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Asset Management Plan

Town of Arnprior | 2021

This Asset Management Program was prepared by:

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Key Statistics

Replacement cost of asset portfolio
$254.4 million

Replacement cost of infrastructure per household
$59,088

Percentage of assets in fair or better condition
78%

Percentage of assets with assessed condition data
17%

Annual capital infrastructure deficit
$1.7 million

Recommended timeframe for eliminating annual infrastructure deficit
5-10 Years

Target reinvestment rate
2.61%

Actual reinvestment rate
1.93%

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Executive Summary

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

Scope

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

This AMP includes 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 $254.4 million. 78% of all assets analysed in this AMP are in fair or better condition and assessed condition data was available for 17% of assets. For the remaining 83% 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.

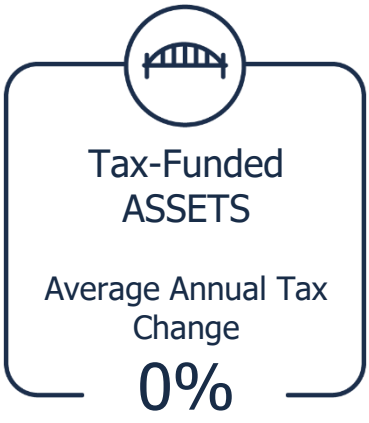
To meet capital replacement and rehabilitation needs for existing infrastructure, prevent infrastructure backlogs, and achieve long-term sustainability, the Town's average annual capital requirement totals $6.6 million. Based on a historical analysis of sustainable capital funding sources, the Town is committing approximately $4.9 million towards capital projects or reserves per year. As a result, there is currently an annual funding gap of $1.7 million.

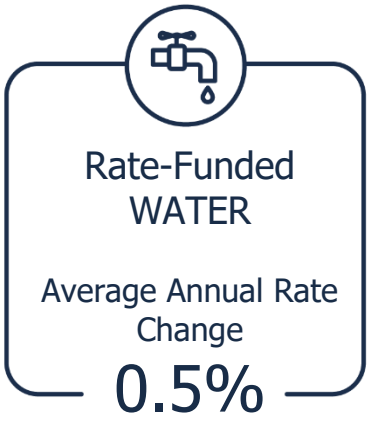
It is important to note that this AMP represents a snapshot in time and is based on the best available processes, data, and information at the Town. Strategic asset management planning is an ongoing and dynamic process that requires continuous improvement and dedicated resources.

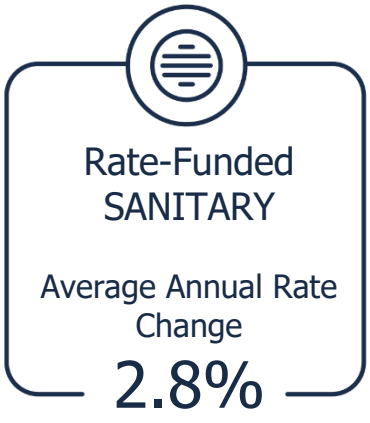
Average Annual Capital Requirement Deficit per Household

Recommendations

A financial strategy was developed to address the annual capital funding gap. The following graphics show the annual tax and rate change required to eliminate the Town's infrastructure deficit based on a 5-year plan for tax-funded assets and a 10-year plan for rate-funded assets:







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
- Continue annual review of short- and long-term plans to meet capital requirements
- Measure current levels of service and identify sustainable proposed levels of service

1 Introduction & Context

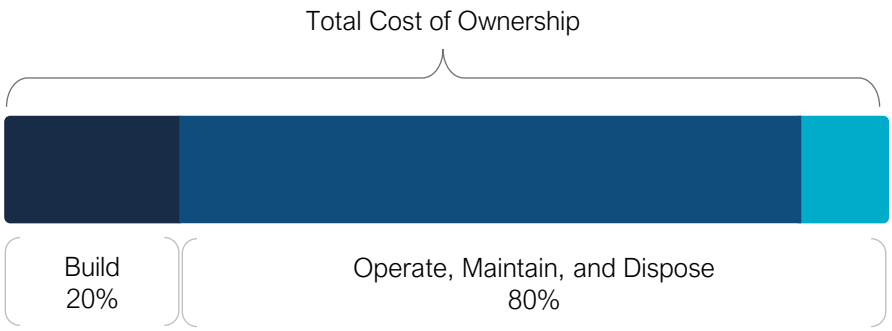
Key Insights

- 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 an essential element of broader asset management program. The industry-standard approach and sequence to developing a practical asset management program begins with a Strategic Plan, followed by an Asset Management Policy and an Asset Management Strategy, concluding with an Asset Management Plan.

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

1.1.1 Asset Management Policy

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

The Town of Arnprior adopted By-law No. 6951-19 a "By-law to establish and approve a Strategic Asset management Policy." The policy was enacted in on May 13, 2019, in accordance with Ontario Regulation 588/17.

The Strategic Asset Management Policy follows long-term objectives defined by the Town's Strategic Plan, including robust sustainable growth, sustainable financial model, infrastructure lifecycle renewal, effective service delivery, and sound operations.

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 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 or improved 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 rural road. These high-value assets should receive funding before others.

By identifying the various impacts of asset failure and the likelihood that it will fail, risk management strategies can identify critical assets, and determine where maintenance efforts, and spending, should be focused. Risk-based prioritization can be a useful tool to manage the infrastructure backlog in a way that is risk-averse.

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.

Community Levels of Service

Community levels of service are a simple, plain language description or measure of the service that the community receives. For core asset categories (Roads, Bridges & Culverts, Water, Wastewater, Storm Water) the Province, through O. Reg. 588/17, has provided qualitative descriptions that are required to be included in this AMP. For non-core asset categories, the 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 & Culverts, Water, Wastewater, Storm Water) the Province, through O. Reg. 588/17, has provided technical metrics that are required to be included in this AMP.

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 2025, 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 and risk of lifecycle activities
5. Population and employment forecasts
6. Discussion of growth impacts

2024

Asset Management Plan for Core and Non-Core Assets with the 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 8 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 Arnprior is produced in compliance with Ontario Regulation 588/17. The July 2022 deadline under the regulation—the first of three AMPs—requires analysis of only core assets (roads, bridges & culverts, water, wastewater, and Storm Water).

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
Storm Water Network	
Buildings	
Machinery & Equipment	
Vehicles	
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.

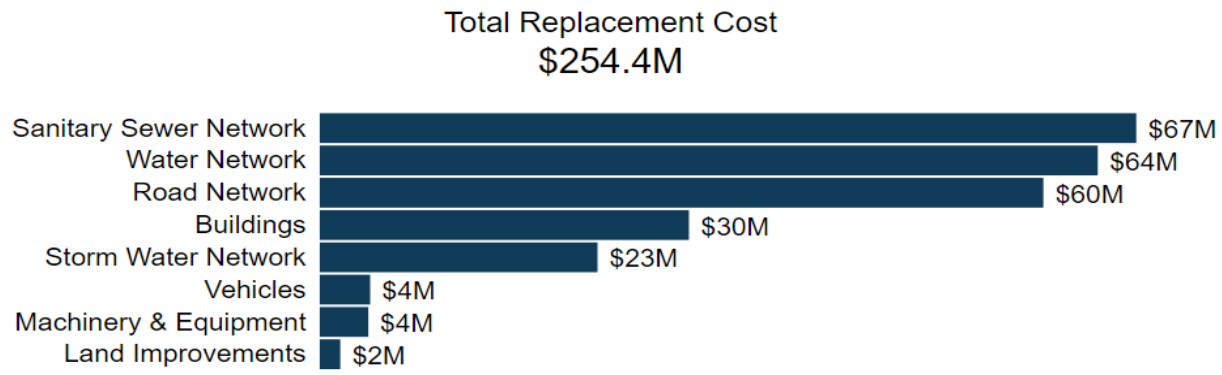
3 Portfolio Overview

Key Insights

- The total replacement cost of the Town's asset portfolio is $254.4 million
- The Town's target re-investment rate is 2.61%, and the actual re-investment rate is 1.93%, contributing to an expanding infrastructure deficit
- 78% of all assets are in fair or better condition
- 13% of assets are projected to require replacement in the next 10 years
- Average annual capital requirements total $6.6 million per year across all assets

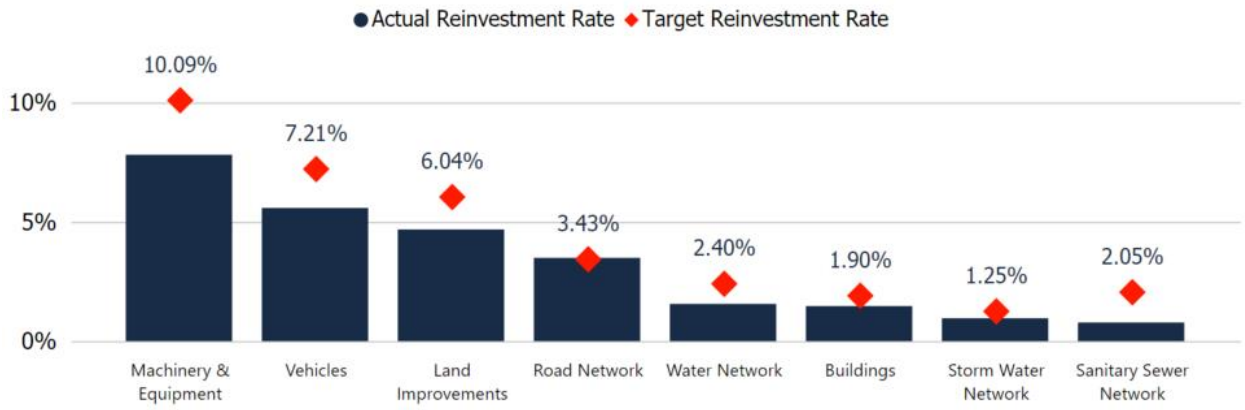
3.1 Total Replacement Cost of Asset Portfolio

The asset categories analyzed in this AMP have a total replacement cost of $254.4 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.



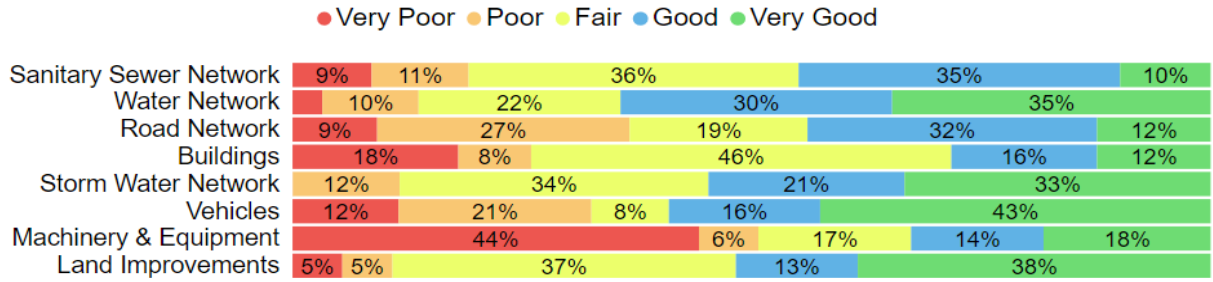
3.2 Target vs. Actual Reinvestment Rate

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 $6.6 million annually, for a target reinvestment rate of 2.61%. Actual annual spending on infrastructure totals approximately $4.9 million, for an actual reinvestment rate of 1.93%.



3.3 Condition of Asset Portfolio

The current condition of the assets is central to all asset management planning. Collectively, 78% of assets in Arnprior are in fair or better condition. This estimate relies on both age-based and field condition data.

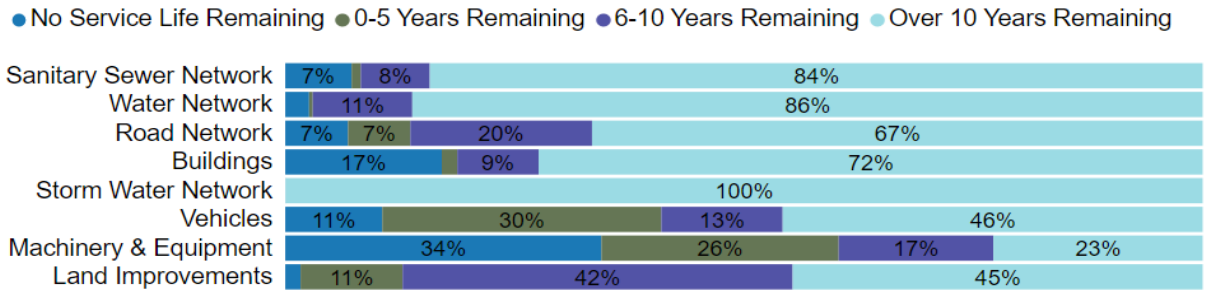


This AMP relies on assessed condition data for 17% of assets; for the remaining portfolio, age is used as an approximation of condition. Assessed condition data is invaluable in asset management planning as it reflects the true condition of the asset and its ability to perform its functions. The table 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	Road Surface	100%	2020 StreetScan
	Curb, Sidewalk, Streetlights	0%	N/A
Storm Water Network	All	0%	N/A
Buildings	All	0%	N/A
Machinery & Equipment	All	28%	Staff Assessments
Vehicles	All	29%	Staff Assessments
Land Improvements	All	100%	Staff Assessments
Water Network	All	0%	N/A
Sanitary Sewer Network	All	0%	N/A

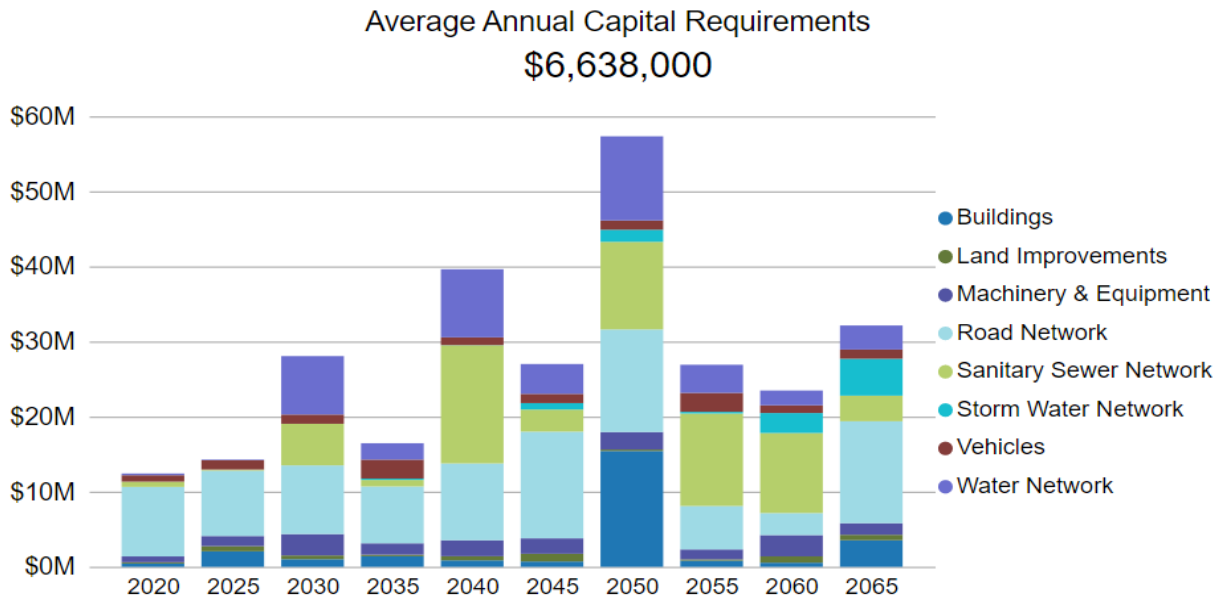
3.4 Service Life Remaining

Based on asset age, available assessed condition data and estimated useful life, 13% 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 50 years.



4 Analysis of Tax-funded Assets

Key Insights

- Tax-funded assets are valued at $122.9 million
- 74% 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 $3.7 million
- Critical assets should be evaluated to determine appropriate risk mitigation activities and treatment options

4.1 Road Network

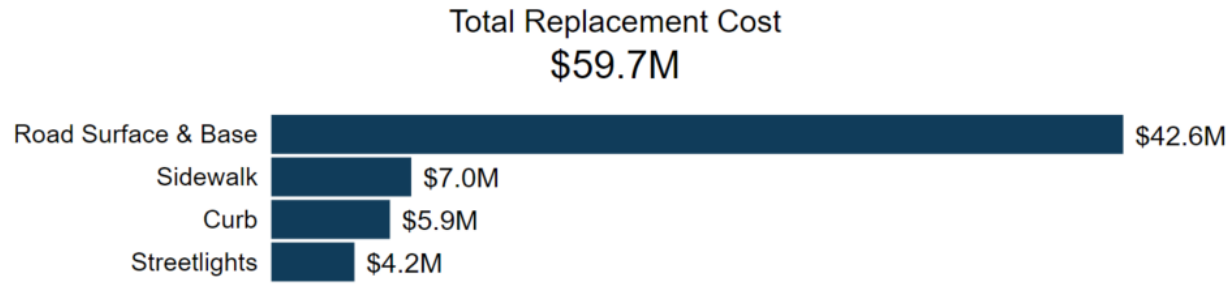
The Road Network is a critical component of the provision of safe and efficient transportation services and represents the highest value asset category in the Town's asset portfolio. It includes all municipally owned and maintained roadways in addition to supporting roadside infrastructure including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

The Town's roads and sidewalks are maintained by the Roads & Services Branch of the Operations Department who is also responsible for winter snow clearing, ice control and snow removal operations.

4.1.1 Asset Inventory & Replacement Cost

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

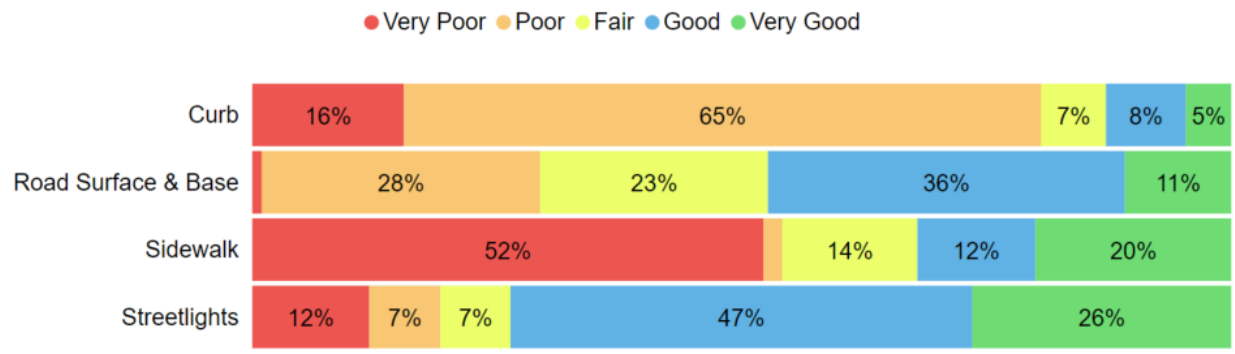
Asset Segment	Quantity	Replacement Cost Method	Total Replacement Cost
Curb	66,523 m	CPI Tables	$5,937,246
Road Surface & Base	60,424 m	Cost/Unit	$42,569,247
Sidewalk	74,596 m^2	CPI Tables	$7,000,856
Streetlights	1,174	CPI Tables	$4,164,312
Total			**$59,671,661**



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
Curb	32%	Poor	Age-Based
Road Surface	56%	Fair	100% Assessed
Sidewalk	34%	Poor	Age-Based
Streetlights	63%	Good	Age-Based
Average	**51%**	**Fair**	**71% Assessed**



Current Approach to Condition Assessment

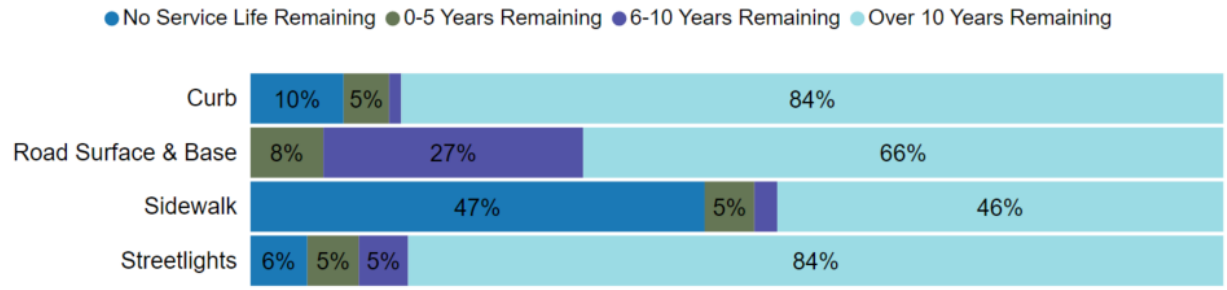
Accurate and reliable condition data allows staff to more confidently determine the remaining service life of assets and identify the most cost-effective approach to managing assets. The following describes the municipality's current approach:

- A Road Needs Study was completed by external contractors in 2020. The Study included a detailed assessment of the condition of each road segment, measuring Pavement Condition Index (PCI), roadside environment, and other details. The Town is seeking to implement a 5-year program to renew the Roads Need Study.
- Condition data from the Study informs short- and long-term capital planning and project prioritization.
- Staff identify road segments that do not meet the Town's desired design standards. These segments are considered candidates for structural upgrade, therefore, lifecycle strategies are simplified for financial efficiencies.

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)[1]
Curb	50	35.0	15.0
Road Surface & Base	30	20.1	14.1
Sidewalk	30	27.4	2.6
Streetlights	20-50	12.6	14.1
Average		**21.1**	**12.2**



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.

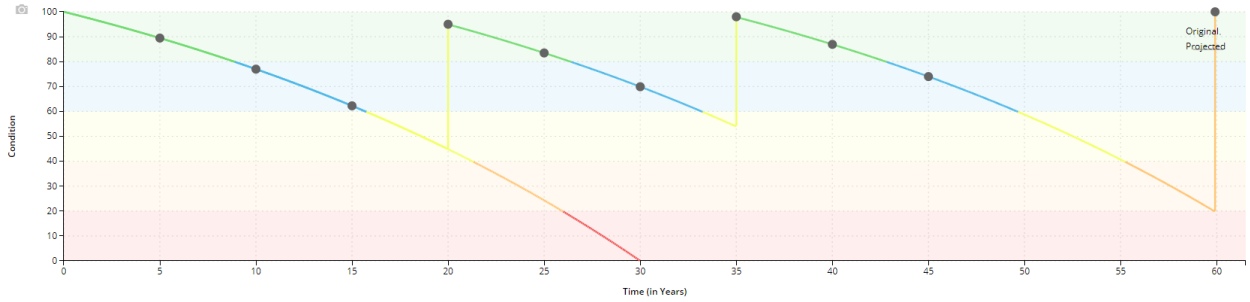
[1] The average service life remaining for roads is greater than what age-based condition predicts as a result of assessed condition.

4.1.4 Lifecycle Management Strategy

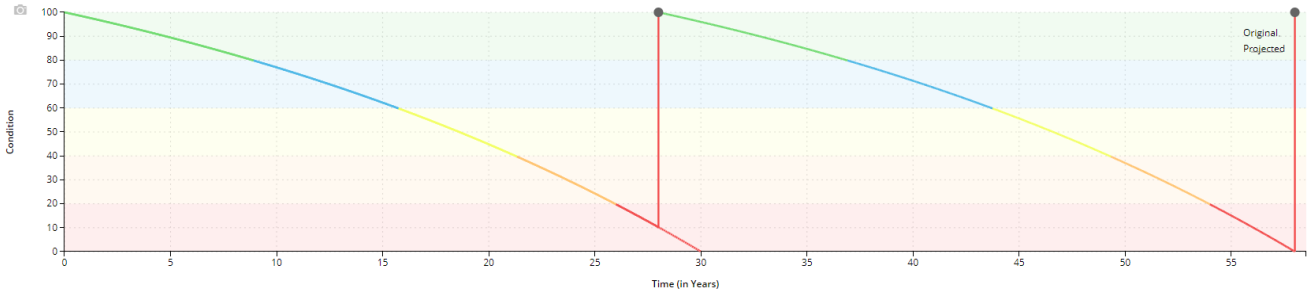
The condition or performance of most assets will deteriorate over time. This process is affected by a range of factors including an asset's characteristics, location, utilization, maintenance history and environment.

The following lifecycle strategies have been developed as a proactive approach to managing the lifecycle of paved roads. These strategies illustrate the most ideal scenario of events. 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. Some roads are identified as candidates for replacement as they do not meet the Town's desired design standards; these roads have a simplified lifecycle management strategy to create efficiencies.

Paved Roads		
Event Name	**Event Class**	**Event Trigger**
Crack Sealing	Preventative Maintenance	5 Years (Repeated)
Mill & Overlay	Rehabilitation	15 to 20 Years
Strip & Pave	Rehabilitation	30 to 35 Years
Full Reconstruction	Replacement	20% to 30% Condition



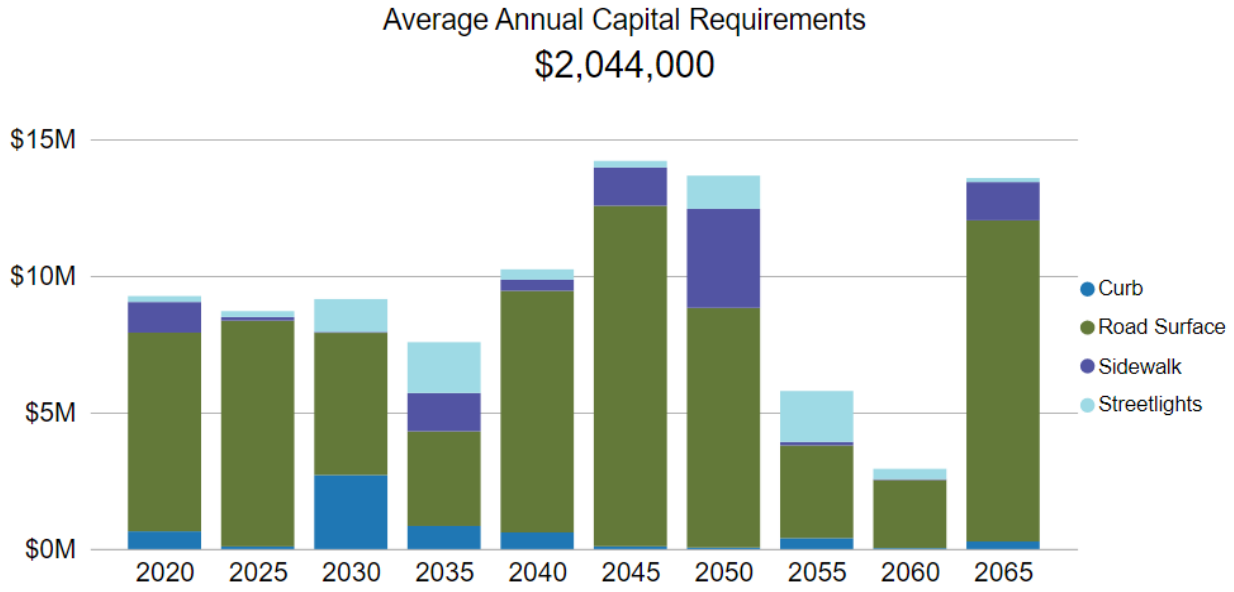
Paved Roads – Candidate for Upgrade		
Event Name	**Event Class**	**Event Trigger**
Full Reconstruction	Replacement	Condition 20%



Forecasted Capital Requirements

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

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

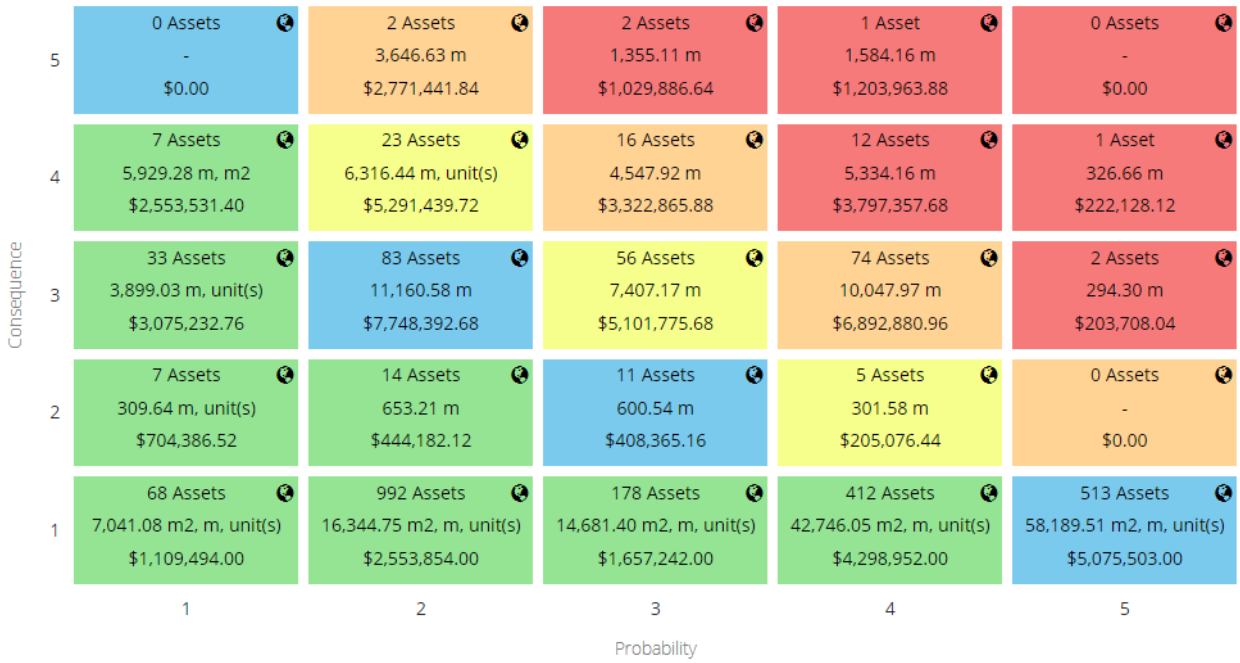


The projected cost of lifecycle activities that will need to be undertaken over the next 10 years to maintain the current level of service can be found in Appendix B.

4.1.5 Risk & Criticality

Risk Matrix

The following risk matrix provides a visual representation of the level of risk exposure for this asset category. It considers both the probability of failure and consequence of failure. The metrics that have been used to determine both can be found in Appendix D.



Risks to Current Asset Management Strategies

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

Climate Change & Extreme Weather Events

An increase in the frequency and intensity of precipitation events can result in flooding of sections of the road network. The drainage capacity of the road network is sometimes not sufficient to withstand heavy water flow, particularly in low lying areas along the Ottawa River. This risk is most notable at McLean Avenue and Chats Crescent as well as well as Leo Lavoie Road and Lena Street off of Riverview Drive. Further issues can arise as a result of flooding and poor drainage, including accelerated deterioration caused by freeze/thaw cycles. To improve asset resiliency, staff should identify problem areas and improve drainage through enhanced lifecycle strategies.

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 as defined above that will replace inferior infrastructure design, extend pavement lifecycle, and the lower total cost. These strategies will require sustainable annual funding to minimize the deferral of capital works. Town Council has supported a Road Strategy that includes a proactive capital budget for roads, with a minimum, one major road reconstruction project per year along with an annual rolling road rehabilitation project.

4.1.6 Levels of Service

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 (2020)
Scope	Description, which may include maps, of the road network in the municipality and its level of connectivity	See Appendix C
Quality	Description or images that illustrate the different levels of road class pavement condition	See Appendix C

Technical Levels of Service

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

Service Attribute	**Technical Metric**	**Current LOS (2020)**
Scope	Lane-km of arterial roads (MMS classes 1 and 2) per land area (km/km^2)	0
	Lane-km of collector roads (MMS classes 3 and 4) per land area (km/km^2)	2.19
	Lane-km of local roads (MMS classes 5 and 6) per land area (km/km^2)	4.43
Quality	Average pavement condition index for paved roads in the municipality	56% (Fair)
	Average surface condition for unpaved roads in the municipality (e.g. excellent, good, fair, poor)	N/A
Performance	Capital reinvestment rate	3.49%

4.1.7 Recommendations

Asset Inventory

- Review road curbs and sidewalk inventory to determine whether all municipal assets within these asset segments have been accounted for with accurate replacement costs and updated condition assessments.

Condition Assessment Strategies

- The last comprehensive assessment of the road network was completed in 2020. Consider adopting a 5-year program to update assessed condition of roads on a continuous basis.

Lifecycle Management Strategies

- Implement the identified lifecycle management strategies for paved roads to maintain a high quality of road pavement condition.
- Evaluate the efficacy of the Town's lifecycle management strategies at regular intervals to refine the impact of cost, condition, and risk. Identify updated replacement costs to ensure cost savings are being accurately assessed.

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 to provide meaningful and reliable inputs into asset management planning.
- Work towards identifying proposed levels of service as per O. Reg. 588/17 and identify the strategies that are required to close any gaps between current and proposed levels of service.

4.2 Storm Water Network

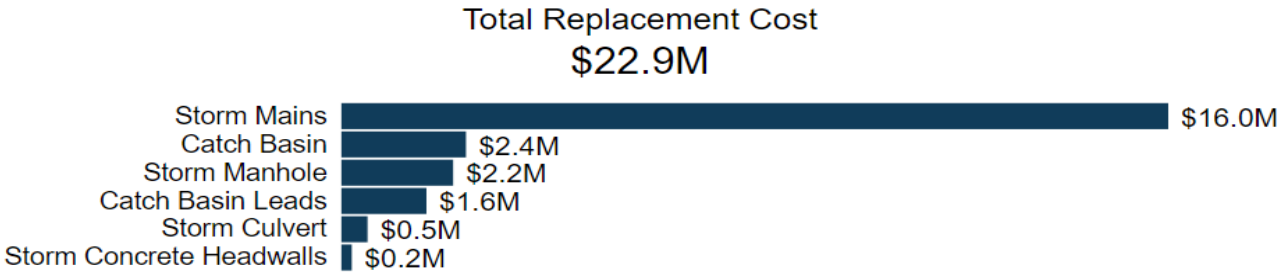
The Town is responsible for owning and maintaining a storm water network of storm sewer mains, catch basins and other supporting infrastructure.

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

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 Storm Water Network inventory.

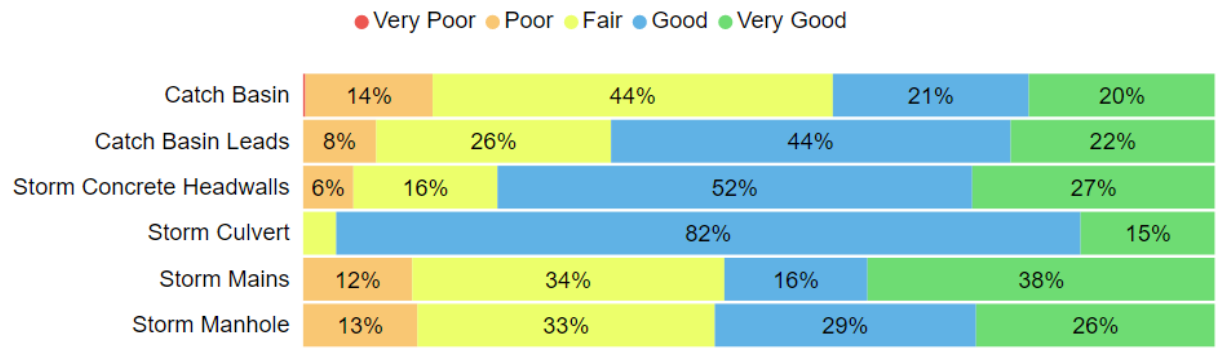
Asset Segment	Quantity	Replacement Cost Method	Total Replacement Cost
Catch Basin	782	CPI Tables	$2,412,517
Catch Basin Leads	5,956 m	CPI Tables	$1,648,478
Storm Concrete Headwalls	39	CPI Tables	$206,595
Storm Culvert	839 m	CPI Tables	$510,909
Storm Mains	28,378 m	CPI Tables	$15,974,419
Storm Manhole	393	CPI Tables	$2,163,932
Total			**$22,916,850**



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
Catch Basin	62%	Good	Age-Based
Catch Basin Leads	67%	Good	Age-Based
Storm Concrete Headwalls	71%	Good	Age-Based
Storm Culvert	77%	Good	Age-Based
Storm Mains	68%	Good	Age-Based
Storm Manhole	64%	Good	Age-Based
Average	**67%**	**Good**	**Age-Based**



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

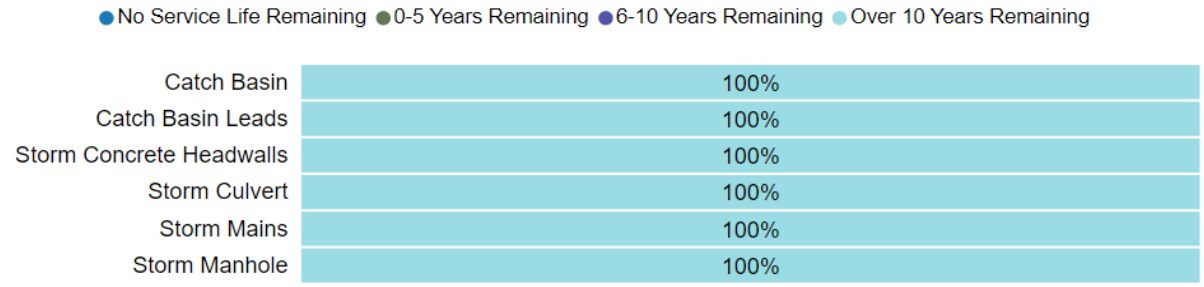
Accurate and reliable condition data allows staff to more confidently determine the remaining service life of assets and identify the most cost-effective approach to managing assets. The following describes the municipality's current approach:

- Closed-Circuit Television (CCTV) inspections are completed by external contractors and bundled with planned roadwork, e.g., resurfacing. The Town is developing a scheduled condition assessment program with 2-5% of the network assessed with CCTV annually.
- There are no formal condition assessment strategies in place for manholes and catch basins.
- As the Town refines the asset inventory data for the Storm Water Network a regular assessment cycle may be established.

4.2.3 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)
Catch Basin	80	32.1	47.9
Catch Basin Leads	80	30.6	49.4
Storm Concrete Headwalls	80	23.9	56.1
Storm Culvert	80	18.2	61.8
Storm Mains	80	30.3	49,8
Storm Manhole	80	30.2	49.8
Average		30.8	49.3



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

4.2.4 Lifecycle Management Strategy

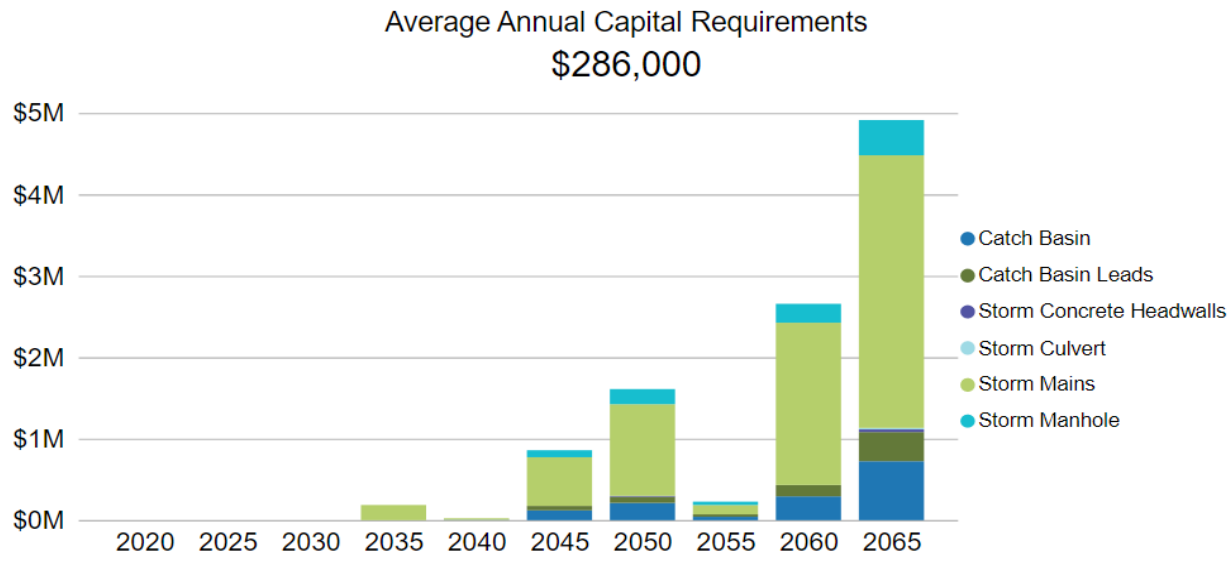
The condition or performance of most assets will deteriorate over time. To ensure that municipal assets are performing as expected and meeting the needs of customers, it is important to establish a lifecycle management strategy to proactively manage asset deterioration.

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

Activity Type	Description of Current Strategy
Maintenance	Repairs are reactive, and conducted only after issues are identified by camera inspections (e.g., loose joints, cracked or sunken pipe, root infiltration).
	Primary activities include catch basin cleanTing and storm main flushing, but only a small percentage of the entire network is completed per year in advance of CCTV inspections.
	CCTV inspections and cleaning is completed as budget becomes available and this information will be used to drive forward rehabilitation and replacement plans.
Rehabilitation	Trenchless re-lining has the potential to reduce total lifecycle costs but would require a formal condition assessment program to determine viability.
Replacement	Replacement of Storm Water assets is partly reactive. However, replacement of storm assets may also take place in coordination with road construction based on an assessment of asset age, material, and CCTV inspections. Due to the overall young age and good condition of the Town's storm sewer network, storm sewers are generally upgraded only to accommodate new growth. The Town continues to add new Storm Water assets through combined sewer separation.

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 level of risk exposure for this asset category. It considers both the probability of failure and consequence of failure. The metrics that have been used to determine both can be found in Appendix D.

Risks to Current Asset Management Strategies

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

Infrastructure Design

11.7% of the wastewater network is made up of combined sewers. Combined sewers can lead to overflows and backups of sanitary water in people's homes and other habitable areas such as beaches. The Town is dedicated to proactively separating wastewater and storm water sewers in accordance with provincial regulations. However, this is a costly and timely endeavour.

Asset Data & Information

There is a lack of confidence in the available inventory data for storm sewers. Staff are in the process of evaluating the resources and activities required to build and/or improve the existing asset inventory. Staff plan to prioritize data refinement efforts to increase confidence in the accuracy and reliability of asset data and information. Staff are also seeking to optimize information gathered from CCTV inspections and they hope to develop better defined strategies that will extend the network's lifecycle, increase capacity for growth, and the lower total cost. Once completed there will be greater confidence in the development of data-driven strategies to address infrastructure needs.

4.2.6 Levels of Service

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

Technical Levels of Service

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

Service Attribute	Technical Metric	Current LOS (2020)
Scope	% of the municipal storm water management system resilient to a 100-year storm	44%[2]
	% of the municipal storm water management system resilient to a 5-year storm	100%[3]
Performance	Capital reinvestment rate	0.96%

[2] The Town does not currently have data available to determine the percentage of properties that are resilient to a 100-year storm. However, Town staff is confident that storm infrastructure installed within the last 20 years is resilient to a 100-year storm. Further information can be found in the 2015 Storm Water Management Plan.

[3] This is based on the observations of Town staff. The minor system (pipes and catchbasins) is generally designed to withstand at least 5-year storm.

4.2.7 Recommendations

Asset Inventory

- The Town's Storm Water Network inventory remains at a basic level of maturity and staff are working to increase the level of confidence in its accuracy or reliability. The development of a comprehensive inventory of the storm water network should be priority.
- Staff has made improving the quality of asset inventory data a priority in 2021 and is actively working towards this goal.

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. These inspections should provide a condition index following industry standards protocols, such as the Pipeline Assessment Certification Program.

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.
- Storm water resilience should be further investigated, either through detailed hydraulic studies.
- 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 Buildings

The Town of Arnprior owns and maintains several facilities including a recreation centre that provide key services to the community. These include:

- Administrative offices
- Public library
- Museum
- Fire hall and associated offices and facilities
- Public works garage and storage sheds
- Park facilities, a marina as well as a community centre containing 2 rinks, a swimming pool and a community hall.

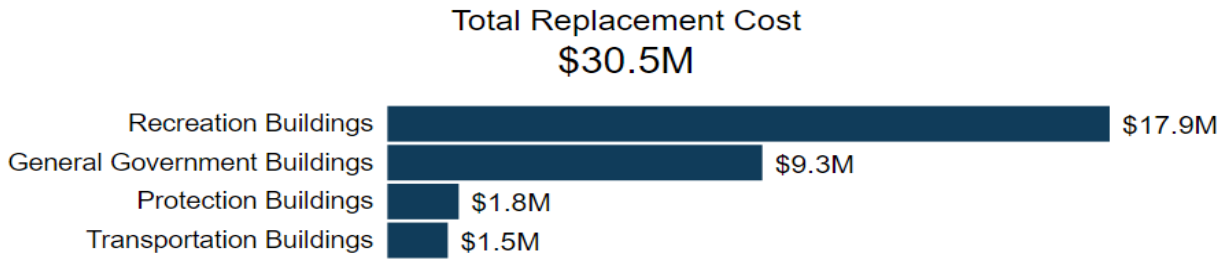
It should be noted that the Town's water and wastewater facilities are included separately under Water Network and Sanitary Network.

The Town owns and manages historical buildings that are aged beyond the Estimated Useful Life (EUL). The Henry A. Murdoch Building (Town Hall) was built in 1888 and D.A. Gillies building (Arnprior & District Museum) was built in 1896, both of which are essential assets to the community. Buildings are replaced or refurbished at a component level (e.g. HVAC, roofing elements, etc.), staged over a period of time. However, many of the buildings in this AMP are represented as a single asset or only a few components, rather than a comprehensive group of components, therefore the replacement cost and EUL approximate the capital requirements over the lifecycle of all components. Future improvements to this AMP should include componentization so that capital projections match component level replacements/refurbishments.

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 Buildings inventory.

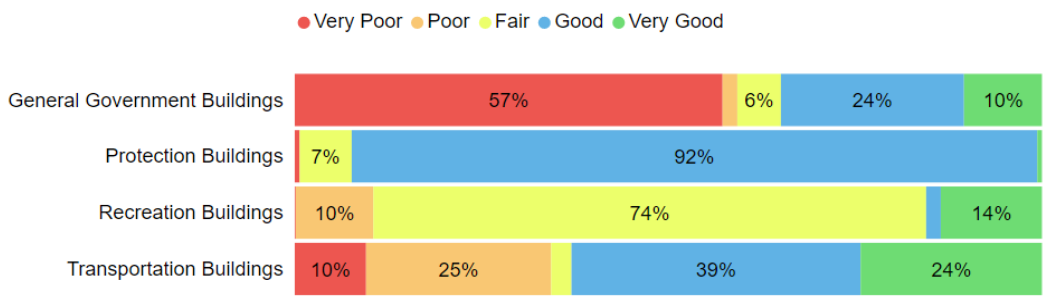
Asset Segment	Quantity	Replacement Cost Method	Total Replacement Cost
General Government Buildings	3	CPI Tables	$9,289,131
Protection Buildings	1	CPI Tables	$1,771,992
Recreation Buildings	8	CPI Tables	$17,891,942
Transportation Buildings	2	CPI Tables	$1,500,819
Total			**$30,453,884**



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
General Government Buildings	29%	Poor	Age-Based
Protection Buildings	66%	Good	Age-Based
Recreation Buildings	50%	Fair	Age-Based
Transportation Buildings	56%	Fair	Age-Based
Average	**45%**	**Fair**	**Age-Based**



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.

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:

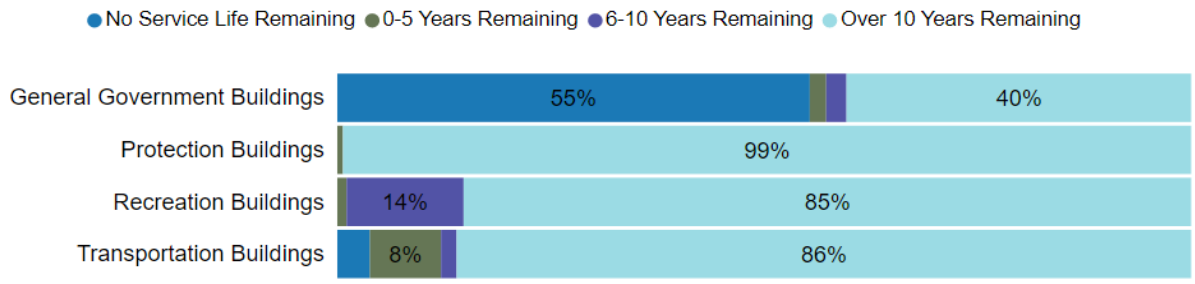
- Internal and contracted assessments are completed on an as-needed basis in accordance with available budget. There is no scheduled condition assessment program in place.
- A condition assessment for the Town Hall was completed in 2014. Condition assessments of the D.A. Gillies Building and Nick Smith Centre were completed in 2018/19. The HVAC systems are inspected regularly.

- Assessment data is essential in decision-making and informs annual budgeting. The Town is further componentizing the buildings to further improve the precision of the asset inventory.

4.3.3 Estimated Useful Life & Average Age

The Estimated Useful Life for Buildings 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. The average age and service life remaining are weighted values based on replacement cost.

Asset Segment	Estimated Useful Life (Years)	Average Age (Years)	Average Service Life Remaining (Years)
General Government Buildings[4]	7-75	80.4	47.6
Protection Buildings	25-75	23.3	47.9
Recreation Buildings	15-75	32.1	29
Transportation Buildings	20-75	24.4	36.1
Average		**46**	**36.1**



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] The Town owns and manages historical buildings that are aged beyond the Estimated Useful Life (EUL). The Henry A. Murdoch Building was built in 1888 and D.A. Gillies building was built in 1896, both of which are essential assets to the community.

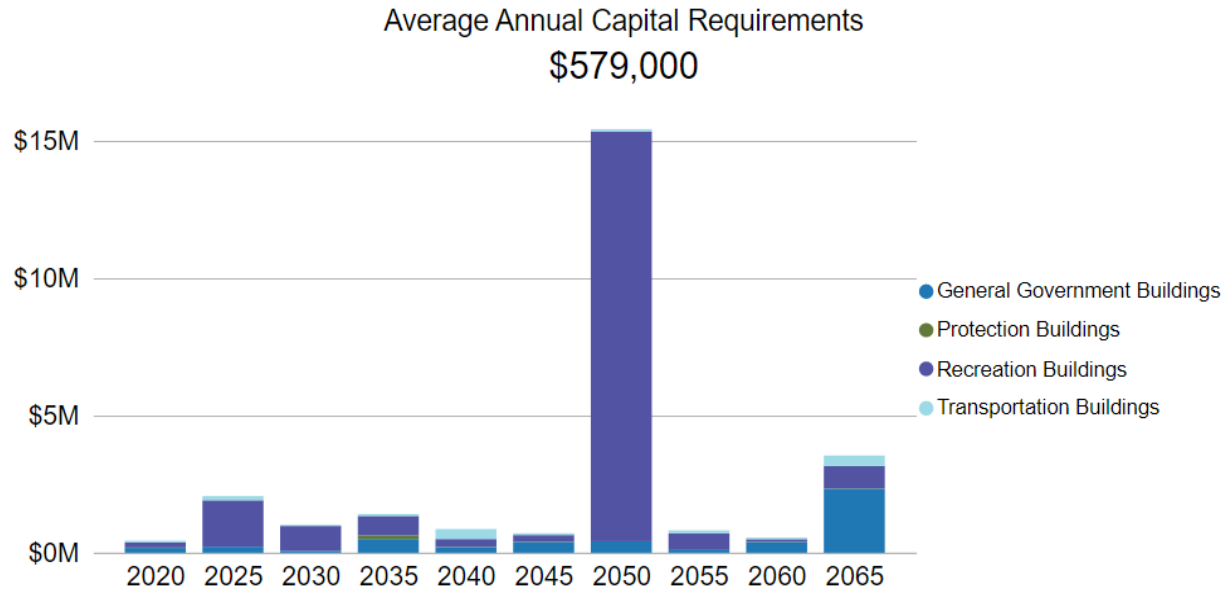
4.3.4 Lifecycle Management Strategy

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	Municipal buildings are subject to regular inspections to identify health & safety requirements as well as structural deficiencies that require additional attention.
	Critical buildings (Fire Halls etc.) have a detailed maintenance and rehabilitation schedule, while the maintenance of other facilities are dealt with on a case-by-case basis,
Rehabilitation/ Replacement	As a supplement to the knowledge and expertise of municipal staff the Town regularly works with contractors to complete Facility Needs Assessment Studies.
	Assessments for replacement are completed strategically as buildings approach their end-of-life to determine whether replacement or rehabilitation is appropriate.

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.

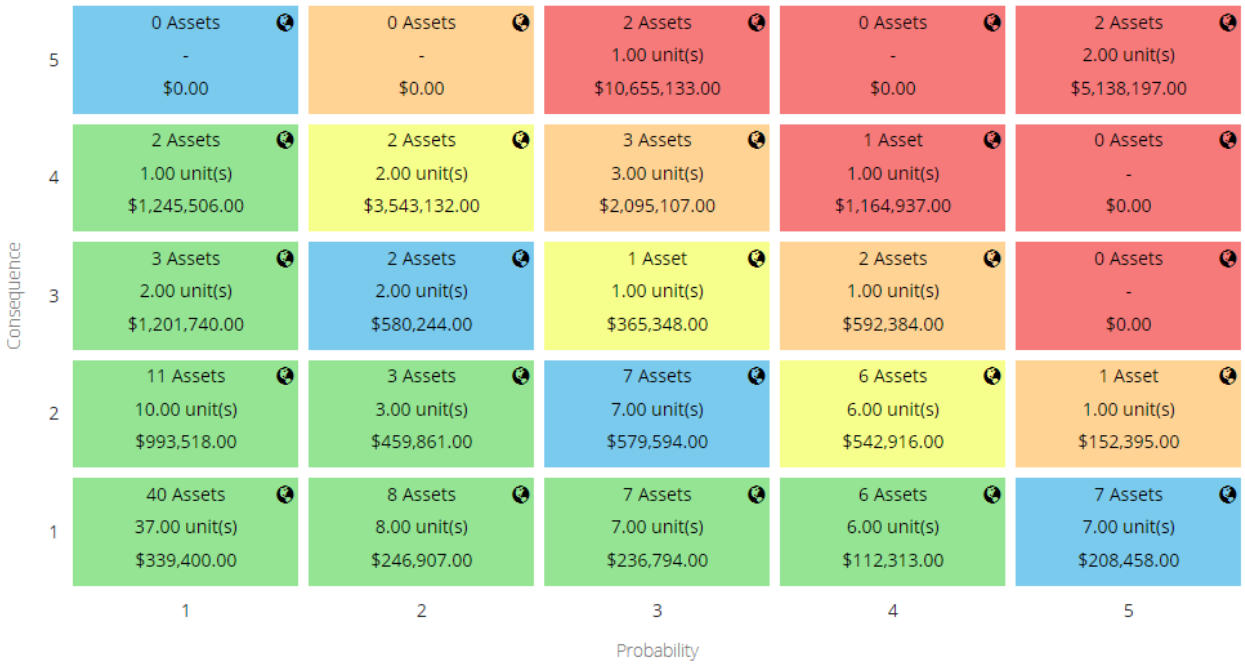


The projected cost of lifecycle activities that will need to be undertaken over the next 10 years to maintain the current level of service can be found in Appendix B.

4.3.5 Risk & Criticality

Risk Matrix

The following risk matrix provides a visual representation of the level of risk exposure for this asset category. It considers both the probability of failure and consequence of failure. The metrics that have been used to determine both can be found in Appendix D.



In accordance with O. Reg. 588/17, the Town will continue to gather data and information in order to advance and review risk for all non-core asset categories by July 1, 2024.

4.3.6 Levels of Service

The following tables identify the Town's current level of service for Buildings. These metrics include high-level 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 Buildings.

Service Attribute	Qualitative Description	Current LOS (2020)
Scope	Description, which may include maps, of the types of facilities that the town operates and maintains	• Museum (D.A. Gillies Building) • Community Centre and Hall (Nick Smith Centre) - Pool & 2 ice rinks • Park Washrooms and Canteen (Robert Simpson Park) • Library • Public Works Garages • Public Works Salt Shed • Town Hall (Henry A. Murdoch Building) • Marina Office • Lifeguard Storage Shed • Washrooms at Ball Diamonds • Fire Hall (Stanley Tourangeau)

Technical Levels of Service

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

Service Attribute	Technical Metric	Current LOS (2020)
Quality	Average condition of buildings (e.g. very good, good, fair, poor, very poor)	Fair (45%)
Performance	Capital re-investment rate	1.47%

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

4.3.7 Recommendations

Asset Inventory

- The Town owns several historical buildings that appear to be aged well beyond their EUL. 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 buildings 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.

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.

4.4 Machinery & 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:

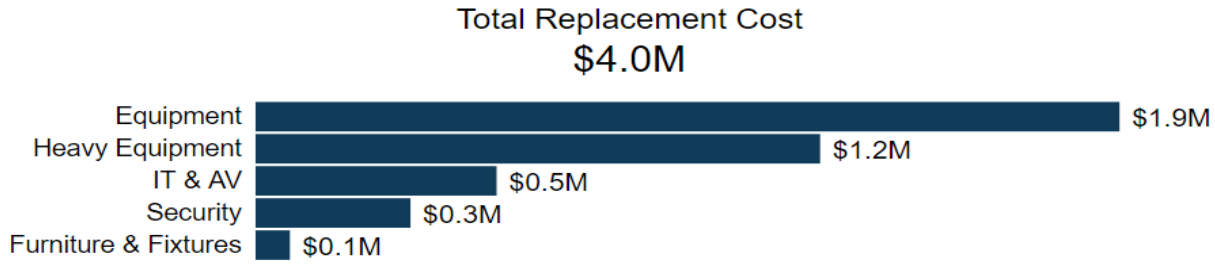
- Landscaping equipment to maintain public parks
- Fire protection equipment to support the delivery of emergency services
- Plows and snowblowers for winter control activities
- Computer hardware and IT infrastructure for administrative offices

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

4.4.1 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 Machinery & Equipment inventory.

Asset Segment	Quantity	Replacement Cost Method	Total Replacement Cost
Equipment	54	CPI Tables	$1,868,793
Furniture & Fixtures[5]	8	CPI Tables	$74,747
Heavy Equipment	13	CPI Tables	$1,221,351
IT & AV	15	CPI Tables	$521,689
Security	2	CPI Tables	$335,487
Total			**$4,022,067**

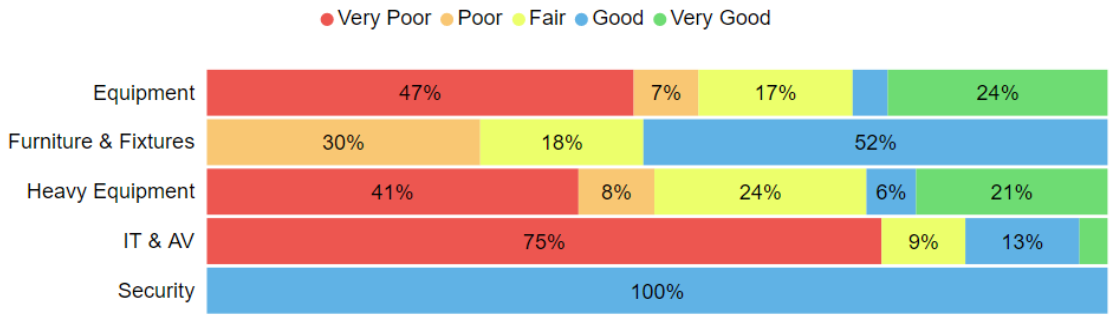


[5] Each of these assets is comprised of a group of assets purchased in the same timeframe.

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
Equipment	37%	Poor	18% Assessed
Furniture & Fixtures	52%	Fair	Age-Based
Heavy Equipment	41%	Fair	56% Assessed
IT & AV	19%	Very Poor	Age-Based
Security	77%	Good	37% Assessed
Average	**40%**	**Poor**	**28% Assessed**



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

Current Approach to Condition Assessment

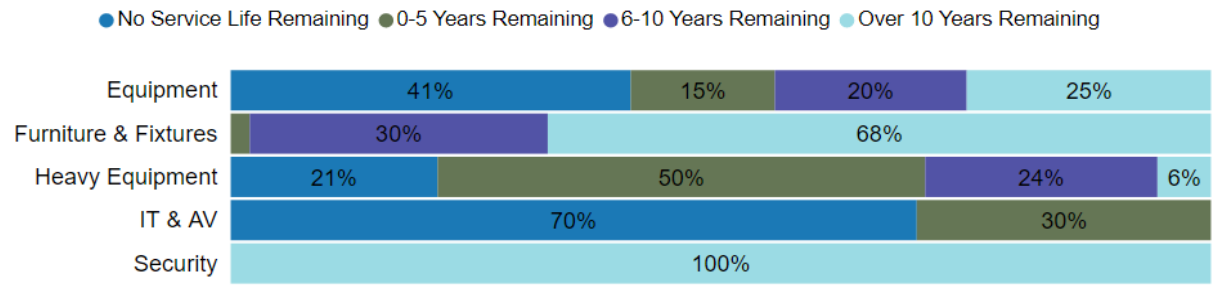
Accurate and reliable condition data allows staff to more confidently determine the remaining service life of assets and identify the most cost-effective approach to managing assets. The following describes the municipality's current approach:

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

4.4.3 Estimated Useful Life & Average Age

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

Asset Segment	Estimated Useful Life (Years)	Average Age (Years)	Average Service Life Remaining (Years)
Equipment	5-20	13.7	-0.4
Furniture & Fixtures	20	11.4	8.7
Heavy Equipment	10-15	14.0	2.2
IT & AV	5	6.7	-1.2
Security	15	3.1	11.3
Average		**12.2**	**0.8**



The service life of equipment and machinery can vary widely, depending on hours of use and the nature of work, resulting in some assets being able to provide service beyond the estimated useful life. 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.

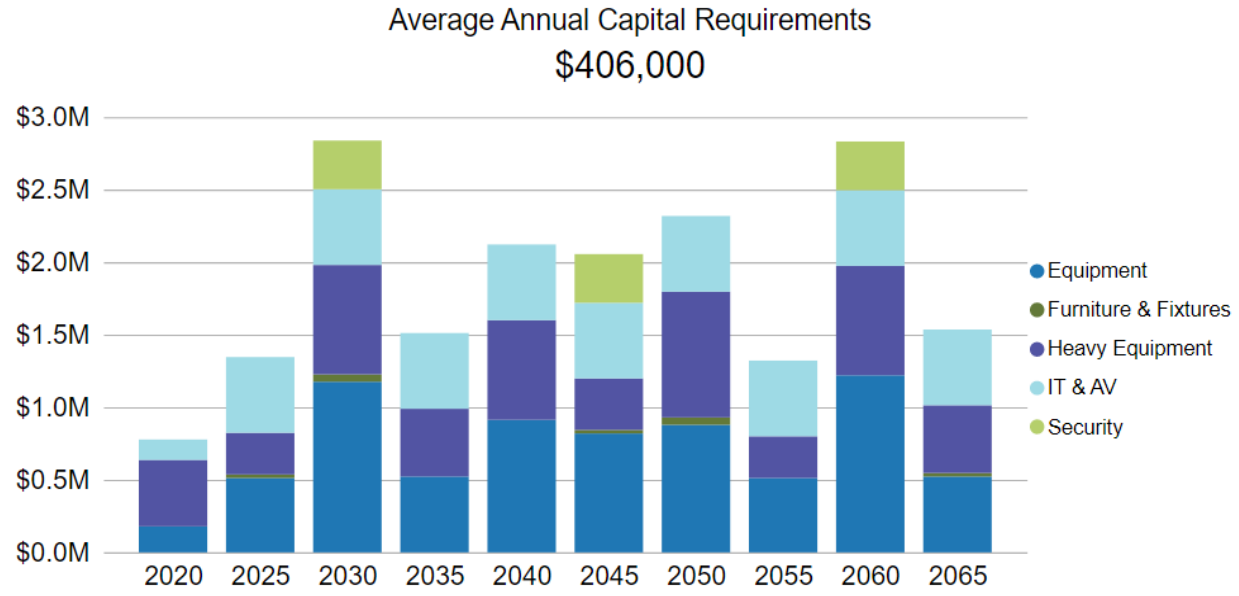
4.4.4 Lifecycle Management Strategy

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	The maintenance program varies by department.
	Fire Protection Services equipment is subject to a more rigorous inspection and maintenance program in accordance with the guidelines provided by the National Fire Protection Association (NFPA).
	Machinery & equipment is maintained according to manufacturer recommended actions and supplemented by the expertise of municipal staff.
Replacement	The replacement of machinery & equipment depends on deficiencies identified by operators that may impact their ability to complete required tasks.

Forecasted Capital Requirements

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.

4.4.5 Risk & Criticality

Risk Matrix

The following risk matrix provides a visual representation of the level of risk exposure for this asset category. It considers both the probability of failure and consequence of failure. The metrics that have been used to determine both can be found in Appendix D.

In accordance with O. Reg. 588/17, the Town will continue to gather data and information in order to advance and review risk for all non-core asset categories by July 1, 2024.

4.4.6 Levels of Service

The following tables identify the Town's current level of service for Machinery & Equipment. These metrics include high-level 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 Machinery & Equipment.

Service Attribute	Qualitative Description	Current LOS (2020)
Scope	Description or images of the types of equipment that the town operates and the services that they help to provide to the community	• Recreation Services Equipment • Transportation Services Equipment • General Government Equipment (Computer hardware/software, IT infrastructure, telephone systems, etc.) • Park Equipment • Protection Services Equipment

Technical Levels of Service

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

Service Attribute	Technical Metric	Current LOS (2020)
Quality	Average condition of Machinery & Equipment (e.g. very good, good, fair, poor, very poor)	Poor (40%)
Performance	Capital re-investment rate	7.81%

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

4.4.7 Recommendations

Asset Inventory

- Review estimated useful life values and revise to reflect the true service life achievable in the field.

Replacement Costs

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

Condition Assessment Strategies

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

Risk Management Strategies

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

Levels of Service

- 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 Vehicles

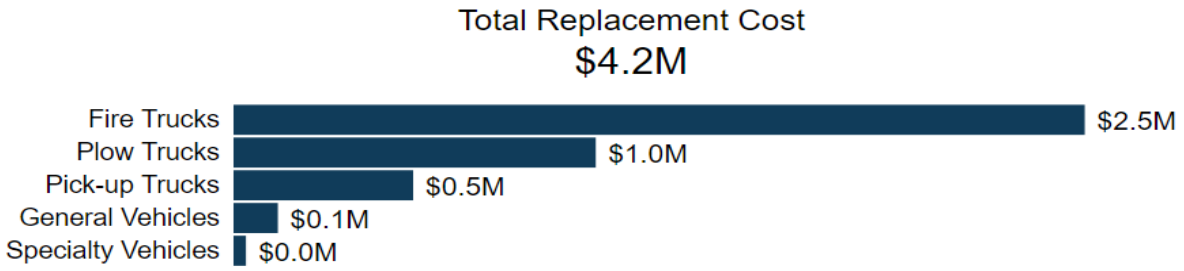
Vehicles allow staff to efficiently deliver municipal services and personnel. Municipal vehicles are used to support several service areas, including:

- Plow trucks for winter control activities
- Fire rescue vehicles to provide emergency services
- Pick-up trucks and vans to support the maintenance of the transportation network and address service requests for Environmental Services and Parks & Recreation

4.5.1 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.

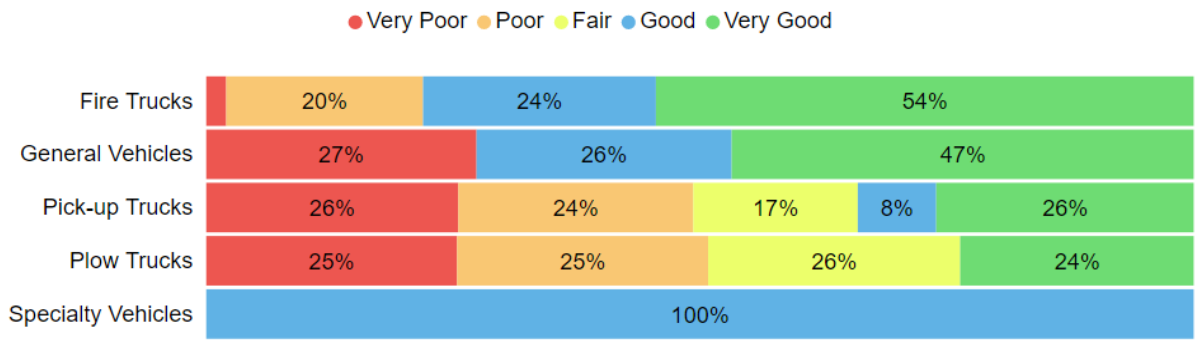
Asset Segment	Quantity	Replacement Cost Method	Total Replacement Cost
Fire Trucks	6	CPI Tables	$2,450,230
General Vehicles	3	CPI Tables	$127,811
Pick-Up Trucks	11	CPI Tables	$517,271
Plow Trucks	4	CPI Tables	$1,042,869
Specialty Vehicles	1	CPI Tables	$36,000
Total			**$4,174,181**



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
Fire Trucks	70%	Good	Age-Based
General Vehicles	60%	Good	26% Assessed
Pick-Up Trucks	49%	Fair	69% Assessed
Plow Trucks	41%	Fair	76% Assessed
Specialty Vehicles	79%	Good	100% Assessed
Average	60%	Good	29% 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.

Current Approach to Condition Assessment

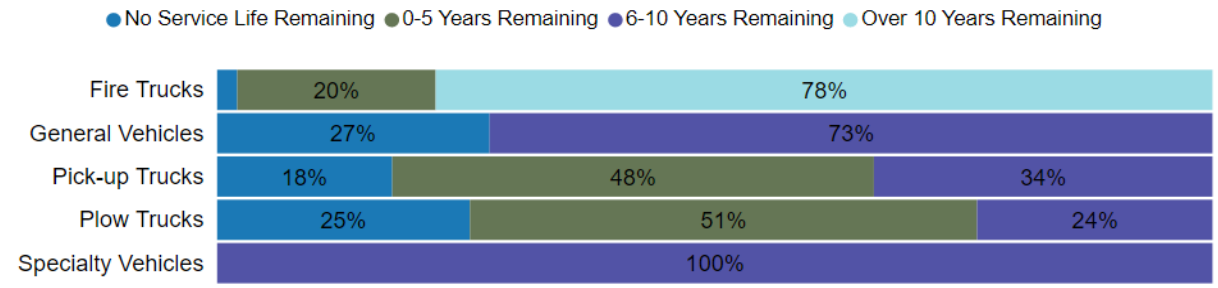
Accurate and reliable condition data allows staff to more confidently determine the remaining service life of assets and identify the most cost-effective approach to managing assets. The following describes the municipality's current approach:

- Staff complete regular visual inspections of vehicles to ensure they are in state of adequate repair prior to operation. Annual certification and safeties are completed.
- Inspection of fire-related vehicles adhere to health and safety guidelines, such as the National Fire Protection Association (NFPA).

4.5.3 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)
Fire Trucks	10-20	9.3	7.4
General Vehicles	10	6.9	3.1
Pick-Up Trucks	10	7.3	5.3
Plow Trucks	10	8.4	4.2
Specialty Vehicles	10	2.1	7.8
Average		**7.8**	**5.4**



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.

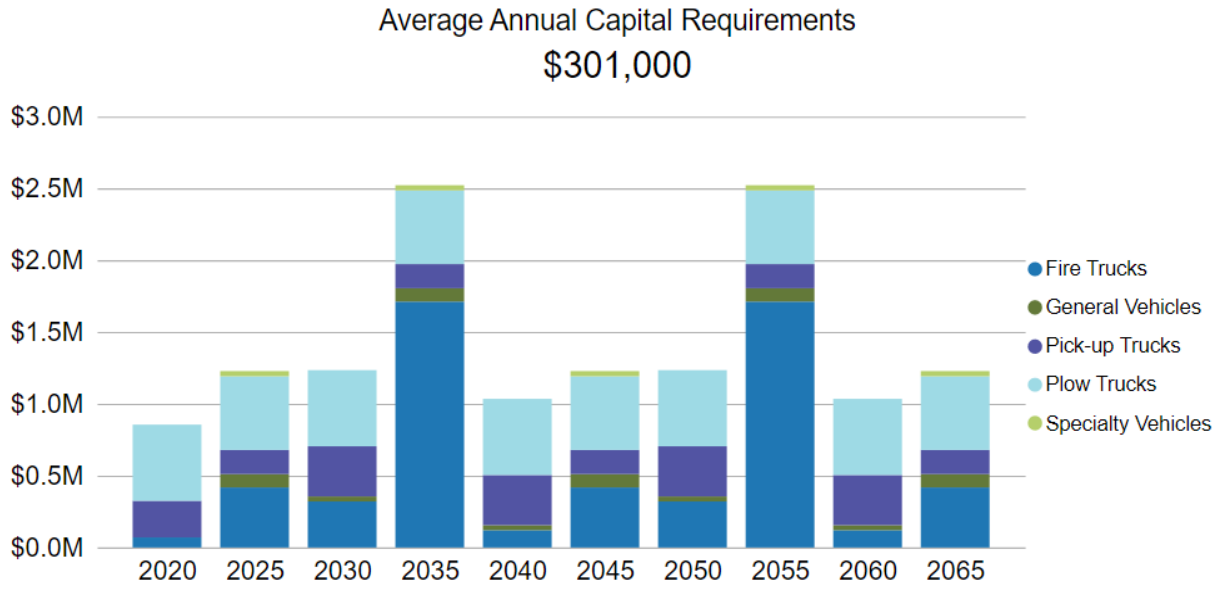
4.5.4 Lifecycle Management Strategy

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	Visual inspections are completed and documented daily; fluids are inspected at every fuel stop; tires inspected monthly.
	Certification and inspections are completed annually.
	Annual preventative maintenance activities include system components check and additional detailed inspections.
Replacement	Vehicle replacements are based on the Town's Capital Asset Policy.
	Vehicle age, kilometres, and annual repair costs are taken into consideration when determining appropriate treatment options.

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.

4.5.5 Risk & Criticality

Risk Matrix

The following risk matrix provides a visual representation of the level of risk exposure for this asset category. It considers both the probability of failure and consequence of failure. The metrics that have been used to determine both can be found in Appendix D.

In accordance with O. Reg. 588/17, the Town will continue to gather data and information in order to advance and review risk for all non-core asset categories by July 1, 2024.

4.5.6 Levels of Service

The following tables identify the Town's current level of service for Vehicles. These metrics include high-level 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 Vehicles.

Service Attribute	Qualitative Description	Current LOS (2020)
Scope	Description or images of the types of vehicles (e.g. light, medium and heavy-duty) that the town operates and the services that they help to provide to the community.	• General Vehicles • Pick-Up Trucks • Fire Trucks • Plow Trucks

Technical Levels of Service

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

Service Attribute	Technical Metric	Current LOS (2020)
Quality	Average condition of vehicles (e.g. very good, good, fair, poor, very poor)	Good (60%)
Performance	Capital re-investment rate	5.58%

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

4.5.7 Recommendations

Replacement Costs

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

Condition Assessment Strategies

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

Risk Management Strategies

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

Levels of Service

- 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 Land Improvements

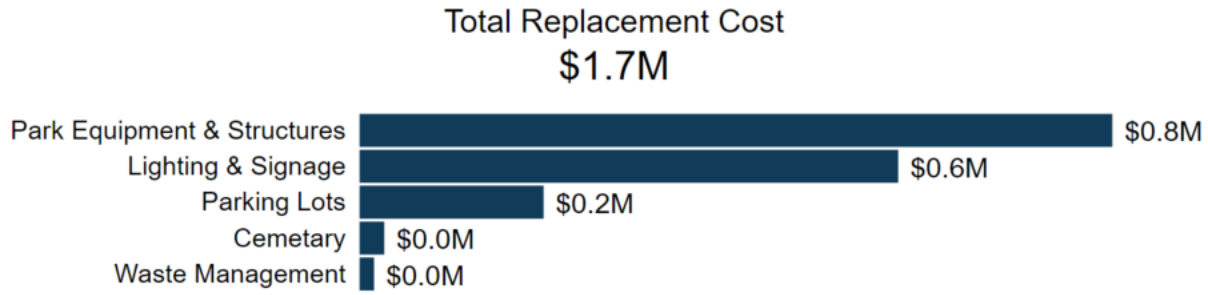
The Town of Arnprior owns a small number of assets that are considered Land Improvements. This category includes:

- Parking lots for municipal facilities & a public parking lot
- Lighting and signage
- Park equipment and structures
- Miscellaneous landscaping and other assets

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 Land Improvements inventory.

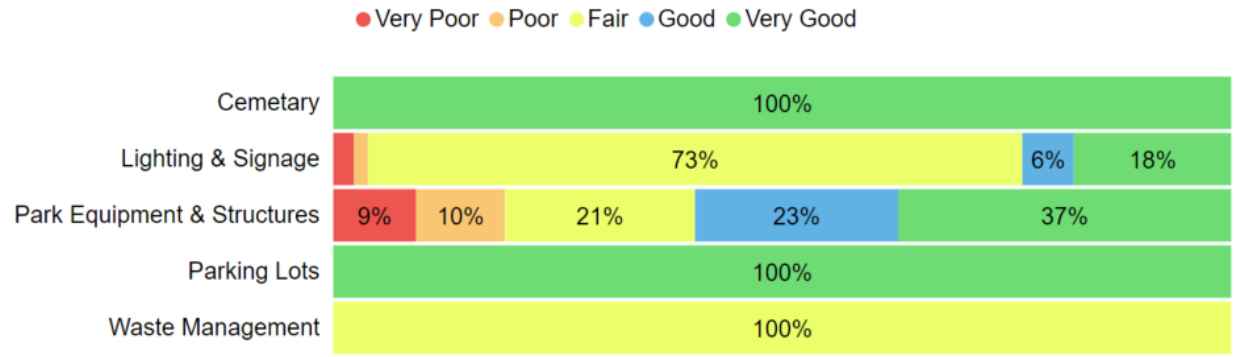
Asset Segment	Quantity	Replacement Cost Method	Total Replacement Cost
Cemetary	1	CPI Tables	$28,056
Lighting & Signage	57	CPI Tables	$608,251
Park Equipment & Structures	19	CPI Tables	$849,991
Parking Lots	2	CPI Tables	$207,948
Waste Management	1	CPI Tables	$16,517
Total			**$1,710,763**



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
Cemetary	94%	Very Good	100% Assessed
Lighting & Signage	54%	Fair	100% Assessed
Park Equipment & Structures	65%	Good	100% Assessed
Parking Lot	83%	Very Good	100% Assessed
Waste Management	55%	Fair	100% Assessed
Average	**63%**	**Good**	**100% 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.

Current Approach to Condition Assessment

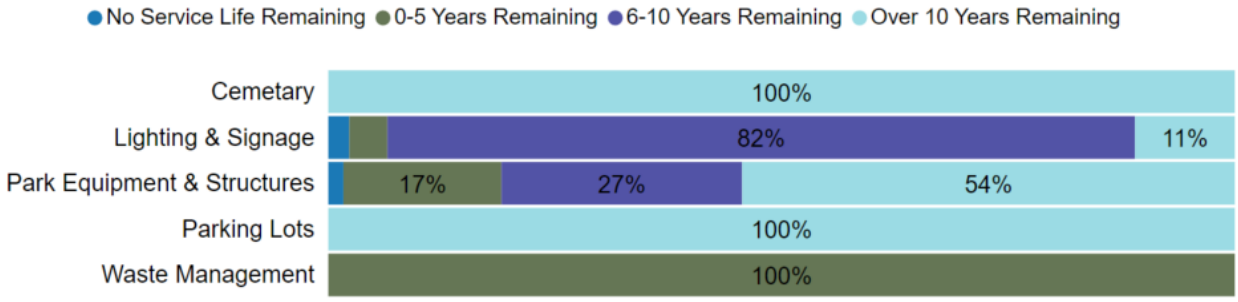
Accurate and reliable condition data allows staff to more confidently determine the remaining service life of assets and identify the most cost-effective approach to managing assets. The following describes the municipality's current approach:

- To ensure they are in a state of adequate repair, regular visual inspections of land improvements (playground) assets are undertaken. In 2019, staff conducted a network wide condition assessment.
- Safety inspections are conducted by a qualified playground inspector in accordance with Ontario Recreation Facilities Association (ORFA) standards.

4.6.3 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)
Cemetary	20	5.5	18.8
Lighting & Signage	10-20	13.3	7.7
Park Equipment & Structures	10-33	16.7	7.2
Parking Lot	15-20	2.6	15.0
Waste Management	5	5.5	2.8
Average		**14.3**	**8.1**



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.

4.6.4 Lifecycle Management Strategy

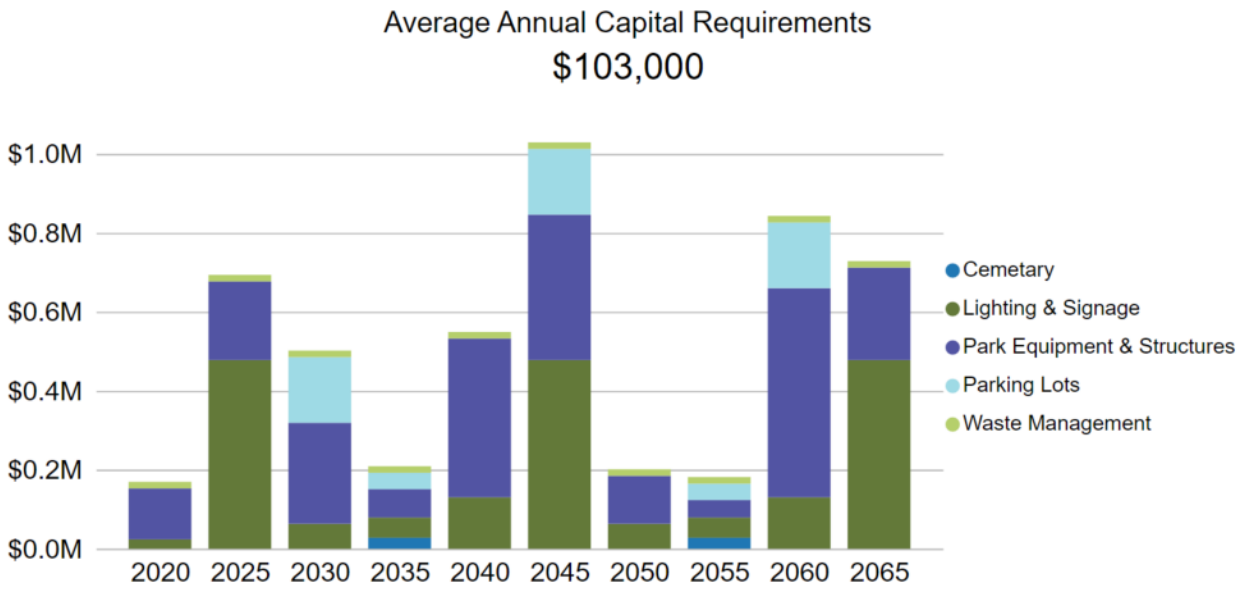
The condition or performance of most assets will deteriorate over time. To ensure that municipal assets are performing as expected and meeting the needs of customers, it is important to establish a lifecycle management strategy to proactively manage asset deterioration.

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

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

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.

4.6.5 Risk & Criticality

Risk Matrix

The following risk matrix provides a visual representation of the level of risk exposure for this asset category. It considers both the probability of failure and consequence of failure. The metrics that have been used to determine both can be found in Appendix D.

In accordance with O. Reg. 588/17, the Town will continue to gather data and information in order to advance and review risk for all non-core asset categories by July 1, 2024.

4.6.6 Levels of Service

The following tables identify the Town's current level of service for Land Improvements. These metrics include high-level 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 Land Improvements.

Service Attribute	Qualitative Description	Current LOS (2020)
Scope	Description, which may include maps, of the types of land improvements that the Town operates and maintains.	• Lighting & Signage • Park Equipment & Structures • Parking Lots • Cemetery (Columbarium)

Technical Levels of Service

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

Service Attribute	Technical Metric	Current LOS (2020)
Quality	Average condition of Land Improvements (e.g. very good, good, fair, poor, very poor)	Good (63%)
Performance	Capital re-investment rate	4.68%

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

4.6.7 Recommendations

Replacement Costs

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

Condition Assessment Strategies

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

Risk Management Strategies

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

Levels of Service

- 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 $131.5 million
- 83.5% 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 $2.9 million
- Critical assets should be evaluated to determine appropriate risk mitigation activities and treatment options

5.1 Water Network

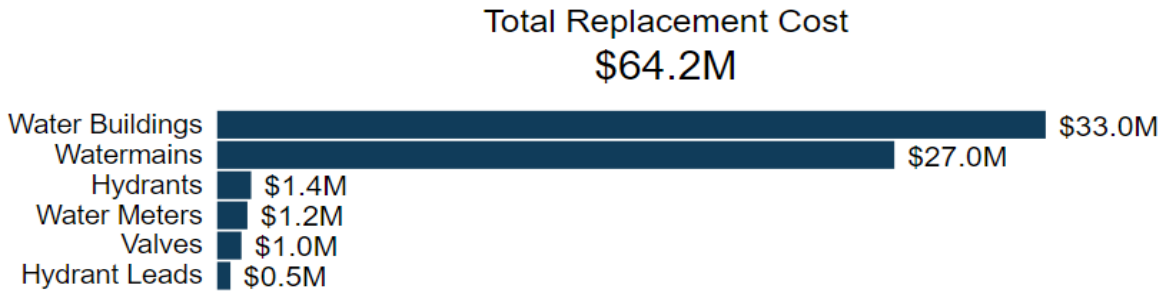
The Town is responsible for the supply and distribution of safe drinking water. Water is taken from the Madawaska River and treated at the Walter E. Prentice Water Filtration Plant. The Town is responsible for the following:

- Water tower
- Water Filtration Plant
- Pump House
- Water meters, watermains, hydrants, and accompanying components

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.

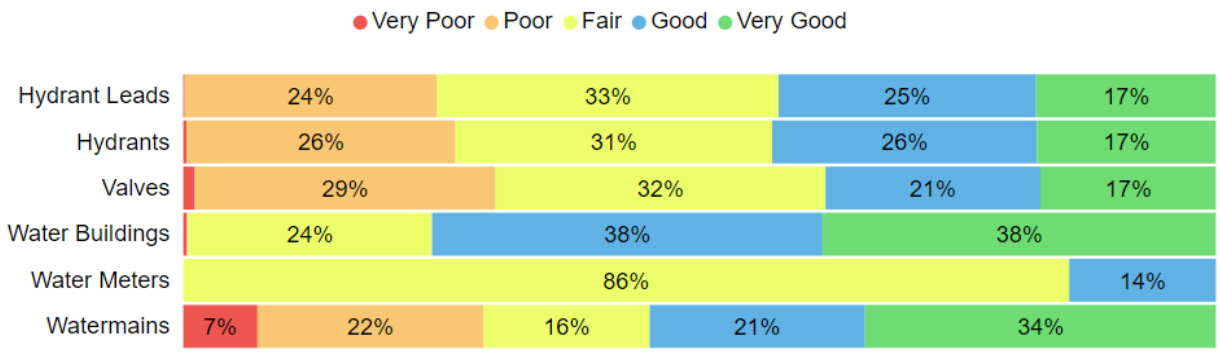
Asset Segment	Quantity	Replacement Cost Method	Total Replacement Cost
Hydrant Leads	1,614 m	CPI Tables	$542,409
Hydrants	316	CPI Tables	$1,368,416
Valves	617	CPI Tables	$980,838
Water Buildings	4	CPI Tables	$33,038,331
Water Meters	7	CPI Tables	$1,219,833
Watermains	57,292 m	CPI Tables	$27,005,851
Total			**$64,155,678**



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
Hydrant Leads	58%	Fair	Age-Based
Hydrants	58%	Fair	Age-Based
Valves	55%	Fair	Age-Based
Water Buildings	68%	Good	Age-Based
Water Meters	57%	Fair	Age-Based
Watermains	61%	Good	Age-Based
Average	**65%**	**Good**	**Age-Based**



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

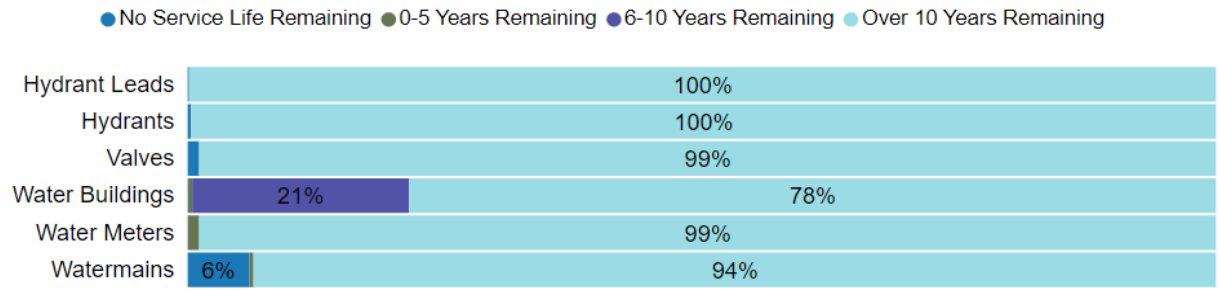
Accurate and reliable condition data allows staff to more confidently determine the remaining service life of assets and identify the most cost-effective approach to managing assets. The following describes the municipality's current approach:

- Staff primarily rely on the age and material of water mains to determine the projected condition of water mains
- There are no formal condition assessment programs in place for the Water Network
- Fire hydrant flushing is conducted twice per year throughout the entire system. Fire flow testing is conducted on a five-year program for the entire system.

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)
Hydrant Leads	80	37.1	42.9
Hydrants	80	36.8	43.3
Valves	80	39.8	40.3
Water Buildings	5-60	13.3	18.9
Water Meters	5-25	7.8	14.3
Watermains	80	41.9	38.1
Average		**38.8**	**40.2**



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.

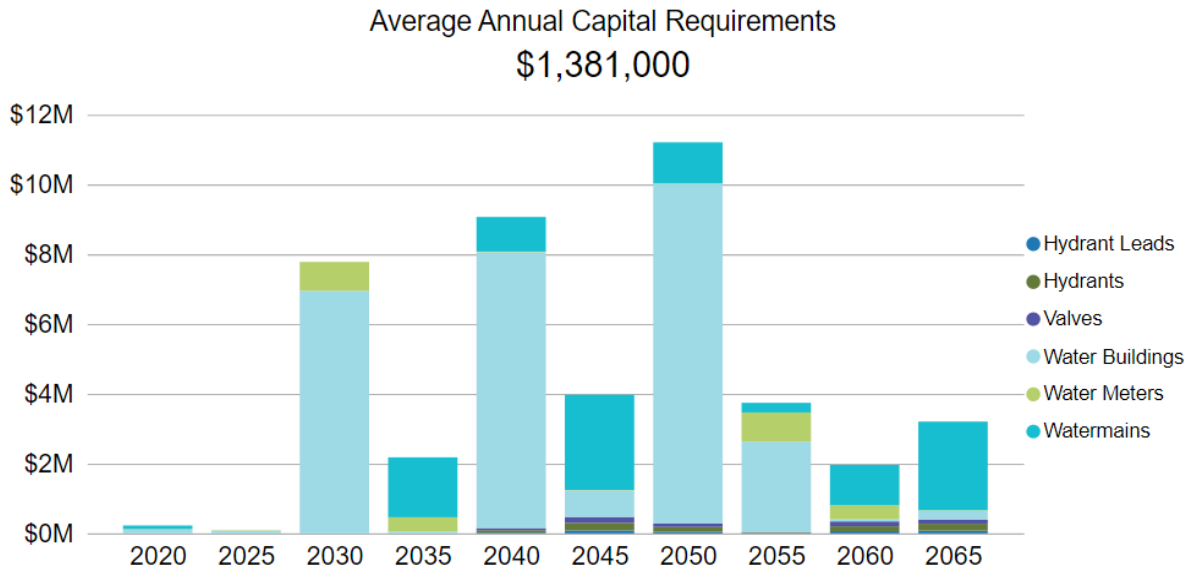
5.1.4 Lifecycle Management Strategy

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	Fire hydrants are flushed twice per year to ensure proper operation of the hydrants and to flush the watermains throughout the distribution sytem to remove sediment and corrosion.
	Staff conduct a valve turning exercise on one third of the network every year using in-house resources.
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 activities are identified based on an analysis of the main break rate as well as any issues identified during regular maintenance activities. Staff also aim to prioritize replacement of cast iron and ductile iron mains. Watermains are typically replaced with higher capacity pipes to accommodate population growth and increased demand.
	A replacement program is in place to proactively replace water hydrants based on age.

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.

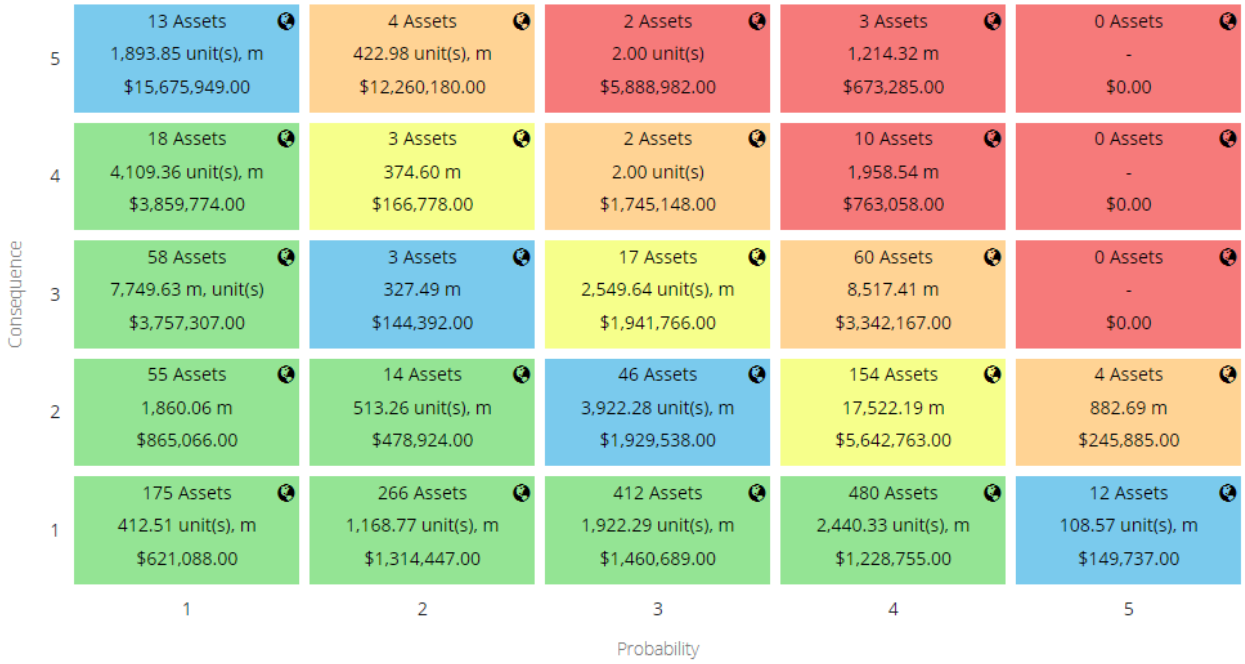


The projected cost of lifecycle activities that will need to be undertaken over the next 10 years to maintain the current level of service can be found in Appendix B.

5.1.5 Risk & Criticality

Risk Matrix

The following risk matrix provides a visual representation of the level of risk exposure for this asset category. It considers both the probability of failure and consequence of failure. The metrics that have been used to determine both can be found in Appendix D.



Risks to Current Asset Management Strategies

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

Growth

The Town of Arnprior is expected to experience significant growth. Population and employment growth will increase the demand on municipal services and potentially decrease the lifecycle of certain assets. The total annual raw water flow increased by 8.5% from 2019 to 2020. Furthermore, the peak day demand reached 63% of the maximum daily allowable. As the population continues to grow, the Town must prioritize expanding its capacity to serve a larger population. Staff are working towards amending redundancies in the network and developing a comprehensive long-term capital plan with considerations for growth.

Asset Data & Information

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

5.1.6 Levels of Service

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

Service Attribute	Qualitative Description	Current LOS (2020)
Scope	Description, which may include maps, of the user groups or areas of the municipality that are connected to the municipal water system	See Appendix C
	Description, which may include maps, of the user groups or areas of the municipality that have fire flow	All properties in the Town have access to fire flow.[6]
Reliability	Description of boil water advisories and service interruptions	The Town adopted a policy that dictates a communication protocol during a boil water advisory. The Town follows Ontario's Drinking Water Quality Management Standard (DWQMS) as defined in their Water Treatment Operations Manual and the Water Distribution Operations Manual.

[6] Four dead-end streets off of Elgin Street have low proximity to fire flow but still have access from Elgin Street. Johnston Road and the most eastern section of Baskin Drive East do not have full fire flow access.

Technical Levels of Service

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

Service Attribute	Technical Metric	Current LOS (2020)
Scope	% of properties connected to the municipal water system	93%
	% of properties where fire flow is available	99%
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	0.14
Performance	Average daily production	4,638[7] m^3
	Maximum day demand	6,490[8] m^3
	Capital re-investment rate	1.56%

[7] The total annual raw water flow in 2020, 1,691,619 m^3, has increased since 2019 by over 133,000m^3.
[8] The maximum day was measured on April 17, 2020, however, was noted to be caused by a significant watermain break. The maximum daily allowable is 10,340 m^3.

5.1.7 Recommendations

Replacement Costs

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

Condition Assessment Strategies

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

Risk Management Strategies

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

Levels of Service

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

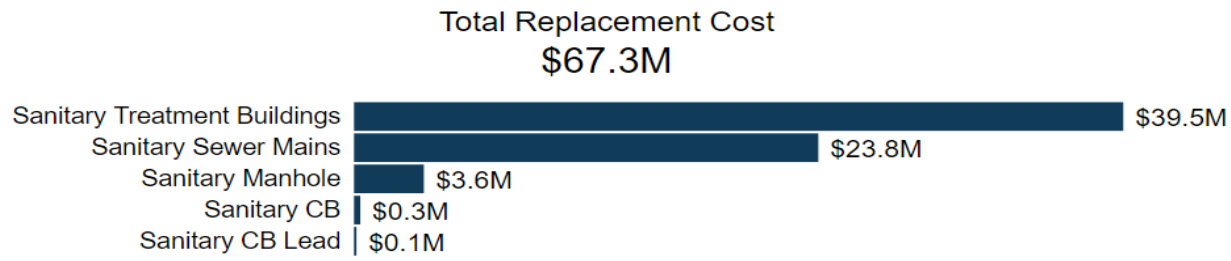
The Town is responsible for collecting sanitary sewer discharges (wastewater) and storm water from the entire Town. Sanitary sewer wastewater is treated in Town's water pollution control center and treated water is discharged to the Ottawa River. The Town is responsible for the following:

- Pump stations
- Sanitary sewer treatment system
- Sanitary mains, manholes, catch basins, and other accompanying components

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.

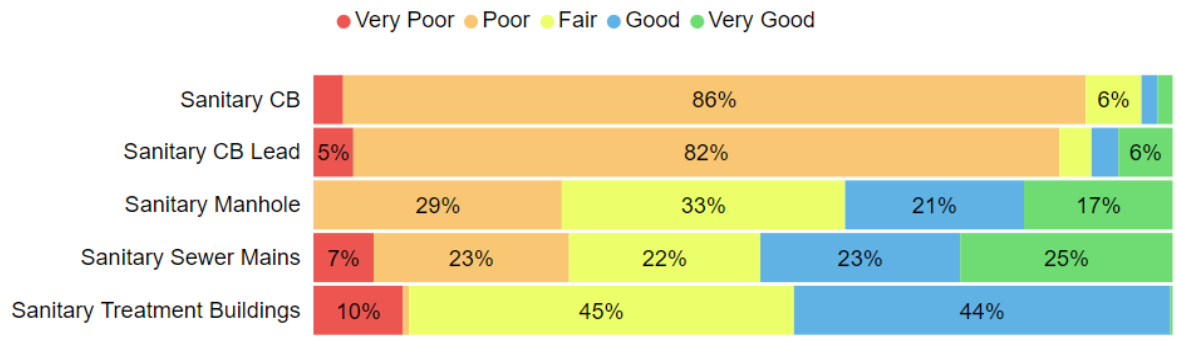
Asset Segment	Quantity	Replacement Cost Method	Total Replacement Cost
Sanitary CB	168	CPI Tables	$331,792
Sanitary CB Lead	806 m	CPI Tables	$132,140
Sanitary Manhole	659	CPI Tables	$3,588,851
Sanitary Sewer Mains	50,520 m	CPI Tables	$23,819,100
Sanitary Treatment Buildings	6	CPI Tables	$39,458,368
Total			**$67,330,251**



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
Sanitary CB	34%	Poor	Age-Based
Sanitary CB Lead	35%	Poor	Age-Based
Sanitary Manhole	56%	Fair	Age-Based
Sanitary Sewer Mains	58%	Fair	Age-Based
Sanitary Treatment Buildings	56%	Fair	Age-Based
Average	**57%**	**Fair**	**Age-Based**



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

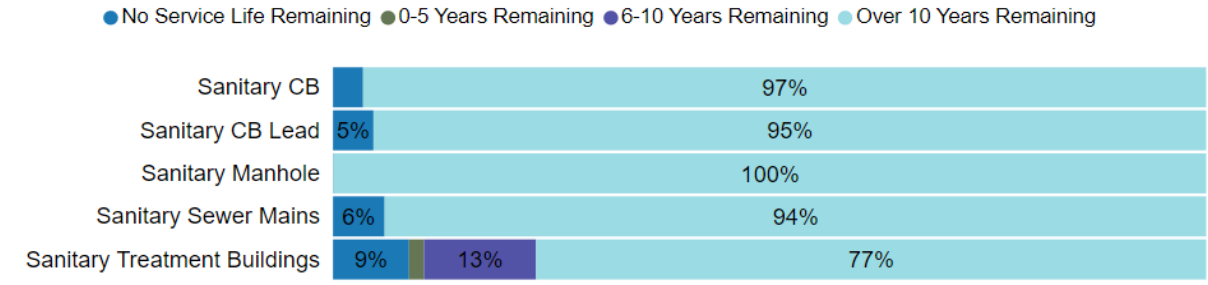
Accurate and reliable condition data allows staff to more confidently determine the remaining service life of assets and identify the most cost-effective approach to managing assets. The following describes the municipality's current approach:

- CCTV inspections are completed on 15% to 20% of the sanitary mains annually based on age. Manholes are also captured during CCTV inspections.
- CCTV footage collection serves to identify deficiencies and guide project prioritization; however, condition ratings are not provided based on the footage.

5.2.3 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)
Sanitary CB	80	56.0	24.0
Sanitary CB Lead	80	57.1	22.9
Sanitary Manhole	80	37.9	42.1
Sanitary Sewer Mains	80	42.8	37.3
Sanitary Treatment Buildings	10-60	17.1	15.4
Average		**42.7**	**36.0**



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

5.2.4 Lifecycle Management Strategy

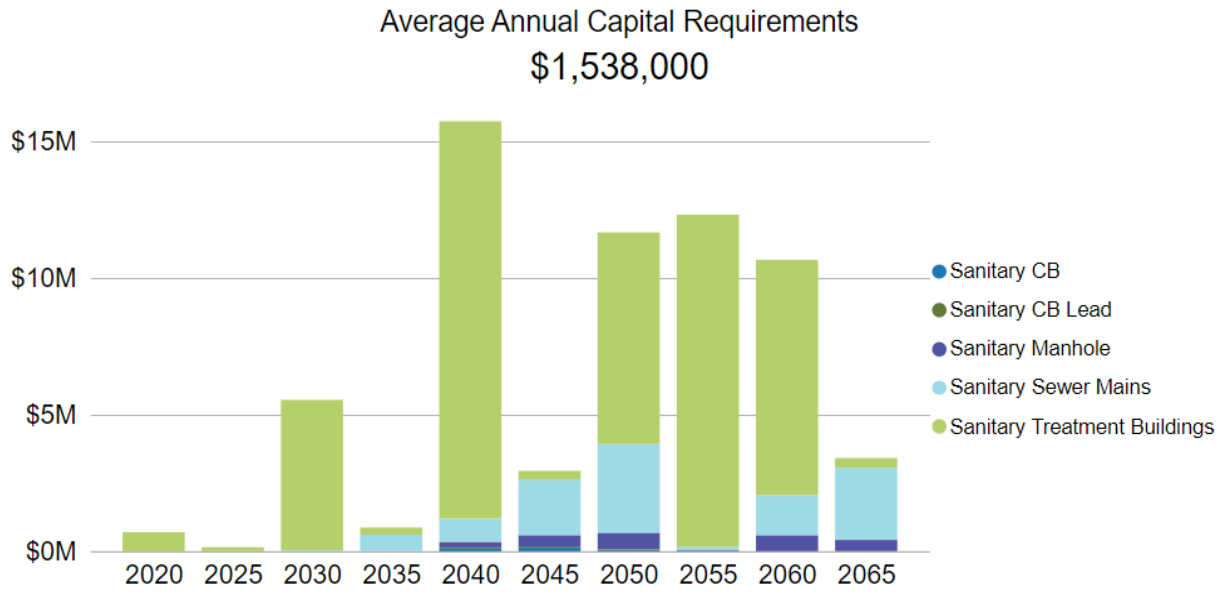
The condition or performance of most assets will deteriorate over time. To ensure that municipal assets are performing as expected and meeting the needs of customers, it is important to establish a lifecycle management strategy to proactively manage asset deterioration.

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

Activity Type	Description of Current Strategy
Maintenance	Through CCTV inspections and historical data staff have an understanding of the sanitary mains that require more regular flushing to prevent blockages.
	CCTV and flushing work is aligned with road work when possible to reduce costs.
Rehabilitation	Sanitary sewer lining presents significant challenges and is not always a viable option. The Town will undertake spot lining in some areas based on the findings from the CCTV inspections.
Replacement	In the absence of mid-lifecycle rehabilitative events, most mains are simply maintained with the goal of full replacement once it reaches its end-of-life.
	Replacement activities are identified based on an analysis of the main break rate as well as any issues identified during CCTV inspection.

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.

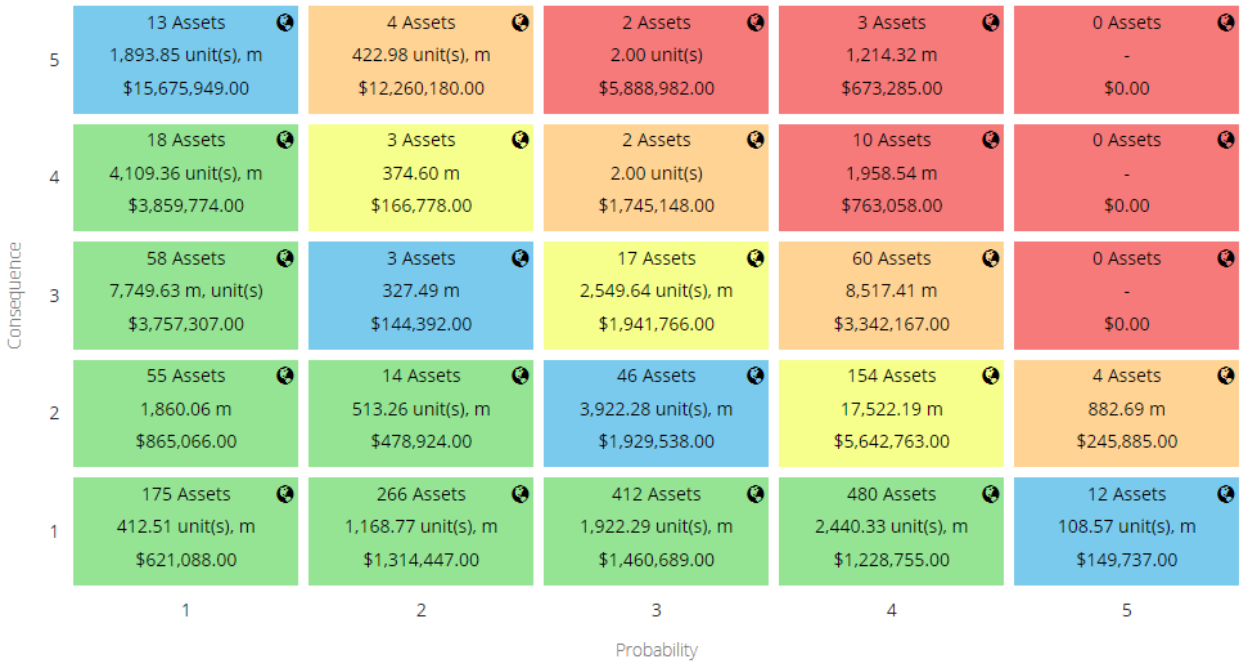


The projected cost of lifecycle activities that will need to be undertaken over the next 10 years to maintain the current level of service can be found in Appendix B.

5.2.5 Risk & Criticality

Risk Matrix

The following risk matrix provides a visual representation of the level of risk exposure for this asset category. It considers both the probability of failure and consequence of failure. The metrics that have been used to determine both can be found in Appendix D.



Risks to Current Asset Management Strategies

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

Growth

The Town of Arnprior is expected to experience significant growth. Population and employment growth will increase the demand on municipal services and potentially decrease the lifecycle of certain assets. In 2020, the average day flow reached 61% of the daily limit. As the population continues to grow, the Town must prioritize expanding its capacity to serve a larger population. Staff are working towards developing a comprehensive long-term capital plan with considerations for growth.

Asset Data & Information

There is a lack of confidence in the available inventory data for the sanitary sewer network. Staff plan to prioritize data refinement efforts to increase confidence in the accuracy and reliability of asset data and information. Staff hope to improve the accuracy of condition data by advancing their CCTV inspection program and utilizing the information to provide a condition rating for underground assets. Once completed there will be greater confidence in the development of data-driven strategies to address infrastructure needs.

Infrastructure Design

11.7% of the wastewater network is made up of combined sewers. Combined sewers can lead to overflows and sanitary water backups in people's homes and other habitable areas such as beaches. Storm water flow into combined sewers reduces the overall capacity available for the sanitary system, and places greater demands on the treatment system. The Town is dedicated to proactively separating wastewater and storm water sewers in accordance with provincial regulations. However, this is a costly and timely endeavour.

5.2.6 Levels of Service

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

Service Attribute	Qualitative Description	Current LOS (2020)
Scope	Description, which may include maps, of the user groups or areas of the municipality that are connected to the municipal wastewater system	11.7% of the Sanitary Sewer System is made up of combined sewer. See Appendix C for a map of the Sanitary Sewer System.
Reliability	Description of how combined sewers in the municipal wastewater system are designed with overflow structures in place which allow overflow during storm events to prevent backups into homes	4 of the 6 sanitary plants have combined sewer overflows to prevent backups by directing water to the river during storm events.
	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 experienced 4 bypass events in 2020, as follows: • Secondary WPCC by-pass of 17.1 m^3 due to heavy precipitation and snow melt (March 20). • Pump station #3 by-passed a total of 1.0 m^3 due to heavy rain (July 19). • August 11th a WPCC by-pass at the Albert St. manhole amounted to 133.9 m^3 due to heavy precipitation. A beach closure was initiated and affected residences were notified. • Pump station #P1 by-passed a volume of 0.06 m^3 due to heavy rain (August 23).

Service Attribute	Qualitative Description	Current LOS (2020)
		Required samples were collected for all by-passes and lab results were received. All by-passes were reported to the MECP and the local health unit.
	Description of how stormwater can get into sanitary sewers in the municipal wastewater system, causing sewage to overflow into streets or backup into homes	Storm water can get into sanitary sewers as a result of combined sewers, illegal roof drains connected to the sanitary system, and infiltration related to aging and damaged infrastructure. Scada equipment tracks flow meters, which are then manually tracked in the records management system. The results are reported in the Water Pollution Control Centre summary report and made available to the public.
	Description of how sanitary sewers in the municipal wastewater system are designed to be resilient to stormwater infiltration	The municipality follows a series of design standards that integrate servicing requirements and land use considerations when constructing or replacing sanitary sewers. These standards have been determined with consideration of the minimization of sewage overflows and backups.
	Description of the effluent that is discharged from sewage treatment plants in the municipal wastewater system	Approximately 5,045 m^3 of liquid is discharged daily and tested regularly. All contaminants were consistently found to be below the MECP limits. Nitrogen levels were higher than the plant goals which is inconsequential at this time due to the assimilative capacity report included in the 2008 Environmental Study Report (ESR) that states that the Ottawa River's nitrates are not a concern. This is confirmed by the observation that neighbouring facilities that also discharge to the Ottawa River do not have a total nitrogen objective.

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 (2020)
Scope	% of properties connected to the municipal wastewater system	91%
Reliability	# of events per year where combined sewer flow in the municipal wastewater system exceeds system capacity compared to the total number of properties connected to the municipal wastewater system	0.001
	# of connection-days per year having wastewater backups compared to the total number of properties connected to the municipal wastewater system	0
	# of effluent violations per year due to wastewater discharge compared to the total number of properties connected to the municipal wastewater system	0
Performance	Average daily flow	5,045[9] m^3
	Capital re-investment rate	0.78%

[9] The maximum day was measured in March 2020. The average daily maximum capacity is 9,700 m^3 and design peak hour flow is 59,200 m^3 per day. The average peak hourly flow was recorded as 43,585 m^3 per day.

5.2.7 Recommendations

Replacement Costs

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

Condition Assessment Strategies

- Identify condition assessment strategies for high value and high-risk sanitary network assets. Consider expanding CCTV inspections to a 5-year program to gather assessed condition. The assessment process should include the collection of condition scores following industry practice, such as the Pipeline Assessment Certification Program.

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

- 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 to severe 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 Arnprior Official Plan (June 2017)

The Town of Arnprior adopted a new Official Plan in June of 2017. The Official Plan guides development through policies that address the need for services such as sewers, water, and roads and the community's vision for growth. The Official Plan has been approved at County of Renfrew in December of 2017.

The five-year review of the Official Plan commenced in 2015 with a focus on anticipated population and employment growth. The Plan projects the population to increase to 11,773 and employment to increase to 7,137 by 2036. These figures are based on Renfrew County's 2015 Official Plan.

As part of the review, the Town completed a land inventory in conjunction with the Town's Water and Wastewater Master Plan (2013). This exercise confirmed that there is sufficient land supply to accommodate anticipated growth. The available residential area is 114.71 hectares, which is expected to accommodate a population of over 6,100. Housing projections anticipate 1,660 new dwellings by 2036.

The land inventory also found 57.82 hectares of available industrial land and 38.75 hectares of available commercial land. Growth in Arnprior's employment sector is projected to result in 729 new industrial jobs and 900 new commercial jobs by 2031. According to the analysis, the available industrial land can withstand such growth.

Due to recent accelerated growth, the Town has identified the need to update its development lands needs by initiating a Land Needs Study in the summer of 2021. This study is expected to be complete in 2022.

The Town's growth management policies focus on developing a complete community with access to employment, education, health care, cultural and recreational facilities, housing, social services, diverse goods and services, and sustainable public infrastructure and services. The Official Plan states that planning for infrastructure and public services will be coordinated with land use planning and growth projections. Municipal infrastructure and public services will also be financially viable over their life cycle as demonstrated in the Town's asset management planning.

6.1.2 County of Renfrew Official Plan (March 2020)

The County of Renfrew adopted a new Official Plan in March 2020 to replace the 2002 Official Plan. The County is responsible for the allocation of growth to the local municipalities, which includes twelve Townships and five Towns. The Town of Arnprior is expected to make up 18% of the County's projected growth.

The Plan's objectives include the promotion of efficient and cost-effective development to ensure the financial viability of infrastructure and public services as demonstrated through asset management planning.

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.

Arnprior has developed and adopted numerous documents to guide strategic planning and promote efficient growth. Such documents include a Development Charges Background Study (2013), Water and Wastewater Master Plan (2013), Storm Water Master Plan (2015), and support the development of the County of Renfrew's Background Report and Population Projections document.

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 level of service.

7 Financial Strategy

Key Insights

- The Town is committing approximately $4,902,000 towards capital projects per year from sustainable revenue sources
- Given the annual capital requirement of $6,638,000, there is currently a funding gap of $1,736,000 annually
- For tax-funded assets, we recommend maintaining the current status quo funding model each year for the next 5 years
- For the Water Network, we recommend increasing rate revenues by 0.5% annually for the next 10 years to achieve a sustainable level of funding
- For the Sanitary Sewer Network, we recommend increasing rate revenues by 2.8% annually for the next 10 years to achieve a sustainable level of funding

7.1 Financial Strategy Overview

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

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

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

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

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

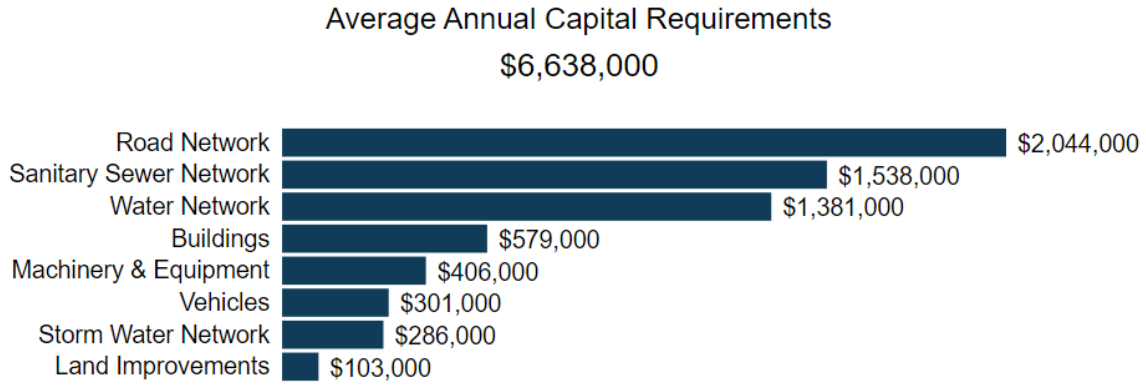
1. In order to reduce financial requirements, consideration has been given to revising service levels downward.
2. All asset management and financial strategies have been considered. For example:

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 $6.6 million annually to address capital requirements for the assets included in this AMP.



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

However, for the Road Network, lifecycle management strategies have been developed to identify capital costs that are realized through strategic rehabilitation and renewal of the 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:

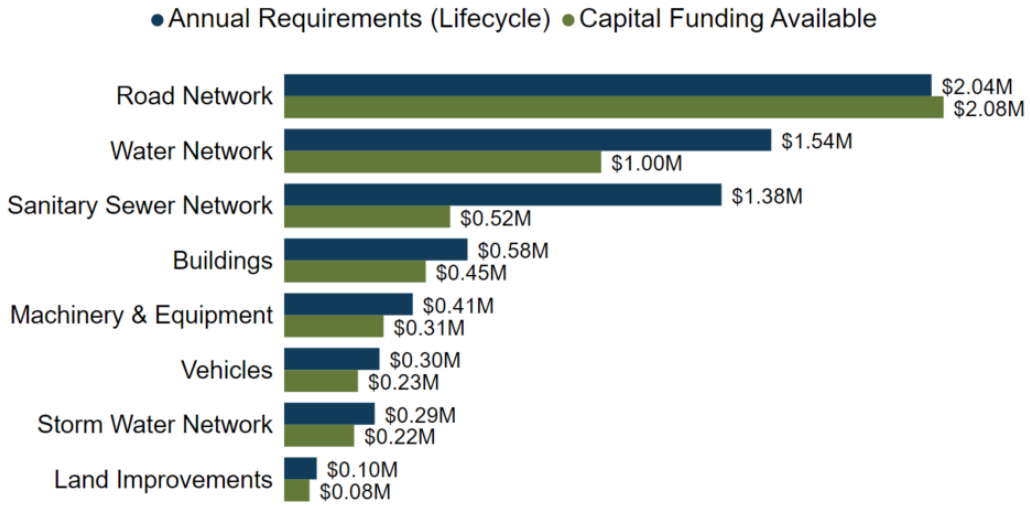
1. **Replacement Only Scenario**: Based on the assumption that assets deteriorate and – without regularly scheduled maintenance and rehabilitation – are replaced at the end of their service life.
2. **Lifecycle Strategy Scenario**: Based on the assumption that lifecycle activities are performed at strategic 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	$1,954,000	$2,044,000	$90,000

The implementation of a proactive lifecycle strategy for roads leads to a potential annual cost addition of $90,000 for the Road Network. This represents an overall increase of the annual requirements by 4.6%. As the lifecycle strategy scenario results in a higher level of service, we have used these annual requirements in the development of the financial strategy.[10]

Annual Funding Available

Based on a historical analysis of sustainable capital funding sources, the Town is committing approximately $4,902,000 towards capital projects per year. Given the annual capital requirement of $6,638,000 there is currently a funding gap of $1,736,000 annually.



7.2 Funding Objective

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

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

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

[10] The lifecycle strategy scenario typically provides opportunities for cost savings. In this case, the lifecycle strategies for roads may not be contributing to cost savings as a result of inaccurate replacement costs for roads.

7.3 Financial Profile: Tax Funded Assets

7.3.1 Current Funding Position

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

Asset Category	Avg. Annual Requirement	Annual Funding Available					Annual Deficit
		Taxes	Gas Tax	OCIF	Taxes To Reserves	Total Available	
Road Network	2,044,000	1,181,000	267,000	235,000	399,000	2,082,000	-38,000
Storm Water Network	286,000	165,000	0	0	56,000	221,000	65,000
Buildings	579,000	334,000	0	0	113,000	447,000	132,000
Machinery & Equipment	406,000	235,000	0	0	79,000	314,000	92,000
Land Improvements	103,000	60,000	0	0	20,000	80,000	23,000
Vehicles	301,000	174,000	0	0	59,000	233,000	68,000
	3,719,000	2,149,000	267,000	235,000	726,000	3,377,000	342,000

The average annual capital expenditure requirement for the above categories is $3.72 million. Annual revenue currently allocated to these assets for capital purposes is $3.38 million leaving an annual deficit of $342,000. Put differently, these infrastructure categories are currently funded at 91% of their long-term requirements.

7.3.2 Full Funding Requirements

In 2020, Town of Arnprior had annual tax revenues of $9.9 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	-0.4%
Storm Water Network	0.7%
Buildings	1.3%
Machinery & Equipment	0.9%
Land Improvements	0.2%
Vehicles	0.7%
	3.4%

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

- Arnprior's debt payments for these asset categories will be decreasing by $461k over the next 5 years.

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

	Without Capturing Changes				With Capturing Changes			
	5 Years	**10 Years**	**15 Years**	**20 Years**	**5 Years**	**10 Years**	**15 Years**	**20 Years**
Infrastructure Deficit	342,000	342,000	342,000	342,000	342,000	342,000	342,000	342,000
Change in Debt Costs	N/A	N/A	N/A	N/A	-461,000	-461,000	-461,000	-461,000
Change in OCIF Grants	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Resulting Infrastructure Deficit	342,000	342,000	342,000	342,000	-119,000	-119,000	-119,000	-119,000
Tax Increase Required	3.5%	3.5%	3.5%	3.5%	-1.2%	-1.2%	-1.2%	-1.2%
Annually	0.7%	0.4%	0.2%	0.2%	-0.2%	-0.1%	-0.1%	-0.1%

7.3.3 Financial Strategy Recommendations

Considering all the above information, we recommend maintaining the current status quo funding model for tax funded assets. This is based on the infrastructure deficit being less than the change in debt costs over the next 5 years. The Town is well positioned to maintain fully funded infrastructure for tax funded assets by:

- Maintaining current funding rates for capital expenditure for tax-funded assets each year for the next 5 years.
- When realized, reallocating the debt cost reductions of $461,000 to the infrastructure deficit as outlined above.
- Allocating the current gas tax and OCIF revenue as outlined previously.
- Allocating the scheduled OCIF grant increases to the infrastructure deficit as they occur.
- Reallocating appropriate revenue from categories in a surplus position to those in a deficit position.
- Increasing existing and future infrastructure budgets by the applicable inflation index on an annual basis.

Notes:

- 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 and annual Gas Tax funds since this funding is a multi-year commitment.
- We recognize the Town has had a reasonable funding strategy for tax-funded infrastructure, and the data suggests the Town has a successful approach to asset management, capital expenditure investments and financing of the tax-funded capital assets.[11]

Although this option provides financial sustainability over the period modeled, the recommendations do require prioritizing capital projects to fit the resulting annual funding available. Current data shows a pent-up investment demand of $2,887,000 for the Road Network, $7,000 for the Storm Water Network, $5,138,000 for the Buildings, $1,248,000 for Machinery & Equipment, $14,000 for Land Improvements, and $85,000 for Vehicles.

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

[11] 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, Arnprior's average annual asset investment requirements, current funding positions, and funding increases required to achieve full funding on assets funded by rates.

Asset Category	Avg. Annual Requirement	Annual Funding Available				Annual Deficit
		Rates	To Operations	OCIF	Total Available	
Water Network	1,538,000	3,093,000	-2,269,000	177,000	1,001,000	537,000
Sanitary Sewer Network	1,381,000	2,078,000	-1,713,000	159,000	524,000	857,000
	2,919,000	5,171,000	-3,982,000	336,000	1,525,000	1,394,000

The average annual investment requirement for the above categories is $2.919 million. Annual revenue currently allocated to these assets for capital purposes is $1.525 million leaving an annual deficit of $1.394 million. Put differently, these infrastructure categories are currently funded at 52% of their long-term requirements.

7.4.2 Full Funding Requirements

In 2020, Arnprior had annual sanitary revenues of $2.078 million and annual water revenues of $3.093 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	Tax Change Required for Full Funding
Water Network	17.4%
Sanitary Sewer Network	41.2%

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

	Water Network				Sanitary Sewer Network			
	5 Years	**10 Years**	**15 Years**	**20 Years**	**5 Years**	**10 Years**	**15 Years**	**20 Years**
Infrastructure Deficit	537,000	537,000	537,000	537,000	857,000	857,000	857,000	857,000
Rate Increase Required	17.4%	17.4%	17.4%	17.4%	41.2%	41.2%	41.2%	41.2%
Annually	3.5%	1.7%	1.2%	0.9%	8.2%	4.1%	2.7%	2.1%

	Water Network				Sanitary Sewer Network			
	5 Years	**10 Years**	**15 Years**	**20 Years**	**5 Years**	**10 Years**	**15 Years**	**20 Years**
Infrastructure Deficit	537,000	537,000	537,000	537,000	857,000	857,000	857,000	857,000
Less the Decrease in debt payments	-250,000	-375,000	-975,000	-975,000	-240,000	-269,000	-847,000	-847,000
Tax Increase Required	9.3%	5.2%	-14.2%	-14.2%	29.7%	28.3%	0.5%	0.5%
Annually	1.9%	0.5%	-0.9%	-0.7%	5.9%	2.8%	0.0%	0.0%

7.4.3 Financial Strategy Recommendations

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

- when realized, reallocating the debt cost reductions to the infrastructure deficit as outlined above.
- increasing rate revenues by 0.5% for the water network and 2.8% for the sanitary sewer network 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.
- increasing existing and future infrastructure budgets by the applicable inflation index on an annual basis in addition to the deficit phase-in.

Notes:

- 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.

- 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.
- While debt costs will decrease substantially in years 11-15, this option ensures full funding in the first 10 years.
- Any increase in rates required for operations would be in addition to the above recommendations.

Although this strategy achieves full funding for rate-funded assets in 10 years, the recommendation does require prioritizing capital projects to fit the resulting annual funding available. Current data shows a pent-up investment demand of $1.670 million for the Water Network and $4.845 million for the Sanitary Sewer Network.

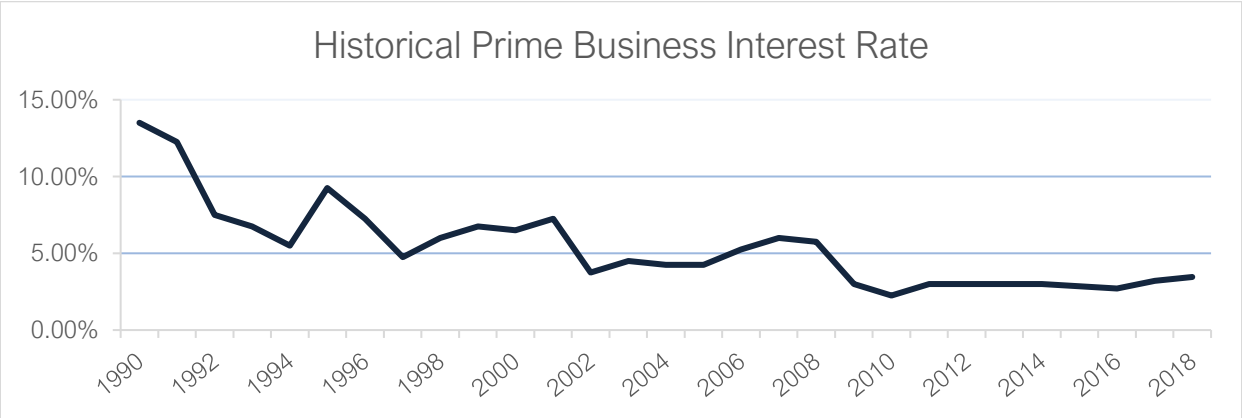
Prioritizing future projects will require the current data to be replaced by condition-based data. Although our recommendations include no further use of debt, the results of the condition-based analysis may require otherwise.

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 $1 million project financed at 3.0%[12] 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:



[12] 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 Arnprior has historically used debt for investing in the asset categories as listed. There is currently $14,101,000 of debt outstanding for the assets covered by this AMP with corresponding principal and interest payments of $2,283,000.

Asset Category	Current Debt Outstanding	Use of Debt in the Last Five Years				
		2016	2017	2018	2019	2020
Road Network	618,000	3,000,000	0	0	0	0
Storm Water Network	0	0	0	0	0	0
Buildings	0	0	0	0	0	0
Machinery & Equipment	0	0	0	0	0	0
Land Improvements	0	0	0	0	0	0
Vehicles	1,059,000	0	0	0	1,284,000	0
Total Tax Funded	1,677,000	3,000,000	0	0	1,284,000	0
Water Network	6,656,000	1,500,000	0	0	0	0
Sanitary Sewer Network	5,768,000	1,500,000	0	0	0	0
Total Rate Funded	12,424,000	3,000,000	0	0	0	0

Asset Category	Principal & Interest Payments in the Next Ten Years						
	2021	2022	2023	2024	2025	2026	2031
Road Network	385,000	52,000	52,000	52,000	9,000	0	0
Storm Water Network	0	0	0	0	0	0	0
Buildings	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	76,000	76,000	76,000	76,000	76,000	0	0
Total Tax Funded	461,000	128,000	128,000	128,000	85,000	0	0
Water Network	975,000	851,000	851,000	851,000	851,000	725,000	600,000
Sanitary Sewer Network	847,000	719,000	718,000	716,000	637,000	607,000	578,000
Total Rate Funded	1,822,000	1,570,000	1,569,000	1,567,000	1,488,000	1,332,000	1,178,000

The revenue options outlined in this plan allow Arnprior 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 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 Arnprior.

Asset Category	Balance on December 31, 2020
Road Network	940,000
Storm Water Network	929,000
Buildings	1,013,000
Machinery & Equipment	929,000
Land Improvements	1,120,000
Vehicles	929,000
Total Tax Funded	5,860,000
Water Network	0
Sanitary Sewer Network	417,000
Total Rate Funded	417,000

There is considerable debate in the municipal sector as to the appropriate level of reserves that a Town should have on hand. There is no clear guideline that has gained wide acceptance. Factors that municipalities should take into account when determining their capital reserve requirements include:

a) breadth of services provided
b) age and condition of infrastructure
c) use and level of debt
d) economic conditions and outlook
e) internal reserve and debt policies.

These reserves are available for use by applicable asset categories during the phase-in period to full funding. This coupled with Arnprior'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 2025, Ontario Regulation 588/17 will require Arnprior to integrate proposed levels of service for all asset categories in its asset management plan update. We recommend that future planning should reflect adjustments to service levels and their impacts on reserve balances.

8 Appendices

Key Insights

- Appendix A includes a one-page report card with an overview of key data from each asset category
- Appendix B identifies projected 10-year capital requirements for each asset category
- Appendix C includes several maps that have been used to visualize the current level of service
- Appendix D identifies the criteria used to calculate risk for each asset category
- Appendix E provides additional guidance on the development of a condition assessment program

Appendix A: Infrastructure Report Card

Asset Category	Replacement Cost (millions)	Asset Condition	Financial Capacity	
Road Network	$59.7	Fair (51%)	Annual Requirement:	$2,044,000
			Funding Available:	$2,082,000
			Annual Deficit:	**$-38,000**
Storm Water Network	$22.9	Good (67%)	Annual Requirement:	$286,000
			Funding Available:	$221,000
			Annual Deficit:	**$65,000**
Buildings	$30.4	Fair (45%)	Annual Requirement:	$579,000
			Funding Available:	$447,000
			Annual Deficit:	**$132,000**
Machinery & Equipment	$4	Poor (40%)	Annual Requirement:	$406,000
			Funding Available:	$314,000
			Annual Deficit:	**$92,000**
Vehicles	$4.2	Good (60%)	Annual Requirement:	$301,000
			Funding Available:	$233,000
			Annual Deficit:	**$68,000**
Land Improvements	$1.7	Good (63%)	Annual Requirement:	$103,000
			Funding Available:	$80,000
			Annual Deficit:	**$23,000**
Water Network	$64.1	Good (65%)	Annual Requirement:	$1,538,000
			Funding Available:	$1,001,000
			Annual Deficit:	**$537,000**
Sanitary Sewer Network	$67.3	Fair (57%)	Annual Requirement:	$1,381,000
			Funding Available:	$524,000
			Annual Deficit:	**$857,000**
Overall	$254.4	Fair (57%)	Annual Requirement:	$6,638,000
			Funding Available:	$4,902,000
			Annual Deficit:	**$1,736,000**

Appendix B: 10-Year Capital Requirements

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

Road Network											
Segment	Backlog	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029
Curb	$178,875	$390,821	$0	$11,715	$117,233	$128,481	$19,799	$0	$32,009	$0	$41,534
Road Surface	$0	$27,148	$1,685,278	$1,747,029	$2,888,613	$924,975	$2,691,067	$949,919	$830,262	$2,088,303	$1,708,961
Sidewalk	$2,504,716	$763,576	$0	$85,092	$260,920	$11,939	$0	$30,183	$0	$101,563	$0
Streetlights	$203,019	$41,256	$42,499	$43,047	$43,107	$47,352	$44,088	$42,877	$41,927	$41,291	$44,084
	$2,886,610	$1,222,801	$1,727,777	$1,886,883	$3,309,873	$1,112,747	$2,754,954	$1,022,979	$904,198	$2,231,157	$1,794,579

Storm Water Network											
Segment	Backlog	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029
Catch Basin	$6,524	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Catch Basin Leads	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Storm Concrete Headwalls	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Storm Culvert	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Storm Mains	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Storm Manhole	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
	$6,524	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0

Buildings											
Segment	Backlog	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029
General Government Buildings	$5,138,197	$0	$178,014	$0	$0	$0	$0	$129,642	$13,536	$53,974	$23,806
Protection Buildings	$0	$0	$0	$12,000	$0	$0	$0	$0	$0	$0	$0
Recreation Buildings	$0	$0	$0	$0	$27,356	$166,308	$4,871	$23,448	$0	$9,033	$1,653,860
Transportation Buildings	$0	$57,555	$0	$0	$0	$0	$124,893	$0	$27,399	$0	$0
	$5,138,197	$57,555	$178,014	$12,000	$27,356	$166,308	$129,764	$153,090	$40,935	$63,007	$1,677,666

Machinery & Equipment											
Segment	Backlog	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029
Equipment	$734,875	$27,719	$95,291	$27,490	$0	$28,393	$156,414	$249,212	$106,931	$0	$0
Furniture & Fixtures	$0	$0	$0	$0	$0	$0	$1,472	$1,976	$6,780	$12,458	$1,492
Heavy Equipment	$148,157	$109,774	$245,878	$0	$0	$102,838	$258,325	$29,031	$0	$0	$0
IT & AV	$364,987	$0	$25,631	$0	$48,499	$66,047	$381,512	$25,631	$0	$48,499	$66,047
Security	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
	$1,248,019	$137,493	$366,800	$27,490	$48,499	$197,278	$797,723	$305,850	$113,711	$60,957	$67,539

Vehicles											
Segment	Backlog	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029
Fire Trucks	$50,334	$0	$0	$0	$70,000	$0	$418,000	$0	$0	$0	$0
General Vehicles	$35,000	$0	$0	$0	$0	$0	$0	$0	$33,000	$0	$59,811
Pick-Up Trucks	$0	$91,100	$0	$41,000	$82,000	$41,000	$86,111	$0	$0	$41,060	$41,000
Plow Trucks	$0	$265,000	$0	$0	$265,000	$0	$265,933	$0	$0	$0	$246,936
Specialty Vehicles	$0	$0	$0	$0	$0	$0	$0	$0	$0	$36,000	$0
	$85,334	$356,100	$0	$41,000	$417,000	$41,000	$770,044	$0	$33,000	$77,060	$347,747

Land Improvements											
Segment	Backlog	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029
Cemetary	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Lighting & Signage	$0	$14,230	$0	$0	$0	$9,508	$16,038	$0	$34,977	$0	$426,925
Park Equipment & Structures	$14,388	$0	$24,390	$32,228	$7,641	$64,836	$18,997	$0	$0	$17,721	$162,354
Parking Lot	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Waste Management	$0	$0	$0	$0	$16,517	$0	$0	$0	$0	$16,517	$0
	$14,388	$14,230	$24,390	$32,228	$24,158	$74,344	$35,035	$0	$34,977	$34,238	$589,279

Water Network											
Segment	Backlog	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029
Hydrant Leads	$875	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Hydrants	$4,949	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Valves	$11,226	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Water Buildings	$19,580	$0	$0	$0	$97,900	$11,989	$27,276	$0	$0	$0	$52,035
Water Meters	$0	$0	$0	$0	$0	$13,963	$0	$0	$0	$0	$13,963
Watermains	$1,632,987	$0	$0	$102,573	$0	$0	$0	$0	$0	$0	$0
	$1,669,617	$0	$0	$102,573	$97,900	$25,952	$27,276	$0	$0	$0	$65,998

Sanitary Sewer Network											
Segment	Backlog	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029
Sanitary CB	$11,460	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Sanitary CB Lead	$6,135	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Sanitary Manhole	$2,397	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Sanitary Sewer Mains	$1,410,337	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Sanitary Treatment Buildings	$3,414,584	$24,720	$0	$258,645	$414,200	$0	$0	$0	$0	$137,753	$10,039
	$4,844,913	$24,720	$0	$258,645	$414,200	$0	$0	$0	$0	$137,753	$10,039

Appendix C: Level of Service Maps

Road Network Map

Road Class Pavement Condition

Sample Serious/Failed Road (0-25)
(Grey & Dark Red)

Sample Very Poor Road (26-40)
(Red)

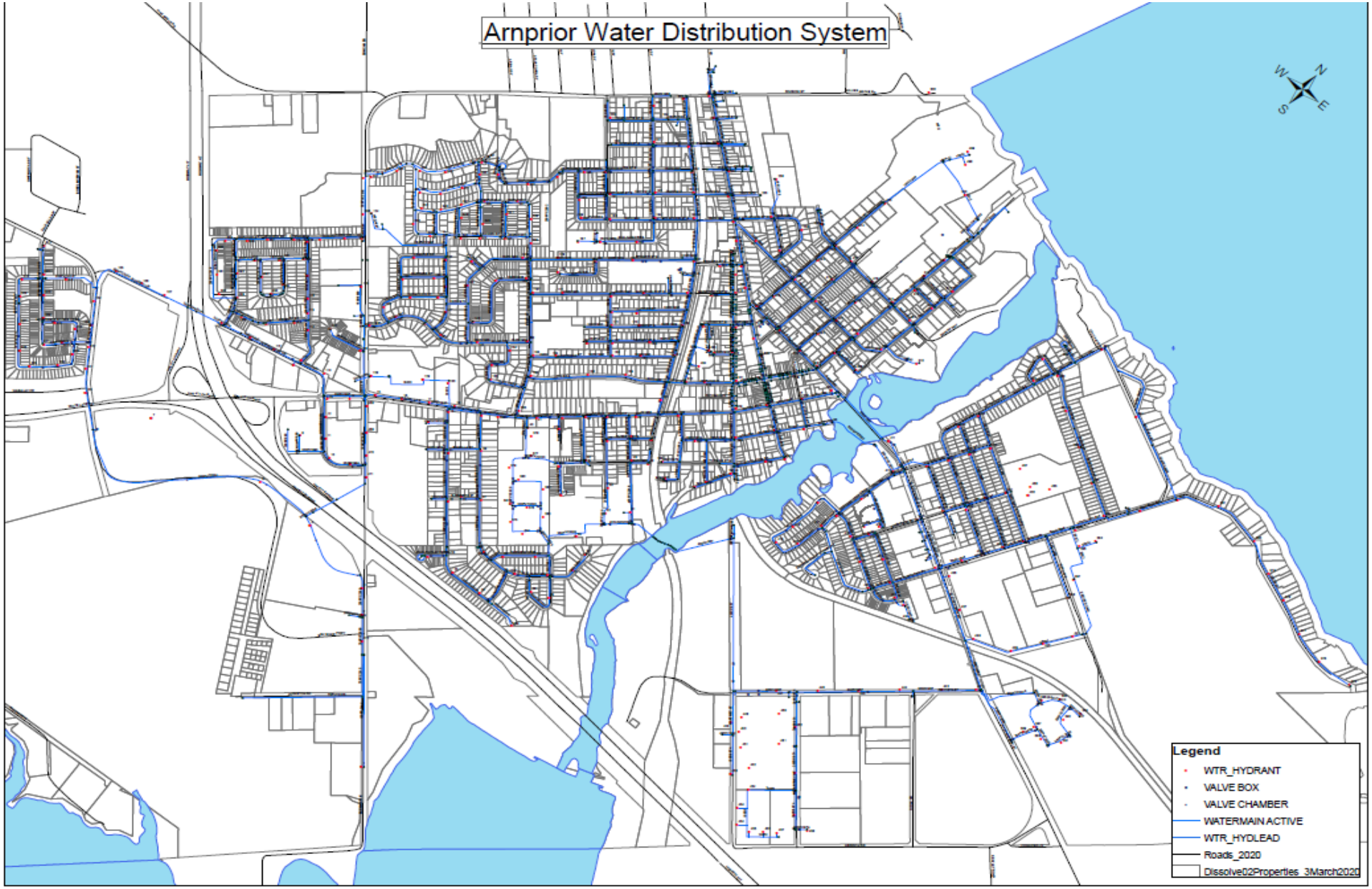
Sample Poor Road (41-55)
(Orange)

Sample Fair Road (56-70)
(Yellow)

Sample Good Road (71-85)
(Light Green)

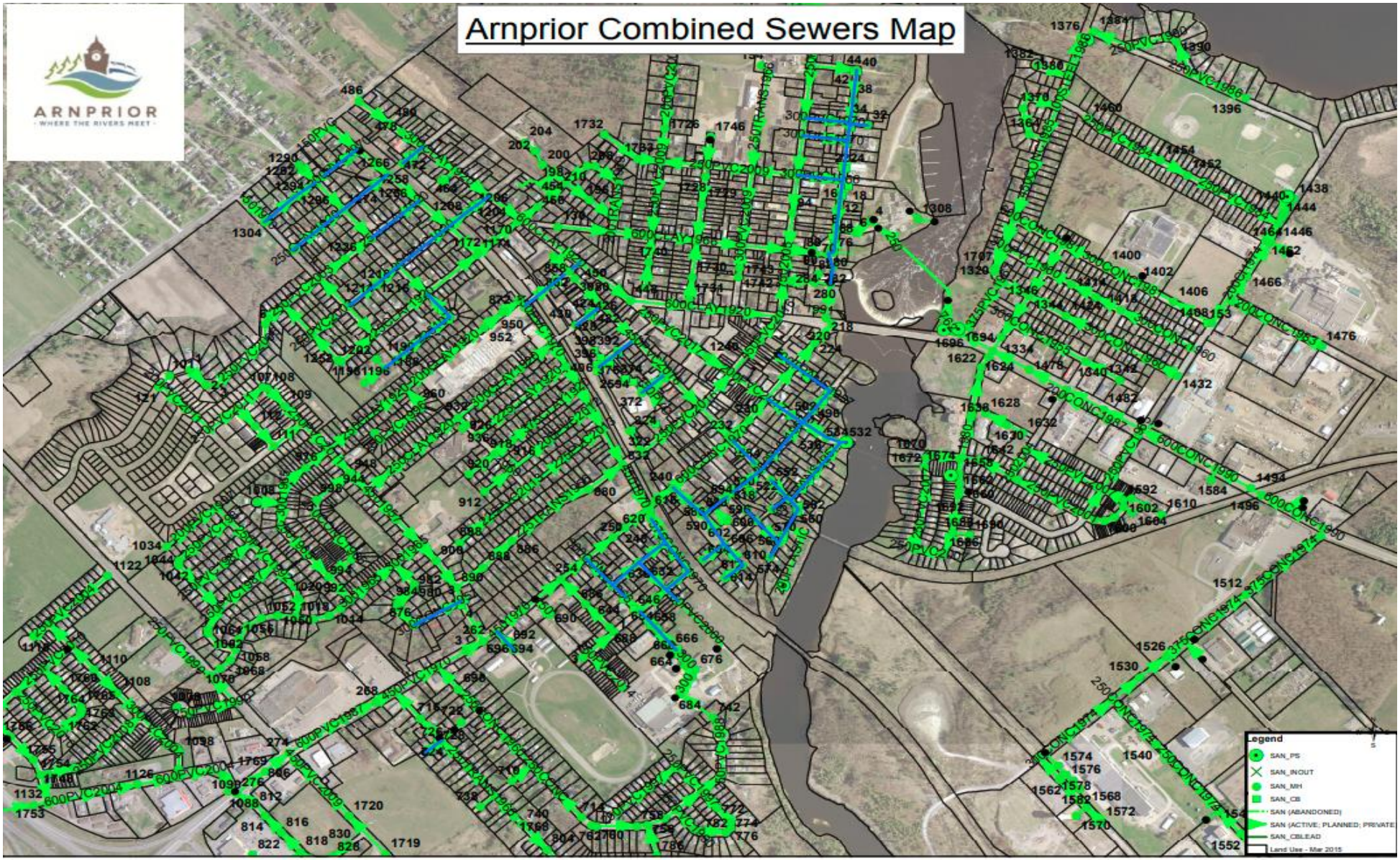
Sample Excellent Road (86-100)
(Dark Green)

Water Network Map



October 2020

Combined Sewer and Storm Water Network



0 105 210 420
Meters

November 2018

Appendix D: Risk Rating Criteria

Probability of Failure

Asset Category	Risk Criteria	Criteria Weighting	Value/Range	Probability of Failure Score
Road Network Storm Water Network Buildings Machinery & Equipment Vehicles Land Improvements	Condition	100%	80-100	1
			60-79	2
			40-59	3
			20-39	4
			0-19	5
Sanitary Sewer Network (Mains)	Condition	50%	80-100	1
			60-79	2
			40-59	3
			20-39	4
			0-19	5
	Pipe Material	50%	PVC, Plastic	1
			Concrete	2
			Transite, Asbestos Concrete, Steel, Steel Forcemain, Cast Iron	4
			Clay, Clay Tile	5
Water Network (Mains)	Condition	50%	80-100	1
			60-79	2
			40-59	3
			20-39	4
			0-19	5
	Pipe Material	50%	PVC, Plastic	1
			HDPE	2
			Copper, CU	3
			Cast Iron, Steel	4
			Ductile Iron	5

Consequence of Failure

Asset Category	Risk Classification	Risk Criteria	Value/Range	Consequence of Failure Score
Road Network	Economic (50%)	Replacement Cost	50,000	1
			100,000	2
			200,000	3
			400,000	4
			750,000	5
	Social (50%)	Road Design Class	Local	4
			Collector	5
Storm Water Network	Environmental (100%)	Pipe Diameter (mm)	250	1
			450	2
			600	3
			1,000	4
			100,000	5

Asset Category	Risk Classification	Risk Criteria	Value/Range	Consequence of Failure Score
Buildings	Economic (100%)	Replacement Cost	$0-$50,000	1
			$50,000-$250,000	2
			$250,000-500,000	3
			$500,000-2,000,000	4
			$2,000,000+	5
Machinery & Equipment	Economic (100%)	Replacement Cost	$0-$15,000	1
			$15,000-$40,000	2
			$40,000-$100,000	3
			$100,000-$150,000	4
			$150,000+	5
Vehicles	Economic (100%)	Replacement Cost	$0-$25,000	1
			$25,000-$40,000	2
			$40,000-$100,000	3
			$100,000-$300,000	4
			$300,000+	5
Land Improvements	Economic (100%)	Replacement Cost	$0-10,000	1
			$10,000-$20,000	2
			$20,000-$40,000	3
			$40,000-$100,000	4
			$100,000+	5

Asset Category	Risk Classification	Risk Criteria	Value/Range	Consequence of Failure Score
Water Network (mains)	Economic (10%)	Replacement Cost	$0-$5,000	1
			$5,000-$20,000	2
			$20,000-$50,000	3
			$50,000-$100,000	4
			$100,000+	5
	Environmental (90%)	Pipe Diameter (mm)	100	1
			150	2
			250	3
			300	4
			300+	5
Sanitary Sewer Network (mains)	Economic (10%)	Replacement Cost	$0-$10,000	1
			$10,000-$25,000	2
			$25,000-$50,000	3
			$50,000-$100,000	4
			$100,000+	5
	Environmental (90%)	Pipe Diameter (mm)	150	1
			220	2
			350	3
			500	4
			500+	5

Appendix E: Condition Assessment Guidelines

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

Condition data is vital to the development of data-driven asset management strategies. Without accurate and reliable asset data, there may be little confidence in asset management decision-making which can lead to premature asset failure, service disruption and suboptimal investment strategies. To prevent these outcomes, the 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 assets life and the service being provided
3. **Reliability**: the data should be sufficiently accurate, have sufficient spatial coverage and be appropriately complete and current
4. **Affordability**: the data should be affordable to collect and maintain