Asset Management Plan

Municipality of Arran-Elderslie

2020

This Asset Management Program was prepared by:

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

Key Statistics

Replacement cost of asset portfolio

$443.4 million

Replacement cost of infrastructure per household

$140,000 (2016)

Percentage of assets in fair or better condition

75%

Percentage of assets with assessed condition data

82%

Annual capital infrastructure deficit

$6.02 million

Recommended timeframe for eliminating annual infrastructure deficit

15-20 Years

Target reinvestment rate

2.30%

Actual reinvestment rate

0.94%

Table of Contents

Executive Summary

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

Scope

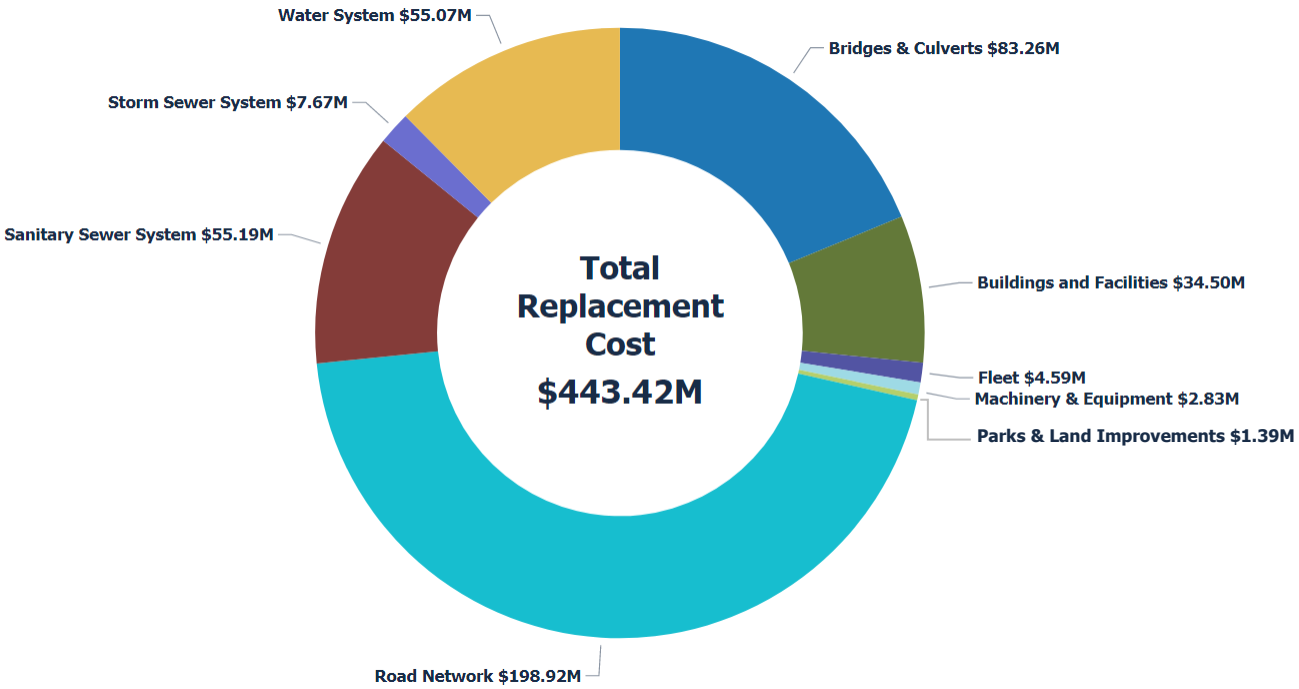
This Asset Management Plan (AMP) identifies the current practices and strategies that are in place to manage public infrastructure and makes recommendations where they can be further refined. Through the implementation of sound asset management strategies, the Municipality of Arran-Elderslie can ensure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

This AMP include the following asset categories:

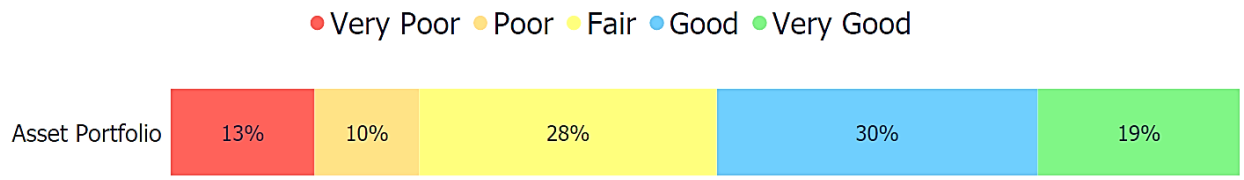
With the development of this AMP the Municipality of Arran-Elderslie has achieved compliance with O. Reg. 588/17 to the extent of the requirements that must be completed by July 1, 2022. There are additional requirements concerning proposed levels of service and growth that must be met by July 1, 2024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

Findings

The overall replacement cost of the asset categories included in this AMP totals to $443.4 million based on 2020 year-end data.



About 77% of all assets analysed in this AMP are in fair or better condition and assessed condition data was available for 82% of assets.



For the remaining assets, assessed condition data was unavailable and age was used to approximate condition – a data gap that persists in most municipalities. Generally, age misstates the true condition of assets, making assessments essential to accurate asset management planning, and a recurring recommendation in this AMP.

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

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

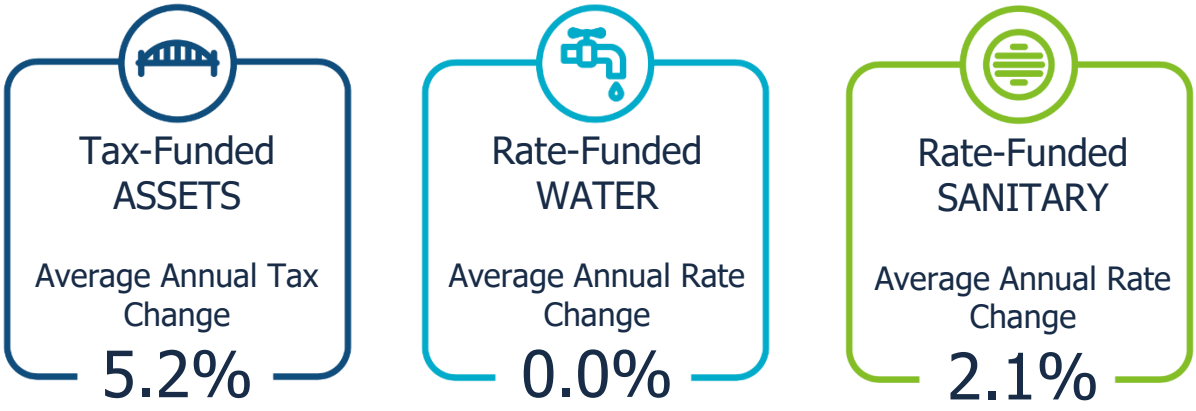
To meet capital replacement and rehabilitation needs for existing infrastructure, prevent infrastructure backlogs, and achieve long-term sustainability, the Municipality's average annual capital requirement totals $10.2 million. Based on a historical analysis of sustainable capital funding sources, the Municipality is committing approximately $4.2 million towards capital projects or reserves per year. As a result, there is currently an annual funding gap of $6.0 million.

Annual Capital Requirements 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 shows annual tax/rate change required to eliminate the Municipality's infrastructure deficit based on a 20-year plan for Tax-Funded assets and a 15-year plan for Rate-Funded[1] assets:



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

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

[1] The current funding model for the water assets is sufficient for the existing infrastructure. As a result, no rate increases are recommended at this time.

1 Introduction & Context

Key Insights

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

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

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

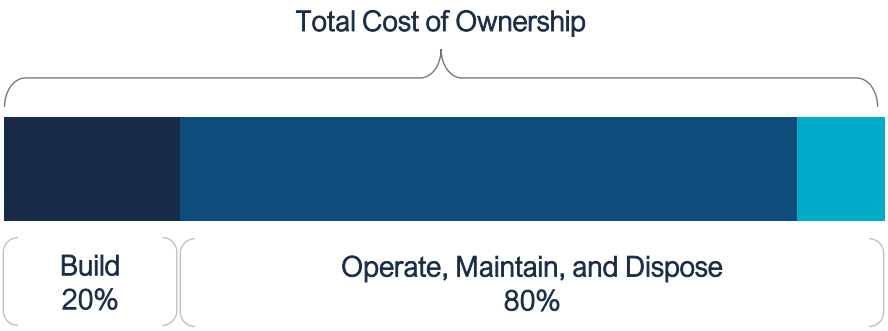
- An asset management plan is a dynamic document that should be updated regularly to inform long-term planning

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

An Overview of Asset Management

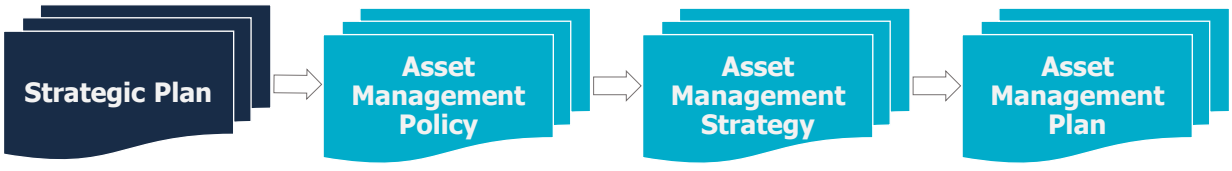
Municipalities are responsible for managing and maintaining a broad portfolio of infrastructure assets to deliver services to the community. The goal of asset management is to minimize the lifecycle costs of delivering infrastructure services, manage the associated risks, while maximizing the value ratepayers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

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



These costs can span decades, requiring planning and foresight to ensure 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 diagram below depicts an industry standard approach and sequence developing a practical asset management program. Beginning with a Strategic Plan, followed by an Asset Management Policy and an Asset Management Strategy, concluding with an Asset Management Plan.



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

1.1.1 Asset Management Policy

An asset management policy represents a statement of the principles guiding the 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 of Arran-Elderslie adopted By-law No. 41-2019 "Strategic Asset Management Policy" on June 24th, 2019 in accordance with accordance with Ontario Regulation 588/17.

The stated objectives of the policy are to:

- Provide a framework for implementing asset management to enable a consistent and strategic approach to all levels of the organization

- Demonstrate Council's commitment to support the implementation of asset management methods that are consistent with their priorities and objectives

- Provide guidance to staff responsible for asset management

- Provide transparency and accountability and demonstrate the validity of decision-making process which combine strategic plans, budgets, service levels and risks

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

- The policy's objectives dictate the use of asset management practices to ensure all assets meet the agreed levels of service in the most efficient and effective manner;
- the policy commits to, where appropriate, incorporating asset management in the Municipality's other plans;
- there are formally defined roles and responsibilities of internal staff and stakeholders;
- the guiding principles include the use of a cost/benefit analysis in the management of risk; and
- the policy statements are well defined.

1.1.2 Asset Management Strategy

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

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

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

1.1.3 Asset Management Plan

The 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.

The Municipality's last iteration of the AMP was completed in 2016. Since then, the asset inventory has undergone revisions and updates. This document is an AMP that uses the updated asset inventory and has been prepared in accordance with O. Reg. 588/17.

Key Concepts in Asset Management

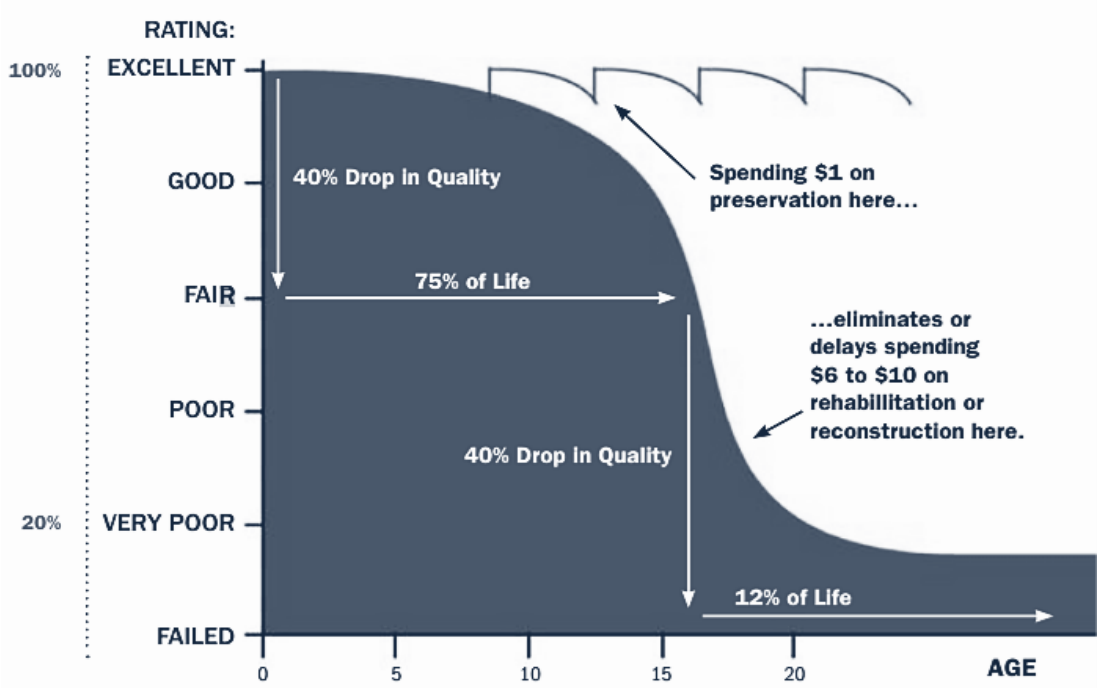
Effective asset management integrates several key components, including lifecycle management, risk management, and levels of service. These concepts are applied throughout this asset management plan and are described below in greater detail.

1.1.4 Lifecycle Management Strategies

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

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

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



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

Lifecycle Activity	Description	Example (Roads)	Cost
Preventative Maintenance	Activities that prevent defects or deteriorations from occurring	Crack Seal	$
General Maintenance	Activities that focus on current defects or inhibit deterioration	Pothole Repairs	$
Rehabilitation/ Renewal	Activities that rectify defects or deficiencies that are already present and may be affecting asset performance	Mill & Re-surface	$$
Replacement/ Reconstruction	Asset end-of-life activities that often involve the complete replacement of assets	Full Reconstruction	$$$
Replacement Upgrade	Asset end-of-life activities that involve the replacement of an asset to an 'upgraded' asset	Gravel Road to a Surface Treated Road	$$$

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

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

1.1.5 Risk Management Strategies

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

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

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

1.1.6 Levels of Service

A level of service (LOS) is a measure of what the 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, Sanitary, Storm Water) the Province, through O. Reg. 588/17, has provided qualitative descriptions that are required to be included in this AMP.

For non-core asset categories, the Municipality will define the qualitative descriptions that will be used to determine the community level of service by the July 2024 deadline.

Technical Levels of Service

Technical levels of service are a measure of key technical attributes of the service being provided to the community. These include mostly quantitative measures and tend to reflect the impact of the 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 will define the technical metrics that will be used to determine the technical level of service by the July 2024 deadline.

Current and Proposed Levels of Service

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

Proposed levels of service should be realistic and achievable within the timeframe outlined by the Municipality. They should also be determined with consideration of a variety of community expectations, fiscal capacity, regulatory requirements, corporate goals and long-term sustainability. Once proposed levels of service have been established, and prior to July 2025, the Municipality must identify a lifecycle management and financial strategy which allows these targets to be achieved.

Ontario Regulation 588/17

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

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

2019

Strategic Asset Management Policy

2022

Asset Management Plan for **Core Assets** with the following components:

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

2024

Asset Management Plan for **Core and Non-Core Assets**

2025

A Strategic Asset Management Policy update and an Asset Management Plan for **All Assets** with the following additional components:

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

1.1.7 O. Reg. 588/17 Compliance Review

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

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

2 Scope and Methodology

Key Insights

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

- Asset data from various data sources was consolidated into the Municipality's tangible capital asset inventory to establish it as the primary asset inventory

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

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

Asset categories included in this AMP

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

The 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
Road Network	Tax Levy
Bridges & Culverts	
Storm Sewer System	
Buildings & Facilities	
Machinery & Equipment	
Fleet	
Parks & Land Improvements	
Water System	User Rates
Sanitary Sewer System	

The Asset Inventory

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

Asset Category	Asset Data Source
Bridges & Culverts	2020 Bridge & Culvert Inspections report (OSIMs)
Road Network	2020 Road and Sidewalk Needs Study (RNS)
	GIS Data
Sanitary Sewer System	Sewer Financial Plan (2021 - 2026)
Water System	Drinking Water System Financial Plan (2021 - 2026)
Buildings & Facilities	2021/2022 Property Insurance Appraisal
Storm Water System	GIS Data
Parks & Land Improvements	Staff Expertise
Machinery & Equipment	
Fleet	

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

Deriving Replacement Costs

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

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

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

Estimated Useful Life and Service Life Remaining

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

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

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

Deriving Annual Capital Requirements

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

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

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

Reinvestment Rate

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

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

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

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

Deriving Asset Condition

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

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

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

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

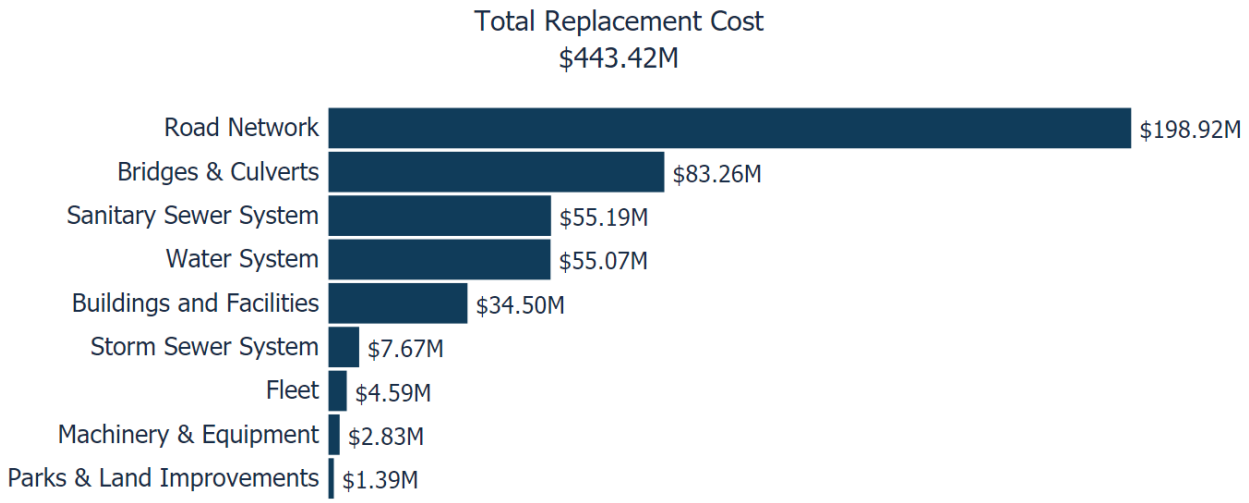
3 Portfolio Overview

Key Insights

- The total replacement cost of the Municipality's asset portfolio is $443.4 million
- The Municipality's target re-investment rate is 2.3%, and the actual re-investment rate is 0.9%, contributing to an expanding infrastructure deficit
- 77% of all assets are in fair or better condition
- 24% of assets are projected to require replacement in the next 10 years
- Average annual capital requirements total $10.2 million per year across all assets
- Annual capital funding by the Municipality totals $4.2 million across all assets

Total Replacement Cost of Asset Portfolio

The asset categories analyzed in this AMP have a total replacement cost of $443.4 million based on inventory data at the end of 2020. This total was determined based on a combination of user-defined costs and historical cost inflation. This estimate reflects replacement of historical assets with similar, not necessarily identical, assets available for procurement today.

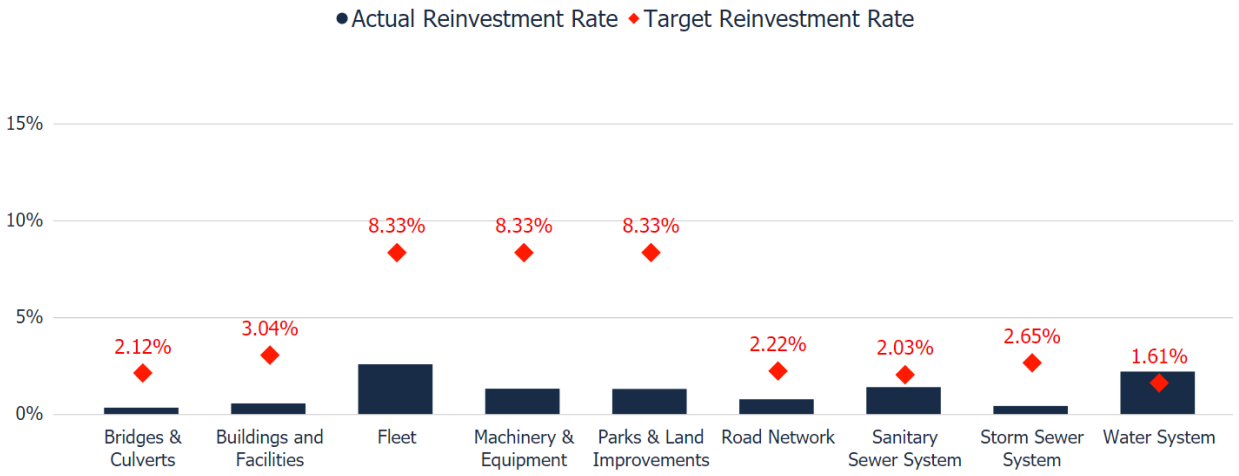


The table below identifies the replacement cost method and sources used throughout this AMP.

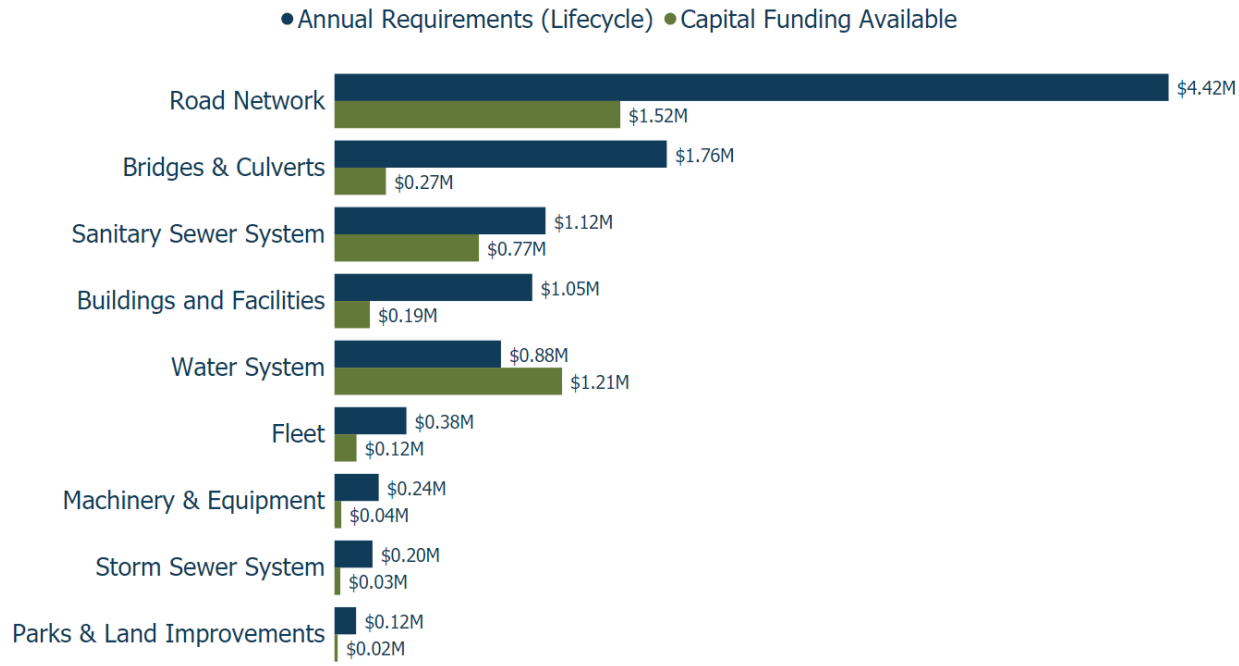
Asset Category	Replacement Cost Method		
	Unit Cost/User-Defined Cost	Historical Cost Inflation	Replacement Cost Source
Road Network	95%	5%	2020 RNS
Bridges & Culverts	100%	0%	Regional Cost
Storm Sewer System	99%	1%	Municipal Staff
Buildings & Facilities	92%	7%	2020/2021 Property Schedule
Machinery & Equipment	0%	100%	Historical Cost Inflation
Parks & Land Improvements	65%	35%	Municipal Staff
Fleet	0%	100%	Historical Cost Inflation
Water System	90%	10%	Municipal Staff
Sanitary Sewer System	1%	99%	Municipal Staff
Overall	**92%**	**8%**	

Target vs. Actual Reinvestment Rate

The graph below depicts funding gaps or surpluses by comparing the target vs the actual reinvestment rate. To meet the long-term replacement needs, the Municipality should be allocating approximately $10.2 million annually, for a target reinvestment rate of 2.3%. Actual annual spending on infrastructure totals approximately $4.2 million, for an actual reinvestment rate of 0.9%.

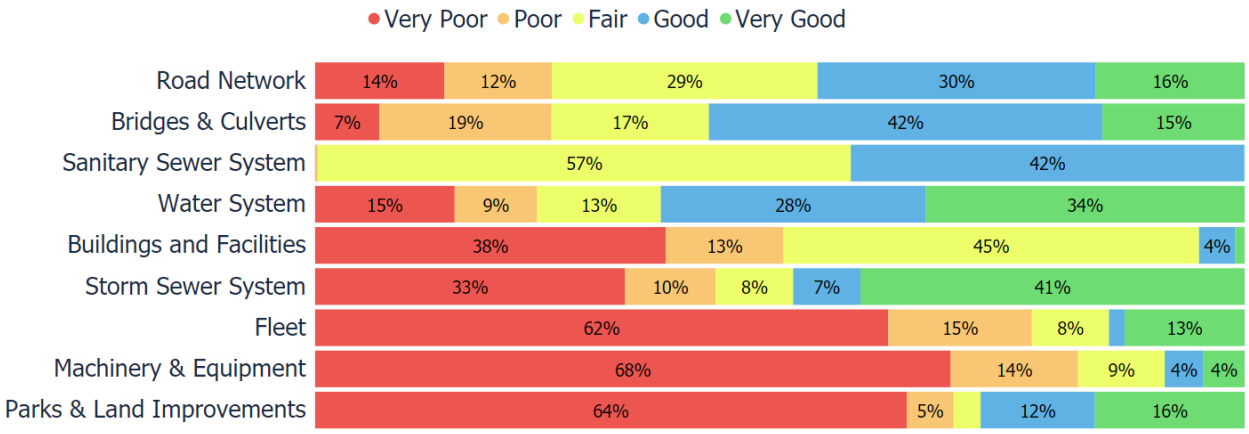


To highlight the monetary magnitude of the reinvestment rates, the graph below compares the capital annual requirements (target investment) versus the current level of service to the capital annual funding that is available (actual reinvestment). This comparison is examined in more detail under Section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



Condition of Asset Portfolio

The current condition of the assets is central to all asset management planning. Collectively, 77% of assets in the Municipality are in fair or better condition. This estimate relies on both age-based and field condition data. It is also important to acknowledge that for certain larger assets such as facilities and park structures, having a componentized inventory will produce a more accurate condition and forecast, rather than just an asset.

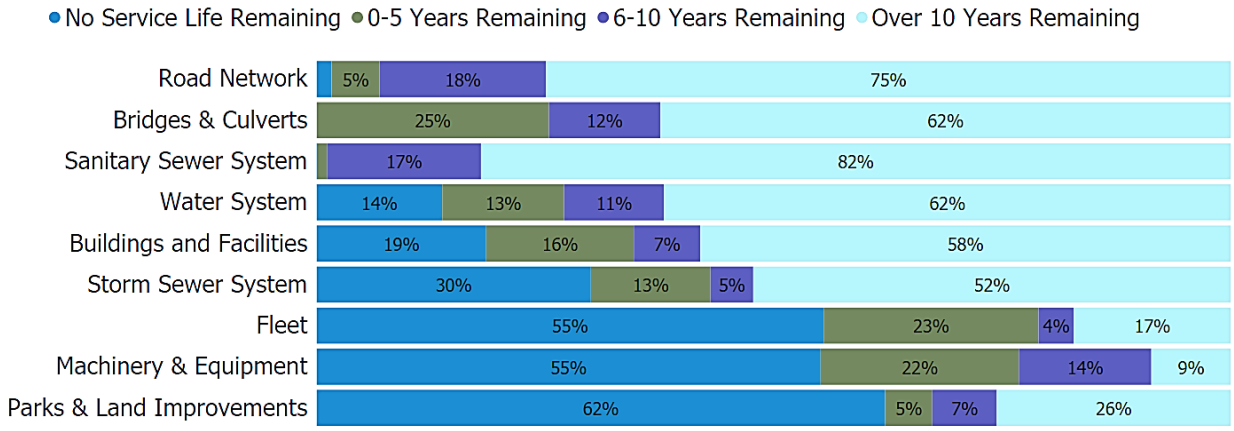


This AMP relies on assessed condition data for 82% of assets; for the remaining portfolio, age is used as an approximation of condition. Assessed condition data is invaluable in asset management planning as it reflects the true condition of the asset and its ability to perform its functions. The table below identifies the source of condition data used throughout this AMP.

Asset Category	% of Assets with Age-based Condition	% of Assets with Assessed Condition	Source of Condition Data
Road Network	8%	92%	2020 RNS, 2016 Staff Assessments
Bridges & Culverts	0%	100%	2020 OSIM Report
Storm Sewer System	94%	6%	2016 Staff Assessments
Buildings & Facilities	99%	1%	
Machinery & Equipment	95%	5%	
Parks & Land Improvements	95%	5%	
Fleet	100%	0%	Age-based
Water System	21%	79%	2021 Staff Assessments
Sanitary Sewer System	1%	99%	
Overall	**12%**	**82%**	

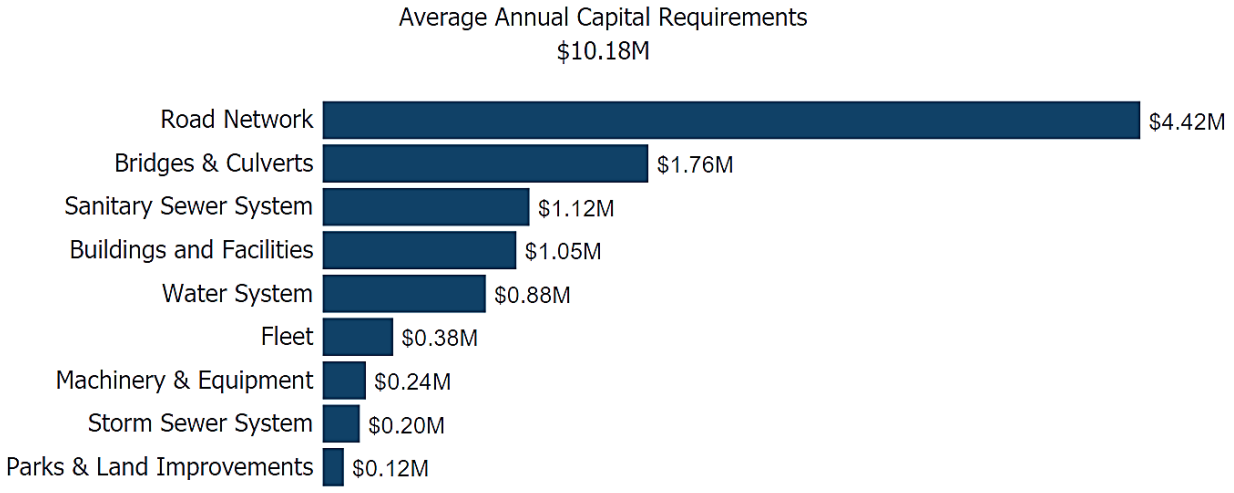
Service Life Remaining

Based on asset age, available assessed condition data and estimated useful life, 24% of the Municipality's assets will require replacement within the next 10 years. Capital requirements over the next 10 years are identified in Appendix B.



Annual Capital Requirements

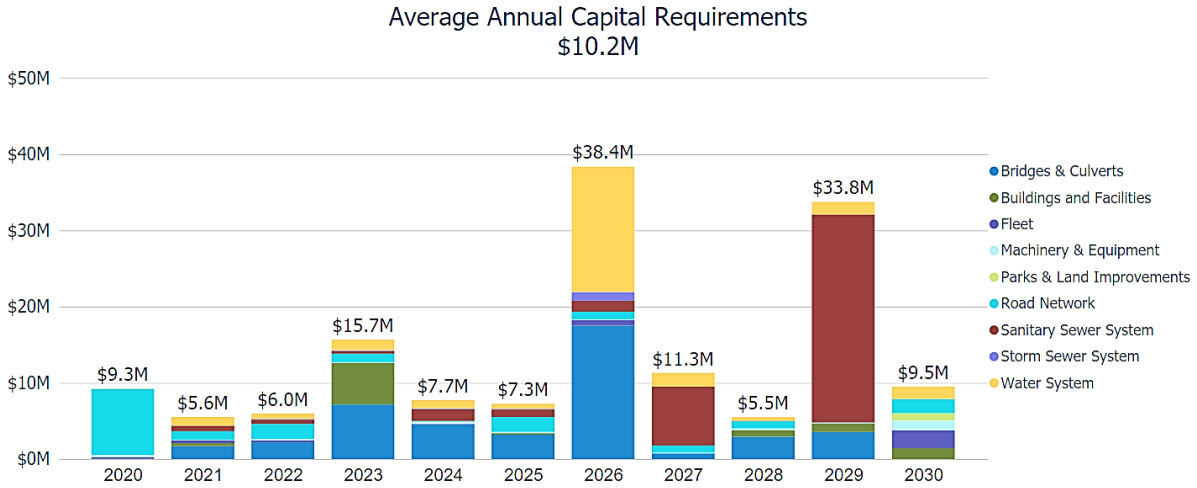
Based on the replacement cost of the assets, the estimated useful life, the cost and impact of lifecycle activities, the average annual capital requirements can be calculated for each category in the asset portfolio. This is the average annual amount required to maintain the current level of service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



Forecasted Capital Requirements

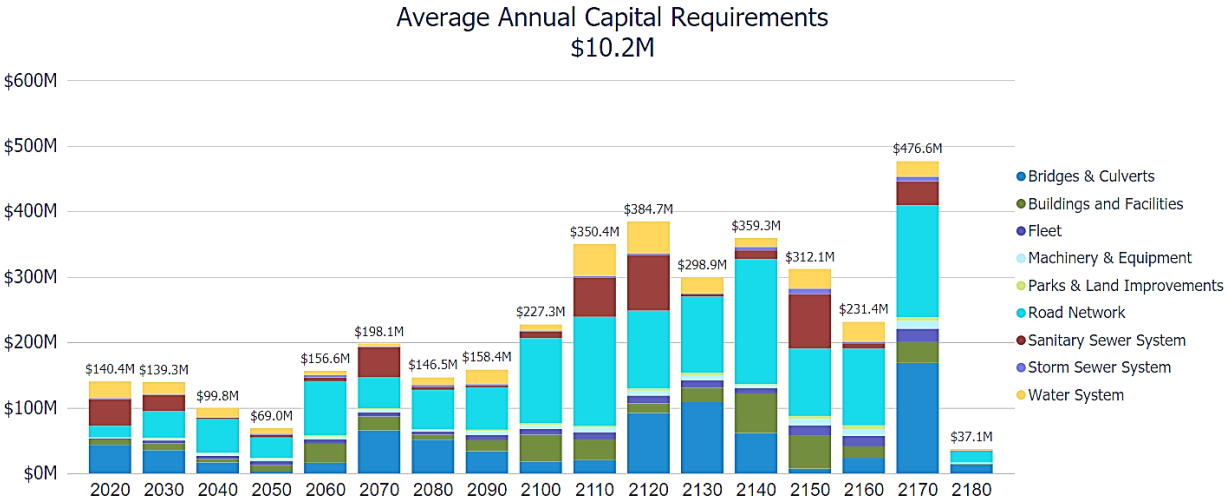
The development of a long-term capital forecast should include both asset rehabilitation and replacement requirements. With the development of asset-specific lifecycle strategies that include the timing and cost of future capital events and the refinement of the asset inventory, the Municipality can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

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



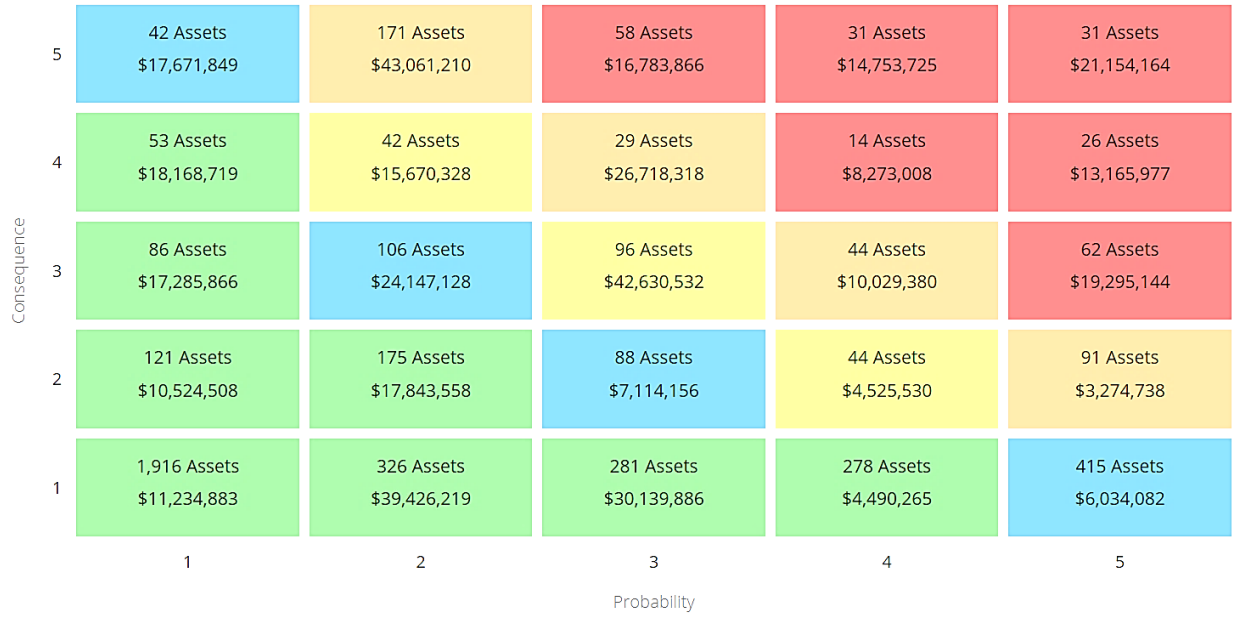
The specific projected cost of lifecycle activities that will need to be undertaken over the next 10 years to maintain the current level of service can be found in Appendix B.

The following graph identifies the average annual capital requirements required over the next 160 years. This projection is used as it ensures that every asset has gone through one full iteration of replacement. The forecasted requirements are aggregated into 10-year bins and are based on the Municipality's asset inventory as of 2020 and do not include assets that may be required for growth.



Risk & Criticality

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



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

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

4 Analysis of Tax-funded Assets

Key Insights

- Tax-funded assets are valued at $333.2 million
- 73% 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 $8.2 million
- To reach sustainability, tax revenues need to be increased by 5.2% annually for the next 20 years to eliminate annual deficits

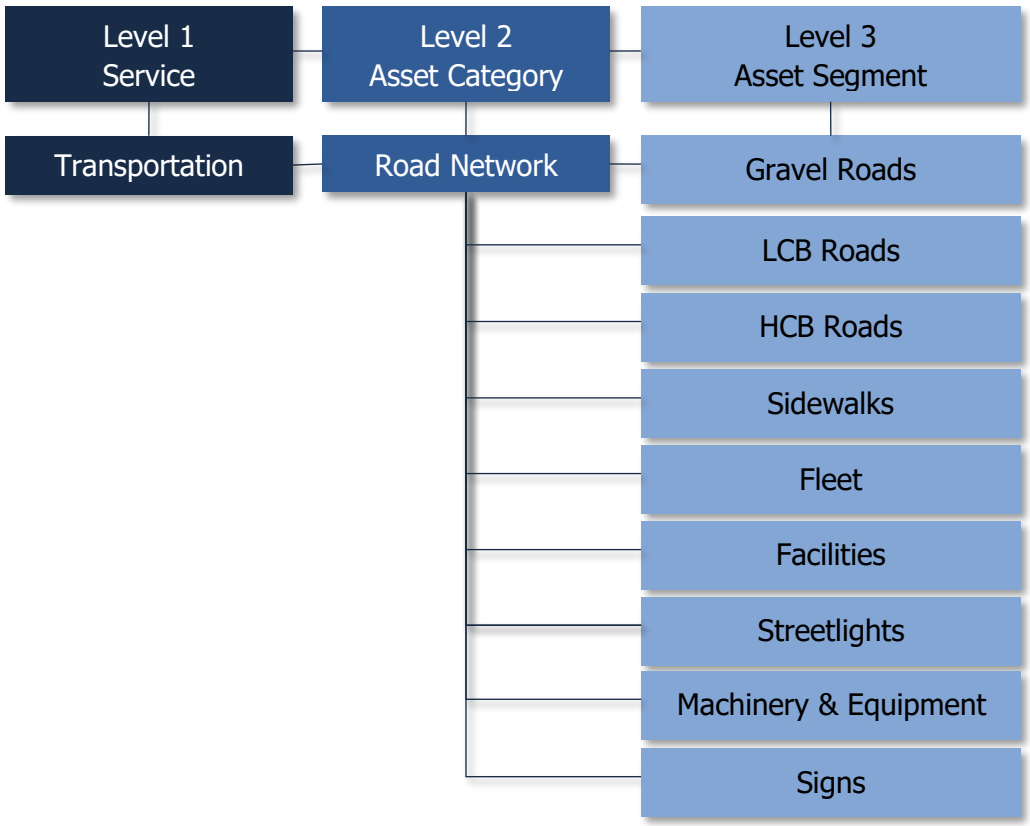
Road Network

The Municipality's Road Network inventory is managed in CityWide™, and comprises of 1,547 unique assets, including 370 kilometres of paved and unpaved roads, around 26 kilometres of sidewalks, and roadway appurtenances such as streetlights and street signs.

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

4.1.1 Asset Hierarchy & Segmentation

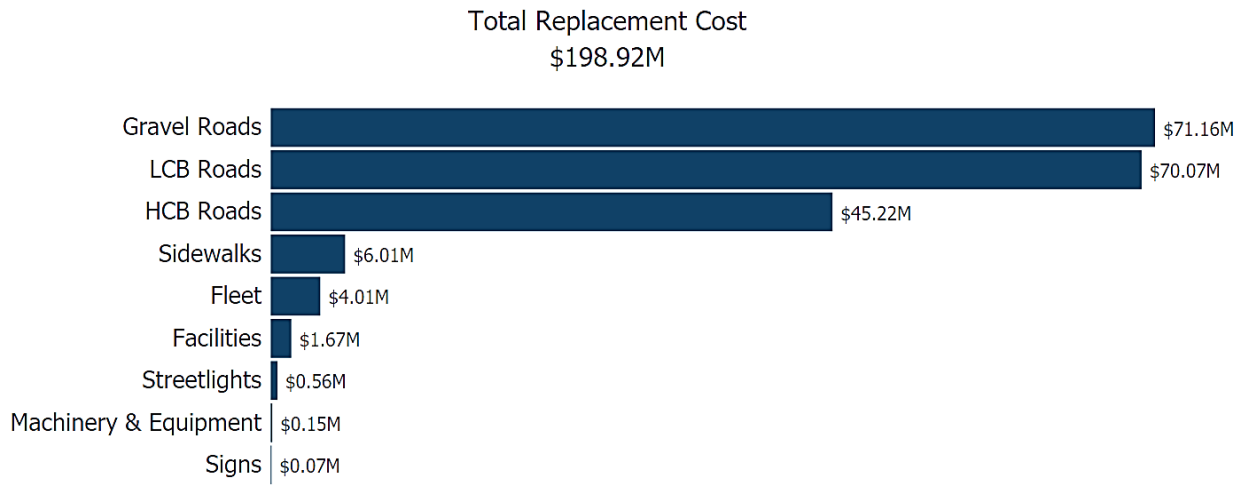
Asset hierarchy explains the relationship between individual assets and their components, and a wider, more expansive network and system. How assets are grouped in a hierarchy structure can impact how data is interpreted. Assets were structured to support meaningful, efficient reporting and analysis.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



4.1.2 Asset Inventory & Replacement Cost

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

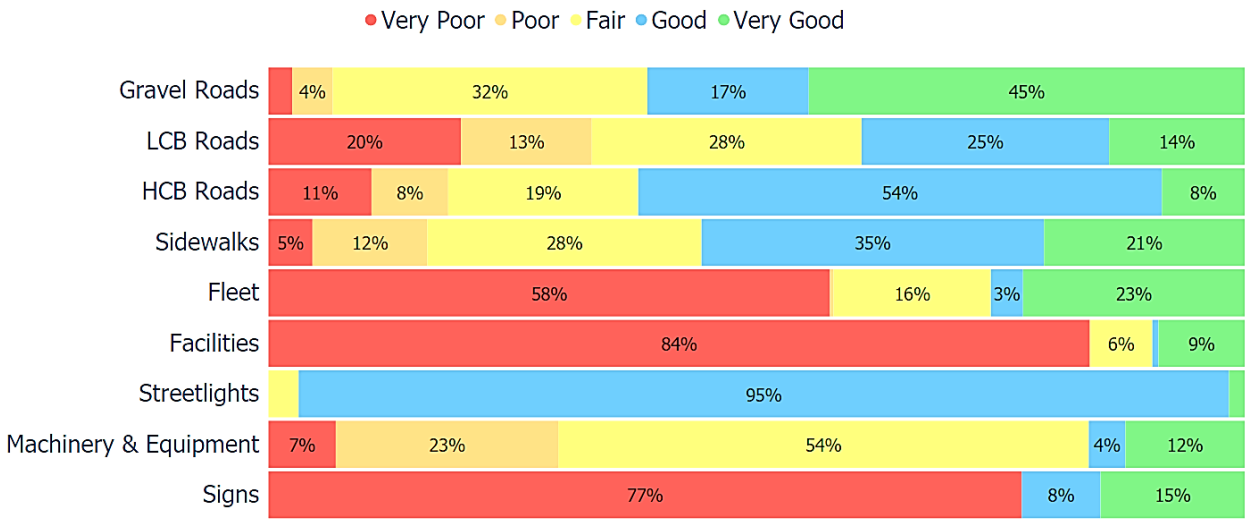
Asset Segment	Quantity	Replacement Cost Method	Total Replacement Cost
Gravel Roads	199 km	Cost per Unit	$71,162,559
LCB Roads	116 km	Cost per Unit	$70,073,001
HCB Roads	55 km	Cost per Unit	$45,215,956
Sidewalks	26 km	Cost per Unit, Historical Cost Inflation	$6,007,026
Fleet	44	Historical Cost Inflation	$4,010,138
Facilities	6	Historical Cost Inflation, 2021/2022 Property Schedule	$1,673,087
Streetlights	859	Historical Cost Inflation	$561,052
Machinery & Equipment	21	Historical Cost Inflation	$147,556
Signs	1,753	Historical Cost Inflation	$65,758
			$198,916,133



4.1.3 Asset Condition

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

Asset Segment	Average Condition (%)	Average Condition Rating	Condition Source
Gravel Roads	62%	Good	100% Assessed
LCB Roads	61%	Good	89% Assessed
HCB Roads	69%	Good	96% Assessed
Sidewalks	59%	Fair	93% Assessed
Fleet	32%	Poor	4% Assessed
Facilities	11%	Very Poor	5% Assessed
Streetlights	69%	Good	Age-based
Machinery & Equipment	49%	Fair	10% Assessed
Signs	18%	Very Poor	Age-based
	62%	**Good**	



Current Approach to Condition Assessment

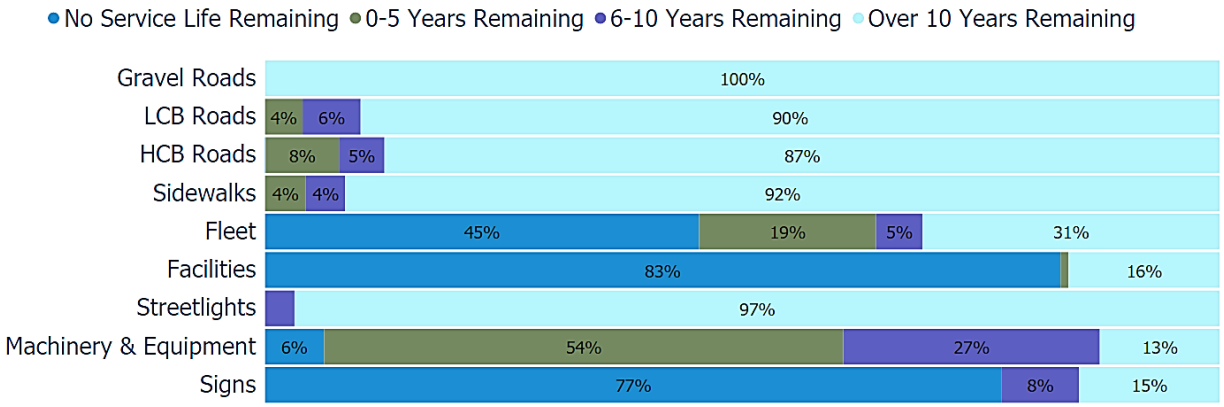
Accurate and reliable condition data allows staff to more confidently determine the remaining service life of assets and identify the most cost-effective approach to managing assets. The following describes the municipality's current approach:

- A Road and Sidewalk Needs Study was completed in 2020 that included a detailed assessment of the condition of each road and sidewalk segment
- Road patrols are undertaken every 2 weeks, granular roads are also visually inspected during grading activities
- Road Network assets are inspected as per O. Reg. 239/02

4.1.4 Estimated Useful Life & Average Age

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

Asset Segment	Estimated Useful Life (Years)	Average Age (Years)	Average Service Life Remaining (Years)
Gravel Roads	50 Years[2]	56.1	25.3
LCB Roads	30 Years	38.3	26.2
HCB Roads	15 Years	36.0	21.8
Sidewalks	30 - 60 Years	31.4	37.7
Fleet	4 - 20 Years	11.4	2.2
Facilities	10 - 50 Years	23.6	9.6
Streetlights	15 - 30 Years	6.1	13.9
Machinery & Equipment	4 - 20 Years	5.0	6.6
Signs	10 - 20 Years	12.5	2.5
		19.4	**19.0**



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

[2] The estimated useful life of gravel roads is derived from the base component of the road asset, as the surface component is not capitalized (in a state of perpetual maintenance).

4.1.5 Lifecycle Management Strategy

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

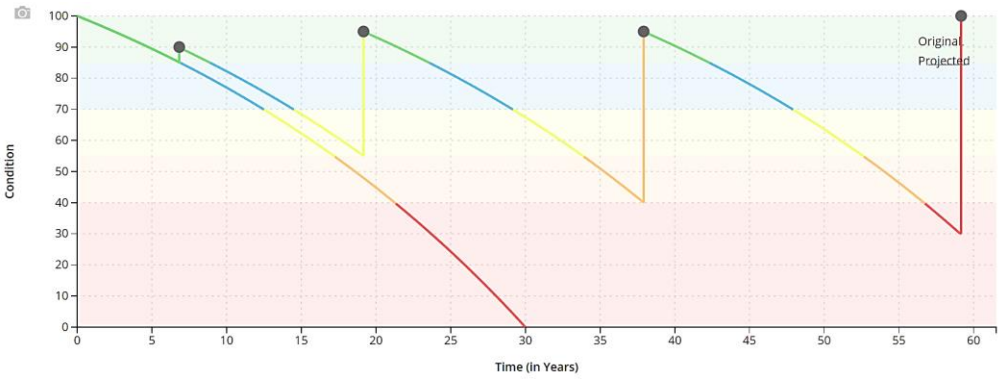
The following table outlines the Municipality's current lifecycle management strategy.

Activity Type	Description of Current Strategy
Maintenance	Pothole repairs are completed annually based on deficiencies identified through regular road patrols and feedback from the public.
	Seasonal maintenance activities include asphalt patching, graveling, and tree cutting.
	Summer maintenance activities include sidewalk repairs, grading, re-gravelling, dust control, ditching, roadside mowing, tree trimming, brush cleanup, road sign installation/maintenance, and line painting.
	Winter maintenance activities include snow plowing, slating, and snow removal.
	A crack sealing program is in place for asphalt roads as needed to reduce erosion caused by poor drainage.
Rehabilitation	Rehabilitation activities include: microsealing, pulverize & pave, asphalt overlay, and full depth asphalt reclamation.
	Road replacement prioritization is determined by consideration of growth, risk, condition, health and safety, and social impact.
Replacement	Road reconstruction projects (base & surface) are identified based on road condition, risk, and sub-surface asset requirements (water/sewer/storm)

The following lifecycle strategies have been developed to formalize the current approach to manage the lifecycle of HCB, LCB and Gravel roads. Instead of allowing the roads to deteriorate until replacement is required, strategic rehabilitation is expected to extend the service life of roads at a lower total cost.

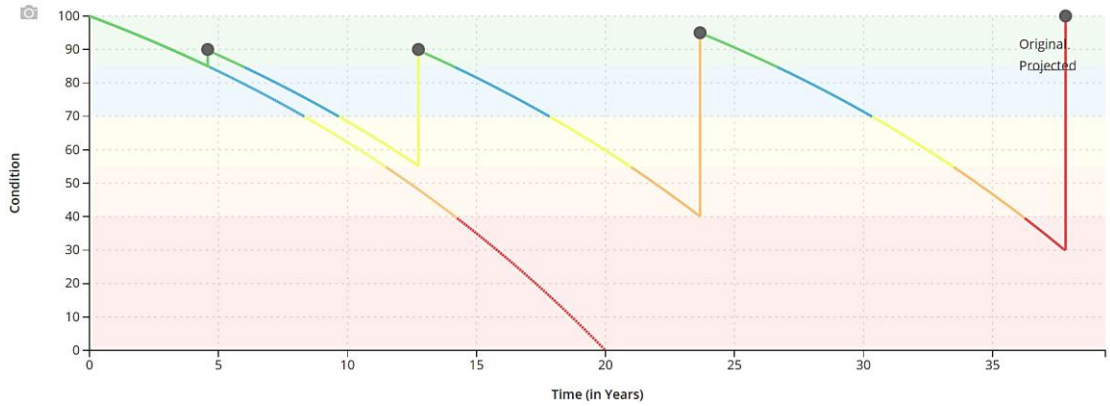
Urban Roads (HCB)

Event Name	Event Class	Event Trigger
Crack Sealing & Asphalt Patching	Preventative Maintenance	Condition: 75 - 95
Full Depth Pulverize and Pave	Rehabilitation	Condition: 55 - 75
Pulverize and Pave	Rehabilitation	Condition: 40 - 55
Full Reconstruction	Replacement	Condition: 30 - 40

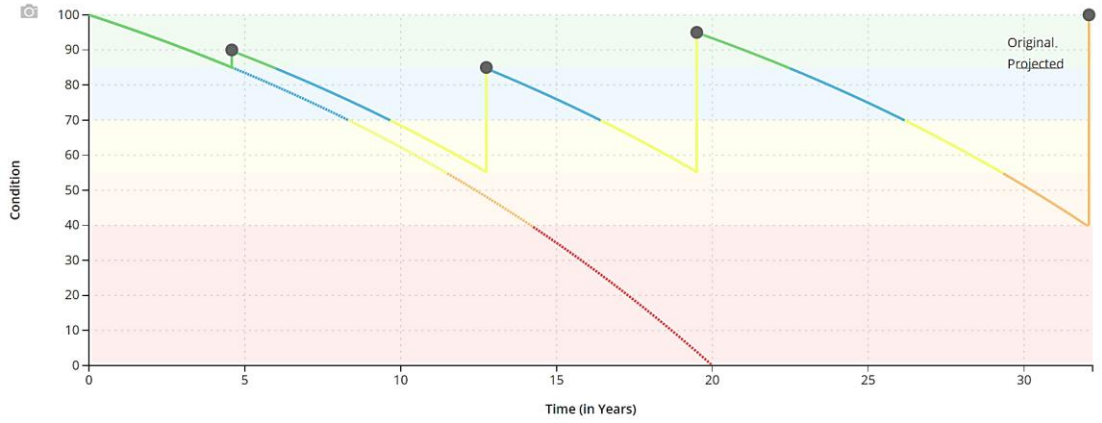


Semi-Urban Roads (HCB)

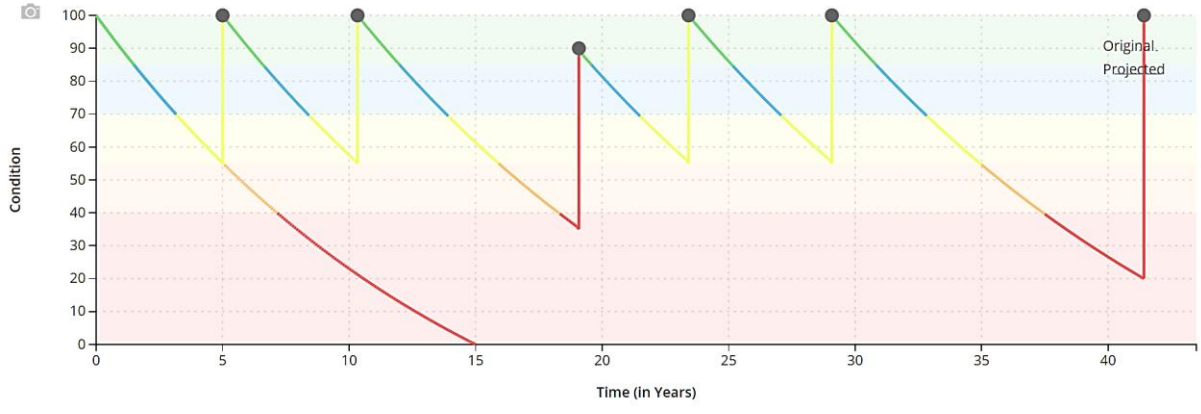
Event Name	Event Class	Event Trigger
Crack Sealing & Asphalth Patching	Preventative Maintenance	Condition: 85 - 95
Hot Mix Resurfacing	Rehabilitation	Condition: 55 - 70
Pulverize and Pave	Rehabilitation	Condition: 40 - 55
Full Reconstruction	Replacement	Condition: 30



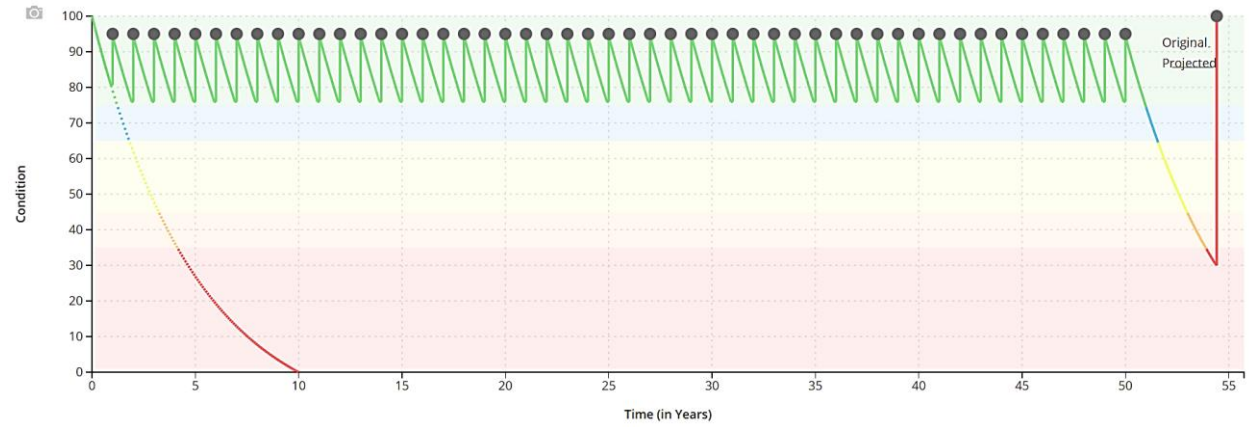
Rural Roads (HCB)		
Event Name	**Event Class**	**Event Trigger**
Crack Sealing & Asphalt Patching	Preventative Maintenance	Condition: 85 - 95
Microsealing	Rehabilitation	Condition: 55 - 70
Rural Paving	Rehabilitation	
Full Reconstruction	Replacement	Condition: 40



Rural Roads (LCB)		
Event Name	**Event Class**	**Event Trigger**
Single Surface Treatment	Rehabilitation	Condition: 55 - 70
Double Surface Treatment	Rehabilitation	Condition: 35 - 55
Full Reconstruction	Replacement	Condition: 20



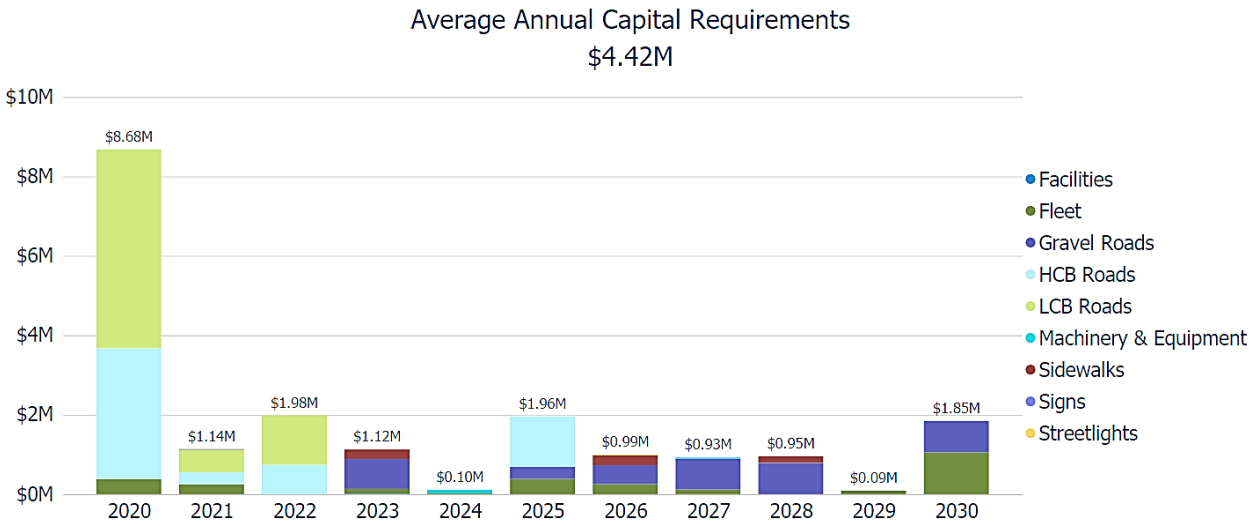
Gravel Roads		
Event Name	**Event Class**	**Event Trigger**
Calcium Chloride Application	Preventative Maintenance	Annually
Ditching/Mowing/Brushing/Spraying	Maintenance	Multiple times per year
Grading	Maintenance	4 times per year
Gravel Resurfacing - 50 mm	Maintenance	Annually
Full Reconstruction	Replacement	Condition: 30



Forecasted Capital Requirements

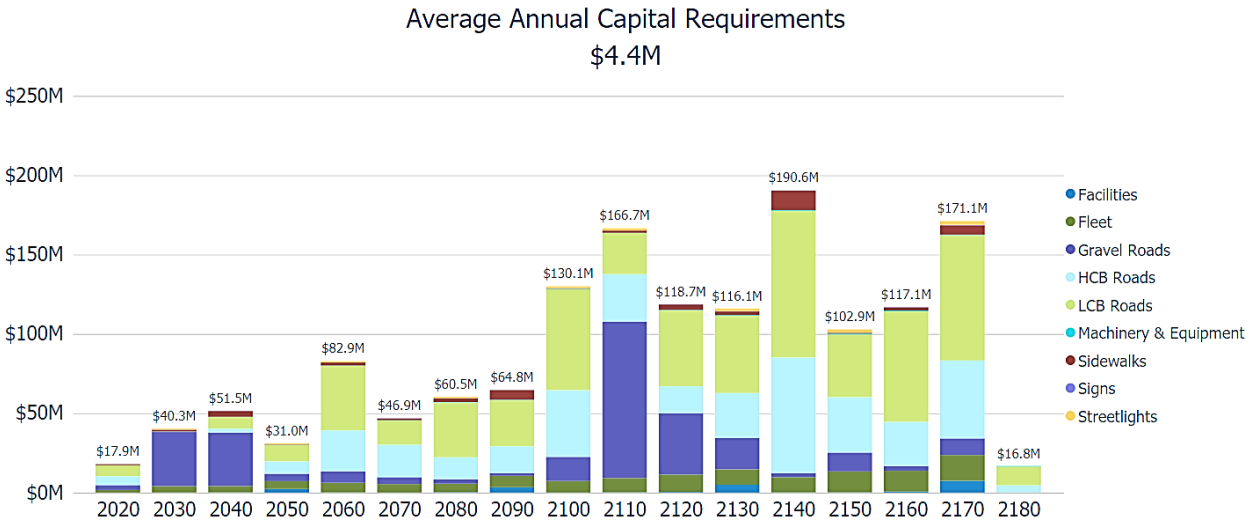
Based on the lifecycle strategies identified previously for HCB and LCB Roads, and assuming the end-of-life replacement of all other assets in this category, the following graphs forecasts short- and long-term capital requirements for the Road Network.

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 graph below provides a 10-year forecast of the capital requirements for the Road Network, not including assets that will be required due to growth.



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

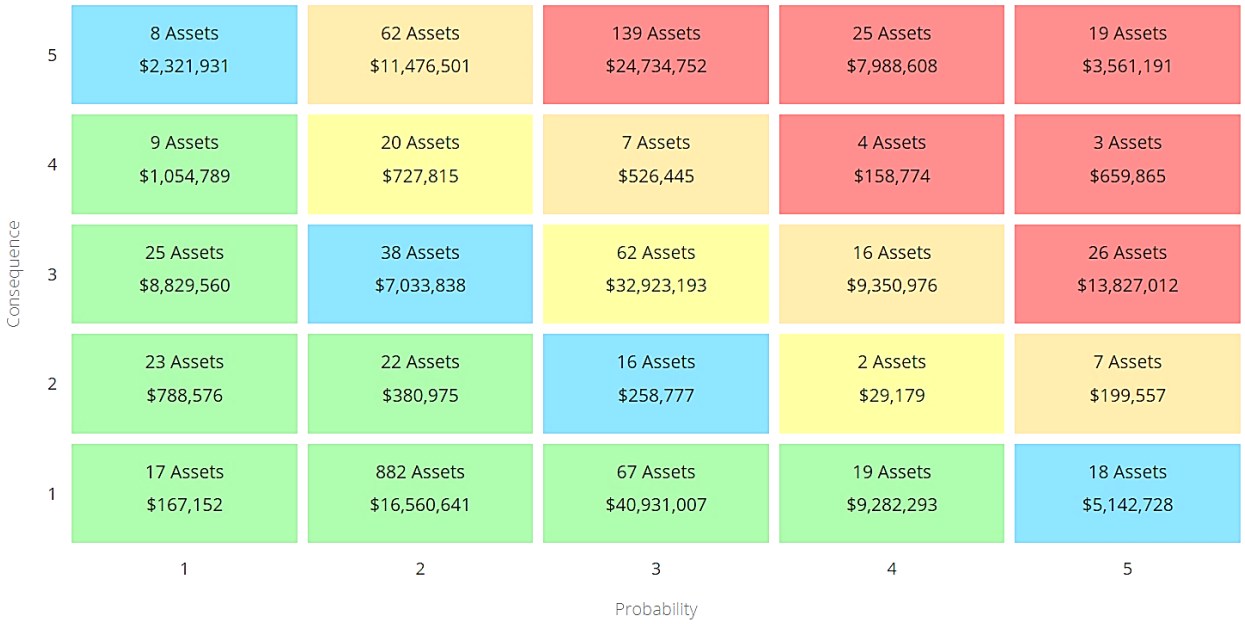
The graph below provides a 160-year forecast. This projection is used as it ensures that every asset has gone through one full iteration of replacement and does not include assets that may be required for growth.



4.1.6 Risk & Criticality

Risk Matrix

The following risk matrix provides a visual representation of the relationship between the probability of failure and the consequence of failure for the assets within this asset category based on 2020 inventory data. See Appendix D for the criteria used to determine the risk rating of each asset.



Risks to Current Asset Management Strategies

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

Climate Change & Extreme Weather Events

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

Organizational Knowledge & Capacity

Both short- and long-term planning requires the regular collection, storage and maintenance of infrastructure data to support asset management decision-making. Staff find it a continuous challenge to dedicate resource time towards data collection to ensure that asset condition and asset attribute data is regularly reviewed and updated. Consequently, the Municipality often utilizes third party contractors to meet needs.

4.1.7 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 (2020)
Scope	Description, which may include maps, of the road network in the municipality and its level of connectivity	See Appendix C
Quality	Description or images that illustrate the different levels of road class pavement condition	The Municipality completed a Road and Sidewalk Needs Assessment Study in 2020 in coordination with GSS Engineering Consultants Ltd. In addition to the assessment of roads and calculation of PCI, condition ratings of each road section were also determined. The Condition Rating number is a visual assessment of the structural condition or integrity of the road. The rating numbers were assigned on a scale of 1 to 10 with the lower numbers describing those roads with the most structural distress or poorest shaped road cross section. (1-5) Road surface exhibits moderate to significant deterioration and requires improvement. (6-10) Road surface is in generally good condition, with localized deficiencies. See Appendix C for sample photographs to indicate the examples of physical distress of road surface.

Technical Levels of Service

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

Service Attribute	Technical Metric	Current LOS (2020)
Scope	Lane-km of arterial roads (MMS classes 1 and 2) per land area (km/km^2)	0 km/km^2
	Lane-km of collector roads (MMS classes 3 and 4) per land area (km/km^2)	1.2 km/km^2
	Lane-km of local roads (MMS classes 5 and 6) per land area (km/km^2)	0.26 km/km^2
Quality	Average pavement condition index for paved roads in the municipality	HCB Roads: 69%
		LCB Roads: 61%
	Average surface condition for unpaved roads in the municipality (e.g., excellent, good, fair, poor)	62% - Good
Performance	Capital reinvestment rate	0.76%
	Operating costs for unpaved (loose top) roads per lane kilometre	TBD

4.1.8 Recommendations

Asset Inventory

- Review streetlight and sidewalk inventory to determine whether all municipal assets within these asset segments have been accounted for.
- The sign inventory includes several pooled assets that should be broken into individual assets to allow for detailed planning and analysis.
- Continue to consolidate critical asset information from other asset data sources into the Municipality's centralized asset inventory.

Lifecycle Management Strategies

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

Risk Management Strategies

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

Levels of Service

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

Bridges & Culverts

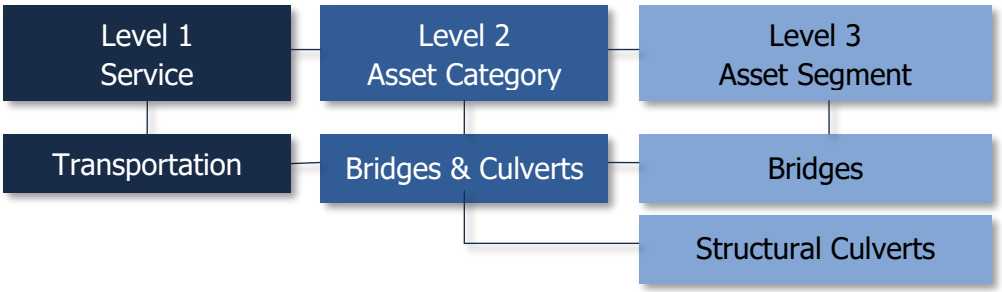
The Municipality's Bridges and Culverts inventory is managed in CityWide™ and comprises of 64 structures that have a span of 3 meters or more and are therefore categorized as a bridge or a structural culvert asset.

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

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

4.1.9 Asset Hierarchy & Segmentation

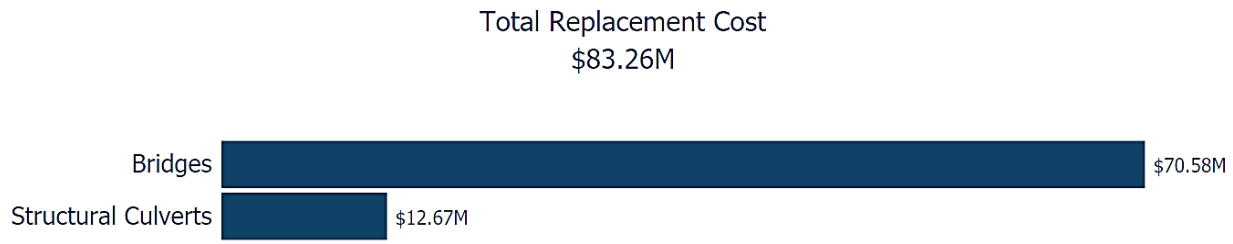
Asset hierarchy explains the relationship between individual assets and their components, and a wider, more expansive network and system. How assets are grouped in a hierarchy structure can impact how data is interpreted. Assets were structured to support meaningful, efficient reporting and analysis.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



4.1.10 Asset Inventory & Replacement Cost

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

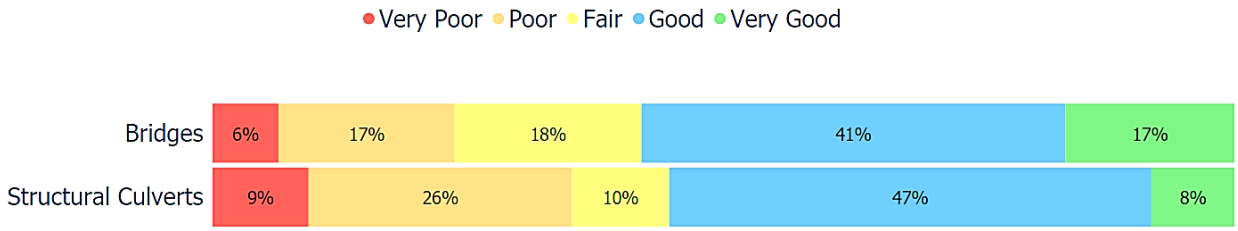
Asset Segment	Quantity	Replacement Cost Method	Total Replacement Cost
Bridges	49	User-Defined Cost	$70,583,871
Structural Culverts	16	User-Defined Cost	$12,674,983
			$83,258,854



4.1.11 Asset Condition

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

Asset Segment	Average Condition (%)	Average Condition Rating	Condition Source
Bridges	65%	Good	100% Assessed
Structural Culverts	61%	Good	100% Assessed
	64%	**Good**	



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

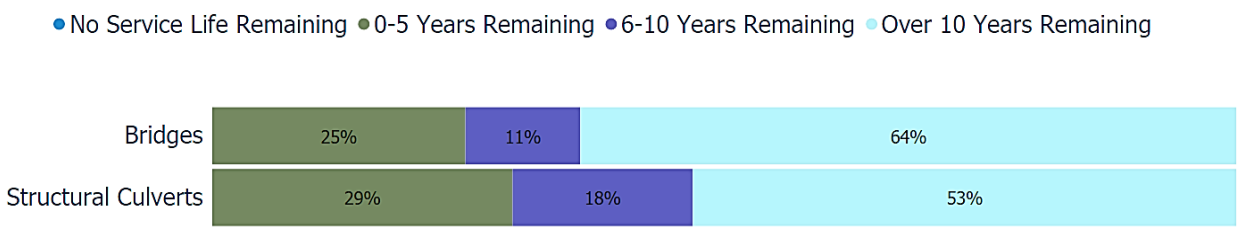
Accurate and reliable condition data allows staff to more confidently determine the remaining service life of assets and identify the most cost-effective approach to managing assets. The following describes the municipality's current approach:

- Condition assessments of all bridges and culverts with a span greater than or equal to 3 meters are completed every 2 years in accordance with the Ontario Structure Inspection Manual (OSIM)
- The most recent OSIM inspection was conducted in 2020 by B. M. Ross and Associates Limited

4.1.12 Estimated Useful Life & Average Age

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

Asset Segment	Estimated Useful Life (Years)	Average Age (Years)	Average Service Life Remaining (Years)
Bridges	30 - 50 Years	65.1	14.4
Structural Culverts	40 - 50 Years	58.8	15.8
		63.5	**14.8**



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

4.1.13 Lifecycle Management Strategy

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

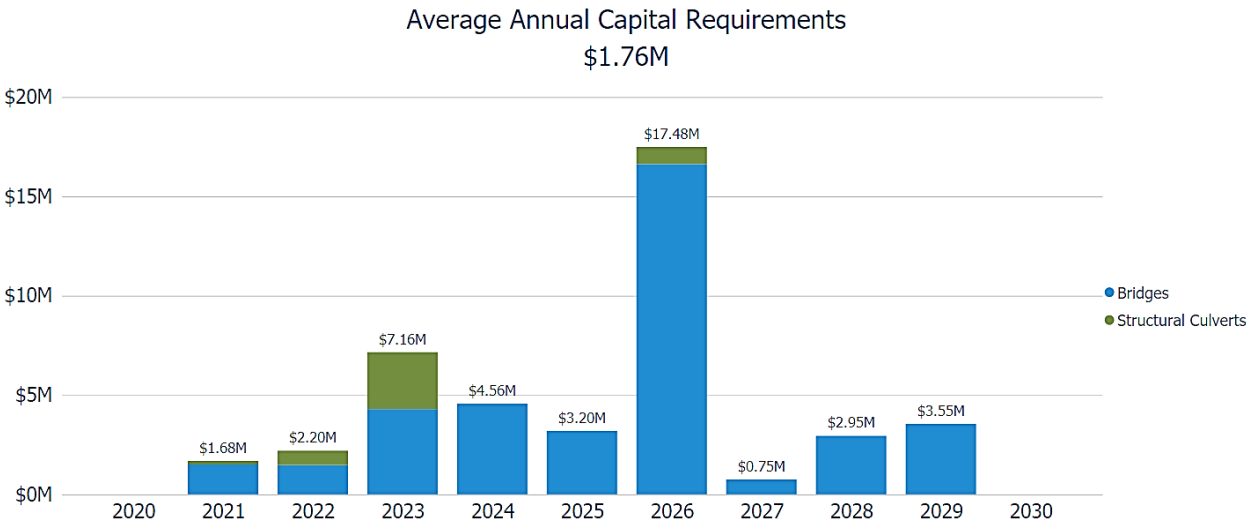
The following table outlines the Municipality's current lifecycle management strategy.

Activity Type	Description of Current Strategy
Maintenance	Typical maintenance includes: • Obstruction removal • Cleaning/sweeping • Erosion control • Brush/tree removal
	Biennial OSIM inspections including a list of recommended maintenance activities that the Municipality considers and completes according to cost and urgency.
Rehabilitation / Replacement	Biennial OSIM inspection reports including a Capital Needs List identifying recommended rehabilitation and replacement activities with estimated costs.
Inspection	The most recent inspection report was completed in 2020 by B. M. Ross and Associates Limited

Forecasted Capital Requirements

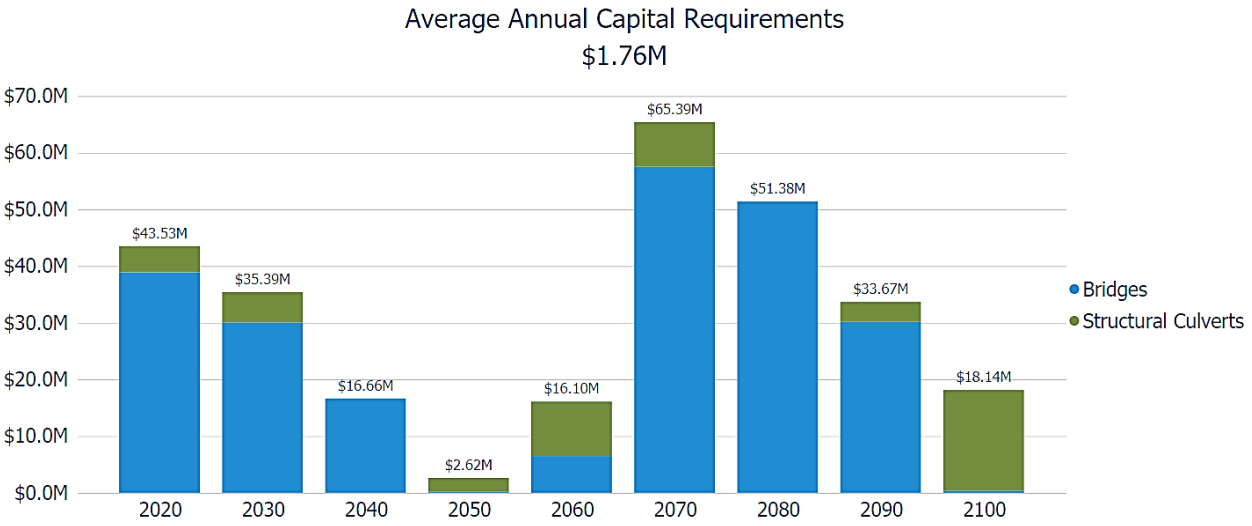
Based on the lifecycle activities identified in the 2020 inspection report, and assuming end-of-life replacement for all assets, the following graph forecasts short- and long-term capital requirements for the Bridges & Culverts category.

The annual capital requirement represents the average amount per year that the Municipality should allocate towards funding rehabilitation and replacement needs to meet future capital needs. The graph below provides a 10-year forecast of the capital requirements for Bridges & Culverts, not including assets that may be required due to growth.



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

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



4.1.14 Risk & Criticality

Risk Matrix

The following risk matrix provides a visual representation of the relationship between the probability of failure and the consequence of failure for the assets within this asset category based on 2020 inventory data. See Appendix D for the criteria used to determine the risk rating of each asset.

Risks to Current Asset Management Strategies

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

Aging Infrastructure

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

Funding & Staff Capacity

The Municipality has a large inventory of bridges which require regular maintenance and assessment. It can be challenging for Staff to deploy optimal maintenance and assessment strategies. Major capital rehabilitation projects for bridges and culverts may also be deferred depending on the availability of grant funding opportunities. A long-term capital funding strategy can reduce dependency on grant funding and help prevent the deferral of necessary capital works.

Climate Change & Extreme Weather Events

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

4.1.15 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 (2020)
Scope	Description of the traffic that is supported by municipal bridges (e.g., heavy transport vehicles, motor vehicles, emergency vehicles, pedestrians, cyclists)	Bridges and structural culverts are a key component of the municipal transportation network. There are approximately 16 structures with load limits. See Appendix C for additional detail on the 16 structures.
Quality	Description or images of the condition of bridges & culverts and how this would affect use of the bridges & culverts	Good (BCI 70-100): Generally considered to be in good-excellent condition, and repair or rehabilitation work is not usually required within the next 5 years. Routine maintenance, such as sweeping, cleaning, and washing are still recommended. Fair (BCI 50-70): Generally considered to be in good-fair condition. Repair or rehabilitation work recommended is ideally scheduled to be completed within the next 5 years. Poor (BCI Less than 50): Generally considered poor with lower numbers representing structures nearing the end of their service life. The repair or rehabilitation of these structures is ideally best scheduled to be completed within approximately 1 year. However, if it is determined that the replacement of the structure would be a more viable, the structure can be identified for continued monitoring and scheduled for replacement within the short-term.

Technical Levels of Service

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

Service Attribute	Technical Metric	Current LOS (2020)
Scope	% of bridges in the Municipality with loading or dimensional restrictions	0%
Quality	Average bridge condition index value for bridges in the Municipality	62%
	Average bridge condition index value for structural culverts in the Municipality	54%
Performance	Capital re-investment rate	0.33%
	Average duration of unplanned bridge closure	TBD

4.1.16 Recommendations

Data Review/Validation

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

Risk Management Strategies

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

Lifecycle Management Strategies

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

Levels of Service

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

Storm Sewer System

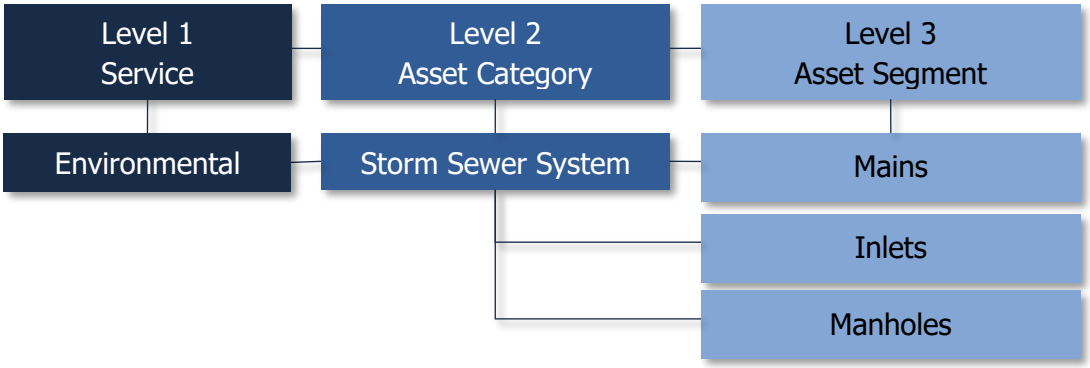
The Municipality's Storm Sewer inventory is managed in CityWide™, and comprises of 1,226 unique assets, including 259 manholes, 873 inlets and around 9 kilometres of mains.

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

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

4.1.17 Asset Hierarchy & Segmentation

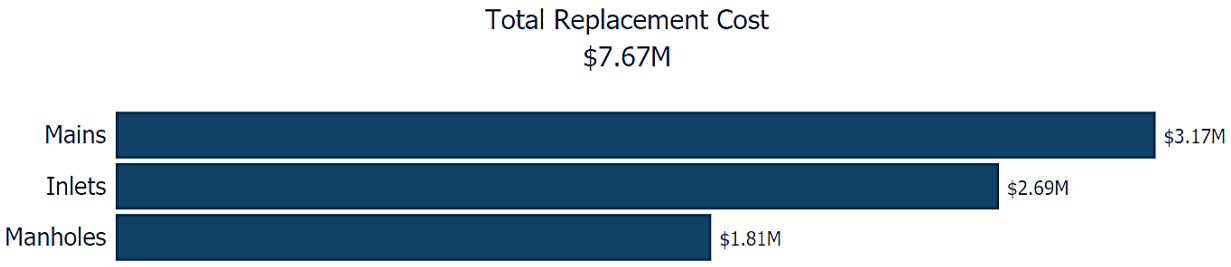
Asset hierarchy explains the relationship between individual assets and their components, and a wider, more expansive network and system. How assets are grouped in a hierarchy structure can impact how data is interpreted. Assets were structured to support meaningful, efficient reporting and analysis.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



4.1.18 Asset Inventory & Replacement Cost

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

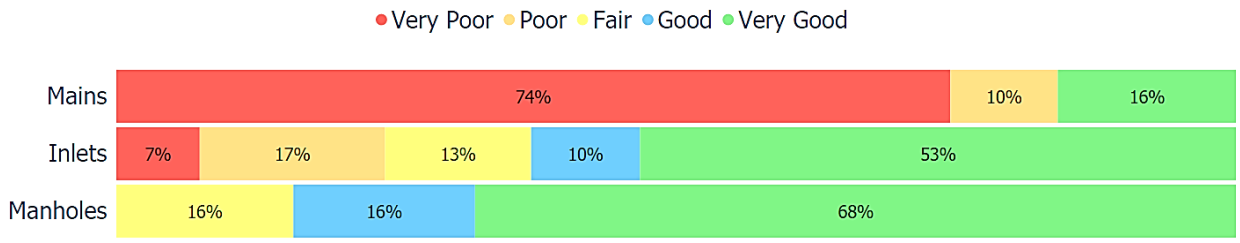
Asset Segment	Quantity	Replacement Cost Method	Total Replacement Cost
Mains	9 km	Cost per Unit, Historical Cost Inflation	$3,165,014
Inlets	873	Cost per Unit	$2,688,180
Manholes	259	Cost per Unit	$1,813,000
			$7,666,194



4.1.19 Asset Condition

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

	Average Condition (%)	Average Condition Rating	Condition Source
Mains	19%	Very Poor	Age-based
Inlets	71%	Good	Age-based
Manholes	83%	Very Good	Age-based
	52%	**Fair**	



To ensure that the Municipality's Storm Sewer System 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 Sewer System.

Current Approach to Condition Assessment

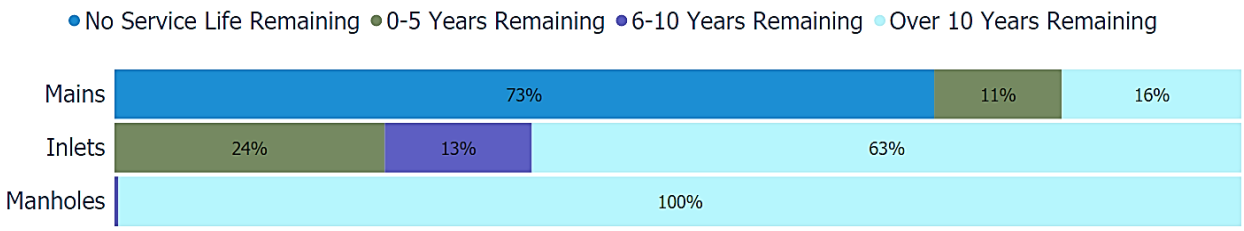
Accurate and reliable condition data allows staff to more confidently determine the remaining service life of assets and identify the most cost-effective approach to managing assets. The following describes the municipality's current approach:

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

4.1.20 Estimated Useful Life & Average Age

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

Asset Segment	Estimated Useful Life (Years)	Average Age (Years)	Average Service Life Remaining (Years)
Mains	10 - 100 Years	37.3	-6.4
Inlets	40 - 100 Years	27.6	22.3
Manholes	50 - 60 Years	27.0	33.0
		28.3	**22.3**



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

4.1.21 Lifecycle Management Strategy

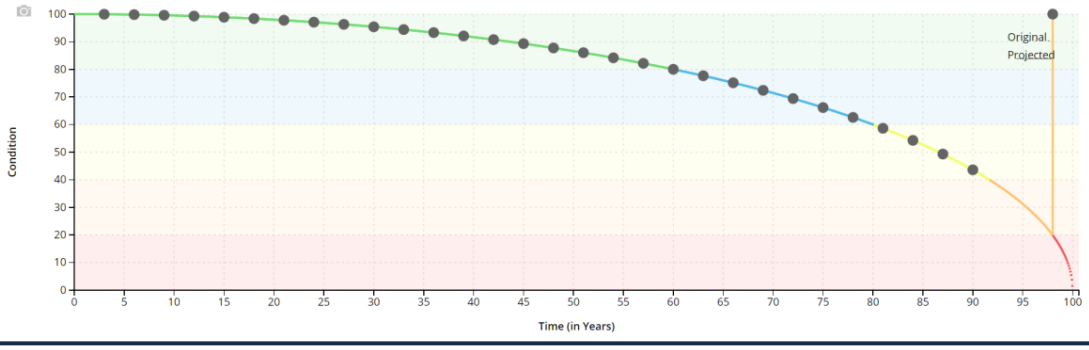
The condition or performance of most assets will deteriorate over time. To ensure that municipal assets are performing as expected and meeting the needs of customers, it is important to establish a lifecycle management strategy to proactively manage asset deterioration.

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

Activity Type	Description of Current Strategy
Maintenance	Catch basins are cleaned annually and outlets are inspected regularly to ensure unobstructed flow
	Flushing and cleaning of storm mains is conducted every 3 years; one town per year
	All other maintenance activities are completed on a reactive basis when operational issues are identified (e.g., blockages, backups)
Rehabilitation	Trenchless re-lining has the potential to reduce total lifecycle costs but would require a formal condition assessment program to determine viability
Replacement	Staff have proposed that $400,000 be allocated from 2022 - 2026 to expand the existing storm sewer infrastructure
	Without the availability of up-to-date condition assessment information replacement activities are purely reactive in nature

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

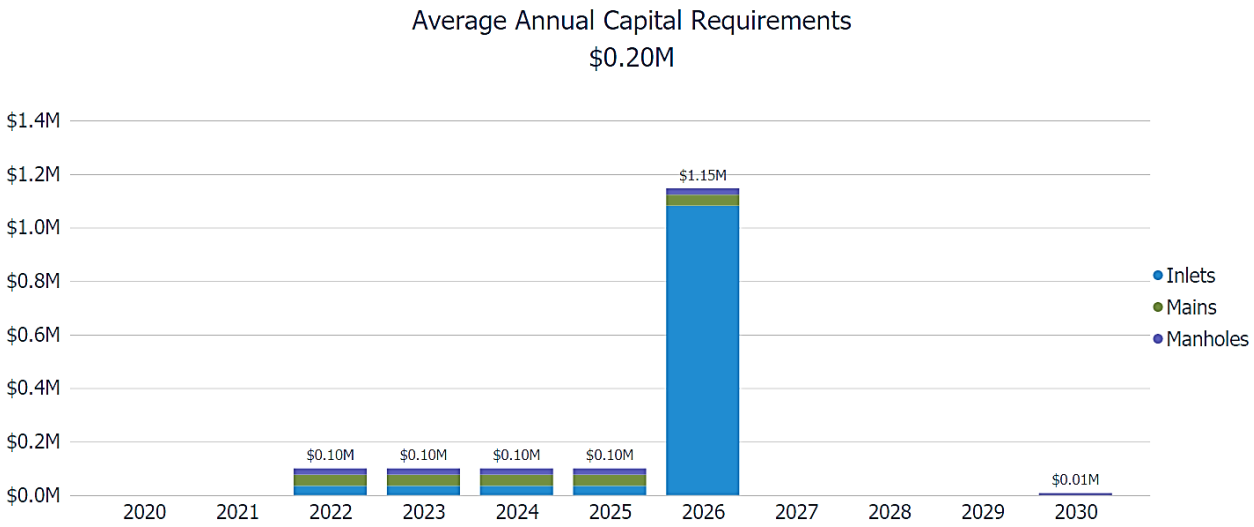
Storm Mains		
Event Name	**Event Class**	**Event Trigger**
Catch Basin Cleaing	Maintenance	Annually
Storm Sewer Flushing	Maintenance	Every 3 Years
Full Reconstruction	Replacement	Condition: 20



Forecasted Capital Requirements

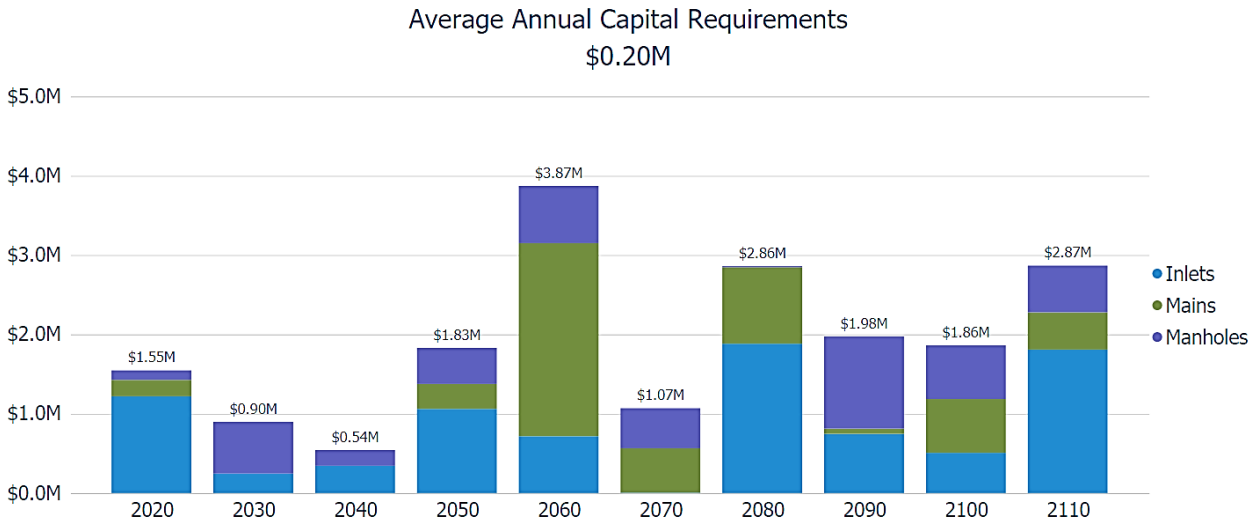
Based on the current storm sewer inventory, a 4-year allocation of capital funds in order to develop new storm sewer infrastructure, and assuming end-of-life replacement for all assets, the following graph forecasts short- and long-term capital requirements for the Storm Sewer System category.

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 graph below provides a 10-year forecast of the capital requirements for the Storm Sewer System, not including assets that may be required due to growth.



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

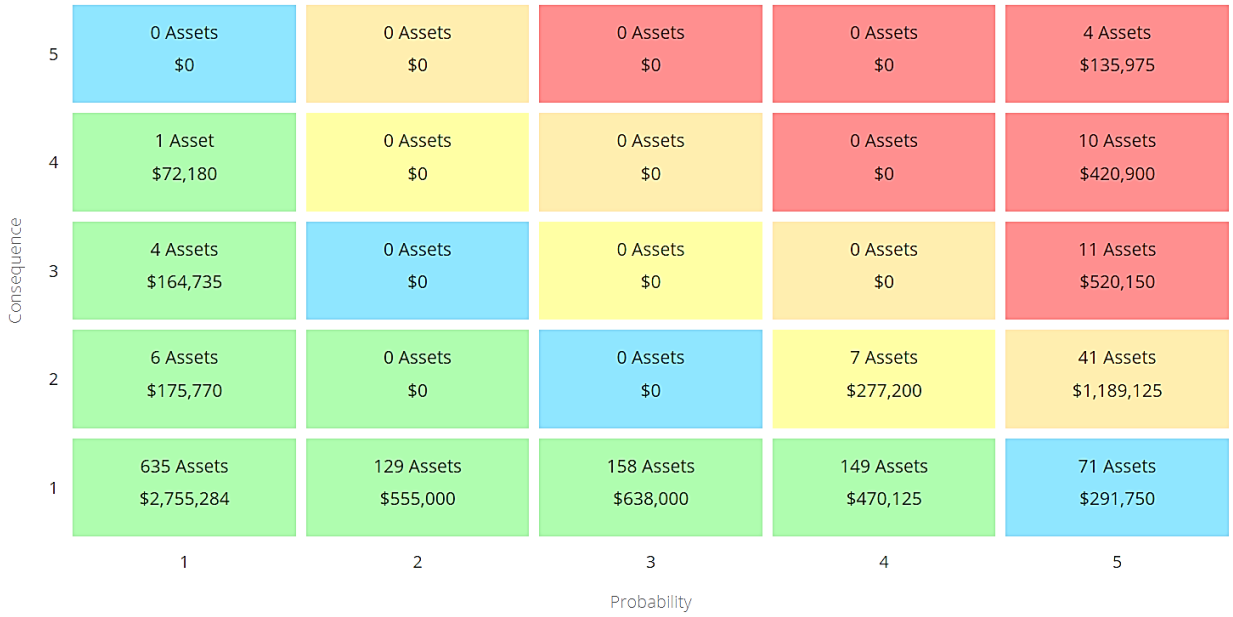
The graph below provides a 95-year forecast. This projection is used as it ensures that every asset has gone through one full iteration of replacement and does not include assets that may be required for growth.



4.1.22 Risk & Criticality

Risk Matrix

The following risk matrix provides a visual representation of the relationship between the probability of failure and the consequence of failure for the assets within this asset category based on 2020 inventory data. See Appendix D for the criteria used to determine the risk rating of each asset.



Risks to Current Asset Management Strategies

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

Asset Data and Information

There is a lack of confidence in the available inventory data for the storm sewer system. Some of the asset data, including an inventory of drainages, is missing, not available, and/or incomplete. Flows can be very unpredictable compared to water and sanitary systems. This poses a significant risk when trying to manage assets and planning future work.

Capital Funding Strategies

Partially owing to the lacking asset data, operations tend to be reactive rather than proactive for this category. Problems are generally only known when issues arise, and complaints are made. The capacity of the storm system is also unknown, especially in the context of handling extreme weather events. Staff have proposed $100,000 for the next four years to address this uncertainty.

4.1.23 Levels of Service

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

Service Attribute	Qualitative Description	Current LOS (2020)
Scope	Description, which may include map, of the user groups or areas of the municipality that are protected from flooding, including the extent of protection provided by the municipal stormwater system	See Appendix C

Technical Levels of Service

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

Service Attribute	Technical Metric	Current LOS (2020)
Scope	% of properties in municipality resilient to a 100-year storm	TBD[3]
	% of the municipal stormwater management system resilient to a 5-year storm	TBD[3]
Performance	Capital reinvestment rate	0.42%

[3] The Municipality does not currently have data available to determine this technical metric. Staff are working to gather this metric for the next iteration of the AMP.

4.1.24 Recommendations

Asset Inventory

- The Municipality's Storm Sewer System 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 Storm Sewer System should be priority.
- Gather and consolidate relevant asset data into the central asset inventory to ensure all relevant assets are accounted for.

Condition Assessment Strategies

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

Risk Management Strategies

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

Lifecycle Management Strategies

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

Levels of Service

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

Buildings & Facilities

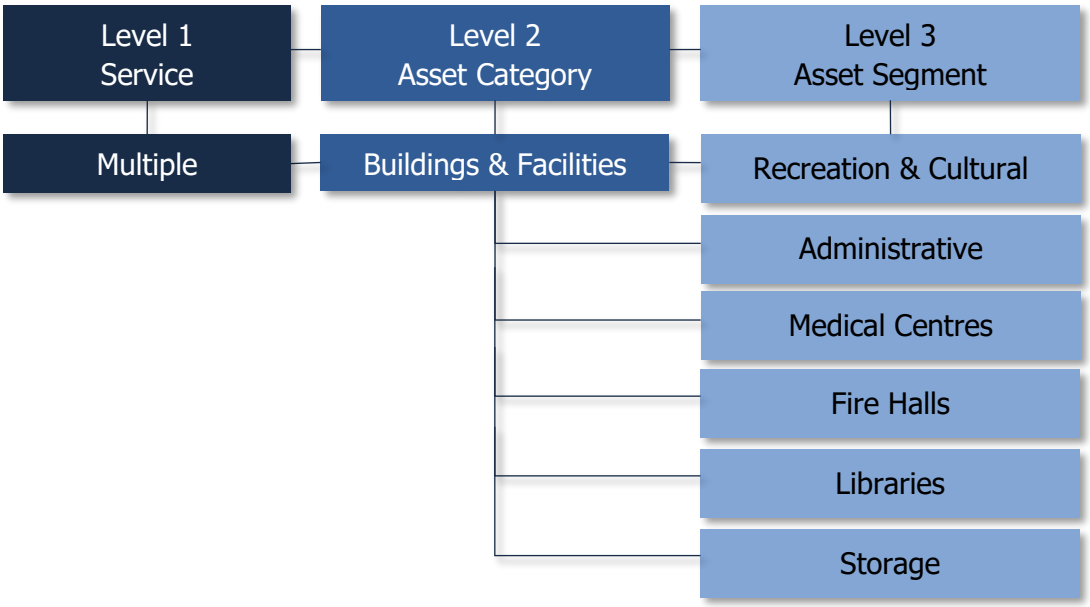
The Municipality's Buildings & Facilities inventory is managed in CityWide™, and comprises of 75 unique assets, that represent 45 individual facilities. These are owned by the Municipality and maintained by various departments that provide key administrative, protective, recreational and cultural services to the community. These facilities include:

- administrative offices and town halls
- public libraries
- medical centres
- fire stations and associated offices and facilities
- park structures and facilities
- pools and changerooms
- museums and theatres
- arenas and community centres

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

4.1.25 Asset Hierarchy & Segmentation

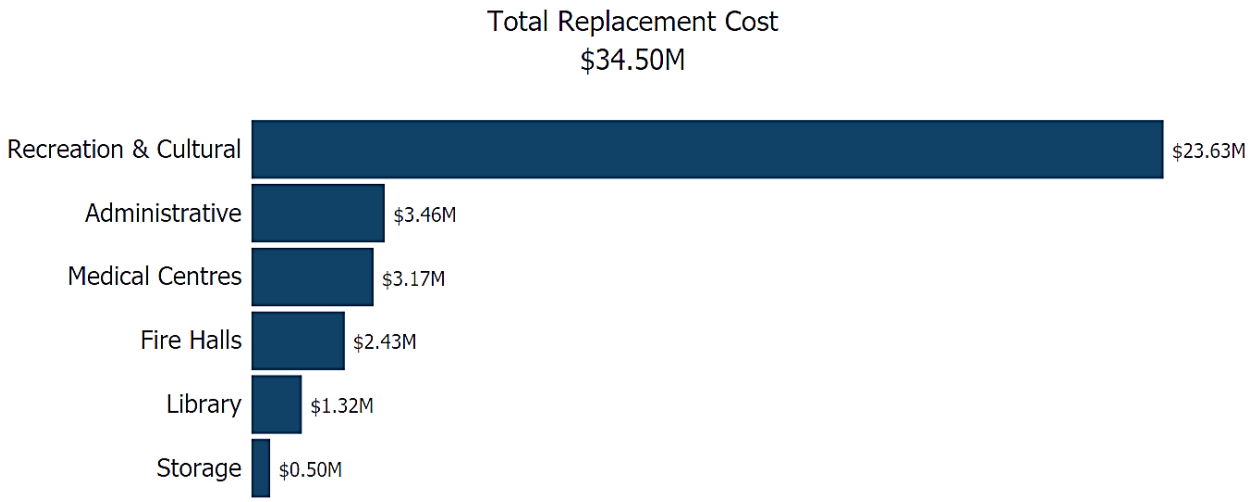
Asset hierarchy explains the relationship between individual assets and their components, and a wider, more expansive network and system. How assets are grouped in a hierarchy structure can impact how data is interpreted. Assets were structured to support meaningful, efficient reporting and analysis.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



4.1.26 Asset Inventory & Replacement Cost

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

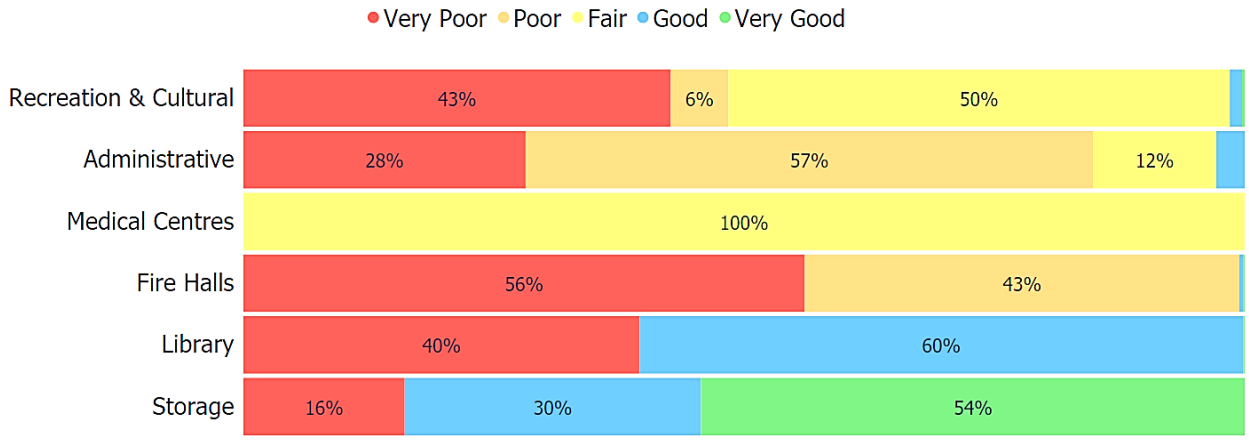
Asset Segment	Number of Facilities	Replacement Cost Method	Total Replacement Cost
Recreation & Cultural	28	Historical Cost Inflation, 2021/2022 Property Schedule	$23,625,999
Administrative	3	Historical Cost Inflation, 2021/2022 Property Schedule	$3,464,612
Medical Centres	2	Historical Cost Inflation, 2021/2022 Property Schedule	$3,171,201
Fire Halls	3	Historical Cost Inflation, 2021/2022 Property Schedule	$2,425,778
Libraries	3	Historical Cost Inflation, 2021/2022 Property Schedule	$1,316,576
Storage	5	Historical Cost Inflation, 2021/2022 Property Schedule	$497,968
			$34,502,134



4.1.27 Asset Condition

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

Asset Segment	Average Condition (%)	Average Condition Rating	Condition Source
Recreation & Cultural	30%	Poor	1% Assessed
Administrative	27%	Poor	3% Assessed
Medical Centres	48%	Fair	Age-based
Fire Halls	16%	Very Poor	Age-based
Libraries	41%	Fair	Age-based
Storage	63%	Good	Age-based
	31%	**Poor**	



The current condition overview of Buildings & Facilities is based on its pooled and incomplete inventory, as such this should be considered supplementary and/or discarded if a building condition assessment (BCA) is ever conducted.

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

Current Approach to Condition Assessment

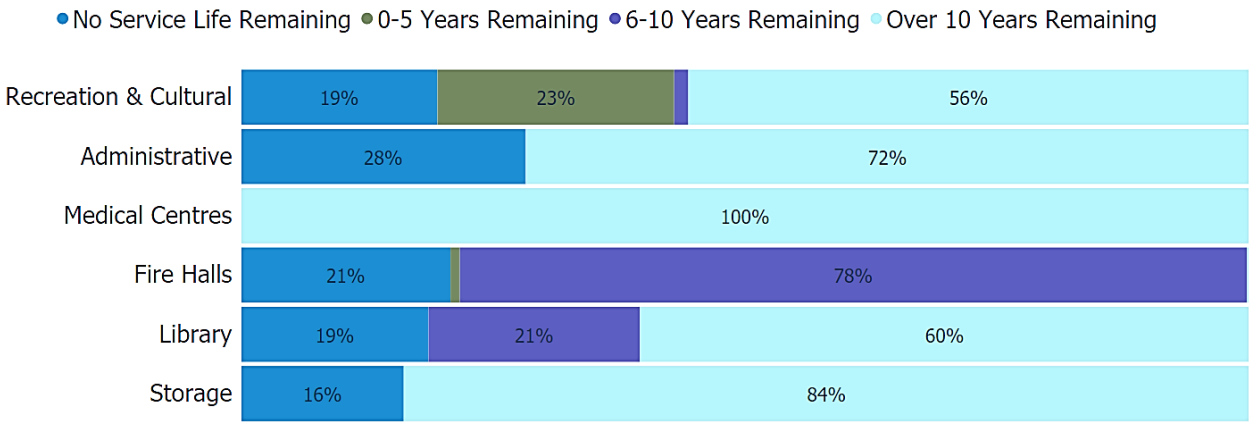
Accurate and reliable condition data allows staff to more confidently determine the remaining service life of assets and identify the most cost-effective approach to managing assets. The following describes the municipality's current approach:

- Formal workplace inspections conducted every year through the Municipality's health and safety program.
- High-level assessments by internal staff are performed annually to determine the condition of facilities.

4.1.28 Estimated Useful Life & Average Age

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

Asset Segment	Estimated Useful Life (Years)	Average Age (Years)	Average Service Life Remaining (Years)
Recreation & Cultural	5 - 100 Years	16.5	13.6
Administrative	10 - 40 Years	38.6	-3.1
Medical Centres	30 - 40 Years	31.0	29.1
Fire Halls	5 - 40 Years	19.1	7.4
Libraries	20 - 60 Years	19.9	21.0
Storage	20 - 40 Years	12.8	21.5
		18.8	**13.3**



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

4.1.29 Lifecycle Management Strategy

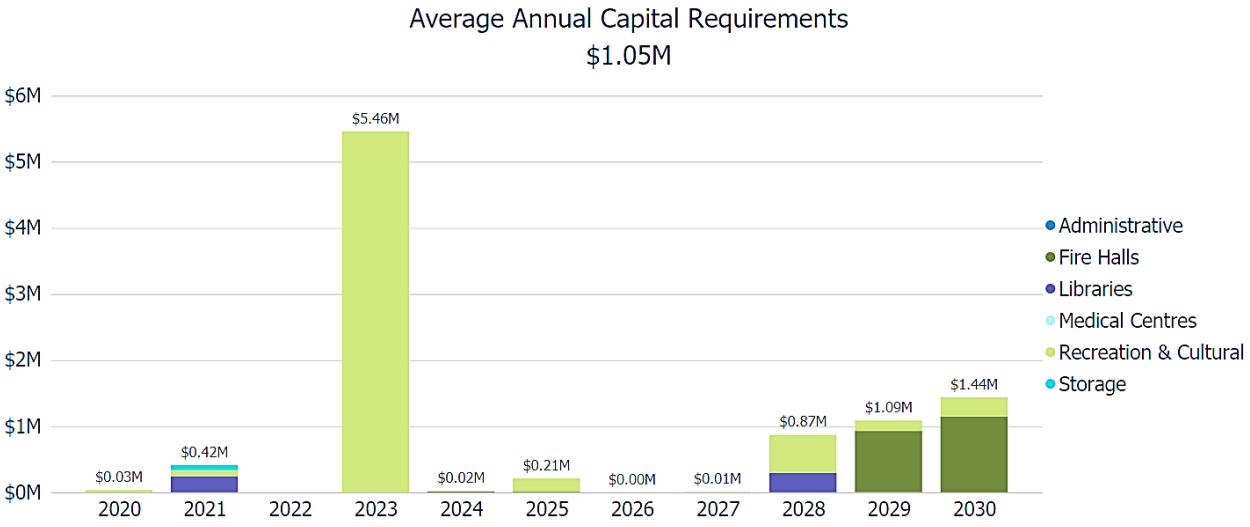
The condition or performance of most assets will deteriorate over time. To ensure that municipal assets are performing as expected and meeting the needs of customers, it is important to establish a lifecycle management strategy to proactively manage asset deterioration. The following table outlines the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

Activity Type	Description of Current Strategy
Maintenance / Rehabilitation	Municipal buildings are subject to regular inspections to identify health & safety requirements as well as structural deficiencies that require additional attention
	Critical buildings (Fire Stations, Arenas, Town Hall, etc.) have a detailed maintenance and rehabilitation schedule, while the maintenance of other facilities are dealt with on a case-by-case basis
Replacement	Assessments are completed strategically as buildings approach their end-of-life to determine whether replacement or rehabilitation is appropriate

Forecasted Capital Requirements

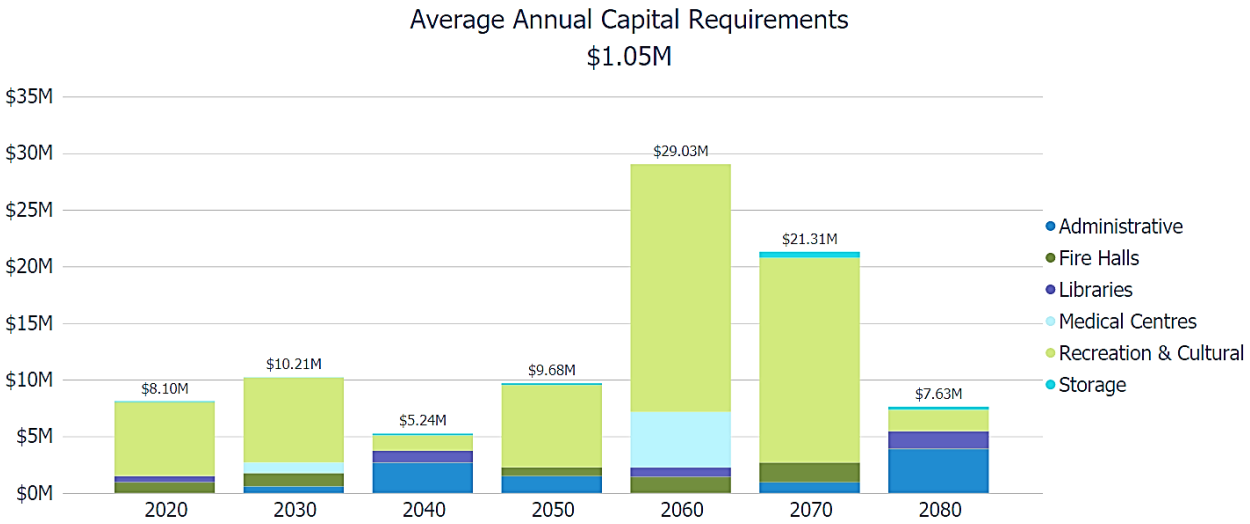
Based on the current buildings and facilities inventory, financial valuation from the 2021/2022 property schedule, and assuming end-of-life replacement for all assets, the following graph forecasts short- and long-term capital requirements for the Buildings & Facilities category.

The graph below provides a 10-year forecast of the capital requirements for Buildings & Facilities, not including assets that may be required due to growth.



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

The graph below provides a 60-year forecast. This projection is used as it ensures that every asset has gone through one full iteration of replacement and does not include assets that may be required for growth.

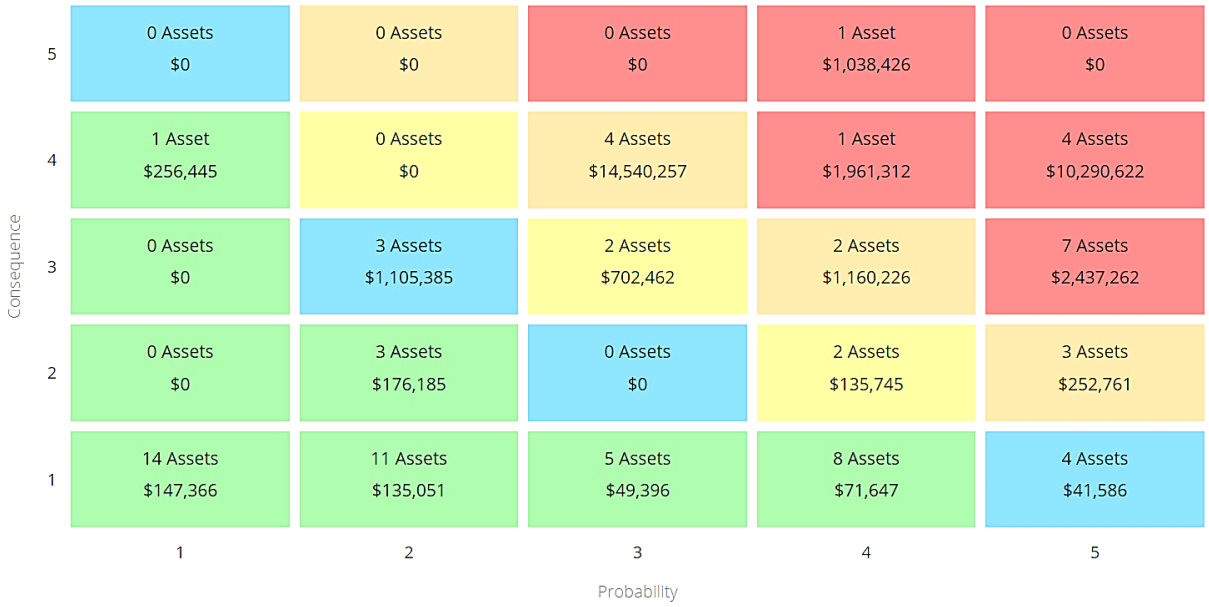


It is important to acknowledge the limitations of the current buildings and facilities inventory due to its pooled asset listing. Accuracy and reliability can be improved by collecting asset data on the specific components that make up the facilities and consolidating it into the current inventory.

4.1.30 Risk & Criticality

Risk Matrix

The following risk matrix provides a visual representation of the relationship between the probability of failure and the consequence of failure for the assets within this asset category based on 2020 inventory data. See Appendix D for the criteria used to determine the risk rating of each asset.



Risks to Current Asset Management Strategies

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

Asset Data Confidence

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

Organizational Knowledge & Capacity

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

4.1.31 Levels of Service

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

4.1.32 Recommendations

Asset Inventory

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

Condition Assessment Strategies

- A comprehensive structural assessment of all buildings & facilities based on the UNIFORMAT II data structure is highly recommended to gain a better understanding of the overall heath and condition of each facility to identify accurate short- and long-term capital requirements.

Risk Management Strategies

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

Levels of Service

- Work towards identifying current and proposed levels of service as per O. Reg. 588/17 and identify the strategies that are required to close any gaps between current and proposed levels of service.

Machinery & Equipment

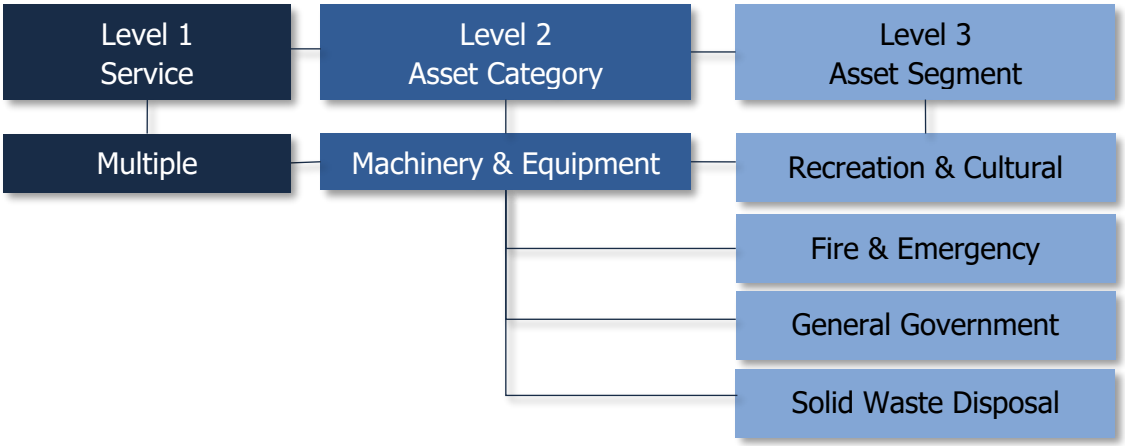
The Municipality's Machinery & Equipment inventory is managed in CityWide™ and comprises of 200 unique assets. In order to maintain the high quality of public infrastructure and support the delivery of core and non-core services, Municipal Staff own and employ machinery and equipment assets which include:

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

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

4.1.33 Asset Hierarchy & Segmentation

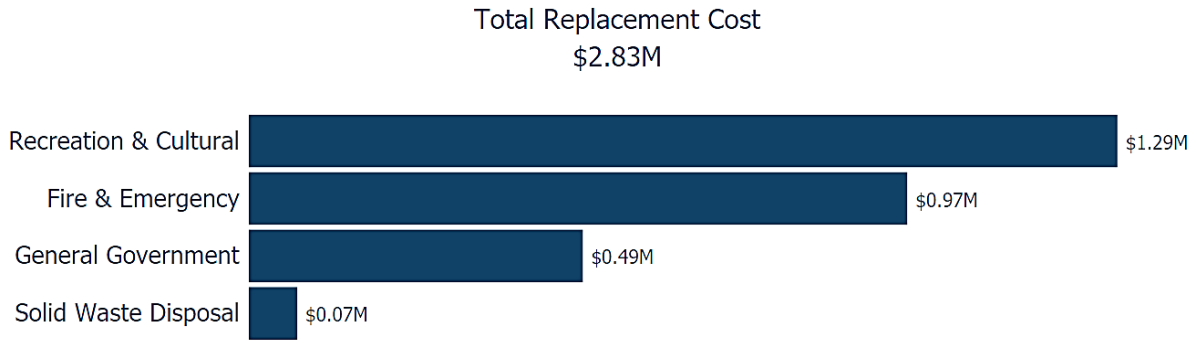
Asset hierarchy explains the relationship between individual assets and their components, and a wider, more expansive network and system. How assets are grouped in a hierarchy structure can impact how data is interpreted. Assets were structured to support meaningful, efficient reporting and analysis.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



4.1.34 Asset Inventory & Replacement Cost

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

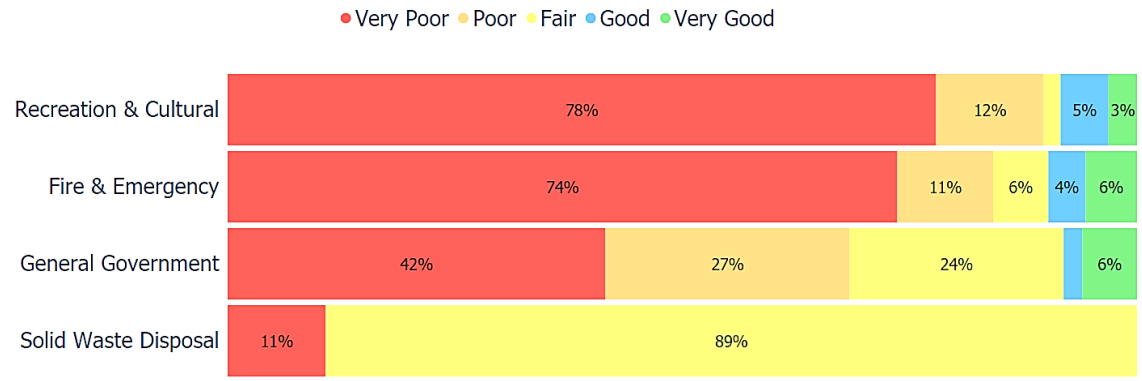
Asset Segment	Quantity	Replacement Cost Method	Total Replacement Cost
Recreation & Cultural	64	Historical Cost Inflation	$1,285,766
Fire & Emergency	348	Historical Cost Inflation	$974,884
General Government	134	Historical Cost Inflation	$494,632
Solid Waste Disposal	2	Historical Cost Inflation	$71,863
			$2,827,145



4.1.35 Asset Condition

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

Asset Segment	Average Condition (%)	Average Condition Rating	Condition Source
Recreation & Cultural	13%	Very Poor	6% Assessed
Fire & Emergency	16%	Very Poor	3% Assessed
General Government	29%	Poor	4% Assessed
Solid Waste Disposal	52%	Fair	Age-based
	18%	**Very Poor**	



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

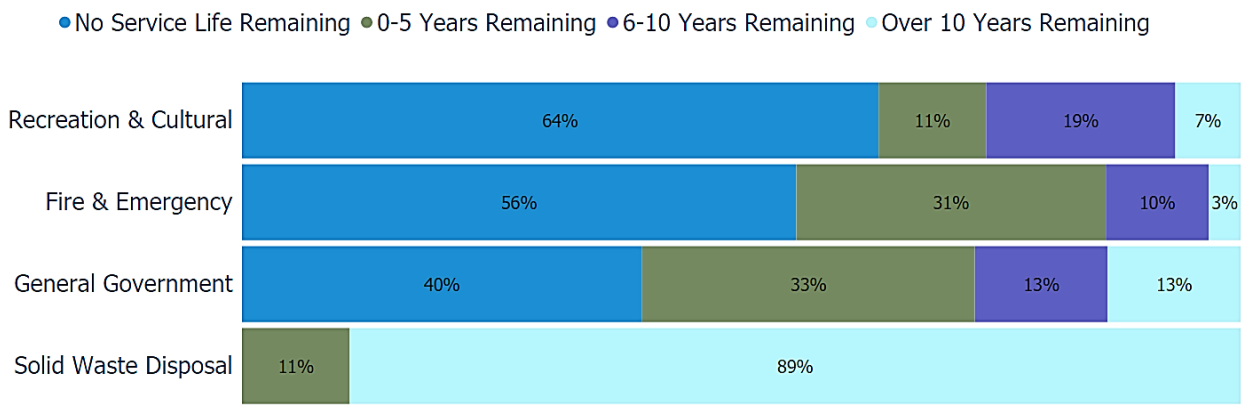
Accurate and reliable condition data allows staff to more confidently determine the remaining service life of assets and identify the most cost-effective approach to managing assets. The following describes the municipality's current approach:

- Staff complete regular visual inspections of machinery & equipment to ensure they are in state of adequate repair
- Some machinery & equipment have previously been assigned cursory condition ratings
- Condition assessments are conducted on Fire & Emergency assets in accordance with health and safety regulations including National Fire Protection Association (NFPA) codes and standards for fire service-related assets

4.1.36 Estimated Useful Life & Average Age

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

Asset Segment	Estimated Useful Life (Years)	Average Age (Years)	Average Service Life Remaining (Years)
Recreation & Cultural	4 - 30 Years	14.1	-1.8
Fire & Emergency	4 - 30 Years	9.6	-0.6
General Government	4 - 30 Years	8.3	1.5
Solid Waste Disposal	10 - 20 Years	8.7	6.4
		10.3	**-0.3**



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

4.1.37 Lifecycle Management Strategy

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

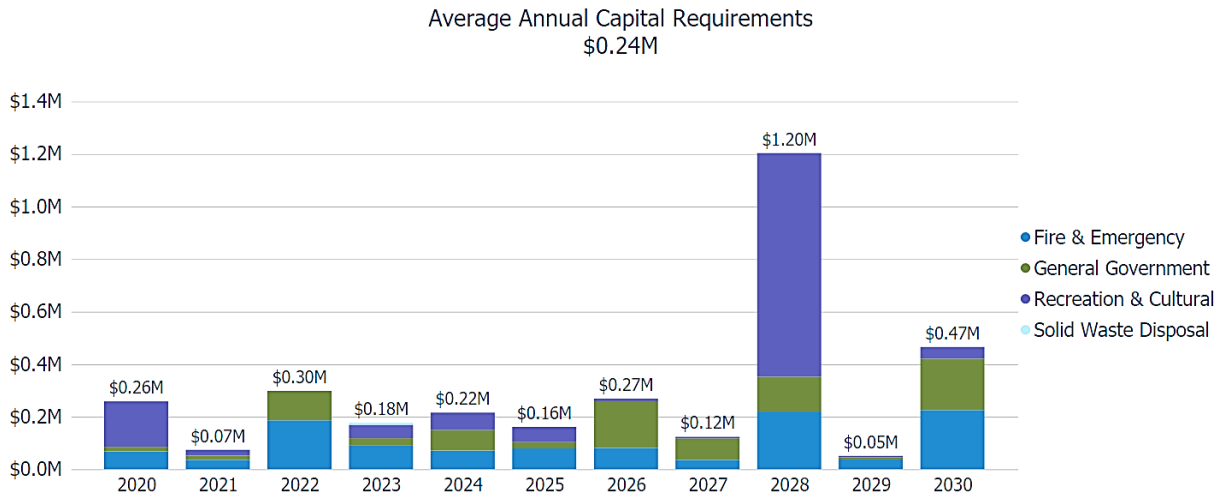
The following table outlines the Municipality's current lifecycle management strategy.

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

Forecasted Capital Requirements

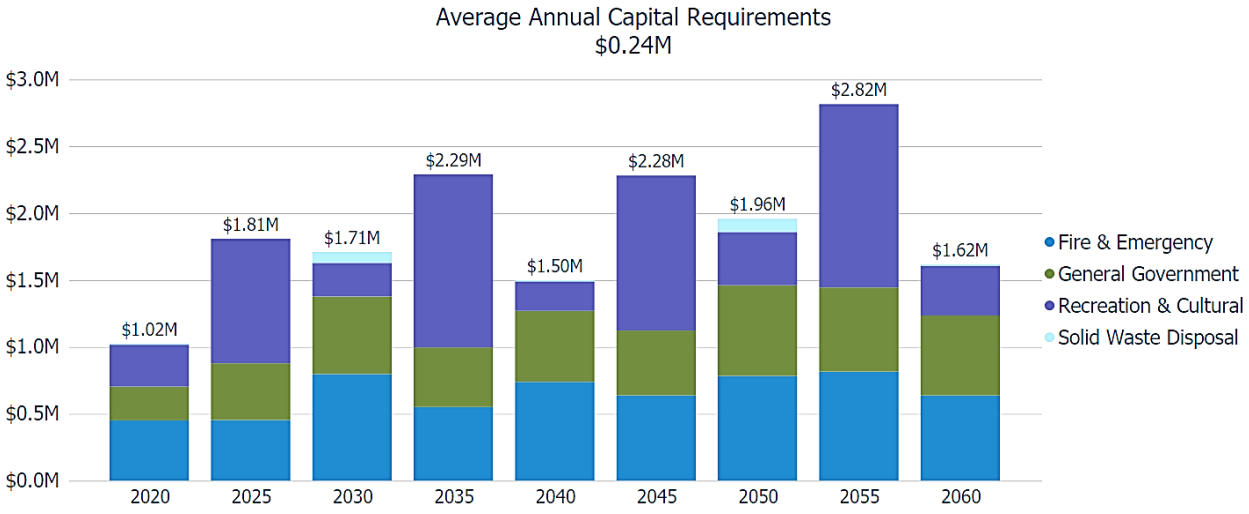
Based on the current machinery & equipment inventory, and assuming end-of-life replacement for all assets, the following graph forecasts short- and long-term capital requirements for the Machinery & Equipment category.

The graph below provides a 10-year forecast of the capital requirements for Machinery & Equipment, not including assets that may be required due to growth.



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

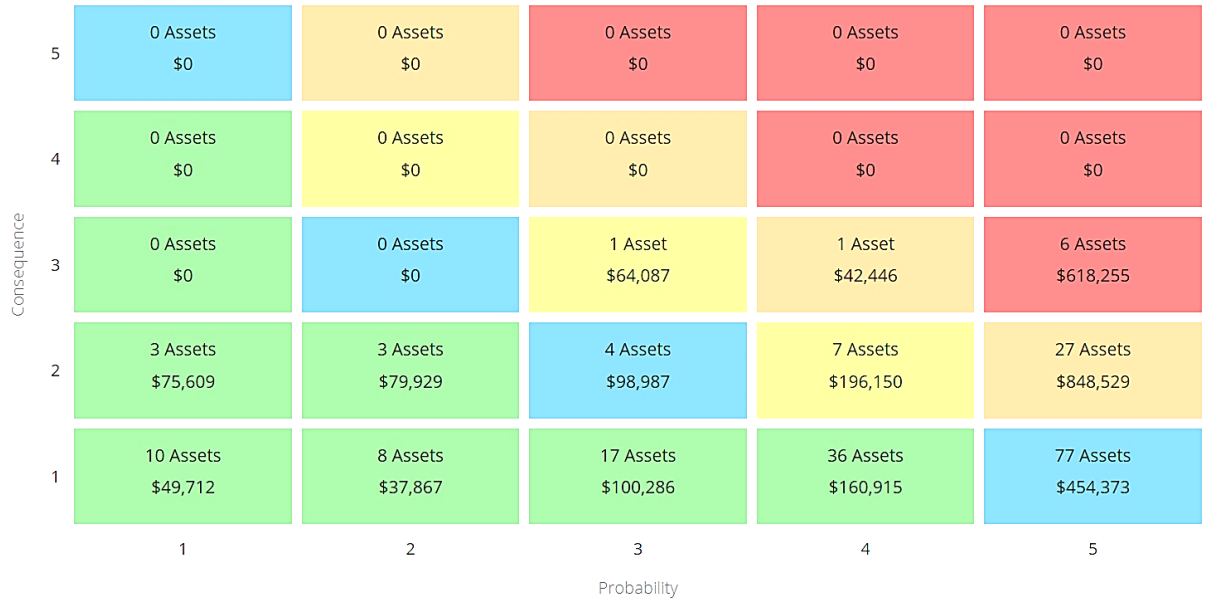
The graph below provides a 40-year forecast. This projection is used as it ensures that every asset has gone through one full iteration of replacement and does not include assets that may be required for growth.



4.1.38 Risk & Criticality

Risk Matrix

The following risk matrix provides a visual representation of the relationship between the probability of failure and the consequence of failure for the assets within this asset category based on 2020 inventory data. See Appendix D for the criteria used to determine the risk rating of each asset.



Risks to Current Asset Management Strategies

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

Aging Assets

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

4.1.39 Levels of Service

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

4.1.40 Recommendations

Asset Inventory

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

Replacement Costs

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

Condition Assessment Strategies

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

Risk Management Strategies

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

Levels of Service

- Work towards identifying current and proposed levels of service as per O. Reg. 588/17 and identify the strategies that are required to close any gaps between current and proposed levels of service.

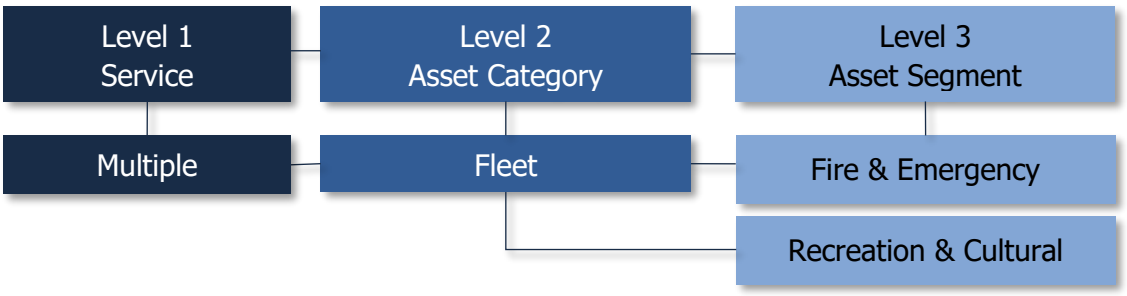
Fleet

The Municipality's Fleet inventory is managed in CityWide™ and comprises of 35 assets. Like Machinery and Equipment assets, Fleet assets allow staff to efficiently deliver municipal services and personnel. Municipal fleet assets are used to support several service areas, some of which include the use of:

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

4.1.41 Asset Hierarchy & Segmentation

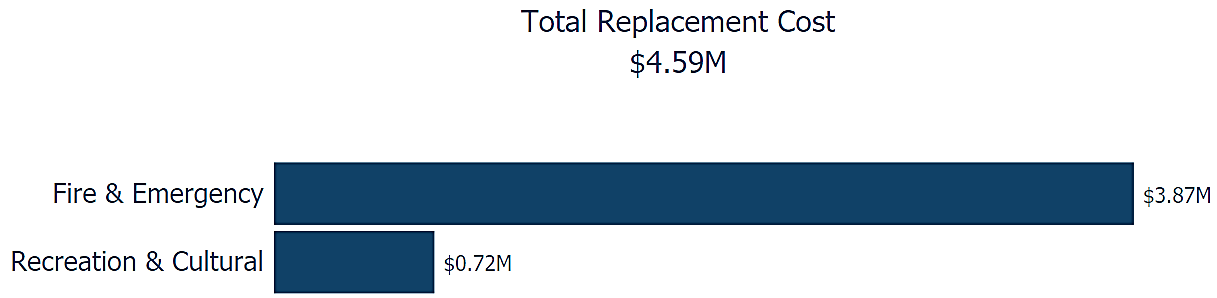
Asset hierarchy explains the relationship between individual assets and their components, and a wider, more expansive network and system. How assets are grouped in a hierarchy structure can impact how data is interpreted. Assets were structured to support meaningful, efficient reporting and analysis.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



4.1.42 Asset Inventory & Replacement Cost

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

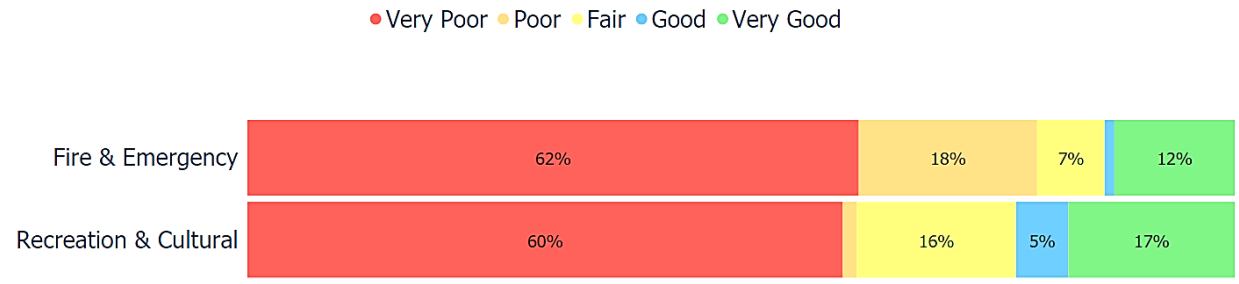
Asset Segment	Quantity	Replacement Cost Method	Total Replacement Cost
Fire & Emergency	17	Historical Cost Inflation	$3,868,407
Recreation & Cultural	18	Historical Cost Inflation	$722,848
			$4,591,255



4.1.43 Asset Condition

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

Asset Segment	Average Condition (%)	Average Condition Rating	Condition Source
Fire & Emergency	22%	Poor	Age-based
Recreation & Cultural	27%	Poor	Age-based
	23%	**Poor**	



To ensure that the Municipality's Fleet assets 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

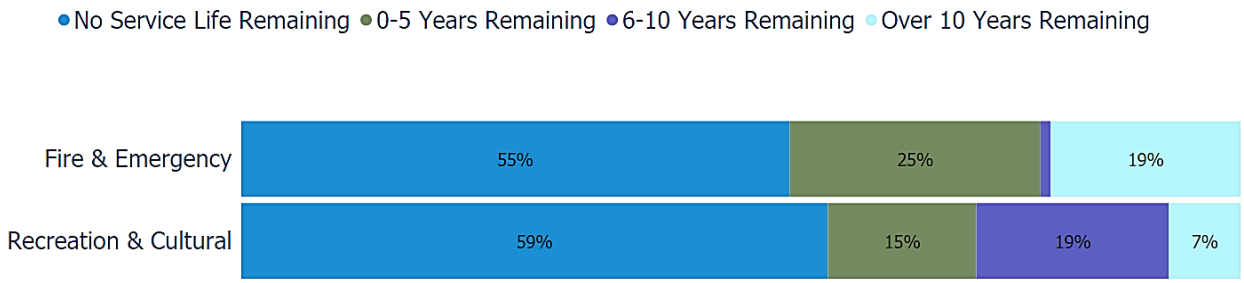
Accurate and reliable condition data allows staff to more confidently determine the remaining service life of assets and identify the most cost-effective approach to managing assets. The following describes the municipality's current approach:

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

4.1.44 Estimated Useful Life & Average Age

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

Asset Segment	Estimated Useful Life (Years)	Average Age (Years)	Average Service Life Remaining (Years)
Fire & Emergency	5 - 20 Years	15.3	-4.0
Recreation & Cultural	5 - 20 Years	10.8	1.9
		13.0	**-0.9**



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

4.1.45 Lifecycle Management Strategy

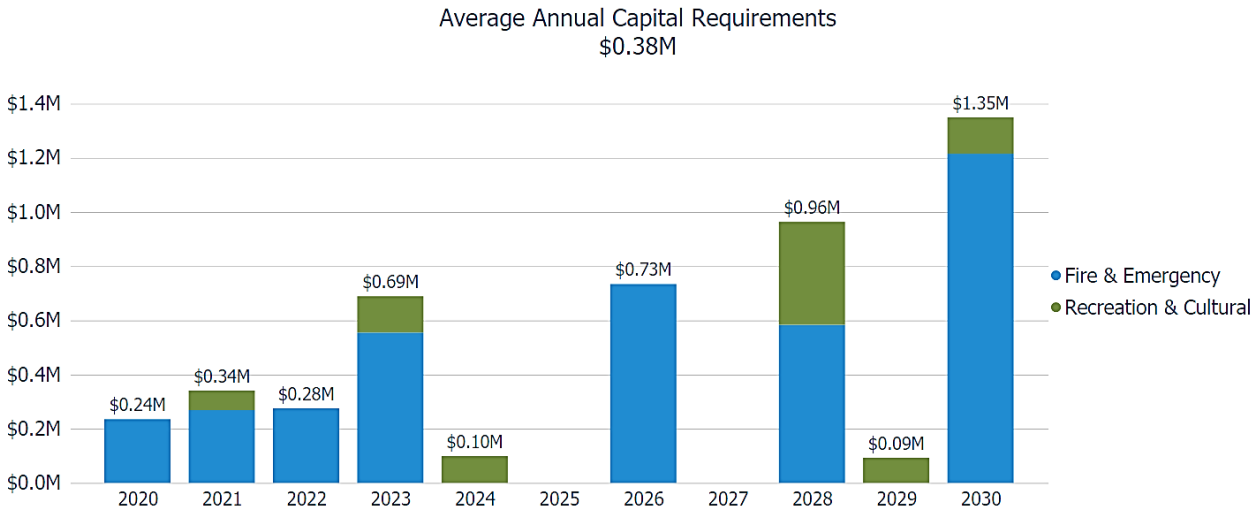
The condition or performance of most assets will deteriorate over time. To ensure that municipal assets are performing as expected and meeting the needs of customers, it is important to establish a lifecycle management strategy to proactively manage asset deterioration. The following table outlines the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

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

Forecasted Capital Requirements

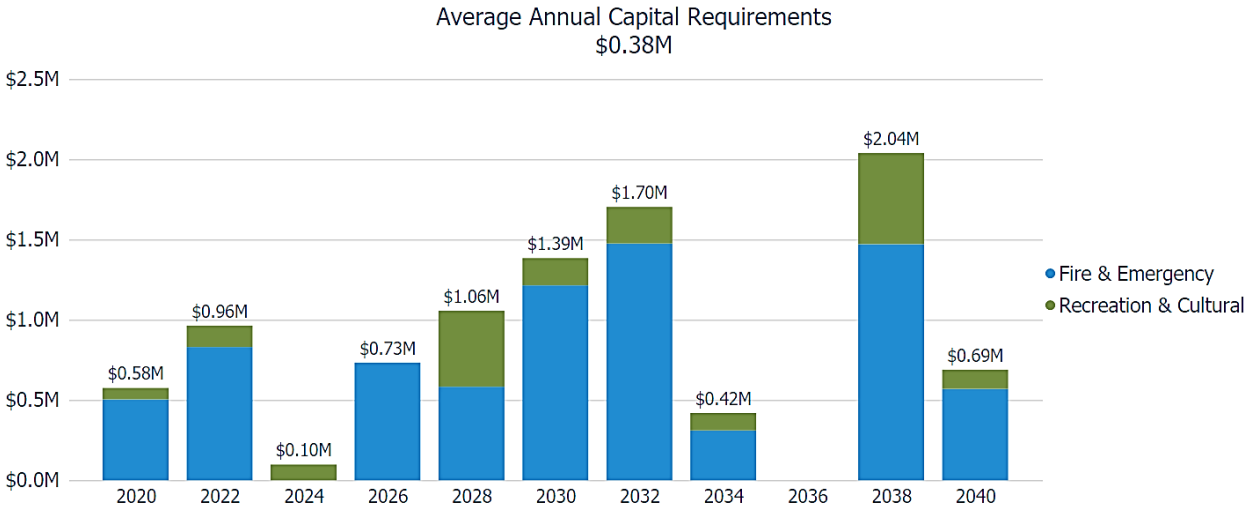
Based on the current fleet inventory, and assuming end-of-life replacement for all assets, the following graph forecasts short- and long-term capital requirements for the fleet category.

The graph below provides a 10-year forecast of the capital requirements for fleet assets, not including assets that may be required due to growth.



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

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



4.1.46 Risk & Criticality

Risk Matrix

The following risk matrix provides a visual representation of the relationship between the probability of failure and the consequence of failure for the assets within this asset category based on 2020 inventory data. See Appendix D for the criteria used to determine the risk rating of each asset.

Risks to Current Asset Management Strategies

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

Aging Assets

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

4.1.47 Levels of Service

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

4.1.48 Recommendations

Replacement Costs

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

Condition Assessment Strategies

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

Risk Management Strategies

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

Levels of Service

- Work towards identifying current and 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.

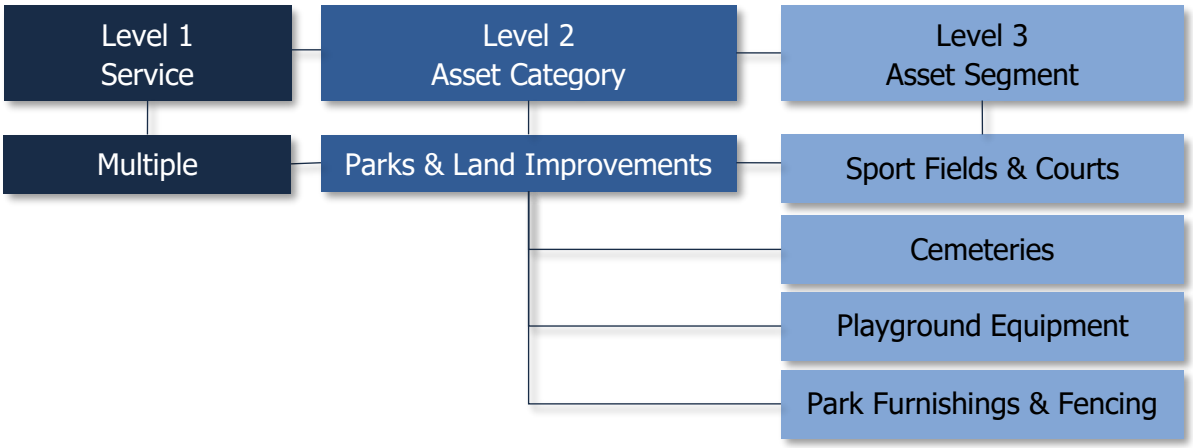
Parks & Land Improvements

The Parks & Land Improvements inventory is managed in CityWide™ and comprises of 41 unique assets that assist the Municipality in providing community recreation, cultural and natural outdoor space. This includes:

- Soccer fields, courts and ball diamonds
- Playground equipment
- Park furnishings and fencing
- Cemeteries
- Dock assets
- Miscellaneous landscaping, irrigation and other purposed assets

4.1.49 Asset Hierarchy & Segmentation

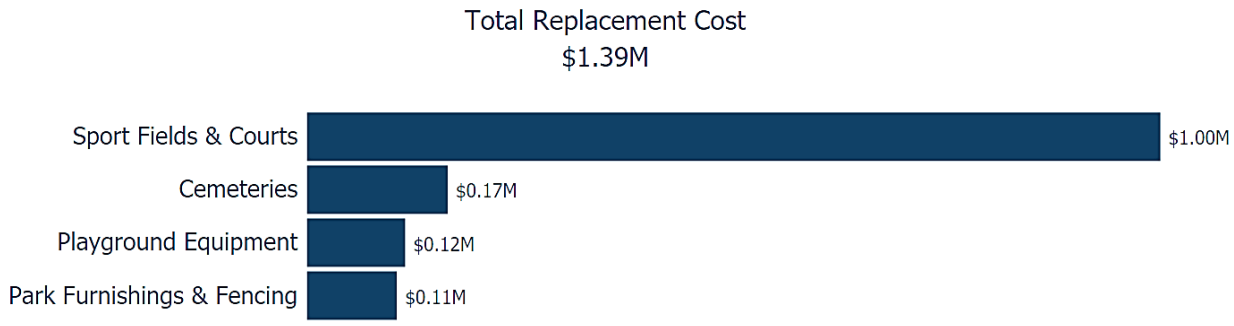
Asset hierarchy explains the relationship between individual assets and their components, and a wider, more expansive network and system. How assets are grouped in a hierarchy structure can impact how data is interpreted. Assets were structured to support meaningful, efficient reporting and analysis.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



4.1.50 Asset Inventory & Replacement Cost

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

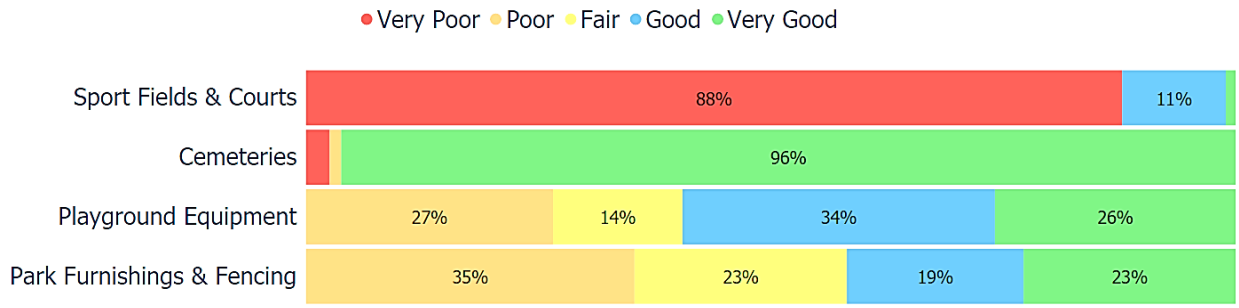
Asset Segment	Quantity	Replacement Cost Method	Total Replacement Cost
Sport Fields & Courts	15	Historical Cost Inflation, User-Defined Cost	$1,001,911
Cemeteries	9	Historical Cost Inflation, User-Defined Cost	$165,411
Playground Equipment	12	Historical Cost Inflation	$115,593
Park Furnishings & Fencing	20	Historical Cost Inflation	$105,839
			$1,388,754



4.1.51 Asset Condition

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

Asset Segment	Average Condition (%)	Average Condition Rating	Condition Source
Sport Fields & Courts	9%	Very Poor	Age-based
Cemeteries	93%	Very Good	64% Assessed
Playground Equipment	62%	Good	Age-based
Park Furnishings & Fencing	59%	Fair	Age-based
	27%	**Poor**	



To ensure that the Municipality's Parks & 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

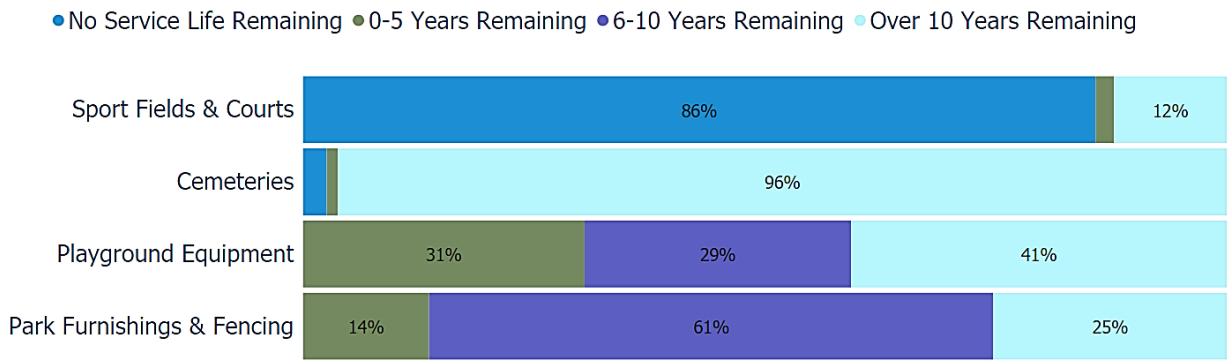
Accurate and reliable condition data allows staff to more confidently determine the remaining service life of assets and identify the most cost-effective approach to managing assets. The following describes the municipality's current approach:

- Staff complete regular visual inspections of parks and land improvements assets to ensure they are in state of adequate repair
- Staff conduct formal inspections of outdoor play space, fixed play structures and surfacing in accordance with CAN/CSA-Z614 and required as per O. Reg. 137/15
- There are no formal condition assessment programs in place for other parks and land improvements assets

4.1.52 Estimated Useful Life & Average Age

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

Asset Segment	Estimated Useful Life (Years)	Average Age (Years)	Average Service Life Remaining (Years)
Sport Fields & Courts	5 - 30 Years	26.9	-8.6
Cemeteries	10 - 150 Years	3.7	78.3
Playground Equipment	10 - 30 Years	6.2	10.5
Park Furnishings & Fencing	10 - 20 Years	5.6	8.7
		13.1	**16.3**



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

4.1.53 Lifecycle Management Strategy

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

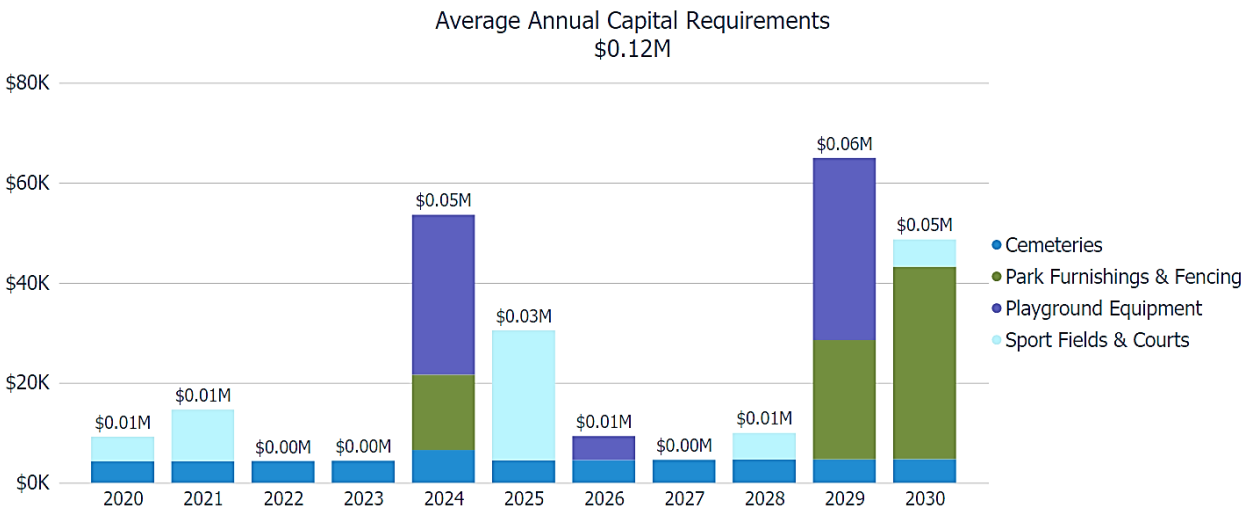
The following table outlines the Municipality's current lifecycle management strategy.

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

Forecasted Capital Requirements

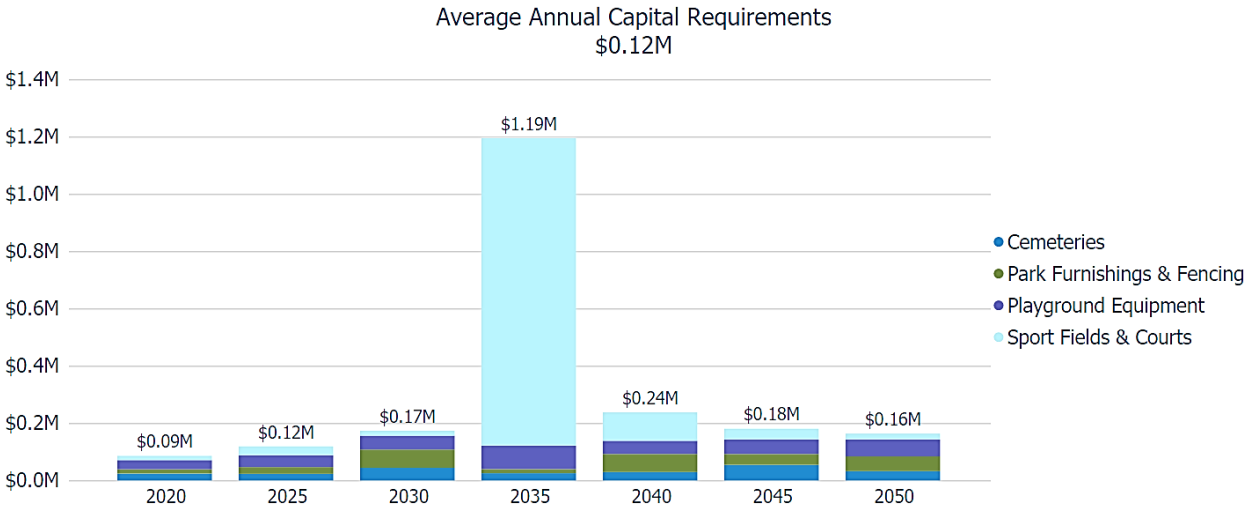
Based on the current fleet inventory, and assuming end-of-life replacement for all assets, the following graph forecasts short- and long-term capital requirements for the fleet category.

The graph below provides a 10-year forecast of the capital requirements for fleet assets, not including assets that may be required due to growth.



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

The graph below provides a 30-year forecast. This projection is used as it ensures that every asset has gone through one full iteration of replacement and does not include assets that may be required for growth.



4.1.54 Risk & Criticality

Risk Matrix

The following risk matrix provides a visual representation of the relationship between the probability of failure and the consequence of failure for the assets within this asset category based on 2020 inventory data. See Appendix D for the criteria used to determine the risk rating of each asset.

Risks to Current Asset Management Strategies

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

Asset Data Confidence

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

4.1.55 Levels of Service

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

4.1.56 Recommendations

Asset Inventory

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

Replacement Costs

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

Condition Assessment Strategies

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

Risk Management Strategies

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

Levels of Service

- Work towards identifying current and 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 $110.3 million
- 88% 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 $2.0 million
- The water system is fully funded for the existing infrastructure and does not require any rate increases at this time
- To reach sustainability for the sanitary sewer system, sewer rates need to be increased by 2.1% annually for the next 15 years to eliminate annual deficits

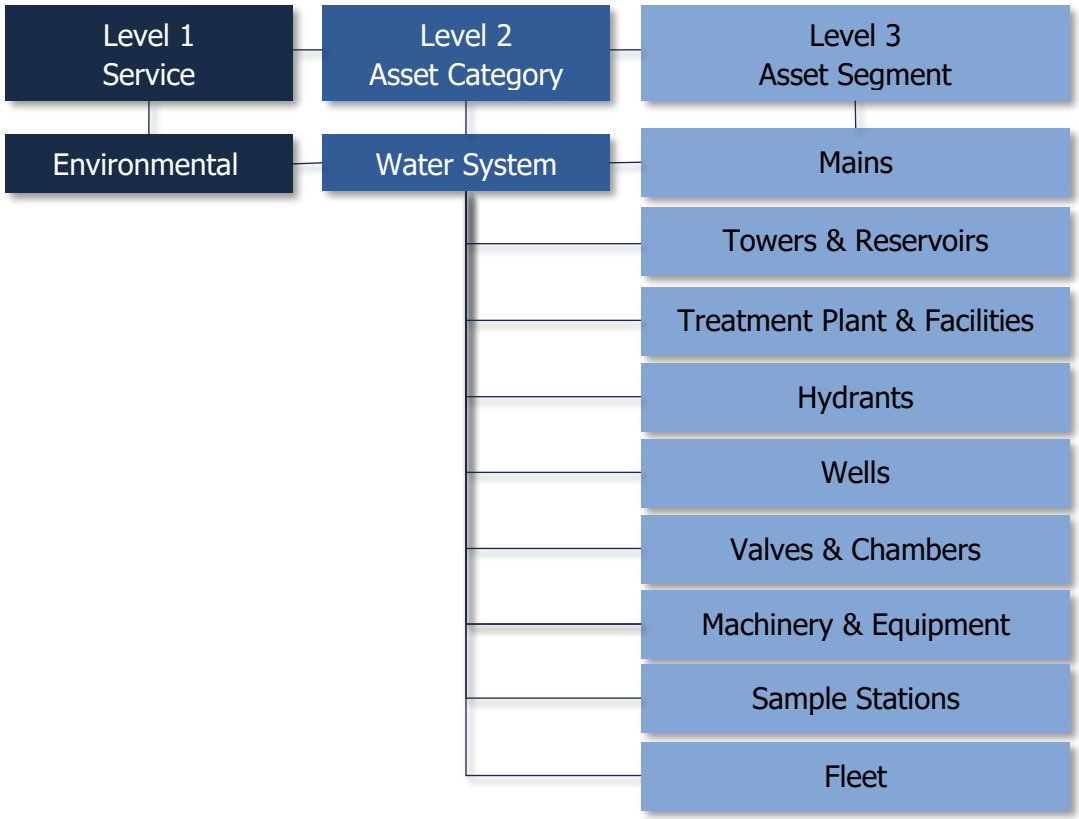
Water System

The Municipality's Water System inventory is managed in CityWide™, and comprises of 702 unique assets, including 51 kilometres of water mains, approximately 220 hydrants and 103 valves and chambers, as well as several water facilities like water towers, reservoirs, wells, sample stations and treatment plants. The Public Works department, along with supporting assets such as facilities, fleet and machinery & equipment, is responsible for planning and managing the Water System.

The inventory used for this AMP represents the 2 water systems that the Municipality owns and operates. However, there is a misalignment between the inventories for water system assets. Staff are working towards developing a centralized inventory to ensure alignment with other municipal plans.

5.1.1 Asset Hierarchy & Segmentation

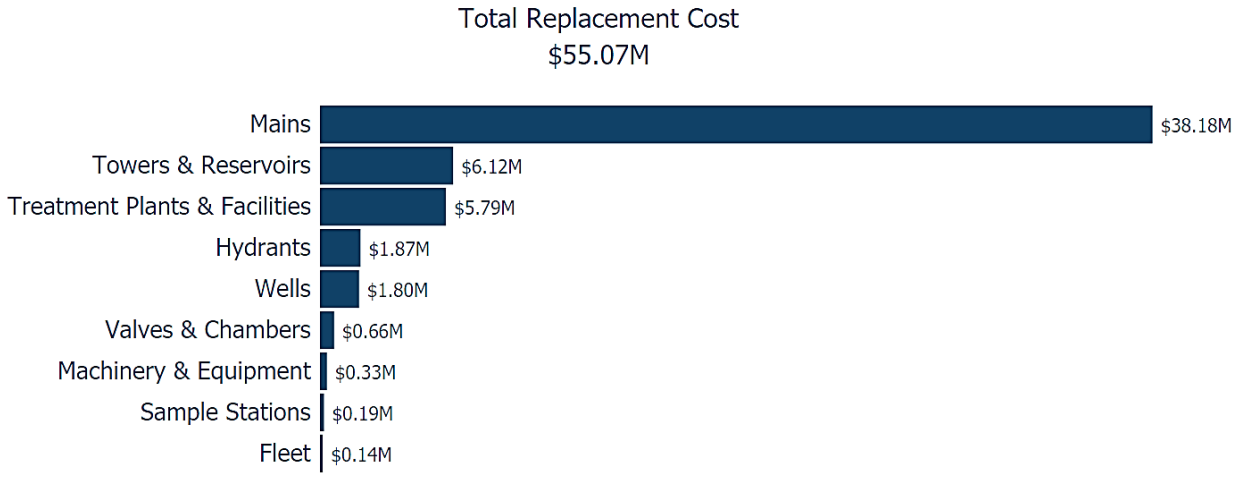
Asset hierarchy explains the relationship between individual assets and their components, and a wider, more expansive network and system. How assets are grouped in a hierarchy structure can impact how data is interpreted. Assets were structured to support meaningful, efficient reporting and analysis.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



5.1.2 Asset Inventory & Replacement Cost

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

Asset Segment	Quantity[4]	Replacement Cost Method	Total Replacement Cost[4]
Mains	51 km	Cost per Unit Historical Cost Inflation	$38,178,585
Towers & Reservoirs	3	Historical Cost Inflation User-Defined Cost	$6,120,031
Treatment Plants & Facilities	5	Historical Cost Inflation User-Defined Cost	$5,789,327
Hydrants	220	Cost per Unit	$1,870,000
Wells	6	User-Defined Cost	$1,800,000
Valves & Chambers	600	Historical Cost Inflation User-Defined Cost	$656,340
Machinery & Equipment	Varied	Historical Cost Inflation	$325,579
Sample Stations	26	User-Defined Cost	$194,551
Fleet	4	Historical Cost Inflation	$140,301
			$55,074,714

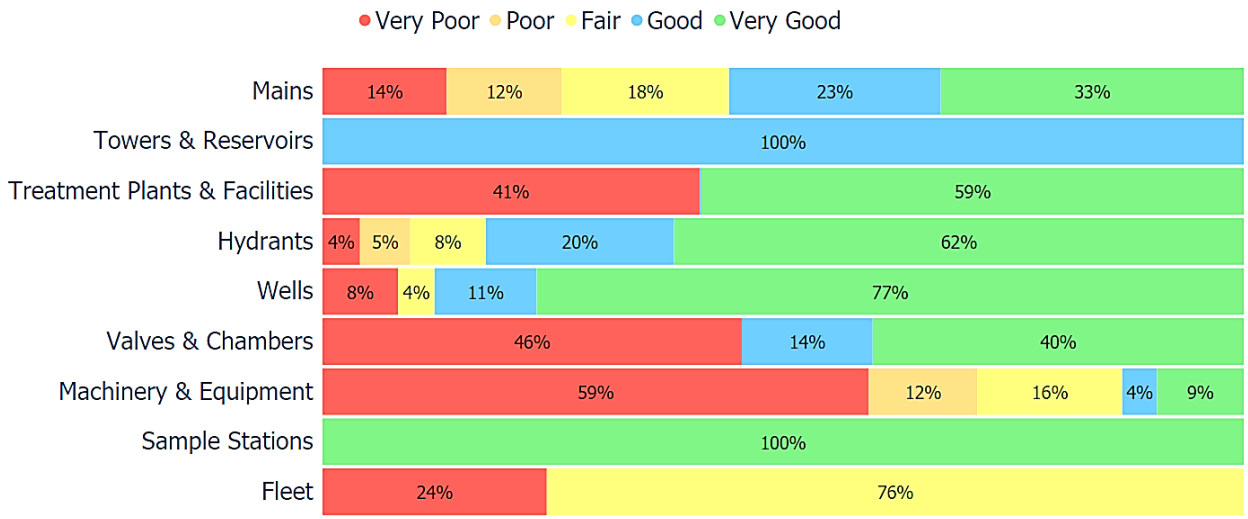


[4] The current quantity values have been provided by Staff to provide an accurate representation of the water system. These quantity values are not representative of the CityWide™ inventory and serve to highlight the discrepancies between the Municipality's water system inventories. Staff are developing a consolidated and centralized water system inventory for the 2024 iteration of the AMP.

5.1.3 Asset Condition

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

Asset Segment	Average Condition (%)	Average Condition Rating	Condition Source
Mains	61%	Good	92% Assessed
Towers & Reservoirs	69%	Good	100% Assessed
Treatment Plants & Facilities	55%	Fair	Age-based
Hydrants	76%	Good	96% Assessed
Wells	81%	Very Good	2% Assessed
Valves & Chambers	45%	Fair	54% Assessed
Machinery & Equipment	32%	Fair	Age-based
Sample Stations	87%	Very Good	80% Assessed
Fleet	41%	Fair	100% Assessed
	62%	**Good**	



To ensure that the Municipality's Water System 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 System.

Current Approach to Condition Assessment

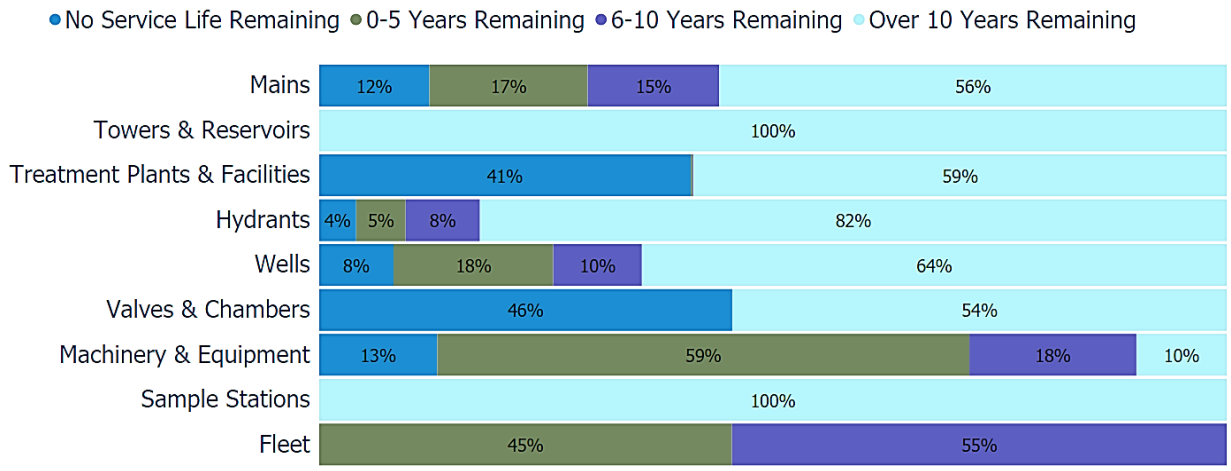
Accurate and reliable condition data allows staff to more confidently determine the remaining service life of assets and identify the most cost-effective approach to managing assets. The following describes the municipality's current approach:

- Staff primarily rely on the age and material of water mains to determine the projected condition of water mains
- As part of this AMP, Staff have provided cursory condition ratings through desktop assessments for specific water system assets to accurately reflect the condition
- Aside from the inspections required under O. Reg. 170/3, there are no formal condition assessment programs in place for the Water System

5.1.4 Estimated Useful Life & Average Age

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

Asset Segment	Estimated Useful Life (Years)	Average Age (Years)	Average Service Life Remaining (Years)
Mains	25 - 100 Years	30.1	19.8
Towers & Reservoirs	60 - 80 Years	33.4	20.8
Treatment Plants & Facilities	10 - 80 Years	24.8	7.3
Hydrants	25 - 50 Years	26.3	21.5
Wells	10 - 50 Years	14.3	12.4
Valves & Chambers	10 - 50 Years	14.4	21.9
Machinery & Equipment	4 - 40 Years	8.3	4.8
Sample Stations	40 - 50 Years	13.7	24.1
Fleet	5 - 12 Years	10.8	5.0
		25.3	**19.9**



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

5.1.5 Lifecycle Management Strategy

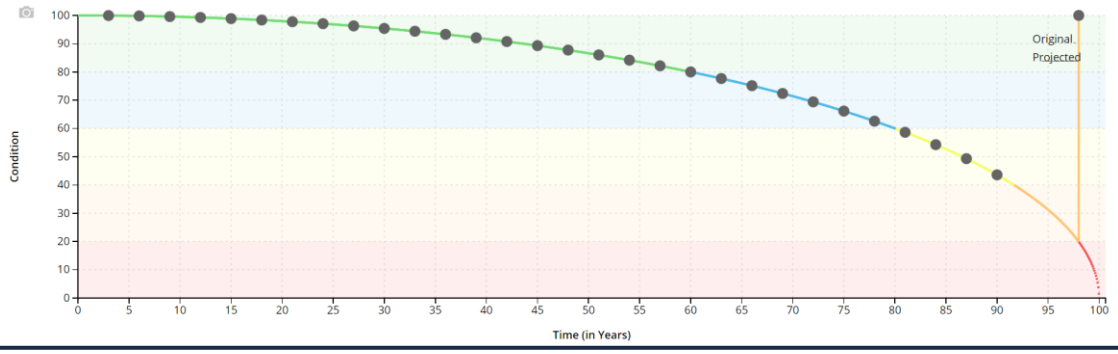
The condition or performance of most assets will deteriorate over time. To ensure that municipal assets are performing as expected and meeting the needs of customers, it is important to establish a lifecycle management strategy to proactively manage asset deterioration.

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

Activity Type	Description of Current Strategy
Maintenance	Valves undergo annual maintenance
	Periodic pressure testing to identify deficiencies and potential leaks
	Mains are flushed annually, and hydrants are flushed biannually
Rehabilitation/ Replacement	In the absence of mid-lifecycle rehabilitative events, most mains are simply maintained with the goal of full replacement once it reaches its end-of-life
	The 2021 - 2026 Drinking Water Financial Plan provides capital projections that include replacement and rehabilitative activities for specific assets and components
	Other replacement activities are identified based on an analysis of the main break rate as well as any issues identified during regular maintenance activities

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

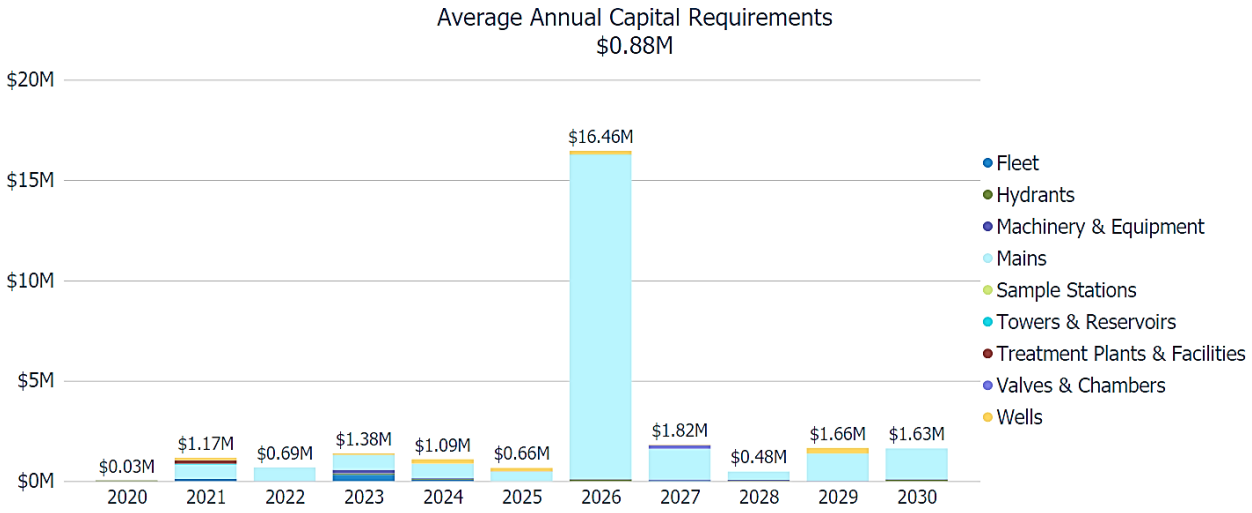
Water Mains		
Event Name	**Event Class**	**Event Trigger**
Valve Maintenance	Maintenance	Annually
Water Main Flushing	Maintenance	Annually
Hydrant Flushing	Maintenance	Biannually
Full Reconstruction	Replacement	Condition: 20



Forecasted Capital Requirements

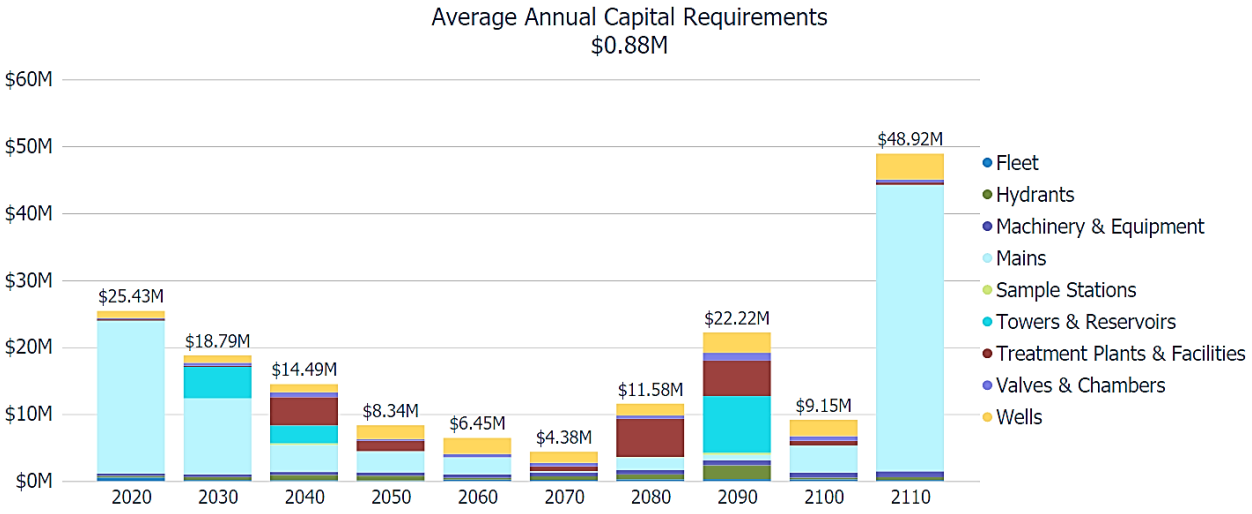
Based on the specific lifecycle activities identified in the 2021 - 2026 Drinking Water System Financial Plan, desktop assessments provided by Staff and assuming end-of-life replacement for all assets, the following graph forecasts short- and long-term capital requirements for the Water System category.

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 graph below provides a 10-year forecast of the capital requirements for the Water System, not including assets that may be required due to growth.



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

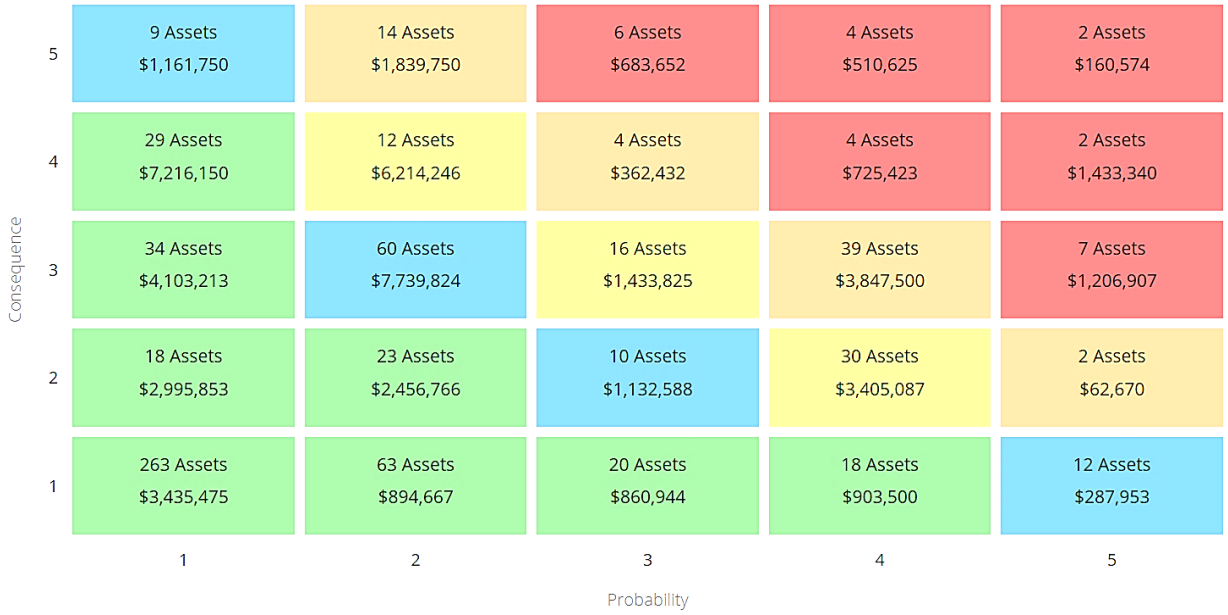
The graph below provides a 90-year forecast. This projection is used as it ensures that every asset has gone through one full iteration of replacement and does not include assets that may be required for growth.



5.1.6 Risk & Criticality

Risk Matrix

The following risk matrix provides a visual representation of the relationship between the probability of failure and the consequence of failure for the assets within this asset category based on 2020 inventory data. See Appendix D for the criteria used to determine the risk rating of each asset.



Risks to Current Asset Management Strategies

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

Asset Data and Information

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

Assessed Condition Data

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

5.1.7 Levels of Service

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

Service Attribute	Qualitative Description	Current LOS (2020)
Scope	Description, which may include maps, of the user groups or areas of the municipality that are connected to the municipal water system	See Appendix C
	Description, which may include maps, of the user groups or areas of the municipality that have fire flow	See Appendix C
Reliability	Description of boil water advisories and service interruptions	The Municipality experienced no boil water advisories in 2020. On occasion, water service interruptions may occur due to unexpected main breaks, maintenance activities, or water infrastructure replacement. Staff make every effort to keep service interruptions to a minimum.

Technical Levels of Service

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

Service Attribute	Technical Metric	Current LOS (2020)
Scope	% of properties connected to the municipal water system	57%
	% of properties where fire flow is available	100%
Reliability	# of connection-days per year where a boil water advisory notice is in place compared to the total number of properties connected to the municipal water system	0
	# of connection-days per year where water is not available due to water main breaks compared to the total number of properties connected to the municipal water system	0.34
Performance	Capital re-investment rate	2.19%

5.1.8 Recommendations

Asset Inventory

- Continue to refine and consolidate asset data into the central asset inventory to ensure all relevant assets are accounted for.
- Review and revise replacement costs and critical asset attribute data on a regular basis.

Condition Assessment Strategies

- Identify condition assessment strategies for high value and high-risk Water System assets.

Risk Management Strategies

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

Levels of Service

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

Sanitary Sewer System

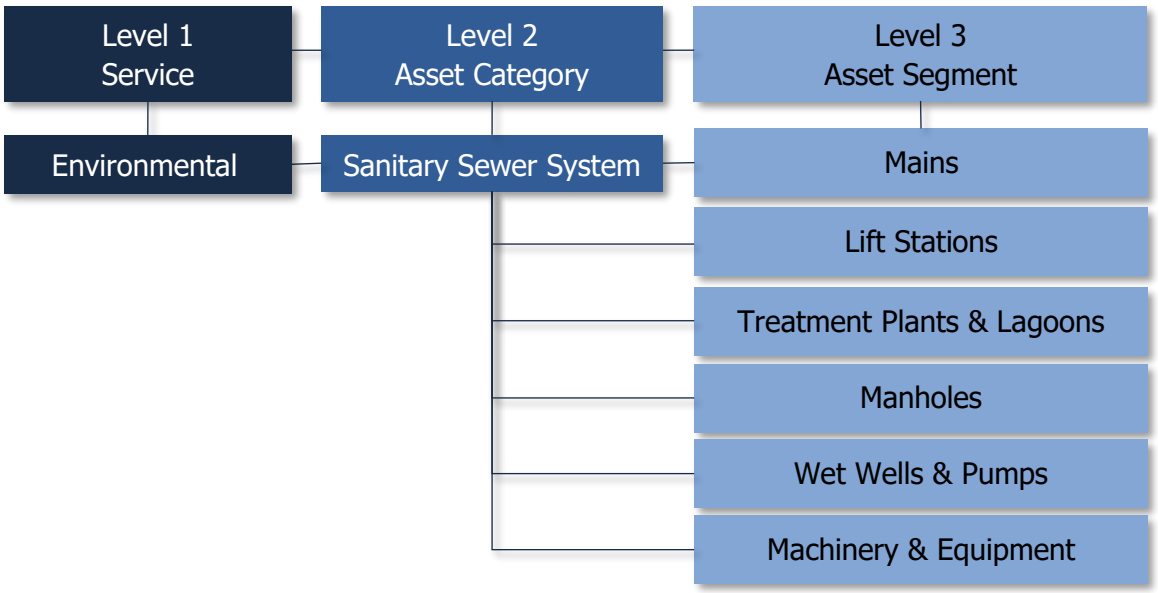
The Municipality's Sanitary Sewer System inventory is managed in CityWide™, and comprises of 747 unique assets, including 40 kilometres of sanitary mains, approximately 445 manholes, and several sanitary facilities like lift stations, wet wells and pumps, treatment plants and lagoons.

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

The inventory used for this AMP represents the 3 sanitary sewer systems that the Municipality owns and operates. However, there is a misalignment between the inventories for the sanitary sewer system. Staff are working towards developing a centralized inventory to ensure alignment with other municipal plans.

5.1.9 Asset Hierarchy & Segmentation

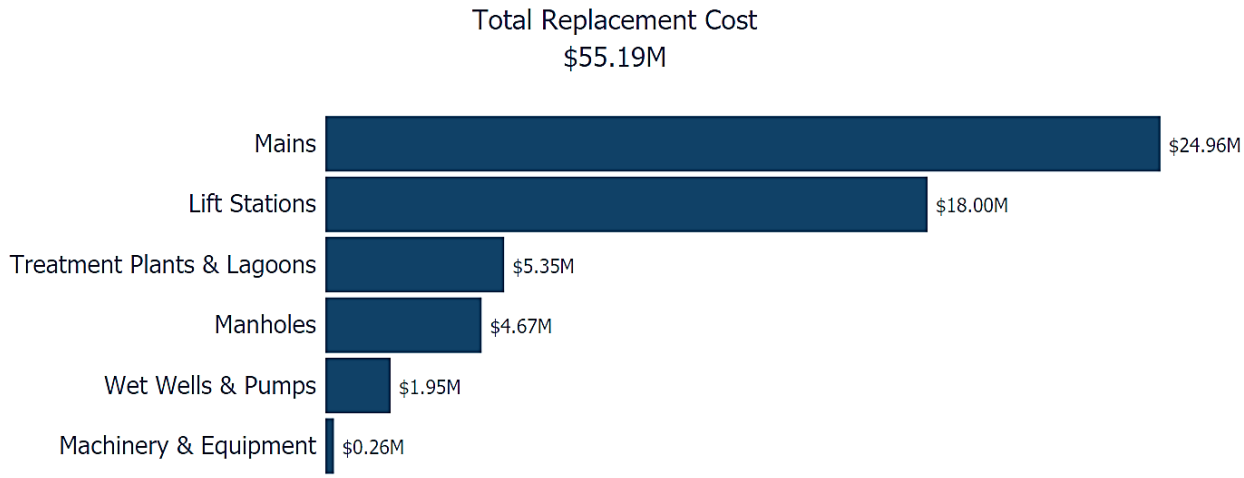
Asset hierarchy explains the relationship between individual assets and their components, and a wider, more expansive network and system. How assets are grouped in a hierarchy structure can impact how data is interpreted. Assets were structured to support meaningful, efficient reporting and analysis.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



5.1.10 Asset Inventory & Replacement Cost

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

Asset Segment	Quantity[5]	Replacement Cost Method	Total Replacement Cost[5]
Mains	40 km	Cost per Unit, Historical Cost Inflation	$24,958,524
Lift Stations	9	User-Defined Cost	$18,000,000
Treatment Plants & Lagoons	3	Historical Cost Inflation	$5,348,908
Manholes	445	Cost per Unit	$4,672,500
Wet Wells & Pumps	9	Historical Cost Inflation, User-Defined Cost	$1,953,220
Machinery & Equipment	2	Historical Cost Inflation	$258,705
			$55,191,857

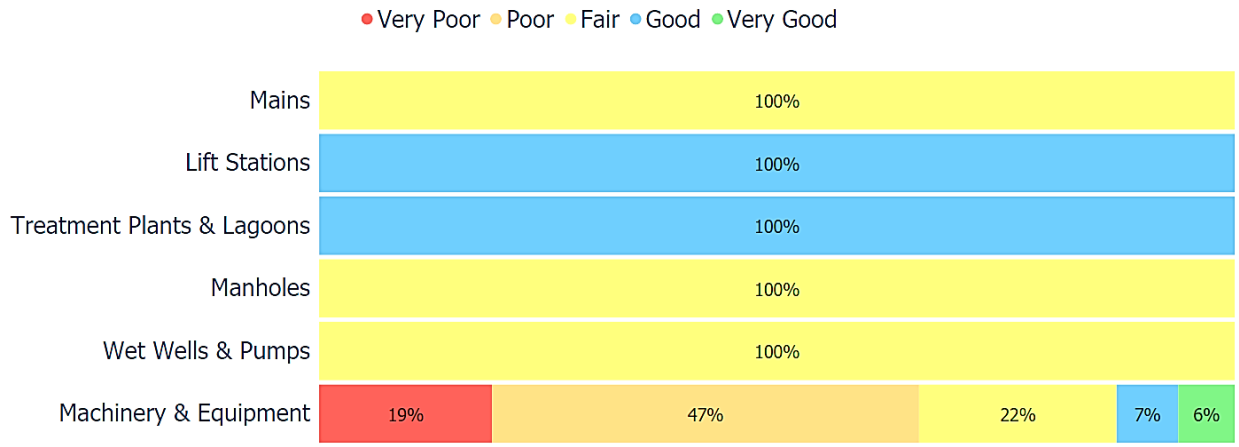


[5] The current quantity values have been provided by Staff to provide an accurate representation of the sanitary sewer system. These quantity values are not representative of the CityWide™ inventory and serve to highlight the discrepancies between the Municipality's sanitary sewer system inventories. Staff are developing a consolidated and centralized water system inventory for the 2024 iteration of the AMP.

5.1.11 Asset Condition

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

Asset Segment	Average Condition (%)	Average Condition Rating	Condition Source
Mains	54%	Fair	100% Assessed
Lift Stations	74%	Good	100% Assessed
Treatment Plants & Lagoons	74%	Good	100% Assessed
Manholes	53%	Fair	100% Assessed
Wet Wells & Pumps	53%	Fair	100% Assessed
Machinery & Equipment	35%	Poor	4% Assessed
	62%	**Good**	



To ensure that the Municipality's Sanitary Sewer System 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 Sanitary Sewer System.

Current Approach to Condition Assessment

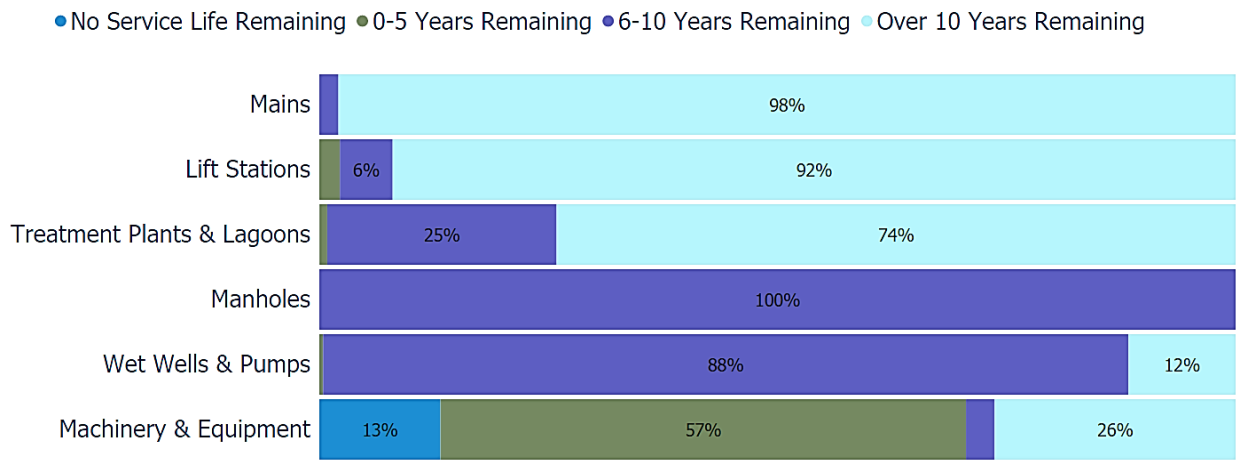
Accurate and reliable condition data allows staff to more confidently determine the remaining service life of assets and identify the most cost-effective approach to managing assets. The following describes the municipality's current approach:

- CCTV inspections are conducted on as-needed or in coordination with road construction
- Staff rely on a variety of metrics including age, pipe material and diameter, location, and available CCTV assessments to determine the projection condition of linear assets
- Other sanitary assets are inspected by staff on a regular basis

5.1.12 Estimated Useful Life & Average Age

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

Asset Segment	Estimated Useful Life (Years)	Average Age (Years)	Average Service Life Remaining (Years)
Mains	50 – 100 Years	39.2	15.6
Lift Stations	5 – 40 Years	14.8	8.7
Treatment Plants & Lagoons	10 – 50 Years	7.2	7.8
Manholes	40 – 50 Years	42.2	6.1
Wet Wells & Pumps	20 – 50 Years	30.3	8.9
Machinery & Equipment	4 – 30 Years	7.1	5.0
		38.8	**9.3**



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

5.1.13 Lifecycle Management Strategy

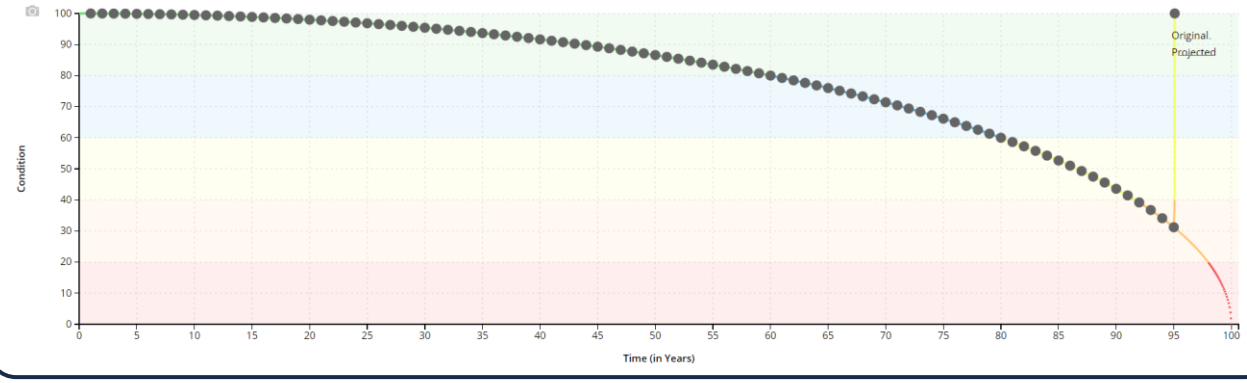
The condition or performance of most assets will deteriorate over time. To ensure that municipal assets are performing as expected and meeting the needs of customers, it is important to establish a lifecycle management strategy to proactively manage asset deterioration.

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

Activity Type	Description of Current Strategy
Maintenance	Annual maintenance of mains that consists of main flushing, rodding and inspections
	Annual maintenance of manholes that consists of manhole inspection, lining and grouting
Rehabilitation/ Replacement	In the absence of mid-lifecycle rehabilitative events, most mains are simply maintained with the goal of full replacement once it reaches its end-of-life
	The 2021 - 2026 Sewer Financial Plan provides capital projections that include replacement and rehabilitative activities for specific assets and components
	Project prioritization is based on CCTV inspections, asset age, material, environmental risks, health and safety risks, and social impact.

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

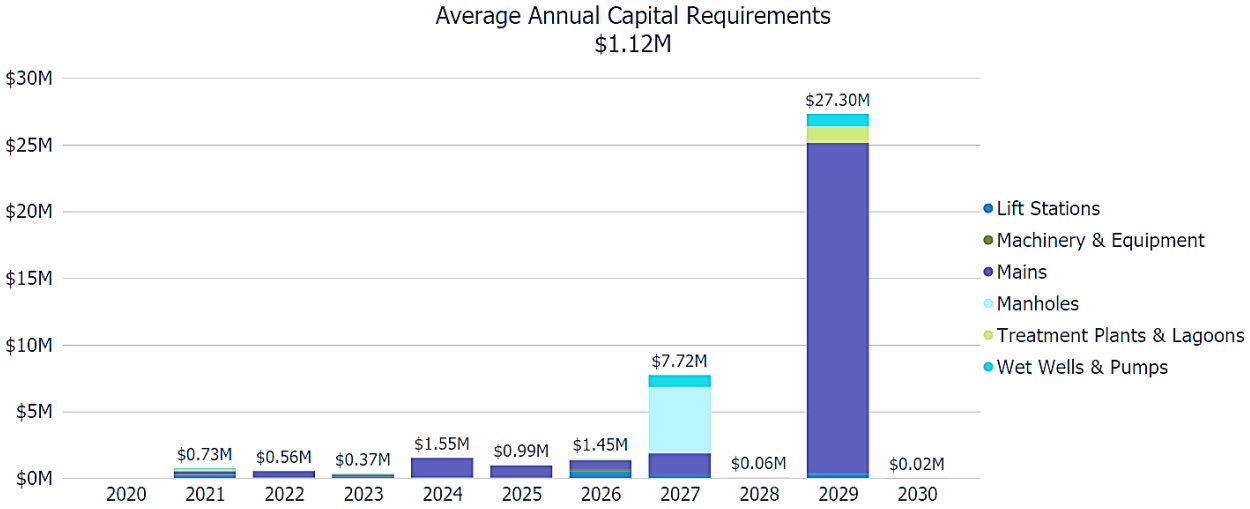
Sanitary Mains		
Event Name	**Event Class**	**Event Trigger**
Main Flushing, Rodding & Inspections	Maintenance	Annually
Manhole Inspection, Lining & Grouting	Maintenance	Annually
Full Reconstruction	Replacement	Condition: 40



Forecasted Capital Requirements

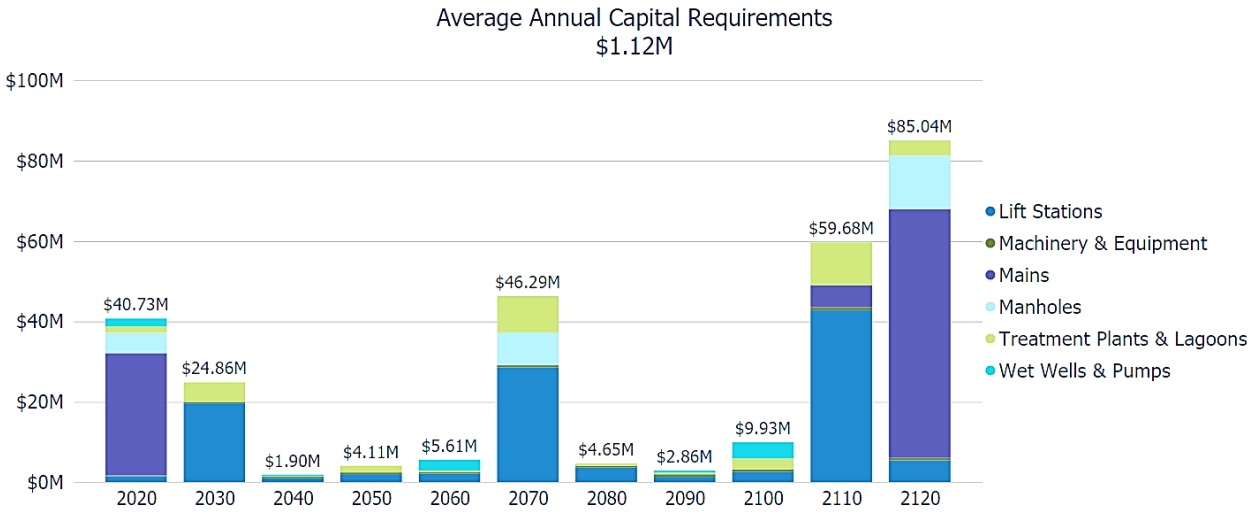
Based on the specific lifecycle activities identified in the 2021 - 2026 Sewer Financial Plan, assessments provided by Staff and assuming end-of-life replacement for all assets, the following graph forecasts short- and long-term capital requirements for the Sanitary Sewer System category.

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 graph below provides a 10-year forecast of the capital requirements for the Water System, not including assets that may be required due to growth.



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

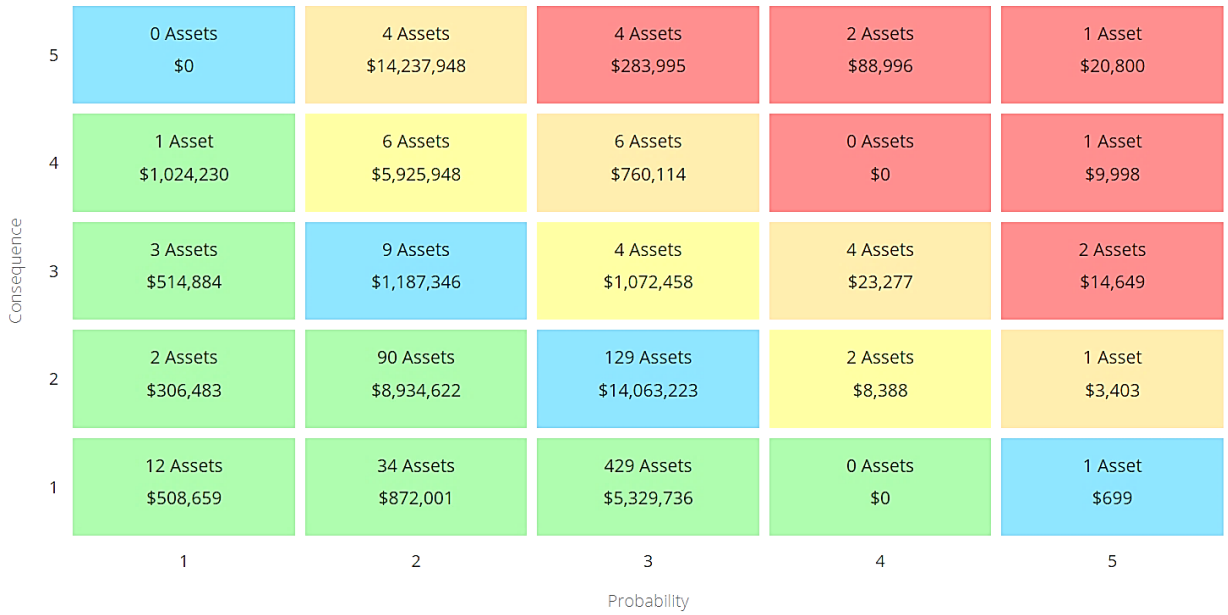
The graph below provides a 100-year forecast. This projection is used as it ensures that every asset has gone through one full iteration of replacement and does not include assets that may be required for growth.



5.1.14 Risk & Criticality

Risk Matrix

The following risk matrix provides a visual representation of the relationship between the probability of failure and the consequence of failure for the assets within this asset category based on 2020 inventory data. See Appendix D for the criteria used to determine the risk rating of each asset.



Risks to Current Asset Management Strategies

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

Asset Data and Information

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

Climate Change & Extreme Weather Events

With the intensity and frequency of climate change and extreme weather events increasing, the Municipality has experienced sewage overflow in the Chesley Sanitary System.

5.1.15 Levels of Service

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

Service Attribute	Qualitative Description	Current LOS (2020)
Scope	Description, which may include maps, of the user groups or areas of the municipality that are connected to the municipal wastewater system	See Appendix C
Reliability	Description of how combined sewers in the municipal wastewater system are designed with overflow structures in place which allow overflow during storm events to prevent backups into homes	The Municipality does not own any combined sewers
	Description of the frequency and volume of overflows in combined sewers in the municipal wastewater system that occur in habitable areas or beaches	The Municipality does not own any combined sewers
	Description of how stormwater can get into sanitary sewers in the municipal wastewater system, causing sewage to overflow into streets or backup into homes	Stormwater can enter into sanitary sewers due to cracks in sanitary mains or through indirect connections (e.g., weeping tiles). In the case of heavy rainfall events, sanitary sewers may experience a volume of water and sewage that exceeds its designed capacity. In some cases, this can cause water and/or sewage to overflow backup into homes. the disconnection of weeping tiles from sanitary mains and the use of sump pumps and pits directing storm water to the storm drain

Service Attribute	Qualitative Description	Current LOS (2020)
		system can help to reduce the chance of this occurring.
	Description of how sanitary sewers in the municipal wastewater system are designed to be resilient to stormwater infiltration	The municipality follows a series of design standards that integrate servicing requirements and land use considerations when constructing or replacing sanitary sewers. These standards have been determined with consideration of the minimization of sewage overflows and backups.
	Description of the effluent that is discharged from sewage treatment plants in the municipal wastewater system	Effluent refers to water pollution that is discharged from a wastewater treatment plant, and may include suspended solids, total phosphorous and biological oxygen demand. The Environmental Compliance Approval (ECA) identifies the effluent criteria for municipal wastewater treatment plants.

Technical Levels of Service

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

Service Attribute	Technical Metric	Current LOS (2020)
Scope	% of properties connected to the municipal wastewater system	44%
Reliability	# of events per year where combined sewer flow in the municipal wastewater system exceeds system capacity compared to the total number of properties connected to the municipal wastewater system	3%
	# of connection-days per year having wastewater backups compared to the total number of properties connected to the municipal wastewater system	0
	# of effluent violations per year due to wastewater discharge compared to the total number of properties connected to the municipal wastewater system	0.0006
Performance	Capital re-investment rate	1.39%

5.1.16 Recommendations

Asset Inventory

- Continue to refine and consolidate asset data into the central asset inventory to ensure all relevant assets are accounted for.
- Review and revise replacement costs and critical asset attribute data on a regular basis.

Condition Assessment Strategies

- Identify condition assessment strategies for high value and high-risk sanitary sewer assets.

Risk Management Strategies

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

Lifecycle Management Strategies

- A trenchless re-lining strategy is expected to extend the service life of sanitary mains at a lower total cost of ownership and should be implemented to extend the life of infrastructure at the lowest total cost of ownership.
- Evaluate the efficacy of the 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 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.

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

- The population of Arran-Elderslie is expected to grow at a slow rate or remain stable

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

Description of Growth Assumptions

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

6.1.1 The Official Plan for the Urban Areas of Chesley, Paisley & Tara/Invermay (September 2004)

The Municipality adopted the Official Plan for the Urban Areas of Chesley, Paisley & Tara/Invermay in September 2004. The Official Plan was then approved with modifications by the County Council of Bruce County in January 2005, in order to ensure conformance with the County of Bruce Official Plan.

The Official Plan is a planning document for the purpose of guiding future development and land use planning. The Official Plan contains policies regarding the distribution of land uses, the provision of community services, and the classification of the road pattern. The Plan also establishes goals, actions and policies to shape, guide and direct the physical growth and composition of the urban areas of the Municipality. The Official Plan is intended to function as a major policy document to the year 2021.

The most recent consolidation of the plan occurred in January of 2018.

6.1.2 County of Bruce Official Plan (May 1997)

In 1997, the County Council of Bruce County adopted the Official Plan to establish a policy framework to guide the physical, social and economic development of the County and to protect the natural environment with the County to the year 2021.

The most recent consolidation of the plan occurred in September of 2017.

Through this Official Plan it is County Council's intent to:

- Achieve an orderly pattern of settlement
- Protect and conserve good agricultural land
- Protect and when possible, enhance the quality of the natural environment
- Encourage economic development and prosperity
- Encourage necessary social, cultural and educational facilities and services.

The Counties is responsible for the allocation of growth to the local municipalities, which is based on a combination of local factors including: local planning policy; historic and recent growth trends; market demand; and the capacity to accommodate growth from land supply and servicing perspectives.

The following table outlines the population and employment forecasts allocated to the Municipality.

	2011	2016	2021
Population Forecast – Arran-Elderslie	6,188	6,065	5,943
Population Forecast – Bruce County	66,101	67,818	67,866
Employment Forecast – Arran-Elderslie	3,201	3,137	3,074
Employment Forecast – Bruce County	35,390	36,309	36,335

The Official Plan projects the population of Arran-Elderslie to grow at a slow rate or remain stable as a result of the aging of the population and slower growth in agricultural employment.

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.

7 Financial Strategy

Key Insights

- The Municipality is committing approximately $4.16 million towards capital projects per year from sustainable revenue sources
- Given the annual capital requirement of $10.18 million, there is currently a funding gap of $6.02 million annually
- For Tax-Funded assets, we recommend increasing tax revenues by 5.2% each year for the next 20 years to achieve a sustainable level of funding
- For the Water System, we recommend maintaining the current funding model and no rate increases at this time
- For the Sanitary Sewer System, we recommend increasing rate revenues by 2.1% annually for the next 15 years to achieve a sustainable level of funding

Financial Strategy Overview

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

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

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

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

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

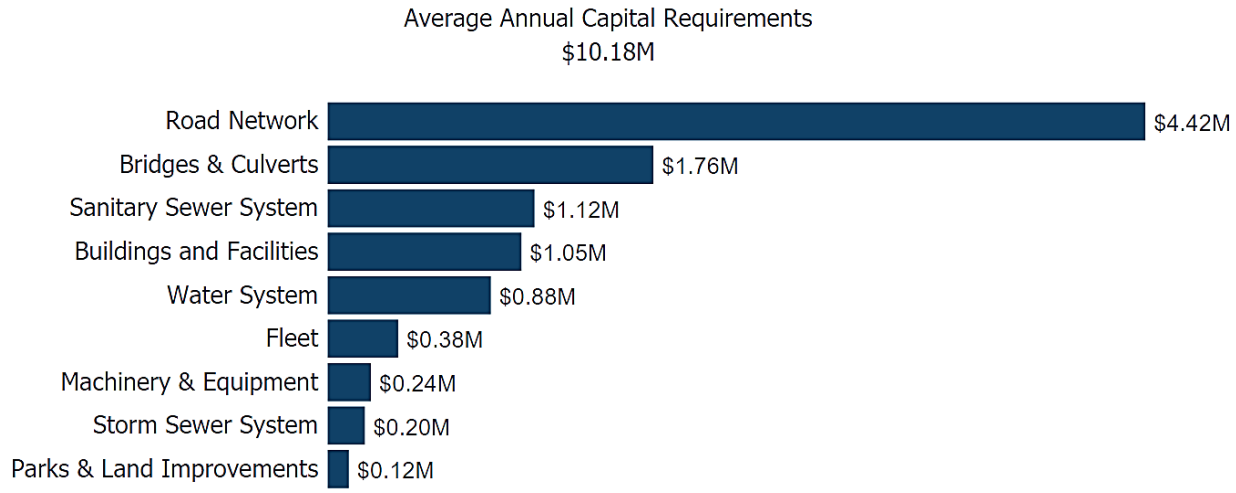
1. In order to reduce financial requirements, consideration has been given to revising service levels downward

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

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 $10.18 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. This also includes specific lifecycle activities found on the 2020 OSIM Report, the Drinking Water System Financial Plan and the Sewer Financial Plan that have been factored into the calculation.

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

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

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

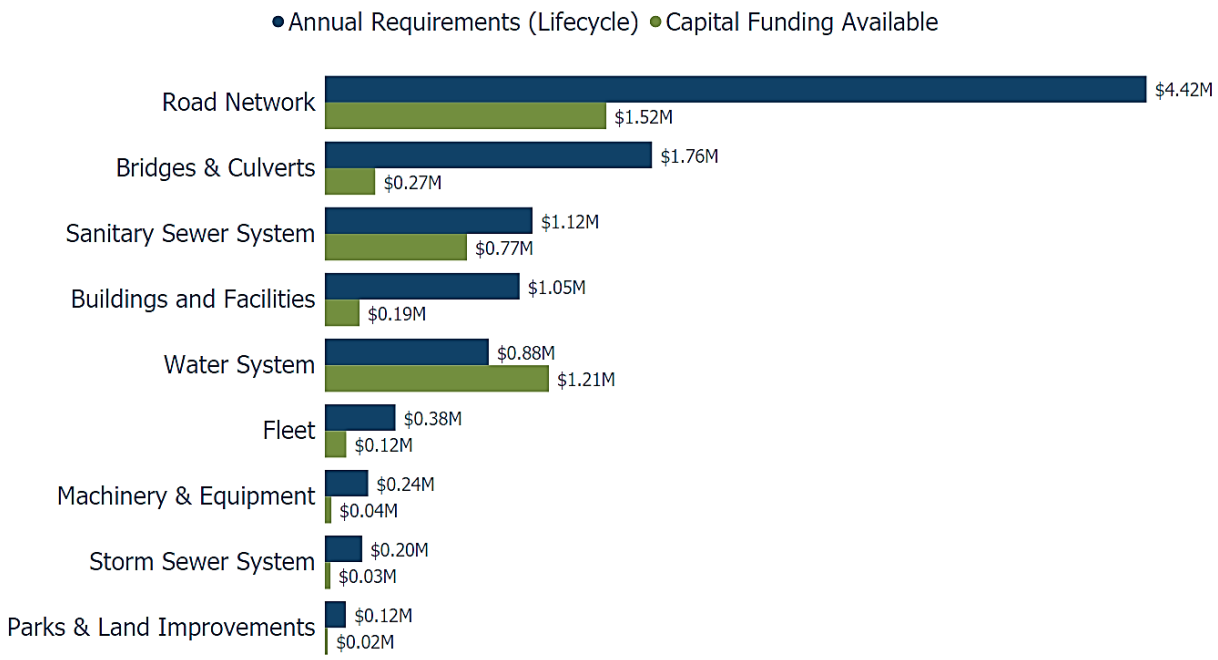
Asset Category	Annual Requirements (Replacement Only)	Annual Requirements (Lifecycle Strategy)	Difference
Road Network	$8,861,325	$4,424,663	$4,436,662

The impact of the current lifecycle strategy for roads leads to a potential annual cost avoidance of $4.4 million for the Road Network. This represents an overall reduction of the annual requirements for the category by 50%.

As the lifecycle strategy scenario represents the actual activities the Municipality undertakes and also because it is the lowest cost option available to the Municipality, we have used these annual requirements in the development of the financial strategy.

Annual Funding Available

Based on a historical analysis of sustainable capital funding sources, the Municipality is committing approximately $4,160,000 towards capital projects per year from sustainable revenue sources. Given the annual capital requirement of $10,180,000, there is currently a funding gap of $6,020,000 annually.



Funding Objective

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

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

Note: For the purposes of this AMP, we have assigned a revised useful life to the gravel roads that is based on the base component of the road – 50 years. Gravel roads are a perpetual maintenance asset, and if maintained properly, they can theoretically have a limitless service life. Staff have indicated that the reconstruction of gravel roads is capitalized, and on average 2 to 4 km of gravel roads are reconstructed each year.

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

Financial Profile: Tax Funded Assets

7.1.2 Current Funding Position

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

Asset Category	Avg. Annual Requirement	Annual Funding Available						Annual Deficit
		Taxes	Gas Tax	OCIF	Bell Mobility (Fire Services)	Municipal Fire Service Agreement	Total Available	
Road Network	$4,425,000	$688,000	$634,000	$195,000	$0	$0	$1,517,000	$2,908,000
Bridges & Culverts	$1,763,000	$274,000	$0	$0	$0	$0	$32,000	$171,000
Storm Sewer System	$203,000	$32,000	$0	$0	$0	$0	$274,000	$1,489,000
Buildings & Facilities	$1,050,000	$163,000	$0	$0	$26,000	$0	$189,000	$861,000
Machinery & Equipment	$236,000	$37,000	$0	$0	$0	$0	$37,000	$199,000
Fleet	$383,000	$60,000	$0	$0	$0	$58,000	$18,000	$98,000
Parks & Land Improvements	$116,000	$18,000	$0	$0	$0	$0	$118,000	$265,000
	$8,176,000	**$1,272,000**	**$634,000**	**$195,000**	**$26,000**	**$58,000**	**$2,185,000**	**$5,991,000**

The average annual investment requirement for the above categories is $8,176,000. Annual revenue currently allocated to these assets for capital purposes is $2,185,000 leaving an annual deficit of $5,991,000. Put differently, these infrastructure categories are currently funded at 26.7% of their long-term requirements.

7.1.3 Full Funding Requirements

In 2021, Municipality of Arran-Elderslie has budgeted annual tax revenues of $5,633,000. 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	51.6%
Bridges & Culverts	26.4%
Storm Sewer System	3.1%
Buildings & Facilities	15.3%
Machinery & Equipment	3.5%
Fleet	4.7%
Parks & Land Improvements	1.7%
	106.3%

The following change in revenue over the next number of years should also be considered in the financial strategy:

a) The Municipality's formula based OCIF grant is scheduled to grow from $195,000 in 2021 to $333,000 in 2022.

Our recommendations include capturing the above change and allocating it 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	$5,992,000	$5,992,000	$5,992,000	$5,992,000	$5,992,000	$5,992,000	$5,992,000	$5,992,000
Change in Debt Costs	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Change in OCIF Grants	N/A	N/A	N/A	N/A	-$138,000	-$138,000	-$138,000	-$138,000
Resulting Infrastructure Deficit:	**$5,991,000**	**$5,991,000**	**$5,991,000**	**$5,991,000**	**$5,854,000**	**$5,854,000**	**$5,854,000**	**$5,854,000**
Tax Increase Required	106.4%	106.4%	106.4%	106.4%	103.9%	103.9%	103.9%	103.9%
Annually	**21.3%**	**10.6%**	**7.1%**	**5.3%**	**20.8%**	**10.4%**	**6.9%**	**5.2%**

7.1.4 Financial Strategy Recommendations

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

a) increasing tax revenues dedicated to CapEx by 5.2% 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;
b) allocating government transfer revenues (e.g., gas tax and OCIF) for CapEx outlined previously;
c) allocating the scheduled OCIF grant increases to the infrastructure deficit as they occur.
d) reallocating appropriate revenue from categories in a surplus position to those in a deficit position; and
e) increasing existing and future infrastructure budgets by the applicable inflation index on an annual basis in addition to the deficit phase-in.

Notes:

1. As in the past, periodic senior government infrastructure funding will most likely be available during the phase-in period. By Provincial AMP rules, this periodic funding cannot be incorporated into an AMP unless there are firm commitments in place. We have included OCIF formula-based funding, if applicable since this funding is a multi-year commitment[6].
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 strategy 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 $2.668 million for the Road Network, $2.117 million the Storm Sewer System, $5.901 million for Buildings & Facilities, $1.225 million for Machinery & Equipment, and $836 thousand for Parks & Land Improvements.

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

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

Financial Profile: Rate Funded Assets

7.1.5 Current Funding Position

The following tables show, by asset category, the Municipality's average annual CapEx requirements, current funding positions[7], and funding increases required to achieve full funding on assets funded by rates.

Asset Category	Avg. Annual Requirement	Annual Funding Available			Annual Deficit
		Rates	To Operations	Total Available	
Water System	$884,000	$1,509,000	-$310,000	$1,199,000	-$315,000
Sanitary Sewer System	$1,120,000	$1,095,000	-$328,000	$767,000	$353,000
	$2,004,000	**$2,604,000**	**-$638,000**	**$1,966,000**	**$38,000**

The average annual investment requirement for the above categories is $2.004 million. Annual rate revenues currently allocated to these assets for capital purposes is $1.966 million leaving a total annual deficit for both utilities of $38,000. State differently, the two utility infrastructure categories are currently funded at 98.1% of their long-term requirements. This is a significant positive for the Municipality and ongoing management of its utilities.

7.1.6 Full Funding Requirements

In 2020, Arran-Elderslie had budgeted annual Water rate revenues of $1.509 million and annual Sanitary Sewer revenues of $1.095 million. In the following tables, we have analyzed the various scenarios of long-term funding options up to 20 years.

Asset Category	Tax Change Required for Full Funding
Water System	-21.5%
Sanitary Sewer System	32.2%

[7] The annual rate funding excludes other taxes and government transfer revenues applied to utilities.

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

	Water System				Sanitary Sewer System			
	5 Years	**10 Years**	**15 Years**	**20 Years**	**5 Years**	**10 Years**	**15 Years**	**20 Years**
Infrastructure Deficit	-$324,000	-$324,000	-$324,000	-$324,000	$353,000	$353,000	$353,000	$353,000
Rate Increase Required	-21.5%	-21.5%	-21.5%	-21.5%	32.2%	32.2%	32.2%	32.2%
Annually:	**-4.3%**	**-2.2%**	**-1.4%**	**-1.1%**	**6.4%**	**3.2%**	**2.1%**	**1.6%**

7.1.7 Financial Strategy Recommendations

Considering all of the above information, we recommend maintaining the current status quo funding model for the Water utility based on the Utility already being fully funded for the existing infrastructure. We recommend the 15-year funding option for the Sanitary Sewer utility rate funded assets. This involves full CapEx funding being achieved over 15 years by:

The Sanitary Sewer utility is trending towards being fully-funded within the time horizon analyzed. This involves striving to maintain full funding for both utilities by:

a) maintaining the current rates (i.e., no rate hikes recommended at this time) and revenue allocations for CapEx purposes, for Water.
b) increasing sewer rate revenues by 2.1% for sanitary services each year for the next 15 years solely for the purpose of phasing in full funding to the asset categories covered in this section of the AMP.
c) increasing existing and future infrastructure budgets by the applicable inflation index on an annual basis in addition to the deficit phase-in.

Notes:

1. We acknowledge that raising rate revenues consistently for the next twenty years to invest in infrastructure purposes is **not** necessary for the Water utility.
2. Assumption is that no new debt will be taken on to pay for existing infrastructure.
3. 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.
4. We realize that raising Sanitary Sewer rate revenues for CapEx purposes will be very difficult to do. However, considering a longer phase-in window may have even greater consequences in terms of infrastructure failure.
5. Also, the Municipality could choose to implement a potential rate increase at any time during the next twenty years for one of the following reasons: new technical information/data amends the infrastructure investment requirement, and/or the

Municipality wishes to fund specific Water or Sewer Capital Reserves for future infrastructure needs.

6. 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 15 years, the recommendation does require prioritizing capital projects to fit the annual funding available. Current data shows a pent-up investment demand of $5.747 million for the Water System and $24 thousand for the Sanitary Sewer System.

Prioritizing future projects will require the current data to be reviewed to ensure that all assets are accurately captured and that additional assessed condition data is considered. Although our recommendations include no further use of debt, the changes from the asset inventory review and the results of a condition-based analysis may require otherwise.

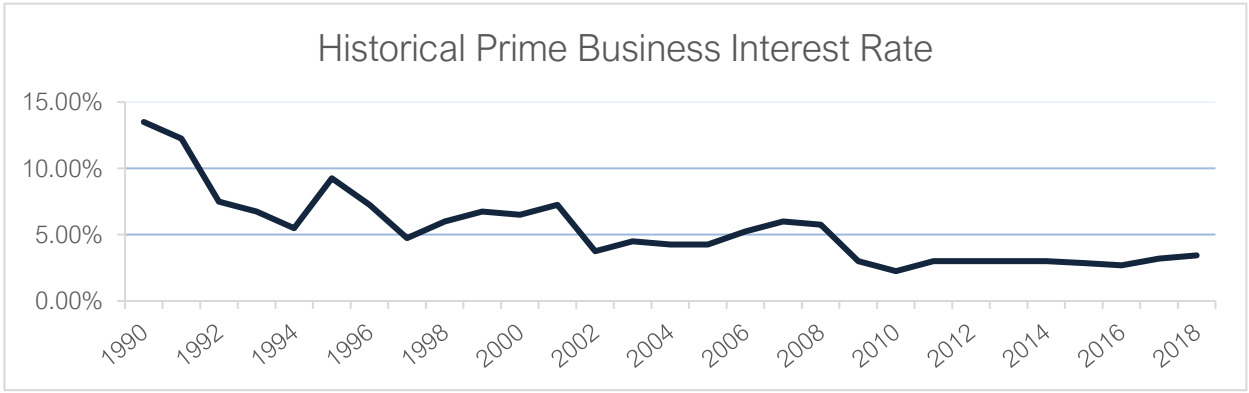
Use of Debt

The Municipality of Arran-Elderslie does not have any projects that have been funded through debt at this time.

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%[8] 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:



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

Use of Reserves

7.1.8 Available Reserves

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

a) the ability to stabilize tax rates when dealing with variable and 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 reserves currently available to the Municipality.

Asset Category	Balance on December 31, 2020
Road Network	$3,570,000
Bridges & Culverts	$70,000
Storm Sewer System	$1,638,000
Buildings & Facilities	$1,263,000
Machinery & Equipment	$361,000
Fleet	$183,000
Parks & Land Improvements	$987,000
Total Tax Funded:	**$8,072,000**
Water System	$8,052,000
Sanitary Sewer System	$4,118,000
Total Rate Funded:	**$12,170,000**

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

7.1.9 Recommendation

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

8 Appendices

Key Insights

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

Appendix A: Infrastructure Report Card

Asset Category	Replacement Cost (millions)	Asset Condition	Financial Capacity	
Road Network	$198.9	**Good**	Annual Requirement:	$4,424,663
			Funding Available:	$1,517,000
			Annual Deficit:	**$2,907,663**
Bridges & Culverts	$83.3	**Good**	Annual Requirement:	$1,763,417
			Funding Available:	$274,000
			Annual Deficit:	**$1,489,417**
Storm Sewer System	$7.7	**Fair**	Annual Requirement:	$202,829
			Funding Available:	$32,000
			Annual Deficit:	**$170,829**
Buildings & Facilities	$34.5	**Poor**	Annual Requirement:	$1,049,982
			Funding Available:	$189,000
			Annual Deficit:	**$860,982**
Machinery & Equipment	$2.8	**Very Poor**	Annual Requirement:	$235,595
			Funding Available:	$37,000
			Annual Deficit:	**$198,595**
Fleet	$4.6	**Poor**	Annual Requirement:	$382,605
			Funding Available:	$118,000
			Annual Deficit:	**$264,605**
Parks & Land Improvements	$1.4	**Poor**	Annual Requirement:	$115,730
			Funding Available:	$18,000
			Annual Deficit:	**$97,730**
Water System	$55.1	**Good**	Annual Requirement:	$884,008
			Funding Available:	$1,208,000
			Annual Deficit:	**-$323,992**
Sanitary Sewer System	$55.2	**Good**	Annual Requirement:	$1,120,329
			Funding Available:	$767,000
			Annual Deficit:	**$353,329**
Overall	$443.4	**Fair**	Annual Requirement:	$10,179,157
			Funding Available:	$4,160,000
			Annual Deficit:	**$6,019,157**

Appendix B: 10-Year Capital Requirements

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

Road Network

Asset Segment	Backlog	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
Facilities	$1,389,617	$0	$0	$14,537	$0	$0	$0	$0	$0	$0	$0
Fleet	$1,564,251	$243,115	$0	$116,769	$22,724	$384,476	$249,845	$117,177	$0	$90,846	$0
Gravel Roads	$815,445	$1,024,947	$1,453,097	$7,533,339	$9,232,586	$6,458,452	$0	$776,116	$2,329,431	$3,121,632	$946,440
HCB Roads	$3,626,019	$310,168	$738,640	$0	$0	$1,271,659	$0	$0	$0	$0	$0
LCB Roads	$5,298,282	$559,020	$1,242,876	$0	$0	$0	$0	$0	$0	$0	$0
Machinery & Equipment	$0	$9,242	$0	$1,094	$81,771	$597	$0	$27,781	$9,438	$0	$5,542
Sidewalks	$258,415	$13,845	$0	$240,304	$0	$0	$247,724	$0	$165,867	$0	$0
Signs	$50,742	$0	$0	$0	$0	$0	$0	$5,694	$0	$0	$0
Streetlights	$0	$0	$0	$0	$0	$0	$18,532	$0	$0	$0	$0
	$13,002,772	**$2,160,337**	**$3,434,613**	**$7,906,042**	**$9,337,081**	**$8,115,184**	**$516,101**	**$926,768**	**$2,504,736**	**$3,212,479**	**$951,982**

Bridges & Culverts

Asset Segment	Backlog	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
Bridges	$0	$1,501,400	$1,470,408	$4,290,637	$4,561,442	$3,201,127	$16,621,317	$751,470	$2,946,751	$3,553,892	$0
Structural Culverts	$0	$179,300	$727,852	$2,867,256	$0	$0	$861,209	$0	$0	$0	$0
	$0	**$1,680,700**	**$2,198,261**	**$7,157,892**	**$4,561,442**	**$3,201,127**	**$17,482,527**	**$751,470**	**$2,946,751**	**$3,553,892**	**$0**

Storm Sewer System

Asset Segment	Backlog	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
Inlets	$0	$0	$34,573	$34,573	$34,573	$34,573	$1,081,379	$0	$0	$0	$0
Mains	$0	$0	$41,467	$41,467	$41,467	$41,467	$41,467	$0	$0	$0	$0
Manholes	$0	$0	$23,960	$23,960	$23,960	$23,960	$23,960	$0	$0	$0	$7,656
	$0	**$0**	**$100,000**	**$100,000**	**$100,000**	**$100,000**	**$1,146,806**	**$0**	**$0**	**$0**	**$7,656**

Buildings & Facilities

Asset Segment	Backlog	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
Administrative	$967,177	$0	$0	$0	$0	$0	$0	$0	$0	$1,915	$0
Fire Halls	$498,795	$0	$0	$0	$14,063	$9,506	$0	$0	$0	$926,546	$1,145,703
Library	$0	$244,677	$0	$0	$0	$0	$0	$0	$296,128	$0	$0
Recreation & Cultural	$4,468,476	$90,410	$0	$5,458,728	$3,789	$200,063	$2,938	$6,703	$146,992	$158,455	$726,215
Storage	$0	$80,338	$0	$0	$0	$0	$0	$0	$0	$0	$0
	$5,934,448	**$415,425**	**$0**	**$5,458,728**	**$17,852**	**$209,569**	**$2,938**	**$6,703**	**$443,121**	**$1,086,917**	**$1,871,917**

Machinery & Equipment

Asset Segment	Backlog	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
Fire & Emergency	$505,570	$35,997	$141,128	$39,711	$35,771	$61,444	$34,362	$30,198	$15,064	$0	$32,278
General Government	$182,617	$15,752	$21,984	$7,297	$66,130	$15,475	$61,131	$62,962	$7,114	$0	$0
Recreation & Cultural	$794,997	$22,577	$0	$15,574	$66,712	$53,106	$9,195	$0	$177,323	$5,592	$5,329
Solid Waste Disposal	$0	$0	$0	$8,012	$0	$0	$0	$0	$0	$0	$0
	$1,483,184	**$74,326**	**$163,112**	**$70,593**	**$168,613**	**$130,026**	**$104,689**	**$93,160**	**$199,501**	**$5,592**	**$37,607**

Fleet

Asset Segment	Backlog	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
Fire & Emergency	$1,835,798	$268,758	$275,672	$0	$0	$0	$734,163	$0	$0	$0	$42,250
Recreation & Cultural	$351,177	$72,027	$0	$11,835	$98,869	$0	$0	$0	$0	$0	$134,653
	$2,186,975	**$340,785**	**$275,672**	**$11,835**	**$98,869**	**$0**	**$734,163**	**$0**	**$0**	**$0**	**$176,903**

Parks & Land Improvements

Asset Segment	Backlog	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
Cemeteries	$4,277	$0	$0	$0	$2,104	$0	$0	$0	$0	$0	$0
Park Furnishings & Fencing	$0	$0	$0	$0	$15,066	$0	$0	$0	$0	$23,862	$38,499
Playground Equipment	$0	$0	$0	$0	$31,986	$0	$4,799	$0	$0	$36,450	$0
Sport Fields & Courts	$840,937	$10,312	$0	$0	$0	$20,812	$0	$0	$0	$0	$0
	$845,214	**$10,312**	**$0**	**$0**	**$49,156**	**$20,812**	**$4,799**	**$0**	**$0**	**$60,312**	**$38,499**

Water System

Asset Segment	Backlog	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
Fleet	$0	$120,637	$0	$314,773	$66,663	$0	$0	$33,112	$0	$0	$0
Hydrants	$75,743	$0	$0	$69,367	$35,030	$0	$80,402	$0	$18,226	$0	$65,074
Machinery & Equipment	$41,952	$0	$0	$148,950	$45,109	$30,548	$9,740	$45,794	$7,208	$10,755	$57,613
Mains	$0	$696,780	$680,340	$733,029	$726,853	$478,435	$16,160,360	$1,526,997	$424,566	$1,363,587	$1,539,635
Towers & Reservoirs	$0	$47,500	$0	$6,763	$0	$0	$14,354	$0	$0	$0	$0
Treatment Plants & Facilities	$2,348,115	$175,000	$0	$0	$0	$10,747	$1,852	$5,543	$0	$0	$0
Valves & Chambers	$297,466	$0	$0	$0	$0	$0	$0	$0	$0	$180,617	$0
Wells	$34,445	$127,914	$0	$72,880	$224,259	$168,462	$183,642	$29,860	$0	$282,073	$0
	$2,797,721	**$1,167,831**	**$680,340**	**$1,345,761**	**$1,097,914**	**$688,191**	**$16,450,350**	**$1,641,306**	**$450,000**	**$1,837,031**	**$1,662,322**

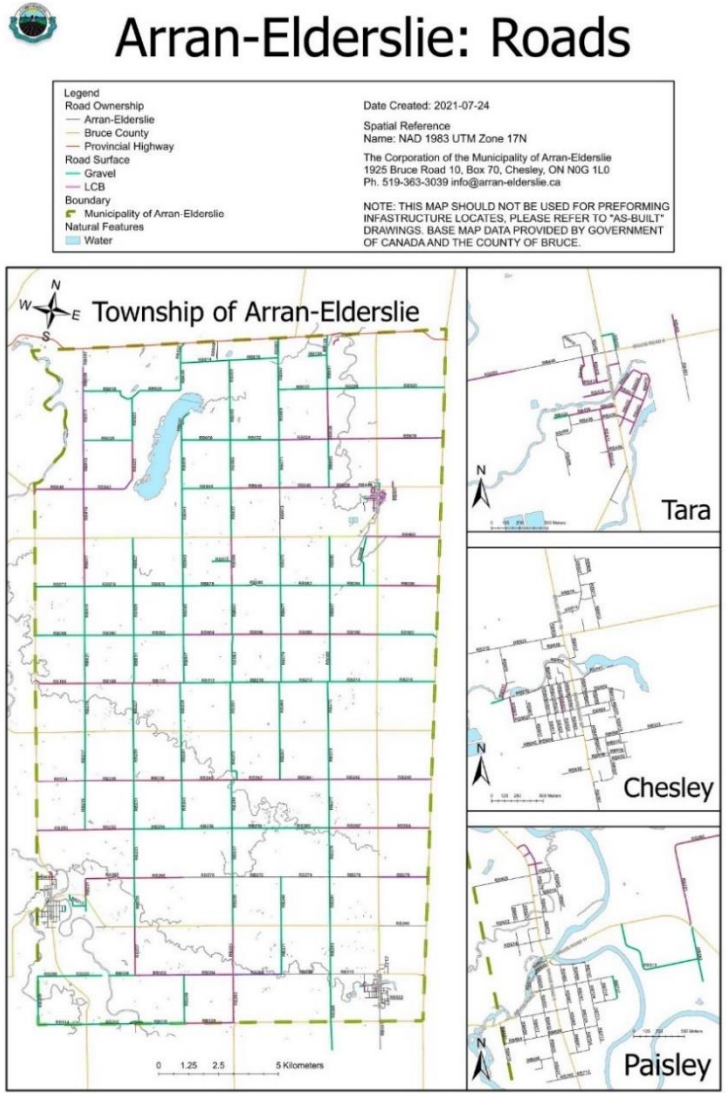
Sanitary Sewer System

Asset Segment	Backlog	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
Lift Stations	$0	$248,768	$33,665	$116,639	$37,341	$29,821	$481,452	$211,970	$0	$329,435	$0
Machinery & Equipment	$0	$7,279	$985	$3,413	$1,093	$873	$193,716	$3,648	$3,685	$3,722	$22,862
Mains	$0	$265,000	$494,700	$145,656	$1,480,386	$920,067	$670,175	$1,639,231	$0	$24,789,579	$0
Manholes	$0	$10,000	$0	$10,404	$0	$10,824	$0	$4,953,265	$56,850	$0	$0
Treatment Plants & Lagoons	$0	$150,497	$20,367	$70,563	$22,590	$18,041	$83,814	$20,519	$757	$1,231,820	$772
Wet Wells & Pumps	$0	$49,456	$6,693	$23,188	$7,424	$5,929	$19,848	$895,712	$0	$946,864	$0
	$0	**$731,000**	**$556,410**	**$369,863**	**$1,548,833**	**$985,554**	**$1,449,005**	**$7,724,344**	**$61,292**	**$27,301,419**	**$23,634**

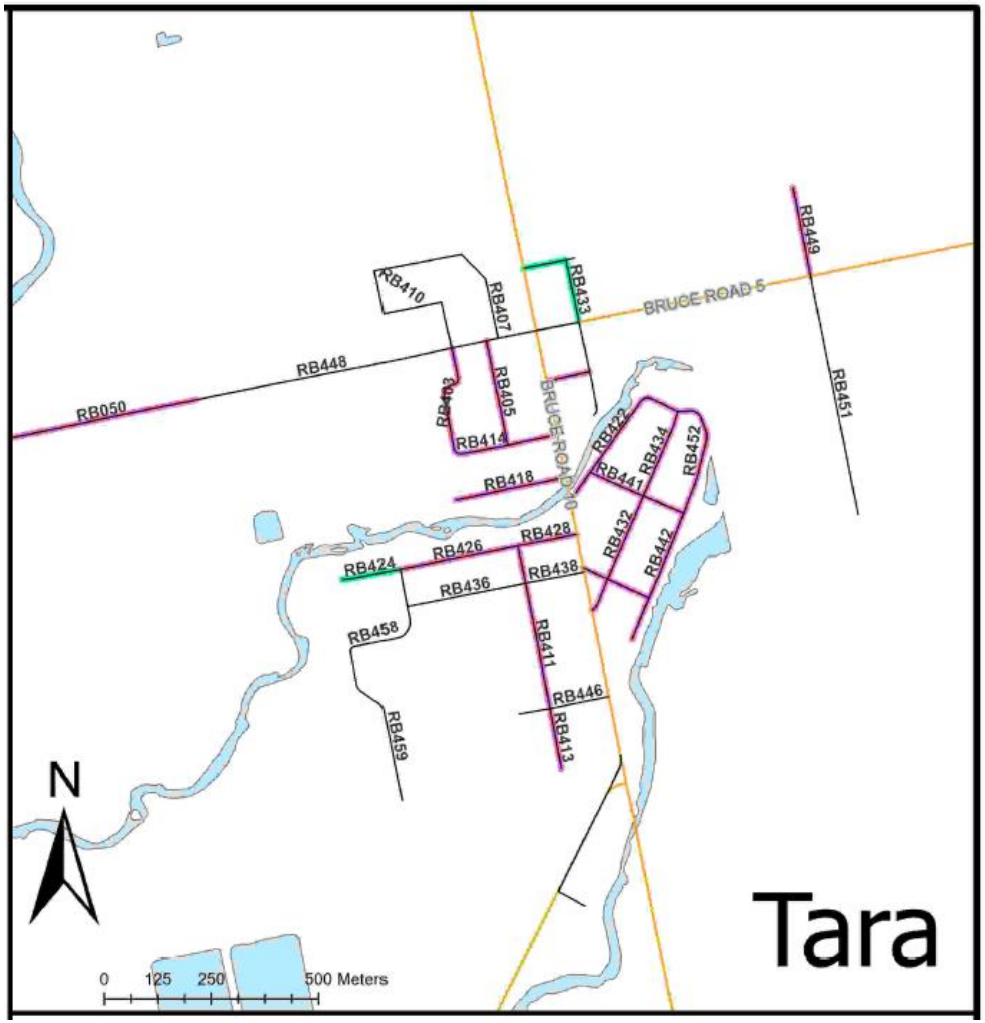
Asset Portfolio											
Asset Category	**Backlog**	**2021**	**2022**	**2023**	**2024**	**2025**	**2026**	**2027**	**2028**	**2029**	**2030**
Road Network	$13,002,772	$2,160,337	$3,434,613	$7,906,042	$9,337,081	$8,115,184	$516,101	$926,768	$2,504,736	$3,212,479	$951,982
Bridges & Culverts	$0	$1,680,700	$2,198,261	$7,157,892	$4,561,442	$3,201,127	$17,482,527	$751,470	$2,946,751	$3,553,892	$0
Storm Sewer System	$0	$0	$100,000	$100,000	$100,000	$100,000	$1,146,806	$0	$0	$0	$7,656
Buildings and Facilities	$5,934,448	$415,425	$0	$5,458,728	$17,852	$209,569	$2,938	$6,703	$443,121	$1,086,917	$1,871,917
Machinery & Equipment	$1,483,184	$74,326	$163,112	$70,593	$168,613	$130,026	$104,689	$93,160	$199,501	$5,592	$37,607
Fleet	$2,186,975	$340,785	$275,672	$11,835	$98,869	$0	$734,163	$0	$0	$0	$176,903
Parks & Land Improvements	$845,214	$10,312	$0	$0	$49,156	$20,812	$4,799	$0	$0	$60,312	$38,499
Water System	$2,797,721	$1,167,831	$680,340	$1,345,761	$1,097,914	$688,191	$16,450,350	$1,641,306	$450,000	$1,837,031	$1,662,322
Sanitary Sewer System	$0	$731,000	$556,410	$369,863	$1,548,833	$985,554	$1,449,005	$7,724,344	$61,292	$27,301,419	$23,634
	$26,250,313	**$6,580,716**	**$7,408,407**	**$22,420,715**	**$16,979,760**	**$13,450,463**	**$37,891,379**	**$11,143,751**	**$6,605,400**	**$37,057,642**	**$4,770,521**

Appendix C: Level of Service Maps & Tables

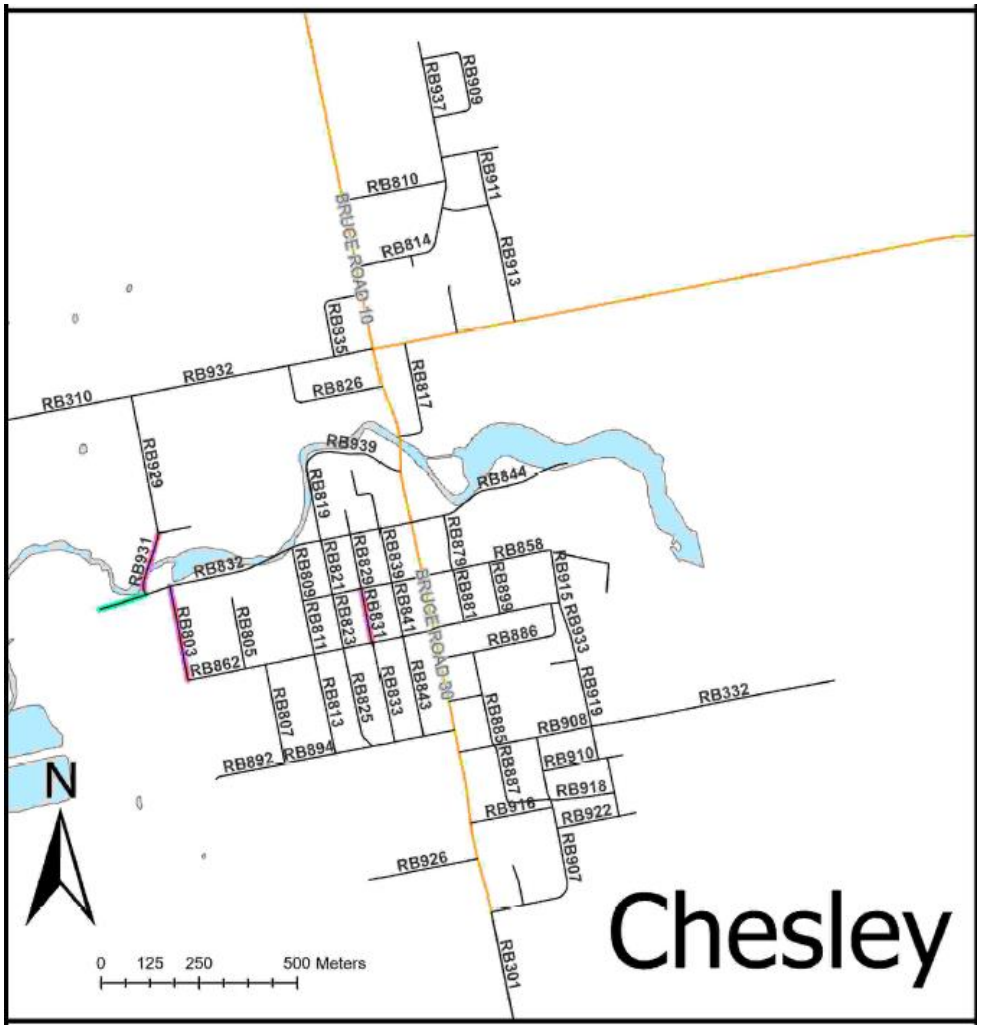
Road Network Maps



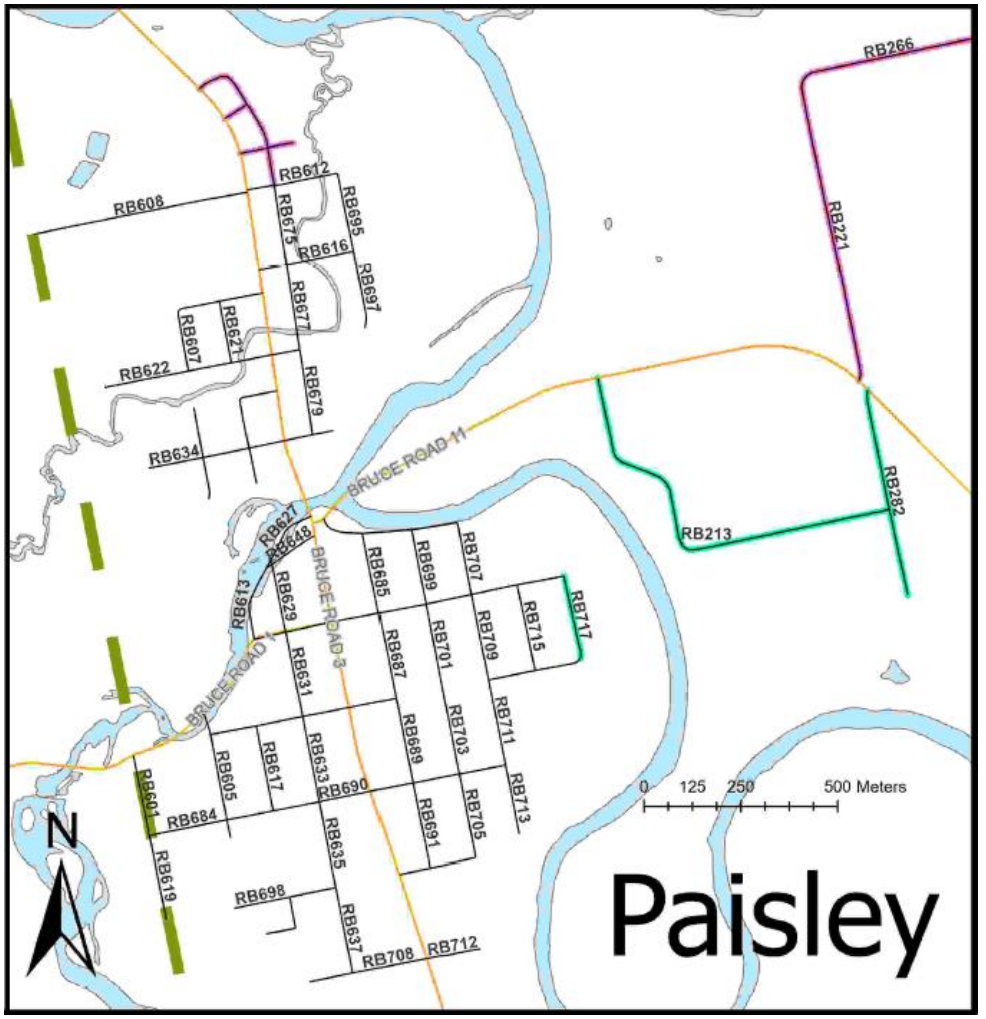
Road Network Map – Tara



Road Network Map – Chesley



Road Network Map – Paisley

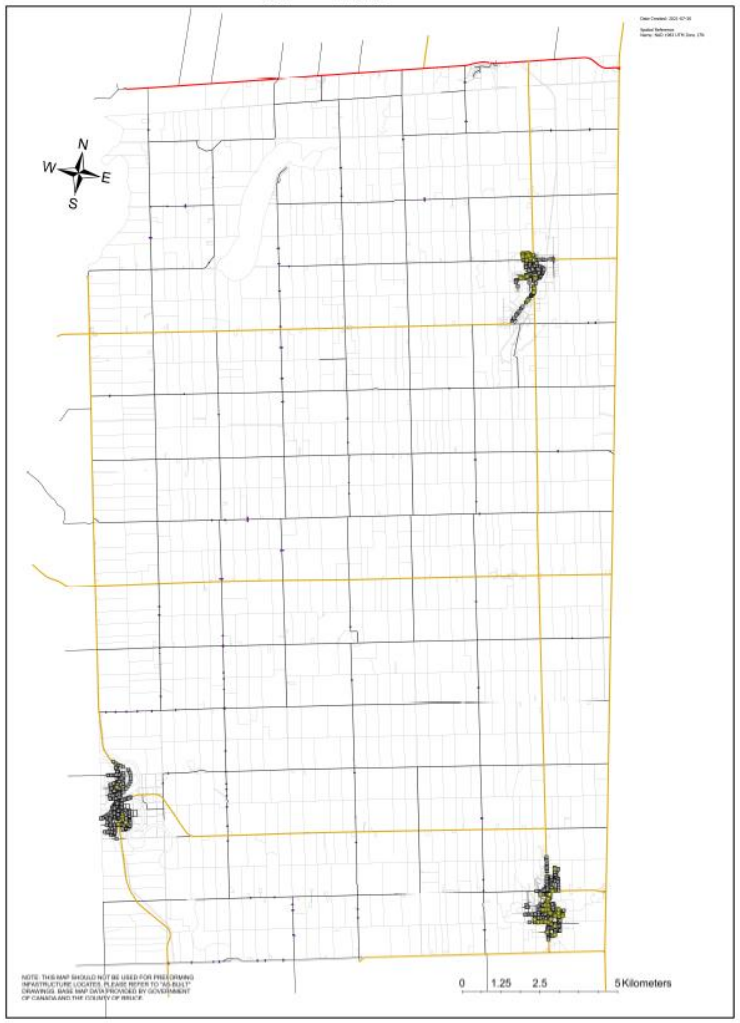


Bridges & Culverts Load Limits

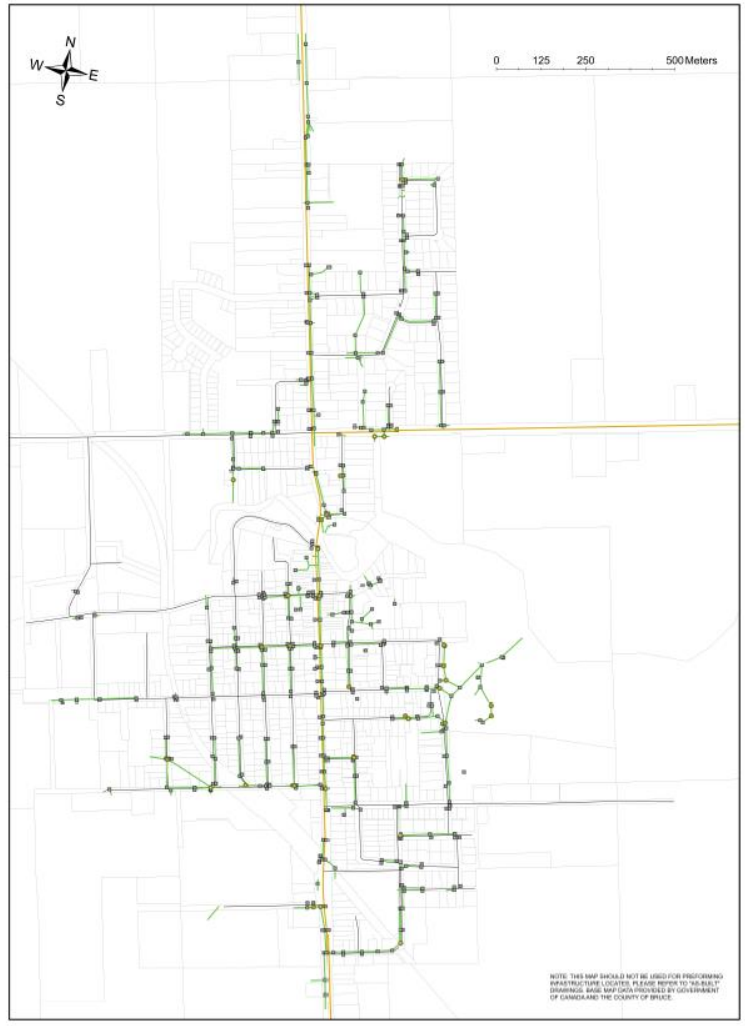
Site Number	Road Name	BCI	Current Load Limit(s) (tonnes)
A5	Concession 4	54	9
A8	Sideroad 25 South	57	14
A11	Sideroad 5 South	45	12
A14	Mill Road	45	14
A25	Sideroad 20	17	11
A30	Arran-Elderslie Boundary	38	12
E1	Sideroad 25	40	10
E4	Concession 2	50	18/29/36
E10	Sideroad 5	48	11
E12	Sideroad 5	46	8
E16	Concession 8	31	15
E17	Sideroad 25	38	11
E20	Sideroad 15	16	5
E21	Sideroad 15	15	5
E22	Sideroad 10	46	3
E24	B Line	53	10

Storm Sewer System Maps

Storm Sewer System Map – Arran-Elderslie



Storm Sewer System Map – Chesley



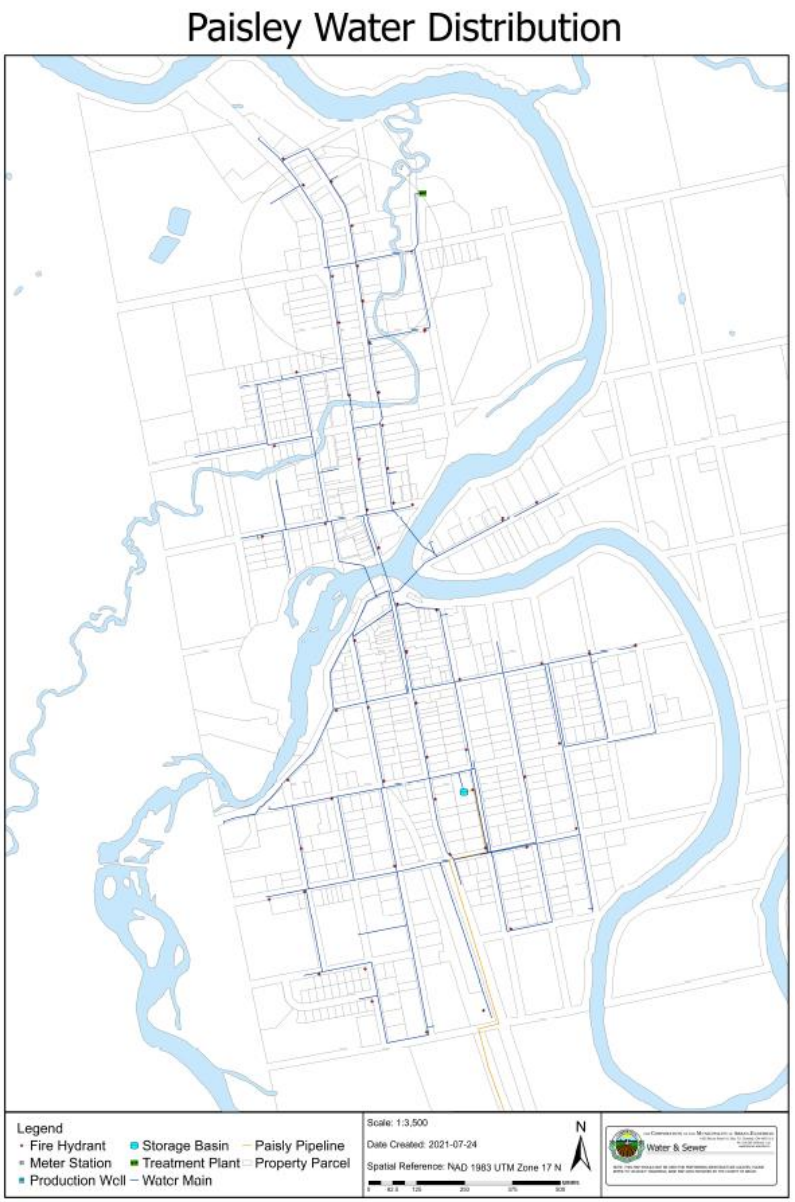
Storm Sewer System Map – Paisley

Storm Sewer System Map – Tara

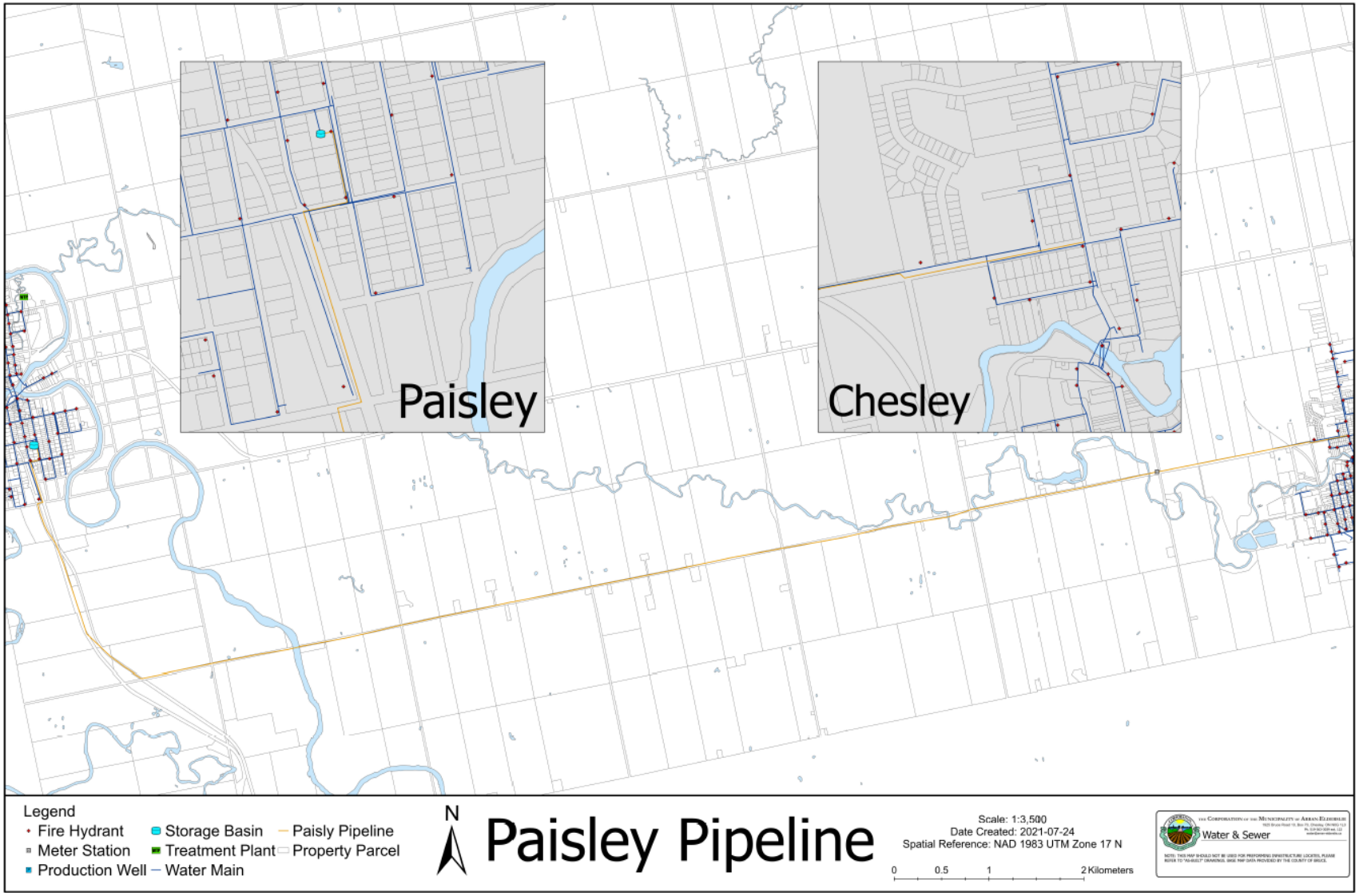
Water System Maps

Water System Map – Chesley

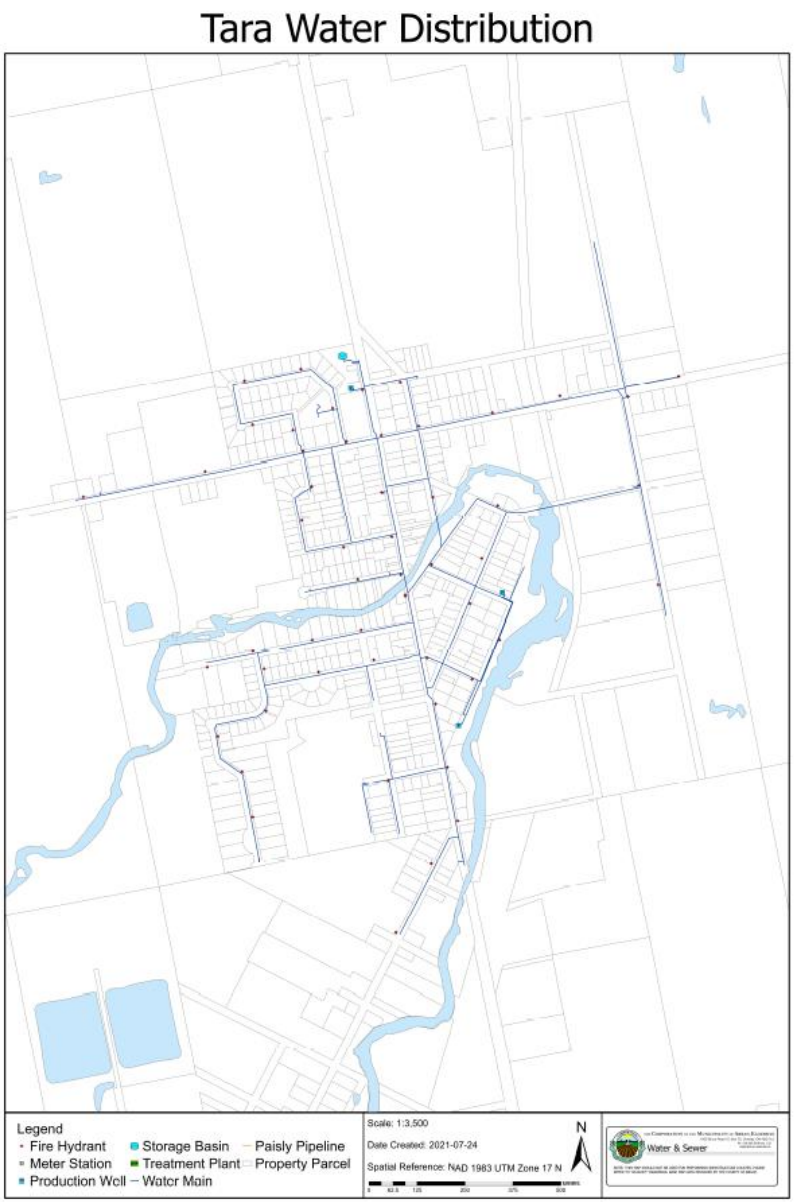
Water System Map – Paisley



Water System Map – Paisley Pipeline



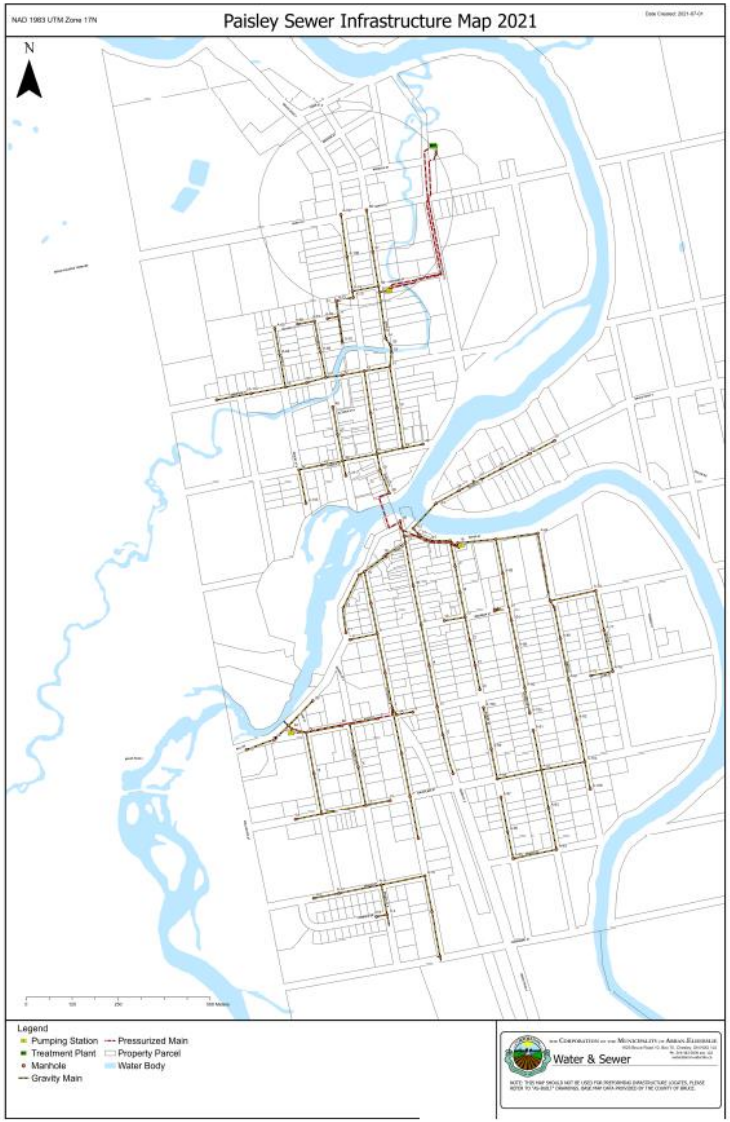
Water System Map – Tara



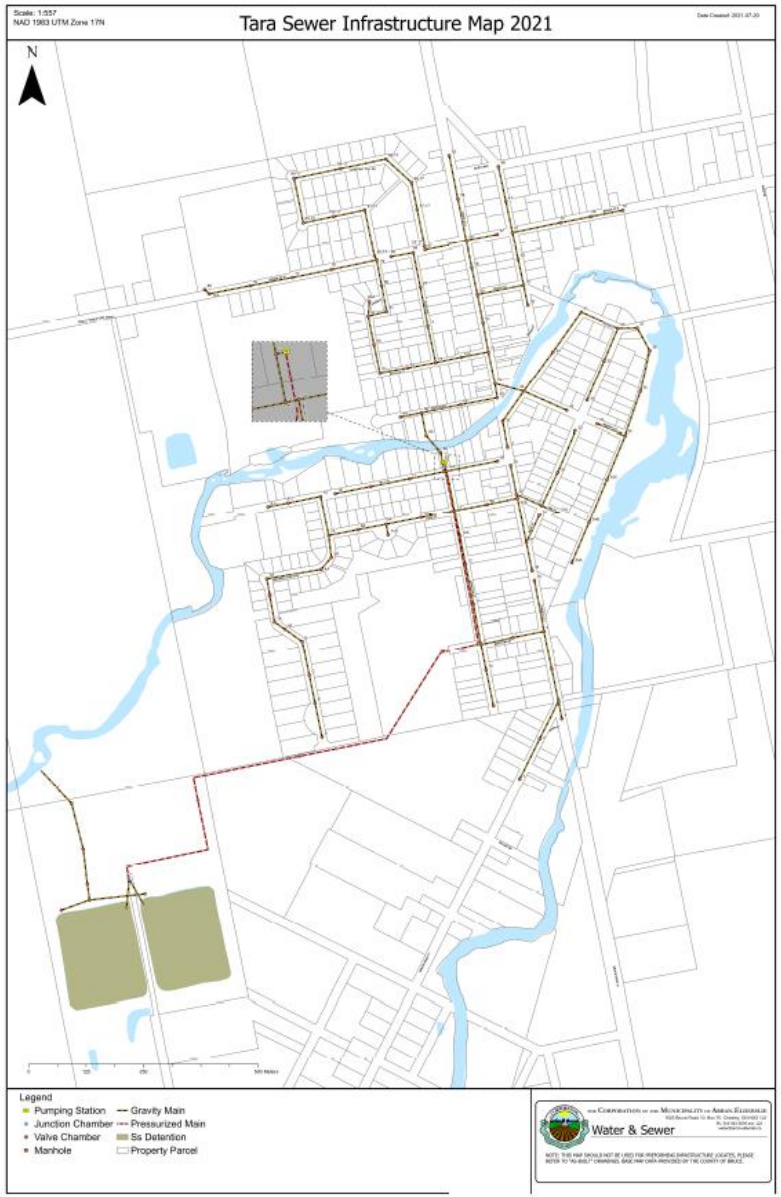
Sanitary Sewer System Maps

Sanitary Sewer System Map – Chesley

Sanitary Sewer System Map – Paisley



Sanitary Sewer System Map – Tara



Appendix D: Risk Rating Criteria

Probability of Failure

Asset Category	Risk Criteria	Criteria Weighting	Value/Range	Probability of Failure Score
Road Network (Roads)	Condition	60%	85-100	1
			70-84	2
			55-69	3
			40-54	4
			0-39	5
	Service Life Remaining (%)	40%	80-100	1
			60-79	2
			40-59	3
			20-39	4
			0-19	5
Bridges & Culverts	Condition	75%	80-100	1
			70-79	2
			60-69	3
			50-59	4
			0-49	5
	Service Life Remaining %	25%	80-100	1
			60-79	2
			40-59	3
			20-39	4
			0-19	5
Buildings & Facilities Machinery & Equipment Fleet Parks & Land Improvements	Condition	75%	80-100	1
			60-79	2
			40-59	3
			20-39	4
			0-19	5
	Service Life Remaining %	25%	80-100	1
			60-79	2

Asset Category	Risk Criteria	Criteria Weighting	Value/Range	Probability of Failure Score
			40-59	3
			20-39	4
			0-19	5
Road Network (Other) Storm Sewer System (Other) Water System (Other) Sanitary Sewer System (Other)	Condition	75%	80-100	1
			60-79	2
			40-59	3
			20-39	4
			0-19	5
	Service Life Remaining %	25%	80-100	1
			60-79	2
			40-59	3
			20-39	4
			0-19	5
Sanitary Sewer System (Mains)	Condition	50%	80-100	1
			60-79	2
			40-59	3
			20-39	4
			0-19	5
	Service Life Remaining %	40%	80-100	1
			60-79	2
			40-59	3
			20-39	4
			0-19	5
	Pipe Material	10%	Concrete	4
			Ductile Iron	3
			PVC	2
Water System (Mains)	Condition	50%	80-100	1
			60-79	2
			40-59	3
			20-39	4

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

Consequence of Failure

Asset Category	Risk Classification	Risk Criteria	Value/Range	Consequence of Failure Score
Road Network (Roads)	Economic (35%)	Replacement Cost (100%)	$0-$50,000	1
			$50,000-$150,000	2
			$150,000-$300,000	3
			$300,000-$500,000	4
			$500,000+	5
	Socio-Political (15%)	AADT (50%)	0-50	1
			51-250	2
			250-450	3
			450-650	4
			650-1050	5
		Road Class (50%)	Arterial	5
			Collector	4
			Collector Commerical	3
			Collector Industrial	3
			Local	2
			Local Commercial	3
			Local Industrial	3
	Operational (20%)	Surface Material (100%)	Gravel	2
			LCB	3
			HCB	4
	Economic (25%)	Roadside Environment (100%)	Rural	2
			Semi-Urban	3
			Semi-Urban/Urban	4
			Urban	5
Bridges & Culverts	Economic (75%)	Replacement Cost (100%)	$0-$100,000	1
			$100,000-$250,000	2
			$250,000-$500,000	3
			$500,000-$1,000,000	4
			$1,000,000+	5
	Social	AADT	0-150	1

Asset Category	Risk Classification	Risk Criteria	Value/Range	Consequence of Failure Score
	(20%)	(100%)	151-300	2
			301-450	3
			451-600	4
			601-1000	5
	Socio-Political (5%)	Detour Distance (100%)	2-5	2
			6-8	3
			9-10	4
			11-20	5
Buildings & Facilities Machinery & Equipment Fleet Parks & Land Improvements	Economic (80%)	Replacement Cost (100%)	$0-$50,000	1
			$50,000-$350,000	2
			$350,000-$1,000,000	3
			$1,000,000-$2,000,000	4
			$2,000,000+	5
	Strategic (20%)	Department (100%)	Recreation & Cultural Services	2
			General Government	2
			Transportation Services	3
			Public Works	3
			Environmental Services	4
			Health Services	5
			Protection Services	5
Road Network (Other) Storm Sewer System (Other) Water System (Other) Sanitary Sewer System (Other)	Economic (100%)	Replacement Cost (100%)	$0-$50,000	1
			$50,000-$150,000	2
			$150,000-$250,000	3
			$250,000-$500,000	4
			$500,000+	5
Sanitary Sewer System (Mains)	Economic (80%)	Replacement Cost (100%)	$0-$50,000	1
			$50,000-$100,000	2
			$100,000-$150,000	3
			$150,000-$250,000	4
			$250,000+	5
	Operational (20%)	Pipe Diameter (100%)	0-50	1
			51-150	2

Asset Category	Risk Classification	Risk Criteria	Value/Range	Consequence of Failure Score
			151-250	3
			251-450	4
			451-1000	5
Water System (Mains)	Economic (80%)	Replacement Cost (100%)	$0-$50,000	1
			$50,000-$100,000	2
			$100,000-$150,000	3
			$150,000-$250,000	4
			$250,000+	5
	Operational (20%)	Pipe Diameter (100%)	0-50	1
			51-150	2
			151-250	3
			251-450	4
			451-1000	5
			Severe	5
Storm Sewer System (Mains)	Economic (80%)	Replacement Cost (100%)	$0-$50,000	1
			$50,000-$100,000	2
			$100,000-$150,000	3
			$150,000-$250,000	4
			$250,000+	5
	Operational (20%)	Pipe Diameter (100%)	0-50	1
			51-150	2
			151-250	3
			251-450	4
			451-1000	5
			451-1000	5

Appendix E: Next Steps

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

Next Steps
Conduct a TCA data review to identify missing and/or incomplete assets in the CityWide™ asset inventory.
Componentize buildings & facilities and obtain component based assessed condition scores.
Review and confirm that all assets have been accounted for in the asset inventory, particularly for non-core assets.
Regularly review & update replacement costs for all asset classes, incorporating industry standard costing references and local market pricing.
Continue to integrate data from various studies, reports, and staff journals within CityWide™ to ensure a centralized, comprehensive, and current asset inventory.
Implement a data governance strategy and framework to maintain the level of data maturity
Identify and develop LOS for non-core assets
Develop detailed LOS frameworks for all assets and identify proposed LOS
Educate and train key personnel on broader asset management best practices including database management and the optimal use of CityWide™
Review, consider, and as appropriate, account for growth and demand changes to infrastructure management.
Provide opportunities for staff and elected officials to attend webinars, educational conferences, and workshops to expand their technical knowledge of asset management principles and practices
Develop a medium- to long-term external communication strategy to engage public on asset management and obtain feedback to inform development of proposed LOS
An asset management strategy enforces the asset management policy and aligns it to the asset management plan. Consider developing a formalized, documented asset management strategy.

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

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

Appendix G: Condition Assessment Guidelines

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

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

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

Role of Asset Condition Data

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

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

Guidelines for Condition Assessment

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

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

Developing a Condition Assessment Schedule

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

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

Appendix H: Glossary of Terms

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

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

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