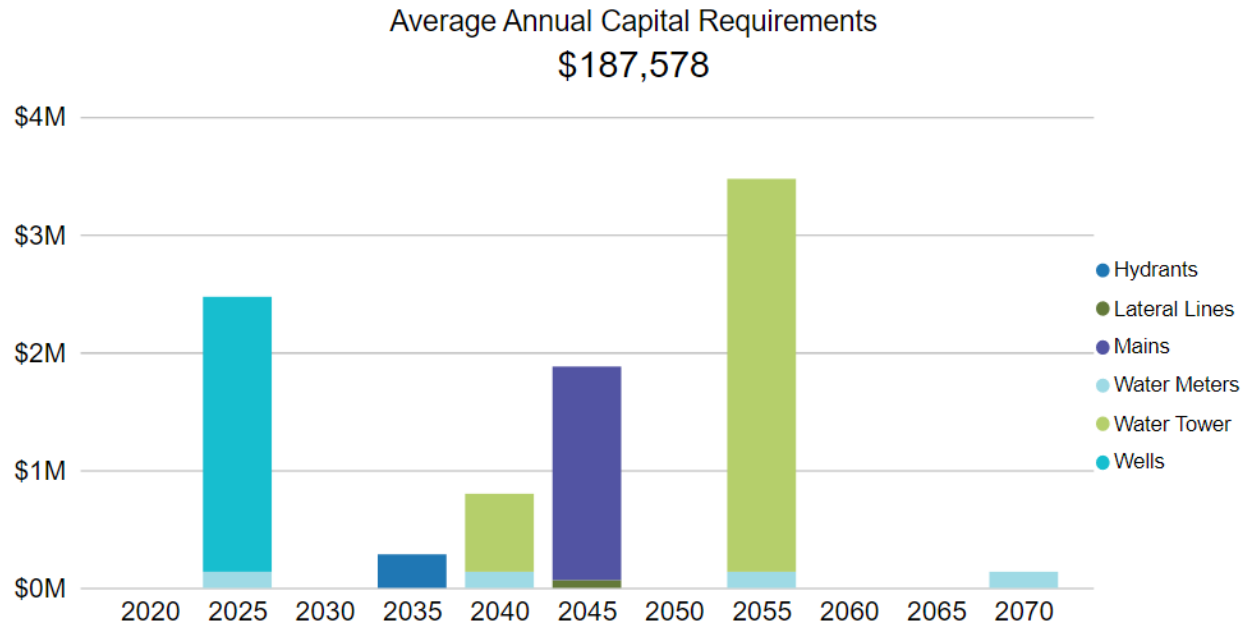


Forecasted Capital Requirements

The following graphics forecast the short and long-term capital requirements for the Water System but are produced from two different sources.

The graph is generated based on the Township's CityWide asset inventory, and also outlines the annual capital requirement which represents the average amount per year that the Township should allocate towards funding rehabilitation and replacement needs.

The projected cost of lifecycle activities that will need to be undertaken over the next 10 years to maintain the current level of service can be found in Appendix A.



The table below has been produced as part of the Water and Wastewater Rate Study and the Financial Plan and includes capital expenditures for the next 5 years.

Capital Expenditures	2020	2021	2022	2023	2024	2025
Replace Flow Meters	$0	$0	$0	$11,000	$0	-
Replace Well Pump#1 and Camera Inspection of Well	$15,000	$0	$0	$0	$0	-
Replace Well Pump#2 and Camera Inspection of Well	$0	$0	$0	$0	$17,000	-
Water Meter Replacement Program	$0	$17,000	$18,000	$18,000	$0	-
Total	**$15,000**	**$17,000**	**$18,000**	**$29,000**	**$17,000**	**-**

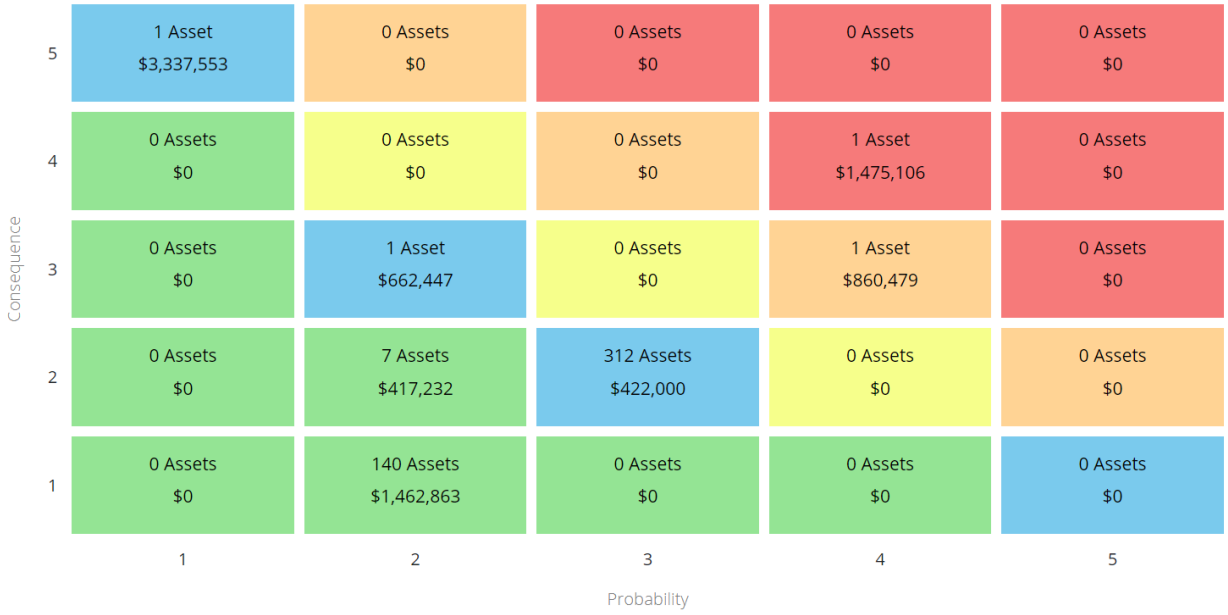
The capital costs will typically differ between these two graphics since a capital plan resulting from individual asset needs will be different than the capital plan resulting from a project-based approach. Furthermore, the current water system inventory originates from the Township's tangible capital asset inventory, as a result it is pooled and finance-based, ultimately affecting the capital forecasts that are generated.

As Staff work towards consolidating asset data and refining the structure within the Township's centralized asset inventory, they will be able to run various risk and lifecycle strategies and generate accurate short- and long-term forecasts that will help them prioritize assets for rehabilitation and/or replacement effectively. This enhancement to the level of detail and accuracy of the inventory will allow for individual projects such as replacing flow meters and well pumps to be identified and captured in the AMP.

5.1.5 Risk & Criticality

Risk Matrix

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 2020 inventory data. See Appendix C for the criteria used to determine the risk rating of each asset.



This risk matrix is based on an advanced risk model for linear water assets and a high-level risk model for all other water assets that were developed for the purposes of this AMP. Municipal staff should review and adjust the risk models to reflect the availability of asset data as well as an evolving understanding of both the probability and consequences of asset failure.

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

5.1.6 Levels of Service

The following tables identify the Township's current level of service for Water System. These metrics include the technical and community level of service metrics that are required as part of O. Reg. 588/17 as well as any additional performance measures that the Township has selected for this AMP.

Community Levels of Service

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

Service Attribute	Qualitative Description	Current LOS (2020)
Scope	Description, which may include maps, of the user groups or areas of the municipality that are connected to the municipal water system	The current water system is limited to the village of Lansdowne. All households and businesses within this village are connected to the system. This distribution system has one standpipe located approximately 150 meters from the water treatment plant with a storage capacity of approximately 2,700 m^3.
	Description, which may include maps, of the user groups or areas of the municipality that have fire flow	The standpipe provides for peak hour demands and fire flows.
Reliability	Description of boil water advisories and service interruptions	The Township experienced no boil water advisories or service interruptions in 2020. However, water service interruptions may occur due to main breaks, maintenance activities or reconstruction projects. Staff attend to these interruptions in a timely manner, when possible.

Technical Levels of Service

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

Service Attribute	Technical Metric	Current LOS (2020)
Scope	% of properties connected to the municipal water system	100%
	% of properties where fire flow is available	0%
Reliability	# of connection-days per year where a boil water advisory notice is in place compared to the total number of properties connected to the municipal water system	0
	# of connection-days per year where water is not available due to water main breaks compared to the total number of properties connected to the municipal water system	0
Performance	Capital re-investment rate	0.87%

5.1.7 Recommendations

Asset Inventory

- Continue to refine the asset inventory to ensure all relevant asset types are included.
- Review and revise replacement costs and critical asset attribute data on a regular basis.

Condition Assessment Strategies

- Identify condition assessment strategies for high value and high-risk water assets and expand this to a comprehensive condition assessment program for all water assets so that, where achievable, Staff can use assessed condition data.

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 Township has established in this AMP. 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.

Sanitary Sewer System

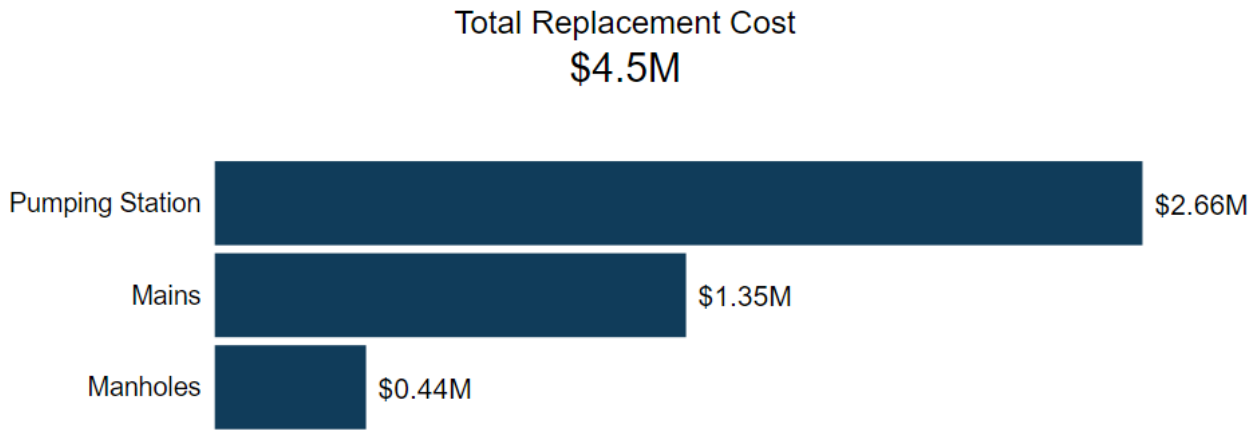
The Township is responsible for sanitary collection, storage and treatment. The management of the sanitary sewer system is coordinated between the Ontario Water Clean Agency (OCWA) and the Township's Operations and Infrastructure Department.

Asset data from GIS data sources was gathered and consolidated into the Township's current asset inventory as a starting point to develop a centralized sanitary sewer asset inventory for the Township.

5.1.8 Asset Inventory & Replacement Cost

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

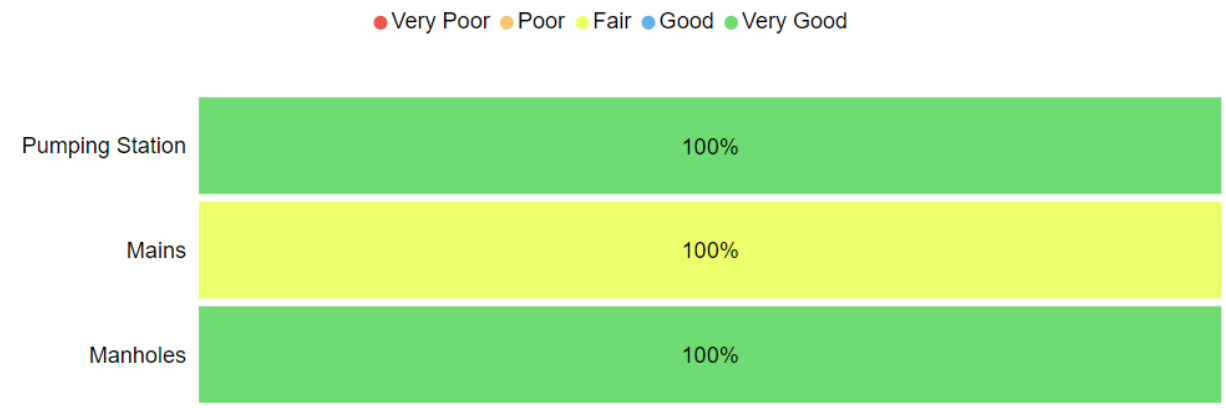
Asset Segment	Quantity	Replacement Cost Method	Total Replacement Cost
Mains	4.7 km	Cost per unit	$1,353,591
Manholes	58	Cost per unit	$435,000
Pumping Station	1	User-Defined	$2,663,800
			$4,452,391



5.1.9 Asset Condition

The table below identifies the current average condition and source of available condition data for each asset segment. The Average Condition (%) is a weighted value based on replacement cost.

Asset Segment	Average Condition (%)	Average Condition Rating	Condition Source
Mains	44%	Fair	Age-based
Manholes	83%	Very Good	Age-based
Pumping Station	90%	Very Good	Age-based
	75%	**Good**	



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

Current Approach to Condition Assessment

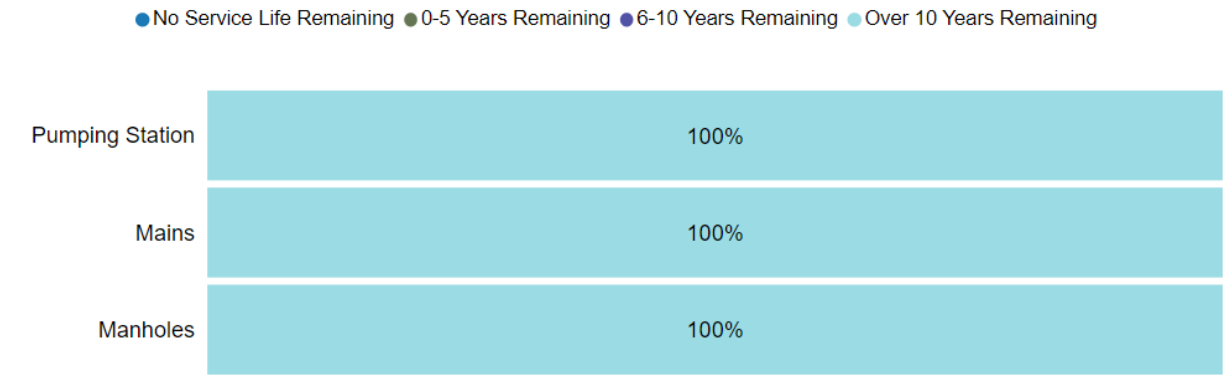
Accurate and reliable condition data allows staff to more confidently determine the remaining service life of assets and identify the most cost-effective approach to managing assets. The following describes the municipality's current approach:

- Camera/CCTV inspections are completed for on a regular cycle for sanitary sewer assets.
- Manholes and pumping station assets are inspected annually
- Mains are flushed and inspected annually

5.1.10 Estimated Useful Life & Average Age

The Estimated Useful Life for Sanitary Sewer System assets has been assigned according to a combination of established industry standards and staff knowledge. The Average Age of each asset is based on the number of years each asset has been in-service. Finally, the Average Service Life Remaining represents the difference between the Estimated Useful Life and the Average Age, except when an asset has been assigned an assessed condition rating. Assessed condition may increase or decrease the average service life remaining.

Asset Segment	Estimated Useful Life (Years)	Average Age (Years)	Average Service Life Remaining (Years)
Mains	80	45.0	35.0
Manholes	80	45.0	35.0
Pumping Station	40	17.2	22.8
		44.8	**34.9**



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

5.1.11 Lifecycle Management Strategy

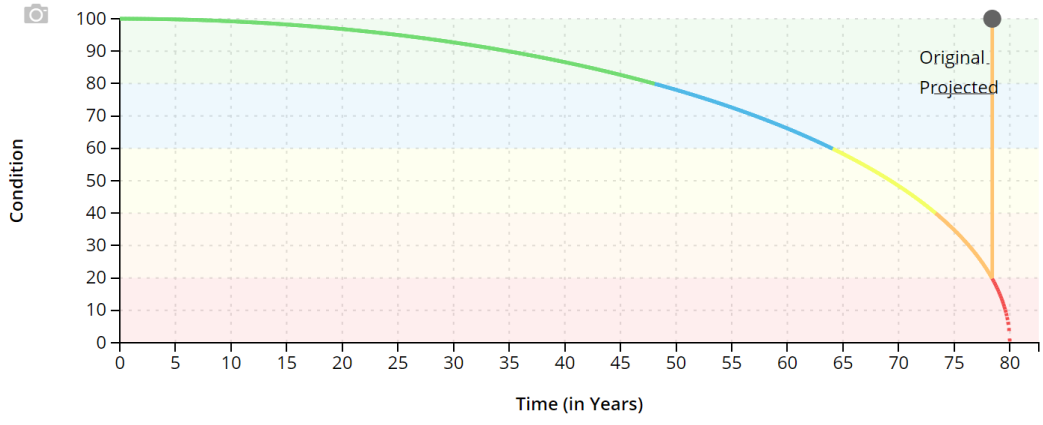
The condition or performance of most assets will deteriorate over time. To ensure that municipal assets are performing as expected and meeting the needs of customers, it is important to establish a lifecycle management strategy to proactively manage asset deterioration.

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

Activity Type	Description of Current Strategy
Maintenance	Annual maintenance program includes: • Manhole inspection, lining and grouting • Sanitary main flushing, rodding and inspections
Rehabilitation/ Replacement	Multi-year capital forecasts are provided by OCWA and further reviewed by municipal staff
	Unless there is structural failure, sanitary mains are typically left until replacement is required
	Similar to other sub-surface infrastructure staff attempt to coordinate water reconstruction projects with road reconstruction projects to produce cost efficiencies

Sanitary Mains

Event Name	Event Class	Event Trigger
Manhole inspection, lining and grouting	Preventative Maintenance	Annual
Sewermain flushing, rodding, and inspections	Preventative Maintenance	Annual
Full Reconstruction	Replacement	At 20 Condition

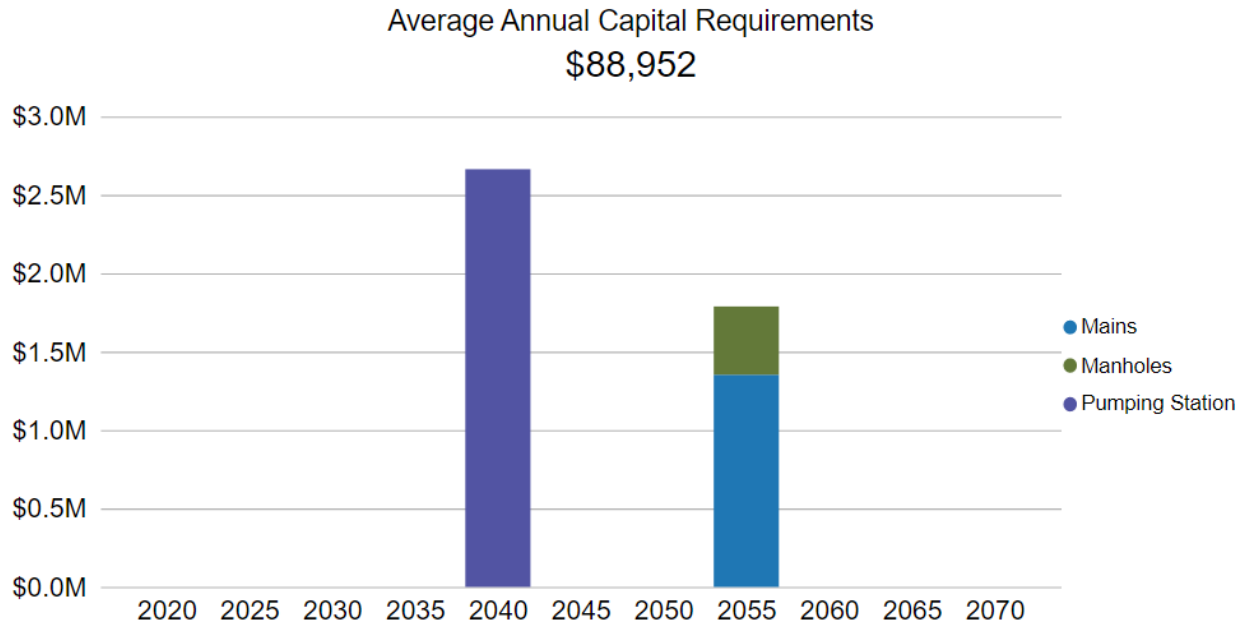


Forecasted Capital Requirements

The following graphics forecast the short and long-term capital requirements for the Sanitary Sewer but are produced from two different sources.

The graph is generated based on the Township's CityWide asset inventory, and also outlines the annual capital requirement which represents the average amount per year that the Township should allocate towards funding rehabilitation and replacement needs.

The projected cost of lifecycle activities that will need to be undertaken over the next 10 years to maintain the current level of service can be found in Appendix A.



The table below has been produced as part of the Water and Wastewater Rate Study and the Financial Plan and includes capital expenditures for the next 5 years.

Capital Expenditures	2020	2021	2022	2023	2024	2025
Build Shed at SPS	$0	$10,000	$0	$0	-	-
Submersible Pump #1 Rebuild/Replace	$15,000	$0	$0	$0	-	-
Submersible Pump #2 Rebuild/Replace	$0	$0	$21,000	$0	-	-
Water Meter Replacement Program	$0	$17,000	$18,000	$18,000	-	-
Total	**$15,000**	**$27,000**	**$39,000**	**$18,000**	**-**	**-**

The capital costs will typically differ between these two graphics since a capital plan resulting from individual asset needs will be different than the capital plan resulting from a project-based approach. Furthermore, the current sanitary sewer system inventory originates from the Township's tangible capital asset inventory, as a result it is pooled and finance-based, and ultimately affects the capital forecasts that are generated.

As Staff work towards consolidating asset data into and refining the structure within the Township's centralized asset inventory, they will be able to run various risk and lifecycle strategies and generate accurate short- and long-term forecasts that will help them prioritize assets for rehabilitation and/or replacement effectively. This enhancement to the level of detail and accuracy of the inventory will allow for individual projects to be identified and captured in the AMP.

5.1.12 Risk & Criticality

Risk Matrix

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 2020 inventory data. See Appendix C for the criteria used to determine the risk rating of each asset.

This risk matrix is based on an advanced risk model for linear sanitary assets and a high-level risk model for all other assets that were developed for the purposes of this AMP. Municipal staff should review and adjust the risk models to reflect the availability of asset data as well as an evolving understanding of both the probability and consequences of asset failure.

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

5.1.13 Levels of Service

The following tables identify the Township's current level of service for Sanitary Sewer System. These metrics include the technical and community level of service metrics that are required as part of O. Reg. 588/17 as well as any additional performance measures that the Township has selected for this AMP.

Community Levels of Service

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

Service Attribute	Qualitative Description	Current LOS (2020)
Scope	Description, which may include maps, of the user groups or areas of the municipality that are connected to the municipal wastewater system	The current sanitary sewer system is limited to the village of Lansdowne. All households and businesses within this village are connected to the 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	The Township does not own any combined sewers
	Description of the frequency and volume of overflows in combined sewers in the municipal wastewater system that occur in habitable areas or beaches	
	Description of how stormwater can get into sanitary sewers in the municipal wastewater system, causing sewage to overflow into streets or backup into homes	Stormwater can enter into sanitary sewers due to cracks in sanitary mains or through indirect connections (e.g., weeping tiles). In the case of heavy rainfall events, sanitary sewers may experience a volume of water and sewage that exceeds its designed capacity. In some cases, this can cause water and/or sewage to overflow backup into homes. the disconnection of weeping tiles from sanitary mains and the use of sump pumps and pits directing storm water

Service Attribute	Qualitative Description	Current LOS (2020)
		to the storm drain system can help to reduce the chance of this occurring.
	Description of how sanitary sewers in the municipal wastewater system are designed to be resilient to stormwater infiltration	The municipality 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.
	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 System.

Service Attribute	Technical Metric	Current LOS (2020)
Scope	% of properties connected to the municipal wastewater system	100%
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	22%
	# of connection-days per year having wastewater backups compared to the total number of properties connected to the municipal wastewater system	0
	# of effluent violations per year due to wastewater discharge compared to the total number of properties connected to the municipal wastewater system	0
Performance	Capital re-investment rate	1.80%

5.1.14 Recommendations

Asset Inventory

- Continue to refine the asset inventory to ensure all relevant asset types are included.
- Review and revise replacement costs and critical attribute data on a regular basis.

Condition Assessment Strategies

- Identify condition assessment strategies for high value and high-risk sanitary assets and expand this to a comprehensive condition assessment program for all sanitary assets so that, where achievable, Staff can use assessed condition data.

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.

Lifecycle Management Strategies

- A trenchless re-lining strategy is expected to extend the service life of sanitary mains at a lower total cost of ownership and should be implemented to extend the life of infrastructure at the lowest total cost of ownership.
- Evaluate the efficacy of the Township's lifecycle management strategies at regular intervals to determine the impact cost, condition and risk.

Levels of Service

- Continue to measure current levels of service in accordance with the metrics that the Township has established in this AMP. 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.

6 Impacts of Growth

Key Insights

- Understanding the key drivers of growth and demand will allow the Township to more effectively plan for new infrastructure, and the upgrade or disposal of existing infrastructure

- Moderate population and employment growth is expected

- The costs of growth should be considered in long-term funding strategies that are designed to maintain the current level of service

Description of Growth Assumptions

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

6.1.1 Township's Official Plan (September 2018)

The Township of Leeds and the Thousand Islands Official Plan is consistent with the 2014 Provincial Policy Statement, conforms to the United Counties of Leeds and Grenville Official Plan, incorporates new legislation and addresses matters of provincial interest. The Official Plan will balance development with the wider interests and objectives of the township and the upper-tier municipality of the United Counties of Leeds and Grenville. The Official Plan is intended to guide the future development of the Township to the year 2031.

The Official Plan was adopted by Township Council on September 10th, 2018 and the United Counties of Leeds and Grenville on November 22, 2018.

As per the plan objectives, growth and development shall be focused and encouraged within the settlement areas to strengthen their role as local industrial, commercial, residential, social, and cultural centres for the Township, as well as to enhance their function in providing services and facilities that cater to tourists.

This plan includes the growth forecasts in terms of population, occupied housing units and employment for which the Township will be required to provide services.

The following table outlines the population and employment forecasts allocated to Leeds and Thousand Islands.

Year	Population	Housing Units	Employment
2011	9,505	3,700	1,860
2021	9,770	3,900	1,960
2031	9,990	4,100	1,840

Impact of Growth on Lifecycle Activities

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

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

7 Financial Strategy

Key Insights

- The Township is committing approximately $2.18 million towards capital projects per year from sustainable revenue sources
- Given the annual capital requirement of $3.99 million there is currently a funding gap of $1.81 million annually
- For tax-funded assets, we recommend increasing tax revenues by 1.1% each year for the next 15 years to achieve a sustainable level of funding
- For the Water System, we recommend increasing rate revenues by 1.9% annually for the next 20 years to achieve a sustainable level of funding
- For the Sanitary Sewer System, we recommend increasing rate revenues by 0.7% annually for the next 5 years to achieve a sustainable level of funding

Financial Strategy Overview

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

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

1. The financial requirements for:
    a. Existing assets (based on the Township's central asset inventory)
    b. Existing service levels
    c. Requirements of contemplated changes in service levels (none identified for this plan)
    d. Requirements of anticipated growth (none identified for this plan)
2. Use of traditional sources of municipal funds:
    a. Tax levies
    b. User fees
    c. Reserves
    d. Debt
3. Use of non-traditional sources of municipal funds:
    a. Reallocated budgets
    b. Partnerships
    c. Procurement methods
4. Use of Senior Government Funds:
    a. Gas tax
    b. Annual grants

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

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

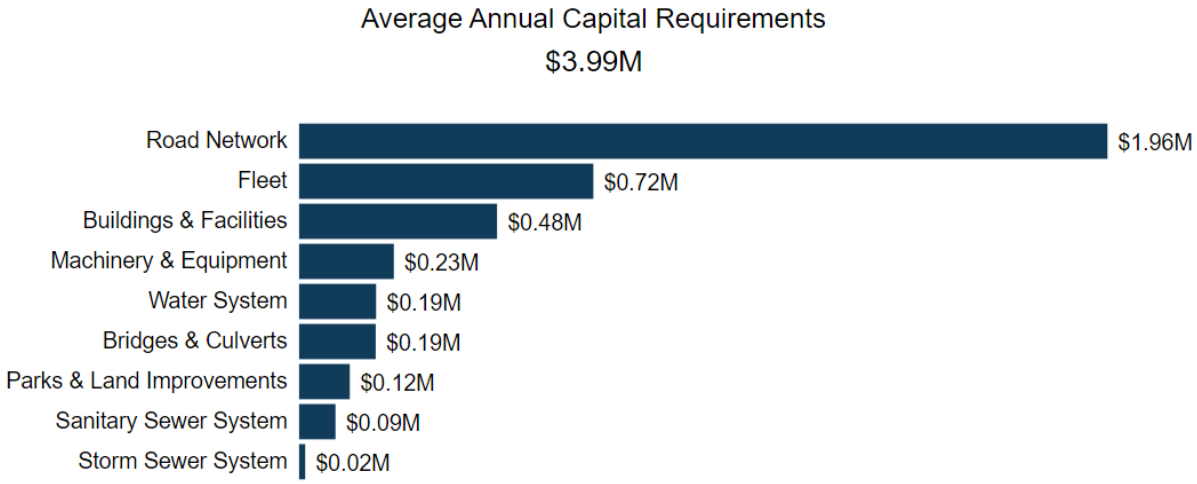
1. In order to reduce financial requirements, consideration has been given to revising service levels downward.

2. All asset management and financial strategies have been considered. For example:
    a. If a zero-debt policy is in place, is it warranted? If not, the use of debt should be considered.
    b. Do user fees reflect the cost of the applicable service? If not, increased user fees should be considered.

7.1.1 Annual Requirements & Capital Funding

Annual Requirements

The annual requirements represent the amount the Township should allocate annually to each asset category to meet replacement needs as they arise, prevent infrastructure backlogs and achieve long-term sustainability. In total, the Township must allocate approximately $3.99 million annually to address capital requirements for the assets included in this AMP.



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

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

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

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

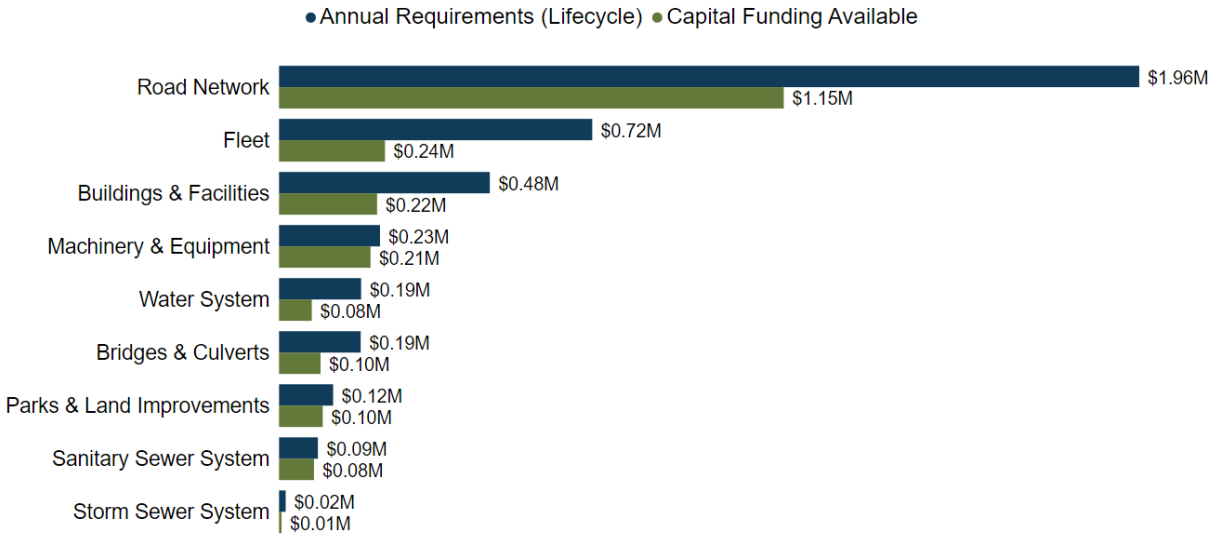
Asset Category	Annual Requirements (Replacement Only)	Annual Requirements (Lifecycle Strategy)	Difference
Road Network	$3,362,000	$1,963,000	$1,598,000

The implementation of a proactive lifecycle strategy for roads leads to a potential annual cost avoidance of $1,598,000. This represents an overall reduction of the annual requirements for the Road Network category by 49%.

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

Annual Funding Available

Based on a historical analysis of sustainable capital funding sources, the Township is committing approximately $2.18 million towards capital projects per year from sustainable revenue sources. Given the annual capital requirement of $3.99 million, there is currently a funding gap of $1.81 million annually.



Funding Objective

We have developed a scenario that would enable the Township to achieve full funding within 10 to 20 years for the following assets:

a) **Tax Funded Assets:** Road Network, Storm Sewer System, Bridges & Culverts, Buildings & Facilities, Machinery & Equipment, Parks & Land Improvements, Fleet
b) **Rate-Funded Assets:** Water System, Sanitary Sewer System

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

Financial Profile: Tax Funded Assets

7.1.2 Current Funding Position

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

Asset Category	Avg. Annual Requirement	Annual Funding Available				Annual Deficit
		Taxes	Gas Tax	OCIF	Total Available	
Bridges & Culverts	$187,000	$69,000	$26,000	$0	$95,000	$92,000
Buildings & Facilities	$481,000	$224,000	$0	$0	$224,000	$257,000
Fleet	$715,000	$242,000	$0	$0	$242,000	$473,000
Machinery & Equipment	$231,000	$209,000	$0	$0	$209,000	$22,000
Parks & Land Improvements	$124,000	$100,000	$0	$0	$100,000	$24,000
Road Network	$1,963,000	$725,000	$274,000	$153,000	$1,152,000	$811,000
Storm Sewer System	$15,000	$6,000	$0	$0	$6,000	$9,000
	$3,717,000	**$1,575,000**	**$300,000**	**$153,000**	**$2,028,000**	**$1,688,000**

The average annual CapEx requirement for the above categories is $3.7 million. Based on the 2021 budget, annual revenue currently allocated to these assets for capital purposes is $2.0 million leaving an annual deficit of $1.7 million. Put differently, these infrastructure categories are currently funded at 54.6% of their long-term requirements.

7.1.3 Full Funding Requirements

In 2020, Township of Leeds and the Thousand Islands had annual tax revenues of $9.953 million. As illustrated in the following table, without consideration of any other sources of revenue or cost containment strategies, full funding would require the following tax change over time:

Asset Category	Tax Change Required for Full Funding
Bridges & Culverts	0.9%
Buildings & Facilities	2.6%
Fleet	4.8%
Machinery & Equipment	0.2%
Parks & Land Improvements	0.2%
Road Network	8.1%
Storm Sewer System	0.1%
	16.9%

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

a) Leeds and the Thousand Islands debt payments for these asset categories will be decreasing by $67,000 over the next 15 years.

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

	Without Capturing Changes				With Capturing Changes			
	5 Years	**10 Years**	**15 Years**	**20 Years**	**5 Years**	**10 Years**	**15 Years**	**20 Years**
Infrastructure Deficit	1,688,000	1,688,000	1,688,000	1,688,000	1,688,000	1,688,000	1,688,000	1,688,000
Change in Debt Costs	N/A	N/A	N/A	N/A	0	0	-67,000	-67,000
Change in OCIF Grants	N/A	N/A	N/A	N/A				
Resulting Infrastructure Deficit	**1,688,000**	**1,688,000**	**1,688,000**	**1,688,000**	**1,688,000**	**1,688,000**	**1,621,000**	**1,621,000**
Tax Increase Required	17.0%	17.0%	17.0%	17.0%	17.0%	17.0%	16.3%	16.3%
Annually	**3.4%**	**1.7%**	**1.1%**	**0.9%**	**3.4%**	**1.7%**	**1.1%**	**0.8%**

7.1.4 Financial Strategy Recommendations

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

a) when realized, reallocating the debt cost reductions to the infrastructure deficit as outlined above.
b) increasing tax revenue by 1.1% each year for the next 15 years solely for the purpose of phasing in full funding to the asset categories covered in this section of the AMP.
c) allocating the current gas tax and OCIF revenue as outlined previously.
d) allocating the scheduled OCIF grant increases to the infrastructure deficit as they occur.
e) reallocating appropriate revenue from categories in a surplus position to those in a deficit position.
f) increasing existing and future infrastructure budgets by the applicable inflation index on an annual basis in addition to the deficit phase-in.

Notes:

1. As in the past, periodic senior government infrastructure funding will most likely be available during the phase-in period. By Provincial AMP rules, this periodic funding cannot be incorporated into an AMP unless there are firm commitments in place. We have included OCIF formula-based funding, if applicable since this funding is a multi-year commitment[3].
2. We realize that raising tax revenues by the amounts recommended above for infrastructure purposes will be very difficult to do. However, considering a longer phase-in window may have even greater consequences in terms of infrastructure failure.

Although this option achieves full CapEx funding on an annual basis in 15 years and provides financial sustainability over the period modeled, the recommendations do require prioritizing capital projects to fit the resulting annual funding available. Current data shows a pent-up investment demand of $1,900,600 for Buildings & Facilities and $523,002 for Fleet.

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

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

Financial Profile: Rate Funded Assets

7.1.5 Current Funding Position

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

Asset Category	Avg. Annual Requirement	Annual Funding Available				Annual Deficit
		Rates	Gas Tax	OCIF	Total Available	
Water System	$186,000	75,000	$0	$0	$75,000	$111,000
Santiary Sewer System	$89,000	80,000	$0	$0	$80,000	$9,000
	$275,000	**$155,000**	**$0**	**$0**	**$155,00**	**$120,000**

The average annual investment requirement for the above categories is $11.6 million. Annual revenue currently allocated to these assets for capital purposes is $4.8 million leaving an annual deficit of $6.8 million. Put differently, these infrastructure categories are currently funded at 42% of their long-term requirements.

7.1.6 Full Funding Requirements

The Township's average annual sanitary sewer revenues are $276,000[4] and average annual water revenues are $295,000[5]. As illustrated in the table below, without consideration of any other sources of revenue, full funding would require the following changes over time:

Asset Category	Rate Change Required for Full Funding
Water System	37.6%
Santiary Sewer System	3.3%

[4] Annual sanitary sewer rate revenues - average of 264k in 2019, 276k in 2020, and 289k budgeted for 2021.

[5] Annual water revenues - average of 282k in 2019, 295k in 2020, and 309k budgeted for 2021.

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

	Water System				Sanitary Sewer System			
	5 Years	**10 Years**	**15 Years**	**20 Years**	**5 Years**	**10 Years**	**15 Years**	**20 Years**
Infrastructure Deficit	111,000	111,000	111,000	111,000	9,000	9,000	9,000	9,000
Rate Increase Required	37.6%	37.6%	37.6%	37.6%	3.3%	3.3%	3.3%	3.3%
Annually:	**7.5%**	**3.8%**	**2.5%**	**1.9%**	**0.7%**	**0.3%**	**0.2%**	**0.2%**

7.1.7 Financial Strategy Recommendations

Considering the above information, we recommend the 20-year option for the Water System, and the 5-year option for the Sanitary Sewer System. This involves full CapEx funding being achieved over 20 years by:

a) increasing rate revenues by 1.9% for the Water System each year for the next 20 years and 0.7% for the Sanitary Sewer System each year for the next 5 years
b) These rate revenue increases are solely for the purpose of phasing in full funding to the respective asset categories covered in this AMP.
c) increasing existing and future infrastructure budgets by the applicable inflation index on an annual basis in addition to the deficit phase-in.

Notes:

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

Although this strategy achieves full CapEx funding for rate-funded assets over 20 years, the recommendation does require prioritizing capital projects to fit the annual funding available.

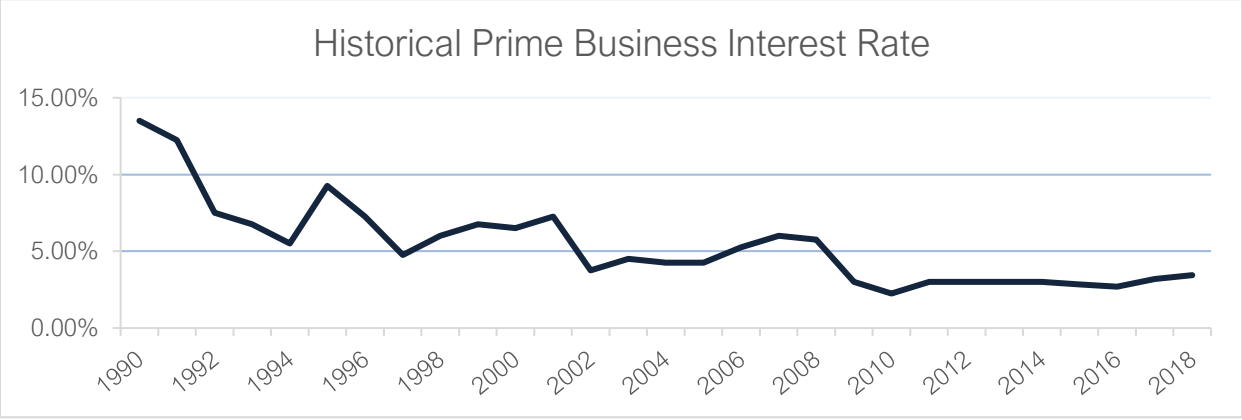
Prioritizing future projects will require the current data to be replaced by condition-based data. Although our recommendations include no further use of debt, the results of the condition-based analysis may require otherwise.

Use of Debt

For reference purposes, the following table outlines the premium paid on a project if financed by debt. For example, a $1M project financed at 3.0%[6] over 15 years would result in a 26% premium or $260,000 of increased costs due to interest payments. For simplicity, the table does not consider the time value of money or the effect of inflation on delayed projects.

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

It should be noted that current interest rates are near all-time lows. Sustainable funding models that include debt need to incorporate the risk of rising interest rates. The following graph shows where historical lending rates have been:



[6] Current municipal Infrastructure Ontario rates for 15-year money is 3.2%.

A change in 15-year rates from 3% to 6% would change the premium from 26% to 54%. Such a change would have a significant impact on a financial plan.

The following tables outline how the Township has historically used debt for investing in the asset categories as listed. There is currently $635,000 of debt outstanding for the assets covered by this AMP with corresponding principal and interest payments of $67,000, well within its provincially prescribed maximum of $3,008,000.

Asset Category	Current Debt Outstanding	Use of Debt in the Last Five Years				
		2016	2017	2018	2019	2020
Road Network	$0	$0	$0	$0	$0	$0
Storm Sewer System	$0	$0	$0	$0	$0	$0
Bridges & Culverts	$0	$0	$0	$0	$0	$0
Buildings & Facilities	$635,000	$0	$0	$0	$0	$0
Machinery & Equipment	$0	$0	$0	$0	$0	$0
Parks & Land Improvements	$0	$0	$0	$0	$0	$0
Fleet	$0	$0	$0	$0	$0	$0
Total Tax Funded:	**$635,000**	**$0**	**$0**	**$0**	**$0**	**$0**
Water System	$0	$0	$0	$0	$0	$0
Sanitary Sewer System	$0	$0	$0	$0	$0	$0
Total Rate Funded:	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**

Asset Category	Principal & Interest Payments in the Next Ten Years						
	2020	2021	2022	2023	2024	2025	2030
Road Network	$0	$0	$0	$0	$0	$0	$0
Storm Sewer System	$0	$0	$0	$0	$0	$0	$0
Bridges & Culverts	$0	$0	$0	$0	$0	$0	$0
Buildings & Facilities	$67,000	$67,000	$67,000	$67,000	$67,000	$67,000	$67,000
Machinery & Equipment	$0	$0	$0	$0	$0	$0	$0
Parks & Land Improvements	$0	$0	$0	$0	$0	$0	$0
Fleet	$0	$0	$0	$0	$0	$0	$0
Total Tax Funded:	**$67,000**	**$67,000**	**$67,000**	**$67,000**	**$67,000**	**$67,000**	**$67,000**
Water System	$0	$0	$0	$0	$0	$0	$0
Sanitary Sewer System	$0	$0	$0	$0	$0	$0	$0
Total Rate Funded:	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**

The revenue options outlined in this plan allow Leeds and the Thousand Islands to fully fund its long-term infrastructure requirements without further use of debt.

Use of Reserves

7.1.8 Available Reserves

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

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

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

Asset Category	Balance on December 31, 2020
Bridges & Culverts	$189,000
Buildings & Facilities	$664,000
Fleet	$372,000
Machinery & Equipment	$385,000
Parks & Land Improvements	$562,000
Road Network	$1,988,000
Storm Sewer System	$15,000
Total Tax Funded:	**$4,175,000**
Water System	$446,000
Sanitary Sewer System	$412,000
Total Rate Funded:	**$858,000**

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

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

These reserves are available for use by applicable asset categories during the phase-in period to full funding. This coupled with the Township's judicious use of debt in the past, allows the

scenarios to assume that, if required, available reserves and debt capacity can be used for high priority and emergency infrastructure investments in the short- to medium-term.

7.1.9 Recommendation

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

8 Appendices

Key Insights

- Appendix A identifies projected 10-year capital requirements for each asset category
- Appendix B includes images that have been used to visualize the current levels of service
- Appendix C identifies the criteria used to calculate risk for each asset category
- Appendix D provides additional guidance on the development of a condition assessment program

Appendix A: 10-Year Capital Requirements

The following tables identify the capital cost requirements for each of the next 10 years in order to meet projected capital requirements and maintain the current level of service.

Road Network											
Asset Segment	Backlog	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
HCB Roads	$0	$292,000	$1,029,000	$112,500	$321,000	$2,800,800	$2,368,000	$1,124,500	$525,000	$3,330,000	$4,874,000
LCB Roads	$0	$195,000	$210,000	$828,000	$171,900	$742,500	$195,000	$210,000	$828,000	$171,900	$742,500
Roadside Appurtenances	$0	$0	$0	$0	$0	$0	$0	$0	$0	$124,070	$0
Streetlights	$0	$0	$0	$0	$54,278	$0	$41,026	$0	$0	$79,145	$0
	$0	**$487,000**	**$1,239,000**	**$940,500**	**$547,178**	**$3,543,300**	**$2,604,026**	**$1,334,500**	**$1,353,000**	**$3,705,115**	**$5,616,500**

Bridges & Culverts											
Asset Segment	Backlog	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
Bridges	$0	$0	$49,000	$170,000	$82,230	$810,230	$88,350	$533,470	$157,000	$0	$0
Structural Culverts	$0	$623,210	$43,460	$427,310	$0	$0	$0	$0	$123,980	$515,780	$0
	$0	**$623,210**	**$92,460**	**$597,310**	**$82,230**	**$810,230**	**$88,350**	**$533,470**	**$280,980**	**$515,780**	**$0**

Storm Sewer System											
Asset Segment	Backlog	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
Storm Mains	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Storm Manholes	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Catch Basins	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
	$0	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**

Buildings & Facilities											
Asset Segment	Backlog	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
Fire Stations	$1,900,600	$0	$0	$93,077	$0	$0	$0	$0	$0	$0	$0
Historical & Cultural	$0	$0	$0	$0	$0	$0	$0	$0	$0	$870,100	$0
Libraries	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Recreational	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Storage & Garage	$0	$0	$0	$873,345	$0	$0	$1,085,800	$0	$0	$0	$0
	$1,900,600	**$0**	**$0**	**$966,422**	**$0**	**$0**	**$1,085,800**	**$0**	**$0**	**$870,100**	**$0**

Parks & Land Improvements											
Asset Segment	Backlog	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
Docks & Piers	$0	$200,000	$1,000,000	$21,519	$0	$0	$0	$0	$0	$108,400	$0
Playground Equipment	$150,000	$0	$0	$0	$0	$225,000	$0	$0	$0	$0	$0
Site Works	$0	$0	$0	$39,007	$0	$50,000	$0	$0	$74,684	$44,867	$0
Splashpad	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Trails	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
	$150,000	**$200,000**	**$1,000,000**	**$60,526**	**$0**	**$275,000**	**$0**	**$0**	**$74,684**	**$153,267**	**$0**

Machinery & Equipment											
Asset Segment	Backlog	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
Fire & Emergency	$94,578	$0	$25,000	$28,019	$396,165	$10,985	$27,335	$436,058	$186,742	$183,238	$79,272
Furniture & Fixtures	$0	$0	$20,822	$57,971	$9,721	$0	$0	$0	$0	$199,119	$0
Information Technology	$0	$4,000	$11,700	$37,650	$21,430	$106,122	$13,500	$37,650	$21,430	$4,900	$112,922
Public Works	$0	$0	$31,353	$28,461	$23,058	$142,064	$0	$10,609	$10,000	$60,786	$40,759
	$94,578	**$4,000**	**$88,875**	**$152,101**	**$450,374**	**$259,171**	**$40,835**	**$484,317**	**$218,172**	**$448,043**	**$232,953**

Fleet											
Asset Segment	Backlog	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
Administrative	$0	$0	$0	$68,320	$0	$36,020	$0	$0	$0	$0	$68,320
Fire & Emergency	$492,638	$0	$700,027	$542,839	$429,824	$383,711	$767,420	$0	$401,729	$62,038	$111,531
Public Works	$137,120	$138,291	$321,787	$90,999	$45,627	$390,529	$1,068,855	$698,665	$87,120	$597,754	$652,809
	$629,758	**$138,291**	**$1,021,814**	**$702,158**	**$475,451**	**$810,260**	**$1,836,275**	**$698,665**	**$488,849**	**$659,792**	**$832,660**

Water System											
Asset Segment	Backlog	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
Hydrants	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Lateral Lines	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Mains	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Water Meter	$0	$0	$0	$0	$0	$137,000	$0	$0	$0	$0	$0
Water Tower	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Wells	$0	$0	$0	$0	$0	$2,335,585	$0	$0	$0	$0	$0
	$0	**$0**	**$0**	**$0**	**$0**	**$2,472,585**	**$0**	**$0**	**$0**	**$0**	**$0**

Sanitary Sewer System											
Asset Segment	Backlog	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
Mains	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Manholes	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Pumping Station	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
	$0	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**

All Asset Categories											
Asset Segment	Backlog	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
Road Network	$0	$487,000	$1,239,000	$940,500	$547,178	$3,543,300	$2,604,026	$1,334,500	$1,353,000	$3,705,115	$5,616,500
Bridges & Culverts	$0	$623,210	$92,460	$597,310	$82,230	$810,230	$88,350	$533,470	$280,980	$515,780	$0
Stormwater System	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Buildings & Facilities	$1,900,600	$0	$0	$966,422	$0	$0	$1,085,800	$0	$0	$870,100	$0
Parks & Land Improvements	$150,000	$200,000	$1,000,000	$60,526	$0	$275,000	$0	$0	$74,684	$153,267	$0
Machinery & Equipment	$94,578	$4,000	$88,875	$152,101	$450,374	$259,171	$40,835	$484,317	$218,172	$448,043	$232,953
Fleet	$629,758	$138,291	$1,021,814	$702,158	$475,451	$810,260	$1,836,275	$698,665	$488,849	$659,792	$832,660
Water System	$0	$0	$0	$0	$0	$2,472,585	$0	$0	$0	$0	$0
Sanitary Sewer System	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
	$2,774,936	**$1,452,501**	**$3,442,149**	**$3,419,017**	**$1,555,233**	**$8,170,546**	**$5,655,286**	**$3,050,952**	**$2,415,685**	**$6,352,097**	**$6,682,113**

Appendix B: Level of Service Images

Images of Bridge in Very Good Condition

LTI14 – Mountain Street Bridge
Inspected: October 10th, 2019

North Elevation

South Elevation

Riprap on Embankment Spacing Between Two Culvert Barrels

Culvert Barrel Polymeric Coating Condition; Evidence of Minor Scratch

Structure is generally in excellent condition. Minor construction defects as identified in this benchmark OSIM inspection report, as well as severe erosion along the upstream riverbank, are expected to be fixed under the new construction warranty.

Images of Culvert in Good Condition

LTI13 – Blue Mountain Rd Culvert
Inspected: October 10th, 2019

Culvert Anchor Bolts; Evidence of Minor to Medium Rust Due to Lack of Grout

West Elevation

Inlet Component

East Elevation

Structure is in an overall good condition. The exposed gap between precast segments and exposed anchor bolts should be covered with grout to increase durability. Roadway safety measure (guiderails and hazard signs) are recommended to be installed on approaches.

Images of Bridge in Fair Condition

LTI2 – Black Rapids Rd. Bridge
Inspected: October 10th, 2019

Steel Flex Beam Condition;
Evidence of Locolized Dent

North Elevation

Bridge Railing Wood Post

South Elevation

Evidence of severe erosion along all four (4) embankments and apparent movement of timber planks riding surface despite recent bridge construction. Local residents stood by during inspection and raised their safety concerns.

Images of Bridge in Poor Condition

LTI11 – Kidd Rd North (North Bridge)
Inspected: October 9th, 2019

Culvert Barrel; Evidence of Wide Crack and Medium to Severe Erosion

East Elevation

NW Embankment; Evidence of Severe Erosion

West Elevation

Structure is in overall poor condition, evidencing wide crack, spall, separation between wall and top slab and potential foundation issues.

Appendix C: Risk Rating Criteria

Probability of Failure

Asset Category	Risk Criteria	Criteria Weighting	Value/Range	Probability of Failure Score
Road Network (Roads)	Condition	75%	85-100	1
			70-84	2
			55-69	3
			40-54	4
			0-39	5
	Service Life Remaining %	20%	80-100	1
			60-79	2
			40-59	3
			20-39	4
			0-19	5
	Base Defect	5%	Yes	2
			No	4
Bridges & Culverts	Condition	75	80-100	1
			70-79	2
			60-69	3
			50-59	4
			0-49	5
	Service Life Remaining %	25	80-100	1
			60-79	2
			40-59	3
			20-39	4
			0-19	5
Storm Sewer System Water System (Other) Sanitary Sewer System Buildings & Facilities	Condition	100%	80-100	1
			60-79	2
			40-59	3
			20-39	4

Asset Category	Risk Criteria	Criteria Weighting	Value/Range	Probability of Failure Score
Machinery & Equipment Fleet Parks & Land Improvements			0-19	5
Sanitary Sewer System (Mains)	Condition	50%	80-100	1
			60-79	2
			40-59	3
			20-39	4
			0-19	5
	Service Life Remaining %	40%	80-100	1
			60-79	2
			40-59	3
			20-39	4
			0-19	5
	Pipe Material	10%	Concrete	4
			Ductile Iron	3
			PVC	2
Water System (Mains)	Condition	50%	80-100	1
			60-79	2
			40-59	3
			20-39	4
			0-19	5
	Service Life Remaining %	40%	80-100	1
			60-79	2
			40-59	3
			20-39	4
			0-19	5
	Pipe Material	10%	Ductile Iron	3
			PVC	2
Storm Sewer System (Mains)	Condition	50%	80-100	1

Asset Category	Risk Criteria	Criteria Weighting	Value/Range	Probability of Failure Score
			60-79	2
			40-59	3
			20-39	4
			0-19	5
	Service Life Remaining %	40%	80-100	1
			60-79	2
			40-59	3
			20-39	4
			0-19	5
	Pipe Material	10%	Concrete	4
			Ductile Iron	3
			PVC	2

Consequence of Failure

Asset Category	Risk Classification	Risk Criteria	Value/Range	Consequence of Failure Score
Road Network (Roads)	Economic (70%)	Replacement Cost (100%)	$0-$50,000	1
			$50,000-$150,000	2
			$150,000-$300,000	3
			$300,000-$500,000	4
			$500,000+	5
	Social (15%)	AADT (80%)	0-50	1
			51-200	2
			201-500	3
			501-1000	4
			1001-2000	5
		Roadside Environment (20%)	Rural	2
			Semi-Urban	3
			Urban	4
	Health & Safety (5%)	Speed Limit (100%)	0-40	1
			50	2
			70	4
			80	5
	Strategic (10%)	Asset Function Risk (100%)	Insignifcant	1
			Minor	2
			Moderate	3
			Major	4
			Severe	5
Bridges & Culverts	Economic (75%)	Replacement Cost (100%)	$0-$100,000	1
			$100,000-$250,000	2
			$250,000-$500,000	3
			$500,000-$1,000,000	4
			$1,000,000+	5
	Social (20%)	AADT (100%)	0-150	1
			151-300	2

Asset Category	Risk Classification	Risk Criteria	Value/Range	Consequence of Failure Score
			301-600	3
			601-1000	4
			1001-2000	5
	Strategic (5%)	Asset Function Risk (100%)	Insignifcant	1
			Minor	2
			Moderate	3
			Major	4
Buildings & Facilities Machinery & Equipment Fleet Parks & Land Improvements	Economic (90%)	Replacement Cost (100%)	$0-$50,000	1
			$50,000-$350,000	2
			$350,000-$1,000,000	3
			$1,000,000-$2,000,000	4
			$2,000,000+	5
	Strategic (10%)	Asset Function Risk (100%)	Insignifcant	1
			Minor	2
			Moderate	3
			Major	4
			Severe	5
Sanitary Sewer System (Mains)	Economic (75%)	Replacement Cost (100%)	$0-$50,000	1
			$50,000-$100,000	2
			$100,000-$150,000	3
			$150,000-$250,000	4
			$250,000+	5
	Strategic (5%)	Asset Function Risk (100%)	Insignifcant	1
			Minor	2
			Moderate	3
			Major	4
			Severe	5
	Operational (20%)	Pipe Diameter (100%)	0-50	1
			51-150	2
			151-250	3
			251-450	4
			451-1000	5

Asset Category	Risk Classification	Risk Criteria	Value/Range	Consequence of Failure Score
Water System (Mains)	Economic (75%)	Replacement Cost (100%)	$0-$50,000	1
			$50,000-$100,000	2
			$100,000-$150,000	3
			$150,000-$250,000	4
			$250,000+	5
	Operational (20%)	Pipe Diameter (100%)	0-50	1
			51-150	2
			151-250	3
			251-450	4
			451-1000	5
	Strategic (5%)	Asset Function Risk (100%)	Insignifcant	1
			Minor	2
			Moderate	3
			Major	4
			Severe	5
Storm Sewer System (Mains)	Economic (75%)	Replacement Cost (100%)	$0-$50,000	1
			$50,000-$100,000	2
			$100,000-$150,000	3
			$150,000-$250,000	4
			$250,000+	5
	Operational (20%)	Pipe Diameter (100%)	0-50	1
			51-150	2
			151-250	3
			251-450	4
			451-1000	5
			451-1000	5
	Strategic (5%)	Asset Function Risk (100%)	Insignifcant	1
			Minor	2
			Moderate	3
			Major	4
			Severe	5
Storm Sewer System	Economic	Replacement Cost	$0-$50,000	1

Asset Category	Risk Classification	Risk Criteria	Value/Range	Consequence of Failure Score
Water System Sanitary Sewer System	(90%)	(100%)	$50,000-$150,000	2
			$150,000-$250,000	3
			$250,000-$500,000	4
			$500,000+	5
	Strategic (10%)	Asset Function Risk (100%)	Insignifcant	1
			Minor	2
			Moderate	3
			Major	4
			Severe	5

Appendix D: Condition Assessment Guidelines

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

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

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

Role of Asset Condition Data

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

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

Guidelines for Condition Assessment

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

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

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

Developing a Condition Assessment Schedule

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

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