

Asset Management Plan

Township of Billings

2021



Township of
BILLINGS

This Asset Management Program was prepared by:



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

Key Statistics

Replacement cost of
asset portfolio

\$77.64 million

Replacement cost of
infrastructure per household

\$277,287 (2016)

Percentage of assets in fair or
better condition

61%

Percentage of assets with
assessed condition data

55%

Annual capital
infrastructure deficit

\$1.59 million

Recommended timeframe
for eliminating annual
infrastructure deficit

20 Years

Target reinvestment rate

2.49%

Actual reinvestment rate

0.44%

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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 include the following asset categories:

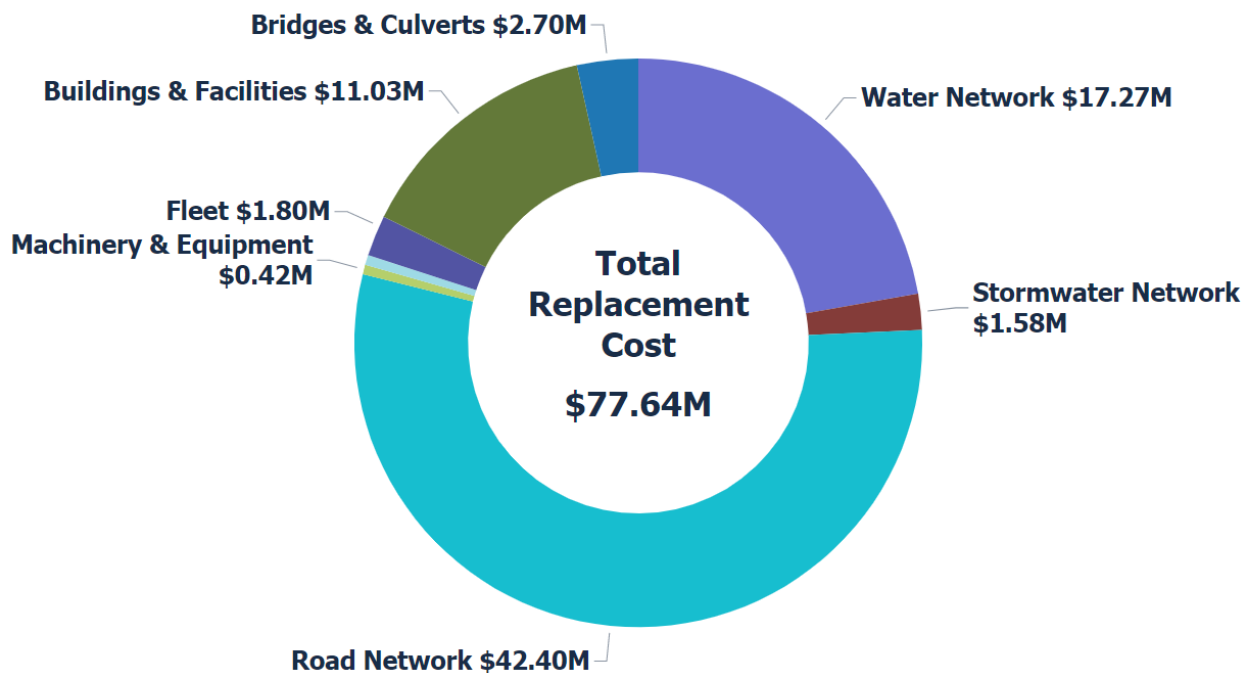
Asset Category

 Road Network	 Bridges & Culverts
 Stormwater Network	 Buildings & Facilities
 Machinery & Equipment	 Fleet
 Land Improvements	 Water Network

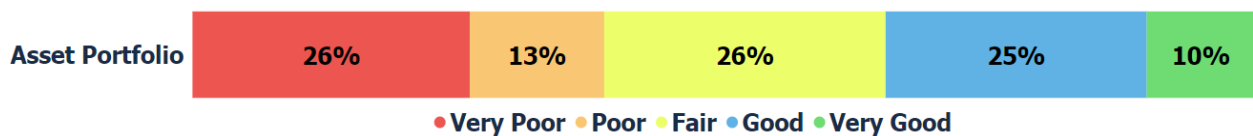
With the development of this AMP the Township of Billings has achieved compliance with O. Reg. 588/17 to the extent of the requirements that must be completed by July 1, 2022 and 2024. There are additional requirements concerning proposed levels of service and growth that must be met by July 1, 2025.

Findings

The overall replacement cost of the asset categories included in this AMP totals to \$77.64 million based on 2020 year-end asset information.



About 61% of all assets analysed in this AMP are in fair or better condition and assessed condition data was available for 55% of assets.



For the remaining assets, assessed condition data was unavailable and 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 accuracy and completeness of the asset inventory is another critical input to accurate asset management planning. It is important to review and update the primary asset inventory to ensure that it is at a higher level of data maturity for the next iteration of the AMP and that all assets have been accounted for.

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 (for roads, scheduled activities (for roads, bridges & culverts, buildings & facilities, and water network assets) and replacement only strategies (for 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 \$1.94 million. Based on a historical analysis of sustainable capital funding sources, the Township is committing approximately \$0.35 million towards capital projects or reserves per year. As a result, there is currently an annual capital requirements deficit of \$1.59 million.

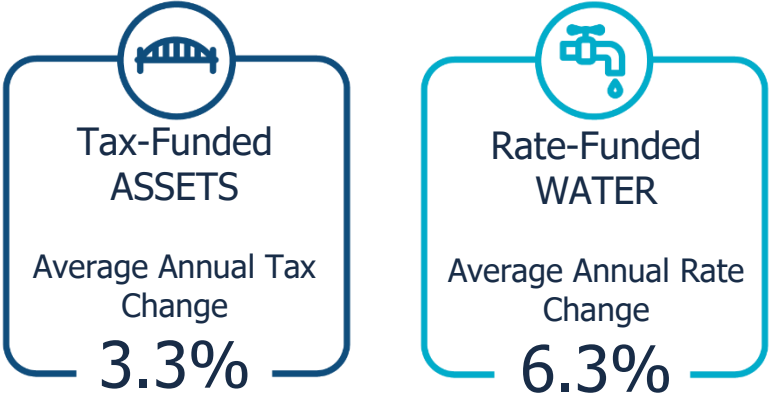
Annual Infrastructure Deficit Per Household



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.

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 20-year plan for Tax-Funded assets and a 20-year plan for Rate-Funded assets:



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

- Reviewing asset data to update and maintain a complete and accurate centralized asset inventory
- Implementing a data governance strategy to increase confidence and continue operationalizing the asset management program
- Developing a condition assessment strategy with a regular schedule
- Reviewing and updating lifecycle management strategies
- Developing and regularly reviewing short- and long-term plans to meet capital requirements
- Continuing to measure current levels of service and identify sustainable proposed levels of service

1 Introduction & Context

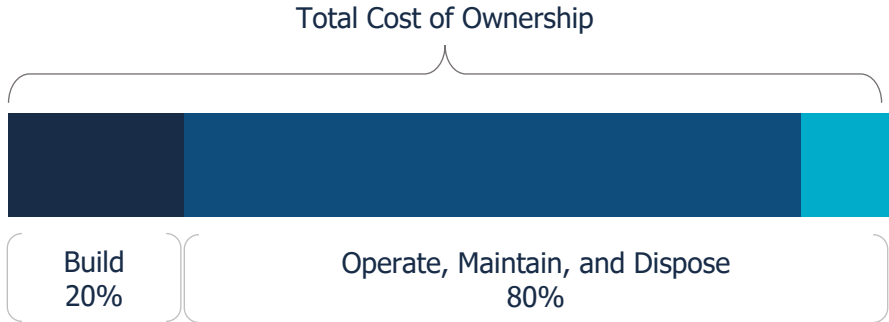
Key Insights

- 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
- A municipal asset management program is a combination of several disciplines or business functions, including management, financial and economic analyses, engineering and operations and maintenance
- 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 dynamic 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

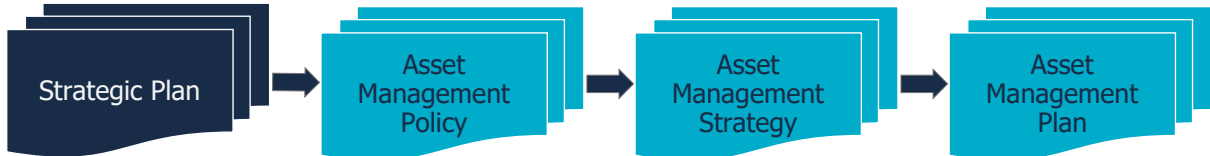
Municipalities are responsible for managing and maintaining a broad portfolio of infrastructure assets to deliver services to the community. The goal of asset management is to minimize the lifecycle costs of delivering infrastructure services, manage the associated risks, while maximizing the value ratepayers 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 fiscal responsibility is spread equitably across generations. An asset management plan is critical to this planning, and an essential element of broader asset management program.

The diagram below depicts an industry standard approach and sequence developing a practical asset management program. Beginning with a Strategic Plan, followed by an Asset Management Policy and an Asset Management Strategy, concluding with an Asset Management Plan.



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

1.1.1 Asset Management Policy

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

The Township of Billings adopted By-law No. 2019-24 “Asset Management Policy” on May 7th, 2019 in accordance with accordance with Ontario Regulation 588/17.

The stated objectives of the policy are to:

- Continue to develop and implement long-term roads maintenance and improvement.
- Continue to pursue rational, cost-effective, and efficient use of municipal property.
- Continue to improve/increase public use washroom facilities.
- Continue with the waterfront development as outlined in the Waterfront Master Plan Study and the project intent.
- Continue to improve municipal waste site efficiency including waste diversion and recycling.
- Continue to insure the most efficient and effective operations of the municipal water treatment and distribution system for the hamlet of Kagawong.
- Engage in joint municipal energy planning initiatives.
- Update our Asset management program with supporting long-term financial plan of major assets to guide the Township’s future growth.

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

- The policy’s principles dictate the use of asset management practices to ensure all assets meet the agreed levels of service in the most efficient and effective manner;
- the policy commits to, where appropriate, incorporating asset management in the Township’s other plans;
- there are formally defined roles and responsibilities of internal staff and stakeholders;
- the policy includes the use of a cost/benefit analysis as well as the acknowledgement of climate change in the management of risk; and
- the policy principles are well defined.

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

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

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

1.1.3 Asset Management Plan

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

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

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

The Township’s last iteration of the AMP was prepared in 2013 by DFA Infrastructure International Inc. Since then, the Township’s central asset inventory has undergone revisions and updates. This document is an AMP that uses the updated asset inventory and has been prepared in accordance with O. Reg. 588/17.

Key Concepts in Asset Management

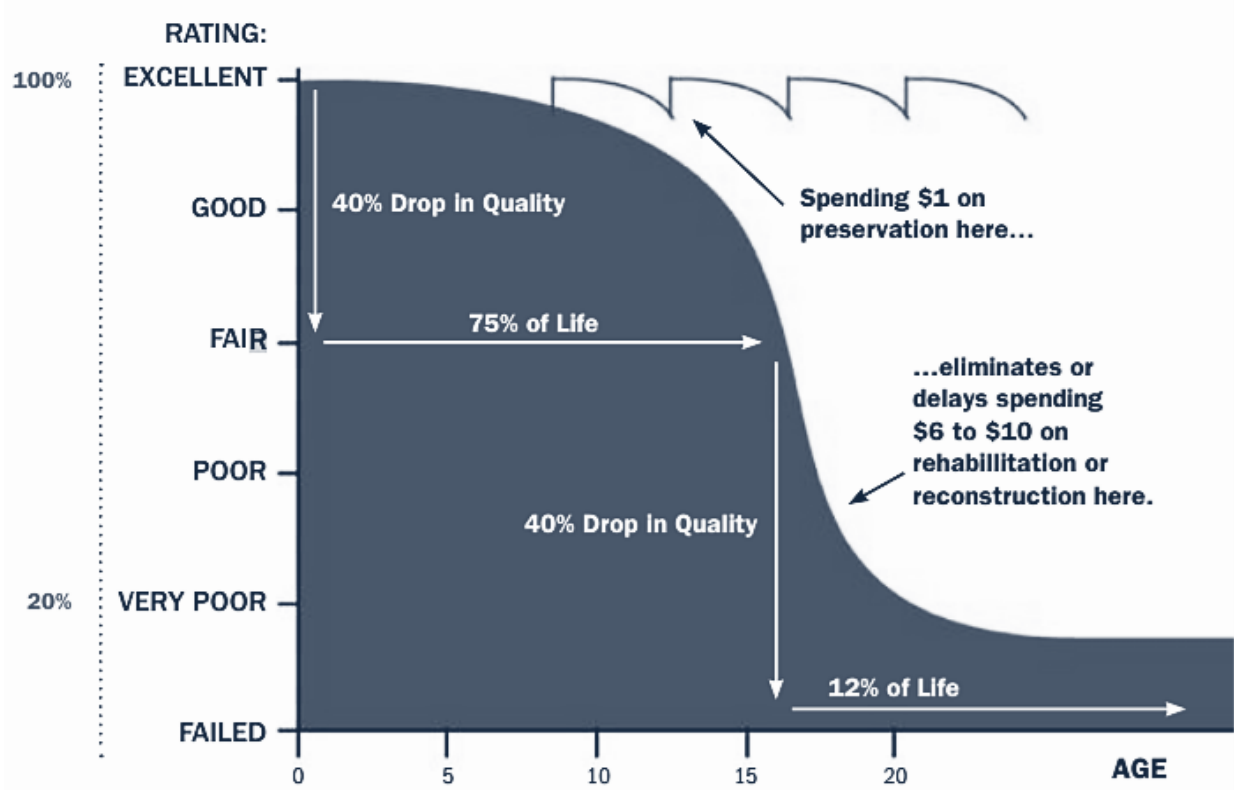
Effective asset management integrates several key components, including lifecycle management, risk management, and levels of service. These concepts are applied throughout this asset management plan and are described below in greater detail.

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 lifecycle costs.

This concept is further illustrated by the graphic below, 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
Preventative Maintenance	Activities that prevent defects or deteriorations from occurring	Crack Seal	\$
General Maintenance	Activities that focus on current defects or inhibit deterioration	Pothole Repairs	\$
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	\$\$\$
Replacement Upgrade	Asset end-of-life activities that involve the replacement of an asset to an 'upgraded' asset	Gravel Road to a Surface Treated Road	\$\$\$

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

The Township's approach to lifecycle management is described within each asset category outlined in this AMP. Developing and implementing proactive lifecycle strategies 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, Sanitary, Storm Water) 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 has defined the current qualitative descriptions that will be used to determine the community level of service 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 Township'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 has defined the current technical metrics that will be used to determine the technical level of service 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

2024

Asset Management Plan for Core and Non-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

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

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 and July 1, 2024. Next to each requirement a page or section reference is included in addition to any necessary commentary.

Appendix F provides an overall compliance overview that includes requirements for the 2025 deadline.

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
Current performance measures in each category	S.5(2), 2	4.1.6 - 5.2.6	Complete
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 B	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 8 asset categories and is divided between tax-funded and rate-funded categories
- Asset data from various data sources was consolidated into the Township's tangible capital asset inventory to establish it as the primary 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 Billings 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). The July 2024 deadline requires analysis of core and non-core assets.

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	
Buildings & Facilities	
Bridges & Culverts	
Fleet	Tax Levy
Stormwater Network	
Land Improvements	
Machinery & Equipment	
Water Network	User Rates

The Asset Inventory

The asset information presented in this AMP has been developed from the asset inventory in CityWide Asset Manager™. This inventory serves as the Township’s tangible capital asset inventory and has been consolidated with additional asset data from the data sources listed below.

Asset Category	Asset Data Source
Bridges & Culverts	2020 Bridge & Culvert Inspections report (OSIMs)
Road Network	Staff Expertise
	GIS Data
Water Network	Water System Financial Plan (2021 - 2027)
	GIS Data
Buildings & Facilities	2018 Building Inspection Report
Stormwater Network	GIS Data
Land Improvements	
Machinery & Equipment	Staff Expertise
Fleet	

The asset inventory was restructured through the establishment of an industry standard asset hierarchy, and critical asset fields were standardized. In addition to this, and where possible, duplicate data was removed and asset data gaps were addressed.

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. Using condition data and the asset’s SLR, the Township can more accurately forecast when it will require replacement. The SLR is calculated as follows:

$$\text{Service Life Remaining (SLR)} = \text{In Service Date} + \text{Estimated Useful Life (EUL)} - \text{Current Year}$$

Deriving Annual Capital Requirements

By dividing the replacement cost of an asset with the asset’s estimated useful life and factoring in the cost and impact of any lifecycle activities, the average annual capital requirements can be derived. The average annual requirement is calculated as follows:

$$\begin{aligned} \text{Annual Capital Requirement (Lifecycle Scenario)} &= \\ &= \frac{(\text{Replacement Cost} + \text{Cost of Lifecycle Activities})}{(\text{Estimated Useful Life (EUL)} + \text{Impact of Lifecycle Activities})} \end{aligned}$$

$$\text{Annual Capital Requirement (Replacement Only Scenario)} = \frac{\text{Replacement Cost}}{\text{Estimated Useful Life (EUL)}}$$

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:

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

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

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

The analysis in this AMP is based on assessed condition data only as available. In the absence of assessed condition data, asset age is used as a proxy to determine asset condition. Appendix E includes additional information on the role of asset condition data and provides basic guidelines for the development of a condition assessment program.

3

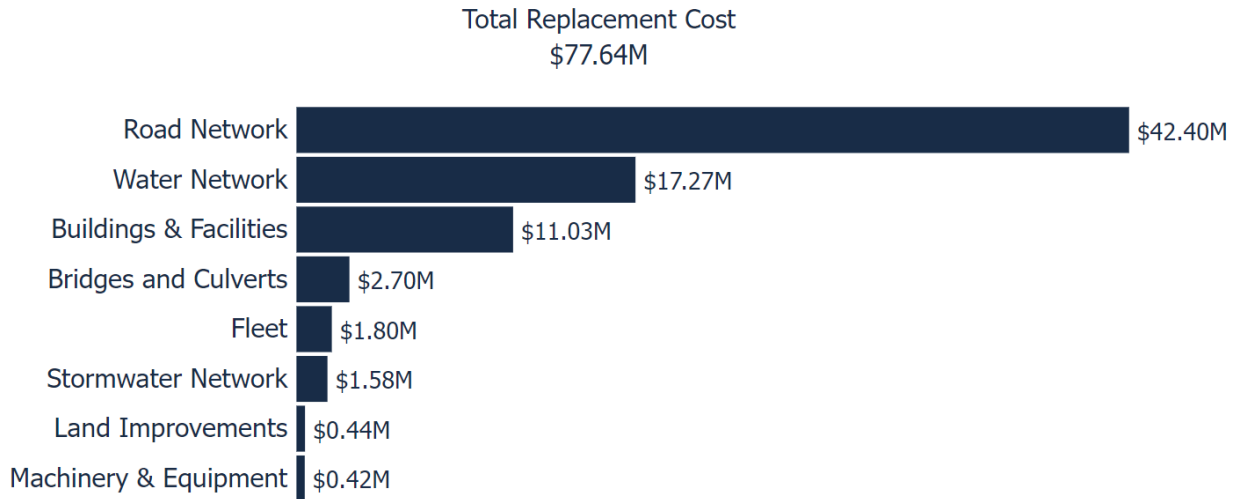
Portfolio Overview

Key Insights

- The total replacement cost of the Township's asset portfolio is \$77.64 million
- The Township's target re-investment rate is 2.49%, and the actual re-investment rate is 0.44%, contributing to an expanding infrastructure deficit
- 61% of all assets are in fair or better condition
- 31% of assets are projected to require replacement in the next 10 years
- Average annual capital requirements total \$1.94 million per year across all assets
- Annual capital funding by the Township totals \$0.35 million across all assets

Total Replacement Cost of Asset Portfolio

The asset categories analyzed in this AMP have a total replacement cost of \$77.64 million based on inventory data at the end of 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.

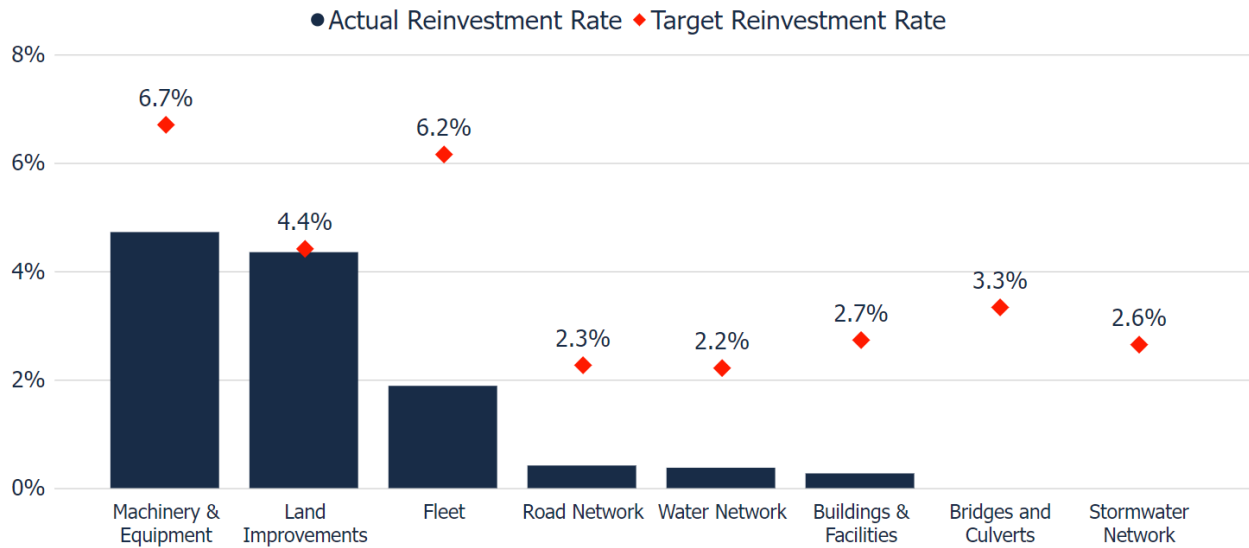


The table below identifies the replacement cost method and sources used throughout this AMP.

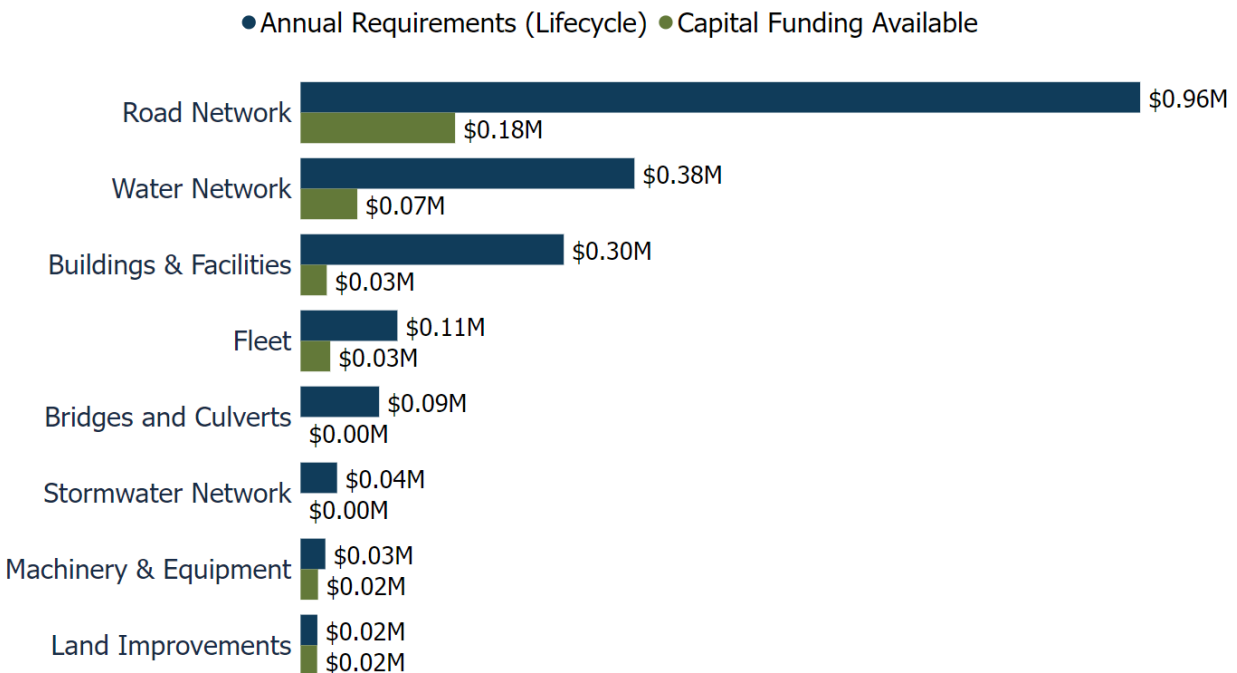
Asset Category	Replacement Cost Method		
	Unit Cost/User-Defined Cost	Historical Cost Inflation	Replacement Cost Source
Road Network	100%	0%	Municipal Staff
Water Network	61%	39%	Water System Financial Plan 2021 - 2027, Municipal Staff
Buildings & Facilities	27%	73%	2018 Building Inspection Report, Municipal Staff
Bridges & Culverts	100%	0%	Municipal Staff
Fleet	0%	100%	Historical Cost Inflation
Stormwater Network	61%	39%	Municipal Staff
Land Improvements	0%	100%	Historical Cost Inflation
Machinery & Equipment	0%	100%	Historical Cost Inflation
Overall	77%	23%	

Target vs. Actual Reinvestment Rate

The graph below depicts funding gaps or surpluses by comparing the target vs the actual reinvestment rate. To meet the long-term replacement needs, the Township should be allocating \$1.94 million annually, for a target reinvestment rate of 2.49%. Actual annual spending on infrastructure totals \$0.35 million, for an actual reinvestment rate of 0.44%.

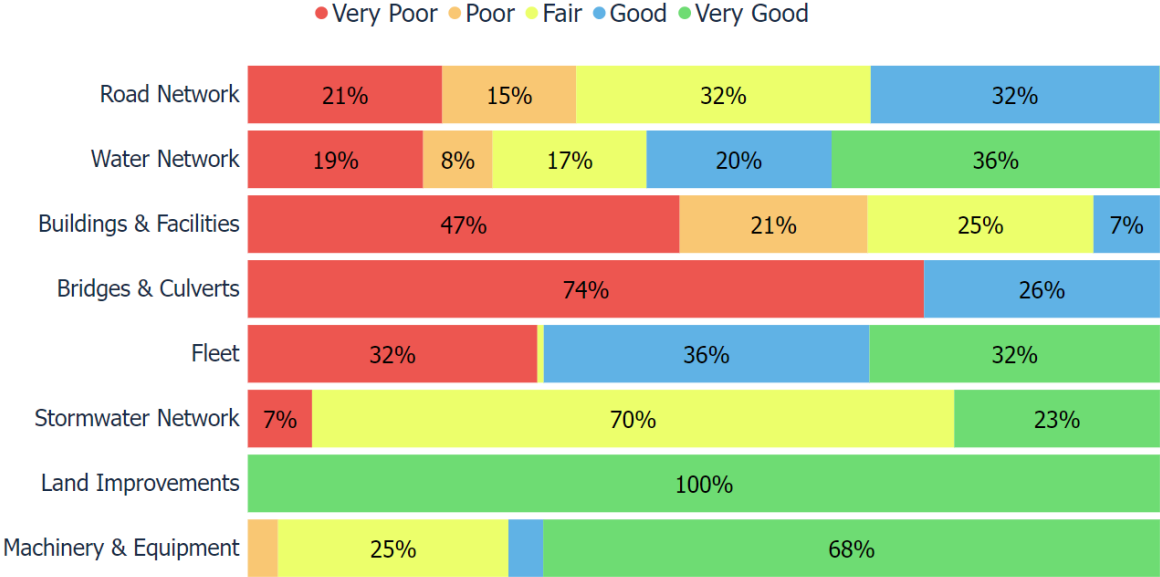


To highlight the monetary magnitude of the reinvestment rates, the graph below compares the capital annual requirements (target investment) versus the current level of service to the capital annual funding that is available (actual reinvestment). This comparison is examined in more detail under Section 7.1.1



Condition of Asset Portfolio

The current condition of the assets is central to all asset management planning. Collectively, 61% of assets in the Township are in fair or better condition. This estimate relies on both age-based and field condition data. It is also important to acknowledge that for certain larger assets such as facilities and park structures, having a componentized inventory will produce a more accurate condition and forecast, rather than just an asset.



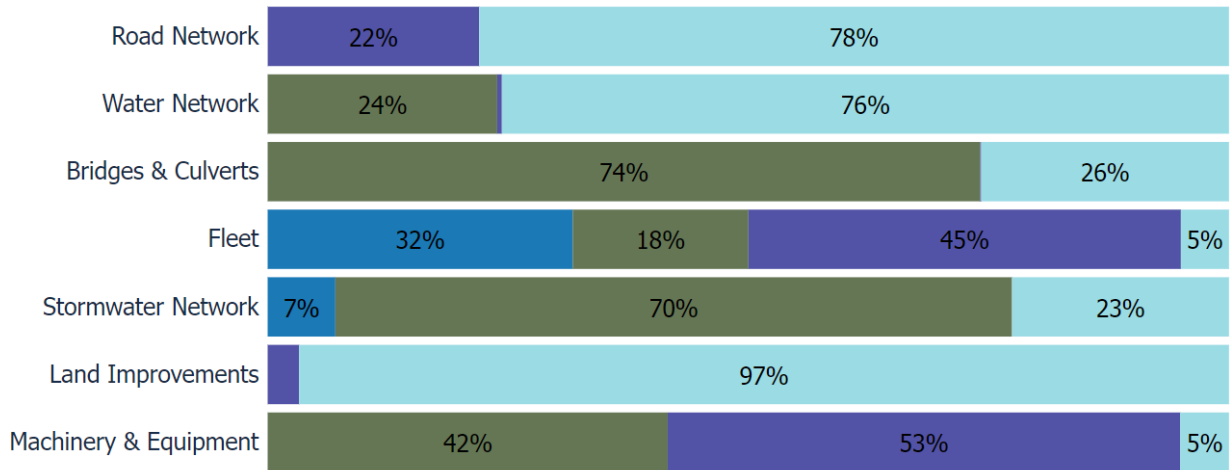
This AMP relies on assessed condition data for 55% of assets; for the remaining portfolio, age is used as an approximation of condition. Assessed condition data is invaluable in asset management planning as it reflects the true condition of the asset and its ability to perform its functions. The table below identifies the source of condition data used throughout this AMP.

Asset Category	% of Assets with Age-based Condition	% of Assets with Assessed Condition	Source of Condition Data
Road Network	59%	41%	Municipal Staff
Water Network	27%	73%	Municipal Staff
Buildings & Facilities	6%	94%	2018 Building Inspection Report
Bridges & Culverts	0%	100%	2020 OSIM
Fleet	100%	0%	Age-based
Stormwater Network	100%	0%	Age-based
Land Improvements	100%	0%	Age-based
Machinery & Equipment	100%	0%	Age-based
Overall	45%	55%	

Service Life Remaining

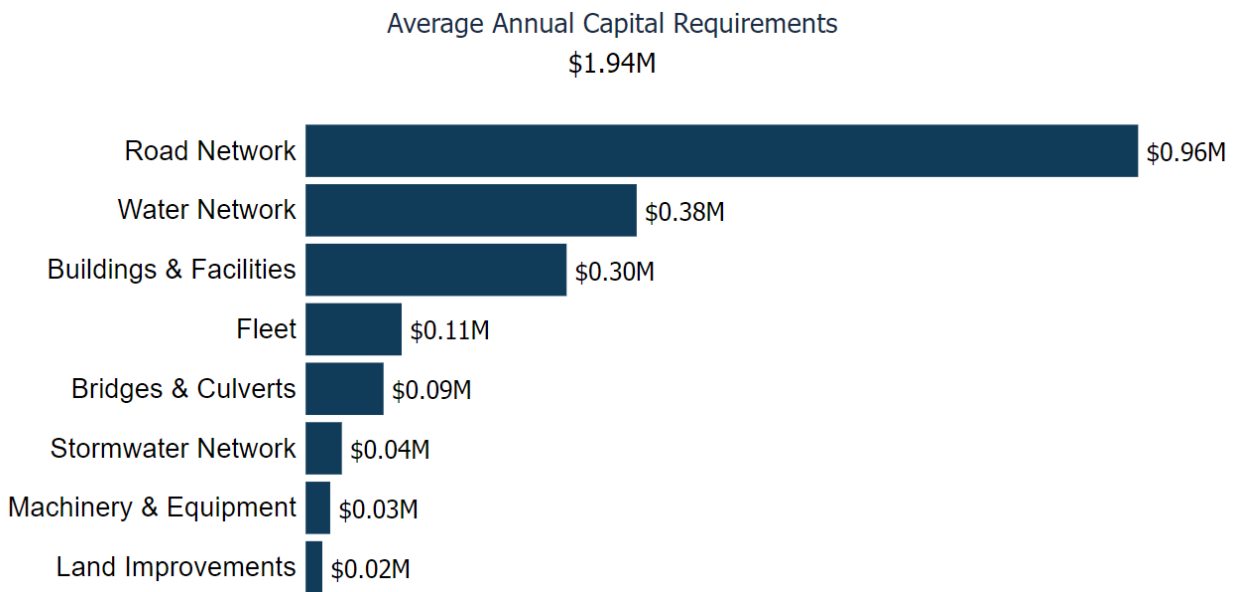
Based on asset age, available assessed condition data and estimated useful life, 31% of the Township's assets will require replacement within the next 10 years. Capital requirements over the next 10 years are identified in Appendix B.

● No Service Life Remaining ● 0-5 Years Remaining ● 6-10 Years Remaining ● Over 10 Years Remaining



Annual Capital Requirements

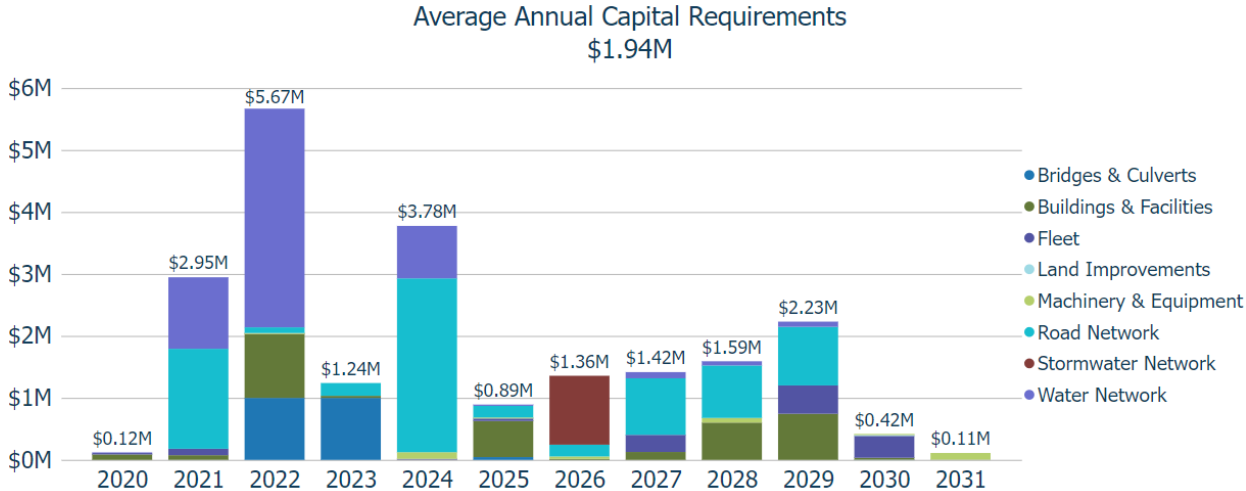
Based on the replacement cost of the assets, the estimated useful life, the cost and impact of lifecycle activities, the average annual capital requirements can be calculated for each category in the asset portfolio. This is the average annual amount required to maintain the current level of service that the Township is providing.



Forecasted Capital Requirements

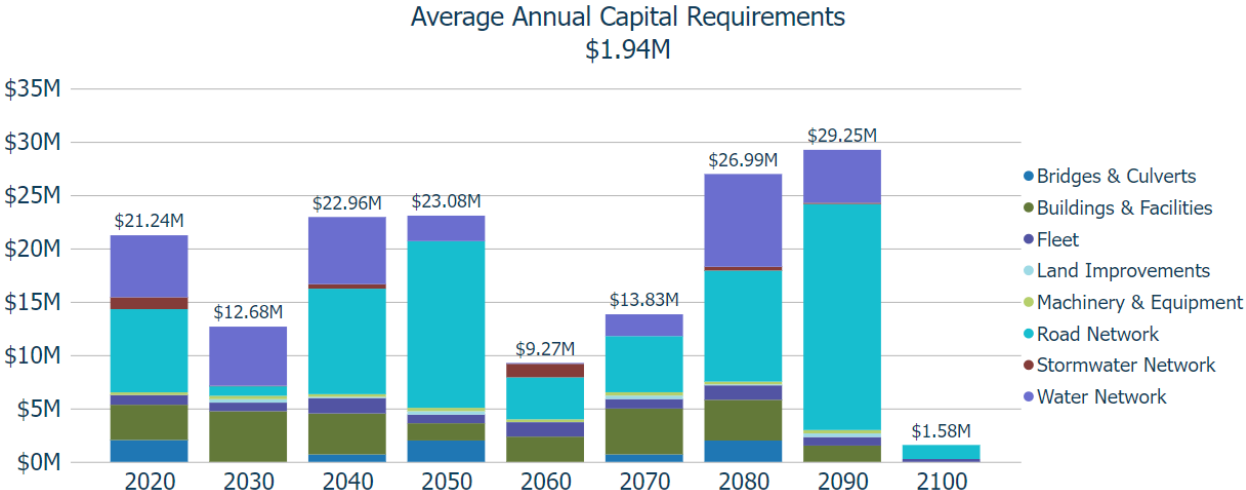
The development of a long-term capital forecast should include both asset rehabilitation and replacement requirements. With the development of asset-specific lifecycle strategies that include the timing and cost of future capital events and the refinement of the asset inventory, the Township can produce an accurate short- and long-term capital forecast.

The graph below identifies the annual capital requirements over the next 10 years and is based on the Township’s asset inventory as of 2020, not including assets that may be required due to growth.



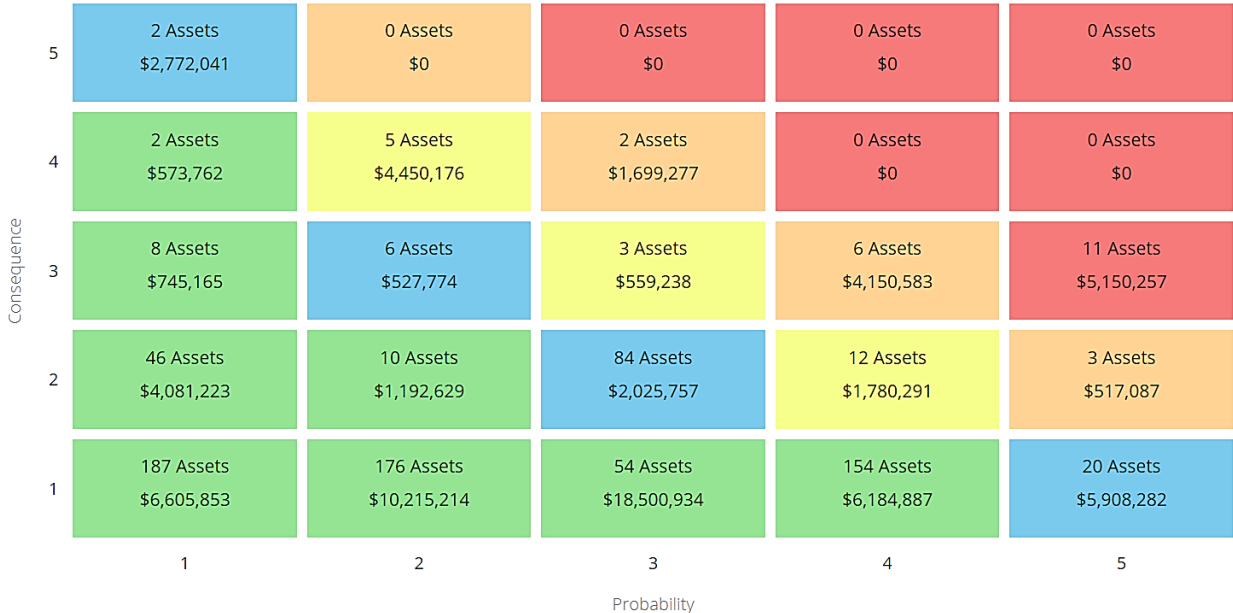
The specific projected cost of lifecycle activities that will need to be undertaken over the next 10 years to maintain the current level of service can be found in Appendix B.

The following graph identifies the average annual capital requirements required over the next 80 years. This projection is used as it ensures that every asset has gone through one full iteration of replacement. The forecasted requirements are aggregated into 10-year bins and are based on the Township’s asset inventory as of 2020 and do not include assets that may be required for 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 \$60.38 million
- 58% 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 \$1.55 million
- To reach sustainability, tax revenues need to be increased by 3.3% annually for the next 20 years to eliminate annual deficits

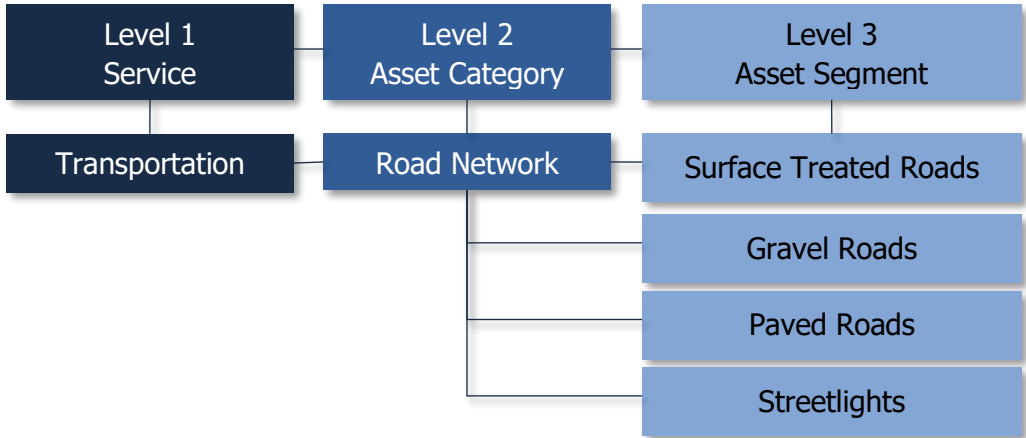
Road Network

The Township’s Road Network inventory is managed in CityWide™, and comprises of 100 unique assets, including 188 lane kilometres of paved and unpaved roads, and roadway appurtenances such as streetlights.

The Public Works department, along with supporting assets such as facilities, fleet and machinery & equipment, is responsible for planning and managing the road network. The department is also responsible for winter snow clearing, ice control and snow removal operations.

4.1.1 Asset Hierarchy & Segmentation

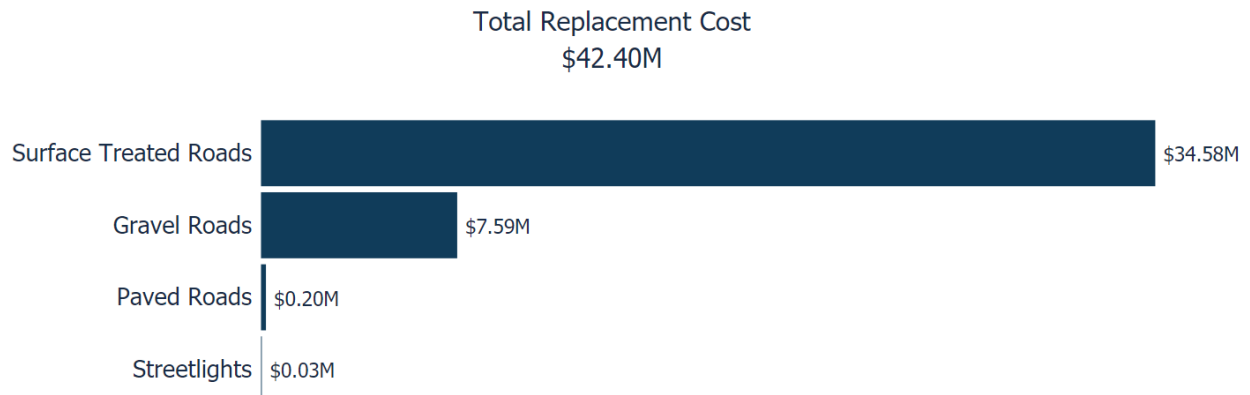
Asset hierarchy explains the relationship between individual assets and their components, and a wider, more expansive network and system. How assets are grouped in a hierarchy structure can impact how data is interpreted. Assets were structured to support meaningful, efficient reporting and analysis. Most reports and analytics presented in this AMP are summarized at the Asset Segment and/or Asset Category Levels.



4.1.2 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.

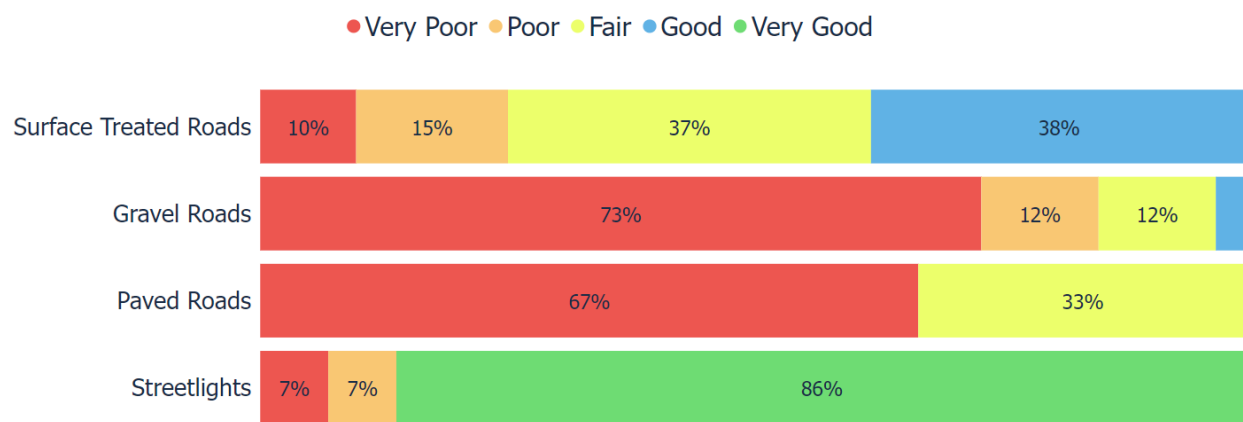
Asset Segment	Quantity	Replacement Cost Method	Total Replacement Cost
Surface Treated Roads	103 lane-km	Cost per Unit	\$34,580,550
Gravel Roads	35 lane-km	Cost per Unit	\$7,592,000
Paved Roads	6 lane-km	Cost per Unit	\$197,100
Streetlights	30	Cost per Unit	\$31,900
			\$42,401,550



4.1.3 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
Surface Treated Roads	64%	Good	50% Assessed
Gravel Roads	35%	Poor	98% Assessed
Paved Roads	48%	Fair	100% Assessed
Streetlights	87%	Very Good	Age-based
	59%	Fair	



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:

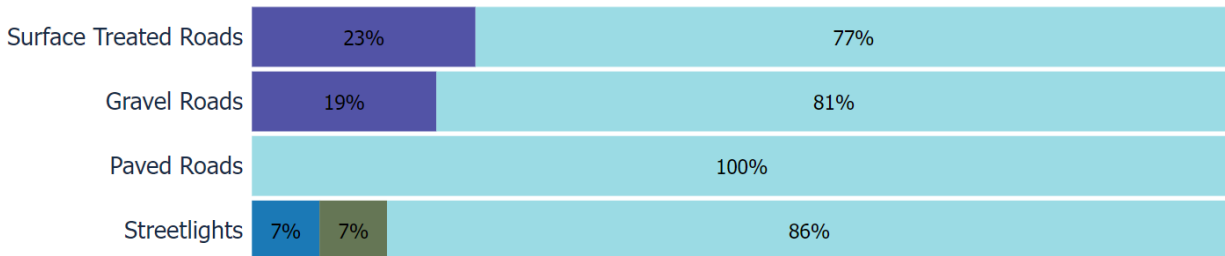
- Roads are assessed on a 7-year cycle
- Road patrols are undertaken every 2 weeks, granular roads are also visually inspected during grading activities
- Road Network assets are inspected as per O. Reg. 239/02

4.1.4 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)
Surface Treated Roads	20 Years	21.2	15.3
Gravel Roads	40 Years	53.8	15.0
Paved Roads	25 Years	57.0	17.0
Streetlights	20 Years	1.3	16.1
		24.6	15.5

● No Service Life Remaining ● 0-5 Years Remaining ● 6-10 Years Remaining ● Over 10 Years Remaining



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.

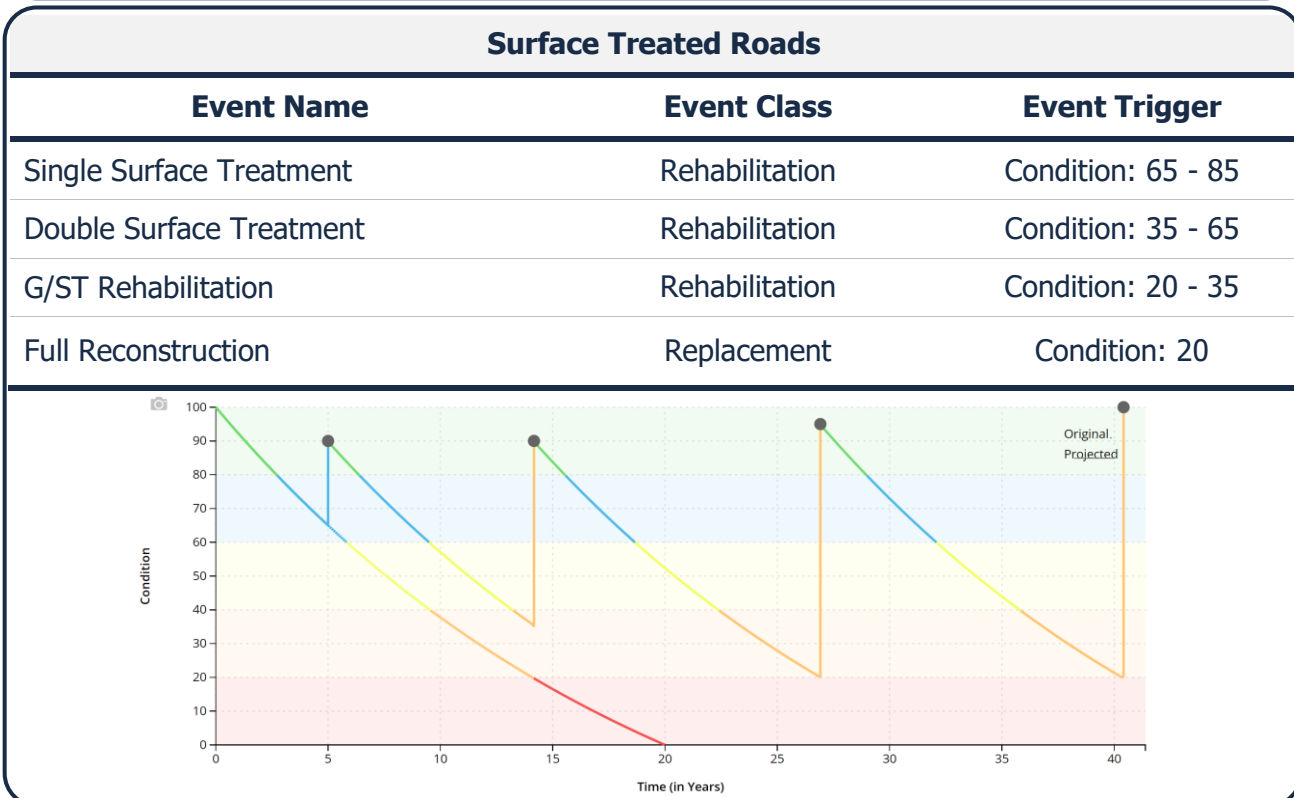
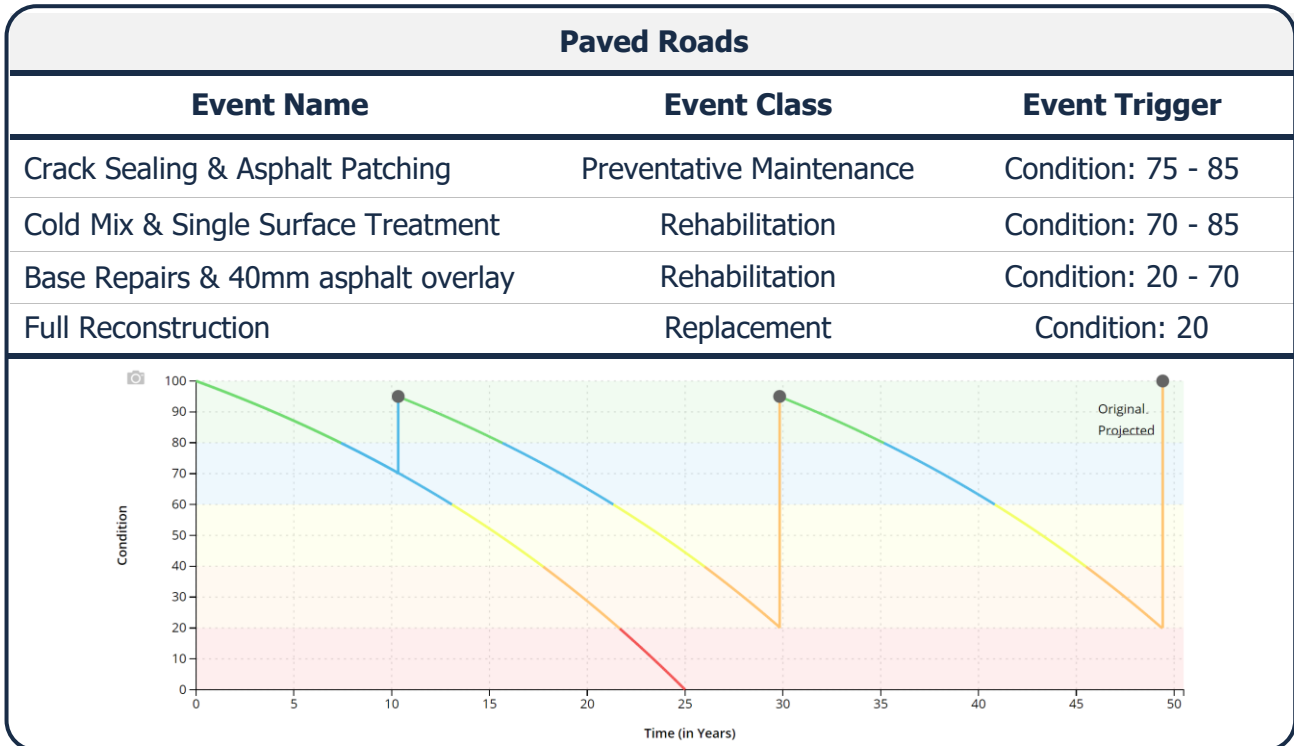
4.1.5 Lifecycle Management Strategy

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 table outlines the Township’s current lifecycle management strategy.

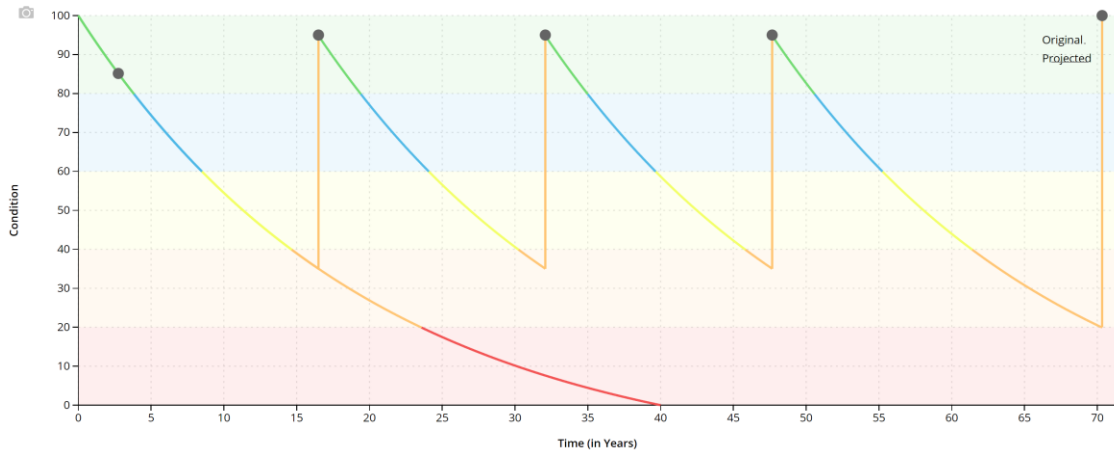
Activity Type	Description of Current Strategy
Maintenance	Pothole repairs are completed annually based on deficiencies identified through regular road patrols and feedback from the public.
	Roads are graded twice annually.
	Seasonal maintenance activities include asphalt patching, graveling, and tree cutting.
	Summer maintenance activities include sidewalk repairs, grading, re-gravelling, dust control, ditching, roadside mowing, tree trimming, brush cleanup, road sign installation/maintenance, and line painting.
	Winter maintenance activities include snow plowing, snow removal, salt/sand application, de-icing, frost control, and drift control.
Rehabilitation	Crack sealing is done for paved roads as needed to reduce erosion caused by poor drainage.
	On an annual basis, Staff aim to hard surface about 5 km of roads
	Rehabilitation activities include: cold mix & single surface treatment, base repairs & 40mm asphalt overlay, single surface treatment, double surface treatment, and G/ST rehabilitation.
Replacement	Road replacement prioritization is determined by consideration of growth, risk, condition, health and safety, and social impact.
Replacement	Road reconstruction projects (base & surface) are identified based on road condition, risk, and sub-surface asset requirements (water/storm)

The following lifecycle strategies have been developed to formalize the current approach to manage the lifecycle of Paved, Surface Treated and 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.



Gravel Roads

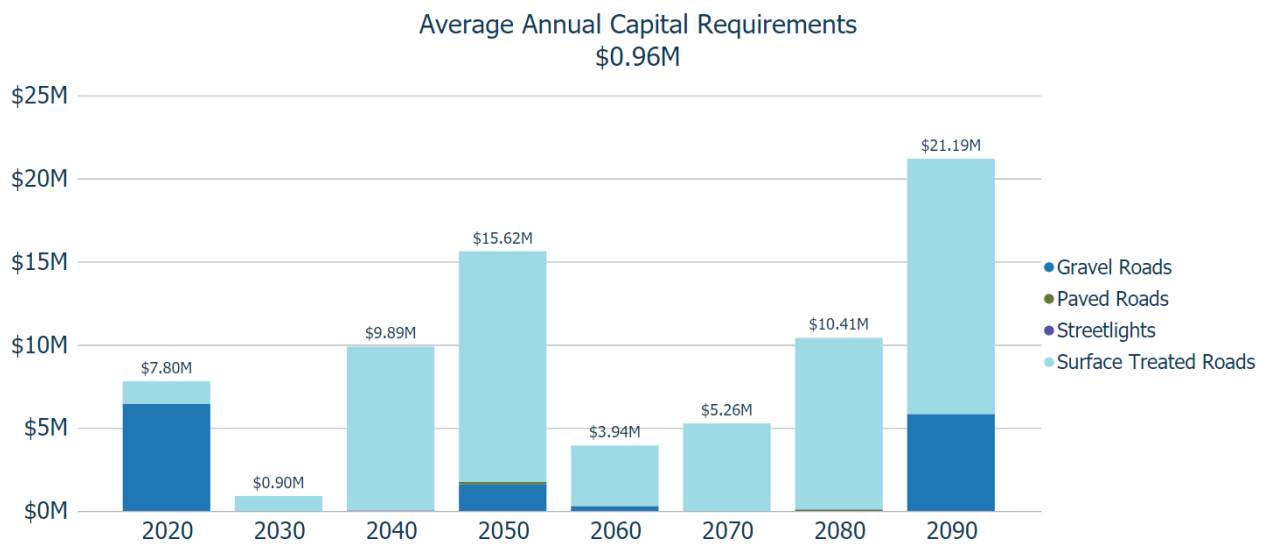
Event Name	Event Class	Event Trigger
Annual Grading (2 Treatments)	Maintenance	Condition: 85 - 95
G/ST Rehabilitation	Rehabilitation	Condition: 35 - 85
Full Reconstruction	Replacement	Condition: 20



Forecasted Capital Requirements

Based on the lifecycle strategies identified previously for Paved, Surface Treated, and Gravel Roads, the 10-year Road Improvement Plan, and assuming the end-of-life replacement of all other assets in this category, the following graphs forecasts short- and long-term 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 graph below provides a 70-year forecast. This projection is used as it ensures that every asset has gone through one full iteration of replacement and does not include assets that may be required for growth.



The specific 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 B.

4.1.6 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.



Risks to Current Asset Management Strategies

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



Climate Change & Extreme Weather Events

An increase in freeze/thaw cycles causes road pavement to heave and settle. This can cause the accelerated deterioration of road surface pavement which leads to an increased need for maintenance and rehabilitation. The uncertainty surrounding the impact of extreme weather events can make changing conditions difficult to plan for.



Organizational Knowledge & Capacity

Both short- and long-term planning requires the regular collection, storage and maintenance of infrastructure data to support asset management decision-making. Staff can find it challenging to dedicate resource time towards data collection to ensure that asset condition and asset attribute data is regularly reviewed and updated.

4.1.7 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 (2021)
Scope	Description, which may include maps, of the road network in the municipality and its level of connectivity	<p>The Township’s transportation network comprises of 144 lane-km of roads, of which:</p> <ul style="list-style-type: none"> - 35 lane-km are gravel roads - 103 lane-km are surface treated roads - 6 lane-km are paved roads <p>The network mostly consists of roads with MMS classes of 3, 4, 5 and 6. In addition, the network consists of 30 streetlight assets, and other roadside appurtenances.</p>
Quality	Description or images that illustrate the different levels of road class pavement condition	<p>The Condition Rating number is a visual assessment of the structural condition or integrity of the road. The rating numbers were assigned on a scale of 1 to 10 with the lower numbers describing those roads with the most structural distress or poorest shaped road cross section.</p> <p>(1-5) Road surface exhibits moderate to significant deterioration and requires improvement.</p> <p>(6-10) Road surface is in generally good condition, with localized deficiencies.</p>

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 (2021)
Scope	Number of lane-km of arterial roads (MMS classes 1 and 2) per land area of municipality (km/km ²)	0 km/km ²
	Number of lane-km of collector roads (MMS classes 3 and 4) per land area of municipality (km/km ²)	0.36 km km/km ²
	Number of lane-km of local roads (MMS classes 5 and 6) per land area of municipality (km/km ²)	0.33 km/km ²
Quality	Average pavement condition index for paved roads in the municipality	Paved Roads - 48%
		Surface Treated Roads - 64%
	Average surface condition for unpaved roads in the municipality (e.g., excellent, good, fair, poor)	Poor - 35%
Performance	Capital reinvestment rate	0.42%
	Operating costs for unpaved (loose top) roads per lane kilometre	\$691

4.1.8 Recommendations

Asset Inventory

- Review streetlight inventory to determine whether all municipal assets within this asset segment has been accounted for.
- Continue to consolidate critical asset information from other asset data sources into the Township's centralized asset inventory.

Lifecycle Management Strategies

- Gather unit costs for assets that have relied primarily on historical inflation and review periodically to ensure a higher level of accuracy and within the context of current market condition.
- Evaluate the efficacy of the Township's lifecycle management strategies at regular intervals to determine the impact cost, condition 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.

Buildings & Facilities

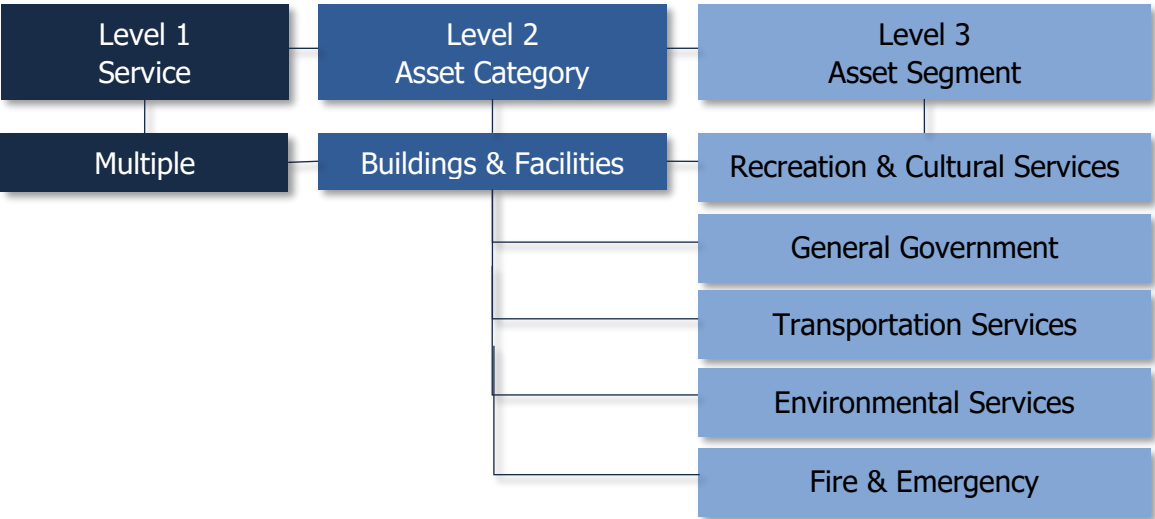
The Township’s Buildings & Facilities inventory is managed in CityWide™, and comprises of 27 unique assets, that represent around 20 individual facilities. These are owned by the Township and maintained by various departments that provide key administrative, protective, recreational and cultural services to the community.

In 2018, the Township retained Tulloch Engineering Ltd. to carry out an assessment of the building structures within the Township.

The current buildings & facilities inventory poses serious limitations for accurate and long-term asset management planning. Due to its origins from a pooled, finance-based inventory, the current inventory is not componentized and lacks accuracy.

4.1.9 Asset Hierarchy & Segmentation

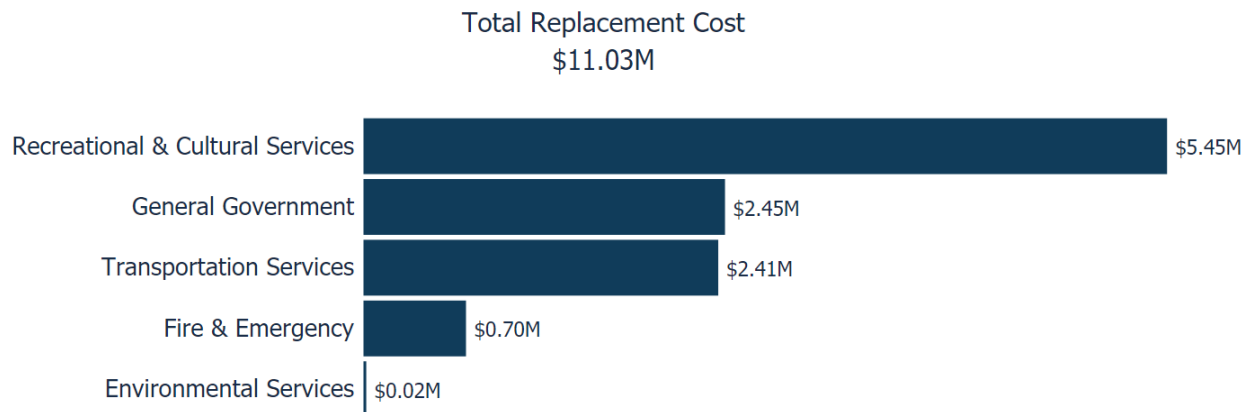
Asset hierarchy explains the relationship between individual assets and their components, and a wider, more expansive network and system. How assets are grouped in a hierarchy structure can impact how data is interpreted. Assets were structured to support meaningful, efficient reporting and analysis. Most reports and analytics presented in this AMP are summarized at the Asset Segment and/or Asset Category Levels.



4.1.10 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 inventory.

Asset Segment	Number of Facilities	Replacement Cost Method	Total Replacement Cost
Recreational & Cultural Services	8	Historical Cost Inflation, 2018 Building Inspection Report	\$5,454,000
General Government	2	Historical Cost Inflation, 2018 Building Inspection Report	\$2,454,349
Transportation Services	2	Historical Cost Inflation, 2018 Building Inspection Report	\$2,408,571
Fire & Emergency	1	Historical Cost Inflation, 2018 Building Inspection Report	\$696,731
Environmental Services	1	Historical Cost Inflation, 2018 Building Inspection Report	\$20,070
			\$11,033,721



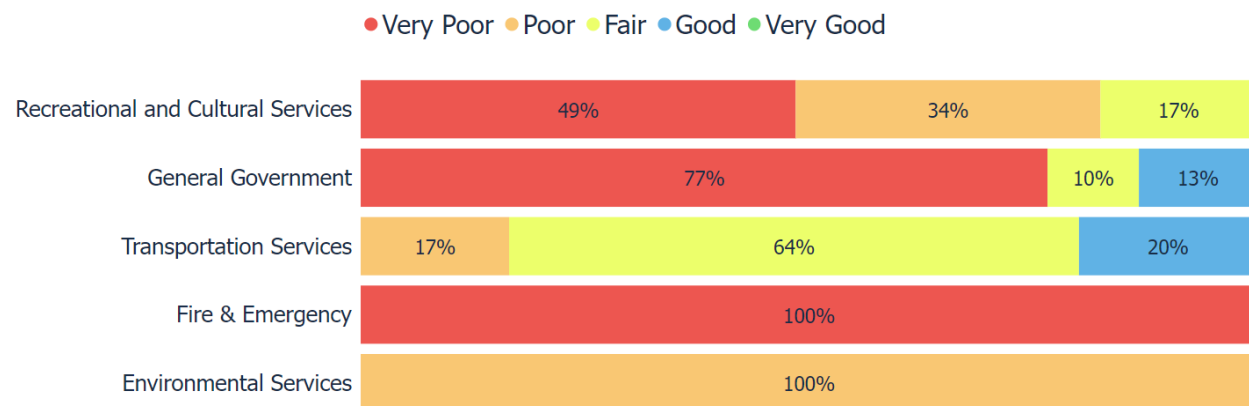
4.1.11 Asset Condition

The 2018 Building Inspection Report by Tulloch Engineering, and the resulting Facility Condition Index (FCI) has been consolidated into the Township’s asset inventory. The table below provides the accepted definition of varying levels of the FCI.

Condition	FCI Value	Condition Rating
Very Good	0 to 0.5	Very Good or Good condition with minimal ongoing maintenance/upgrading.
Good		
Fair	0.5 to 1.0	Fair condition with typical annual maintenance requirements
Poor	1.0 to 3.0	Poor condition with increasing anticipated annual maintenance and upgrading
Very Poor	3.0 to 10.0	Critical condition with significant repair/upgrading and potential need for short term shut down or loss of use.

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
Recreational & Cultural Services	5.8	Very Poor	98% Assessed
General Government	1.6	Poor	77% Assessed
Transportation Services	0.7	Fair	100% Assessed
Fire & Emergency	10.0	Very Poor	100% Assessed
Environmental Services	1.7	Poor	Age-based
4.1		Very Poor	



The current condition overview of Buildings & Facilities is based on its pooled and incomplete inventory, as such this should be considered supplementary and/or discarded if a componentized inventory is developed.

To ensure that the Township's Buildings & Facilities 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 Buildings & Facilities.

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:

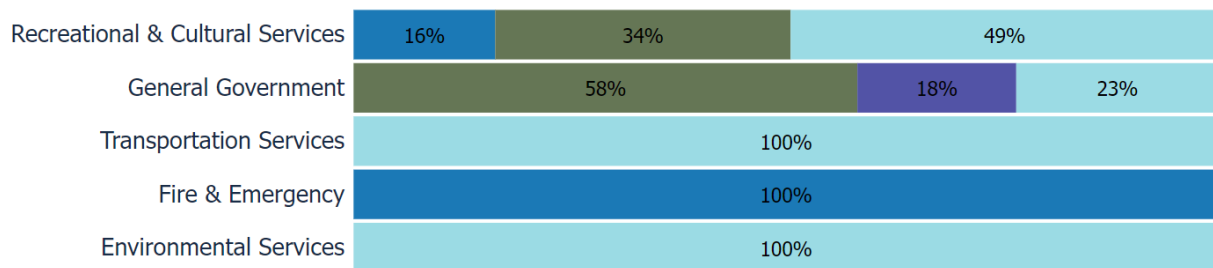
- There was a 2018 condition assessment conducted by Tulloch Engineering Inc.
- Formal workplace inspections conducted every year through the Township's health and safety program.
- High-level assessments by internal staff are performed annually to determine the condition of facilities.

4.1.12 Estimated Useful Life & Average Age

The Estimated Useful Life for Buildings & Facilities 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)
Recreational & Cultural Services	10 - 40 Years	23.2	8.1
General Government	40 Years	17.8	24.7
Transportation Services	40 Years	58.7	24.3
Fire & Emergency	40 Years	41.5	-3.0
Environmental Services	40 Years	23.5	16.4
		26.4	14.1

● No Service Life Remaining ● 0-5 Years Remaining ● 6-10 Years Remaining ● Over 10 Years Remaining



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.

4.1.13 Lifecycle Management Strategy

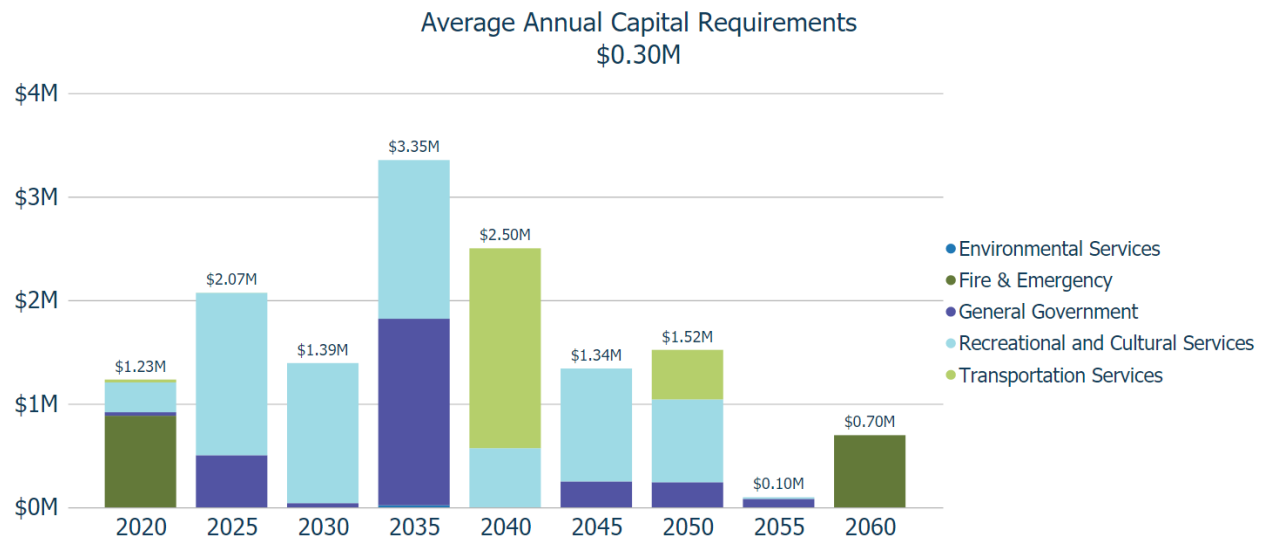
The condition or performance of most assets will deteriorate over time. To ensure that municipal assets are performing as expected and meeting the needs of customers, it is important to establish a lifecycle management strategy to proactively manage asset deterioration. The following table outlines the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

Activity Type	Description of Current Strategy
	Municipal buildings are subject to regular inspections to identify health & safety requirements as well as structural deficiencies that require additional attention
Maintenance / Rehabilitation	The 2018 Building Inspection report also included a 25-year forecast that is incorporated into the decision-making process. Critical buildings have a detailed maintenance and rehabilitation schedule, while the maintenance of other facilities are dealt with on a case-by-case basis
Replacement	Assessments are completed strategically as buildings approach their end-of-life to determine whether replacement or rehabilitation is appropriate

Forecasted Capital Requirements

Based on the current buildings and facilities inventory, the 2018 building inspection report, and assuming end-of-life replacement for all assets, the following graph forecasts short- and long-term capital requirements for the Buildings & Facilities category.

The graph below provides a 40-year forecast. This projection is used as it ensures that every asset has gone through one full iteration of replacement and does not include assets that may be required for growth.



It is important to acknowledge the limitations of the current buildings and facilities inventory due to its pooled asset listing. Accuracy and reliability can be improved by collecting asset data on the specific components that make up the facilities and consolidating it into the current inventory.

The specific 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 B.

4.1.14 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.



Risks to Current Asset Management Strategies

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



Asset Data Confidence

The current inventory for buildings & facilities is pooled and not componentized, resulting in a basic level of data maturity. This is a limiting factor in allowing for accurate and reliable projections, and Staff have indicated that the current inventory is incomplete.



Organizational Knowledge & Capacity

Both short- and long-term planning requires the collection of infrastructure data to support asset management decision-making. Staff find it a continuous challenge to dedicate resource time towards data collection and consolidation.

4.1.15 Levels of Service

The following tables identify the Township’s current level of service for Buildings & Facilities. 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 Buildings & Facilities.

Service Attribute	Qualitative Description	Current LOS (2021)
Accessible & Reliable	List of facilities that meet accessibility standards and any work that has been undertaken to achieve alignment	No facilities meet accessibility standards at this time.
Safe & Regulatory	Description of monthly and annual facilities inspection process	TBD ¹
Affordable	Description of the lifecycle activities (maintenance, rehabilitation and replacement) performed on municipal facilities	TBD ¹
Sustainable	Description of the current condition of municipal facilities and the plans that are in place to maintain or improve the provided level of service	TBD ¹

¹ The Township does not currently have data available to determine this qualitative metric. Staff are working to gather this metric for the next iteration of the AMP that is required in 2025.

Technical Levels of Service

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

Service Attribute	Technical Metric	Current LOS (2021)
Accessible & Reliable	Number of unplanned facility closures	0
Safe & Regulatory	Number of service requests about unsafe conditions in facilities	0
	Number of identified defects	0
Affordable	O&M cost / # of municipal facilities	\$7,924
	Annual capital reinvestment rate	0.27%
Sustainable	% of facilities that are in good or very good condition	0%
	% of facilities that are in poor or very poor condition	17%

4.1.16 Recommendations

Asset Inventory

- The Township's asset inventory contains a single or a few assets for all facilities. Facilities consist of several separate capital components that have unique estimated useful lives and require asset-specific lifecycle strategies. Staff should work towards implementing a component-based inventory of all facilities that is based on the UNIFORMAT II data structure.

Condition Assessment Strategies

- While the 2018 condition assessment did provide an overall condition of each facility that was inspected. A comprehensive structural assessment of all buildings & facilities, based on the UNIFORMAT II data structure, is highly recommended to gain a better understanding of the overall health and condition of each facility to identify accurate short- and long-term capital requirements.

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 this AMP 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

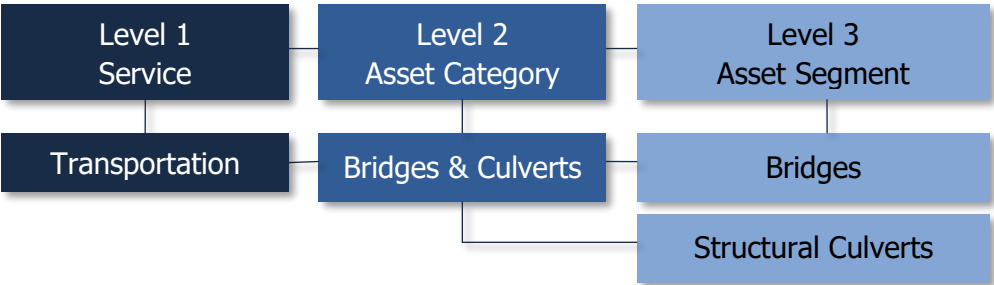
The Township’s Bridges and Culverts inventory is managed in CityWide™ and comprises of 3 structures that have a span of 3 meters or more and are therefore categorized as a bridge or a structural culvert asset.

The Public Works department is responsible for the planning and managing 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.

Based on the requirements outlined by the Ministry of Transportation, the most recent Bridge and Culvert inspection was conducted by K. Smart Associates Limited in 2020.

4.1.17 Asset Hierarchy & Segmentation

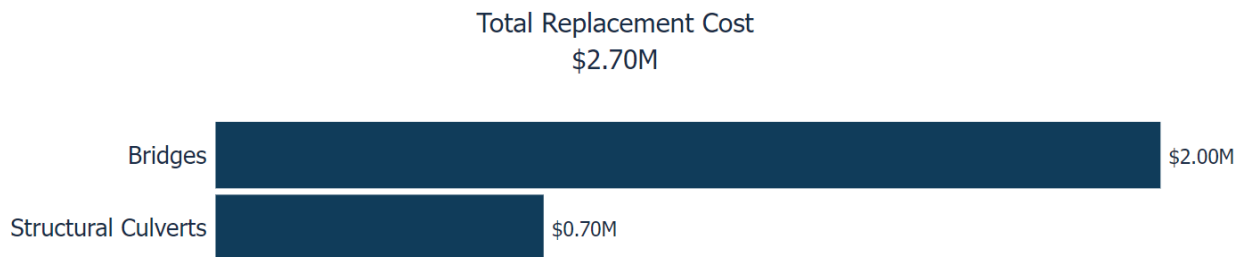
Asset hierarchy explains the relationship between individual assets and their components, and a wider, more expansive network and system. How assets are grouped in a hierarchy structure can impact how data is interpreted. Assets were structured to support meaningful, efficient reporting and analysis. Most reports and analytics presented in this AMP are summarized at the Asset Segment and/or Asset Category Levels.



4.1.18 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.

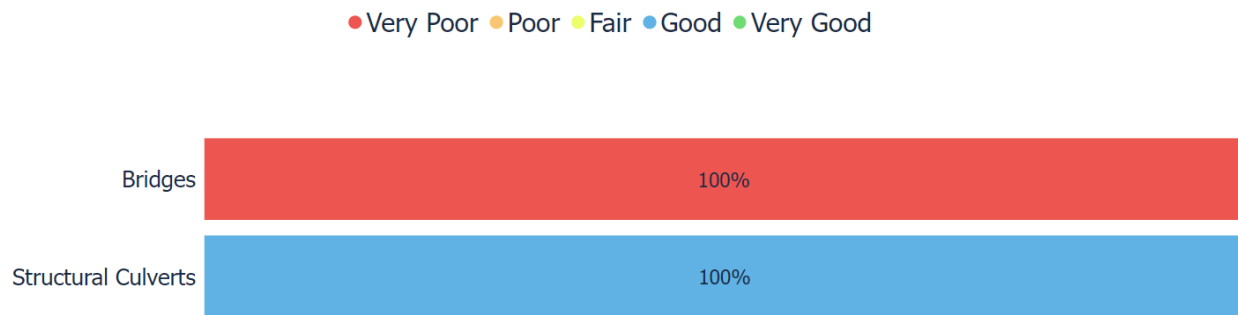
Asset Segment	Quantity	Replacement Cost Method	Total Replacement Cost
Bridges	2	User-Defined Cost	\$2,002,895
Structural Culverts	1	User-Defined Cost	\$695,400
			\$2,698,295



4.1.19 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	16%	Very Poor	100% Assessed
Structural Culverts	89%	Good	100% Assessed
	35%	Poor	



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)
- The most recent OSIM inspection was conducted in 2020 by K. Smart Associates Limited

4.1.20 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	20 - 30 Years	22.7	3.0
Structural Culverts	30 Years	42.0	21.3
		27.5	7.6

● No Service Life Remaining ● 0-5 Years Remaining ● 6-10 Years Remaining ● Over 10 Years Remaining



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.

4.1.21 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.

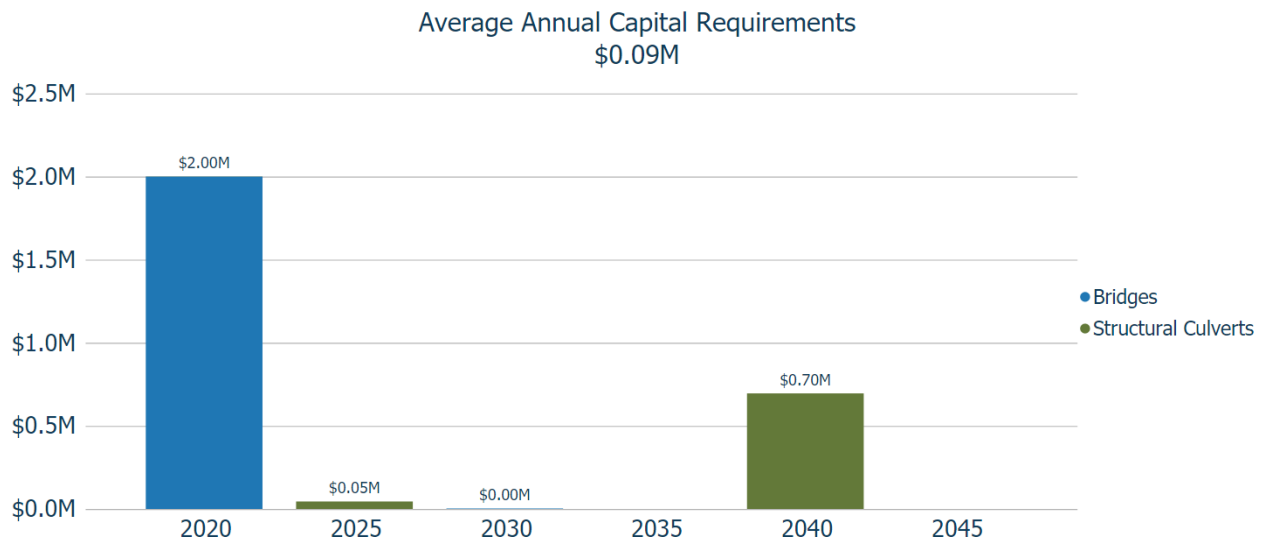
Activity Type	Description of Current Strategy
Maintenance	Typical maintenance includes: <ul style="list-style-type: none">• Obstruction removal• Cleaning/sweeping• Erosion control• Brush/tree removal
	Biennial OSIM inspections including a list of recommended maintenance activities that the Township considers and completes according to cost and urgency.
Rehabilitation / Replacement	Biennial OSIM inspection reports including a Capital Needs List identifying recommended rehabilitation and replacement activities with estimated costs.
Inspection	The most recent inspection report was completed in 2020 by K. Smart Associates Limited

Forecasted Capital Requirements

Based on the lifecycle activities identified in the 2020 inspection report, staff expertise and assuming end-of-life replacement for all assets, the following graph forecasts short- and long-term capital requirements for the Bridges & Culverts category.

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 graph below provides a 25-year forecast. This projection is used as it ensures that every asset has gone through one full iteration of replacement and does not include assets that may be required for growth.



The specific 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 B.

4.1.22 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.



Risks to Current Asset Management Strategies

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



Aging Infrastructure

As municipal bridges and culverts continue to age and deteriorate, the 2020 OSIM inspections have indicated assets that have a low bridge condition index (BCI) and will require significant capital investment over the next 5 years.



Capital Funding Strategies

Major capital rehabilitation projects for bridges and culverts are almost entirely dependent on the availability of grant funding opportunities. When grants are not available, bridge rehabilitation may be deferred. An annual capital funding strategy can reduce dependency on grant funding and help prevent deferral of capital works.



Climate Change & Extreme Weather Events

Flooding and extreme weather can cause damage to multiple elements of the Township's bridges including the deck, superstructure, substructure, and approaches. The rising levels of freshwater and the increased frequency and intensity of precipitation events are likely to advance the deterioration of bridge components. Staff should identify and monitor affected bridges and culverts. The Township should also prioritize infrastructure maintenance, rehabilitation, and replacement based on susceptibility to climate impacts.

4.1.23 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 (2021)
Scope	Description of the traffic that is supported by municipal bridges (e.g., heavy transport vehicles, motor vehicles, emergency vehicles, pedestrians, cyclists)	<p>Bridges and structural culverts are a key component of the municipal transportation network. The 2020 OSIM report has recommended posting load limits on two structures:</p> <ol style="list-style-type: none"> 1) Old Mill Road Bridge = 15 tonnes 2) Mud Creek Road Bridge = 5 tonnes
Quality	Description or images of the condition of bridges & culverts and how this would affect use of the bridges & culverts	<p>Good (BCI 70-100): Generally considered to be in good-excellent condition, and repair or rehabilitation work is not usually required within the next 5 years. Routine maintenance, such as sweeping, cleaning, and washing are still recommended.</p> <p>Fair (BCI 50-70): Generally considered to be in good-fair condition. Repair or rehabilitation work recommended is ideally scheduled to be completed within the next 5 years.</p> <p>Poor (BCI Less than 50): Generally considered poor with lower numbers representing structures nearing the end of their service life. The repair or rehabilitation of these structures is ideally best scheduled to be completed within approximately 1 year. However, if it is determined that the replacement of the structure would be a more viable, the structure can be identified for continued monitoring and scheduled for replacement within the short-term.</p>

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 (2021)
Scope	% of bridges in the Township with loading or dimensional restrictions	67%
Quality	Average bridge condition index value for bridges in the Township	29%
	Average bridge condition index value for structural culverts in the Township	89%
Performance	Capital re-investment rate	0.00%
	Average duration of unplanned bridge closure	0

4.1.24 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.

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

- Continue to incorporate the recommended maintenance, rehabilitative and renewal activities from the OSIM inspections.

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.

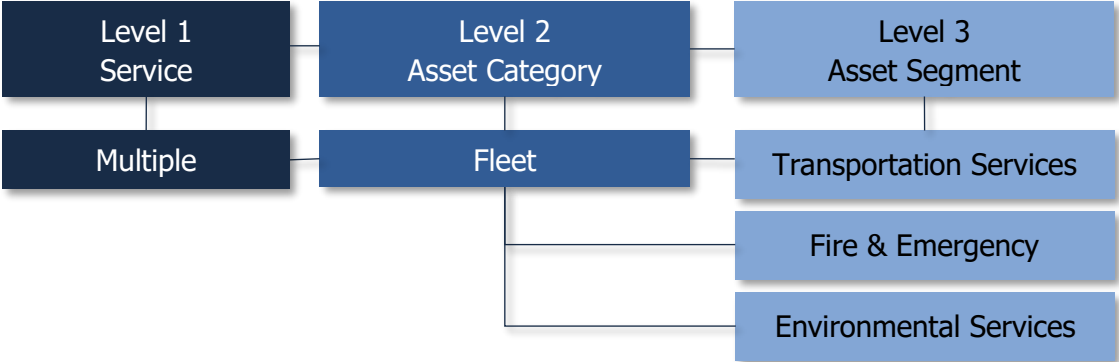
Fleet

The Township’s Fleet inventory is managed in CityWide™ and comprises of 19 assets. Fleet assets allow staff to efficiently deliver municipal services and personnel. Municipal fleet assets are used to support several service areas, some of which include the use of:

- fire rescue and emergency vehicles to support emergency services, and
- light-duty and heavy-duty vehicles to support the maintenance of municipal infrastructure and address service requests.

4.1.25 Asset Hierarchy & Segmentation

Asset hierarchy explains the relationship between individual assets and their components, and a wider, more expansive network and system. How assets are grouped in a hierarchy structure can impact how data is interpreted. Assets were structured to support meaningful, efficient reporting and analysis. Most reports and analytics presented in this AMP are summarized at the Asset Segment and/or Asset Category Levels.

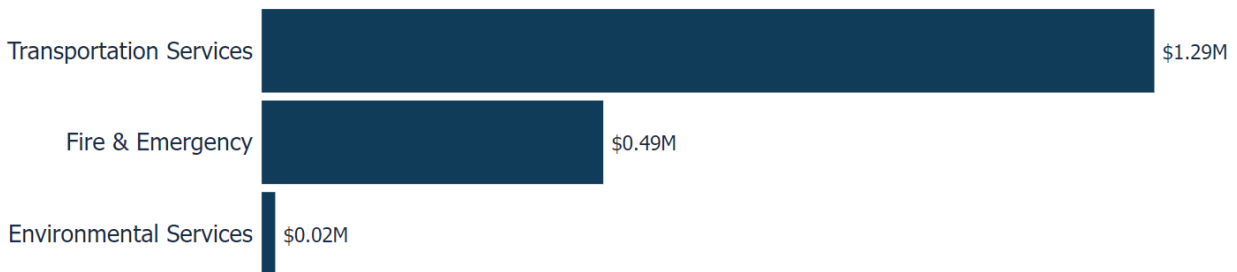


4.1.26 Asset Inventory & Replacement Cost

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

Asset Segment	Quantity	Replacement Cost Method	Total Replacement Cost
Transportation Services	12	Historical Cost Inflation	\$1,288,850
Fire & Emergency	4	Historical Cost Inflation	\$493,220
Environmental Services	2	Historical Cost Inflation	\$19,545
			\$1,801,615

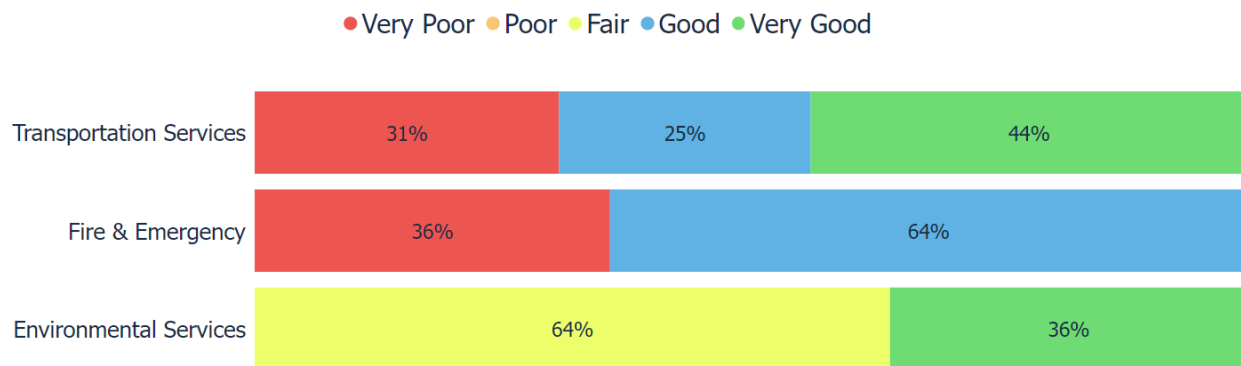
Total Replacement Cost
\$1.80M



4.1.27 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
Transportation Services	59%	Fair	Age-based
Fire & Emergency	47%	Fair	Age-based
Environmental Services	70%	Good	Age-based
	56%	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 Vehicles.

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:

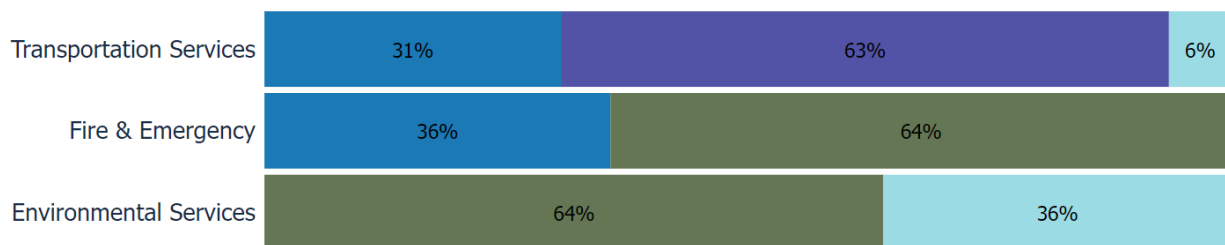
- Staff complete regular visual inspections of fleet assets to ensure they are in state of adequate repair prior to operation
- The mileage of vehicles is used as a proxy to determine remaining useful life and relative vehicle condition
- Condition assessments are conducted on Fire & Emergency fleet assets in accordance with regulations for health and safety regulations including National Fire Protection Association (NFPA) codes and standards for fire service-related fleet assets

4.1.28 Estimated Useful Life & Average Age

The Estimated Useful Life for Vehicles 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)
Transportation Services	15 - 20 Years	11.2	4.7
Fire & Emergency	15 Years	17.4	-2.4
Environmental Services	15 Years	8.0	7.0
		12.2	3.3

● No Service Life Remaining ● 0-5 Years Remaining ● 6-10 Years Remaining ● Over 10 Years Remaining



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.

4.1.29 Lifecycle Management Strategy

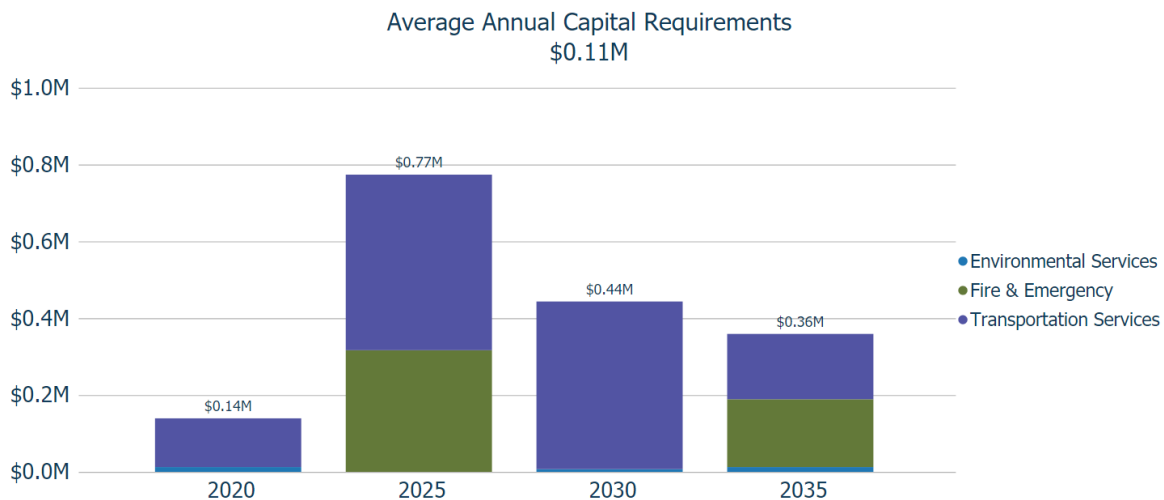
The condition or performance of most assets will deteriorate over time. To ensure that municipal assets are performing as expected and meeting the needs of customers, it is important to establish a lifecycle management strategy to proactively manage asset deterioration. The following table outlines the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

Activity Type	Description of Current Strategy
Maintenance / Rehabilitation	Visual inspections completed and documented daily; fluids inspected at every fuel stop; tires inspected monthly
	Every 4-7000km includes a detailed inspection; tires are rotated and oil changed
	Annual preventative maintenance activities include system components check and additional detailed inspections
Replacement	Vehicle age, kilometres and annual repair costs are taken into consideration when determining appropriate treatment options

Forecasted Capital Requirements

Based on the current fleet inventory, and assuming end-of-life replacement for all assets, the following graph forecasts short- and long-term capital requirements for the fleet category.

The graph below provides a 15-year forecast. This projection is used as it ensures that every asset has gone through one full iteration of replacement and does not include assets that may be required for growth.



The specific 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 B.

4.1.30 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.



Risks to Current Asset Management Strategies

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



Aging Assets

As fleet assets continue to age, there are several assets that have approached and/or exceeded their original useful life. Staff have recognized this and are developing a decision-making process to determine how to plan and prioritize for assets that will require replacement or disposal.

4.1.31 Levels of Service

The following tables identify the Township’s current level of service for Buildings & Facilities. 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 (2021)
Safe & Reliable	Description of the routine maintenance and check-up procedures	TBD ²
Sustainable	List of day-to-day vehicles in operation and the replacement values of those assets	3/4 GMC Truck 2015 - \$50,000 1/2 Ton 2020 Chevrolet Silverado - \$40,000 1992 Ford Plow Truck - \$340,000 2010 International Plow Truck - \$340,000 2016 Western Star - \$340,000 ³ 2021 International Plow truck - \$340,000

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 (2021)
Sustainable	Annual Capital Reinvestment Rate	1.89%
	% of fleet that is idle	0%
	% of fleet utilization	100%
	% of fleet that are in good or very good condition	80%
	% of fleet that are in poor or very poor condition	20%

² The Township does not currently have data available to determine this technical metric. Staff are working to gather this metric for the next iteration of the AMP that is required in 2025.

4.1.32 Recommendations

Replacement Costs

- All replacement costs used in this AMP were based on the inflation of historical costs. These costs should be evaluated to determine their accuracy and reliability. Replacement costs should be updated according to the best available information on the cost to replace the asset in today's value.

Condition Assessment Strategies

- Identify condition assessment strategies for high value and high-risk fleet assets.
- Review assets that have surpassed their estimated useful life to determine if immediate replacement is required or whether these assets are expected to remain in-service. Adjust the service life and/or condition ratings for these assets accordingly.

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 this AMP 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.

Stormwater Network

The Township’s Stormwater inventory is managed in CityWide™, and comprises of 131 unique assets, including about 308 metres of storm lines, around a kilometre of culverts, catch basins and catch basin leads.

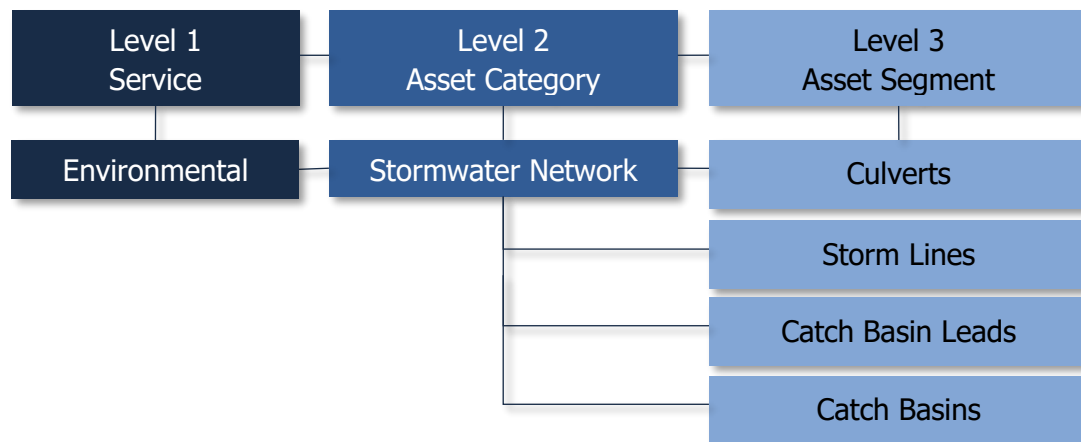
The Public Works department, along with supporting assets such as facilities, fleet and machinery & equipment, is responsible for planning and managing the Stormwater Network.

Staff have indicated that some of the stormwater infrastructure has been rebuilt in 2021.

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

4.1.33 Asset Hierarchy & Segmentation

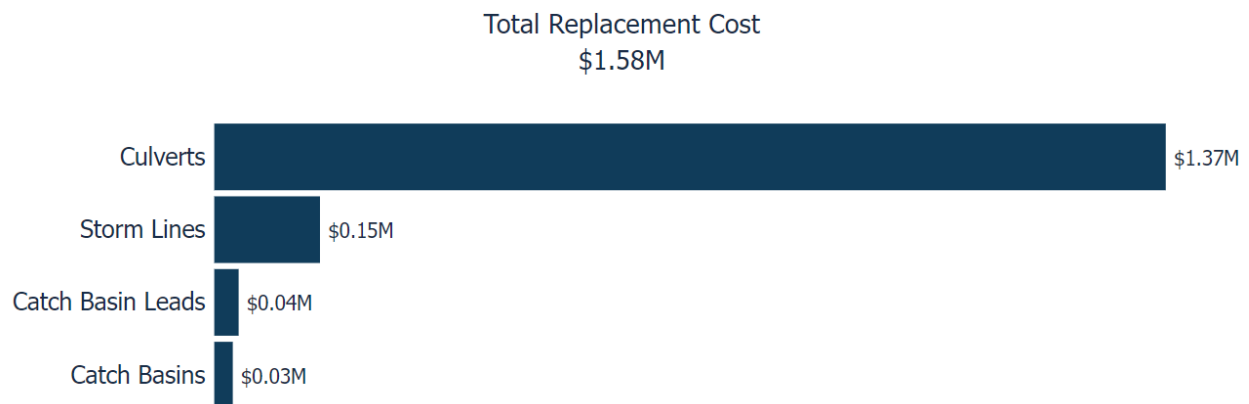
Asset hierarchy explains the relationship between individual assets and their components, and a wider, more expansive network and system. How assets are grouped in a hierarchy structure can impact how data is interpreted. Assets were structured to support meaningful, efficient reporting and analysis. Most reports and analytics presented in this AMP are summarized at the Asset Segment and/or Asset Category Levels.



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 Stormwater Network inventory.

Asset Segment	Quantity	Replacement Cost Method	Total Replacement Cost
Culverts	1 km	Cost per Unit	\$1,366,717
Storm Lines	234 m	Cost per Unit	\$151,853
Catch Basin Leads	104 m	Cost per Unit	\$35,000
Catch Basins	7	Cost per Unit	\$26,600
			\$1,580,170

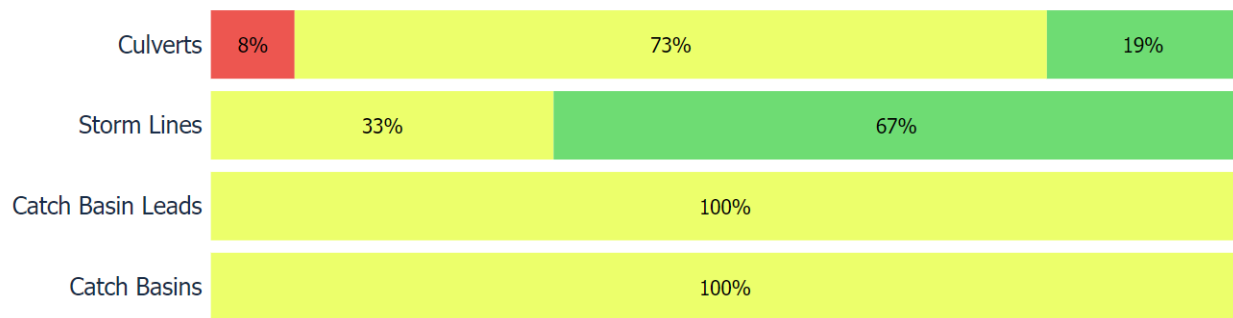


4.1.35 Asset Condition

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.

	Average Condition (%)	Average Condition Rating	Condition Source
Culverts	52%	Fair	Age-based
Storm Lines	77%	Good	Age-based
Catch Basin Leads	48%	Fair	Age-based
Catch Basins	48%	Fair	Age-based
	55%⁴	Fair	

● Very Poor ● Poor ● Fair ● Good ● Very Good



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

⁴ The average condition is based on asset inventory data as of 2020 and does not include the storm infrastructure that has been rebuilt in 2021.

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:

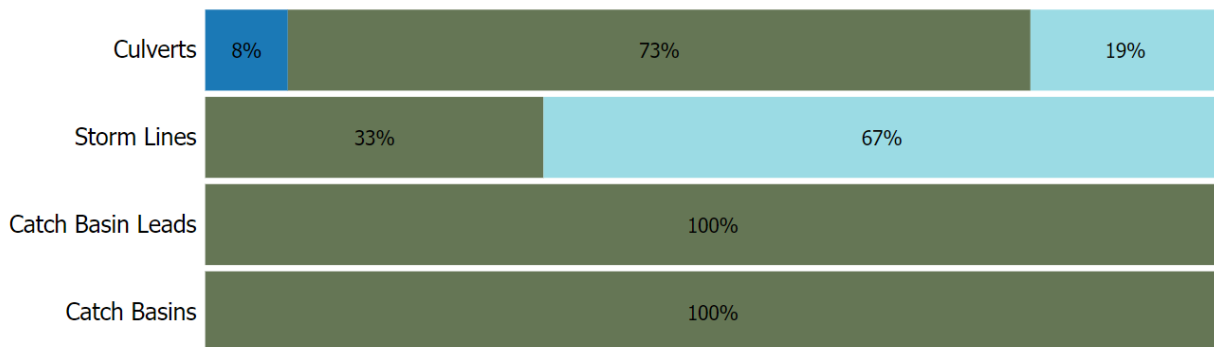
- There are no formal condition assessment programs in place for storm sewer infrastructure currently and CCTV inspections are not completed regularly
- Age-based estimates of condition are used to project current condition, although confidence in accuracy of these estimates is low
- As the Township refines the available asset inventory for the storm sewer system, a regular assessment cycle should be established

4.1.36 Estimated Useful Life & Average Age

The Estimated Useful Life for Stormwater 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)
Culverts	40 Years	31.6	8.1
Storm Lines	40 Years	18.2	21.8
Catch Basin Leads	40 Years	35.0	5.0
Catch Basins	40 Years	35.0	5.0
		30.4	9.3

● No Service Life Remaining ● 0-5 Years Remaining ● 6-10 Years Remaining ● Over 10 Years Remaining



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.

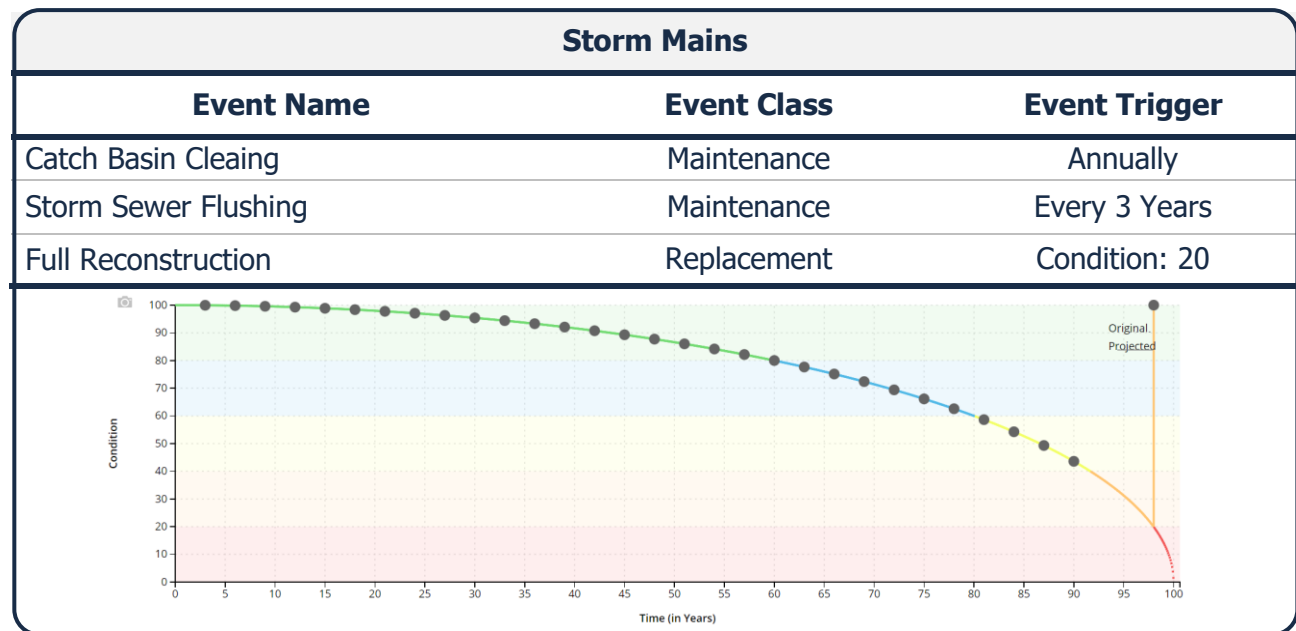
4.1.37 Lifecycle Management Strategy

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	Catch basins are cleaned annually and outlets are inspected regularly to ensure unobstructed flow
	With the installation of new stormwater infrastructure in 2021, Staff have indicated that there will be a flushing and cleaning program implemented in the near future.
	All other maintenance activities are completed on a reactive basis when operational issues are identified (e.g., blockages, backups)
Rehabilitation	Trenchless re-lining has the potential to reduce total lifecycle costs but would require a formal condition assessment program to determine viability
Replacement	Without the availability of up-to-date condition assessment information replacement activities are purely reactive in nature

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

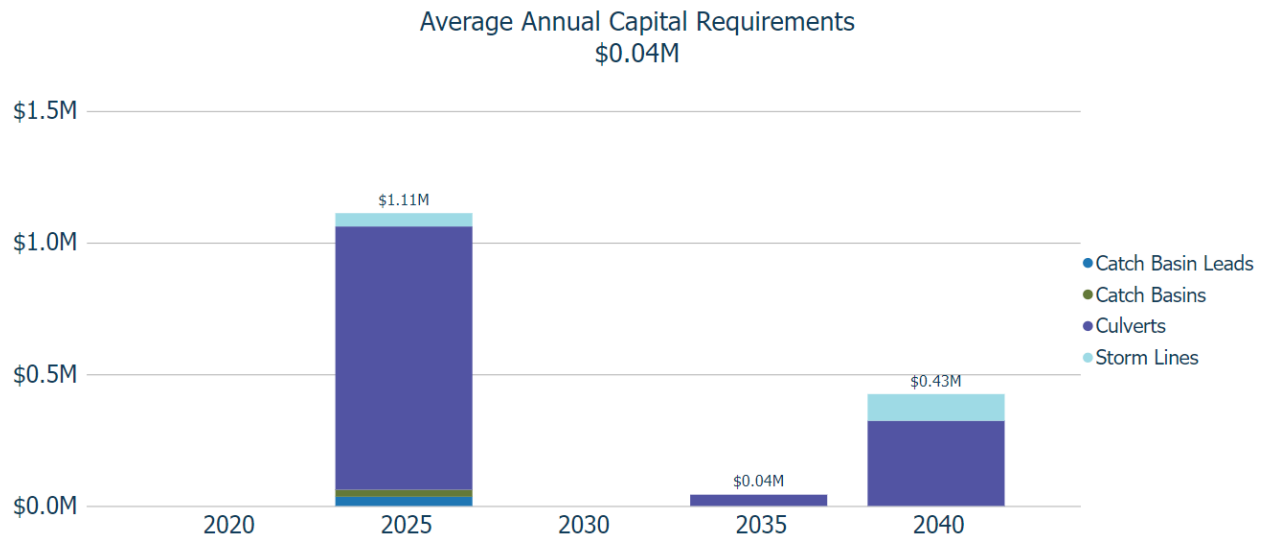


Forecasted Capital Requirements

Based on the current storm sewer inventory and assuming end-of-life replacement for all assets, the following graph forecasts short- and long-term capital requirements for the Stormwater Network category.

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 graph below provides a 20-year forecast. This projection is used as it ensures that every asset has gone through one full iteration of replacement and does not include assets that may be required for growth.



The specific 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 B.

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.



Risks to Current Asset Management Strategies

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



Asset Lifecycle Management

Operations tend to be reactive rather than proactive for this category. Problems are generally only known when issues arise, and complaints are made.

4.1.39 Levels of Service

The following tables identify the Township’s current level of service for Stormwater 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 Stormwater Network.

Service Attribute	Qualitative Description	Current LOS (2021)
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	TBD ⁵

Technical Levels of Service

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

Service Attribute	Technical Metric	Current LOS (2021)
Scope	% of properties in municipality resilient to a 100-year storm	0% ⁶
	% of the municipal stormwater management system resilient to a 5-year storm	100%
Performance	Capital reinvestment rate	0.00%

⁵ The Township does not currently have data available to determine this technical metric. Staff are working to gather this metric for the next iteration of the AMP that is required in 2025.

⁶ Staff have also indicated that the 2021 stormwater infrastructure installation located on Main Street in Kagawong has been designed to be resilient to a 25-year storm

4.1.40 Recommendations

Asset Inventory

- With the installation of the 2021 stormwater infrastructure, it is important to gather and consolidate relevant asset data into the central asset inventory to ensure all relevant assets are accounted for.

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 Stormwater Network through CCTV inspections.

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

- Gather unit costs for assets that have relied primarily on historical inflation and review periodically to ensure a higher level of accuracy and within the context of current market condition.
- Document and review lifecycle management strategies for the Stormwater Network on a regular basis to achieve the lowest total cost of ownership while maintaining adequate service levels.

Levels of Service

- Begin measuring 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.

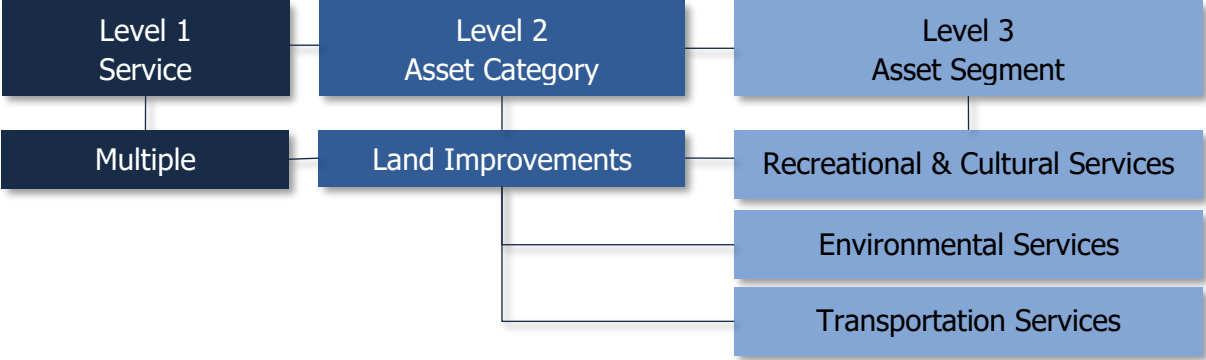
Land Improvements

The Land Improvements inventory is managed in CityWide™ and comprises of 5 unique assets that assist the Township in providing community recreation, cultural and natural outdoor space. This includes:

- Waterfront Improvements
- Parking Lots and Paved Surfaces
- Miscellaneous landscaping, irrigation and other purposed assets

4.1.41 Asset Hierarchy & Segmentation

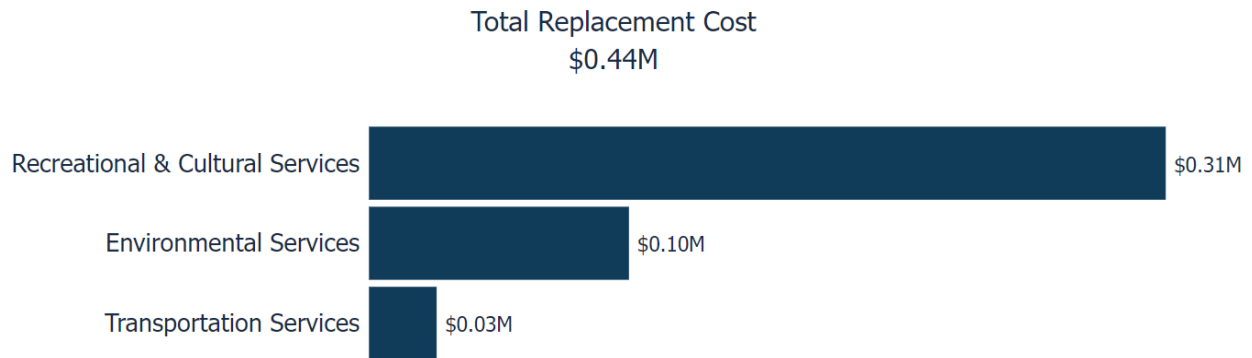
Asset hierarchy explains the relationship between individual assets and their components, and a wider, more expansive network and system. How assets are grouped in a hierarchy structure can impact how data is interpreted. Assets were structured to support meaningful, efficient reporting and analysis. Most reports and analytics presented in this AMP are summarized at the Asset Segment and/or Asset Category Levels.



4.1.42 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 Land Improvements inventory.

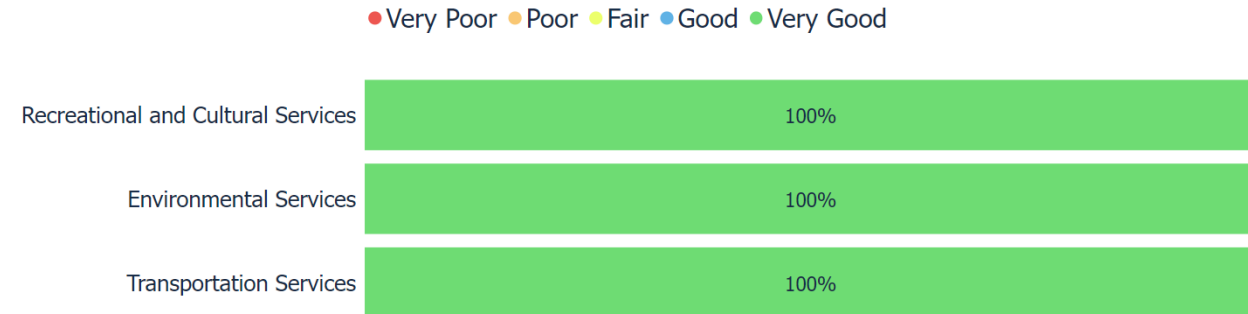
Asset Segment	Quantity	Replacement Cost Method	Total Replacement Cost
Recreational & Cultural Services	1	Historical Cost Inflation	\$309,253
Environmental Services	2	Historical Cost Inflation	\$100,908
Transportation Services	2	Historical Cost Inflation	\$26,265
			\$436,426



4.1.43 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
Recreational & Cultural Services	88%	Very Good	Age-based
Environmental Services	98%	Very Good	Age-based
Transportation Services	92%	Very Good	Age-based
	95%	Very Good	



To ensure that the Township’s Land Improvements 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 Land Improvements.

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:

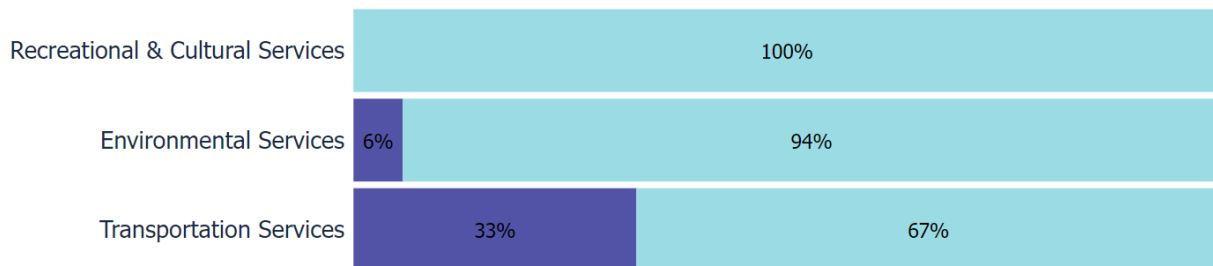
- Staff complete regular visual inspections of land improvements assets to ensure they are in state of adequate repair
- There are no formal condition assessment programs in place for land improvements assets

4.1.44 Estimated Useful Life & Average Age

The Estimated Useful Life for Land Improvements 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)
Recreational & Cultural Services	20 Years	4.0	15.9
Environmental Services	20 - 40 Years	15.3	14.8
Transportation Services	20 - 25 Years	8.8	13.8
		10.4	14.6

● No Service Life Remaining ● 0-5 Years Remaining ● 6-10 Years Remaining ● Over 10 Years Remaining



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.

4.1.45 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.

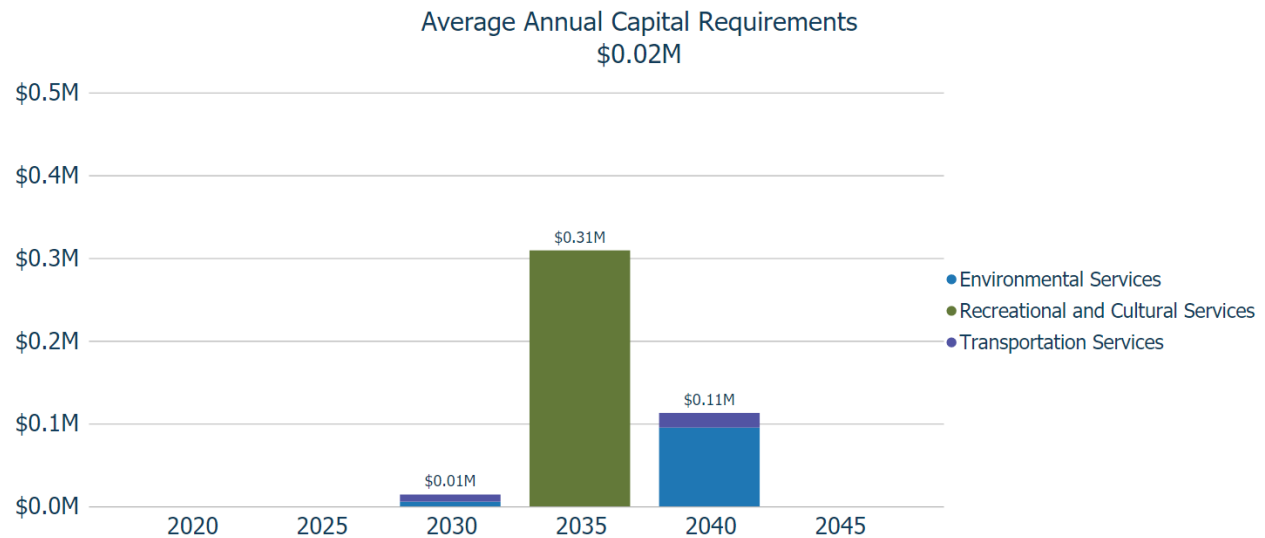
The following table outlines the Township’s current lifecycle management strategy.

Activity Type	Description of Current Strategy
Maintenance, Rehabilitation & Replacement	The Land Improvements asset category includes several unique asset types and lifecycle requirements are dealt with on a case-by-case basis

Forecasted Capital Requirements

Based on the current fleet inventory, and assuming end-of-life replacement for all assets, the following graph forecasts short- and long-term capital requirements for the land improvements category.

The graph below provides a 25-year forecast. This projection is used as it ensures that every asset has gone through one full iteration of replacement and does not include assets that may be required for growth.



The specific 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 B.

4.1.46 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.



Risks to Current Asset Management Strategies

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

Asset Data Confidence



The current inventory for land improvements is incomplete, resulting in a basic level of data maturity. This is a limiting factor in allowing for accurate and reliable projections, and Staff have indicated that the current inventory is incomplete.

4.1.47 Levels of Service

The following tables identify the Township’s current level of service for Land Improvement assets. 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 Land Improvement assets.

Service Attribute	Qualitative Description	Current LOS (2021)
Accessible & Reliable	Description, which may include maps, of municipal parks, trails, and recreational areas and their proximity to the surrounding community	Municipal Trails are not maintained on a structured schedule and do not meet accessibility requirements.
Safe & Regulatory	Description of the park inspection process and timelines for inspections	Parks are inspected on receipt of a complaint. There is an annual inspection, and garbage pickup two or three times per week during summer that provides cursory inspections.
Affordable	Description of the lifecycle activities (maintenance, rehabilitation and replacement) performed on parks and recreation assets	As required, no regular schedule, upgrades are usually funding based.
Sustainable	Description of the current condition of parks and the plans that are in place to maintain or improve the provided level of service	Fair Condition Walking bridge replacement in 2022 (pending funding)

Technical Levels of Service

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

Service Attribute	Qualitative Description	Current LOS (2021)
Accesible & Reliable	Square metres of park area per resident	56.87 m ²
	% park area in the Township	0.02%
Affordable	O&M cost for recreational assets	\$1,000
	Annual capital reinvestment rate	4.35%
Sustainable	% of parks and recreation assets that are in good or very good condition	100%
	% of parks and recreation assets that are in poor or very poor condition	0%

4.1.48 Recommendations

Asset Inventory

- Staff have indicated that the current land improvements asset inventory is incomplete and there are assets that have not been included. The Township should conduct an inventory review, collect and consolidate asset data to ensure all relevant assets are accounted for.

Replacement Costs

- All replacement costs used in this AMP were based on the inflation of historical costs. These costs should be evaluated to determine their accuracy and reliability. Replacement costs should be updated according to the best available information on the cost to replace the asset in today's value.

Condition Assessment Strategies

- Identify condition assessment strategies for high value and high-risk assets.
- Review assets that have surpassed their estimated useful life to determine if immediate replacement is required or whether these assets are expected to remain in-service. Adjust the service life and/or condition ratings for these assets accordingly.

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 this AMP 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.

Machinery & Equipment

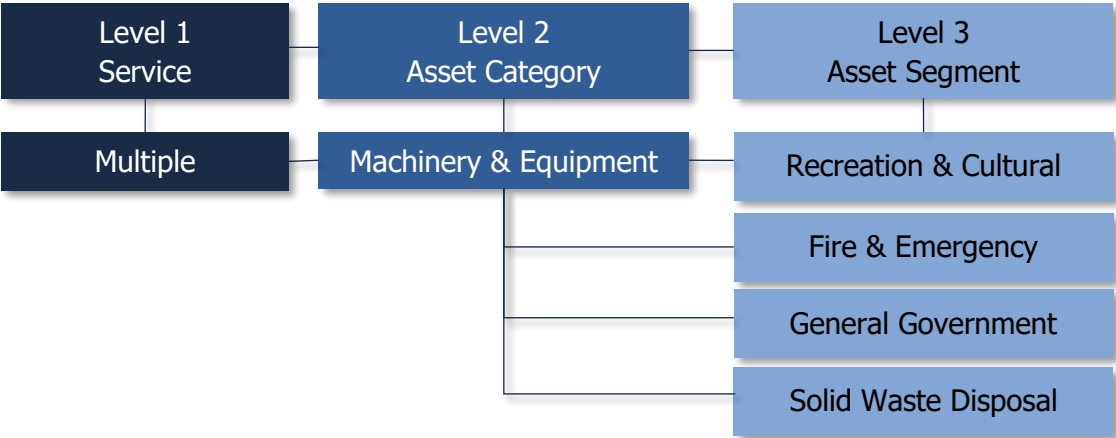
The Township’s Machinery & Equipment inventory is managed in CityWide™ and comprises of 12 unique assets. In order to maintain the high quality of public infrastructure and support the delivery of core and non-core services, Municipal Staff own and employ machinery and equipment assets which include:

- custodial equipment to maintain facilities,
- emergency services equipment to support first responders,
- furniture and fixtures for facilities, offices and buildings, and
- recreation equipment for parks and sports facilities.

Keeping machinery & equipment in an adequate state of repair is important to maintain a high level of service.

4.1.49 Asset Hierarchy & Segmentation

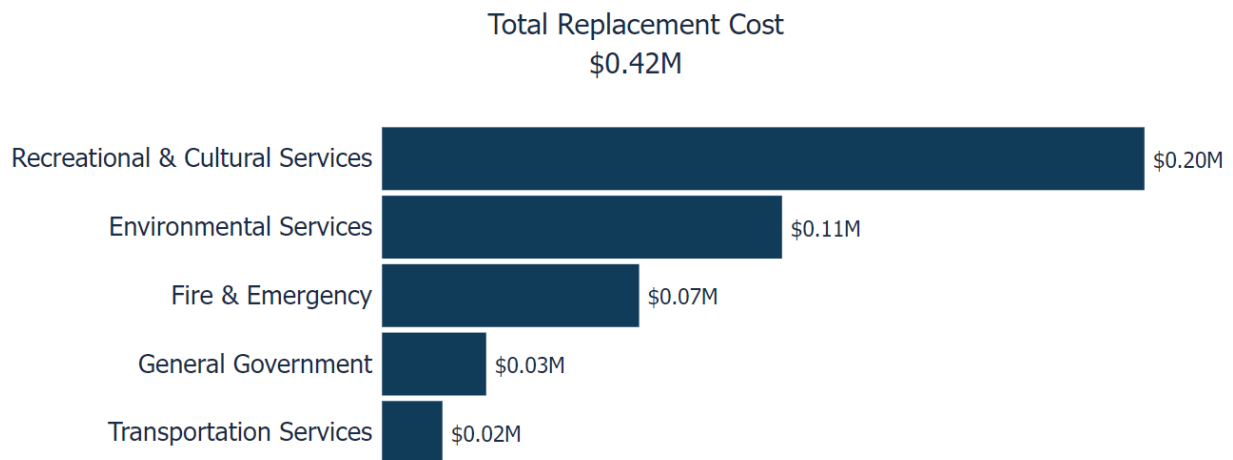
Asset hierarchy explains the relationship between individual assets and their components, and a wider, more expansive network and system. How assets are grouped in a hierarchy structure can impact how data is interpreted. Assets were structured to support meaningful, efficient reporting and analysis. Most reports and analytics presented in this AMP are summarized at the Asset Segment and/or Asset Category Levels.



4.1.50 Asset Inventory & Replacement Cost

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

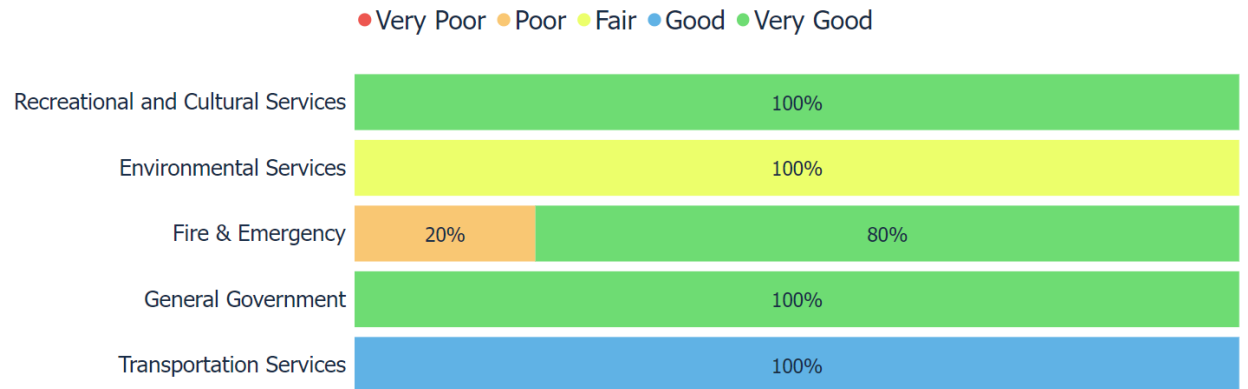
Asset Segment	Quantity	Replacement Cost Method	Total Replacement Cost
Recreation & Cultural Services	3	Historical Cost Inflation	\$203,756
Environmental Services	1	Historical Cost Inflation	\$106,900
Fire & Emergency	6	Historical Cost Inflation	\$68,714
General Government	1	Historical Cost Inflation	\$27,835
Transportation Services	1	Historical Cost Inflation	\$16,136
			\$423,341



4.1.51 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
Recreation & Cultural Services	87%	Very Good	Age-based
Environmental Services	44%	Fair	Age-based
Fire & Emergency	74%	Good	Age-based
General Government	87%	Very Good	Age-based
Transportation Services	76%	Good	Age-based
	73%	Good	



To ensure that the Township's Machinery & Equipment 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 Machinery & Equipment.

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:

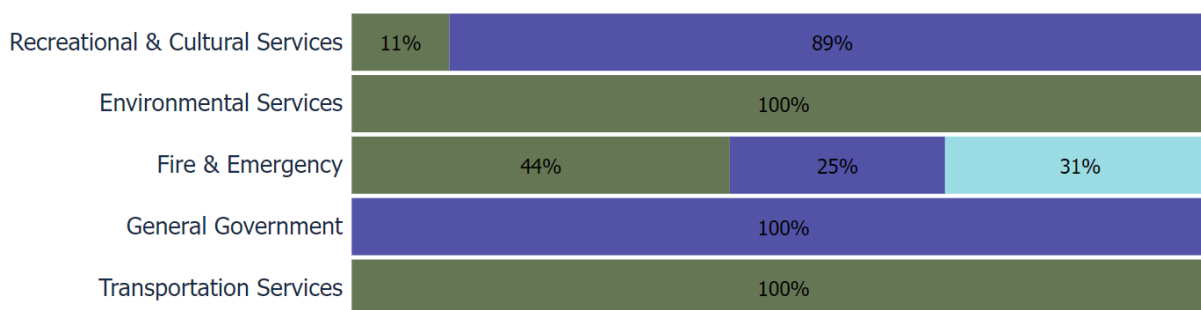
- Staff complete regular visual inspections of machinery & equipment to ensure they are in state of adequate repair
- Condition assessments are conducted on Fire & Emergency assets in accordance with health and safety regulations including National Fire Protection Association (NFPA) codes and standards for fire service-related assets
- Staff conduct formal inspections of outdoor play space, fixed play structures and surfacing in accordance with CAN/CSA-Z614 and required as per O. Reg. 137/15

4.1.52 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)
Recreation & Cultural Services	10 - 20 Years	6.8	6.5
Environmental Services	20 Years	18.0	2.0
Fire & Emergency	10 - 20 Years	8.8	7.9
General Government	20 Years	10.0	9.9
Transportation Services	10 Years	6.5	3.5
		9.0	6.8

● No Service Life Remaining ● 0-5 Years Remaining ● 6-10 Years Remaining ● Over 10 Years Remaining



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.

4.1.53 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.

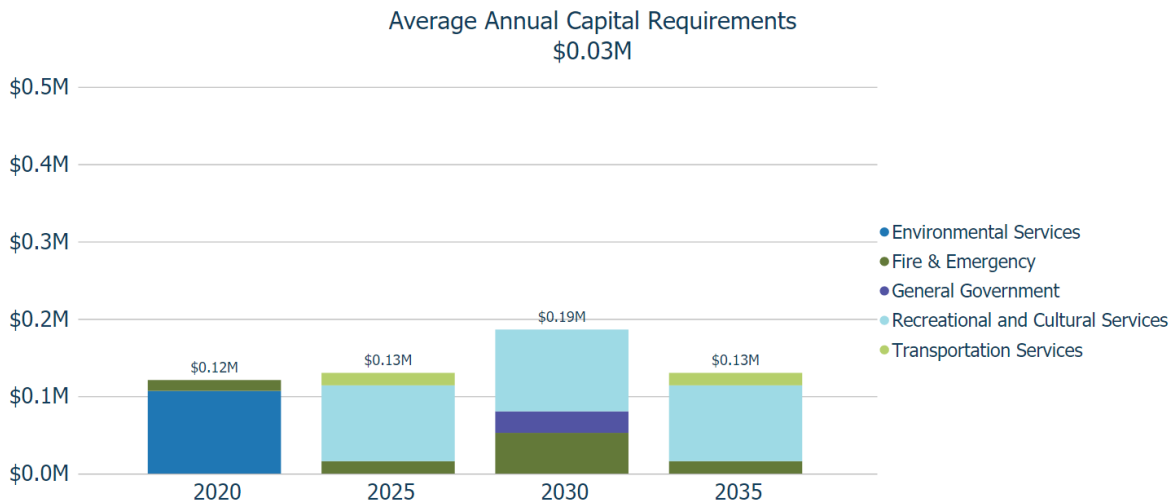
The following table outlines the Township’s current lifecycle management strategy.

Activity Type	Description of Current Strategy
Maintenance/ Rehabilitation	Maintenance program varies by department
	Fire Protection and Emergency Services equipment is subject to a much more rigorous inspection and maintenance program compared to most other departments
	Machinery & Equipment is maintained according to manufacturer recommended actions and supplemented by the expertise of municipal staff
Replacement	The replacement of machinery & equipment depends on deficiencies identified by operators that may impact their ability to complete required tasks

Forecasted Capital Requirements

Based on the current machinery & equipment inventory, and assuming end-of-life replacement for all assets, the following graph forecasts short- and long-term capital requirements for the Machinery & Equipment category.

The graph below provides a 15-year forecast. This projection is used as it ensures that every asset has gone through one full iteration of replacement and does not include assets that may be required for growth.



The specific 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 B.

4.1.54 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.



Risks to Current Asset Management Strategies

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



Aging Assets

As machinery and equipment assets continue to age, there are several assets that have approached and/or exceeded their original useful life. Staff have recognized this and are developing a decision-making process to determine how to plan and prioritize for assets that will require replacement or disposal.

4.1.55 Levels of Service

The following tables identify the Township’s current level of service for Land Improvement assets. 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 Machinery & Equipment assets.

Service Attribute	Qualitative Description	Current LOS (2021)
Safe & Reliable	Description of the equipment inspection process and any licensing requirements for operators.	Operators are trained, properly licenced, inspection processes are in place for all machinery and equipment.
Sustainable	Description of the current condition of equipment and the plans that are in place to maintain or improve the provided level of service.	Machinery & Equipment assets are in good to fair condition and the Township is going to maintain the current level of service.

Technical Levels of Service

The following table outlines the quantitative metrics that determine the technical level of service provided by Machinery & Equipment assets.

Service Attribute	Qualitative Description	Current LOS (2021)
Safe & Reliable	% of equipment where pre/post inspections are completed	0%
	Annual capital reinvestment rate	4.72%
Sustainable	% of machinery & equipment assets that are in good or very good condition	33%
	% of machinery & equipment assets that are in poor or very poor condition	11%

4.1.56 Recommendations

Asset Inventory

- Staff have indicated that the current asset inventory is incomplete and there are machinery and equipment assets that have not been included. The Township should conduct an inventory review, collect and consolidate asset data to ensure all relevant assets are accounted for.

Replacement Costs

- All replacement costs used in this asset category were based on the inflation of historical costs. These costs should be evaluated to determine their accuracy and reliability. Replacement costs should be updated according to the best available information on the cost to replace the asset in today's value.

Condition Assessment Strategies

- Identify condition assessment strategies for high value and high-risk machinery and equipment assets.
- Review assets that have surpassed their estimated useful life to determine if immediate replacement is required or whether these assets are expected to remain in-service. Adjust the service life and/or condition ratings for these assets accordingly.

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 this AMP 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.

5

Analysis of Rate-funded Assets

Key Insights

- Rate-funded assets are valued at \$17.27 million
- 78% 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 \$0.38 million
- To reach sustainability for the water network, water rates need to be increased by 6.3% annually for the next 20 years to eliminate annual deficits

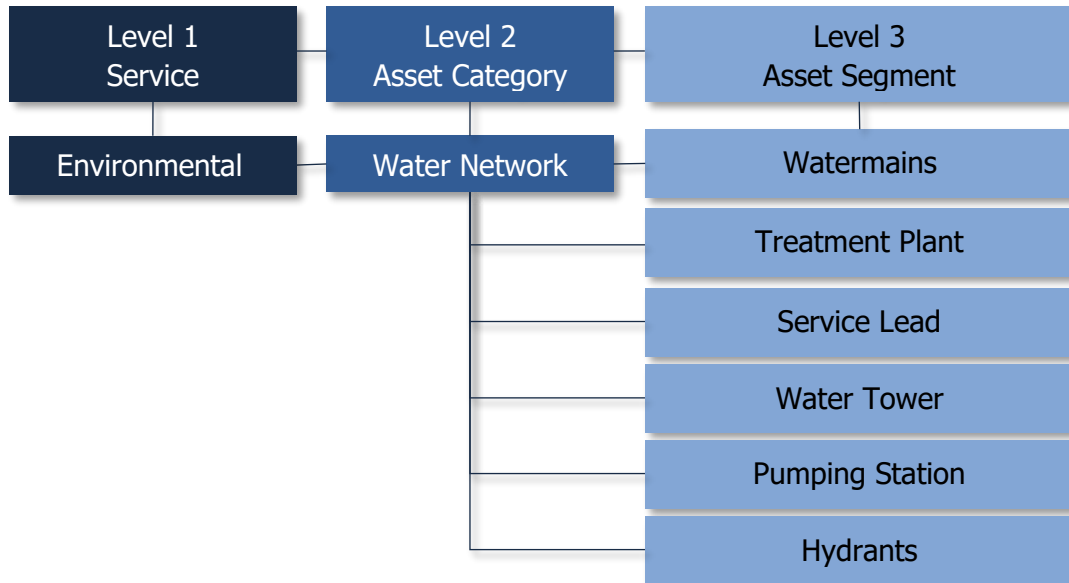
Water Network

The Township’s Water Network inventory is managed in CityWide™, and comprises of 497 unique assets, including 12 kilometres of mains, approximately 8 hydrants and 3 kilometres of service leads, as well as several water facilities like the treatment plant, water tower, low lift station and the pumping station.

The Public Works department, along with supporting assets such as facilities, fleet and machinery & equipment, as well as coordination from the Ontario Clean Water Agency (OCWA), is responsible for planning and managing the Water Network.

5.1.1 Asset Hierarchy & Segmentation

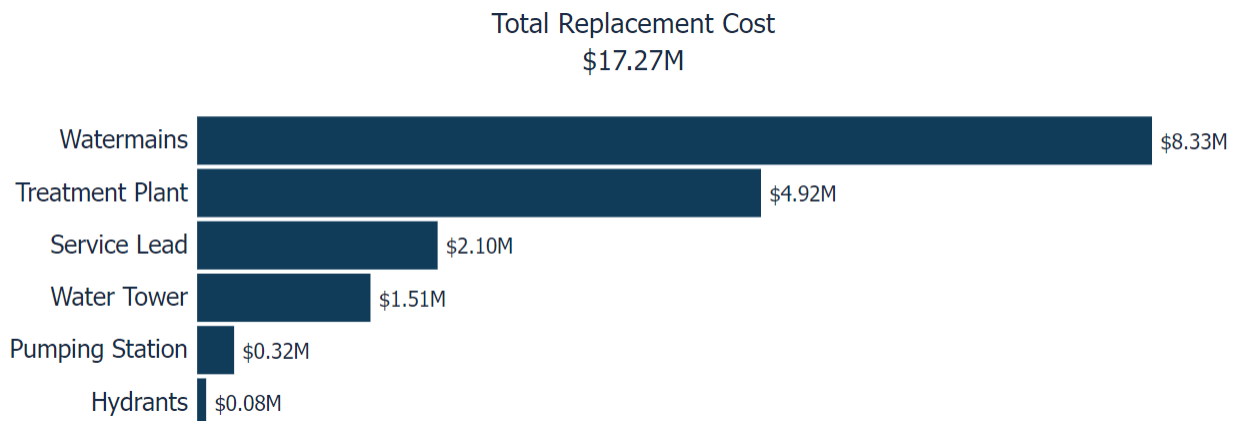
Asset hierarchy explains the relationship between individual assets and their components, and a wider, more expansive network and system. How assets are grouped in a hierarchy structure can impact how data is interpreted. Assets were structured to support meaningful, efficient reporting and analysis. Most reports and analytics presented in this AMP are summarized at the Asset Segment and/or Asset Category Levels.



5.1.2 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 Network inventory.

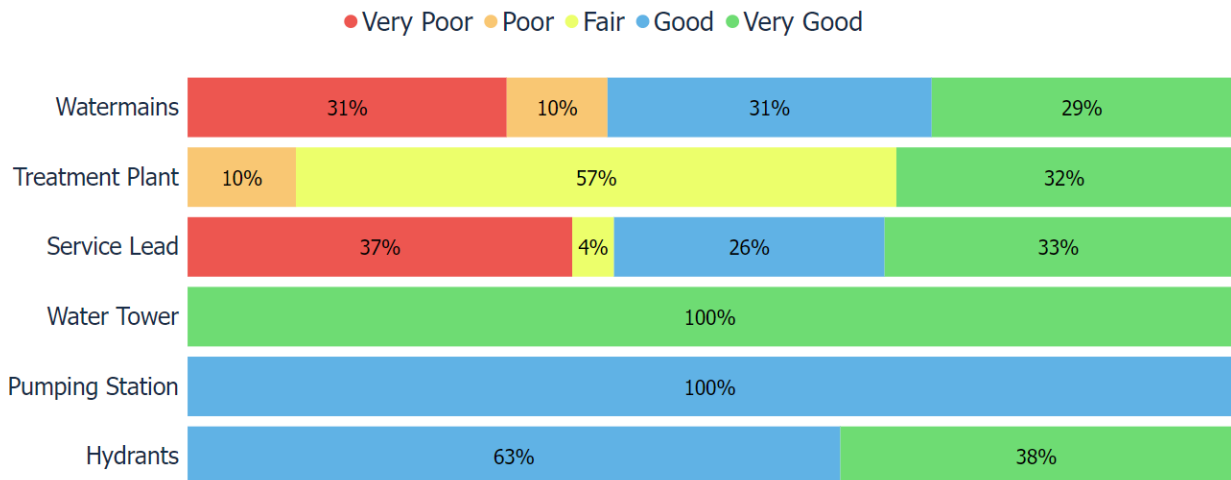
Asset Segment	Quantity	Replacement Cost Method	Total Replacement Cost
Watermains	12 km	Cost per Unit	\$8,332,121
Treatment Plant	1	Historical Cost Inflation	\$4,920,182
Service Lead	3 km	Cost per Unit	\$2,098,654
Water Tower	1	Historical Cost Inflation	\$1,512,663
Pumping Station	1	Historical Cost Inflation	\$322,894
Hydrants	8	Cost per Unit	\$78,800
			\$17,265,313



5.1.3 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
Watermains	57%	Fair	Age-based
Treatment Plant	91%	Very Good	Age-based
Service Lead	58%	Fair	Age-based
Water Tower	94%	Very Good	Age-based
Pumping Station	77%	Good	Age-based
Hydrants	77%	Good	Age-based
	70%	Good	



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

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:

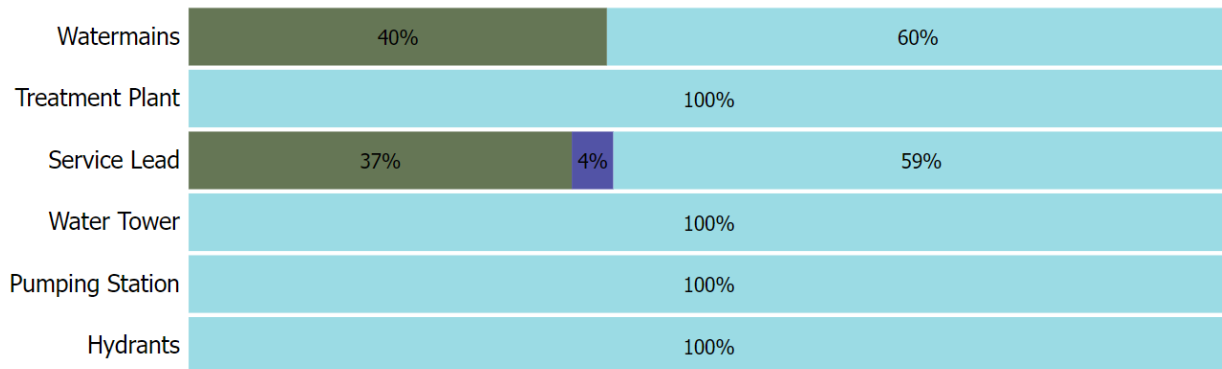
- OCWA provides the Township with multi-year forecasts and inspections as required under O. Reg. 170/3 are conducted
- Staff primarily rely on the age and material of water mains to determine the projected condition of water mains

5.1.4 Estimated Useful Life & Average Age

The Estimated Useful Life for Water 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)
Watermains	50 Years	31.5	17.5
Treatment Plant	20 - 40 Years	18.2	19.0
Service Lead	50 Years	38.1	11.9
Water Tower	40 - 80 Years	9.5	50.5
Pumping Station	40 Years	25.5	14.5
Hydrants	50 Years	31.7	18.4
		34.8	14.6

● No Service Life Remaining ● 0-5 Years Remaining ● 6-10 Years Remaining ● Over 10 Years Remaining



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.

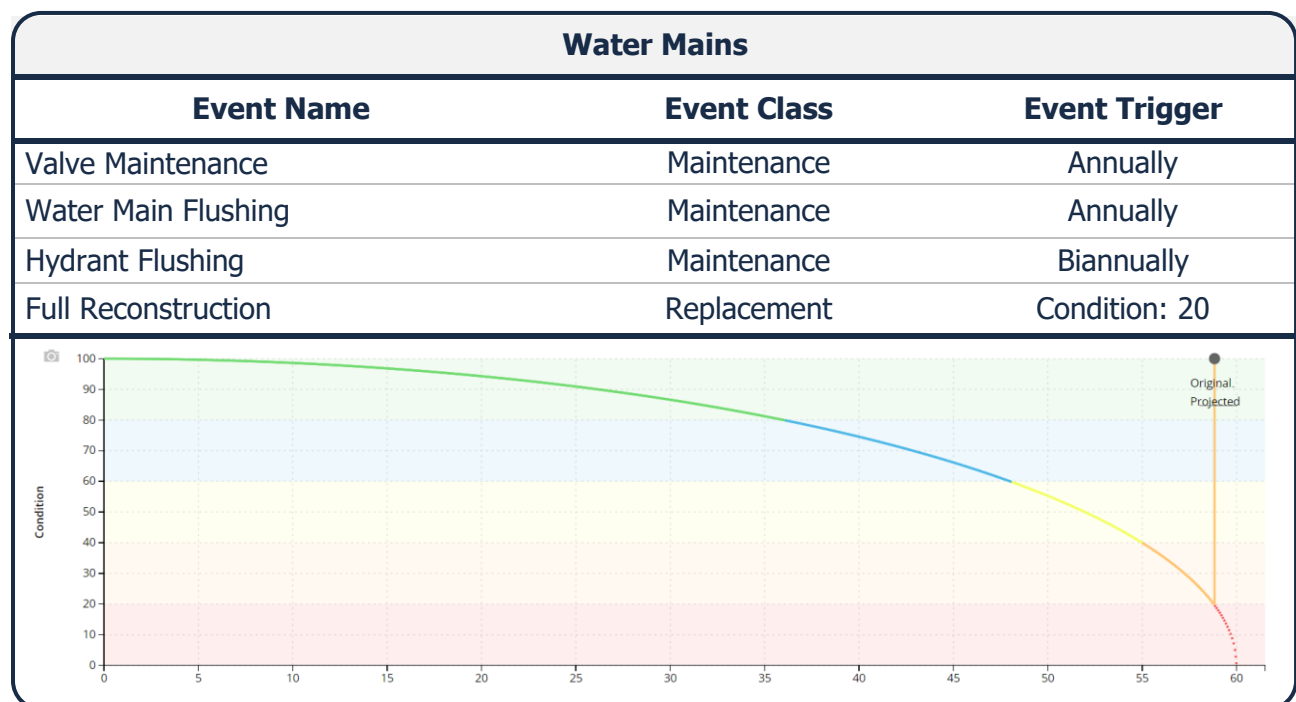
5.1.5 Lifecycle Management Strategy

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	Valves undergo annual maintenance
	Periodic pressure testing to identify deficiencies and potential leaks
	Mains are flushed annually, and hydrants are flushed biannually
Rehabilitation/ Replacement	In the absence of mid-lifecycle rehabilitative events, most mains are simply maintained with the goal of full replacement once it reaches its end-of-life
	The Water System Financial Plan (2021 - 2027) provides capital projections that include replacement and rehabilitative activities for specific assets and components
	Other replacement activities are identified based on an analysis of the main break rate as well as any issues identified during regular maintenance activities

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

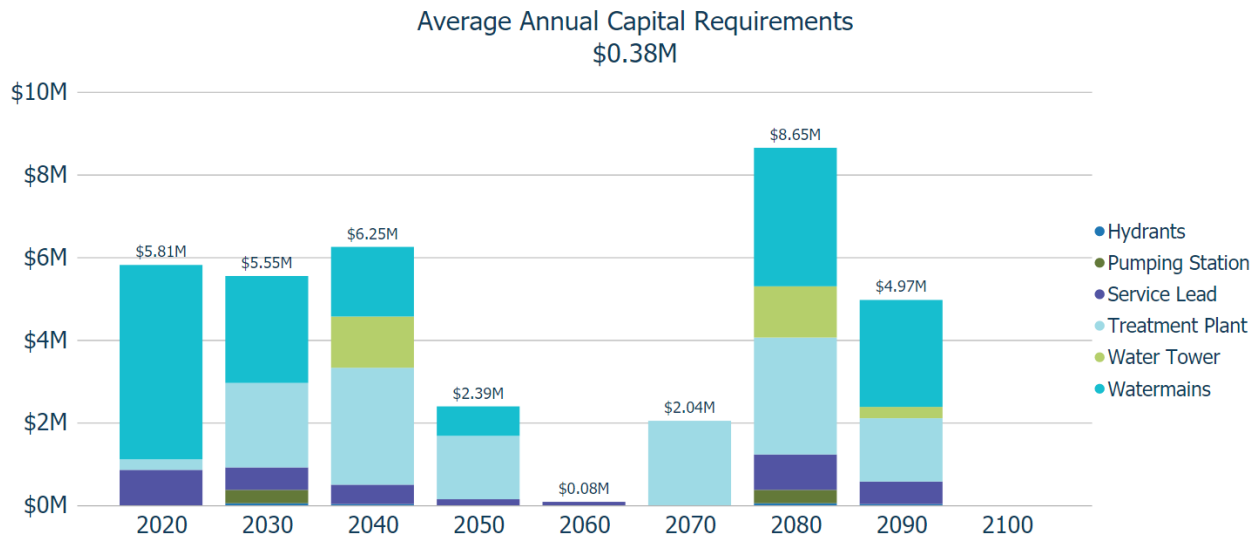


Forecasted Capital Requirements

Based on the specific lifecycle activities identified in the Water System Financial Plan (2021 - 2027), and assuming end-of-life replacement for all assets, the following graph forecasts short- and long-term capital requirements for the Water Network category.

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 graph below provides an 80-year forecast. This projection is used as it ensures that every asset has gone through one full iteration of replacement and does not include assets that may be required for growth.



The specific 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 B.

5.1.6 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.



Risks to Current Asset Management Strategies

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



Asset Data and Information

There is a misalignment in the current inventory data for critical water network assets, particularly water network facilities. Some of the asset data has not been consolidated into the Township's central asset inventory. This poses a risk and will lead to discrepancies when trying to manage assets and planning future work.



Assessed Condition Data

Water Network assets such as mains are difficult to visually inspect, in contrast to storm and sanitary mains which can have CCTV inspections. Water main condition assessments generally rely on age-based estimates of current condition and pipe material to try and predict when mains need to be replaced.

5.1.7 Levels of Service

The following tables identify the Township’s current level of service for the Water 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 Water Network.

Service Attribute	Qualitative Description	Current LOS (2021)
Scope	Description, which may include maps, of the user groups or areas of the municipality that are connected to the municipal water system	TBD ⁷
	Description, which may include maps, of the user groups or areas of the municipality that have fire flow	There are hydrants within in the Township that can provide fire flow and have fire fighting capacity.
Reliability	Description of boil water advisories and service interruptions	The Township has experienced 2 boil water advisories in 2020 due to marina upgrades.

⁷ The Township does not currently have data available to determine this qualitative metric. Staff are working to gather this metric for the next iteration of the AMP that is required in 2025.

Technical Levels of Service

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

Service Attribute	Technical Metric	Current LOS (2021)
Scope	% of properties connected to the municipal water system	13%
	% 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	0.11
	# 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	0.083
Performance	Capital re-investment rate	0.38%

5.1.8 Recommendations

Asset Inventory

- Continue to refine and consolidate asset data into the central asset inventory to ensure all relevant assets are accounted for.
- 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 Network assets.

Risk Management Strategies

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

Levels of Service

- Continue to measure current levels of service in accordance with the metrics that the 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
- The population of the Township is expected to grow at a slow rate
- 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 District of Manitoulin Official Plan (October 2018)

The District of Manitoulin adopted the Official Plan with modifications in October 2018 and replaces the last provincially approved Official Plan of 1979.

The Official Plan provides the essential tools to direct future growth, development and change within the Planning Area and to create more sustainable communities for its residents. It responds to future uncertainties through clear and resilient principles and policies.

The Plan plays a number of essential roles in the future planning of the District. Specifically, the Plan:

1. Establishes the basic land use framework for all land within the jurisdiction of the District.
2. Sets out a 20-year growth management regime for the District through to 2036.
3. Provides for the coordination of land use planning and infrastructure deployment to ensure that the District can accommodate anticipated population levels over the 20-year planning horizon to 2036.
4. Sets out policies to encourage economic development in the District, including policies for employment-based land uses, with the view to encourage synergies and collaboration between compatible businesses.
5. Guides private investment through land use and development policies to ensure efficient development approvals and administrative processes that strive to achieve the District's goals through a number of objectives.
6. Provides policies to improve the sustainability of the District, to ensure the quality of life and to secure the health, safety, convenience and welfare for the present and future inhabitants of the District.
7. Responds to provincial policies, statements and guidelines that affect the District and appropriately incorporates them in the Official Plan.

The Plan is intended to guide Councils and the Planning Board in the consideration of their responsibilities and provides direction and certainty to the citizens and business of the District of Manitoulin.

The following table outlines the growth projections as indicated in the Plan.

Year	Population	Dwellings	Employment
2011	8,350	3,710	3,370
2016	8,470	3,760	3,350
2021	8,610	3,820	3,290
2026	8,730	3,870	3,220
2031	8,810	3,910	3,050
2036	8,880	3,940	2,950

The Official Plan projects the population of the District to grow at a slow rate and there is an expected decrease of the working population (ages 15 to 69 years) in 2036.

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 \$345,000 towards capital projects per year from sustainable revenue sources
- Given the annual capital requirement of \$1,935,748 there is currently a funding gap of \$1,590,748 annually
- For tax-funded assets, we recommend increasing tax revenues by 3.3% each year for the next 20 years to achieve a sustainable level of funding
- For the Water Network, we recommend increasing rate revenues by 6.3% annually for the next 20 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 Billings to identify the financial resources required for sustainable asset management based on existing asset inventories, desired levels of service, and projected growth requirements.

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

1. The financial requirements for:
 - a. Existing assets
 - b. Existing service levels
 - c. Requirements of contemplated changes in service levels (none identified for this plan)
 - d. Requirements of anticipated growth (none identified for this plan)
2. Use of traditional sources of municipal funds:
 - a. Tax levies
 - b. User fees
 - c. 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:

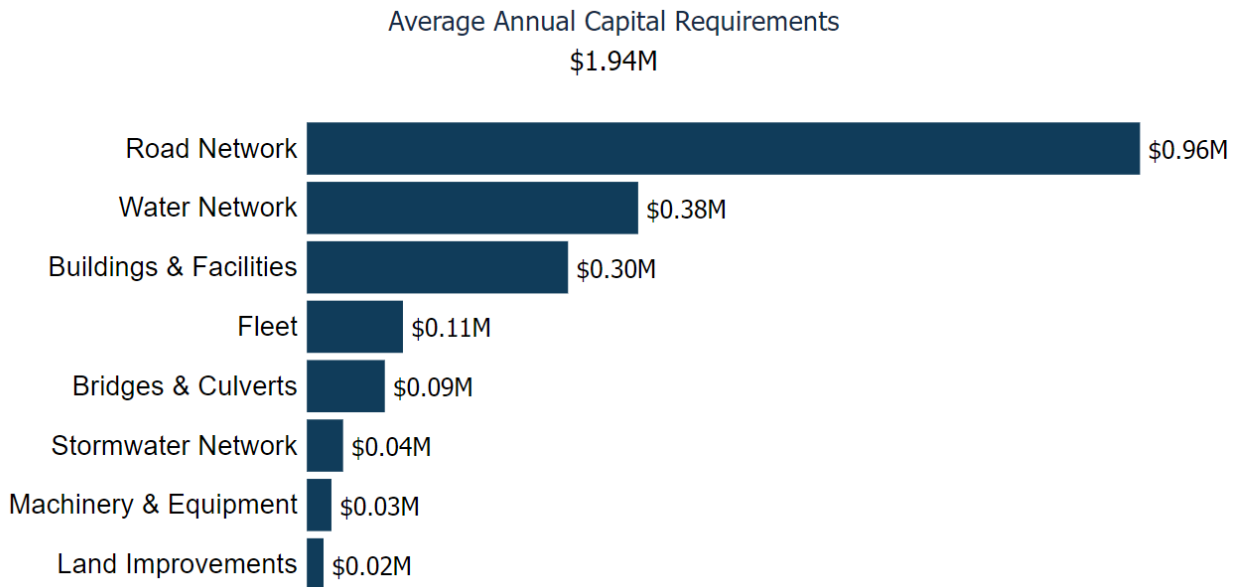
1. In order to reduce financial requirements, consideration has been given to revising service levels downward.

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 \$1.94 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. In addition, capital project forecasts from the Water System Financial Plan 2021-2027, the 2020 Bridge & Culvert Inspection report and the 2018 Building Inspection Report have also been factored in.

The development of these strategies allows for a comparison of potential cost avoidance if the strategies were to be implemented. The following table compares two scenarios for the Road Network and the Water Network:

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

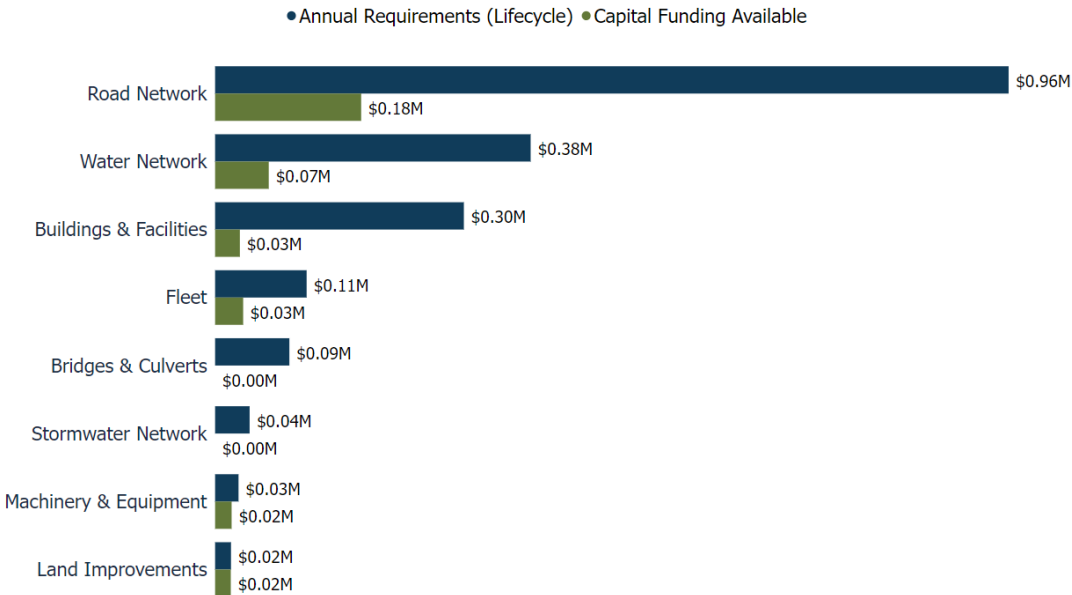
Asset Category	Annual Requirements (Replacement Only)	Annual Requirements (Lifecycle Strategy)	Difference
Road Network	\$1,912,000	\$962,000	\$950,000

The implementation of a proactive lifecycle strategy for roads leads to a potential annual cost avoidance of \$950,000 for the Road Network. This represents a reduction of the annual requirements for Road Network by 50%.

As the lifecycle strategy scenario represents the lowest cost option available to the Township, we have used it 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 \$345,000 towards capital projects per year. Given the annual capital requirement of \$1,935,748 there is currently a funding gap of \$1,590,748 annually.



Funding Objective

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

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

Note: For the purposes of this AMP, we have excluded gravel roads since they are a perpetual maintenance asset and end of life replacement calculations do not normally apply. If gravel roads are maintained properly, they can theoretically have a limitless service life. For each scenario developed we have included strategies, where applicable, regarding the use of cost containment and funding opportunities.

Financial Profile: Tax Funded Assets

7.1.2 Current Funding Position

The following tables show, by asset category, the Township’s average annual asset capital expenditure (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			Total Available	Annual Deficit
		Taxes	Gas Tax	OCIF		
Bridges and Culverts	90,000	0	0	0	0	90,000
Buildings & Facilities	302,000	30,000	0	0	30,000	272,000
Fleet	111,000	34,000	0	0	34,000	77,000
Land Improvements	19,000	19,000	0	0	19,000	0
Machinery & Equipment	28,000	20,000	0	0	20,000	8,000
Road Network	962,000	90,000	37,000	50,000	177,000	785,000
Stormwater Network	41,818	0	0	0	0	41,818
	1,553,376	193,000	37,000	50,000	280,000	1,273,376

The average annual investment requirement for the above categories is \$1.55 million. Annual revenue currently allocated to these assets for capital purposes is \$0.28 million leaving an annual deficit of \$1.27 million. Put differently, these infrastructure categories are currently funded at 18% of their long-term requirements.

7.1.3 Full Funding Requirements

In 2020, the Township of Billings had annual tax revenues of \$1.9 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 and Culverts	4.8%
Buildings & Facilities	14.4%
Fleet	4.1%
Land Improvements	0.0%
Machinery & Equipment	0.4%
Road Network	41.6%
Stormwater Network	2.2%
	67.5%

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

- a) The Township’s formula based OCIF grant is scheduled to remain the same at \$50,000 from 2019 to 2021.
- b) The Township’s debt payments for these asset categories will be decreasing by \$36,000 next year.

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	1,275,000	1,275,000	1,275,000	1,275,000	1,275,000	1,275,000	1,275,000	1,275,000
Change in Debt Costs	N/A	N/A	N/A	N/A	-18,000	-18,000	-18,000	-18,000
Change in OCIF Grants	N/A	N/A	N/A	N/A	-	-	-	-
Resulting Infrastructure Deficit	1,275,000	1,275,000	1,275,000	1,275,000	1,257,000	1,257,000	1,257,000	1,257,000
Tax Increase Required	67.6%	67.6%	67.6%	67.6%	66.6%	66.6%	66.6%	66.6%
Annually	13.5%	6.8%	4.5%	3.4%	13.3%	6.7%	4.4%	3.3%

7.1.4 Financial Strategy Recommendations

Considering all the above information, we recommend the 20-year option. This involves full CapEx funding being achieved over 20 years by:

- a) when realized, reallocating the debt cost reductions to the infrastructure deficit as outlined above.
- b) increasing tax revenue by 3.3% each year for the next 20 years solely for the purpose of phasing in full funding to the asset categories covered in this section of the AMP.
- c) adjusting tax revenue increases in future year(s) when allocations to CapEx exceed or fail to meet budgeted amounts.
- d) allocating the current gas tax and OCIF revenue as outlined previously.
- e) allocating the scheduled OCIF grant increases to the infrastructure deficit as they occur.
- f) reallocating appropriate revenue from categories in a surplus position to those in a deficit position.
- g) 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 any applicable OCIF formula-based funding since this funding is a multi-year commitment⁸.
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 20 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 \$445k 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.

⁸ 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. This review may 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 CapEx investment 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
		Rates	OCIF	Total Available	
Water Network	382,373	65,000	0	65,000	317,373
	382,373	65,000	0	65,000	317,373

The average annual CapEx requirement for the above categories is \$382k. Annual revenue currently allocated to these assets for capital purposes is \$65k leaving an annual deficit of \$317k. Put differently, these infrastructure categories are currently funded at 17% of their long-term requirements.

7.1.6 Full Funding Requirements

In 2020, the Township had annual water revenues of \$254k. 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	Tax Change Required for Full Funding
Water Network	125%
Total	125%

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

	Water Network			
	5 Years	10 Years	15 Years	20 Years
Infrastructure Deficit	317,000	317,000	317,000	317,000
Rate Increase Required	124.8%	124.8%	124.8%	124.8%
Annually:	25.0%	12.5%	8.3%	6.3%

7.1.7 Financial Strategy Recommendations

Considering the above information, we recommend the 20-year option. This involves full CapEx funding being achieved over 20 years by:

- a) increasing rate revenues by 6.3% for the Water Network each year for the next 20 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. Current data shows no pent-up investment demand for the Water Network.

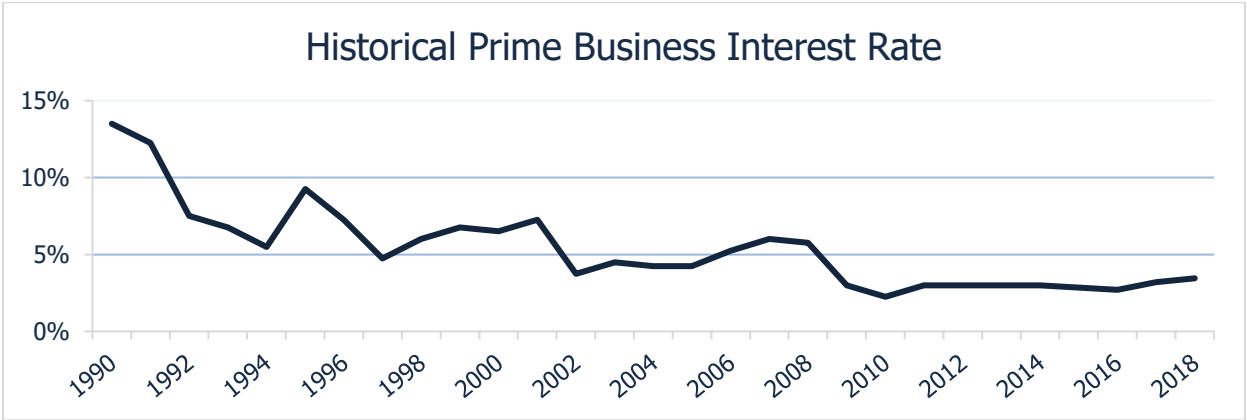
Prioritizing future projects will require the current data to be replaced by condition-based data. Although our recommendations include no further use of debt, the results of the condition-based analysis may require otherwise.

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%⁹ 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:



⁹ 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 \$35,000 of debt outstanding for the assets covered by this AMP with corresponding principal and interest payments of \$18,000, well within its provincially prescribed maximum of \$611,307.

Asset Category	Current Debt Outstanding	Use of Debt in the Last Five Years				
		2016	2017	2018	2019	2020
Bridges and Culverts	0	0	0	0	0	0
Buildings & Facilities	0	0	0	0	0	0
Fleet	0	0	0	0	0	0
Land Improvements	0	0	0	0	0	0
Machinery & Equipment	35,000	0	0	0	0	0
Road Network	0	0	0	0	0	0
Stormwater Network	0	0	0	0	0	0
Total Tax Funded:	35,000	0	0	0	0	0
<hr/>						
Water Network	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
Bridges and Culverts	0	0	0	0	0	0	0
Buildings & Facilities	0	0	0	0	0	0	0
Fleet	0	0	0	0	0	0	0
Land Improvements	0	0	0	0	0	0	0
Machinery & Equipment	18,000	36,000	0	0	0	0	0
Road Network	0	0	0	0	0	0	0
Stormwater Network	0	0	0	0	0	0	0
Total Tax Funded:	18,000	36,000	0	0	0	0	0
<hr/>							
Water Network	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 The Township 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 and Culverts	0
Buildings & Facilities	1,093,000
Fleet	0
Land Improvements	0
Machinery & Equipment	445,000
Road Network	445,000
Stormwater Network	0
Total Tax Funded:	1,983,000
<hr/>	
Water Network	340,000
Total Rate Funded:	340,000

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 of Billings 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 includes a one-page report card with an overview of key data from each asset category
- Appendix B identifies projected 10-year capital requirements for each asset category
- Appendix C identifies the criteria used to calculate risk for each asset category
- Appendix D provides a tailored list of next steps to advance the Township's asset management program
- Appendix E provides an O. Reg. 588/17 compliance snapshot
- Appendix F provides additional guidance on the development of a condition assessment program
- Appendix G provides a glossary of terms

Appendix A: Infrastructure Report Card

Asset Category	Replacement Cost (millions)	Asset Condition	Financial Capacity	
Road Network	\$42.4	Fair	Annual Requirement:	\$961,573
			Funding Available:	\$177,000
			Annual Deficit:	\$784,573
Buildings & Facilities	\$11.03	Very Poor	Annual Requirement:	\$301,441
			Funding Available:	\$30,000
			Annual Deficit:	\$271,441
Bridges & Culverts	\$2.70	Poor	Annual Requirement:	\$89,991
			Funding Available:	\$0
			Annual Deficit:	\$0
Fleet	\$1.80	Fair	Annual Requirement:	\$110,909
			Funding Available:	\$34,000
			Annual Deficit:	\$76,909
Stormwater Network	\$1.58	Fair	Annual Requirement:	\$41,818
			Funding Available:	\$0
			Annual Deficit:	\$41,818
Land Improvements	\$0.44	Very Good	Annual Requirement:	\$19,265
			Funding Available:	\$19,000
			Annual Deficit:	\$265
Machinery & Equipment	\$0.42	Good	Annual Requirement:	\$28,379
			Funding Available:	\$20,000
			Annual Deficit:	\$8,379
Water Network	\$17.27	Good	Annual Requirement:	\$382,373
			Funding Available:	\$65,000
			Annual Deficit:	\$317,373
Overall	\$77.64	Fair	Annual Requirement:	\$1,935,748
			Funding Available:	\$345,000
			Annual Deficit:	\$1,590,748

Appendix B: 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
Gravel Roads	\$0	\$1,470,000	\$11,424	\$130,000	\$2,780,500	\$87,500	\$144,231	\$830,707	\$50,000	\$946,000	\$0
Paved Roads	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Streetlights	\$0	\$0	\$0	\$2,200	\$0	\$0	\$0	\$2,200	\$0	\$0	\$0
Surface Treated Roads	\$0	\$143,556	\$81,072	\$74,000	\$25,000	\$100,000	\$45,538	\$79,415	\$797,000	\$0	\$0
	\$0	\$1,613,556	\$92,496	\$206,200	\$2,805,500	\$187,500	\$189,769	\$912,322	\$847,000	\$946,000	\$0

Buildings & Facilities											
Asset Segment	Backlog	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
Fire & Emergency	\$0	\$0	\$884,425	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
General Government	\$0	\$5,412	\$17,665	\$11,262	\$0	\$1,172	\$0	\$0	\$12,434	\$489,558	\$0
Recreational and Cultural Services	\$75,345	\$69,276	\$115,929	\$22,524	\$4,595	\$580,374	\$16,284	\$127,486	\$589,543	\$254,627	\$31,046
Transportation Services	\$12,734	\$0	\$14,905	\$0	\$0	\$1,172	\$0	\$0	\$0	\$0	\$0
	\$88,079	\$74,688	\$1,032,924	\$33,786	\$4,595	\$582,718	\$16,284	\$127,486	\$601,977	\$744,185	\$31,046

Bridges & Culverts

Asset Segment	Backlog	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
Bridges	\$0	\$0	\$1,000,000	\$1,000,000	\$0	\$0	\$0	\$0	\$0	\$0	\$2,895
Structural Culverts	\$0	\$1,000	\$0	\$0	\$0	\$45,000	\$0	\$0	\$0	\$0	\$0
	\$0	\$1,000	\$1,000,000	\$1,000,000	\$0	\$45,000	\$0	\$0	\$0	\$0	\$2,895

Fleet

Asset Segment	Backlog	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
Environmental Services	\$0	\$0	\$0	\$0	\$12,511	\$0	\$0	\$0	\$0	\$0	\$0
Fire & Emergency	\$176,540	\$0	\$0	\$0	\$0	\$40,039	\$0	\$276,641	\$0	\$0	\$0
Transportation Services	\$291,497	\$103,820	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$457,092	\$353,304
	\$468,037	\$103,820	\$0	\$0	\$12,511	\$40,039	\$0	\$276,641	\$0	\$457,092	\$353,304

Stormwater Network

Asset Segment	Backlog	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
Catchbasin Lead	\$0	\$0	\$0	\$0	\$0	\$0	\$35,000	\$0	\$0	\$0	\$0
Storm Catchbasins	\$0	\$0	\$0	\$0	\$0	\$0	\$26,600	\$0	\$0	\$0	\$0
Storm Culverts	\$111,304	\$0	\$0	\$0	\$0	\$0	\$1,000,000	\$0	\$0	\$0	\$0
Storm Lines	\$0	\$0	\$0	\$0	\$0	\$0	\$50,616	\$0	\$0	\$0	\$0
	\$111,304	\$0	\$0	\$0	\$0	\$0	\$1,112,216	\$0	\$0	\$0	\$0

Land Improvements

Asset Segment	Backlog	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
Environmental Services	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$5,716
Recreational and Cultural Services	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Transportation Services	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$8,574
	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$14,290

Machinery & Equipment

Asset Segment	Backlog	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
Environmental Services	\$0	\$0	\$0	\$0	\$106,900	\$0	\$0	\$0	\$0	\$0	\$0
Fire & Emergency	\$0	\$0	\$14,042	\$0	\$0	\$0	\$16,047	\$0	\$0	\$0	\$17,117
General Government	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Recreational and Cultural Services	\$0	\$0	\$0	\$0	\$0	\$0	\$23,046	\$0	\$74,974	\$0	\$0
Transportation Services	\$0	\$0	\$0	\$0	\$0	\$16,136	\$0	\$0	\$0	\$0	\$0
	\$0	\$0	\$14,042	\$0	\$106,900	\$16,136	\$39,093	\$0	\$74,974	\$0	\$17,117

Water Network

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
Pumping Station	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Service Lead	\$0	\$0	\$772,857	\$0	\$0	\$0	\$0	\$0	\$0	\$83,922	\$0
Treatment Plant	\$11,143	\$9,742	\$2,208	\$0	\$42,501	\$21,000	\$0	\$100,000	\$67,460	\$0	\$0
Water Tower	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Watermains	\$0	\$1,144,335	\$2,753,832	\$0	\$803,958	\$0	\$0	\$0	\$0	\$0	\$0
	\$11,143	\$1,154,077	\$3,528,897	\$0	\$846,459	\$21,000	\$0	\$100,000	\$67,460	\$83,922	\$0

Asset Portfolio

Asset Category	Backlog	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
Road Network	\$0	\$1,615,756	\$94,696	\$204,000	\$2,805,500	\$187,500	\$189,769	\$910,122	\$847,000	\$946,000	\$0
Buildings and Facilities	\$88,079	\$74,688	\$1,032,924	\$33,786	\$4,595	\$582,718	\$16,284	\$127,486	\$601,977	\$744,185	\$31,046
Fleet	\$468,037	\$103,820	\$0	\$0	\$12,511	\$40,039	\$0	\$276,641	\$0	\$457,092	\$353,304
Bridges & Culverts	\$0	\$1,000	\$1,000,000	\$1,000,000	\$0	\$45,000	\$0	\$0	\$0	\$0	\$2,895
Stormwater Network	\$111,304	\$0	\$0	\$0	\$0	\$0	\$1,112,216	\$0	\$0	\$0	\$0
Machinery & Equipment	\$0	\$0	\$14,042	\$0	\$106,900	\$16,136	\$39,093	\$0	\$74,974	\$0	\$17,117
Land Improvements	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$14,290
Water Network	\$11,143	\$1,154,077	\$3,528,897	\$0	\$846,459	\$21,000	\$0	\$100,000	\$67,460	\$83,922	\$0
	\$678,563	\$2,949,341	\$5,670,559	\$1,237,786	\$3,775,965	\$892,393	\$1,357,362	\$1,414,249	\$1,591,411	\$2,231,199	\$418,652

Appendix C: Risk Rating Criteria

Probability of Failure

Asset Category	Risk Criteria	Criteria Weighting	Value/Range	Probability of Failure Score
Road Network (Roads)	Condition	60%	85-100	1
			70-84	2
			55-69	3
			40-54	4
			0-39	5
	Service Life Remaining (%)	40%	80-100	1
			60-79	2
			40-59	3
			20-39	4
			0-19	5
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
Buildings & Facilities Machinery & Equipment Fleet Parks & Land Improvements	Condition	75%	80-100	1
			60-79	2
			40-59	3
			20-39	4
			0-19	5
	Service Life Remaining %	25%	80-100	1
			60-79	2

Asset Category	Risk Criteria	Criteria Weighting	Value/Range	Probability of Failure Score	
Road Network (Other) Stormwater Network (Other) Water Network (Other)	Condition	75%	40-59	3	
			20-39	4	
			0-19	5	
			80-100	1	
			60-79	2	
	Service Life Remaining %	25%	40-59	3	
			20-39	4	
			0-19	5	
			80-100	1	
			60-79	2	
	Water Network (Mains)	Condition	50%	40-59	3
				20-39	4
				0-19	5
				80-100	1
				60-79	2
Service Life Remaining %		40%	40-59	3	
			20-39	4	
			0-19	5	
			80-100	1	
			60-79	2	
Pipe Material	10%	HDPE	2		
		PVC	2		
		CU	3		
		CI	3		
		P	4		

Asset Category	Risk Criteria	Criteria Weighting	Value/Range	Probability of Failure Score
Stormwater Network (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	

Consequence of Failure

Asset Category	Risk Classification	Risk Criteria	Value/Range	Consequence of Failure Score
Road Network (Roads)	Economic (35%)	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
	Socio-Political (15%)	AADT (50%)	0-50	1
			51-250	2
			250-450	3
			450-650	4
			650-1050	5
		Road Class (50%)	Arterial	5
			Collector	4
			Collector Commerical	3
			Collector Industrial	3
			Local	2
	Operational (20%)	Surface Material (100%)	Local Commercial	3
			Local Industrial	3
			Gravel	2
			LCB	3
			HCB	4
Economic (25%)	Roadside Environment (100%)	Rural	2	
		Semi-Urban	3	
		Semi-Urban/Urban	4	
		Urban	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
	Social	AADT	\$1,000,000+	5
			0-150	1

Asset Category	Risk Classification	Risk Criteria	Value/Range	Consequence of Failure Score		
	(20%)	(100%)	151-300	2		
			301-450	3		
			451-600	4		
			601-1000	5		
	Socio-Political (5%)	Detour Distance (100%)	2-5	2		
			6-8	3		
			9-10	4		
			11-20	5		
			Economic (80%)	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					
Buildings & Facilities Machinery & Equipment Fleet Parks & Land Improvements	Strategic (20%)	Department (100%)	Recreation & Cultural Services	2		
			General Government	2		
			Transportation Services	3		
			Public Works	3		
			Environmental Services	4		
			Health Services	5		
			Protection Services	5		
Road Network (Other) Stormwater Network (Other) Water Network (Other)	Economic (100%)	Replacement Cost (100%)	\$0-\$50,000	1		
			\$50,000-\$150,000	2		
			\$150,000-\$250,000	3		
			\$250,000-\$500,000	4		
			\$500,000+	5		
Water Network (Mains)	Economic (80%)	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			

Asset Category	Risk Classification	Risk Criteria	Value/Range	Consequence of Failure Score
Stormwater Network (Mains)			151-250	3
			251-450	4
			451-1000	5
			Severe	5
	Economic (80%)	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	

Appendix D: Next Steps

A workplan has been provided to the Township to advance its Asset Management Program. These steps are ranked based on their overall asset management value to the Township. Value considers the priority and impact of a recommendation relative to its cost.

Next Steps

Conduct a TCA data review to identify missing and/or incomplete assets in the CityWide™ asset inventory.

Componentize the inventory for buildings & facilities and obtain component based assessed condition scores.

Review and confirm that all assets have been accounted for within the asset inventory, particularly for non-core assets.

Regularly review & update replacement costs for all asset classes, incorporating industry standard costing references and local market pricing.

Continue to integrate data from various studies, reports, and staff journals within CityWide™ to ensure a centralized, comprehensive, and current asset inventory.

Implement a data governance strategy and framework to maintain the level of data maturity

Develop detailed LOS frameworks for all assets and identify proposed LOS

Educate and train key personnel on broader asset management best practices including database management and the optimal use of CityWide™

Review, consider, and as appropriate, account for growth and demand changes to infrastructure management.

Provide opportunities for staff and elected officials to attend webinars, educational conferences, and workshops to expand their technical knowledge of asset management principles and practices

Develop a medium- to long-term external communication strategy to engage public on asset management and obtain feedback to inform development of proposed LOS

An asset management strategy enforces the asset management policy and aligns it to the asset management plan. Consider developing a formalized, documented asset management strategy.

Appendix E: O. Reg. 588/ 17 - Compliance Snapshot

O. Reg. Requirement	2022 Compliance		2024 Compliance		2025 Compliance
	Core	Non-Core	Core	Non-Core	Core & Non-Core
1.0 Asset Inventory					
1.1 Asset Summary	Yes	N/A	Yes	Yes	No
1.2 Replacement Cost	Yes		Yes	Yes	No
1.3 Average Age	Yes		Yes	Yes	No
1.4 Condition	Yes		Yes	Yes	No
1.5 Condition Assessment Approach	Yes		Yes	Yes	No
2.0 Lifecycle Activities					
2.1 Identify Full Asset Lifecycle	Yes	N/A	Yes	Yes	No
2.2 Document Lifecycle Activities	Yes		Yes	Yes	No
2.3 Quantify Asset Risk	Yes		Yes	Yes	No
2.4 Lifecycle Cost Analysis	Yes		Yes	Yes	No
3.0 Growth					
3.1 Population & Economic assumptions	Yes	N/A	Yes	Yes	No
3.2 Document impact of growth on capital planning	N/A		Yes	Yes	No
4.0 Current Level of Service					
4.1 Define and document current LOS metrics	Yes	Yes	Yes	Yes	No
5.0 Proposed Level of Service					
5.1 Define Proposed LOS	N/A	N/A	N/A	N/A	No
5.2 Difference b/w Current & Proposed LOS					No
5.3 Required Lifecycle Activities and associated Risk					No
5.4 Achievability of Proposed LOS					No
5.5 Affordability of Proposed LOS					No
5.6 Lifecycle activities and risk associated with potential funding shortfall					No

Appendix F: 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

Appendix G: Glossary of Terms

Term	Term Description
Asset	An item, thing or entity that has potential or actual value to a Township. (Such as plant, machinery, buildings, etc.)
Asset Inventory/Asset Register	A record of asset information, typically held in spreadsheets, databases, or software systems, including asset attribute data such as quantity, type, and construction cost.
Asset Management (AM)	<p>The systematic and coordinated activities and practices of an organization to deliver on its objectives optimally and sustainably through cost-effective lifecycle management of assets.</p> <p>ISO 55000 definition: coordinated activity of an organization to realize value from assets.</p>
Asset Management Plan (AMP)	Long-term plans (usually 10-20 years or more for infrastructure assets) that outline the asset activities and programs for each asset class to provide a defined level of service in the most cost-effective way.
Asset Management Policy	A high-level statement of an organization’s principles and approach to asset management.
Capital Expenditure (CAPEX)	Expenditure used to create new assets, renew assets, or upgrade assets or to increase the capacity of existing assets beyond their original design capacity or service potential. CAPEX increases the value of the asset stock.
CCTV	Closed Circuit Television Video
Condition	The physical state of the asset.
Condition Assessment	The inspection, assessment, measurement, and interpretation of the resultant data, to indicate the condition of a specific component to determine the need for some preventive or remedial action.
Consequence of Failure	The effect of asset failure on organizational objectives.

Critical Assets	Assets that have a higher probability of failure and consequence of failure (in terms of financial, environment, social and any other financial or non-financial impacts).
EUL	Estimated Useful Life. The period from the acquisition of the asset to the time when the asset, while physically able to provide a service, ceases to be the lowest cost alternative to satisfy a particular level of service.
Facility	A complex structure comprising of many assets (e.g., a hospital, water treatment plant, recreation complex, etc.) that represents a single management unit for financial, operational, maintenance or other purposes.
GIS	Geographic Information System
Federal Gas Tax Fund (GTF)	A permanent source of funding provided up front, twice-a-year, to provinces and territories, who in turn flow this funding to their municipalities to support local infrastructure priorities. Municipalities can pool, bank, and borrow against this funding, providing significant financial flexibility.
Paved Roads	Hot mix asphalt pavement that is typically placed as a surface for rural, semi-urban and urban roads with higher traffic volumes, and is placed at thicknesses ranging from 50mm (2 inches) to 200mm (8 inches).
IAM	Institute of Asset Management
Infrastructure Assets	Stationary systems forming a network or a portfolio of assets serving whole communities, where the system is intended to be maintained indefinitely at a particular level of service potential by continuing replacement and refurbishment of its components.
Key Performance Indicator (KPI)	A performance measure that is important to the Township.
Surface Treated	A thin protective wearing surface applied to existing pavement or gravel surface that acts as a seal from water and fills in cracks and uneven surfaces. Surface treatments are typically placed on rural roads with low traffic volumes and consists of asphalt emulsion and aggregate.
Level of Service (LOS)	The parameters or combination of parameters that reflect social, political, economic, and environmental outcomes that the Township delivers.

Maintenance	All actions necessary for retaining an asset as near as practicable to its original condition but excluding rehabilitation or renewal. Maintenance does not necessarily increase the service potential of the asset or keep it in its original condition, it slows down deterioration and delays when rehabilitation or replacement is necessary.
OCWA	Ontario Clean Water Agency
OSIM	Ontario Structure Inspection Manual
Probability of Failure	The probability or likelihood of asset failure at a given time.
Rehabilitation	Works to rebuild or replace parts or components of an asset, to restore it to a required functional condition and extend its life, which may incorporate modification. Generally, involves repairing the asset to deliver its original level of service without resorting to significant upgrading or renewal, using available techniques and standards.
Replacement	The complete replacement of an asset that has reached the end of its life, so as to provide a similar, or agreed alternative, level of service.
Replacement Cost	The cost the municipality would incur to acquire the asset on the reporting year.
Rural	Refers to predominant characteristics of the adjacent land use; rural being agricultural, light commercial and vacant/undeveloped properties.
Semi-Urban	Refers to the predominant characteristics of the adjacent land use; semi-urban being settlement clusters with low-density residential and light commercial/industrial properties.
Service Life Remaining	The asset's remaining service life with the most recent condition assessment value taken into consideration.
Uniformat II	A standard for classifying building specifications, cost estimating and cost analysis in Canada and the U.S. The elements are major components common to most buildings.