Asset Management Plan

Municipality of Callander

2022

Council Approved – December 13, 2022

This Asset Management Program was prepared by:

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

Key Statistics

Replacement cost of asset portfolio
$87.7 million

Replacement cost of infrastructure per household
$49,900 (2021)

Percentage of assets in fair or better condition
75%

Percentage of assets with assessed condition data
29%

Annual capital infrastructure deficit
$105,000

Recommended timeframe for eliminating annual infrastructure deficit
20 Years

Target reinvestment rate
2.75%

Actual reinvestment rate
2.63%

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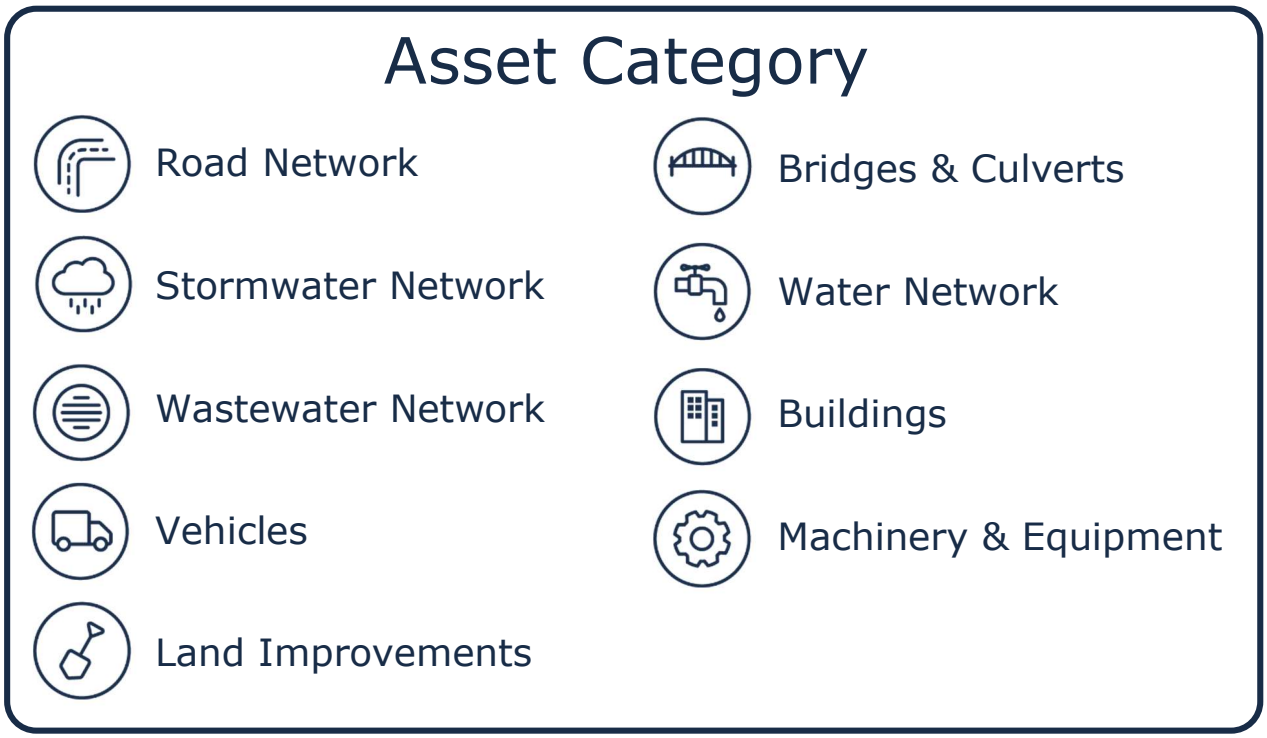
Executive Summary

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

Scope

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

This AMP include the following asset categories:



With the development of this AMP the Municipality has achieved compliance with O. Reg. 588/17 to the extent of the requirements that must be completed by July 1, 2024.

Findings

The overall replacement cost of the asset categories included in this AMP totals $87.7 million. 75% of all assets analysed in this AMP are in fair or better condition and assessed condition data was available for 29% of assets. For the remaining 71% of assets, assessed condition data was unavailable, and asset age was used to approximate condition – a data gap that persists in most municipalities. Generally, age misstates the true condition of assets, making assessments essential to accurate asset management planning, and a recurring recommendation in this AMP.

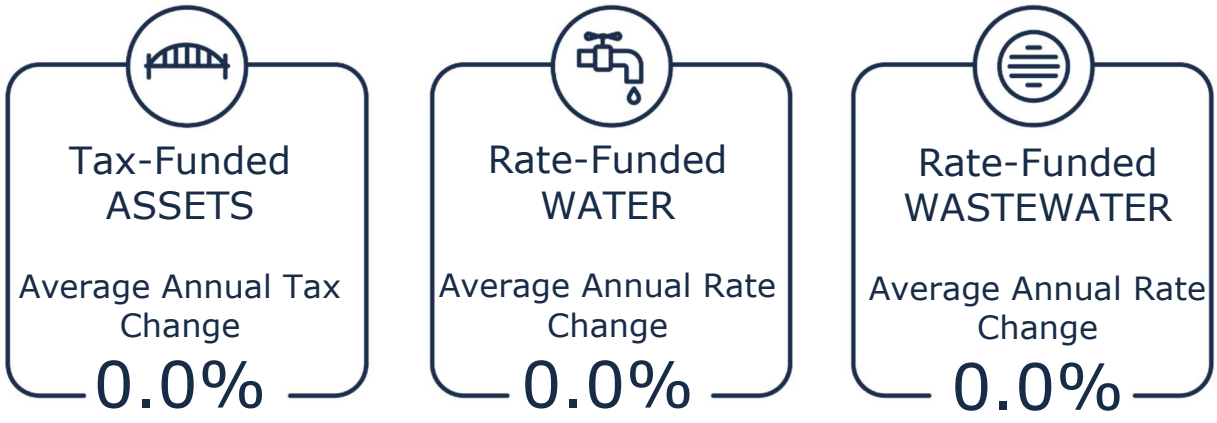
The development of a long-term, sustainable financial plan requires an analysis of whole lifecycle costs. This AMP uses a combination of proactive lifecycle strategies (paved roads) and replacement only strategies (all other assets) to determine the lowest cost option to maintain the current level of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

To meet capital replacement and rehabilitation needs for existing infrastructure, prevent infrastructure backlogs, and achieve long-term sustainability, the Municipality's average annual capital requirement totals $2.4 million. Based on a historical analysis of sustainable capital funding sources, the Municipality is committing approximately $2.3 million towards capital projects or reserves per year. As a result, there is currently an annual funding gap of $105,000.

It is important to note that this AMP is based on assets under ownership as of December 2021. All data and replacement cost information are also as of December 2021 and based on the best available information. Strategic asset management planning is an ongoing and dynamic process that requires continuous data updates that reflect changes to assets, alongside data refinement and improvement as well as dedicated resources to support these processes.

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 Municipality's infrastructure deficit based on a 20-year plan:



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

- Review data to update and maintain a complete and accurate dataset, especially in-service dates, condition, and rehabilitation information
- Develop a condition assessment strategy with a regular schedule.
- Develop a condition assessment program with a regular schedule, including clear documentation on assessment methodology. Ensure assessment approach is suitable to each asset and appropriately adhered to
- Review and update lifecycle management strategies
- Develop and regularly review short- and long-term plans to meet capital requirements
- Measure current levels of service and begin to identify sustainable proposed levels of service

1 Introduction & Context

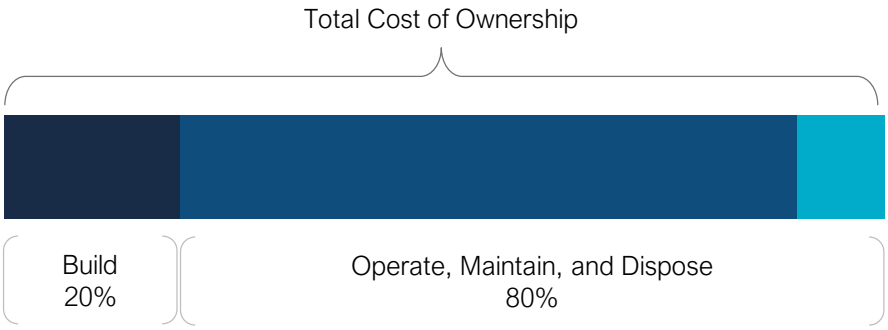
Key Insights

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

An Overview of Asset Management

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

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



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

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

1.1.1 Asset Management Policy

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

The Municipality adopted an Asset Management Policy in June of 2019 in accordance with Ontario Regulation 588/17. The Policy states that the Municipality will continue to develop its best practices to management all current and future assets.

The objectives of the policy include:

- Minimization of service interruptions
- Adoption of effective fiscal planning
- Achieving existing and expected levels of service

1.1.2 Asset Management Strategy

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

The Municipality'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.

1.1.3 Asset Management Plan

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

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

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

Key Concepts in Asset Management

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

1.1.4 Lifecycle Management Strategies

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

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

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

1.1.5 Risk Management Strategies

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

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

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

1.1.6 Levels of Service

A level of service (LOS) is a measure of what the Municipality 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 Municipality as worth measuring and evaluating. The Municipality 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 Municipality 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 Municipality's asset management strategies on the physical condition of assets or the quality/capacity of the services they provide.

For core asset categories (Roads, Bridges & Culverts, Water, Wastewater, Stormwater) the Province, through O. Reg. 588/17, has provided technical metrics that are required to be included in this AMP. For non-core asset categories, the Municipality 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 Municipality 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 Municipality. 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 Municipality must identify a lifecycle management and financial strategy which allows these targets to be achieved.

Ontario Regulation 588/17

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

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

2019

Strategic Asset Management Policy

2022

Asset Management Plan for Core Assets with the following components:

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

2024

Asset Management Plan for Core and Non-Core Assets (same components as 2022) and Asset Management Policy Update

2025

Asset Management Plan for All Assets with the following additional components:

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

1.1.7 O. Reg. 588/17 Compliance Review

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

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

2 Scope and Methodology

Key Insights

- This asset management plan includes 9 asset categories and is divided between tax-funded and rate-funded categories
- The method and recency of replacement costs impacts the accuracy and reliability of asset portfolio valuation
- Accurate and reliable condition data helps to prevent premature and costly rehabilitation or replacement and ensures that lifecycle activities occur at the right time to maximize asset value and useful life

Asset Categories Included in this AMP

This asset management plan for the Municipality of Callander 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 Municipality's asset portfolio, establishes current levels of service and the associated technical and customer oriented key performance indicators (KPIs), outlines lifecycle strategies maintaining assets, and provides financial strategies to reach sustainability for the asset categories listed below.

Asset Category	Source of Funding
Road Network	Tax Levy
Bridges & Culverts	
Stormwater Network	
Buildings & Facilities	
Vehicles	
Machinery & Equipment	
Land Improvements	
Water Network	User Rates
Wastewater Network	

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 Municipality incurred. As assets age, and new products and technologies become available, cost inflation becomes a less reliable method.

Estimated Useful Life and Service Life Remaining

The estimated useful life (EUL) of an asset is the period over which the Municipality 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 Municipality can determine the service life remaining (SLR) for each asset. Using condition data and the asset's SLR, the Municipality can more accurately forecast when it will require replacement. The SLR is calculated as follows:

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

Reinvestment Rate

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

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

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

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

Deriving Asset Condition

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

A condition assessment rating system provides a standardized descriptive framework that allows comparative benchmarking across the Municipality'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.

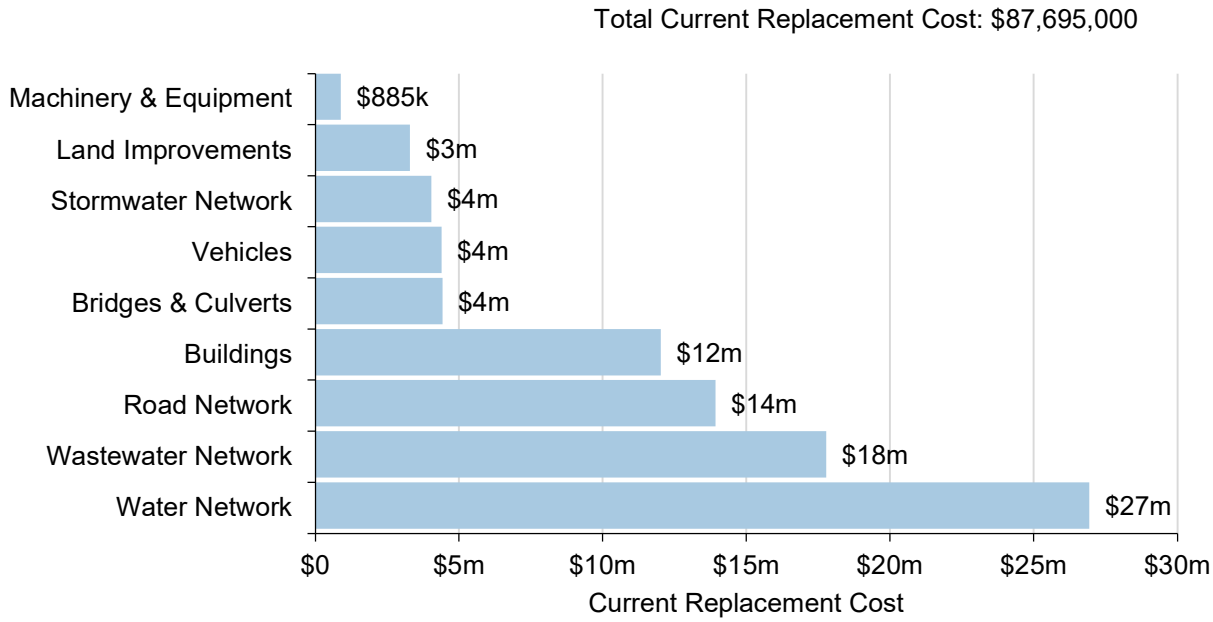
3 Portfolio Overview

Key Insights

- The total replacement cost of the Municipality's asset portfolio is $87.7 million
- The Municipality's target re-investment rate is 2.75%, and the actual re-investment rate is 2.63%, contributing to an infrastructure deficit
- 75% of all assets are in fair or better condition
- Average annual capital requirements total $2.4 million per year across all assets

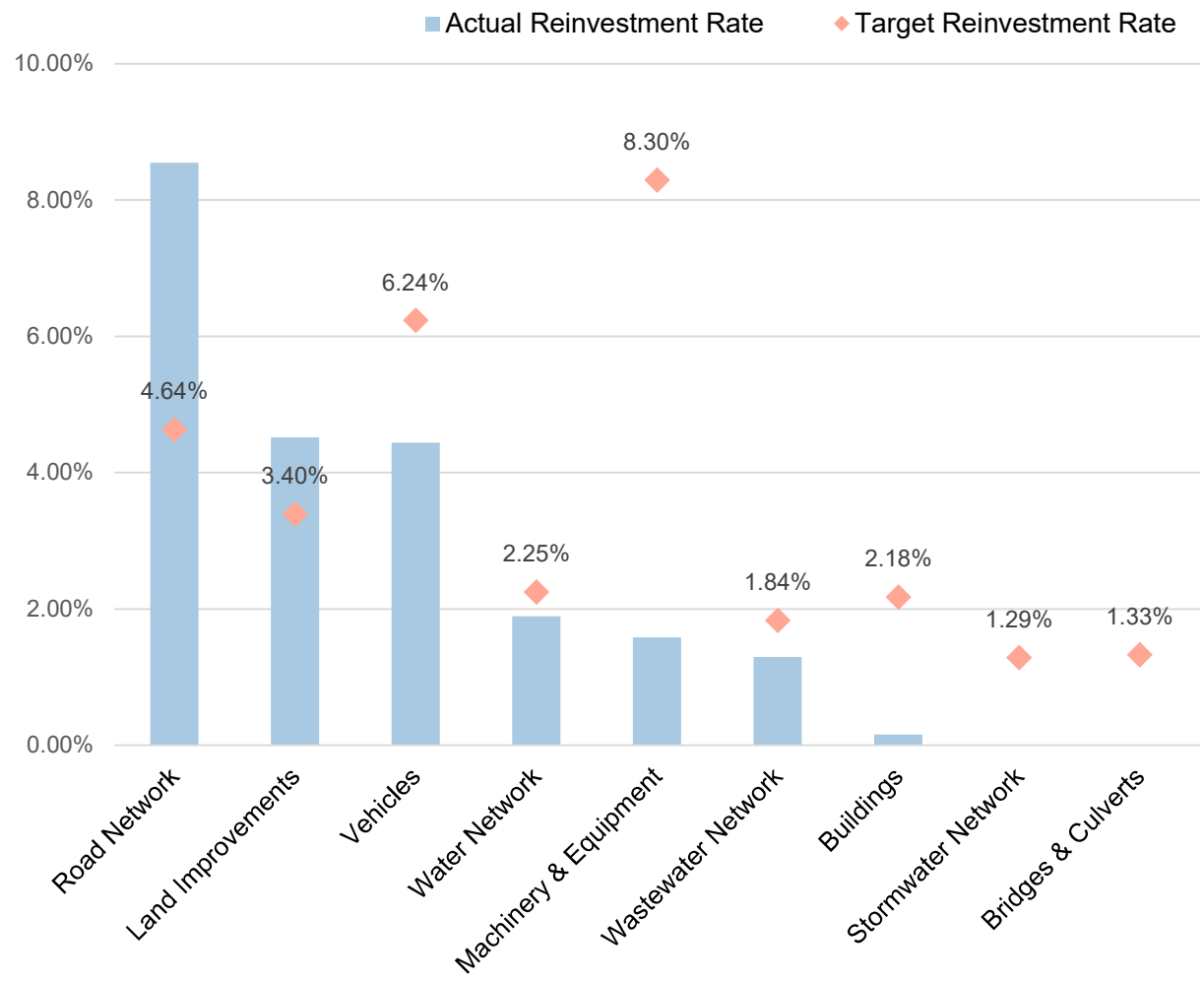
Total Replacement Cost of Asset Portfolio

The asset categories analyzed in this AMP have a total replacement cost of $87.7 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.



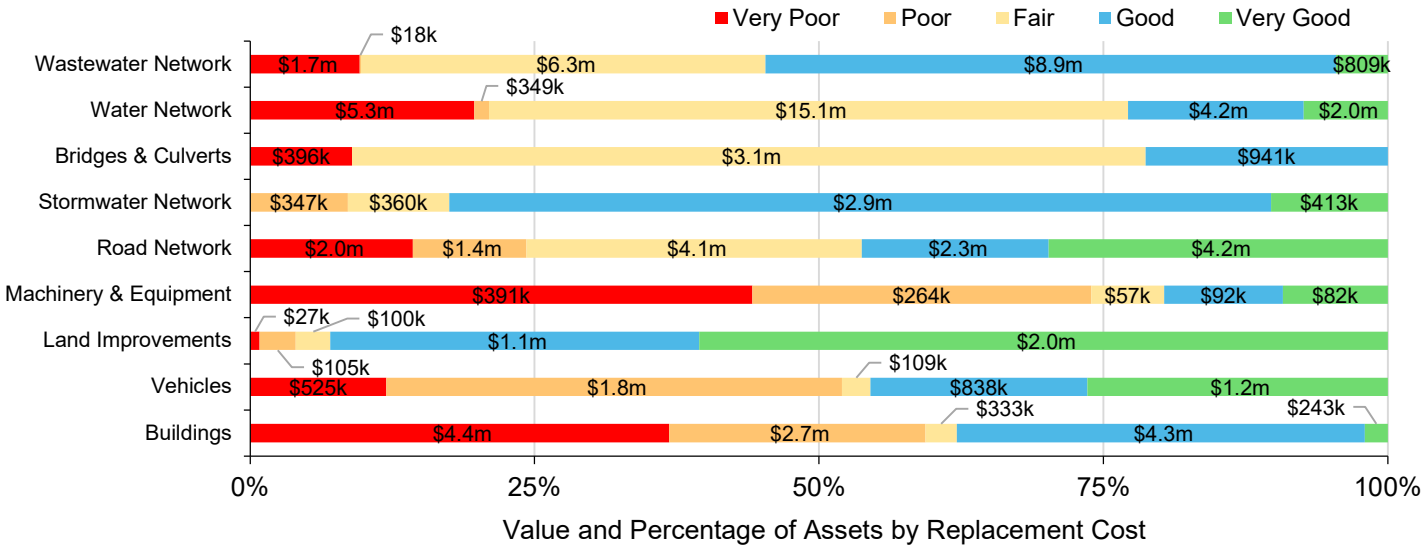
Target vs. Actual Reinvestment Rate

The graph below depicts funding gaps or surpluses by comparing target vs actual reinvestment rate. To meet the long-term replacement needs, the Municipality should be allocating approximately $2.4 million annually, for a target reinvestment rate of 2.75%. Actual annual spending on infrastructure totals approximately $2.3 million, for an actual reinvestment rate of 2.63%.



Condition of Asset Portfolio

The current condition of the assets is central to all asset management planning. Collectively, 75% of assets in Callander are in fair or better condition, based on replacement costs. This estimate relies on both age-based and field condition data.

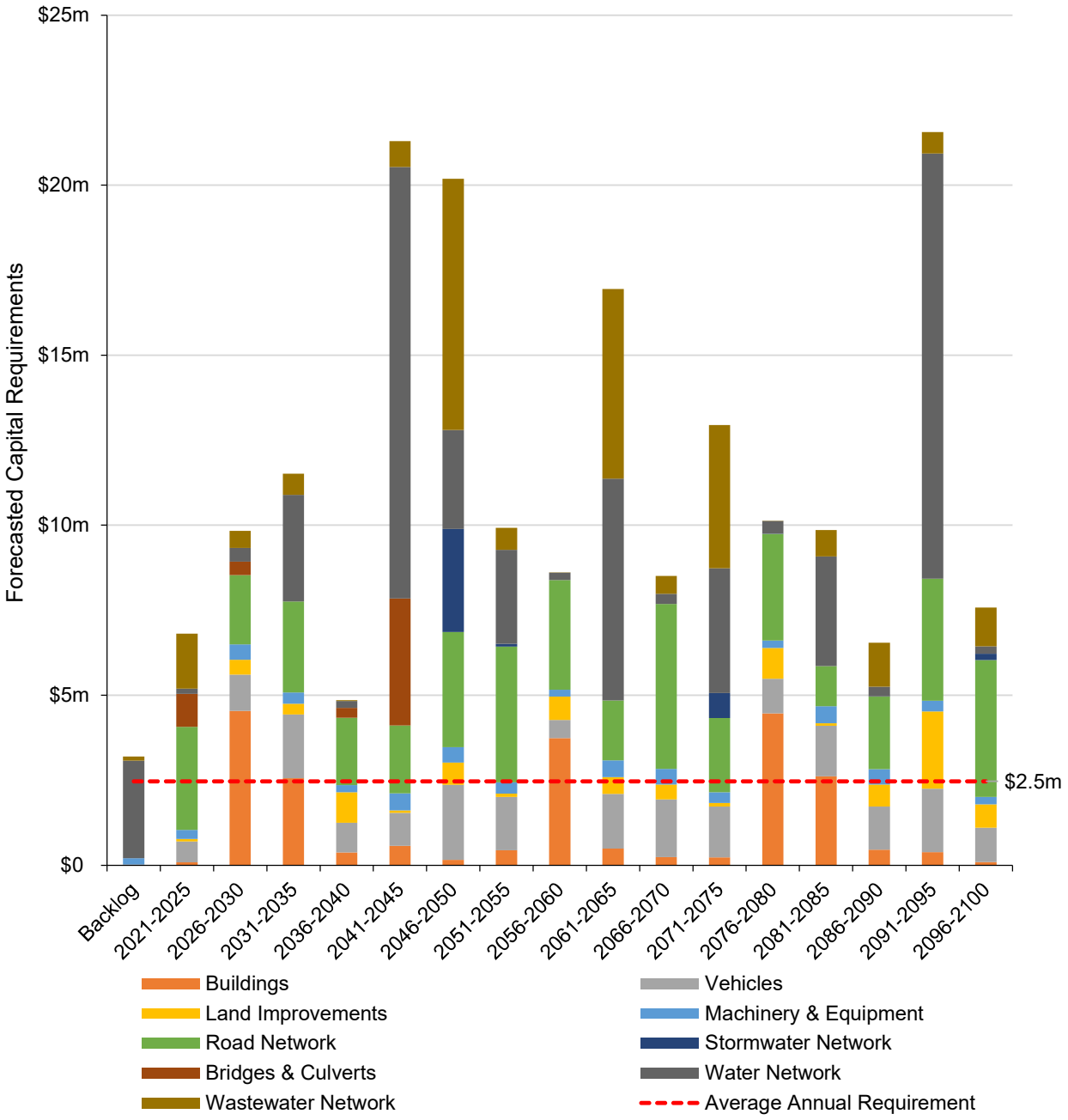


This AMP relies on assessed condition data for 29% of assets; for the remaining portfolio, age is used as an approximation of condition. Assessed condition data is invaluable in asset management planning as it reflects the true condition of the asset and its ability to perform its functions. The table below identifies the source of condition data used throughout this AMP.

Asset Category	Asset Segment	% of Assets with Assessed Condition	Source of Condition Data
Road Network	Paved Roads	96%	Streetlogix
Bridges & Culverts	Bridges	100%	2020 OSIM Report
	Structural Culverts	100%	2020 OSIM Report
Stormwater Network	All	0%	N/A
Buildings & Facilities	All	0%	N/A
Machinery & Equipment	All	0%	N/A
Vehicles	All	0%	N/A
Land Improvements	All	18%	Staff Assessments
Water Network	All	14%	OCWA and Staff Assessments
Wastewater Network	All	23%	Staff Assessments

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 Municipality can produce an accurate long-term capital forecast. The following graph identifies capital requirements over the next 80 years. This projection is used as it ensures that every asset has gone through one full iteration of replacement. The forecasted requirements are aggregated into 5-year bins and the dashed red line represents the average annual capital requirements.



4 Road Network

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

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

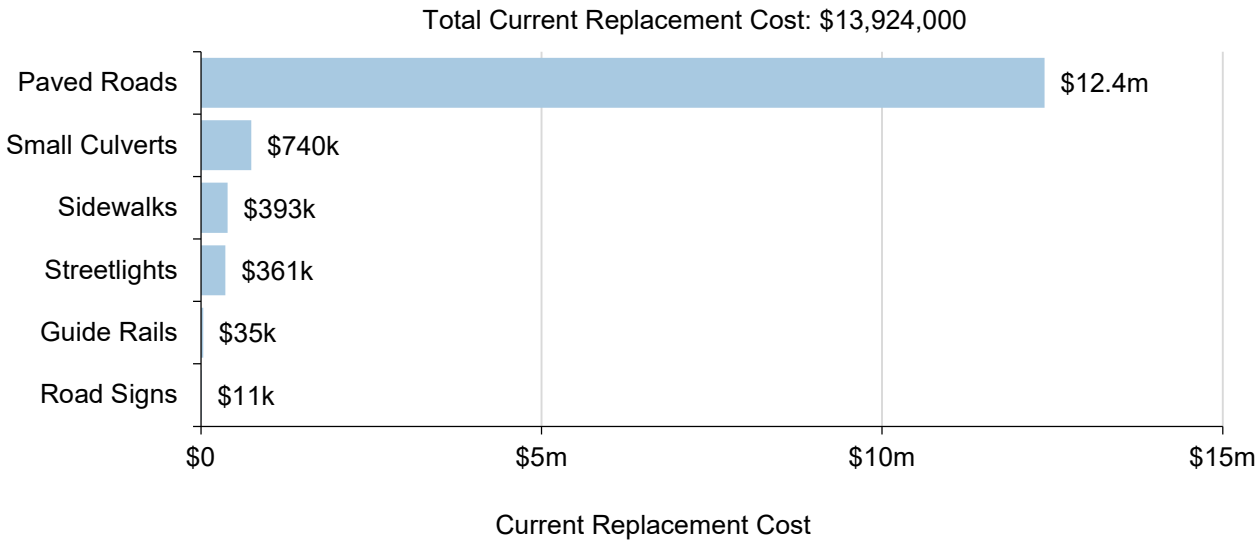
The state of the infrastructure for the road network is summarized in the following table.

Replacement Cost	Condition	Financial Capacity	
$14.0 million	Good (62%)	Annual Requirement:	$645,000
		Funding Available:	$1,190,000
		Annual Surplus:	**$545,000**

Asset Inventory & Replacement Costs

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

Asset Segment	Quantity	Replacement Cost	Annual Capital Requirement
Unpaved Roads	126,700 m^2	Not Planned for Replacement[1]	
Guide Rails	176	$35,000	$2,000
Paved Roads	50,500 m	$12,384,000	$534,000
Road Signs	74	$11,000	$2,000
Sidewalks	6,500 m	$393,000	$10,000
Small Culverts	96	$740,000	$15,000
Streetlights	278	$361,000	$18,000
Total		**$13,924,000**	**$581,000**



Each asset's replacement cost should be reviewed periodically to determine whether cost estimates are realistic and reflect current market conditions.

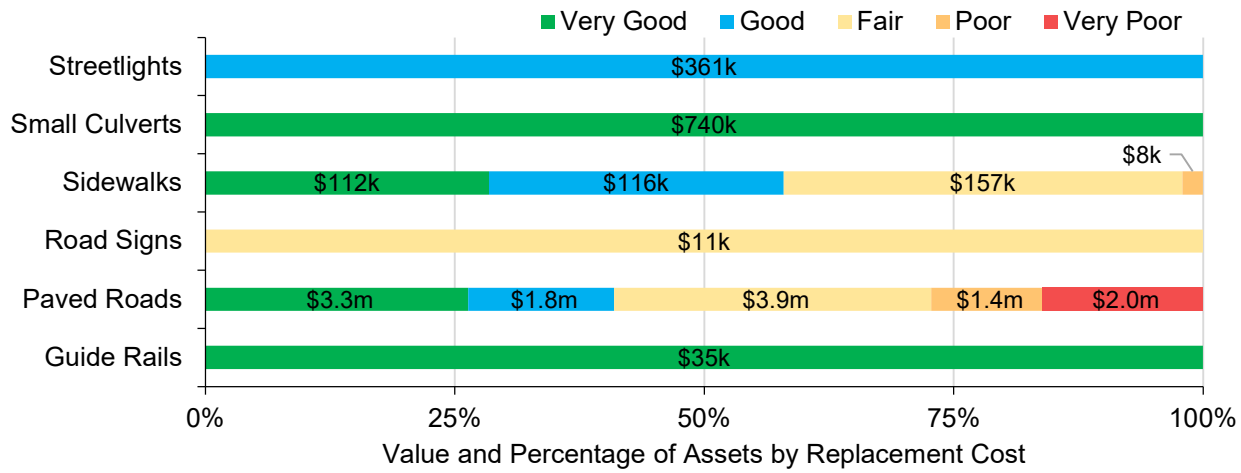
[1] Gravel roads undergo perpetual operating and maintenance activities. If maintained properly, they can theoretically have a limitless service life.

Asset Condition

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

Asset Segment	Average Condition (%)	Average Condition Rating	Condition Source
Guide Rails	98%	Very Good	0% Assessed
Paved Roads	60%	Good	96% Assessed
Road Signs	49%	Fair	0% Assessed
Sidewalks	67%	Good	92% Assessed
Small Culverts	100%	Very Good	0% Assessed
Streetlights	70%	Good	0% Assessed
Average	**62%**	**Good**	**88% Assessed**

The graph below visually illustrates the average condition for each asset segment.



To ensure that the Municipality's Road Network continues to provide an acceptable level of service, the Municipality 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.

4.1.1 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 Municipality's current approach:

- The road network is visually assessed by municipal staff on a regular basis to note deficiencies and create work orders.
- Road Needs Studies are conducted on a 5-year cycle. The most recent study was completed in July of 2019. The studies include a detailed assessment of the condition of each road segment which informs capital planning.
- Regulatory signs, although not formally inventoried within Citywide, undergo reflectivity testing as required.

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	70-80
Fair	50-70
Poor	40-50
Very Poor	0-20

Lifecycle Management Strategy

4.1.2 Current Lifecycle 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.

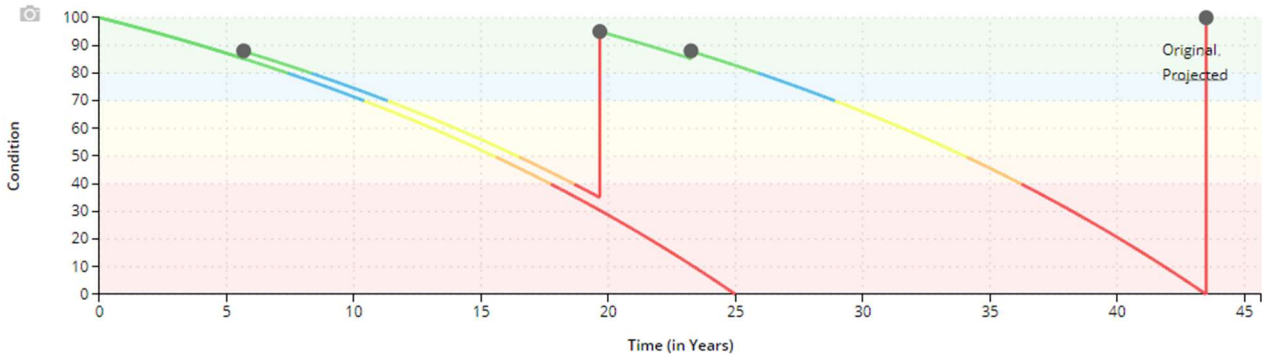
The Municipality is responsible for 69.9 kilometres of road network comprising paved (HCB), surface treated (LCB), and gravel roads. Of the three road categories, paved and surface treated roads are dominant within the Municipality. The data used is considered by staff to be an accurate representation of all roads that the Municipality is responsible for.

The following lifecycle strategies have been developed as a proactive approach to managing the lifecycle of roads. Instead of allowing roads to deteriorate until replacement is required, strategic rehabilitation is expected to extend the service life of roads at a lower total cost.

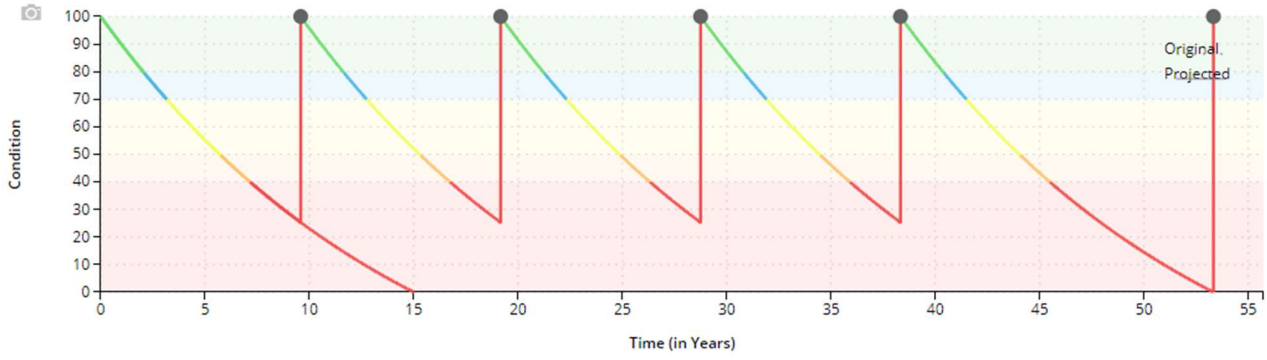
Current Lifecycle Strategies for HCB and LCB Roads

Event Class	Description
Operations and Maintenance	Crack sealing is performed every three to four years on an as needed basis, usually completed in conjunction with the County.
	Patching is completed as needed based on the conditions of the PCI and patrolling.
	Operating costs include winter maintenance, line painting, sweeping, and asphalt and gravel patching.
Renewal and Rehabilitation	Mill and pave consisting of a single lift of asphalt is performed approximately every 20 years, based on current condition and maintenance history.
	Single lift surface treatments are triggered at when road condition declines to 25-40%
Replacement	Road replacement is typically coordinated with underground assets to minimize project costs.
	A Road Needs Study completed in 2019 primarily drives replacement decisions. Additional studies will occur on a 5-year cycle and regular road patrols are ongoing.

Asphalt Roads (HCB)		
Event Name	**Event Class**	**Event Trigger**
Crack Sealing	Preventative Maintenance	85-100% Condition
Mill & Pave	Rehabilitation	35-50% Condition
Reconstruction	Reconstruction	20% Condition



Surface Treated Roads (LCB)		
Event Name	**Event Class**	**Event Trigger**
Single Surface Treatment	Rehabilitation	25-40% Condition
Reconstruction	Reconstruction	0% Condition



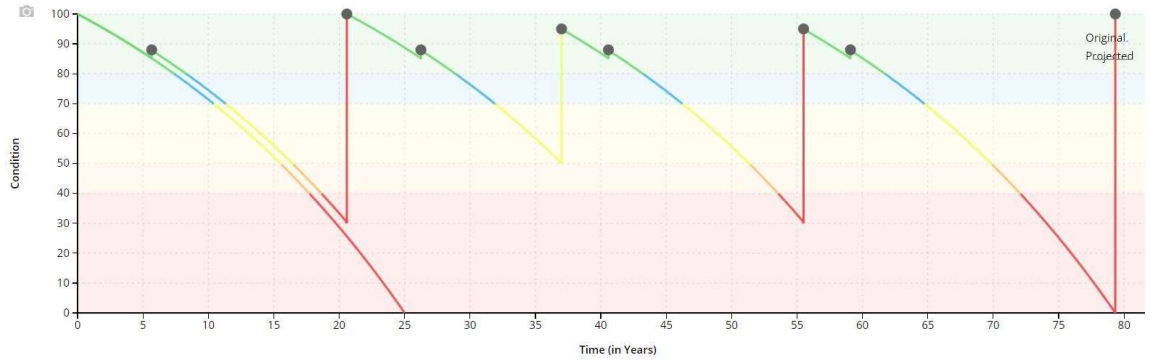
Current Lifecycle Strategies for Gravel Roads	
Event Class	**Description**
Operations and Maintenance	Pothole and spot repairs are undertaken as needed. Ditching, mowing, and brushing is performed annually, with the entire road network completed every five years.
	Roads are regraded annually in the spring/summer with a simultaneous assessment of whether additional gravel is necessary.
	Routine grading ensures the gravel road surface is level.
	Annual dust suppression applications of liquid calcium take place each spring/summer.
Renewal and Rehabilitation	Renewals are reviewed annually based on maintenance issues and through patrolling. Decisions for prioritizing renewals are based on condition rating and historic maintenance level.
	Gravel roads are perpetually maintained and do not require rehabilitation.
Replacement	Gravel roads do not require conventional asset replacement events.

4.1.3 Proposed Lifecycle Strategies

A proposed scenario is presented below illustrating an upgrade of surface treated roads (LCB) to asphalt roads (HCB). The average capital costs of LCB roads are almost 50% of HCB roads but provide less than half the service life. It may be more cost-effective and strategic in the long-term to upgrade certain LCB roads to maintain the desired level of service for the Road Network.

The following table outlines a potential strategy for upgrading LCB roads to HCB roads upon full reconstruction.

Surface Treated Roads (LCB) to Asphalt Roads (HCB)		
Event Name	**Event Class**	**Event Trigger**
Crack Sealant	Preventive Maintenance	85% Condition
Mill & Pave (Full Depth)	Rehabilitation	30% Condition
Single Lift Overlay	Rehabilitation	50% Condition
Mill & Pave	Rehabilitation	30% Condition
Full Reconstruction	Replacement	0% Condition

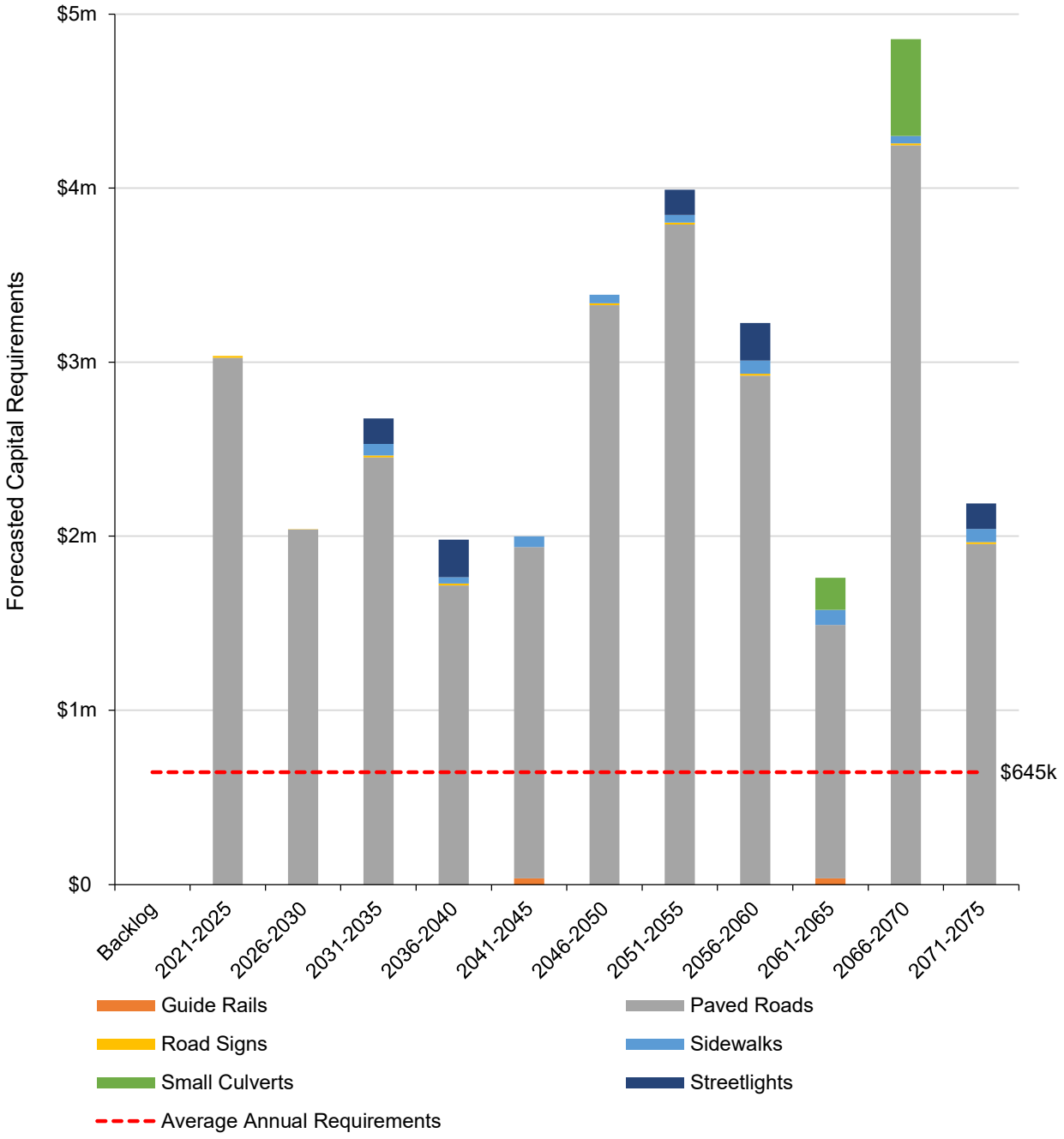


4.1.4 Forecasted Capital Requirements

Based on the current lifecycle strategies identified previously for roads, and assuming the end-of-life replacement of all other assets in this category, the following graph forecasts capital requirements for the Road Network.

The annual capital requirement represents the average amount per year that the Municipality should allocate towards funding rehabilitation and replacement needs. The following graph identifies capital requirements over the next 55 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 dashed red line represents the average annual capital requirements.



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.

Risk & Criticality

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

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

The identification of critical assets allows the Municipality 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.

4.1.6 Risks to Current Asset Management Strategies

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

Lifecycle Management Strategies

The Municipality is currently considering alternative lifecycle management strategies to create cost and time efficiencies. Surface treated roads (LCB) have a shorter useful life and the costs of surface treatments are rising, thus making it more efficient to transition them to asphalt roads (HCB).

Levels of Service

The following tables identify the Municipality'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 Municipality has selected for this AMP.

4.1.7 Community Levels of Service

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

Service Attribute	Qualitative Description	Current LOS (2021)
Scope	Description, which may include maps, of the road network in the municipality and its level of connectivity	See Appendix C
Quality	Description or images that illustrate the different levels of road class pavement condition	Roads are given a PCI (Pavement Condition Index) rating from 0-100 in the 2020 Road Needs Study. A road in "very good" condition (rating between 80-100) is considered well maintained, exhibits few pavement distresses with a low severity and provides a smooth and pleasant ride for drivers. A road in "very poor" condition (rating between 0-40) exhibits several pavement distresses of increasing severity and is very rough and bumpy for drivers.

4.1.8 Technical Levels of Service

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

Service Attribute	Technical Metric	Current LOS (2021)
Scope	Lane-km of arterial roads (MMS classes 1 and 2) per land area (km/km^2)	0.26
	Lane-km of collector roads (MMS classes 3 and 4) per land area (km/km^2)	0.01
	Lane-km of local roads (MMS classes 5 and 6) per land area (km/km^2)	0.71
Quality	Average pavement condition index for paved roads in the municipality	60%
	Average surface condition for unpaved roads in the municipality (e.g. excellent, good, fair, poor)	Fair
Performance	Current annual capital reinvestment rate	8.55%
	% of road network in poor/very poor condition	27%
	Average risk rating associated to road network	10.2 / 25

Recommendations

Replacement Costs

- Update replacement costs on a regular basis to ensure the accuracy of capital projections.

Condition Assessment Strategies

- Maintain a regular condition assessment cycle for paved roads and sidewalks and upload condition ratings to Citywide (e.g. every three to five years).
- Consider gathering visual condition assessments for other point assets within the Road Network, such as streetlights, to minimize reliance on age-based assessments.

Lifecycle Management Strategies

- Staff should evaluate lifecycle event schedules, timing, and costs on a regular basis and update according to an evolving understanding of the optimal strategy to extend the life of the asset at the lowest total cost of ownership.
- Staff may consider implementing the recommended strategies in increments, as proposed for the LCB network. Doing so will incrementally distribute short term costs, and ensure equipment and materials are secured for the undertaking.

Risk Management Strategies

- Review risk models on a regular basis and adjust according to an evolving understanding of the probability and consequences of asset failure. This should include a regular review of high-risk assets to determine appropriate risk mitigation strategies.

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 Municipality 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 Department of Public Works is responsible for the maintenance of all bridges and structural culverts located across municipal roads with the goal of keeping structures in an adequate state of repair and minimizing service disruptions.

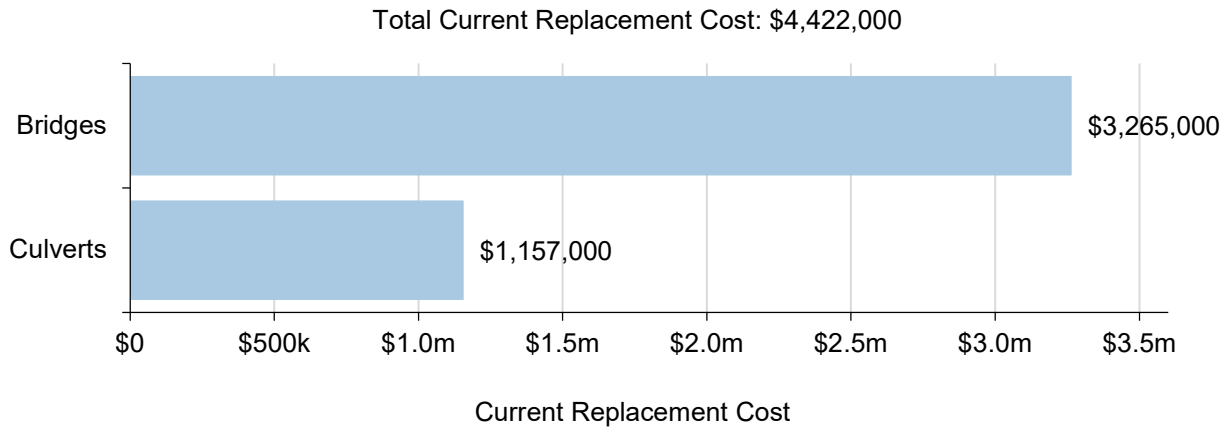
The state of the infrastructure for bridges and culverts is summarized in the following table.

Replacement Cost	Condition	Financial Capacity	
$4.4 million	Good (68%)	Annual Requirement:	$59,000
		Funding Available:	$0
		Annual Deficit:	**$59,000**

Asset Inventory & Replacement Costs

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

Asset Segment	Quantity	Replacement Cost	Annual Capital Requirement
Bridges	3	$3,265,000	$47,000
Culverts	3	$1,157,000	$25,000
Total		**$4,422,000**	**$72,000**



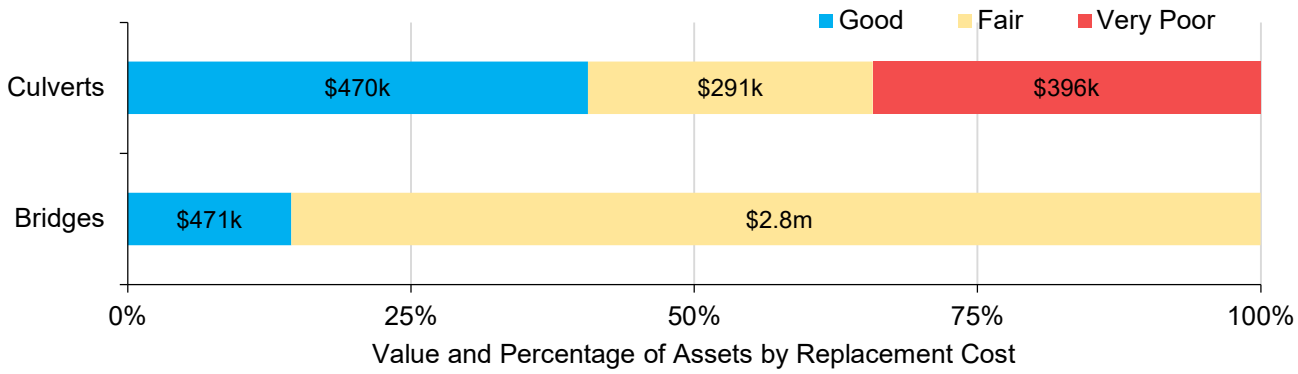
Each asset's replacement cost should be reviewed periodically to determine whether adjustments are needed to more accurately represent realistic capital requirements.

Asset Condition

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

Asset Segment	Average Condition (%)	Average Condition Rating	Condition Source
Bridges	68%	Fair	100% Assessed
Structural Culverts	61%	Fair	100% Assessed
Average	**66%**	**Fair**	**100% Assessed**

The graph below visually illustrates the average condition for each asset segment



To ensure that the Municipality's Bridges & Culverts continue to provide an acceptable level of service, the Municipality 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.

5.1.1 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 Municipality's current approach:

- Condition assessments of all bridges and culverts with a span greater than or equal to three meters are completed every two years in accordance with the Ontario Structure Inspection Manual (OSIM)
- Visual inspections are performed regularly, between OSIM inspections, to ensure the performance and condition of the structures has not deteriorated unexpectedly.

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

Condition	Rating
Very Good	80-100
Good	70-80
Fair	60-70
Poor	50-60
Very Poor	0-20

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.

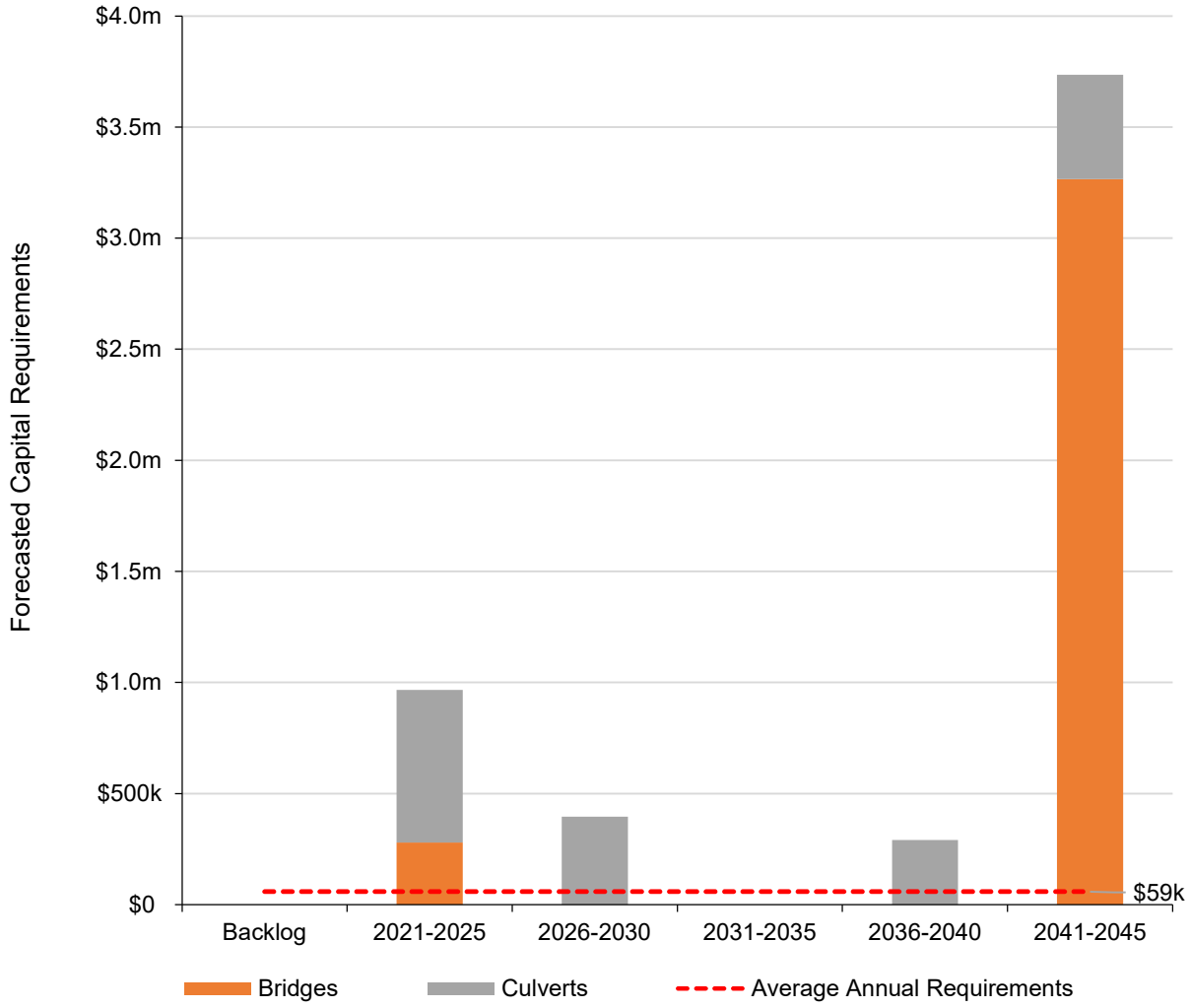
The following table outlines the Municipality's current lifecycle management strategy.

Activity Type	Description of Current Strategy
Maintenance, Rehabilitation and Replacement	All lifecycle activities are driven by the results of mandated structural inspections completed according to the Ontario Structure Inspection Manual (OSIM), within budget constraints.
	OSIM inspections are contracted out and completed every 2 years as required.
	Annual bridge washing and sweeping is conducted in the Spring.
Inspection	The most recent inspection report was completed in 2020 by HP Engineering.

5.1.2 Forecasted Capital Requirements

Based on lifecycle activities proposed in the latest OSIMs report and end-of-life replacement, the following graph forecasts capital replacements for bridges and structural culverts.

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



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.

Risk & Criticality

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

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

The identification of critical assets allows the Municipality 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.

5.1.4 Risks to Current Asset Management Strategies

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

Capital Funding Strategies

The Municipality is developing a capital funding strategy to reduce dependency on grant funding, prevent deferral of capital works, and eventually improve accessibility.

Levels of Service

The following tables identify the Municipality'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 Municipality has selected for this AMP.

5.1.5 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 (2021)
Scope	Description of the traffic that is supported by municipal bridges (e.g. heavy transport vehicles, motor vehicles, emergency vehicles, pedestrians, cyclists)	Bridges and structural culverts are a key component of the municipal transportation network. None of the municipality's structures have loading or dimensional restrictions.
Quality	Description or images of the condition of bridges & culverts and how this would affect use of the bridges & culverts	See Appendix C

5.1.6 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 (2021)
Scope	% of bridges in the Municipality with loading or dimensional restrictions	0%
Quality	Average bridge condition index value for bridges in the Municipality	68
	Average bridge condition index value for structural culverts in the Municipality	61
Performance	Current annual capital reinvestment rate	0%
	% of Bridges & Culverts in poor/very poor condition	9%
	Average risk rating associated to bridges & culverts	9.82 / 25

Recommendations

Data Review

- 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. As completed, all condition assessments should be uploaded into the asset inventory to drive forward asset management planning and forecasting activities.

Risk Management Strategies

- Implement risk-based decision-making as part of asset management planning and budgeting processes. This should include a 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

- This AMP includes capital costs associated with the rehabilitation and/or reconstruction of bridges and structural culverts. The Municipality should continue to integrate the OSIM recommended capital activities into their long-term planning.
- Update current asset replacement and event costs on a cyclical basis.

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 Municipality 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 Stormwater Network

The Municipality is responsible for owning and maintaining a stormwater network of an unknown length of storm sewer mains, catch basins and other supporting infrastructure.

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

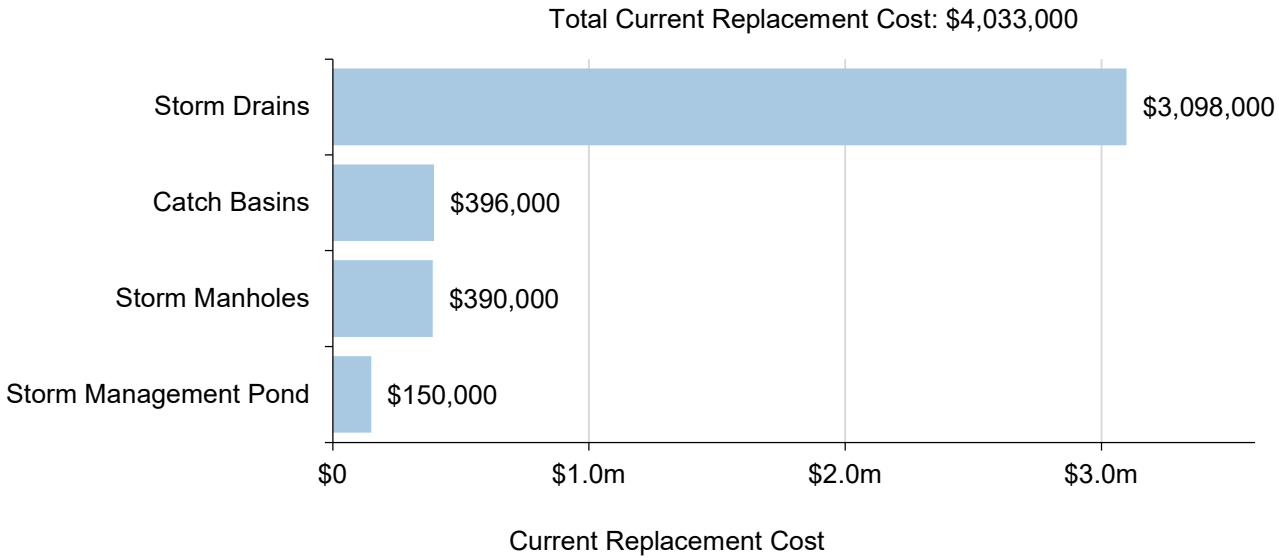
The state of the infrastructure for the stormwater network is summarized in the following table.

Replacement Cost	Condition	Financial Capacity	
$4.0 million	Good (73%)	Annual Requirement:	$52,000
		Funding Available:	$0
		Annual Deficit:	**$52,000**

Asset Inventory & Replacement Costs

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

Asset Segment	Quantity	Replacement Cost	Annual Capital Requirement
Catch Basins	113	$396,000	$5,000
Storm Drains	6,412 m	$3,098,000	$41,000
Storm Management Pond	3	$150,000	$2,000
Storm Manholes	52	$390,000	$4,000
Total		**$4,033,000**	**$52,000**



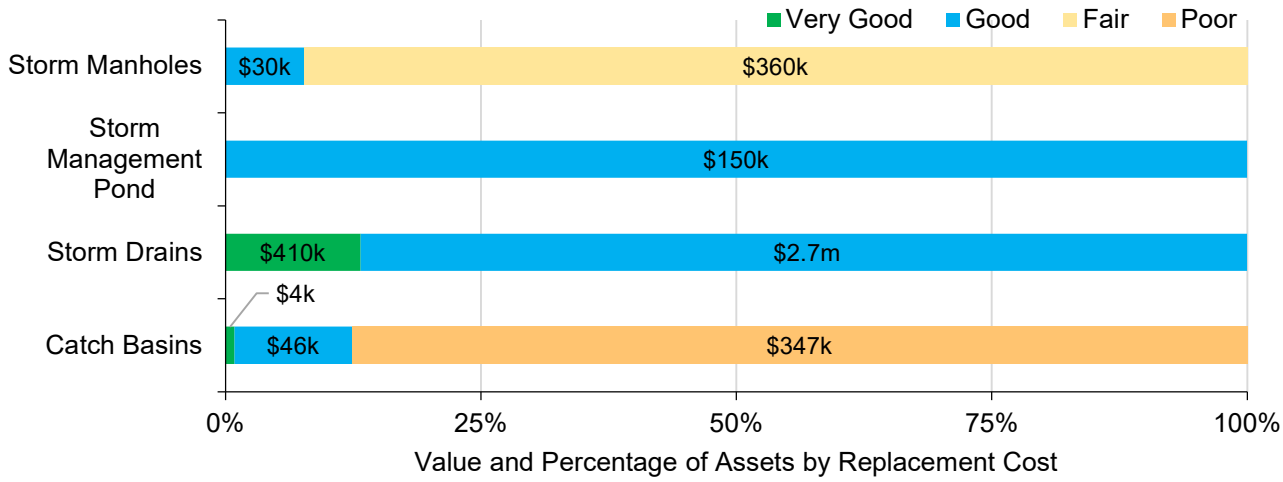
Each asset's replacement cost should be reviewed periodically to determine whether cost estimates are realistic and reflect current market conditions.

Asset Condition

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

Asset Segment	Average Condition (%)	Average Condition Rating	Condition Source
Catch Basins	42%	Fair	Age-Based
Storm Drains	79%	Good	Age-Based
Storm Management Pond	77%	Good	Age-Based
Storm Manholes	56%	Fair	Age-Based
Average	**73%**	**Good**	Age-Based

The graph below visually illustrates the average condition for each asset segment.



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

6.1.1 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 Municipality's current approach:

- There are no formal condition assessment programs in place for the stormwater network, however, catch basins and ponds are visually inspected annually through road patrols.
- CCTV inspections are performed on an as-needed basis for the storm sewers.
- As the Municipality refines the available asset inventory for the stormwater network, a regular assessment cycle will be established.

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

Lifecycle Management Strategy

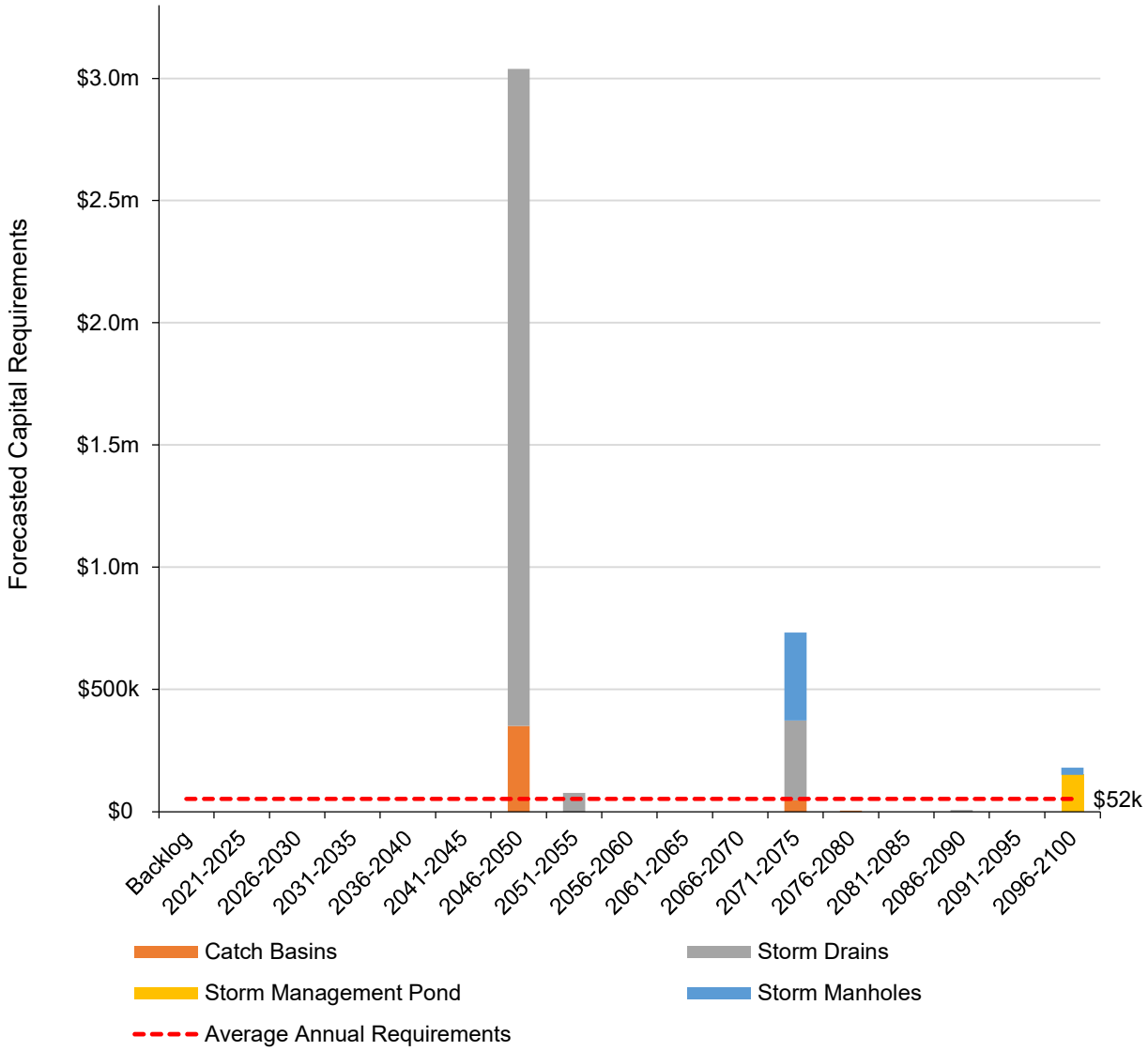
The condition or performance of most assets will deteriorate over time. To ensure that municipal assets are performing as expected and meeting the needs of customers, it is important to establish a lifecycle management strategy to proactively manage asset deterioration.

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

Activity Type	Description of Current Strategy
Maintenance	The engineered storm ponds are not maintained at this time. Vegetation, ice buildup, and debris buildup from wildlife are removed as needed.
	Primary activities include catch basin cleaning and storm main flushing, but only a small percentage of the entire network is completed per year.
Rehabilitation	Trenchless re-lining has the potential to reduce total lifecycle costs but would require a formal condition assessment program to determine viability.
Replacement	Without the availability of up-to-date condition assessment information replacement activities are based on age and main break history.
	Replacements are failure driven, as this is considered more cost-effective than proactive replacements. Since the storm mains are generally lower risk than the road, water, or sanitary network, a reactive strategy is acceptable.

6.1.2 Forecasted Capital Requirements

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



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.

Risk & Criticality

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

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

The identification of critical assets allows the Municipality 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.

6.1.4 Risks to Current Asset Management Strategies

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

Asset Data and Information

There is a lack of confidence in the available inventory data for storm sewers. Staff are in the process of evaluating the resources and activities required to build and/or improve the existing asset inventory. The Municipality has some unassumed private assets that are in poor condition and some an unknown number of undiscovered underground assets. Staff plan to prioritize data refinement efforts to increase confidence in the accuracy and reliability of asset data and information.

Climate Change and Extreme Weather Events

The network is prone to surcharging as a result of heavy precipitation events. Areas around the rivers and creeks experience frequent flooding. Certain elements of the stormwater network do not have the capacity to withstand extreme weather events. Staff are working towards enhancing the data and information for the stormwater network to support capital planning that will enable system expansion.

Levels of Service

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

6.1.5 Community Levels of Service

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

Service Attribute	Qualitative Description	Current LOS (2021)
Scope	Description, which may include map, of the user groups or areas of the municipality that are protected from flooding, including the extent of protection provided by the municipal stormwater system	See Appendix C

6.1.6 Technical Levels of Service

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

Service Attribute	Technical Metric	Current LOS (2021)
Scope	% of properties in municipality resilient to a 100-year storm	2%[2]
	% of the municipal stormwater management system resilient to a 5-year storm	100%[3]
Performance	Current annual capital reinvestment rate	0%
	% of storm network in poor/very poor condition	9%
	Average risk rating associated to storm network	7.8 / 25

[2] The Municipality 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.
[3] This is based on the observations of municipal staff.

Recommendations

Asset Inventory

- The Municipality's Stormwater Network inventory remains at a basic level of maturity and staff do not have a high level of confidence in its accuracy or reliability. The development of a comprehensive inventory of the stormwater network should be prioritized.

Condition Assessment Strategies

- The development of a comprehensive inventory should be accompanied by a system-wide assessment of the condition of all assets in the Stormwater Network through network-wide CCTV inspections.

Risk Management Strategies

- Implement risk-based decision-making as part of asset management planning and budgeting processes. This should include a 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 Stormwater Network on a regular basis to achieve the lowest total cost of ownership while maintaining adequate service levels.
- Consider regular clearing of catch basins during Fall and Spring to ensure reliable collection and conveyance.
- Consider annual inspections and maintenance of the municipal drains to reduce surface ponding inquiries. Activities typically include ditch and vegetation maintenance, and re-alignment.
- Update current asset replacement and event costs on a cyclical basis (recommended cycle is 5 years).

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 Municipality 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.

7 Buildings

The Municipality of Callander owns and maintains several facilities and recreation centres that provide key services to the community. These include:

- Administrative offices
- A Public library, community centre, and park buildings
- Fire stations and the medical centre
- Public works garages and storage sheds

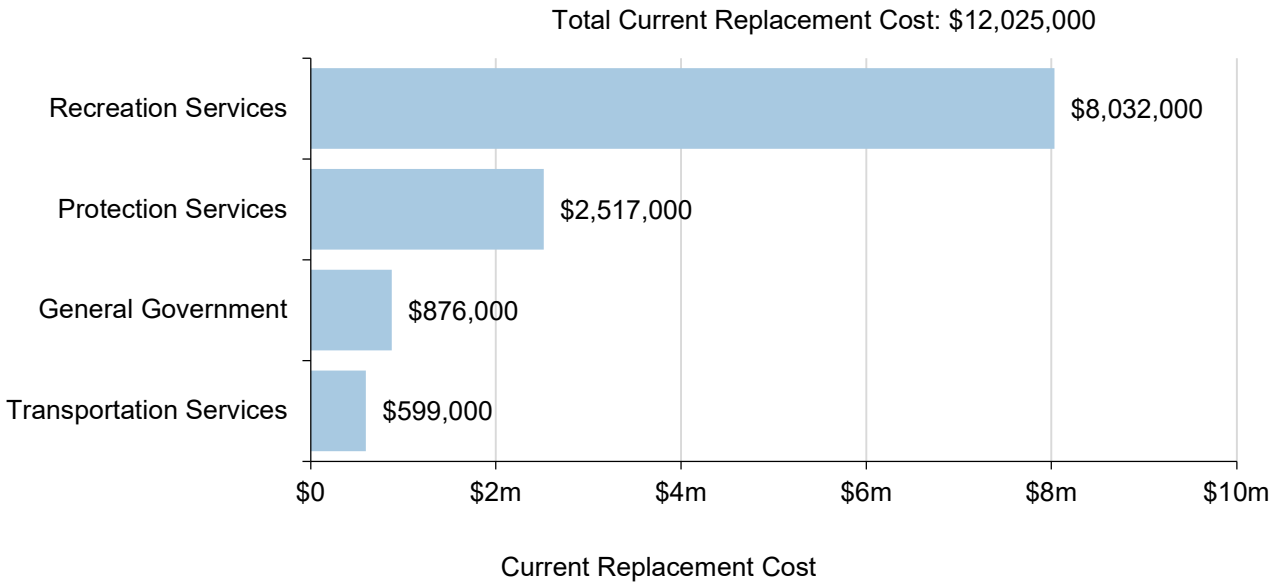
The state of the infrastructure for buildings is summarized in the following table.

Replacement Cost	Condition	Financial Capacity	
$12.0 million	Fair (42%)	Annual Requirement:	$262,000
		Funding Available:	$19,000
		Annual Deficit:	**$243,000**

Asset Inventory & Replacement Costs

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

Asset Segment	Quantity (Components)	Replacement Cost	Annual Capital Requirement
General Government	8	$876,000	$22,000
Protection Services	8	$2,517,000	$53,000
Recreation Services	263	$8,032,000	$170,000
Transportation Services	3	$599,000	$18,000
Total		**$12,025,000**	**$262,000**



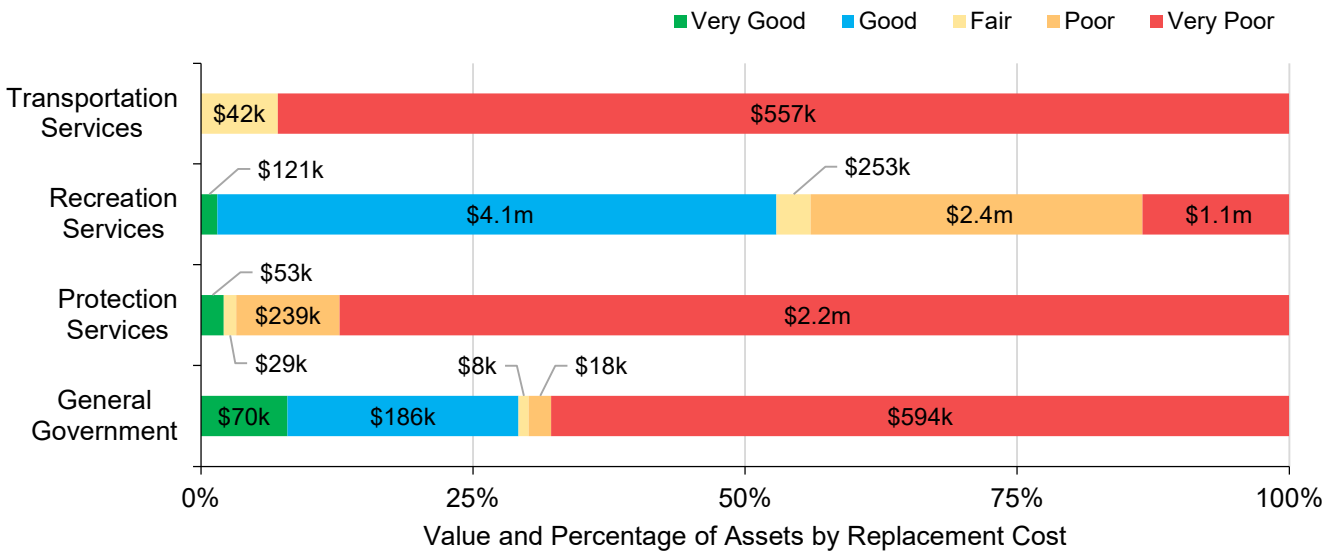
Each asset's replacement cost should be reviewed periodically to determine whether cost estimates are realistic and reflect current market conditions.

Asset Condition

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

Asset Segment	Average Condition (%)	Average Condition Rating	Condition Source
General Government	35%	Poor	Age-Based
Protection Services	17%	Very Poor	Age-Based
Recreation Services	52%	Fair	Age-Based
Transportation Services	17%	Very Poor	Age-Based
Average	**43%**	**Good**	**Age-Based**

The graph below visually illustrates the average condition for each asset segment.



To ensure that the Municipality's buildings continue to provide an acceptable level of service, the Municipality 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.

7.1.1 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 Municipality's current approach:

- No formal condition assessment strategy is in place at present. Asset condition is currently age-based.
- The Municipality is currently planning to conduct a building condition assessment in the next 5-10 years.

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

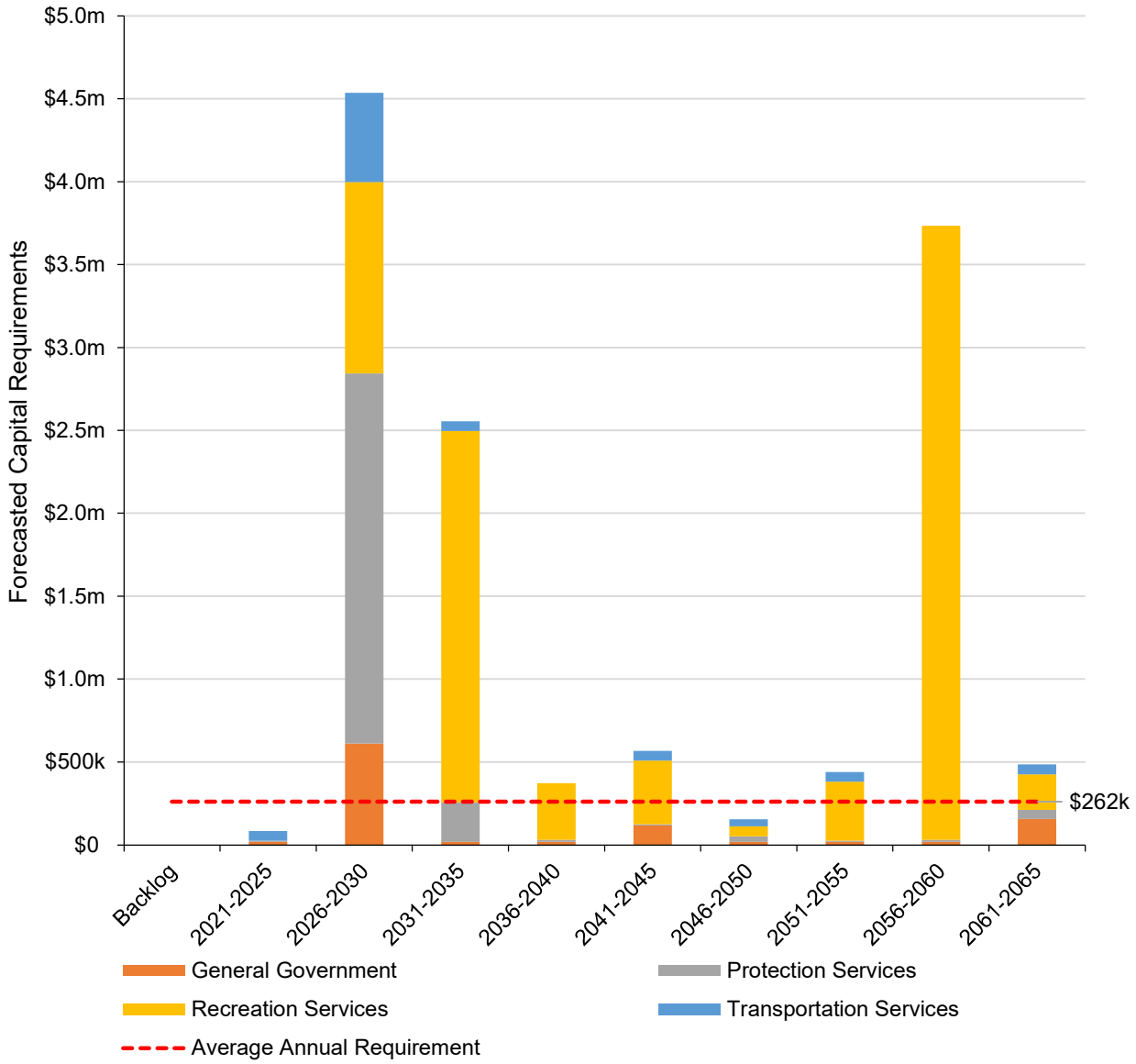
Lifecycle Management Strategy

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 Municipality's current lifecycle management strategy.

Activity Type	Description of Current Strategy
Maintenance / Rehabilitation	Municipal buildings are subject to internal inspections on an as-needed basis. Health and safety inspections are undertaken monthly.
	Maintenance activities are undertaken because of internal inspections, prioritizing activities related to health and safety and regulatory compliance.
	HVAC for the Fire Hall is inspected by an external contractor while the operations director conducts the physical inspection of the generator.
Replacement	Currently, refurbishments and replacements are only projected out for the next 1 – 2 years. However, the Municipality is moving towards a 5 – 10-year proactive planning horizon.

7.1.2 Forecasted Capital Requirements

The following graph forecasts long-term capital requirements. The annual capital requirement represents the average amount per year that the Municipality should allocate towards funding rehabilitation and replacement needs. The following graph identifies capital requirements over the next 45 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 dashed red line represents the average annual capital requirements.



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.

Risk & Criticality

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

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

The identification of critical assets allows the Municipality 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.

7.1.4 Risks to Current Asset Management Strategies

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

Capacity Constraints

Many smaller municipal buildings and structures result in both economic and operational deficiencies due to the nature of the layout. Departments working together may be in different buildings and frequently have to leave one building for another to collaborate with colleagues. Operating multiple locations is also less cost-effective than managing a more central location. Social distancing requirements due to COVID-19 has made capacity constraints more challenging.

Capital Funding Strategies

Funding for planned infrastructure is sufficient, but any unexpected asset failures would put a strain on the Municipality's budgeting. As grants have been unavailable, necessary building upgrades have been funded by taxes in the past and may sometimes require the use of reserves.

Levels of Service

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

7.1.5 Community Levels of Service

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

Service Attribute	Qualitative Description	Current LOS (2021)
Scope	Description, which may include maps, of the types of facilities that the municipality operates and maintains	See Appendix C

7.1.6 Technical Levels of Service

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

Service Attribute	Technical Metric	Current LOS (2021)
Quality	Average facility condition index value for facilities in the municipality	42%[4]
Performance	Annual capital reinvestment rate	0.16%
	% of buildings and facilities inspected per year	100%

[4] Condition is based solely on the age of the asset.

Recommendations

Asset Inventory

- The Municipality's asset inventory contains several non-segmented buildings. Buildings consist of many 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, utilizing the UNIFORMAT II Code Classification as a guide.
- Update current asset replacement and event costs on a cyclical basis (recommended cycle is 5 years).

Condition Assessment Strategies

- This AMP utilizes age-based condition for all buildings. The Municipality should consider conducting building condition assessments for all its critical buildings to better inform their short- and long-term decision-making. Use this assessment to develop a 5-to-10-year proactive facilities replacement/rehabilitation plan, utilizing existing inspection information.

Risk Management Strategies

- Implement risk-based decision-making as part of asset management planning and budgeting processes. This should include a 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 Strategies

- Document lifecycle management strategies for buildings. Review current lifecycle management strategies to achieve the lowest total cost of ownership while maintaining adequate service levels.

Levels of Service

- Begin measuring current levels of service in accordance with the metrics that the Municipality 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.

8 Vehicles

Vehicles allow staff to efficiently deliver municipal services and personnel. Municipal vehicles are used to support several service areas, including:

- Fire rescue vehicles to provide emergency services
- Backhoes, tractors, graders, and mowers to maintain municipal parks and the transportation network
- Pick-up trucks to support the maintenance of the transportation network and address service requests

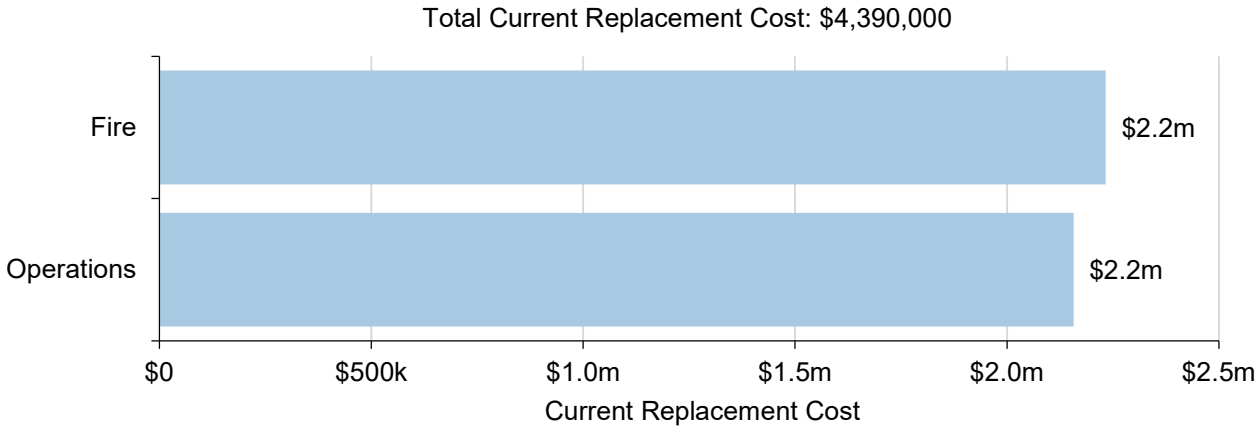
The state of the infrastructure for the vehicles is summarized in the following table.

Replacement Cost	Condition	Financial Capacity	
$4.4 million	Fair (52%)	Annual Requirement:	$274,000
		Funding Available:	$195,000
		Annual Deficit:	**$79,000**

Asset Inventory & Replacement Costs

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

Asset Segment	Quantity	Replacement Cost	Annual Capital Requirement
Fire	8	$2,233,000	$130,000
Operations	14	$2,157,000	$143,000
Total		**$4,390,000**	**$274,000**



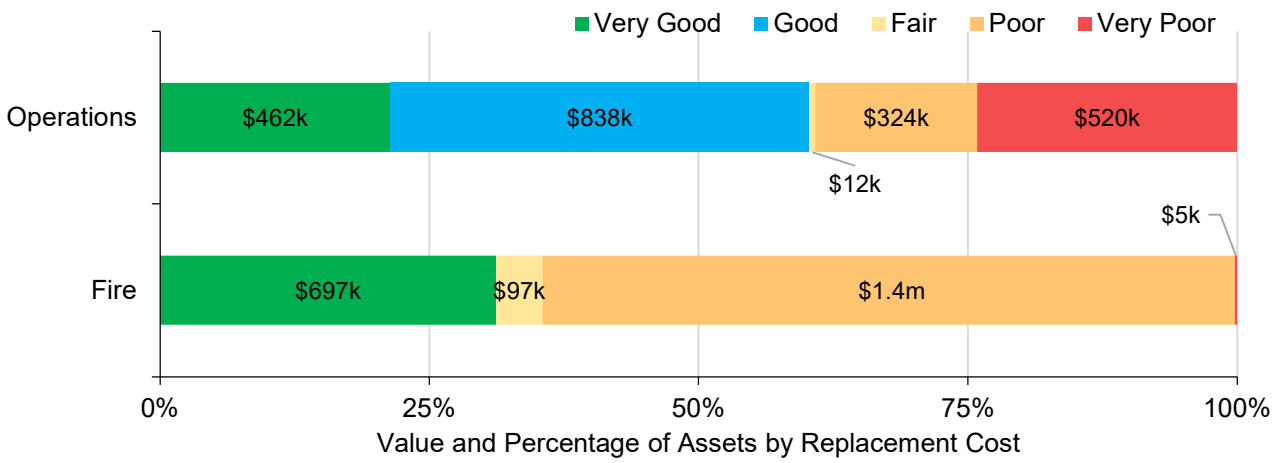
Each asset's replacement cost should be reviewed periodically to determine whether cost estimates are realistic and reflect current market conditions.

Asset Condition

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

Asset Segment	Average Condition (%)	Average Condition Rating	Condition Source
Fire	50%	Fair	Age-Based
Operations	55%	Fair	Age-Based
Average	**52%**	**Fair**	**Age-Based**

The graph below visually illustrates the average condition for each asset segment.



To ensure that the Municipality's vehicles continue to provide an acceptable level of service, the Municipality 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.

8.1.1 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 Municipality'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
- There are no formal condition assessment programs in place, although discussions with mechanics during yearly safety inspections for trucks and manufacturer-specified maintenance for heavy equipment specify current condition and drive replacement decisions

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

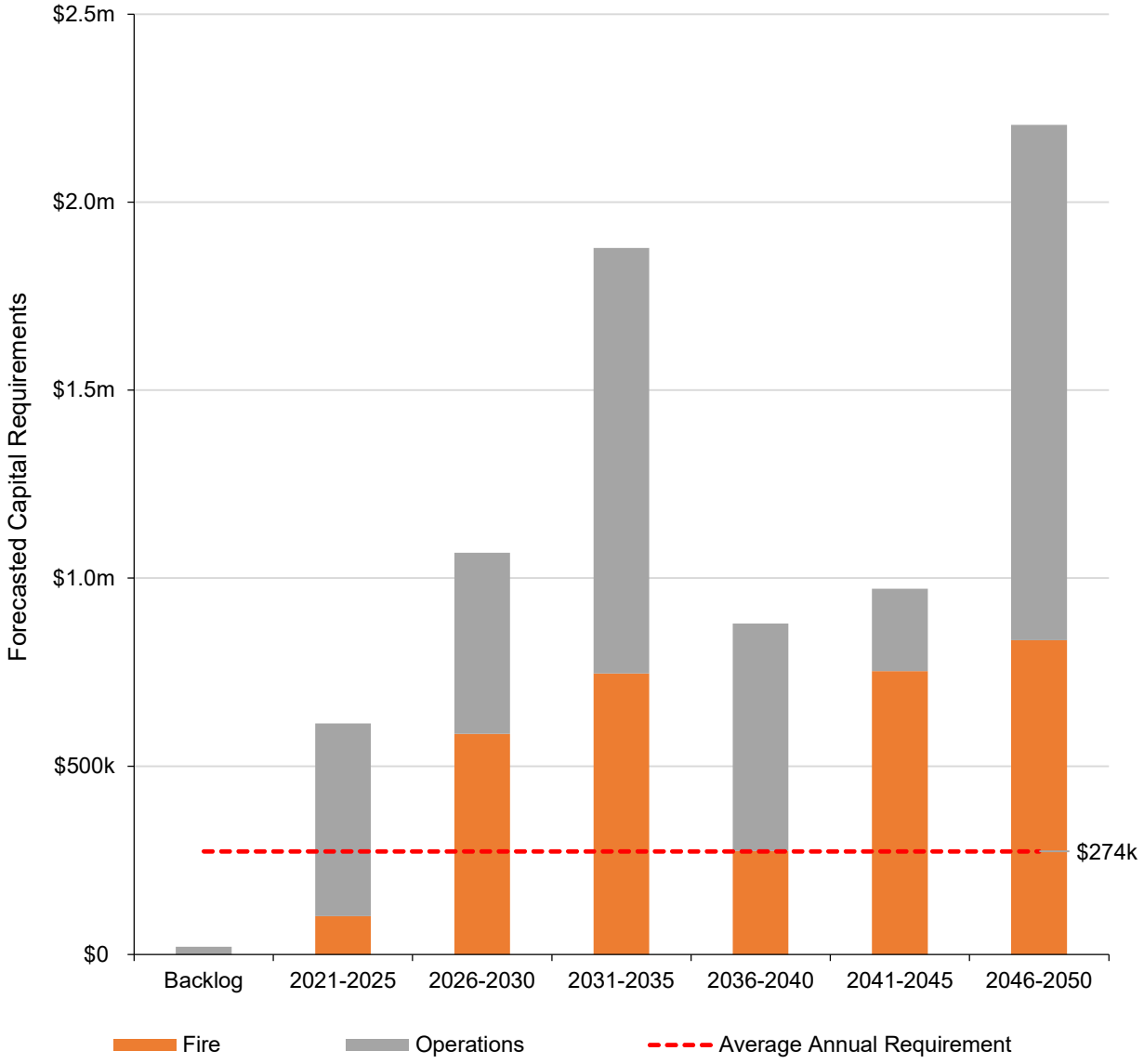
Lifecycle Management Strategy

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 Municipality's current lifecycle management strategy.

Activity Type	Description of Current Strategy
Maintenance / Rehabilitation	Currently, most maintenance and recommendations are completed by 3rd party mechanics.
	License stickers, and registration if needed under CVOR, are competed on an annual basis.
	Tire changes, fluid top up, minor component changes, such as wipers, are completed on an as needed basis.
	Visual inspections on vehicles are completed and documented as part of circle inspections. CVOR vehicles have detailed inspections on an annual basis. Non-CVOR vehicle inspections have less formality and are completed mainly for safety on a regular basis.
	For fire vehicles, monthly inspections are completed internally with an annual inspection performed by an external certified mechanic. Any safety-related issues are attended to immediately.
Replacement	Fire department pumpers and tankers are replaced at the end of a 20-year lifecycle, fire support vehicles are replaced at the end of year 10.
	Generally, operational vehicles are operated with a 20-year fleet replacement plan.

8.1.2 Forecasted Capital Requirements

The following graph forecasts long-term capital requirements. The annual capital requirement represents the average amount per year that the Municipality should allocate towards funding rehabilitation and replacement needs. The following graph identifies capital requirements over the next 30 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 dashed red line represents the average annual capital requirements.



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.

Risk & Criticality

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

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

The identification of critical assets allows the Municipality 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.

8.1.4 Risks to Current Asset Management Strategies

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

Capacity Constraints

Gates for fire trucks are a close fit and navigating through can be a challenge. Small bays in fire halls make proper decontamination a struggle.

Levels of Service

The following tables identify the Municipality's current level of service for 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 Municipality has selected for this AMP.

8.1.5 Community Levels of Service

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

Service Attribute	Qualitative Description	Current LOS (2021)
Scope	Description or images of the types of vehicles (e.g. light, medium and heavy-duty) that the municipality operates and the services that they help to provide to the community	The Municipality is responsible for managing 25 vehicles across multiple service areas, including public works, fire, and community services. Fire rescue vehicles provide emergency services. Backhoes, tractors, graders, and mowers maintain municipal parks and the transportation network. Pick-up trucks to support the maintenance of the transportation network and address service requests

8.1.6 Technical Levels of Service

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

Service Attribute	Technical Metric	Current LOS (2021)
Quality	% of vehicles in good / very good condition	45%
	% of vehicles in poor / very poor condition	52%

Recommendations

Replacement Costs

- Update current asset replacement and event costs on a cyclical basis (recommended cycle is 3 years).
- Undertake an annual review of all fleet assets to determine and update the replacement schedule. Vehicle age, kilometers and annual repair costs should be taken into consideration when determining appropriate replacement options.
- Vehicle replacement should consider industry standards – including the operating environment, corrosion, and heavy usage. Although capital requirement can be reduced by operating the vehicles beyond the recommended replacement schedule, additional operating costs will accumulate.

Condition Assessment Strategies

- This AMP utilizes age-based condition for all vehicles. 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 a 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 Strategies

- Document lifecycle management strategies for vehicles. Review current lifecycle management strategies to achieve the lowest total cost of ownership while maintaining adequate service levels.

Levels of Service

- Begin measuring current levels of service in accordance with the metrics that the Municipality 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.

9 Machinery & Equipment

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

- Landscaping equipment to maintain public parks
- Fire equipment to support the delivery of emergency services
- Generators for municipal buildings

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

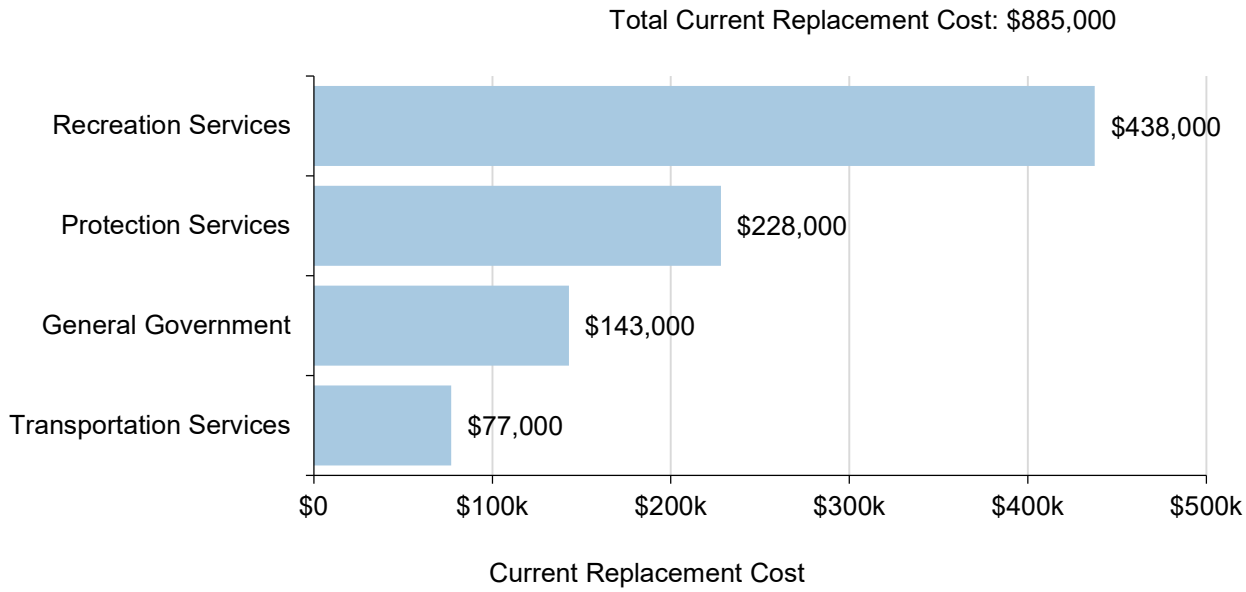
The state of the infrastructure for the machinery and equipment is summarized in the following table.

Replacement Cost	Condition	Financial Capacity	
$885,000	Poor (27%)	Annual Requirement:	$73,000
		Funding Available:	$14,000
		Annual Deficit:	**$59,000**

Asset Inventory & Replacement Costs

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

Asset Segment	Quantity	Replacement Cost	Annual Capital Requirement
General Government	28	$143,000	$21,000
Protection Services	9	$228,000	$21,000
Recreation Services	15	$438,000	$24,000
Transportation Services	7	$77,000	$8,000
Total		**$885,000**	**$73,000**



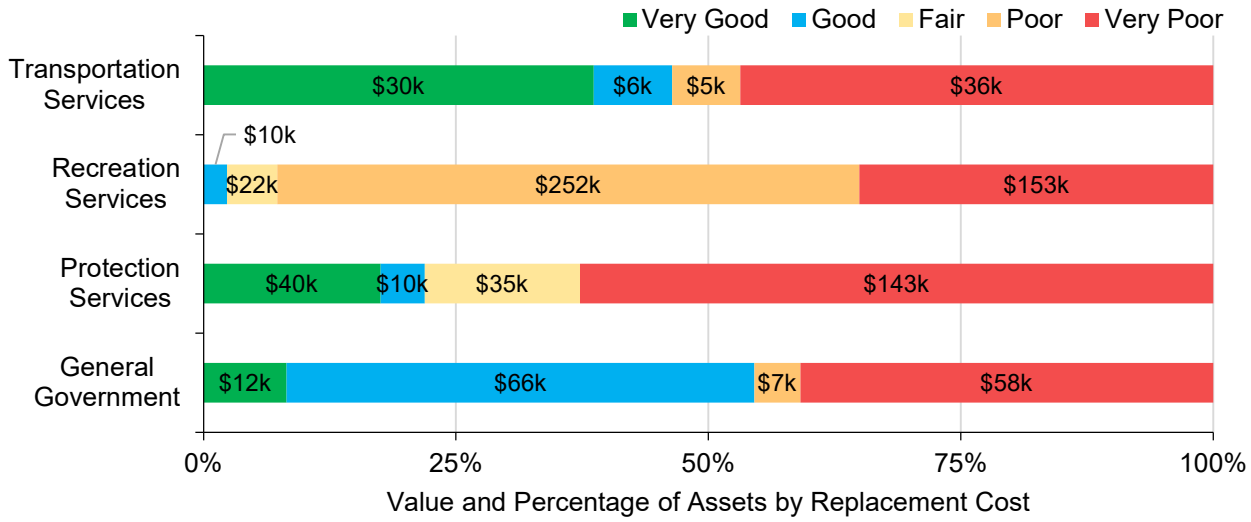
Each asset's replacement cost should be reviewed periodically to determine whether cost estimates are realistic and reflect current market conditions.

Asset Condition

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

Asset Segment	Average Condition (%)	Average Condition Rating	Condition Source
General Government	43%	Fair	Age-Based
Protection Services	25%	Poor	Age-Based
Recreation Services	21%	Poor	Age-Based
Transportation Services	43%	Fair	Age-Based
Average	**27%**	**Poor**	**Age-Based**

The graph below visually illustrates the average condition for each asset segment.



To ensure that the Municipality's machinery and equipment continues to provide an acceptable level of service, the Municipality 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.

9.1.1 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 Municipality'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

Lifecycle Management Strategy

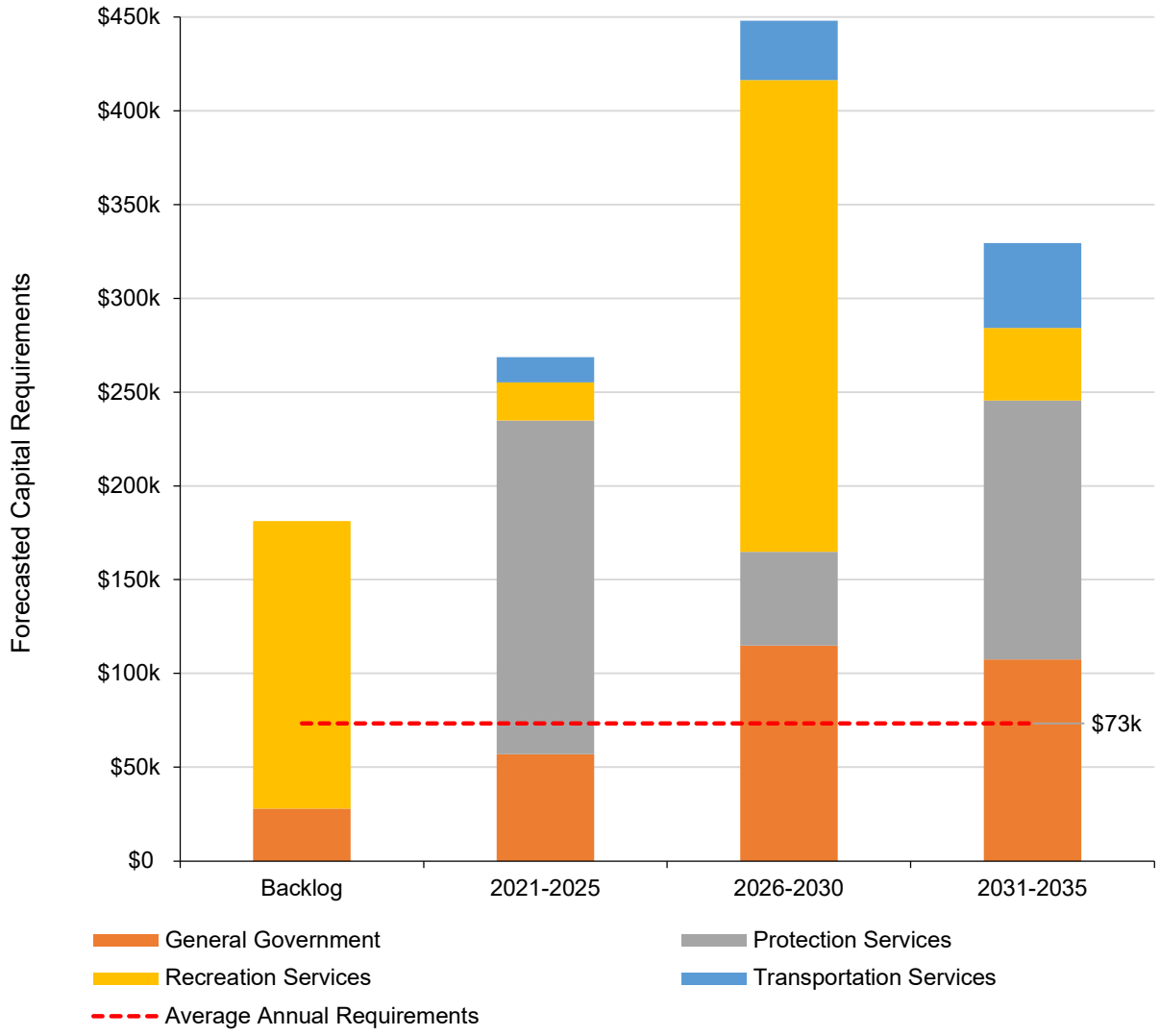
The condition or performance of most assets will deteriorate over time. To ensure that municipal assets are performing as expected and meeting the needs of customers, it is important to establish a lifecycle management strategy to proactively manage asset deterioration.

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

Activity Type	Description of Current Strategy
Maintenance/ Rehabilitation	SCBAs are subject to annual bench testing to ensure functioning as per NFPA requirements.
	Other fire equipment, such as the radios, Jaws of Life, firehose, and portable pumps, are subject to annual external testing. Health and Safety standards govern the functionality of this equipment, and repairs are made to reduce risk of failure.
	Public Works equipment is generally inspected and maintained on a seasonal, or as-needed basis. There is no formal condition assessment program in place.
Replacement	The replacement of machinery & equipment depends on deficiencies identified by operators that may impact their ability to complete required tasks.
	Fire equipment is replaced on schedules defined by the Health and Safety Act, and manufacturer recommendations, and the Levels of Service Bylaw. Prioritization for upgrades is based on third-party inspection recommendations.

9.1.2 Forecasted Capital Requirements

The following graph forecasts long-term capital requirements. The annual capital requirement represents the average amount per year that the Municipality should allocate towards funding rehabilitation and replacement needs. The following graph identifies capital requirements over the next 15 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 dashed red line represents the average annual capital requirements.



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.

Risk & Criticality

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

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

The identification of critical assets allows the Municipality 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.

9.1.4 Risks to Current Asset Management Strategies

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

Capital Funding Strategies

The Municipality strives to provide services to residents without taking on debt. This can be a challenging while endeavouring to maintain current levels of service

Levels of Service

The following tables identify the Municipality's current level of service for 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 Municipality has selected for this AMP.

9.1.5 Community Levels of Service

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

Service Attribute	Qualitative Description	Current LOS (2021)
Scope	Description or images of the types of equipment that the municipality operates and the services that they help to provide to the community	The Municipality is responsible for a variety of machinery & equipment, fit for different purposes across a variety of service areas. These include furniture, safety equipment, IT equipment, Public Works machinery, and others. Landscaping equipment maintains public parks. Fire equipment supports the delivery of emergency services. Generators provide emergency electricity for municipal buildings and laptops and other IT equipment supports the administration of all municipal services.

9.1.6 Technical Levels of Service

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

Service Attribute	Technical Metric	Current LOS (2021)
Quality	% of machinery and equipment in good / very good condition	20%
	% of machinery and equipment in poor / very poor condition	74%

Recommendations

Replacement Costs

- Most replacement costs for machinery and equipment 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.
- Update current asset replacement and event costs on a cyclical basis (recommended cycle is 3 years).

Condition Assessment Strategies

- This AMP utilizes age-based condition for all information technology assets. Staff should identify condition assessment strategies for high value and high-risk machinery and equipment.
- Install a replacement cycle strategy for specialized equipment based on assessed condition or manufacturer recommendations where equipment useful-lives are not regulated.

Risk Management Strategies

- Implement risk-based decision-making as part of asset management planning and budgeting processes. This should include a 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 Strategies

- Document lifecycle management strategies for machinery and equipment. Review current lifecycle management strategies to achieve the lowest total cost of ownership while maintaining adequate service levels.
- Explore the opportunity to repurpose equipment to different departments or lower risk applications. (E.g., repurpose critical backup generators to noncritical applications when being replaced).

Levels of Service

- Begin measuring current levels of service in accordance with the metrics that the Municipality 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.

10 Land Improvements

The Municipality of Callander owns a small number of assets that are considered land improvements. This category includes:

- Parking lots for municipal facilities
- Fencing and signage
- Marina with deck and sub-structures that are maintained by municipal staff for public use
- Miscellaneous park equipment and other assets

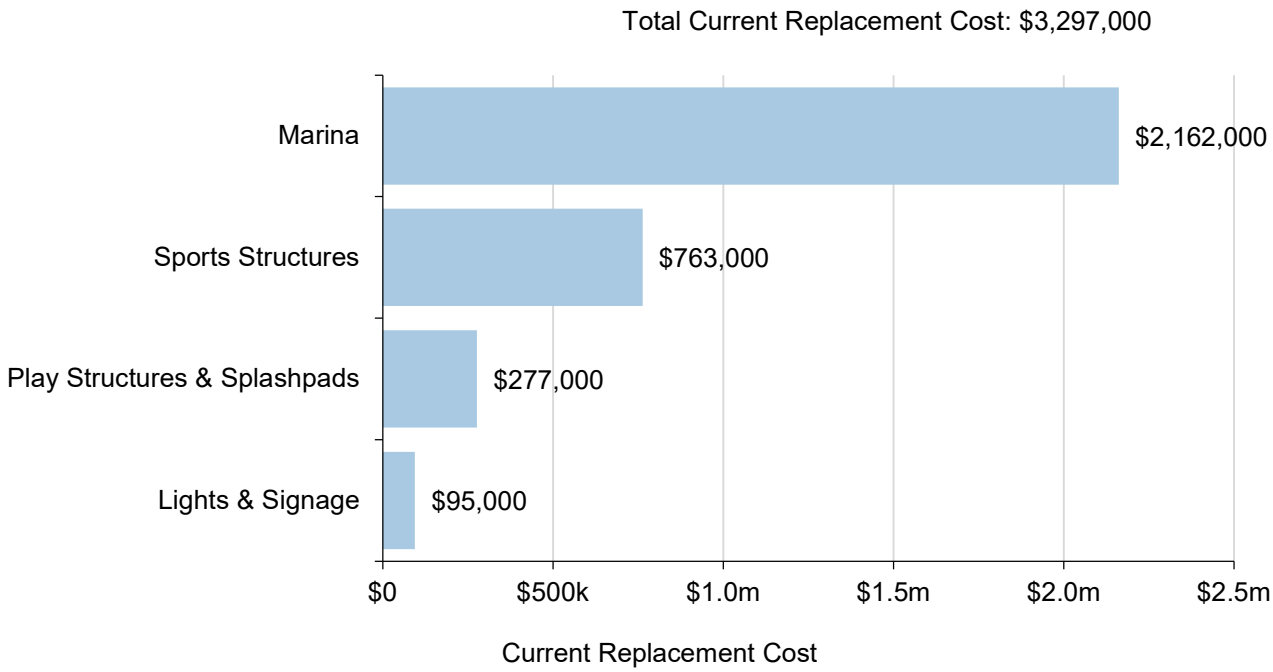
The state of the infrastructure for the land improvements is summarized in the following table.

Replacement Cost	Condition	Financial Capacity	
$3.3 million	Very Good (81%)	Annual Requirement:	$112,000
		Funding Available:	$149,000
		Annual Surplus:	**$37,000**

Asset Inventory & Replacement Costs

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

Asset Segment	Quantity	Replacement Cost	Annual Capital Requirement
Lights & Signage	21	$95,000	$6,000
Marina	2	$2,162,000	$33,000
Play Structures & Splashpads	3	$277,000	$28,000
Sports Structures	22	$763,000	$46,000
Total		**$3,297,000**	**$112,000**



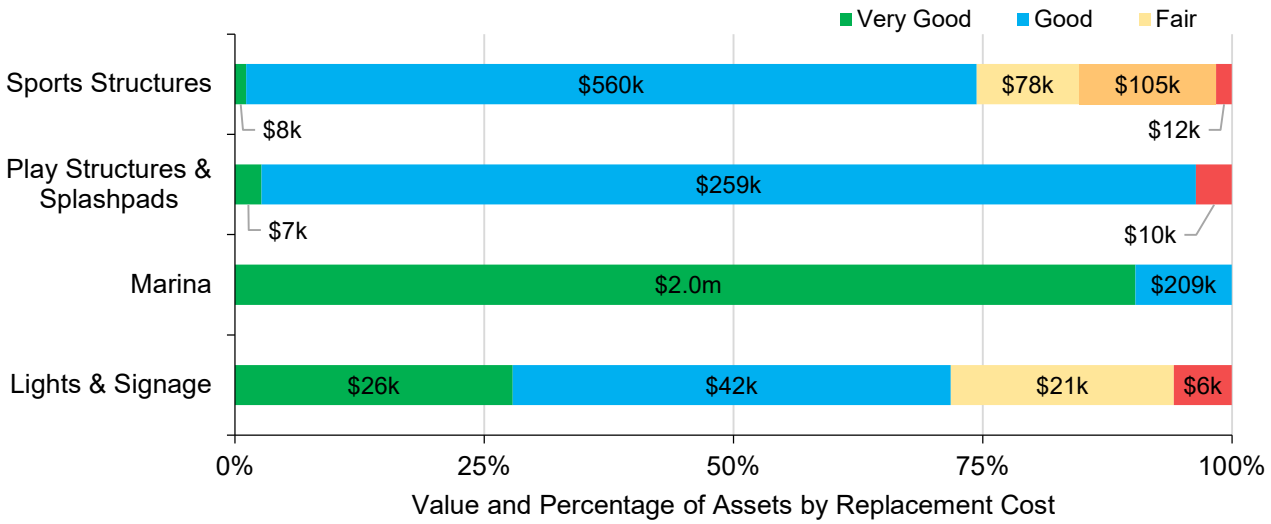
Each asset's replacement cost should be reviewed periodically to determine whether cost estimates are realistic and reflect current market conditions.

Asset Condition

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

Asset Segment	Average Condition (%)	Average Condition Rating	Condition Source
Lights & Signage	67%	Good	Age-Based
Marina	89%	Very Good	Age-Based
Play Structures & Splashpads	72%	Good	Age-Based
Sports Structures	62%	Good	Age-Based
Average	**81%**	**Very Good**	**Age-Based**

The graph below visually illustrates the average condition for each asset segment.



To ensure that the Municipality's land improvements continue to provide an acceptable level of service, the Municipality 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.

10.1.1 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 Municipality's current approach:

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

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

Lifecycle Management Strategy

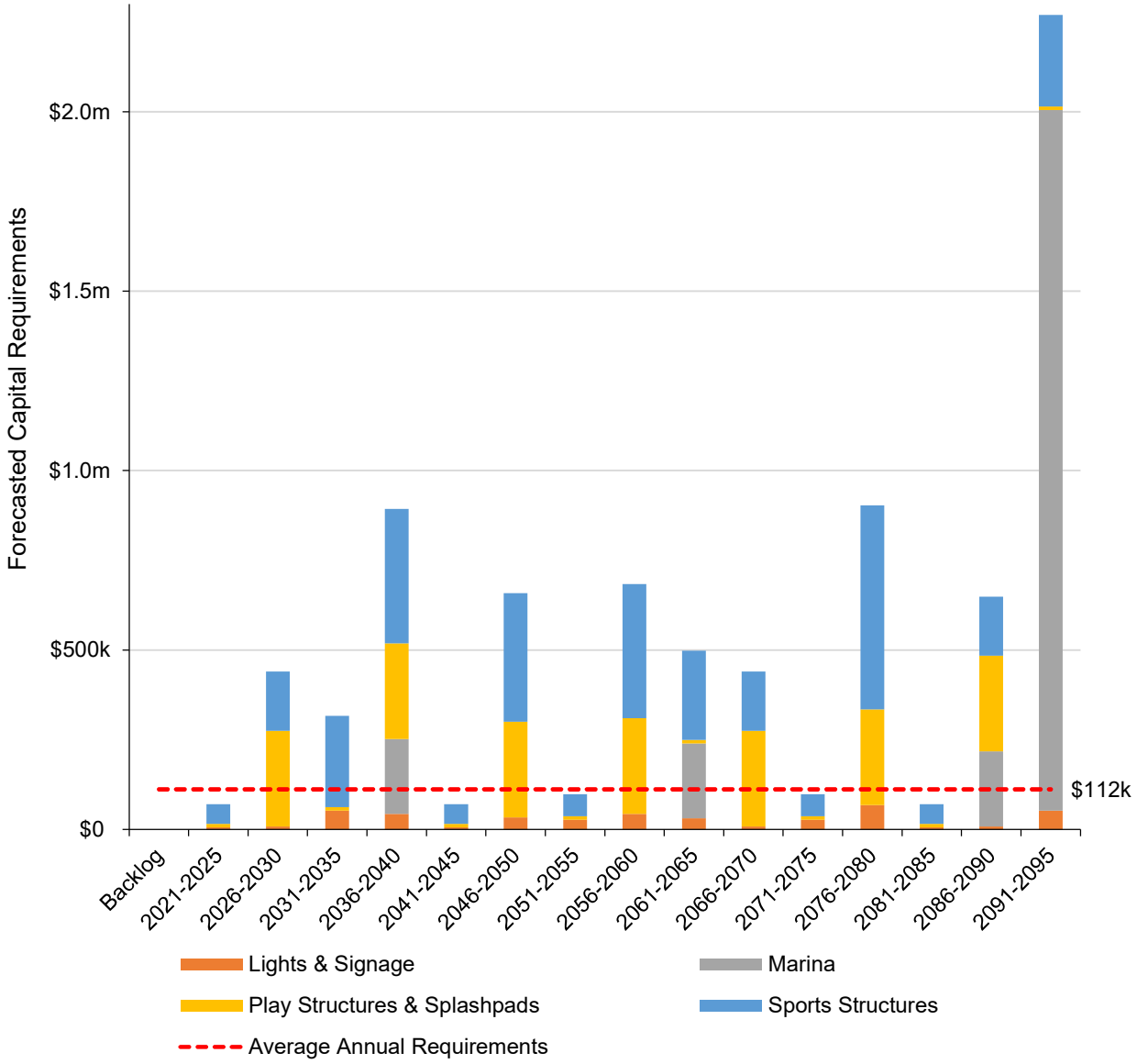
The condition or performance of most assets will deteriorate over time. To ensure that municipal assets are performing as expected and meeting the needs of customers, it is important to establish a lifecycle management strategy to proactively manage asset deterioration.

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

Activity Type	Description of Current Strategy
Maintenanace/ Rehabilitation	Parks are subject to weekly inspections using internal resources. Play structures are inspected for CSA compliance monthly.
	Sports fields are inspected monthly, or in response to user group planning.
	Parks are subjected to scheduled mowing and landscaping, prescribed by asset usage and season. Trails are inspected regularly by staff.
Replacement	There are no guiding documents prescribing replacement or upgrades of most parks and recreation assets.

10.1.2 Forecasted Capital Requirements

The following graph forecasts long-term capital requirements. The annual capital requirement represents the average amount per year that the Municipality should allocate towards funding rehabilitation and replacement needs. The following graph identifies capital requirements over the next 75 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 dashed red line represents the average annual capital requirements.



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.

Risk & Criticality

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

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

The identification of critical assets allows the Municipality 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.

10.1.4 Risks to Current Asset Management Strategies

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

Capacity Constraints

Parking capacity for municipal buildings is insufficient for residents and is sometimes a distance from the building. Other areas may be very close to the street and are a safety concern for residents maneuvering around road traffic.

Capital Funding Strategies

Grant funding and inflation have both been unpredictable in the past, making it difficult to plan asset lifecycle events and pushing out such events until funding does become available.

Public Expectation

Changing demographics may result in higher public expectation and demand. Staff capacity, funding constraints, and the Municipality's desire to remain debt-free all have an impact on the Municipality's ability to meet public expectation.

Levels of Service

The following tables identify the Municipality's current level of service for 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 Municipality has selected for this AMP.

10.1.5 Community Levels of Service

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

Service Attribute	Qualitative Description	Current LOS (2021)
Scope	Description, which may include maps, of the outdoor recreational facilities that the municipality operates and maintains	See Appendix C.

10.1.6 Technical Levels of Service

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

Service Attribute	Technical Metric	Current LOS (2021)
Quality	% of land improvements in good / very good condition	93%
	% of land improvements in poor / very poor condition	4%

Recommendations

Replacement Costs

- Most 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 and should be updated according to the best available information on the cost to replace the asset in today's value.
- Update current asset replacement and event costs on a cyclical basis (recommended cycle is 5 years).

Condition Assessment Strategies

- This AMP utilizes age-based condition for land improvement assets. Staff should 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

- Develop a deficiencies list and prioritize lifecycle activities by the risk each deficiency poses.
- Review risk models on a regular basis and adjust according to an evolving understanding of the probability and consequences of asset failure.

Lifecycle Strategies

- Document lifecycle management strategies for land improvement assets. Review current lifecycle management strategies to achieve the lowest total cost of ownership while maintaining adequate service levels.

Levels of Service

- Begin measuring current levels of service in accordance with the metrics that the Municipality 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.

11 Water Network

The water services provided by the Municipality are delivered and maintained by municipal staff and OCWA (Ontario Clean Water Agency). The Water Network includes the following assets:

- Machinery and equipment for system maintenance
- Water valves, hydrants, mains, and service connections
- A water treatment plant and tower

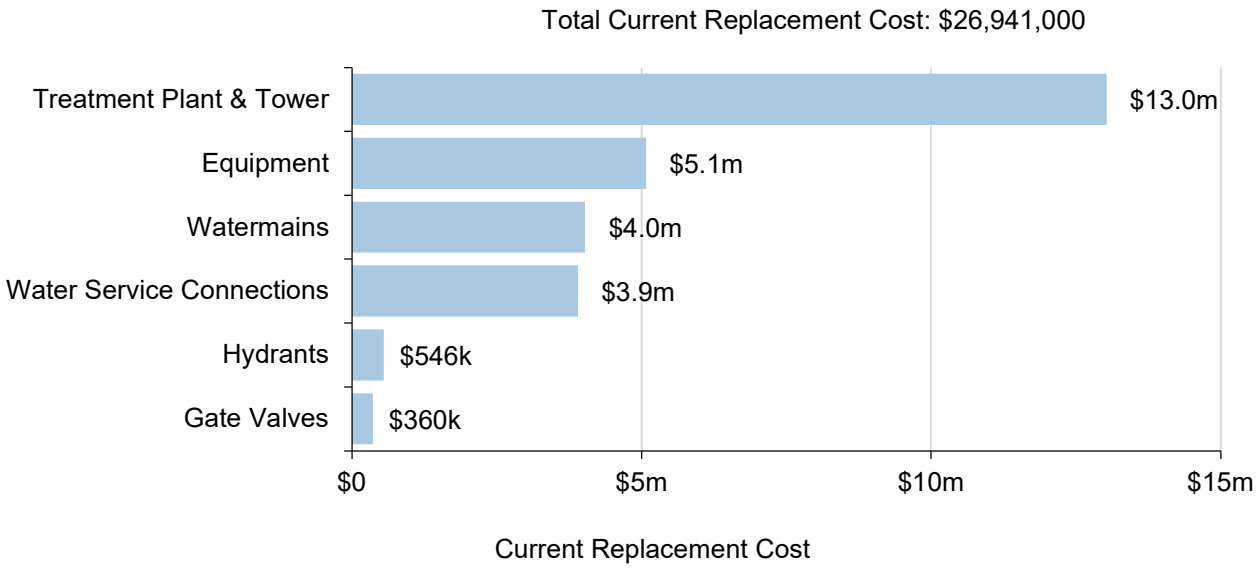
The state of the infrastructure for the water network is summarized in the following table:

Replacement Cost	Condition	Financial Capacity	
$27.0 million	Fair (48%)	Annual Requirement:	$607,000
		Funding Available:	$509,000
		Annual Deficit:	**$98,000**

Asset Inventory & Replacement Costs

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

Asset Segment	Quantity	Replacement Cost	Annual Capital Requirement
Equipment	796	$5,080,000	$98,000
Gate Valves	90	$360,000	$13,000
Hydrants	84	$546,000	$7,000
Treatment Plant & Tower	33	$13,029,000	$383,000
Water Service Connections	780	$3,900,000	$52,000
Watermains	11,922	$4,026,000	$54,000
Total		**$26,941,000**	**$607,000**



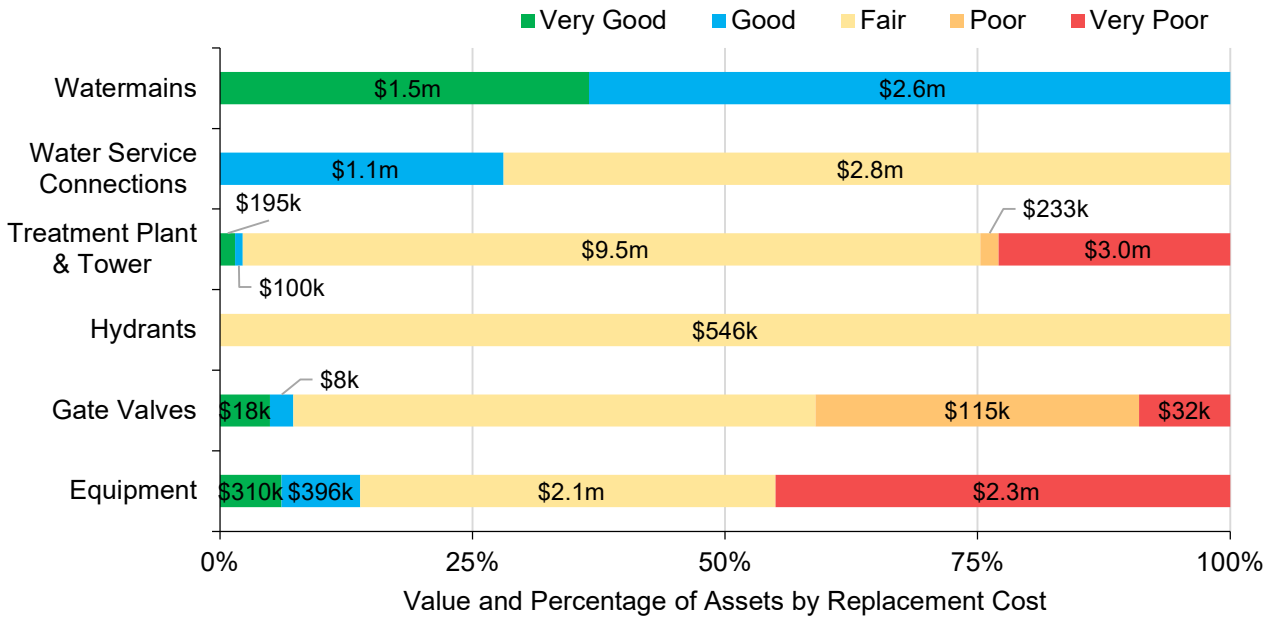
Each asset's replacement cost should be reviewed periodically to determine whether cost estimates are realistic and reflect current market conditions.

Asset Condition

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

Asset Segment	Average Condition (%)	Average Condition Rating	Condition Source
Equipment	41%	Fair	Age-Based
Gate Valves	43%	Fair	84% Assessed
Hydrants	57%	Fair	100% Assessed
Treatment Plant & Tower	35%	Poor	Age-Based
Water Service Connections	61%	Good	72% Assessed
Watermains	83%	Very Good	Age-Based
Average	**48%**	**Fair**	**14% Assessed**

The graph below visually illustrates the average condition for each asset segment.



To ensure that the Municipality's water network continues to provide an acceptable level of service, the Municipality 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.

11.1.1 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 Municipality's current approach:

- Staff primarily rely on the age and material of water mains to determine the projected condition of watermains. However, there have been staff discussions around the viability of inspecting the pipes directly (CCTV inspections, electromagnetic and/or ultrasonic inspections) to gain a better understanding of their true physical condition.
- Visual assessments are conducted on above ground assets, equipment, and buildings within the network. Formal condition assessments are conducted as needed for critical assets.

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

Lifecycle Management Strategy

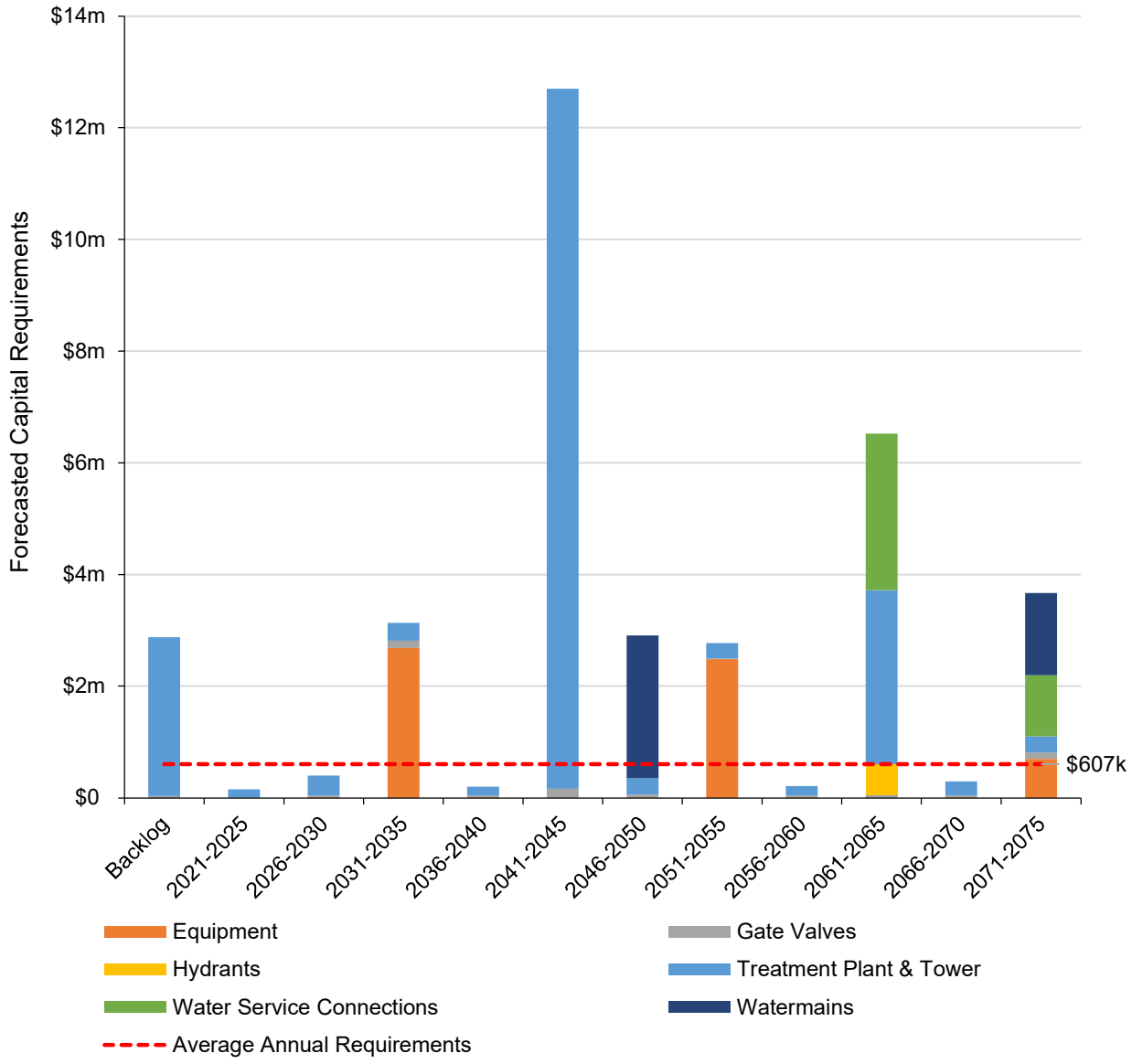
The condition or performance of most assets will deteriorate over time. To ensure that municipal assets are performing as expected and meeting the needs of customers, it is important to establish a lifecycle management strategy to proactively manage asset deterioration.

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

Activity Type	Description of Current Strategy
Maintenance	Main flushing is completed in the spring and fall to maintain the water system.
	Hydrant flow testing takes place every 3 years.
	Valve turning exercises are done on the entire system every 5 to 7 years.
Rehabilitation	Trenchless re-lining of water mains presents significant challenges and is not always a viable option.
	OCWA provides 5-year capital rehabilitation and replacement recommendations for vertical assets.
Replacement	In the absence of mid-lifecycle rehabilitative events, most mains are simply maintained with the goal of full replacement once it reaches its end-of-life.
	Replacement activities are identified based on an analysis of the main break rate as well as any issues identified during regular maintenance activities.

11.1.2 Forecasted Capital Requirements

The following graph forecasts long-term capital requirements. The annual capital requirement represents the average amount per year that the Municipality should allocate towards funding rehabilitation and replacement needs. The following graph identifies capital requirements over the next 55 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 dashed line represents the average annual capital requirements.



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.

Risk & Criticality

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

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

The identification of critical assets allows the Municipality 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.

11.1.4 Risks to Current Asset Management Strategies

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

Asset Data & Information

Staff is actively working towards improving the quality of the available inventory data for the water network. Staff plan to prioritize data refinement efforts to increase confidence in the accuracy and reliability of asset data and information. Staff plan to improve the accuracy of condition data for above ground asset components. Once completed there will be greater confidence in the development of data-driven strategies to address infrastructure needs.

Levels of Service

The following tables identify the Municipality'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 Municipality has selected for this AMP.

11.1.5 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 (2021)
Scope	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
	Description, which may include maps, of the user groups or areas of the municipality that have fire flow	See Appendix C
Reliability	Description of boil water advisories and service interruptions	The Municipality has not experienced any service interruptions in 2021. The Town follows Ontario's Drinking Water Quality Management Standard (DWQMS). The Municipality delivers boil water advisories to affected households.

11.1.6 Technical Levels of Service

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

Service Attribute	Technical Metric	Current LOS (2021)
Scope	% of properties connected to the municipal water system	45%
	% of properties where fire flow is available	100%
Reliability	# of connection-days per year where a boil water advisory notice is in place compared to the total number of properties connected to the municipal water system	0
	# of connection-days per year where water is not available due to water main breaks compared to the total number of properties connected to the municipal water system	0
Performance	Annual capital re-investment rate	1.89%
	% of water network in poor / very poor condition	21%
	Average risk rating associated to the water network	11.75 / 25

Recommendations

Replacement Costs

- Many of the replacement costs for water assets 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. Update current asset replacement and event costs on a cyclical basis (recommended cycle is 5 years).

Condition Assessment Strategies

- This AMP utilizes age-based condition for most water assets. Staff should identify condition assessment strategies for high value and high-risk water network assets.
- It can be challenging to gather assessed condition for watermains. Consider optimizing other attributes to approximate condition, such as age, material, soil type, history of main breaks, etc.

Risk Management Strategies

- Implement risk-based decision-making as part of asset management planning and budgeting processes. This should include a 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.
- Consider leak detection technologies to reduce costs related to water loss and excavation to find leak locations.

Lifecycle Strategies

- Assess the suitability of corrosion protection for metallic mains, such as cathodic protection systems, zinc galvanization, and plastic coating.

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 Municipality 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.

12 Wastewater Network

The sewer services provided by the Municipality are overseen by municipal staff. The department is responsible for the following:

- Sanitary manholes, mains, and service connections
- Pumping stations
- Machinery and equipment used for system maintenance

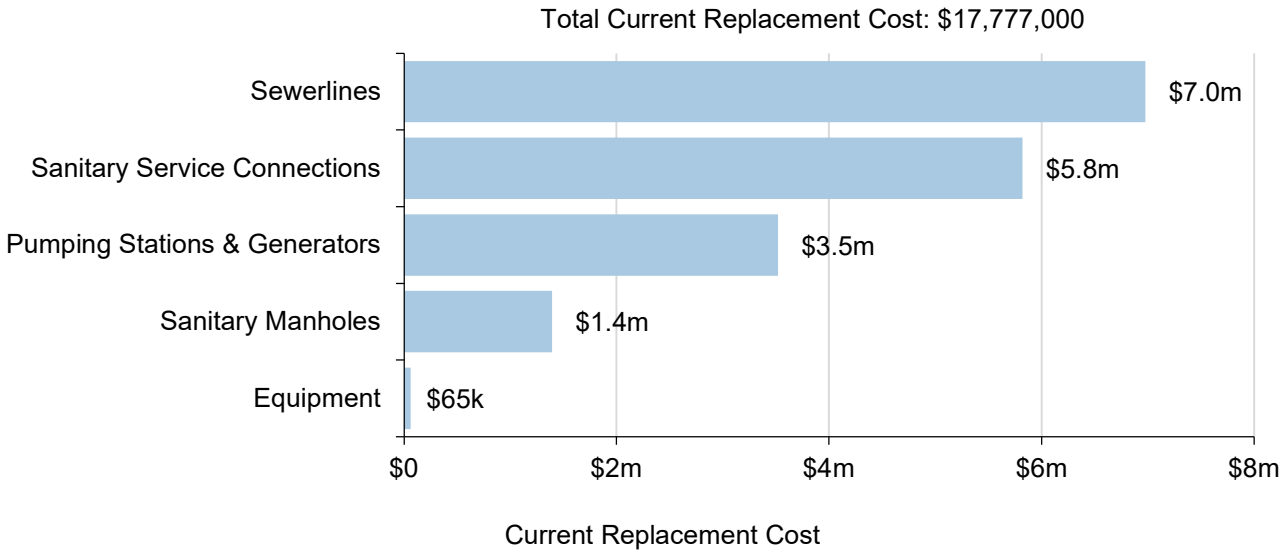
The state of the infrastructure for the sanitary network is summarized in the following table.

Replacement Cost	Condition	Financial Capacity	
$17.8 million	Good (62%)	Annual Requirement:	$327,000
		Funding Available:	$230,000
		Annual Deficit:	**$97,000**

Asset Inventory & Replacement Costs

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

Asset Segment	Quantity	Replacement Cost	Annual Capital Requirement
Equipment	3	$65,000	$6,000
Pumping Stations & Generators	20	$3,519,000	$136,000
Sanitary Manholes	186	$1,395,000	$14,000
Sanitary Service Connections	779	$5,820,000	$78,000
Sewerlines	17,711	$6,978,000	$93,000
Total		**$17,777,000**	**$327,000**



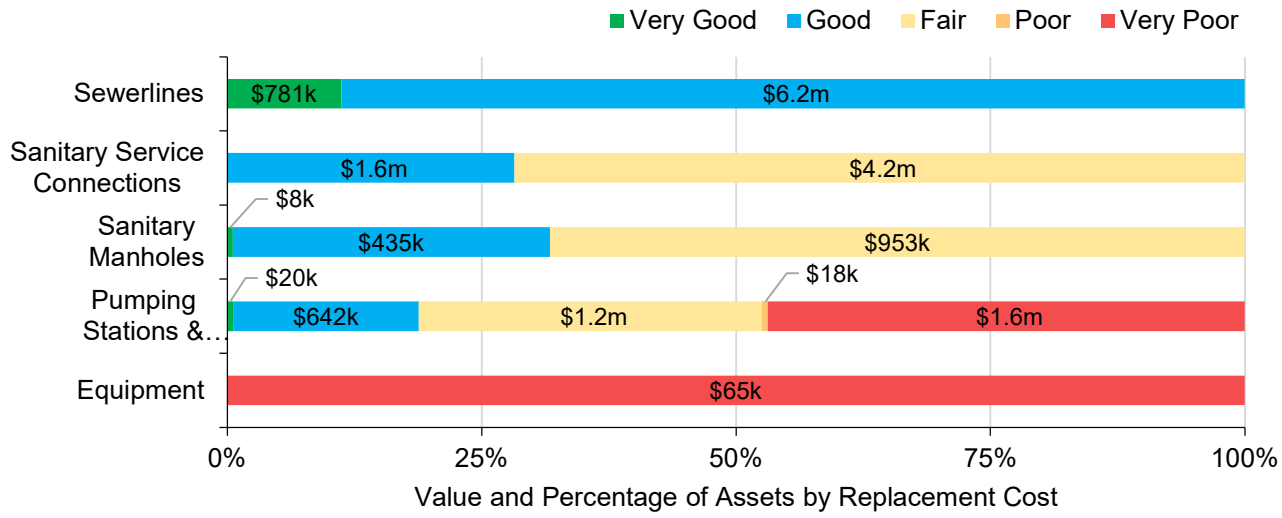
Each asset's replacement cost should be reviewed periodically to determine whether cost estimates are realistic and reflect current market conditions.

Asset Condition

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

Asset Segment	Average Condition (%)	Average Condition Rating	Condition Source
Equipment	15%	Very Poor	Age-Based
Pumping Stations & Generators	33%	Poor	Age-Based
Sanitary Manholes	61%	Good	Age-Based
Sanitary Service Connections	61%	Good	72% Assessed
Sewerlines	78%	Good	Age-Based
Average	**62%**	**Good**	**23% Assessed**

The graph below visually illustrates the average condition for each asset segment.



To ensure that the Municipality's wastewater network continues to provide an acceptable level of service, the Municipality 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.

12.1.1 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 Municipality's current approach:

- CCTV inspections are completed for the sanitary system on 3-year cycle, with one third of the network complete every year. The footage is used to discover deficiencies; however, condition ratings are not calculated or documented.

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

Lifecycle Management Strategy

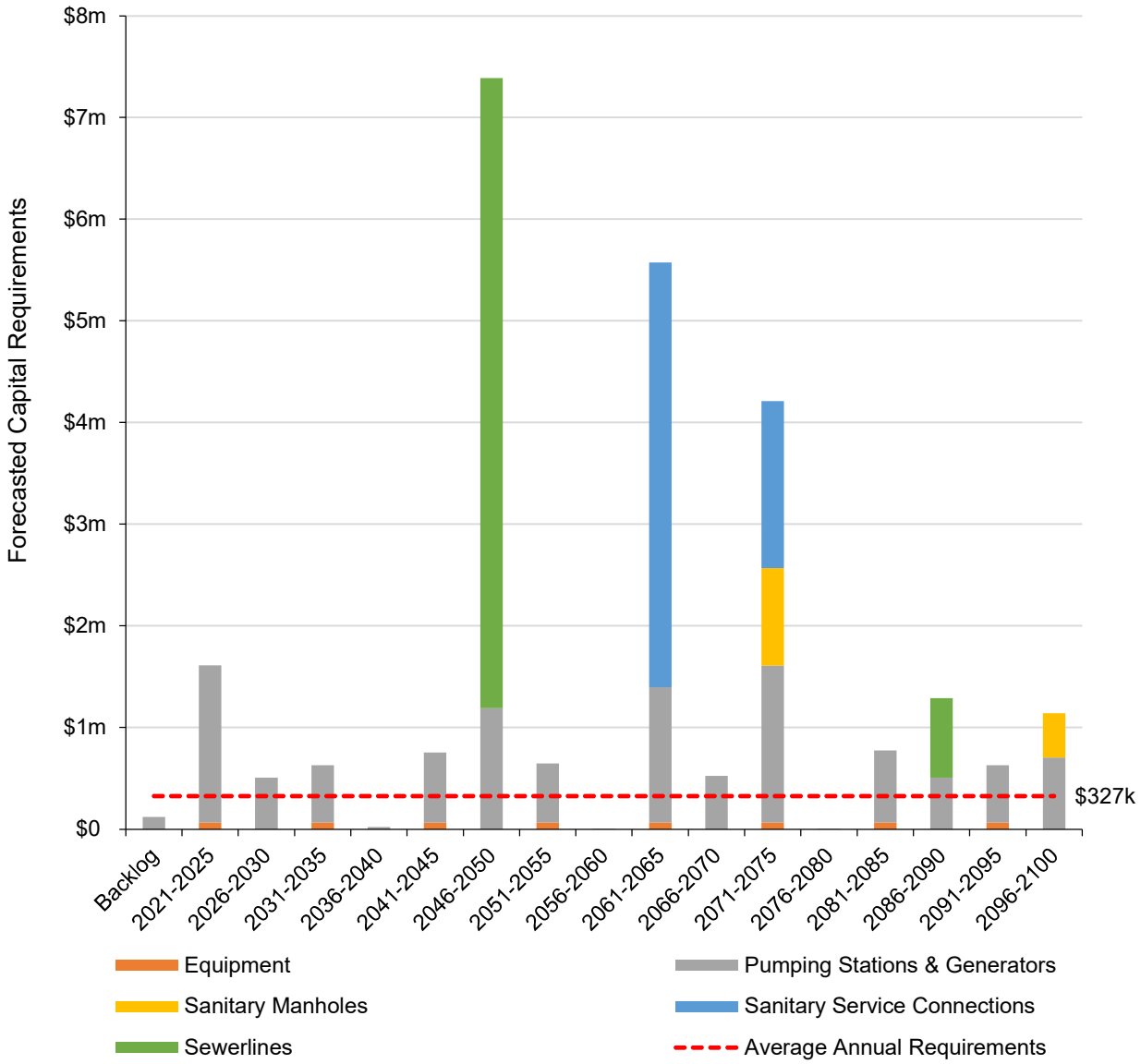
The condition or performance of most assets will deteriorate over time. To ensure that municipal assets are performing as expected and meeting the needs of customers, it is important to establish a lifecycle management strategy to proactively manage asset deterioration.

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

Activity Type	Description of Current Strategy
Maintenance	CCTV inspections are conducted in conjunction with flushing. Flushing is conducted on a 3-year cycle, with one third of the network complete annually.
	Sanitary manhole repairs and inspections are performed as needed.
Rehabilitation	Sanitary sewer lining presents significant challenges, and it is not always a viable option.
	OCWA provides 5-year capital rehabilitation and replacement recommendations for vertical assets.
Replacement	In the absence of mid-lifecycle rehabilitative events, most mains are simply maintained with the goal of full replacement once it reaches its end-of-life.
	Replacement activities are identified based on an analysis of the main break rate as well as any issues identified during CCTV inspection.

12.1.2 Forecasted Capital Requirements

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



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.

Risk & Criticality

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

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

The identification of critical assets allows the Municipality 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.

12.1.4 Risks to Current Asset Management Strategies

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

Environmental Risks

The sanitary network is in close proximity to natural bodies of water. Due to the proximity, there is a higher risk of polluting the natural environment in the case of a line breaks. Municipal staff should continue to monitor higher-risk assets to proactively replace assets before failure occurs.

Levels of Service

The following tables identify the Municipality's current level of service for the 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 Municipality has selected for this AMP.

12.1.5 Community Levels of Service

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

Service Attribute	Qualitative Description	Current LOS (2021)
Scope	Description, which may include maps, of the user groups or areas of the municipality that are connected to the municipal wastewater system	See Appendix C
Reliability	Description of how combined sewers in the municipal wastewater system are designed with overflow structures in place which allow overflow during storm events to prevent backups into homes	The Municipality does not own any combined sewers

Service Attribute	Qualitative Description	Current LOS (2021)
	Description of the frequency and volume of overflows in combined sewers in the municipal wastewater system that occur in habitable areas or beaches	The Municipality does not own any combined sewers
	Description of how stormwater can get into sanitary sewers in the municipal wastewater system, causing sewage to overflow into streets or backup into homes	Stormwater can enter into sanitary sewers due to cracks in sanitary mains or through indirect connections (e.g. weeping tiles). In the case of heavy rainfall events, sanitary sewers may experience a volume of water and sewage that exceeds its designed capacity. In some cases, this can cause water and/or sewage to overflow backup into homes. the disconnection of weeping tiles from sanitary mains and the use of sump pumps and pits directing storm water to the storm drain system can help to reduce the chance of this occurring.
	Description of how sanitary sewers in the municipal wastewater system are designed to be resilient to stormwater infiltration	The municipality follows a series of design standards that integrate servicing requirements and land use considerations when constructing or replacing sanitary sewers. These standards have been determined with consideration of the minimization of sewage overflows and backups.
	Description of the effluent that is discharged from sewage treatment plants in the municipal wastewater system	Effluent refers to water pollution that is discharged from a wastewater treatment plant, and may include suspended solids, total phosphorous and biological oxygen demand. The Environmental Compliance Approval (ECA) identifies the effluent criteria for municipal wastewater treatment plants.

12.1.6 Technical Levels of Service

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

Service Attribute	Technical Metric	Current LOS (2021)
Scope	% of properties connected to the municipal wastewater system	46%
Reliability	# of events per year where combined sewer flow in the municipal wastewater system exceeds system capacity compared to the total number of properties connected to the municipal wastewater system	0
	# of connection-days per year having wastewater backups compared to the total number of properties connected to the municipal wastewater system	0
	# of effluent violations per year due to wastewater discharge compared to the total number of properties connected to the municipal wastewater system	0
Performance	Annual capital re-investment rate	1.29%
	% of wastewater network in poor / very poor condition	10%
	Average risk rating associated to the wastewater network	6.31 / 25

Recommendations

Condition Assessment Strategies

- This AMP utilizes age-based condition for all wastewater assets. Staff should identify condition assessment strategies for high value and high-risk water network assets.

Risk Management Strategies

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

Lifecycle Management Strategies

- Continue to evaluate the efficacy of the Municipality's lifecycle management strategies at regular intervals to determine the impact cost, condition and risk. Consider trenchless relining for potential sewer main candidates, when possible.

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 Municipality 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.

13 Impacts of Growth

Key Insights

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

Description of Growth Assumptions

The demand for infrastructure and services will change over time based on a combination of internal and external factors. Understanding the key drivers of growth and demand will allow the Municipality 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 Callander Draft Official Plan (March 2022)

The Municipality of Callander's Official Plan is intended to establish goals, objectives and policies to management and direct physical change and its effects on the social, economic and natural environment. It contains policies and measures to help ensure the adequate provision of affordable housing. It also describes the measures and procedures that will be used to obtain the views of the public during the land use planning approval process.

The Plan is based on the basic assumptions, observations and forecasts derived from a series of detailed background studies dealing with growth management, local planning, and the environment. The Official Plan is intended to guide the future development of the Municipality over the next 20-25 years.

The Draft Official Plan has been approved by Municipal Council as of August 16th, 2022.

As per the plan objectives, the growth and development shall provide an adequate land supply to meet short-, mid-, and long-term needs, establish and maintain an urban settlement area boundary, direct the majority of future growth to the urban settlement area, permit appropriate development in the rural area, encourage a mix of uses in the settlement area, and encourage intensification and redevelopment in the settlement area.

This plan includes the growth forecasts in terms of population and housing for which the Municipality will be required to provide services. The following table outlines the population and housing unit forecasts allocated to Callander.

	Year	Population	Housing Units
Historical	2021	3,964	1,636
Projections	2026	4,027	1,679
	2031	4,137	1,725
	2036	4,294	1,790
	2041	4,427	1,845
	2046	4,564	1,903

Impact of Growth on Lifecycle Activities

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

Planning for forecasted population growth may require the expansion of existing infrastructure and services. As growth-related assets are constructed or acquired, they should be integrated into the Municipality's AMP. While the addition of residential units will add to the existing assessment base and offset some of the costs associated with growth, the 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 Municipality is committing approximately $2,306,000 towards capital projects per year from sustainable revenue sources
- Given the annual capital requirement of $2,411,000, there is currently a funding gap of $105,000 annually
- For tax-funded assets, we recommend increasing taxes as necessary for infrastructure deficit over the next 20 years to achieve a sustainable level of funding
- For the wastewater network, we recommend increasing rate revenues as necessary for infrastructure deficit over the next 20 years to achieve a sustainable level of funding
- For the water network, we recommend increasing rate revenues as necessary for infrastructure deficit over the next 20 years to achieve a sustainable level of funding

Financial Strategy Overview

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

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

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

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

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

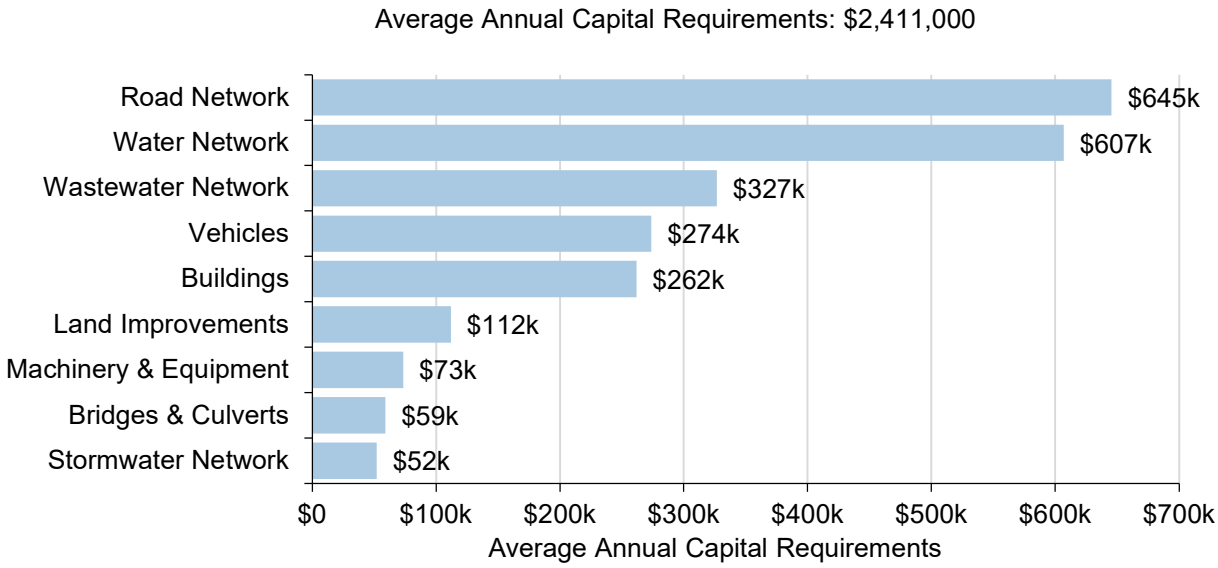
1. In order to reduce financial requirements, consideration has been given to revising service levels downward.

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

14.1.1 Annual Requirements & Capital Funding

Annual Requirements

The annual requirements represent the amount the Municipality 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 Municipality must allocate approximately $2.4 million annually to address capital requirements for the assets included in this AMP.



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

However, for the road network, lifecycle management strategies have been developed to identify capital costs that are realized through strategic rehabilitation and renewal of the Municipality's roads. The development of these strategies allows for a comparison of potential cost avoidance if the strategies were to be implemented. The following table compares two scenarios for the road network:

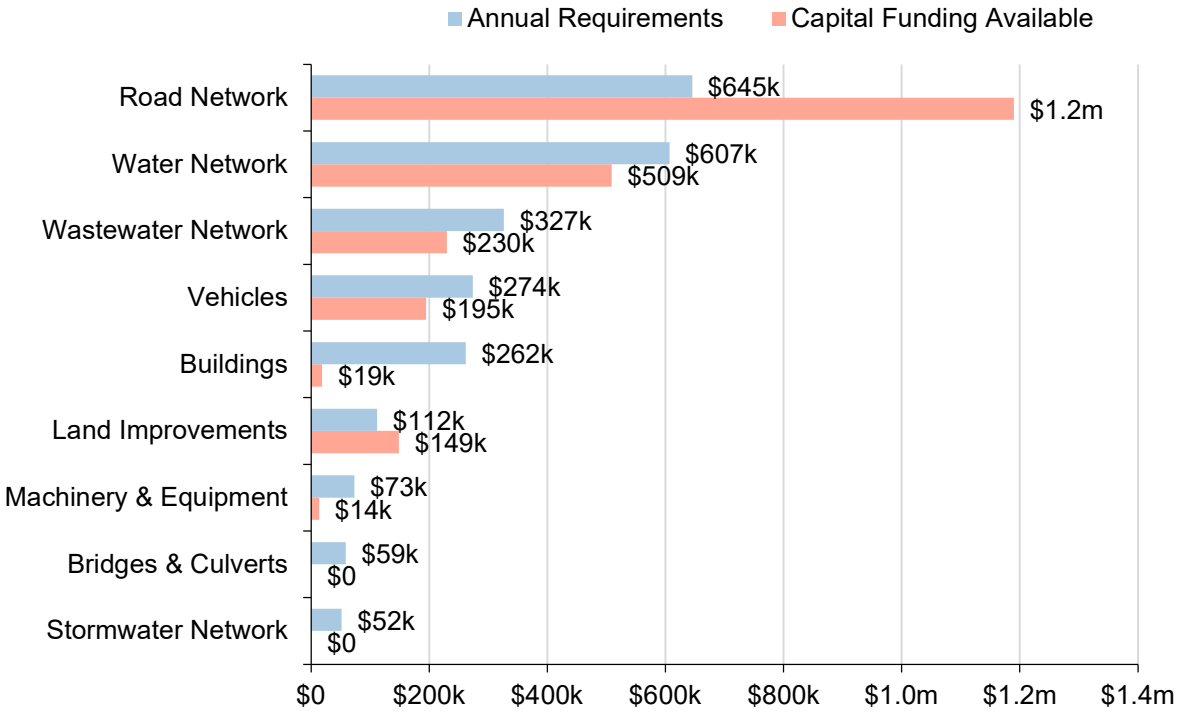
1. **Replacement Only Scenario**: Based on the assumption that assets deteriorate and – without regularly scheduled maintenance and rehabilitation – are replaced at the end of their service life.
2. **Lifecycle Strategy Scenario**: Based on the assumption that lifecycle activities are performed at strategic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

Asset Category	Annual Requirements (Replacement Only)	Annual Requirements (Lifecycle Strategy)	Difference
Road Network	$645,000	$581,000	$64,000

The implementation of a proactive lifecycle strategy for roads leads to a potential annual cost avoidance of $64,000 for the road network. This represents an overall reduction of the annual requirements by 10%. As the lifecycle strategy scenario represents the lowest cost option available to the Municipality, we have used this annual requirement in the development of the financial strategy.

Annual Funding Available

Based on a historical analysis of sustainable capital funding sources, the Municipality is committing approximately $2,306,000 towards capital projects per year from sustainable revenue sources. Given the annual capital requirement of $2,411,000, there is currently a funding gap of $105,000 annually.



Funding Objective

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

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

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

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

Financial Profile: Tax Funded Assets

14.1.2 Current Funding Position

The following tables show, by asset category, Callander'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	Gas Tax	OCIF	Total Available	
Buildings	262,000	19,000			19,000	243,000
Vehicles	274,000	195,000			195,000	79,000
Land Improvements	112,000	149,000			149,000	-37,000
Machinery & Equipment	73,000	14,000			14,000	59,000
Road Network	645,000	869,000	245,000	76,000	1,190,000	-545,000
Stormwater Network	52,000				0	52,000
Bridges & Culverts	59,000				0	59,000
	1,477,000	**1,246,000**	**245,000**	**76,000**	**1,567,000**	**-90,000**

The average annual investment requirement for the above categories is $1,477,000. Annual revenue currently allocated to these assets for capital purposes is $1,567,000

leaving an annual surplus of $90,000. Put differently, these infrastructure categories are currently funded at 106% of their long-term requirements.

14.1.3 Full Funding Requirements

In 2021, Municipality of Callander has annual tax revenues of $5,841,000. 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
Buildings	4.2%
Vehicles	1.4%
Land Improvements	-0.6%
Machinery & Equipment	1.0%
Road Network	-9.3%
Stormwater Network	0.9%
Bridges & Culverts	1.0%
	-1.4%

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

a) Callander's debt payments for these asset categories will be decreasing by $35,000 over the next 5 years and by $90,000 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				With Capturing Changes			
	5 Years	**10 Years**	**15 Years**	**20 Years**	**5 Years**	**10 Years**	**15 Years**	**20 Years**
Infrastructure Deficit	-90,000	-90,000	-90,000	-90,000	-90,000	-90,000	-90,000	-90,000
Change in Debt Costs	N/A	N/A	N/A	N/A	-35,000	-90,000	-90,000	-90,000
Change in OCIF Grants	N/A	N/A	N/A	N/A	0	0	0	0
Resulting Infrastructure Deficit	-90,000	-90,000	-90,000	-90,000	-125,000	-180,000	-180,000	-180,000
Tax Increase Required	-1.5%	-1.5%	-1.5%	-1.5%	-2.1%	-3.1%	-3.1%	-3.1%
Annually	**-0.4%**	**-0.2%**	**-0.2%**	**-0.1%**	**-0.5%**	**-0.4%**	**-0.3%**	**-0.2%**

14.1.4 Financial Strategy Recommendations

Considering all the above information, we recommend keeping capital expenditure annual funding at current levels:

a) Increasing taxes as necessary for infrastructure deficits due to any increases in operational requirements over the next 20 years.
b) allocating the current gas tax and OCIF revenue as outlined previously.
c) allocating the scheduled OCIF grant increases to the infrastructure deficit as they occur.
d) increasing existing and future infrastructure budgets by the applicable inflation index on an annual basis in addition to the deficit phase-in.

Notes:

1. As in the past, periodic senior government infrastructure funding will most likely be available during the phase-in period. By Provincial AMP rules, this periodic funding cannot be incorporated into an AMP unless there are firm commitments in place. We have included OCIF formula-based funding, if applicable, since this funding is a multi-year commitment[5].
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 AMP provides financial sustainability over the period modeled, the recommendations do require prioritizing capital projects to fit the resulting annual funding available. Current data shows a pent-up investment demand of $181,000 for Machinery & Equipment, and $1.7 million for Vehicles.

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.

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

Financial Profile: Rate Funded Assets

14.1.5 Current Funding Position

The following tables show, by asset category, Callander'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	607,000	579,000	-70,000	0	509,000	98,000
Wastewater Network	327,000	709,000	-479,000	0	230,000	97,000
	934,000	**1,288,000**	**-549,000**	**0**	**739,000**	**195,000**

The average annual investment requirement for the above categories is $934,000. Annual revenue currently allocated to these assets for capital purposes is $739,000 leaving an annual deficit of $195,000. Put differently, these infrastructure categories are currently funded at 79% of their long-term requirements.

14.1.6 Full Funding Requirements

In 2021, Callander had annual wastewater revenues of $709,000 and annual water revenues of $579,000. 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	16.9%
Wastewater Network	13.7%

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	98,000	98,000	98,000	98,000	97,000	97,000	97,000	97,000
Decrease in debt payments	0	0	0	0	0	-115,000	-200,000	-200,000
Resulting Infrastructure Deficit:	98,000	98,000	98,000	98,000	97,000	-18,000	-103,000	-103,000
Rate Increase Required	16.9%	16.9%	16.9%	16.9%	13.7%	-2.5%	-14.5%	-14.5%
Annually:	**3.2%**	**1.6%**	**1.1%**	**0.8%**	**2.6%**	**-0.3%**	**-1.1%**	**-0.8%**

14.1.7 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) when realized, reallocating the debt cost reductions of $200,000 for wastewater services to the applicable infrastructure deficit
b) reallocating funding from the wastewater network to balance the water network and keeping capital expenditure annual funding at current levels for the both networks 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) increasing existing and future infrastructure budgets by the applicable inflation index on an annual basis in addition to the deficit phase-in.

Notes:

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

Although this option achieves full funding on an annual basis in 15 years and provides financial sustainability over the period modeled, the recommendations do require prioritizing capital projects to fit the resulting annual funding available. Current data shows a pent-up investment demand of $2.9 million for the water network and $120,000 for the wastewater network.

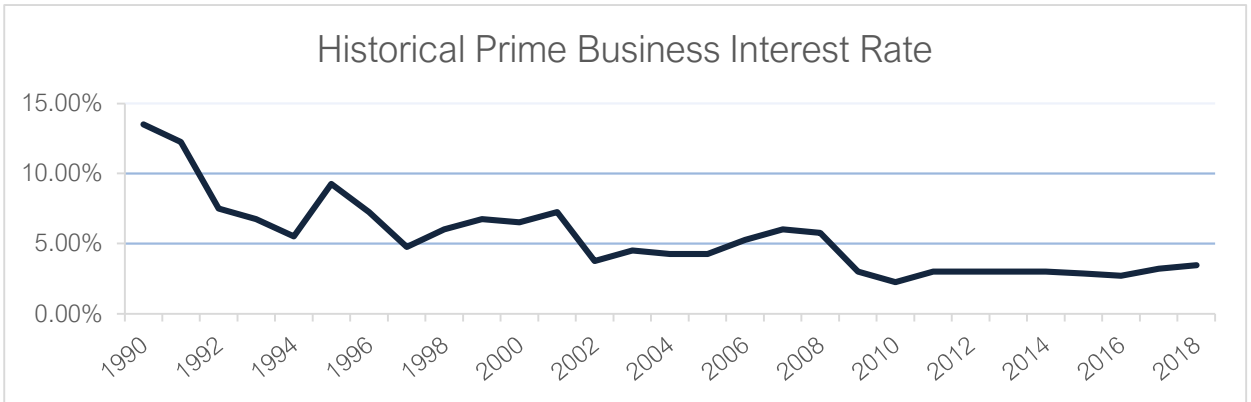
Prioritizing future projects will require the current data to be replaced by condition-based data. Although our recommendations include no further use of debt, the results of the condition-based analysis may require otherwise.

Use of Debt

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

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

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



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

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

The following tables outline how Callander has historically used debt for investing in the asset categories as listed. There is currently $2,033,000 of debt outstanding for the assets covered by this AMP with corresponding principal and interest payments of $290,000, well within its provincially prescribed maximum of $1,657,000.

Asset Category	Current Debt Outstanding	Use of Debt in the Last Five Years				
		2017	2018	2019	2020	2021
Buildings	0	0	0	0	0	0
Vehicles	0	0	0	0	0	0
Land Improvements	337,000	0	0	0	0	0
Machinery & Equipment	0	0	0	0	0	0
Road Network	68,000	0	0	0	0	0
Stormwater Network	0	0	0	0	0	0
Bridges & Culverts	0	0	0	0	0	0
Total Tax Funded:	**405,000**	**0**	**0**	**0**	**0**	**0**
Water Network	0	0	0	0	0	0
Wastewater Network	1,628,000	0	0	0	0	0
Total Rate Funded:	1,628,000	**0**	**0**	**0**	**0**	**0**
Overall Total:	**2,033,000**	**0**	**0**	**0**	**0**	**0**

Asset Category	Principal & Interest Payments in the Next Ten Years						
	2022	2023	2024	2025	2026	2027	2032
Buildings	0	0	0	0	0	0	0
Vehicles	0	0	0	0	0	0	0
Land Improvements	55,000	55,000	55,000	55,000	55,000	55,000	0
Machinery & Equipment	0	0	0	0	0	0	0
Road Network	35,000	35,000	0	0	0	0	0
Stormwater Network	0	0	0	0	0	0	0
Bridges & Culverts	0	0	0	0	0	0	0
Total Tax Funded:	**90,000**	**90,000**	**55,000**	**55,000**	**55,000**	**55,000**	**0**
Water Network	0	0	0	0	0	0	0
Sanitary Network	200,000	200,000	200,000	200,000	200,000	200,000	85,000
Total Rate Funded:	**200,000**	**200,000**	**200,000**	**200,000**	**200,000**	**200,000**	**85,000**
Overall Total:	**290,000**	**290,000**	**255,000**	**255,000**	**255,000**	**255,000**	**85,000**

The revenue options outlined in this plan allow Callander to fully fund its long-term infrastructure requirements without further use of debt.

Use of Reserves

14.1.8 Available Reserves

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

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

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

Asset Category	Balance on December 31, 2021
Buildings	1,628,000
Vehicles	322,000
Land Improvements	32,000
Machinery & Equipment	3,000
Road Network	3,070,000
Stormwater Network	0
Bridges & Culverts	0
Total Tax Funded:	**5,055,000**
Water Network	0
Wastewater Network	0
Total Rate Funded:	**0**

There is considerable debate in the municipal sector as to the appropriate level of reserves that a Municipality 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 Callander's judicious use of debt in the past, allows the scenarios to assume that, if required, available reserves and debt capacity can be used for high priority and emergency infrastructure investments in the short- to medium-term.

14.1.9 Recommendation

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

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 identifies the criteria used to calculate risk for each asset category
- Appendix E 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	$14.0	Good	Annual Requirement:	$645,000
			Funding Available:	$1,190,000
			Annual Surplus:	**$545,000**
Bridges & Culverts	$4.4	Good	Annual Requirement:	$59,000
			Funding Available:	$0
			Annual Deficit:	**$59,000**
Stormwater Network	$4.0	Good	Annual Requirement:	$52,000
			Funding Available:	$0
			Annual Deficit:	**$52,000**
Buildings & Facilities	$12.0	Fair	Annual Requirement:	$262,000
			Funding Available:	$19,000
			Annual Deficit:	**$243,000**
Vehicles	$4.4	Fair	Annual Requirement:	$274,000
			Funding Available:	$195,000
			Annual Deficit:	**$79,000**
Machinery & Equipment	$0.9	Poor	Annual Requirement:	$73,000
			Funding Available:	$14,000
			Annual Deficit:	**$59,000**
Land Improvements	$3.3	Very Good	Annual Requirement:	$112,000
			Funding Available:	$149,000
			Annual Surplus:	**$37,000**
Water Network	$27.0	Fair	Annual Requirement:	$607,000
			Funding Available:	509,000
			Annual Deficit:	**$98,000**
Wastewater Network	$17.8	Good	Annual Requirement:	$327,000
			Funding Available:	$230,000
			Annual Deficit:	**$97,000**
Overall	$87.7	Fair	Annual Requirement:	$2,411,000
			Funding Available:	$2,306,000
			Annual Deficit:	**$105,000**

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

Asset Segment	Backlog	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
Guide Rails	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Paved Roads	$0	$260k	$1.6m	$96k	$214k	$846k	$666k	$616k	$162k	$191k	$404k
Road Signs	$0	$0	$0	$0	$0	$11k	$150	$0	$0	$0	$0
Sidewalks	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Small Culverts	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Streetlights	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
	$0	**$260k**	**$1.6m**	**$96k**	**$214k**	**$857k**	**$666k**	**$616k**	**$162k**	**$191k**	**$404k**

Bridges & Culverts

Asset Segment	Backlog	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
Bridges	$0	$253k	$0	$26k	$0	$0	$0	$0	$0	$0	$0
Structural Culverts	$0	$154k	$0	$534k	$0	$0	$0	$0	$0	$396k	$0
	$0	**$407k**	**$0**	**$560k**	**$0**	**$0**	**$0**	**$0**	**$0**	**$396k**	**$0**

Stormwater Network											
Asset Segment	Backlog	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
Catch Basins	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Storm Drains	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Storm Management Pond	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Storm Manholes	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
	$0	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**

Buildings											
Asset Segment	Backlog	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
General Government	$0	$0	$0	$0	$0	$18k	$0	$8k	$0	$594k	$9k
Protection Services	$0	$0	$0	$0	$0	$7k	$0	$7k	$0	$2.2m	$27k
Recreation Services	$0	$0	$0	$0	$0	$0	$0	$12k	$15k	$1.1m	$5k
Transportation Services	$0	$0	$0	$60k	$0	$0	$0	$0	$0	$497k	$42k
	$0	**$0**	**$0**	**$60k**	**$0**	**$25k**	**$0**	**$28k**	**$15k**	**$4.4m**	**$84k**

Machinery & Equipment											
Asset Segment	Backlog	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
General Government	$28k	$8k	$23k	$7k	$0	$20k	$8k	$35k	$24k	$16k	$32k
Protection Services	$0	$0	$40k	$130k	$0	$8k	$0	$0	$0	$10k	$40k
Recreation Services	$153k	$0	$0	$0	$0	$20k	$43k	$87k	$122k	$0	$0
Transportation Services	$0	$0	$0	$0	$13k	$0	$0	$0	$21k	$0	$10k
	$181k	**$8k**	**$63k**	**$137k**	**$13k**	**$48k**	**$50k**	**$122k**	**$167k**	**$26k**	**$82k**

Vehicles											
Asset Segment	Backlog	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
Fire	$0	$0	$0	$31k	$0	$71k	$561k	$0	$0	$0	$25k
Operations	$20k	$0	$0	$350k	$150k	$12k	$18k	$65k	$324k	$74k	$0
	$20k	**$0**	**$0**	**$381k**	**$150k**	**$83k**	**$579k**	**$65k**	**$324k**	**$74k**	**$25k**

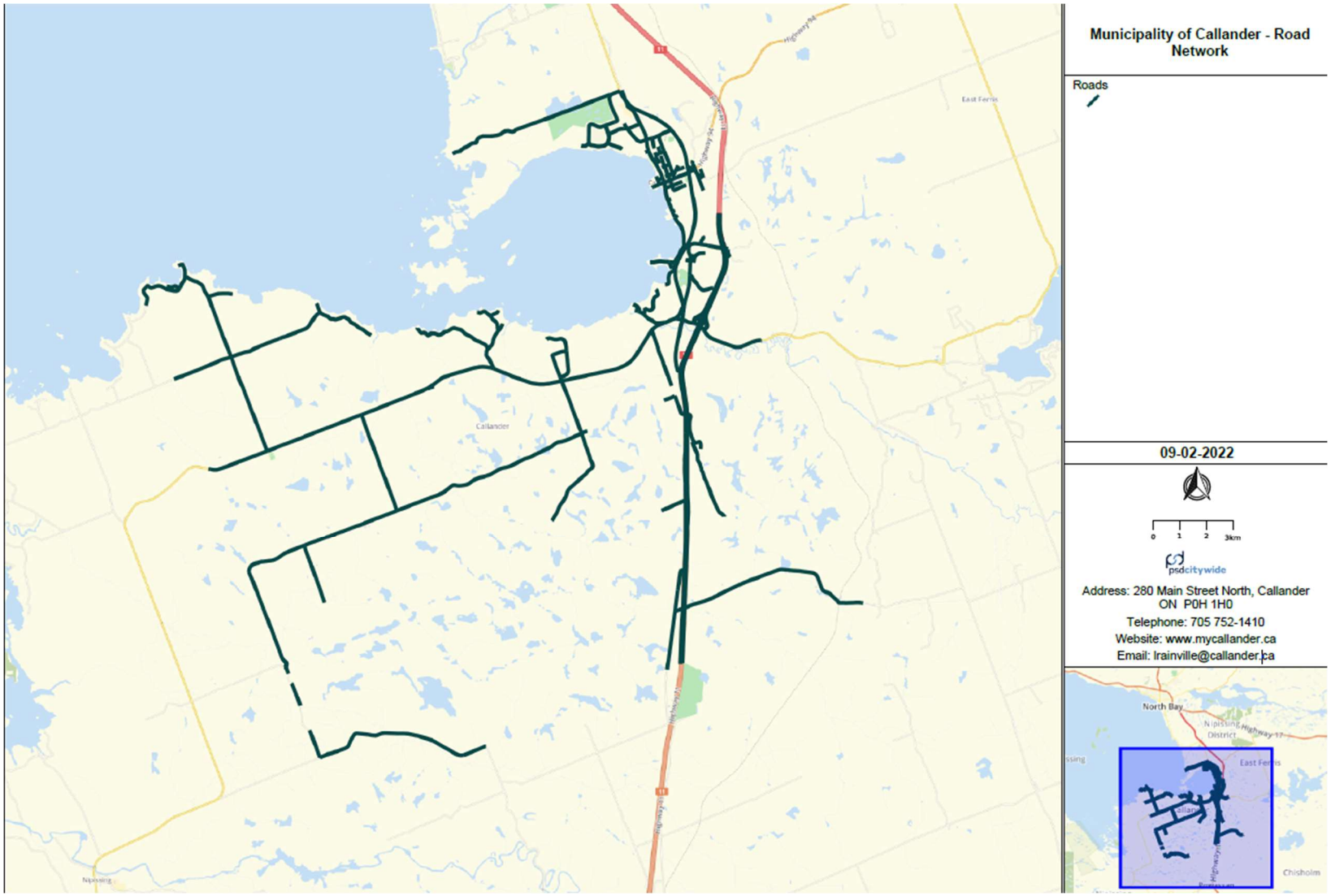
Land Improvements											
Asset Segment	Backlog	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
Lights & Signage	$0	$0	$0	$6k	$0	$0	$0	$0	$0	$7k	$1k
Marina	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Play Structures & Splashpads	$0	$0	$0	$10k	$0	$0	$0	$0	$0	$259k	$7k
Sports Structures	$0	$0	$0	$12k	$43k	$0	$0	$0	$0	$84k	$80k
	$0	**$0**	**$0**	**$27k**	**$43k**	**$0**	**$0**	**$0**	**$0**	**$351k**	**$89k**

Water Network											
Asset Segment	Backlog	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
Equipment	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$7k
Gate Valves	$32k	$0	$0	$0	$0	$6k	$13k	$17k	$5k	$0	$0
Hydrants	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Treatment Plant & Tower	$2.8m	$5k	$5k	$19k	$116k	$3k	$125k	$17k	$52k	$114k	$51k
Water Service Connections	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Watermains	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
	$2.9m	**$5k**	**$5k**	**$19k**	**$116k**	**$9k**	**$138k**	**$34k**	**$57k**	**$114k**	**$58k**

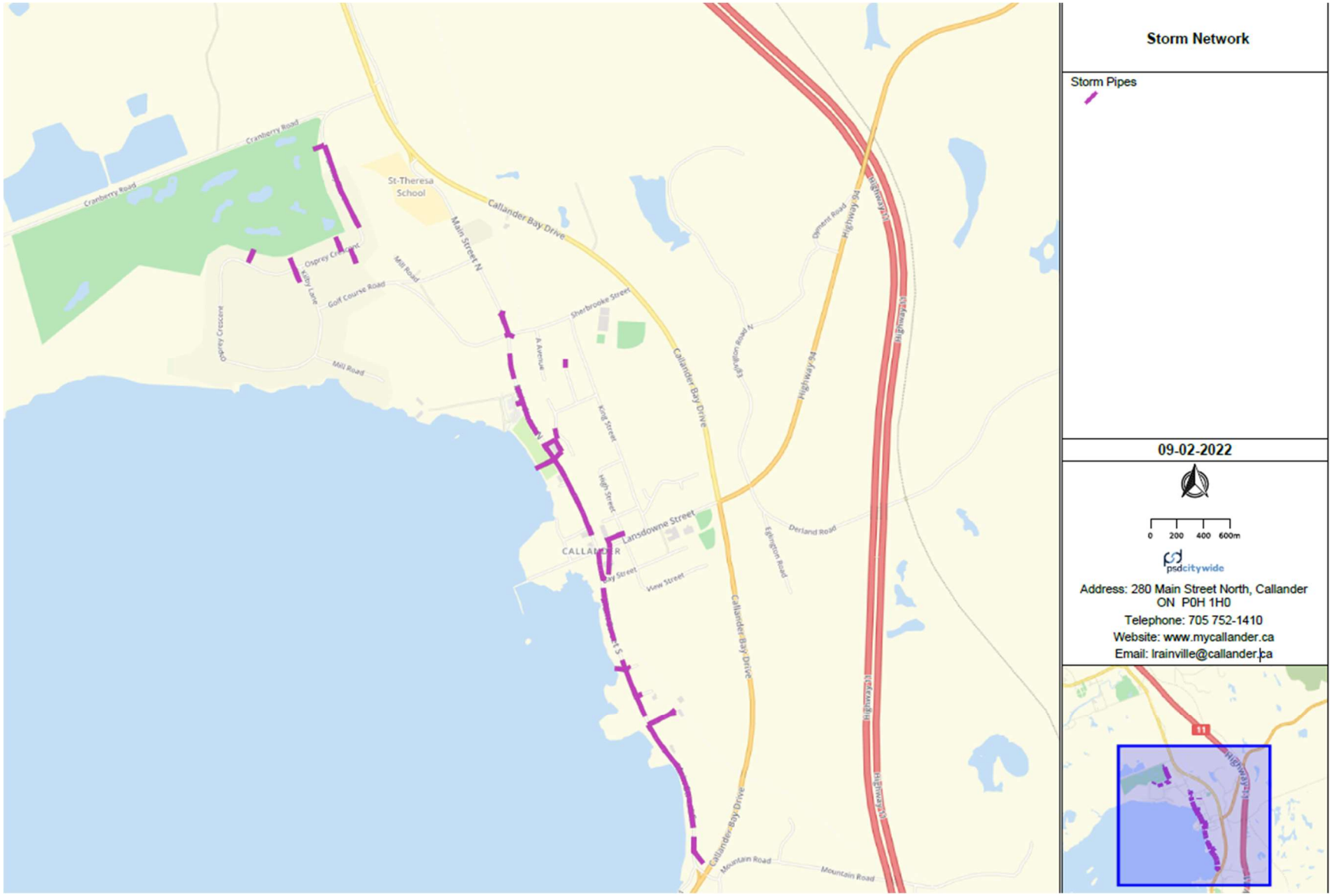
Wastewater Network											
Asset Segment	Backlog	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
Equipment	$0	$0	$0	$65k	$0	$0	$0	$0	$0	$0	$0
Pumping Stations & Generators	$120k	$477k	$0	$1.1m	$0	$18k	$4k	$0	$0	$0	$503k
Sanitary Manholes	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Sanitary Service Connections	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Sewerlines	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
	$120k	**$477k**	**$0**	**$1.1m**	**$0**	**$18k**	**$4k**	**$0**	**$0**	**$0**	**$503k**

Appendix C: Level of Service Maps

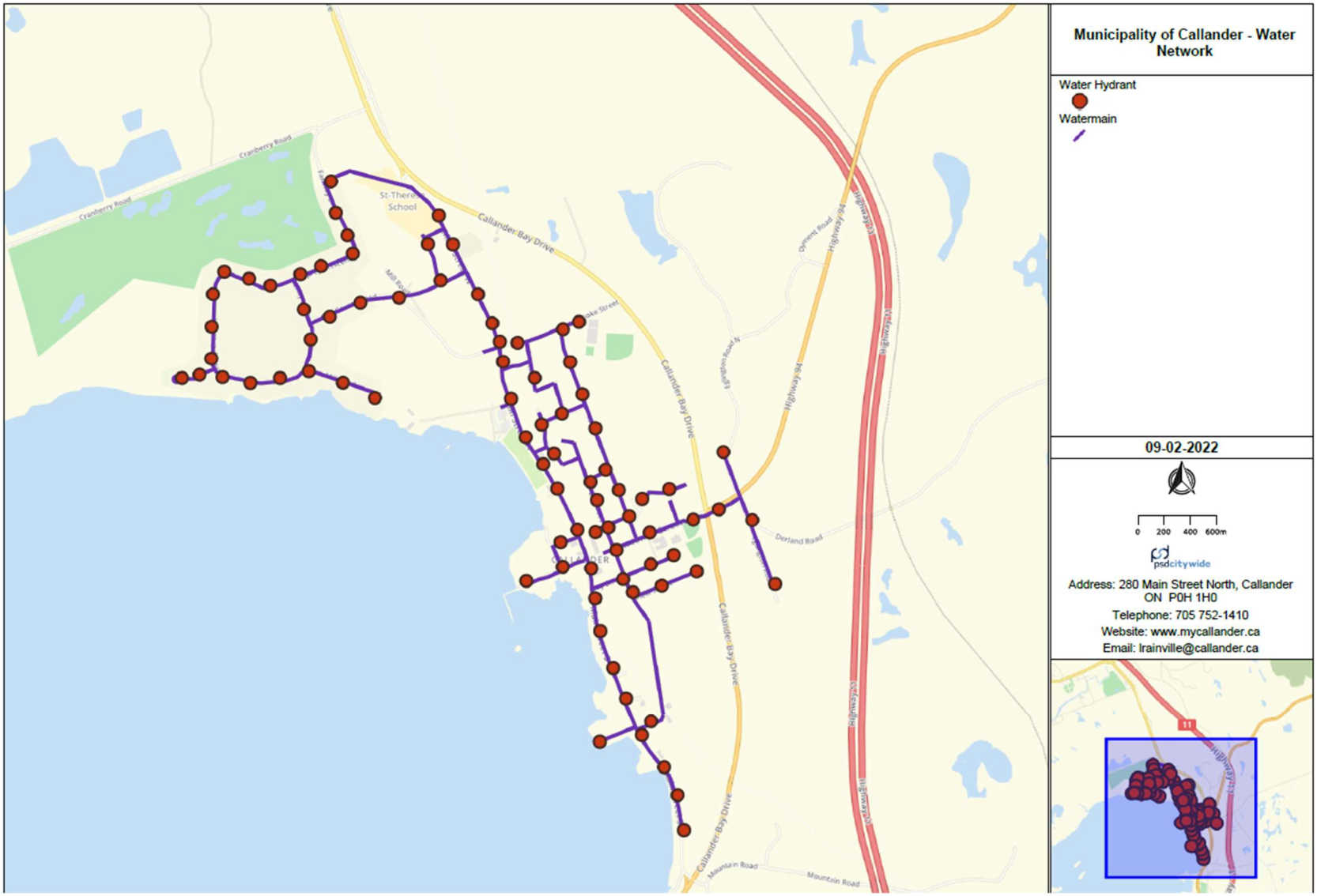
Road Network



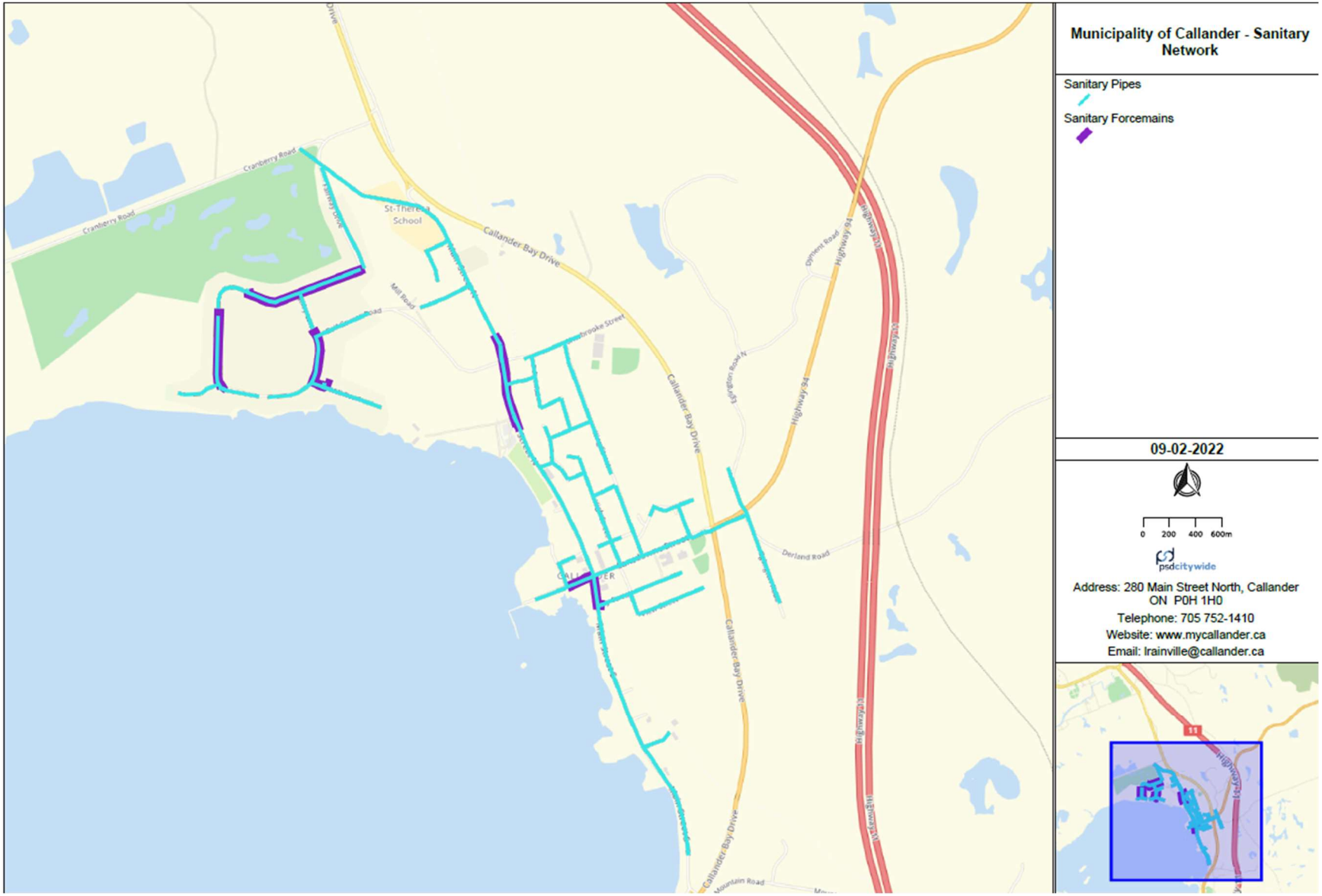
Stormwater Network



Water Network Map



Wastewater Network



Culvert in Poor Condition
102 – Hart Road Culvert

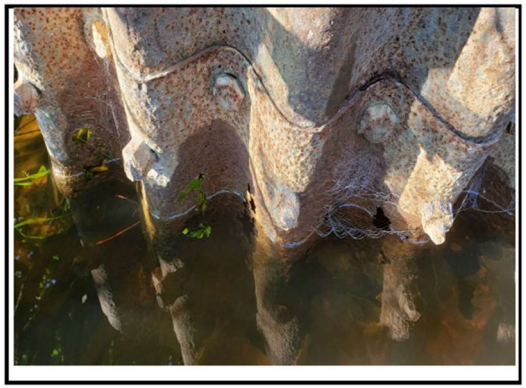


Photo 9 Perforations at the east end of culvert

Photo 10 Moderate corrosion at waterline of barrel

Bridge in Fair Condition
001 – Stones Road Bridge

Photo 5 East elevation

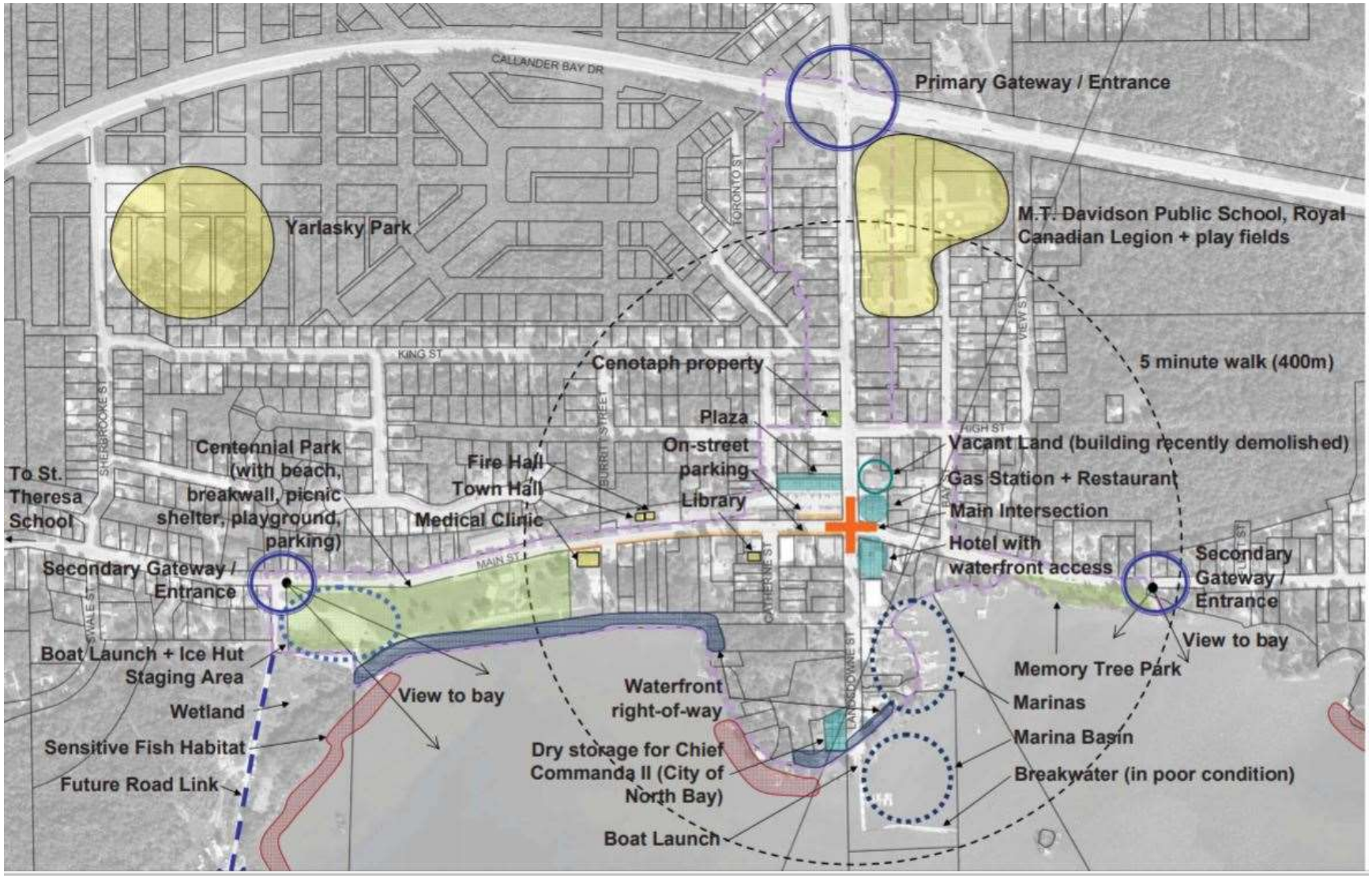
Photo 6 West elevation

Culvert in Good Condition
103 – Hazel Glen Road Culvert

Photo 9 Interior of barrel

Buildings Map

Outdoor Recreation Area Map



Appendix D: Risk Rating Criteria

Probability of Failure

Asset Category	Risk Classification	Risk Criteria	Value/Range	Probability of Failure Score
Road Network (Roads)	Structural (70%)	Condition (%) (85%)	80-100	1
			70-80	2
			50-70	3
			40-50	4
			0-40	5
		Service Life Remaining (%) (15%)	40-100	1
			30-40	2
			20-30	3
			10-20	4
			0-10	5
	Functional (30%)	AADT (70%)	1,000+	5
			500-1,000	4
			200-500	3
			50-200	2
			0-50	1
		Truck Route (30%)	No	3
			Yes	4

Asset Category	Risk Classification	Risk Criteria	Value/Range	Probability of Failure Score
Bridges & Structural Culverts	Structural (75%)	Condition (%) (85%)	80-100	1
			70-80	2
			60-70	3
			50-60	4
			0-50	5
		Service Life Remaining (%) (15%)	40-100	1
			30-40	2
			20-30	3
			10-20	4
			0-10	5
	Functional (25%)	AADT (60%)	1,000+	5
			500-1,000	4
			200-500	3
			50-200	2
			0-50	1
		Dimensional Restrictions (20%)	No	3
			Yes	4
		Loading Restrictions (20%)	No	3
			Yes	4

Asset Category	Risk Classification	Risk Criteria	Value/Range	Probability of Failure Score
Forcemains Sanitary Sewers	Structural (85%)	Condition (%) (65%)	80-100	1
			60-80	2
			40-60	3
			20-40	4
			0-20	5
		Service Life Remaining (%) (10%)	40-100	1
			30-40	2
			20-30	3
			10-20	4
			0-10	5
		Material Type (10%)	PVC	2
			Asbestos Cement, HDPE	3
			Ductile Iron	4
			Cast Iron	5
		Surchagre/ Blockage (15%)	No	3
			Yes	4
	Functional (15%)	Slope	1	5
			0.75	4
			0.5	3
			0.25	1
			0	4

Asset Category	Risk Classification	Risk Criteria	Value/Range	Probability of Failure Score
Storm Drains	Structural (85%)	Condition (%) (70%)	80-100	1
			60-80	2
			40-60	3
			20-40	4
			0-20	5
		Service Life Remaining (%) (15%)	40-100	1
			30-40	2
			20-30	3
			10-20	4
			0-10	5
		Material Type (15%)	PVC	2
			Asbestos Cement, HDPE	3
			Ductile Iron	4
			Cast Iron	5

Asset Category	Risk Classification	Risk Criteria	Value/Range	Probability of Failure Score
Watermains	Structural (85%)	Condition (%) (65%)	80-100	1
			60-80	2
			40-60	3
			20-40	4
			0-20	5
		Service Life Remaining (%) (10%)	40-100	1
			30-40	2
			20-30	3
			10-20	4
			0-10	5
		Material Type (10%)	PVC	2
			Asbestos Cement, HDPE	3
			Ductile Iron	4
			Cast Iron	5
		No. of Watermain Breaks (15%)	1	1
			3	2
			5	3
			7	4
			10	5

Consequence of Failure

Asset Category	Risk Classification	Risk Criteria	Value/Range	Consequence of Failure Score
Road Network (Roads)	Economic (35%)	Replacement Cost Per Sq. M ($/m2)	0-15	1
			15-30	2
			30-45	3
			45-60	4
			60-75	5
	Social (30%)	Functional Class (60%)	Local	2
			Collector	3
			Minor Arterial	4
			Arterial	5
		Ride Condition Rating (40%)	8+	1
			6-8	2
			4-6	3
			2-4	4
			0-2	5
	Strategic (10%)	Tourism/Business Impact	No	3
			Yes	4
	Health and Safety (25%)	Proximity to Critical Services (50%)	Residential	2
			Schools	3
			Downtown	4
			Emergency Services	5
		Speed (kmph) (50%)	0-40	1
			40-50	2
			50-60	3
			60-80	4
			80-100	5

Asset Category	Risk Classification	Risk Criteria	Value/Range	Consequence of Failure Score
Bridges & Structural Culverts	Economic (40%)	Replacement Cost ($)	0-100,000	1
			100,000-300,000	2
			300,000-500,000	3
			500,000-800,000	4
			800,000+	5
	Social (30%)	Functional Class (40%)	Local	2
			Collector	3
			Minor Arterial	4
			Arterial	5
		Detour Distance (km) (60%)	0-1	1
			1-5	2
			5-10	3
			10-15	4
			15-20	5
	Strategic (10%)	Tourism/Business Impact	No	3
			Yes	4
	Health and Safety (20%)	Proximity to Critical Services (50%)	Residential	2
			Schools	3
			Downtown	4
			Emergency Services	5
		Speed (kmph) (50%)	0-40	1
			40-50	2
			50-60	3
			60-80	4
			80-100	5

Asset Category	Risk Classification	Risk Criteria	Value/Range	Consequence of Failure Score
Forcemains Sanitar Sewers Watermains	Economic (40%)	Replacement Cost ($/m) (70%)	0-150	1
			150-250	2
			250-350	3
			350-450	4
			450-550	5
		Bury Depth (m) (30%)	0-1.5	1
			1.5-2.5	2
			2.5-3.5	3
			3.5-4.5	4
			4.5-5.5	5
	Social (30%)	AADT	0-50	2
			50-200	3
			200-500	4
			500-1,000	5
			1,000-2,000	
		Service Connection Density (# per 100m)	0-2	1
			2-4	2
			4-6	3
			6-8	4
			8-10	5
	Operational (15%)	Size	0-100	1
			100-150	2
			150-200	3
			200-250	4
			250-350	5
	Health and Safety (15%)	Proximity to Critical Services	Residential	2
			Schools	3
			Downtown	4
			Emergency Services	5

Asset Category	Risk Classification	Risk Criteria	Value/Range	Consequence of Failure Score
Storm Drains	Economic (50%)	Replacement Cost ($/m) (70%)	0-150	1
			150-250	2
			250-350	3
			350-450	4
			450-550	5
		Bury Depth (m) (30%)	0-1.5	1
			1.5-2.5	2
			2.5-3.5	3
			3.5-4.5	4
			4.5-5.5	5
	Social (30%)	AADT	0-50	2
			50-200	3
			200-500	4
			500-1,000	5
			1,000-2,000	
	Operational (15%)	Size	0-100	1
			100-200	2
			200-375	3
			375-525	4
			525-750	5
	Health and Safety (15%)	Proximity to Critical Services	Residential	2
			Schools	3
			Downtown	4
			Emergency Services	5

Appendix E: 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 Municipality'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 Municipality'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 Municipality 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 Municipality 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 Municipality 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 Municipality 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