Asset Management Plan

Municipality of South Bruce

2021

This Asset Management Program was prepared by:

PSD | CITYWIDE

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

Key Statistics

Replacement cost of asset portfolio
$271.9 million

Replacement cost of infrastructure per household
$110,000 (2021 Census)

Percentage of assets in fair or better condition
74%

Percentage of assets with assessed condition data
65%

Annual capital infrastructure deficit
$5.9 million

Recommended timeframe for eliminating annual infrastructure deficit
15-20 Years

Target reinvestment rate
3.2%

Actual reinvestment rate
1.2%

[1] All key statistic percentages are replacement cost weighted

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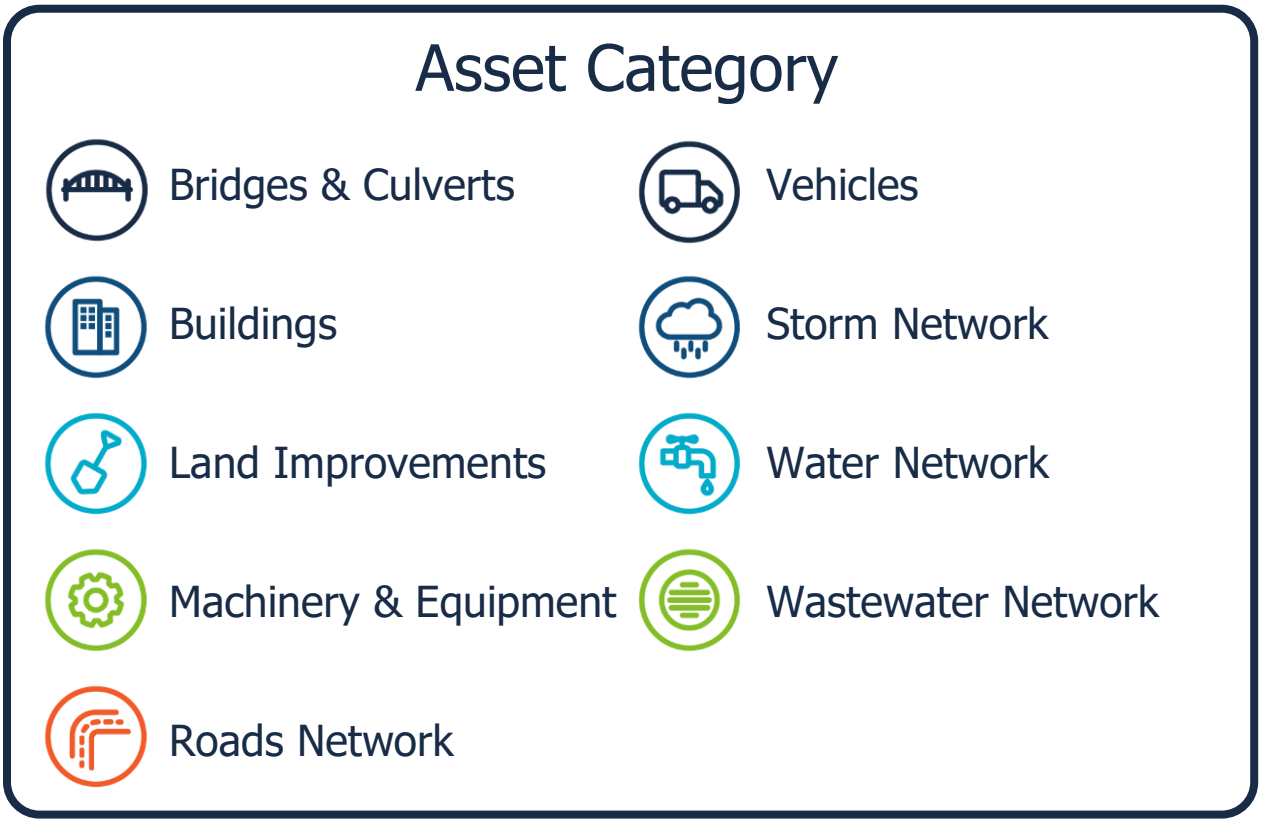
Executive Summary

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

Scope

This AMP identifies the current practices and strategies that are in place to manage public infrastructure and makes recommendations where they can be further refined. Through the implementation of sound asset management strategies, the 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. There are additional requirements concerning proposed levels of service and growth that must be met by July 1, 2025.

Findings

The overall replacement cost of the asset categories included in this AMP totals $271.9 million. 74 % of all assets analysed in this AMP are in fair or better condition and assessed condition data was available for 65% of assets. For the remaining 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 bridges & culverts) and replacement only strategies (all other assets) to determine the lowest cost option to maintain the current level of service.

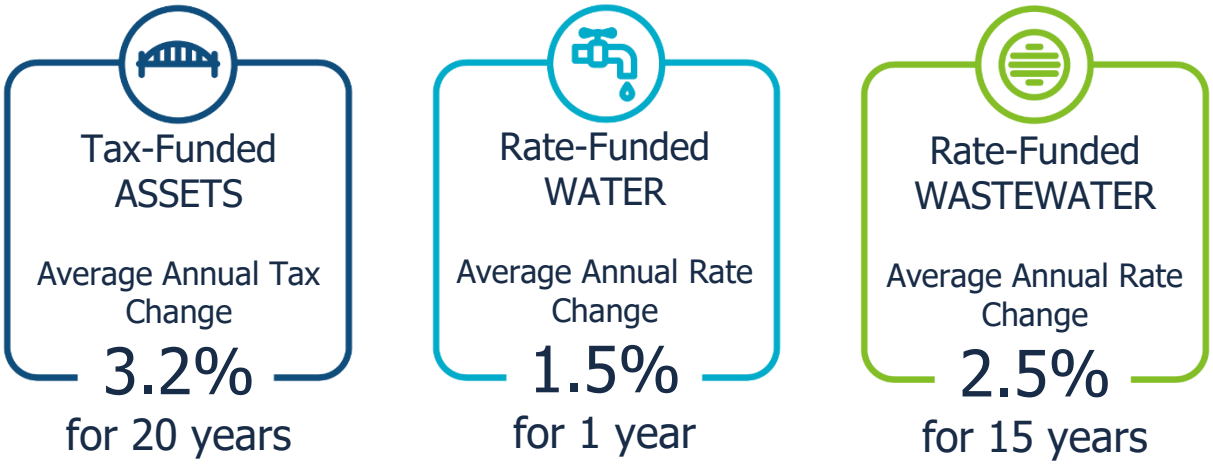
To meet capital replacement and rehabilitation needs for existing infrastructure, prevent infrastructure backlogs, and achieve long-term sustainability, the Municipality's average annual capital requirement totals $8.8 million. Based on a historical analysis of sustainable capital funding sources, the Municipality is committing approximately $2.9 million towards capital projects or reserves per year. As a result, there is currently an annual funding gap of $5.9 million, translating to $2,300 per household (2021 Census).

Annual Deficit Per Household

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

Recommendations

A financial strategy was developed to address the annual capital funding gap. The following graphics show annual tax/rate changes required to eliminate the Municipality's infrastructure deficit:



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
- Develop a data governance policy, including a condition assessment strategy, to sustain the Municipality's asset management planning
- Review and update lifecycle management strategies regularly
- Track current levels of service and identify sustainable proposed levels of service in preparation for 2025 O.Reg. 588/17 requirements

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

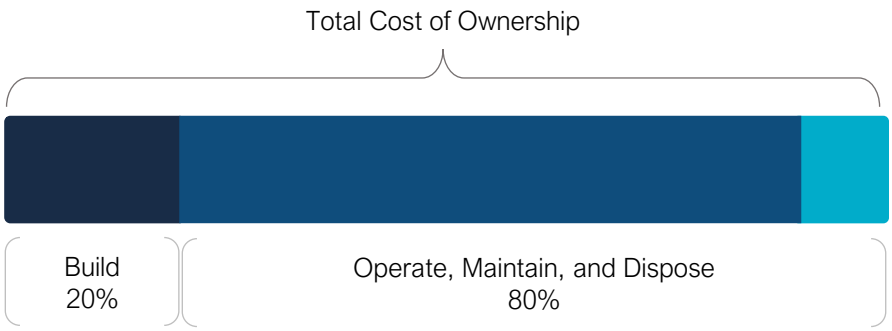
- An asset management plan is a living document that should be updated regularly to inform long-term planning

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

1.1 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 By-law #2019-46 – Schedule A that contains the "Strategic Asset Management Policy" in May 2018 in accordance with Ontario Regulation 588/17.

The asset management plan satisfies policy statement 7:

> "*The Municipality will develop an Asset Management Plan that incorporates all infrastructure categories and municipal capital infrastructure assets in accordance with legislated requirements.*"

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.

1.2 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.

1.2.1 Lifecycle Management Strategies

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

To ensure that municipal assets are performing as expected and meeting the needs of customers, it is important to establish a lifecycle management strategy to proactively manage asset deterioration. There are several field intervention activities that are available to extend the life of an asset. These activities can be generally placed into one of three categories: maintenance, rehabilitation and replacement. The following table provides a description of each type of activity and the general difference in cost.

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

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

The 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.

1.2.2 Risk Management Strategies

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

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

This AMP includes a high-level 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.

1.2.3 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 & 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.

1.3 Ontario Regulation 588/17

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

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

2019

Strategic Asset Management Policy

2022

Asset Management Plan for Core Assets with the following components:

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

2024

Asset Management Plan for Core and Non-Core Assets

2025

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

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

1.3.1 O. Reg. 588/17 Compliance Review

The following table identifies the requirements outlined in Ontario Regulation 588/17 for municipalities to meet by July 1, 2024. Next to each requirement a page or section reference is included in addition to any necessary commentary.

Requirement	O. Reg. Section	AMP Section Reference	Status
Summary of assets in each category	S.5(2), 3(i)	4.1.1 - 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 A	Complete
Growth assumptions	S.5(2), 5(i-ii) S.5(2), 6(i-vi)	6.1-6.2	Complete

1.4 Asset Management Roadmap

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

Asset Management Maturity Assessment (Completion Date: February 2020)
The State of Maturity Report provided an audit of the existing asset management capacity and competency. It outlined strategic recommendations to improve the Municipality's asset management program.

Condition Assessment Program Development (Completion Date: October 2019)
Municipality staff received training on the development of condition assessment strategies for municipal assets. This included condition assessment guidelines as well as data collection templates to ensure asset condition data is collected consistently and updated regularly.

Asset Data Review and Refinement (Completion Date: December 2020)
The Road Network inventory was updated based on data provided from the Municipality's most recent Road Need Study. Bridges and Culverts were updated with the most recent OSIM Study. Wastewater main assets were updated using the most recent CCTV inspections. Asset inventory data was refined continuously over the course of this project.

Risk and Criticality Model Development (Completion Date: April 2020)
Risk models were developed to determine the relative criticality of assets based on their probability and consequence of failure. These models assist with the prioritization and ranking of infrastructure needs.

Lifecycle Model Development (Completion Date: May 2020)
The Municipality's lifecycle management strategies were reviewed and documented to determine current practices and identify opportunities for improvement and potential cost avoidance.

Level of Service Framework Development (Completion Date: July 2020)
A framework was developed to determine the current level of service provided to the community through municipal infrastructure.

AMP & Financial Strategy
This document represents the culminating deliverable of the Asset Management Roadmap.

2 Scope and Methodology

Key Insights

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

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

- Accurate and reliable condition data helps to prevent premature and costly rehabilitation or replacement and ensures that lifecycle activities occur at the right time to maximize asset value and useful life

2.1 Assets categories included in this AMP

This asset management plan for the Municipality of South Bruce is produced in compliance with Ontario Regulation 588/17. The July 2022 deadline under the regulation—the first of three AMPs—requires analysis of only core assets (roads, bridges & culverts, water, wastewater, and stormwater). The July 2024 deadline requires analysis of all the Municipality's assets, including non-core assets (buildings, vehicles, machinery & equipment, and land improvement assets).

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 for optimal asset management and performance, and provides financial strategies to reach sustainability for the asset categories listed below.

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

2.2 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.

2.3 Estimated Useful Life

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.

2.4 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:

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

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

2.5 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.

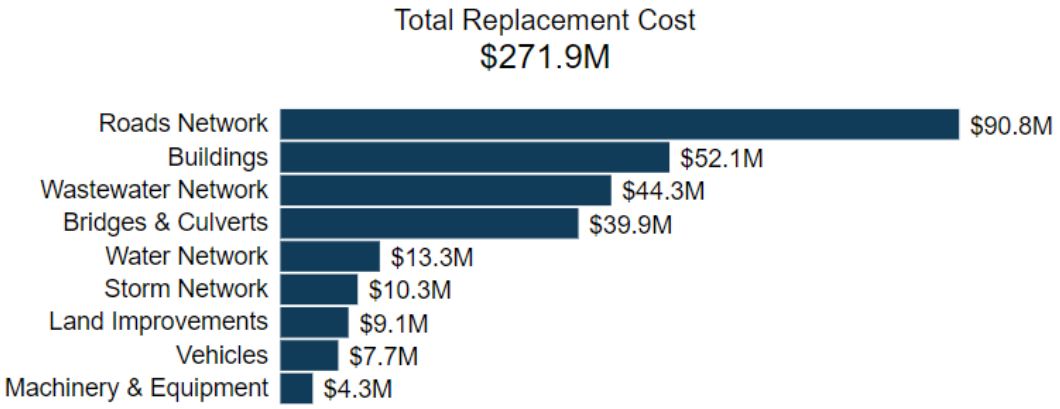
3 Portfolio Overview

Key Insights

- The total replacement cost of the Municipality's asset portfolio is $271.9 million
- The Municipality's target re-investment rate is 3.2%, and the actual re-investment rate is 1.0%, contributing to an expanding infrastructure deficit
- 74% of all assets are in fair or better condition
- Average annual capital requirements total $8.8 million per year across all assets

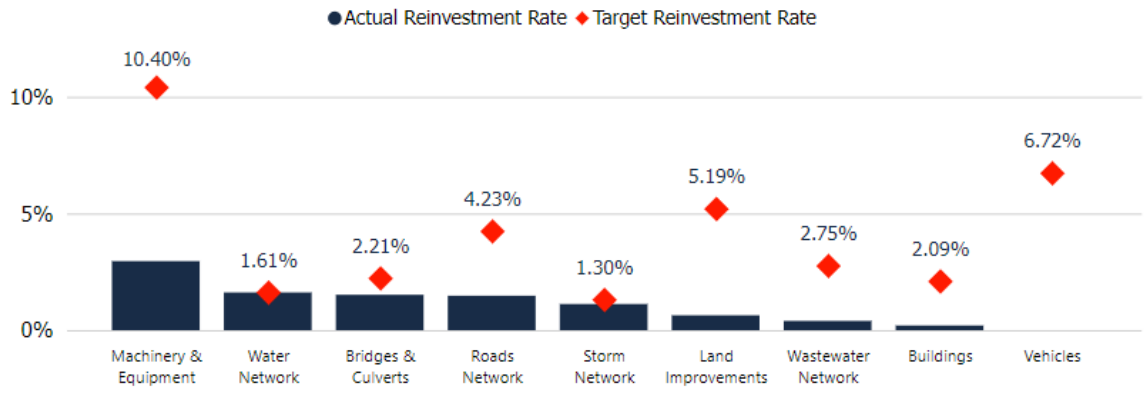
3.1 Total Replacement Cost of Asset Portfolio

The asset categories analyzed in this AMP have a total replacement cost of $271.9 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.



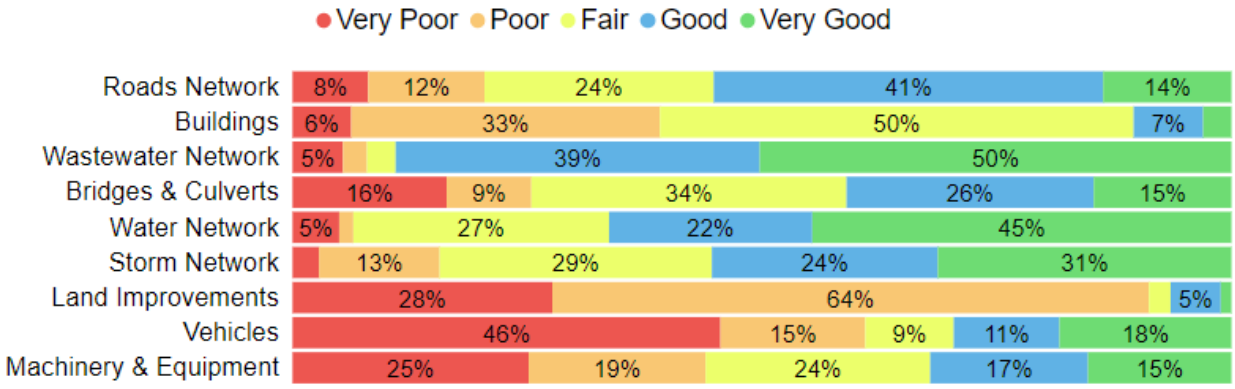
3.2 Target vs. Actual Reinvestment Rate

The graph below depicts funding gaps or surpluses by comparing target vs actual reinvestment rate. To meet the long-term replacement needs, the Municipality should be allocating approximately $8.8 million annually, for a target reinvestment rate of 3.2%. Actual annual spending on infrastructure totals approximately $2.9 million, for an actual reinvestment rate of 1.2%.



3.3 Condition of Asset Portfolio

The current condition of the assets is central to all asset management planning. Collectively, 74% of assets in South Bruce are in fair or better condition. This estimate relies on both age-based and field condition data.



This AMP relies on assessed condition data for 65% 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.

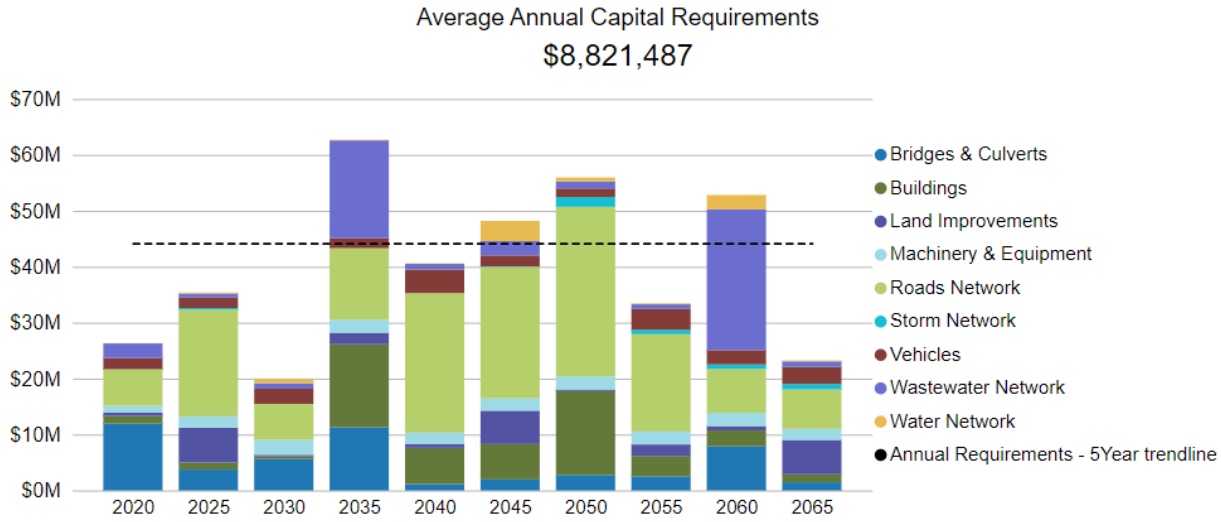
Asset Category	Asset Segment	% of Assets with Assessed Condition	Source of Condition Data
Road Network	Paved Roads	100%	2020 Road Needs Study
Bridges & Culverts	All	100%	2020 Bridge Inspections
Stormwater Network	All	0%	Age-based
Buildings[2]	All	18%	Staff Assessments
Machinery & Equipment	All	40%	Staff Assessments
Vehicles	All	41%	Staff Assessments
Land Improvements	All	43%	Staff Assessments
Water Network	All	8%	Staff Assessments
Wastewater Network	All	19%	Staff Assessments

[2] Building condition assessments are being conducted in 2022 by a third-party contractor for all critical municipal buildings.

3.4 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 50 years. The forecasted requirements are aggregated into 5-year increments and the trend line represents the average 5-year capital requirements.[3]



[3] The current annual requirements do not include the costs of proposed projects such as the new water tower or the expansion of the wastewater treatment plant. These projects are vital to the Municipality's service levels, and will impact future annual requirements.

4 Analysis of Tax-funded Assets

Key Insights

- Tax-funded assets are valued at $214.3 million
- 69% of tax-funded assets are in fair or better condition
- The average annual capital requirement to sustain the current level of service for tax-funded assets is approximately $7.4 million
- Critical assets should be evaluated to determine appropriate risk mitigation activities and treatment options

4.1 Roads Network

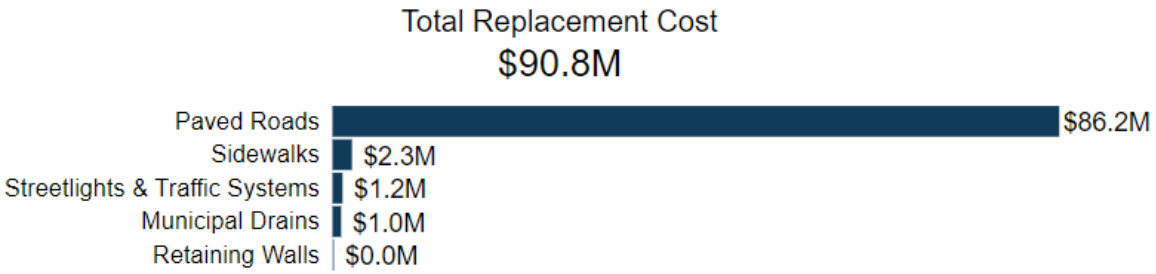
The Road Network is a critical component of the provision of safe and efficient transportation services and represents the highest value asset category in the Municipality's asset portfolio. It includes all municipally owned and maintained roadways in addition to supporting roadside infrastructure including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

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.

4.1.1 Asset Inventory & Replacement Cost

The table below includes the quantity, replacement cost and annual capital requirement of each asset segment in the Municipality's Road Network inventory.

Asset Segment	Quantity	Replacement Cost	Annual Capital Requirement
Gravel Roads	174 kms	Not Planned for Replacement[4]	
Municipal Drains	15[5]	$1,033,000	$26,000
Paved Roads	239 kms	$86,244,000	$3,720,000
Retaining Walls	2	$33,000	$1,000
Sidewalks	12 kms	$2,311,000	$58,000
Streetlights & Traffic Systems	533	$1,197,000	$40,000
		$90,816,000	**$3,844,000**

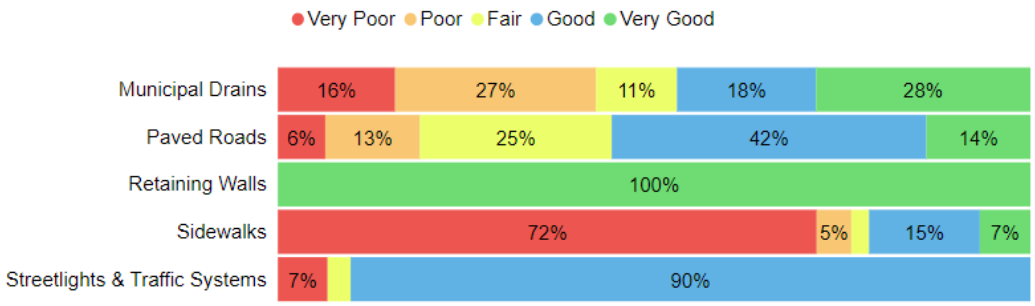


[4] Gravel roads undergo perpetual maintenance, with minimal capital work required.
[5] Municipal staff are working to collect and document a comprehensive inventory of their municipal drains. The roads portions of 16 drains are currently included out of 86 municipal drains.

4.1.2 Asset Condition, Age & Useful Life

The table below identifies the current average condition, average age, and estimated useful life for each asset segment. The Average Condition (%) is a weighted value based on replacement cost. The Estimated Useful Life has been assigned according to a combination of established industry standards and staff knowledge. The Average Age of each asset is based on the number of years each asset has been in-service

Asset Segment	Average Condition (%)	Estimated Useful Life (Years)	Average Age (Years)
Municipal Drains	52% (Fair)	40	21.4
Paved Roads	60% (Good)	15 - 30	27.5
Retaining Walls	86% (Very Good)	40	4.3
Sidewalks	21% (Poor)	40	37.0
Streetlights & Traffic Systems	69% (Good)	30	5.3
	60% (Good)		**23.3**



Current Approach to Condition Assessment

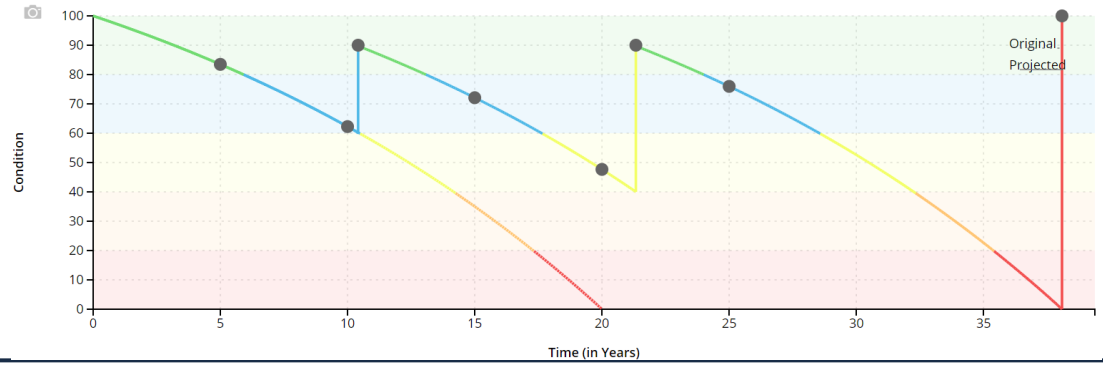
Accurate and reliable condition data allows staff to more confidently determine the remaining service life of assets and identify the most cost-effective approach to managing assets. The following describes the municipality's current approach:

- A Road Needs Study was completed in 2020 that included a detailed condition assessment of each road segment. Between studies, Staff asses their roads on a regular basis during patrols
- Sidewalks and regulatory signs are inspected on an annual basis in accordance with Minimum Maintenance Standards (MMS).
- Other road appurtenances are visually inspected by Staff, as needed.

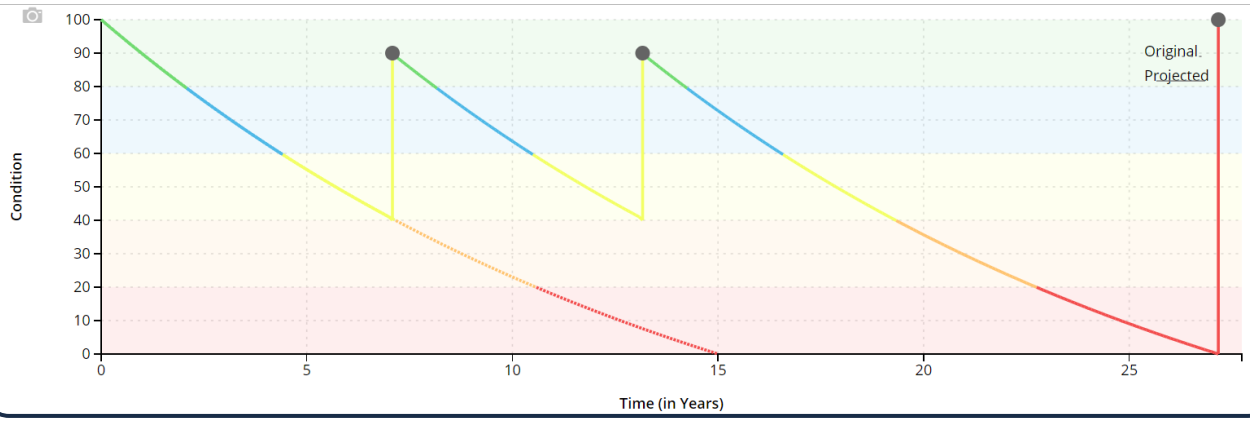
4.1.3 Lifecycle Management Strategy

The condition or performance of most assets will deteriorate over time. This process is affected by a range of factors including an asset's characteristics, location, utilization, maintenance history and environment. The following lifecycle strategies have been developed as a proactive approach to managing the lifecycle of paved roads. Instead of allowing the roads to deteriorate until replacement is required, strategic rehabilitation is expected to extend the service life of roads at a lower total cost. These lifecycle strategies incorporate staff expertise and third-party recommendations (latest road needs study available).

Paved Roads (Asphalt)		
Event Name	**Event Class**	**Event Trigger**
Crack Sealing	Maintenance	5 Years (Repeated)
Pulverize and Pave (Rural or Semi-Urban roads)	Rehabilitation	30%-50% Condition
Mill and Pave (Urban roads)	Rehabilitation	30%-50% Condition
Reconstruction	Reconstruction	<30% Condition



Paved Roads (Surface Treated)		
Event Name	**Event Class**	**Event Trigger**
Double Surface Treatment	Rehabilitation	30%-50% Condition
Single Surface Treatment	Rehabilitation	70%-80% Condition
Full Reconstruction	Reconstruction	<30% Condition



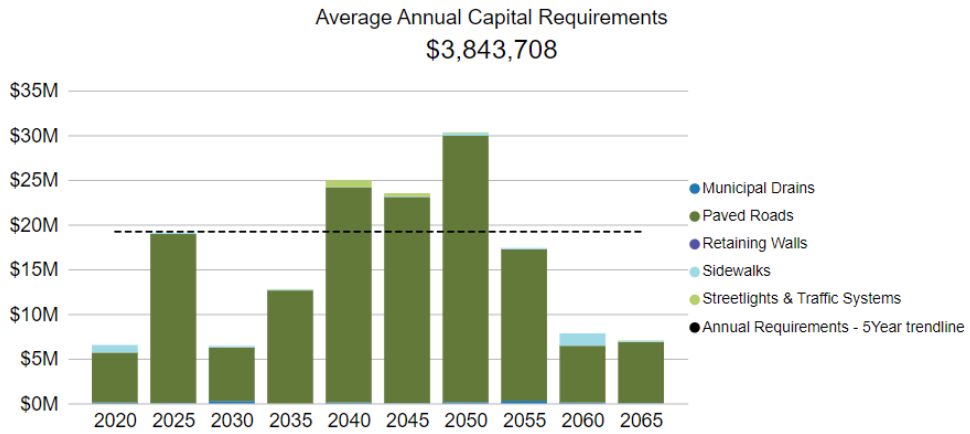
The following table outlines the Municipality's current lifecycle management strategy.

Activity Type	Description of Current Strategy
Maintenance	Pothole patching is applied as per Minimum Maintenance Standards (MMS) requirements to repair and prevent pothole formations.
	The Municipality conducts several seasonal maintenance activities. Summer mainteance activities include sidewalk repairs, grading, re-gravelling, dust control, brushing, ditching, road sign installation/maintenance, and line painting. Winter maintenance activities include snow plowing and slating.
Rehabilitation/ Replacement	Pavement re-surfacing is applied to deteriorating road surfaces in an effort to extend the life of road assets and prevent the need for full road reconstruction.
	Road replacement prioritization is determined by condition, recommendations from road needs studies, criticality, coordination with underground infrastructure, and growth opportunities.
	Other road assets are replaced on an as-needed basis.

Forecasted Capital Requirements

Based on the lifecycle strategies identified previously for paved 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.

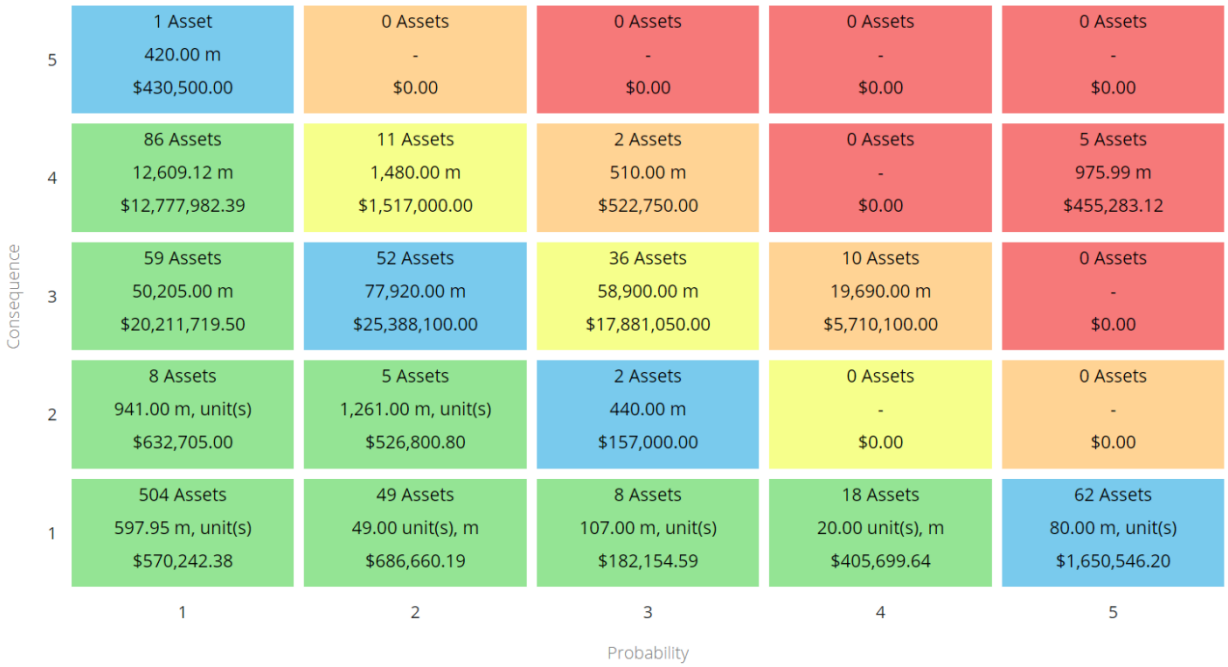
The annual capital requirement represents the average amount per year that the Municipality should allocate towards funding rehabilitation and replacement needs to meet future capital needs. The following graph identifies capital requirements over the next 50 years. The forecasted requirements are aggregated into 5-year increments and the trend line represents the average 5-year 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 A.

4.1.4 Risk & Criticality

The following risk matrix provides a visual representation of the relationship between the probability of failure and the consequence of failure for the assets within this asset category based on 2021 inventory data.



Some of the asset-specific attributes that Staff utilize when prioritizing/defining the criticality of their Road Network are documented below:

Probability of Failure (POF)	Consequence of Failure (COF)
Condition	Replacement Cost (Financial)
Average Daily Traffic Counts	Road Environment (Operational)
Drainage Adequacy	Road Classification (Operational)
	Winter Maintenance (Social)

4.1.5 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.

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)
Accessible & Reliable	Description, which may include maps, of the road network in the municipality and its level of connectivity	See Appendix B
Sustainable	Description or images that illustrate the different levels of road class pavement condition	Municipal roads receive a Pavement Condition Index (PCI) score from 0-100 based on a combination of distress issues and ride comfort ratings. The PCI scores are used to inform a recommended timeframe for maintenance, rehabilitation, or replacement. (80-100 PCI) – Roads are considered in very good condition, with minimal maintenance required. (70-80 PCI) – Roads are considered in fair-good condition with major rehabilitation required in 6-10 years. (50-70 PCI) – Roads are considered in poor-fair condition with major rehabilitation required in 1 to 5 years. (<50 PCI) – Roads are considered in poor-very poor condition requiring resurfacing or major rehabilitation within 2 years.

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)
Accessible & Reliable[6]	Lane-km of arterial roads (MMS classes 1 and 2) per land area (km/km^2)	0 km / 487 km^2
	Lane-km of collector roads (MMS classes 3 and 4) per land area (km/km^2)	572 km / 487 km^2
	Lane-km of local roads (MMS classes 5 and 6) per land area (km/km^2)	229 km / 487 km^2
Sustainable	Average pavement condition index for paved roads in the municipality	60%
	Average surface condition for unpaved roads in the municipality	75%
	Average condition for sidewalks in the municipality	21%

[6] For any road segments missing lane information, 2 lanes were assumed for those roads.

4.1.6 Recommendations

Asset Inventory

- Review road network inventory, particularly road segments and sidewalks, to ensure all municipal assets are accounted for.
- The sidewalk inventory includes several pooled assets that should be broken into discrete segments to allow for more detailed planning and analysis.
- Critical asset attribute information such as traffic counts should be collected on a regular basis, in a staggered approach over a few years, to augment risk and lifecycle strategies.

Condition Assessment Strategies

- Road Needs Studies should be completed every 5-7 years, when possible, to maintain the reliability and accuracy of asset management planning.

Lifecycle Management Strategies

- Evaluate the efficacy of the Municipality's lifecycle management strategies at regular intervals to determine the impact cost, condition and risk. Update and apply the recommended activities from road needs studies to each road segment to account for all possible lifecycle costs.

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.

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.

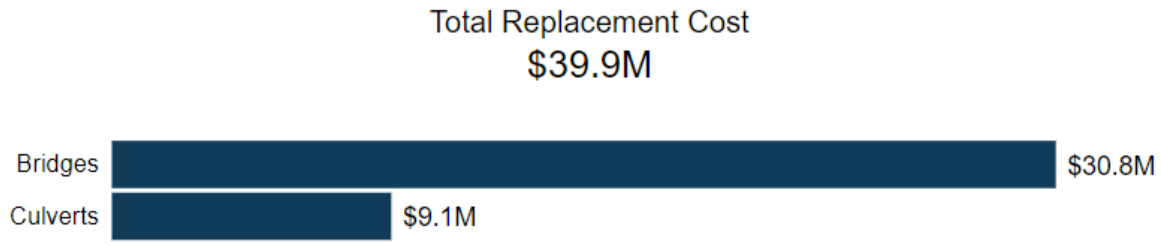
4.2 Bridges & Culverts

Bridges & Culverts represent a critical portion of the transportation services provided to the community. Public Works staff are 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.

4.2.1 Asset Inventory & Replacement Cost

The table below includes the quantity, replacement cost and annual capital requirement of each asset segment in the Municipality's Bridges & Culverts inventory.

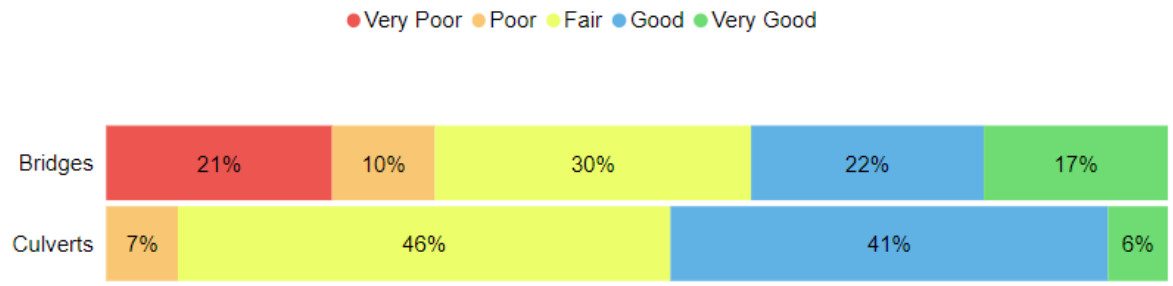
Asset Segment	Quantity (components)	Replacement Cost	Annual Capital Requirement
Bridges	26 (88)	$30,770,000	$706,000
Culverts	16	$9,109,000	$177,000
		$39,879,000	**$883,000**



4.2.2 Asset Condition, Age & Useful Life

The table below identifies the current average condition, average age, and estimated useful life for each asset segment. The Average Condition (%) is a weighted value based on replacement cost. The Estimated Useful Life has been assigned according to a combination of established industry standards and staff knowledge. The Average Age of each asset is based on the number of years each asset has been in-service

Asset Segment	Average Condition (%)	Estimated Useful Life (Years)	Average Age (Years)
Bridges	56% (Fair)	30 - 80	61.1
Culverts	65% (Fair)	50 - 80	31.7
	58% (Fair)		**56.2**



To ensure that the Municipality's Bridges & Culverts 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 Bridges & Culverts.

Current Approach to Condition Assessment

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

- Inspections of bridges and culverts, with a span greater than or equal to 3 meters, are completed every 2-4 years in accordance with the Ontario Structure Inspection Manual (OSIMs). Staff visually assess assets between OSIMs to ensure they are functioning as expected.

4.2.3 Lifecycle Management Strategy

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

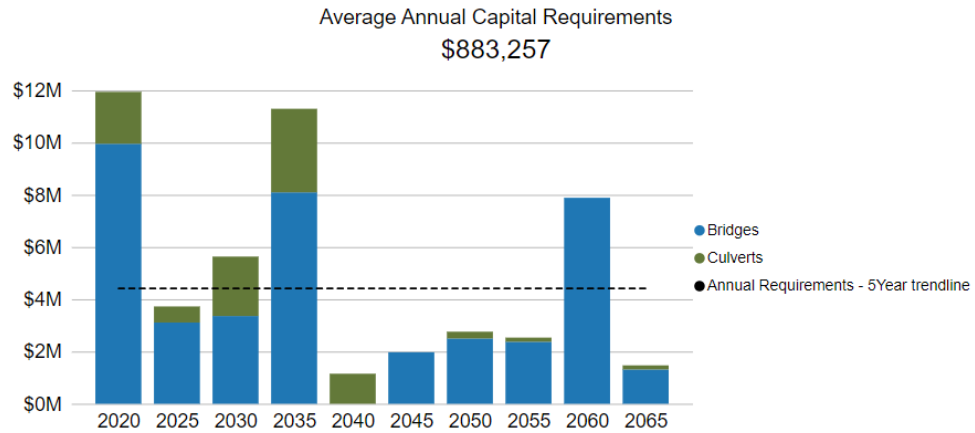
The following table outlines the Municipality's current lifecycle management strategy.

Activity Type	Description of Current Strategy
Maintenance, Rehabilitation and Replacement	All lifecycle activities are driven primarily by the results of mandated structural inspections competed according to the Ontario Structure Inspection Manual (OSIMs) Staff perform regular maintenace activiteis such as sweeping and dust control on bridge and culvert structure, as needed.

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 annual capital requirement represents the average amount per year that the Municipality should allocate towards funding rehabilitation and replacement needs to meet future capital needs. The following graph identifies capital requirements over the next 50 years. The forecasted requirements are aggregated into 5-year increments and the trend line represents the average 5-year 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 A.

4.2.4 Risk & Criticality

The following risk matrix provides a visual representation of the relationship between the probability of failure and the consequence of failure for the assets within this asset category based on 2021 inventory data.

Some of the asset-specific attributes that Staff utilize when prioritizing/defining the criticality of their Bridges & Culverts are documented below:

Probability of Failure (POF)	Consequence of Failure (COF)
Condition	Replacement Cost (Financial)
Service Life Remaining	Recommended Work (Operational)
Structure Type	Detour Distance (Social)

4.2.5 Levels of Service

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

Community Levels of Service

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

Service Attribute	Qualitative Description	Current LOS (2021)
Accessible & Reliable	Description of the traffic that is supported by municipal bridges (e.g. heavy transport vehicles, motor vehicles, emergency vehicles, pedestrians, cyclists)	Bridges and structural culverts are a key component of the municipal transportation network. Only 8 of the municipality's structures have loading or dimensional restrictions meaning that most types of vehicles, including heavy transport, motor vehicles, emergency vehicles and cyclists can cross them without restriction.
Sustainable	Description or images of the condition of bridges & culverts and how this would affect use of the bridges & culverts	See Appendix B

Technical Levels of Service

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

Service Attribute	Technical Metric	Current LOS (2021)
Accessible & Reliable	% of bridges in the Municipality with loading or dimensional restrictions	20%
Sustainable	Average bridge condition index value for bridges in the Municipality	56
	Average bridge condition index value for structural culverts in the Municipality	65

4.2.6 Recommendations

Data Review/Validation

- Continue to review and validate inventory data, assessed condition data and replacement costs for all bridges and structural culverts upon the completion of OSIM inspections every 2-4 years.

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.

Lifecycle Management Strategies

- This AMP includes capital costs associated with the rehabilitation and/or reconstruction of bridges and culverts. The Municipality should continue to upload and refine its capital projections and integrate these costs whenever available to improve their long-term planning.

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.

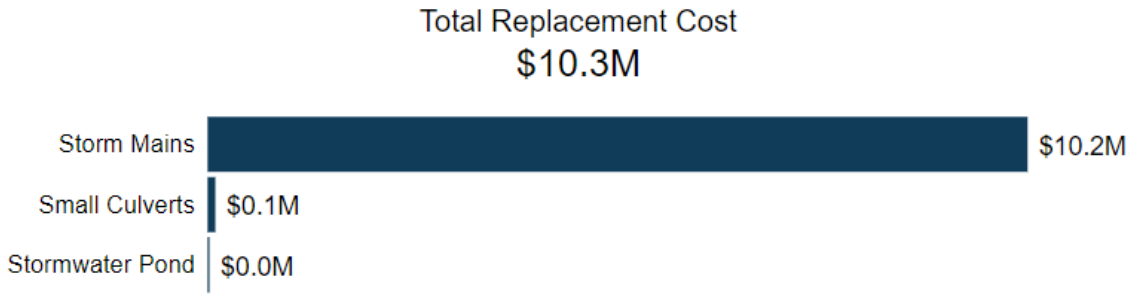
4.3 Storm Network

The Municipality is responsible for maintaining a stormwater network of storm mains, small culverts, stormwater management ponds, and other supporting infrastructure. Staff are working towards improving the accuracy and reliability of their inventory to assist with long-term asset management planning.

4.3.1 Asset Inventory & Replacement Cost

The table below includes the quantity, replacement cost and annual capital requirement of each asset segment in the Municipality's Storm Network inventory.

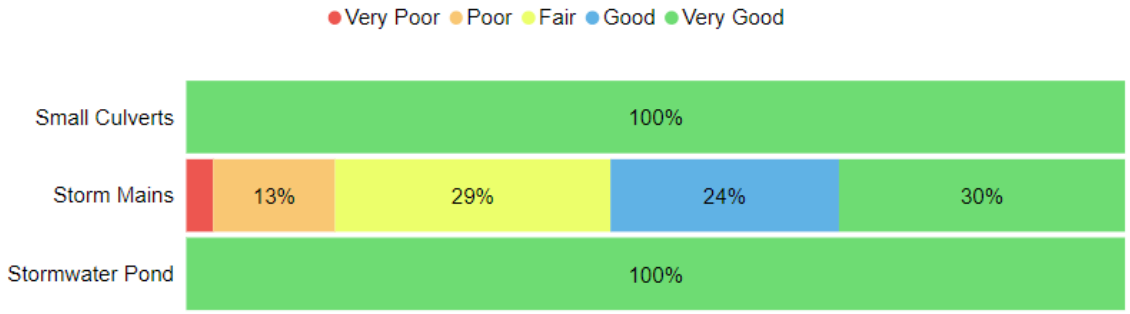
Asset Segment	Quantity	Replacement Cost	Annual Capital Requirement
Small Culverts	11	$97,000	$1,500
Storm Mains	15 km	$10,230,000	$132,000
Stormwater Ponds	3	$23,000	$1,000
		$10,349,000	**$134,000**



4.3.2 Asset Condition, Age & Useful Life

The table below identifies the current average condition, average age, and estimated useful life for each asset segment. The Average Condition (%) is a weighted value based on replacement cost. The Estimated Useful Life has been assigned according to a combination of established industry standards and staff knowledge. The Average Age of each asset is based on the number of years each asset has been in-service

	Average Condition (%)	Estimated Useful Life (Years)	Average Age (Years)
Small Culverts	85% (Very Good)	50	6.9
Storm Mains	66% (Good)	75	26.7
Stormwater Pond	98% (Very Good)	75	12.3
	66% (Good)		**26.1**



To ensure that the Municipality's Storm 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 Storm Network.

Current Approach to Condition Assessment

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

- There are no formal condition assessment programs in place for the stormwater network. CCTV inspections are completed on a project-by-project basis
- Other non-linear storm assets are regularly inspected by internal staff.

4.3.3 Lifecycle Management Strategy

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

The following lifecycle strategies have been developed as a proactive approach to managing the lifecycle of storm mains. Instead of allowing the storm mains to deteriorate until replacement is required, trenchless re-lining methods can minimize service disruption and additional social costs that are typically associated with open cut replacement methods. These costs should also be factored into the Municipality's asset management decision-making process. The Municipality may consider high risk mains (e.g. near failure and/or large diameter) under relatively new road services as strong candidates for a relining program.

Storm Mains		
Event Name	**Event Class**	**Event Trigger**
CCTV Inspection	Maintenance	10-15 Years (Repeated)
Flushing/Cleaning	Preventative Maintenance	5 Years (Repeated)
Trenchless Relining	Rehabilitation	20%-40% Condition
Asset Replacement	Reconstruction	0% Condition

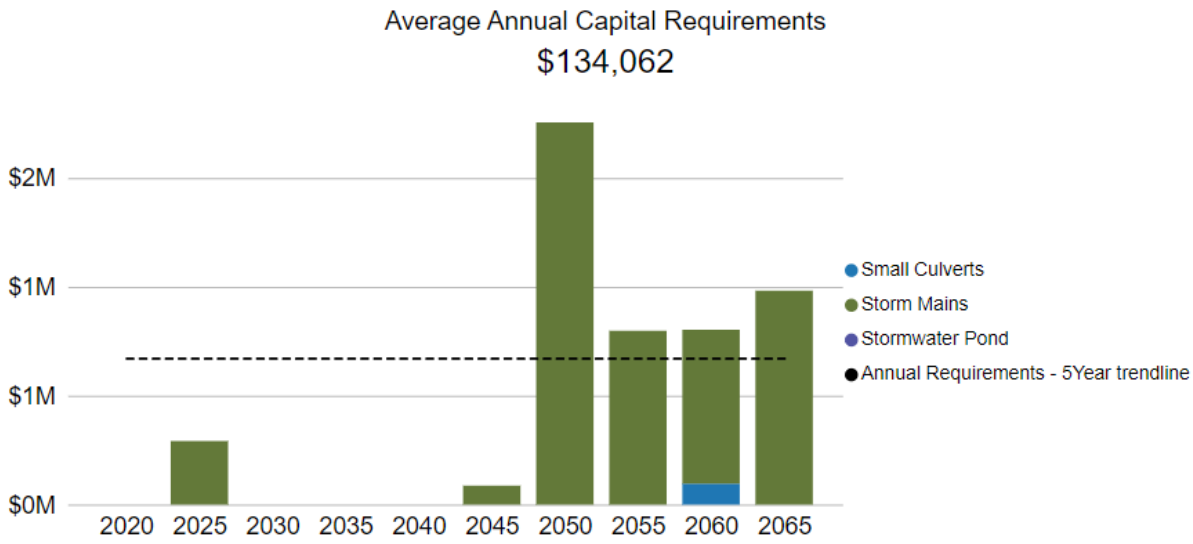
The following table outlines the Municipality's current lifecycle management strategy.

Activity Type	Description of Current Strategy
Maintenance	CCTV inspections occur on select storm mains on a project basis
	System flushing is usually performed on an as needed basis, such as when blockages occur
	Catch basins are inspected and cleaned regularly to avoid blockages
	Stormwater management ponds are maintained and repaired as needed.
Rehabilitation/ Replacement	Replacement projects are prioritized primarily by age and in coordination with road and other underground projects
	Staff are considering proactive re-lining rehabilitation for future projects involving high risk mains

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 annual capital requirement represents the average amount per year that the Municipality should allocate towards funding rehabilitation and replacement needs to meet future capital needs. The following graph identifies capital requirements over the next 50 years. The forecasted requirements are aggregated into 5-year increments and the trend line represents the average 5-year 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 A.

4.3.4 Risk & Criticality

The following risk matrix provides a visual representation of the relationship between the probability of failure and the consequence of failure for the assets within this asset category based on 2021 inventory data.

Some of the asset-specific attributes that Staff utilize when prioritizing/defining the criticality of their storm mains are documented below:

Probability of Failure (POF)	Consequence of Failure (COF)
Condition	Replacement Cost (Financial)
Service Life Remaining	Average Daily Traffic Counts (Operational)
	Proximity to Critical Services (Operational)
	Diameter Size (Social)

4.3.5 Levels of Service

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

Community Levels of Service

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

Service Attribute	Qualitative Description	Current LOS (2021)
Accessible & Reliable	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 B

Technical Levels of Service

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

Service Attribute	Technical Metric	Current LOS (2021)
Safe & Regulatory	% of properties in municipality resilient to a 100-year storm	TBD[7]
	% of the municipal stormwater management system resilient to a 5-year storm	TBD
Sustainable	% of the stormwater network that is in good or very good condition	56%
	% of the stormwater network that is in poor or very poor condition	16%

[7] The Municipality does not currently have data available to determine this technical metric. The number of properties that are expected to be resilient to a 100-year storm is expected to be low.

4.3.6 Recommendations

Asset Inventory

- The Municipality's Storm 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 priority.

Condition Assessment Strategies

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

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.

Lifecycle Management Strategies

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

Levels of Service

- Continue to measure current levels of service in accordance with the metrics 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.

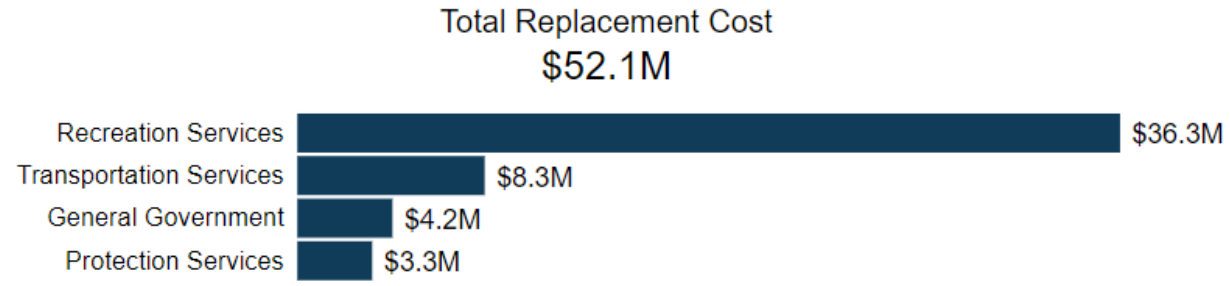
4.4 Buildings

The Municipality is responsible for various facilities, including fire halls, libraries, municipal office, arenas, etc. Although some of the more critical buildings are segmented into the major components that make up a building (i.e. HVAC, mechanical, roof/exterior), the Municipality does not currently have a formal or consistent approach to componentizing their buildings. Staff will be conducting a building condition assessment on all critical buildings to obtain a componentized inventory, along with condition ratings and renewal/rehabilitation costs.

4.4.1 Asset Inventory & Replacement Cost

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

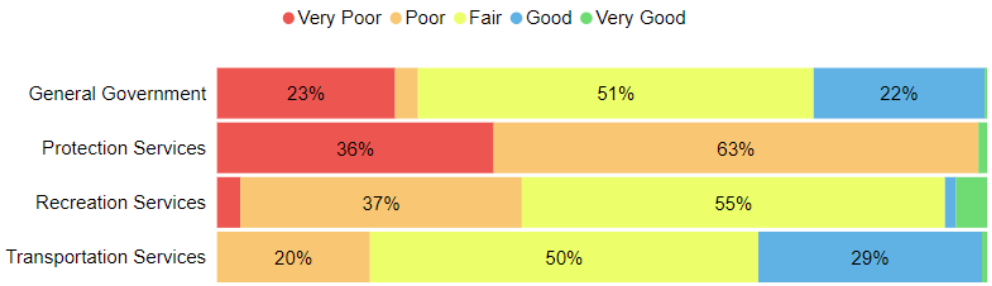
Asset Segment	Quantity (components)	Replacement Cost	Annual Capital Requirement
General Government	8	$4,197,000	$84,000
Protection Services	2 (5)	$3,303,000	$67,000
Recreation Services	21 (42)	$36,300,000	$770,000
Transportation Services	8 (10)	$8,265,000	$166,000
		$52,063,000	**$1,086,000**



4.4.2 Asset Condition, Age & Useful Life

The table below identifies the current average condition, average age, and estimated useful life for each asset segment. The Average Condition (%) is a weighted value based on replacement cost. The Estimated Useful Life has been assigned according to a combination of established industry standards and staff knowledge. The Average Age of each asset is based on the number of years each asset has been in-service.[8]

Asset Segment	Average Condition (%)	Estimated Useful Life (Years)	Average Age (Years)
General Government	42% (Fair)	50	31.1
Protection Services	27% (Poor)	30 - 50	17.5
Recreation Services	46% (Fair)	10 - 50	19.1
Transportation Services	52% (Fair)	25 - 50	29.2
	45% (Fair)		**22.0**



To ensure that the Municipality's Buildings 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 Buildings.

[8] Staff are conducting building condition assessments in 2022 to override the age-based assessments used in this AMP.

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:

- Health and safety inspections are carried out on a monthly basis.
- Critical components such as elevators, generators, and HVAC units are inspected by third-party contractors on a monthly and/or annual basis as recommended by manufacturer suggestions.
- Staff visually inspect their building assets, on a regular basis, to inform their capital and operating planning.

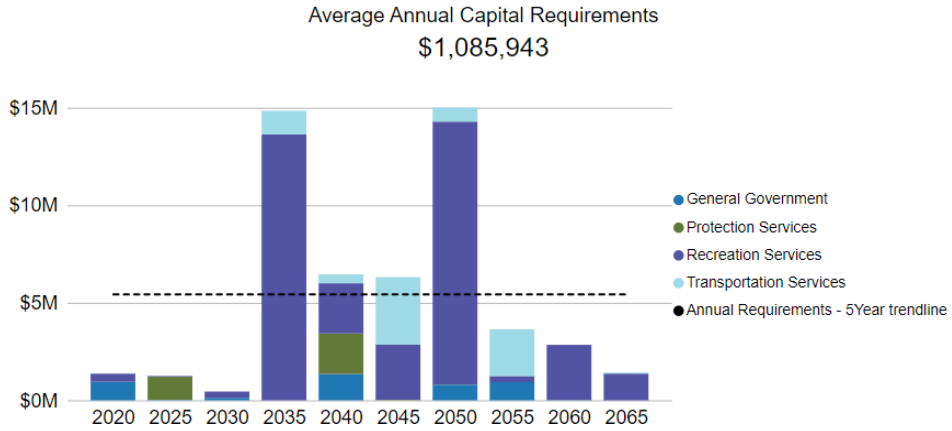
4.4.3 Lifecycle Management Strategy

The condition or performance of most assets will deteriorate over time. To ensure that municipal assets are performing as expected and meeting the needs of customers, it is important to establish a lifecycle management strategy to proactively manage asset deterioration. Lifecycle activities are primarily directed from health & safety, and regulatory requirements. Activities that are not mandated are derived from an operational budget and undertaken as issues arise. The following table outlines the Municipality's current lifecycle management strategy.

Activity Type	Description of Current Strategy
Maintenance	Health and safety, workplace, and elevator inspections are carried out internally on a monthly basis
	Maintenance activities are undertaken as a result of internal inspections, prioritizing activities related to health and safety and regulatory compliance
	HVAC systems are inspected annually by a third-party contractor
Rehabilitation/ Replacement	Assessments are completed strategically as buildings approach their end-of-life to determine whether replacement or rehabilitation is a more appropriate treatment option

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 annual capital requirement represents the average amount per year that the Municipality should allocate towards funding rehabilitation and replacement needs to meet future capital needs. The following graph identifies capital requirements over the next 50 years. This projection is used as it ensures that every asset has gone through one full iteration of replacement. The forecasted requirements are aggregated into 5-year increments and the trend line represents the average 5-year 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 A.

4.4.4 Risk & Criticality

The following risk matrix provides a visual representation of the relationship between the probability of failure and the consequence of failure for the assets within this asset category based on 2021 inventory data.

Some of the asset-specific attributes that Staff utilize when prioritizing/defining the criticality of their Buildings are documented below:

Probability of Failure (POF)	Consequence of Failure (COF)
Condition	Replacement Cost (Financial)
	Function (Strategic)

4.4.5 Levels of Service

The following tables identify the Municipality's current level of service for Buildings. These metrics include the technical and community level of service performance measures that the Municipality has selected to track.

Community Levels of Service

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

Service Attribute	Qualitative Description	Current LOS (2021)
Safe & Regulatory	Description of the current condition of municipal buildings and the plans that are in place to maintain or improve the provided level of service	The average condition of the Municipality's buildings is Fair (45%) based on a mix of age-based and assessed condition information. Staff undertake regular maintenance and renewal activities to ensure they are meeting the desired level of service.

Technical Levels of Service

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

Service Attribute	Technical Metric	Current LOS (2021)
Sustainable	% of facilities that are in good or very good condition	11%
	% of facilities that are in poor or very poor condition	39%

4.4.6 Recommendations

Asset Inventory

- The Municipality's building inventory is not currently componentized into the major elements (i.e. roofing, HVAC, electrical, etc) which reduces staff's ability to plan capital repairs and replacements proactively and effectively. Staff will be working towards a component-based inventory of all critical facilities to allow for more accurate lifecycle planning.
- Almost half of the replacement costs used for the buildings inventory are based on historical inflation. Going forward, replacement costs will require regular review and update (through insurance appraisals, building condition assessments or unit cost estimates) to ensure they are accurate and reliable.

Condition Assessment Strategies

- Staff should conduct Building Condition Assessments (BCAs) on their critical buildings every 10-15 years. As a best practice, data should be collected utilizing the Uniformat Code Classification Level Three is recommended.

Risk and Lifecycle Management Strategies

- Review risk models on a regular basis and adjust according to an evolving understanding of the probability and consequences of asset failure.
- Develop a 5-10 year proactive facilities replacement/rehabilitation plan, utilizing existing inspection information.

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.

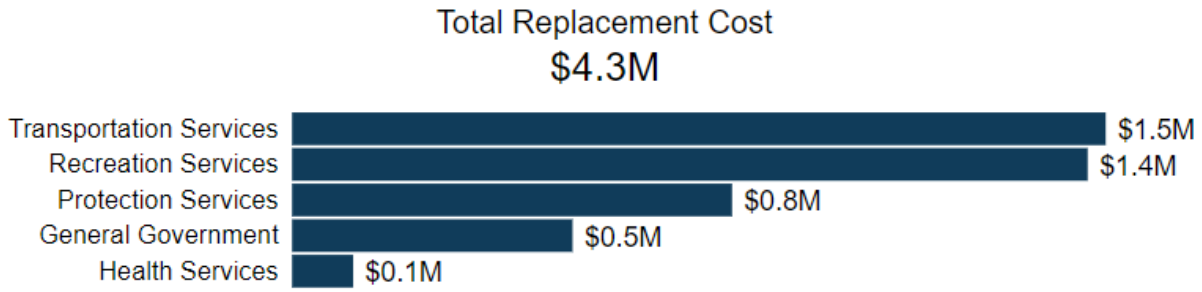
4.5 Machinery & Equipment

The Municipality is responsible for managing equipment assets, including machinery, general equipment, computer hardware and software, and furniture.

4.5.1 Asset Inventory & Replacement Cost

The following table includes the quantity, replacement cost and annual capital requirement of each asset segment in the Municipality's Machinery & Equipment inventory.

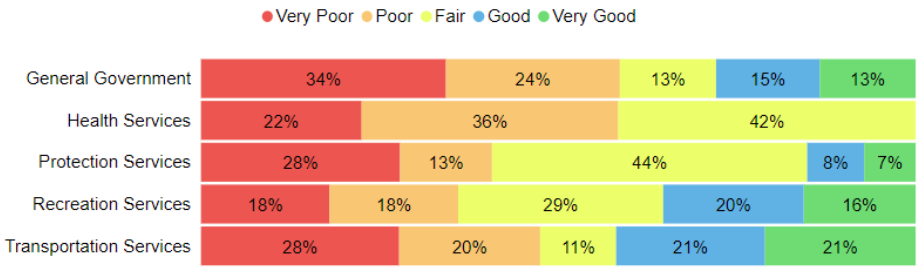
Asset Segment	Quantity	Replacement Cost	Annual Capital Requirement
General Government	135	$508,000	$75,000
Health Services	17	$111,000	$7,000
Protection Services	619	$796,000	$163,000
Recreation Services	827	$1,440,000	$97,000
Transportation Services	57	$1,472,000	$110,000
		$4,325,000	**$450,000**



4.5.2 Asset Condition, Age & Useful Life

The table below identifies the current average condition, average age, and estimated useful life for each asset segment. The Average Condition (%) is a weighted value based on replacement cost. The Estimated Useful Life has been assigned according to a combination of established industry standards and staff knowledge. The Average Age of each asset is based on the number of years each asset has been in-service

Asset Segment	Average Condition (%)	Estimated Useful Life (Years)	Average Age (Years)
General Government	37% (Poor)	5 - 25	7.7
Health Services	39% (Poor)	10 - 20	9.3
Protection Services	40% (Fair)	10 - 40	8.5
Recreation Services	49% (Fair)	5 - 25	9.0
Transportation Services	44% (Fair)	10 - 40	8.7
	44% (Fair)		**8.4**



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

Current Approach to Condition Assessment

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

- Machinery & Equipment is inspected regularly by internal staff, with more critical assets such as Public Works and Fire equipment being prioritized.

4.5.3 Lifecycle Management Strategy

The condition or performance of most assets will deteriorate over time. To ensure that municipal assets are performing as expected and meeting the needs of customers, it is important to establish a lifecycle management strategy to proactively manage asset deterioration. Lifecycle activities are generally prioritized by criticality, cost, and Health and Safety and regulatory requirements.

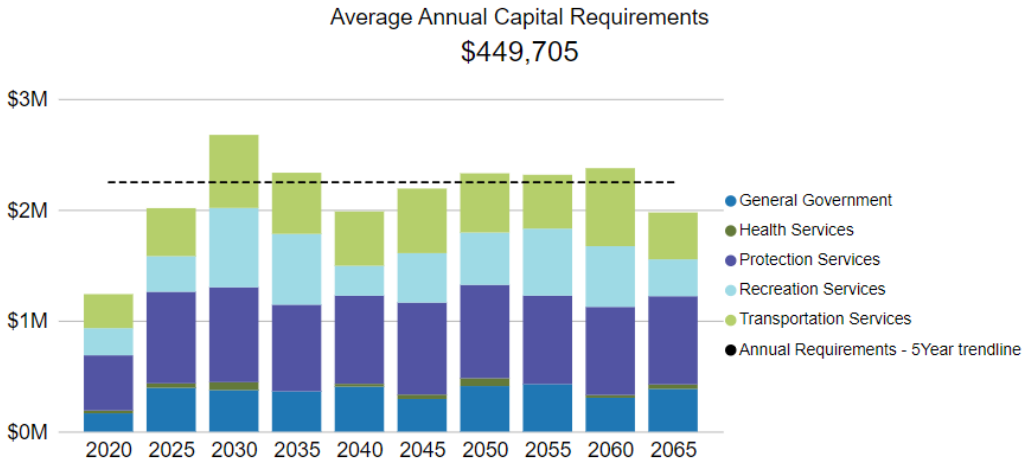
The following table outlines the Municipality's current lifecycle management strategy.

Activity Type	Description of Current Strategy
Maintenance	Maintenance activities vary by department and type of asset in question. Some assets are replaced at end-of-life with no maintenance whereas more critical assets, such as Fire equipment, are inspected and maintained more stringently.
	Fire equipment (e.g. self-contained breathing apparatuses) is tested annually, based on National Fire Protection Association (NFPA) requirements.
Rehabilitation/Replacement	The rehabilitation and/or replacement of machinery & equipment assets depends on their criticality, performance, and budget constraints.
	Heavy equipment is generally replaced based on operating hours.

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

The following graph identifies capital requirements over the next 40 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 increments and the trend line represents the average 5-year 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 A.

4.5.4 Risk & Criticality

The following risk matrix provides a visual representation of the relationship between the probability of failure and the consequence of failure for the assets within this asset category based on 2021 inventory data.

Some of the asset-specific attributes that Staff utilize when prioritizing/defining the criticality of their Machinery & Equipment are documented below:

Probability of Failure (POF)	Consequence of Failure (COF)
Condition	Replacement Cost (Financial)
	Function (Strategic)

4.5.5 Levels of Service

The following tables identify the Municipality's current level of service for Machinery & Equipment. These metrics include the technical and community level of service performance measures that the Municipality has selected to track.

Community Levels of Service

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

Service Attribute	Qualitative Description	Current LOS (2021)
Sustainable	Description of the current condition of machinery & equipment and the plans that are in place to maintain or improve the provided level of service	The average condition of the machinery and equipment assets is Fair (50%). Assets are maintained proactively depending on their criticality to the municipality's operation.

Technical Levels of Service

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

Service Attribute	Technical Metric	Current LOS (2021)
Sustainable	% of machinery & equipment that is in good or very good condition	34%
	% of machinery & equipment that is in poor or very poor condition	44%

4.5.6 Recommendations

Data and Asset Information

- The replacement cost values are a mix of user-defined costs and historical inflation. These costs should be evaluated regularly to determine their accuracy in today's current market/construction prices.
- Many of the machinery & equipment assets (i.e. computers, monitors) can be pooled together to refine the inventory and simplify its management.

Condition Assessment Strategies

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

Risk and Lifecycle Management Strategies

- Review risk models on a regular basis and adjust according to an evolving understanding of the probability and consequences of asset failure.
- Install a replacement cycle strategy for specialized equipment based on assessed condition or manufacturer recommendations.

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.

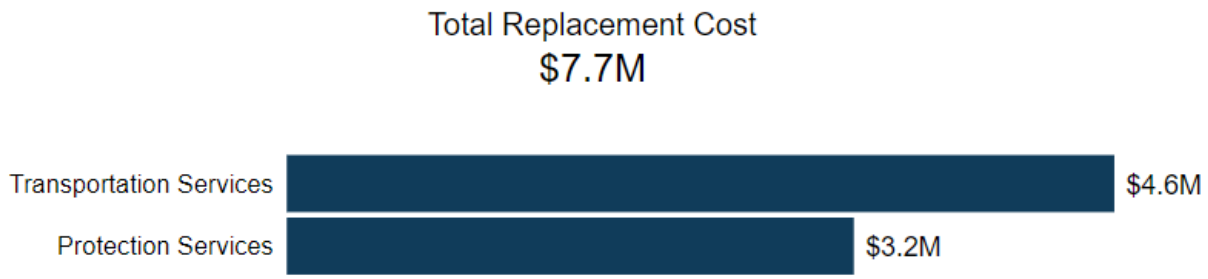
4.6 Vehicles

The Municipality is responsible for managing vehicles across Transportation and Protective Services.

4.6.1 Asset Inventory & Replacement Cost

The table below includes the quantity, replacement cost and annual capital requirement of each asset segment in the Municipality's Vehicles.

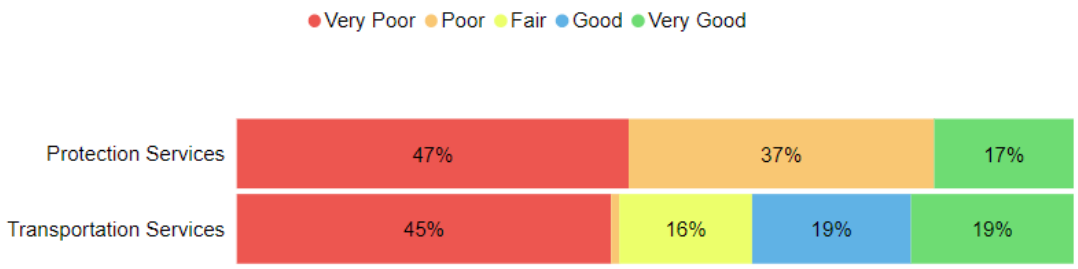
Asset Segment	Quantity	Replacement Cost	Annual Capital Requirement
Protection Services	9	$3,150,000	$165,000
Transportation Services	20	$4,597,000	$357,000
		$7,747,000	**$521,000**



4.6.2 Asset Condition, Age & Useful Life

The table below identifies the current average condition, average age, and estimated useful life for each asset segment. The Average Condition (%) is a weighted value based on replacement cost. The Estimated Useful Life has been assigned according to a combination of established industry standards and staff knowledge. The Average Age of each asset is based on the number of years each asset has been in-service

Asset Segment	Average Condition (%)	Estimated Useful Life (Years)	Average Age (Years)
Protection Services	26% (Poor)	7 - 25	15.4
Transportation Services	41% (Poor)	6 - 20	8.6
	35% (Poor)		**10.7**



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.

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:

- Vehicles are inspected in accordance with Commercial Vehicle Operators Registration (CVOR) annually
- Fire vehicles are inspected by the fire technician to comply with National Fire Protection Association (NFPA) standards
- Vehicles that are nearing their end-of-life are inspected more frequently and proactive plans are put in place to rehabilitate or replace the assets strategically.

4.6.3 Lifecycle Management Strategy

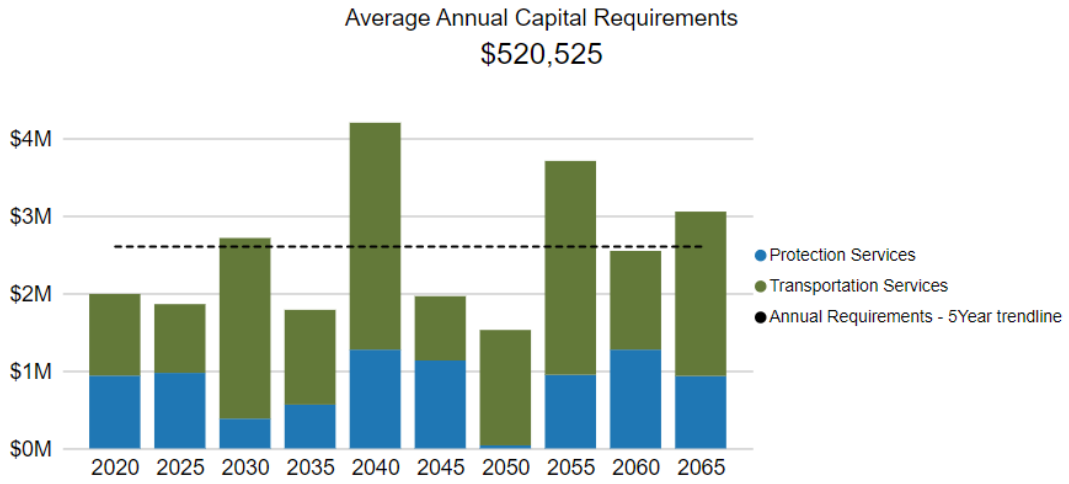
The condition or performance of most assets will deteriorate over time. To ensure that municipal assets are performing as expected and meeting the needs of customers, it is important to establish a lifecycle management strategy to proactively manage asset deterioration. The following table outlines the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

Activity Type	Description of Current Strategy
Maintenance	Visual staff inspections are conducted daily
	Regular maintenance is conducted on the vehicles to ensure they live to their maximum useful life
	Vehicles are inspected two years before the scheduled replacement date to extend service life where it is feasible to do so
	Pumps on Fire Trucks are tested annually based on the National Fire Protection Association (NFPA) requirements
Rehabilitation/ Replacement	Major rehabilitations or replacements are conducted based on the vehicles' performance, mileage, criticality, and budget restraints.

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 annual capital requirement represents the average amount per year that the Municipality should allocate towards funding rehabilitation and replacement needs to meet future capital needs. The following graph identifies capital requirements over the next 50 years. This projection is used as it ensures that every asset has gone through one full iteration of replacement. The forecasted requirements are aggregated into 5-year increments and the trend line represents the average 5-year 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 A.

4.6.4 Risk & Criticality

The following risk matrix provides a visual representation of the relationship between the probability of failure and the consequence of failure for the assets within this asset category based on 2021 inventory data.

Some of the asset-specific attributes that Staff utilize when prioritizing/defining the criticality of their Vehicles are documented below:

Probability of Failure (POF)	Consequence of Failure (COF)
Condition	Replacement Cost (Financial)
	Function (Strategic)

4.6.5 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 performance measures that the Municipality has selected to track.

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)
Safe & Reliable	Description of vehicles inspection process and any licensing requirements for operators	Fire vehicles are inspected in reference to vehicle manuals and in accordance with the guidelines set by the National Fire Protection Association (NFPA). The transportation vehicles abide by the Commercial Vehicle Operator's Registration (CVOR) and are inspected and maintained by a certified mechanic.
Sustainable	Description of the current condition of municipal vehicles and the plans that are in place to maintain or improve the provided level of service	Vehicles are in an adequare state of repair. Regular maintenance and rehabilitation activities such as servicing or engine refurbishments are performed when required.

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)
Sustainable	% of vehicles that are in good or very good condition	30%
	% of vehicles that are in poor or very poor condition	60%

4.6.6 Recommendations

Condition Assessment Strategies

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

Risk and Lifecycle Management Strategies

- Undertake an annual review of all vehicle assets to determine and updated the replacement schedule. Vehicle age, kilometers and annual repair costs should be taken into consideration when determining appropriate replacement options.
- Develop targeted lifecycle strategies to specific vehicles and attachments for further optimization of the Municipality's asset management program.
- Review risk models on a regular basis and adjust according to an evolving understanding of the probability and consequences of asset failure.

Levels of Service

- 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.

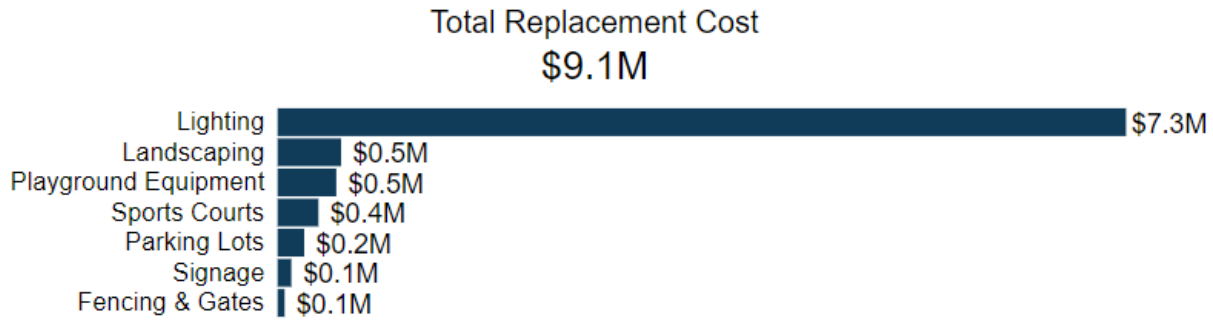
4.7 Land Improvements

The Municipality has a diverse portfolio of land improvement assets comprised of driveways, fencing, playground equipment, and signage.

4.7.1 Asset Inventory & Replacement Cost

The table below includes the quantity, replacement cost and annual capital requirement cost of each asset segment in the Municipality's Land Improvements inventory.

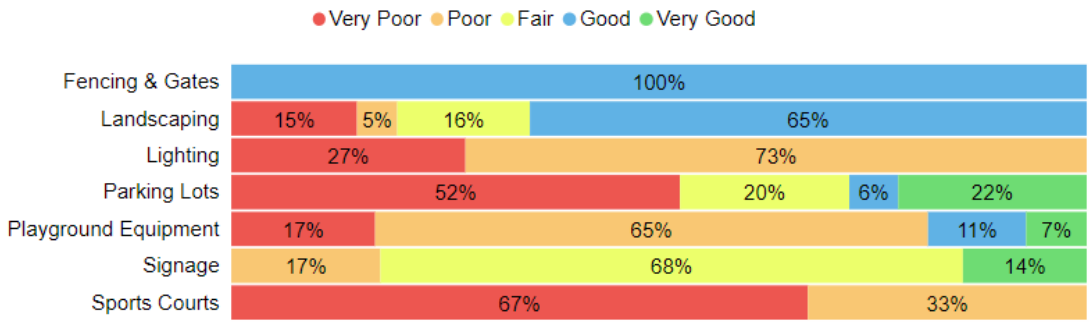
Asset Segment	Quantity	Total Replacement Cost	Annual Capital Requirement
Fencing & Gates	2	$61,000	$4,000
Landscaping	7	$547,000	$23,000
Lighting	36	$7,307,000	$368,000
Parking Lots	6	$230,000	$12,000
Playground Equipment	9	$506,000	$33,000
Signage	3	$119,000	$6,000
Sports Courts	5	$352,000	$30,000
		$9,118,000	**$473,000**



4.7.2 Asset Condition, Age & Useful Life

The table below identifies the current average condition, average age, and estimated useful life for each asset segment. The Average Condition (%) is a weighted value based on replacement cost. The Estimated Useful Life has been assigned according to a combination of established industry standards and staff knowledge. The Average Age of each asset is based on the number of years each asset has been in-service

Asset Segment	Average Condition (%)	Estimated Useful Life (Years)	Average Age (Years)
Fencing & Gates	69% (Good)	10-25 years	4.8
Landscaping	53% (Fair)	20-25 years	11.3
Lighting	26% (Poor)	20 years	39.4
Parking Lots	34% (Poor)	15-25 years	24.1
Playground Equipment	34% (Poor)	15-40 years	15.3
Signage	57% (Fair)	20 years	7.3
Sports Courts	12% (Very Poor)	20-30 years	31.8
	28% (Poor)		**21.7**



To ensure that the Municipality's Land Improvements 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 Land Improvements.

Current Approach to Condition Assessment

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

- Staff complete regular visual inspections of land improvements assets to ensure they are in a state of adequate repair.
- Playgrounds are inspected on a monthly basis based on Canadian Standard Association (CSA) standards
- Trails are inspected internally on a bi-weekly basis to ensure safety and proper functioning

4.7.3 Lifecycle Management Strategy

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

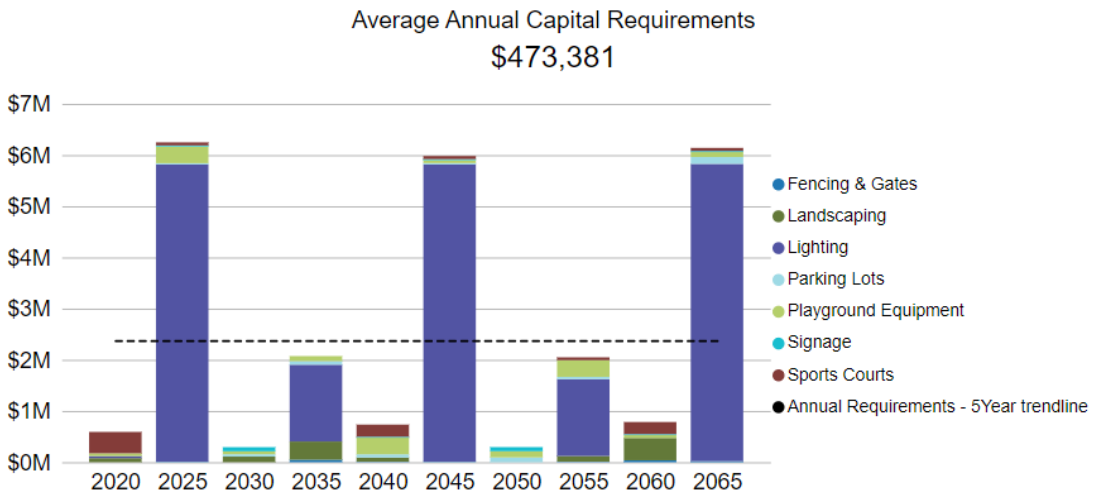
The following table outlines the Municipality's current lifecycle management strategy.

Activity Type	Description of Current Strategy
Maintenance	Inspections of parks and playground equipment are carried out monthly by CSA-certified playground inspectors
	Trails are inspected internally on a bi-weekly basis to ensure safety and proper functioning
Rehabilitation/ Replacement	Assets are rehabilitated and/or replaced based on staff expertise and performance. More critical assets such as parking lots and playgrounds are prioritized.

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 annual capital requirement represents the average amount per year that the Municipality should allocate towards funding rehabilitation and replacement needs to meet future capital needs. The following graph identifies capital requirements over the next 50 years. This projection is used as it ensures that every asset has gone through one full iteration of replacement. The forecasted requirements are aggregated into 5-year increments and the trend line represents the average 5-year 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 A.

4.7.4 Risk & Criticality

The following risk matrix provides a visual representation of the relationship between the probability of failure and the consequence of failure for the assets within this asset category based on 2021 inventory data.

Some of the asset-specific attributes that Staff utilize when prioritizing/defining the criticality of their Land Improvements are documented below:

Probability of Failure (POF)	Consequence of Failure (COF)
Condition	Replacement Cost (Financial)
	Function (Strategic)

4.7.5 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.

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)
Sustainable	Description of the current condition of parks and land improvement assets and the plans in place to maintain or improve the provided level of service	Trails, parks and land improvement assets are managed on an as-needed basis or to end-of-life replacement. Critical assets are managed more proactively in accordance with regulatory requirements (i.e. CSA standards, AODA compliance)

Technical Levels of Service

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

Service Attribute	Technical Metric	Current LOS (2021)
Safe & Regulatory	% of playgrounds in compliance with CSA standards	100%
Sustainable	% of land improvement assets that are in good or very good condition	6%
	% of land improvement assets that are in poor or very poor condition	92%

4.7.6 Recommendations

Asset Data and Information

- Many of the replacement costs utilized 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.
- Some assessed condition information was applied to the more critical land improvement assets, but the majority rely on an age-based condition rating. Staff should review the assets that have surpassed their estimated useful life to determine if rehabilitation or replacement is required or if the asset condition can be updated.

Risk and Lifecycle Management Strategies

- Implement risk-based decision-making as part of asset management planning and budgeting processes. This should include the regular review of high-risk assets to determine appropriate risk mitigation strategies and lifecycle strategies.

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.

5 Analysis of Rate-funded Assets

Key Insights

- Rate-funded assets are valued at $57.6 million
- 92% of rate-funded assets are in fair or better condition
- The average annual capital requirement to sustain the current level of service for rate-funded assets is approximately $1.4 million
- Critical assets should be evaluated to determine appropriate risk mitigation activities and treatment options

5.1 Water Network

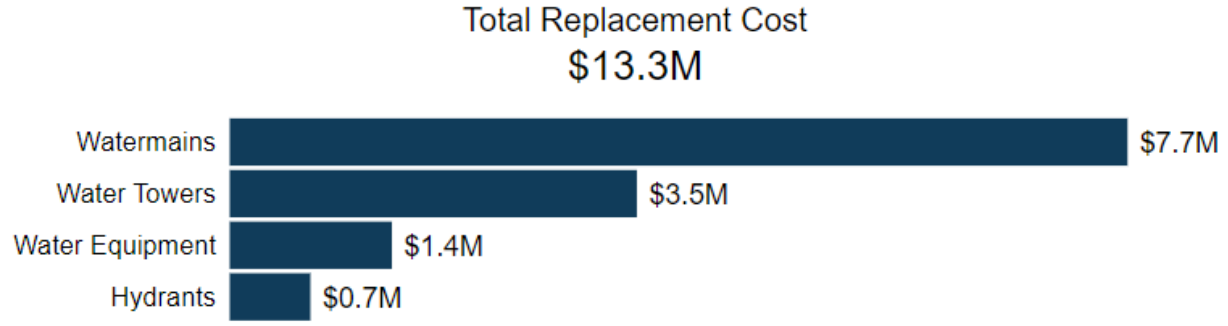
The Municipality is responsible for managing the Teeswater and Mildmay water systems that are comprised of linear watermains, hydrants, pumping stations and other non-linear equipment. The Municipality is partnered with Veolia to manage non-linear or vertical assets within the water systems such as the water tower and pumphouses.

Although not included in this iteration of the asset management plan, Staff plan on constructing a second well and new water tower in the Teeswater settlement area. These assets will play a vital part of the Municipality's water network levels of service, and are considered a high priority for Council and Staff.

5.1.1 Asset Inventory & Replacement Cost

The table below includes the quantity, replacement cost and annual capital requirement of each asset segment in the Municipality's Water Network inventory.

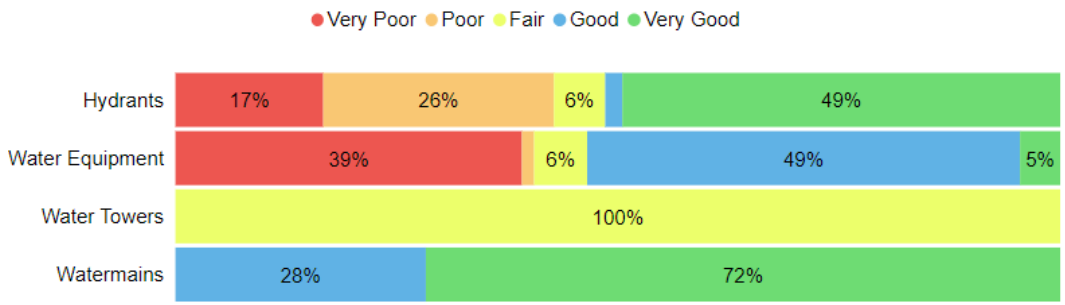
Asset Segment	Quantity	Total Replacement Cost	Annual Capital Requirement
Hydrants	103	$694,000	$14,000
Water Equipment	12	$1,395,000	$46,000
Water Towers	1	$3,500,000	$78,000
Watermains	21 kms	$7,718,000	$77,000
		$13,305,000	**$214,000**



5.1.2 Asset Condition, Age & Useful Life

The table below identifies the current average condition, average age, and estimated useful life for each asset segment. The Average Condition (%) is a weighted value based on replacement cost. The Estimated Useful Life has been assigned according to a combination of established industry standards and staff knowledge. The Average Age of each asset is based on the number of years each asset has been in-service

Asset Segment	Average Condition (%)	Estimated Useful Life (Years)	Average Age (Years)
Hydrants	53% (Fair)	50 years	24.5
Water Equipment	48% (Fair)	3-45 years	9.4
Water Towers	60% (Good)	45 years	33.8
Watermains	90% (Very Good)	100 years	37.0
	76% (Good)		**32.0**



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.

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:

- For linear watermains, staff utilize a combination of age, breaks per segment, pipe material and diameter size to approximate assessed condition of the pipes.
- For non-linear assets, such as the towers and pumphouses, Veolia inspects these assets and their components at varying frequencies in accordance with the Safe Drinking Water Act.

5.1.3 Lifecycle Management Strategy

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

The following lifecycle strategies have been developed as a proactive approach to managing the lifecycle of water mains. Instead of allowing the water mains to deteriorate until replacement is required, re-lining methods can minimize service disruption and additional social costs that are typically associated with open cut replacement methods. These costs should also be factored into the Municipality's asset management decision-making process. The Municipality may consider high risk mains (e.g. near failure and/or large diameter) under relatively new road services as strong candidates for a relining program. Asset lifecycle activities are prioritized based on known historical breaks, pipe age, pipe material, and location.

Water Mains		
Event Name	**Event Class**	**Event Trigger**
Flushing	Maintenance	Annually
Valve Turning	Preventative Maintenance	Annually
Relining	Rehabilitation	20%-40% Condition
Asset Replacement	Reconstruction	0%-20% Condition

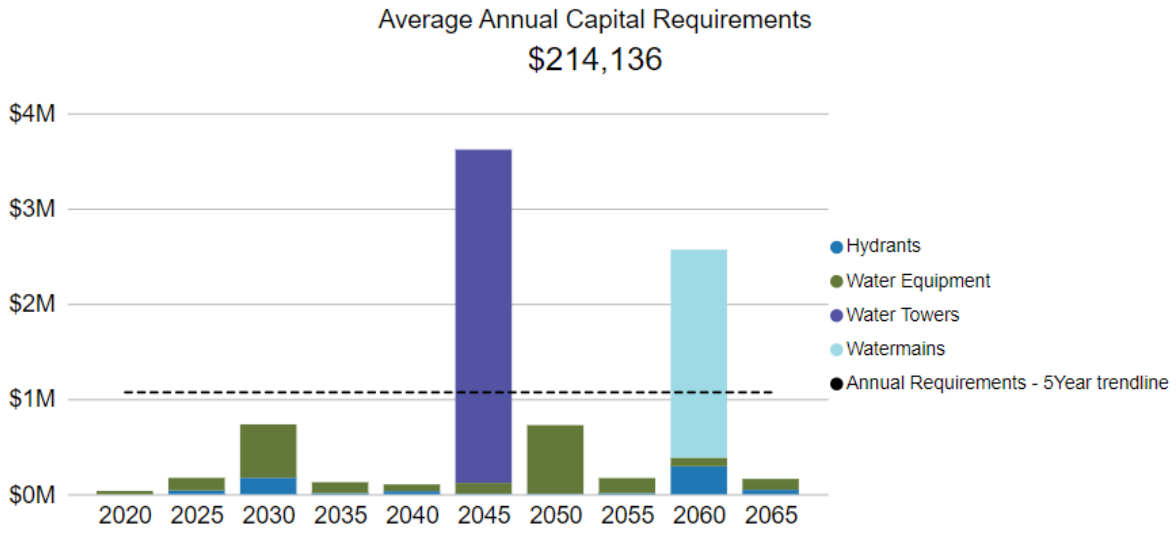
The following table outlines the Municipality's current lifecycle management strategy.

Activity Type	Description of Current Strategy
Maintenance	Hydrant flushing and valve exercising is completed on the network annually.
	Fire flow and pressure testing is performed as needed
Rehabilitation/ Replacement	Trenchless relining is completed when viable watermain candidates have been identified, and reconstruction is not the best option (i.e road above is still in good shape).
	Water equipment is maintained and/or rehabilitated based on recommendations from Veolia, in accordance with O.Reg. 170/03 (Safe Drinking Water Act)
	Watermains are replaced as they near their end-of-life, typically being replaced with polvinyl chloride (PVC) pipes due to their durability. Staff prioritize the replacement of watermains in coordination with other asset replacements and for health and safety issues.

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 annual capital requirement represents the average amount per year that the Municipality should allocate towards funding rehabilitation and replacement needs to meet future capital needs. The following graph identifies capital requirements over the next 50 years. This projection is used as it ensures that every asset has gone through one full iteration of replacement. The forecasted requirements are aggregated into 5-year increments and the trend line represents the average 5-year 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 A.

5.1.4 Risk & Criticality

The following risk matrix provides a visual representation of the relationship between the probability of failure and the consequence of failure for the assets within this asset category based on 2021 inventory data.

Some of the asset-specific attributes that Staff utilize when prioritizing/defining the criticality of their Water Network are documented below:

Probability of Failure (POF)	Consequence of Failure (COF)
Condition	Replacement Cost (Financial)
Breaks per Segment	Road Classification (Operational)
Pipe Material	Proximity to Critical Services (Social)
	Pipe Diameter (Social)

5.1.5 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.

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)
Accessible & Reliable	Description, which may include maps, of the user groups or areas of the municipality that are connected to the municipal water system	See Appendix B
	Description, which may include maps, of the user groups or areas of the municipality that have fire flow	See Appendix B
Safe & Regulatory	Description of boil water advisories and service interruptions	Water service interruptions may occur due to main breaks, maintenance work or projects. Staff provide notice for planned interruptions and respond in a timely manner in accordance with regulatory requirements.

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)
Accessible & Reliable	% of properties connected to the municipal water system	19%
	% of properties where fire flow is available	100%
	# 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
Safe & Regulatory	# 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
Sustainable	% of the water network that is in good or very good condition	67%
	% of the water network that is in poor or very poor condition	7%

5.1.6 Recommendations

Replacement Costs

- Continue to revise and update user-defined replacement costs; especially for linear mains and high-priority assets (i.e., water pumphouse, water tower). Replacement costs should be updated according to the latest tender or project prices, every 1-2 years.

Condition Assessment Strategies

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

Risk and Lifecycle Management Strategies

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

Levels of Service

- Continue to measure current levels of service in accordance with the metrics identified in O. Reg. 588/17 and those metrics that the 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.

5.2 Wastewater Network

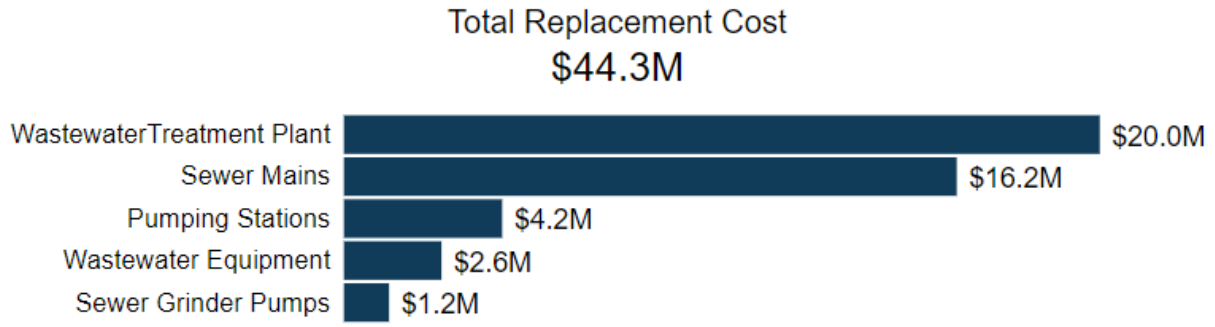
The Municipality is responsible for managing the Teeswater Formosa sewer system which is comprised of mains, manholes, and various wastewater equipment. The Municipality also owns a wastewater treatment plant and pumping stations that are maintained by Veolia.

Although not included in this iteration of the asset management plan, Staff plan on expanding the Teeswater Formosa wastewater treatment plant within the next 2-3 years. While the existing treatment plant is in good physical condition, the functional capacity of the plant is a growing concern. This project is considered a high priority for Council and Staff.

5.2.1 Asset Inventory & Replacement Cost

The table below includes the quantity, replacement cost and annual capital requirement of each asset segment in the Municipality's Wastewater Network.

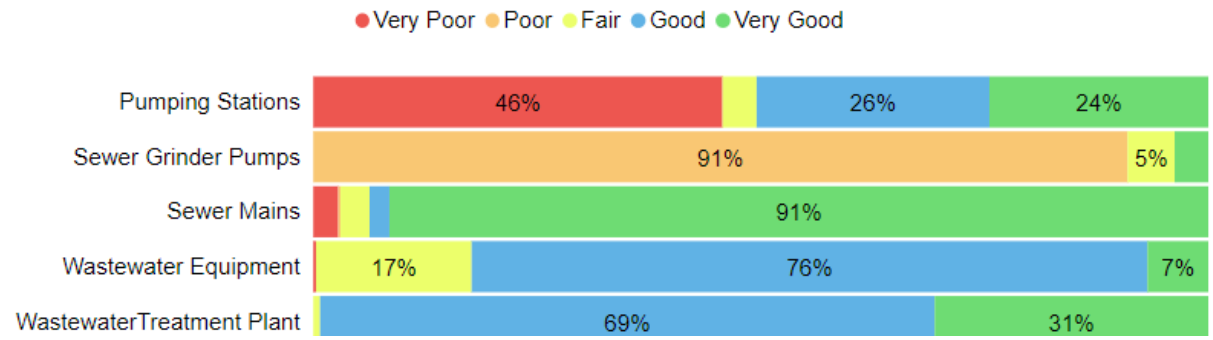
Asset Segment	Quantity	Total Replacement Cost	Annual Capital Requirement
Pumping Stations	8 (19)	$4,196,000	$145,000
Wastewater Equipment	29	$1,197,000	$119,000
WastewaterTreatment Plant	2 (20)	$16,248,000	$158,000
Sewer Grinder Pumps	139	$2,587,000	$116,000
Sewer Mains	28 kms	$20,041,000	$681,000
		$44,267,000	**$1,217,000**



5.2.2 Asset Condition, Age & Useful Life

The table below identifies the current average condition, average age, and estimated useful life for each asset segment. The Average Condition (%) is a weighted value based on replacement cost. The Estimated Useful Life has been assigned according to a combination of established industry standards and staff knowledge. The Average Age of each asset is based on the number of years each asset has been in-service

Asset Segment	Average Condition (%)	Estimated Useful Life (Years)	Average Age (Years)
Pumping Stations	41% (Fair)	15-50 years	9.1
Wastewater Equipment	66% (Good)	10-75 years	6.9
Wastewater Treatment Plant	74% (Good)	20-50 years	8.1
Sewer Grinder Pumps	34% (Poor)	10 years	5.8
Sewer Mains	90% (Very Good)	75 years	19.1
	75% (Good)		**14.8**



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.

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 conducted on an as-needed basis, typically prior to a reconstruction project. However, a network-wide inspection of the Teeswater sewer system was completed in 2017.
- Considering that the majority of the sewer mains are made of polyvinyl chloride (PVC) material, which is durable and can last for 75-100 years, and over 75% of the mains were built after the 2000s, the condition of the pipes should theoretically be Good-Very Good. Staff utilize other sources of performance indicators such as infiltration issues, bedding issues or pipe capacity to approximate a more reliable indicator of the pipes' condition.
- The pumping station, wastewater treatment plant and other vertical assets are assessed regularly by Veolia staff, in accordance with the Ontario Water Resources Act and/or manufacturer recommendations.

5.2.3 Lifecycle Management Strategy

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

The following lifecycle strategies have been developed as a proactive approach to managing the lifecycle of sewer mains. Instead of allowing the sewer mains to deteriorate until replacement is required, trenchless re-lining methods can minimize service disruption and additional social costs that are typically associated with open cut replacement methods. These costs should also be factored into the Municipality's asset management decision-making process. The Municipality may consider high risk mains (e.g. near failure and/or large diameter) under relatively new road services as strong candidates for a relining program.

Sewer Mains		
Event Name	**Event Class**	**Event Trigger**
CCTV Inspection	Maintenance	Every 10-15 Years
Flushing/Cleaning	Preventative Maintenance	Annual
Trenchless Relining	Rehabilitation	PACP: 4 Condition[9]
Asset Replacement	Reconstruction	0% Condition

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

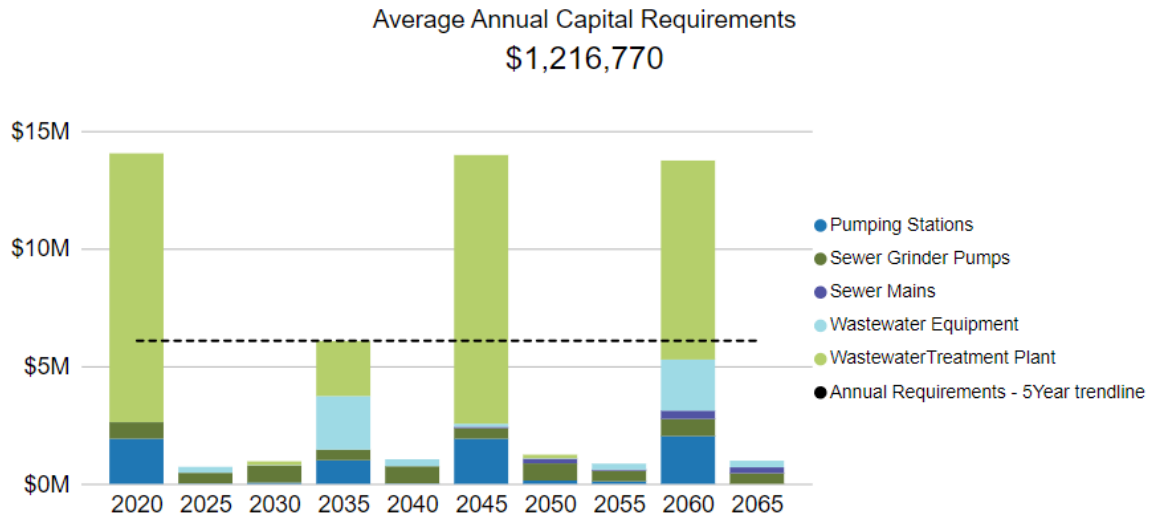
Activity Type	Description of Current Strategy
Maintenance/ Rehabilitation/ Replacement	CCTV inspections are performed as-needed
	System flushing is performed annually; broken out by zones
	Smoke testing is performed when necessary to identify leaks
	Non-linear assets are repaired and/or replaced based on Veolia recommendations, criticality and budget limitations.
	Trenchless relining is considered when viable sewer main candidates are identified to optimize time, effort and budget.
	Sewer main replacements are prioritized by condition, service life remaining, capacity or infiltration issues, and in coordination with other reconstruction projects

[9] Pipeline Assessment and Certification Program (PACP) has a grading system for pipes that ranges from 0 to 5. A higher value indicates the pipe has greater deficiencies and therefore poorer condition. A condition rating of 4 can roughly be interpreted as a 20% condition rating here.

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 annual capital requirement represents the average amount per year that the Municipality should allocate towards funding rehabilitation and replacement needs to meet future capital needs. The following graph identifies capital requirements over the next 50 years. This projection is used as it ensures that every asset has gone through one full iteration of replacement. The forecasted requirements are aggregated into 5-year increments and the trend line represents the average 5-year 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 A.

5.2.4 Risk & Criticality

The following risk matrix provides a visual representation of the relationship between the probability of failure and the consequence of failure for the assets within this asset category based on 2021 inventory data.

Some of the asset-specific attributes that Staff utilize when prioritizing/defining the criticality of their Wastewater Network are documented below:

Probability of Failure (POF)	Consequence of Failure (COF)
Condition	Replacement Cost (Financial)
Pipe Material	Road Classification (Operational)
Slope %	Proximity to Critical Services (Social)
Inflow & Infiltration issues	Pipe Diameter (Social)

5.2.5 Levels of Service

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

Community Levels of Service

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

Service Attribute	Qualitative Description	Current LOS (2021)
Accessible & Reliable	Description, which may include maps, of the user groups or areas of the municipality that are connected to the municipal wastewater system	See Appendix B
Safe & Regulatory	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
	Description of the frequency and volume of overflows in combined sewers in the municipal wastewater system that occur in habitable areas or beaches	
	Description of how stormwater can get into sanitary sewers in the municipal wastewater system, causing sewage to overflow into streets or backup into homes	Stormwater can enter into sanitary sewers due to cracks in sanitary mains or through indirect connections (e.g. weeping tiles). In the case of heavy rainfall events, sanitary sewers may experience a volume of water and sewage that exceeds its designed capacity. In some cases, this can cause water and/or sewage to overflow backup into homes.

Service Attribute	Qualitative Description	Current LOS (2021)
	Description of how sanitary sewers in the municipal wastewater system are designed to be resilient to stormwater infiltration	The municipality follows a series of design standards that integrate servicing requirements and land use considerations when constructing or replacing sanitary sewers. These standards have been determined with consideration of the minimization of sewage overflows and backups.
	Description of the effluent that is discharged from sewage treatment plants in the municipal wastewater system	Effluent refers to water pollution that is discharged from a wastewater treatment plant, and may include suspended solids, total phosphorous and biological oxygen demand. The Environmental Compliance Approval (ECA) identifies the effluent criteria for municipal wastewater treatment plants.

Technical Levels of Service

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

Service Attribute	Technical Metric	Current LOS (2021)
Accessible & Reliable	% of properties connected to the municipal wastewater system	22%
Safe & Regulatory	# of events per year where combined sewer flow in the municipal wastewater system exceeds system capacity compared to the total number of properties connected to the municipal wastewater system	Not Applicable
	# of connection-days per year due to sanitary main 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
Sustainable	% of the wastewater system that is in good or very good condition	89%
	% of the wastewater system that is in poor or very poor condition	8%

5.2.6 Recommendations

Asset Data and Information

- Staff should continue to revise and update assets with user-defined replacement costs. Replacement costs should be updated according to the best available information on the cost to replace the asset in today's value.
- Conduct building condition assessments on the Wastewater buildings to obtain condition information, rehabilitation recommendations and a componentized inventory.
- Consider developing a CCTV inspection program to complete a network-wide inspection every 10-15 years for all sewer mains to build a rehabilitation/replacement strategy.

Risk and Lifecycle Management Strategies

- Review risk models on a regular basis and adjust according to an evolving understanding of the probability and consequences of asset failure.
- A trenchless re-lining strategy is expected to extend the service life of sewer mains at a lower total cost of ownership and should be implemented to extend the life of infrastructure at the lowest total cost of ownership.
- Evaluate the efficacy of the Municipality's lifecycle management strategies at regular intervals to determine the impact cost, condition and risk.

Levels of Service

- Continue to measure current levels of service in accordance with the metrics 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.

6 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

- Although moderate population and employment decline was projected by the County Planning department in the past Official plan updates, Metroeconomics was retained to assess the potential for economic and demographic growth over the period from 2022 to 2046 of South Bruce and of the four municipalities surrounding it.
    - The report indicated that Populations in the Municipality of South Bruce experienced a 0.2% average annual decline between 2011 and 2016, but are estimated to have grown at an average annual rate of 2.1% between 2016 and 2021. The South Bruce and Area Growth Expectations anticipate continued growth through the study period.

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

6.1 Description of Growth Assumptions

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

6.1.1 Official Plan for the Formosa, Mildmay and Teeswater Settlement Area (September 2004)

South Bruce adopted an official plan for Formosa, Mildmay, and Teeswater communities on September 21st, 2004. It was then approved and modified by the Bruce County council on September 15th, 2005.

The plan indicated that rural areas of South Bruce were expected to have a relatively unchanged population. The plan aimed to have the downtown communities as the major focus of commercial activity while contributing to an overall small town rural environment. Some lands were designated as Future Development areas, which requires an amendment to the official plan prior to converting the lands to an urban use.

Since 2001, the municipality has experienced steady population decline. This is further compounded by an aging population and an inability to grow the residential base.

6.1.2 Bruce County Official Plan (September 2017)

Relevant information pertaining to the municipality's growth in population, employment, and household statistics are taken from the upper municipality of Bruce (Bruce County). Their official plan was adopted by County Council in 1997, with its most recent amendments dating September 2017.

Section 4.2.2 indicates that South Bruce's population will remain relatively stable despite an aging population. The table below summarizes historical trends in population, employment, and household statistics along with the official plans 2021 projection.

Year	2011	2016	2021
Population	5,705	5,591	5,479
Employment	3,439	3,370	3,303
Households	2,098	2,077	2,056

From 2011 to 2021, population, employment and households have declined by 3.97%, 3.96%, and 2.00%, respectively while the rest of Bruce County has increased.

Housing Programs & Initiatives

The Bruce County Long Term Housing Strategy 2013-2023 aims to create 445 affordable housing units by focusing on:

i. Consolidating housing and homelessness programs
ii. Rent geared-to-income reform;
iii. Administrative reform focusing on system outcome requirements; and
iv. Requiring each Service Manager to develop a 10-year housing and homelessness plan.

Provincial policy focuses on a *Housing First* approach, which the county of South Bruce has adopted with its Long-Term Housing Strategy.

6.2 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.

Staff have already identified multiple growth-related activities that will impact the Municipality's desired levels of service and asset management planning. These include:

- The expansion of the Teeswater Formosa wastewater treatment plant within the next 2-3 years. While the existing treatment plant is in good-very good physical condition, the functional capacity of the plant is a growing concern. Staff estimate the treatment plant will cost approximately $10 million.
- The construction of a second well and water tower in the Teeswater settlement area for $5 million.
- A new medical clinic, in Teeswater, is being considered for construction in the next few years. Staff have conducted a feasibility study to weigh costs and benefits of building it.
- The Dam removal and reconstruction of Adam St scheduled for 2022 for $8 million.

7 Financial Strategy

Key Insights

- The Municipality is committing approximately $2,902,000 towards capital projects per year from sustainable revenue sources
- Given the annual capital requirement of $8,821,000, there is currently a funding gap of $5,919,000 annually
- For tax-funded assets, we recommend increasing tax revenues by 3.2% each year for the next 20 years to achieve a sustainable level of funding
- For the Wastewater Network, we recommend increasing rate revenues by 2.5% annually for the next 15 years to achieve a sustainable level of funding
- For the Water Network, we recommend increasing rate revenues by 1.5% for the next year to achieve a sustainable level of funding

7.1 Financial Strategy Overview

For an asset management plan to be effective and meaningful, it must be integrated with financial planning and long-term budgeting. The development of a comprehensive financial plan will allow Municipality of South Bruce 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
    e. Development charges
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:

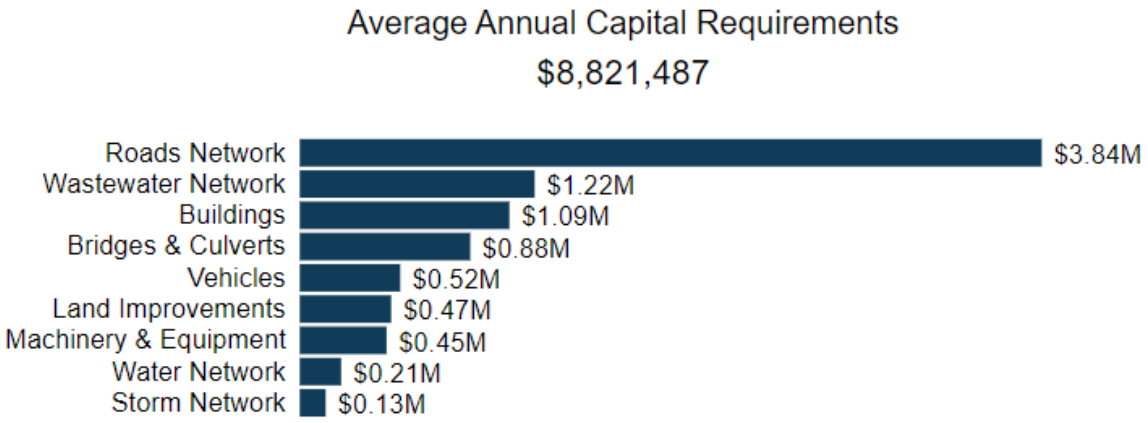
1. In order to reduce financial requirements, consideration has been given to revising service levels downward.
2. All asset management and financial strategies have been considered. For example:
    a. If a zero-debt policy is in place, is it warranted? If not the use of debt should be considered.

b. Do user fees reflect the cost of the applicable service? If not, increased user fees should be considered.

7.1.1 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 $8.8 million annually to address capital requirements for the assets included in this AMP.

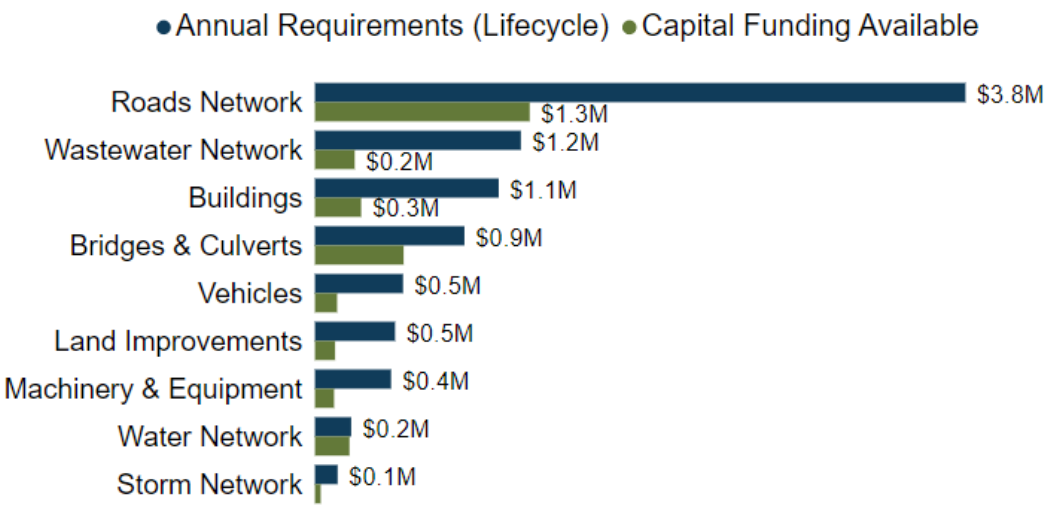


For most asset categories the annual requirement has been calculated based on a "replacement only" scenario, in which capital costs are only incurred at the construction and replacement of each asset. However, for the Road Network and Bridges & Culverts, lifecycle management strategies have been developed to identify capital costs that are realized through strategic rehabilitation and renewal of the Municipality's assets. The development of these strategies allows for a comparison of potential cost avoidance if the strategies were to be implemented.

The implementation of a proactive lifecycle strategy can lead to direct and indirect cost savings. Potential cost savings are influenced by current rehabilitation and reconstruction costs, the coordination of projects, and the criticality of the assets. Beyond cost avoidance, having proactive lifecycle strategies can also improve other important levels of service to the Municipality such as lowering health and safety hazards, decreasing the number of complaints received, and meeting Public expectations.

Annual Funding Available

Based on a historical analysis of sustainable capital funding sources, the Municipality is committing approximately $2.9 million towards capital projects per year. Given the annual capital requirement of $8.8 million, there is currently a funding gap of $5.9 million.



7.2 Funding Objective

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

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

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

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

7.3 Financial Profile: Tax Funded Assets

7.3.1 Current Funding Position

The following tables show, by asset category, South Bruce'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
		To Capital Reserves	Gas Tax	OCIF	Total Available	
Road Network	3,844,000	967,000	86,000	216,000	1,269,000	2,575,000
Storm Network	134,000	34,000	0	0	34,000	100,000
Bridges & Culverts	883,000	222,000	86,000	216,000	524,000	359,000
Buildings	1,086,000	273,000	0	0	273,000	813,000
Machinery & Equipment	450,000	113,000	0	0	113,000	337,000
Land Improvements	473,000	119,000	0	0	119,000	354,000
Vehicles	521,000	131,000	0	0	131,000	390,000
Total	**7,391,000**	**1,859,000**	**172,000**	**432,000**	**2,463,000**	**4,928,000**

The average annual investment requirement for the above categories is $7,391,000. Annual revenue currently allocated to these assets for capital purposes is $2,463,000 leaving an annual deficit of $4,928,000. Put differently, these infrastructure categories are currently funded at 33% of their long-term requirements.

7.3.2 Full Funding Requirements

In 2021, Municipality of South Bruce has annual tax revenues of $5,341,000. As illustrated in the following table, without consideration of any other sources of revenue or cost containment strategies, full funding would require the following tax change over time:

Asset Category	Tax Change Required for Full Funding
Road Network	48.2%
Storm Network	1.9%
Bridges & Culverts	6.7%
Buildings	15.2%
Machinery & Equipment	6.3%
Land Improvements	6.6%
Vehicles	7.3%
Total	**92.2%**

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

a) South Bruce's formula based OCIF grant is scheduled to remain at $432,080 in 2020 and 2021.
b) South Bruce's debt payments for these asset categories will not be decreasing over the next 5-10 years. Although not shown in the table, debt payment decreases will be $173,000 over the next 15 and 20 years respectively.

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	4,928,000	4,928,000	4,928,000	4,928,000	4,928,000	4,928,000	4,928,000	4,928,000
Change in Debt Costs	N/A	N/A	N/A	N/A	0	0	-173,000	-173,000
Change in OCIF Grants	N/A	N/A	N/A	N/A	0	0	0	0
Resulting Infrastructure Deficit:	4,490,000	4,490,000	4,490,000	4,490,000	4,490,000	4,490,000	4,755,000	4,755,000
Tax Increase Required	92.3%	92.3%	92.3%	92.3%	92.3%	92.3%	89.0%	89.0%
Annually:	**14.0%**	**6.8%**	**4.5%**	**3.3%**	**14.0%**	**6.8%**	**4.3%**	**3.2%**

7.3.3 Financial Strategy Recommendations

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

a) when realized, reallocating the debt cost reductions to the infrastructure deficit as outlined above.
b) increasing tax revenue by 3.2% each year for the next 20 years solely for the purpose of phasing in full funding to the asset categories covered in this section of the AMP.
c) adjusting tax revenue increases in future year(s) when allocations to CapEx exceed or fail to meet budgeted amounts.
d) allocating the current gas tax and OCIF revenue as outlined previously.
e) allocating the scheduled OCIF grant increases to the infrastructure deficit as they occur.
f) reallocating appropriate revenue from categories in a surplus position to those in a deficit position.
g) increasing existing and future infrastructure budgets by the applicable inflation index on an annual basis in addition to the deficit phase-in.

Notes:

1. As in the past, periodic senior government infrastructure funding will most likely be available during the phase-in period. By Provincial AMP rules, this periodic funding cannot be incorporated into an AMP unless there are firm commitments in place. We have included any applicable OCIF formula-based funding since this funding is a multi-year commitment[10].
2. We realize that raising tax revenues by the amounts recommended above for infrastructure purposes will be very difficult to do. However, considering a longer phase-in window may have even greater consequences in terms of infrastructure failure.

Although this option achieves full CapEx funding on an annual basis in 20 years and provides financial sustainability over the period modeled, the recommendations do require prioritizing capital projects to fit the resulting annual funding available. Current data shows a pent-up investment demand of $1,200,000 for the Road Network, $0 for Bridges & Culverts, $342,000 for the Buildings, $630,000 for Machinery & Equipment, $363,000 for Land Improvements, and $2,000,000 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.

[10] 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. This review may impact its availability.

7.4 Financial Profile: Rate Funded Assets

7.4.1 Current Funding Position

The following tables show, by asset category, South Bruce'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 Oper.	OCIF	Total Available	
Water Network	214,000	682,000	-478,000	0	204,000	10,000
Wastewater Network	1,217,000	1,569,000	-1,334,000	0	235,000	982,000
	1,431,000	**2,251,000**	**-1,812,000**	**0**	**439,000**	**992,000**

The average annual investment requirement for the above categories is $1,431,000. Annual revenue currently allocated to these assets for capital purposes is $439,000, leaving an annual deficit of $992,000. Put differently, these infrastructure categories are currently funded at 31% of their long-term requirements.

7.4.2 Full Funding Requirements

In 2021, South Bruce had annual wastewater revenues of $1,569,000 and annual water revenues of $682,000. 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	Rate Change Required for Full Funding
Water Network	1.5%
Wastewater Network	62.6%
Total	44.1%

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	10,000	10,000	10,000	10,000	982,000	982,000	982,000	982,000
Change in Debt Costs	0	0	0	0	-77,000	-276,000	-276,000	-327,000
Resulting Infrastructure Deficit:	10,000	10,000	10,000	10,000	905,000	706,000	706,000	655,000
Rate Increase Required	1.5%	1.5%	1.5%	1.5%	57.7%	45.0%	45.0%	41.7%
Annually:	**0.3%**	**0.1%**	**0.1%**	**0.1%**	**9.5%**	**3.8%**	**2.5%**	**1.8%**

7.4.3 Financial Strategy Recommendations

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

a) when realized, reallocating the debt cost reductions for the Water Network to the infrastructure deficit
b) Increasing rate revenues by 1.5% for the next year for Water Network & increasing rate revenues by 2.5% for Wastewater Network each year for the next 15 years.
c) these rate revenue increases are solely for the purpose of phasing in full funding to the respective asset categories covered in this AMP.
d) increasing existing and future infrastructure budgets by the applicable inflation index on an annual basis in addition to the deficit phase-in.

Notes:

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

Although this strategy achieves full CapEx funding for rate-funded assets over 10 years, the recommendation does require prioritizing capital projects to fit the annual funding available. Current data shows a pent-up investment demand of $79,000 for the Water Network and $3,000 for the Wastewater Network.

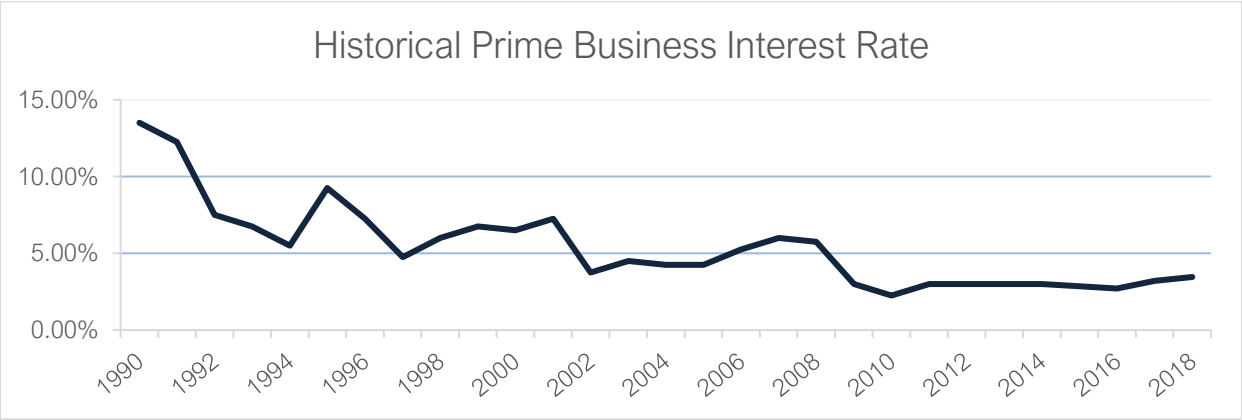
Prioritizing future projects will require the current data to be replaced by condition-based data. Although our recommendations include no further use of debt, the results of the condition-based analysis may require otherwise.

7.6 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%[11] 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:



[11] 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 South Bruce has historically used debt for investing in the asset categories as listed. There is currently $4,093,000 of debt outstanding for the assets covered by this AMP with corresponding principal and interest payments of $500,000, well within its provincially prescribed maximum of $1,731,000.

Asset Category	Current Debt Outstanding	Use of Debt in the Last Five Years				
		2016	2017	2018	2019	2020
Road Network	1,787,000					
Storm Network						
Bridges & Culverts						
Facilities						
Machinery & Equipment						
Land Improvements						
Vehicles						
Total Tax Funded:	1,787,000					
Water Network						
Wastewater Network	2,306,000					
Total Rate Funded:	**2,306,000**	**0**	**0**	**0**	**0**	**0**

Asset Category	Principal & Interest Payments in the Next Ten Years						
	2020	2021	2022	2023	2024	2025	2030
Road Network	173,000	173,000	173,000	173,000	173,000	173,000	173,000
Storm Network							
Bridges & Culverts							
Facilities							
Machinery & Equipment							
Land Improvements							
Vehicles							
Total Tax Funded:	173,000	173,000	173,000	173,000	173,000	173,000	173,000
Water Network							
Wastewater Network	327,000	327,000	327,000	327,000	270,000	250,000	51,000
Total Rate Funded:	**327,000**	**327,000**	**327,000**	**327,000**	**270,000**	**250,000**	**51,000**

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

7.7 Use of Reserves

7.7.1 Available Reserves

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

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

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

Asset Category	Balance at December 31, 2020
Road Network	1,299,000
Storm Network	289,000
Bridges & Culverts	374,000
Buildings	681,000
Machinery & Equipment	387,000
Land Improvements	74,000
Vehicles	565,000
Total Tax Funded:	**3,669,000**
Water Network	1,198,000
Wastewater Network	925,000
Total Rate Funded:	**2,123,000**

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 South Bruce's judicious use of debt in the past, allows the scenarios to assume that, if required, available reserves and debt capacity can be used for high priority and emergency infrastructure investments in the short- to medium-term.

7.7.2 Recommendation

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

8 Appendices

Key Insights

- Appendix A identifies projected 10-year capital requirements for each asset category
- Appendix B includes several maps that have been used to visualize the current level of service

Appendix A: 10-Year Capital Requirements

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

Road Network											
Asset Segment	Backlog	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029
Municipal Drains	$0	$19,000	$0	$44,000	$0	$41,000	$0	$0	$40,000	$0	$20,000
Paved Roads	$456,000	$53,000	$1,231,000	$1,587,000	$927,000	$1,797,000	$4,059,000	$5,768,000	$6,471,000	$1,324,000	$1,273,000
Sidewalks	$533,000	$119,000	$10,000	$467,000	$0	$249,000	$91,000	$54,000	$0	$0	$0
Streetlights & Traffic Systems	$80,000	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
	$1,067,000	**$189,000**	**$1,240,000**	**$2,097,000**	**$927,000**	**$2,087,000**	**$4,150,000**	**$5,821,000**	**$6,511,000**	**$1,324,000**	**$1,292,000**

Bridges & Culverts											
Asset Segment	Backlog	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029
Bridges	$0	$4,419,000	$2,127,000	$1,366,000	$2,047,000	$0	$547,000	$893,000	$262,000	$856,000	$556,000
Culverts	$0	$402,000	$234,000	$616,000	$0	$736,000	$0	$0	$616,000	$0	$0
	$0	**$4,821,000**	**$2,361,000**	**$1,982,000**	**$2,047,000**	**$736,000**	**$547,000**	**$893,000**	**$877,000**	**$856,000**	**$556,000**

Storm Network											
Asset Segment	Backlog	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029
Small Culverts	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Storm Mains	$0	$0	$0	$0	$0	$0	$293,000	$0	$0	$0	$0
Stormwater Pond	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
	$0	**$0**	**$0**	**$0**	**$0**	**$0**	**$293,000**	**$0**	**$0**	**$0**	**$0**

Buildings											
Asset Segment	Backlog	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029
General Government	$0	$0	$0	$765,000	$0	$182,000	$0	$25,000	$0	$0	$0
Protection Services	$0	$0	$0	$0	$0	$0	$0	$1,187,000	$0	$0	$0
Recreation Services	$342,000	$0	$0	$420,000	$0	$0	$0	$0	$0	$42,000	$0
Transportation Services	$342,000	$0	$0	$1,185,000	$0	$182,000	$0	$1,211,000	$0	$42,000	$0
	$0	**$0**	**$0**	**$765,000**	**$0**	**$182,000**	**$0**	**$25,000**	**$0**	**$0**	**$0**

Machinery & Equipment											
Asset Segment	Backlog	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029
General Government	$132,000	$28,000	$0	$25,000	$102,000	$12,000	$46,000	$168,000	$45,000	$20,000	$119,000
Health Services	$0	$13,000	$0	$13,000	$0	$0	$0	$0	$0	$0	$40,000
Protection Services	$177,000	$0	$100,000	$119,000	$117,000	$163,000	$154,000	$168,000	$217,000	$164,000	$125,000
Recreation Services	$15,000	$48,000	$0	$120,000	$31,000	$47,000	$0	$35,000	$143,000	$101,000	$45,000
Transportation Services	$196,000	$25,000	$0	$144,000	$55,000	$85,000	$13,000	$54,000	$223,000	$59,000	$87,000
	$518,000	**$114,000**	**$100,000**	**$419,000**	**$304,000**	**$306,000**	**$213,000**	**$423,000**	**$626,000**	**$343,000**	**$414,000**

Vehicles											
Asset Segment	Backlog	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029
Protection Services	$535,000	$0	$0	$940,000	$0	$0	$0	$0	$510,000	$0	$465,000
Transportation Services	$1,093,000	$300,000	$245,000	$418,000	$45,000	$45,000	$0	$47,000	$0	$386,000	$455,000
	$1,628,000	**$300,000**	**$245,000**	**$1,358,000**	**$45,000**	**$45,000**	**$0**	**$47,000**	**$510,000**	**$386,000**	**$920,000**

Land Improvements											
Asset Segment	Backlog	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029
Fencing & Gates	$0	$0	$0	$0	$0	$0	$0	$0	$0	$12,000	$0
Landscaping	$0	$0	$0	$0	$81,000	$0	$0	$0	$0	$0	$0
Lighting	$0	$0	$0	$40,000	$0	$0	$2,000,000	$0	$0	$3,807,000	$0
Parking Lots	$97,000	$0	$0	$0	$0	$0	$0	$25,000	$0	$0	$0
Playground Equipment	$31,000	$0	$0	$0	$55,000	$0	$0	$291,000	$36,000	$0	$0
Signage	$0	$0	$0	$0	$0	$0	$0	$21,000	$0	$0	$0
Sports Courts	$237,000	$0	$0	$418,000	$0	$0	$0	$0	$0	$60,000	$0
	$364,000	**$0**	**$0**	**$458,000**	**$135,000**	**$0**	**$2,000,000**	**$336,000**	**$36,000**	**$3,878,000**	**$0**

Water Network											
Asset Segment	Backlog	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029
Hydrants	$63,000	$0	$0	$0	$0	$0	$0	$0	$35,000	$6,000	$0
Water Equipment	$17,000	$0	$9,000	$12,000	$16,000	$0	$0	$16,000	$103,000	$0	$16,000
Water Towers	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Watermains	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
	$79,000	**$0**	**$9,000**	**$12,000**	**$16,000**	**$0**	**$0**	**$16,000**	**$137,000**	**$6,000**	**$16,000**

Wastewater Network											
Asset Segment	Backlog	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029
Pumping Stations	$0	$0	$0	$1,919,000	$0	$0	$0	$0	$0	$20,000	$0
Sewer Grinder Pumps	$0	$0	$0	$0	$0	$702,000	$387,000	$0	$63,000	$0	$0
Sewer Mains	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Wastewater Equipment	$3,000	$0	$0	$6,000	$0	$0	$0	$0	$129,000	$124,000	$0
WastewaterTreatment Plant	$0	$0	$0	$11,424,000	$0	$0	$0	$0	$0	$0	$0
	$3,000	**$0**	**$0**	**$13,348,000**	**$0**	**$702,000**	**$387,000**	**$0**	**$192,000**	**$144,000**	**$0**

Appendix B: Level of Service Maps

Road Network Map

Images of Bridges and Culverts in Fair/Good Condition
Inspected in 2020


Structure 0019 on Sideroad 18


Structure 1002 on Concession 12


Structure 1009 on Council Road


Structure 1018 on Sideroad 30

Images of Bridges and Culverts in Poor/Very Poor Condition
Inspected in 2020

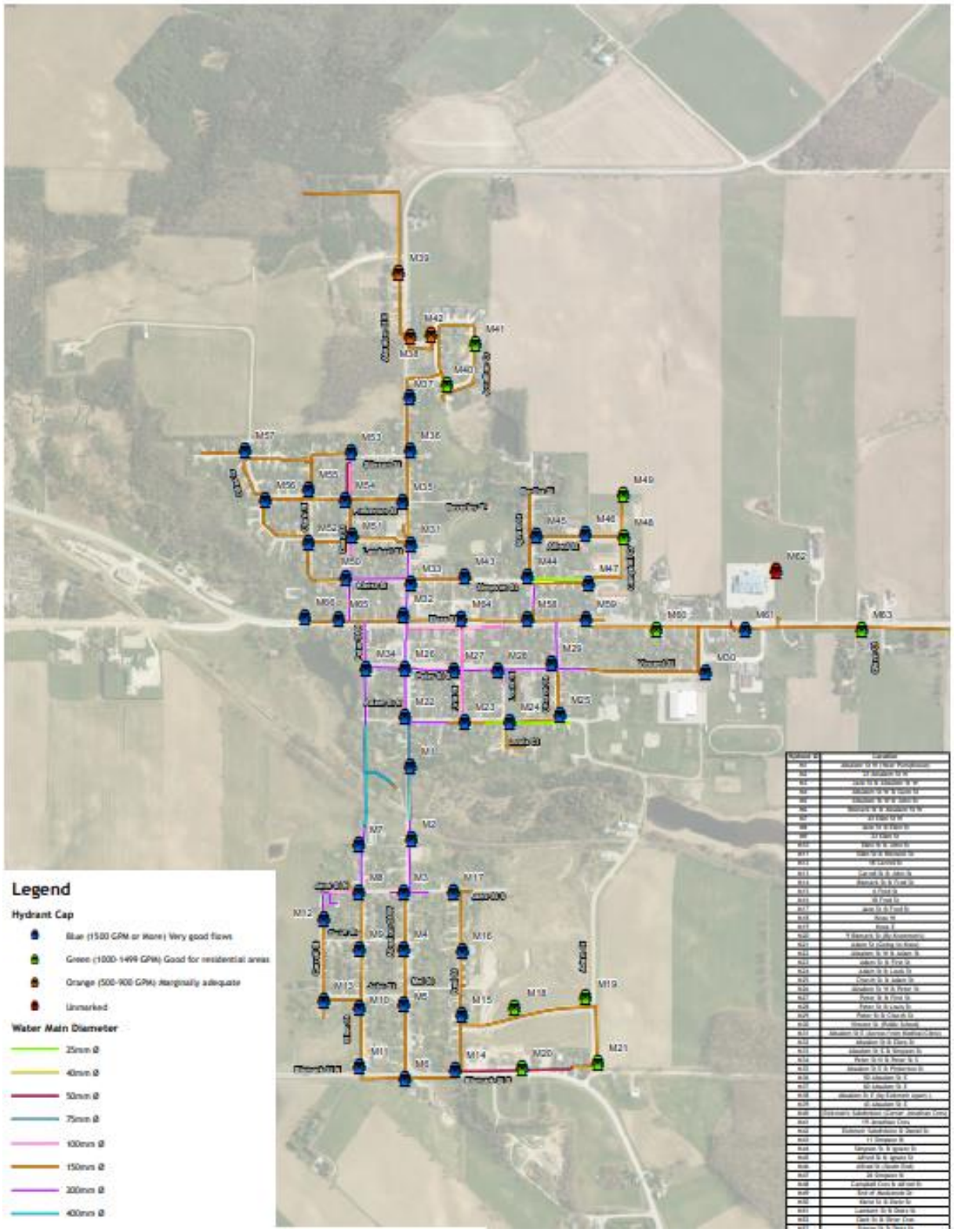

Structure 0007 on Sideroad 25N


Structure 0015 on Concession 12

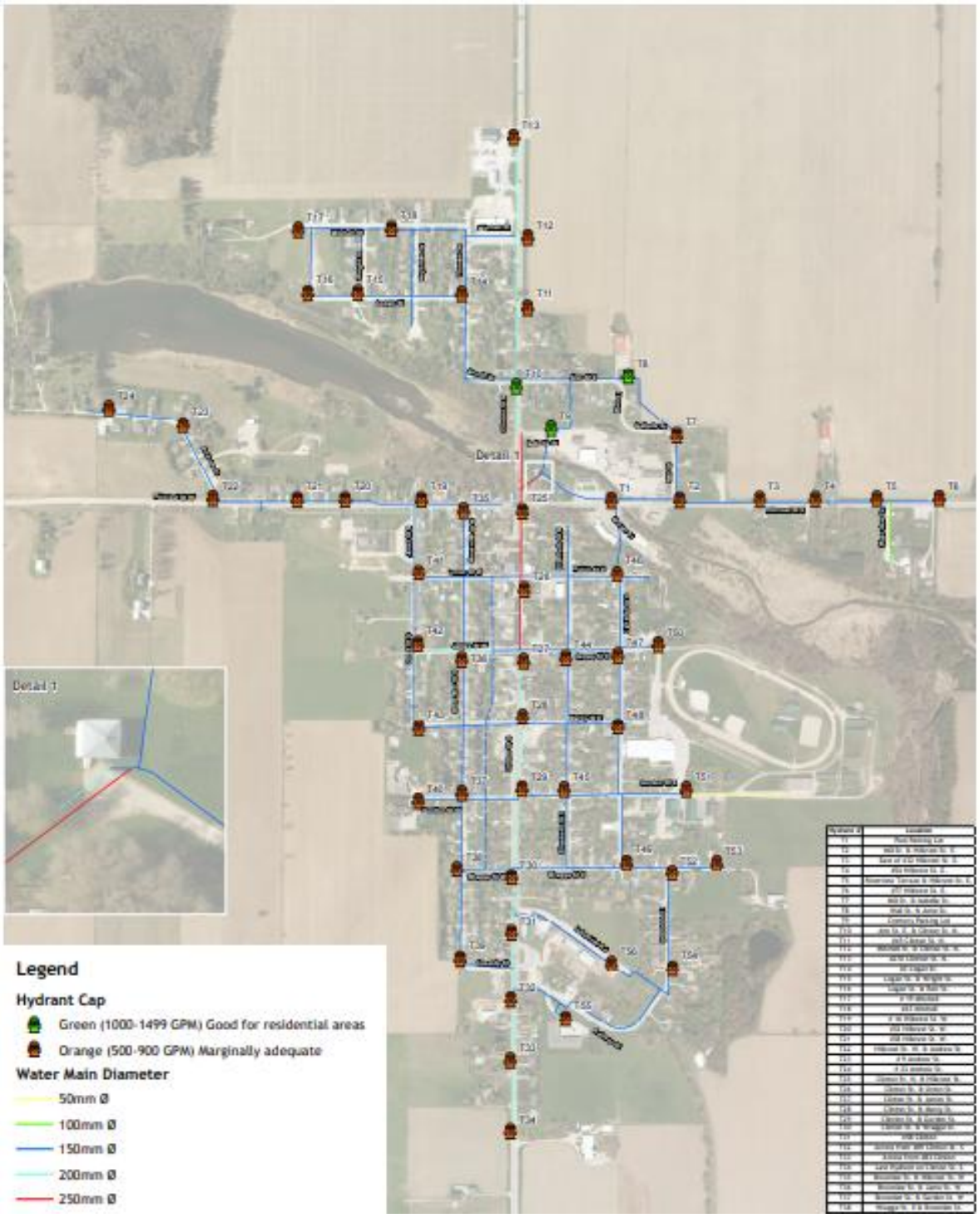

Structure 1019 on Sideroad 35


Structure 0021 on Sideroad 1A

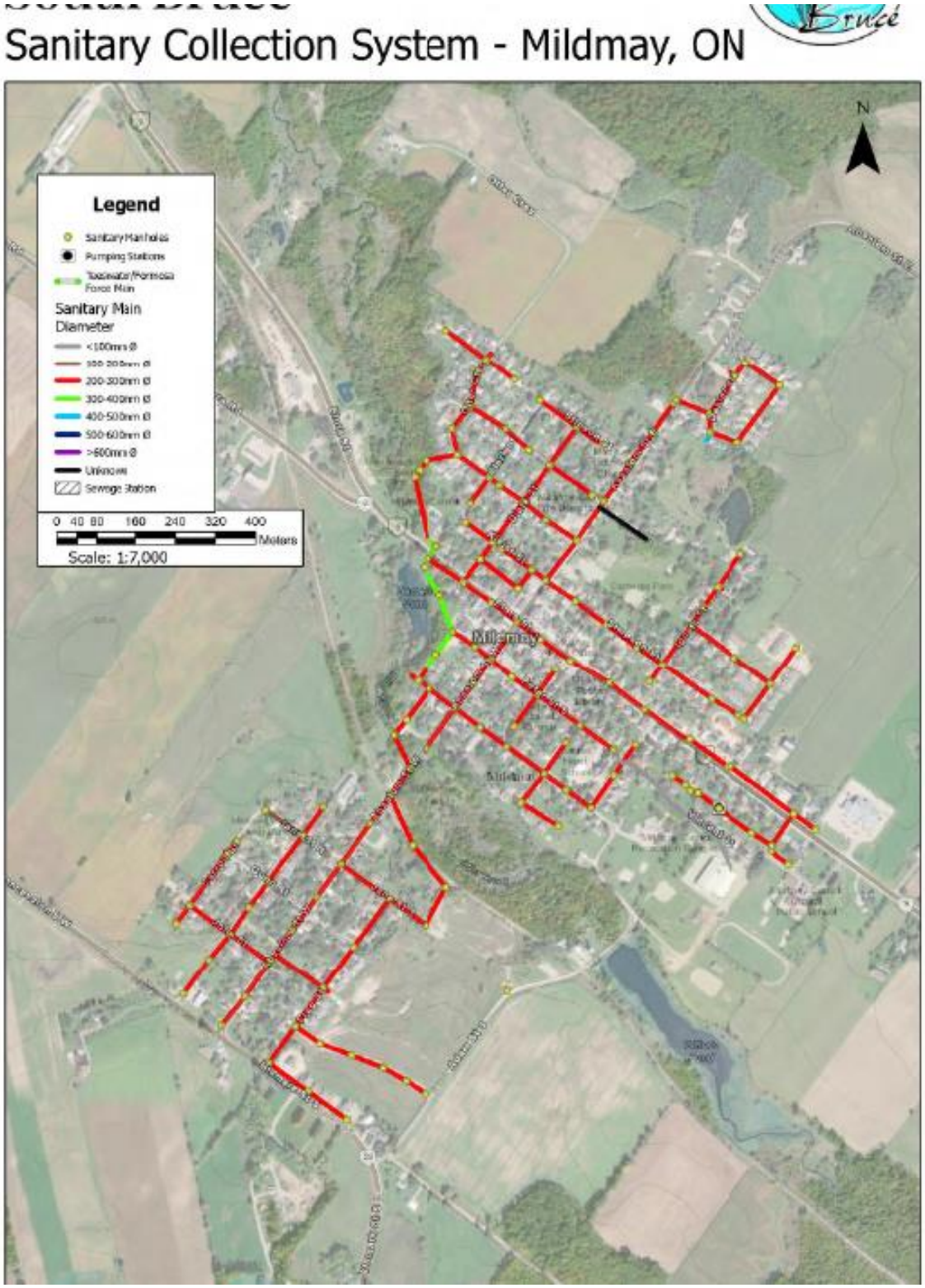
Water Network Map - Mildmay



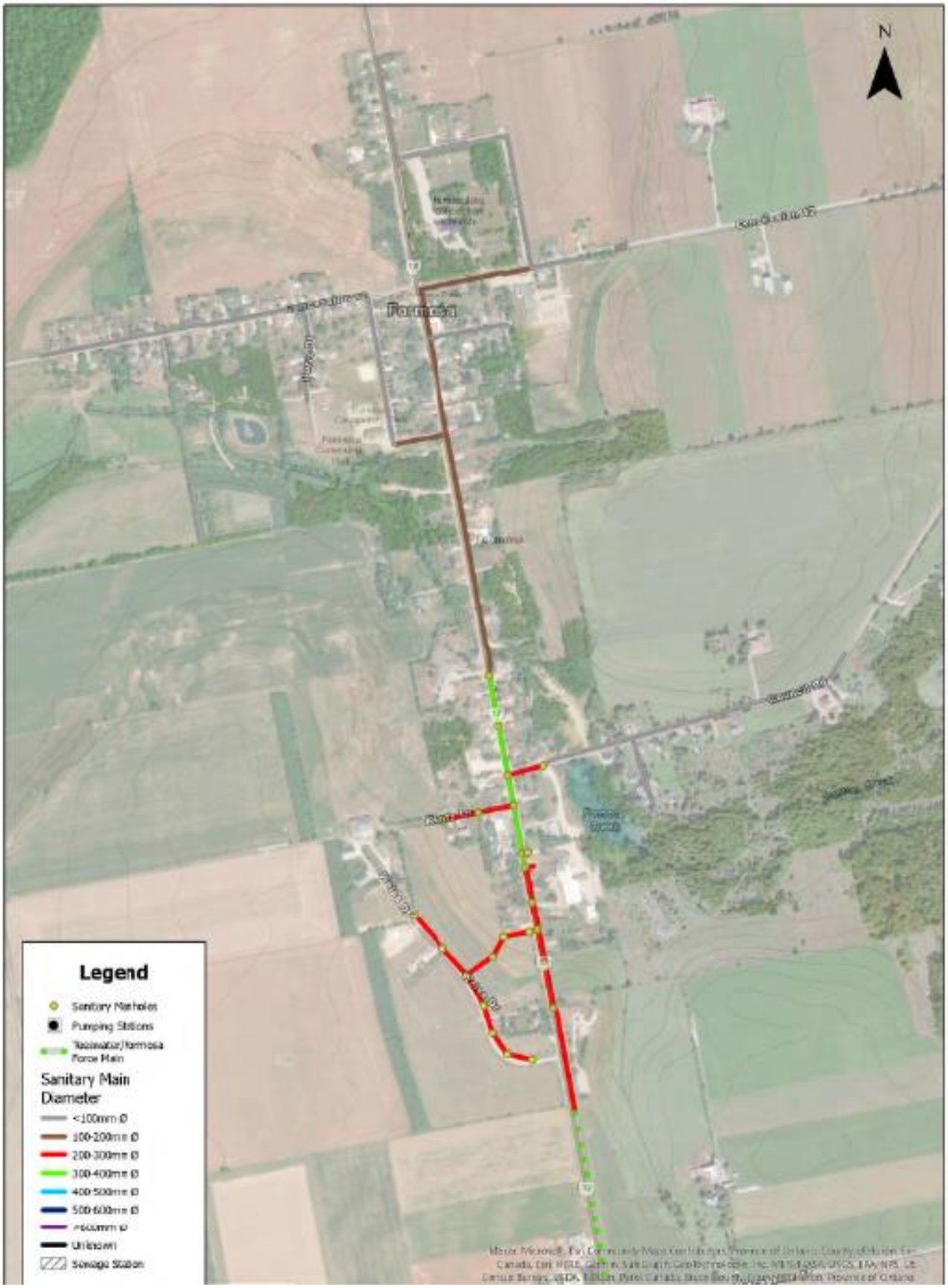
Water Network Map - Teeswater



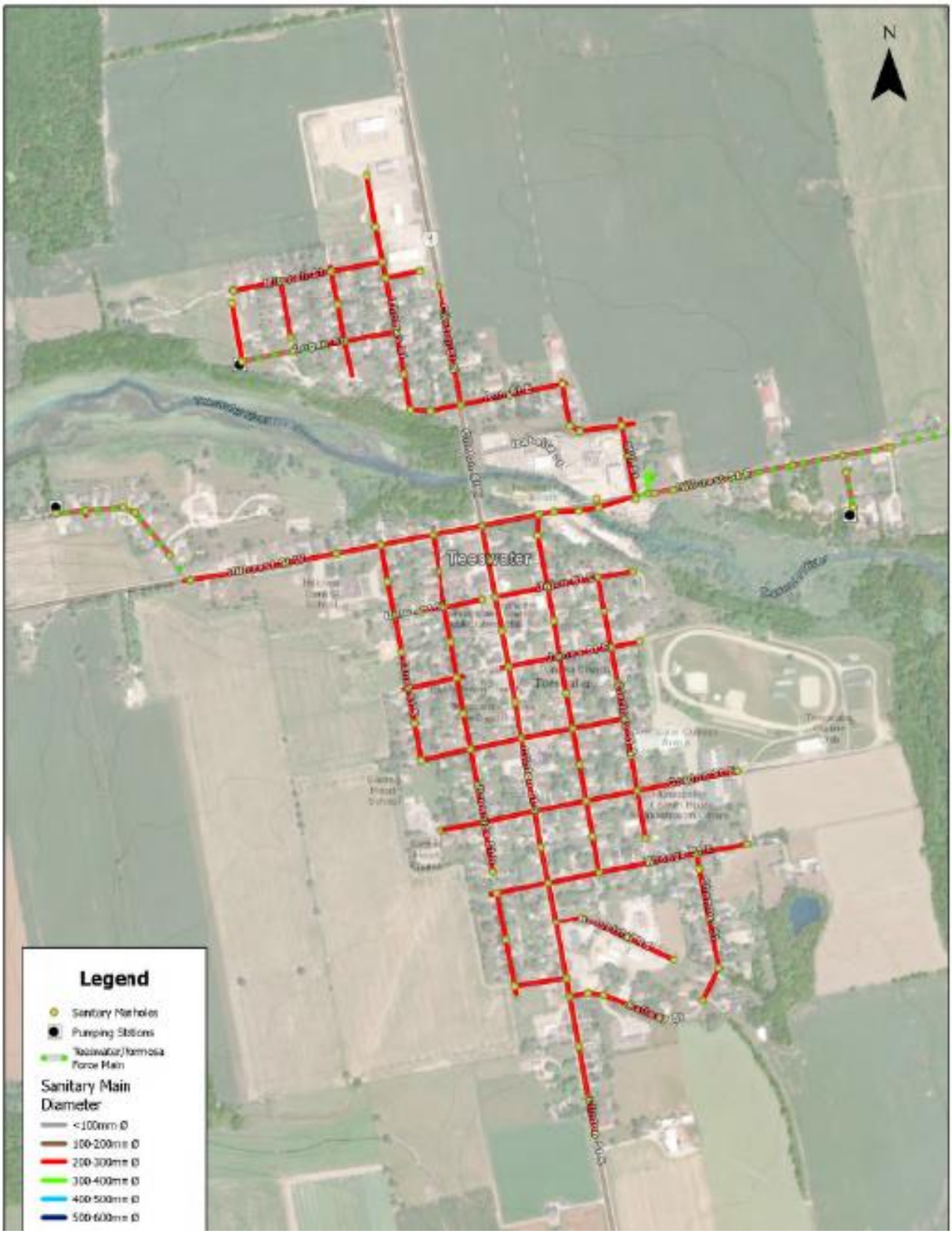
Wastewater Network



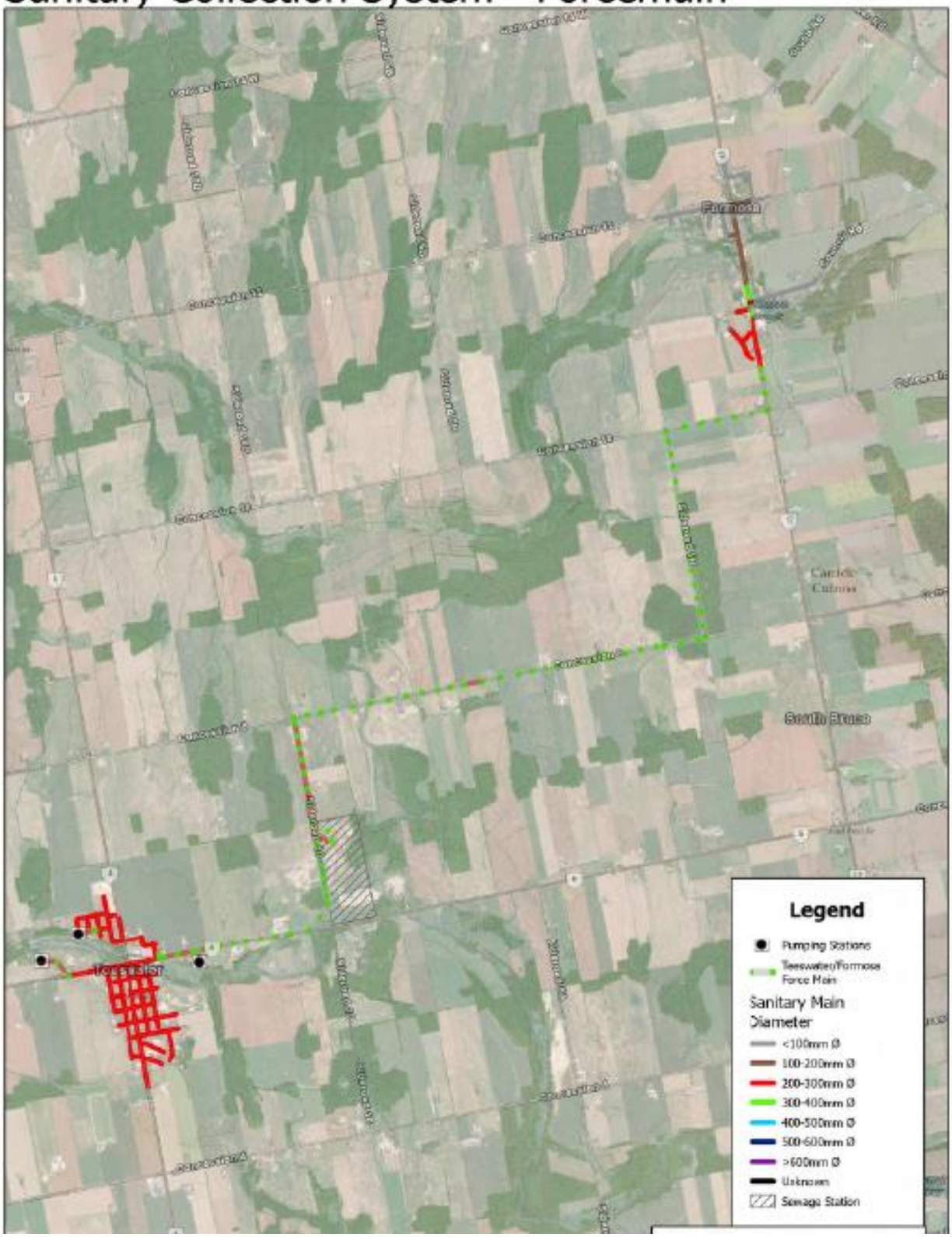
Sanitary Collection System - Formosa, ON



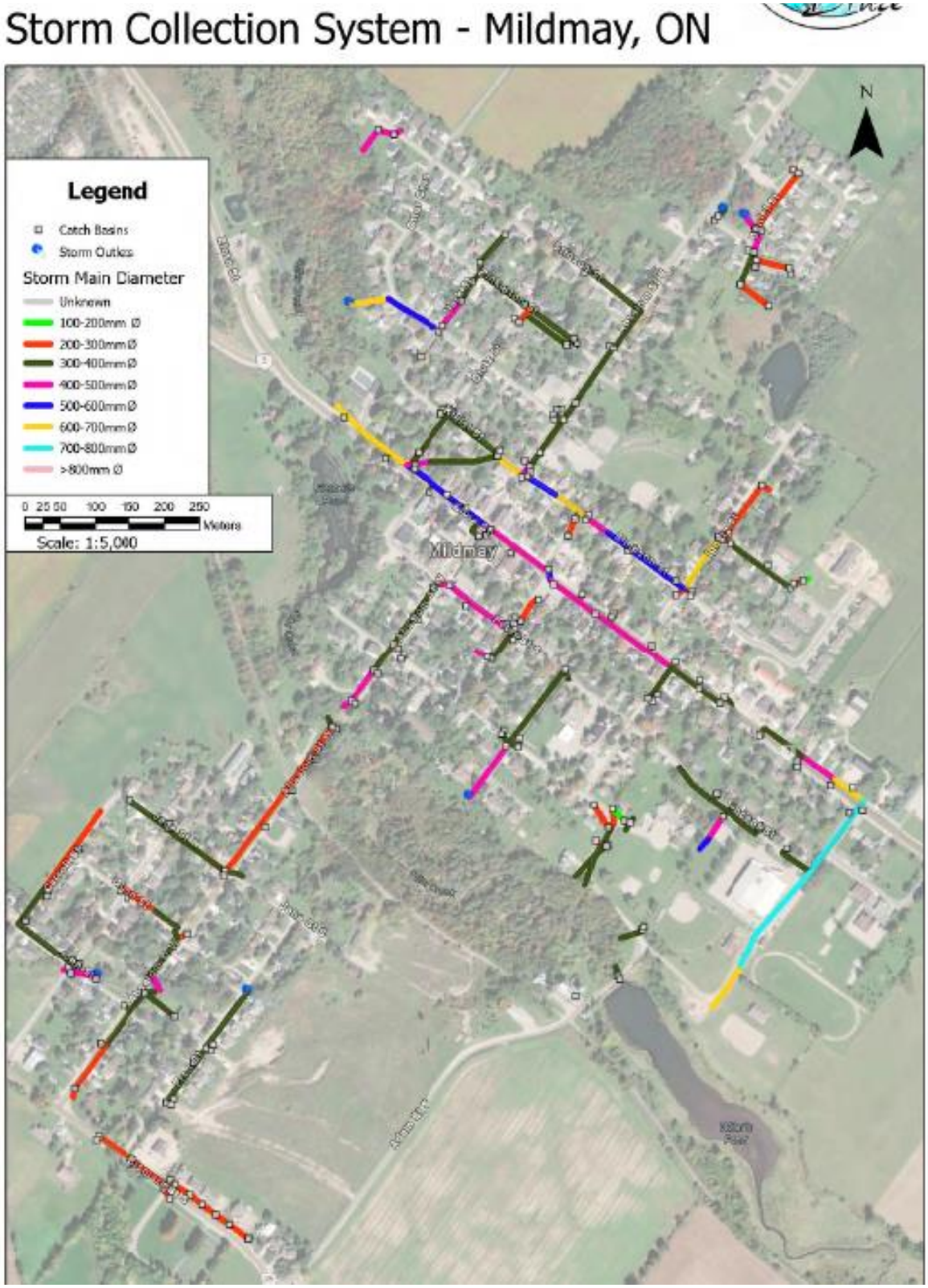
Sanitary Collection System - Teeswater, ON



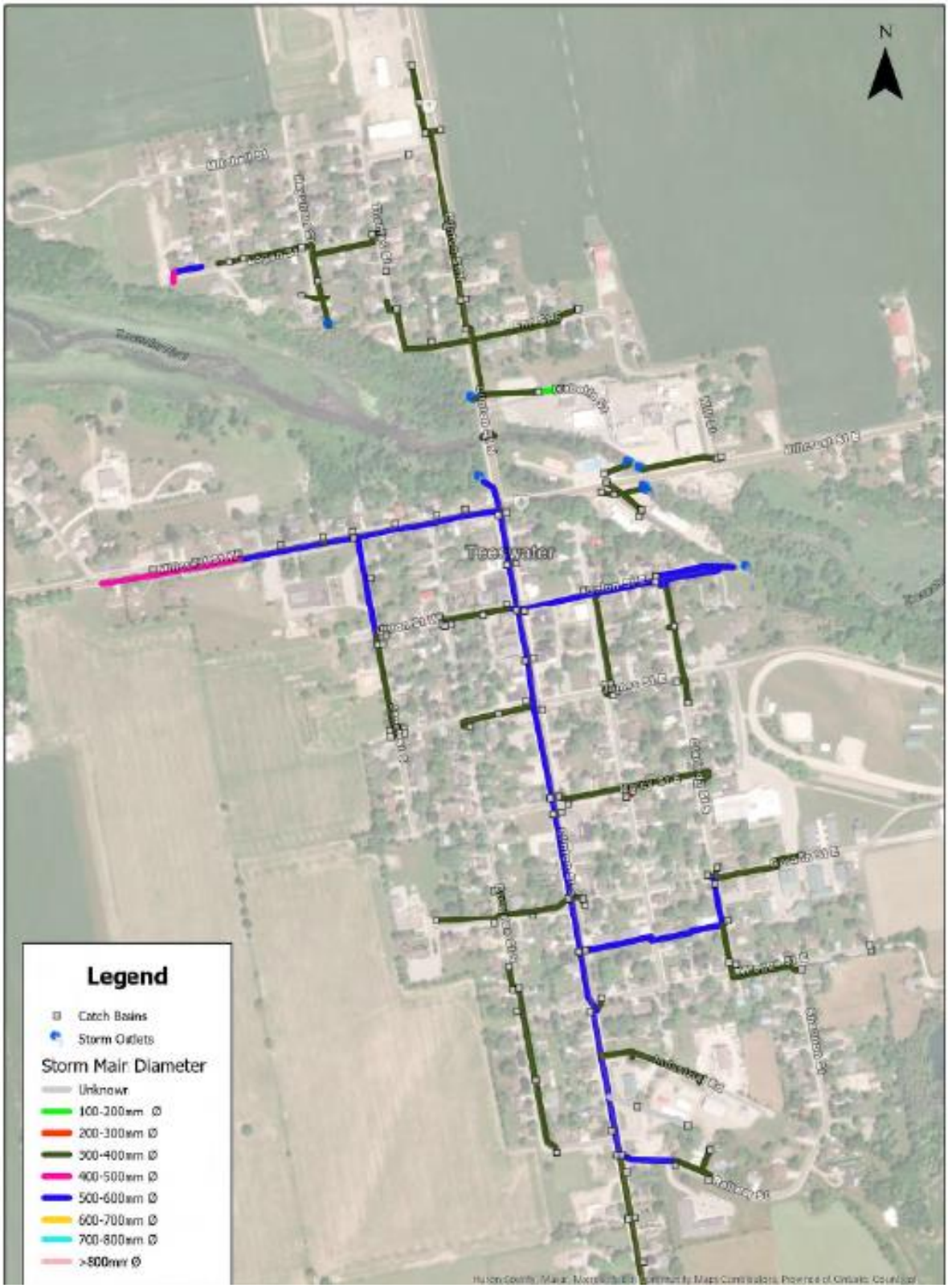
Sanitary Collection System - Forcemain



Storm Network



Storm Collection System - Teeswater, ON



Storm Collection System - Formosa, ON