Asset Management Plan

Town of Carleton Place

2021

This Asset Management Program was prepared by:

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

Key Statistics

Replacement cost of asset portfolio
$327.5 million

Replacement cost of infrastructure per household
$69,025

Percentage of assets in fair or better condition
79%

Percentage of assets with assessed condition data
23%

Annual capital infrastructure deficit
$1.70 million

Recommended timeframe for eliminating annual infrastructure deficit
10 Years

Target reinvestment rate
2.1%

Actual reinvestment rate
1.6%

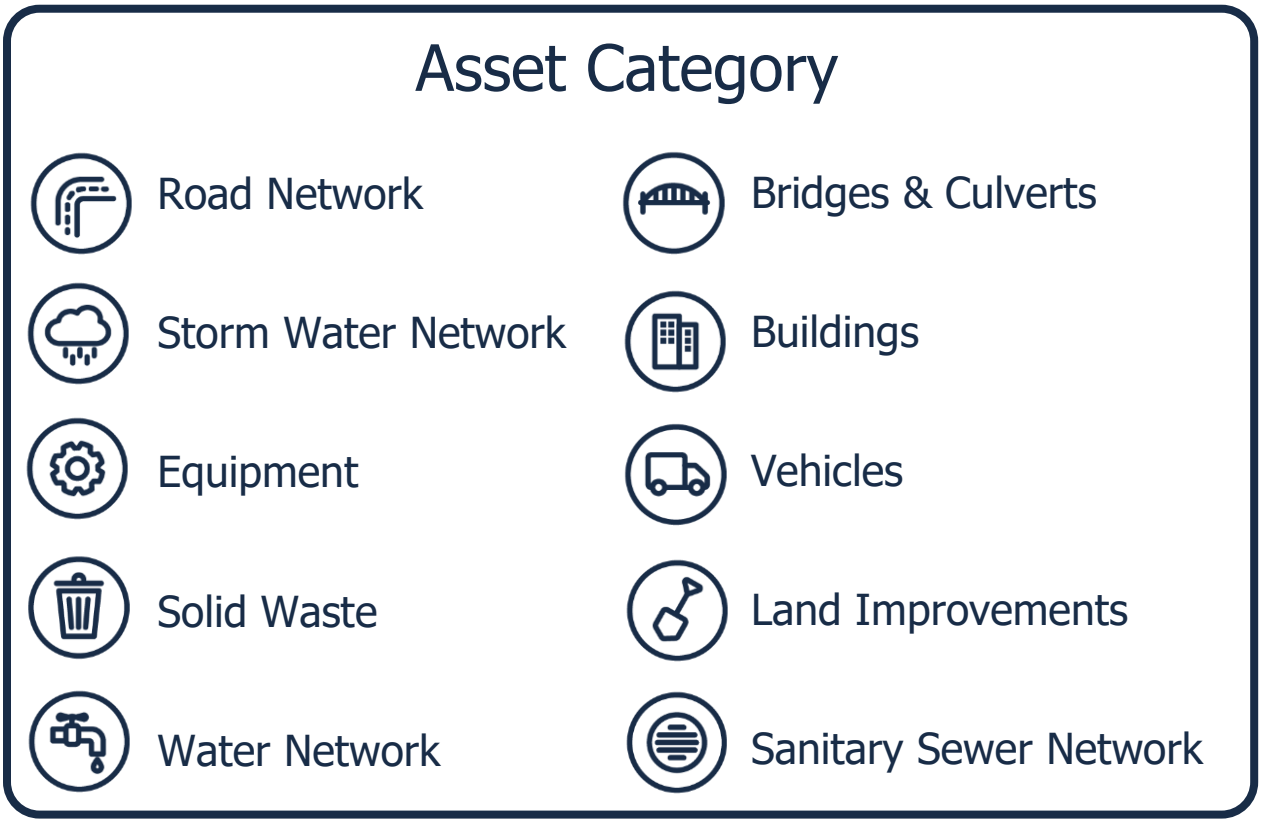
Executive Summary

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

Scope

This AMP identifies the current practices and strategies that are in place to manage public infrastructure and makes recommendations where they can be further refined. Through the implementation of sound asset management strategies, the Town 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 Town 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 $327.5 million. 79% of all assets analysed in this AMP are in fair or better condition and assessed condition data was available for 23% of assets. For the remaining 77% of assets, assessed condition data was unavailable, and asset age was used to approximate condition – a data gap that persists in most municipalities.

Generally, age misstates the true condition of assets, making assessments essential to accurate asset management planning, and a recurring recommendation in this AMP. The development of a long-term, sustainable financial plan requires an analysis of whole lifecycle costs. This AMP uses a combination of proactive lifecycle strategies (paved roads) and replacement only strategies (all other assets) to determine the lowest cost option to maintain the current level of service.

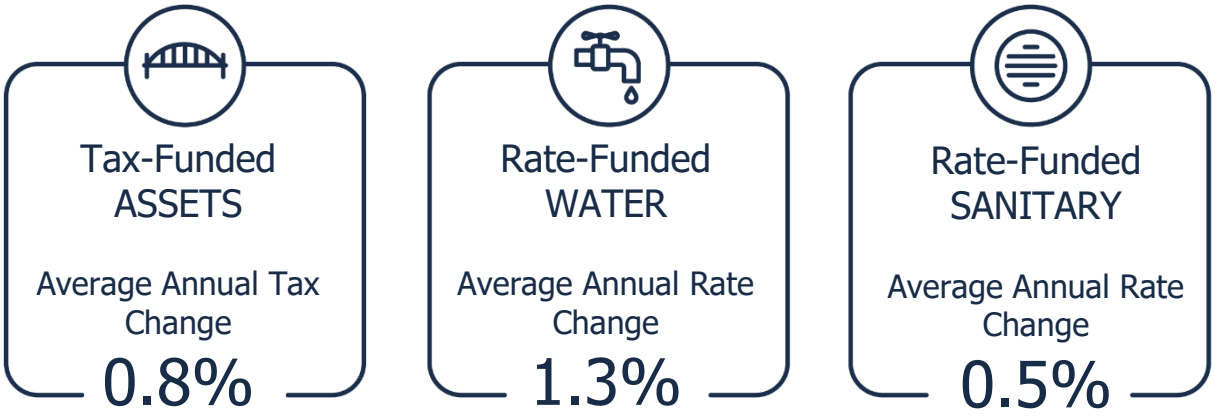
To meet capital replacement and rehabilitation needs for existing infrastructure, prevent infrastructure backlogs, and achieve long-term sustainability, the Town's average annual capital requirement totals $6.85 million. Based on a historical analysis of sustainable capital funding sources, the Town is committing approximately $5.15 million towards capital projects or reserves per year. As a result, there is currently an annual funding gap of $1.70 million.

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

Annual Requirements per Household

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 Town's infrastructure deficit based on a 10 year plan:



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

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

1 Introduction & Context

Key Insights

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

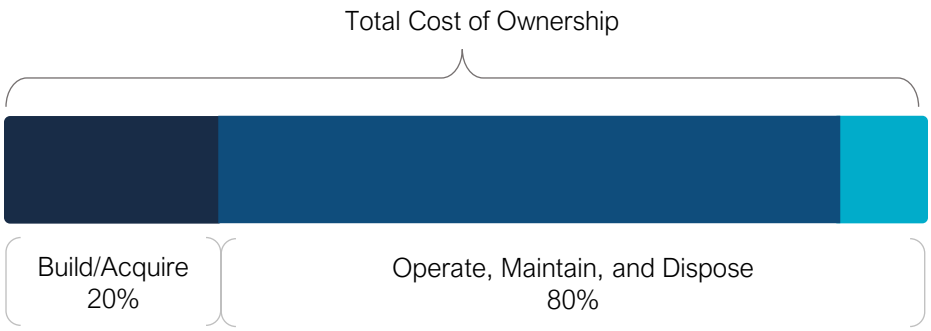
- An asset management plan is a living document that should be updated regularly to inform long-term planning

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

1.1 An Overview of Asset Management

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

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



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

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

1.1.1 Asset Management Policy

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

The Town adopted a Strategic Asset Management Policy in 2019 in accordance with Ontario Regulation 588/17. The policy outlines the Town's mission to implement a municipal-wide asset management program with a primary goal to achieve the lowest total cost of ownership while meeting desired levels of service.

The policy aligns with the Town of Carleton Place's Strategic Plan: Balancing Growth which integrates the concepts of comprehensive communication, managed growth, corporate health and community, and economic development.

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

1.1.3 Asset Management Plan

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

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

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

1.2 Key Concepts in Asset Management

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

1.2.1 Lifecycle Management Strategies

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

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

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

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

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

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

1.2.2 Risk Management Strategies

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

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

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

1.2.3 Levels of Service

A level of service (LOS) is a measure of what the Town 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 Town as worth measuring and evaluating. The Town measures the level of service provided at two levels: Community Levels of Service, and Technical Levels of Service.

High-Level Service Indicators

While community and technical levels of service provide a description of the service provided or performance metrics, these do not always provide a clear, succinct illustration of how the service is balanced. Measuring and evaluating levels of service is a matter of finding a balance between three key indicators: cost, performance, and risk. This balance will inform the high-level decisions of the municipality to key decisions, such as whether it is acceptable to take on more costs to achieve better performance. Ultimately, these key indicators will be supplemented by the community and technical levels of service for further context of service provisions. The criteria for the high-level service indicators are described in the following table:

Indicator	Metric	Measurement
Cost	Annual Average Capital Invested	Annual funding available for each asset category derived from sustainable sources
	Average Annual Capital Required	Annual funding required to sustain and renew the current asset portfolio
Performance	Overall Condition	% of assets in very good, good, fair, poor, and very poor condition
Risk	Overall Risk Distribution	% of assets in very low, low, moderate, high, and very high state of risk

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

Technical Levels of Service

Technical levels of service are a measure of key technical attributes of the service being provided to the community. These include mostly quantitative measures and tend to reflect the impact of the municipality's asset management strategies on the physical condition of assets or the quality/capacity of the services they provide.

For core asset categories (Roads, Bridges, 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 Town will determine technical metrics that measure the current levels of service by July 1, 2024.

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 Town 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 Town. 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 2024, the Town must identify a lifecycle management and financial strategy which allows these targets to be achieved.

1.3 Ontario Regulation 588/17

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

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

2019

Strategic Asset Management Policy

2022

Asset Management Plan for Core Assets with the following components:

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

2024

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

2025

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

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

1.3.1 O. Reg. 588/17 Compliance Review

The following table identifies the requirements outlined in Ontario Regulation 588/17 for municipalities to meet by July 1, 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 10 asset categories and is divided between tax-funded and rate-funded categories

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

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

2.1 Asset Categories Included in This AMP

This asset management plan for the Town of Carleton Place 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, water, wastewater, and stormwater).

The AMP summarizes the state of the infrastructure for the Town'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	
Storm Water Network	
Buildings	
Equipment	
Vehicles	
Solid Waste	
Land Improvements	
Water Network	User Rates
Sanitary Sewer Network	

2.2 Deriving Replacement Costs

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

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

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

2.3 Estimated Useful Life and Service Life Remaining

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

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

2.4 Reinvestment Rate

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

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

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

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

2.5 Deriving Asset Condition

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

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

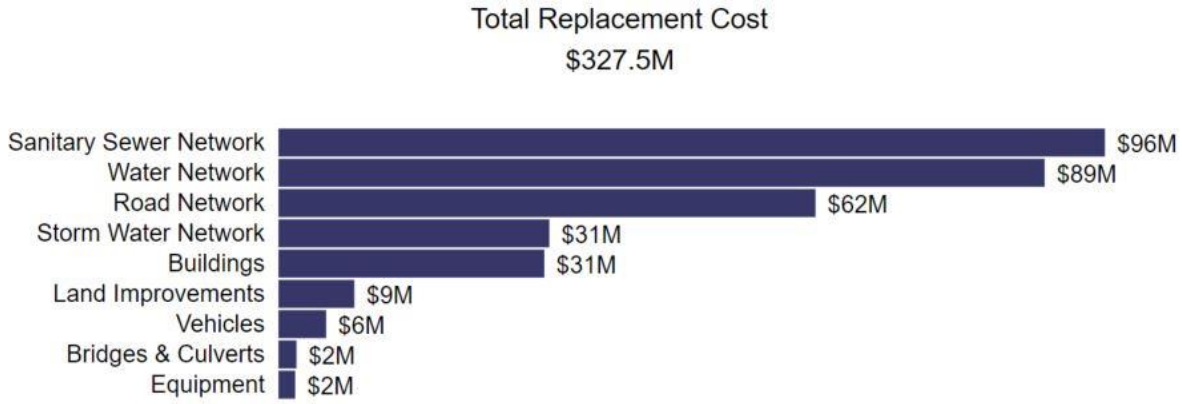
3 Portfolio Overview

Key Insights

- The total replacement cost of the Town's asset portfolio is $327.5 million
- The Town's target re-investment rate is 2.1%, and the actual re-investment rate is 1.6%, contributing to an expanding infrastructure deficit
- 79% of all assets are in fair or better condition
- 15% of assets are projected to require replacement in the next 10 years
- Average annual capital requirements total $6.8 million per year across all assets

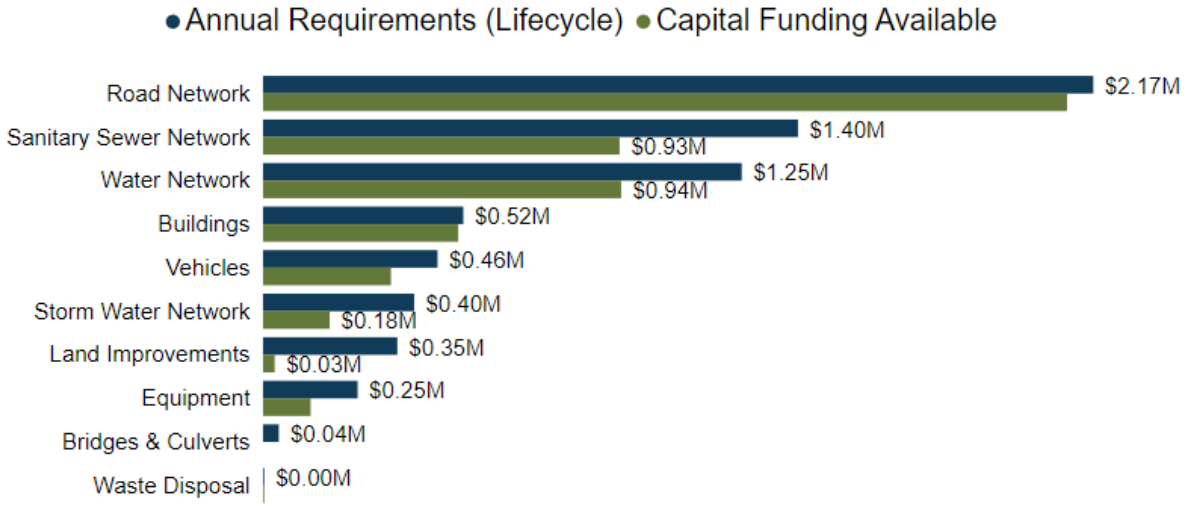
3.1 Total Replacement Cost of Asset Portfolio

The asset categories analyzed in this AMP have a total replacement cost of $327.5 million based on inventory data from 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.



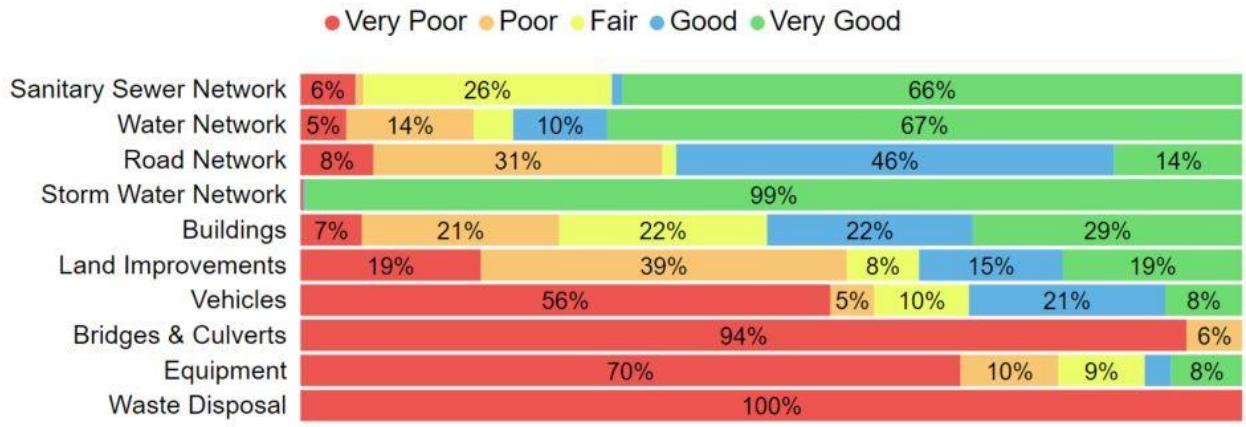
3.2 Target vs. Actual Reinvestment Rate

The graph below depicts funding gaps or surpluses by comparing target vs actual reinvestment rate. To meet the long-term replacement needs, the Town should be allocating approximately $6.8 million annually, for a target reinvestment rate of 2.1%. Actual annual spending on infrastructure totals approximately $5.2 million, for an actual reinvestment rate of 1.6%.



3.3 Condition of Asset Portfolio

The current condition of the assets is central to all asset management planning. Collectively, 79% of assets in Carleton Place, based on replacement value, are in fair or better condition. This estimate relies on both age-based and field condition data.

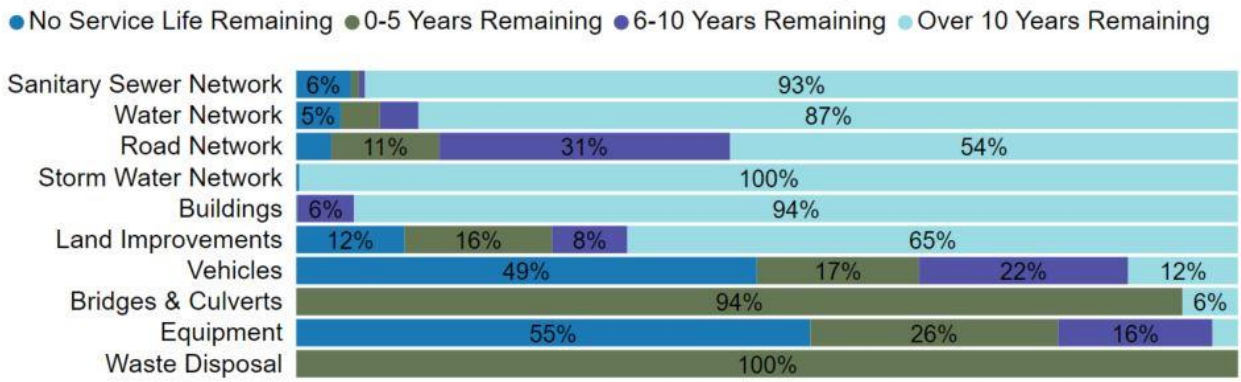


This AMP relies on assessed condition data for 23% of assets; for the remaining portfolio, age is used as an approximation of condition. Assessed condition data is invaluable in asset management planning as it reflects the true condition of the asset and its ability to perform its functions. The table below identifies the source of condition data used throughout this AMP.

Asset Category	Asset Segment	% of Assets with Assessed Condition	Source of Condition Data
Road Network	All	96%	Staff Assessements
Bridges	All	100%	2020 OSIM Report
Storm Water Network	All	0%	N/A
Buildings	All	0%	N/A
Land Improvements	All	0%	N/A
Equipment	All	0%	N/A
Vehicles	All	0%	N/A
Solid Waste	All	0%	N/A
Water Network	All	0%	N/A
Sanitary Sewer Network	All	9%	Staff Assessments

3.4 Service Life Remaining

Based on asset age, available assessed condition data and estimated useful life, 15% of the Town's assets will require replacement within the next 10 years. Capital requirements over the next 10 years are identified in Appendix B.



3.5 Forecasted Capital Requirements

The development of a long-term capital forecast should include both asset rehabilitation and replacement requirements. With the development of asset-specific lifecycle strategies that include the timing and cost of future capital events, the Town can produce an accurate long-term capital forecast. The following graph identifies capital requirements over the next 70 years.

4 Analysis of Tax-funded Assets

Key Insights

- Tax-funded assets are valued at $142.9 million
- 70% 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 $4.2 million
- Critical assets should be evaluated to determine appropriate risk mitigation activities and treatment options

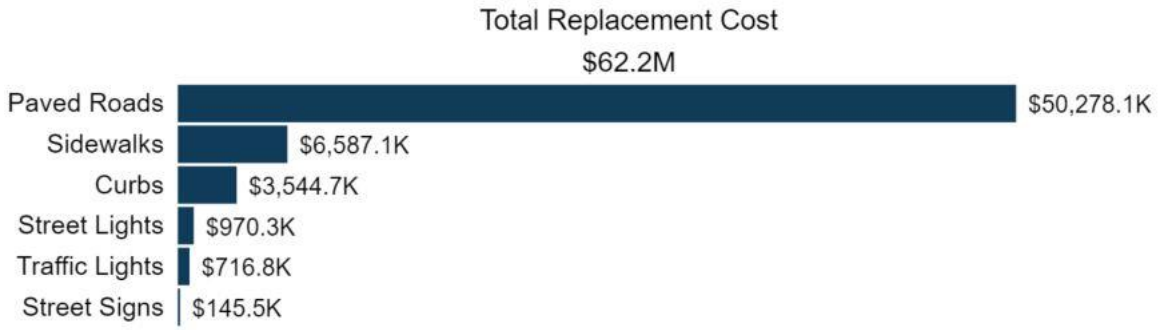
4.1 Road Network

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

4.1.1 Asset Inventory & Replacement Cost

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

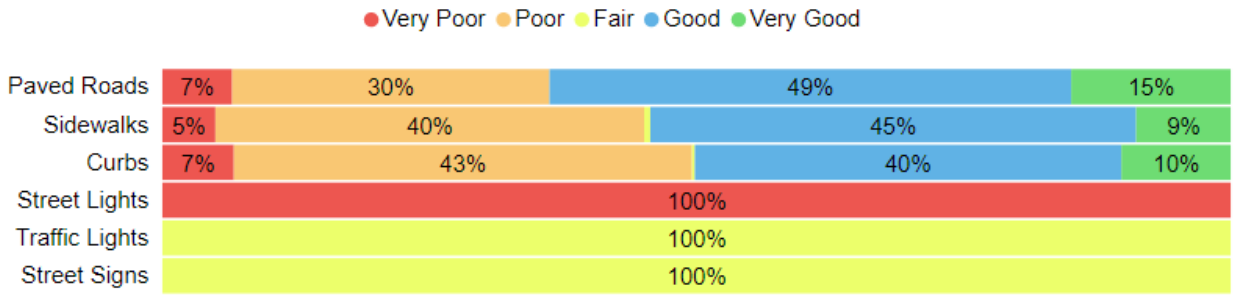
Asset Segment	Quantity	Replacement Cost Method	Total Replacement Cost
Paved Roads	62,564 m	99% CPI Tables	$50,278,074
Sidewalks	45,183 m	97% CPI Tables	$6,587,130
Curbs	42,409 m	98% CPI Tables	$3,544,682
Street Lights	1	CPI Tables	$970,280
Traffic Lights	5	CPI Tables	$716,812
Street Signs	1	CPI Tables	$145,542
			$62,242,520



4.1.2 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
Paved Roads	59%	Fair	99% Assessed
Sidewalks	55%	Fair	99% Assessed
Curbs	54%	Fair	100% Assessed
Street Lights	0%[1]	Very Poor	Age-Based
Traffic Lights	56%	Fair	100% Assessed
Street Signs	54%	Fair	100% Assessed
	58%	**Fair**	**96% Assessed**



Current Approach to Condition Assessment

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

- The road network is assessed by staff on an annual basis to identify defects and update condition ratings.

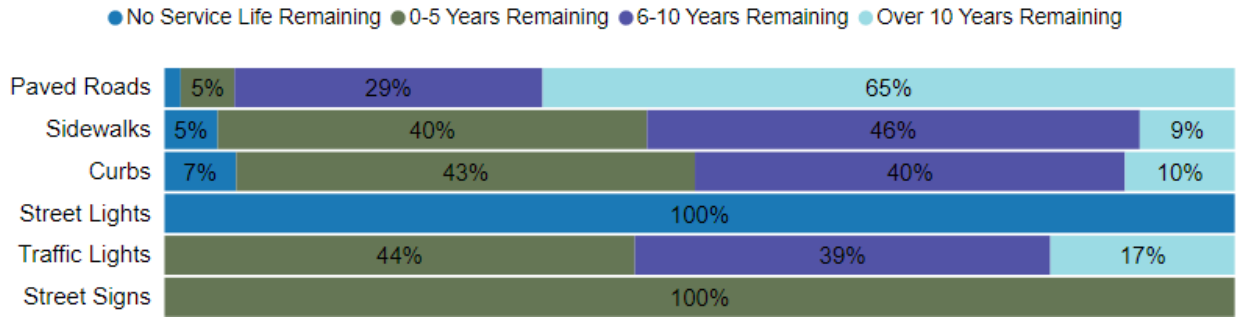
[1] 35% of street lights have been replaced with LED lights in mid-2021. The inventory analysis for this draft was developed before the new lights have been put in service, and does not account for the increased overall condition this replacement would result in.

- Sidewalks are assessed based on provincial Minimum Maintenance Standards (MMS) and risk considerations.
- Project prioritization is based on a multitude of factors including assessed condition of roads, minimum maintenance standards, and the age and condition of underground and nearby infrastructure.

4.1.3 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)
Paved Roads	25 Years	35.8	11.7[2]
Sidewalks	35 Years	28.4	8.4
Curbs	35 Years	27.8	8.4
Street Lights	30 Years	33.0	-3.0[3]
Traffic Lights	30 Years	24.2	16.2
Street Signs	30 Years	33.0	16.2
		31.3	**9.8**



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.

[2] Historical lifecycle events have added service life to several roads sections, increasing the service life remaining.

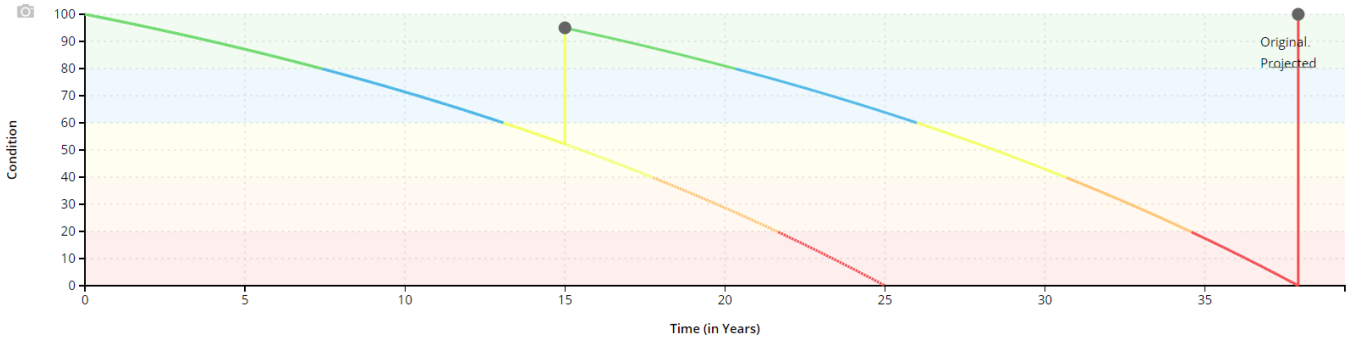
[3] Many street lights are able to provide service beyond the estimated useful life, showing as a negative average service life remaining.

4.1.4 Lifecycle Management Strategy

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

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

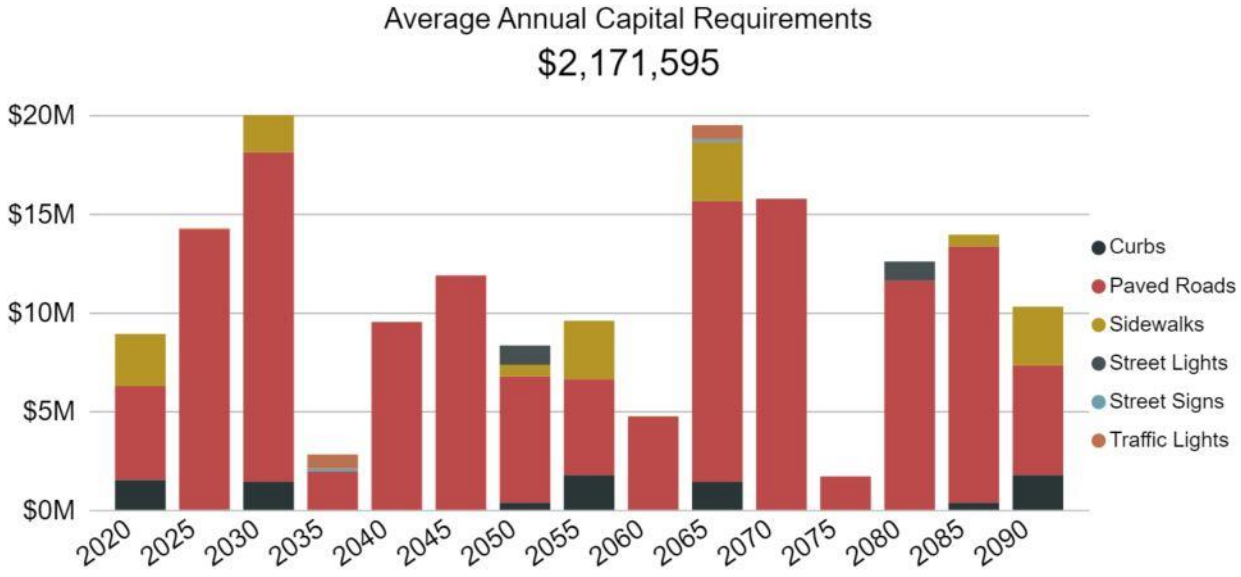
Paved Roads		
Event Name	**Event Class**	**Event Trigger**
Single Lift Grind and Pave	Rehabilitation	15 Years
Full Reconstruction	Replacement	0% Condition



Forecasted Capital Requirements

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

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



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

4.1.5 Risk & Criticality

Risk Matrix

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

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

Risks to Current Asset Management Strategy

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

Lifecycle Management Strategies

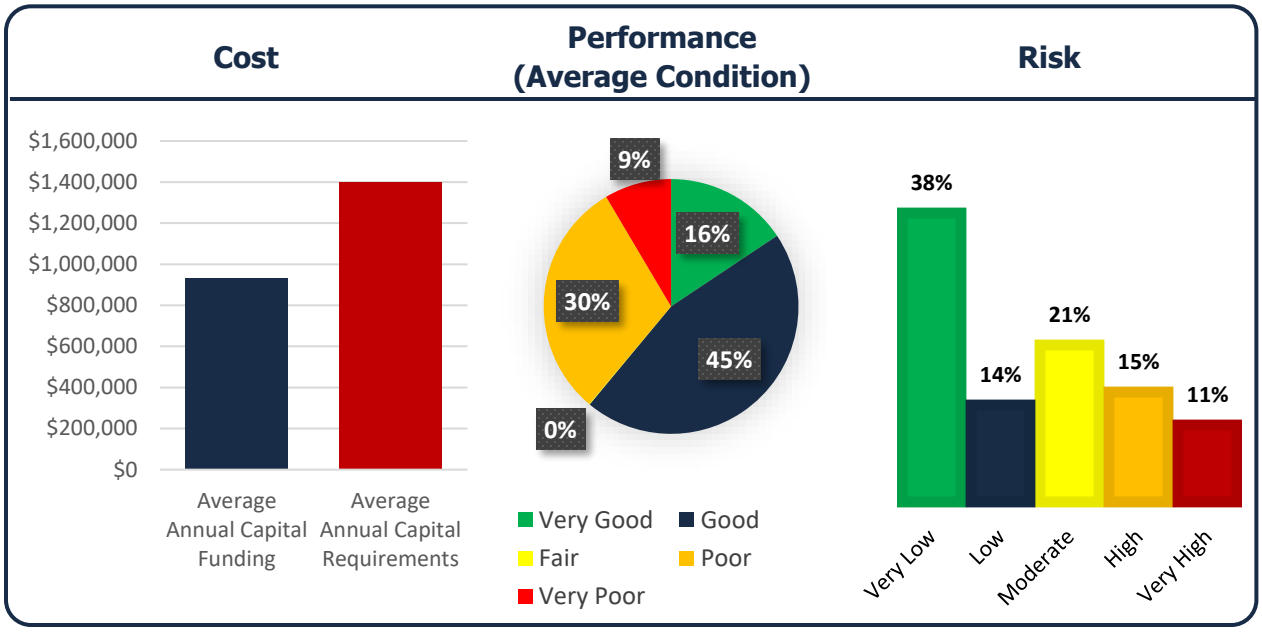
The current lifecycle management strategy for roads is considered more reactive than proactive. It is a challenge to find the right balance between maintenance, capital rehabilitation, and the reconstruction of roads. Staff hope to formally adopt better defined strategies which will extend pavement lifecycle and the lower total cost. These strategies will require sustainable annual funding to minimize the deferral of capital works.

Aging Infrastructure and Capital Funding

As roads continue to age, there are a handful of structures that are approaching their original useful life. More than a third of the network is in poor or very poor condition, thus decreasing the LOS provided to the public. Staff should review and assess annual capital funding strategies on a regular basis to help prevent deferral of capital works.

4.1.6 Levels of Service

The following table outlines the high-level service indicators for Roads assets: Cost, performance (condition), and risk.



The following tables identify the Town'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 Town 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 (2018)
Scope	Description, which may include maps, of the road network in the municipality and its level of connectivity	See Appendix B
Quality	Description or images that illustrate the different levels of road class pavement condition	The Town recently conducted a pavement condition assessment (2018) for all road sections. The assessment takes into account surface distresses and ride conditions, resulting in a rating between 1 and 4. Higher ratings reflect better road conditions. A road in Very Good condition (rating of 4) is considered well maintained, exhibits few pavement distresses with a low severity and provides a smooth and pleasant ride for drivers. A road in Poor condition (rating of 1) exhibits several pavement distresses of increasing severity and is very rough and bumpy for drivers.

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 (2018)
Scope	Lane-km of arterial roads (MMS [4]classes 1 and 2) per land area (km/km^2)	0.34
	Lane-km of collector roads (MMS classes 3 and 4) per land area (km/km^2)	2.52
	Lane-km of local roads (MMS classes 5 and 6) per land area (km/km^2)	7.17
Quality	Average pavement condition index for paved roads in the municipality[5]	60%
	Average surface condition for unpaved roads in the municipality (e.g. excellent, good, fair, poor)	N/A[6]
Performance	Capital reinvestment rate	3.4%

[4] Minimum Maintenance Standards (MMS) are a roads classification system defined within the Ontario Regulation 239/02 and 366/18. Roads are classified using speed limit and average daily traffic, and rated 1 – 6. The class determines what level of maintenance is required for snow removal and defect repairs.
[5] The Pavement Condition Index is a score ranging from 0% (failed) to 100% (new), typically considering the structural adequacy, rideability, surface distresses, geometry, and drainage conditions. An approximation of this index was derived from Town staff visual inspections.
[6] Unpaved roads are not funded through capital expenditures, and as such are not included in this document.

4.1.7 Recommendations

Replacement Costs

- Over 96% of the road network utilizes CPI Tables to determine replacement cost. Staff should consult with local contractors and vendors or neighbouring communities to gather accurate costs per unit for replacement of paved roads, curbs, sidewalks, street lights, street signs, and traffic lights.

Lifecycle Management Strategies

- Implement the identified lifecycle management strategies for paved roads to realize potential cost avoidance and maintain a high quality of road pavement condition.
- Evaluate the efficacy of the Town'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 Town believes provide meaningful and reliable inputs into asset management planning.
- Work towards identifying proposed levels of service as per O. Reg. 588/17 and identify the strategies that are required to close any gaps between current and proposed levels of service.

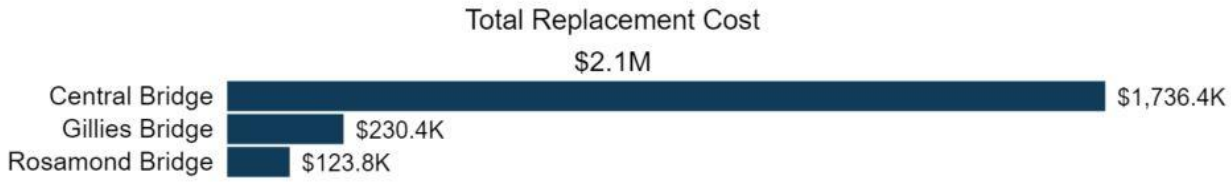
4.2 Bridges

Bridges represent a critical portion of the transportation services provided to the community. The Public Works Department is responsible for the maintenance of all bridges located across municipal roads with the goal of keeping structures in an adequate state of repair and minimizing service disruptions.

4.2.1 Asset Inventory & Replacement Cost

The table below includes the quantity, replacement cost method and total replacement cost of each asset segment in the Town's Bridges inventory.[7]

Asset Segment	Quantity	Replacement Cost Method	Total Replacement Cost
Central Bridge	1	CPI Tables	$1,736,371
Gillies Bridge	1	CPI Tables	$230,396
Rosamond Bridge	1	CPI Tables	$123,803
			$2,090,570

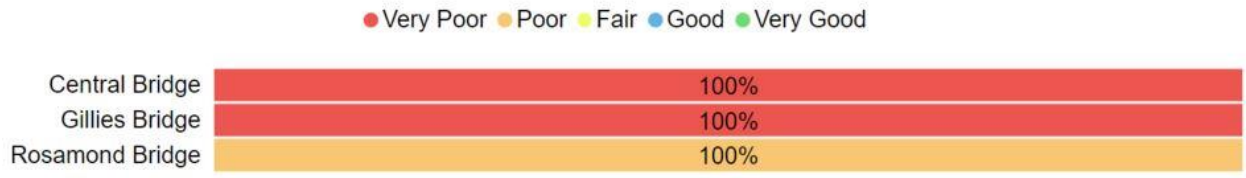


[7] Inflation of historical costs for bridges often does not result in accurate pricing for full replacement. Future iterations of the AMP will include more accurate replacement costs.

4.2.2 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
Central Bridge	10%	Very Poor	100% Assessed
Gillies Bridge	10%	Very Poor	100% Assessed
Rosamond Bridge	40%	Poor	100% Assessed
	11%	**Very Poor**	**100% Assessed**



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

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).

4.2.3 Estimated Useful Life & Average Age

The Estimated Useful Life for Bridge 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)
Central Bridge	50 Years	64.8	4.8
Gillies Bridge	50 Years	37.5	4.8
Rosamond Bridge	50 Years	34.5	19.8
		50.4	**8.5**

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.

4.2.4 Lifecycle Management Strategy

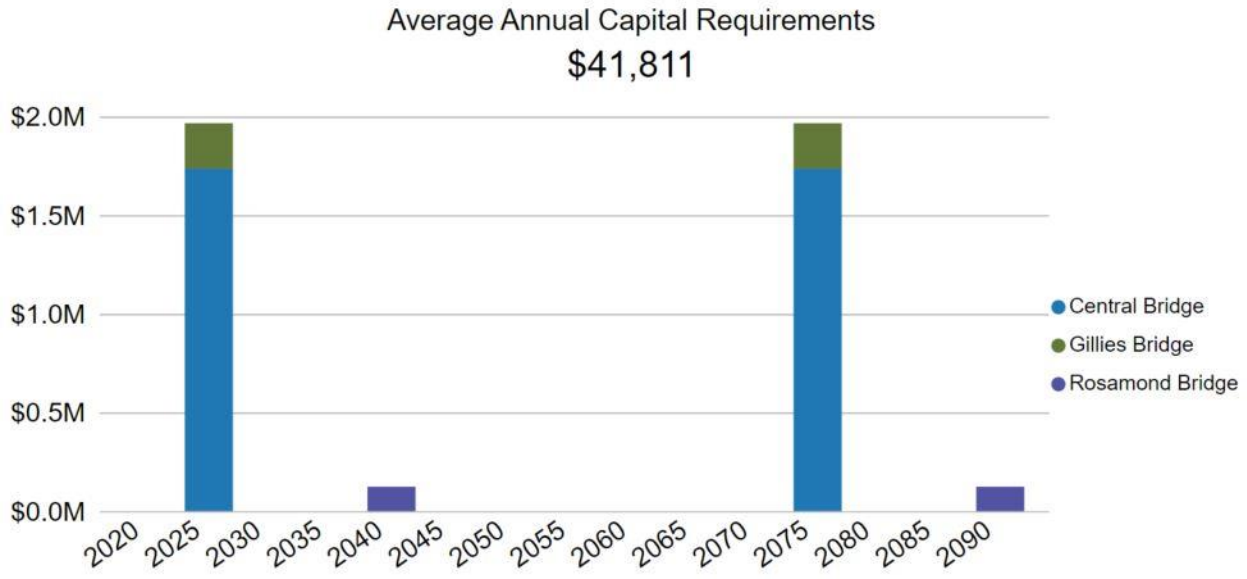
The condition or performance of most assets will deteriorate over time. To ensure that municipal assets are performing as expected and meeting the needs of customers, it is important to establish a lifecycle management strategy to proactively manage asset deterioration.

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

Activity Type	Description of Current Strategy
Maintenance, Rehabilitation and Replacement	All lifecycle activities are driven by the results of mandated structural inspections competed according to the Ontario Structure Inspection Manual (OSIM)
Inspection	The most recent inspection report was completed in 2020 by HP Engineering

Forecasted Capital Requirements

The following graph forecasts long-term capital requirements. The annual capital requirement represents the average amount per year that the Town should allocate towards funding rehabilitation and replacement needs.



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

4.2.5 Risk & Criticality

Risk Matrix

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

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

Risks to Current Asset Management Strategy

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

Aging Infrastructure

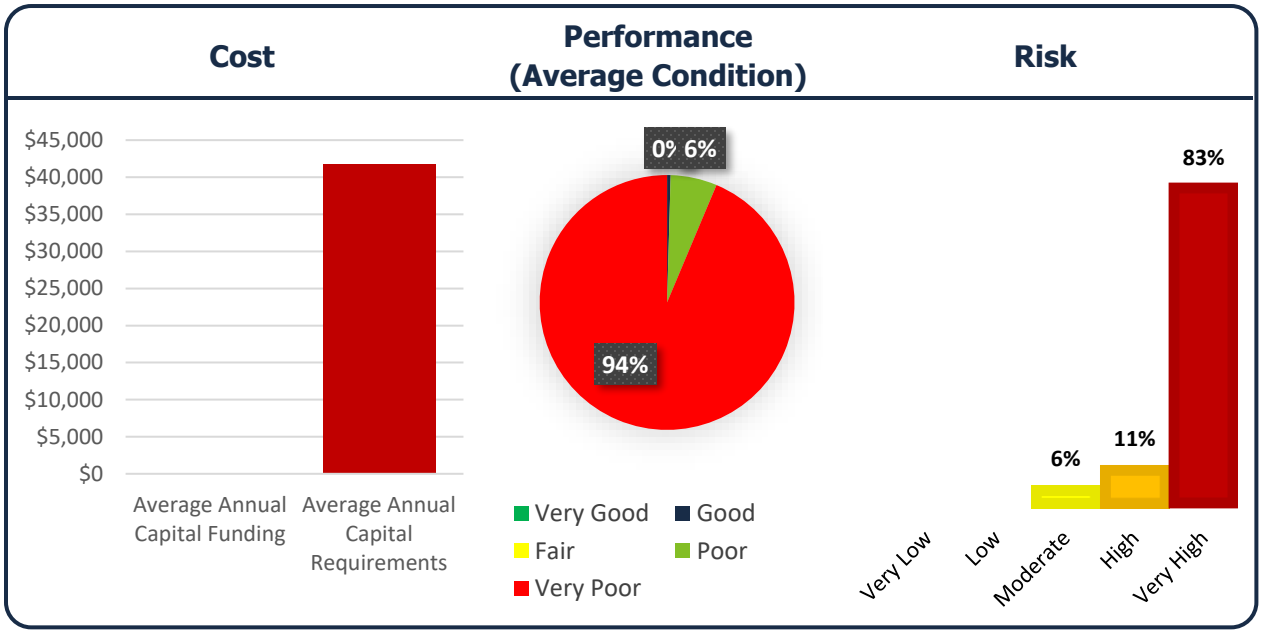
As municipal bridges continue to age, the structures are approaching their original useful life. Based on external assessments, Central Bridge and Gillies Bridge are in very poor condition and Rosamond Bridge is in poor condition. Poor condition presents a health and safety risk to the public and load restrictions (Central Bridge) present a social risk. There is currently no decision-making process in place to support long-term planning for all structures that will require rehabilitation, replacement, or disposal.

Capital Funding Strategies

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

4.2.6 Levels of Service

The following table outlines the high-level service indicators for Bridge assets: cost, performance (condition), and risk.



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

Service Attribute	Qualitative Description	Current LOS (2019)
Scope	Description of the traffic that is supported by municipal bridges (e.g. heavy transport vehicles, motor vehicles, emergency vehicles, pedestrians, cyclists)	The Town owns 3 bridges that represent a critical component of the transportation network. Central Bridge has a low load bearing capacity, planned replacement to begin in 2021 will eliminate load bearing capacity restrictions. Restrictions put in place September 2020 include a maximum gross vehicle weight of 15 tonnes for single units, 25 tonnes for tractor trailer units, and 35 tonnes for tractor multi trailer units. Planned rehabilitation of Gillies bridge and considerations for future potential widening of the bridge to McArthur Island (a single lane bridge) in 2021.
Quality	Description or images of the condition of Bridges and Culverts and how this would affect use of the Bridges and Culverts	See Appendix B

Technical Levels of Service

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

Service Attribute	Technical Metric	Current LOS (2019)
Scope	% of bridges in the Town with loading or dimensional restrictions	33.3%
Quality	Average bridge condition index[8] value for bridges in the Town	0.5
	Average bridge condition index value for structural culverts in the Town	N/A
Performance	Capital re-investment rate	0%

[8] The Bridge Condition Index (BCI) is a condition rating, from 0 – 100, that assesses the structural integrity of bridge components. This score is a useful indicator for prioritizing capital programs.

4.2.7 Recommendations

Asset Inventory

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

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.

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

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

Levels of Service

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

4.3 Storm Water Network

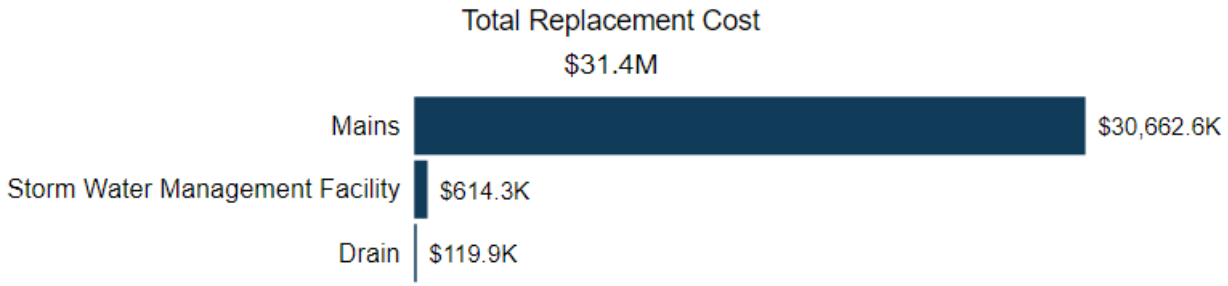
The Town is responsible for owning and maintaining a storm water network consisting of a storm water management facilities and storm sewer mains and other supporting infrastructure.

Staff are working towards improving the accuracy and reliability of their Storm Water Network inventory to assist with long-term asset management planning.[9]

4.3.1 Asset Inventory & Replacement Cost

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

Asset Segment	Quantity	Replacement Cost Method	Total Replacement Cost
Mains	52,405 m	CPI Tables	$30,662,623
Storm Water Management Facility	3	CPI Tables	$614,308
Drain	1	CPI Tables	$119,896
			$31,396,827

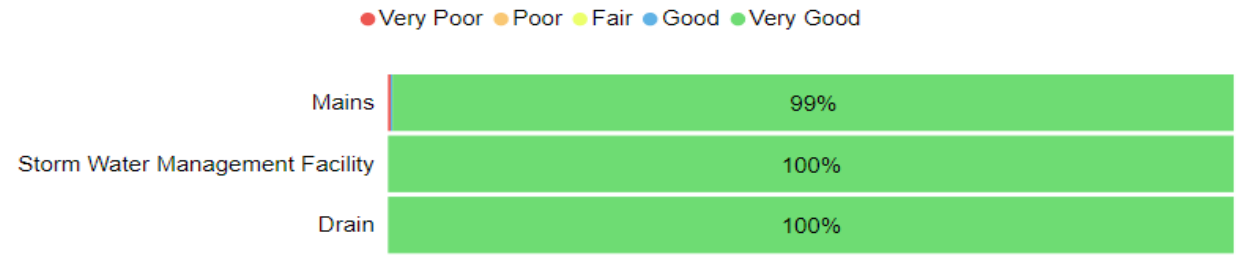


[9] There are a number of storm water ponds unaccounted for in the asset inventory that the Town has not yet assumed.

4.3.2 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	91%	Very Good	Age-Based
Storm Water Management Facility	94%	Very Good	Age-Based
Drain	84%	Very Good	Age-Based
	91%	**Very Good**	**0% Assessed**



To ensure that the Town's Storm Water Network continues to provide an acceptable level of service, the Town 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 Water Network.

Current Approach to Condition Assessment

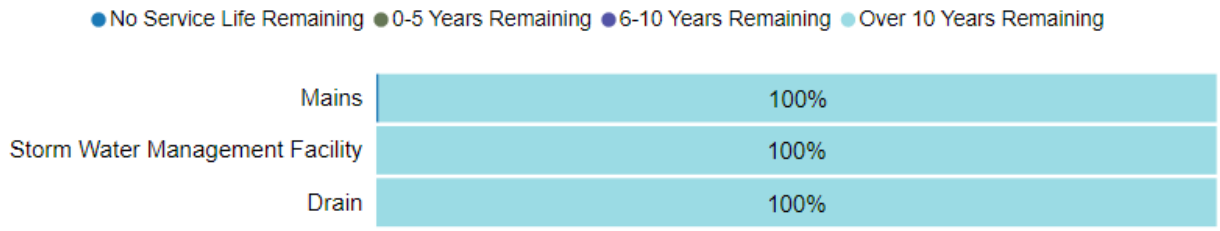
Accurate and reliable condition data allows staff to more confidently determine the remaining service life of assets and identify the most cost-effective approach to managing assets. The following describes the municipality's current approach:

- There are no formal condition assessment programs in place for the storm water network, however, storm water ponds are assessed on an annual basis. Resident complaints drive most maintenance, rehabilitation, and replacement activities. CCTV inspections take place when above ground assets such as roads are replaced.
- The Town is prioritizing data refinement to ensure the accuracy of the asset register and attributes.
- As the Town refines the available asset inventory for the storm water network a regular assessment cycle should be established.

4.3.3 Estimated Useful Life & Average Age

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

Asset Segment	Estimated Useful Life (Years)	Average Age (Years)	Average Service Life Remaining (Years)
Mains	80 Years	29.8	50.2
Storm Water Management Facility	80 Years	21.2	58.8
Drain	25 Years	4.0	20.9
		29.8	**50.2**



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.

4.3.4 Lifecycle Management Strategy

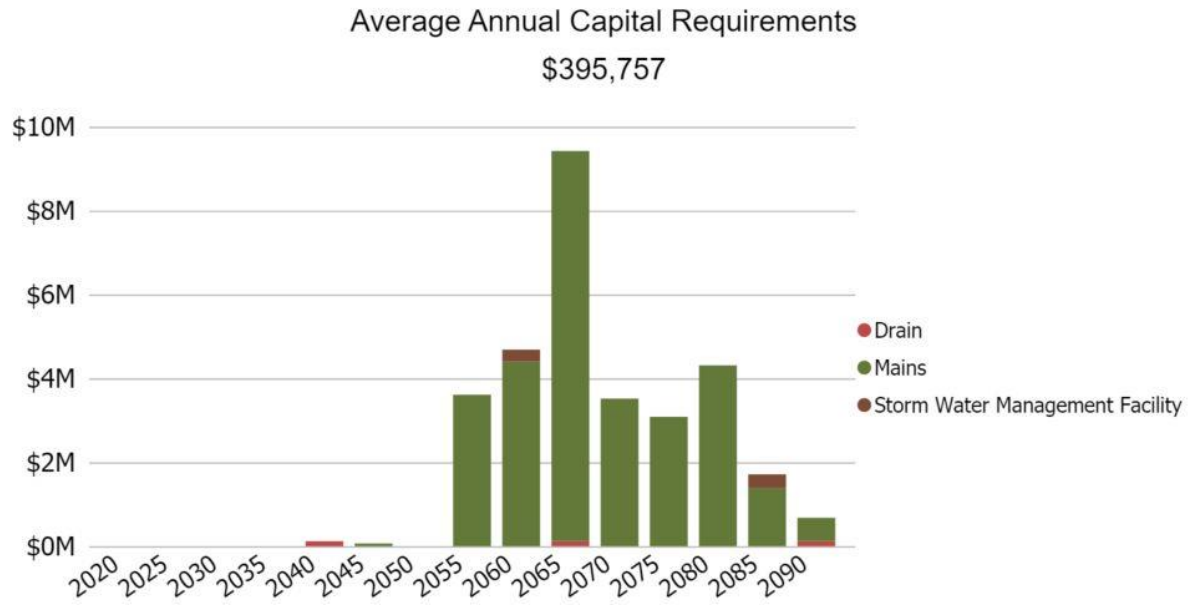
The condition or performance of most assets will deteriorate over time. To ensure that municipal assets are performing as expected and meeting the needs of customers, it is important to establish a lifecycle management strategy to proactively manage asset deterioration.

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

Activity Type	Description of Current Strategy
Maintenance	Maintenance activities are completed to a lesser degree compared to other underground linear infrastructure.
	Primary activities include annual catch basin cleaning and landscaping and cleaning of ponds. Flushing of storm network only takes place as needed.
Rehabilitation	Currently, there are no renewal or rehabilitation strategies in place for the storm system and ponds. Trenchless re-lining has the potential to reduce total lifecycle costs but would require a formal condition assessment program to determine viability.
Replacement	Without the availability of up-to-date condition assessment information replacement activities are purely reactive in nature. The Town has developed a 10-year capital plan to improve funding strategies.

Forecasted Capital Requirements

The following graph forecasts long-term capital requirements. The annual capital requirement represents the average amount per year that the Town should allocate towards funding rehabilitation and replacement needs.



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

4.3.5 Risk & Criticality

Risk Matrix

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

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

Risks to Current Asset Management Strategy

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

Asset Data & Information

There is some concern with the accuracy of the Town's current asset inventory for storm water infrastructure. A lack of confidence in the completeness of this data impacts the reliability of asset management and financial planning. Staff are in the process of evaluating the resources and activities required to build and/or improve the existing asset inventory.

Assumption of New Infrastructure

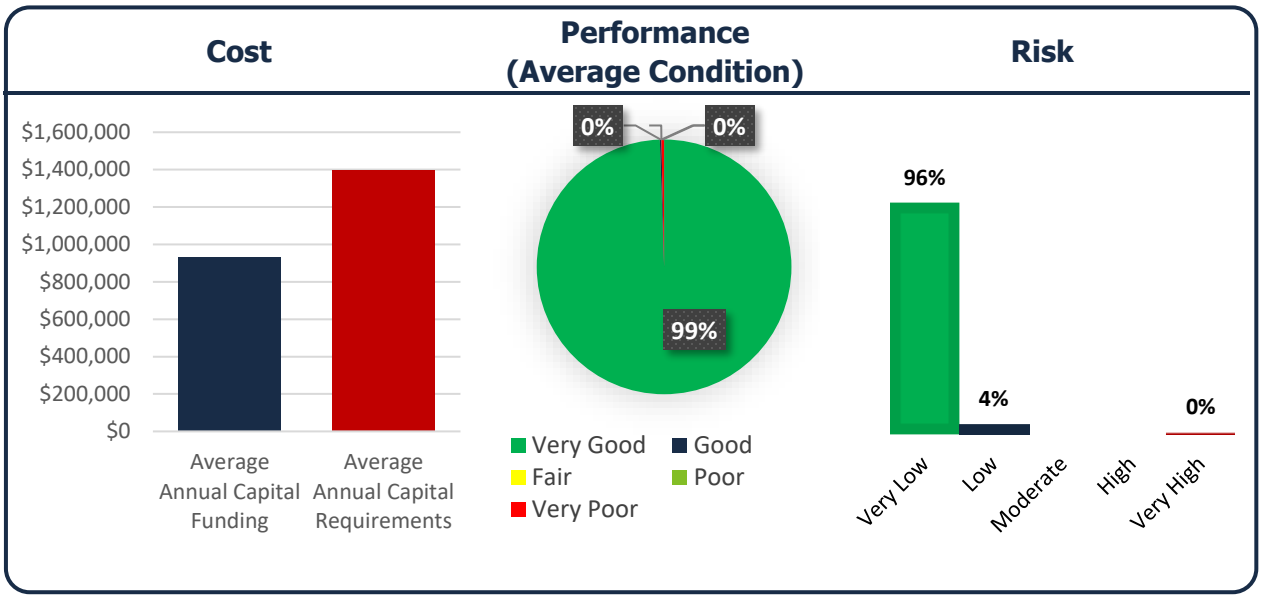
There are several storm water management ponds that have not yet been assumed by the Town. Once assumed they will be the Town's responsibility and staff need to start planning to determine maintenance and rehabilitation requirements.

Inflow and Infiltration

The Town has experienced inflow and infiltration (I&I) issues. I&I has resulted in erosion by the river. Staff need to identify the specific location and causes of I&I.

4.3.6 Levels of Service

The following table outlines the high-level service indicators for Storm Water assets: cost, performance (condition), and risk.



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

Service Attribute	Qualitative Description	Current LOS (2019)
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	The Town's storm system is designed to withstand a 5-year event. Almost all areas of the Town are resilient to a 5-year storm event. There is a small neighborhood that does occasionally report flooding due to poor grading of the surrounding area. The Town has put in place corrective measures such as proper flooding protection and commercial grade sump pumps.

Technical Levels of Service

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

Service Attribute	Technical Metric	Current LOS (2019)
Scope	% of properties in municipality resilient to a 100-year storm	100%[10]
	% of the municipal stormwater management system resilient to a 5-year storm	100%[11]
Performance	Capital reinvestment rate	0.56%

[10] 135 properties are within the 1 in 100-year floodplain and 31 of those properties are municipally owned; however, none of the 135 properties have dwellings. The edge of some properties is within the floodplain, but no flooding occurs.

[11] This assumption is based on the observations of municipal staff.

4.3.7 Recommendations

Asset Inventory

- There is some concern with the accuracy of the Town's current asset inventory for storm water infrastructure. Staff are in the process of evaluating the resources and activities required to build and/or improve the existing asset inventory.
- There are several storm water management ponds that have not yet been assumed by the Town. Once assumed they will need to be added to the asset inventory along with critical attribute data such as age, replacement cost, condition, etc.

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 Water Network through CCTV inspections.

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.

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 Water Network on a regular basis to achieve the lowest total cost of ownership while maintaining adequate service levels.

Levels of Service

- Continue to measure current levels of service in accordance with the metrics that the Town has established in this AMP. Additional metrics can be established as they are determined to provide meaningful and reliable inputs into asset management planning.

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

4.4 Buildings

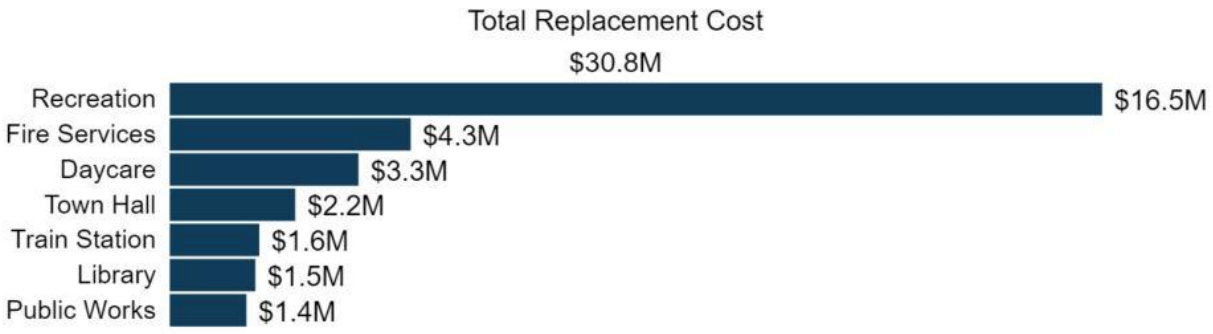
The Town of Carleton Place owns and maintains several facilities and recreation centres that provide key services to the community. These include:

- administrative office
- public library
- fire station and a train station
- public works garages and storage sheds
- recreation and community centres

4.4.1 Asset Inventory & Replacement Cost

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

Asset Segment	Quantity	Replacement Cost Method	Total Replacement Cost[12]
Daycare	1 (1)	CPI Tables	$3,344,413.00
Fire Services	1 (2)	CPI Tables	$4,268,286.00
Library	1 (3)	CPI Tables	$1,518,845.00
Public Works	3 (7)	CPI Tables	$1,360,570.00
Recreation	9 (32)	CPI Tables	$16,508,748.00
Town Hall	1 (8)	CPI Tables	$2,224,413.00
Train Station	1 (1)	CPI Tables	$1,588,156.00
			$30,813,431

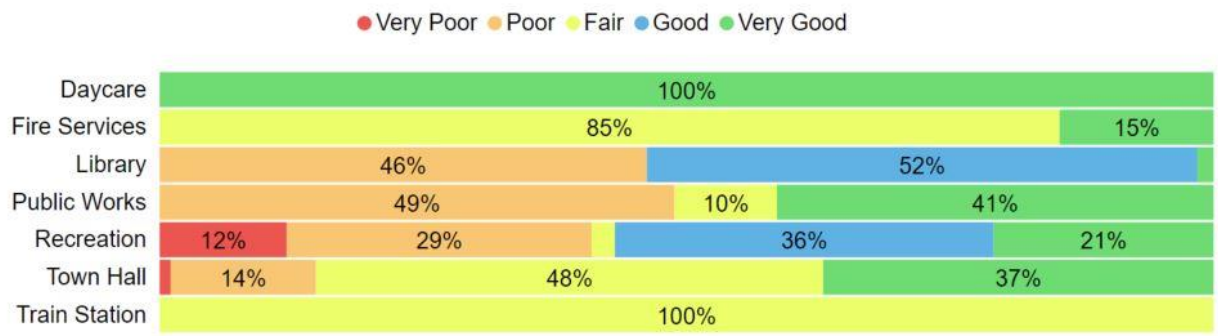


[12] Buildings replacement costs are based on inflated historical values, which likely underestimate the true replacement costs. Future iterations of the AMP will work towards using more accurate costing.

4.4.2 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
Daycare	80%	Very Good	Age-Based
Fire Services	61%	Good	Age-Based
Library	52%	Fair	Age-Based
Public Works	53%	Fair	Age-Based
Recreation	55%	Fair	Age-Based
Town Hall	64%	Good	Age-Based
Train Station	54%	Fair	Age-Based
	59%	**Fair**	**0% Assessed**



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

4.4.3 Estimated Useful Life & Average Age

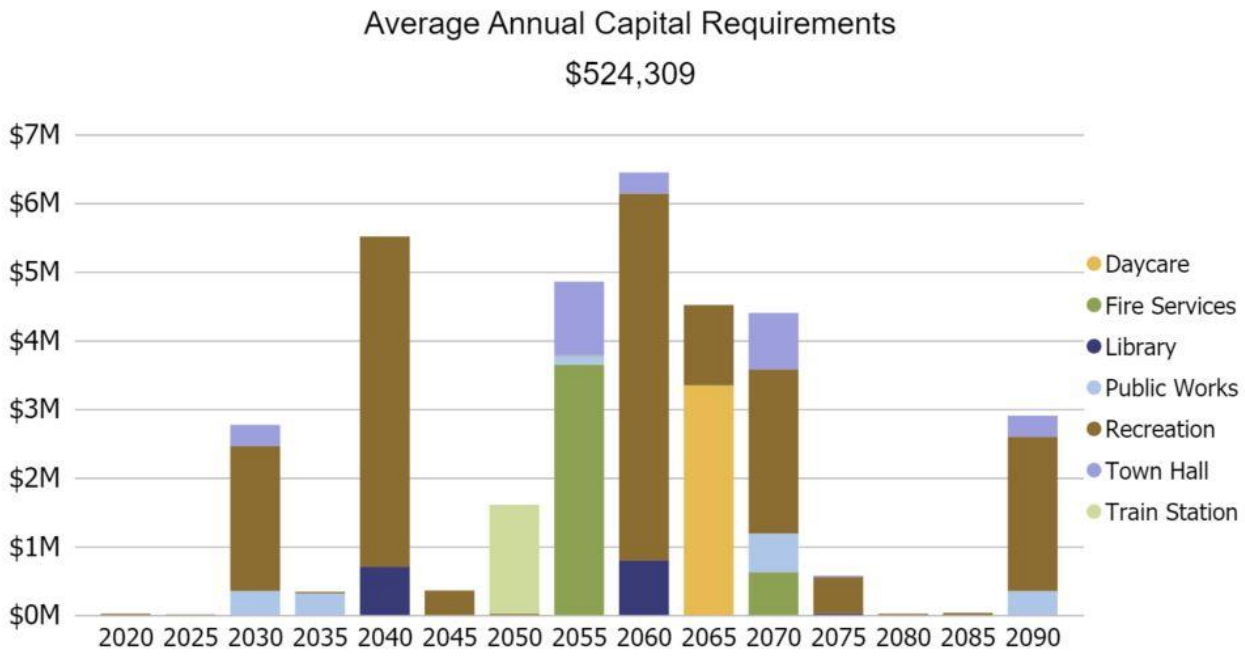
The Estimated Useful Life for Building assets has been assigned according to a combination of established industry standards and staff knowledge. The Average Age of each asset is based on the number of years each asset has been in-service. Finally, the Average Service Life Remaining represents the difference 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)
Daycare	60 Years	12.0	48.0
Fire Services	60 Years	17.8	42.3
Library	60 Years	22.0	38.0
Public Works	60 Years	26.8	33.3
Recreation	10 - 60 Years	23.4	29.9
Town Hall	30 - 60 Years	26.5	29.8
Train Station	60 Years	27.5	32.5
		23.8	**31.6**

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.

Forecasted Capital Requirements

The following graph forecasts long-term capital requirements. The annual capital requirement represents the average amount per year that the Town should allocate towards funding rehabilitation and replacement needs.



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

Asset Management Strategies

The documentation of lifecycle management strategies, current levels of service, and risk is critical to the development of a comprehensive asset management program. These components of the asset management plan support effective short- and long-term capital planning and contribute to more proactive asset management practices, thus extending the estimated useful life of many assets and a providing a higher level of service.

In accordance with O. Reg. 588/17, the Town will continue to gather data and information in order to detail and review the lifecycle management strategies, levels of service, and risk of all non-core asset categories by July 1, 2024.

4.4.4 Recommendations

Asset Inventory

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

Condition Assessment Strategies

- The Town should implement regular condition assessments for all buildings to better inform short- and long-term capital requirements.

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.

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

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

4.5 Equipment

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

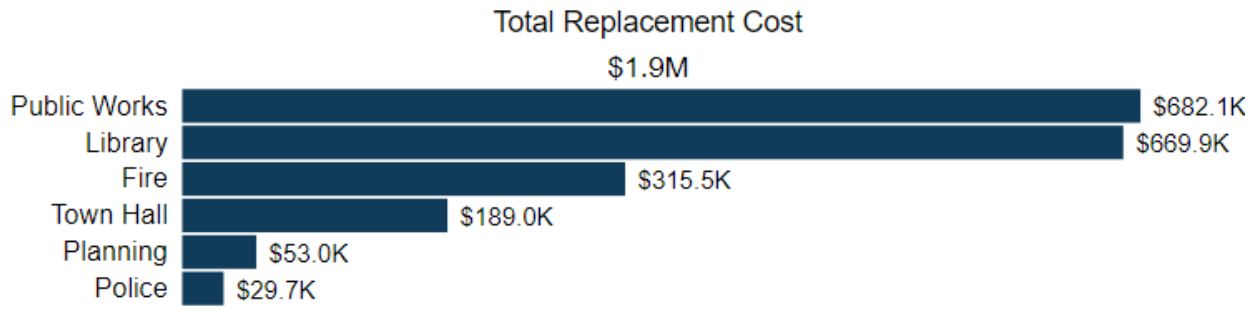
- Landscaping equipment to maintain public parks and roadsides
- Fire equipment to support the delivery of emergency services
- Plows and sanders to provide winter control activities
- Library books for public loan

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

4.5.1 Asset Inventory & Replacement Cost

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

Asset Segment	Quantity	Replacement Cost Method	Total Replacement Cost[13]
Public Works	21	CPI Tables	$682,124
Library	11	CPI Tables	$669,921
Fire	15	CPI Tables	$315,458
Town Hall	7	CPI Tables	$188,967
Planning	1	CPI Tables	$52,983
Police	2	CPI Tables	$29,702
			$1,939,155

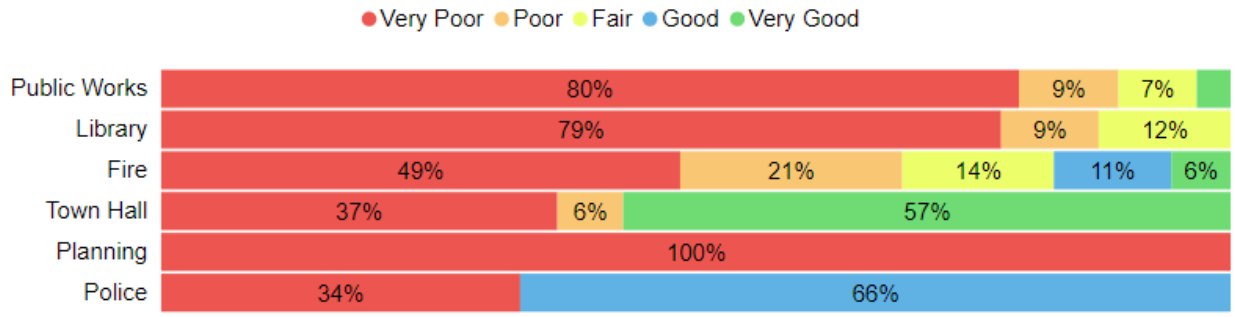


[13] Equipment replacement costs are based on inflated historical values, which likely underestimate the true replacement costs. Future iterations of the AMP will work towards using more accurate costing.

4.5.2 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
Public Works	12%	Very Poor	Age-Based
Library	9%	Very Poor	Age-Based
Fire	25%	Poor	Age-Based
Town Hall	54%	Fair	Age-Based
Planning	0%	Very Poor	Age-Based
Police	47%	Fair	Age-Based
	17%	**Very Poor**	**0% Assessed**

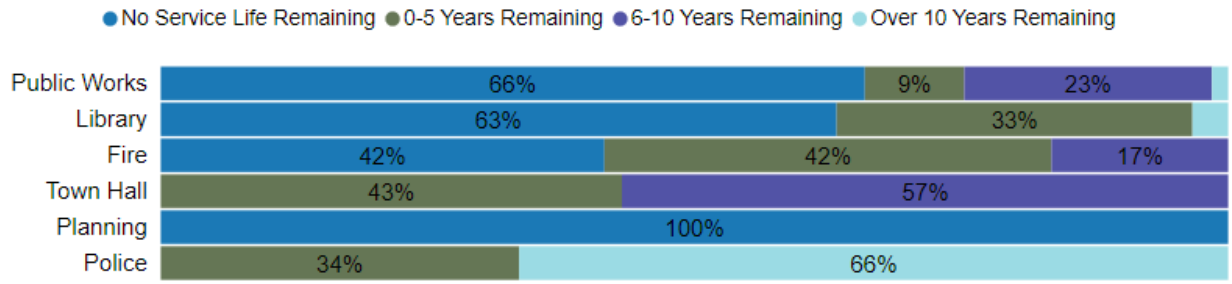


To ensure that the Town's Equipment continues to provide an acceptable level of service, the Town should monitor the average condition of all assets. If the average condition declines, staff should re-evaluate their lifecycle management strategy to determine what combination of maintenance, rehabilitation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

4.5.3 Estimated Useful Life & Average Age

The Estimated Useful Life for 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)[14]
Public Works	10 - 30 Years	14.5	-2.7
Library	3 - 30 Years	12.8	-4.4
Fire	10 Years	10.5	-0.6
Town Hall	3 - 10 Years	5.8	2.3
Planning	3 Years	9.0	-6.0
Police	10 - 30 Years	9.5	10.5
		11.8	**-1.4**

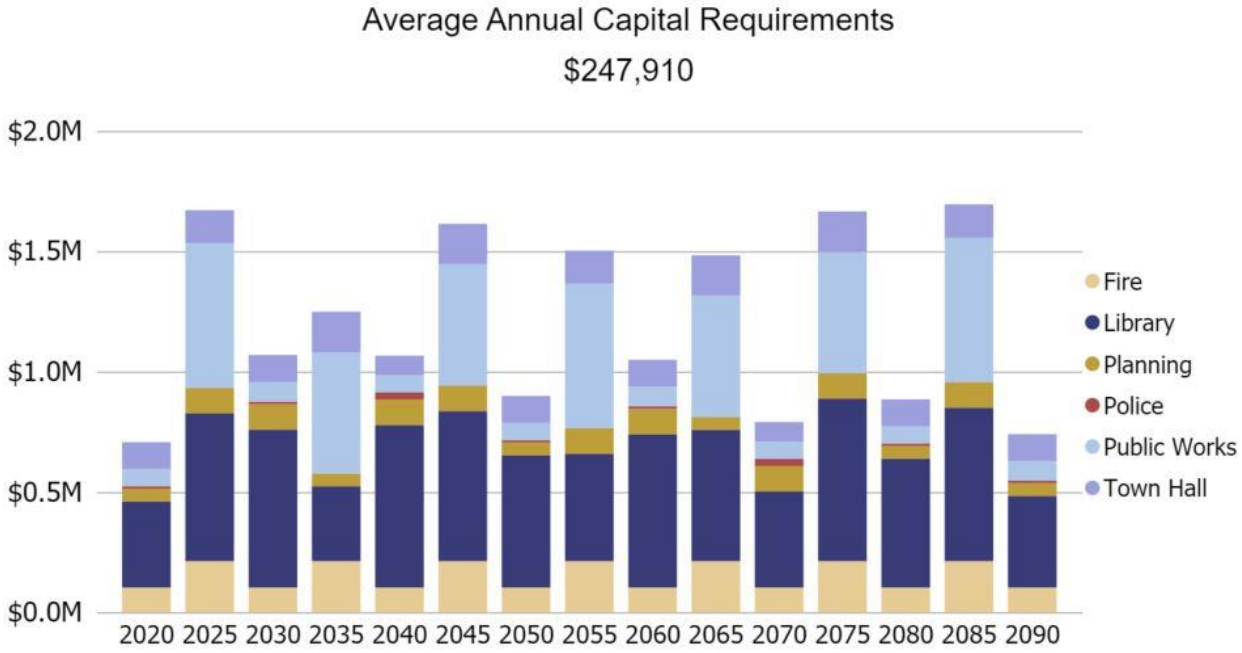


Each asset's Estimated Useful Life should be reviewed periodically to determine whether adjustments need to be made to better align with the observed length of service life for each asset type.

[14] Many machinery and equipment assets are pooled and have a useful life defined by the manufacturer. In practice, these assets can be used beyond their estimated useful life.

Forecasted Capital Requirements

The following graph forecasts long-term capital requirements. The annual capital requirement represents the average amount per year that the Town should allocate towards funding rehabilitation and replacement needs.



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

Asset Management Strategies

The documentation of lifecycle management strategies, current levels of service, and risk is critical to the development of a comprehensive asset management program. These components of the asset management plan support effective short- and long-term capital planning and contribute to more proactive asset management practices, thus extending the estimated useful life of many assets and a providing a higher level of service.

In accordance with O. Reg. 588/17, the Town will continue gather data and information in order to detail and review the lifecycle management strategies, levels of service, and risk of all non-core asset categories by July 1, 2024.

4.5.4 Recommendations

Asset Inventory

- The Town's asset inventory contains several pooled assets. Asset segments often have unique estimated useful lives and require asset-specific lifecycle strategies. Staff should work towards a component-based inventory of all facilities to allow for component-based lifecycle planning.
- Often, the equipment is used beyond the estimated useful life. Staff should revise EUL to reflect the true service life of the asset.

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.

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.

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

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

4.6 Vehicles

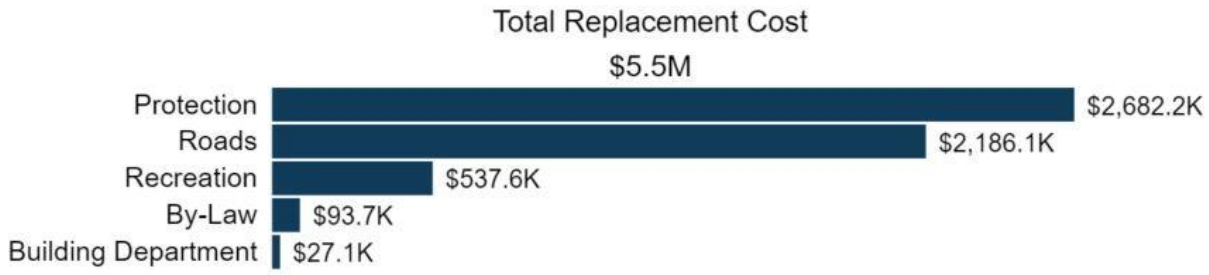
Vehicles allow staff to efficiently deliver municipal services and personnel. Municipal vehicles are used to support several service areas, including:

- fire rescue vehicles to provide emergency services
- pick-up trucks and machines to support the maintenance of the transportation network and address service requests for public works and parks and recreation
- light duty vehicles to support operations of Building and By-law services
- machines and trucks for winter control activities

4.6.1 Asset Inventory & Replacement Cost

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

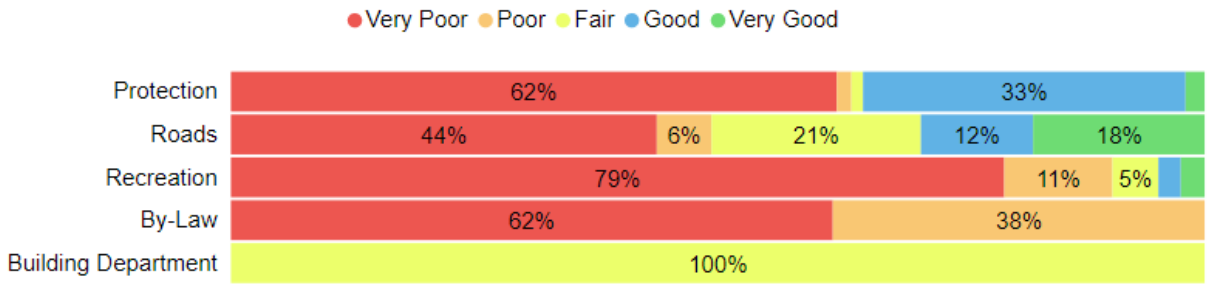
Asset Segment	Quantity	Replacement Cost Method	Total Replacement Cost
Protection	10	CPI Tables	$2,682,206
Roads	22	16.47% User-Defined 83.53% CPI Tables	$2,186,069
Recreation	17	CPI Tables	$537,574
By-Law	2	CPI Tables	$93,727
Building Department	1	CPI Tables	$27,144
			$5,526,720



4.6.2 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
Protection	26%	Poor	Age-Based
Roads	35%	Poor	Age-Based
Recreation	12%	Very Poor	Age-Based
By-Law	13%	Very Poor	Age-Based
Building Department	55%	Fair	Age-Based
	28%	**Poor**	**0% Assessed**

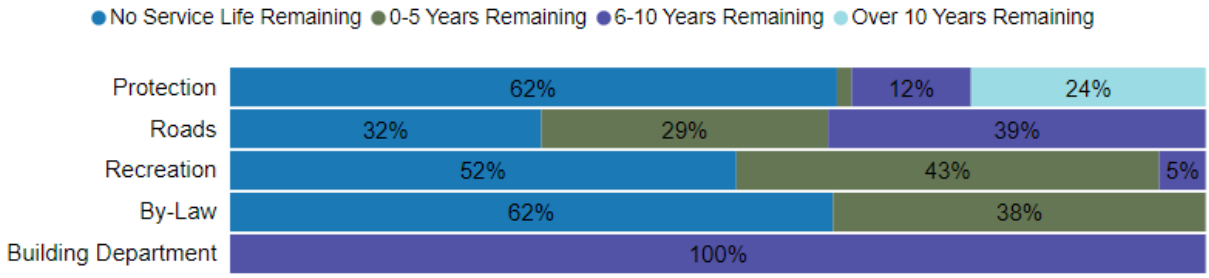


To ensure that the Town's Vehicles continue to provide an acceptable level of service, the Town should monitor the average condition of all assets. If the average condition declines, staff should re-evaluate their lifecycle management strategy to determine what combination of maintenance, rehabilitation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

4.6.3 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.

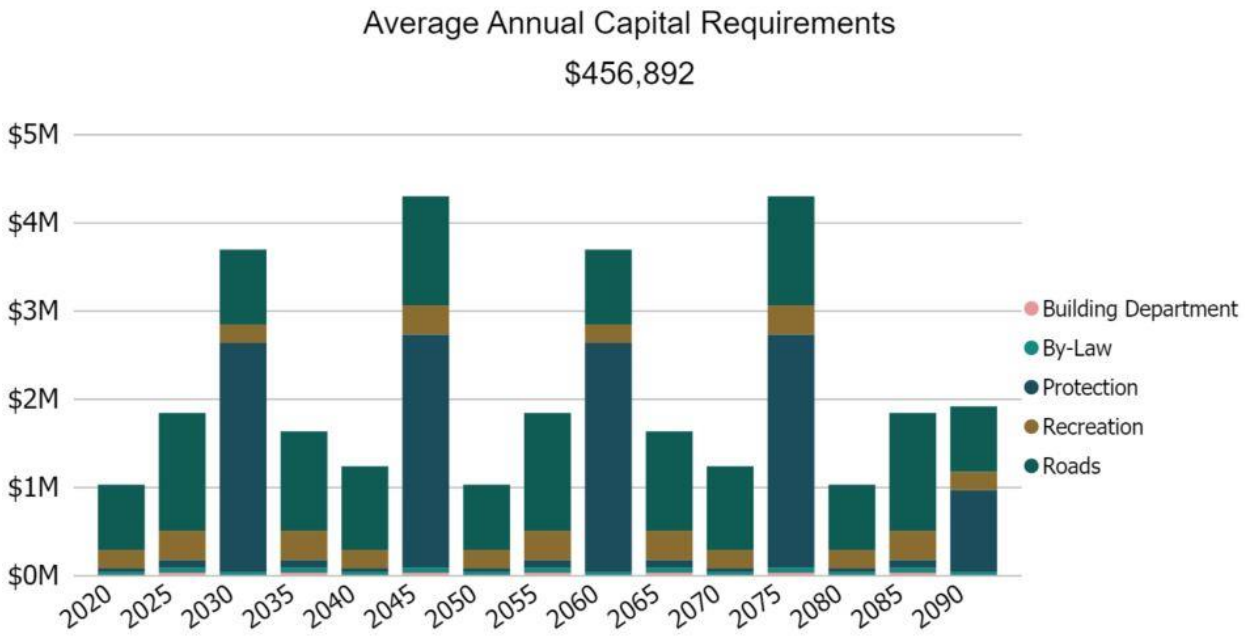
Asset Segment	Estimated Useful Life (Years)	Average Age (Years)	Average Service Life Remaining (Years)
Protection	10 - 15 Years	20.3	-6.8
Roads	10 - 15 Years	10.0	0.7
Recreation	10 Years	10.2	-0.2
By-Law	10 Years	9.3	0.8
Building Department	10 Years	4.5	5.5
		11.9	**-0.9**



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.

Forecasted Capital Requirements

The following graph forecasts long-term capital requirements. The annual capital requirement represents the average amount per year that the Town should allocate towards funding rehabilitation and replacement needs.



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

Asset Management Strategies

The documentation of lifecycle management strategies, current levels of service, and risk is critical to the development of a comprehensive asset management program. These components of the asset management plan support effective short- and long-term capital planning and contribute to more proactive asset management practices, thus extending the estimated useful life of many assets and a providing a higher level of service.

In accordance with O. Reg. 588/17, the Town will continue gather data and information in order to detail and review the lifecycle management strategies, levels of service, and risk of all non-core asset categories by July 1, 2024.

4.6.4 Recommendations

Condition Assessment Strategies

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

Replacement Costs

- Nearly 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.

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

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

4.7 Solid Waste

The Town of Carleton Place manages and maintains a compost yard and a hazardous household waste depot. The facility services the public through the collection, hauling, sorting, transfer, and disposal of non-hazardous solid waste (including recyclable materials and organics).

4.7.1 Asset Inventory & Replacement Cost

The table below includes the quantity, replacement cost method and total replacement cost of the Town's Solid Waste Facility.

Asset Segment	Quantity	Replacement Cost Method	Total Replacement Cost
Solid Waste Facility	1	CPI Tables	$74,434
			$74,434

4.7.2 Asset Condition

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

Asset Segment	Average Condition (%)	Average Condition Rating	Condition Source
Solid Waste Facility	20%	Poor	Age-Based
	20%	**Poor**	**0% Assessed**

To ensure that the Town's Solid Waste Facility continues to provide an acceptable level of service, the Town should monitor the average condition of all components. 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 Solid Waste Facility.

4.7.3 Estimated Useful Life & Average Age

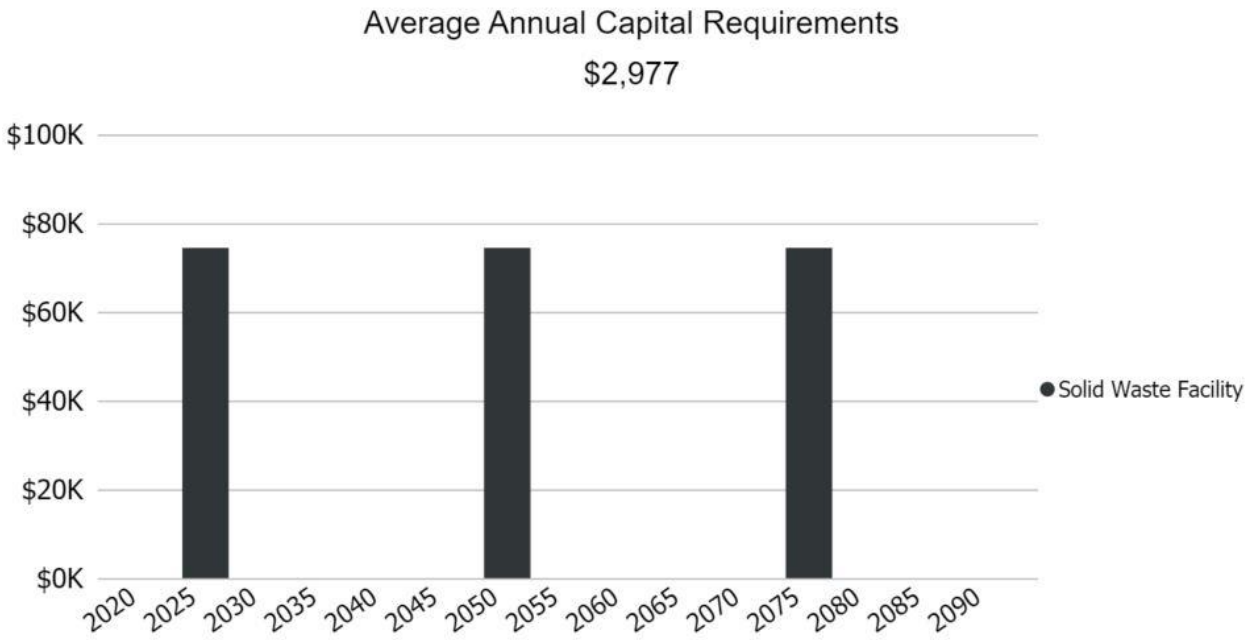
The Estimated Useful Life for the Solid Waste Facility assets has been assigned according to a combination of established industry standards and staff knowledge. The Average Age of each asset is based on the number of years the asset has been in-service. Finally, the Average Service Life Remaining represents 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)
Solid Waste Facility	25 Years	20.0	5.0
		20.0	**5.0**

The 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.

Forecasted Capital Requirements

The following graph forecasts long-term capital requirements. The annual capital requirement represents the average amount per year that the Town should allocate towards funding rehabilitation and replacement needs.



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

Asset Management Strategies

The documentation of lifecycle management strategies, current levels of service, and risk is critical to the development of a comprehensive asset management program. These components of the asset management plan support effective short- and long-term capital planning and contribute to more proactive asset management practices, thus extending the estimated useful life of many assets and a providing a higher level of service.

In accordance with O. Reg. 588/17, the Town will continue gather data and information in order to detail and review the lifecycle management strategies, levels of service, and risk of all non-core asset categories by July 1, 2024.

4.7.4 Recommendations

Asset Inventory

- The Solid Waste Facility is pooled into a single asset. Facilities consist of several separate capital components that have unique estimated useful lives and require asset-specific lifecycle strategies. Staff should work towards a component-based inventory of the facility to allow for component-based lifecycle planning.

Condition Assessment Strategies

- Identify condition assessment strategies for high value and high-risk components.
- 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.

Replacement Costs

- Nearly 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.

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

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

4.8 Land Improvements

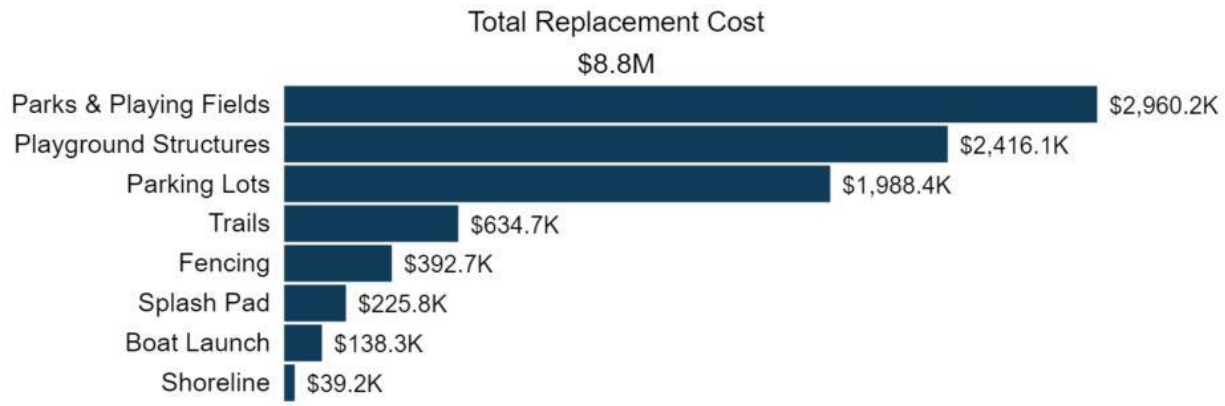
The Town of Carleton Place owns a small number of assets that are considered Land Improvements. This category includes:

- Parks, playing fields, and related structures
- Miscellaneous landscaping, trails, and other assets
- Parking lots

4.8.1 Asset Inventory & Replacement Cost

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

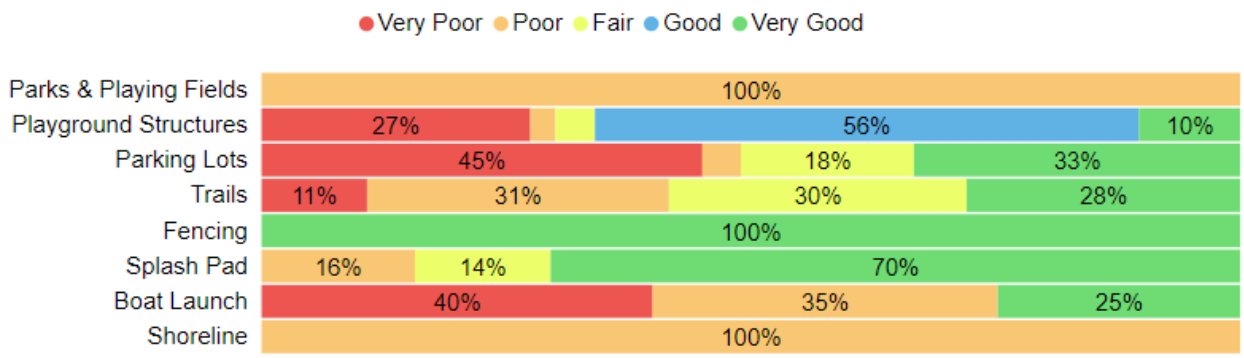
Asset Segment	Quantity	Replacement Cost Method	Total Replacement Cost
Parks & Playing Fields	47.65 acres	CPI Tables	$2,960,168
Playground Structures	22	95% CPI Tables 5% User-Defined	$2,416,087
Parking Lots	12	CPI Tables	$1,988,432
Trails	8	CPI Tables	$634,666
Fencing	2	CPI Tables	$392,675
Splash Pad	3	CPI Tables	$225,757
Boat Launch	3	CPI Tables	$138,295
Shoreline	1	CPI Tables	$39,211
			$8,795,291



4.8.2 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
Parks & Playing Fields	27%	Poor	100% Assessed
Playground Structures	49%	Fair	Age-Based
Parking Lots	44%	Fair	Age-Based
Trails	49%	Fair	Age-Based
Fencing	85%	Very Good	Age-Based
Splash Pad	69%	Good	Age-Based
Boat Launch	36%	Poor	Age-Based
Shoreline	22%	Poor	Age-Based
	48%	**Fair**	**0% Assessed**

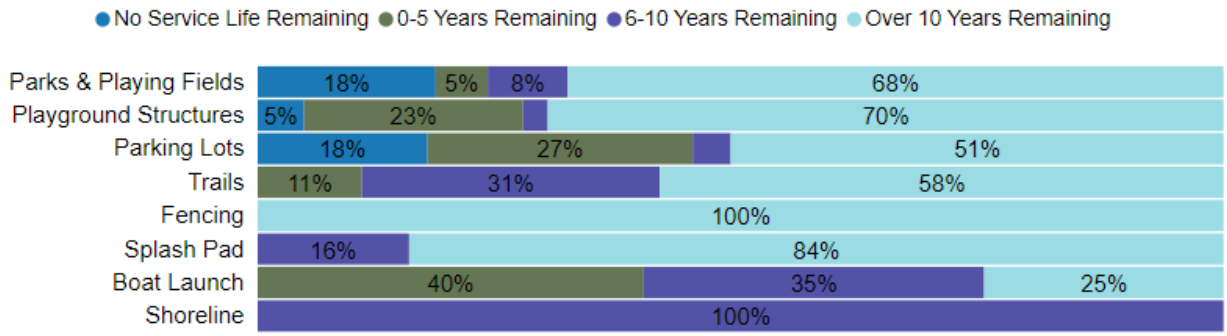


To ensure that the Town's Land Improvements continue to provide an acceptable level of service, the Town should monitor the average condition of all assets. If the average condition declines, staff should re-evaluate their lifecycle management strategy to determine what combination of maintenance, rehabilitation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

4.8.3 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)
Parks & Playing Fields	25 Years	70.2	-45.2
Playground Structures	25 Years	16.8	8.2
Parking Lots	25 Years	21.5	3.5
Trails	25 Years	13.8	11.3
Fencing	25 Years	3.0	22.0
Splash Pad	25 Years	12.3	12.7
Boat Launch	25 Years	14.9	10.1
Shoreline	25 Years	19.5	5.5
		32.5	**-7.5**



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.

Forecasted Capital Requirements

The following graph forecasts long-term capital requirements. The annual capital requirement represents the average amount per year that the Town should allocate towards funding rehabilitation and replacement needs.

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

Asset Management Strategies

The documentation of lifecycle management strategies, current levels of service, and risk is critical to the development of a comprehensive asset management program. These components of the asset management plan support effective short- and long-term capital planning and contribute to more proactive asset management practices, thus extending the estimated useful life of many assets and a providing a higher level of service.

In accordance with O. Reg. 588/17, the Town will continue gather data and information in order to detail and review the lifecycle management strategies, levels of service, and risk of all non-core asset categories by July 1, 2024.

4.8.4 Recommendations

Asset Inventory

- The Town's asset inventory contains several pooled assets. Asset segments often have unique estimated useful lives and require asset-specific lifecycle strategies. Staff should work towards a component-based inventory of all land improvement assets to allow for component-based lifecycle planning.
- Often, the land improvement assets are used beyond the estimated useful life. Staff should revise EUL to reflect the true service life of the asset.

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.

Replacement Costs

- Nearly 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.

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

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

5 Analysis of Rate-funded Assets

Key Insights

- Rate-funded assets are valued at $184.6 million
- 86% 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 $2.7 million
- Critical assets should be evaluated to determine appropriate risk mitigation activities and treatment options

5.1 Water Network

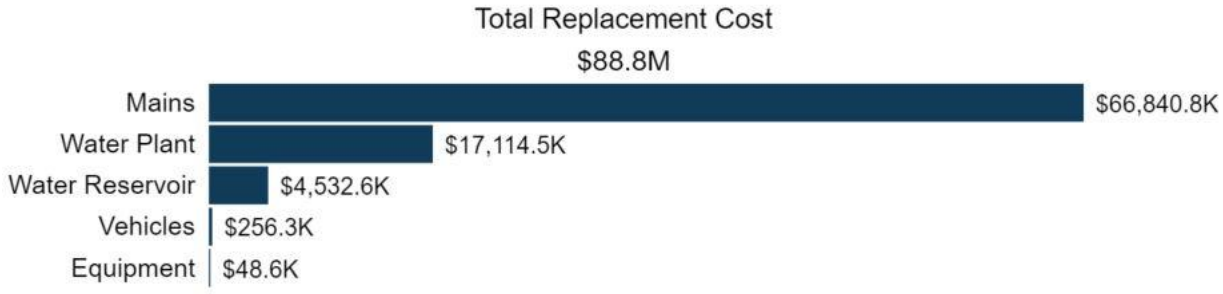
The water services provided by the Town are overseen by the Public Works Department and the Ontario Clean Water Association (OCWA). They are responsible for the following:

- Water Filtration Plant
- Pump House & Intake
- Water mains
- Vehicles and equipment utilized for maintenance of the water network

5.1.1 Asset Inventory & Replacement Cost

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

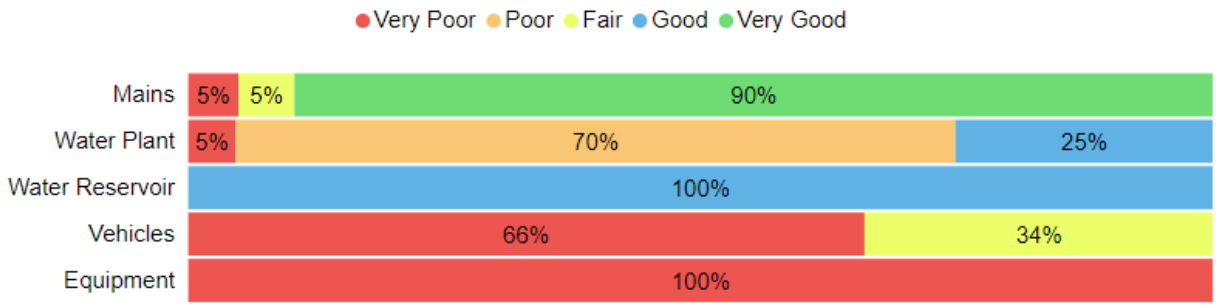
Asset Segment	Quantity (components)	Replacement Cost Method	Total Replacement Cost
Mains	67,237.5 m	0.10% Cost/Unit 99.90% CPI Tables	$66,840,848
Water Plant	1 (4)	CPI Tables	$17,114,525
Water Reservoir	1 (3)	CPI Tables	$4,532,630
Vehicles	4	CPI Tables	$256,292
Equipment	4	CPI Tables	$48,638
			$88,792,933



5.1.2 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	85%	Very Good	Age-Based
Water Plant	44%	Fair	Age-Based
Water Reservoir	73%	Good	100% Assessed
Vehicles	22%	Poor	Age-Based
Equipment	0%	Very Poor	Age-Based
	74%	**Good**	**5% Assessed**



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

Current Approach to Condition Assessment

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

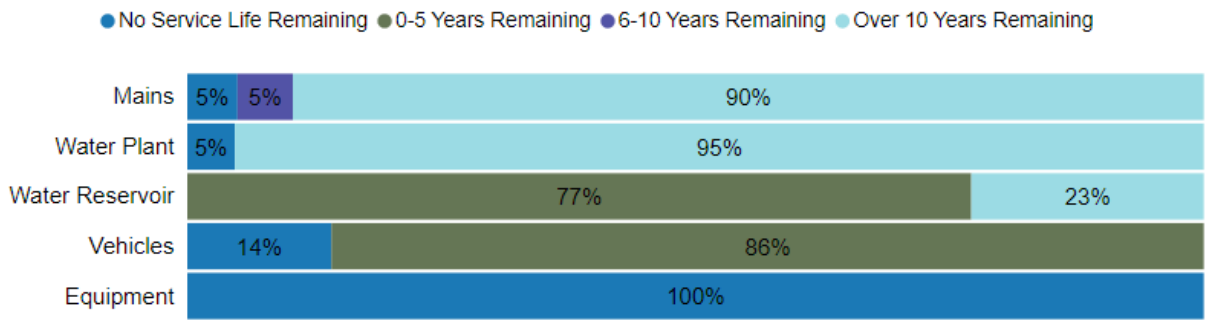
- The treatment plant is managed and maintained by OCWA.
- There are no formal condition assessment programs in place for the Water Network.
- Staff primarily rely on the age, material, and main break history of water mains to determine the projected condition of water mains.

- Hydrants are inspected annually and there is an ongoing valve exercising program.
- Condition data helps inform both capital and operating strategies. Various reports support decision-making as it relates to maintenance, rehabilitation, and replacement.
- The Town will be developing a Water and Wastewater Master Plan to support asset management decision-making and project prioritization.

5.1.3 Estimated Useful Life & Average Age

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

Asset Segment	Estimated Useful Life (Years)	Average Age (Years)	Average Service Life Remaining (Years)
Mains	80 Years	29.7	50.3
Water Plant	60 Years	50.7	9.3
Water Reservoir	40 - 60 Years	28.3	32.3
Vehicles	10 - 15 Years	9.8	1.4
Equipment	10 Years	14.8	-4.8
		29.5	**49.5**



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.

5.1.4 Lifecycle Management Strategy

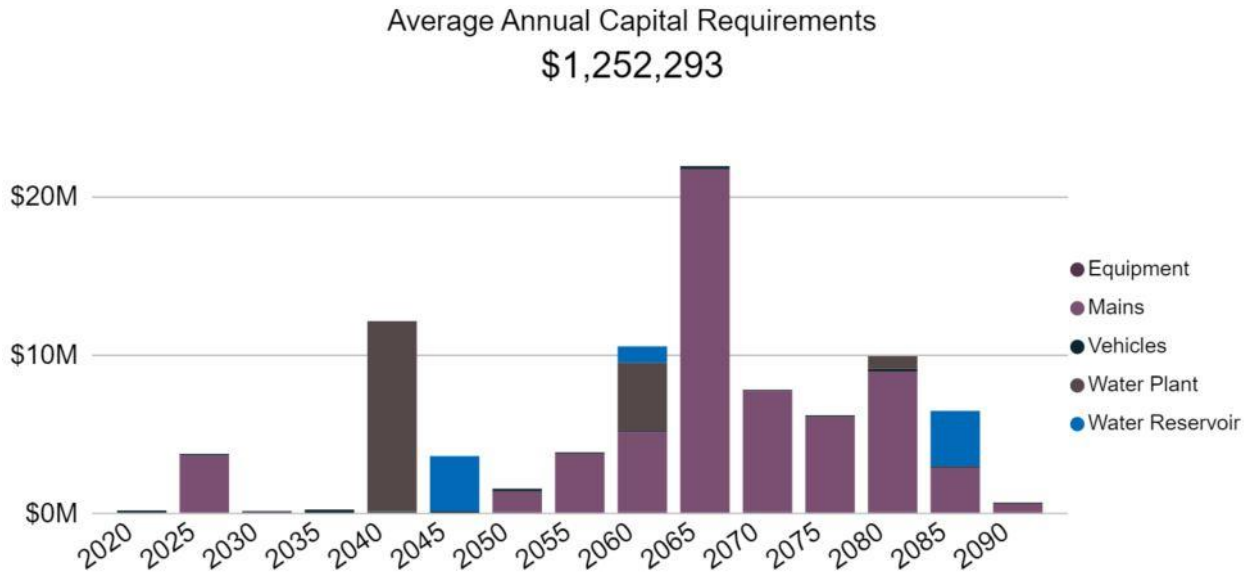
The condition or performance of most assets will deteriorate over time. To ensure that municipal assets are performing as expected and meeting the needs of customers, it is important to establish a lifecycle management strategy to proactively manage asset deterioration.

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

Activity Type	Description of Current Strategy
Maintenance	Hydrant flushing takes place on an annual basis. Main flushing is completed for water quality maintenance purposes.
	Hydrants and valves are exercised annually.
	Vehicles are maintened by an internal mechanic based on mileage.
Rehabilitation	Trenchless re-lining of water mains presents significant challenges and is not always a viable option.
Replacement	In the absence of mid-lifecycle rehabilitative events, most mains are simply maintained with the goal of full replacement once it reaches its end-of-life. Replacement of watermains is coordinated with road replacement based on age, material, and main break data.
	Vehicles and mains have a 10-year capital plan.

Forecasted Capital Requirements

The following graph forecasts long-term capital requirements. The annual capital requirement represents the average amount per year that the Town should allocate towards funding rehabilitation and replacement needs.



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

5.1.5 Risk & Criticality

Risk Matrix

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

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

Risks to Current Asset Management Strategy

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

Asset Data & Information

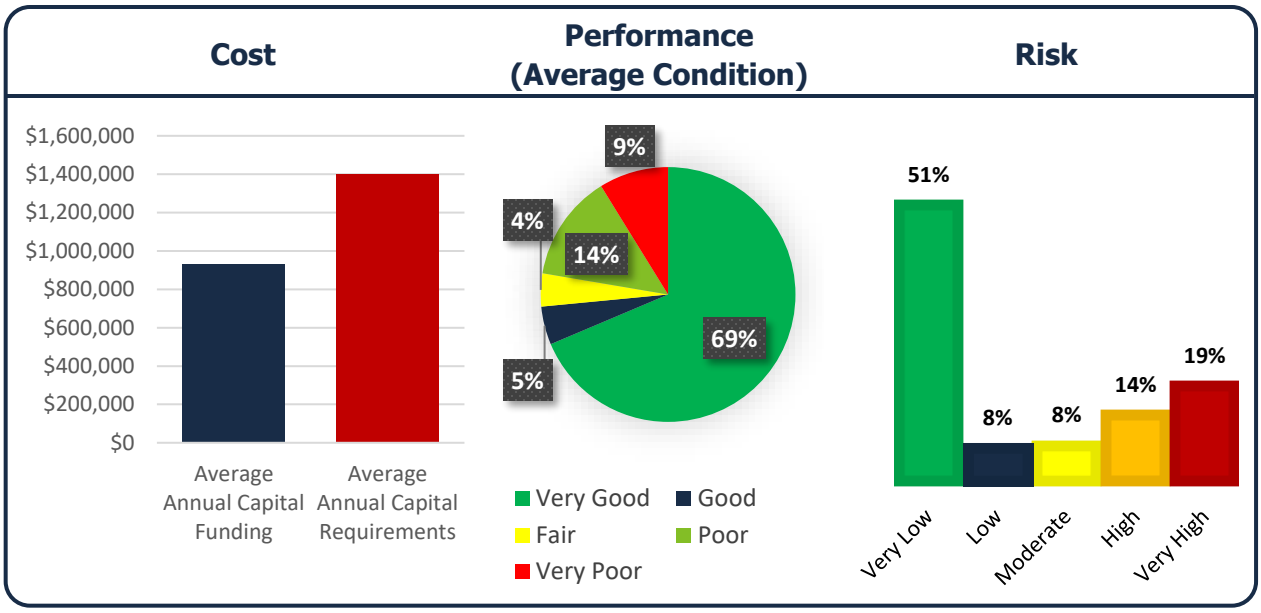
There is a lack of confidence in the available data and information for the water network. The water network is lacking assessed condition data and accurate replacement costs. Staff should plan to prioritize data refinement efforts to increase confidence in the accuracy and reliability of asset data and information.

Growth and Demand

The Town of Carleton is expected to experience moderate to severe growth. Population and employment growth will increase the demand on municipal services and potentially decrease the lifecycle of certain assets. Demand also often increases when the Town experiences drought – an additional risk brought on by climate change. As the population continues to grow, the Town must prioritize expanding its capacity to serve a larger population.

5.1.6 Levels of Service

The following table outlines the high-level service indicators for Water assets: cost, performance (condition), and risk.



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

Community Levels of Service

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

Service Attribute	Qualitative Description	Current LOS (2018)
Scope	Description, which may include maps, of the user groups or areas of the municipality that are connected to the municipal water system	Hydraulic model maps from JLR can be seen in AMP appendix B. The Town estimates that less than 2% of households are on private services.
	Description, which may include maps, of the user groups or areas of the municipality that have fire flow	See Appendix B
Reliability	Description of boil water advisories and service interruptions	Experience an average of 1 break per year, with small impacts. Two breaks occurred in 2019 and no breaks occurred in 2020.

Technical Levels of Service

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

Service Attribute	Technical Metric	Current LOS (2018)
Scope	% of properties connected to the municipal water system	98%
	% of properties where fire flow is available	98%
Reliability	# of connection-days per year where a boil water advisory notice is in place compared to the total number of properties connected to the municipal water system	0
	# of connection-days per year where water is not available due to water main breaks compared to the total number of properties connected to the municipal water system	0
Performance	Capital re-investment rate	1.1%

5.1.7 Recommendations

Condition Assessment Strategies

- Identify condition assessment strategies for high value and high-risk water network assets. Staff should develop condition ratings using age, material, and main break records to determine condition for water mains.

Replacement Costs

- A majority of 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.

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

5.2 Sanitary Sewer Network

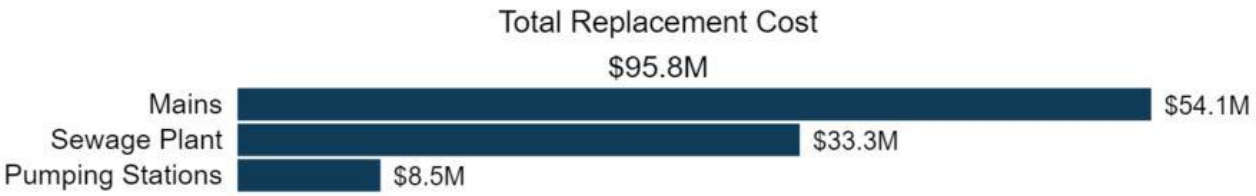
The Sanitary Sewer services provided by the Town are overseen by the Public Works department and Ontario Clean Water Association (OCWA). They are responsible for the following:

- Pumping stations
- Sewage Plant
- Mains

5.2.1 Asset Inventory & Replacement Cost

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

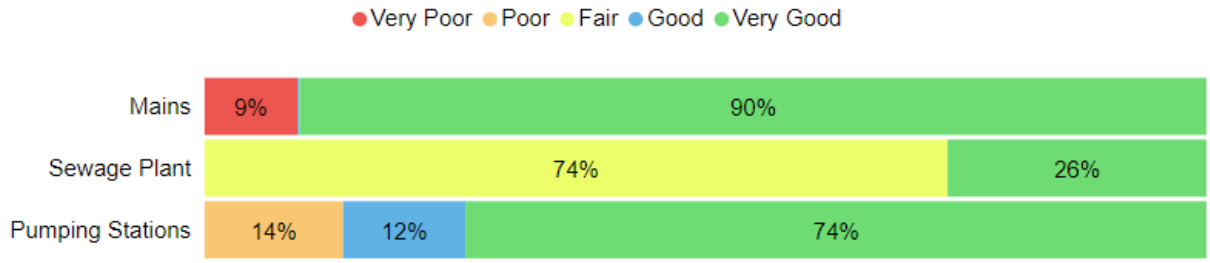
Asset Segment	Quantity (components)	Replacement Cost Method	Total Replacement Cost
Mains	61,188 m	CPI Tables	$54,050,465
Sewage Plant	1 (5)	CPI Tables	$33,264,522
Pumping Stations	11	92% CPI Tables 8% User-Defined	$8,469,254
			$95,784,241



5.2.2 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	84%	Very Good	Age-Based
Sewage Plant	62%	Good	Age-Based
Pumping Stations	81%	Very Good	100% Assessed
	76%	**Good**	**8.84% Assessed**



To ensure that the Town's Sanitary Sewer Network continues to provide an acceptable level of service, the Town 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 Network.

Current Approach to Condition Assessment

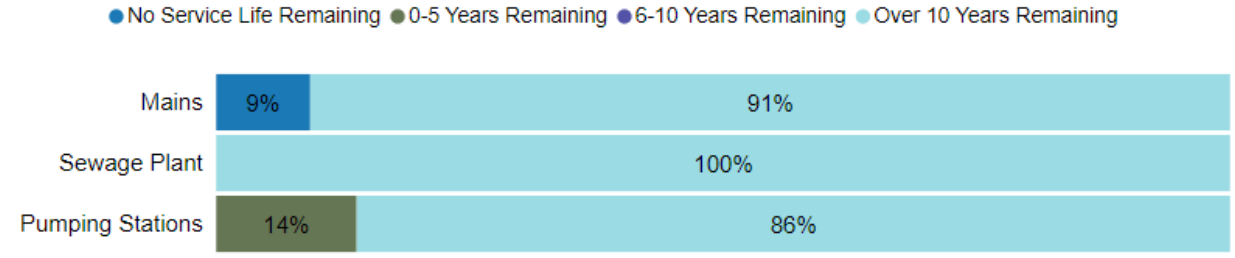
Accurate and reliable condition data allows staff to more confidently determine the remaining service life of assets and identify the most cost-effective approach to managing assets. The following describes the municipality's current approach:

- There are no formal condition assessment programs in place for the sanitary mains. Resident complaints drive most maintenance, rehabilitation, and replacement activities. CCTV inspections take place when above ground assets such as roads are replaced.
- OCWA manages the pumping stations and treatment plant. A condition assessment was completed for the pumping station in the past; the Town is considering adopting a 5- to 10-year program to renew condition assessments.
- The Town will be developing a Water and Wastewater Master Plan to support asset management decision-making and project prioritization.

Estimated Useful Life & Average Age

The Estimated Useful Life for Sanitary Sewer 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)
Mains	80 Years	27.6	52.3
Sewage Plant	60 Years	11.9	48.1
Pumping Stations	50 Years	30.4	8.9
		27.6	**51.8**



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.

5.2.3 Lifecycle Management Strategy

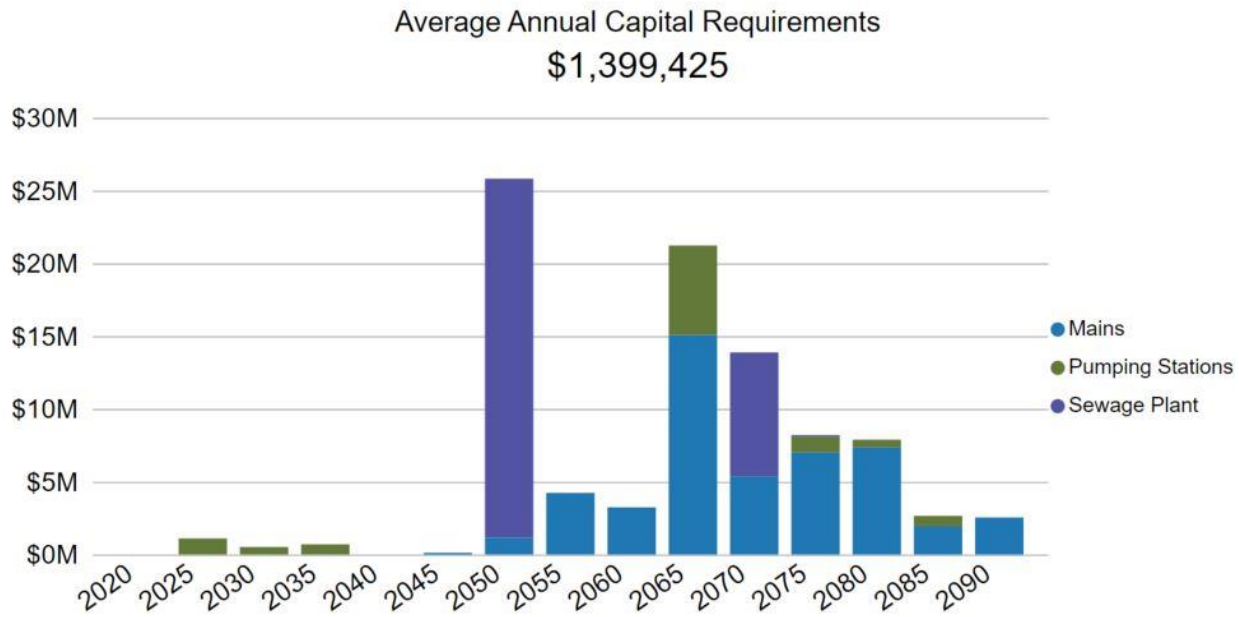
The condition or performance of most assets will deteriorate over time. This process is affected by a range of factors including an asset's characteristics, location, utilization, maintenance history and environment. To ensure that municipal assets are performing as expected and meeting the needs of customers, it is important to establish a lifecycle management strategy to proactively manage asset deterioration.

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

Activity Type	Description of Current Strategy
Maintenance	Sewer main flushing/cleaning is completed every 4 years. Staff work with contractors to complete manhole inspections annually.
	OCWA maintains the pumpting stations and treatment plant.
Rehabilitation /Replacement	There are very few rehabilitation activities required for saintary mains, apart from minor spot repairs. Some relining takes place but no ongoing program is in place.
	OCWA conducts internal assessments to determine pump replacements and replacement of other major items. Annual reports are conducted by OCWA and provided to the Town.
	The Town develops a 10-year capital plan. OCWA develops a 5-year capital plan that is found to be more reliable than the 10-year capital plan.

Forecasted Capital Requirements

The following graph forecasts long-term capital requirements. The annual capital requirement represents the average amount per year that the Town should allocate towards funding rehabilitation and replacement needs.



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

5.2.4 Risk & Criticality

Risk Matrix

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

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

Risks to Current Asset Management Strategy

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

Asset Data & Information

There is a lack of confidence in the available data and information for the sanitary sewer network. The sanitary sewer network is lacking assessed condition data and accurate replacement costs. Staff should plan to prioritize data refinement efforts to increase confidence in the accuracy and reliability of asset data and information.

Lifecycle Management Strategies

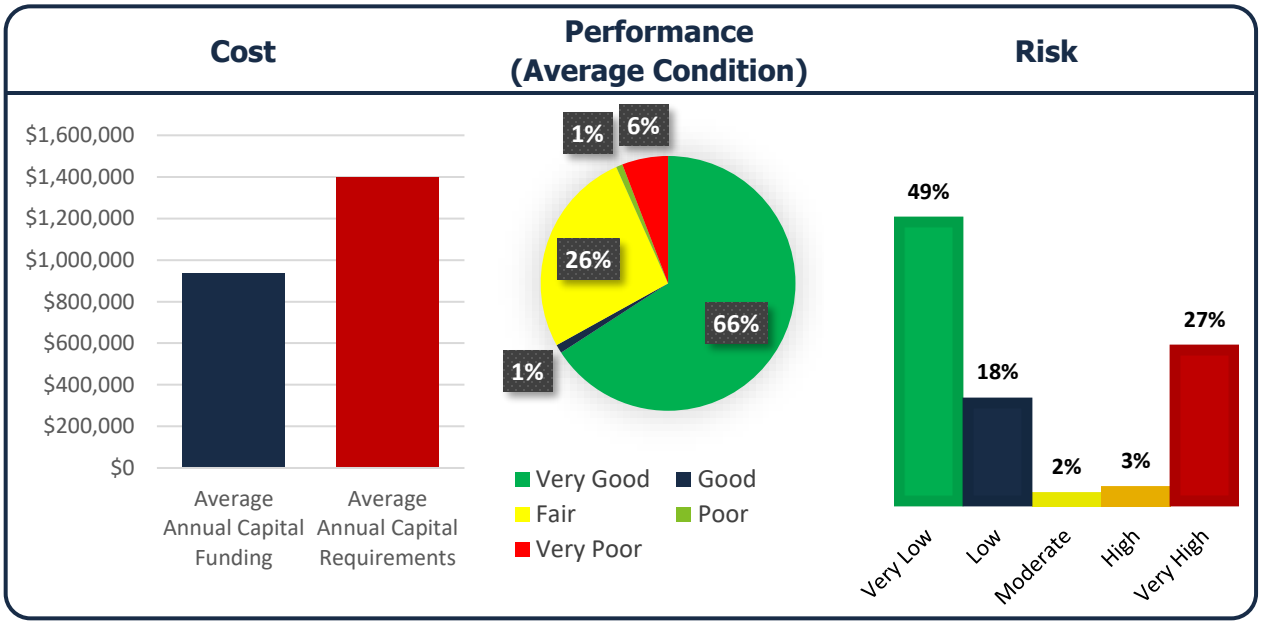
The current lifecycle management strategy for the sanitary sewer network is considered more reactive than proactive. It is a challenge to find the right balance between maintenance, capital rehabilitation, and reconstruction. In the absence of mid-lifecycle rehabilitative events, most mains are simply maintained with the goal of full replacement once they reach its end-of-life. Staff hope to develop better defined strategies that will extend lifecycle and a lower total cost. These strategies will require sustainable annual funding to minimize the deferral of capital works.

Inflow and Infiltration

The Town has experienced inflow and infiltration (I&I) issues. I&I has resulted in by-passes to the river. Staff need to identify the specific location and causes of I&I. Private connections and extreme rainfall events are likely causes of I&I, thus overwhelming the sanitary treatment plant.

5.2.5 Levels of Service

The following table outlines the high-level service indicators for Sanitary Sewer assets: cost, performance (condition), and risk.



The following tables identify the Town's current level of service for the Sanitary Sewer 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 Town 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 Sanitary Sewer Network.

Service Attribute	Qualitative Description	Current LOS (2019)
Scope	Description, which may include maps, of the user groups or areas of the municipality that are connected to the municipal sanitary sewer system	See Appendix B
Reliability	Description of how combined sewers in the municipal sanitary sewer system are designed with overflow structures in place which allow overflow during storm events to prevent backups into homes	The Town 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 Town 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	The Town's sanitary sewer system is susceptible to extreme rain events. The system experiences a significant amount of inflow and infiltration which will occasionally overwhelm the sanitary treatment plant. Unfiltered water may sometimes reach the river. The Town has implemented UV disinfection as a final resort to treat any unfiltered water reaching the river. Over the past two years (2019-2020), the Town has had one sanitary sewer back-up (Jan. 2020) where the sewer, located in the rear yards of properties, became blocked with yard debris. The issue was rectified. The Town will

Service Attribute	Qualitative Description	Current LOS (2019)
		investigate options to replace covers to prevent reoccurrence.
	Description of how sanitary sewers in the municipal sanitary sewer system are designed to be resilient to stormwater infiltration	The Town tracks costumer complaints related to sewer backups. The Town has conducted a study to identify infiltration and added lining to sewers where infiltration was an issue.
	Description of the effluent that is discharged from sewage treatment plants in the municipal sanitary sewer system	Effluent refers to water pollution that is discharged from a sanitary treatment plant, and may include suspended solids, total phosphorous and biological oxygen demand. The Wastewater Systems Effluent Regulation, as established under the Fisheries Act, identifies mandatory minimum effluent quality standards. The Town via OCWA, follows all requirements for monitoring, record-keeping and toxicity testing as specified and have not experienced any effluent violations.

Technical Levels of Service

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

Service Attribute	Technical Metric	Current LOS (2019)
Scope	% of properties connected to the municipal wastewater system	98%
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 sanitary sewer system	N/A
	# of connection-days per year having sanitary sewer backups compared to the total number of properties connected to the municipal sanitary sewer system	0
	# of effluent violations per year due to wastewater discharge compared to the total number of properties connected to the municipal sanitary sewer system	0
Performance	Capital re-investment rate	1.0%

5.2.6 Recommendations

Condition Assessment Strategies

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

Replacement Costs

- A majority of 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.

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 Town'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 Town 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 Town to more effectively plan for new infrastructure, and the upgrade or disposal of existing infrastructure

- Moderate population and employment growth is expected

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

6.1 Description of Growth Assumptions

The demand for infrastructure and services will change over time based on a combination of internal and external factors. Understanding the key drivers of growth and demand will allow the Town 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 Carleton Place Official Plan (April 2014)

The Town adopted the most recent version of the Official Plan in July 2013, with modification from April 2014. The vision of the Official Plan is to maintain and celebrate the Town's heritage through balanced and sustainable growth to support a superior quality of life for the Town's citizens.

The Town of Carleton Place Official Plan is essential for the management of future growth, development, and change in the municipality. The Town has experienced significant growth over the past couple of decades. The municipality has experienced growth in its employment areas as well as a slight decline related to vacant or underutilized non-residential buildings in the Town's core area.

The Official Plan is designed to encourage and manage continued growth which is expected to result in a forecasted population of approximately 20,964 by 2038[15]. In 2016, the population of the Town was recorded at 11,936 and total private dwellings occupied by usual residents was recorded at 4,744.

Notably, the population of Carleton Place census agglomeration (CA) was stated as 31,451 in 2016. The CA population describes the greater population from adjacent municipalities that commute to Carleton Place, which is considered a CA core. The Town and its infrastructure therefore service a population greater than their residents. This factor will be important to consider in the analysis of the impact of growth on the Municipality's lifecycle activities.

6.1.2 Lanark County (June 2012)

The County is responsible for the allocation of growth to the local municipalities. Lanark County adopted their first Sustainable Communities Official Plan in June 2014. The County's vision is to strengthen and diversify the economy, effectively management growth, protect the environment, preserve heritage, and maintain their unique character for future generations.

Lanark County is expecting moderate population growth between the years 2011 and 2031. According to projection, the 2011 population of 56,589 may reach 70,434 by 2031. The Town of Carleton Place will likely makeup 20.5% of the County's growth.

[15] Official Plan amended in June 2019 to include revised growth projections.

6.1.3 Development Charges Background Study (2020)

The Town of Carleton Place recently completed a Development Charges Background Study in 2020. The following table provides the most up to date population projections determined by the Town based on data collection between November 2019 and March 2020.

Period	Population	Housing Units	Employment
Early 2020	12,088	5,274	4,122
Early 2030	17,625	8,110	5,627
Early 2038	20,964	9,849	6,411
Urban Buildout	23,641	1,340	6,961

6.2 Impact of Growth on Lifecycle Activities

By July 1, 2025, the Town'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 Town'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 Town 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 levels of service.

7 Financial Strategy

Key Insights

- The Town is committing approximately $5.2 million towards capital projects per year from sustainable revenue sources
- Given the annual capital requirement of $6.8 million, there is currently a funding gap of $1.7 million annually
- For tax-funded assets, we recommend increasing tax revenues by 0.8% each year for the next 10 years to achieve a sustainable level of funding
- For the Sanitary Sewer Network, we recommend increasing rate revenues by 0.5% annually for the next 10 years to achieve a sustainable level of funding
- For the Water Network, we recommend increasing rate revenues by 1.3% annually for the next 10 years to achieve a sustainable level of funding

7.1 Financial Strategy Overview

For an asset management plan (AMP) to be effective and meaningful, it must be integrated with a long-term financial plan (LTFP). The development of a comprehensive LTFP will allow the Town of Carleton Place to identify the financial resources required for sustainable asset management based on existing asset inventories, desired levels of service, and projected growth requirements.

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

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

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

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

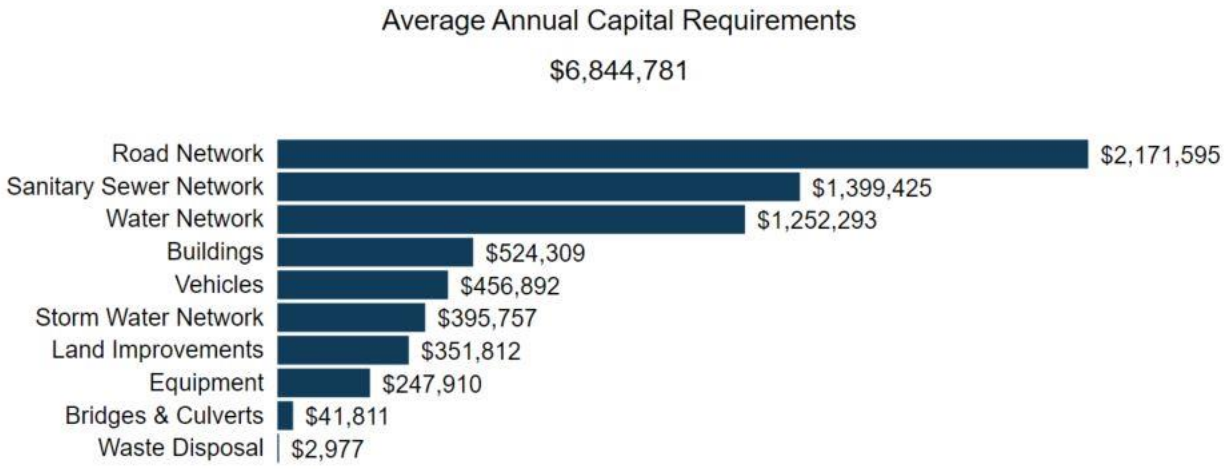
1. In order to reduce financial requirements, consideration has been given to revising service levels downward.
2. All asset management and financial strategies have been considered. For example:

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 Town 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 Town must allocate approximately $6.8 million annually to address capital expenditures (CapEx) for the assets included in this AMP.



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

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

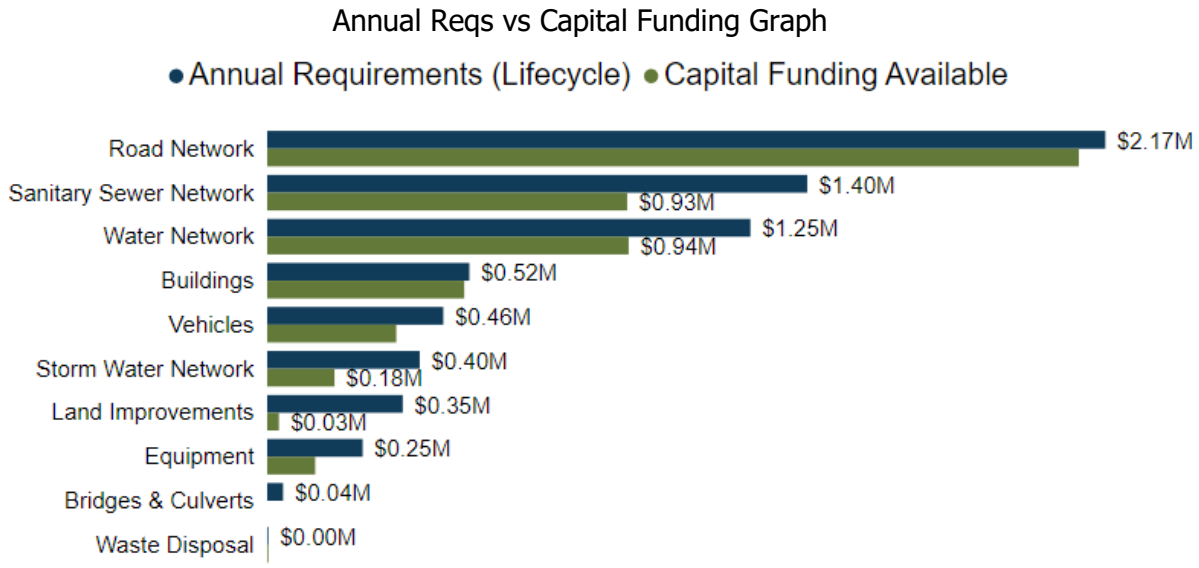
1. **Replacement Only Scenario**: Based on the assumption that assets deteriorate and – without regularly scheduled maintenance and rehabilitation – are replaced at the end of their service life.
2. **Lifecycle Strategy Scenario**: Based on the assumption that lifecycle activities are performed at strategic 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	$2,362,000	$2,172,000	$190,000

The implementation of a proactive lifecycle strategy for roads leads to a potential annual cost avoidance of $190,000 for the Road Network. This represents an overall reduction of the annual requirements for roads by 8.0%. As the lifecycle strategy scenario represents the lowest cost option available to the Town, 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 Town is committing approximately $5,150,000 towards capital projects per year. Given the annual capital requirement of $6,845,000, there is currently a funding gap of $1,695,000 annually.



7.2 Funding Objective

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

a) **Tax Funded Assets:** Road Network, Stormwater Network, Bridges & Culverts, Buildings & Facilities, Machinery & Equipment, Land Improvements, Vehicles, Waste Disposal
b) Rate-Funded Assets: Water Network, Sanitary Sewer Network

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

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

7.3 Financial Profile: Tax Funded Assets

7.3.1 Current Funding Position

The following tables show, by asset category, Carleton Place's average CapEx requirements, current funding positions, and funding increases required to achieve full funding on assets funded by taxes.

Asset Category	Avg. Annual Requirement	Annual Funding Available				Annual Deficit
		Taxes	Gas Tax	OCIF	Total Available	
Road Network	2,172,000	1,200,000	338,000	565,000	2,103,000	69,000
Stormwater Network	396,000	175,000			175,000	221,000
Bridges & Culverts	42,000				0	42,000
Buildings & Facilities	524,000	511,000			511,000	13,000
Machinery & Equipment	248,000	125,000			125,000	123,000
Land Improvements	352,000	31,000			31,000	321,000
Vehicles	457,000	335,000			335,000	122,000
Waste Disposal	3,000				0	3,000
	4,194,000	**2,375,000**	**338,000**	**565,000**	**3,280,000**	**914,000**

The average annual CapEx requirement for the above categories is $4.194 million. Annual revenue currently allocated to these assets for capital purposes is $3.280 million leaving an annual deficit of $914k. Put differently, these infrastructure categories are currently funded at 78.2% of their long-term requirements.

7.3.2 Full Funding Requirements

In 2020, Town of Carleton Place has annual tax revenues of $2.38 million. As illustrated in the following table, without consideration of any other sources of revenue or cost containment strategies, full funding would require the following tax change over time:

Asset Category	Tax Change Required for Full Funding
Road Network	0.6%
Stormwater Network	1.9%
Bridges & Culverts	0.4%
Buildings & Facilities	0.1%
Machinery & Equipment	1.1%
Land Improvements	2.8%
Vehicles	1.1%
Waste Disposal	0.0%
Total	**8.0%**

Our recommendations include capturing the above change and allocating them to the infrastructure deficit outlined above. The table below outlines a phased-in approach of up to 20 years:

	5 Years	10 Years	15 Years	20 Years
Infrastructure Deficit	914,000	914,000	914,000	914,000
Change in Debt Costs	N/A	N/A	N/A	N/A
Change in OCIF Grants	N/A	N/A	N/A	N/A
Resulting Infrastructure Deficit:	**914,000**	**914,000**	**914,000**	**914,000**
7.6				
Tax Increase Required	8.0%	8.0%	8.0%	8.0%
Annually:	**1.6%**	**0.8%**	**0.5%**	**0.4%**

7.3.3 Financial Strategy Recommendations

Considering all the above information, we recommend the 10-year option. This involves full CapEx funding being achieved over 10 years by:

a) increasing tax revenues by 0.8% each year for the next 10 years solely for the purpose of phasing in full funding to the asset categories covered in this section of the AMP.
b) allocating the current gas tax and OCIF revenue as outlined previously.
c) allocating the scheduled OCIF grant increases to the infrastructure deficit as they occur.
d) reallocating appropriate revenue from categories in a surplus position to those in a deficit position.
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[16].
2. We realize that raising tax revenues by the amounts recommended above for infrastructure purposes will be very difficult to do. However, considering a longer phase-in window may have even greater consequences in terms of infrastructure failure.

Although this option achieves full CapEx funding on an annual basis in 10 years and provides financial sustainability over the period modeled, the recommendations do require prioritizing capital projects to fit the resulting annual funding available. Current data shows a backlog of $2.433 million for the Road Network, $30k for the Buildings & Facilities, $927k for Machinery & Equipment, $178k for Land Improvements, and $1.358 million for Vehicles. These backlogs are based on available data, which currently considers age-based condition. Inclusion of assessed condition for these assets will likely reduce the overall backlogs.

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.

[16] The Town 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.

7.4 Financial Profile: Rate Funded Assets

7.4.1 Current Funding Position

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

Asset Category	Avg. Annual Requirement	Annual Funding Available				Annual Deficit
		Rates	To Oper	OCIF	Total Available	
Water Network	1,252,000	2,436,000	-1,499,000	0	937,000	315,000
Sanitary Sewer Network	1,399,000	2,722,000	-1,789,000	0	933,000	466,000
	2,651,000	**5,158,000**	**-3,288,000**	**0**	**1,870,000**	**781,000**

The average annual CapEx requirement for the above categories is $2.651 million. Annual revenue currently allocated to these assets for capital purposes is $1.870 million leaving an annual deficit of $781k. Put differently, these infrastructure categories are currently funded at 70.5% of their long-term requirements.

7.4.2 Full Funding Requirements

In 2020, Carleton Place had annual sanitary revenues of $2.722 million and annual water revenues of $2.436 million. As illustrated in the table below, without consideration of any other sources of revenue, full funding would require the following changes over time:

Asset Category	Rate Change Required for Full Funding
Water Network	12.9%
Sanitary Sewer Network	17.1%

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

a) Debt payments for the Sanitary Sewer Network will be decreasing by $330k over the next 5 years.
b) Although not captured in the tables below, there is a repayment to reserves annually of 121k scheduled to end in 2022.

Without Capturing Debt Cost Changes								
	Water Network				Sanitary Sewer Network			
	5 Years	10 Years	15 Years	20 Years	5 Years	10 Years	15 Years	20 Years
Infrastructure Deficit	315,000	315,000	315,000	315,000	466,000	466,000	466,000	466,000
Rate Increase Required	12.9%	12.9%	12.9%	12.9%	17.1%	17.1%	17.1%	17.1%
Annually:	**2.6%**	**1.3%**	**0.9%**	**0.6%**	**3.4%**	**1.7%**	**1.1%**	**0.9%**

With Capturing Debt Cost Changes								
	Water Network				Sanitary Sewer Network			
	5 Years	10 Years	15 Years	20 Years	5 Years	10 Years	15 Years	20 Years
Infrastructure Deficit	315,000	315,000	315,000	315,000	466,000	466,000	466,000	466,000
Less: Decrease in debt payments	0	0	0	0	0	-330,000	-330,000	-330,000
Net Defict	**315,000**	**315,000**	**315,000**	**315,000**	**466,000**	**136,000**	**136,000**	**136,000**
Rate Increase Required	12.9%	12.9%	12.9%	12.9%	17.1%	5.0%	5.0%	5.0%
Annually:	**2.6%**	**1.3%**	**0.9%**	**0.6%**	**3.4%**	**0.5%**	**0.3%**	**0.3%**

7.4.3 Financial Strategy Recommendations

Considering the above information, we recommend the 10-year option that includes debt cost reallocations. This involves full CapEx funding being achieved over 10 years by:

a) when realized, reallocating the debt cost reductions to the infrastructure deficit as outlined above.
b) increasing rate revenues by 1.3% for the Water Network and 0.5% for the Sanitary Sewer Network each year for the next 10years solely for the purpose of phasing in full funding to the asset categories covered in this section of the AMP.
c) increasing existing and future infrastructure budgets by the applicable inflation index on an annual basis in addition to the deficit phase-in.

Notes:

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

Although this strategy achieves full CapEx funding for rate-funded assets in 10 years, the recommendation does require prioritizing capital projects to fit the annual funding available. Current data shows a pent-up investment demand of $877k for the Water Network and $579k for the Sanitary Sewer Network.

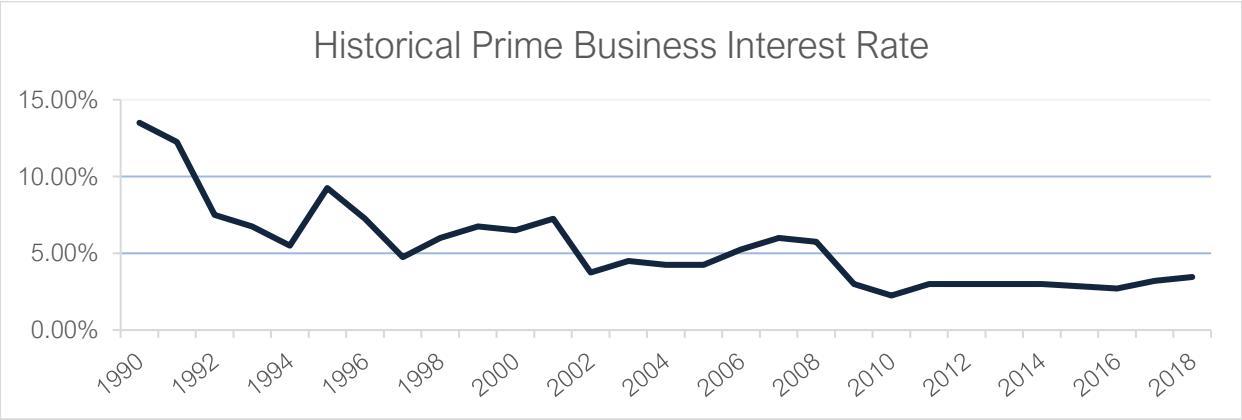
Prioritizing future projects will require the current data to be replaced by condition-based data. Although our recommendations include no further use of debt, the results of the condition-based analysis may require otherwise.

7.5 Use of Debt

For reference purposes, the following table outlines the premium paid on a project if financed by debt. For example, a $1M project financed at 3.0%[17] 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:



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

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

The following tables outline how the Town has historically used debt for investing in the asset categories as listed. There is currently $1,486,000 of debt outstanding for the assets covered by this AMP with corresponding principal and interest payments of $330,000 well within its provincially prescribed maximum of $5,366,000.

Asset Category	Current Debt Outstanding	Use of Debt in the Last Five Years				
		2016	2017	2018	2019	2020
Road Network	0	0	0	0	0	0
Stormwater Network	0	0	0	0	0	0
Bridges & Culverts	0	0	0	0	0	0
Buildings & Facilities	0	0	0	0	0	0
Machinery & Equipment	0	0	0	0	0	0
Land Improvements	0	0	0	0	0	0
Vehicles	0	0	0	0	0	0
Waste Disposal	0	0	0	0	0	0
Total Tax Funded:	**0**	**0**	**0**	**0**	**0**	**0**
Water Network	0	0	0	0	0	0
Sanitary Sewer Network	1,486,000	0	0	0	0	0
Total Rate Funded:	**1,486,000**	**0**	**0**	**0**	**0**	**0**

Asset Category	Principal & Interest Payments in the Next Ten Years						
	2020	2021	2022	2023	2024	2025	2030
Road Network	0	0	0	0	0	0	0
Stormwater Network	0	0	0	0	0	0	0
Bridges & Culverts	0	0	0	0	0	0	0
Buildings & Facilities	0	0	0	0	0	0	0
Machinery & Equipment	0	0	0	0	0	0	0
Land Improvements	0	0	0	0	0	0	0
Vehicles	0	0	0	0	0	0	0
Waste Disposal	0	0	0	0	0	0	0
Total Tax Funded:	**0**	**0**	**0**	**0**	**0**	**0**	**0**
Water Network	0	0	0	0	0	0	0
Sanitary Sewer Network	330,000	330,000	330,000	330,000	330,000	330,000	$0
Total Rate Funded:	**330,000**	**330,000**	**330,000**	**330,000**	**330,000**	**330,000**	**330,000**

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

7.6 Use of Reserves

7.6.1 Available Reserves

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

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

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

Asset Category	Balance at December 31, 2020
Road Network	1,573,000
Stormwater Network	964,000
Bridges & Culverts	938,000
Buildings & Facilities	2,373,000
Machinery & Equipment	1,304,000
Land Improvements	1,214,000
Vehicles	1,127,000
Waste Disposal	938,000
Total Tax Funded:	**10,431,000**
Water Network	10,046,000
Sanitary Sewer Network	10,046,000
Total Rate Funded:	**20,092,000**

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 consider 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 Carleton Place'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.

7.6.2 Recommendation

In 2024, Ontario Regulation 588/17 will require the Town to integrate proposed levels of service for all asset categories in its asset management plan update. We recommend that future planning should reflect adjustments to service levels and their impacts on reserve balances.

8 Appendices

Key Insights

- Appendix A identifies projected 10-year capital requirements for each asset category
- Appendix B includes several maps that have been used to visualize the current level of service
- Appendix C identifies the criteria used to calculate risk for each asset category
- Appendix D provides additional guidance on the development of a condition assessment program

Appendix A: 10-Year Capital Requirements

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

Road Network											
Segment	Backlog	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029
Curbs	$238,179	$0	$0	$0	$1,518,454	$0	$0	$9,555	$0	$0	$0
Paved Roads	$774,511	$631,500	$593,700	$1,162,500	$2,305,123	$61,800	$203,700	$0	$1,364,899	$12,128,405	$520,500
Sidewalks	$328,761	$0	$0	$0	$2,641,007	$0	$0	$37,885	$0	$0	$0
Street Lights	$970,280	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Street Signs	$145,542	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Traffic Lights	$139,233	$175,745	$0	$0	$0	$0	$0	$0	$0	$0	$113,839
	$2,596,506	$807,245	$593,700	$1,162,500	$6,464,584	$61,800	$203,700	$47,440	$1,364,899	$12,128,405	$634,339

Bridges & Culverts											
Segment	Backlog	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029
Central Bridge	$0	$0	$0	$0	$0	$0	$1,736,371	$0	$0	$0	$0
Gillies Bridge	$0	$0	$0	$0	$0	$0	$230,396	$0	$0	$0	$0
Rosamond Bridge	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
	$0	$0	$0	$0	$0	$0	$1,966,767	$0	$0	$0	$0

Storm Water Network											
Segment	Backlog	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029
Drain	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Mains	$104,140	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Storm Water Management Facility	$0	$0	$175,000	$0	$0	$0	$600,000	$0	$0	$600,000	$0
	$104,140	$0	$175,000	$0	$0	$0	$600,000	$0	$0	$600,000	$0

Buildings											
Segment	Backlog	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029
Daycare	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Fire Services	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Library	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Public Works	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Recreation	$6,260	$0	$0	$8,931	$9,746	$0	$0	$0	$8,001	$0	$0
Town Hall	$23,320	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Train Station	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
	$29,580	$0	$0	$8,931	$9,746	$0	$0	$0	$8,001	$0	$0

Equipment											
Segment	Backlog	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029
Fire	$115,568	$15,547	$0	$21,935	$65,446	$0	$44,664	$0	$0	$34,617	$17,681
Library	$377,472	$46,633	$50,918	$50,866	$149,020	$60,353	$0	$88,019	$336,086	$50,918	$138,885
Planning	$52,983	$0	$0	$0	$52,983	$0	$0	$52,983	$0	$0	$52,983
Police	$0	$0	$9,972	$0	$0	$0	$0	$0	$0	$0	$0
Public Works	$442,266	$7,597	$0	$0	$0	$63,468	$0	$136,130	$0	$0	$22,062
Town Hall	$0	$0	$30,522	$25,792	$25,325	$30,522	$0	$0	$30,522	$0	$107,328
	$988,289	$69,777	$91,412	$98,593	$292,774	$154,343	$44,664	$277,132	$366,608	$85,535	$338,939

Vehicles											
Segment	Backlog	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029
Building Department	$0	$0	$0	$0	$0	$0	$0	$27,144	$0	$0	$0
By-Law	$57,908	$0	$0	$0	$0	$35,819	$0	$0	$0	$0	$0
Protection	$1,668,178	$0	$0	$0	$0	$40,111	$0	$32,094	$0	$0	$54,231
Recreation	$278,895	$0	$57,870	$83,247	$39,734	$26,625	$25,344	$0	$0	$12,370	$13,489
Roads	$337,701	$360,000	$191,073	$67,059	$0	$122,869	$261,000	$0	$200,058	$260,099	$386,210
	$2,342,682	$360,000	$248,943	$150,306	$39,734	$225,424	$286,344	$59,238	$200,058	$272,469	$453,930

Land Improvements											
Segment	Backlog	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029
Boat Launch	$0	$0	$55,269	$0	$0	$0	$0	$0	$0	$11,576	$37,128
Fencing	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Parking Lots	$329,487	$0	$0	$144,000	$329,664	$504,000	$878,000	$240,000	$0	$0	$0
Parks & Playing Fields	$545,878	$0	$0	$49,511	$52,353	$0	$57,326	$0	$41,795	$0	$203,498
Playground Structures	$116,177	$0	$0	$24,968	$0	$157,511	$365,190	$0	$11,869	$0	$50,018
Shoreline	$0	$0	$0	$0	$0	$0	$0	$39,211	$0	$0	$0
Splash Pad	$0	$0	$0	$0	$0	$0	$0	$35,418	$0	$0	$0
Trails	$0	$0	$0	$68,571	$0	$0	$0	$75,388	$0	$0	$72,587
	$991,542	$0	$55,269	$287,050	$382,017	$661,511	$1,300,516	$390,017	$53,664	$11,576	$363,231

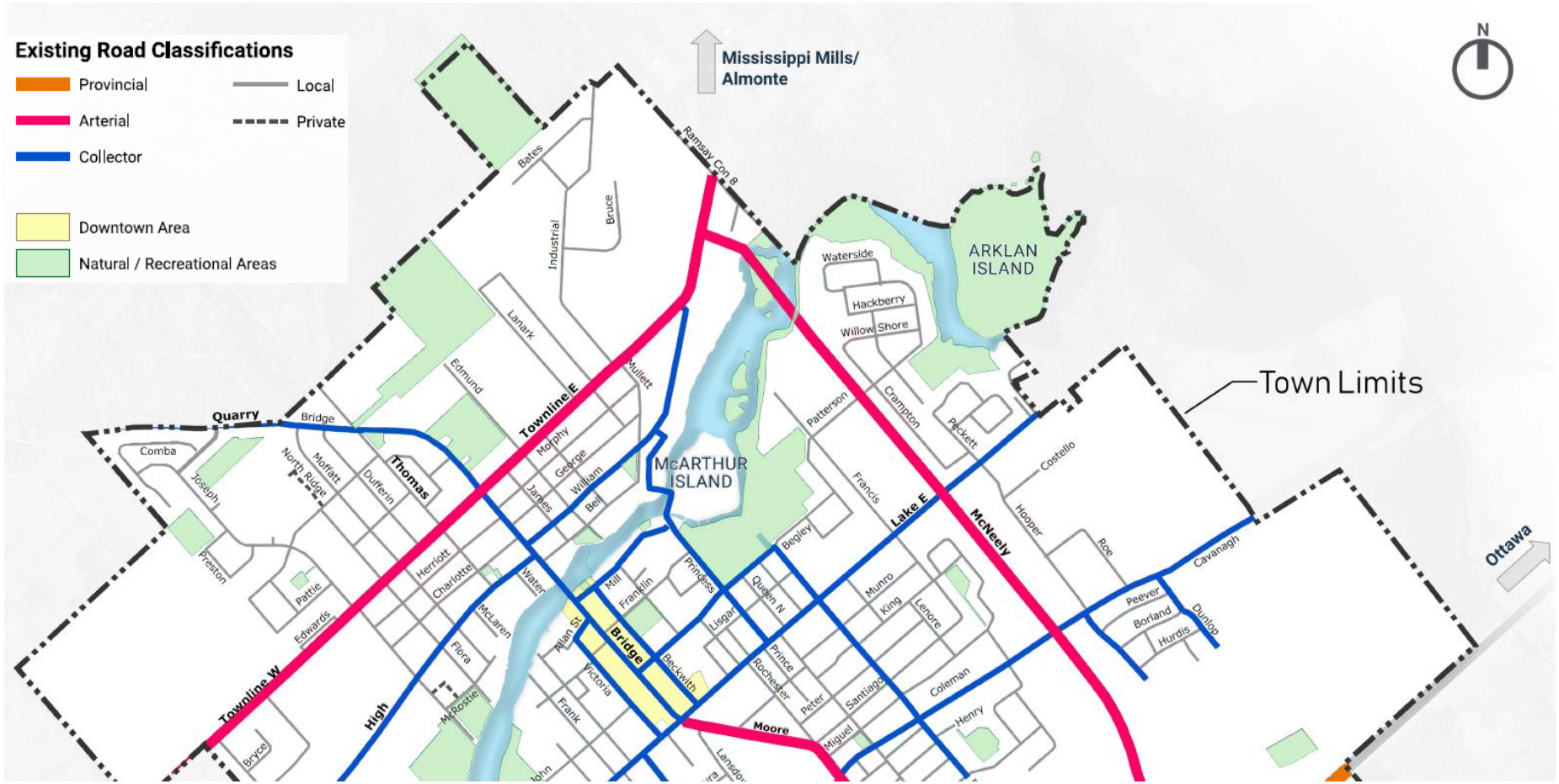
Solid Waste											
Segment	Backlog	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029
Solid Waste Facility	$0	$0	$0	$0	$0	$0	$0	$74,434	$0	$0	$0
	$0	$0	$0	$0	$0	$0	$0	$74,434	$0	$0	$0

Water Network											
Segment	Backlog	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029
Equipment	$39,359	$9,279	$0	$0	$0	$0	$0	$0	$0	$0	$0
Mains	$3,308,245	$0	$0	$0	$0	$0	$0	$0	$0	$0	$3,633,986
Vehicles	$36,344	$0	$0	$132,762	$0	$0	$87,186	$0	$0	$0	$0
Water Plant	$801,500	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Water Reservoir	$0	$0	$0	$0	$0	$0	$3,494,709	$0	$0	$0	$0
	$4,185,448	$9,279	$0	$132,762	$0	$0	$3,581,895	$0	$0	$0	$3,633,986

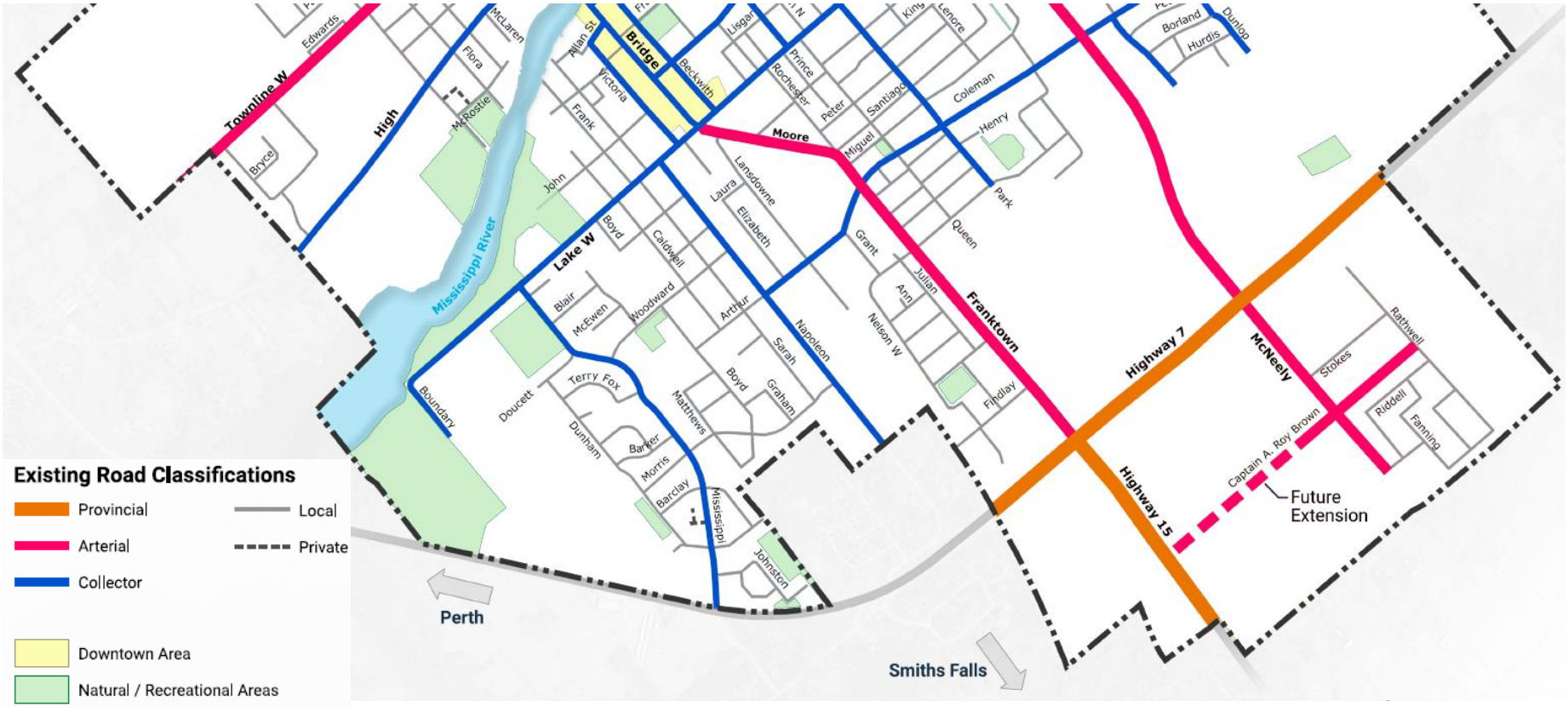
Sanitary Sewer Network											
Segment	Backlog	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029
Mains	$5,019,457	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Pumping Stations	$579,080	$0	$0	$0	$0	$0	$797,461	$0	$0	$310,479	$0
Sewage Plant	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
	$5,598,537	$0	$0	$0	$0	$0	$797,461	$0	$0	$310,479	$0

Appendix B: Level of Service Maps

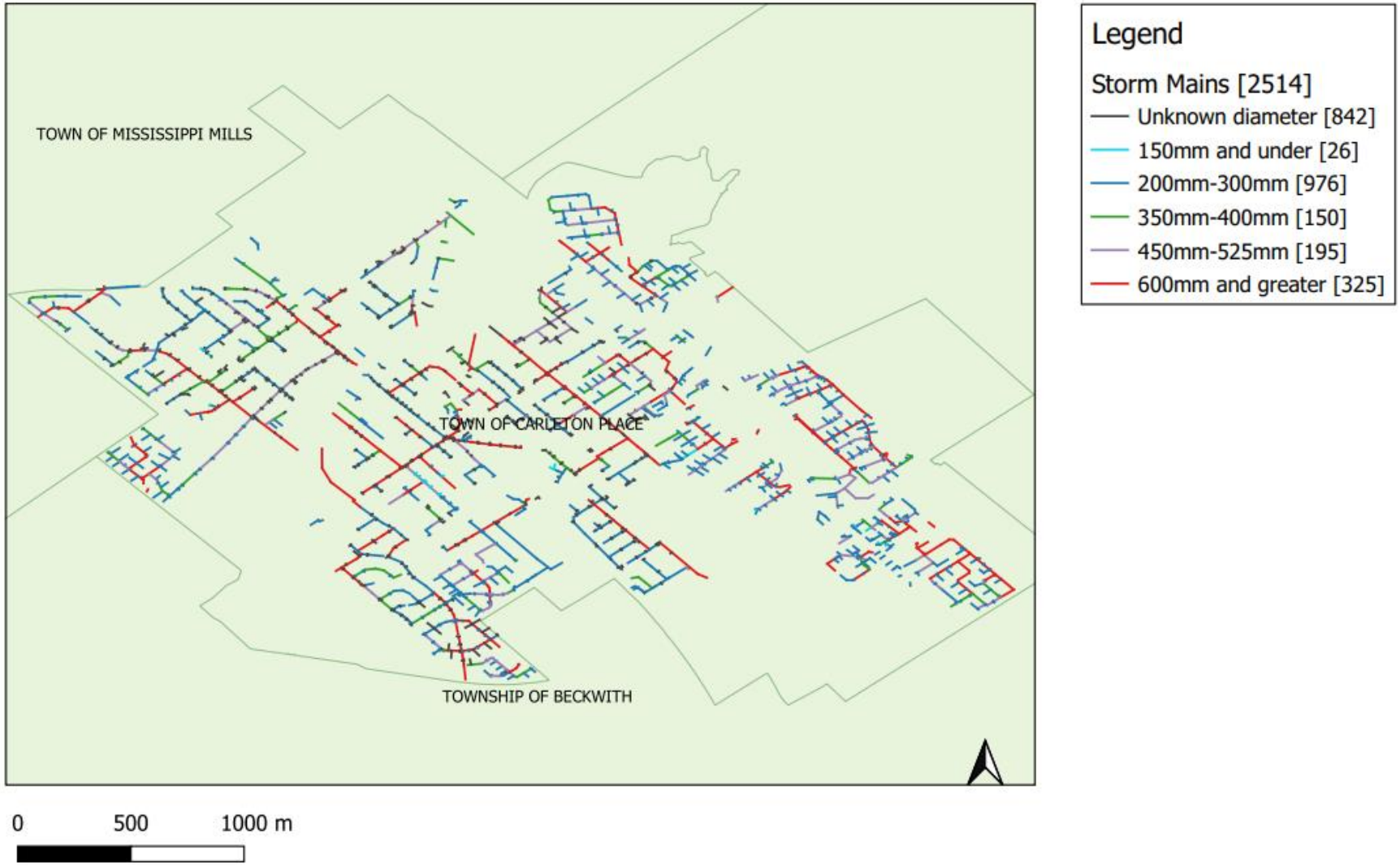
Road Network Map – Part 1



Road Network Map – Part 2

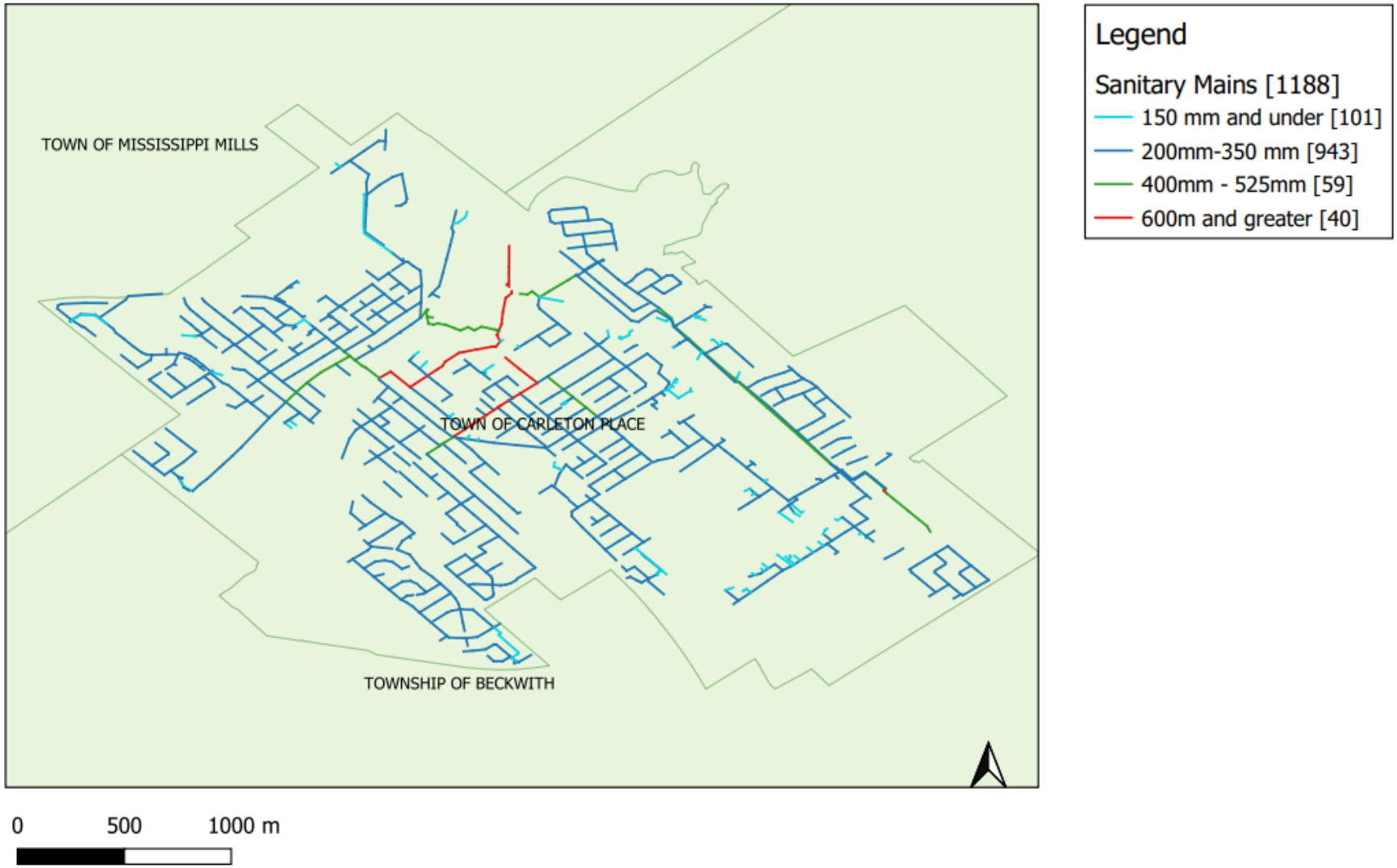


Storm Water Network Map



Water Network Map

Sanitary Sewer Network Map



Appendix C: Risk Rating Criteria

Probability of Failure

Asset Category	Risk Criteria	Criteria Weighting	Value/Range	Probability of Failure Score
Road Network, Sidewalks, Curbs, Bridges, Storm Water Network, Storm Water Management Ponds, Pumping Stations	Condition	100%	80-100	1
			60-79	2
			40-59	3
			20-39	4
			0-19	5
Sanitary Sewer Network (Mains)	Condition	70%	80-100	1
			60-79	2
			40-59	3
			20-39	4
			0-19	5
	Pipe Material	30%	Ductile Iron	5
			CSP	4
			Clay	3
			Concrete, Cement, Transite	2
			PVC	1
Water Network (Mains)	Condition	70%	80-100	1
			60-79	2
			40-59	3
			20-39	4
			0-19	5
	Pipe Material	30%	Cast Iron, Ductile Iron	5
			Copper, Copper Type k	4
			Stainless Steel	3
			PVC, Blue Brute	1

Consequence of Failure

Asset Category	Risk Classification	Risk Criteria	Value/Range	Consequence of Failure Score
Road Network (Roads)	Economic (100%)	Replacement Cost ($)	0-10,000	1
			10,000-100,000	2
			100,000-250,000	3
			250,000-1,000,000	4
			1,000,000+	5
Bridges	Economic (100%)	Replacement Cost ($)	0-100,000	1
			100,000-400,000	2
			400,000-600,000	3
			600,000-1,000,000	4
			1,000,000+	5
Storm Water Network	Economic (100%)	Replacement Cost ($)	0-100,000	1
			100,000-250,000	2
			250,000-500,000	3
			500,000-1,000,000	4
			1,000,000+	5
Sidewalks	Economic (70%)	Historical ($)	0-100,000	1
			100,000-250,000	2
			250,000-500,000	3
			500,000-1,000,000	4
			1,000,000+	5
Curbs	Economic (70%)	Historical ($)	0-100,000	1
			100,000-250,000	2
			250,000-500,000	3
			500,000-1,000,000	4
			1,000,000+	5

Asset Category	Risk Classification	Risk Criteria	Value/Range	Consequence of Failure Score
Storm Water Management Ponds	Economic (70%)	Historical (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
Pumping Stations	Economic (100%)	Historical (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
Water Network (Water Mains)	Economic (70%)	Pipe Diameter (mm)	0-100	1
			100-150	2
			150-200	3
			200-450	4
			450	5
Sanitary Sewer Network (Sanitary Mains)	Economic (100%)	Pipe Diameter (mm)	0-100	1
			100-250	2
			250-450	3
			450-750	4
			750	5

Appendix D: Condition Assessment Guidelines

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

Condition data is vital to the development of data-driven asset management strategies. Without accurate and reliable asset data, there may be little confidence in asset management decision-making which can lead to premature asset failure, service disruption and suboptimal investment strategies. To prevent these outcomes, the Town'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 Town'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 Town 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 Town 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 Town 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 Town 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 asset's 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