TOWNSHIP OF
HAVELOCK • BELMONT • METHUEN
INC. 1998

June 2020

The Asset Management Plan for the Township of Havelock-Belmont-Methuen

PSD RESEARCH CONSULTING SOFTWARE

Key Statistics

$91.3 million Replacement cost of asset portfolio	**$20,154** Replacement cost of infrastructure per capita
2.91% Target average annual infrastructure reinvestment rate	**2.24%** Actual average annual infrastructure reinvestment rate
67% Percentage of assets in fair or better condition	**77%** Percentage of annual infrastructure funding needs currently being met
14% Portion of total infrastructure funding that comes from the Gas Tax	**39%** Annual cost savings for roads through proactive lifecycle management
$136 Annual infrastructure deficit per capita	**20 years** Recommended timeframe for eliminating annual infrastructure deficit

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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.

All municipalities in Ontario are required to complete an asset management plan (AMP) in accordance with Ontario Regulation 588/17 (O. Reg. 588/17). This AMP outlines the current state of asset management planning in the Township of Havelock-Belmont-Methuen. It 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 Township can ensure that public infrastructure is managed to support the sustainable delivery of municipal services.

This AMP includes the following asset categories:

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

The overall replacement cost of the asset categories included in this AMP totals $91.3 million. 67% of all assets analysed in this AMP are in fair or better condition and assessed condition data was available for 28% of assets. The majority of assets relied on age as an indicator of condition, rather than visual assessments – 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 has used a combination of proactive lifecycle strategies (roads, stormwater mains and sanitary mains) 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 Township's average annual capital

requirement totals $2.7 million. Based on a historical analysis of sustainable capital funding sources, the Township is committing approximately $2.0 million towards capital projects per year. As a result, there is currently an annual funding gap of $615,302.

A financial strategy was developed to address the annual capital funding gap. The following table compares the total and average annual tax/rate change required to eliminate the Township's infrastructure deficit:

Funding Source	Years Until Full Funding	Total Tax/Rate Change	Average Annual Tax/Rate Change
Tax-Funded Assets	10 Years	4.6%	0.5%
Rate-Funded (Water)	20 Years	25.2%	1.3%
Rate-Funded (Sanitary)	20 Years	44.4%	2.2%

With the development of this AMP the Township has achieved compliance with O. Reg. 588/17 to the extent of the requirements that must be completed by July 1, 2021. There are additional requirements concerning proposed levels of service and growth that must be met by July 1, 2024.

This AMP represents a snapshot in time and is based on the best available processes, data, and information at the Township. Strategic asset management planning is an ongoing and dynamic process that requires continuous improvement and dedicated resources. Several recommendations have been developed to guide the continuous refinement of the Township's asset management program. These include:

a) asset inventory data review and validation
b) review replacement cost information, using accurate unit costs where possible
c) the formalization of condition assessment strategies
d) the implementation of risk-based decision-making as part of asset management planning and budgeting
e) the continuous review, development, and implementation of optimal lifecycle management strategies
f) the identification of proposed levels of service

The evaluation of the above items and further development of a data-driven, best-practice approach to asset management is recommended to ensure the Township is providing optimal value through its management of infrastructure and delivery of services.

1 Introduction & Context

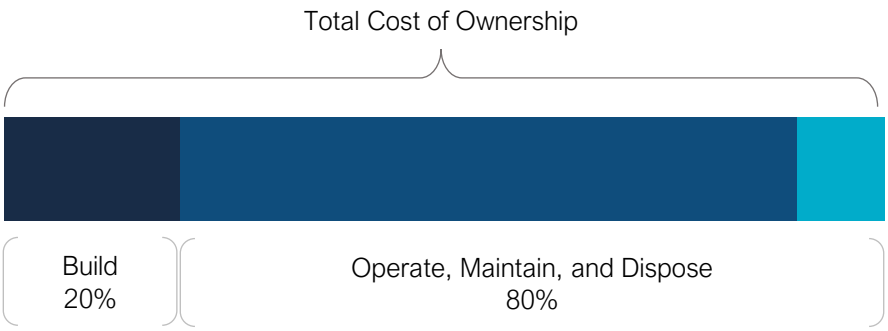
Key Insights

- 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 Township'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, 2021 and 2024

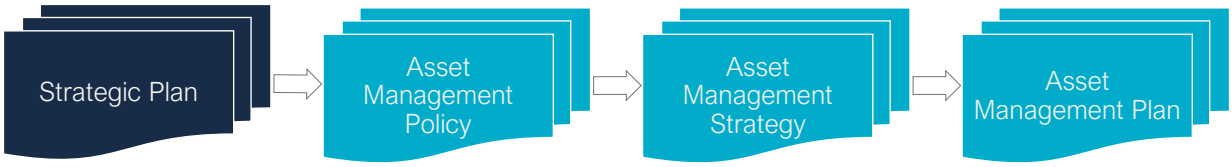
1.1 An Overview of Asset Management

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% comes from operations, maintenance, and rehabilitation. This AMP focuses its analysis on the capital costs to maintain, rehabilitate and replace existing municipal infrastructure assets.



These costs can span decades, requiring planning and foresight to ensure financial responsibility is spread equitably across generations. An asset management plan is critical to this planning, and an essential element of broader asset management program. The diagram below depicts an industry-standard approach and sequence to developing a practical asset management program.



The diagram, adopted from the Institute of Asset Management (IAM), illustrates the concept of 'line of sight', or 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 Township adopted Policy No. 47 "Strategic Asset Management Policy" on February 5th, 2018 in accordance with Ontario Regulation 588/17.

The objectives of the policy include:

- Fiscal Responsibilities
- Delivery of Services/Programs
- Public Input/Council Direction
- Risk/Impact Mitigation

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

1.1.3 Asset Management Plan

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

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

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

1.2 Key Concepts in Asset Management

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

1.2.1 Lifecycle Management Strategies

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

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

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

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

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

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

1.2.2 Risk Management Strategies

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

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

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

1.2.3 Levels of Service

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

Community Levels of Service

Community levels of service are a simple, plain language description or measure of the service that the community receives. For core asset categories (Roads, Bridges & Culverts, Water, Wastewater, Stormwater) the Province, through O. Reg. 588/17, has provided qualitative descriptions that are required to be included in this AMP. For non-core asset categories, the Township has determined the qualitative descriptions that will be used to determine the community level of service provided. These descriptions can be found in the Levels of Service subsection within each asset category.

Technical Levels of Service

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

For core asset categories (Roads, Bridges & Culverts, Water, Wastewater, Stormwater) the Province, through O. Reg. 588/17, has provided technical metrics that are required to be included in this AMP. For non-core asset categories, the Township has determined the technical metrics that will be used to determine the technical level of service provided. These metrics can be found in the Levels of Service subsection within each asset category.

Current and Proposed Levels of Service

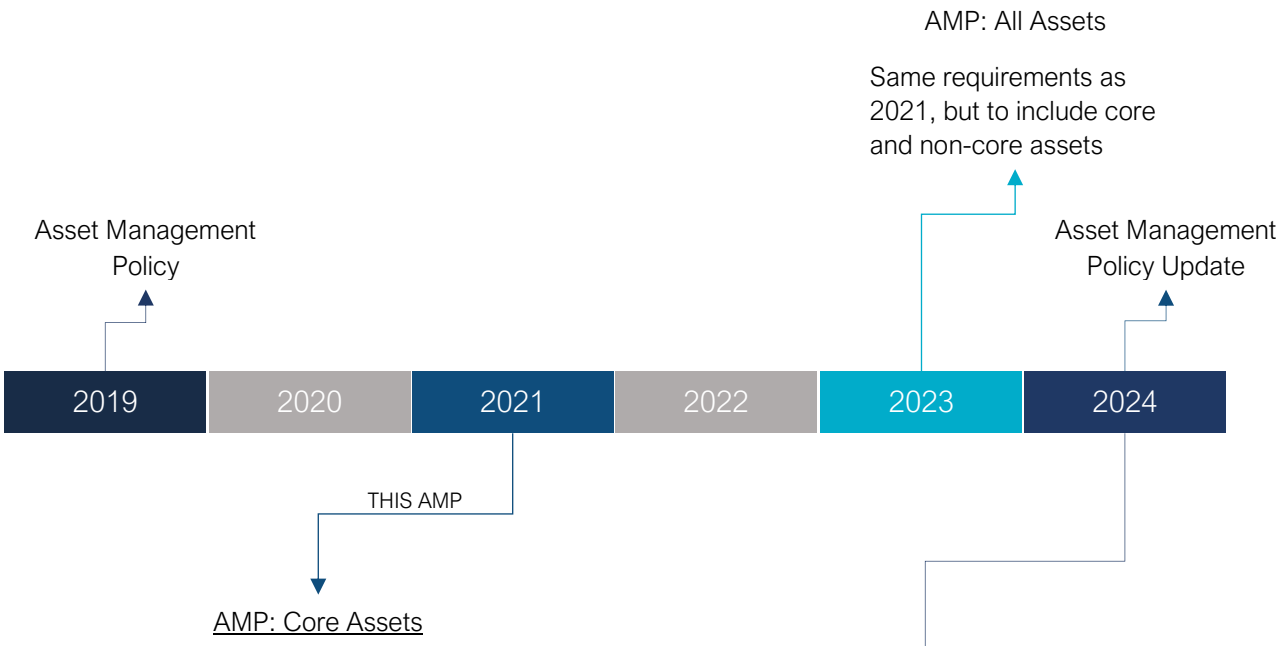
This AMP focuses on measuring the current level of service provided to the community. Once current levels of service have been measured, the Township plans to establish proposed levels of service over a 10-year period, in accordance with O. Reg. 588/17.

Proposed levels of service should be realistic and achievable within the timeframe outlined by the Township. They should also be determined with consideration of a variety of community expectations, fiscal capacity, regulatory requirements, corporate goals, and long-term sustainability. Once proposed levels of service have been established, and prior to July 2024, the Township 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.



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

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 strategy

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, 2021. 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

The Municipality's Asset Management Plan, together with the Asset Management Policy, meets the 2021 O. Reg. 588/17 requirements. Future revisions of the Plan will be required to meet the 2023 and 2024 O. Reg. 588/17 requirements.

1.4 Asset Management Roadmap

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

Asset Management Maturity Assessment (Completion Date: January 29th, 2018)
The State of Maturity Report provided an audit of the existing asset management capacity and competency. It outlined strategic recommendations to improve the Township's asset management program.

Condition Assessment Program Development (Completion Date: April 27th, 2018)
Township staff received training on the development of condition assessment strategies for municipal assets. This included condition assessment guidelines as well as data collection templates to ensure asset condition data is collected consistently and updated regularly.

Asset Data Review and Refinement (Completion Date: January 20th, 2020)
Asset data gaps were closed continuously over the course of this project. Data refinement included the upload of additional attributes from the 2016 Roads Needs Study, 2018 building condition assessments, and 2019 OSIM report, as well as restructuring roads and buildings assets.

Risk and Criticality Model Development (Completion Date: May 26th, 2019)
Risk models were developed to determine the relative criticality of assets based on their probability and consequence of failure. These models assist with the prioritization and ranking of infrastructure needs.

Lifecycle Model Development (Completion Date: October 29th, 2019)
The Township's lifecycle management strategies were reviewed and documented to determine current practices and identify opportunities for improvement and potential cost avoidance.

Level of Service Framework Development (Completion Date: December 17th, 2019)
A framework was developed to determine the current level of service provided to the community through municipal infrastructure.

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

2 Scope and Methodology

Key Insights

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

2.1 Assets categories included in this AMP

This asset management plan for the Township of Havelock-Belmont-Methuen is produced in compliance with Ontario Regulation 588/17. The July 2021 deadline under the regulation—the first of three AMPs—requires analysis of only core assets (roads, bridges & culverts, water, wastewater, and stormwater).

The AMP summarizes the state of the infrastructure for the Township's asset portfolio, establishes current levels of service and the associated technical and customer oriented key performance indicators (KPIs), outlines lifecycle strategies for optimal asset management and performance, and provides financial strategies to reach sustainability for the asset categories listed below.

Asset Category	Source of Funding
Road Network	Tax Levy
Bridges & Culverts	
Stormwater 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 Township 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 Township 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 Township can determine the service life remaining (SLR) for each asset. Using condition data and the asset's SLR, the Township 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 Township 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 Township'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.

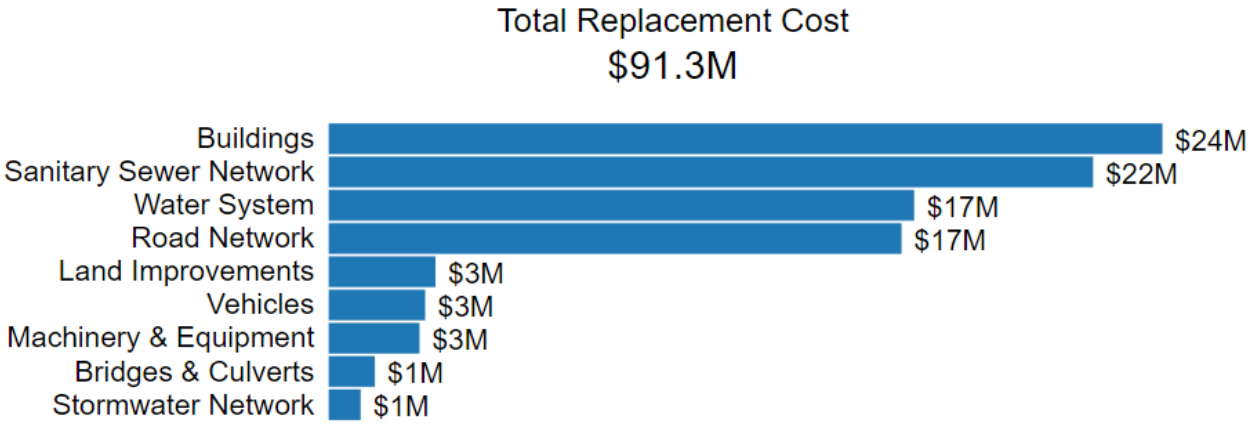
3 Portfolio Overview

Key Insights

- The total replacement cost of the Township's asset portfolio is $91.3 million
- The Township's target re-investment rate is 2.91%, and the actual re-investment rate is 2.24%, contributing to an expanding infrastructure deficit
- 67% of all assets are in fair or better condition
- 33% of assets are projected to require replacement in the next 10 years
- Average annual capital requirements total $2.7 million per year across all assets

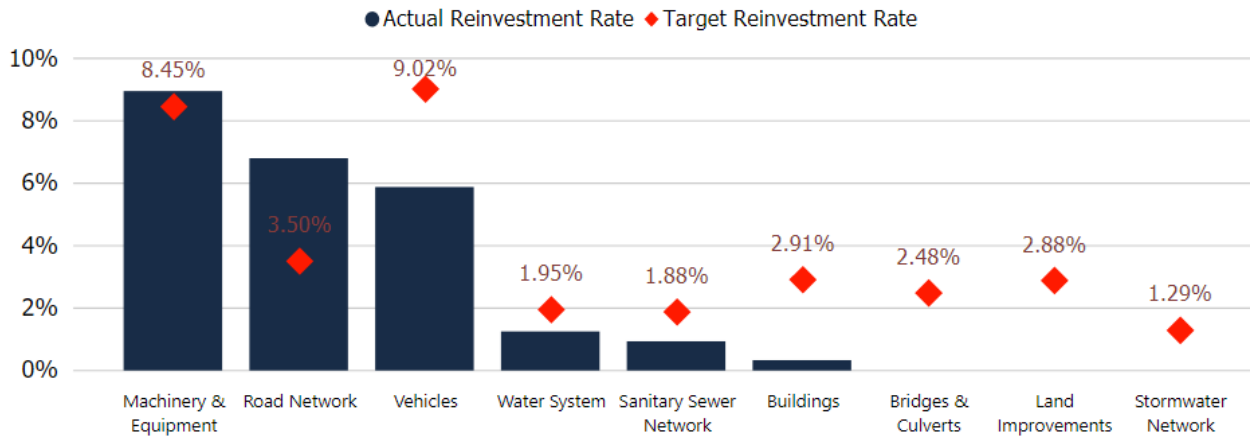
3.1 Total Replacement Cost of Asset Portfolio

The asset categories analyzed in this AMP have a total replacement cost of $91.3 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.



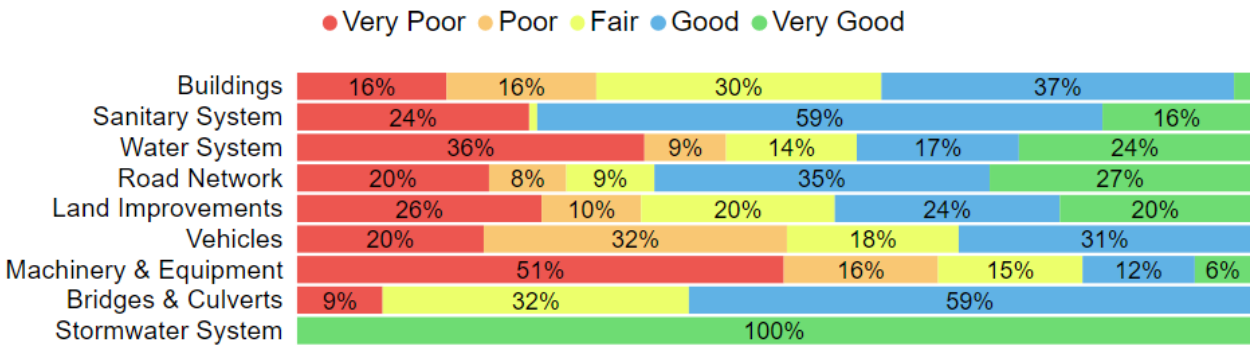
3.2 Target vs. Actual Reinvestment Rate

The graph below depicts funding gaps or surpluses by comparing target vs actual reinvestment rate. To meet the long-term replacement needs, the Township should be allocating approximately $2.6 million annually, for a target reinvestment rate of 2.91%. Actual annual spending on infrastructure totals approximately $2.0 million, for an actual reinvestment rate of 2.24%.



3.3 Condition of Asset Portfolio

The current condition of the assets is central to all asset management planning. Collectively, 68% of assets in Havelock-Belmont-Methuen are in fair or better condition. This estimate relies on both age-based and field condition data.

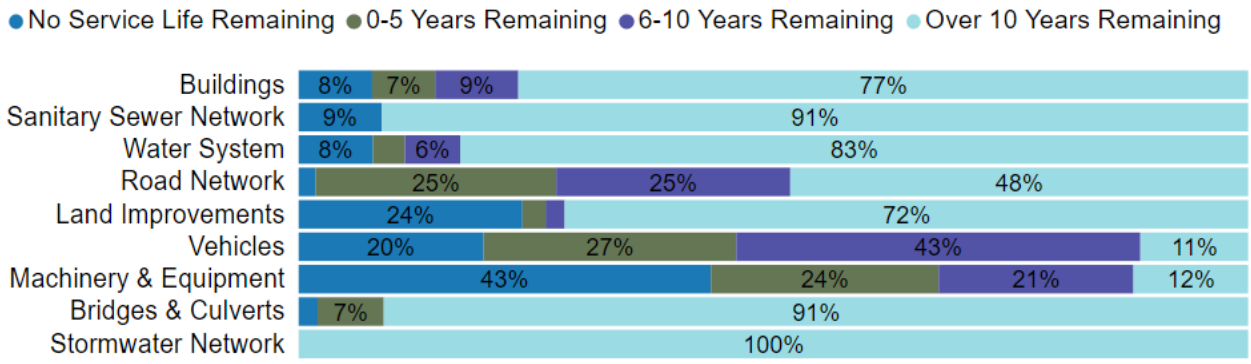


This AMP relies on assessed condition data for 28% of assets; for the remaining portfolio, age is used as an approximation of condition. Assessed condition data is invaluable in asset management planning as it reflects the true condition of the asset and its ability to perform its functions. The table below identifies the source of condition data used throughout this AMP.

Asset Category	Asset Segment	% of Assets with Assessed Condition	Source of Condition Data
Road Network	Paved Roads - HCB	11%	2016 Roads Needs Study
	Paved Roads – LCB	79%	2016 Roads Needs Study
	Sidewalks, Signs & Signals, Street Lights, Drainage Culverts	0%	Age-based
Bridges & Culverts	Bridges	100%	2019 OSIM Report
	Structural Culverts	0%	Age-based
Stormwater Network	All	0%	Age-based
Buildings	All	56%	2018 Building Condition Assessment
Machinery & Equipment	All	0%	Age-based
Vehicles	All	0%	Age-based
Land Improvements	All	0%	Age-based
Water System	All	0%	Age-based
Sanitary Sewer Network	Sewer Mains	11%	2019 Sewer Technologies CCTV inspection
	Other	0%	Age-based

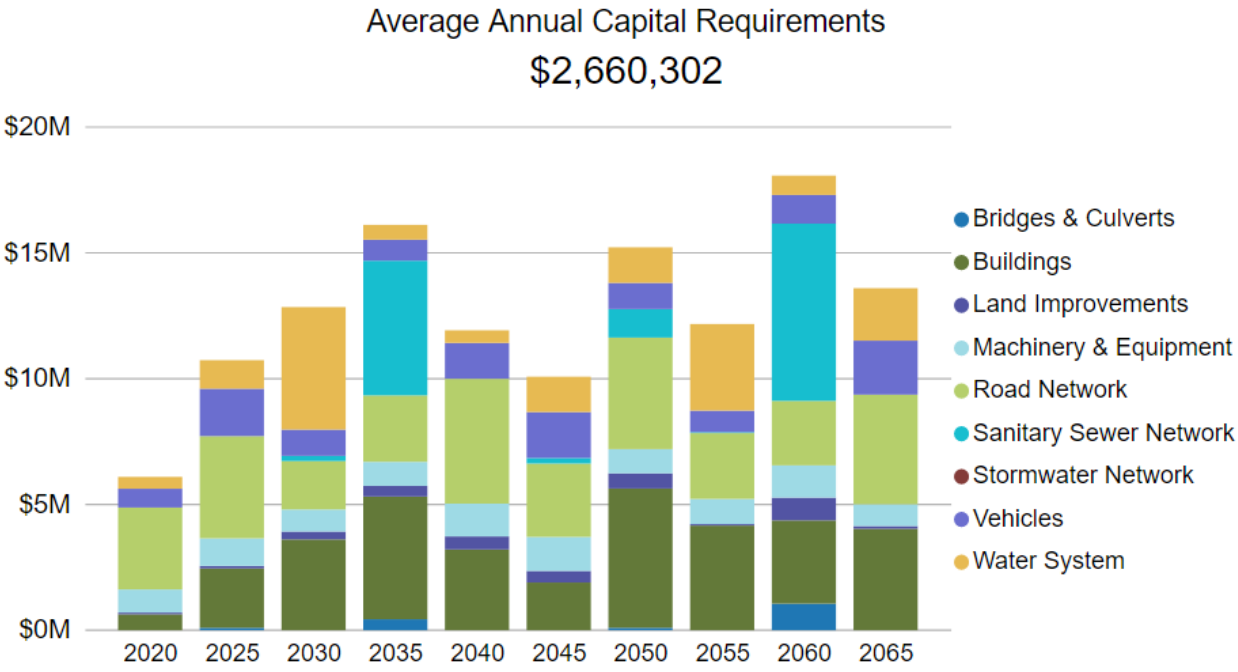
3.4 Service Life Remaining

Based on asset age, available assessed condition data and estimated useful life, 33% of the Township'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 Township 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 $52 million
- 68% 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 $2.0 million
- Critical assets should be evaluated to determine appropriate risk mitigation activities and treatment options

4.1 Road Network

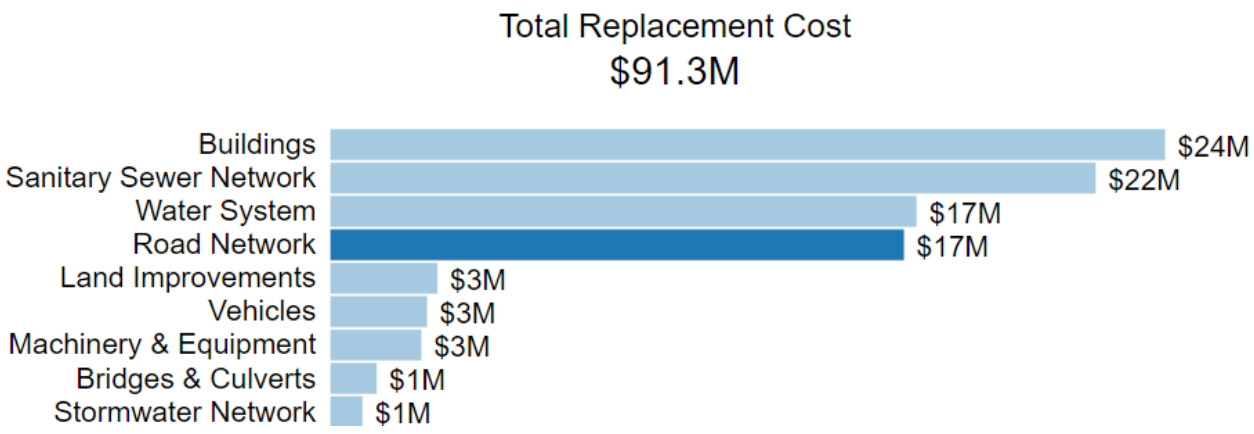
The Road Network is a critical component of the provision of safe and efficient transportation services for communities within the Township. This asset category represents the largest network within Township's asset portfolio, primarily consisting of gravel and LCB roads. It includes all municipally owned and maintained roadways in addition to supporting roadside infrastructure including sidewalks, drainage culverts, signs & signals and street lights.

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

4.1.1 Asset Inventory & Replacement Cost

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

Asset Segment	Quantity	Replacement Cost Method	Total Replacement Cost
Gravel Roads	110,801m	Not Planned for Replacement[1]	
Paved Roads - HCB	6,245 m	User-Defined	$1,873,500
Paved Roads - LCB	62,240 m	92% User-Defined	$12,189,390
Sidewalks	13,638 m	CPI Tables	$1,234,818
Signs & Signals	86	CPI Tables	$18,609
Street Lights	Pooled	CPI Tables	$116,937
Drainage Culverts	5,658 m	CPI Tables	$1,283,370
			$16,716,624

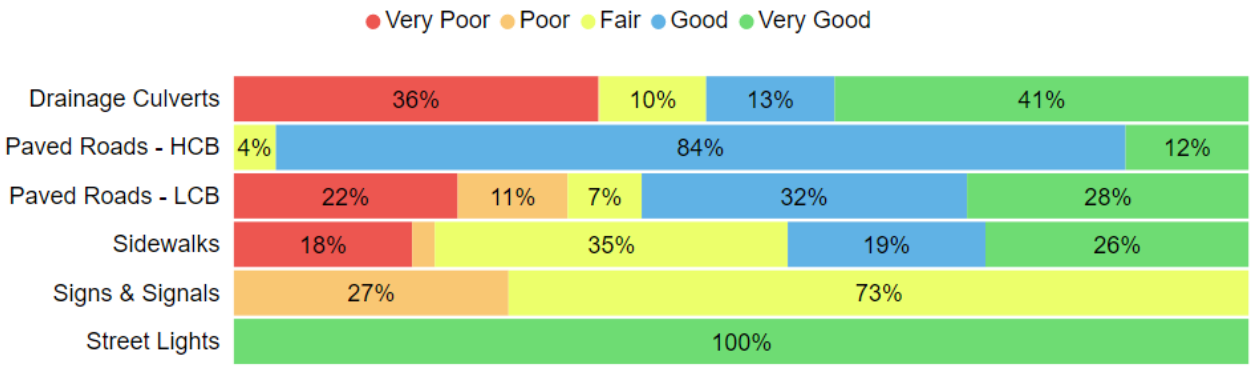


[1] Gravel roads have been included as they comprise a significant portion of the Township's road network. However, the lifecycle management strategies for these assets consist of perpetual maintenance activities and do not require capital costs for rehabilitation or replacement.

4.1.2 Asset Condition

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

Asset Segment	Average Condition (%)	Average Condition Rating	Condition Source
Paved Roads - HCB	78%	Good	11% Assessed
Paved Roads - LCB	56%	Fair	79% Assessed
Sidewalks	54%	Fair	Age-based
Signs & Signals	42%	Fair	Age-based
Street Lights	85%	Very Good	Age-based
Drainage Culverts	56%	Good	Age-based
	59%	**Fair**	**59% Assessed**



Current Approach to Condition Assessment

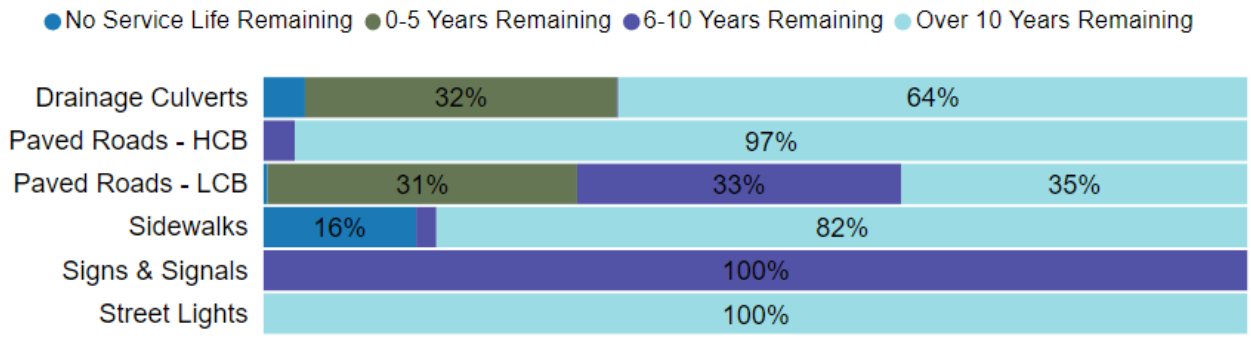
Accurate and reliable condition data allows staff to more confidently determine the remaining service life of assets and identify the most cost-effective approach for managing assets. The following describes the municipality's current approach:

- A Road Needs Study was completed in 2016 that included a detailed assessment of the condition of each road segment
- The Roads Needs Study is updated on a cyclical basis, the next study expected for completion in 2020

4.1.3 Estimated Useful Life & Average Age

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

Asset Segment	Estimated Useful Life (Years)	Average Age (Years)	Average Service Life Remaining (Years)
Paved Roads - HCB	25-40 Years	9.3	16.0
Paved Roads - LCB	10-15 Years	18.5	6.5
Sidewalks	10-20 Years	16.3	17.1
Signs & Signals	40 Years	24.8	8.5
Street Lights	20 Years	11.5	16.9
Drainage Culverts	20 Years	2.0	43.1
		16.0	**11.2**



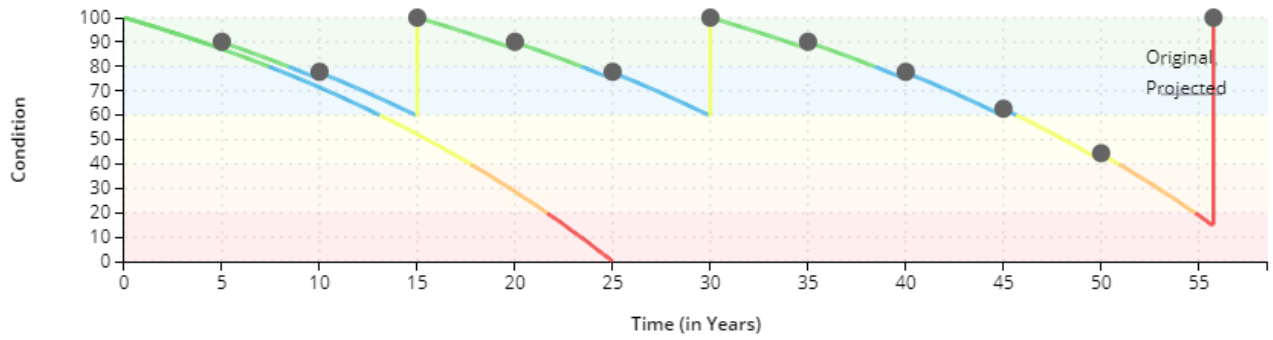
Each asset's Estimated Useful Life should be reviewed periodically to determine whether adjustments need to be made to better align with the observed length of service life for each asset type.

4.1.4 Lifecycle Management Strategy

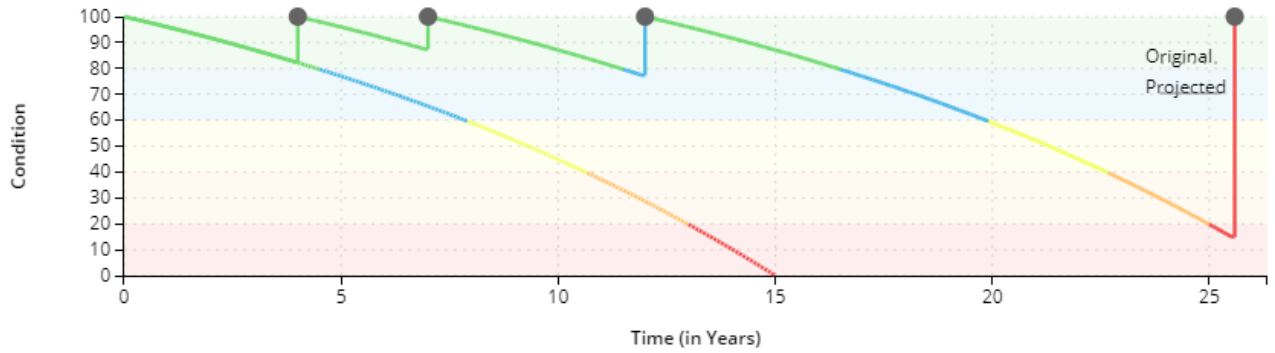
The condition or performance of most assets will deteriorate over time. This process is affected by a range of factors including an asset's characteristics, location, utilization, maintenance history and environment.

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

Paved Roads (HCB)		
Event Name	Event Class	Event Trigger
Crack Sealing	Maintenance	5 Years (Repeated)
Single Surface Overlay	Rehabilitation	15 Years
Double Lift Mill & Pave	Rehabilitation	30 Years
Reconstruction	Replacement	15% Condition



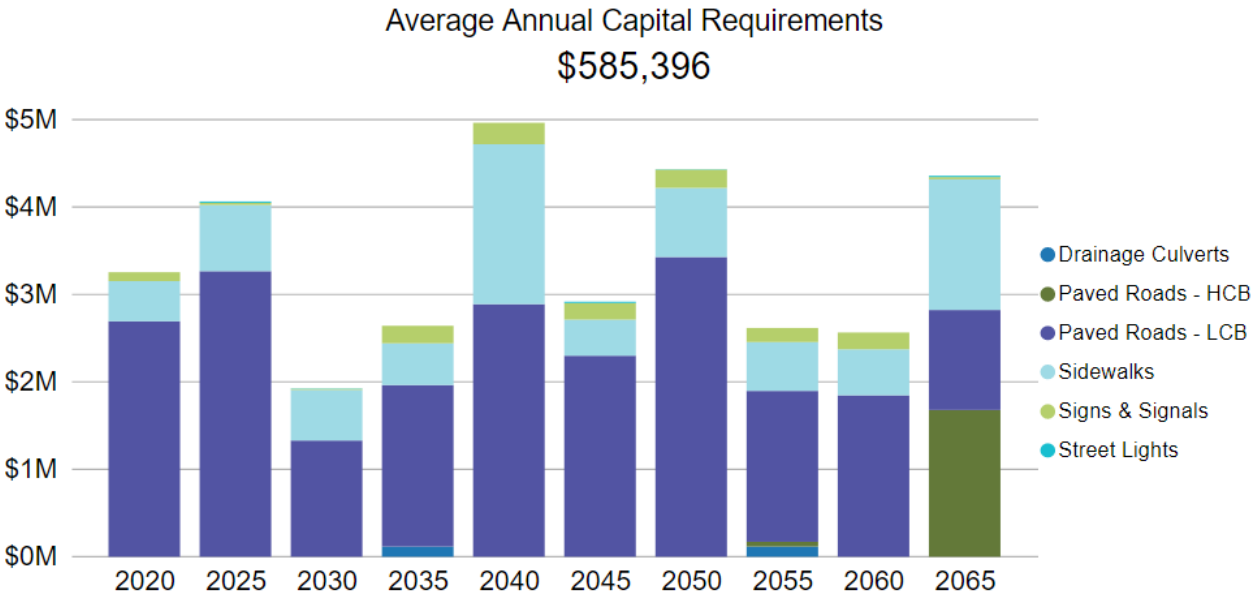
Paved Roads (LCB)		
Event Name	Event Class	Event Trigger
Slurry Seal 1	Maintenance	4 Years
Slurry Seal 2	Maintenance	7 Years
Double Surface Treatment	Rehabilitation	12 Years
Full Reconstruction	Replacement	15% Condition



Forecasted Capital Requirements

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

The annual capital requirement represents the average amount per year that the Township 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

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

Critical Assets

The identification of critical assets allows the Township to determine appropriate risk mitigation strategies and treatment options. These may include asset-specific lifecycle strategies, condition assessment strategies, or simply the need to collect better asset data. Critical assets do not necessarily require immediate renewal or replacement.

The following table identifies critical assets according to the risk criteria identified in Appendix D. The risk rating is calculated by multiplying the probability of failure and the consequence of failure for each asset.

Segment	Name	Risk Rating
Paved Roads - LCB	MATHISON ST 23H	20
Paved Roads - LCB	NORTH SCHOOL RD 37B	20
Drainage Culverts	CULVERT ROUND STEEL DRVWY .4M	18
Paved Roads - LCB	ELM ST 10H	16
Paved Roads - LCB	QUEBEC ST 12H	16
Paved Roads - LCB	WILLIAM ST 18H	16
Paved Roads - LCB	WILLIAM ST 19H	16
Paved Roads - LCB	MARY ST 20H	16
Paved Roads - LCB	INDUSTRIAL DR 21H	16
Paved Roads - LCB	3RD LINE 13B	16

4.1.6 Levels of Service

The following tables identify the Township'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 Township 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 (2019)
Scope	Description, which may include maps, of the road network in the municipality and its level of connectivity	The majority of the Township's roads are unpaved, primarily making up the rural areas. Residential and urban areas utilize a mix of HCB and LCB roads. Most of these roads are single lane rural, local, and collector segments.
Quality	Description or images that illustrate the different levels of road class pavement condition	The Township completed a Road Management Study in August 2016 in coordination with D.M. Wills Associates Limited. Every road section received a surface condition rating (1-10). (1-5) Road surface exhibits moderate to significant deterioration and generally requires renewal or full replacement within 1-5 years (6-10) Road surface is in good condition or has been recently re-surfaced. Renewal or reconstruction is generally not required for 6-10+ years

Technical Levels of Service

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

Service Attribute	Technical Metric	Current LOS (2019)
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)	TBD[2]
	Lane-km of local roads (MMS classes 5 and 6) per land area (km/km^2)	TBD[3]
Quality	Average pavement condition index for paved roads in the municipality	HCB: 78% LCB: 56%
	Average surface condition for unpaved roads in the municipality (e.g. excellent, good, fair, poor)	Good
Performance	Capital reinvestment rate	6.8%

[2] The Township does not currently have data available to determine this technical metric. The density of collector roads is expected to be low and centralized around the Village of Havelock.
[3] The Township does not currently have data available to determine this technical metric. The majority of roads are expected to be local roads.

4.1.7 Recommendations

Asset Inventory

- Review road culverts and sidewalk inventory to determine whether all municipal assets within these asset segments have been accounted for.
- Use available unit costs to develop user-defined replacement costs, which are more reliable than inflate costs.
- Incorporate additional attribute data, such as speed limit, MMS category, and road width to support risk, lifecycle, and levels of service strategies.

Condition Assessment Strategies

- The last comprehensive assessment of the road network was completed in 2016. Consider completing an updated assessment of all roads within the next 1-2 years, and continue on a 4 to 5-year cycle

Lifecycle Management Strategies

- Implement the identified lifecycle management strategies for HCB and LCB roads to realize potential cost avoidance and maintain a high quality of road pavement condition.
- Evaluate the efficacy of the Township's lifecycle management strategies at regular intervals to determine the impact cost, condition and risk.

Risk Management Strategies

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

Levels of Service

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

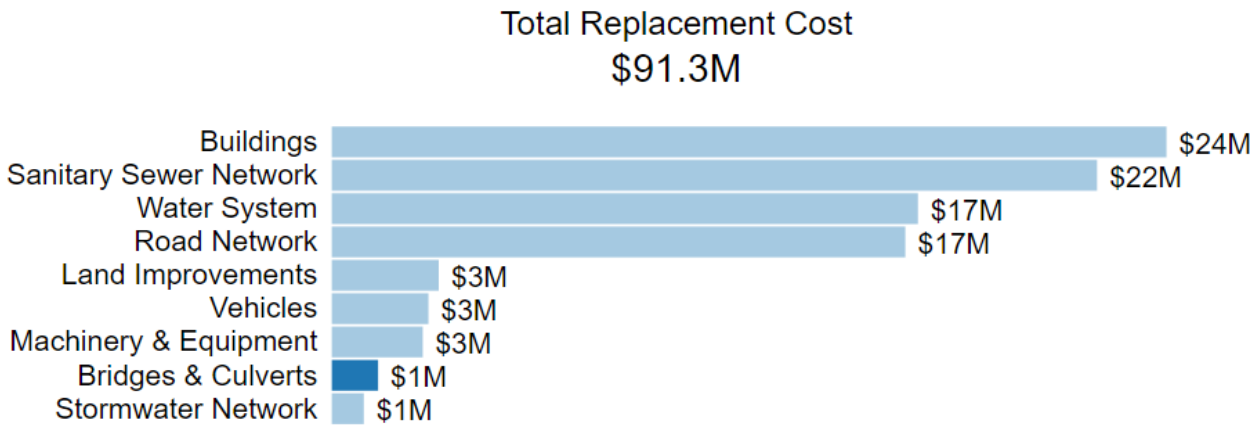
4.2 Bridges & Culverts

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

4.2.1 Asset Inventory & Replacement Cost

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

Asset Segment	Quantity	Replacement Cost Method	Total Replacement Cost
Bridges	2	100% User-Defined	$822,800
Structural Culverts	5 (64m)	CPI Tables	$534,928
			$1,357,728



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.

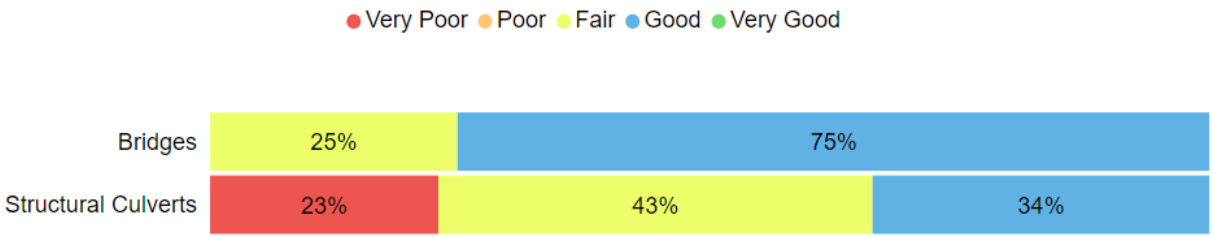
Asset Segment	Average Condition (%)	Average Condition Rating	Condition Source
Bridges	68%	Good	100% Assessed
Structural Culverts	49%	Fair	Age-Based
	60%	**Good**	**61% Assessed**

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

Current Approach to Condition Assessment

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

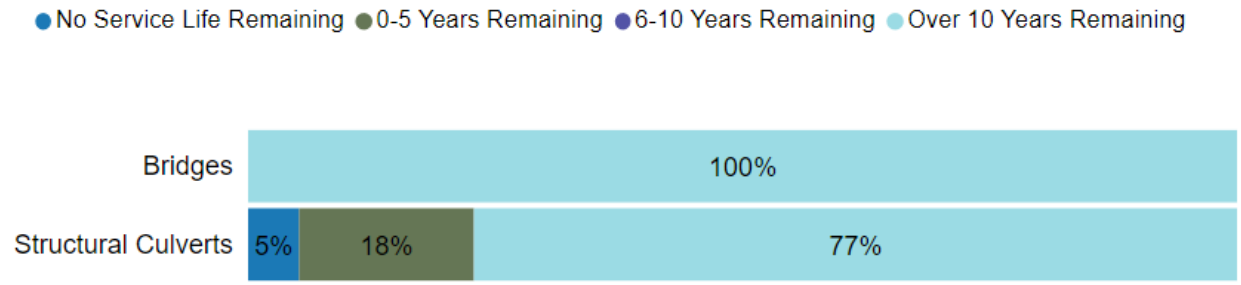
- Condition assessments of all bridges and culverts with a span greater than or equal to 3 meters are completed every 2 years in accordance with the Ontario Structure Inspection Manual (OSIM)



4.2.3 Estimated Useful Life & Average Age

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

Asset Segment	Estimated Useful Life (Years)	Average Age (Years)	Average Service Life Remaining (Years)
Bridges	25 - 35	7.3	29.1
Structural Culverts	25 - 75	34.8	20.2
		18.1	**25.6**



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

4.2.4 Lifecycle Management Strategy

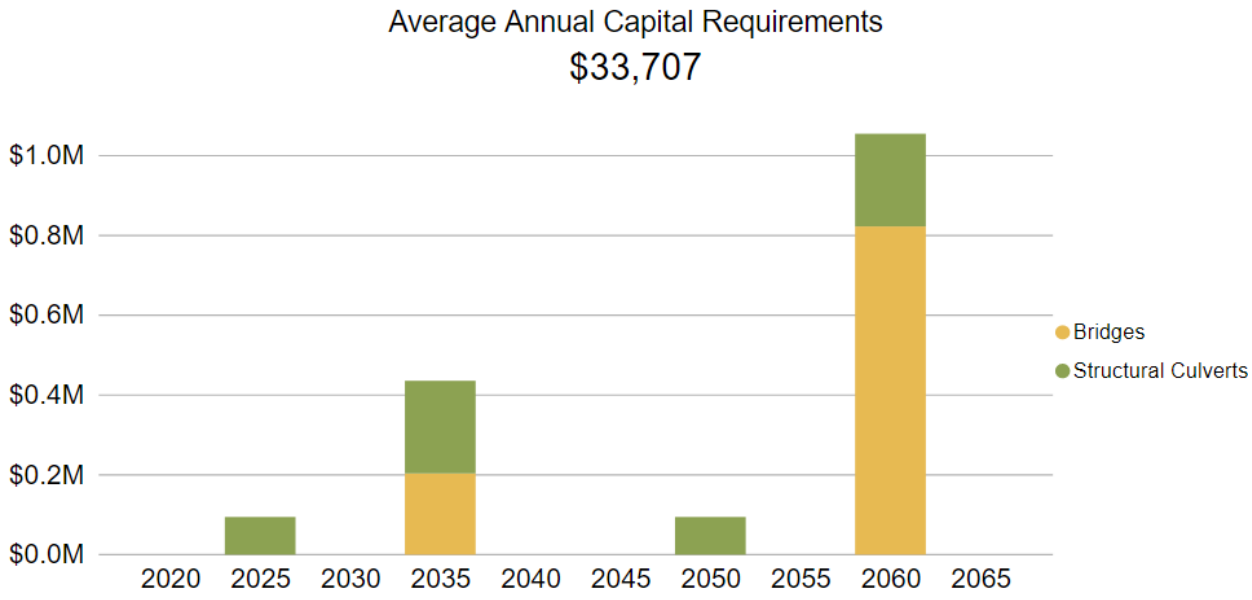
The condition or performance of most assets will deteriorate over time. To ensure that municipal assets are performing as expected and meeting the needs of customers, it is important to establish a lifecycle management strategy to proactively manage asset deterioration.

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

Activity Type	Description of Current Strategy
Maintenance, Rehabilitation and Replacement	All lifecycle activities are driven by the results of mandated structural inspections competed according to the Ontario Structure Inspection Manual (OSIM)
Inspection	The most recent inspection report was completed in 2019 by D.M. Wills Associates Limited

Forecasted Capital Requirements

The following graph forecasts long-term capital requirements. The annual capital requirement represents the average amount per year that the Township 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

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

Critical Assets

The identification of critical assets allows the Township to determine appropriate risk mitigation strategies and treatment options. These may include asset-specific lifecycle strategies, condition assessment strategies, or simply the need to collect better asset data. Critical assets do not necessarily require immediate renewal or replacement.

The following table identifies critical assets according to the risk criteria identified in Appendix D. The risk rating is calculated by multiplying the probability of failure and the consequence of failure for each asset.

Segment	Name	Risk Rating
Structural Culverts	CULVERT ARC STEEL CROSS 3M	18 – Very High
Structural Culverts	BRIDGE BOX CONCRETE CROSS 7.0M	15 – Very High
Structural Culverts	CULVERT ARC STEEL CROSS 3.3 M	10 – High
Structural Culverts	BRIDGE BOX CONCRETE CROSS 7.0M	8 – Moderate
Bridges	Plato Creek Bridge	8 – Moderate

4.2.6 Levels of Service

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

Community Levels of Service

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

Service Attribute	Qualitative Description	Current LOS (2019)
Scope	Description of the traffic that is supported by municipal bridges (e.g. heavy transport vehicles, motor vehicles, emergency vehicles, pedestrians, cyclists)	Bridges and structural culverts are a key component of the municipal transportation network. None of the municipality's structures have loading or dimensional restrictions meaning that most types of vehicles, including heavy transport, motor vehicles, emergency vehicles and cyclists can cross them without restriction.
Quality	Description or images of the condition of bridges & culverts and how this would affect use of the bridges & culverts	See Appendix C

Technical Levels of Service

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

Service Attribute	Technical Metric	Current LOS (2019)
Scope	% of bridges in the Township with loading or dimensional restrictions	0%
Quality	Average bridge condition index value for bridges in the Township	75
	Average bridge condition index value for structural culverts in the Township	74
Performance	Capital re-investment rate	0%

4.2.7 Recommendations

Data Review/Validation

- Continue to review and validate inventory data, assessed condition data and replacement costs for all bridges and structural culverts upon the completion of OSIM inspections every 2 years.
- Ensure unique IDs and naming conventions in future OSIM studies align with the asset Inventory structure. Doing so will provide a completer and more reliable inventory of culverts.

Risk Management Strategies

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

Lifecycle Management Strategies

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

Levels of Service

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

4.3 Stormwater Network

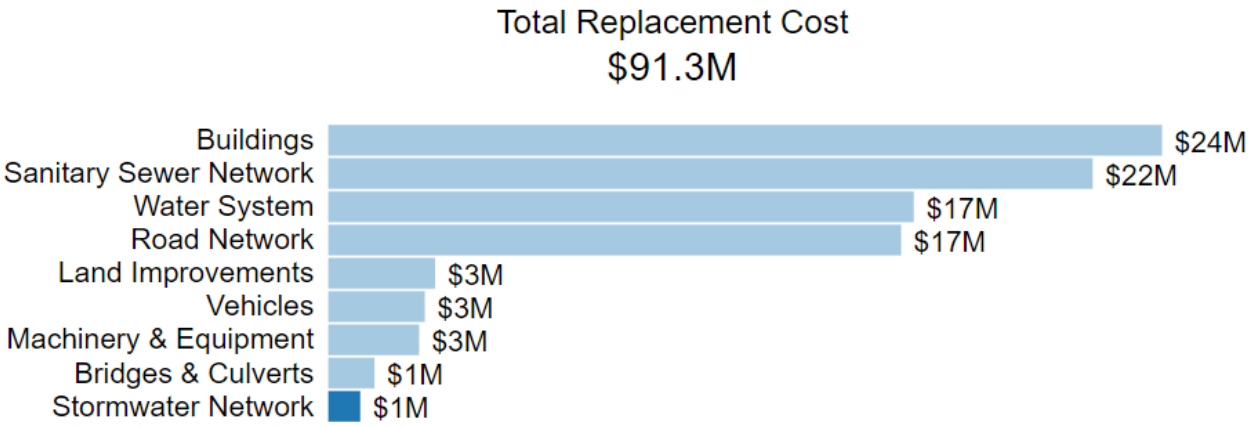
The Township is responsible for owning and maintaining a stormwater network of an unknown length of storm sewer mains and catch basins. Information within this document reflects data within the asset register as of 2020.

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

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 Township's Stormwater Network inventory.

Asset Segment	Quantity	Replacement Cost Method	Total Replacement Cost
Storm Sewer Mains	Unknown[4]	CPI Tables	$730,847[5]
Catch Basins	Unknown[4]	CPI Tables	$209,897[5]
			$940,744



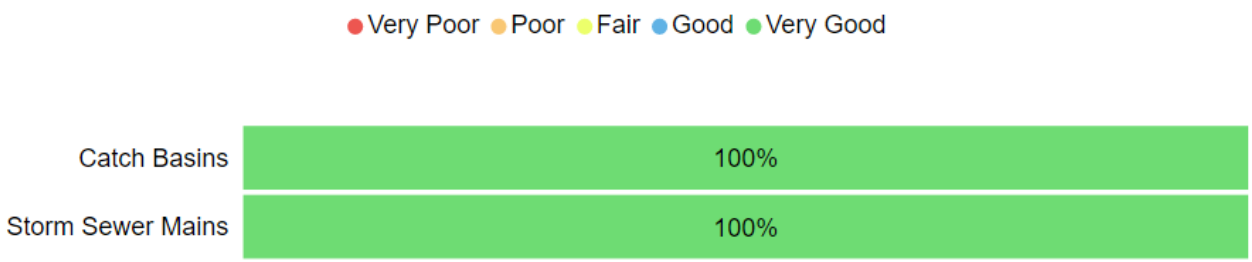
[4] The stormwater inventory is incomplete and has not been broken out into consistent sections of storm sewer mains. The Township plans to update the inventory as assessments occur, and should be updated in future iterations of the Plan.

[5] This value is based on the best available costs in the Township's asset inventory. It is recognized that it likely understates the full value of the stormwater network.

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
Storm Sewer Mains[6]	93%	Very Good	Age-Based
Catch Basins[6]	94%	Very Good	Age-Based
	93%	**Very Good**	**0% Assessed**



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

Current Approach to Condition Assessment

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

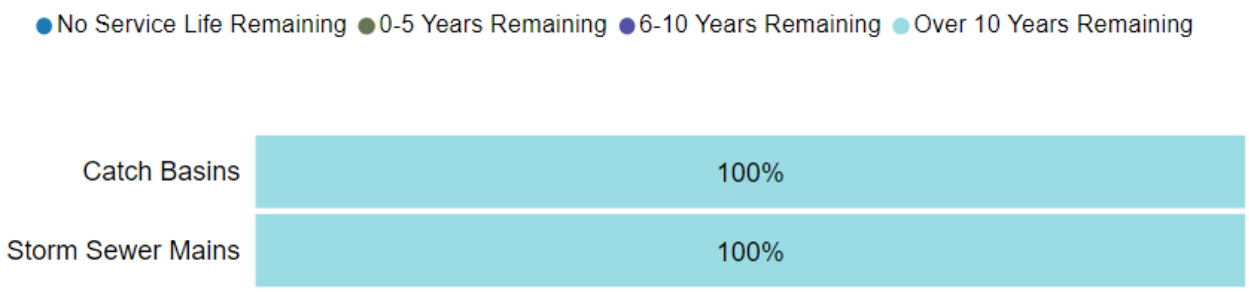
- There are no formal condition assessment programs in place for the stormwater network
- As the Township refines the available asset inventory for the stormwater network a regular assessment cycle should be established

[6] The condition of storm mains and catch basins are likely overstated as the available stormwater inventory is incomplete. Assets included are from the last four years, excluding older assets that are likely in poorer condition. Staff estimates place the stormwater network to be in poor condition overall; however, future iterations of the Plan will be updated as the inventory becomes more accurate.

4.3.3 Estimated Useful Life & Average Age

The Estimated Useful Life for Stormwater 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)
Storm Sewer Mains	60	6.6	60.1
Catch Basins	60	3.3	56.7
		5.9	**59.3**

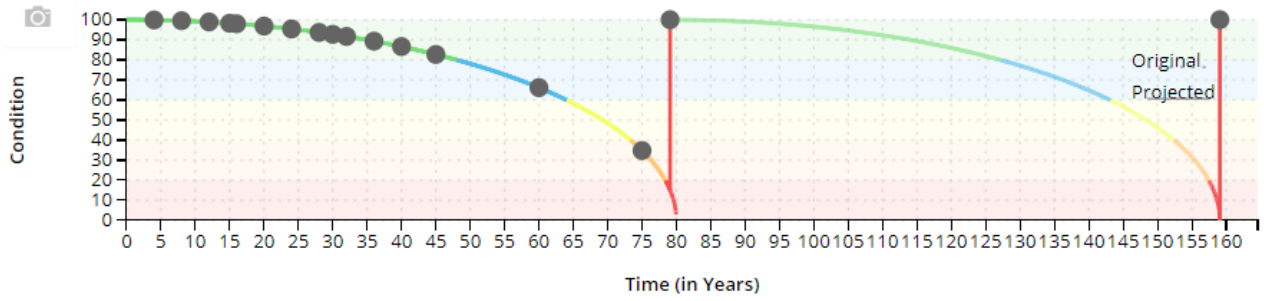


Each asset's Estimated Useful Life should be reviewed periodically to determine whether adjustments need to be made to better align with the observed length of service life for each asset type.

4.3.4 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 strategy has been developed as a proactive approach to managing the lifecycle of stormwater mains. A trenchless re-lining strategy is expected to extend the service life of sanitary mains at a lower total cost of ownership. However, this approach is not universal across all storm sewer mains and only applies to mains that are typically relined. Candidate storm sewer mains will undergo a selection process to determine if the below lifecycle strategy is feasible.

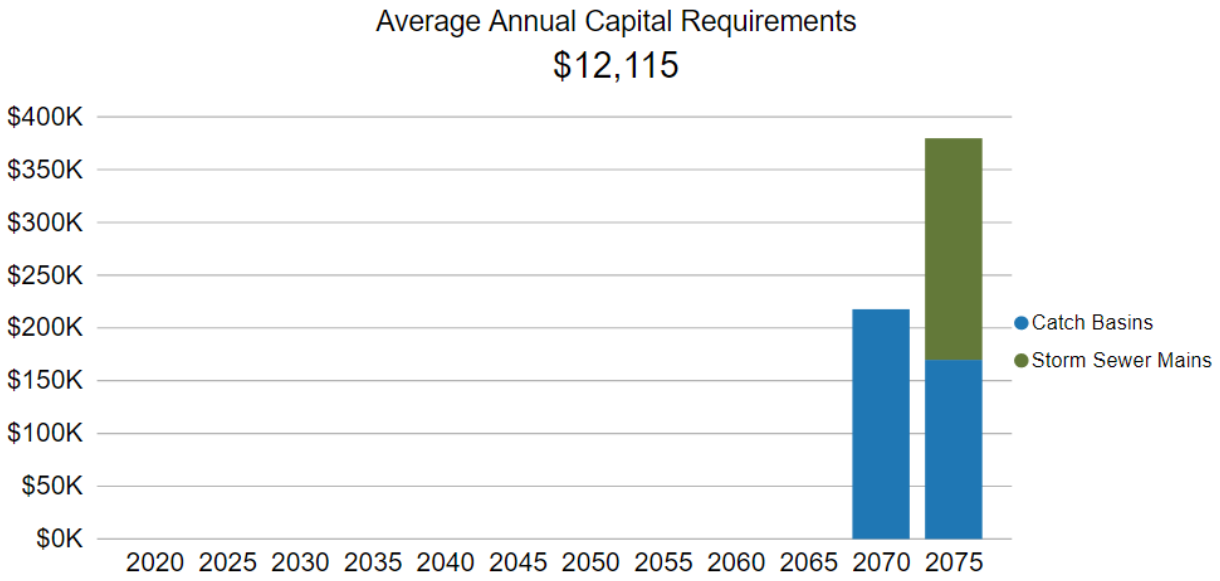
Storm Sewer Mains		
Event Name	Event Class	Event Trigger
Flushing/Cleaning	Maintenance/Inspection	Every 5 Years
Boring/Smoke Testing	Maintenance	As Needed
CCTV Inspection	Inspection	Every 15 Years
Trenchless Re-lining	Rehabilitation	15% Condition
Full Reconstruction	Replacement	159 Years



Forecasted Capital Requirements

The following graph forecasts long-term capital requirements. The annual capital requirement represents the average amount per year that the Township 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

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

Critical Assets

The identification of critical assets allows the Township to determine appropriate risk mitigation strategies and treatment options. These may include asset-specific lifecycle strategies, condition assessment strategies, or simply the need to collect better asset data. Critical assets do not necessarily require immediate renewal or replacement.

The following table identifies critical assets according to the risk criteria identified in Appendix D. It should be noted that the stormwater inventory does not contain all stormwater mains, as such the list below may not be inclusive of all critical stormwater assets. The risk rating is calculated by multiplying the probability of failure and the consequence of failure for each asset.

Segment	Name	Risk Rating
Storm Sewers	Storm Sewer – Smith Dr	2 – Very Low
Storm Sewers	Storm Sewer – Ann St 08H	1 – Very Low

4.3.6 Levels of Service

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

Service Attribute	Qualitative Description	Current LOS (2019)
Scope	Description, which may include map, of the user groups or areas of the municipality that are protected from flooding, including the extent of protection provided by the municipal stormwater system	The Village of Havelock's stormwater system is comprised of catch basins, stormwater mains, and natural drainage features. Other areas of the Township are primarily managed by ditches and street culverts.

Technical Levels of Service

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

Service Attribute	Technical Metric	Current LOS (2019)
Scope	% of properties in municipality resilient to a 100-year storm	TBD[7]
	% of the municipal stormwater management system resilient to a 5-year storm	TBD[8]
Performance	Capital reinvestment rate	0%

[7] The Township does not currently have data available to determine this technical metric. The rate of properties that are expected to be resilient to a 100-year storm is expected to be low.
[8] The Township does not currently have data available to determine this technical metric. The percentage of the stormwater system resilient to a 5-year storm is expected to be high.

4.3.7 Recommendations

Asset Inventory

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

Condition Assessment Strategies

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

Risk Management Strategies

- 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 Stormwater Network on a regular basis to achieve the lowest total cost of ownership while maintaining adequate service levels.
- Routine preventative maintenance, such as stormwater main flushing and catch basin cleaning, should be scheduled to extend service life of assets and prevent blockages.

Levels of Service

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

4.4 Buildings & Facilities

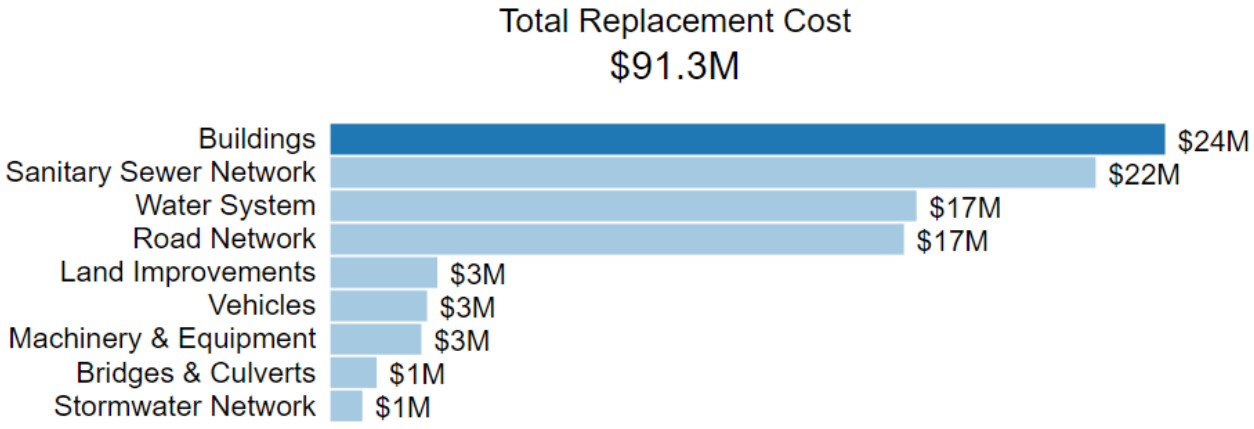
The Township of Havelock-Belmont-Methuen owns and maintains several facilities and recreation centres that provide key services to the community. These include:

- administrative offices
- public libraries
- fire stations and associated offices and facilities
- public works garages and storage sheds
- solid waste facilities
- medical centre
- arenas and community centres

4.4.1 Asset Inventory & Replacement Cost

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

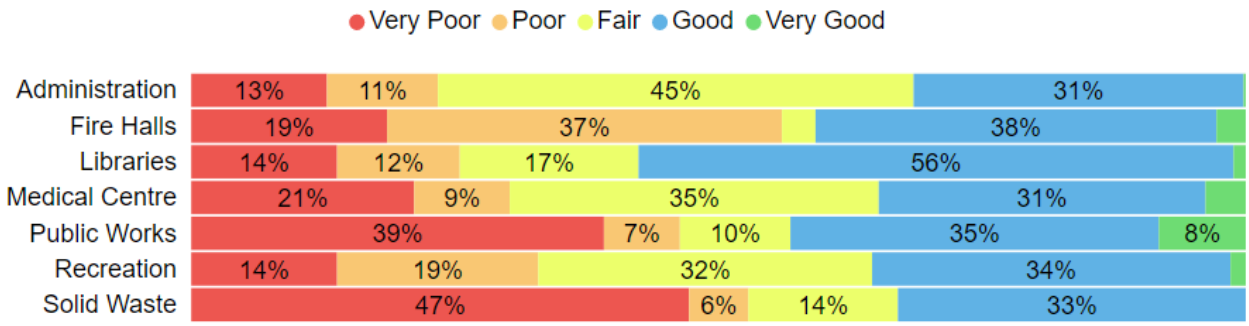
Asset Segment	Facilities (components)	Replacement Cost Method	Total Replacement Cost
Administration	2 (165)	CPI Tables	$4,498,875
Fire Halls	2 (21)	CPI Tables	$910,822
Libraries	3 (200)	CPI Tables	$3,790,310
Medical Centre	1 (64)	CPI Tables	$1,664,041
Public Works	3 (21)	CPI Tables	$1,247,955
Recreation	4 (213)	CPI Tables	$12,170,538
Solid Waste	4 (7)	CPI Tables	$42,107
			$24,324,648



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
Administration	51%	Fair	68% Assessed
Fire Halls	41%	Fair	Age-Based
Libraries	56%	Fair	68% Assessed
Medical Centre	47%	Fair	65% Assessed
Public Works	41%	Fair	Age-Based
Recreation	50%	Fair	56% Assessed
Solid Waste	33%	Poor	Age-Based
	50%	**Fair**	**56% Assessed**



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

Current Approach to Condition Assessment

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

- Detailed structural assessments have been completed recently for the Community Centre, Cordova, Havelock, and Kasshabog Lake libraries, Stone Hall, Havelock Medical Centre,

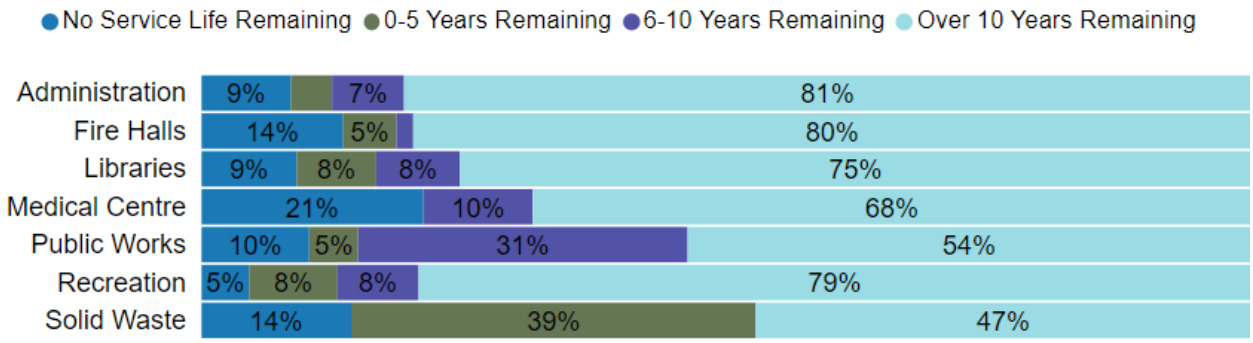
and Havelock Municipal Office. These assessments were performed by Accent Building Sciences in 2018, inspecting each facility at a component level.

- Inspection logs and deficiency lists for the arena are routinely updated internally by staff.

4.4.3 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.

Asset Segment	Estimated Useful Life (Years)	Average Age (Years)	Average Service Life Remaining (Years)
Administration	10 - 60	31.8	18.2
Fire Halls	8 - 60	22.1	12.6
Libraries	10 - 60	19.5	18.3
Medical Centre	10 - 60	25.8	14.8
Public Works	10 - 60	23.3	12.2
Recreation	10 - 100	22.5	16.1
Solid Waste	20 - 30	21.4	6.9
		24.8	**14.1**



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.

4.4.4 Lifecycle Management Strategy

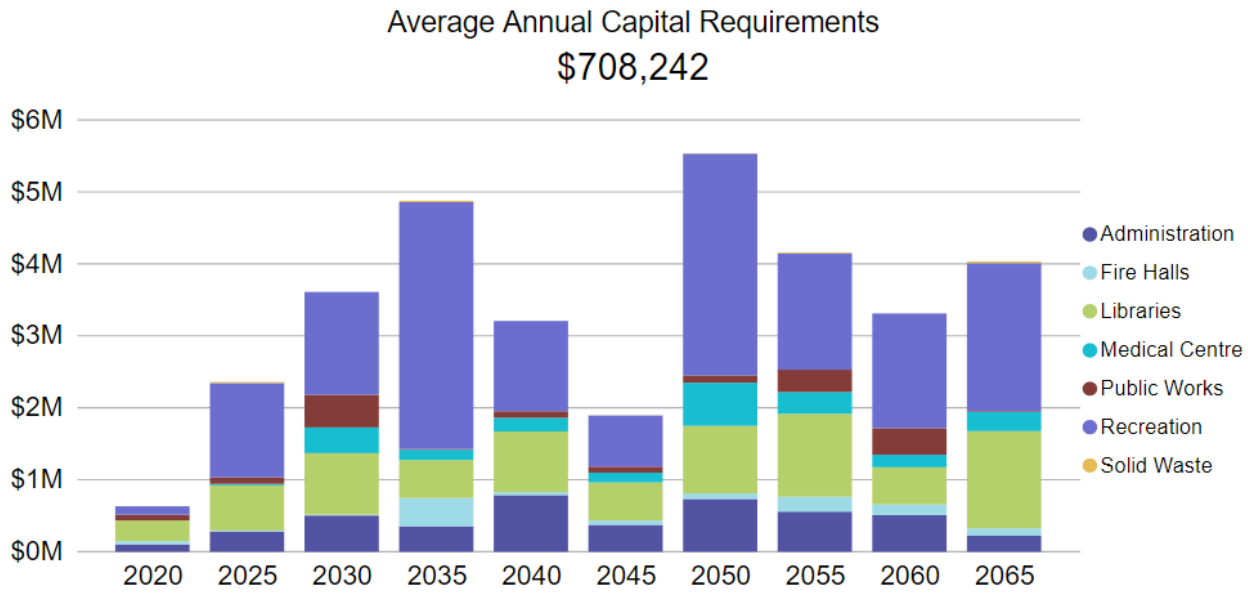
The condition or performance of most assets will deteriorate over time. To ensure that municipal assets are performing as expected and meeting the needs of customers, it is important to establish a lifecycle management strategy to proactively manage asset deterioration.

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

Activity Type	Description of Current Strategy
Maintenance / Rehabilitation	Municipal buildings are subject to internal staff inspections to identify health & safety and accessiblity requirements.
Replacement	Facility condition assessment studies are conducted periodically. These studies assess facilities at a component level, suggesting a replacement schedule for components nearing the end of life.

Forecasted Capital Requirements

The following graph forecasts long-term capital requirements. The annual capital requirement represents the average amount per year that the Township 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

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

Critical Assets

The identification of critical assets allows the Township to determine appropriate risk mitigation strategies and treatment options. These may include asset-specific lifecycle strategies, condition assessment strategies, or simply the need to collect better asset data. Critical assets do not necessarily require immediate renewal or replacement.

The following table identifies critical assets according to the risk criteria identified in Appendix D. The risk rating is calculated by multiplying the probability of failure and the consequence of failure for each asset.

Segment	Name	Risk Rating
Libraries	ELECTRICAL	25 – Very High
Recreation	HYDRAULIC ELEVATOR	25 – Very High
Medical Centre	MECHANICAL	25 – Very High
Recreation	MECHANICAL	25 – Very High
Recreation	STRUCTURAL	20 – Very High
Recreation	NON STRUCTURAL	20 – Very High
Recreation	COMPRESSOR	20 – Very High
Medical Centre	ELECTRICAL	20 – Very High
Recreation	HEAT EXCHANGER	20 – Very High
Administration	MECHANICAL	20 – Very High

4.4.6 Levels of Service

Buildings is considered a non-core asset category. As such, the Township has until July 1, 2023 to determine the qualitative descriptions and technical metrics that measure the current level of service provided.

4.4.7 Recommendations

Asset Inventory

- The Township's asset inventory is structured at a component level across all buildings. Because this data comes from multiple sources the Township should review the inventory to ensure there are no duplicates or missing components
- Although buildings are componentized, they are not done so in a consistent manner. The Township may consider adopting a standardized building component code structure, such as the industry standard UNIFORMAT II, to more easily compare components across separate buildings.

Condition Assessment Strategies

- The Township should implement regular condition assessments for all facilities 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.

Lifecycle Management Strategies

- Continue to execute upon rehabilitation and replacement activities recommended in the facilities condition assessment report.

Levels of Service

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

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

4.5 Machinery & Equipment

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

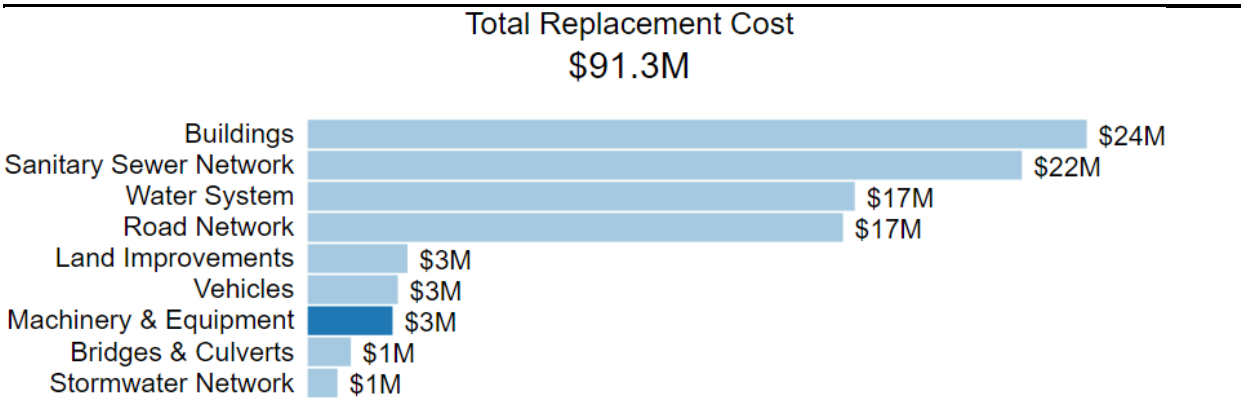
- Administration equipment to serve the Township's IT and office needs
- Fire equipment to outfit staff and vehicles
- Books and computers for the libraries
- Equipment for the medical centre
- Public Works field equipment
- Bleachers, playground equipment and servicing equipment for recreation
- Solid Waste storage bins

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

4.5.1 Asset Inventory & Replacement Cost

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

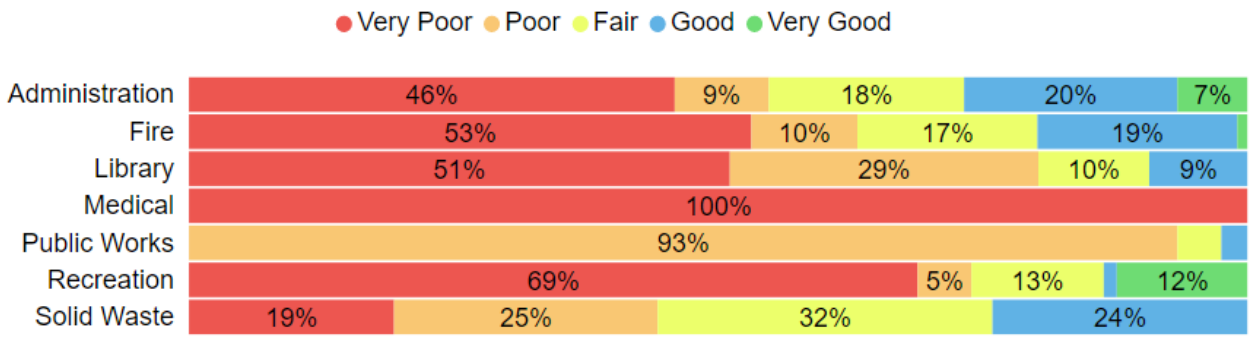
Asset Segment	Quantity	Replacement Cost Method	Total Replacement Cost
Administration	Pooled (173)	CPI Tables	$639,121
Fire	Pooled (15916)	CPI Tables	$627,466
Library	Pooled (3499)	CPI Tables	$214,235
Medical	1	CPI Tables	$560
Public Works	Pooled (7)	CPI Tables	$184,856
Recreation	Pooled (222)	CPI Tables	$866,662
Solid Waste	Pooled (1)7	CPI Tables	$125,760
			$2,658,660



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
Administration	33%	Poor	Age-Based
Fire	26%	Poor	Age-Based
Library	19%	Very Poor	Age-Based
Medical	0%	Very Poor	Age-Based
Public Works	31%	Poor	Age-Based
Recreation	17%	Very Poor	Age-Based
Solid Waste	39%	Poor	Age-Based
	25%	**Poor**	**0% Assessed**



To ensure that the Township's Machinery & Equipment continues to provide an acceptable level of service, the Township 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:

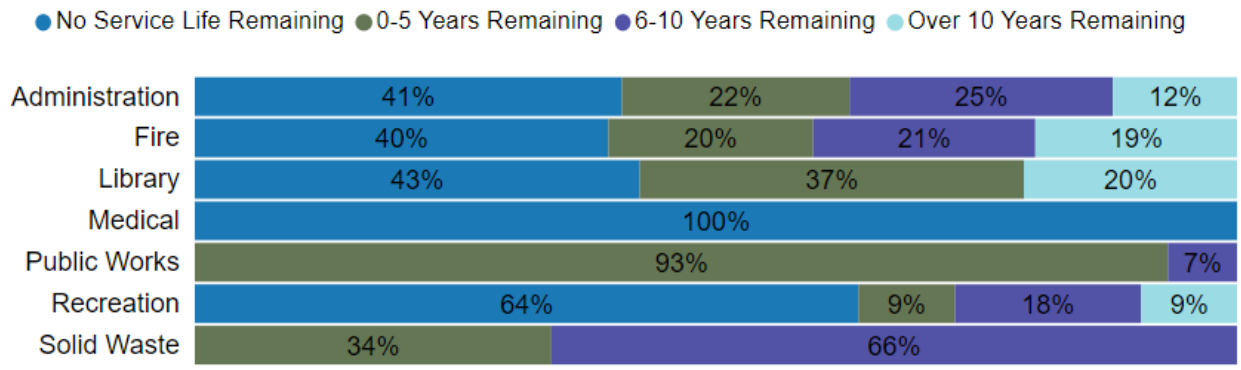
- Fire and emergency equipment are inspected routinely as adherence to the National Fire Protection Agency

- There are no formal condition assessment programs in place for most machinery and equipment

4.5.3 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)
Administration	1 - 25	12.6	-0.3[i]
Fire	5 - 35	17.3	0.7
Library	4 - 50	18.1	3.3
Medical	10	12.5	-2.5
Public Works	10 - 20	8.5	5.9
Recreation	5 - 30	14.8	1.3
Solid Waste	10 - 20	7.7	5.7
		14.3	**1.4**



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

4.5.4 Lifecycle Management Strategy

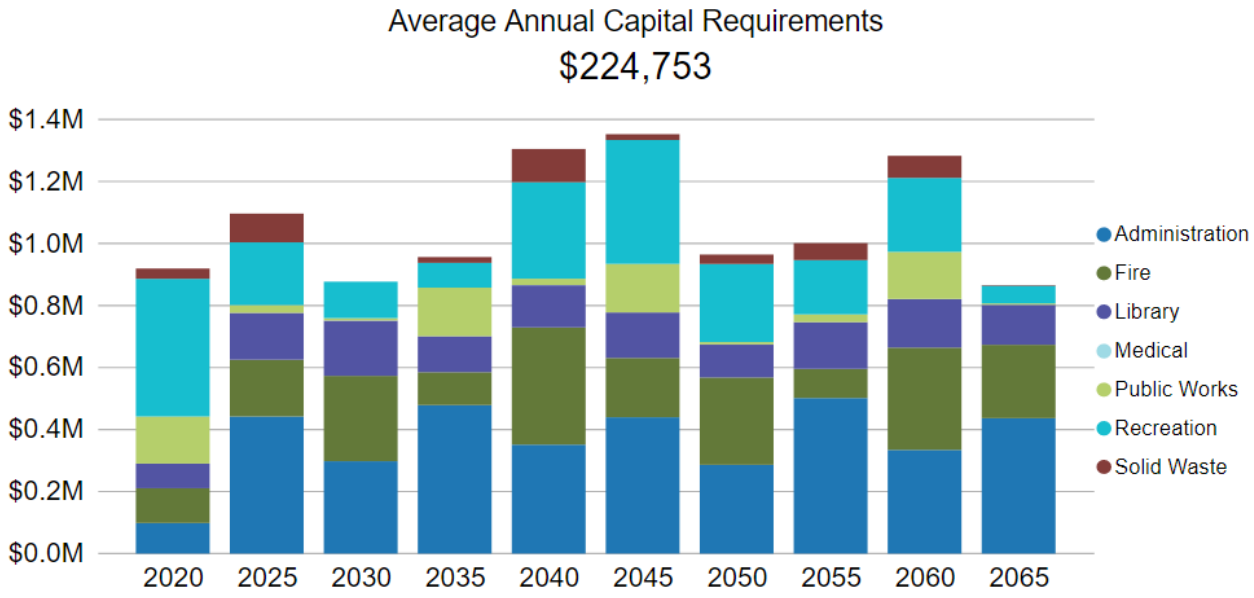
The condition or performance of most assets will deteriorate over time. To ensure that municipal assets are performing as expected and meeting the needs of customers, it is important to establish a lifecycle management strategy to proactively manage asset deterioration.

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

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

Forecasted Capital Requirements

The following graph forecasts long-term capital requirements. The annual capital requirement represents the average amount per year that the Township 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

The following risk matrix provides a visual representation of the relationship between the probability of failure and the consequence of failure for the assets within this asset category based on 2018 inventory data. See Appendix D for the criteria used to determine the risk rating of each asset.

Critical Assets

The identification of critical assets allows the Township to determine appropriate risk mitigation strategies and treatment options. These may include asset-specific lifecycle strategies, condition assessment strategies, or simply the need to collect better asset data. Critical assets do not necessarily require immediate renewal or replacement.

The following table identifies critical assets according to the risk criteria identified in Appendix D. The risk rating is calculated by multiplying the probability of failure and the consequence of failure for each asset.

Segment	Name	Risk Rating
Recreation Equipment	ELECTRICAL	25 – Very High
Recreation Equipment	AIR CONDITIONING UNITS	15 – Very High
Solid Waste Equipment	ROLL OFF BINS	15 – Very High
Recreation Equipment	BALL DIAMOND BLEACHER	15 – Very High
Recreation Equipment	BOILER 155,000 BT/HR	15 – Very High
Admin Equipment	FURNITURE	15 – Very High
Recreation Equipment	ARENA REFRIGERATION CONTROL PANEL	12 – High
Admin Equipment	MUNICIPAL OFFICE SERVER HP[9]	12 – High

[9] Asset was replaced in 2019.

4.5.6 Levels of Service

Machinery & Equipment is considered a non-core asset category. As such, the Township has until July 1, 2023 to determine the qualitative descriptions and technical metrics that measure the current level of service provided.

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

4.6 Vehicles

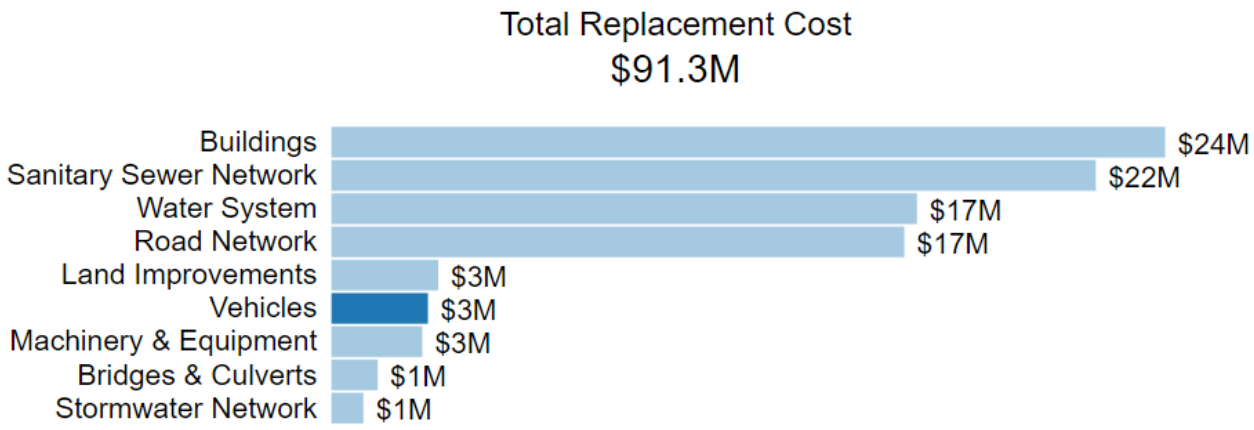
Vehicles allow staff to efficiently deliver municipal services and personnel. Municipal vehicles are used to support several service areas, including:

- tandem axle trucks and snow plows for winter control activities
- fire rescue vehicles to provide emergency services
- pick-up trucks to support the maintenance of the transportation network and address service requests for Environmental Services and Parks & Recreation

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 Township's Vehicles.

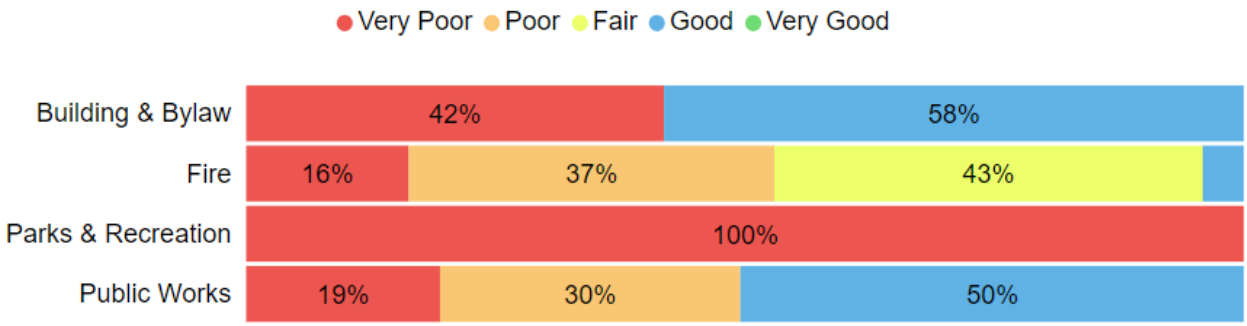
Asset Segment	Quantity	Replacement Cost Method	Total Replacement Cost
Building & Bylaw	1	CPI Tables	$63,272
Fire	7	CPI Tables	$1,185,070
Parks & Recreation	1	CPI Tables	$33,517
Public works	9	CPI Tables	$1,541,966
			$2,823,825



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
Building & Bylaw	41%	Fair	Age-Based
Fire	32%	Poor	Age-Based
Parks & Recreation	0%	Very Poor	Age-Based
Public works	47%	Fair	Age-Based
	42%	**Fair**	**0% Assessed**



To ensure that the Township's Vehicles continue to provide an acceptable level of service, the Township 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

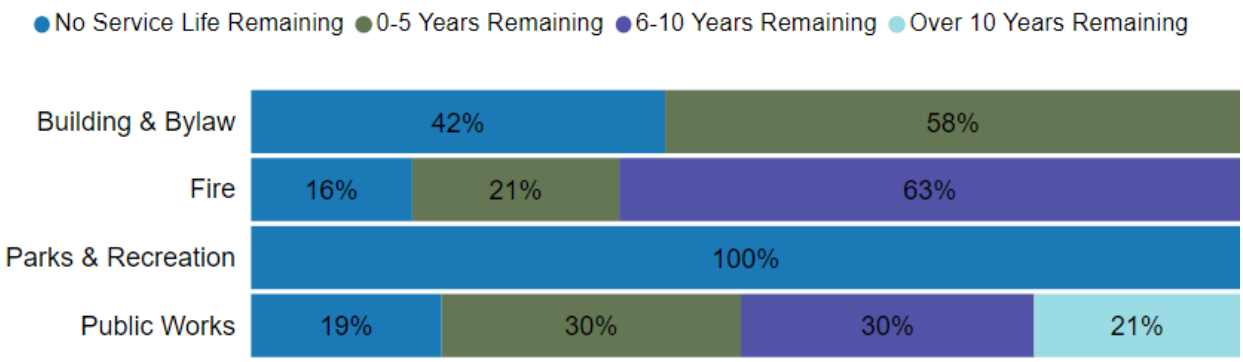
Accurate and reliable condition data allows staff to more confidently determine the remaining service life of assets and identify the most cost-effective approach to managing assets. The following describes the municipality's current approach:

- Staff complete regular visual inspections of vehicles to ensure they are in state of adequate repair prior to operation
- The mileage of vehicles is used as a proxy to determine remaining useful life and relative vehicle condition

4.6.3 Estimated Useful Life & Average Age

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

Asset Segment	Estimated Useful Life (Years)	Average Age (Years)	Average Service Life Remaining (Years)
Building & Bylaw	7	5.8	1.2
Fire	5 - 20	10.3	4.5
Parks & Recreation	5	10.2	-5.2
Public works	4 - 25	6.1	2.5
		7.9	**3.9**



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

4.6.4 Lifecycle Management Strategy

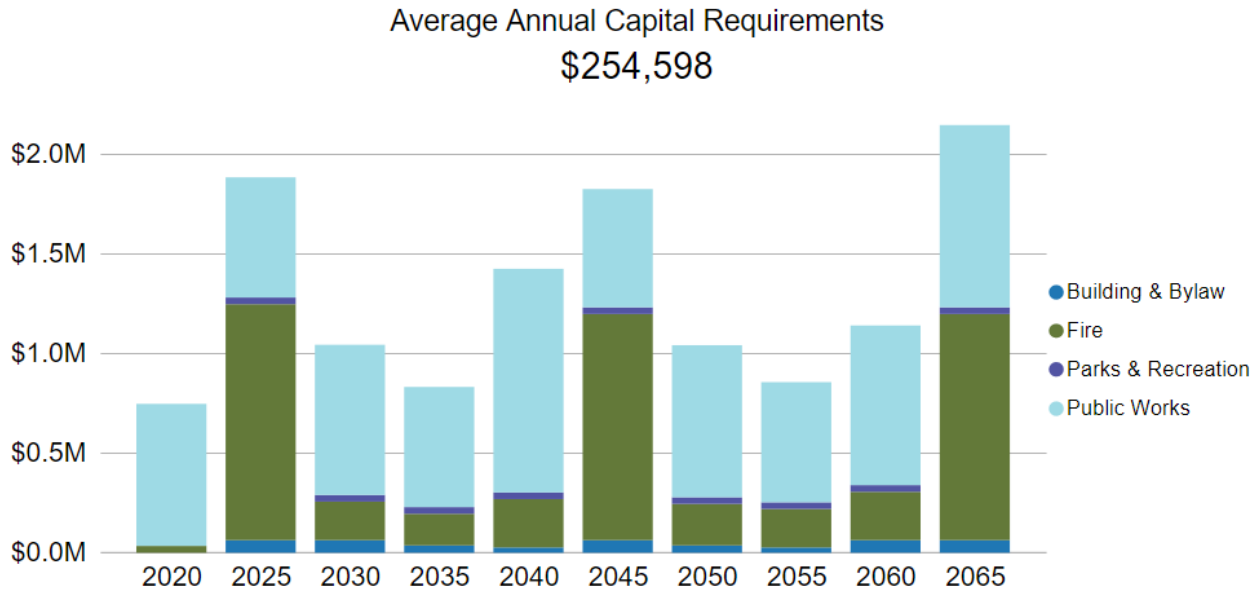
The condition or performance of most assets will deteriorate over time. To ensure that municipal assets are performing as expected and meeting the needs of customers, it is important to establish a lifecycle management strategy to proactively manage asset deterioration.

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

Activity Type	Description of Current Strategy
Maintenance / Rehabilitation	Visual inspections completed and documented on a regular basis
	Annual preventative maintenance activities include system components check and additional detailed inspections
Replacement	Vehicle age, kilometres and annual repair costs are taken into consideration when determining appropriate treatment options

Forecasted Capital Requirements

The following graph forecasts long-term capital requirements. The annual capital requirement represents the average amount per year that the Township 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

The following risk matrix provides a visual representation of the relationship between the probability of failure and the consequence of failure for the assets within this asset category based on 2018 inventory data. See Appendix D for the criteria used to determine the risk rating of each asset.

Critical Assets

The identification of critical assets allows the Township to determine appropriate risk mitigation strategies and treatment options. These may include asset-specific lifecycle strategies, condition assessment strategies, or simply the need to collect better asset data. Critical assets do not necessarily require immediate renewal or replacement.

The following table identifies critical assets according to the risk criteria identified in Appendix D. The risk rating is calculated by multiplying the probability of failure and the consequence of failure for each asset.

Segment	Name	Risk Rating
Fire	FIRE TRUCK 2012 FORD F550 RESC/COMM 1	25 – Very High
Fire	FIRE TRUCK 2005 FORD 550 4X4 RESCUE 2	20 – Very High
Public Works	10-41 INTL TANDEM	20 – Very High
Fire	FIRE TRUCK 2009 INTERNATIONAL TANK 1	15 – Very High
Fire	FIRE TRUCK 2010 INT'L 4400 PUMP 1	15 – Very High

4.6.6 Levels of Service

Vehicles are considered a non-core asset category. As such, the Township has until July 1, 2023 to determine the qualitative descriptions and technical metrics that measure the current level of service provided.

4.6.7 Recommendations

Condition Assessment Strategies

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

Risk 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 Township 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.

Lifecycle Management Strategy

- Define proactive maintenance and renewal strategies employed by the Township to extend service life of vehicles. These activities should have a clear trigger identified (e.g. mileage) to ensure consistency across vehicles.

4.7 Land Improvements

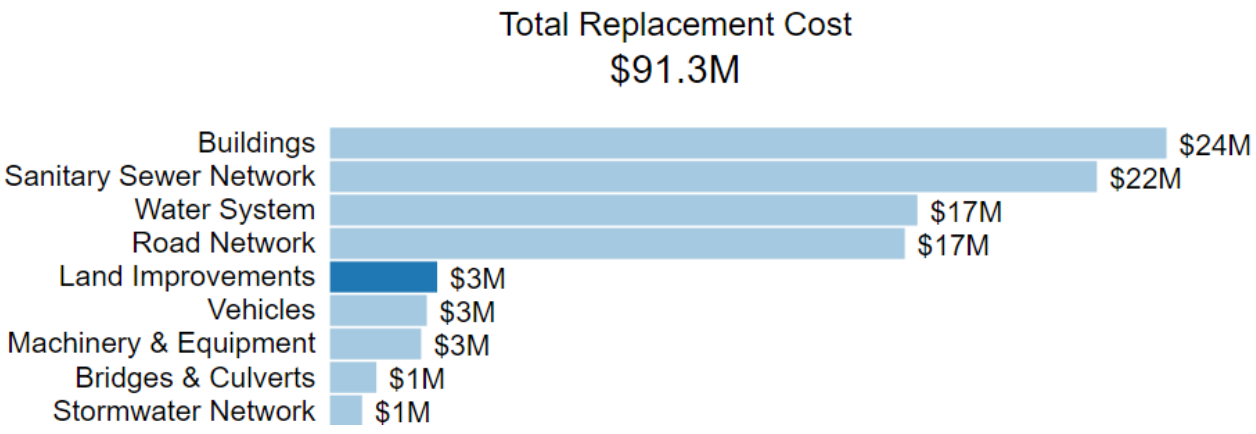
The Township of Havelock-Belmont-Methuen owns a considerable number of assets considered Land Improvements. This category includes:

- Parking lots and site work for municipal facilities
- Landscaping and playground equipment for parks
- Fencing and signage
- Skating rinks and sports fields

4.7.1 Asset Inventory & Replacement Cost

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

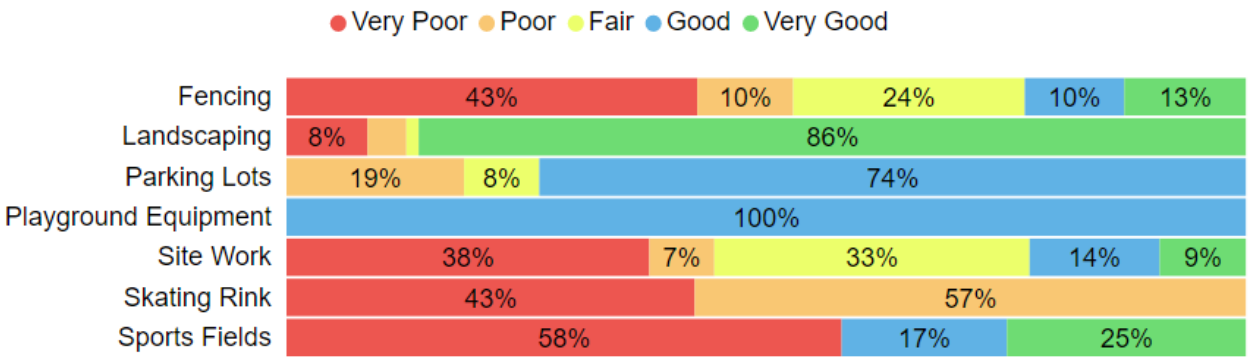
Asset Segment	Quantity	Replacement Cost Method	Total Replacement Cost
Fencing	Pooled	CPI Tables	$143,719
Landscaping	6	CPI Tables	$515,732
Parking Lots	7	CPI Tables	$660,313
Playground Equipment	1	CPI Tables	$2,988
Site Work	31	CPI Tables	$1,648,599
Skating Rinks	4	CPI Tables	$98,924
Sports Fields	3	CPI Tables	$54,039
			$3,124,314



4.7.2 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
Fencing	30%	Poor	Age-Based
Landscaping	77%	Good	Age-Based
Parking Lots	67%	Good	Age-Based
Playground Equipment	63%	Good	Age-Based
Site Work	35%	Poor	Age-Based
Skating Rinks	22%	Poor	Age-Based
Sports Fields	41%	Fair	Age-Based
	48%	**Fair**	**0% Assessed**



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

Current Approach to Condition Assessment

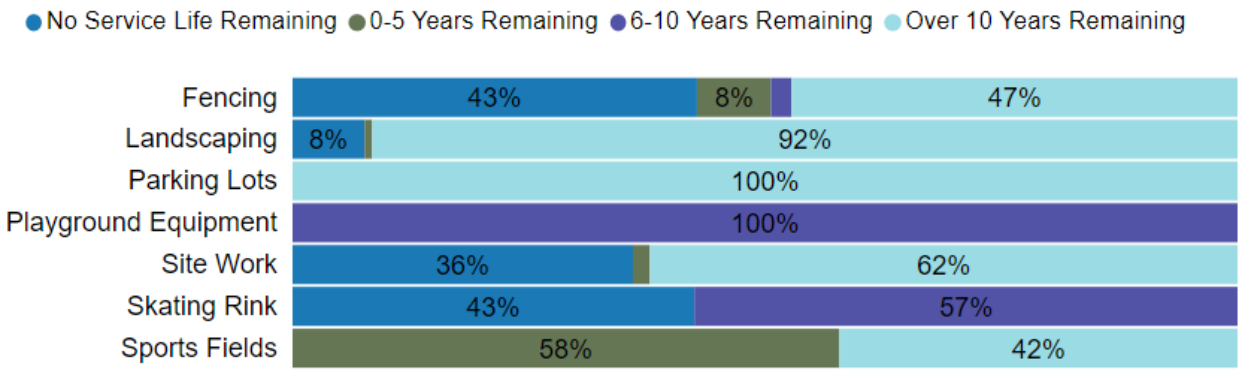
Accurate and reliable condition data allows staff to more confidently determine the remaining service life of assets and identify the most cost-effective approach to managing assets. The following describes the municipality's current approach:

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

4.7.3 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)
Fencing	20 - 40	32.1	-5.3
Landscaping	40 - 75	31.1	14.8
Parking Lots	40	15.8	24.2
Playground Equipment	15	5.5	9.5
Site Work	15 - 40	25.6	12.7
Skating Rinks	1 - 20	11.6	-1.3
Sports Fields	20 - 30	11.2	15.5
		24.0	**14.2**



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

4.7.4 Lifecycle Management Strategy

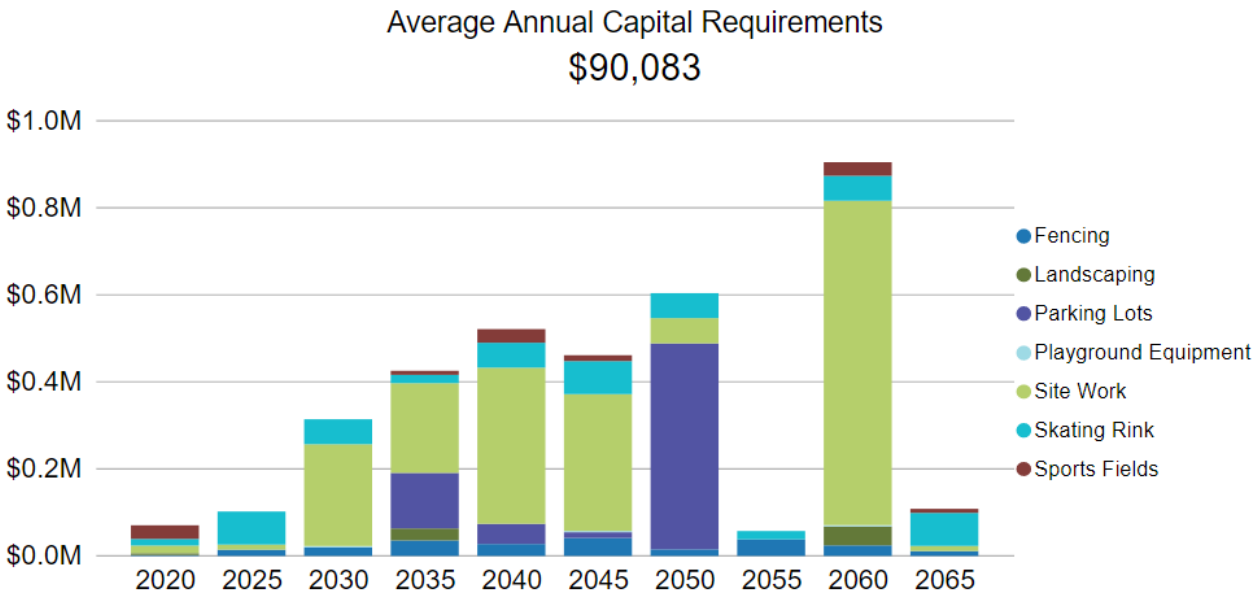
The condition or performance of most assets will deteriorate over time. To ensure that municipal assets are performing as expected and meeting the needs of customers, it is important to establish a lifecycle management strategy to proactively manage asset deterioration.

The following table outlines the Township'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 Township 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.

4.7.5 Risk & Criticality

The following risk matrix provides a visual representation of the relationship between the probability of failure and the consequence of failure for the assets within this asset category based on 2018 inventory data. See Appendix D for the criteria used to determine the risk rating of each asset.

Critical Assets

The identification of critical assets allows the Township to determine appropriate risk mitigation strategies and treatment options. These may include asset-specific lifecycle strategies, condition assessment strategies, or simply the need to collect better asset data. Critical assets do not necessarily require immediate renewal or replacement.

The following table identifies critical assets according to the risk criteria identified in Appendix D. The risk rating is calculated by multiplying the probability of failure and the consequence of failure for each asset.

Segment	Name	Risk Rating
Site Work	PMST SITE WORKS	20 – Very High
Site Work	WELL 3 SITE WORKS 1991	16 – Very High
Site Work	WELL 3 SITE WORKS 1998	15 – Very High
Site Work	6TH LINE WASTE SITE WORKS	12 – High
Skating Rink	CORDOVA OUTDOOR RINK DASHER BOARDS	10 – High

4.7.6 Levels of Service

Land Improvements are considered a non-core asset category. As such, the Township has until July 1, 2023 to determine the qualitative descriptions and technical metrics that measure the current level of service provided.

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

Risk Management Strategies

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

Levels of Service

- Begin measuring current levels of service in accordance with the metrics that the Township 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 $39 million
- 75% 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 $0.8 million
- Critical assets should be evaluated to determine appropriate risk mitigation activities and treatment options

5.1 Water Network

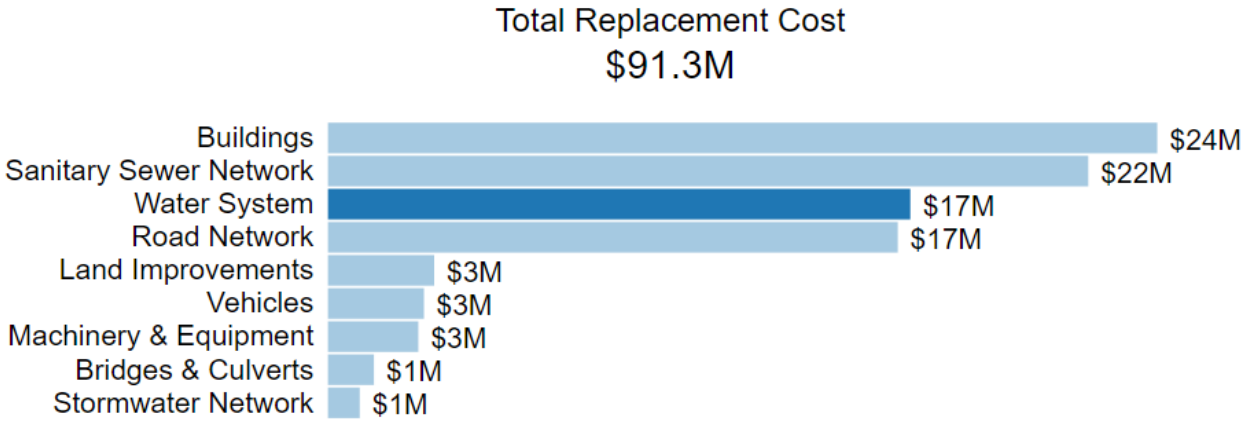
The water services provided by the Township are overseen by the Water and Sewers department, serving the village of Havelock. The Township manages the water lines, whereas Ontario Clean Water Agency monitors the water quality. The water system is comprised of:

- Havelock water distribution system
- Township water wells
- Township treatment and pumping facilities
- Township water storage tower

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 Township's Water Network inventory.

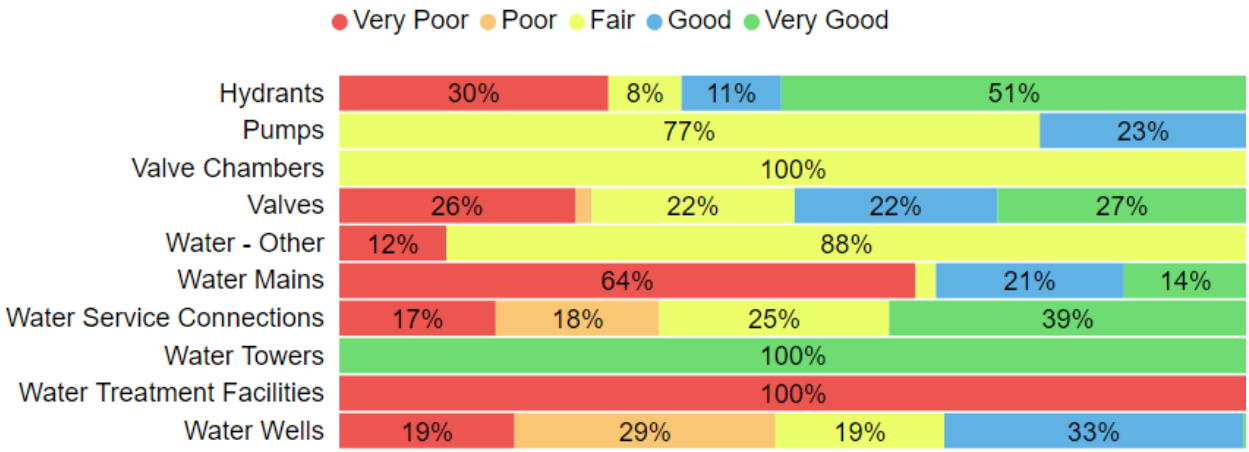
Asset Segment	Quantity (Assets)	Replacement Cost Method	Total Replacement Cost
Water Mains	12,938 m	CPI Tables	$7,457,043
Hydrants	75	CPI Tables	$312,084
Pumps	2	CPI Tables	$28,116
Valve Chambers	2	CPI Tables	$2,480
Valves	103	CPI Tables	$195,836
Water Service Connections	691 m	CPI Tables	$1,925,234
Water Towers	1 (2)	CPI Tables	$2,156,019
Water Treatment Facilities	4	CPI Tables	$148,811
Water Wells	3 (22)	CPI Tables	$3,866,476
Water - Other	1	CPI Tables	$992,223
			$17,084,322



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
Water Mains	38%	Poor	Age-Based
Hydrants	58%	Fair	Age-Based
Pumps	52%	Fair	Age-Based
Valve Chambers	51%	Fair	Age-Based
Valves	51%	Fair	Age-Based
Water Service Connections	41%	Fair	Age-Based
Water Towers	93%	Very Good	Age-Based
Water Treatment Facilities	9%	Very Poor	Age-Based
Water Wells	39%	Poor	Age-Based
Water - Other	36%	Poor	Age-Based
	46%	**Fair**	**0% Assessed**



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

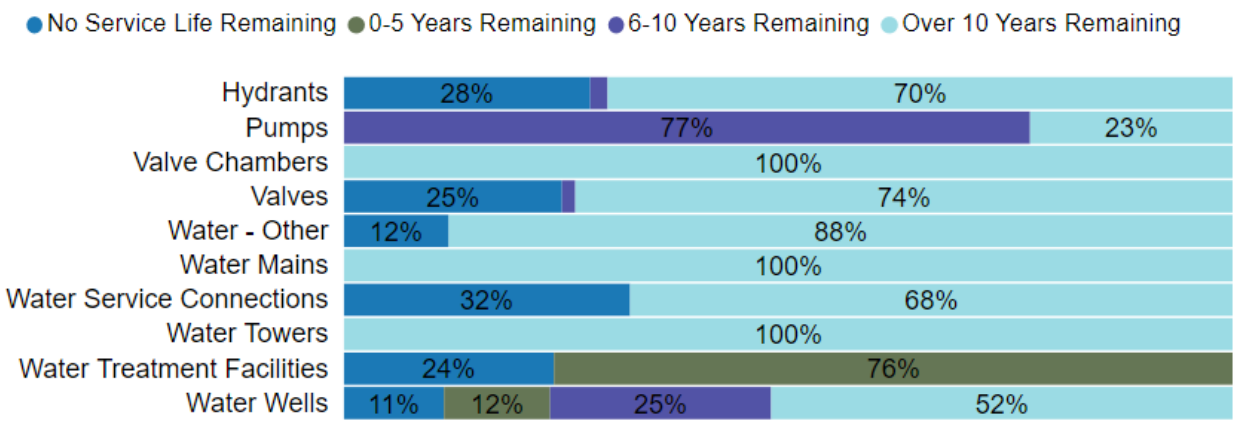
Accurate and reliable condition data allows staff to more confidently determine the remaining service life of assets and identify the most cost-effective approach to managing assets. The following describes the municipality's current approach:

- 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 distribution mains
- Water treatment and pumping facilities are operated on by the Ontario Clean Water Agency (OCWA). Facility components are assessed routinely to meet Drinking Water Quality Management Systems (DWQMS) requirements.

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)
Water Mains	40 - 75	40.7	33.3
Hydrants	60	33.0	27.0
Pumps	20	8.5	11.5
Valve Chambers	60	29.5	30.5
Valves	60	33.3	26.8
Water Service Connections	20 - 60	19.9	21.3
Water Towers	40 - 90	4.1	60.9
Water Treatment Facilities	15 - 40	35.9	-8.4
Water Wells	15 - 60	20.4	9.1
Water - Other	10 - 60	35.8	9.3
		28.5	**27.9**



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

5.1.4 Lifecycle Management Strategy

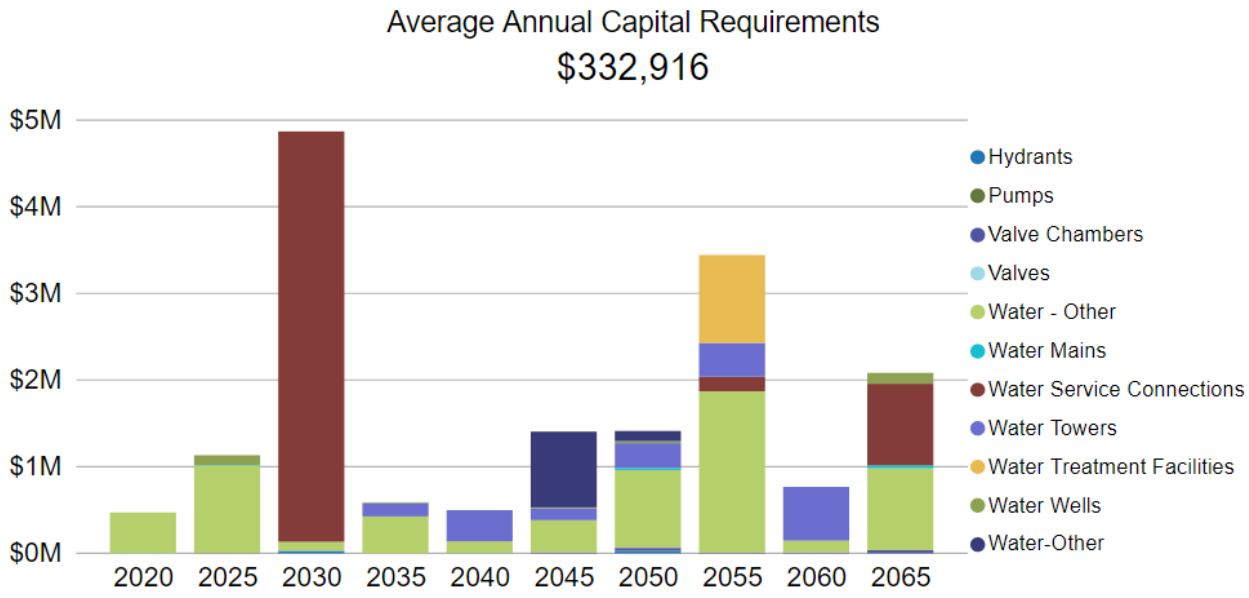
The condition or performance of most assets will deteriorate over time. To ensure that municipal assets are performing as expected and meeting the needs of customers, it is important to establish a lifecycle management strategy to proactively manage asset deterioration.

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

Activity Type	Description of Current Strategy
Maintenance	Main flushing is completed on an as-needed basis to meet water quality requirements
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 a deficiency list that factors in age, pipe material and the history of breaks

Forecasted Capital Requirements

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

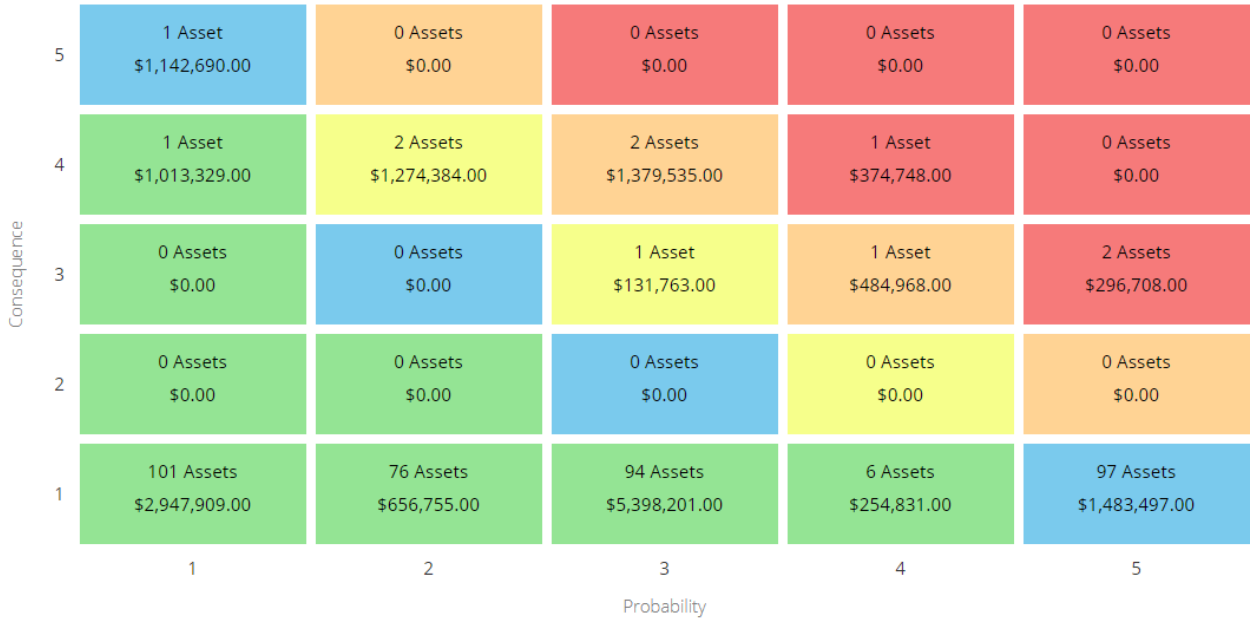


The above graph does not represent backlog items, those already exceeding the estimated useful life, which includes $35,184 worth of Water Treatment assets. The projected cost of lifecycle

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

The following risk matrix provides a visual representation of the relationship between the probability of failure and the consequence of failure for the assets within this asset category based on 2018 inventory data. See Appendix D for the criteria used to determine the risk rating of each asset.



Critical Assets

The identification of critical assets allows the Township to determine appropriate risk mitigation strategies and treatment options. These may include asset-specific lifecycle strategies, condition assessment strategies, or simply the need to collect better asset data. Critical assets do not necessarily require immediate renewal or replacement.

The following table identifies critical assets according to the risk criteria identified in Appendix D. The risk rating is calculated by multiplying the probability of failure and the consequence of failure for each asset.

Segment	Name	Risk Rating
Water Wells	NON STRUCTURAL 1998	16 – Very High
Water Wells	NON STRUCTURAL 1991	15 – Very High
Water- Other	NON STRUCTURAL	15 – Very High
Water Wells	STRUCTURAL 1991	12 – High
Water Wells	WELL 3 PROCESS MECHANICAL 1998	12 – High
Water- Other	STRUCTURAL	12 – High

5.1.6 Levels of Service

The following tables identify the Township'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 Township 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 (2019)
Scope	Description, which may include maps, of the user groups or areas of the municipality that are connected to the municipal water system	See Appendix C
	Description, which may include maps, of the user groups or areas of the municipality that have fire flow	See Appendix C
Reliability	Description of boil water advisories and service interruptions	No boil water advisories have been reported in 2019.

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 (2019)
Scope	% of properties connected to the municipal water system	TBD[10]
	% of properties where fire flow is available	TBD[11]
Reliability	# of connection-days per year where a boil water advisory notice is in place compared to the total number of properties connected to the municipal water system	0
	# of connection-days per year where water is not available due to water main breaks compared to the total number of properties connected to the municipal water system	0
Performance	Capital re-investment rate	1.25%

[10] The Township does not currently have data available to determine this technical metric. All properties within the Village of Havelock are connected to the water system. Other communities rely on well water.
[11] The Township does not currently have data available to determine this technical metric. Properties connected to the water system are expected to meet fire flow requirements.

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.
- 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

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

5.2 Sanitary Sewer Network

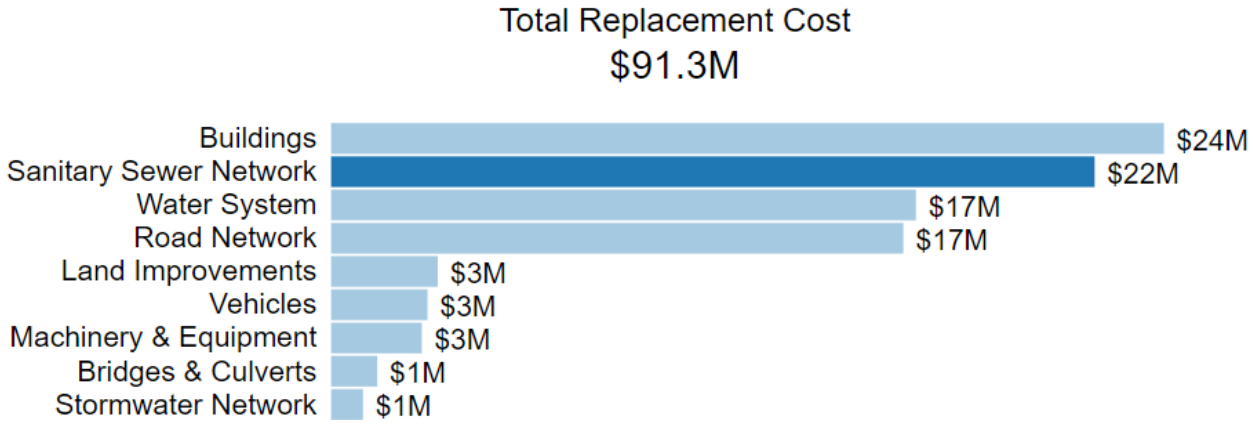
The sanitary sewer services provided by the Township are overseen by the Water and Sewers department, serving the village of Havelock. The Township manages the sanitary lines, whereas Ontario Clean Water Agency monitors the effluent quality. The sanitary sewer system is comprised of:

- The Havelock wastewater collection system
- The Havelock pumping station
- The wastewater treatment facility and lagoons

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 Township's Sanitary Sewer Network inventory.

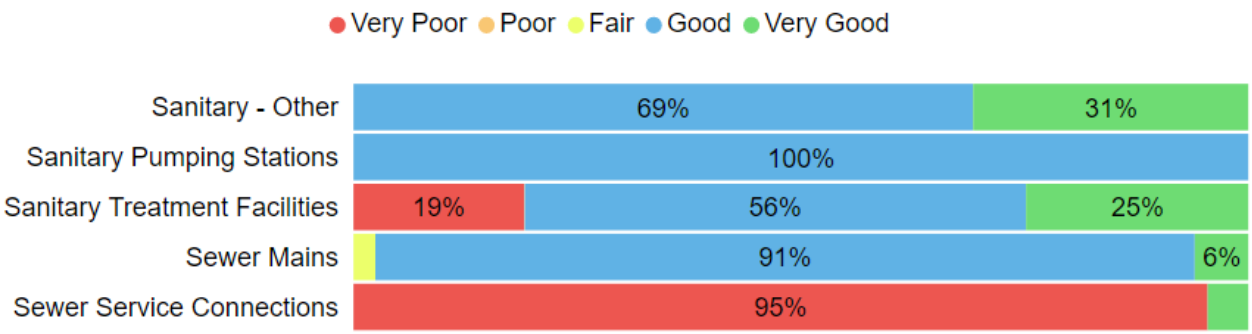
Asset Segment	Quantity	Replacement Cost Method	Total Replacement Cost
Sewer Mains	12,692 m	CPI Tables	$7,360,858
Sewer Service Connections	606 m	CPI Tables	$3,426,682
Sanitary Pumping Stations	1	CPI Tables	$38,410
Sanitary Treatment Facilities	13	CPI Tables	$11,344,037
Sanitary - Other	21	CPI Tables	$132,343
			$22,302,330



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
Sewer Mains	80%	Very Good	11% Assessed
Sewer Service Connections	77%	Good	Age-Based
Sanitary Pumping Stations	73%	Good	Age-Based
Sanitary Treatment Facilities	56%	Fair	Age-Based
Sanitary - Other	73%	Good	Age-Based
	67%	**Good**	**4% Assessed**



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

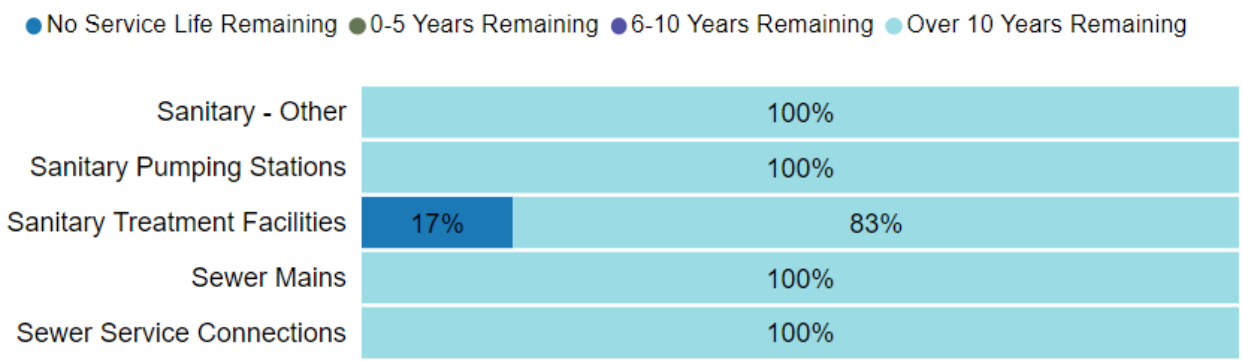
Accurate and reliable condition data allows staff to more confidently determine the remaining service life of assets and identify the most cost-effective approach to managing assets. The following describes the municipality's current approach:

- CCTV inspections are completed for Sanitary Mains on a regular cycle (100% of network every 15 years)

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)
Sewer Mains	70	39.0	38.9
Sewer Service Connections	75	12.0	62.9
Sanitary Pumping Stations	20	5.5	14.5
Sanitary Treatment Facilities	15 - 60	32.7	1.5
Sanitary - Other	25 - 60	6.0	39.0
		31.4	**31.1**

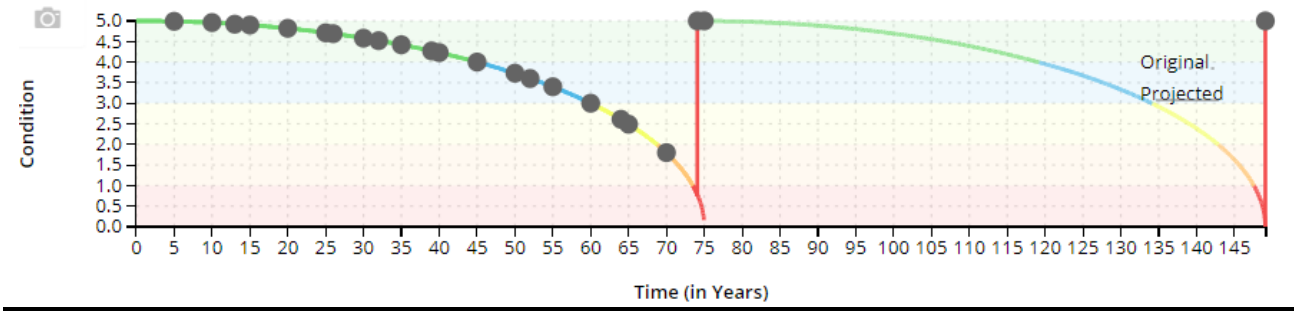


Each asset's Estimated Useful Life should be reviewed periodically to determine whether adjustments need to be made to better align with the observed length of service life for each asset type.

5.2.4 Lifecycle Management Strategy

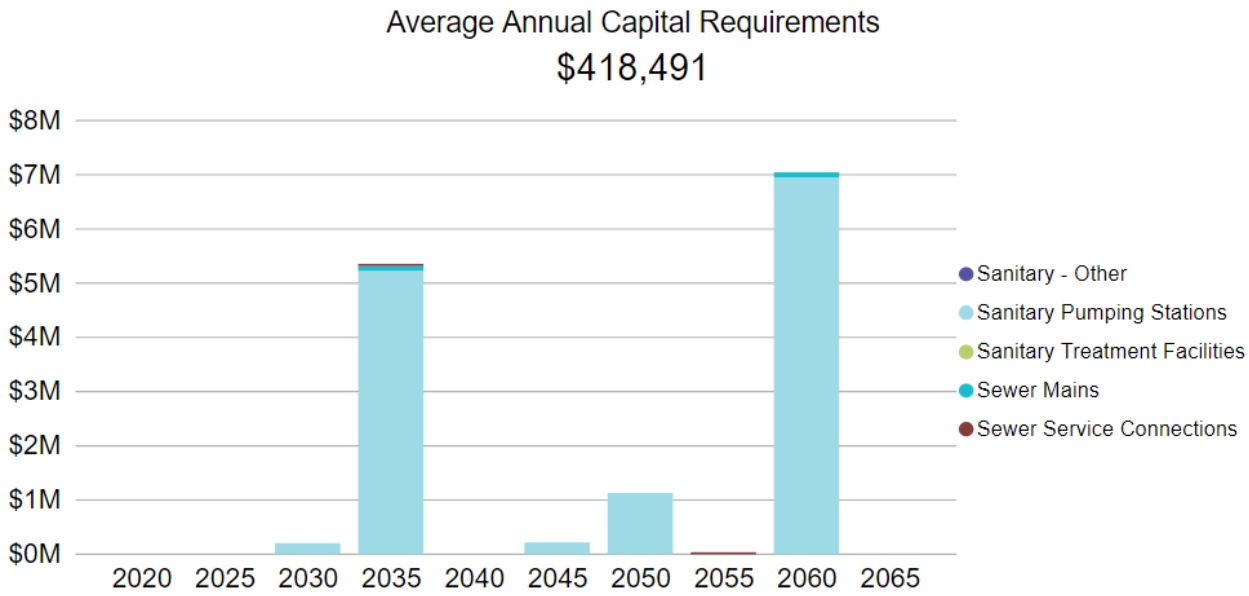
The condition or performance of most assets will deteriorate over time. This process is affected by a range of factors including an asset's characteristics, location, utilization, maintenance history and environment. The following lifecycle strategy has been developed as a proactive approach to managing the lifecycle of sanitary mains. A trenchless re-lining strategy is expected to extend the service life of sanitary mains at a lower total cost of ownership.

Sanitary Mains		
Event Name	Event Class	Event Trigger
Flushing/Cleaning	Maintenance/Inspection	Every 5 Years
Boring/Smoke Testing	Maintenance	As Needed
CCTV Inspection	Inspection	Every 15 Years
Trenchless Re-lining	Rehabilitation	15% Condition
Full Reconstruction	Replacement	149 Years



Forecasted Capital Requirements

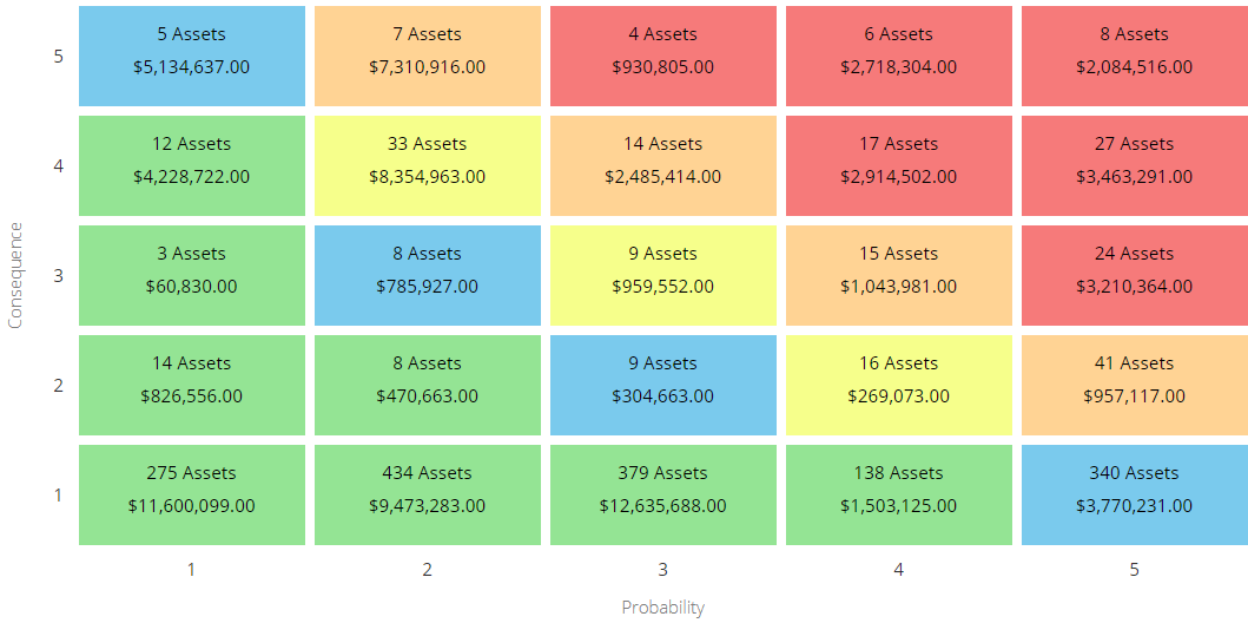
The following graph forecasts long-term capital requirements. The annual capital requirement represents the average amount per year that the Township should allocate towards funding rehabilitation and replacement needs.



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

The following risk matrix provides a visual representation of the relationship between the probability of failure and the consequence of failure for the assets within this asset category based on 2018 inventory data. See Appendix D for the criteria used to determine the risk rating of each asset.



Critical Assets

The identification of critical assets allows the Township to determine appropriate risk mitigation strategies and treatment options. These may include asset-specific lifecycle strategies, condition assessment strategies, or simply the need to collect better asset data. Critical assets do not necessarily require immediate renewal or replacement.

The following table identifies critical assets according to the risk criteria identified in Appendix D. The risk rating is calculated by multiplying the probability of failure and the consequence of failure for each asset.

Segment	Name	Risk Rating
Sanitary Treatment Facilities	LAGOON SITE WORKS[12]	15 – Very High
Sanitary Treatment Facilities	BUILDING MECHANICAL	10 – High
Sanitary Treatment Facilities	BUILDING ARCHITECTURAL	8 – Medium
Sanitary Treatment Facilities	BUILDING ELECTRICAL	8 – Medium

[12] The lagoon has been decommissioned, but still poses a risk as remedial measures may still me required.

5.2.6 Levels of Service

The following tables identify the Township'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 Township 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 (2019)
Scope	Description, which may include maps, of the user groups or areas of the municipality that are connected to the municipal wastewater system	See Appendix C
Reliability	Description of how combined sewers in the municipal wastewater system are designed with overflow structures in place which allow overflow during storm events to prevent backups into homes	The Township does not own any combined sewers
	Description of the frequency and volume of overflows in combined sewers in the municipal wastewater system that occur in habitable areas or beaches	The Township does not own any combined sewers
	Description of how stormwater can get into sanitary sewers in the municipal wastewater system, causing sewage to overflow into streets or backup into homes	Stormwater can enter into sanitary sewers due to cracks in sanitary mains or through indirect connections (e.g. weeping tiles). In the case of heavy rainfall events, sanitary sewers may experience a volume of water and sewage that exceeds its designed capacity. In some cases, this can cause water and/or sewage to overflow backup into homes. the disconnection of weeping tiles from sanitary mains and the use of sump pumps and pits directing storm water to the storm drain system can help to reduce the chance of this occurring.

Service Attribute	Qualitative Description	Current LOS (2019)
	Description of how sanitary sewers in the municipal wastewater system are designed to be resilient to stormwater infiltration	The municipality follows a series of design standards that integrate servicing requirements and land use considerations when constructing or replacing sanitary sewers. These standards have been determined with consideration of the minimization of sewage overflows and backups.
	Description of the effluent that is discharged from sewage treatment plants in the municipal wastewater system	Effluent refers to water pollution that is discharged from a wastewater treatment plant, and may include suspended solids, total phosphorous and biological oxygen demand. The Environmental Compliance Approval (ECA) identifies the effluent criteria for municipal wastewater treatment plants.

Technical Levels of Service

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

Service Attribute	Technical Metric	Current LOS (2019)
Scope	% of properties connected to the municipal wastewater system	TBD[13]
Reliability	# of events per year where combined sewer flow in the municipal wastewater system exceeds system capacity compared to the total number of properties connected to the municipal wastewater system	0
	# of connection-days per year having wastewater backups compared to the total number of properties connected to the municipal wastewater system	0
	# of effluent violations per year due to wastewater discharge compared to the total number of properties connected to the municipal wastewater system	0
Performance	Capital re-investment rate	0.94%

[13] The Township does not currently have data available to determine this technical metric. All properties within the Village of Havelock are connected to the wastewater system. Other communities rely on septic services.

5.2.7 Recommendations

Asset Inventory

- Sanitary sewer mains are currently segmented in large sections, not being identified between specific manhole locations. These assets should be broken out to a level that matches the segmentation recorded in CCTV records, enabling inspection results to be utilized.

Condition Assessment Strategies

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

Lifecycle Management Strategies

- A trenchless re-lining strategy is expected to extend the service life of sanitary mains at a lower total cost of ownership and should be implemented to extend the life of infrastructure at the lowest total cost of ownership.
- Evaluate the efficacy of the Township'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 Township 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 Township to more effectively plan for new infrastructure, and the upgrade or disposal of existing infrastructure

- Moderate population 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 Township 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 Havelock-Belmont-Methuen Official Plan (December 2015)

The Township adopted the Official Plan in 2015 to ensure conformance with the County of Peterborough Official Plan, and address matters of local planning interest. The Official Plan is a planning document for the purpose of guiding the future development of the Township of Havelock-Belmont-Methuen.

The Official plan was approved by Township council on November 2012.

Key settlement areas have been identified in the Official plan to accommodate population growth. Over the next 20 years, from 2012, the Township is expected to grow by 9.2% or approximately 375 persons. The focus of these settlement areas is to optimize the use of public services and infrastructure, and to minimize outward sprawl of development into areas of natural resources and natural heritage.

6.1.2 Peterborough County Official Plan (November 1994)

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

The Peterborough County Official Plan was approved by County council in November 1994, recently amended in March 2020.

The following table outlines the population forecasts allocated to Havelock-Belmont-Methuen.

Historical Total Population					Projected Total Population	
Havelock-Belmont-Methuen	2001	2006	2011	2016	2021	2026
Low					5,240	5,460
Medium	4479	4637	4,523	4,530	5,820	6,070
High					6,400	6,680

6.2 Impact of Growth on Lifecycle Activities

By July 1, 2024 the Township's asset management plan must include a discussion of how the assumptions regarding future changes in population and economic activity informed the preparation of the lifecycle management and financial strategy.

Planning for forecasted population growth may require the expansion of existing infrastructure and services. As growth-related assets are constructed or acquired, they should be integrated into the Township'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 Township 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 Township is committing approximately $2,045,000 towards capital projects per year from sustainable revenue sources
- Given the annual capital requirement of $2,660,302 there is currently a funding gap of $615,302 annually
- For tax-funded assets, we recommend increasing tax revenues by 0.5% each year for the next 20 years to achieve a sustainable level of funding
- For the Sanitary Sewer Network, we recommend increasing rate revenues by 2.2% annually for the next 20 years to achieve a sustainable level of funding
- For the Water Network, we recommend increasing rate revenues by 1.3% annually for the next 20 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 Township of Havelock-Belmont-Methuen to identify the financial resources required for sustainable asset management based on existing asset inventories, desired levels of service, and projected growth requirements.

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

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

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

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

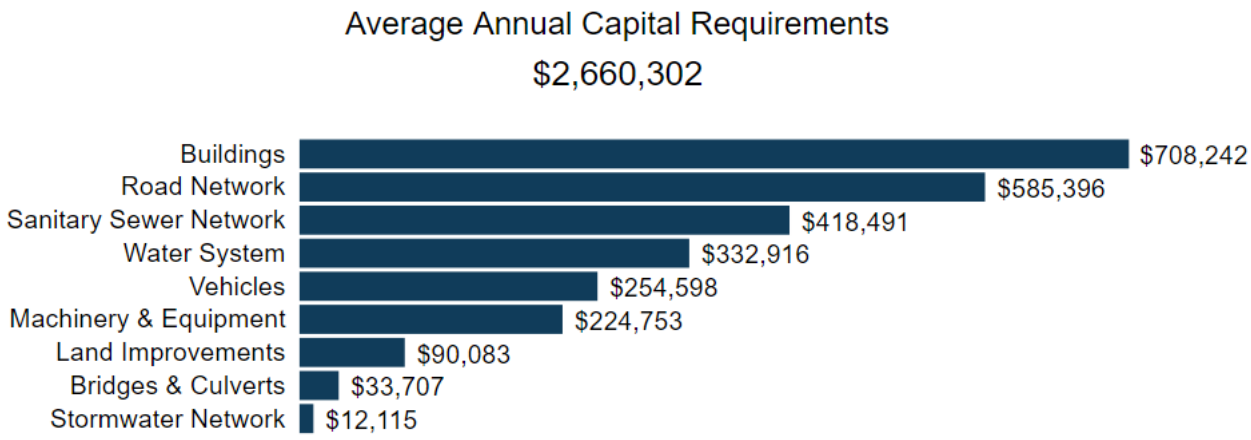
1. In order to reduce financial requirements, consideration has been given to revising service levels downward.

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 Township 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 Township must allocate approximately $2.7 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, Sanitary Sewer Network, and Stormwater Network, lifecycle management strategies have been developed to identify capital costs that are realized through strategic rehabilitation and renewal of the Township's roads, stormwater, and sanitary sewer mains. 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, Stormwater Network, and Sanitary Sewer Network:

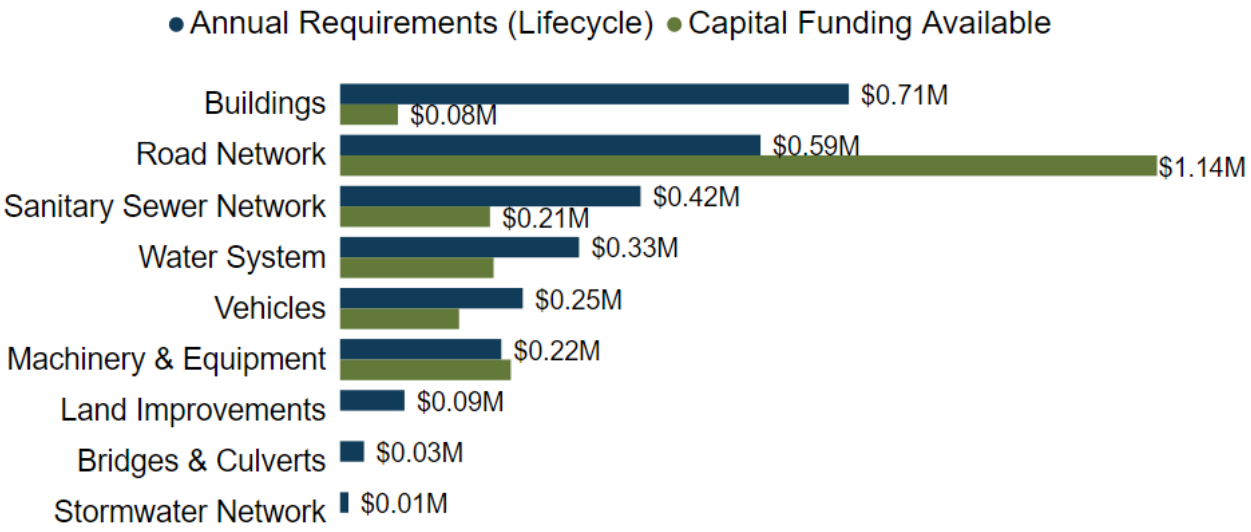
1. Replacement Only Scenario: Based on the assumption that assets deteriorate and – without regularly scheduled maintenance and rehabilitation – are replaced at the end of their service life.
2. Lifecycle Strategy Scenario: Based on the assumption that lifecycle activities are performed at strategic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

Asset Category	Annual Requirements (Replacement Only)	Annual Requirements (Lifecycle Strategy)	Difference
Road Network	$962,898	$585,396	$377,502
Sanitary Sewer Network	$489,966	$418,491	$71,475
Stormwater Network	$14,248	$12,115	$2,134

The implementation of a proactive lifecycle strategy leads to a potential annual cost avoidance of $377,502 for the Road Network, $71,475 for the Sanitary Sewer Network, and $2,134 for the Stormwater Network. This represents an overall reduction of the annual requirements for each category by 39%, 15%, and 15% respectively. As the lifecycle strategy scenario represents the lowest cost option available to the Township, we have used these annual requirements in the development of the financial strategy.

Annual Funding Available

Based on a historical analysis of sustainable capital funding sources, the Township is committing approximately $2,045,000 towards capital projects per year from sustainable revenue sources. Given the annual capital requirement of $2,660,302, there is currently a funding gap of $615,302 annually.



7.2 Funding Objective

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

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

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

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

7.3 Financial Profile: Tax Funded Assets

7.3.1 Current Funding Position

The following tables show, by asset category, Havelock-Belmont-Methuen'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 (Surplus)
		Taxes	Gas Tax	OCIF	OMPF	Taxes to Reserves	Total Available	
Road Network	585,000	150,000	281,000	73,000	633,000	0	1,137,000	-552,000
Storm Water Network	12,000	0	0	0	0	0	0	12,000
Bridges & Culverts	34,000	0	0	0	0	0	0	34,000
Buildings & Facilities	708,000	0	0	0	0	81,000	81,000	627,000
Machinery & Equipment	225,000	0	0	0	0	238,000	238,000	-13,000
Land Improvements	90,000	0	0	0	0	0	0	90,000
Fleet	255,000	0	0	0	0	166,000	166,000	89,000
	1,909,000	**150,000**	**281,000**	**73,000**	**633,000**	**485,000**	**1,622,000**	**287,000**

The average annual investment requirement for the above categories is $1,909,000. Annual revenue currently allocated to these assets for capital purposes is $1,622,000 leaving an annual deficit of $287,000. Put differently, these infrastructure categories are currently funded at 85% of their long-term requirements.

7.3.2 Full Funding Requirements

In 2019, Township of Havelock-Belmont-Methuen has annual tax revenues of $6,212,000. As illustrated in the following table, without consideration of any other sources of revenue or cost containment strategies, full funding would require the following tax change over time:

Asset Category	Tax Change Required for Full Funding
Road Network	-8.9%
Storm Water Network	0.2%
Bridges & Culverts	0.5%
Buildings & Facilities	10.1%
Machinery & Equipment	-0.2%
Land Improvements	1.4%
Fleet	1.4%
	4.5%

The table below outlines 5 to 20 year options in phasing in full funding to the Asset Management Plan:

	5 Years	10 Years	15 Years	20 Years
Infrastructure Deficit	287,000	287,000	287,000	287,000
Tax Increase Required	4.6%	4.6%	4.6%	4.6%
Annually:	**0.9%**	**0.5%**	**0.3%**	**0.2%**

7.3.3 Financial Strategy Recommendations

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

a) increasing tax revenues by 0.5% each year for the next 10 years solely for the purpose of phasing in full funding to the asset categories covered in this section of the AMP.
b) allocating the current gas tax, OCIF, OMPF and taxes from reserves revenue as outlined previously.
c) reallocating appropriate revenue from categories in a surplus position to those in a deficit position.
d) increasing existing and future infrastructure budgets by the applicable inflation index on an annual basis in addition to the deficit phase-in.

Notes:

1. As in the past, periodic senior government infrastructure funding will most likely be available during the phase-in period. By Provincial AMP rules, this periodic funding cannot be

incorporated into an AMP unless there are firm commitments in place. For example, OCIF formula-based funding could be included since this funding is a multi-year commitment[14].

2. We realize that raising tax revenues by the amounts recommended above for infrastructure purposes will be very difficult to do. However, considering a longer phase-in window may have even greater consequences in terms of infrastructure failure.

Although this option achieves full funding on an annual basis in 10 years and provides financial sustainability over the period modeled, the recommendations do require prioritizing capital projects to fit the resulting annual funding available. Current data shows a pent-up investment demand of $168,000 for the Road Network, $0 for Storm Water Network, $28,000 for Bridges & Culverts, $1,751,000 for Buildings & Facilities, $693,000 for Machinery & Equipment, $735,000 for Land Improvements and $307,000 for Fleet.

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.

[14] The Township 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, Havelock-Belmont-Methuen'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
		Rates	To Operations	Taxes to Reserves	Total Available	
Water Network	333,000	473,000	-360,000	101,000	214,000	119,000
Wastewater Network	418,000	471,000	-353,000	91,000	209,000	209,000
	751,000	**944,000**	**-713,000**	**192,000**	**423,000**	**328,000**

The average annual investment requirement for the above categories is $751,000. Annual revenue currently allocated to these assets for capital purposes is $423,000 leaving an annual deficit of $328,000. Put differently, these infrastructure categories are currently funded at 56% of their long-term requirements.

7.4.2 Full Funding Requirements

In 2019, Havelock-Belmont-Methuen had annual sanitary revenues of $418,000 and annual water revenues of $333,000. As illustrated in the table below, without consideration of any other sources of revenue, full funding would require the following changes over time:

Asset Category	Tax Change Required for Full Funding
Water Network	25.2%
Wastewater Network	44.4%

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:

	Sanitary Sewer Network				Water Network			
	5 YEARS	10 YEARS	15 YEARS	20 YEARS	5 YEARS	10 YEARS	15 YEARS	20 YEARS
INFRASTRUCTURE DEFICIT AS OUTLINED IN TABLE 4	209,000	209,000	209,000	209,000	119,000	119,000	119,000	119,000
Resulting Rate Increase Required:								
Total Over Time	**44.4%**	**44.4%**	**44.4%**	**44.4%**	**25.2%**	**25.2%**	**25.2%**	**25.2%**
Annually	8.9%	4.4%	3.0%	2.2%	5.0%	2.5%	1.7%	1.3%

7.4.3 Financial Strategy Recommendations

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

a) increasing rate revenues by 2.2% for sanitary services and 1.3% for water services each year for the next 20 years solely for the purpose of phasing in full funding to the asset categories covered in this section of the AMP.
b) increasing existing and future infrastructure budgets by the applicable inflation index on an annual basis in addition to the deficit phase-in.

Notes:

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

Although this option achieves full funding on an annual basis in 20 years and provides financial sustainability over the period modeled, the recommendations do require prioritizing capital projects to fit the resulting annual funding available. Current data shows a pent-up investment demand of $1,186,000 for the Water Network and $1,957,000 for the Wastewater Network.

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

7.5 Use of Debt

The Township has no debt on the assets included in this Asset Management Plan. The revenue options outlined in this plan allow Havelock-Belmont-Methuen to fully fund its long-term infrastructure requirements without the 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 Havelock-Belmont-Methuen.

Asset Category	Balance at December 31, 2019
Road Network	3,894,000
Storm Water Network	0
Bridges & Culverts	0
Buildings & Facilities	2,681,000
Machinery & Equipment	1,343,000
Land Improvements	162,000
Fleet	1,176,000
Total Tax Funded:	**9,256,000**
Water Network	0
Wastewater Network	287,000
Total Rate Funded:	**287,000**

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

7.6.2 Recommendation

In 2024, Ontario Regulation 588/17 will require Havelock-Belmont-Methuen 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	$16.7	Fair	Annual Requirement:	$585,396
			Funding Available:	$1,137,000
			Annual Deficit:	-
Bridges & Culverts	$1.4	Fair	Annual Requirement:	$33,707
			Funding Available:	$0
			Annual Deficit:	$33,707
Stormwater Network	$0.9	Very Good	Annual Requirement:	$12,115
			Funding Available:	$0
			Annual Deficit:	$12,115
Buildings & Facilities	$24.3	Fair	Annual Requirement:	$708,242
			Funding Available:	$81,000
			Annual Deficit:	$708,161
Machinery & Equipment	$2.6	Poor	Annual Requirement:	$224,753
			Funding Available:	$238,000
			Annual Deficit:	-
Vehicles	$2.8	Poor	Annual Requirement:	$254,598
			Funding Available:	$166,000
			Annual Deficit:	$88,598
Land Improvements	$3.1	Fair	Annual Requirement:	$90,083
			Funding Available:	$0
			Annual Deficit:	$90,083
Water System	$17.1	Poor	Annual Requirement:	$332,916
			Funding Available:	$214,000
			Annual Deficit:	$118,916
Sanitary Sewer Network	$22.3	Good	Annual Requirement:	$418,491
			Funding Available:	$209,000
			Annual Deficit:	$209,491
Overall	$91.3	Fair	Annual Requirement:	$2,660,302
			Funding Available:	$2,045,000
			Annual Deficit:	$615,302

Appendix B: 10-Year Capital Requirements

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

Road Network											
Asset Segment	Backlog	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029
Paved Roads - HCB	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Paved Roads - LCB	$54,000	$254,700	$1,864,800	$54,000	$432,000	$558,000	$199,800	$264,600	$1,118,700	$504,180	$936,180
Sidewalks	$89,761	$102,010	$0	$0	$0	$0	$0	$0	$25,357	$0	$0
Signs & Signals	$0	$0	$0	$0	$0	$0	$0	$0	$0	$5,038	$9,357
Street Lights	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Drainage Culverts	$24,245	$30,217	$0	$0	$0	$10,119	$396,442	$1,568	$0	$0	$0
Total:	**$168,006**	**$386,927**	**$1,864,800**	**$54,000**	**$432,000**	**$568,119**	**$596,242**	**$266,168**	**$1,144,057**	**$509,218**	**$945,537**

Bridges & Culverts											
Asset Segment	Backlog	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029
Bridges	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Structural Culverts	$27,632	$0	$0	$0	$0	$0	$94,485	$0	$0	$0	$0
	$27,632	**$0**	**$0**	**$0**	**$0**	**$0**	**$94,485**	**$0**	**$0**	**$0**	**$0**

Stormwater Network											
Asset Segment	Backlog	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029
Storm Sewer Mains	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Catch Basins	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
	$0	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**

Buildings & Facilities											
Asset Segment	Backlog	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029
Administration	$384,525	$0	$0	$0	$78,790	$22,446	$74,561	$69,050	$2,410	$132,221	$3,633
Fire Halls	$123,158	$0	$0	$35,666	$10,415	$0	$0	$0	$0	$14,629	$0
Libraries	$239,003	$105,292	$45,435	$45,435	$45,435	$46,395	$331,814	$75,159	$90,481	$83,255	$45,435
Medical Centre	$351,740	$0	$0	$0	$0	$0	$0	$3,500	$6,460	$10,700	$0
Public Works	$106,648	$21,597	$0	$0	$58,057	$0	$0	$0	$28,114	$61,763	$0
Recreation	$540,077	$12,956	$4,739	$62,258	$36,947	$0	$921,991	$105,756	$37,684	$170,885	$74,475
Solid Waste	$6,011	$0	$0	$0	$0	$0	$16,231	$0	$0	$0	$0
	$1,751,162	**$139,845**	**$50,174**	**$143,359**	**$229,644**	**$68,841**	**$1,344,597**	**$253,465**	**$165,149**	**$473,453**	**$123,543**

Machinery & Equipment											
Asset Segment	Backlog	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029
Administration	$244,473	$17,250	$22,043	$54,186	$1,385	$3,727	$197,949	$106,797	$86,216	$50,619	$690
Fire	$213,310	$35,659	$14,897	$18,330	$6,869	$36,402	$46,663	$53,353	$0	$24,351	$58,558
Library	$73,615	$17,815	$17,999	$26,706	$0	$16,904	$54,352	$5,519	$51,946	$17,999	$21,187
Medical	$560	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Public Works	$0	$0	$0	$0	$0	$152,047	$20,484	$0	$0	$4,640	$0
Recreation	$160,587	$391,105	$28,521	$16,099	$0	$8,229	$35,124	$10,781	$13,404	$124,663	$18,342
Solid Waste	$0	$0	$24,359	$0	$0	$8,699	$9,961	$14,897	$0	$67,844	$0
	$692,545	**$461,829**	**$107,819**	**$115,321**	**$8,254**	**$226,008**	**$364,533**	**$191,347**	**$151,566**	**$290,116**	**$98,777**

Vehicles											
Asset Segment	Backlog	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029
Building & Bylaw	$26,491	$0	$0	$0	$0	$0	$36,781	$0	$26,491	$0	$0
Fire	$158,941	$34,410	$0	$0	$0	$0	$406,663	$0	$34,410	$235,514	$508,483
Parks & Recreation	$33,517	$0	$0	$0	$0	$0	$33,517	$0	$0	$0	$0
Public works	$88,507	$208,830	$2,501	$55,212	$214,645	$232,022	$50,336	$2,501	$45,882	$495,311	$9,330
	$307,456	**$243,240**	**$2,501**	**$55,212**	**$214,645**	**$232,022**	**$527,297**	**$2,501**	**$106,783**	**$730,825**	**$517,813**

Land Improvements											
Asset Segment	Backlog	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029
Fencing	$75,866	$2,121	$0	$0	$0	$0	$11,255	$2,509	$0	$0	$596
Landscaping	$43,566	$0	$4,114	$0	$0	$0	$0	$0	$0	$0	$0
Parking Lots	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Playground Equipment	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Site Work	$593,870	$0	$17,627	$0	$0	$0	$11,743	$0	$0	$0	$0
Skating Rinks	$42,068	$0	$3,816	$3,816	$3,816	$3,816	$3,816	$3,816	$3,816	$60,672	$3,816
Sports Fields	$0	$0	$0	$0	$0	$31,253	$0	$0	$0	$0	$0
	$755,370	**$2,121**	**$25,557**	**$3,816**	**$3,816**	**$35,069**	**$26,814**	**$6,325**	**$3,816**	**$60,672**	**$4,412**

Water System											
Asset Segment	Backlog	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029
Water Mains	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Hydrants	$86,520	$0	$0	$0	$0	$0	$0	$0	$0	$6,106	$0
Pumps	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Valve Chambers	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Valves	$48,074	$0	$0	$0	$0	$0	$0	$0	$0	$2,940	$0
Water Service Connections	$620,160	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Water Towers	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Water Treatment Facilities	$35,184	$0	$0	$0	$0	$0	$113,627	$0	$0	$0	$0
Water Wells	$278,811	$157,178	$179,415	$0	$132,265	$0	$149,859	$0	$0	$859,716	$0
Water - Other	$117,293	$0	$0	$2,632	$0	$0	$0	$0	$0	$0	$0
	$1,186,042	**$157,178**	**$179,415**	**$2,632**	**$132,265**	**$0**	**$263,486**	**$0**	**$0**	**$868,762**	**$0**

Sanitary Sewer Network											
Asset Segment	Backlog	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029
Sewer Mains	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Sewer Service Connections	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Sanitary Pumping Stations	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Sanitary Treatment Facilities	$1,956,956	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Sanitary - Other	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
	$1,956,956	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**

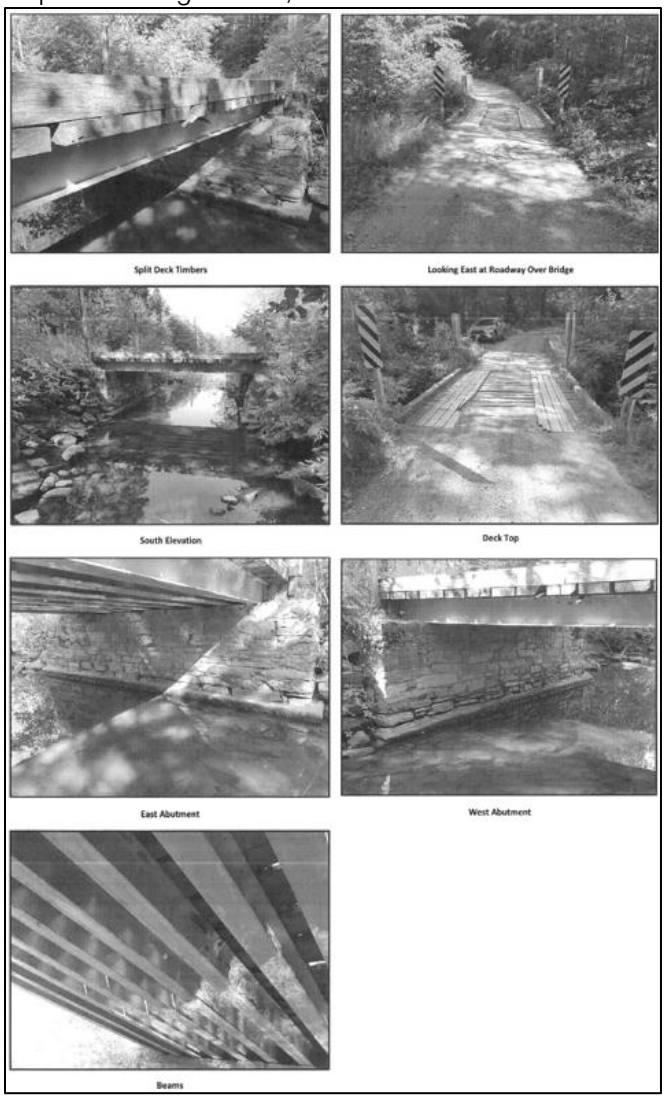
All Asset Categories											
Asset Segment	Backlog	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029
Bridges & Culverts	$27,632	$0	$0	$0	$0	$0	$94,485	$0	$0	$0	$0
Buildings	$1,751,162	$139,845	$50,174	$143,359	$229,644	$68,841	$1,344,597	$253,465	$165,149	$473,453	$123,543
Land Improvements	$734,775	$2,121	$25,557	$3,816	$3,816	$35,069	$26,814	$6,325	$3,816	$60,672	$4,412
Machinery & Equipment	$692,545	$461,829	$107,819	$115,321	$8,254	$226,008	$364,533	$191,347	$151,566	$290,116	$98,777
Road Network	$168,006	$386,927	$1,864,800	$54,000	$432,000	$568,119	$596,242	$266,168	$1,144,057	$509,218	$945537
Vehicles	$307,456	$243,240	$2,501	$55,212	$214,645	$232,022	$527,297	$2,501	$106,783	$730,825	$517,813
Stormwater Network	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Sanitary Sewer Network	$1,956,956	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Water System	$1,186,042	$157,178	$179,415	$2,632	$132,265	$0	$263,486	$0	$0	$868,762	$0
	$6,824,574	**$1,391,140**	**$2,230,266**	**$374,340**	**$1,020,624**	**$1,130,059**	**$3,217,454**	**$719,806**	**$1,571,371**	**$2,933,046**	**$1,690,082**

Appendix C: Level of Service Maps

Images of Bridge in Good Condition

Devil Four Mile Otter Creek Bridge

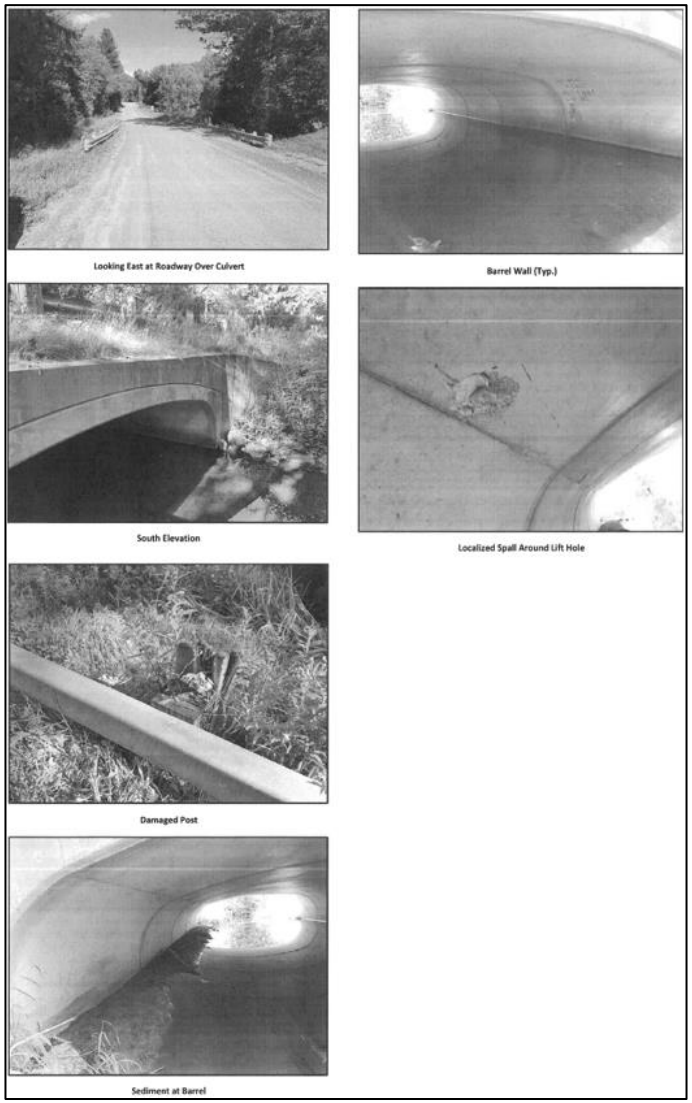
Inspected: August 26th, 2019



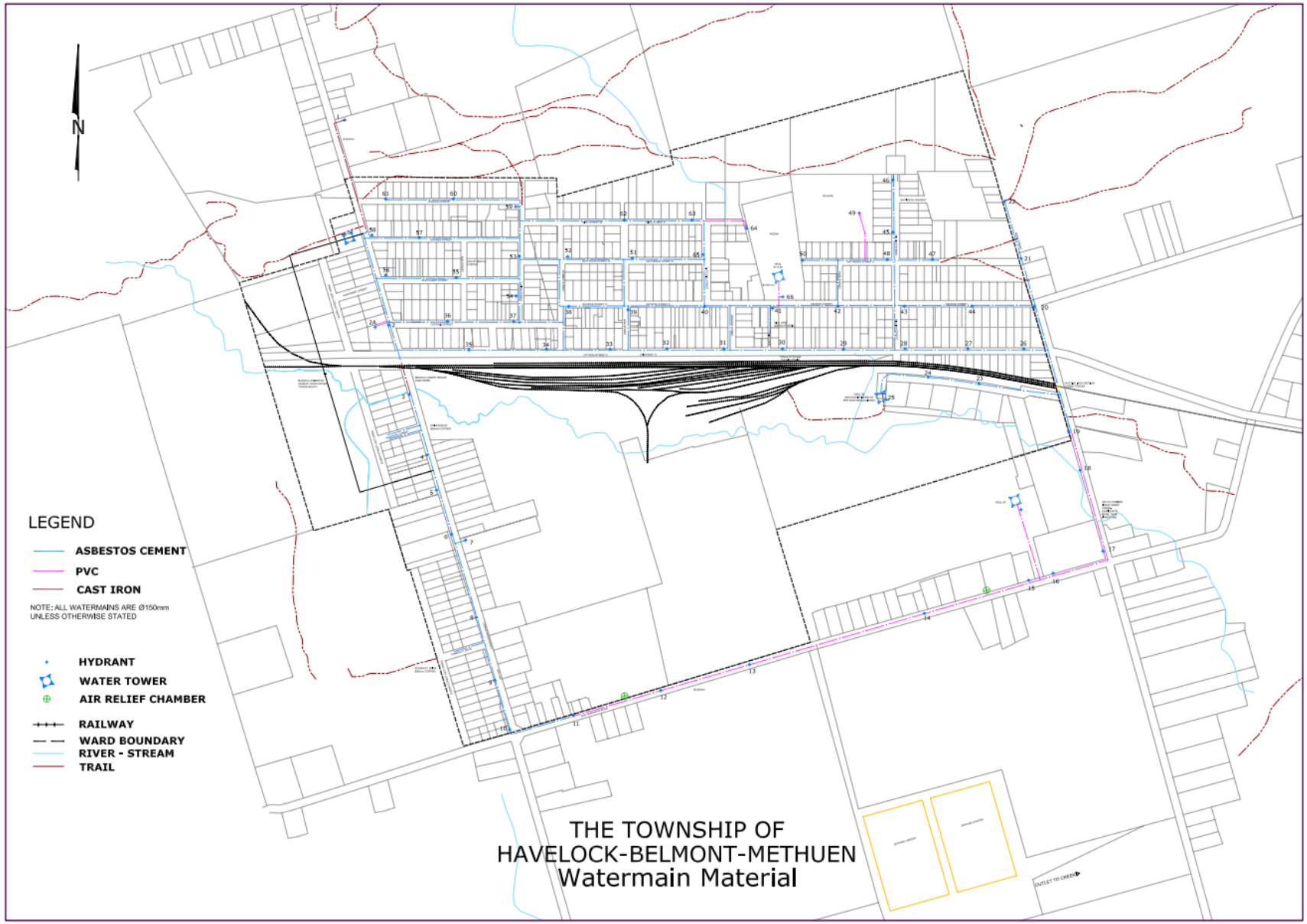
Images of Culvert in Fair Condition

Weller Road Plato Creek Culvert

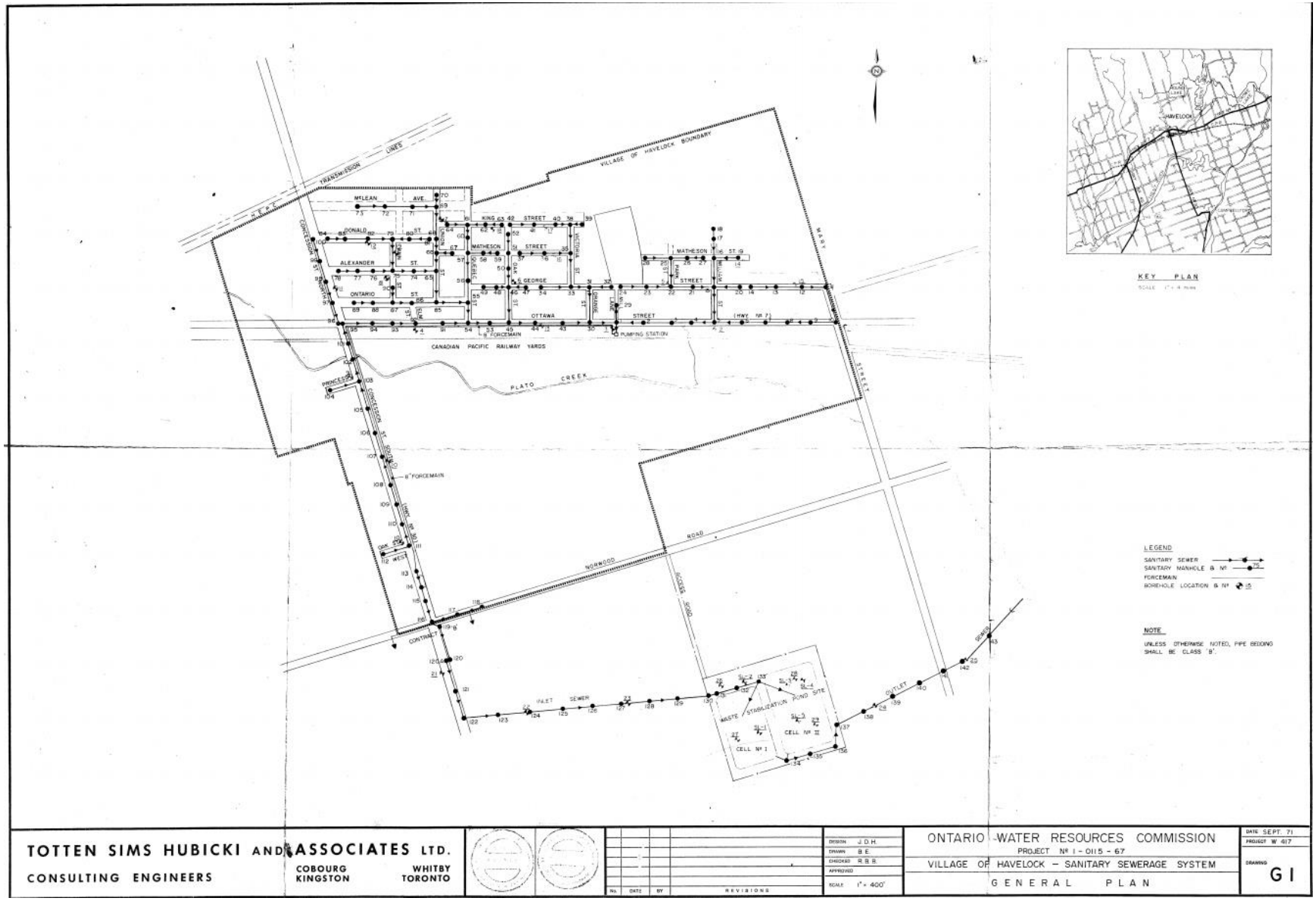
Inspected: August 29th, 2019



Water Network Map



Sanitary Sewer Network



Appendix D: Risk Rating Criteria

Probability of Failure

Asset Category	Risk Criteria	Criteria Weighting	Value/Range	Probability of Failure Score
Road Network (Roads)	Assessed Condition	60%	85-100	1
			70-85	2
			50-70	3
			30-50	4
			0-30	5
	Remaining Service Life	40%	Greater than 20	1
			10 - 20	2
			5 - 10	3
			1 - 5	4
			0	5
Bridges & Culverts	Assessed Condition	60%	80-100	1
			60-80	2
			40-60	3
			20-40	4
			0-20	5
	Service Life Remaining	40%	Greater than 25	1
			10 – 25	2
			5 - 10	3
			1 - 5	4
			0	5
Sanitary Sewer Network (Mains) Stormwater Nework (Mains)	Remaining Service Life	40%	Greater than 45	1
			25 - 45	2
			10 - 25	3
			1 - 10	4
			0	5
	Condition	60%	80-100	1

Asset Category	Risk Criteria	Criteria Weighting	Value/Range	Probability of Failure Score
			60-80	2
			40-60	3
			20-40	4
			0-20	5
Water Network (Mains)	Service Life Remaining (Years)	70%	Greater than 45	1
			25 - 45	2
			10 - 25	3
			1 - 10	4
			0	5
	Pipe Material	30%	Clay	4
			Steel	3
			Asbestos Cement	3
			Cast Iron	3
			HDPE	2
			PVC	2
Buildings & Facilities Land Improvements Machinery & Equipment Vehicles	Condition	100%	80-100	1
			60-80	2
			40-60	3
			20-40	4
			0-20	5

Consequence of Failure

Asset Category	Risk Classification	Risk Criteria	Value/Range	Consequence of Failure Score
Road Network (Roads)	Economic (60%)	Roadside Environment (40%)	Urban	5
			Semi-Urban	3
			Rural	2
		Replacement Cost (60%)	$1M - $2M	5
			$500,000 - $1M	4
			$250,000 - $500,000	3
			$100,000 - $250,000	2
			$0 - $100,000	1
	Social (20%)	Road Design Class (100%)	Arterial	5
			Collector	4
			Local Street	3
			Service Road	2
			Access Road	1
	Health and Safety (20%)	Speed Limit (km) (100%)	40	1
			50	2
			60	3
			70	4
			80 - 100	5
Bridges & Culverts	Economic (60%)	Replacement Cost (100%)	$0-$50,000	1
			$50,000-$100,000	2
			$100,000-$200,000	3
			$200,000-$500,000	4
			$500,000-$1,000,000	5
	Operational (20%)	Number of Spans (100%)	4	5
			3	4
			2	3
			1	2
	Social (20%)	Detour Distance (km) (60%)	Greater than 8	5
			6 - 8	4

Asset Category	Risk Classification	Risk Criteria	Value/Range	Consequence of Failure Score
			4 - 6	3
			2 - 4	2
			0 - 2	1
		AADT (40%)	Greater than 2000	5
			750 – 2000	4
			300 – 750	3
			100 - 300	2
			0 - 100	1
Sanitary Mains	Economic (60%)	Replacement Cost ($/m) (100%)	0 - 150	1
			150 - 300	2
			300 - 500	3
			500 - 1000	4
			Greater than 1000	5
	Environmental (20%)	Segment Type (100%)	Gravity Main	3
			Force Main	5
	Social (20%)	Pipe Diameter (mm) (100%)	200 - 250	1
			250 - 300	2
			300 - 375	3
			375 – 400	4
			Greater than 400	5
Stormwater Mains	Economic (50%)	Replacement Cost ($/m) (100%)	0 – 150	1
			`50 – 300	2
			300 – 500	3
			500 – 1000	4
			Greater than 1000	5
	Operational (20%)	Material (100%)	PVC	2
			Steel	3
			Concrete	4
			Asbestos Cement	5
	Social (30%)	Pipe Diameter (mm)	200 - 250	1
			250 - 300	2

Asset Category	Risk Classification	Risk Criteria	Value/Range	Consequence of Failure Score
		(100%)	300 - 375	3
			375 - 400	4
			Greater than 400	5
Water Network (Mains)	Economic (60%)	Replacement Cost ($/m) (100%)	0 – 150	1
			150 – 300	2
			300 – 500	3
			500 – 1000	4
			Greater than 1000	5
	Social (40%)	Pipe Diameter (mm) (100%)	150	2
			200	4
Buildings & Facilities	Economic (75%)	Replacement Cost (100%)	$0 - $100,0000	1
			$100,000 - $500,000	2
			$500,000 - $1,000,000	3
			$1,000,000 - $3,000,000	4
			Greater than $3,000,000	5
	Social (25%)	Category (100%)	Cemetary	1
			Library, Parks	2
			Administration, Sand Dome, Stone Hall, Town Hall	3
			Arena, Garage, Sewer, Solid Waste, Water, Water Well	4
			Fire Hall, Medical Centre	5
Land Improvement (Parks)	Economic (75)	Replacement Cost	$0 - $5,000	1
			$5,000 - $10,000	2
			$10,000 - $30,000	3
			$30,000 - $50,000	4
			Greater than $50,000	5
	Social (25%)	Park Type	Open Space	1
			Parkette, Parking Land	2
			Community Park, Neighbourhood Park	3

Asset Category	Risk Classification	Risk Criteria	Value/Range	Consequence of Failure Score
			Special Use Park	4
			Township-wide Park	5

Asset Category	Risk Classification	Risk Criteria	Value/Range	Consequence of Failure Score
Machinery & Equipment Vehicles	Economic (100%)	Replacement Cost (100%)	$0-$100,000	1
			$100,000-$250,000	2
			$250,000-$500,000	3
			$500,000-$1,000,000	4
			$1,000,000+	5

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 Township'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 Township'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 Township 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 Township 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 Township 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 Township 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

[i] Future Administration equipment to be amortized over a longer period to better reflect the observed service life.