

Asset Management Plan

Township of Red Rock

2021

This Asset Management Program was prepared by:



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

Key Statistics

Replacement cost of asset portfolio

\$85.3 million

Replacement cost of infrastructure per household

\$187,500

Percentage of assets in fair or better condition

37%

Percentage of assets with assessed condition data

24%

Annual capital requirements

\$2.3 million

Recommended timeframe for eliminating annual infrastructure deficit

20 Years

Target reinvestment rate

2.7%

Actual reinvestment rate

0.4%

Table of Contents

Key Statistics	i
Executive Summary.....	1
1 Introduction & Context.....	4
2 Scope and Methodology	14
3 Portfolio Overview	19
4 Road Network.....	25
5 Bridges & Culverts.....	36
6 Storm Network	47
7 Buildings & Facilities.....	58
8 Vehicles	68
9 Machinery & Equipment	78
10 Land Improvements.....	87
11 Water Network.....	97
12 Wastewater Network.....	109
13 Impacts of Growth	122
14 Financial Strategy	125
15 Appendices	140

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



Storm Network



Buildings & Facilities



Vehicles



Machinery & Equipment



Land Improvements



Water Network



Wastewater Network

With the development of this AMP the Township has achieved compliance with O. Reg. 588/17 to the extent of the requirements that must be completed by July 1, 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 \$85.3 million. 37% of all assets analysed in this AMP are in fair or better condition and assessed condition data was available for 24% of assets. For the remaining 76% of assets, assessed condition data was unavailable, and asset age was used to approximate condition – a data gap that persists in most municipalities. Generally, age misstates the true condition of assets, making assessments essential to accurate asset management planning, and a recurring recommendation in this AMP. The development of a long-term, sustainable financial plan requires an analysis of whole lifecycle costs. This AMP uses replacement only strategies to determine the lowest cost option to maintain the current level of service.

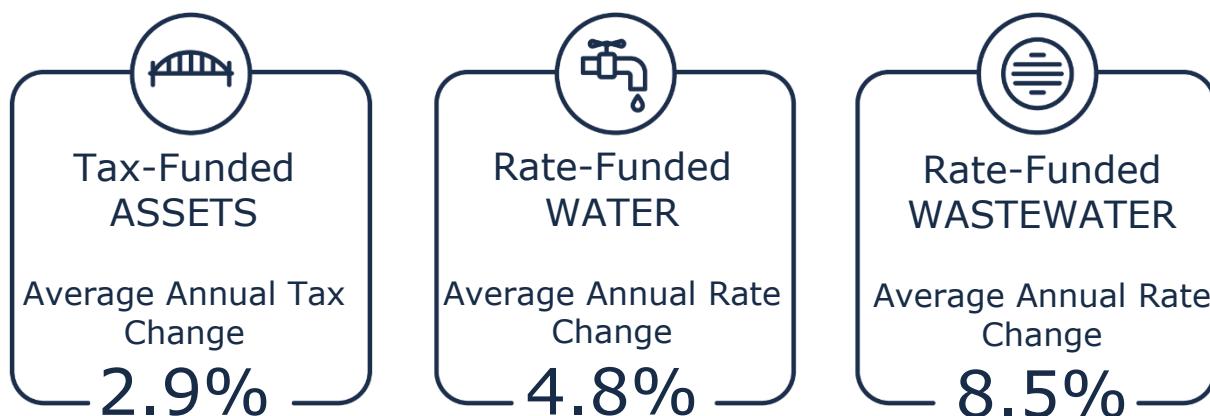
To meet capital replacement and rehabilitation needs for existing infrastructure, prevent infrastructure backlogs, and achieve long-term sustainability, the Township's average annual capital requirement totals \$2.3 million. Based on a historical analysis of sustainable capital funding sources, the Township is committing approximately \$340,000 towards capital projects or reserves per year. As a result, there is currently an annual funding gap of \$2 million.

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



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:



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

- Review data to update and maintain a complete and accurate dataset
- Develop a condition assessment strategy with a regular schedule
- Review and update lifecycle management strategies
- Development and regularly review short- and long-term plans to meet capital requirements
- Measure current levels of service and identify sustainable proposed levels of service

1

Introduction & Context

Key Insights

- The Township of Red Rock is a small municipality in Northeastern Ontario and has identified the water and wastewater network as an infrastructure priority
- The goal of asset management is to minimize the lifecycle costs of delivering infrastructure services, manage the associated risks, while maximizing the value ratepayers receive from the asset portfolio
- The Township's asset management policy provides clear direction to staff on their roles and responsibilities regarding asset management
- An asset management plan is a living document that should be updated regularly to inform long-term planning
- Ontario Regulation 588/17 outlines several key milestone and requirements for asset management plans in Ontario between July 1, 2022, and 2025

1.1 Red Rock Community Profile

Census Characteristic	Township of Red Rock	Ontario
Population 2021	895	14,223,942
Population Change 2016-2021	0	5.8
Total Private Dwellings	455	5,929,250
Population Density	14.4/km ²	15.9/km ²
Land Area	62.1 km ²	892,411.76 km ²

The Township of Red Rock is located 115 kilometres east of Thunder Bay in Northwestern Ontario. The Township lays at the bottom of Red Rock Hills on the western shore of Nipigon Bay.

The community has a long history with an ever-changing economy. The area was settled in the 1680s as the first trading post in the region where it became an important source for fur trade. In the 1930s, the local mill was constructed due its location at the edge of Lake Superior and the abundance of natural resources. During the Second World War, the Township was home to a Prison of War camp.

Today, the Township's economy has evolved since the mill closed. The primary economic sectors are heath care and social assistance, public administration, and accommodation and food services. However, Red Rock remains an ideal site for business as it is located along highway 11/17 and near a water port, rail access, and Thunder Bay's airport. The Township hopes to take advantage of their location to bring new life to the local economy.

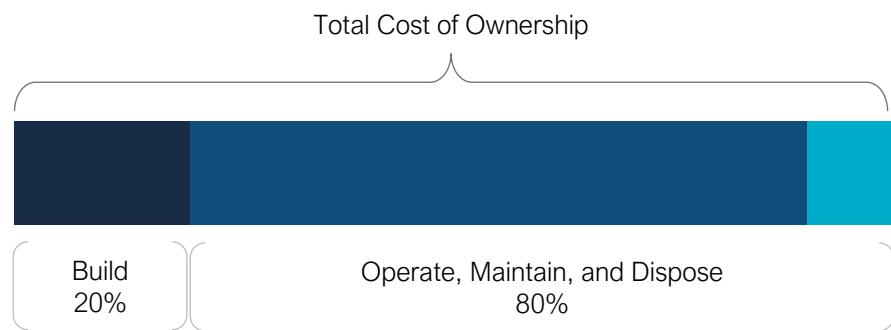
Demand in the region is notably driven an aging population above the provincial average. The population in Red Rock has been steadily declining for several decades, however, the last 5 years found no population change, suggesting a potential shift in the trend. The Township generates a total revenue of \$1.8 million from taxes and rates and spends an average of \$340,000 annually on capital projects.

Municipal staff have identified the wastewater and water networks as a primary infrastructure priority. The Township recently invested in a significant renewal project for their wastewater treatment plant and plan to further invest in their wastewater and water services throughout the next several years. Staff intend to support continuous improvements within the Red Rock Township by investing in critical infrastructure and advancing their asset management program.

1.2 An Overview of Asset Management

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

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



These costs can span decades, requiring planning and foresight to ensure financial responsibility is spread equitably across generations. An asset management plan is critical to this planning, and an essential element of broader asset management program. The industry-standard approach and sequence to developing a practical asset management program begins with a Strategic Plan, followed by an Asset Management Policy and an Asset Management Strategy, concluding with an Asset Management Plan.

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

1.2.1 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 adopted the "Strategy Asset Management Policy" on March 12th, 2018 in accordance with Ontario Regulation 588/17. The policy defines the following asset management goals:

- To guide the Township's efforts to re-establish and maintain ongoing economic stability
- To optimize delivery of infrastructure and services
- To enhance and guide the use of natural heritage, cultural, aggregate, highway, and groundwater resources within the Township

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

1.2.3 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.

1.3 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.

1.3.1 Lifecycle Management Strategies

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

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

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

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

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

The Township's approach to lifecycle management is described within each asset category outlined in this AMP. Developing and implementing a proactive lifecycle strategy will help staff to determine which activities to perform on an asset and when they should be performed to maximize useful life at the lowest total cost of ownership.

1.3.2 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 quantitative 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.

This AMP also includes a high-level qualitative evaluation of asset risk and criticality. The qualitative risk assessment involves the documentation of risks to the delivery of services that the municipality faces given the current state of the infrastructure and asset management strategies.

These risks can be understood as corporate level risks. Municipal staff provided information related to the following potential risks: asset data confidence, lifecycle management strategies, organizational cognizance/capacity, infrastructure design/installation, aging infrastructure, climate change and extreme weather events, growth, and infrastructure re-investment. The qualitative risks identified can guide information and data gathering in the future.

1.3.3 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 and culverts, water, wastewater, stormwater) the Province, through O. Reg. 588/17, has provided qualitative descriptions that are required to be included in this AMP. For non-core asset categories, the Township has determined the qualitative descriptions that will be used to determine the community level of service provided. These descriptions can be found in the Levels of Service subsection within each asset category.

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 and 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 determined the technical metrics that will be used to determine the technical level of service provided. These metrics can be found in the Levels of Service subsection within each asset category.

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.

1.4 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	2024
Strategic Asset Management Policy	Asset Management Plan for Core and Non-Core Assets (same components as 2022) and Asset Management Policy Update
2022	2025
Asset Management Plan for Core Assets with the following components: <ol style="list-style-type: none">1. Current levels of service2. Inventory analysis3. Lifecycle activities to sustain LOS4. Cost of lifecycle activities5. Population and employment forecasts6. Discussion of growth impacts	Asset Management Plan for All Assets with the following additional components: <ol style="list-style-type: none">1. Proposed levels of service for next 10 years2. Updated inventory analysis3. Lifecycle management strategy4. Financial strategy and addressing shortfalls5. Discussion of how growth assumptions impacted lifecycle and financial

1.4.1 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, 2024. Next to each requirement a page or section reference is included in addition to any necessary commentary.

Requirement	O. Reg. Section	AMP Section Reference	Status
Summary of assets in each category	S.5(2), 3(i)	4 – 10	Complete
Replacement cost of assets in each category	S.5(2), 3(ii)	4.1 - 10.1	Complete
Average age of assets in each category	S.5(2), 3(iii)	4.2 - 10.2	Complete
Condition of core assets in each category	S.5(2), 3(iv)	4.2 - 10.2	Complete
Description of municipality's approach to assessing the condition of assets in each category	S.5(2), 3(v)	4.2 - 10.2	Complete
Current levels of service in each category	S.5(2), 1(i-ii)	4.2.1 – 10.2.1	Complete for Core Assets Only
Current performance measures in each category	S.5(2), 2	4.5 – 10.5	Complete for Core Assets Only
Lifecycle activities needed to maintain current levels of service for 10 years	S.5(2), 4	4.3 – 10.3	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	Complete

1.5 Asset Management Roadmap

As part of PSD's Asset Management Roadmap, the Township of Red Rock committed to taking the necessary steps towards developing a systemic, sustainable, and intelligently structured asset management program. This process involved the collaboration of PSD's asset management team with municipal staff over a multi-year engagement. The following summarizes key milestones/deliverables achieved throughout this project.

Risk and Criticality Model Development (Completed on July 14th, 2021)

Risk models were developed to determine the relative criticality of assets based on their probability and consequence of failure. These models assist with the prioritization and ranking of infrastructure needs.

Lifecycle Model Development (Completed on September 8th, 2021)

The Township's lifecycle management strategies were reviewed and documented to determine current practices and identify opportunities for improvement and potential cost avoidance.

Level of Service Framework Development (Completed on November 21st, 2021)

A framework was developed to determine the current level of service provided to the community through municipal infrastructure.

Asset Data Review and Refinement (Completed on August 22nd, 2021)

The implementation of a new road network inventory was completed based on data provided from the Township's most recent Road Need Study. Asset inventory data was refined continuously over the course of this project.

AMP & Financial Strategy (Completed on September 9th, 2022)

This document represents the culminating deliverable of the Asset Management Roadmap.

2 Scope and Methodology

Key Insights

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

2.1 Asset Categories Included in this AMP

This asset management plan for the Township of Red Rock 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 and culverts, water, wastewater, and stormwater).

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	
Bridges & Culverts	
Storm Network	
Buildings & Facilities	Tax Levy
Vehicles	
Machinery & Equipment	
Land Improvements	
Water Network	User Rates
Wastewater Network	

2.2 Asset Data

A key element of a municipality's asset management program includes the current asset related data, and data management practices and processes—including how staff collect, store, analyze, and link data to their decision processes. Standardized, complete, and accurate information contributes to better decision-making and prioritization and can help organizations implement proactive strategies.

A complete asset inventory should include componentized records for high-value assets. Assets such as bridges and buildings consist of several components. For example, a bridge is can be made up of a deck, abutments, columns, piles, bearings, guide rails, and other elements. Each component has a unique estimated useful life and requires asset-specific lifecycle strategies. Over time, each

component will age and deteriorate at different rates, resulting in unique conditions and requiring rehabilitative and replacement activities at different times. Annual capital planning is made easier with a detailed inventory that includes asset components.

In the case of assets that have not been componentized, a single record represents the asset with an average estimated useful life, age, and condition. Pooled asset records reduce the staff's capability to develop comprehensive asset management strategies.

2.3 Deriving Replacement Costs

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

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

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

2.4 Estimated Useful Life and Service Life Remaining

The estimated useful life (EUL) of an asset is the period over which the Township expects the asset to be available for use and remain in service before requiring replacement or disposal. The EUL for each asset 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:

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

2.5 Reinvestment Rate

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

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

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

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

2.6 Deriving Asset Condition

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

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

Condition	Description	Criteria	Service Life Remaining (%)
Very Good	Fit for the future	Well maintained, good condition, new or recently rehabilitated	80-100
Good	Adequate for now	Acceptable, generally approaching mid-stage of expected service life	60-80
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.

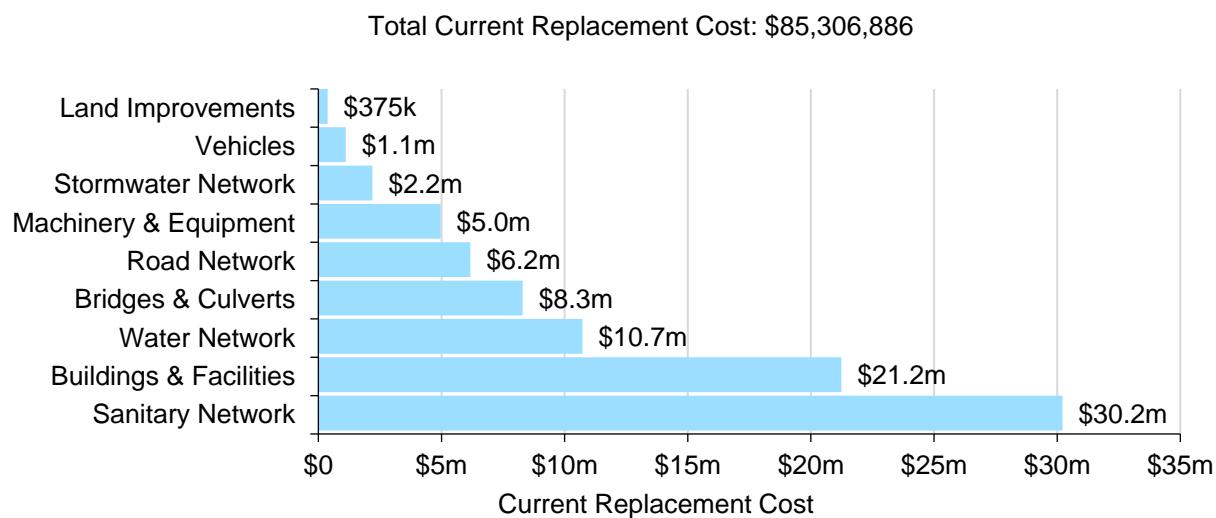
3 Portfolio Overview

Key Insights

- The total replacement cost of the Township's asset portfolio is \$85.3 million
- The Township's target re-investment rate is 2.7%, and the actual re-investment rate is 0.4%, contributing to an expanding infrastructure deficit
- 37% of all assets are in fair or better condition
- 60% of assets are projected to require replacement in the next 10 years
- Average annual capital requirements total \$2.3 million per year across all assets

3.1 Total Replacement Cost of Asset Portfolio

The asset categories analysed in this AMP have a total replacement cost of \$85.3 million based on inventory data from 2021. 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 following table identifies the methods employed to determine replacement costs across each asset category:

Asset Category	Replacement Cost Method	
	User-Defined	Notes
Road Network	93%	Contractor quotes and historical cost
Bridges & Culverts	100%	Data source is 2019 Ontario Structure Inspection Manual (OSIM) report
Stormwater Network	34%	Contractor quotes and historical cost
Buildings & Facilities	87%	Insurance appraisal and historical cost
Vehicles	0%	Historical Cost
Machinery & Equipment	0%	Historical Cost
Land Improvements	73%	Staff estimate and historical cost
Water Network	88%	Contractor quotes and historical cost
Wastewater Network	97%	Contractor quotes and historical cost
Overall	85%	

3.2 Target vs. Actual Reinvestment Rate

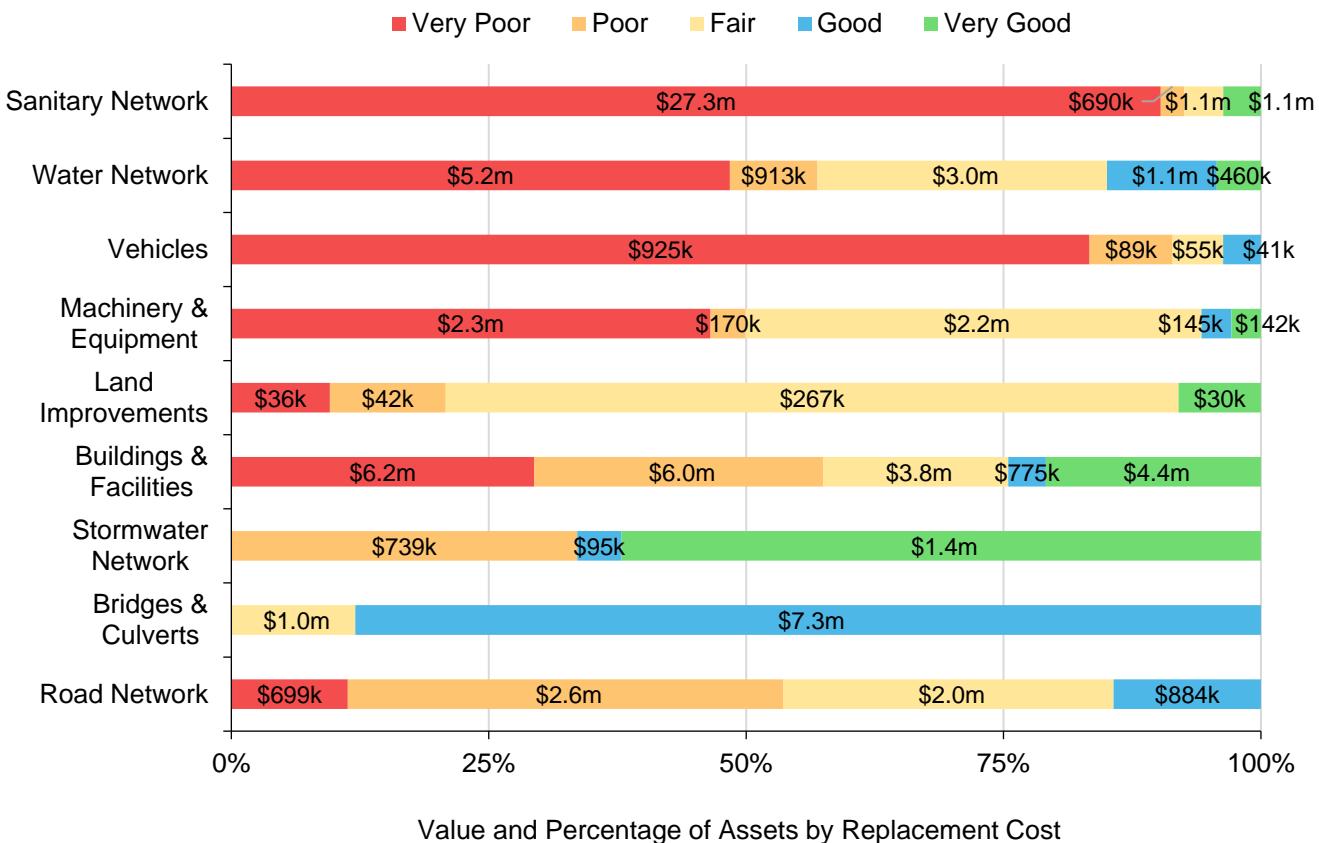
The graph below depicts funding gaps or surpluses by comparing target vs actual reinvestment rate. To meet the long-term replacement needs, the Township should be allocating approximately \$2.3 million annually, for a target reinvestment rate of 2.7%. Actual annual spending on infrastructure totals approximately \$340,000, for an actual reinvestment rate of 0.4%.

3.3 Service Life Remaining

Based on asset age, available assessed condition data and estimated useful life, 60% 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.

3.4 Condition of Asset Portfolio

The current condition of the assets is central to all asset management planning. Collectively, 37% of assets in Red Rock are in fair or better condition. This estimate relies on both age-based and field condition data.



This AMP relies on assessed condition data for 24% 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 Assessed Condition	Source of Condition Data
Road Network	89%	Staff Assessments
Bridges & Culverts	96%	2019 OSIM Report
Stormwater Network	4%	Staff Assessments
Buildings & Facilities	14%	Staff Assessments
Land Improvements	79%	Staff Assessments
Machinery & Equipment	0%	N/A
Vehicles	8%	Staff Assessments
Water Network	22%	Staff Assessments
Wastewater Network	5%	Staff Assessments
Overall	24%	

3.5 Qualitative Risk: Corporate-Wide

The Township has noted recurring trends in corporate-wide risks to their assets and asset management strategies. Asset management strategies within each asset category include risks related to asset data and information, lifecycle management strategies, capital funding strategies, and organizational capacity and cognizance.

3.5.1 Asset Data & Information



There is a lack of confidence in the available inventory data and condition data. Staff plan to prioritize data refinement efforts to increase the accuracy and reliability of asset data and information. Once completed staff can confidently develop data-driven strategies to address infrastructure needs.

3.5.2 Lifecycle Management Strategies



The current lifecycle management strategy for all asset categories is considered more reactive than proactive. It is a challenge to find the right balance between maintenance, capital rehabilitation, and the replacement of assets. Staff hope to develop better defined strategies that will extend asset lifecycles and result in a lower total cost to the Township. These strategies will require sustainable annual funding to minimize the deferral of capital works.

3.5.3 Capital Funding Strategies



works.

Major capital rehabilitation and replacement projects are often entirely dependent on the availability of grant funding opportunities. When grants are not available, rehabilitation and replacement projects may be deferred. An annual capital funding strategy could reduce dependency on grant funding and help prevent deferral of capital

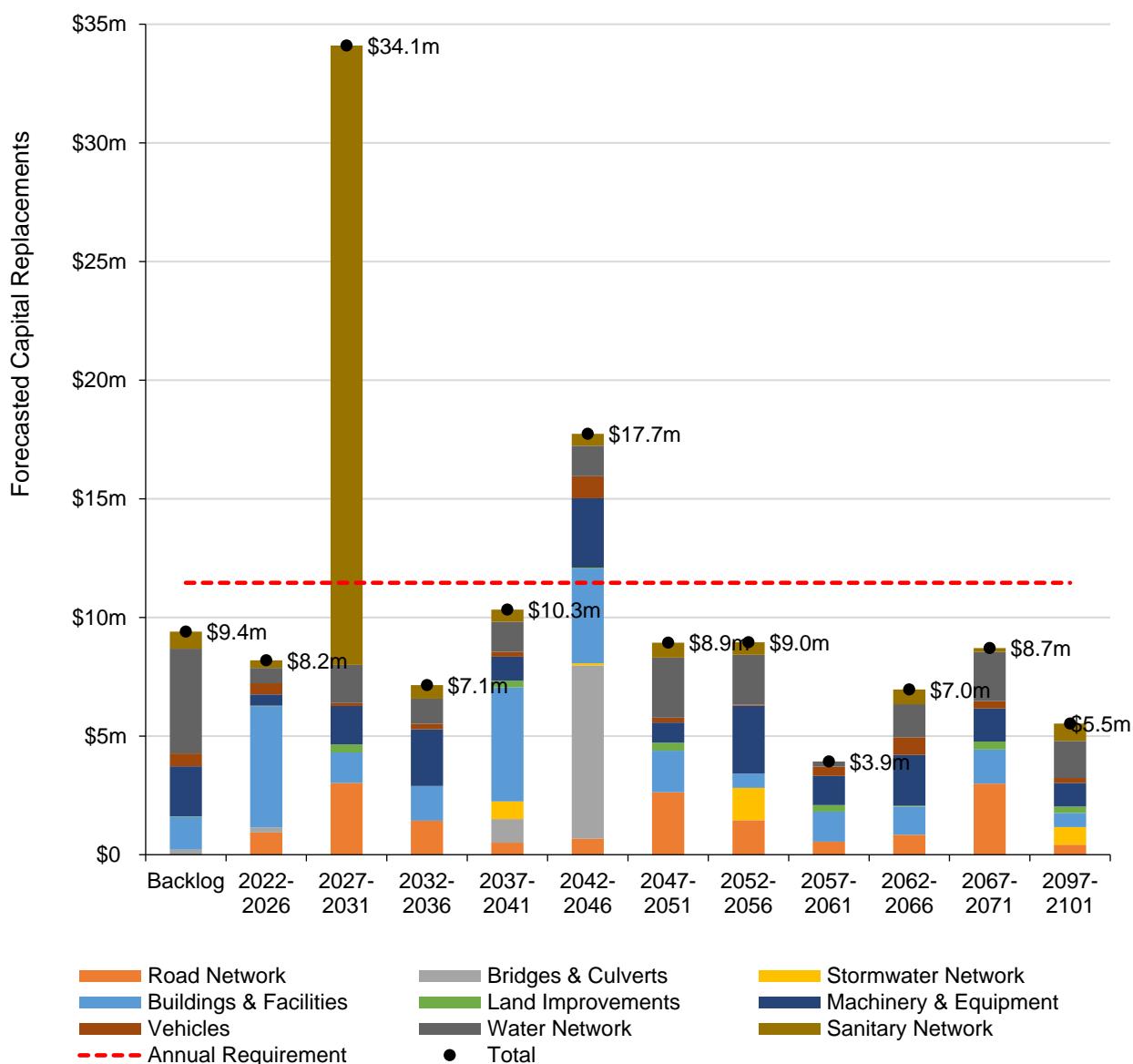
3.5.4 Organizational Capacity and Cognizance



Both short- and long-term planning requires the regular collection of infrastructure data to support asset management decision-making. Staff find it a continuous challenge to dedicate resources and time towards data collection and condition assessments to ensure that road condition and asset attribute data is regularly reviewed and updated. A standardized approach to data gathering and condition assessments with achievable goals can enable the Township to regularly update their asset data and information.

3.6 Forecasted Capital Requirements

The development of a long-term capital forecast should include both asset rehabilitation and replacement requirements. With the development of asset-specific lifecycle strategies that include the timing and cost of future capital events, the Township can produce an accurate long-term capital forecast. The following graph identifies capital requirements over the next 50 years. This projection is used as it ensures that every asset has gone through one full iteration of replacement. The forecasted requirements are aggregated into 5-year. The trend line represents the average 5-year capital requirement of \$11.5 million.



4 Road Network

The Township is responsible for approximately 18.4 kilometres of road network comprised of 7.3 kilometres of asphalt road surface and 11.1 kilometres of gravel road surface and 18.2 kilometres of road base. Detailed attribute data within Citywide includes Estimated Useful Life (EUL), In-Service Date, length, width, and replacement cost. The data used is considered by staff to be an accurate representation of all roads for which the Township is responsible.

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

Replacement Cost	Condition	Financial Capacity	
\$6.2 million	Poor (39%)	Annual Requirement:	\$272,000
		Funding Available:	\$139,000
		Annual Deficit:	\$133,000

The following core values and level of service statements are a key driving force behind the Township's asset management planning:

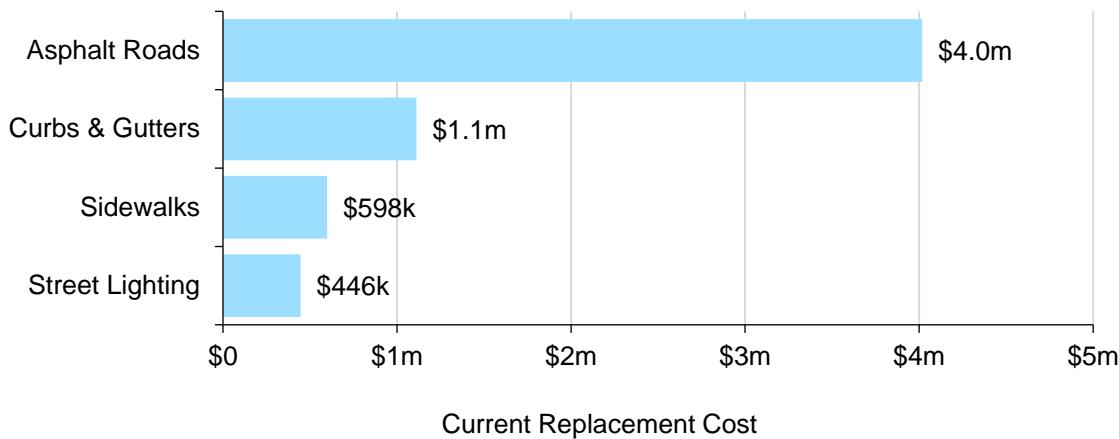
Service Attribute	Level of Service Statement
Accessible & Reliable	The road network service is conveniently accessible to the whole community in sufficient capacity (meets traffic demands) and is available under all weather conditions.
Affordability	The road network is currently partially (51%) funded through sustainable funding sources.
Sustainability	The road network is in poor condition with minimal unplanned service interruptions and road closures.

4.1 Asset Inventory & Costs

The table below includes the quantity, total replacement cost and annual capital requirements of each asset segment in the Township's road network inventory.

Asset Segment	Quantity	Replacement Cost	Annual Capital Requirement
Gravel Roads	11.1 km	Not Planned for Replacement ¹	
Asphalt Roads	7.3 km	\$4,017,891	\$199,357
Curbs & Gutters	6 km	\$1,111,084	\$37,036
Sidewalks	5.5 km	\$598,454	\$17,828
Street Lighting	418	\$445,960	\$17,838
Total		\$6,173,390	\$272,060

Total Current Replacement Cost: \$6,173,390



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

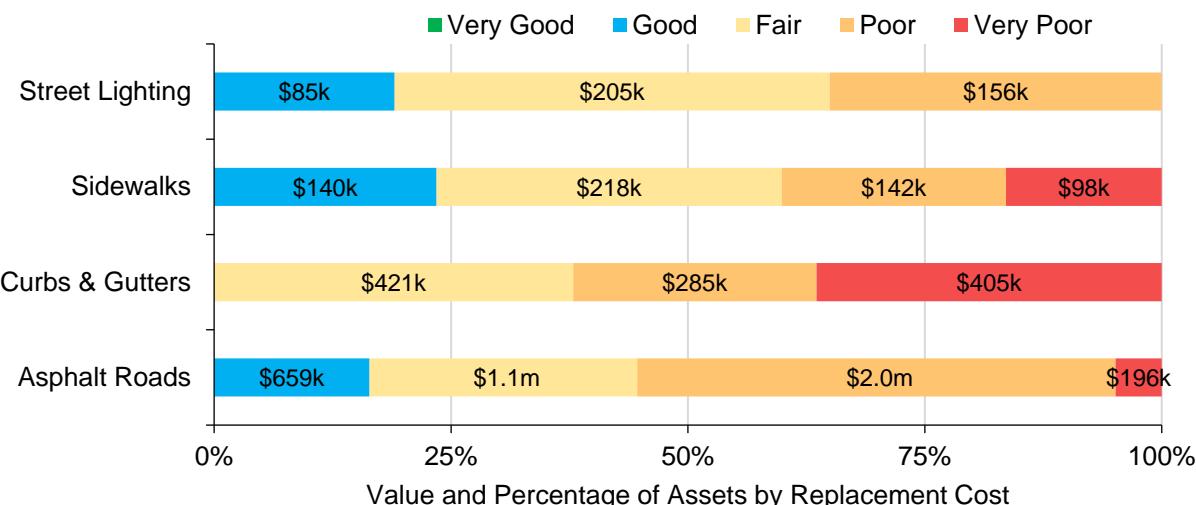
¹ Gravel roads undergo perpetual operating and maintenance activities. If maintained properly, they can theoretically have a limitless service life.

4.2 Asset Condition & Age

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

Asset Segment	Estimated Useful Life (Years)	Average Age (Years)	Average Condition
Asphalt Roads	18	40.8	39% (Poor)
Curbs & Gutters	27	46.6	33% (Poor)
Sidewalks	32	32.8	46% (Fair)
Street Lighting	20	24.7	48% (Fair)
Average			39% (Poor)

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



To ensure that the Township's road 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 roads.

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

4.2.1 Current Approach to Condition Assessment

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

- Ad-hoc condition assessments are completed by staff. The roads, curbs and gutters, and sidewalks on a daily basis to visually assess condition.
- Severe damage and other risks are noted and recorded. There are no formal condition ratings provided. These condition assessments are utilized to plan and prioritize maintenance and replacement activities; however, lifecycle strategies are mostly reactive.

In this AMP the following rating criteria is used to determine the current condition of road segments and forecast future capital requirements:

Condition	Rating
Very Good	80-100
Good	60-80
Fair	40-60
Poor	20-40
Very Poor	0-20

4.3 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 for paved roads and roadside appurtenances.

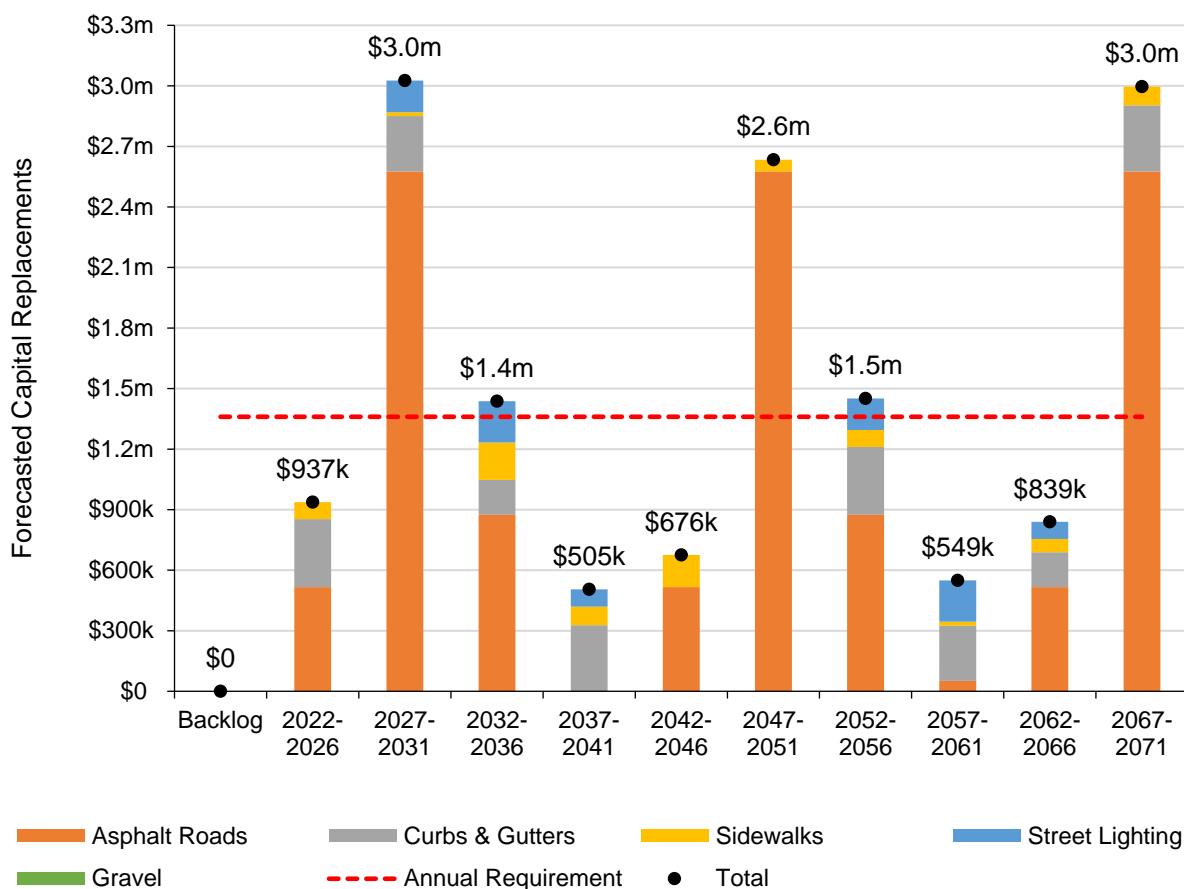
Activity Type	Description of Current Strategy
Maintenance	The asphalt road program includes pothole patching and street sweeping, which typically occurs in the spring.
	Winter control, sanding and snow removal activities are frequent.
	Crack sealing may be considered as needed, determined by internal road condition assessments.
Replacement	No major road replacements have taken place since 2009.
Replacement	Staff consider road condition, approximate average annual daily traffic (AADT), condition, and health and safety to plan and prioritize replacement.

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

Activity Type	Description of Current Strategy
Maintenance	Roadside brushing and ditching are completed as needed.
	Calcium chloride is applied as a dust suppressant annually.
	Routine grading is performed throughout the season.
	Minimum Maintenance Standards are met and usually exceeded for the Winter season.
Rehabilitation	2 inches of gravel is applied every 2 years on each road segment.
Replacement	Gravel roads generally do not require conventional asset replacement.

4.3.1 Forecasted Capital Requirements

The following graph forecasts long-term capital requirements. The annual capital requirement represents the average amount per year that the Township should allocate towards funding rehabilitation and replacement needs. The following graph identifies capital requirements over the next 50 years. This projection is used as it ensures that every asset has gone through one full iteration of replacement. The forecasted requirements are aggregated into 5-year bins and the trend line represents the average 5-year capital requirements. The trend line represents the average 5-year capital requirement of \$1.4 million.



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

4.4 Risk & Criticality

4.4.1 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 2021 inventory data.



This is a high-level model developed for the purposes of this AMP and Township staff should review and adjust the risk model to reflect an evolving understanding of both the probability and consequences of asset failure.

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

Probability of Failure (POF)	Consequence of Failure (COF)
Condition	Road Class
Service Life Remaining	Roadside Environment
Base Service Life Remaining	Replacement Cost
AADT	Speed
Ride Condition Rating	Critical Path

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

4.4.2 Risks to Current Asset Management Strategies

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



Lifecycle Management Strategies & Capital Funding

The road network is at risk due to reactive lifecycle management strategies. The Township struggles to develop asset management strategies with defined maintenance, rehabilitation, and replacement schedules due to limited capital funding and organizational capacity and cognizance. The Township does not have the funding to complete a formal road needs study and is highly dependent on grants for major rehabilitation and replacement projects. Township staff perform visual assessments on their roads to determine the severity of the road performance. In some cases, the Township may determine to replace asphalt roads with gravel roads nearing their end of life to reduce the lifecycle costs and the risks associated with poorly maintained asphalt roads.

4.5 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.

4.5.1 Community Levels of Service

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

Service Attribute	Qualitative Description	Current LOS (2020)
Accessible & Reliable	Description, which may include maps, of the road network in the municipality and its level of connectivity	See Appendix C
Affordable	Description of the lifecycle activities (maintenance, rehabilitation and replacement) performed on the road network	See Section 4.3
Sustainable	Description or images that illustrate the different levels of road class pavement condition	Very Poor: Widespread signs of deterioration. Requires remedial work to bring road up to standard. Service is affected Poor: Large portions of road exhibiting deterioration with rutting, potholes, distortions, longitude and lateral cracking. Road is mostly below standard. Fair: Some sections of road starting to deteriorate. Requires some remedial work and surface upgrade in near future. Good: Road is in overall good condition. Few sections are starting to show signs of minimal deterioration. Very Good: Road is well maintained and in excellent condition. Surface was newly or

recently upgraded. No signs of deterioration or remedial work required.

4.5.2 Technical Levels of Service

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

Service Attribute	Technical Metric	Current LOS (2020)
Accessible & Reliable	Lane-km of arterial roads (MMS classes 1 and 2) per land area (km/km ²)	0
	Lane-km of collector roads (MMS classes 3 and 4) per land area (km/km ²)	0
	Lane-km of local roads (MMS classes 5 and 6) per land area (km/km ²)	0.6
Affordability	Capital reinvestment rate	1.8%
	Average pavement condition index for paved roads in the municipality	39%
Sustainability	Average surface condition for unpaved roads in the municipality (e.g. excellent, good, fair, poor)	Fair
	Average surface condition rating for sidewalks in the municipality	46%

4.6 Recommendations

Asset Inventory

- Review road, curbs & gutter, and sidewalk inventory to determine whether all municipal assets within these asset segments have been accounted for.

Condition Assessment Strategies

- Consider completing an updated assessment of all road and sidewalks on a 5- to 7-year cycle. Utilized assessed condition to guide capital planning.

Lifecycle Management Strategies

- Consider adopting lifecycle management strategies for HCB and LCB roads that include proactive maintenance and rehabilitation to realize potential cost avoidance and maintain a high quality of road pavement 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.

5 Bridges & Culverts

The Township is responsible for 5 bridges with a span greater than 3 meters. The asset inventory contains assessed condition values, replacement cost, and other information from completed Ontario Structure Inspection Manual (OSIM) inspections. The asset inventory for bridges is currently at a basic level. The inventory contains a single record for each bridge and does not include the separate capital components that form a bridge. Municipal staff are working towards enhancing their data.

The state of the infrastructure for bridges and culverts is summarized in the following table.

Replacement Cost	Condition	Financial Capacity	
\$8.3 million	Good (71%)	Annual Requirement:	\$113,000
		Funding Available:	\$15,000
		Annual Deficit:	\$98,000

The following core values and level of service statements are a key driving force behind the Township's asset management planning:

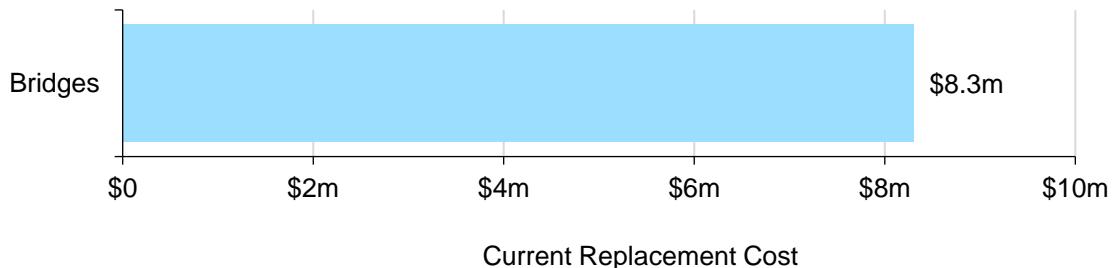
Service Attribute	Level of Service Statement
Accessible & Reliable	Bridges and culverts are conveniently accessible to the whole community in sufficient capacity (meets traffic demands), however, all of the bridges in the Township have loading restrictions.
Affordability	The bridges are currently partially (13%) funded through sustainable funding sources.
Sustainability	The bridges are in good condition with minimal unplanned service interruptions and closures.

5.1 Asset Inventory & Costs

The table below includes the quantity, total replacement cost and annual capital requirements of each asset segment in the Township's bridges and culverts inventory.

Asset Segment	Quantity	Replacement Cost	Annual Capital Requirement
Bridges	5	\$8,300,000 ²	\$113,493
Total		\$8,300,000	\$113,493

Total Current Replacement Cost: \$8,300,000



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

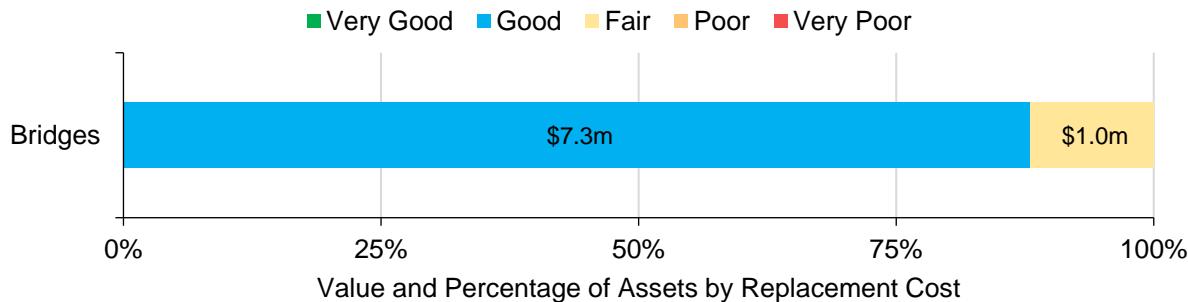
² Rehabilitation and replacement cost information in the OSIM report may not take into account all labour, equipment mobilization, and other costs associated with the replacement of individual components.

5.2 Asset Condition & Age

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

Asset Segment	Estimated Useful Life (Years)	Average Age (Years)	Average Condition
Bridges ³	51	30.6	71% (Good)
Average			71% (Good)

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



To ensure that the Township's Bridges & Culverts 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 bridges and culverts.

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

³ The asset inventory contains a single record for each bridge. Bridges consist of several separate capital components that have unique estimated useful lives and require asset-specific lifecycle strategies. Since the components are pooled under a single record, an average condition for the entire bridge must be applied, which does not account for distinct condition ratings for different components. Municipal staff are working towards enhancing their data.

5.2.1 Current Approach to Condition Assessment

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

- 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).

In this AMP, the following rating criteria is used to determine the current condition of bridges and culverts and forecast future capital requirements:

Condition	Rating
Very Good	80-100
Good	60-80
Fair	40-60
Poor	20-40
Very Poor	0-20

5.3 Lifecycle Management Strategy

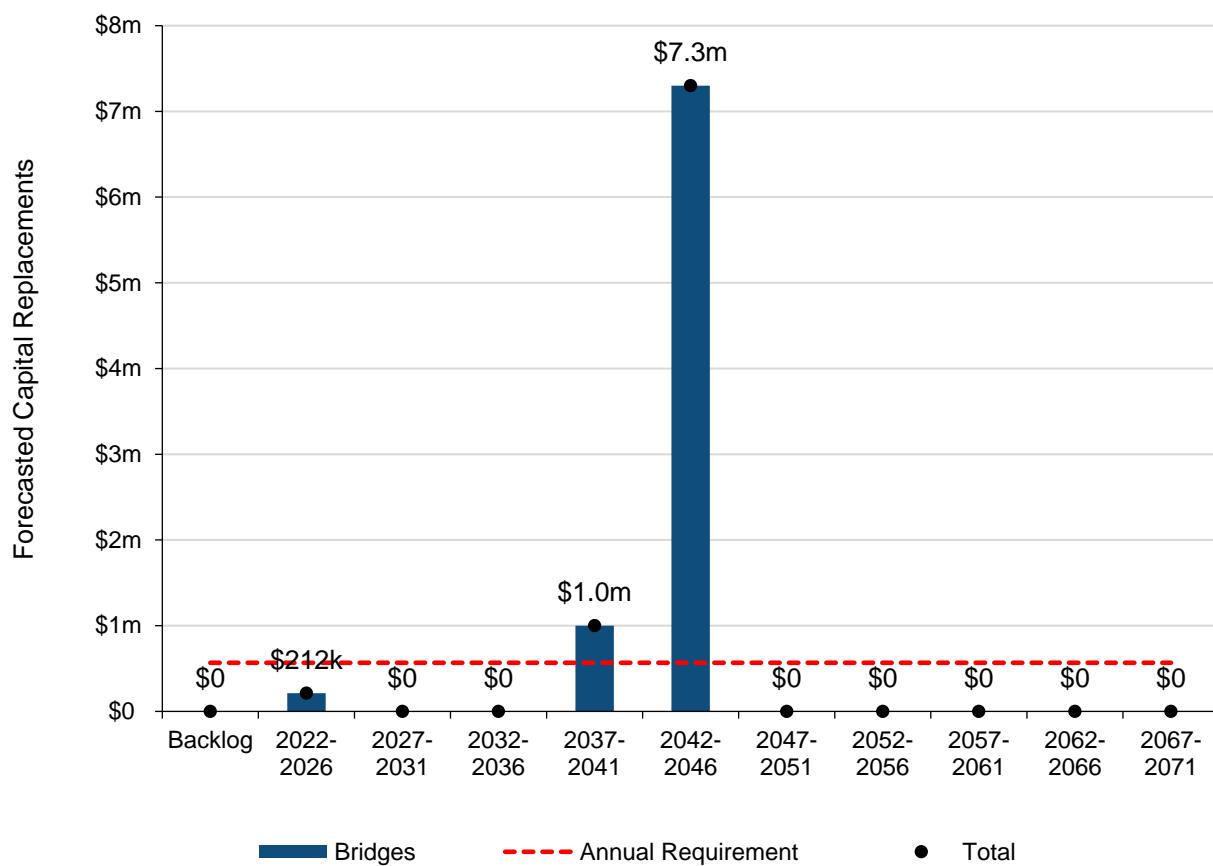
The condition or performance of most assets will deteriorate over time. To ensure that municipal assets are performing as expected and meeting the needs of customers, it is important to establish a lifecycle management strategy to proactively manage asset deterioration.

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

Activity Type	Description of Current Strategy
Maintenance	Sweeping, mowing, and deck washing is completed annually every spring.
	Non-Structural culvert maintenance is performed as-needed, generally based on public complaints. Crushed culverts are noted for replacement. Culverts with significant sedimentation are flushed and thawed in the spring as needed.
	Smaller culverts (non-structural) are typically part of the routine patrols and inspected as a part of road replacement projects.
Rehabilitation/ Replacement	All lifecycle activities are driven by the results of mandated structural inspections completed according to the OSIM report, as funding becomes available.
	Recommendations for detailed inspection by the OSIM report are generally accepted and budgeted in upcoming years.
	Replacement prioritization is generally based on OSIM recommendations; however, cost, AADT, safety, and age are taken into consideration as well.

5.3.1 Forecasted Capital Requirements

The following graph forecasts long-term capital requirements. The annual capital requirement represents the average amount per year that the Township should allocate towards funding rehabilitation and replacement needs. The following graph identifies capital requirements over the next 50 years. This projection is used as it ensures that every asset has gone through one full iteration of replacement. The forecasted requirements are aggregated into 5-year bins. The trend line represents the average 5-year capital requirement of \$567,000.



The asset inventory includes a single pooled asset for each bridge, therefore, does not account for rehabilitation and replacement activities of the many components that make up a single bridge. This graph simply shows when the entire bridge is likely to require renewal or replacement. The projected cost of lifecycle activities that will need to be undertaken over the next 10 years to maintain the current level of service can be found in Appendix B.

5.4 Risk & Criticality

5.4.1 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 2021 inventory data.



This is a high-level model developed for the purposes of this AMP and Township staff should review and adjust the risk model to reflect an evolving understanding of both the probability and consequences of asset failure.

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

Probability of Failure (POF)	Consequence of Failure (COF)
Condition	Replacement Cost
Service Life Remaining	Road Class
Dimensional Restrictions	Detour Distance
Loading Restrictions	Speed
AADT	

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

5.4.2 Risks to Current Asset Management Strategies

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

Condition Assessment Strategies & Mid-Life Rehabilitation

Many of Red Rock's bridges and culverts require rehabilitation and/or replacement. Notably, Bridge No. 1 is in need of major repairs; this bridge is socially critical as it services the entire community as the entrance to the Township.



The Township is dependent on the biennial OSIM report for decision-making and project prioritization; however, they are unable to complete all recommended rehabilitations and replacements due to budget constraints. A significant portion of the Gas Tax Funding is dedicated to bridges and culverts, yet the funding will not likely be sufficient to limit health and safety risks in the future.

5.5 Levels of Service

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

5.5.1 Community Levels of Service

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

Service Attribute	Qualitative Description	Current LOS (2020)
Accessible & Reliable	Description of the traffic that is supported by municipal bridges (e.g. heavy transport vehicles, motor vehicles, emergency vehicles, pedestrians, cyclists)	Bridges and structural culverts are a key component of the municipal transportation network. None of the Township's structures have loading or dimensional restrictions meaning that most types of vehicles, including heavy transport, emergency vehicles, and cyclists can cross them without restriction.
Affordable	Description of the lifecycle activities (maintenance, rehabilitation and replacement) performed on the bridges	See Section 5.3
Sustainable	Description or images of the condition of bridges and culverts and how this would affect use of the bridges and culverts	Very Poor: Widespread signs of deterioration. Requires remedial work to bring the bridge up to standard. Service is affected. Poor: Large portions of the bridge/culvert is exhibiting deterioration of the superstructure, abutments, sub-structure, and/or foundation. The bridge/culvert is mostly below service standards. Fair: Some sections of the bridge/culvert is starting to deteriorate. Requires some remedial work and upgrades in the near

	<p>future to bring the asset up to service standard.</p> <p>Good: Bridge/culvert is in overall good condition. Few sections are starting to show signs of minimal deterioration, service is not affected.</p> <p>Very Good: Bridge/culvert is well maintained and in excellent condition. The asset was newly or recently upgraded. No signs of deterioration or remedial work required.</p>
--	--

5.5.2 Technical Levels of Service

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

Service Attribute	Technical Metric	Current LOS (2020)
Accessible & Reliable	% of bridges in the Township with loading or dimensional restrictions	100%
Affordability	Capital reinvestment rate	0.8%
Sustainability	Average bridge condition index value for bridges in the municipality	71%
	Average bridge condition index value for structural culverts in the municipality	N/A

5.6 Recommendations

Asset Inventory & Condition Data

- The bridges inventory does not include componentized assets. Each bridge is pooled under a single asset record. Bridges consist of several separate capital components – such as abutments, a deck, guiderails, and piles – that have unique estimated useful lives and require asset-specific lifecycle strategies. Staff should work towards a component-based inventory of all bridges to allow for component-based lifecycle planning.
- Continue to review and validate inventory data, assessed condition data, and replacement costs for all bridges and structural culverts upon the completion of OSIM inspections every 2 years.

Lifecycle Management Strategies

- This AMP only includes capital costs associated with the reconstruction of bridges and culverts. The Township should work towards identifying projected capital rehabilitation and renewal costs for bridges and culverts and integrating these costs into long-term planning.

Risk Management Strategies

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

Levels of Service

- Continue to measure current levels of service in accordance with the metrics identified in O. Reg. 588/17 and those metrics that the Township believe to provide meaningful and reliable inputs into asset management planning.
- Work towards identifying proposed levels of service as per O. Reg. 588/17 and identify the strategies that are required to close any gaps between current and proposed levels of service.

6 Storm Network

The Township is responsible for approximately 4.6 kilometres of storm sewers, 110 catch basins and 7 manholes. Detailed attribute data within Citywide includes EUL, In-Service Date, pipe material, diameter, length, size, depth, and replacement cost.

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

Replacement Cost	Condition	Financial Capacity	
		Annual Requirement:	\$32,000
\$2.2 million	Good (66%)	Funding Available:	\$4,000
		Annual Deficit:	\$28,000

The following core values and level of service statements are a key driving force behind the Township's asset management planning:

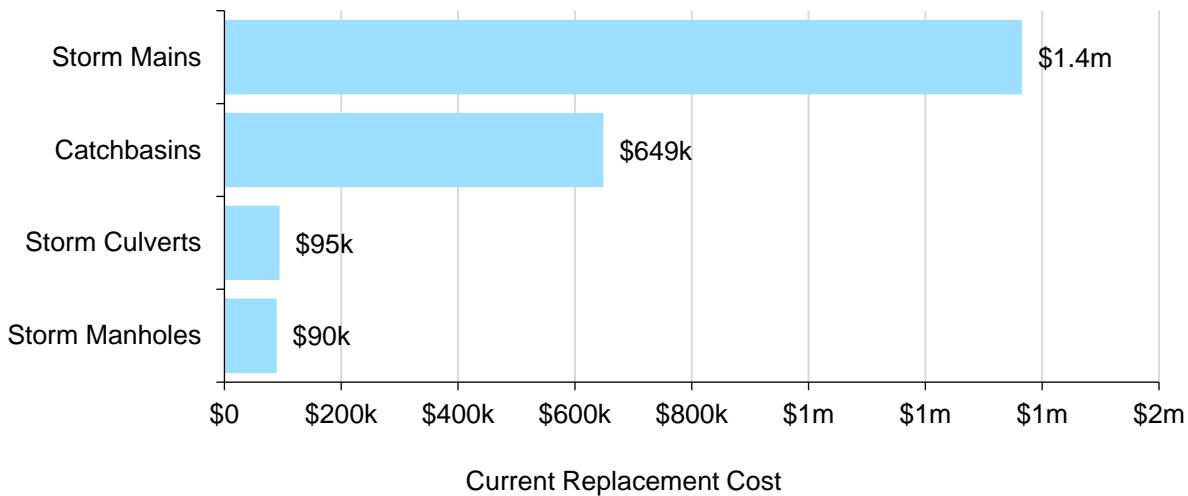
Service Attribute	Level of Service Statement
Accessible & Reliable	The stormwater network service is conveniently accessible to the whole community in sufficient capacity and is available under all weather conditions.
Affordability	The stormwater network is currently partially (13%) funded through sustainable funding sources.
Sustainability	The storm network is in good condition with minimal unplanned service interruptions and closures.

6.1 Asset Inventory & Costs

The table below includes the quantity, total replacement cost and annual capital requirements of each asset segment in the Township's Storm network inventory.

Asset Segment	Quantity	Replacement Cost	Annual Capital Requirement
Catchbasins	110	\$649,000	\$10,817
Storm Culverts	84	\$94,510	\$1,575
Storm Mains	4.6 km	\$1,365,487	\$18,206
Storm Manholes	7	\$89,600	\$1,493
Total		\$2,198,597	\$32,092

Total Current Replacement Cost: \$2,198,597



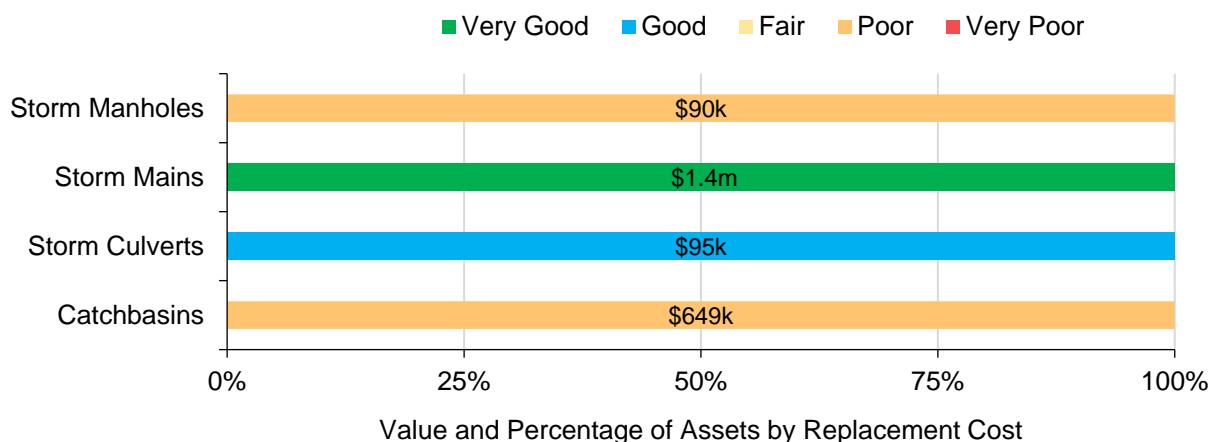
Each asset's replacement cost should be reviewed periodically to determine whether adjustments are needed to more accurately represent realistic capital requirements.

6.2 Asset Condition & Age

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

Asset Segment	Estimated Useful Life (Years)	Average Age (Years)	Average Condition
Catchbasins	60	41.0	31% (Poor)
Storm Culverts	60	41.0	72% (Good)
Storm Mains	60	41.0	83% (Very Good)
Storm Manholes	60	41.0	40% (Fair)
Average			66% (Good)

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



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

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

6.2.1 Current Approach to Condition Assessment

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

- The Township does not have a formal system-wide CCTV condition assessment program in place.
- However, the Township may plan CCTV inspections in coordination with road reconstruction. Asset age, material, and public complaints are utilized for asset management decision-making.
- Catchbasins, manholes, and storm culverts are visual assessed on a regular basis as part of the road patrol. Deficiencies are noted to inform maintenance activities and capital planning.

In this AMP the following rating criteria is used to determine the current condition of road segments and forecast future capital requirements:

Condition	Rating
Very Good	80-100
Good	60-80
Fair	40-60
Poor	20-40
Very Poor	0-20

6.3 Lifecycle Management Strategy

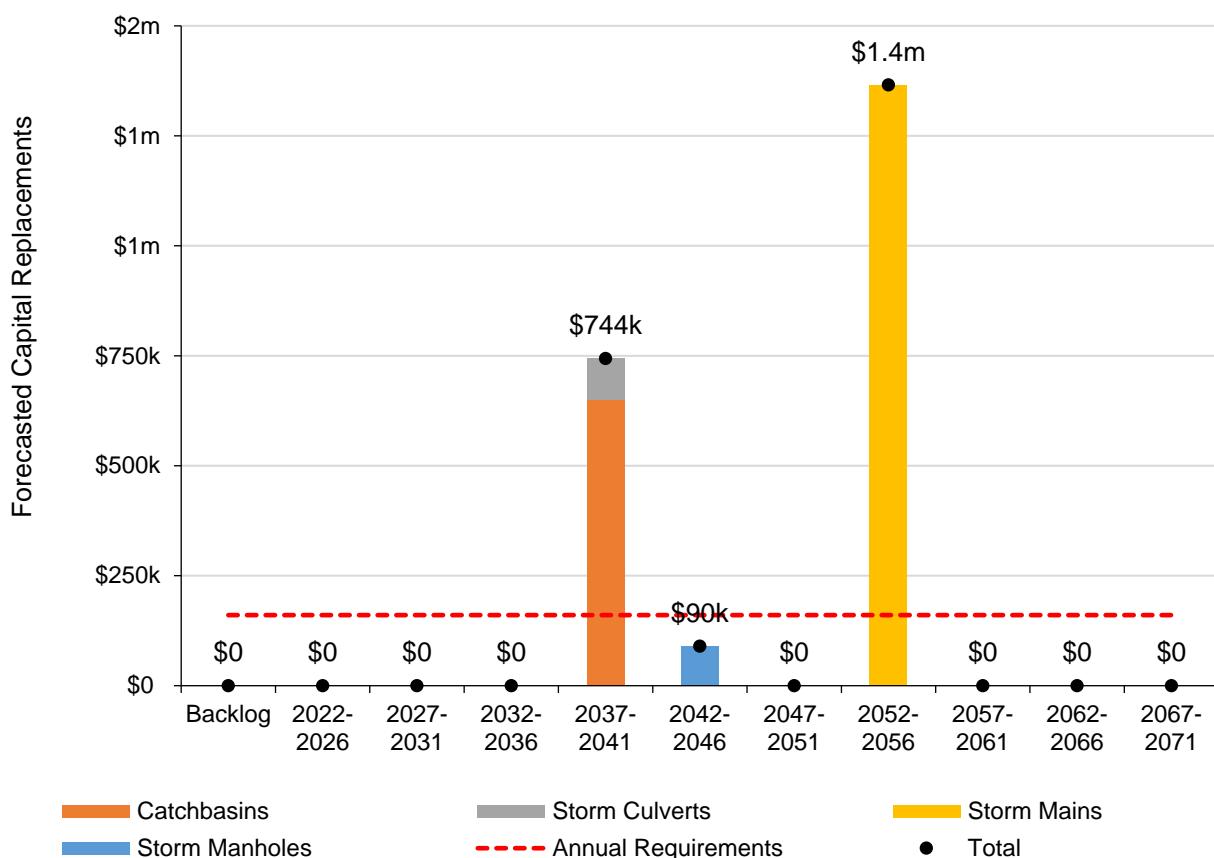
The condition or performance of most assets will deteriorate over time. To ensure that municipal assets are performing as expected and meeting the needs of customers, it is important to establish a lifecycle management strategy to proactively manage asset deterioration.

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

Activity Type	Description of Current Strategy
Maintenance	<p>Primary activities include catch basin cleaning and storm main flushing, but only a small percentage of the entire network is completed per year.</p> <p>Culverts with significant sedimentation are flushed and thawed in the spring as needed.</p>
Rehabilitation	<p>There is no system-wide relining program in place. However, some storm sewers (Brompton Road) may be relined based on CCTV inspection findings.</p>
Replacement	<p>Without the availability of up-to-date condition assessment information replacement activities are purely reactive in nature.</p>

6.3.1 Forecasted Capital Requirements

The following graph forecasts long-term capital requirements. The annual capital requirement represents the average amount per year that the Township should allocate towards funding rehabilitation and replacement needs. The following graph identifies capital requirements over the next 50 years. This projection is used as it ensures that every asset has gone through one full iteration of replacement. The forecasted requirements are aggregated into 5-year bins. The trend line represents the average 5-year capital requirement of \$160,000.



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

6.4 Risk & Criticality

6.4.1 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 2021 inventory data.



This is a high-level model developed for the purposes of this AMP and Township staff should review and adjust the risk model to reflect an evolving understanding of both the probability and consequences of asset failure.

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

Probability of Failure (POF)	Consequence of Failure (COF)
Condition	Replacement Cost
Pipe Material	Bury Depth
Service Life Remaining	Diameter
Slope	AADT
	Proximity to Critical Services

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

6.4.2 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 & Information

The least amount of information is known about the Township's storm network. The catch basins and storm sewer manholes are each pooled into one asset. Furthermore, there is no precise location data or coordinated IDs for sewer mains, which would impede data gathering efforts. Due to the lack of knowledge and capacity to perform condition assessments on underground storm assets, asset management practices are almost entirely reactive with leaks and breaks occurring as a surprise.

6.5 Levels of Service

The following tables identify the Township's current level of service for the storm 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.

6.5.1 Community Levels of Service

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

Service Attribute	Qualitative Description	Current LOS (2020)
Accessidbility & Reliability	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	See Appendix C
Affordable	Description of the lifecycle activities (maintenance, rehabilitation and replacement) performed on the storm network	See Section 6.3

6.5.2 Technical Levels of Service

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

Service Attribute	Technical Metric	Current LOS (2020)
Accessible & Reliable	% of properties in municipality resilient to a 100-year storm	TBD ⁴
	% of the municipal stormwater management system resilient to a 5-year storm	100% ⁵

⁴ The Township does not currently have data available to determine this technical metric. The rate of properties that are expected to be resilient to a 100-year storm is expected to be low.

⁵ This is based on the observations of municipal staff.

Affordability	Capital reinvestment rate	1.8%
Sustainability	Average condition rating of storm mains in the municipality	83%
	Average condition rating of storm culverts in the municipality	72%

6.6 Recommendations

Asset Inventory

- The Township's storm network inventory is at a relatively basic level of maturity and staff do not have a high level of confidence in its accuracy.
- The catch basins and storm sewer manholes are each pooled into one asset which does not allow for unique data information related to the age, condition, and location of the asset. Furthermore, there is no precise location data or coordinated IDs for sewer mains, which would impede data gathering efforts. The development of a comprehensive inventory of the storm network should be priority.

Condition Assessment Strategies

- The development of a comprehensive inventory should be accompanied by a system-wide assessment of the condition of all assets in the storm 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

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

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.

7 Buildings & Facilities

The Township is responsible for an inventory of municipal buildings and facilities, including municipal offices, storage, a firehall, recreation centres, library, marina, and a rental house. Some buildings are segmented into components (e.g., interior, services, special construction, roof, and structure).

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

Replacement Cost	Condition	Financial Capacity	
\$21.2 million	Fair (41%)	Annual Requirement:	\$545,000
		Funding Available:	\$70,000
		Annual Deficit:	\$475,000

The following core values and level of service statements are a key driving force behind the Township's asset management planning:

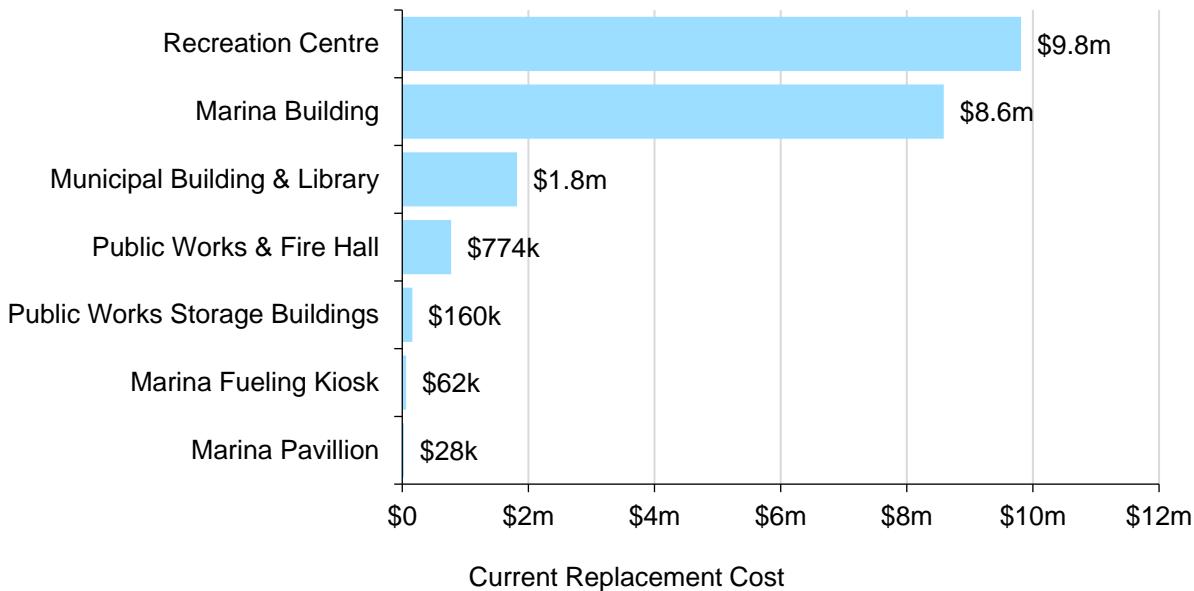
Service Attribute	Level of Service Statement
Accessible & Reliable	The building and facilities service is conveniently accessible to the whole community in sufficient capacity and meets public expectations.
Affordability	The buildings and facilities are currently partially (13%) funded through sustainable funding sources.
Sustainability	The buildings and facilities are in fair condition with minimal unplanned service interruptions and closures.

7.1 Asset Inventory & Costs

The table below includes the quantity, total replacement cost and annual capital requirements of each asset segment in the Township's buildings and facilities inventory.

Asset Segment	Quantity (Component)	Replacement Cost	Annual Capital Requirement
Marina Building	1(42)	\$8,585,588	\$182,228
Marina Fueling Kiosk	1	\$61,895	\$2,476
Marina Pavillion	1	\$27,596	\$1,104
Municipal Building & Library	1(12)	\$1,819,526	\$62,451
Public Works & Fire Hall	1(13)	\$774,468	\$23,468
Public Works Storage Buildings	3(4)	\$160,377	\$4,771
Recreation Centre	1(75)	\$9,811,374	\$268,198
Total		\$21,240,823	\$544,696

Total Current Replacement Cost: \$21,240,823



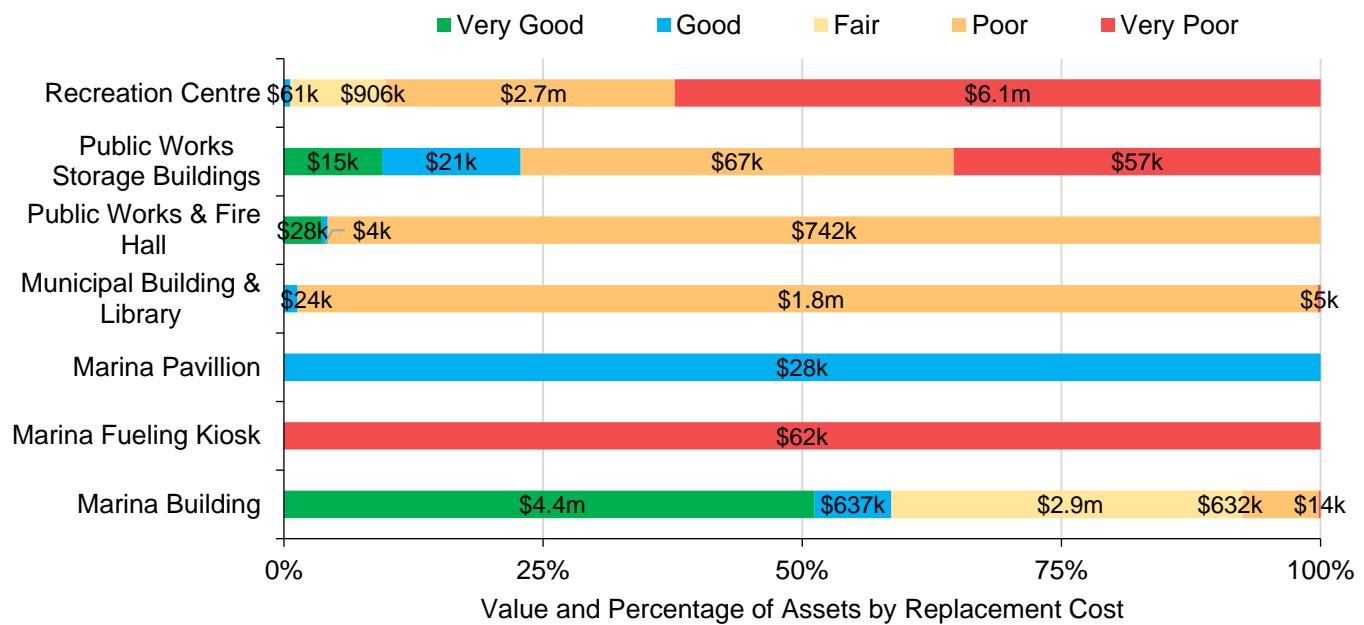
Each asset's replacement cost should be reviewed periodically to determine whether adjustments are needed to more accurately represent realistic capital requirements.

7.2 Asset Condition & Age

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

Asset Segment	Estimated Useful Life (Years)	Average Age (Years)	Average Condition
Marina Building	52	16.0	66% (Good)
Marina Fueling Kiosk	25	28.0	0% (Very Poor)
Marina Pavillion	25	36.0	65% (Good)
Municipal Building & Library	36	43.0	38% (Poor)
Public Works & Fire Hall	41	37.7	38% (Poor)
Public Works Storage Buildings	38	23.7	35% (Poor)
Recreation Centre	43	35.3	20% (Poor)
Average			41% (Fair)

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



To ensure that the Township's buildings and 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 and facilities.

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

7.2.1 Current Approach to Condition Assessment

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

- The Township does not have a formal condition assessment program in place to assess the condition of the buildings. Informal visual assessments take place on a regular basis. Deficiencies are noted and used to inform capital planning.
- The Township is responsible for the annual or biennial marina inspections in compliance with Technical Standards and Safety Authority (TSSA) standards. Management of the buildings is primarily reactive.

In this AMP the following rating criteria is used to determine the current condition of road segments and forecast future capital requirements:

Condition	Rating
Very Good	80-100
Good	60-80
Fair	40-60
Poor	20-40
Very Poor	0-20

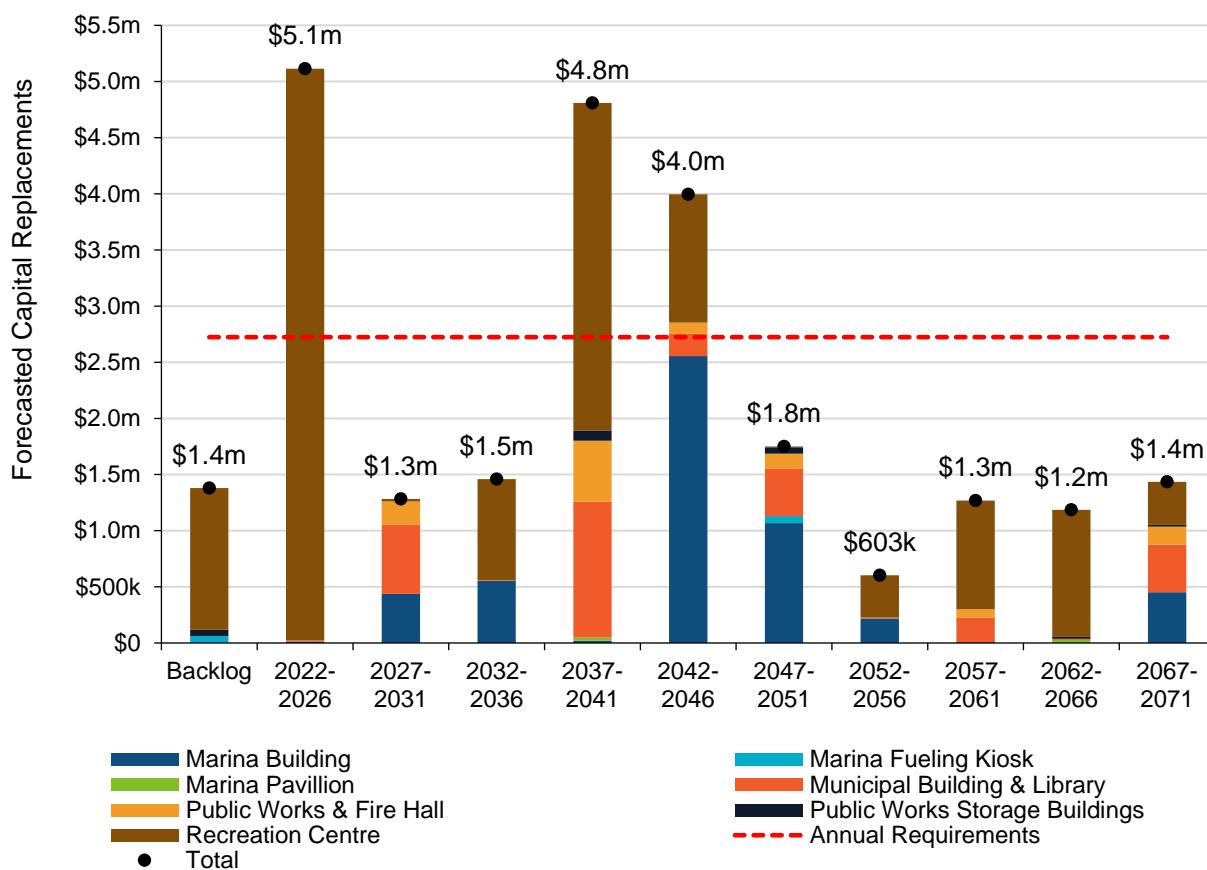
7.3 Lifecycle Management Strategy

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
	The Township's building maintenance staff performs monthly visual inspections with a focus on health and safety. Formal assessments are completed strategically based on the condition and performance of the asset.
Maintenance	Building assets are maintained and cleaned by staff on a routine basis or more often as needed.
Rehabilitation/ Replacement	Visual inspections related to sprinklers, fire extinguishers, HVAC, and the firehall are carried out in consideration of health and safety measures and in accordance with the guidelines set by the National Fire Protection Association (NFPA).

7.3.1 Forecasted Capital Requirements

The following graph forecasts long-term capital requirements. The annual capital requirement represents the average amount per year that the Township should allocate towards funding rehabilitation and replacement needs. The following graph identifies capital requirements over the next 50 years. This projection is used as it ensures that every asset has gone through one full iteration of replacement. The forecasted requirements are aggregated into 5-year bins. The trend line represents the average 5-year capital requirement of \$2.7 million.



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

7.4 Risk & Criticality

7.4.1 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 2021 inventory data.



This is a high-level model developed for the purposes of this AMP and Township staff should review and adjust the risk model to reflect an evolving understanding of both the probability and consequences of asset failure.

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

Probability of Failure (POF)	Consequence of Failure (COF)
Condition	Replacement Cost
Service Life Remaining	Facility Usage
	Function

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

7.4.2 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, Capital Funding, and Public Expectations

The Township's buildings are partly componentized in the asset inventory, which is beneficial for developing detailed lifecycle strategies, however, condition data is age-based and may not be accurate. Age-based condition shows several components to be in poor and very poor condition. The Township cannot contribute sufficient capital funding towards building repairs and retrofits. Public expectations cannot be met with each recreational building and COVID-19 has further altered public expectations. The Township will benefit from consultations with the public to determine the best use for municipal recreational buildings and land.

7.5 Levels of Service

The following tables identify the Township's current level of service for the buildings. 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.

7.5.1 Community Levels of Service

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

Service Attribute	Qualitative Description	Current LOS (2020)
Affordable	Facilities are managed cost-effectively to meet the established level of service	See Section 7.3

7.5.2 Technical Levels of Service

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

Service Attribute	Technical Metric	Current LOS (2020)
Affordability	Capital reinvestment rate	0.1%
Sustainable	Average Condition rating of buildings in the municipality	41%

7.6 Recommendations

Asset Inventory

- The Township's asset inventory contains only a few components for each building. Buildings consist of several separate capital components that have unique estimated useful lives and require asset-specific lifecycle strategies. Staff should work towards a component-based inventory of all facilities to allow for component-based lifecycle planning.

Replacement Costs

- Gather accurate replacement costs and update on a regular basis to ensure the accuracy of capital projections.

Condition Assessment Strategies

- The Township should implement regular condition assessments for all facilities to better inform 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 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.

8 Vehicles

The Township is responsible for managing 9 vehicles across multiple service areas, including public works, fire, administration, and recreation. These assets are documented in the asset inventory with attributes such as In-Service Date, Estimated Useful Life, and historical cost. The Township employs a combination of proactive and reactive maintenance performed by internal staff and external certified mechanics.

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

Replacement Cost	Condition	Financial Capacity	
		Annual Requirement:	\$74,000
\$1.1 million	Very Poor (8%)	Funding Available:	\$9,000
		Annual Deficit:	\$65,000

The following core values and level of service statements are a key driving force behind the Township's asset management planning:

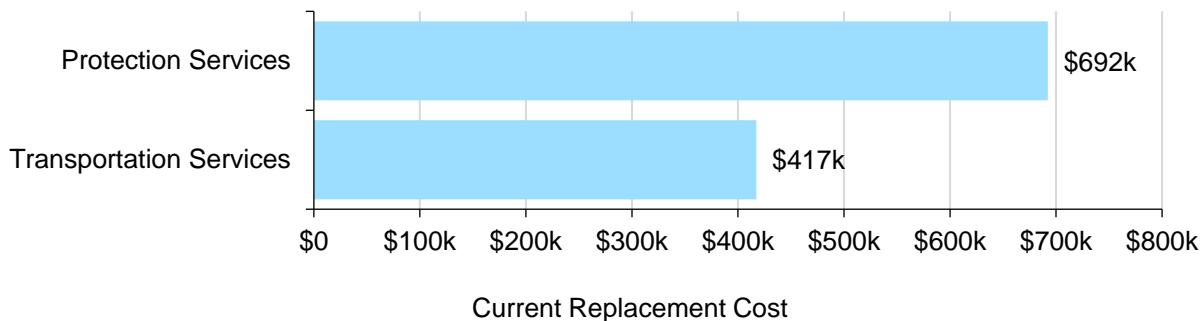
Service Attribute	Level of Service Statement
Accessible & Reliable	The vehicles are conveniently accessible and available to meet the service delivery needs in each department.
Affordability	The vehicles are currently partially (13%) funded through sustainable funding sources.
Sustainability	The vehicles are in very poor condition with minimal unplanned service interruptions.

8.1 Asset Inventory & Costs

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

Asset Segment	Quantity	Replacement Cost	Annual Capital Requirement
Protection Services	3	\$692,249	\$34,612
Transportation Services	6	\$417,304	\$39,629
Total		\$1,109,553	\$74,241

Total Current Replacement Cost: \$1,109,553



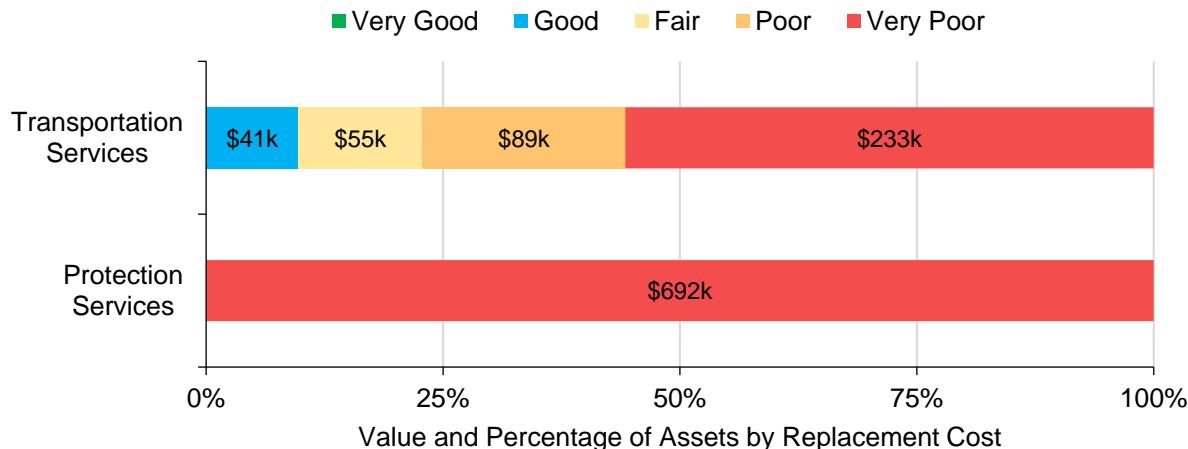
Each asset's replacement cost should be reviewed periodically to determine whether adjustments are needed to more accurately represent realistic capital requirements.

8.2 Asset Condition & Age

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	Estimated Useful Life (Years)	Average Age (Years)	Average Condition
Protection Services	20	24.9	1% (Very Poor) ⁶
Transportation Services	5	11.0	20% (Poor)
Average			8% (Very Poor)

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



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

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

⁶ The age-based condition of these assets is not likely accurate as the protection vehicles are determined to be in good function. Staff estimate a more accurate condition rating of fair (between 40% to 60%).

8.2.1 Current Approach to Condition Assessment

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

- Staff complete regular visual inspections of vehicles 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 except for the Fire Department.
- Fire Trucks are inspected at a Motor Vehicle Inspection Station licensed by the Ministry of Transportation.

In this AMP the following rating criteria is used to determine the current condition of road segments and forecast future capital requirements:

Condition	Rating
Very Good	80-100
Good	60-80
Fair	40-60
Poor	20-40
Very Poor	0-20

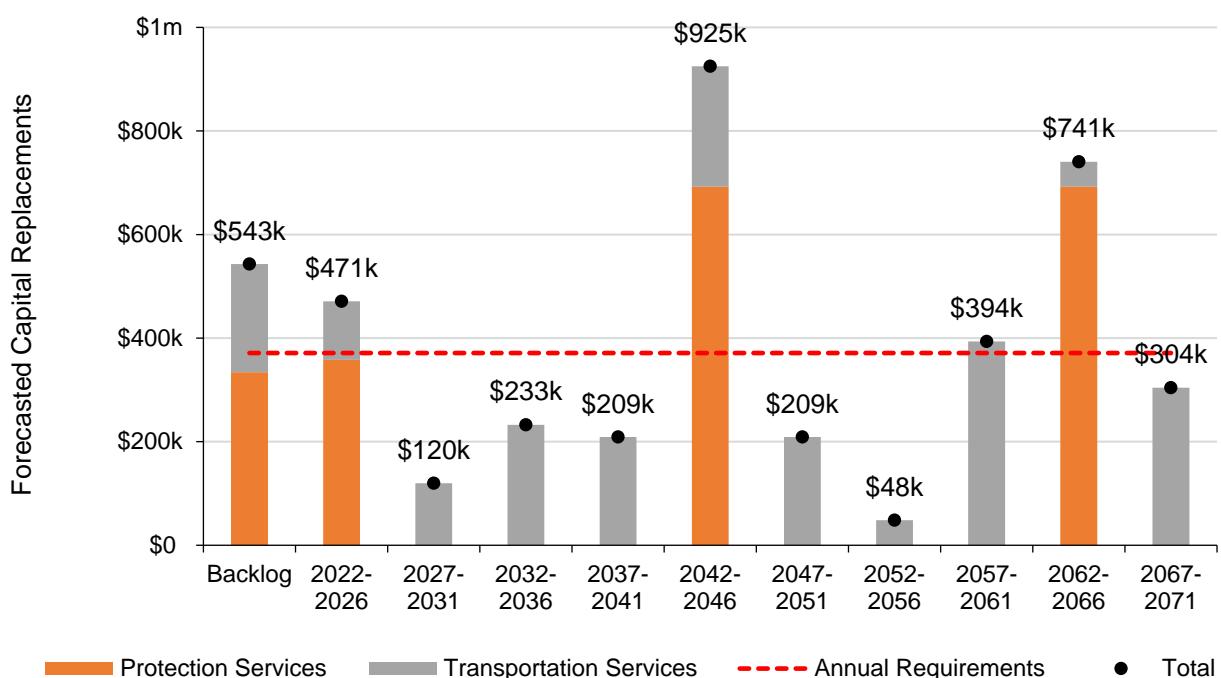
8.3 Lifecycle Management Strategy

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	Maintenance is done externally based on the mileage or as needed. Routine maintenance, such as oil changes and safety inspections, are completed internally.
	Tire changes, fluid top up, minor component changes, such as wipers, are completed as needed.
	Commercial Vehicle Operator's Registration (CVOR) vehicles are inspected and maintained by an external, certified mechanic. Oil changes occur when required, mileage is typically used as an indicator.
	Non-CVOR vehicles have routine oil changes based on mileage. A mechanic completes a 50-point inspection during this time and recommends repairs, such as replacing brakes or tires.
Rehabilitation/ Replacement	Vehicles within the fire department are inspected in reference to vehicle manuals and in accordance with the guidelines set by the National Fire Protection Association (NFPA).
	Most of the fleet has a replacement schedule of 10 years, generally considering the performance of the vehicle.
	Replacement prioritization mainly considers asset condition, mileage, and budget. Consistent and known mechanical issues are also factored in

8.3.1 Forecasted Capital Requirements

The following graph forecasts long-term capital requirements. The annual capital requirement represents the average amount per year that the Township should allocate towards funding rehabilitation and replacement needs. The following graph identifies capital requirements over the next 50 years. This projection is used as it ensures that every asset has gone through one full iteration of replacement. The forecasted requirements are aggregated into 5-year bins. The trend line represents the average 5-year capital requirement of \$371,000.



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

8.4 Risk & Criticality

8.4.1 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 2021 inventory data.



This is a high-level model developed for the purposes of this AMP and Township staff should review and adjust the risk model to reflect an evolving understanding of both the probability and consequences of asset failure.

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

Probability of Failure (POF)		Consequence of Failure (COF)
Condition	Replacement Cost	
Service Life Remaining	Function	
	Segment	

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

8.4.2 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 & Organizational Capacity

There is a lack of confidence in the available inventory data for vehicles. Condition data is age-based and is often found not to be accurate. Decision-making and prioritization are based on how often a vehicle is used but there is no formal lifecycle strategy in place. There is also a lack of organizational capacity to address many concerns since there is no licensed automotive machinic on staff. The Township is dependent on external support for many major vehicle repairs.

8.5 Levels of Service

The following tables identify the Township's current level of service for the vehicles. 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.

8.5.1 Community Levels of Service

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

Service Attribute	Qualitative Description	Current LOS (2020)
Affordable	Facilities are managed cost-effectively to meet the established level of service	See Section 8.3

8.5.2 Technical Levels of Service

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

Service Attribute	Technical Metric	Current LOS (2020)
Affordability	Capital reinvestment rate	0.7%
Sustainable	Average Condition rating of vehicles in the municipality	8%

8.6 Recommendations

Replacement Costs

- All replacement costs used in this AMP are 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 vehicles.
- 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 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.

9

Machinery & Equipment

The Township is responsible for managing 382 machinery and equipment assets across multiple service areas, including public works, administration, fire, parks, libraries, and recreation. These assets are documented in the asset inventory with attributes such as In-Service Date, Estimated Useful Life, and historical cost. Keeping machinery and equipment in an adequate state of repair is important to maintain a high level of service.

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

Replacement Cost	Condition	Financial Capacity	
\$5 million	Poor (30%)	Annual Requirement:	\$378,000
		Funding Available:	\$49,000
		Annual Deficit:	\$329,000

The following core values and level of service statements are a key driving force behind the Township's asset management planning:

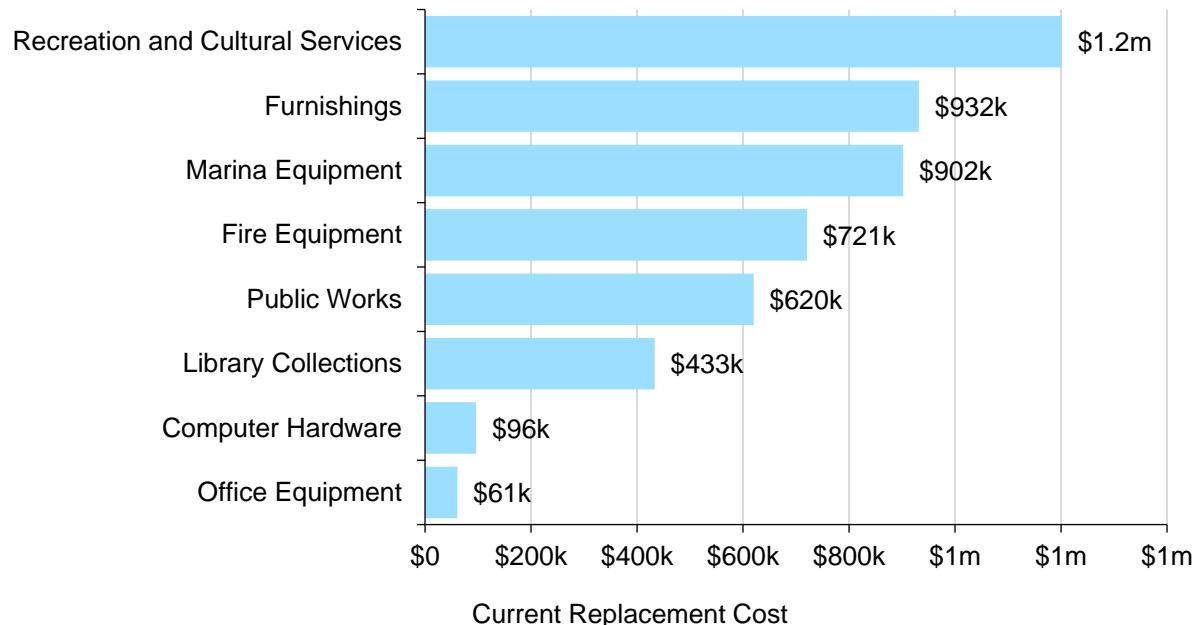
Service Attribute	Level of Service Statement
Accessible & Reliable	The machinery and equipment are conveniently accessible and available to meet the service delivery needs in each department.
Affordability	The machinery and equipment are currently partially (13%) funded through sustainable funding sources.
Sustainability	The machinery and equipment are in poor condition with minimal unplanned service interruptions.

9.1 Asset Inventory & Costs

The table below includes the quantity, total replacement cost and annual capital requirements of each asset segment in the Township's machinery and equipment inventory.

Asset Segment	Quantity (Component)	Replacement Cost	Annual Capital Requirement
Computer Hardware	30	\$96,459	\$16,345
Fire Equipment	203	\$720,583	\$69,468
Furnishings	43	\$931,702	\$65,964
Library Collections	1 (8,043)	\$433,143	\$43,314
Marina Equipment	24	\$902,219	\$45,995
Office Equipment	10	\$60,914	\$11,925
Public Works	38	\$620,019	\$48,251
Recreation and Cultural Services	34	\$1,201,122	\$76,574
Total		\$4,966,161	\$377,836

Total Current Replacement Cost: \$4,966,161



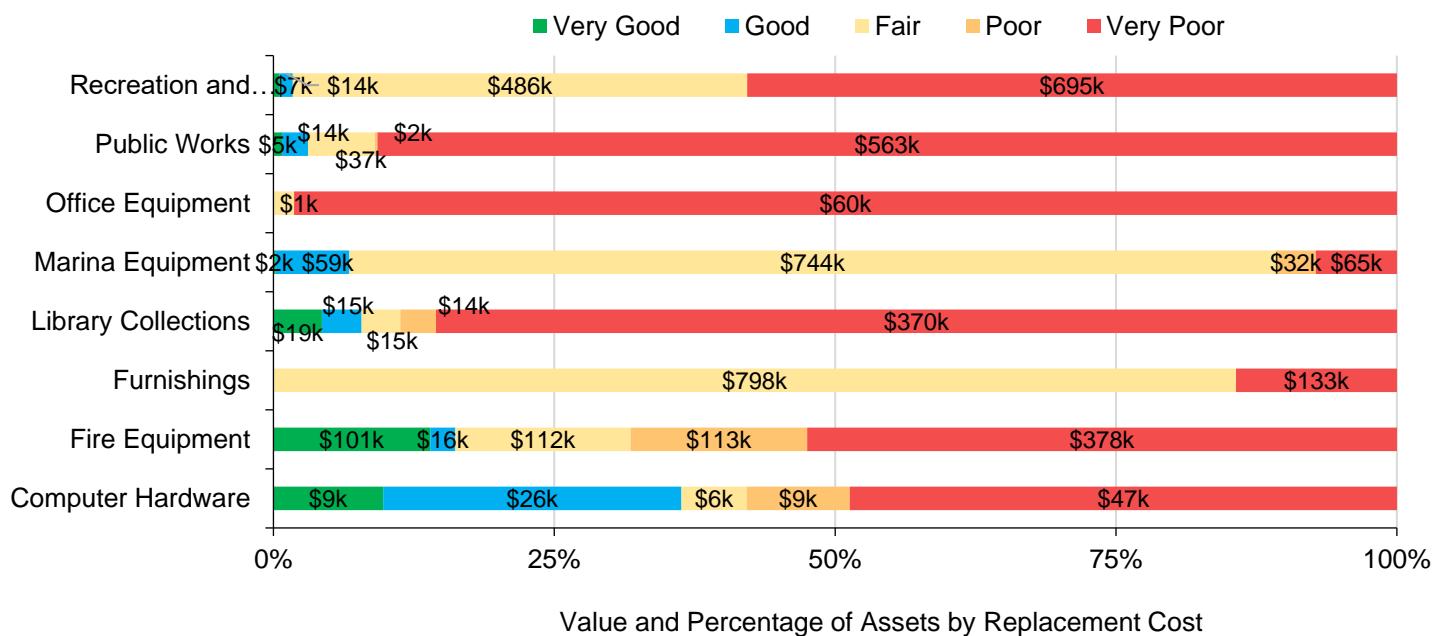
Each asset's replacement cost should be reviewed periodically to determine whether adjustments are needed to more accurately represent realistic capital requirements.

9.2 Asset Condition & Age

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	Estimated Useful Life (Years)	Average Age (Years)	Average Condition
Computer Hardware	7	6.1	31% (Poor)
Fire Equipment	11	13.0	28% (Poor)
Furnishings	14	8.9	48% (Fair)
Library Collections	10	25.8	9% (Very Poor)
Marina Equipment	21	9.4	53% (Fair)
Office Equipment	5	16.7	1% (Very Poor)
Public Works	14	17.4	8% (Very Poor)
Recreation and Cultural Services	17	18.1	20% (Poor)
Average			30% (Poor)

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



To ensure that the Township's machinery and 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 and equipment.

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

9.2.1 Current Approach to Condition Assessment

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

- Staff complete regular visual inspections of machinery and equipment to ensure they are in state of adequate repair.
- There are no formal condition assessment programs in place, although some machinery and equipment were assigned cursory condition ratings for this AMP.

In this AMP the following rating criteria is used to determine the current condition of road segments and forecast future capital requirements:

Condition	Rating
Very Good	80-100
Good	60-80
Fair	40-60
Poor	20-40
Very Poor	0-20

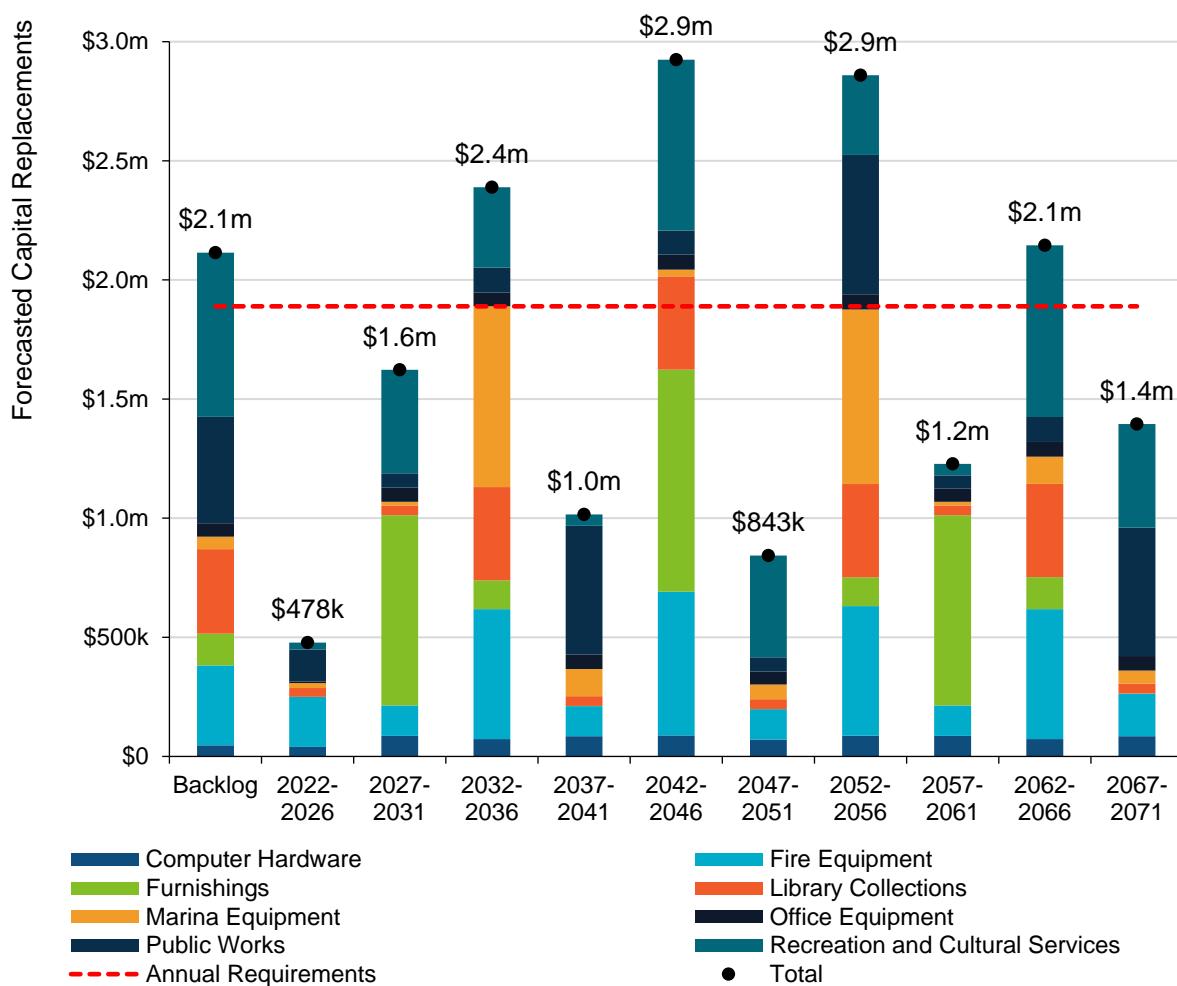
9.3 Lifecycle Management Strategy

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	Machinery related to water and wastewater assets is tested and inspected as part of the regular operations.
	Fueling stations in the Marina are inspected by an external contractor on annual basis.
	Public works snowplows are maintained and inspected on annual basis. This includes replacement of chutes, blades, pins, and other components.
	Ice plant equipment is inspected on annual basis and components are replaced as needed.
	Bunker gear belonging to the fire department is inspected routinely by staff, and every 6 months by the manufacturer, as per NFPA standards. Monthly night maintenance is performed as issues are identified.
	Generators, portable pumps, and fire extinguishers are tested annually for certification.
	Cylinders and cascade cylinders are tested every 5 years for certification.
	Defibrillators are checked monthly to ensure proper functioning.
	Self Contained Breathing Apparatus (SCBA) have an annual inspection and are hydrostatically tested. Staff perform visual inspections monthly.
	Radio equipment is inspected during use and issues are reported as they arise.
Rehabilitation /Replacement	CO2 testers and the air filling machines are tested and sampled every 6 months to ensure proper working order.
	Extrication tools have annual certification and are being switched from old to new technology.
	Computer maintenance is usually done in-house, outside consultants mostly act as support.
	Most of the machinery and equipment assets are replaced on a 10-year cycle. They may be replaced sooner or later depending on performance.
	The replacement of these assets is based on the service life remaining and budget available.

9.3.1 Forecasted Capital Requirements

The following graph forecasts long-term capital requirements. The annual capital requirement represents the average amount per year that the Township should allocate towards funding rehabilitation and replacement needs. The following graph identifies capital requirements over the next 50 years. This projection is used as it ensures that every asset has gone through one full iteration of replacement. The forecasted requirements are aggregated into 5-year bins. The trend line represents the average 5-year capital requirement of \$1.9 million.



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

9.4 Risk & Criticality

9.4.1 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 2021 inventory data.



This is a high-level model developed for the purposes of this AMP and Township staff should review and adjust the risk model to reflect an evolving understanding of both the probability and consequences of asset failure.

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

Probability of Failure (POF)		Consequence of Failure (COF)
Condition	Service Life Remaining	Replacement Cost
		Function

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

9.4.2 Risks to Current Asset Management Strategies

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



Lifecycle Management Strategies & Asset Data

Lifecycle management strategies and project prioritization are made difficult due to the quality of the asset data and information for machinery and equipment. There are a number of pooled assets and little to no information gathered on critical assets such as staff laptops. Refinement of the asset inventory is critical to support informed purchasing and disposing of machinery and equipment assets.

9.5 Levels of Service

The following tables identify the Township's current level of service for the machinery and equipment. 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.

9.5.1 Community Levels of Service

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

Service Attribute	Qualitative Description	Current LOS (2020)
Affordable	Facilities are managed cost-effectively to meet the established level of service	See Section 9.3

9.5.2 Technical Levels of Service

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

Service Attribute	Technical Metric	Current LOS (2020)
Affordability	Capital reinvestment rate	0.6%
Sustainable	Average Condition rating of machinery and equipment in the municipality	30%

9.6 Recommendations

Replacement Costs

- All replacement costs used in this AMP are 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.
- 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 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.

10 Land Improvements

The Township has a diverse portfolio of land improvement assets comprised of parks, a marina, septic fields, a swimming pool, boardwalks, fencing, parking lots and lighting. The inventory contains complete counts for assets and contains accompanying In-Service Date and Estimated Useful Life information.

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

Replacement Cost	Condition	Financial Capacity	
\$375,000	Fair (52%)	Annual Requirement:	\$32,000
		Funding Available:	\$4,000
		Annual Deficit:	\$28,000

The following core values and level of service statements are a key driving force behind the Township's asset management planning:

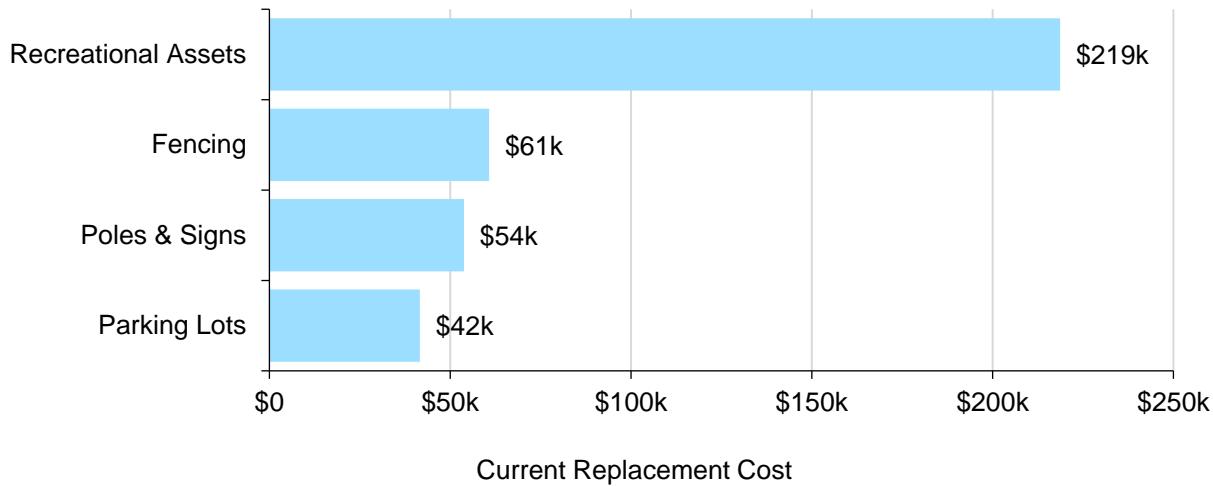
Service Attribute	Level of Service Statement
Accessible & Reliable	The land improvements are conveniently accessible and available to meet the needs of the public.
Affordability	The land improvements are currently partially (13%) funded through sustainable funding sources.
Sustainability	The land improvements are in fair condition with minimal unplanned service interruptions.

10.1 Asset Inventory & Costs

The table below includes the quantity, total replacement cost and annual capital requirements of each asset segment in the Township's land improvements inventory.

Asset Segment	Quantity	Replacement Cost	Annual Capital Requirement
Fencing	4	\$60,767	\$3,038
Parking Lots	2	\$41,588	\$2,079
Poles & Signs	6	\$53,807	\$5,381
Recreational Assets	3	\$218,699	\$21,870
Total		\$374,861	\$32,368

Total Current Replacement Cost: \$374,861



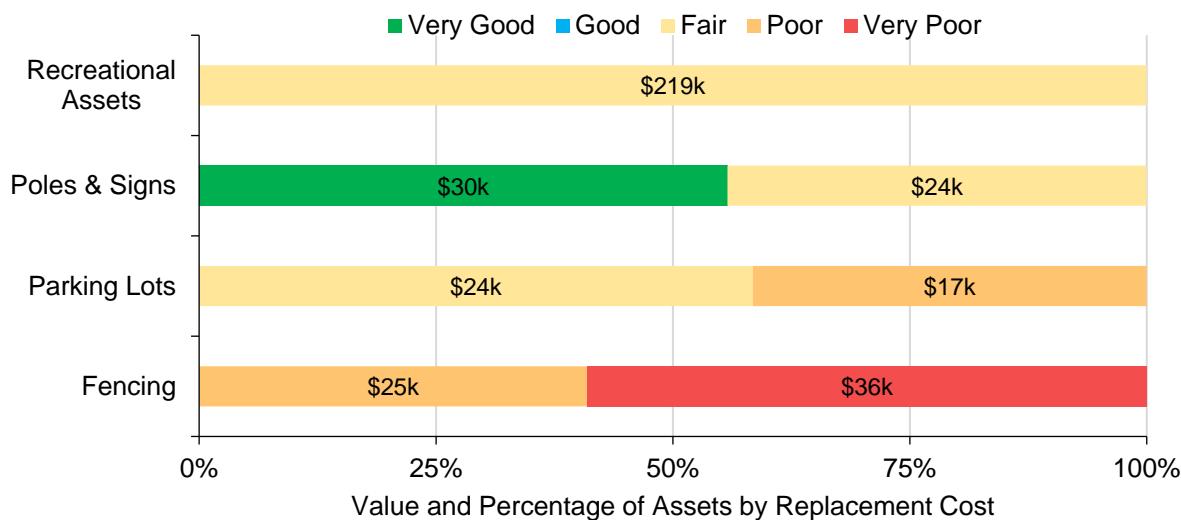
Each asset's replacement cost should be reviewed periodically to determine whether adjustments are needed to more accurately represent realistic capital requirements.

10.2 Asset Condition & Age

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

Asset Segment	Estimated Useful Life (Years)	Average Age (Years)	Average Condition
Fencing	20	16.7	20% (Poor)
Parking Lots	20	21.3	44% (Fair)
Poles & Signs	10	11.0	76% (Good)
Recreational Assets	10	9.0	56% (Fair)
Average			52% (Fair)

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



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

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

10.2.1 Current Approach to Condition Assessment

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

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

In this AMP the following rating criteria is used to determine the current condition of road segments and forecast future capital requirements:

Condition	Rating
Very Good	80-100
Good	60-80
Fair	40-60
Poor	20-40
Very Poor	0-20

10.3 Lifecycle Management Strategy

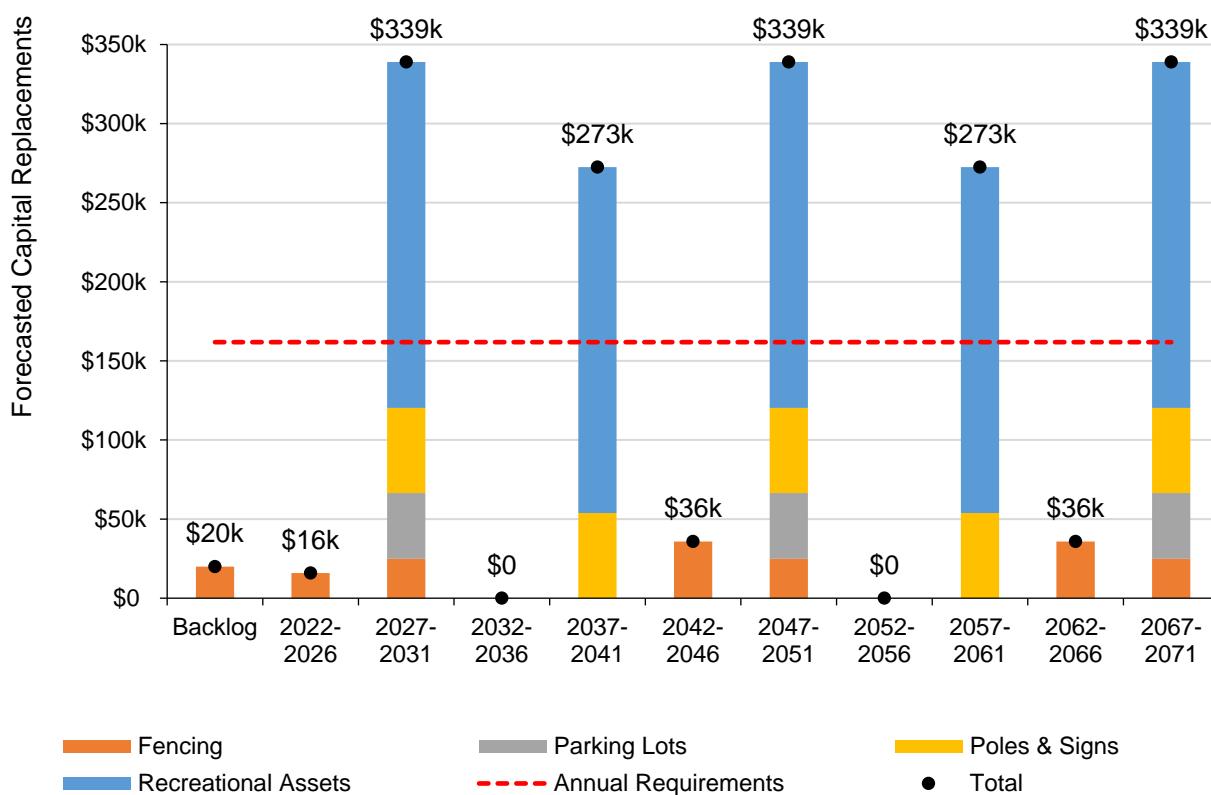
The condition or performance of most assets will deteriorate over time. To ensure that municipal assets are performing as expected and meeting the needs of customers, it is important to establish a lifecycle management strategy to proactively manage asset deterioration.

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

Activity Type	Description of Current Strategy
Maintenance	<p>Parking lots are assessed as the part of road patrols.</p> <p>Playing fields, splashpad, and boardwalks are inspected as needed documenting risks to health and safety.</p> <p>The Covid-19 pandemic has impacted maintenance practices, sanitation frequency has increased to a daily activity following use.</p>
Rehabilitation /Replacement	<p>There are no formal guiding documents prescribing rehabilitation or replacements of most land improvements. Assets are assessed and replaced as needed and budgeted annually.</p> <p>Project prioritizations for rehabilitation/replacement is based on the costs, health and safety, service life remaining and its usefulness to the Township.</p> <p>Currently, the pool is closed but in future it may be planned for renewal and re-opening.</p>

10.3.1 Forecasted Capital Requirements

The following graph forecasts long-term capital requirements. The annual capital requirement represents the average amount per year that the Township should allocate towards funding rehabilitation and replacement needs. The following graph identifies capital requirements over the next 50 years. This projection is used as it ensures that every asset has gone through one full iteration of replacement. The forecasted requirements are aggregated into 5-year bins. The trend line represents the average 5-year capital requirement of \$162,000.



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

10.4 Risk & Criticality

10.4.1 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 2021 inventory data.



This is a high-level model developed for the purposes of this AMP and Township staff should review and adjust the risk model to reflect an evolving understanding of both the probability and consequences of asset failure.

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

Probability of Failure (POF)		Consequence of Failure (COF)	
Condition		Replacement Cost	
Service Life Remaining		Park Type	

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

10.4.2 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 & Lifecycle Strategies

The asset inventory and attribute data are not sufficient to support proactive lifecycle management strategies. Maintenance and replacement strategies rely on public complaints and age-based data. The condition data is age-based, and the replacement costs are based on historical costs and inflation; both condition and replacement cost are often found to be inaccurate.

10.5 Levels of Service

The following tables identify the Township's current level of service for the land improvements. 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.

10.5.1 Community Levels of Service

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

Service Attribute	Qualitative Description	Current LOS (2020)
Affordable	Facilities are managed cost-effectively to meet the established level of service	See Section 8.3

10.5.2 Technical Levels of Service

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

Service Attribute	Technical Metric	Current LOS (2020)
Affordability	Capital reinvestment rate	8%
Sustainable	Average Condition rating of land improvements in the municipality	52%

10.6 Recommendations

Asset Inventory

- Review the asset inventory for land improvement assets to ensure all assets are accounted for.

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 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.

11 Water Network

The Township is responsible for a water treatment plant, water towers, water distribution, water meters, fire hydrants, water service connections and one pump house. Detailed attribute data within Citywide includes Estimated Useful Life, In-Service Date, diameter, length, size, and replacement cost. The Township owns approximately 9.2 kilometres of water mains. The Ontario Clean Water Agency (OCWA) is responsible for the operations and maintenance (O&M) of the treatment plant and some other aspects of the system.

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

Replacement Cost	Condition	Financial Capacity	
\$10.7 million	Poor (30%)	Annual Requirement:	\$330,000
		Funding Available:	\$25,000
		Annual Deficit:	\$305,000

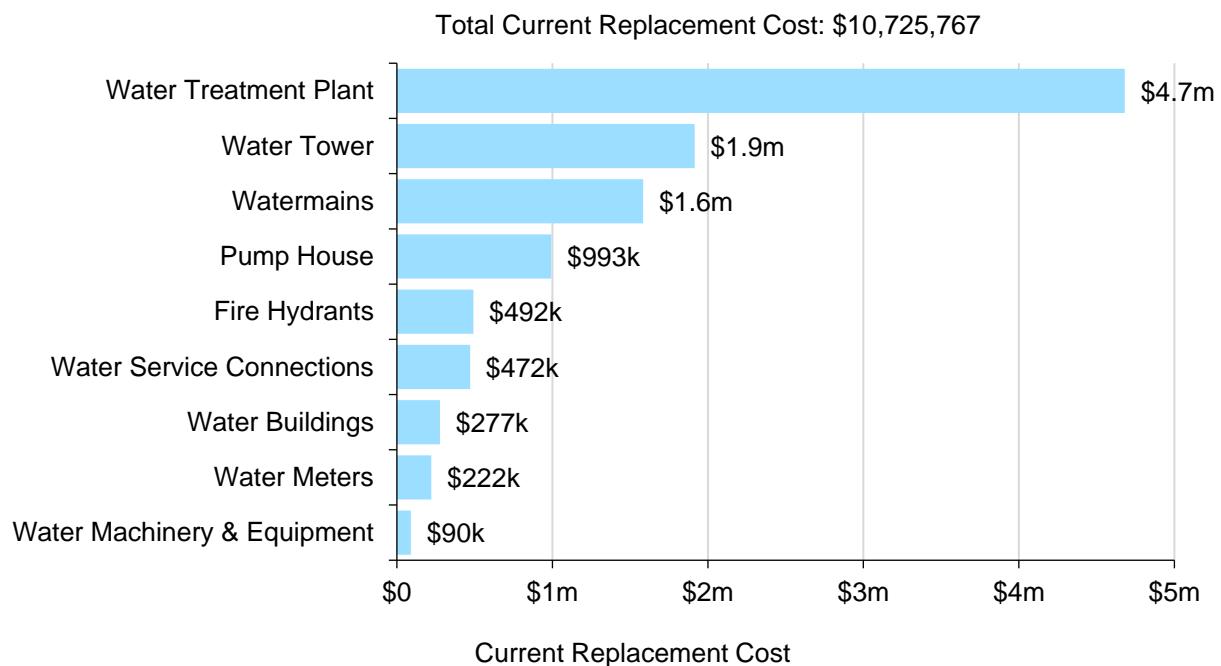
The following core values and level of service statements are a key driving force behind the Township's asset management planning:

Service Attribute	Level of Service Statement
Accessible & Reliable	The municipal water system is conveniently accessible to 62% of the community in sufficient capacity (does not exceed maximum use). The Municipal fire flow system is accessible to 62% of the community in sufficient capacity.
Affordability	The water network is currently partially (8%) funded through sustainable funding sources.
Sustainability	The water network is in poor condition with minimal unplanned service interruptions.

11.1 Asset Inventory & Costs

The table below includes the quantity, replacement cost method, and annual capital requirements of each asset segment in the Township's water network inventory.

Asset Segment	Quantity (Component)	Replacement Cost	Annual Capital Requirement
Fire Hydrants	55	\$492,122	\$8,232
Pump House	1(14)	\$993,336	\$31,810
Water Buildings	4(33)	\$277,442	\$7,729
Water Machinery & Equipment	15	\$89,680	\$9,589
Water Meters	368	\$221,880	\$27,735
Water Service Connections	388	\$471,545	\$9,431
Water Tower	1(3)	\$1,915,247	\$38,886
Water Treatment Plant	1(84)	\$4,681,206	\$175,525
Watermains	9.2 km	\$1,583,310	\$21,111
Total		\$10,725,767	\$330,047



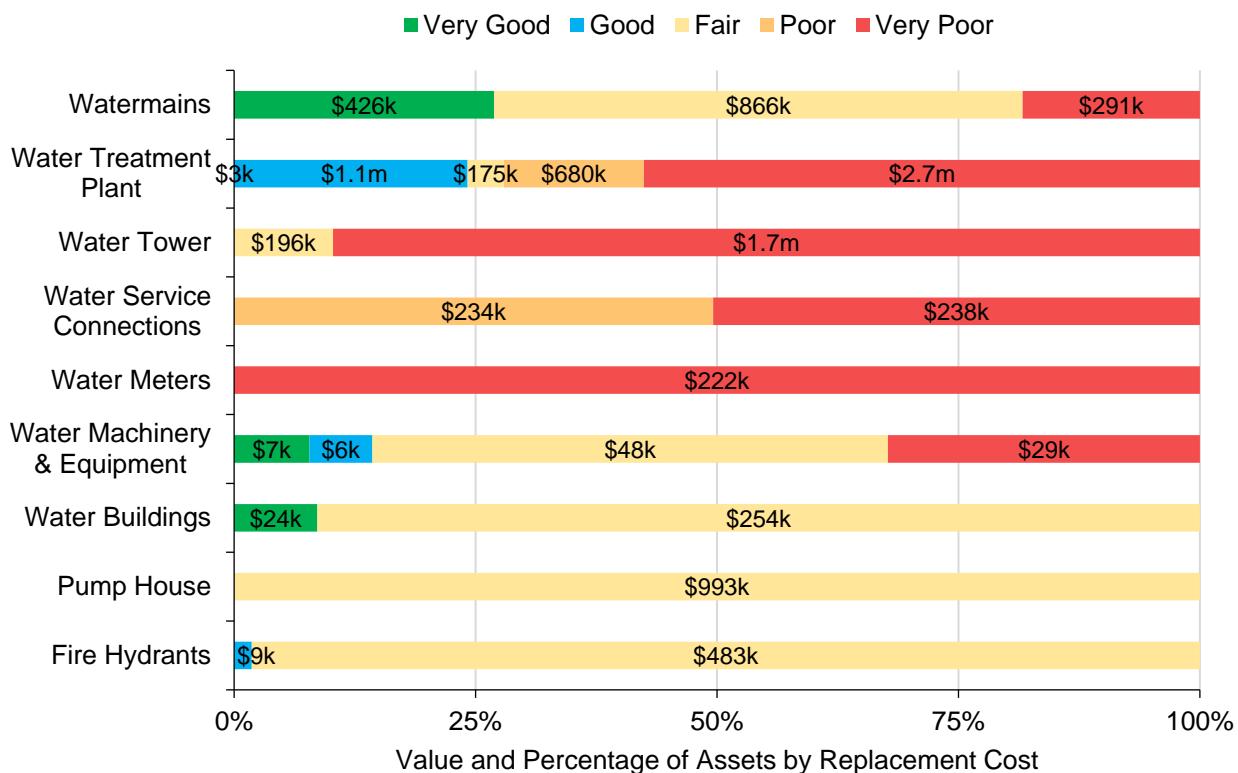
Each asset's replacement cost should be reviewed periodically to determine whether adjustments are needed to more accurately represent realistic capital requirements.

11.2 Asset Condition & Age

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

Asset Segment	Estimated Useful Life (Years)	Average Age (Years)	Average Condition
Fire Hydrants	60	52.5	50% (Fair)
Pump House	37	18.0	59% (Fair)
Water Buildings	42	30.4	58% (Fair)
Water Machinery & Equipment	12	6.5	36% (Poor)
Water Meters	8	11.0	0% (Very Poor)
Water Service Connections	50	63.3	24% (Poor)
Water Tower	49	64.0	6% (Very Poor)
Water Treatment Plant	32	30.0	23% (Poor)
Watermains	57	55.1	56% (Fair)
Average			30% (Poor)

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



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.

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

11.2.1 Current Approach to Condition Assessment

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

- OCWA conducted a comprehensive condition assessment of the water network in the first year of assuming operations.
- Based on these condition assessments a 10-year capital plan and an annual capital plan is prepared for lifecycle management, including maintenance and rehabilitation strategies. The plans are reviewed with the Township on annual basis and the plans are adjusted over time.

In this AMP the following rating criteria is used to determine the current condition of water network assets and forecast future capital requirements:

Condition	Rating
Very Good	80-100
Good	60-80
Fair	40-60
Poor	20-40
Very Poor	0-20

11.3 Lifecycle Management Strategy

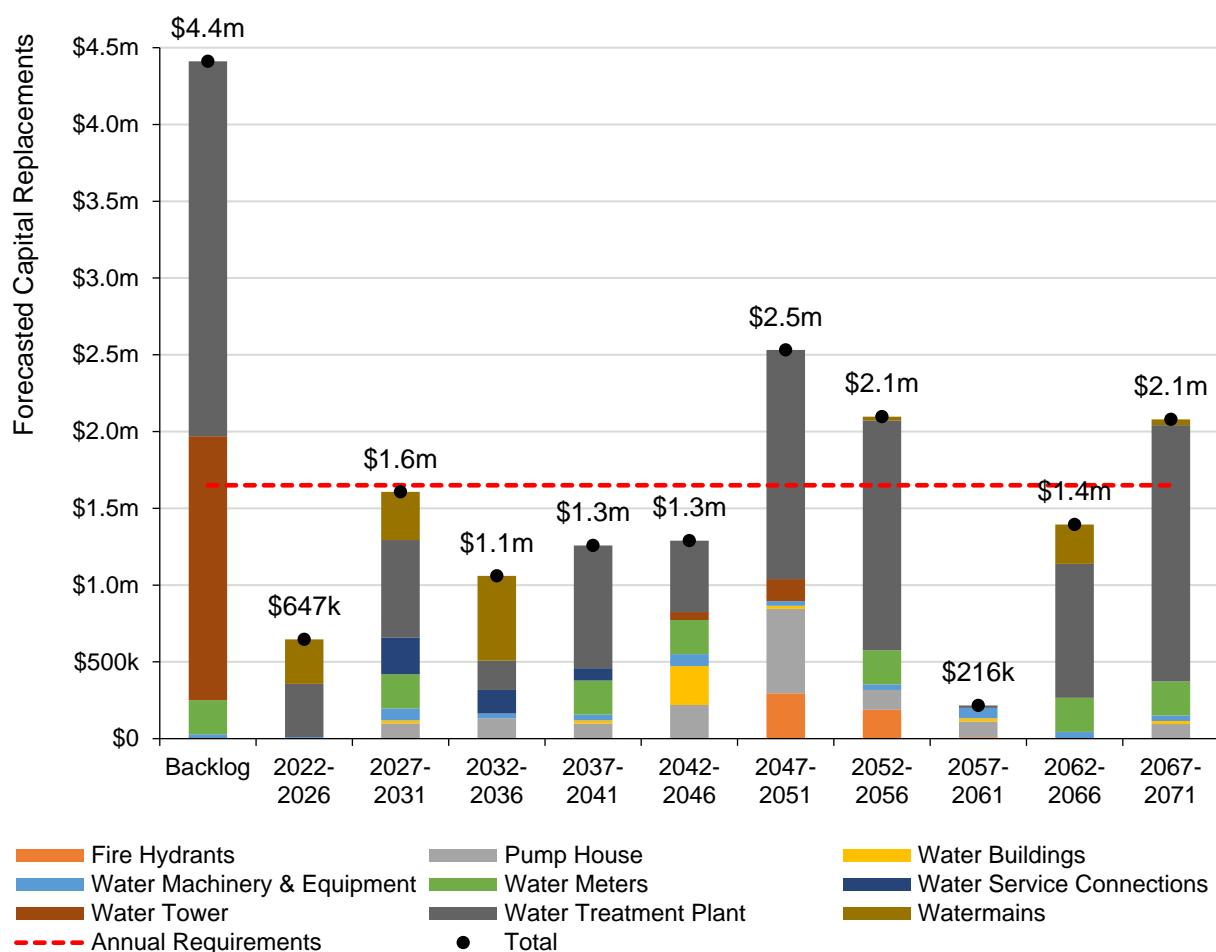
The condition or performance of most assets will deteriorate over time. To ensure that municipal assets are performing as expected and meeting the needs of customers, it is important to establish a lifecycle management strategy to proactively manage asset deterioration.

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

Activity Type	Description of Current Strategy
Maintenance	Condition assessments are carried out in the first year of OCWA assuming operations to investigate the condition of the assets and determine the necessary rehabilitation measures.
	Equipment servicing, calibration, and verification is regularly scheduled – daily, weekly, monthly, quarterly, or annually – depending on the type of the equipment/asset.
	Annual maintenance incurs more significant costs compared to other operations. Maintenance includes main flushing and valve turning.
Rehabilitation	A water relining program is not considered financially viable for the small water network.
	Rehabilitation of assets is prioritized based on the condition of the asset, O&M Manual of the assets, and usage.
Replacement	Comparisons of the rehabilitation and replacement costs inform the rehabilitation and/or renewal strategies.
	Full replacement is determined based on the current state of the operation costs, performance, lifecycle, and age of the assets.

11.3.1 Forecasted Capital Requirements

The following graph forecasts long-term capital requirements. The annual capital requirement represents the average amount per year that the Township should allocate towards funding rehabilitation and replacement needs. The following graph identifies capital requirements over the next 50 years. This projection is used as it ensures that every asset has gone through one full iteration of replacement. The forecasted requirements are aggregated into 5-year bins. The trend line represents the average 5-year capital requirement of \$1.7 million.

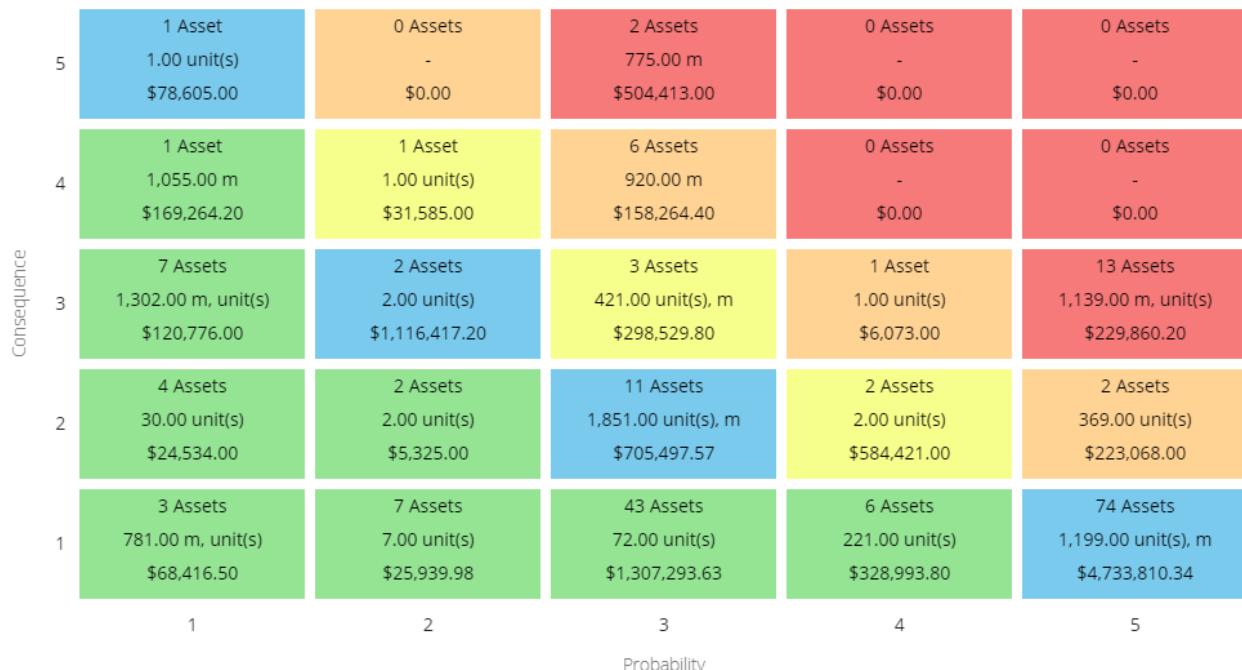


The projected cost of lifecycle activities that will need to be undertaken over the next 10 years to maintain the current level of service can be found in Appendix B.

11.4 Risk & Criticality

11.4.1 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 2021 inventory data.



This is a high-level model developed for the purposes of this AMP and Township staff should review and adjust the risk model to reflect an evolving understanding of both the probability and consequences of asset failure.

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

Probability of Failure (POF)	Consequence of Failure (COF)
Condition	Diameter
Pipe Material	No. of Main Breaks
Service Life Remaining	Bury Depth
Slope	Replacement Cost
	Proximity to Critical Services
	AADT

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

11.4.2 Risks to Current Asset Management Strategies

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

Environmental & Structural Risks



The water network experiences environmental and structural risks. In multiple areas of the Township, corrosive soil has increased the deterioration of under ground assets. The water quality is a risk due to reduced capacity and structural issues such as dead ends and loops in the system. Three bleeder stations are wasting water at all times to mitigate the impacts on water quality.

Capital Funding Strategies



Capital funding is not sufficient to address the issues that the Township has identified nor is there funding available to assess the network to identify other issues and plan for preventative maintenance.

11.5 Levels of Service

The following tables identify the Township's current level of service for 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.

11.5.1 Community Levels of Service

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

Service Attribute	Qualitative Description	Current LOS (2020)
Accessible & Reliable	Description, which may include maps, of the user groups or areas of the municipality that are connected to the municipal water system	See Appendix C
Safe & Regulatory	Description of boil water advisories and service interruptions	The Township experienced a service interruption due to a boil water advisory for a total of 66 days in 2020. The Township follows Ontario's Drinking Water Quality Management Standard (DWQMS). When a boil water advisories or service interruption occurs, the Township delivers a notice to affected households.
Affordable	Description of the lifecycle activities (maintenance, rehabilitation and replacement) performed on the water network	See Section 11.3

11.5.2 Technical Levels of Service

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

Service Attribute	Technical Metric	Current LOS (2020)
Accessible & Reliable	% of properties connected to the municipal water system	62.0%
	# of customer complaints related to the water system	1.0%
	% of properties where fire flow is available	62.0%
	# of connection-days per year due to water main breaks compared to the total number of properties connected to the municipal water system	0:355
Safe & Regulatory	# 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	66:355
Affordability	Capital reinvestment rate	0.2%
Sustainability	Average condition of water mains in the municipality	56%
	Average condition of the water treatment plant in the municipality	23%

11.6 Recommendations

Asset Inventory

- Review the inventory of water mains, hydrants, water meters, and service connections to ensure all assets are accounted for.
- The inventory contains only a few components for the water buildings, pump house, and water treatment plant. Buildings consist of several separate capital components that have unique estimated useful lives and require asset-specific lifecycle strategies. Staff should work towards a component-based inventory of all facilities to allow for component-based lifecycle planning.

Replacement Costs

- Gather accurate replacement costs and update on a regular basis to ensure the accuracy of capital projections.

Condition Assessment Strategies

- Identify condition assessment strategies for high value and high-risk water network assets.
- To approximate condition of water mains, optimize other attributes such as age, material, soil type, and history of main breaks.

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.

12 Wastewater Network

The Township is responsible for a wastewater treatment plant, 9.2 kilometres of wastewater sewers, 112 manholes, two lift stations and 389 wastewater sewer connections. Detailed attribute data within Citywide includes Estimated Useful Life, In-Service Date, diameter, length, size, and replacement cost. The Ontario Clean Water Agency (OCWA) is responsible for the operations and maintenance (O&M) of the treatment plant and some other aspects of the system. The wastewater treatment plant is planned for full replacement in 2021/2022 and will be in-service in 2022.

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

Replacement Cost	Condition	Financial Capacity	
\$30.2 million	Very Poor (15%)	Annual Requirement:	\$515,000
		Funding Available:	\$25,000
		Annual Deficit:	\$490,000

The following core values and level of service statements are a key driving force behind the Township's asset management planning:

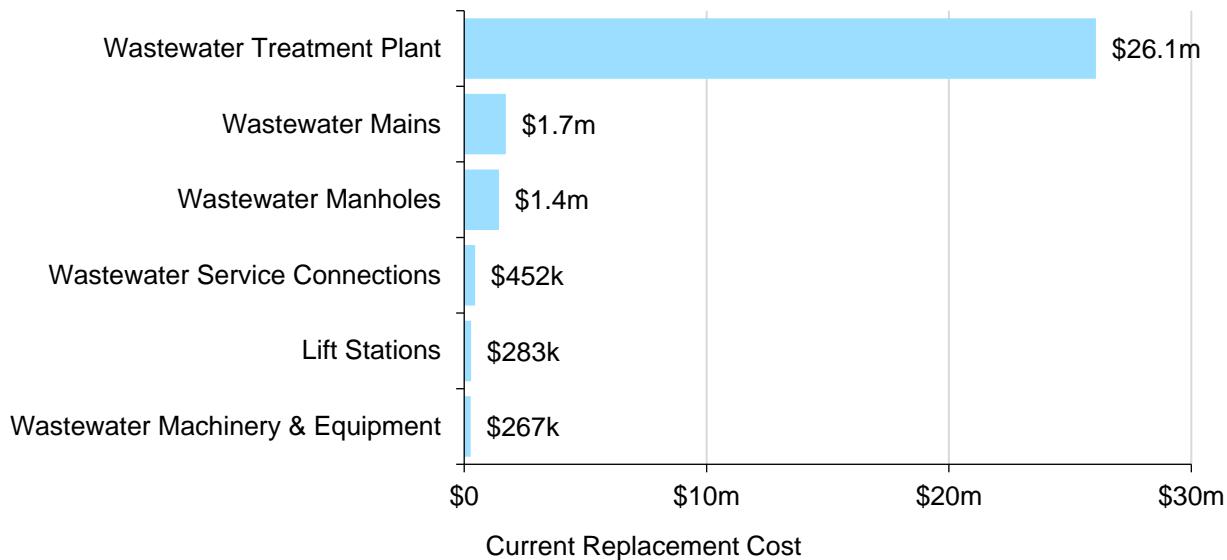
Service Attribute	Level of Service Statement
Accessible & Reliable	The municipal wastewater system is conveniently accessible to 62% of the community in sufficient capacity (does not exceed maximum use).
Affordability	The water network is currently partially (5%) funded through sustainable funding sources.
Sustainability	The wastewater network is in very poor condition with minimal unplanned service interruptions.

12.1 Asset Inventory & Costs

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

Asset Segment	Quantity	Replacement Cost	Annual Capital Requirement
Lift Stations	2(8)	\$282,638	\$7,949
Wastewater Machinery & Equipment	6	\$266,614	\$14,638
Wastewater Mains	9,239	\$1,717,301	\$22,897
Wastewater Manholes	112	\$1,433,600	\$23,893
Wastewater Service Connections	389	\$452,063	\$9,041
Wastewater Treatment Plant	1(2)	\$26,065,518	\$436,609
Total		\$30,217,734	\$515,028

Total Current Replacement Cost: \$30,217,734



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

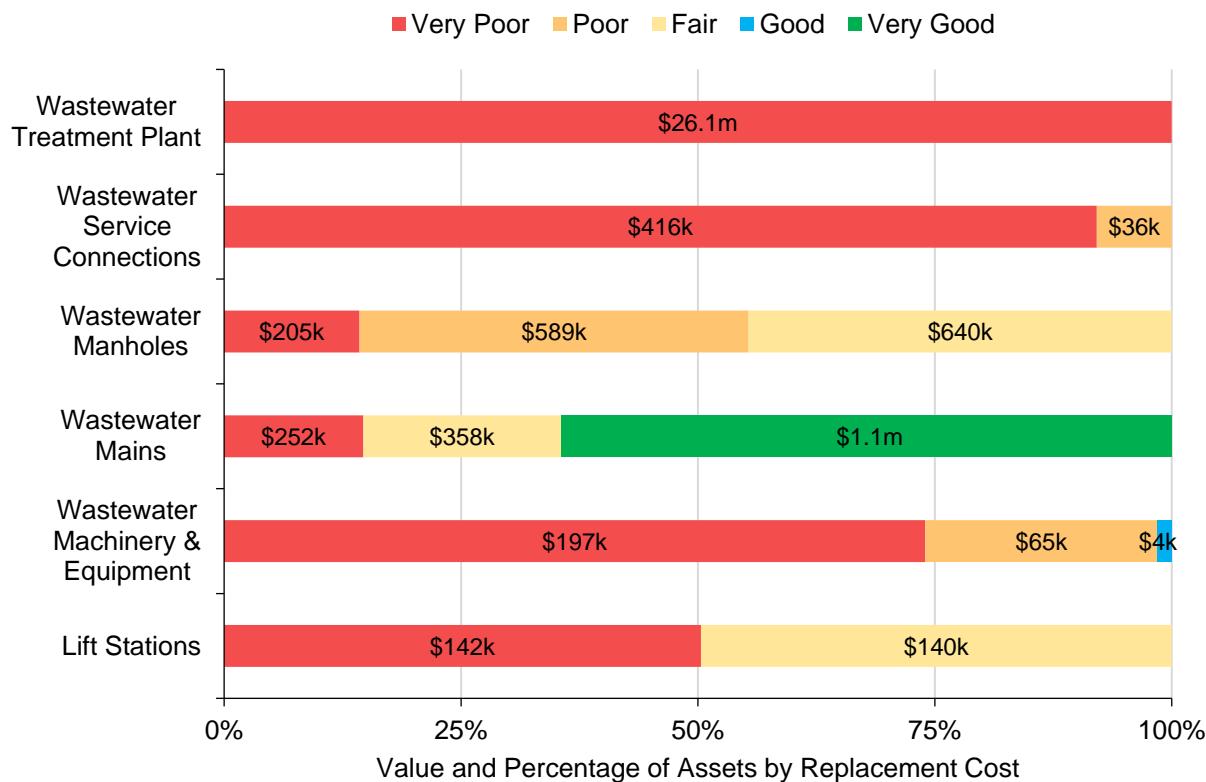
12.2 Asset Condition & Age

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

Asset Segment	Estimated Useful Life (Years)	Average Age	Average Condition (%)
Lift Stations	45	33.0	26% (Poor)
Wastewater Machinery & Equipment	19	26.9	9% (Very Poor)
Wastewater Mains	59	42.1	72% (Good)
Wastewater Manholes	60	45.9	38% (Poor)
Wastewater Service Connections	50	64.5	4% (Very Poor)
Wastewater Treatment Plant	60	43.0	10% (Very Poor) ⁷
Average			15% (Very Poor)

⁷ In 2021/2022 the Township of Red Rock replaced the wastewater treatment plant. It will be in-service in 2022 and therefore is not included in this AMP. Once the new plant is in-service, the asset will have a condition of nearly 100% which will result in an average condition of 92% for the entire wastewater network.

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



To ensure that the Township's wastewater 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 wastewater network.

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

12.2.1 Current Approach to Condition Assessment

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

- OCWA conducts a comprehensive condition assessment of the wastewater network in the first year of assuming operations. Based on these condition assessments a 10-year capital plan and an annual capital plan is prepared for lifecycle management, including maintenance and rehabilitation strategies. The plans are reviewed with the Township on annual basis and the plans are adjusted over time.

In this AMP the following rating criteria is used to determine the current condition of sewer network assets and forecast future capital requirements:

Condition	Rating
Very Good	80-100
Good	60-80
Fair	40-60
Poor	20-40
Very Poor	0-20

12.3 Lifecycle Management Strategy

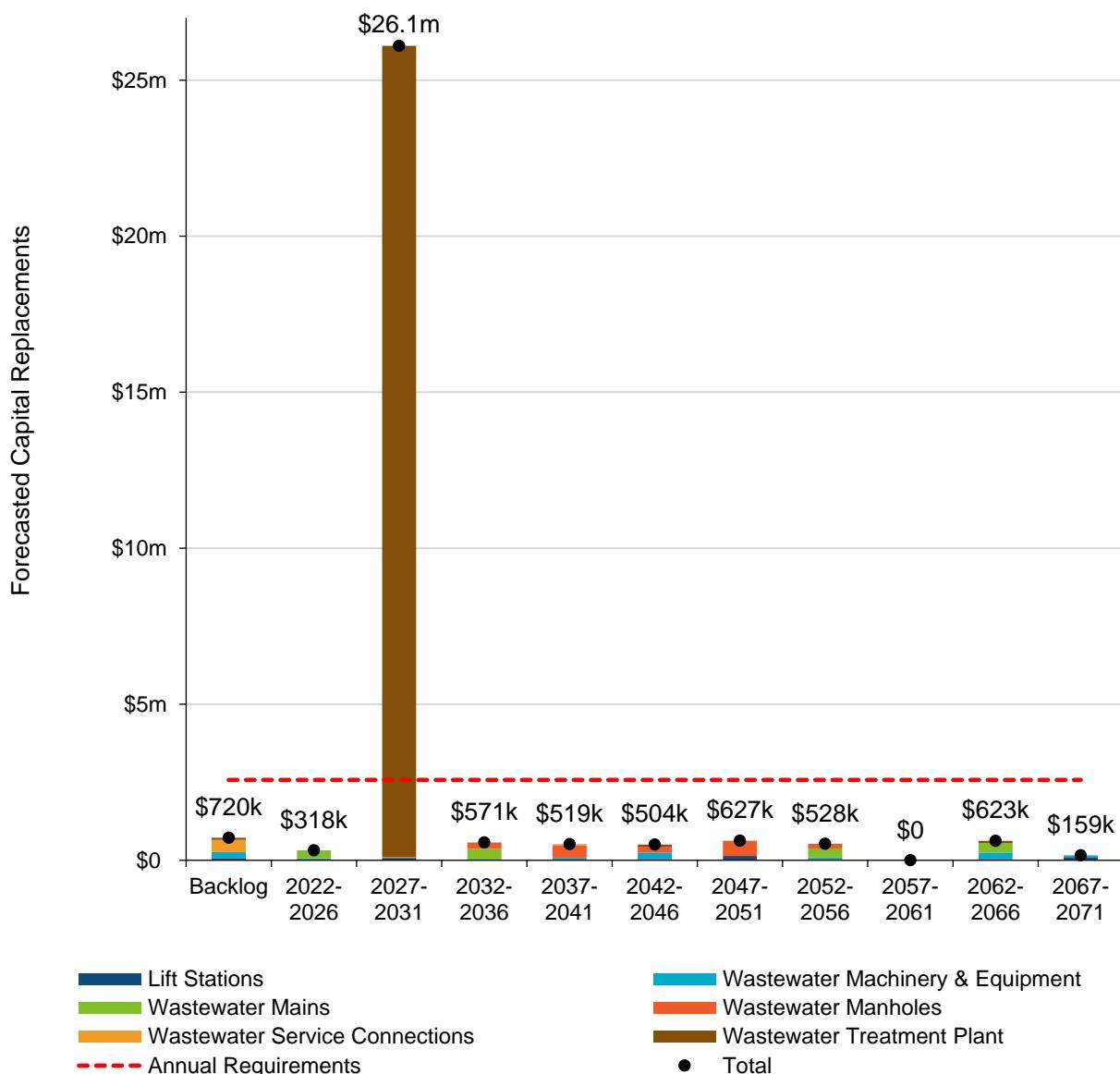
The condition or performance of most assets will deteriorate over time. To ensure that municipal assets are performing as expected and meeting the needs of customers, it is important to establish a lifecycle management strategy to proactively manage asset deterioration.

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

Activity Type	Description of Current Strategy
Maintenance	Equipment servicing, calibration, and verification is regularly scheduled – daily, weekly, monthly, quarterly, or annually – depending on the type of the equipment/asset.
	Annual maintenance incurs more significant costs compared to other operations.
Rehabilitation	Condition assessments are carried out in the first year of OCWA assuming operations to investigate the condition of the assets and determine the necessary rehabilitation measures.
	A main relining program is not considered financially viable for the small water network.
Replacement	Rehabilitation of assets is prioritized based on the condition of the asset, O&M Manual of the assets, and usage.
	Full replacement is determined based on the current state of the operation costs, performance, lifecycle, and age of the assets. Comparisons of the rehabilitation and replacement costs inform the rehabilitation and/or renewal strategies.

12.3.1 Forecasted Capital Requirements

The following graph forecasts long-term capital requirements. The annual capital requirement represents the average amount per year that the Township should allocate towards funding rehabilitation and replacement needs. The following graph identifies capital requirements over the next 50 years. This projection is used as it ensures that every asset has gone through one full iteration of replacement. The forecasted requirements are aggregated into 5-year bins. The trend line represents the average 5-year capital requirement of \$2.6 million.



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

12.4 Risk & Criticality

12.4.1 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 2021 inventory data.



This is a high-level model developed for the purposes of this AMP and Township staff should review and adjust the risk model to reflect an evolving understanding of both the probability and consequences of asset failure. The asset-specific attributes that municipal staff utilize to define and prioritize the criticality of the wastewater network are documented below:

Probability of Failure (POF)	Consequence of Failure (COF)
Condition	Sanitary Pipe Type
Pipe Material	Diameter
Service Life Remaining	No. of Surcharge/Blockage Events
Slope	Replacement Cost
	Bury Depth
	Proximity to Critical Services
	AADT

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

12.4.2 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 Information & Capital Funding



The network is missing condition data and has inflow and infiltration issues. A regular flow monitoring program would help identify inflow and infiltration issues at an earlier stage and provide staff with data to inform lifecycle planning. Budget constraints will not permit an inflow and infiltration study at this time. Above ground assets including the lift station and water treatment plant are in need of repairs and upgrades. The Township does not have the capital funding needed for contracting and component costs. Furthermore, capital funding is highly dependent on grant opportunities.

12.5 Levels of Service

The following tables identify the Township's current level of service for wastewater 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.

12.5.1 Community Levels of Service

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

Service Attribute	Qualitative Description	Current LOS (2020)
Accessibility & Reliability	Description, which may include maps, of the user groups or areas of the municipality that are connected to the municipal wastewater system	See Appendix C
	Description of how combined sewers in the municipal wastewater system are designed with overflow structures in place which allow overflow during storm events to prevent backups into homes	The Township does not own any combined sewers
Safe & Regulatory	Description of the frequency and volume of overflows in combined sewers in the municipal wastewater system that occur in habitable areas or beaches	The Township does not own any combined sewers
	Description of how stormwater can get into sanitary sewers in the municipal wastewater system, causing sewage	Stormwater can enter into sanitary sewers due to cracks in sanitary mains or through indirect connections (e.g. weeping tiles). In the case of heavy rainfall events, sanitary sewers may

Service Attribute	Qualitative Description	Current LOS (2020)
	to overflow into streets or backup into homes	<p>experience a volume of water and sewage that exceeds its designed capacity. In some cases, this can cause water and/or sewage to overflow backup into homes. the disconnection of weeping tiles from sanitary mains and the use of sump pumps and pits directing storm water to the storm drain system can help to reduce the chance of this occurring.</p> <p>The Township follows a series of design standards that integrate servicing requirements and land use considerations when constructing or replacing sanitary sewers. These standards have been determined with consideration of the minimization of sewage overflows and backups.</p>
	Description of how sanitary sewers in the municipal wastewater system are designed to be resilient to stormwater infiltration	
	Description of the effluent that is discharged from sewage treatment plants in the municipal wastewater system	<p>Effluent refers to water pollution that is discharged from a wastewater treatment plant, and may include suspended solids, total phosphorous and biological oxygen demand. The Environmental Compliance Approval (ECA) identifies the effluent criteria for municipal wastewater treatment plants.</p>
Sustainable	Description of the lifecycle activities (maintenance, rehabilitation and replacement) performed on the wastewater network	See Section 12.3

12.5.2 Technical Levels of Service

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

Service Attribute	Technical Metric	Current LOS (2020)
Accessible & Reliable	% of properties connected to the municipal wastewater system	62%
	# of customer complaints related to the sanitary sewer system	0
Safe & Regulatory	# of events per year where combined sewer flow in the municipal wastewater system exceeds system capacity compared to the total number of properties connected to the municipal wastewater system	N/A
	# of connection-days per year having wastewater backups compared to the total number of properties connected to the municipal wastewater system	0:355
	# of effluent violations per year due to wastewater discharge compared to the total number of properties connected to the municipal wastewater system	0:355
Affordable	Capital re-investment rate	0.1%
Sustainable	Average condition of wastewater mains in the municipality	72%
	Average condition of the wastewater treatment plant in the municipality	10% ⁸

⁸ In 2021/2022 the Township of Red Rock replaced the wastewater treatment plant. It will be in-service in 2022 and therefore is not included in this AMP. Once the new plant is in-service, the asset will have a condition of nearly 100%.

12.6 Recommendations

Asset Inventory

- The inventory contains only a few components for the lift stations and wastewater treatment plant. Buildings consist of several separate capital components that have unique estimated useful lives and require asset-specific lifecycle strategies. Staff should work towards a component-based inventory of all facilities to allow for component-based lifecycle planning.

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 wastewater network through CCTV inspections. Identify condition assessment strategies for high value and high-risk buildings and machinery and equipment.

Risk Management Strategies

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

Lifecycle Management Strategies

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

Levels of Service

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

13 Impacts of Growth

Key Insights

- Understanding the key drivers of demand will allow the Township to more effectively plan for new infrastructure, and the upgrade or disposal of existing infrastructure
- Moderate population decline can be expected
- The costs of population change should be considered in long-term funding strategies that are designed to maintain the current level of service

13.1 Description of Growth Assumptions

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

13.1.1 Red Rock Official Plan (2011)

The Township of Red Rock adopted the Official Plan in November of 2011. The Plan, developed in accordance with Ontario's Planning Act, is intended to guide community decision-making in respect to physical changes in the Township over a 20-year planning period. A key objective of the Plan, as noted by Council, is to allay the existing pattern of population decline and achieve economic stability.

The Official Plan acknowledges that an enjoyable living environment and overall positive sense of community are made possible through the coordinated, efficient, and cost-effective capital investment and operation of municipal infrastructure and services. To promote efficient infrastructure and service management, the Plan states that new development should be located to allow for the use of existing infrastructure and public service facilities.

Key objectives identified in the Plan are achievable through advanced asset management practices. As the Township adopts efficient lifecycle strategies and risk-based approaches to managing infrastructure and municipal services, they are able to improve capital planning and more easily maintain desired level of service. Such achievements are critical to support efficient development and managing population and/or demographic changes.

The population growth analysis provided in the Official Plan finds a multi-year pattern of population decline. The population decline is described as a reflection of the economic strain on the forest industry. The following table was developed using historical data from the Official Plan and census data from 2001 to 2021.

Historical Figures	1981	1991	2001	2006	2011	2016	2021
Population	1,542	1,421	1,233	1,063	942	895	895
Population Change	N/A	N/A	N/A	-14%	-11%	-5%	0%
Private Dwellings	N/A	N/A	495	490	472	444	455

Population levels in the Township exhibit a steady decline ranging from 1,542 in 1981 to 895 in 2021. Of note, no population change was recorded in the most recent census period between 2016 and 2021, suggesting a possible abatement of the steady historical population decline.

13.1.2 Community Economic Profile (2015)

The Township of Red Rock developed a Community Economic Profile in 2015 which details the Township's demographics, labour force, quality of life, transportation systems, taxes and utilities, and building and development fees. This document provides a more recent overview of the state of the Township's economy and population changes.

The Profile provides the following key facts about the community:

- There is a steady population decline that is becoming more moderate year after year.
- The population in the Township is older than the Ontario average, with a median age 9 years above the provincial median.
- Key economic sectors include health care and social assistance, public administration, and accommodation and food services.

These factors are critical to consider in the management of infrastructure and municipal services.

13.2 Impact of Growth on Lifecycle Activities

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

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

14 Financial Strategy

Key Insights

- The Township is committing approximately \$340,000 towards capital projects per year from sustainable revenue sources
- Given the annual capital requirement of \$2.3 million, there is currently a funding gap of \$2 million annually
- For tax-funded assets, we recommend increasing tax revenues by 2.9% each year for the next 20 years to achieve a sustainable level of funding
- For the water network, we recommend increasing rate revenues by 4.8% annually for the next 20 years to achieve a sustainable level of funding
- For the wastewater network, we recommend increasing rate revenues by 8.5% annually for the next 20 years to achieve a sustainable level of funding

14.1 Financial Strategy Overview

For an asset management plan to be effective and meaningful, it must be integrated with financial planning and long-term budgeting. The development of a comprehensive financial plan will allow the Township of Red Rock 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. Canada Community-Building Fund (CCBF)
 - b. Annual grants

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

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

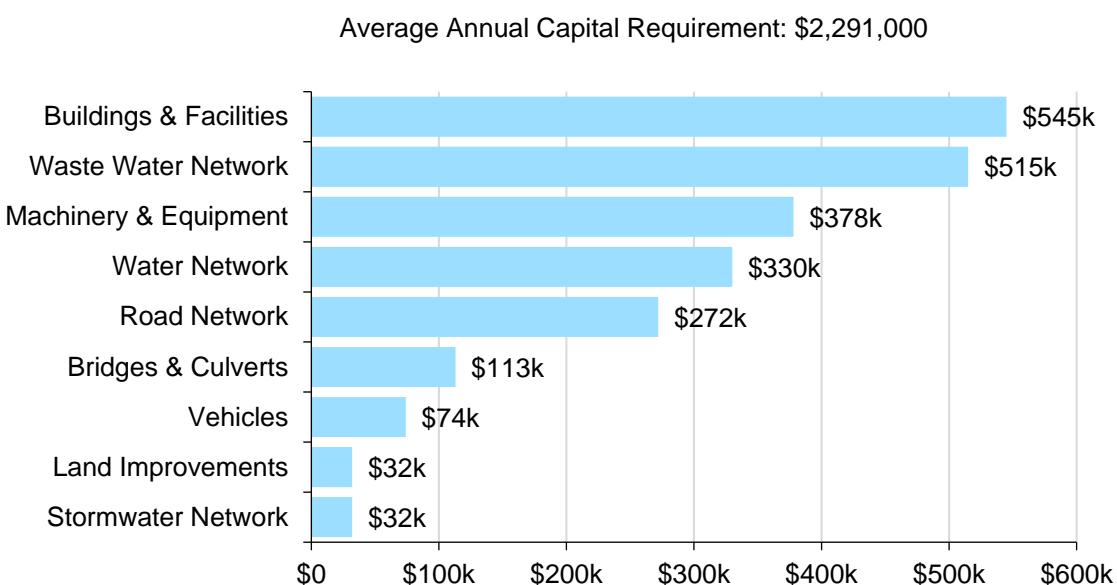
1. In order to reduce financial requirements, consideration has been given to revising service levels downward.

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

14.1.1 Annual Requirements & Capital Funding

Annual Requirements

The annual requirements represent the amount the Township should allocate annually to each asset category to meet replacement needs as they arise, prevent infrastructure backlogs and achieve long-term sustainability. In total, the Township must allocate approximately \$2.3 million annually to address capital requirements for the assets included in this AMP.



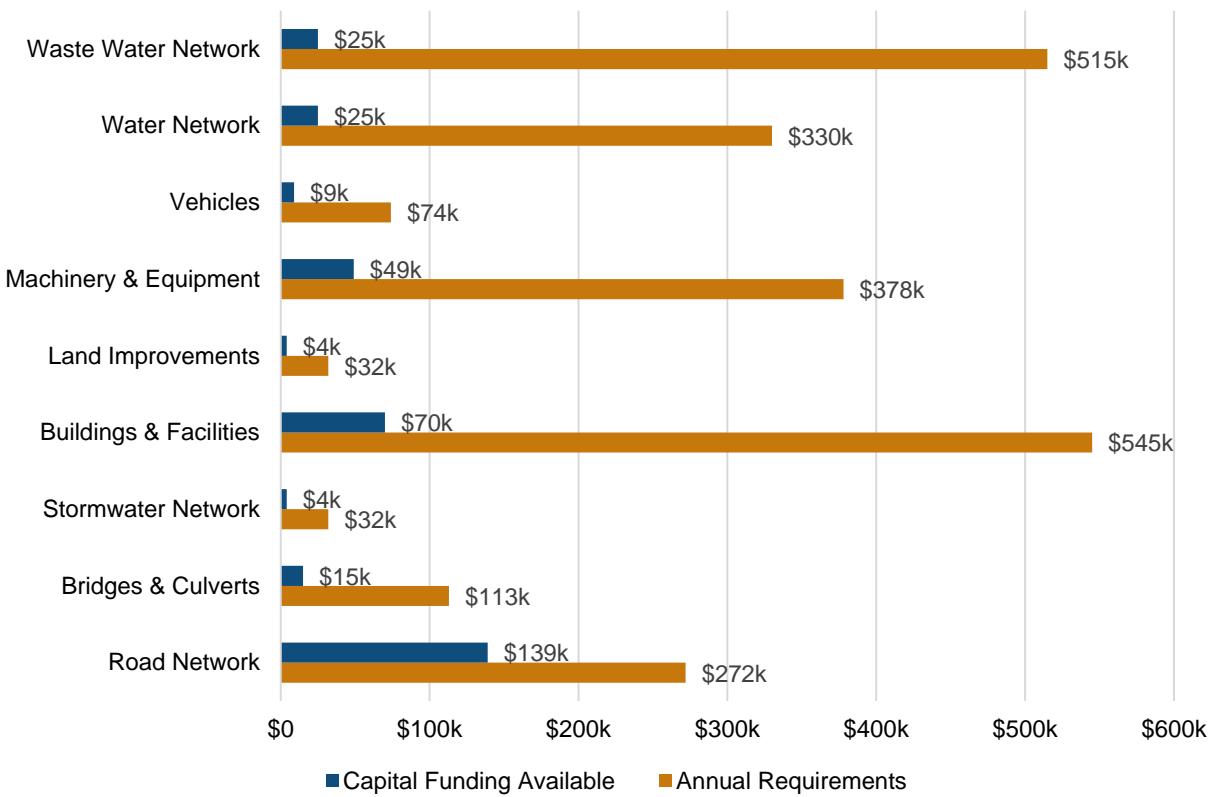
For all asset categories the annual requirement has been calculated based on a “replacement only” scenario, in which capital costs are only incurred at the construction and replacement of each asset.

However, lifecycle management strategies can be developed to identify capital costs that are realized through strategic rehabilitation and renewal of the Township’s assets. The development of these strategies could allow for a comparison of potential cost avoidance if the strategies were to be implemented.

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

Annual Funding Available

Based on a historical analysis of sustainable capital funding sources, the Township is committing approximately \$340,000 towards capital projects per year from sustainable revenue sources. Given the annual capital requirement of \$2.3 million, there is currently a funding gap of \$2 million annually.



14.2 Funding Objective

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

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

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

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

14.3 Financial Profile: Tax Funded Assets

14.3.1 Current Funding Position

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

Asset Category	Avg. Annual Requirement	Annual Funding Available				Annual Deficit
		Taxes	CCBF	OCIF	Total Available	
Road Network	272,000	35,000	54,000	50,000	139,000	133,000
Bridges & Culverts	113,000	15,000	0	0	15,000	98,000
Stormwater Network	32,000	4,000	0	0	4,000	28,000
Buildings	545,000	70,000	0	0	70,000	475,000
Vehicles	74,000	9,000	0	0	9,000	65,000
Machinery & Equipment	378,000	49,000	0	0	49,000	329,000
Land Improvements	32,000	4,000	0	0	4,000	28,000
Total	1,446,000	186,000	54,000	50,000	290,000	1,156,000

The average annual investment requirement for the above categories is \$1,446,000. Annual revenue currently allocated to these assets for capital purposes is \$290,000 leaving an annual deficit of \$1,156,000. Put differently, these

infrastructure categories are currently funded at 20% of their long-term requirements.

14.3.2 Full Funding Requirements

In 2021, Township of Red Rock has annual tax revenues of \$1,459,000. As illustrated in the following table, without consideration of any other sources of revenue or cost containment strategies, full funding would require the following tax change over time:

Asset Category	Tax Change Required for Full Funding
Road Network	9.1%
Bridges & Culverts	6.7%
Stormwater Network	1.9%
Buildings	32.6%
Vehicles	4.5%
Machinery & Equipment	22.6%
Land Improvements	1.9%
	79.3%

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

- a) Red Rock's formula based OCIF grant is scheduled to grow from \$50,000 in 2021 to \$100,000 in 2022.
- b) Red Rock's debt payments for these asset categories will be decreasing by \$44,000 over the next 5 years and by \$35,000 over the next 10 years.

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

Without Capturing Changes				
	5 Years	10 Years	15 Years	20 Years
Infrastructure Deficit	1,155,698	1,155,698	1,155,698	1,155,698
Change in Debt Costs	n/a	n/a	n/a	n/a
Resulting Infrastructure Deficit	1,155,698	1,155,698	1,155,698	1,155,698
Tax Increase Required	79.2%	79.2%	79.2%	79.2%
Annually	12.4%	6.1%	4.0%	3.0%

	With Capturing Changes			
	5 Years	10 Years	15 Years	20 Years
Infrastructure Deficit	1,155,698	1,155,698	1,155,698	1,155,698
Change in Debt Costs	0	-9,000	-44,000	-44,000
Resulting Infrastructure Deficit	1,155,698	1,146,698	1,111,698	1,111,698
Tax Increase Required	79.2%	78.6%	76.2%	76.2%
Annually	12.4%	6.0%	3.9%	2.9%

14.3.3 Financial Strategy Recommendations

Considering all the above information, we recommend the 20-year option. This involves full 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 revenues by 2.9% 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) allocating the current gas tax and OCIF revenue as outlined previously.
- d) should the scheduled OCIF grant increase, the Township should reduce the annual tax increase by an amount equal to the grant increase as it occurs.
- e) reallocating appropriate revenue from categories in a surplus position to those in a deficit position.
- f) increasing existing and future infrastructure budgets by the applicable inflation index on an annual basis in addition to the deficit phase-in

Notes:

1. As in the past, periodic senior government infrastructure funding will most likely be available during the phase-in period. By Provincial AMP rules, this periodic funding cannot be incorporated into an AMP unless there are firm commitments in place. We have included OCIF formula-based funding, if applicable, since this funding is a multi-year commitment⁹.

⁹ The Township should take advantage of all available grant funding programs and transfers from other levels of government. While OCIF has historically been considered a sustainable source of funding, the program is currently undergoing review by the provincial government. Depending on the outcome of this review, there may be changes that impact its availability.

2. We realize that raising tax revenues by the amounts recommended above for infrastructure purposes will be very difficult to do. However, considering a longer phase-in window may have even greater consequences in terms of infrastructure failure.

Although this option achieves full funding on an annual basis in 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 backlog of \$1,379,478 for buildings & facilities, \$543,149 for vehicles, \$1,962,969 for machinery & equipment, and \$19,960 for land improvements. Prioritizing future projects will require the current data to be replaced by condition-based data. Although our recommendations include no further use of debt, the results of the condition-based analysis may require otherwise.

14.4 Financial Profile: Rate Funded Assets

14.4.1 Current Funding Position

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

Asset Category	Avg. Annual Requirement	Annual Funding Available				Annual Deficit
		Rates	To Operations	OCIF	Total Available	
Water Network	330,000	197,315	-197,315	25,000	25,000	305,000
Wastewater Network	515,000	119,627	-119,627	25,000	25,000	490,000
Total	845,000	316,942	-316,942	50,000	50,000	795,000

The average annual investment requirement for the above categories is \$845,000. Annual revenue currently allocated to these assets for capital purposes is \$50,000 leaving an annual deficit of \$795,000. Put differently, these infrastructure categories are currently funded at 6% of their long-term requirements.

14.4.2 Full Funding Requirements

In 2021, Red Rock had annual water revenues of \$197,000 and annual wastewater revenues of \$120,000. 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	154.6%
Wastewater Network	409.6%
Total	250.8%

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				Wastewater Network			
	5 Years	10 Years	15 Years	20 Years	5 Years	10 Years	15 Years	20 Years
Infrastructure Deficit	305,000	305,000	305,000	305,000	490,000	490,000	490,000	490,000
Rate Increase Required	154.6%	154.6%	154.6%	154.6%	409.6%	409.6%	409.6%	409.6%
Annually:	20.6%	9.8%	6.5%	4.8%	38.5%	17.7%	11.5%	8.5%

14.4.3 Financial Strategy Recommendations

Considering all of the above information, we recommend the 20-year option that includes debt cost reallocations. This involves full funding being achieved over 20 years by:

- a) increasing rate revenues by 4.8% each year for the next 20 years for the water network.
- b) increasing rate revenues by 8.5% each year for the next 20 years for the wastewater network.
- c) these rate revenue increases are solely for the purpose of phasing in full funding to the respective asset categories covered in this AMP.
- d) increasing existing and future infrastructure budgets by the applicable inflation index on an annual basis in addition to the deficit phase-in

Notes:

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

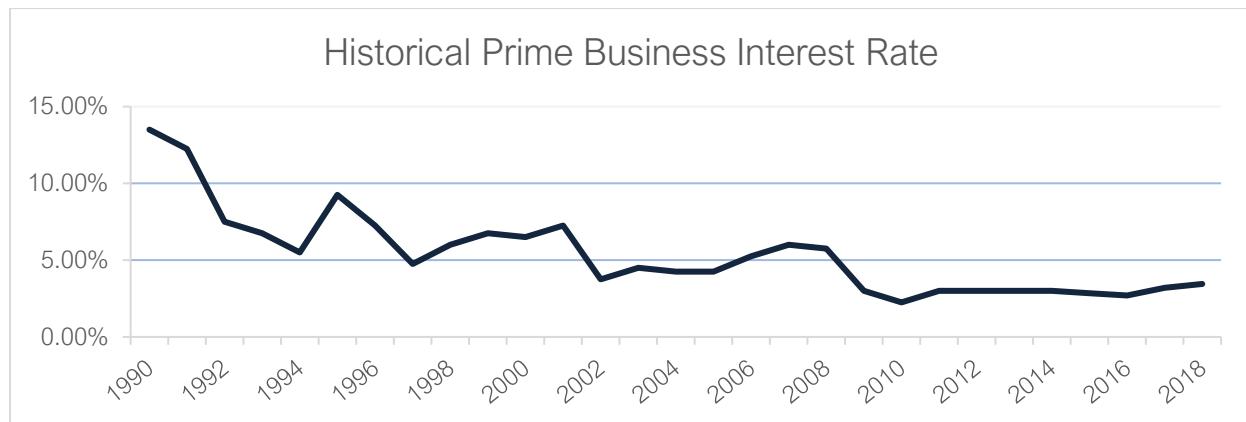
Although this option achieves full funding on an annual basis in 20 years and provides financial sustainability over the period modeled, the recommendations do require prioritizing capital projects to fit the resulting annual funding available. Current data shows a backlog of \$720,453 for the wastewater network, and \$4,401,162 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.

14.5 Use of Debt

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

- a) the ability to stabilize tax & user rates when dealing with variable and sometimes uncontrollable factors
- b) equitable distribution of the cost/benefits of infrastructure over its useful life
- c) a secure source of funding
- d) flexibility in cash flow management

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



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

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%¹⁰ 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.

¹⁰ Current municipal Infrastructure Ontario rates for 15-year money is 3.2%.

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%

The following tables outline how Red Rock has historically used debt for investing in the asset categories as listed. There is currently \$402,000 of debt outstanding for the assets covered by this AMP with corresponding principal and interest payments of \$44,000, well within its provincially prescribed maximum of \$348,592.

Asset Category	Current Debt Outstanding	Use of Debt in the Last Five Years				
		2017	2018	2019	2020	2021
Road Network	50,000	80,000	0	0	0	0
Bridges & Culverts	0	0	0	0	0	0
Stormwater Network	0	0	0	0	0	0
Buildings	352,000	0	0	0	0	0
Vehicles	0	0	0	0	0	0
Machinery & Equipment	0	0	0	0	0	0
Land Improvements	0	0	0	0	0	0
Total Tax Funded:	402,000	80,000	0	0	0	0
Water Network	0	0	0	0	0	0
Wastewater 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						
	2021	2022	2023	2024	2029	2030	2031
Road Network	9,000	9,000	9,000	9,000	9,000	9,000	0
Bridges & Culverts	0	0	0	0	0	0	0
Stormwater Network	0	0	0	0	0	0	0
Buildings	35,000	35,000	35,000	35,000	35,000	35,000	35,000
Vehicles	0	0	0	0	0	0	0
Machinery & Equipment	0	0	0	0	0	0	0
Land Improvements	0	0	0	0	0	0	0
Total Tax Funded:	44,000	44,000	44,000	44,000	44,000	44,000	35,000
Water Network	0	0	0	0	0	0	0
Wastewater 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 Red Rock to fully fund its long-term infrastructure requirements without further use of debt.

14.6 Use of Reserves

14.6.1 Available Reserves

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

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

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

Asset Category	Balance on December 31, 2021
Road Network	9,000
Bridges & Culverts	45,000
Stormwater Network	3,000
Buildings	31,000
Vehicles	6,000
Machinery & Equipment	322,000
Land Improvement	22,000
Total Tax Funded:	438,000
Water Network	134,000
Wastewater Network	97,000
Total Rate Funded:	231,000

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 Red Rock'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.

15 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 includes several maps that have been used to visualize the current level of service
- Appendix D provides additional guidance on the development of a condition assessment program

Appendix A: Infrastructure Report Card

Asset Category	Replacement Cost (millions)	Asset Condition	Financial Capacity	
Road Network	\$6.2	Poor	Annual Requirement:	\$272,000
			Funding Available:	\$139,000
			Annual Deficit:	\$133,000
Bridges & Culverts	\$8.3	Good	Annual Requirement:	\$113,000
			Funding Available:	\$15,000
			Annual Deficit:	\$98,000
Storm Network	\$2.2	Good	Annual Requirement:	\$32,000
			Funding Available:	\$4,000
			Annual Deficit:	\$28,000
Buildings & Facilities	\$21.2	Fair	Annual Requirement:	\$545,000
			Funding Available:	\$70,000
			Annual Deficit:	\$475,000
Machinery & Equipment	\$5	Poor	Annual Requirement:	\$378,000
			Funding Available:	\$49,000
			Annual Deficit:	\$329,000
Vehicles	\$1.1	Very Poor	Annual Requirement:	\$74,000
			Funding Available:	\$9,000
			Annual Deficit:	\$65,000
Land Improvements	\$0.4	Fair	Annual Requirement:	\$32,000
			Funding Available:	\$4,000
			Annual Deficit:	\$28,000
Water Network	\$10.7	Poor	Annual Requirement:	\$330,000
			Funding Available:	\$25,000
			Annual Deficit:	\$305,000
Wastewater Network	\$30.2	Very Poor	Annual Requirement:	\$515,000
			Funding Available:	\$25,000
			Annual Deficit:	\$490,000
Overall	\$85.3	Poor	Annual Requirement:	\$2,291,000
			Funding Available:	\$340,000
			Annual Deficit:	\$1,951,000

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											
Segment	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	
Asphalt Roads	\$0	\$0	\$196k	\$0	\$320k	\$540k	\$1.0m	\$155k	\$345k	\$524k	
Curbs & Gutters	\$0	\$0	\$120k	\$114k	\$103k	\$68k	\$0	\$0	\$66k	\$140k	
Sidewalks	\$0	\$0	\$16k	\$31k	\$37k	\$14k	\$0	\$0	\$0	\$5k	
Street Lighting	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$156k	
Total	\$0	\$0	\$331k	\$145k	\$461k	\$623k	\$1.0m	\$155k	\$411k	\$825k	

Bridges & Culverts											
Asset Segment	Backlog	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031
Bridges	\$0	\$0	\$212k	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Total	\$0	\$0	\$212k	\$0							

Storm Network											
Asset Segment	Backlog	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031
Catchbasins	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Storm Culverts	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Storm Mains	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Storm Manholes	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Total	\$0										

Buildings & Facilities											
Asset Segment	Backlog	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031
Marina Building	\$0	\$0	\$0	\$14k	\$0	\$0	\$0	\$7k	\$282k	\$0	\$149k
Marina Fueling Kiosk	\$62k	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Marina Pavillion	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Municipal Building & Library	\$0	\$0	\$5k	\$0	\$5k	\$0	\$222k	\$0	\$387k	\$5k	\$5k
Public Works & Fire Hall	\$0	\$0	\$0	\$0	\$0	\$0	\$71k	\$103k	\$29k	\$0	\$0
Public Works Storage Buildings	\$57k	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Recreation Centre	\$1.3m	\$0	\$0	\$0	\$65k	\$5.0m	\$7k	\$0	\$0	\$0	\$16k
Total	\$1.4m	\$0	\$5k	\$14k	\$70k	\$5.0m	\$301k	\$110k	\$698k	\$5k	\$169k
Machinery & Equipment											
Asset Segment	Backlog	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031
Computer Hardware	\$47k	\$0	\$9k	\$7k	\$16k	\$8k	\$5k	\$50k	\$6k	\$2k	\$23k
Fire Equipment	\$335k	\$23k	\$21k	\$58k	\$59k	\$47k	\$65k	\$10k	\$7k	\$5k	\$40k
Furnishings	\$133k	\$0	\$0	\$589	\$0	\$0	\$0	\$68k	\$589	\$730k	\$0
Library Collections	\$355k	\$8k	\$8k	\$7k	\$7k	\$8k	\$7k	\$8k	\$7k	\$8k	\$11k
Marina Equipment	\$52k	\$13k	\$8k	\$0	\$0	\$0	\$8k	\$8k	\$0	\$0	\$0
Office Equipment	\$57k	\$3k	\$1k	\$0	\$2k	\$1k	\$50k	\$2k	\$1k	\$5k	\$2k
Public Works	\$447k	\$9k	\$2k	\$123k	\$740	\$0	\$27k	\$2k	\$26k	\$3k	\$2k
Recreation and Cultural Services	\$689k	\$0	\$6k	\$0	\$0	\$23k	\$21k	\$11k	\$10k	\$390k	\$3k

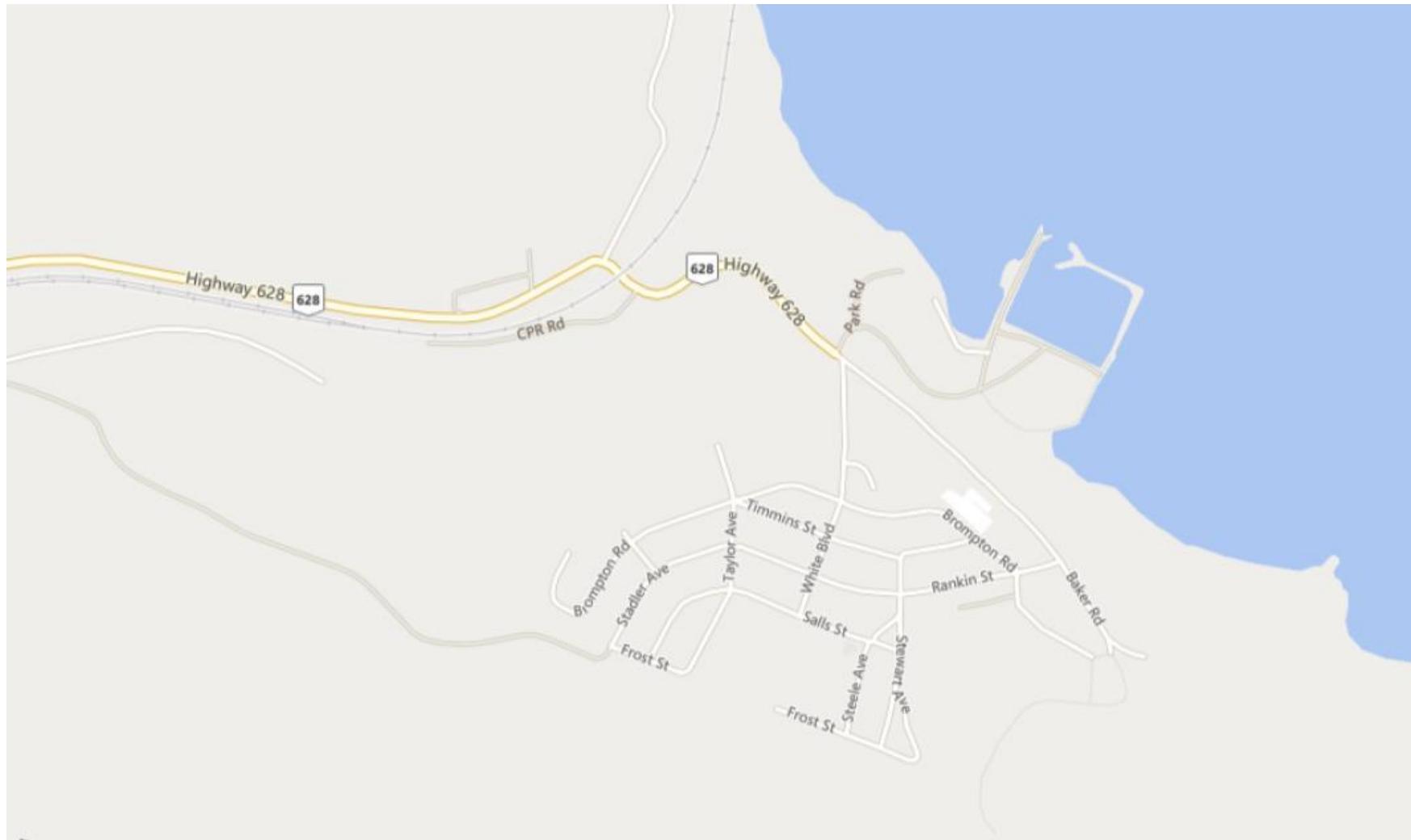
Total	\$2.1m	\$55k	\$55k	\$196k	\$85k	\$87k	\$184k	\$157k	\$58k	\$1.1m	\$82k
Vehicles											
Asset Segment	Backlog	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031
Protection Services	\$358k	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$358k
Transportation Services	\$113k	\$0	\$0	\$89k	\$0	\$79k	\$0	\$41k	\$0	\$0	\$24k
Total	\$471k	\$382k	\$0	\$0	\$89k	\$0	\$79k	\$0	\$41k	\$0	\$0
Land Improvements											
Asset Segment	Backlog	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031
Fencing	\$20k	\$0	\$0	\$0	\$16k	\$0	\$0	\$0	\$25k	\$0	\$0
Parking Lots	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$17k	\$0	\$24k
Poles & Signs	\$0	\$0	\$0	\$0	\$0	\$0	\$24k	\$0	\$0	\$30k	\$0
Recreational Assets	\$0	\$0	\$0	\$0	\$0	\$0	\$219k	\$0	\$0	\$0	\$0
Total	\$20k	\$0	\$0	\$0	\$16k	\$0	\$243k	\$0	\$42k	\$30k	\$24k
Water Network											
Asset Segment	Backlog	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031
Fire Hydrants	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Pump House	\$0	\$0	\$0	\$0	\$3k	\$0	\$0	\$0	\$0	\$99k	\$0
Water Buildings	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$20k	\$0
Water Machinery & Equipment	\$29k	\$0	\$0	\$0	\$1k	\$6k	\$17k	\$38k	\$5k	\$16k	\$1k
Water Meters	\$222k	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$222k	\$0
Water Service Connections	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$238k

Water Tower	\$1.7m	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Water Treatment Plant	\$2.4m	\$0	\$0	\$2k	\$291k	\$52k	\$7k	\$0	\$4k	\$625k	\$0
Water mains	\$0	\$291k	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$315k	\$0
Total	\$4.4m	\$291k	\$0	\$2k	\$296k	\$58k	\$25k	\$38k	\$9k	\$1.3m	\$239k

Wastewater Network											
Asset Segment	Backlog	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031
Lift Stations	\$66k	\$0	\$0	\$0	\$0	\$0	\$0	\$76k	\$0	\$0	\$0
Wastewater Machinery & Equipment	\$197k	\$0	\$0	\$0	\$8k	\$58k	\$0	\$0	\$0	\$0	\$0
Wastewater Mains	\$0	\$252k	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Wastewater Manholes	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Wastewater Service Connections	\$392k	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$24k	\$0
Wastewater Treatment Plant	\$66k	\$0	\$0	\$0	\$0	\$0	\$26.0m	\$0	\$0	\$0	\$0
Total	\$720k	\$252k	\$0	\$0	\$8k	\$58k	\$26.0m	\$76k	\$0	\$24k	\$0

Appendix C: Level of Service Maps

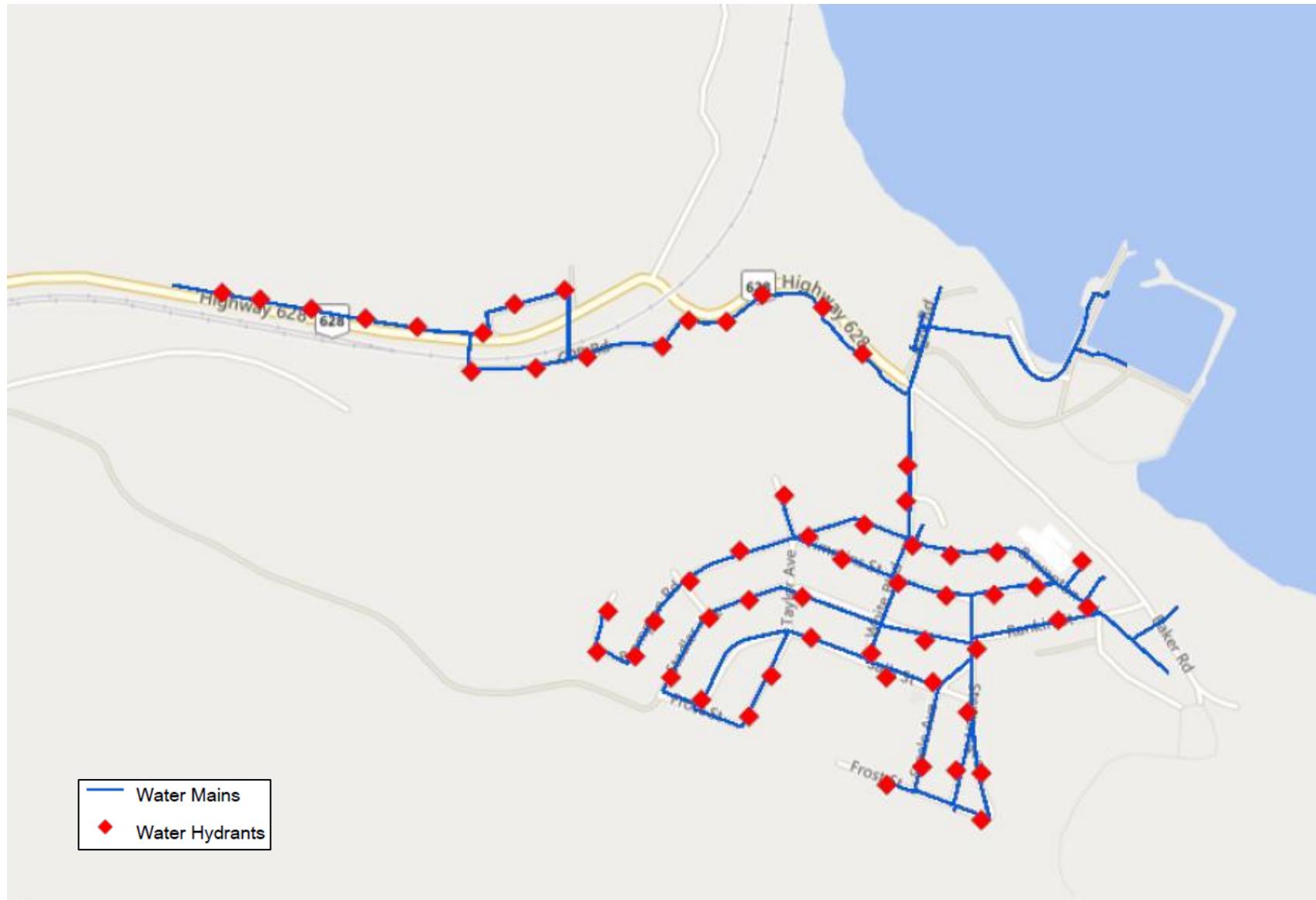
Road Network Map



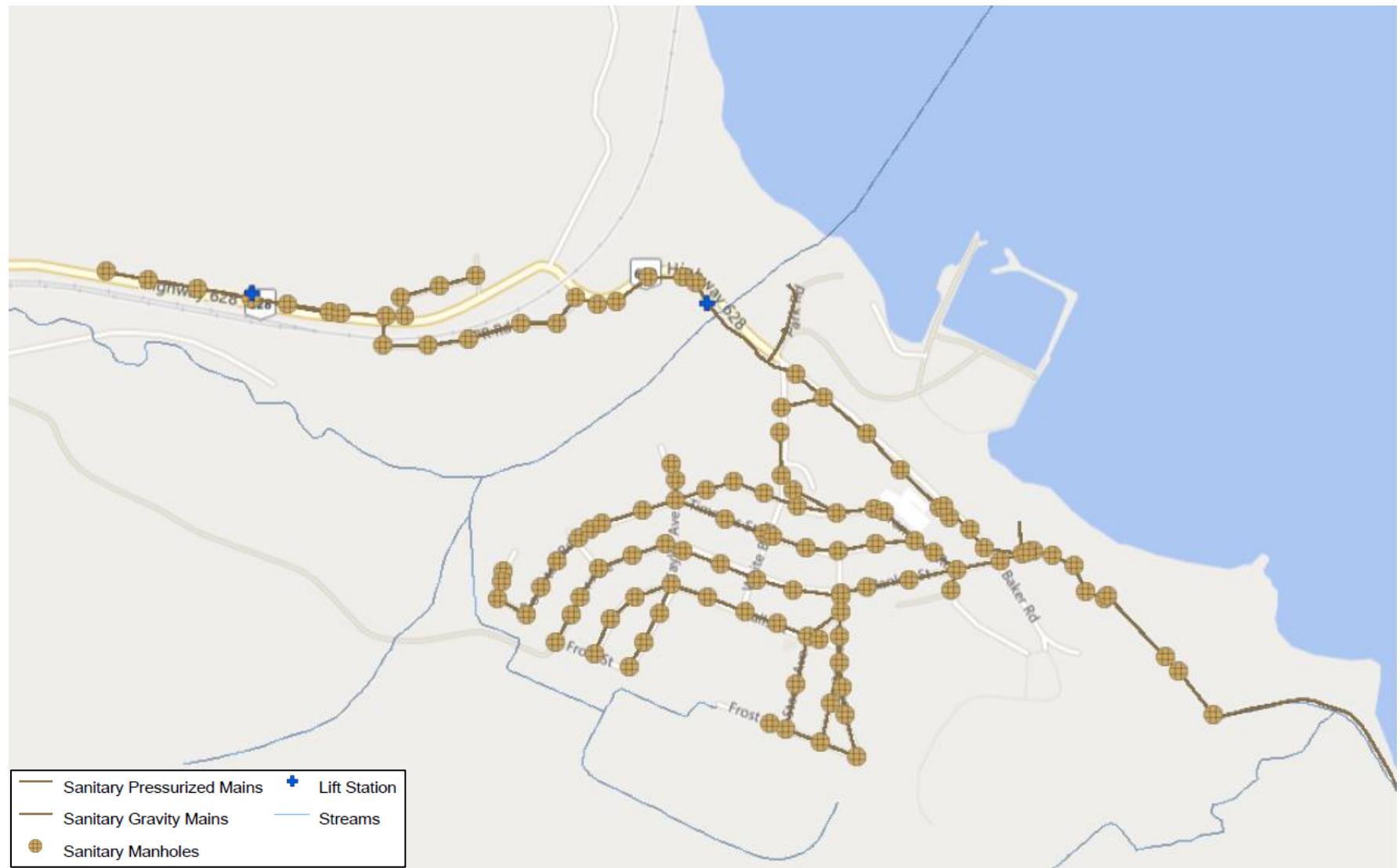
Stormwater Network



Water Network Map



Wastewater Network Map



Appendix D: Condition Assessment Guidelines

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

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

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

Role of Asset Condition Data

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

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

Guidelines for Condition Assessment

Whether completed by external consultants or internal staff, condition assessments should be completed in a structured and repeatable fashion, according to consistent and objective assessment criteria. Without proper guidelines for the completion of

condition assessments there can be little confidence in the validity of condition data and asset management strategies based on this data.

Condition assessments must include a quantitative or qualitative assessment of the current condition of the asset, collected according to specified condition rating criteria, in a format that can be used for asset management decision-making. As a result, it is important that staff adequately define the condition rating criteria that should be used and the assets that require a discrete condition rating. When engaging with external consultants to complete condition assessments, it is critical that these details are communicated as part of the contractual terms of the project. There are many options available to the Township to complete condition assessments. In some cases, external consultants may need to be engaged to complete detailed technical assessments of infrastructure. In other cases, internal staff may have sufficient expertise or training to complete condition assessments.

Developing a Condition Assessment Schedule

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

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