Asset Management Plan

Municipality of Huron East

2022

This Asset Management Program was prepared by:

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

Key Statistics

Replacement cost of asset portfolio
$341.1 million

Replacement cost of infrastructure per household (2016)
$89,189

Percentage of assets in fair or better condition
47%

Percentage of assets with assessed condition data
84%

Annual capital infrastructure deficit
$5.5 million

Recommended timeframe for eliminating annual infrastructure deficit
20 Years

Target reinvestment rate
2.3%

Actual reinvestment rate
0.71%

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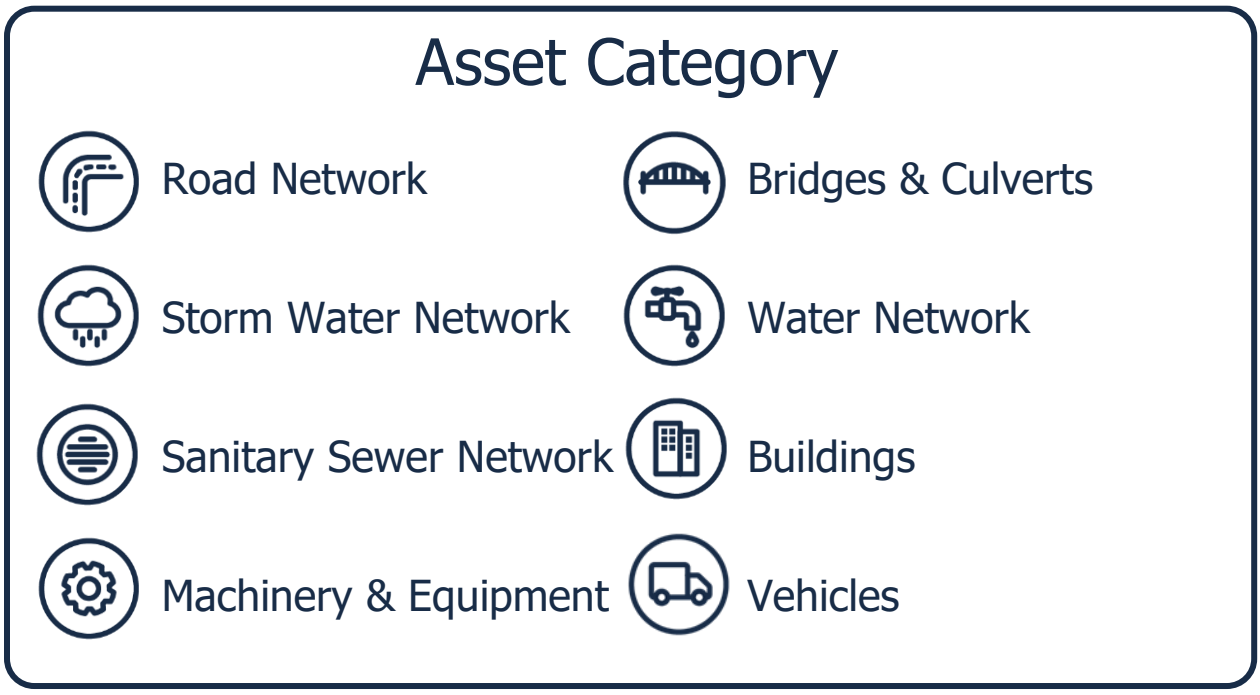
Executive Summary

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

Scope

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

This AMP includes the following asset categories:



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

Findings

The overall replacement cost of the asset categories included in this AMP totals $341.1 million. 47% of all assets analyzed in this AMP are in fair or better condition and assessed condition data was available for 84% of assets. For the remaining 16% of assets, assessed condition data was unavailable, and asset age was used to approximate condition – a data gap that persists in most municipalities. Generally, age misstates the true condition of assets, making assessments essential to accurate asset management planning, and a recurring recommendation in this AMP.
The development of a long-term, sustainable financial plan requires an analysis of whole lifecycle costs. This AMP uses a combination of proactive lifecycle strategies (paved roads) and replacement only strategies (all other assets) to determine the lowest cost option to maintain the current level of service.

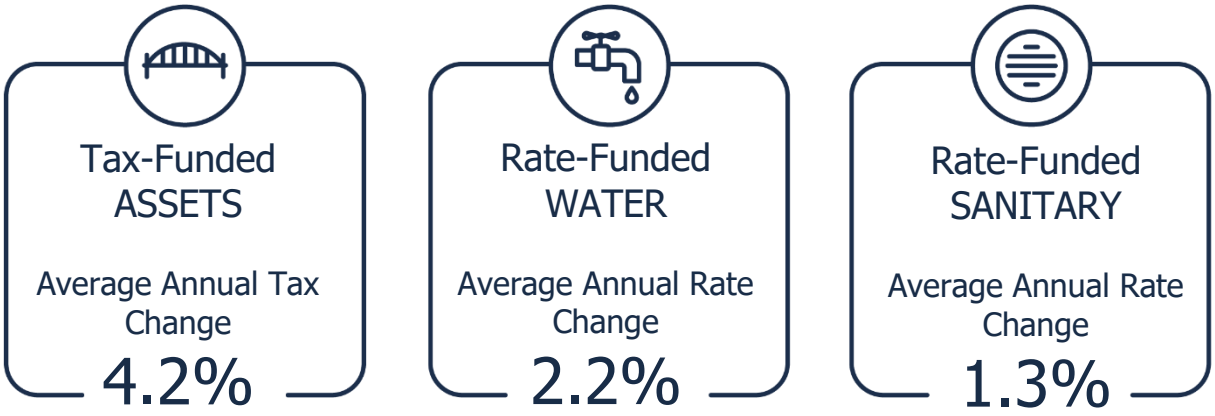
To meet capital replacement and rehabilitation needs for existing infrastructure, prevent infrastructure backlogs, and achieve long-term sustainability, the Municipality's average annual capital requirement totals $7.9 million. Based on a historical analysis of sustainable capital funding sources, the Municipality is committing approximately $2.4 million towards capital projects or reserves per year. As a result, there is currently an annual funding gap of $5.5 million.

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

Total Tax Increase
Per Household

Recommendations

A financial strategy was developed to address the annual capital funding gap. The following graphics shows annual tax/rate change required to eliminate the Municipality's infrastructure deficit based on a 20-year plan:



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

- Reconcile the asset inventory across systems (e.g., TCA, GIS, etc.)
- Review and update the estimated useful life of assets to ensure the life reflects the environment and operating conditions
- Develop a condition assessment strategy with a regular schedule
- Review and update lifecycle management strategies
- Develop and regularly review short- and long-term plans to meet capital requirements
- Measure current levels of service and identify sustainable proposed levels of service

1 Introduction & Context

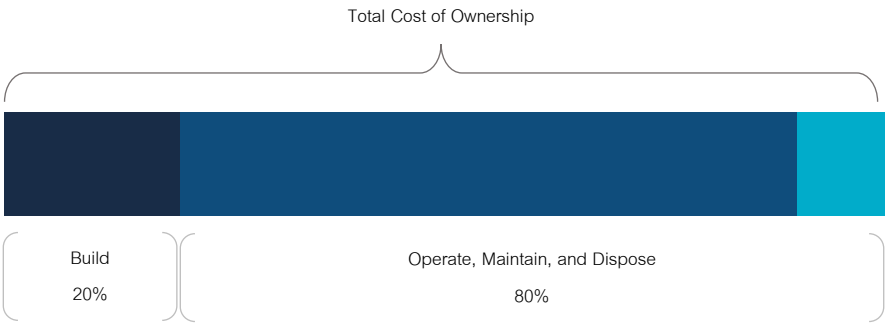
Key Insights

- The goal of asset management is to minimize the lifecycle costs of delivering infrastructure services, manage the associated risks, while maximizing the value ratepayers receive from the asset portfolio
- The Municipality's asset management policy provides clear direction to staff on their roles and responsibilities regarding asset management
- An asset management plan is a living document that should be updated regularly to inform long-term planning
- Ontario Regulation 588/17 outlines several key milestone and requirements for asset management plans in Ontario between July 1, 2022 and 2025

1.1 An Overview of Asset Management

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

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



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

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

1.1.1 Asset Management Policy

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

The Municipality adopted "Municipality of Huron East Strategic Asset Management Policy 1.22" on July 10th, 2018, in accordance with Ontario Regulation 588/17. The asset management plan satisfies policy statement 4:

> *"The Municipality will develop an asset management plan that incorporates all infrastructure categories and municipal infrastructure assets that meet the capitalization threshold outlined in the organization's Tangible Capital Asset Policy 1.21. It will be updated at least every five years in accordance with O. Reg. 588/17 requirements, to promote, document and communicate continuous improvement of the asset management program."*

1.1.2 Asset Management Strategy

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

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

1.1.3 Asset Management Plan

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

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

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

1.2 Key Concepts in Asset Management

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

1.2.1 Lifecycle Management Strategies

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

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

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

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

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

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

1.2.2 Risk Management Strategies

Municipalities generally take a 'worst-first' approach to infrastructure spending. 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. In addition to considering age and condition, considering service delivery impacts of failure can lead to more robust decision-making.

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

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

1.2.3 Levels of Service

A level of service (LOS) is a measure of what the Municipality is providing to the community and the nature and quality of that service. Within each asset category in this AMP, technical metrics and qualitative descriptions that measure both technical and community levels of service have been established and measured as data is available.

These measures include a combination of those that have been outlined in O. Reg. 588/17 in addition to performance measures identified by the Municipality as worth measuring and evaluating. The Municipality measures the level of service provided at two levels: Community Levels of Service, and Technical Levels of Service.

Community Levels of Service

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

Technical Levels of Service

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

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

Current and Proposed Levels of Service

This AMP focuses on measuring the current level of service provided to the community. The Municipality has developed the current levels of service and is now in the process of determining suitable service delivery targets.

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

1.3 Ontario Regulation 588/17

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

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

2019

Strategic Asset Management Policy

2022

Asset Management Plan for Core Assets with the following components:

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

2024

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

2025

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

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

1.3.1 O. Reg. 588/17 Compliance Review

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

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

1.4 Asset Management Roadmap

As part of PSD's Asset Management Roadmap, the Municipality of Huron East 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: 2019)
The State of Maturity Report provided an audit of the existing asset management capacity and competency. It outlined strategic recommendations to improve the Municipality's asset management program.

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

Asset Data Review and Refinement (Completion Date: 2019/2021)
The data work was completed in two iterations of 2019 and 2021. The data work in 2019 included inventory syncing and uploads. The data work in 2021 included facility componentization. Data was also refined continuously over the course of this project.

Risk and Criticality Model Development (Completion Date: 2021)
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.

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

2.1 Asset categories included in this AMP

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

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

Asset Category	Source of Funding
Road Network	Tax Levy
Bridges & Culverts	
Storm Water Network	
Buildings	
Equipment	
Vehicles	
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 Municipality 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 Municipality expects the asset to be available for use and remain in service before requiring replacement or disposal. The EUL for each asset in this AMP was assigned according to the knowledge and expertise of municipal staff and supplemented by existing industry standards when necessary.

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

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

2.4 Reinvestment Rate

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

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

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

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

2.5 Deriving Asset Condition

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

A condition assessment rating system provides a standardized descriptive framework that allows comparative benchmarking across the Municipality's asset portfolio. The table below outlines the condition rating system used in this AMP to determine asset condition. This rating system is aligned with the Canadian Core Public Infrastructure Survey which is used to develop the Canadian Infrastructure Report Card. All asset categories, except Buildings and Facilities, are rated with at 20-point increments. Buildings and Facilities were assessed with the Facility Condition Index, which is outlined in Appendix D. When assessed condition data is not available, service life remaining is used to approximate asset condition.

Condition	Description	Criteria	Facility Condition Index (%)	Service Life Remaining (%)
Very Good	Fit for the future	Well maintained, good condition, new or recently rehabilitated	98	80-100
Good	Adequate for now	Acceptable, generally approaching mid-stage of expected service life	95	60-80
Fair	Requires attention	Signs of deterioration, some elements exhibit significant deficiencies	90	40-60
Poor	Increasing potential of affecting service	Approaching end of service life, condition below standard, large portion of system exhibits significant deterioration	70	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	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 D includes additional information on the role of asset condition data and provides basic guidelines for the development of a condition assessment program.

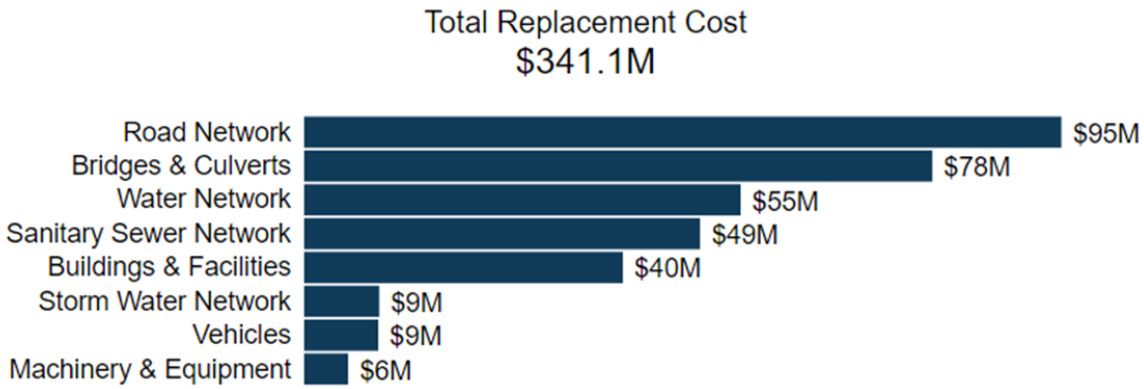
3 Portfolio Overview

Key Insights

- The total replacement cost of the Municipality's asset portfolio is $341 million
- The Municipality's target re-investment rate is 2.33%, and the actual re-investment rate is 0.71%, contributing to an expanding infrastructure deficit
- 47% of all assets are in fair or better condition
- 12% of assets are projected to require replacement in the next 10 years
- Average annual capital requirements total $8.0 million per year across all assets

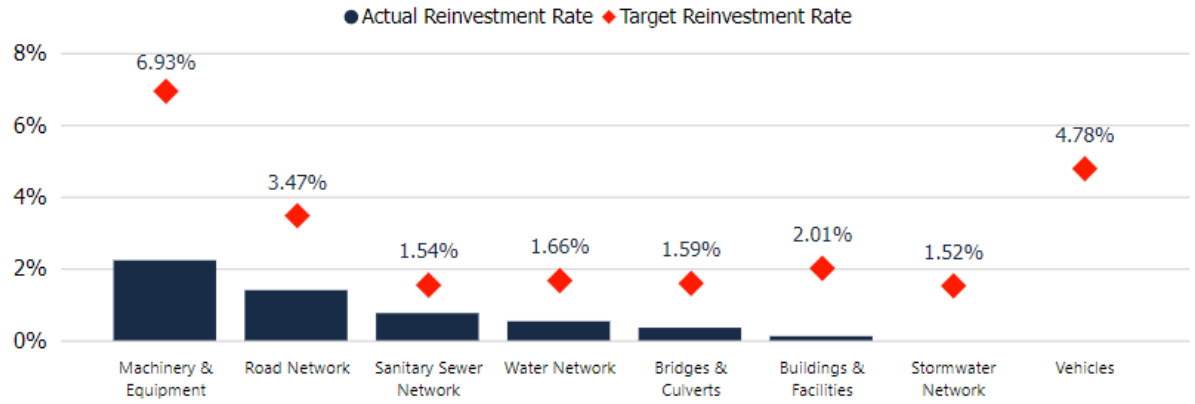
3.1 Total Replacement Cost of Asset Portfolio

The asset categories analyzed in this AMP have a total replacement cost of $341 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.



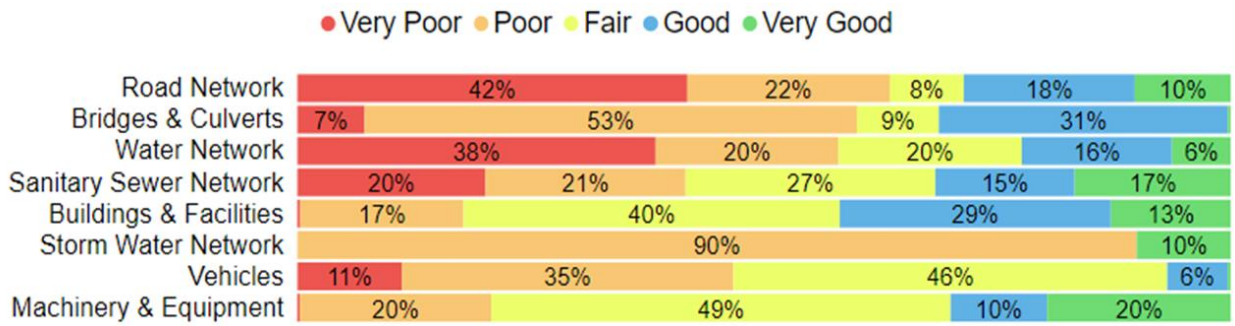
3.2 Target vs. Actual Reinvestment Rate

The graph below depicts funding gaps or surpluses by comparing target vs actual reinvestment rate. To meet the long-term replacement needs, the Municipality should be allocating approximately $8.0 million annually, for a target reinvestment rate of 2.33%. Actual annual spending on infrastructure totals approximately $2.4 million, for an actual reinvestment rate of 0.71%.



3.3 Condition of Asset Portfolio

The current condition of the assets is central to all asset management planning. Collectively, 47% of assets in Huron East are in fair or better condition. This estimate relies on both age-based and field condition data.

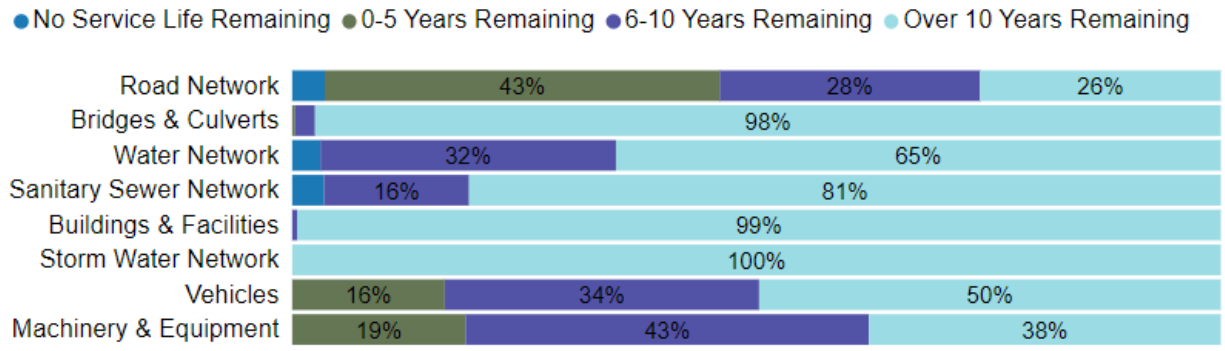


This AMP relies on assessed condition data for 84% of assets; for the remaining portfolio, age is used as an approximation of condition. Assessed condition data is invaluable in asset management planning as it reflects the true condition of the asset and its ability to perform its functions. The table 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	55%	2019 Road Appraisals
Bridges & Culverts	Bridges	92%	2020 OSIM Report
	Structural Culverts	93%	2020 OSIM Report
Storm Water Network	All	90%	Staff Assessments
Buildings	All	100%	2020 BM Ross Assessment
Equipment	All	78%	Staff Assessments
Vehicles	All	100%	Staff Assessments
Water Network	All	97%	2019 Staff Assessments
Sanitary Sewer Network	All	96%	2019 Staff Assessments

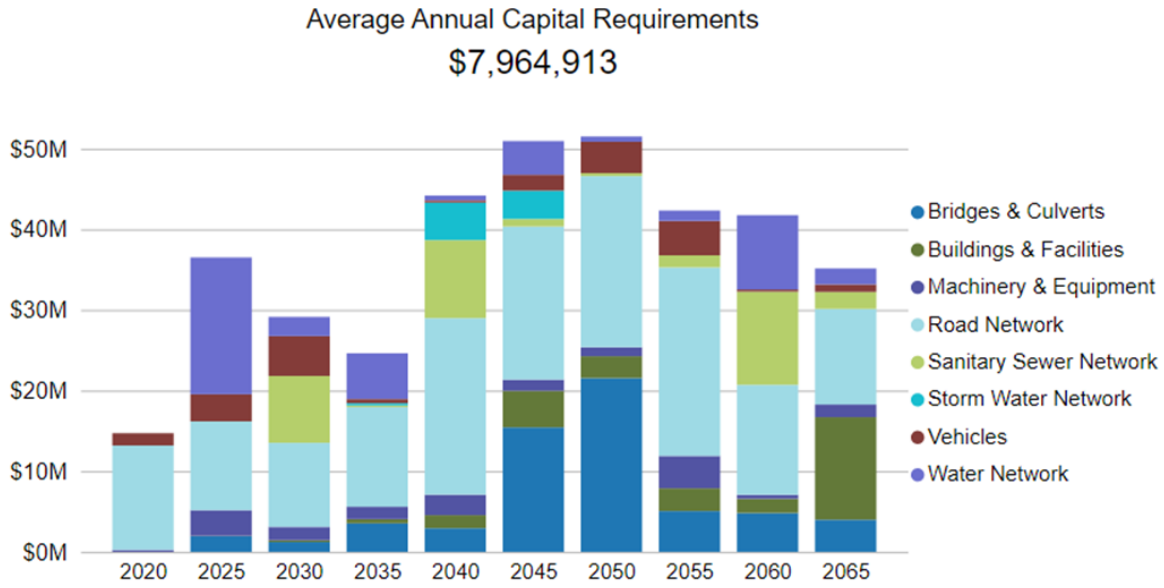
3.4 Service Life Remaining

Based on asset age, available assessed condition data and estimated useful life, 12% of the Municipality's assets will require replacement within the next 10 years. Capital requirements over the next 10 years are identified in Appendix A.



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 Municipality 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

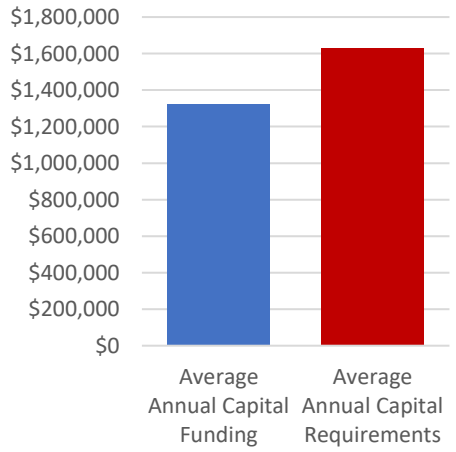
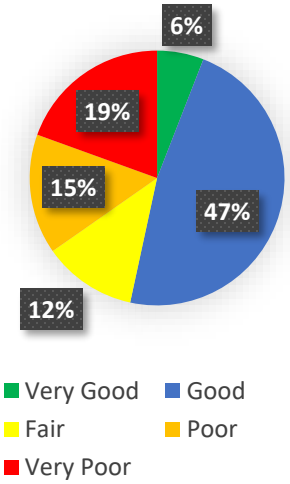
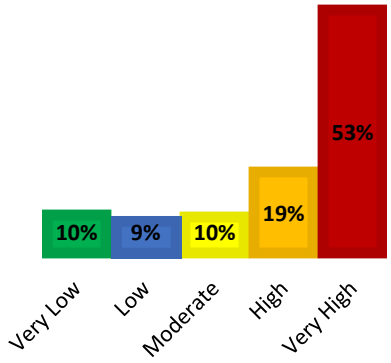
- Tax-funded assets are valued at $237 million
- 46% of tax-funded assets are in fair or better condition
- The average annual capital requirement to sustain the current level of service for tax-funded assets is approximately $6.3 million
- Critical assets should be evaluated to determine appropriate risk mitigation activities and treatment options

4.1 Road Network

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

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

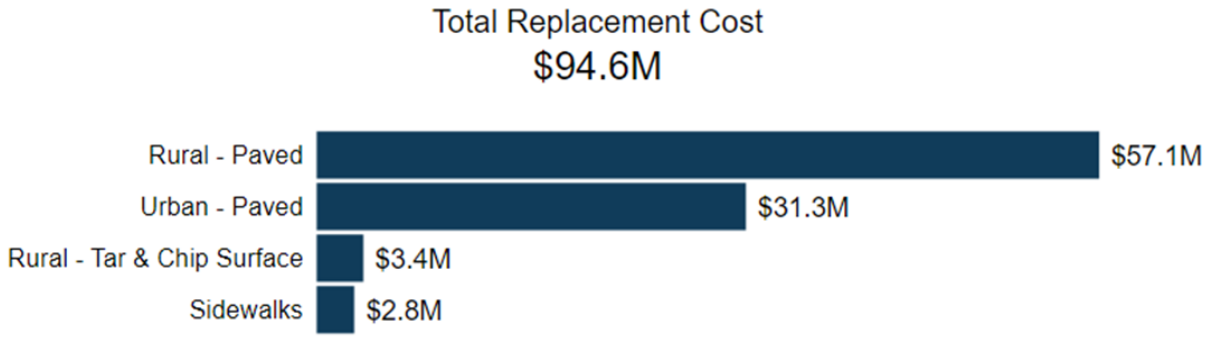
The table below outlines high-level service indicators for Roads.

Cost	Performance (Average Condition)	Risk
		

4.1.1 Asset Inventory & Replacement Cost

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

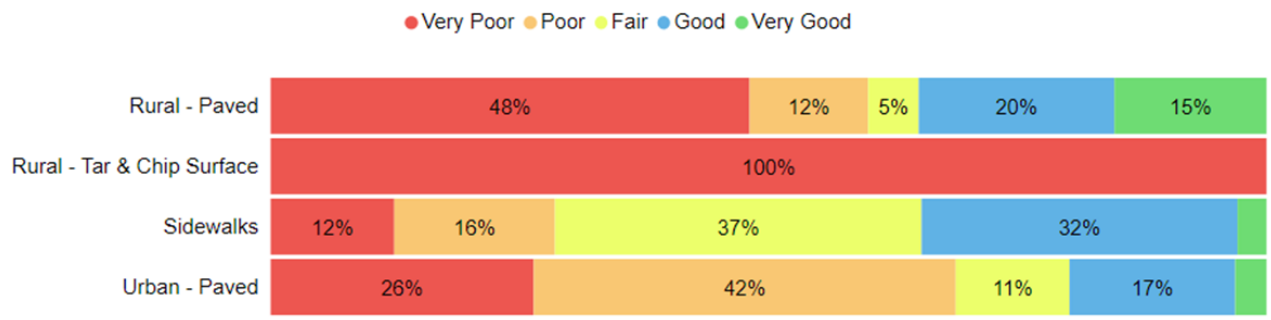
Asset Segment	Quantity	Replacement Cost	Annual Capital Requirement
Rural - Paved	170,943 Length (m)	$57,094,962	$2,270,727
Rural - Tar & Chip Surface	11,539 Length (m)	$3,427,083	$179,123
Sidewalks	23,931 Length (m)	$2,758,526	$92,335
Urban - Paved	35,675 Length (m)	$31,329,684	$741,099
	Total:	**$94,610,255**	**$3,283,284**



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
Rural - Paved	35%	Poor	33% Assessed
Rural - Tar & Chip Surface	0%	Very Poor	Age-based
Sidewalks	55%	Fair	95% Assessed
Urban - Paved	40%	Fair	95% Assessed
	36%	**Poor**	**54% Assessed**



Current Approach to Condition Assessment

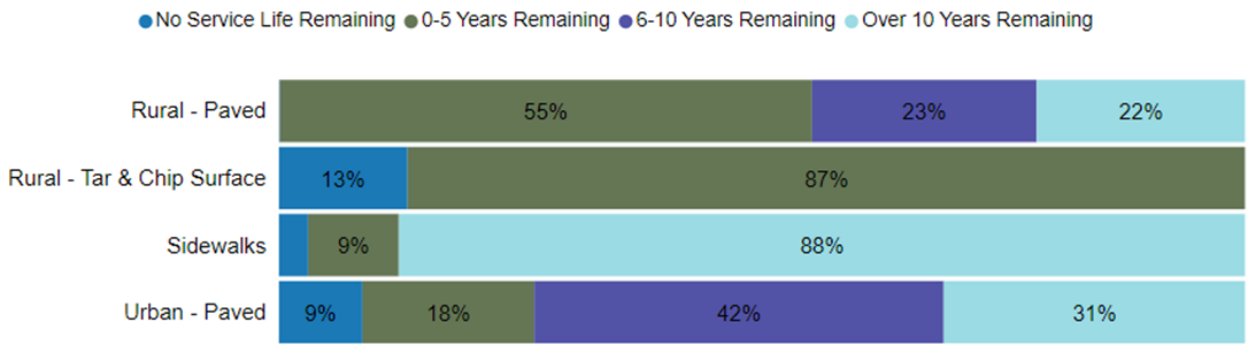
Accurate and reliable condition data allows staff to determine the remaining service life of assets and identify the most cost-effective approach to managing assets more confidently. The following describes the municipality's current approach:

- A Roads Assessment is completed every year on half the network, rotating between the north in one year to the south in the other. The assessment includes condition scores that are based on identified defects and rideability
- A road patrol is conducted regularly every 14 days

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)
Rural - Paved	14-30 years	16.3
Rural - Tar & Chip Surface	8 years	23.7
Sidewalks	20-30 years	26.2
Urban - Paved	30-60 years	30.3
	Average:	**25.7**



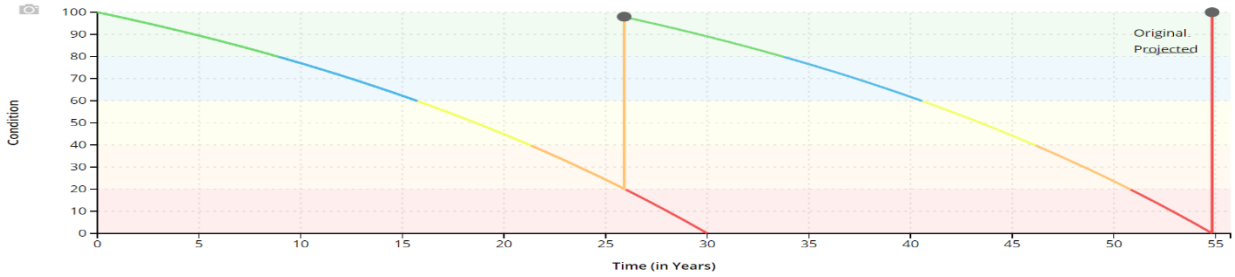
Each asset's Estimated Useful Life should be reviewed periodically to determine whether adjustments need to be made to better align with the observed length of service life for each asset type.

4.1.4 Lifecycle Management Strategy

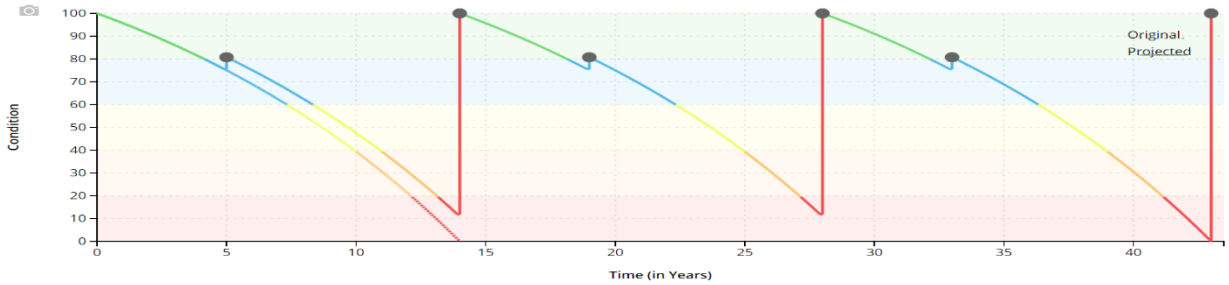
The condition or performance of most assets will deteriorate over time. This process is affected by a range of factors including an asset's characteristics, location, utilization, maintenance history and environment.

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

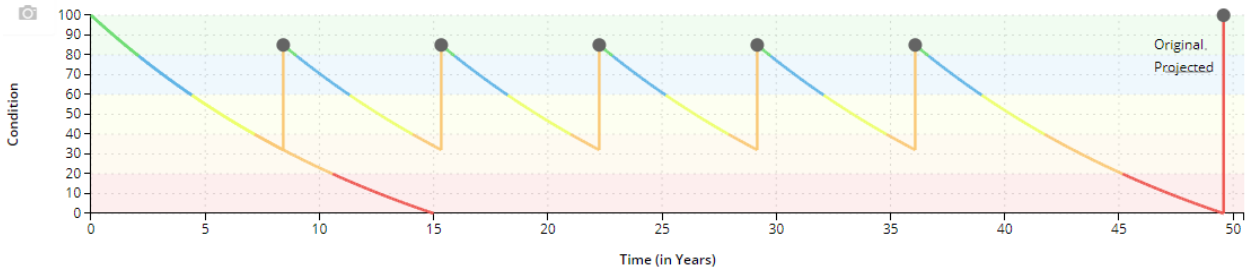
Urban Paved Roads		
Event Name	**Event Class**	**Event Trigger**
Shave and Pave	Rehabilitation	20 Condition
Full Reconstruction	Replacement	0 Condition



Rural Paved Roads		
Event Name	**Event Class**	**Event Trigger**
Crack Sealing	Preventative Maintenance	5 Years after Rehabilitation Events
Overlay	Rehabilitation	14 Years
Pad and Pave	Rehabilitation	28 Years
Full Reconstruction	Replacement	0 Condition



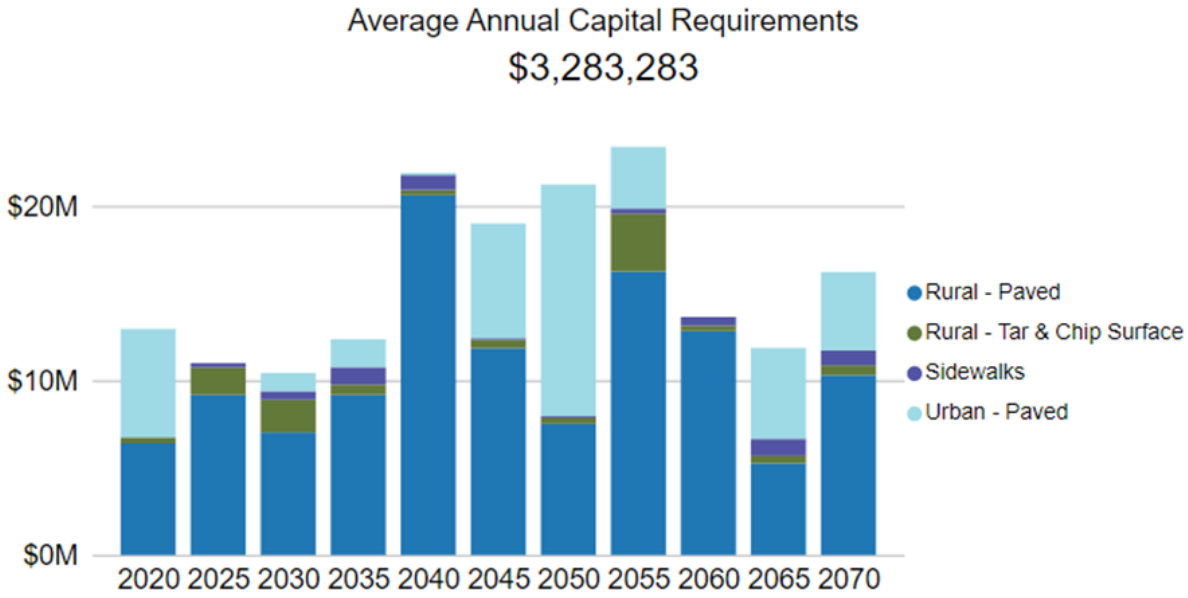
Tar and Chip Roads		
Event Name	**Event Class**	**Event Trigger**
Double Surface Treatment	Preventative Maintenance	7 and 14 Years
Single Lift	Rehabilitation	21 Years
Full Reconstruction	Replacement	0 Condition



Forecasted Capital Requirements

Based on the lifecycle strategies identified previously for Paved Roads and Tar and Chip 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, consolidated in five-year increments.

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



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

4.1.5 Risk & Criticality

Risk Matrix

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

Risks to Current Asset Management Strategies

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

Financial Reinvestment

It is a challenge to find the right balance between maintenance, capital rehabilitation and the reconstruction of roads. Staff hope to develop better defined strategies that will extend pavement lifecycle and a lower total cost. These strategies will require sustainable annual funding to minimize backlog and the deferral of capital works.

Climate Change & Extreme Weather Events

An increase in freeze/thaw cycles causes road pavement to heave and settle. This can cause the accelerated deterioration of road surface pavement which leads to an increased need for maintenance and rehabilitation.

4.1.6 Levels of Service

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

Community Levels of Service

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

Service Attribute	Qualitative Description	Current LOS (2020)
Scope	Description, which may include maps, of the road network in the municipality and its level of connectivity	See Appendix B
Quality	Description or images that illustrate the different levels of road class pavement condition	Very Good - Pavement is in excellent condition with few visible defects. Riding quality is very smooth with not more than a few areas of very slight distortion. Good - Pavement is in good condition with accumulating slight defects and distortions. Riding quality is smooth with intermittent slightly rough and uneven sections. Fair - Pavement is in fair condition with intermittent patterns of slight to moderate defects. Riding quality is comfortable with intermittent bumps or depressions. Poor - Pavement is in poor condition with frequent patterns of moderate defects. Riding quality is uncomfortable, and the surface is rough and uneven. Very Poor - Pavement is in very poor condition with extensive severe defects. Riding quality is very uncomfortable, and surface is very rough and uneven.

Technical Levels of Service

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

Service Attribute	Technical Metric	Current LOS (2020)
Scope	Lane-km of arterial roads (MMS classes 1 and 2) per land area (km/km^2)	N/A
	Lane-km of collector roads (MMS classes 3) per land area (km/km^2)	N/A
	Lane-km of local roads (MMS classes 4, 5 and 6) per land area (km/km^2)	0.33
Quality	Average pavement condition index for paved roads in the municipality	40%
	Average surface condition for unpaved roads in the municipality (e.g., excellent, good, fair, poor)	Good
Performance	Capital reinvestment rate	1.40%

4.1.7 Recommendations

Condition Assessment Strategies

- The last road network appraisal was completed in 2019. Consider completing an updated assessment of all roads within the next few years.

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 Municipality's lifecycle management strategies at regular intervals to determine the impact cost, condition, and risk. Consider utilizing other industry standard preventative maintenance activities to optimize service life.

Risk Management Strategies

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

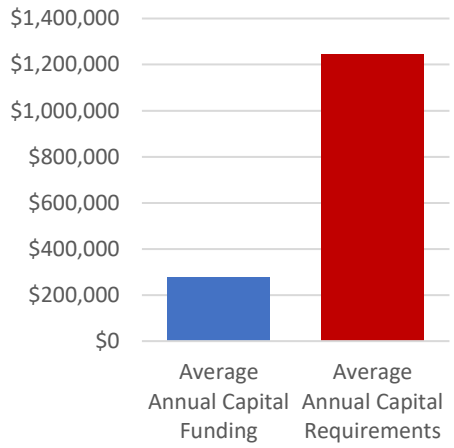
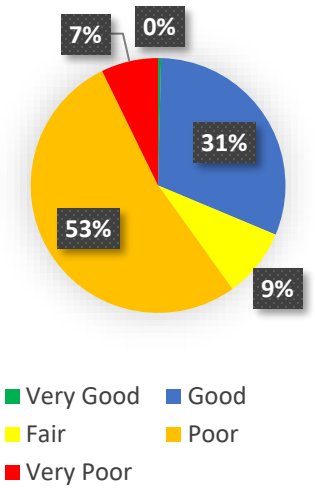
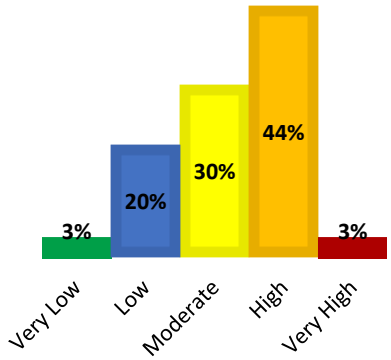
Levels of Service

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

4.2 Bridges & Culverts

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

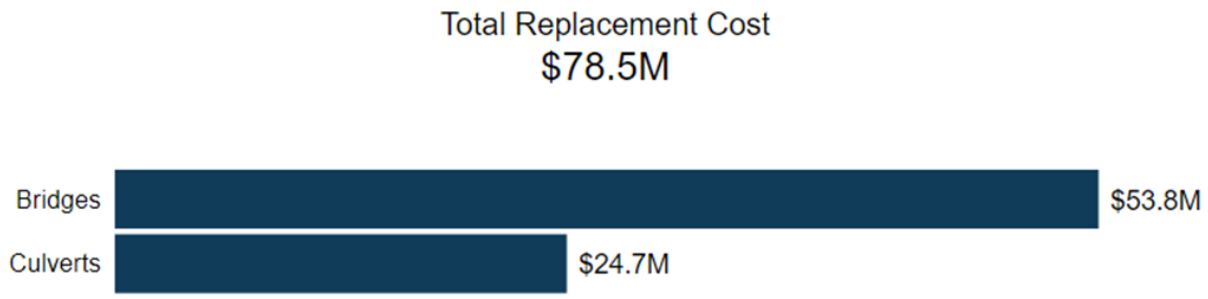
The table below outlines high-level service indicators for Bridges & Culverts.

Cost	Performance (Average Condition)	Risk
		

4.2.1 Asset Inventory & Replacement Cost

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

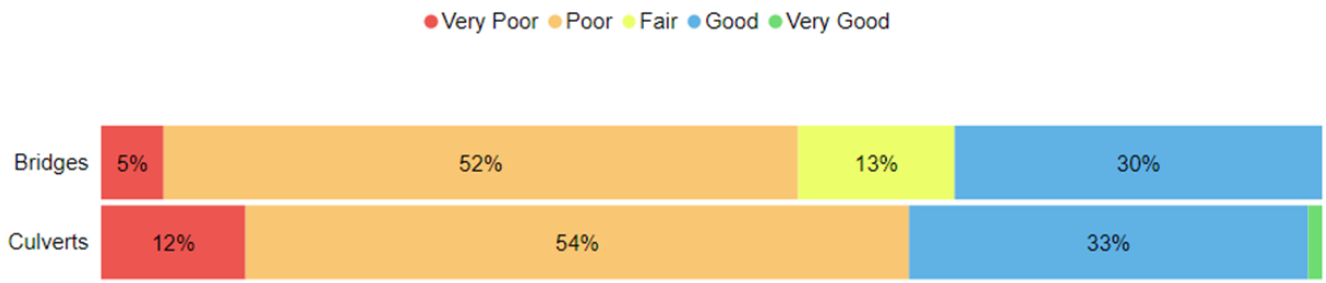
Asset Segment	Quantity	Replacement Cost	Annual Capital Requirement
Bridges	60	$53,761,500	$788,526
Culverts	74	$24,716,067	$457,071
	Total:	**78,477,567**	**$1,245,597**



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	56%	Fair	92% Assessed
Culverts	52%	Fair	95% Assessed
	55%	**Fair**	**93% Assessed**



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

Current Approach to Condition Assessment

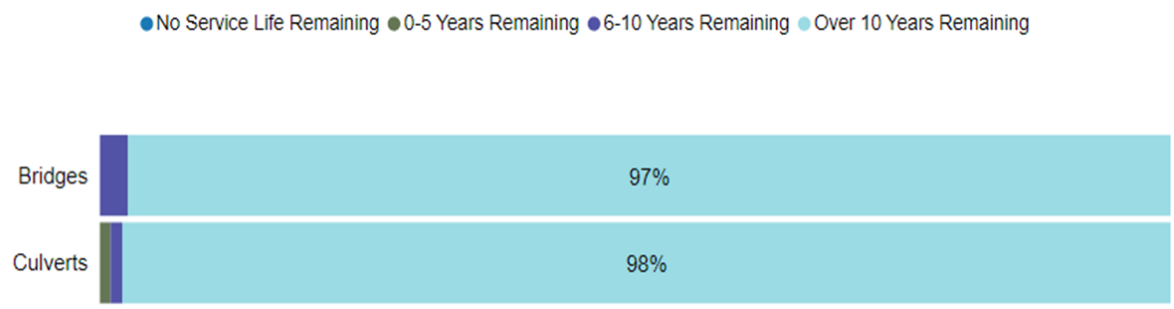
Accurate and reliable condition data allows staff to determine the remaining service life of assets and identify the most cost-effective approach to managing assets more confidently. The following describes the municipality's current approach:

- Condition inspection reports 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)
- A comprehensive OSIM inspection is completed every 8 years to further supplement the regular bi-annual inspections

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)
Bridges	30-75 years	48.5
Culverts	5-75 years	46.0
	Average:	**47.2**



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.

4.2.4 Lifecycle Management Strategy

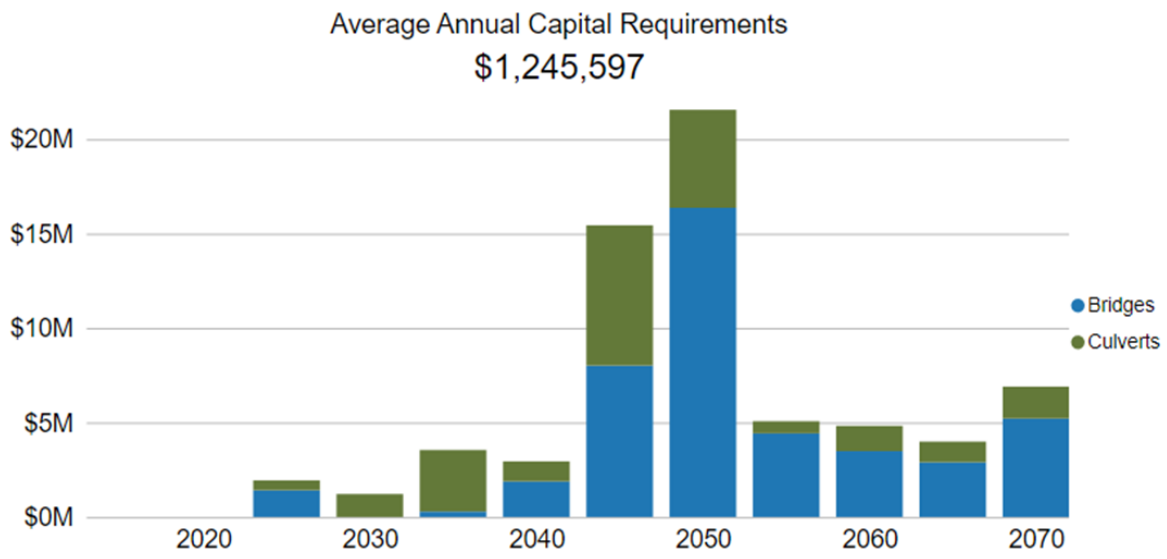
The condition or performance of most assets will deteriorate over time. To ensure that municipal assets are performing as expected and meeting the needs of customers, it is important to establish a lifecycle management strategy to proactively manage asset deterioration.

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

Activity Type	Description of Current Strategy
Maintenance, Rehabilitation and Replacement	Lifecycle activities are driven by the results of mandated structural inspections competed according to the Ontario Structure Inspection Manual Some activities undertaken include deck sweeping, annual cleaning of expansion joints, annual drain hole maintennance, and annual guide rail inspections Rehabilitation and replacement activities are generally followed from the 5 year outlook provided by the OSIM report as funding allows
Inspection	The most recent inspection report was completed in December 2020 by BM Ross & Associates Limited

Forecasted Capital Requirements

The following graph forecasts long-term capital requirements, consolidated in five-year increments. The annual capital requirement represents the average amount per year that the Municipality 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 A.

4.2.5 Risk & Criticality

Risk Matrix

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

Risks to Current Asset Management Strategies

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

Capital Funding Strategies

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

Aging Infrastructure and Usage

As municipal bridges continue to age, there are a handful of structures that are approaching their original useful life. These structures have supported various forms of traffic including heavy traffic. However, their current load limit and width may no longer be adequate.

4.2.6 Levels of Service

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

Community Levels of Service

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

Service Attribute	Qualitative Description	Current LOS (2020)
Scope	Description of the traffic that is supported by municipal bridges (e.g., heavy transport vehicles, motor vehicles, emergency vehicles, pedestrians, cyclists)	Bridges and structural culverts are a key component of the municipal transportation network. Two of the municipality's structures have loading and dimensional restrictions meaning that most types of vehicles, including heavy transport, motor vehicles, and emergency vehicles can cross most structures without restriction.
Quality	Description or images of the condition of bridges & culverts and how this would affect use of the bridges & culverts	See Appendix B

Technical Levels of Service

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

Service Attribute	Technical Metric	Current LOS (2020)
Scope	% of bridges in the Municipality with loading or dimensional restrictions	1.5%
Quality	Average bridge condition index value for bridges in the Municipality	56
	Average bridge condition index value for structural culverts in the Municipality	52
Performance	Capital re-investment rate	0.35%

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.

Risk Management Strategies

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

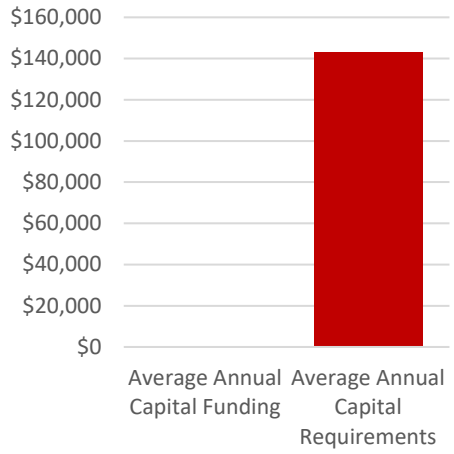
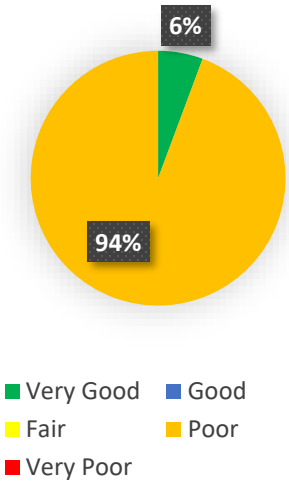
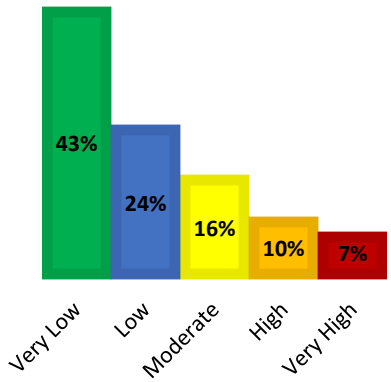
Levels of Service

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

4.3 Storm Water Network

The Municipality is responsible for owning and maintaining a Storm Water Network consisting of storm drains.

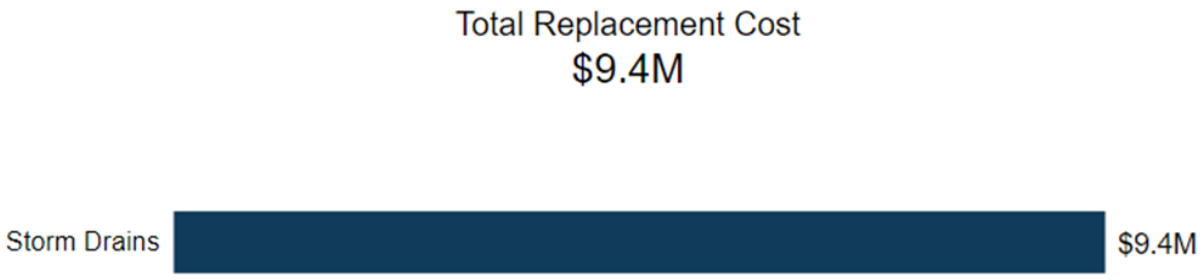
The table below outlines high-level service indicators for the Storm Water Network.

Cost	Performance (Average Condition)	Risk
		

4.3.1 Asset Inventory & Replacement Cost

The table below includes the quantity, replacement cost, and annual capital requirement of each asset segment in the Municipality's Storm Water Network inventory. Currently, the Municipality only has a complete inventory of storm drains and is the process of including other storm water network segments.

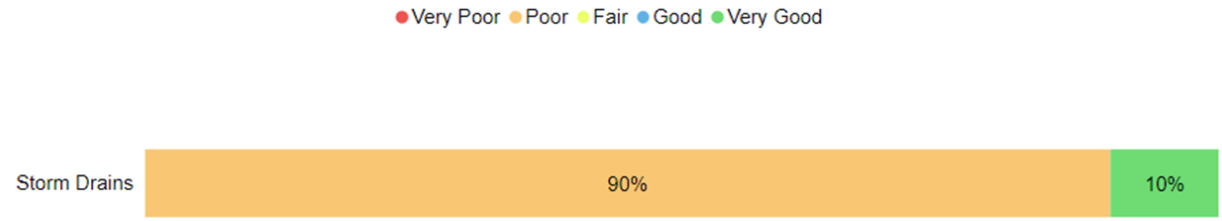
Asset Segment	Quantity	Replacement Cost	Annual Capital Requirement
Storm Drains	12,091 Length (m)	$9,399,899	$142,741
	Total:	**$9,399,899**	**$142,741**



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.

	Average Condition (%)	Average Condition Rating	Condition Source
Storm Drains	44%	Fair	90% Assessed
	44%	**Fair**	**90% Assessed**



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

Current Approach to Condition Assessment

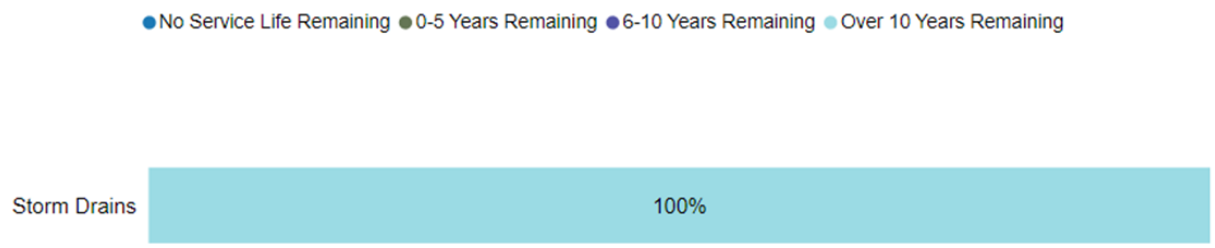
Accurate and reliable condition data allows staff to determine the remaining service life of assets and identify the most cost-effective approach to managing assets more confidently. The following describes the municipality's current approach:

- Assessments are generally only undertaken during street reconstruction, otherwise, there are no formal condition assessment programs in place for the Storm Water Network

4.3.3 Estimated Useful Life & Average Age

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

Asset Segment	Estimated Useful Life (Years)	Average Age (Years)
Storm Drains	50 - 75 Years	22.9
		22.9



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.

4.3.4 Lifecycle Management Strategy

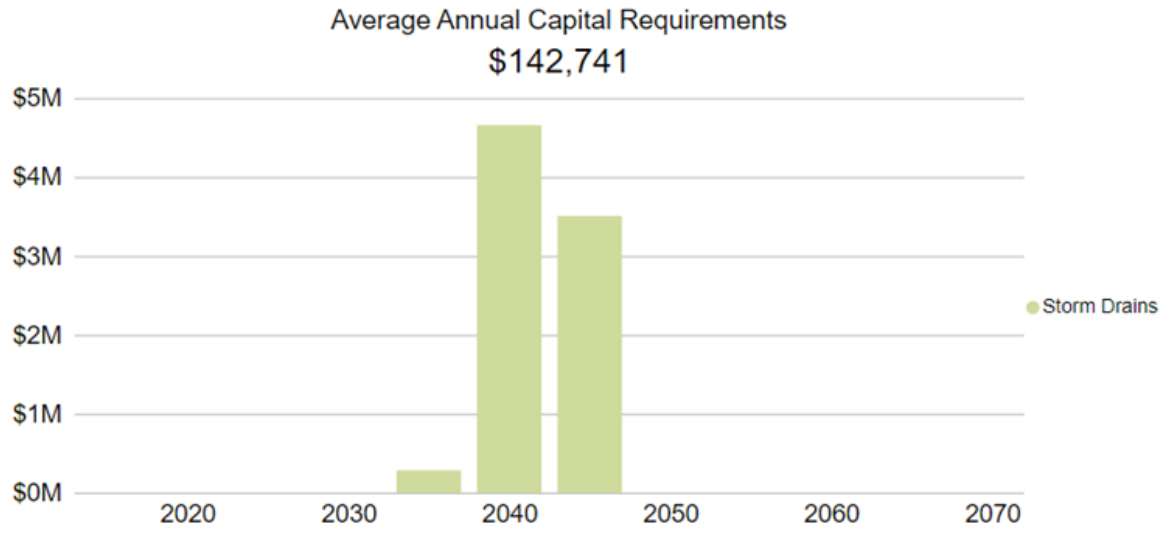
The condition or performance of most assets will deteriorate over time. To ensure that municipal assets are performing as expected and meeting the needs of customers, it is important to establish a lifecycle management strategy to proactively manage asset deterioration.

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

Activity Type	Description of Current Strategy
Maintenance	Catchbasin cleaning is completed on a 2 year cycle
	Drains are unclogged in urban ceter when an issue has been brought up
	Preventative maintenance is completed on rural road overflow crossing annually as the budget allows
Replacement	A 5-year capital plan is followed for storm assets

Forecasted Capital Requirements

The following graph forecasts long-term capital requirements, consolidated in five-year increments. The annual capital requirement represents the average amount per year that the Municipality 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 A.

4.3.5 Risk & Criticality

Risk Matrix

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

Risks to Current Asset Management Strategies

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

Asset Data & Information

There is a lack of confidence in the available inventory data for storm water assets. Without reliable data available for decision making, plan become less robust. This poses a significant risk when trying to manage assets over their lifecycle and plan for future work.

Climate Change & Extreme Weather Events

Extreme weather events and a shifting climate have caused more rainfall in the municipality, leading to more surface flooding as it overwhelms the capacity of the existing system. These events can reduce accessibility and the levels of service generally expected. Residents have expressed a desire to address these issues, but this would have to come at a cost.

4.3.6 Levels of Service

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

Community Levels of Service

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

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

Technical Levels of Service

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

Service Attribute	Technical Metric	Current LOS (2020)
Scope	% of properties in municipality resilient to a 100-year storm	97%
	% of the municipal stormwater management system resilient to a 5-year storm	TBD[1]
Performance	Capital reinvestment rate	0%

[1] The Municipality does not currently have data available to determine this technical metric.

4.3.7 Recommendations

Asset Inventory

- The Municipality's Storm Water 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 Storm Water Network should be priority. Other storm water assets, such as catch basins, should be documented as separate assets.

Condition Assessment Strategies

- The development of a comprehensive inventory should be accompanied by a system-wide assessment of the condition of all assets in the Storm Water Network. The Municipality may consider CCTV inspections of storm drains approaching their useful life.

Risk Management Strategies

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

Lifecycle Management Strategies

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

Levels of Service

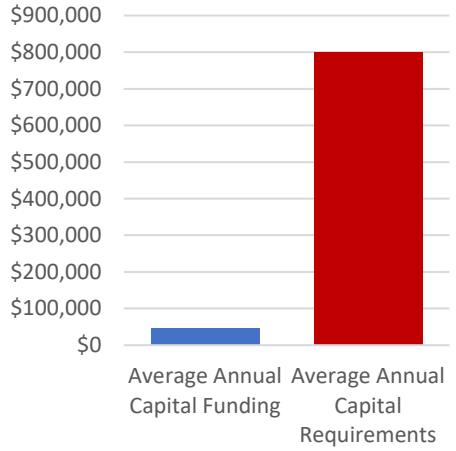
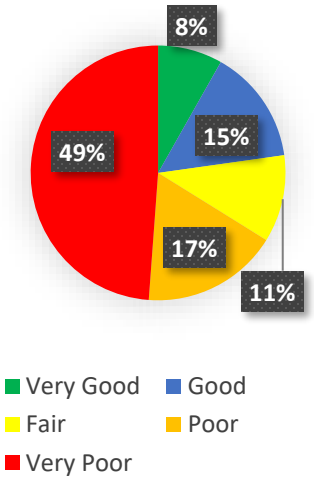
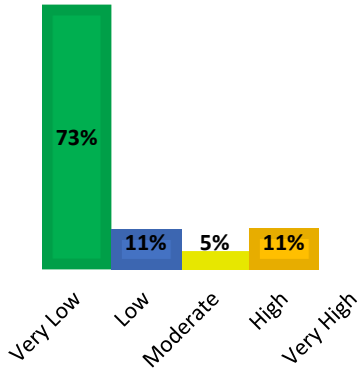
- Continue to measure current levels of service in accordance with the metrics that the Municipality has established in this AMP. Additional metrics can be established as they are determined to provide meaningful and reliable inputs into asset management planning.
- Work towards identifying proposed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

4.4 Buildings

The Municipality of Huron East owns and maintains several facilities and recreation centres that provide key services to the community. These include:

- administrative offices
- health services related facilities and cemeteries
- public libraries
- fire stations and associated offices and facilities
- public works related facilities
- recreational and park facilities

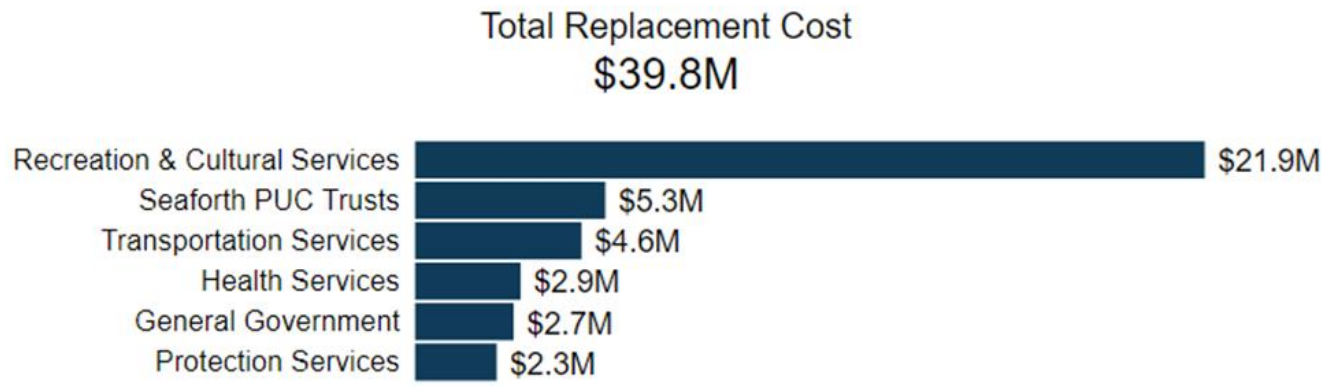
The table below outlines high-level service indicators for Buildings.

Cost	Performance (Average Condition)	Risk
		

4.4.1 Asset Inventory & Replacement Cost

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

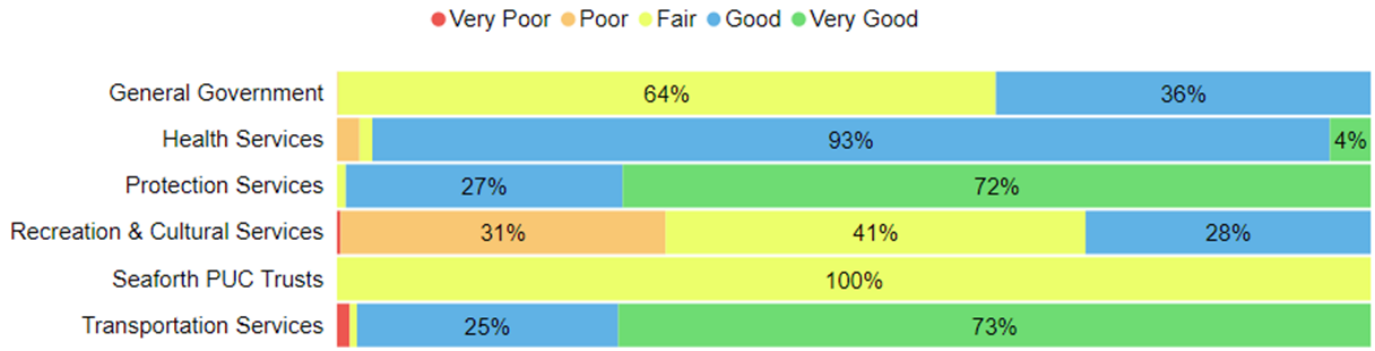
Asset Segment	Quantity (# of components)	Replacement Cost	Annual Capital Requirement
General Government	2 (39)	$2,749,720	$57,139
Health Services	5 (62)	$2,943,562	$66,319
Protection Services	3 (49)	$2,278,892	$50,055
Recreation & Cultural Services	19 (286)	$21,939,462	$465,353
Seaforth PUC Trusts	2	$5,294,343	$70,591
Transportation Services	8 (94)	$4,631,432	$89,973
	Total:	**$39,837,411**	**$799,430**



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
General Government	94%	Fair	100% Assessed
Health Services	97%	Good	100% Assessed
Protection Services	98%	Very Good	100% Assessed
Recreation & Cultural Services	89%	Poor	100% Assessed
Seaforth PUC Trusts[2]	60%	Fair	100% Assessed
Transportation Services	98%	Very Good	100% Assessed
Average FCI (excluding Seaforth PUC Trusts)	**92%**	**Fair**	**100% Assessed**



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

Current Approach to Condition Assessment

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

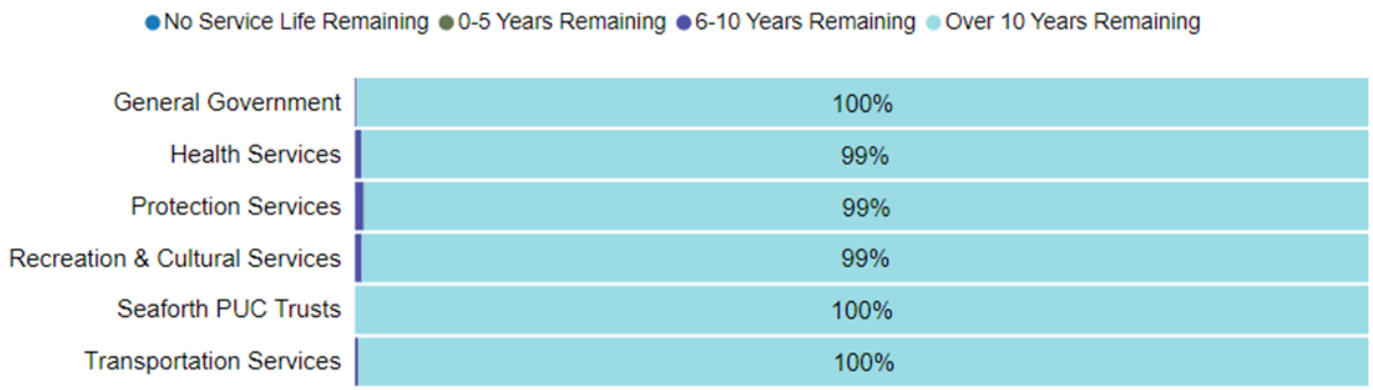
[2] The Seaforth PUC Trusts buildings were not under scope of the BM Ross Facility Assessment and rely on the generalized Canadian Infrastructure Report Card condition scale, rather than the FCI. A condition of 60% means 60% of service life are remaining, which is considered qualitatively as Fair.

- Health and safety (H&S) walk through inspections are completed monthly by a designated H&S representative
- A comprehensive building condition assessment was undertaken in 2020, identifying condition scores and required maintenance for building components. The Municipality is considering an appropriate interval for conducting similar studies in the future
- Recreational manager inspects playgrounds regularly based on CSA standards

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)
General Government	10-100 years	93.3
Health Services	10-100 years	53.4
Protection Services	10-100 years	46.3
Recreation & Cultural Services	10-100 years	51.7
Seaforth PUC Trusts	75 years	61.5
Transportation Services	10-100 years	41.1
	Average:	**52.6**



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.

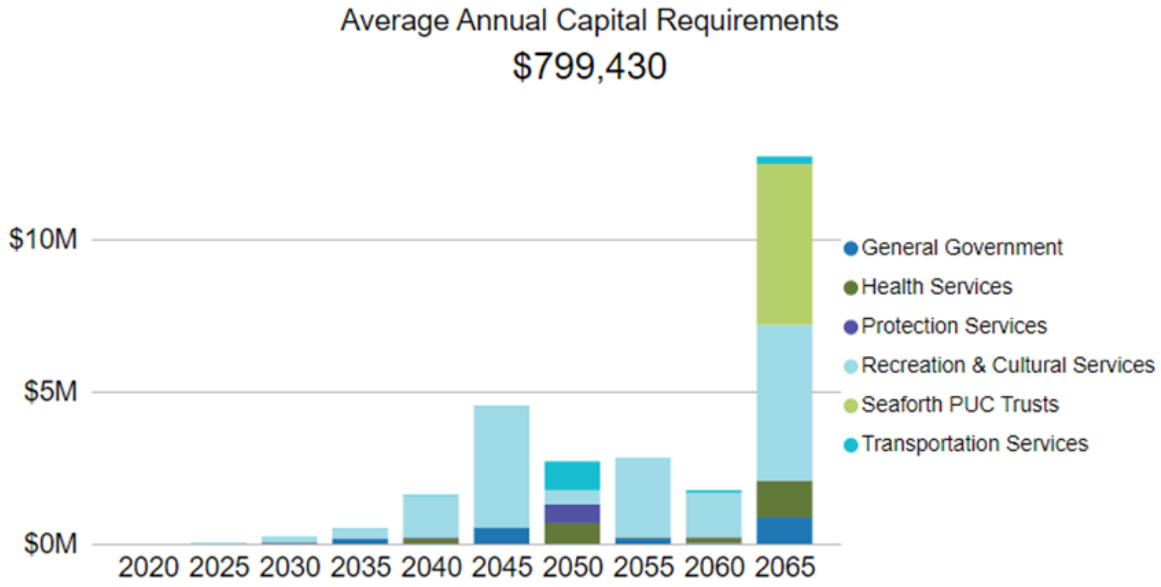
4.4.4 Lifecycle Management Strategy

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 Municipality's current lifecycle management strategy.

Activity Type	Description of Current Strategy
Maintenance / Rehabilitation	Recreational centres are generally maintained by the staff within the buildings – there is no overarching maintenance plan
	Grass cutting is handled on a weekly basis for parks and outdoor areas
	General maintenance of buildings are completed internally
Replacement	A building efficiencies list of improvements are brought forward on a yearly basis, items are generally prioritized on H&S considerations
	Major rehabilitative and replacement activities prioritized by Facilities Manager with input from staff and past building assessment reports
	The current strategy is more reactive with some proactive elements and planning. There is a 5-year capital planning horizon in place

Forecasted Capital Requirements

The following graph forecasts long-term capital requirements, consolidated in five-year increments. The annual capital requirement represents the average amount per year that the Municipality 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 A.

4.4.5 Risk & Criticality

Risk Matrix

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

Risks to Current Asset Management Strategies

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

Aging Infrastructure and Capital Funding

Aging building infrastructure poses one of the larger challenges. The Municipality does not have many new buildings. Buildings that are closer to the end of its life requires more upkeep and maintenance that ultimately translate to higher costs. Older buildings are also more prone to failure. Many building components are at risk of not meeting current standards.

4.4.6 Levels of Service

Buildings is considered a non-core asset category. The following tables identify the Municipality's current level of service for Buildings. These metrics include the technical and community level of service metrics that the Municipality has selected for this AMP.

Community Levels of Service

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

Service Attribute	Qualitative Description	Current LOS (2020)
Accessibility	List of facilities that meet accessibility standards and any work that has been undertaken to achieve alignment	Seaforth Library; Brussels Library; Seaforth Town Hall; Vanastra Recreation Centre; Brussels, Morris & Grey Community Centre; Seaforth & District Community Centre; Brussels Medical Dental Building; Community Care Access Centre; Family Health Team Building; Work Completed to achieve this is installing automatic door openers, ramps
Sustainability and Affordability	Description of lifecycle activities performed on municipal buildings	Refer to 4.4.4

Technical Levels of Service

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

Service Attribute	Technical Metric	Current LOS (2020)
Accessibility	% of Facilities meeting AODA Standards	23%
Quality	O&M cost / # of municipal facilities	$6,499
	Total equivalent kWh energy consumption / sq. m. of buildings	80 kWh / sq m
	% of buildings in poor or very poor condition	66%
	Average Annual Reinvestment Rate	0.12%

4.4.7 Recommendations

Asset Inventory

- Building component information should be updated as renewals and refurbishments are undertaken to ensure the inventory is up to date.

Condition Assessment Strategies

- Continue conducting network-wide assessments to ensure condition information remains reliable.

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.

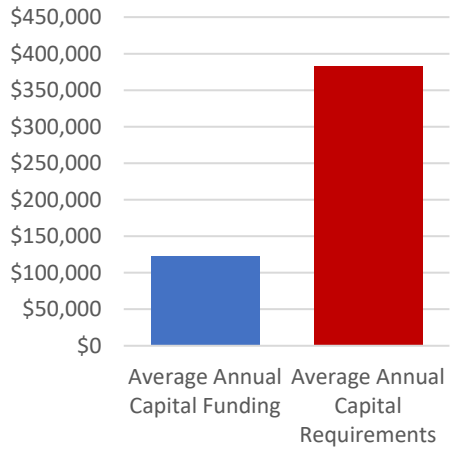
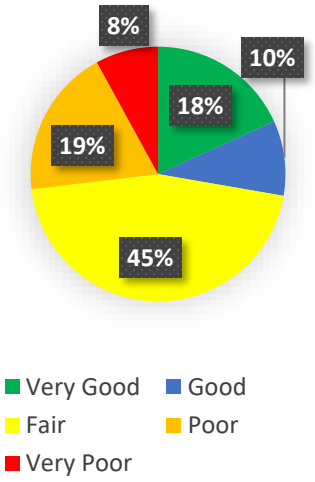
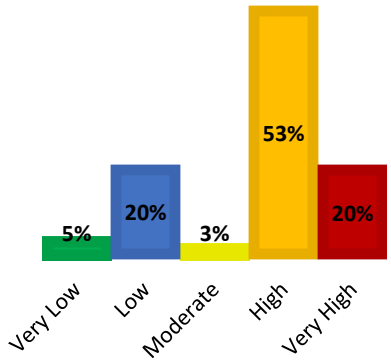
Levels of Service

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

4.5 Machinery & Equipment

In order to maintain the high quality of public infrastructure and support the delivery of core services, Municipality staff own and employ various types of machinery and equipment. Equipment are segmented by departmental use. Keeping Equipment in an adequate state of repair is important to maintain a high level of service.

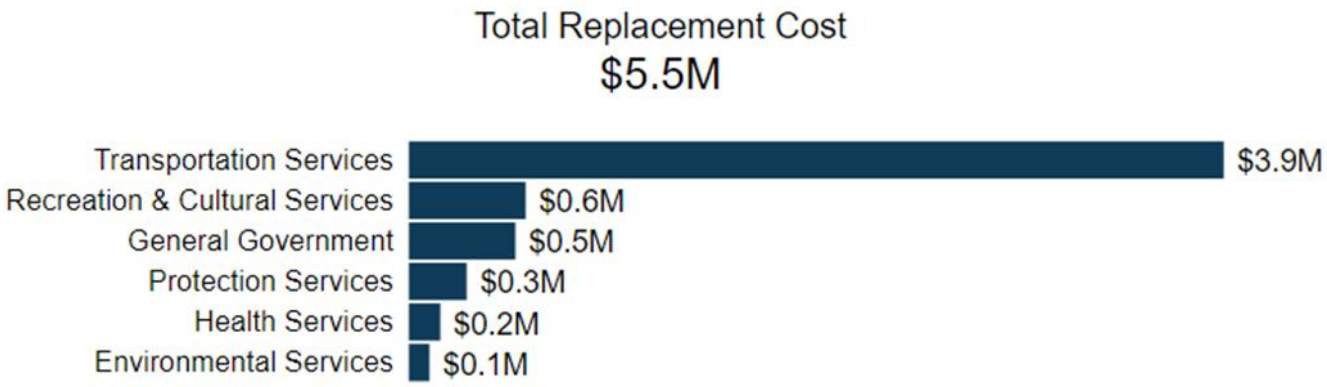
The table below outlines high-level service indicators for Machinery & Equipment.

Cost	Performance (Average Condition)	Risk
		

4.5.1 Asset Inventory & Replacement Cost

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

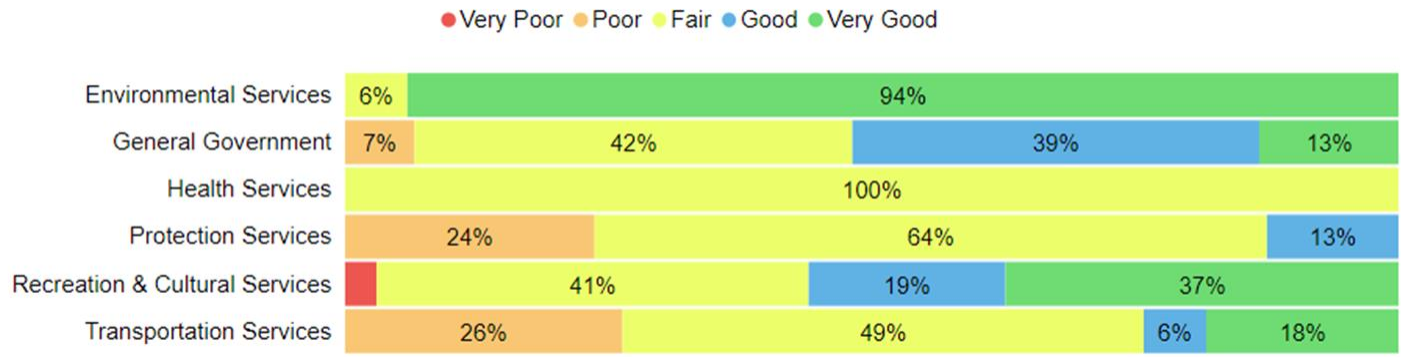
Asset Segment	Quantity	Replacement Cost	Annual Capital Requirement
Environmental Services	2	$101,000	$8,517
General Government	52	$513,000	$79,900
Health Services	3	$153,000	$7,650
Protection Services	13	$279,289	$11,898
Recreation & Cultural Services	11	$562,500	$37,461
Transportation Services	19	$3,909,000	$237,075
	Total:	**$5,517,789**	**$382,500**



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
Environmental Services	85%	Very Good	6% Assessed
General Government	61%	Good	69% Assessed
Health Services	54%	Fair	100% Assessed
Protection Services	51%	Fair	85% Assessed
Recreation & Cultural Services	71%	Good	63% Assessed
Transportation Services	56%	Fair	82% Assessed
	58%	**Fair**	**78% Assessed**



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

Current Approach to Condition Assessment

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

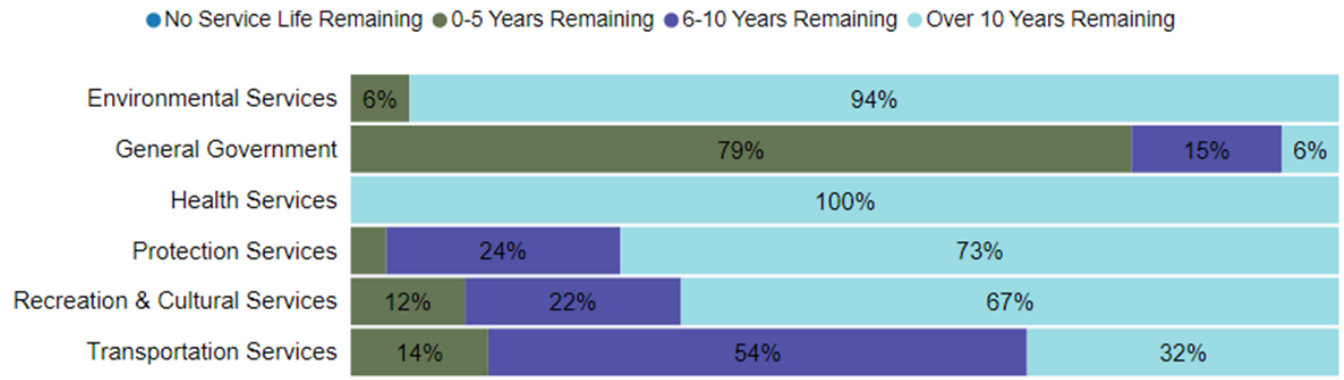
- Each department assesses their own equipment
- Equipment related to vehicles are usually assessed when the vehicle is assessed

- Staff complete regular visual inspections of Equipment to ensure they are in state of adequate repair
- Self Contained Breathing Apparatus (SCBA) are assessed annually and follow National Fire Protection Association (NFPA) standards
- Bunker gear are inspected internally on an annual basis
- Ice surfacing machine are sent back every two years
- Chillers are assessed twice per year
- HVAC and compressor room equipment are inspected every 6 months, typically at the start and mid season, in accordance with Technical Standards and Safety Authority (TSSA) requirements

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)
Environmental Services	10-12 years	4.8
General Government	4-20 years	4.3
Health Services	20 years	12.1
Protection Services	1-25 years	13.1
Recreation & Cultural Services	5-25 years	4.0
Transportation Services	1-25 years	8.3
	Average:	**7.6**



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.

4.5.4 Lifecycle Management Strategy

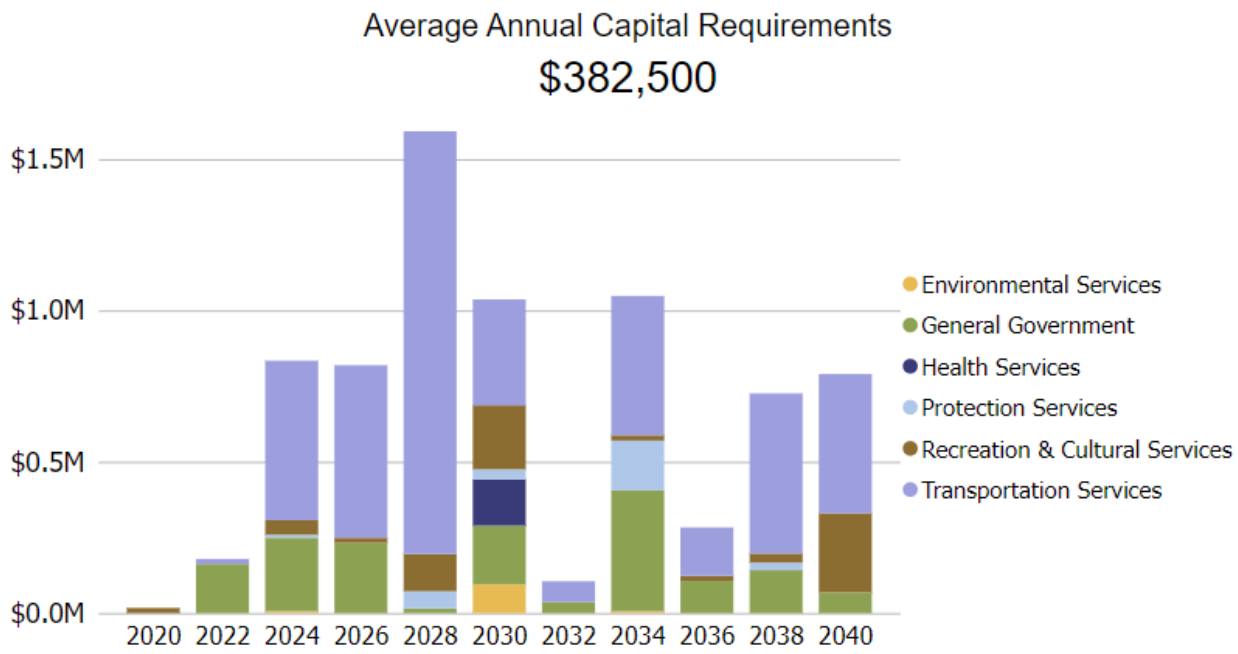
The condition or performance of most assets will deteriorate over time. To ensure that municipal assets are performing as expected and meeting the needs of customers, it is important to establish a lifecycle management strategy to proactively manage asset deterioration.

The following table outlines the Municipality'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 (e.g. following National Fire Protection Association standards)
	SCBA have an annual flow test completed by an external organization
	When bunker gear is sent away externally for cleaning, on an as needed basis, hydrostatic test is completed and documented as well
	Ice surfacing machinery has yearly oil changes and maintenance
Replacement	The replacement of 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 two-year period that the Municipality 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 A.

4.5.5 Risk & Criticality

Risk Matrix

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

Risks to Current Asset Management Strategies

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

Aging Infrastructure and Capital Funding

Aging equipment and the need for renewal poses a challenge. Equipment that are closer to the end of its life requires more upkeep and maintenance that ultimately translate to higher operating costs. Older equipment are also more prone to failure, potentially causing disruption to staff duties, resulting in lower efficiencies.

4.5.6 Levels of Service

Equipment is considered a non-core asset category. The following tables identify the Municipality's current level of service for Equipment. These metrics include the technical and community level of service metrics that the Municipality has selected for this AMP.

Community Levels of Service

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

Service Attribute	Qualitative Description	Current LOS (2020)
Sustainability and Affordability	Description of lifecycle activities performed on machinery and equipment assets	Refer to 4.5.4

Technical Levels of Service

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

Service Attribute	Technical Metric	Current LOS (2020)
Safety	# of workplace injuries due to equipment failure / oversight	0
Quality	O&M Cost / Total value of Equipment	$0.08
	% of machinery and equipment in poor or very poor condition	27%
	Average Annual Reinvestment Rate	2.23%

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.

Estimated Useful Life

- The estimated useful life of each asset should be reviewed to ensure that it reflects the true service life influenced by the asset's environment and operating conditions.

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

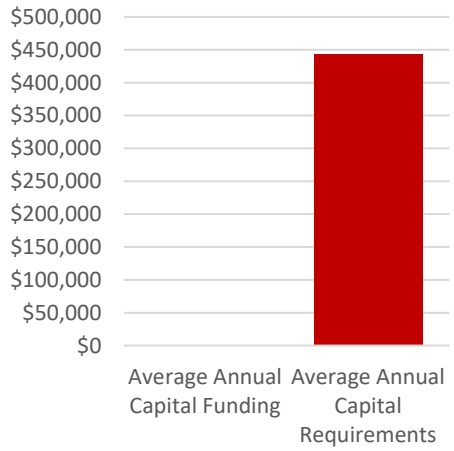
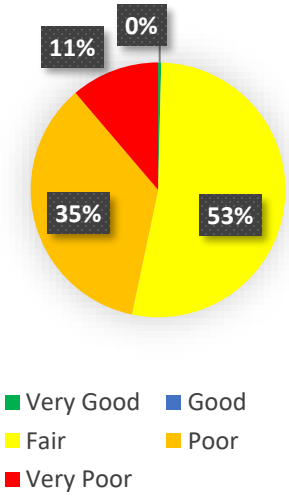
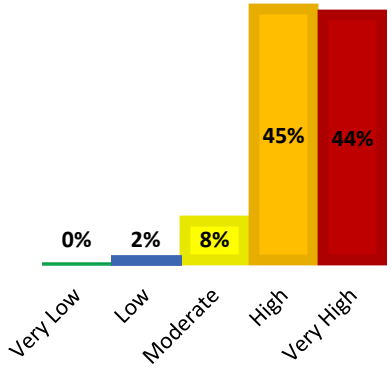
- Begin measuring current levels of service in accordance with the metrics that the Municipality has established in this AMP. Additional metrics can be established as they are determined to provide meaningful and reliable inputs into asset management planning.
- Work towards identifying proposed levels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

4.6 Vehicles

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

- tandem axle trucks 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

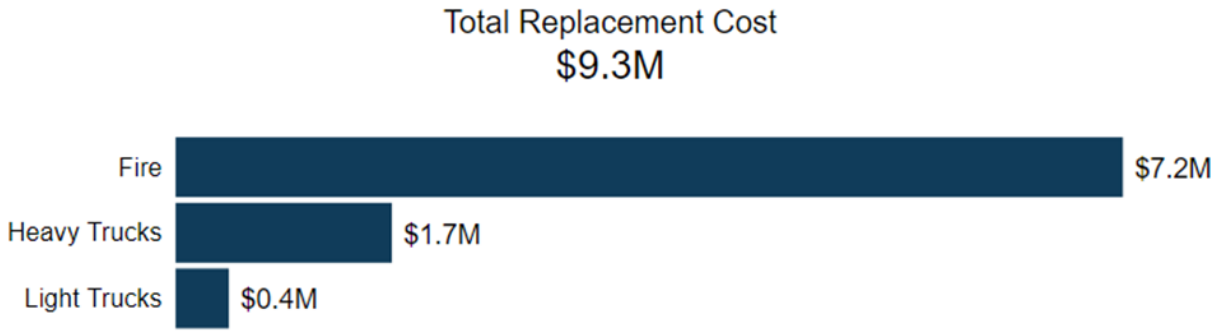
The table below outlines high-level service indicators for Vehicles.

Cost	Performance (Average Condition)	Risk
		

4.6.1 Asset Inventory & Replacement Cost

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

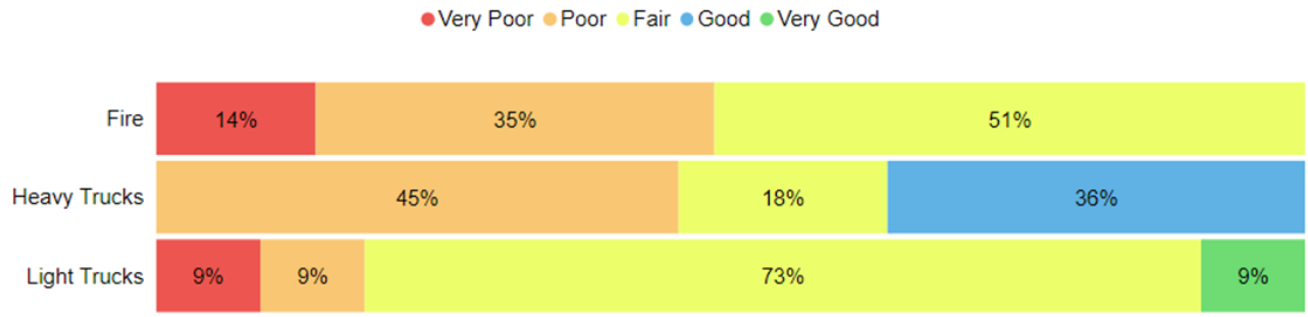
Asset Segment	Quantity	Replacement Cost	Annual Capital Requirement
Fire	17	$7,225,000	$289,000
Heavy Trucks	6	$1,650,000	$96,429
Light Trucks	11	$407,000	$58,143
	Total:	**$9,282,000**	**$443,571**



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
Fire	43%	Fair	100% Assessed
Heavy Trucks	48%	Fair	100% Assessed
Light Trucks	42%	Fair	100% Assessed
	43%	**Fair**	**100% Assessed**



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

Current Approach to Condition Assessment

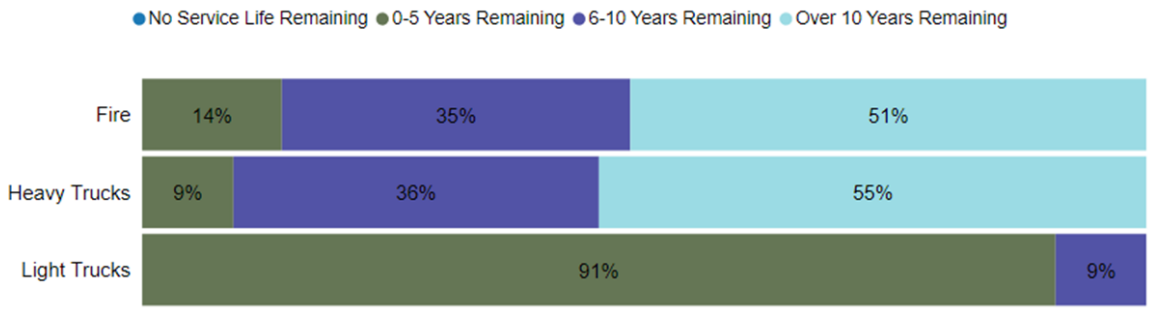
Accurate and reliable condition data allows staff to determine the remaining service life of assets and identify the most cost-effective approach to managing assets more confidently. The following describes the municipality's current approach:

- Staff complete regular visual inspections of vehicles to ensure they are in state of adequate repair prior to operation
- Fire trucks are inspected annually

4.6.3 Estimated Useful Life & Average Age

The Estimated Useful Life for Vehicle 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)
Fire	25 years	19.7
Heavy Trucks	7-20 years	10.3
Light Trucks	7 years	6.3
	Average:	**12.9**



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.

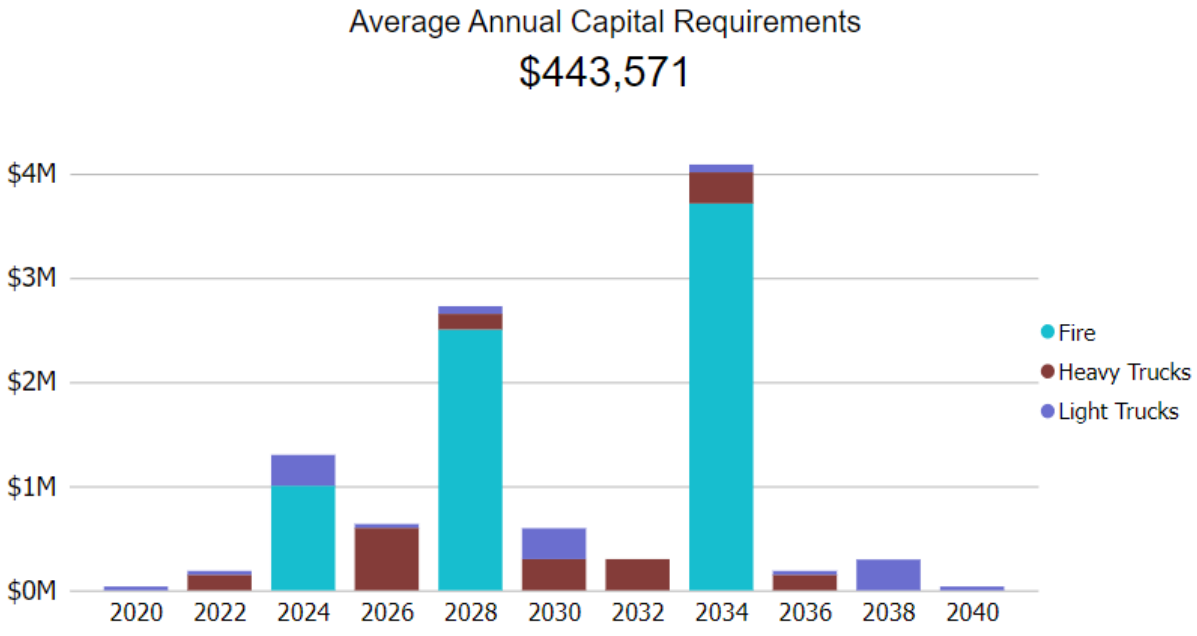
4.6.4 Lifecycle Management Strategy

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 Municipality's current lifecycle management strategy.

Activity Type	Description of Current Strategy
Maintenance	Light trucks are serviced every 5000-7000 km
	Heavy trucks are serviced approximately every 3000 km
	Graders are serviced approximately after 250 hours of use
Replacement	Vehicle replacements are the primary of means of upgrading and restoring condition. Vehicle replacement prioritization is based on condition and age to lesser extent
	Vehicles are replaced on a cycle basis as budget allows. A 5 year minimum capital planning horizon is undertaken

Forecasted Capital Requirements

The following graph forecasts long-term capital requirements. The annual capital requirement represents the average amount per each two-year period that the Municipality 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 A.

4.6.5 Risk & Criticality

Risk Matrix

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

Risks to Current Asset Management Strategies

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

Aging Infrastructure and Capital Funding

Aging vehicles and the need for renewal poses a challenge. Vehicles that are closer to the end of its life requires more upkeep and maintenance that ultimately translates to higher operating costs. Older vehicles are also more prone to failure, potentially causing disruption to staff duties, resulting in lower efficiencies.

4.6.6 Levels of Service

Vehicles is considered a non-core asset category. The following tables identify the Municipality's current level of service for Vehicles. These metrics include the technical and community level of service metrics that the Municipality has selected for this AMP.

Community Levels of Service

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

Service Attribute	Qualitative Description	Current LOS (2020)
Sustainability and Affordability	Description of lifecycle activities performed on vehicles	Refer to 4.6.4

Technical Levels of Service

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

Service Attribute	Technical Metric	Current LOS (2020)
Safety	% of regulated (CVOR, MTO, and NFPA) maintenance inspections completed	100%
Quality	Average O&M cost per vehicle	$4,137
	% of vehicles in poor or very poor condition	47%
	Average Annual Reinvestment Rate	0%

4.6.7 Recommendations

Estimated Useful Life

- Review and revise the estimated useful life of vehicles to ensure that the useful life reflects the vehicle's environment and operating conditions.

Condition Assessment Strategies

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

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

5 Analysis of Rate-funded Assets

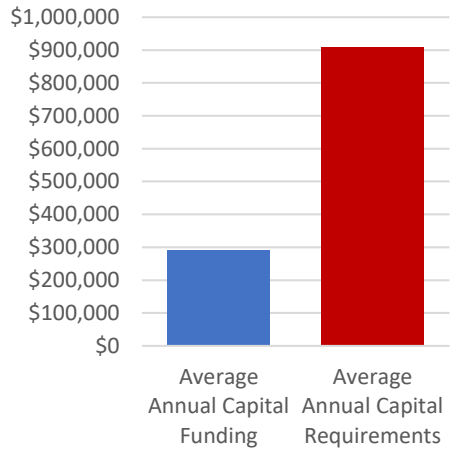
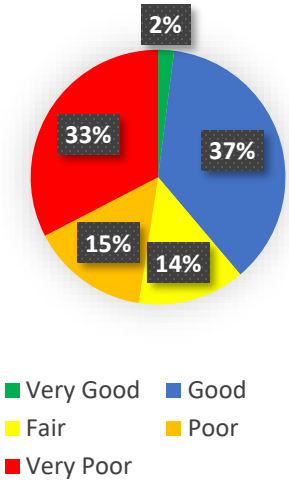
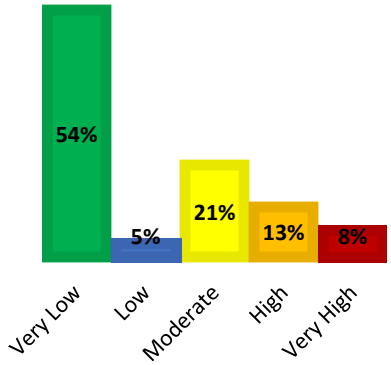
Key Insights

- Rate-funded assets are valued at $104 million
- 50% of rate-funded assets are in fair or better condition
- The average annual capital requirement to sustain the current level of service for rate-funded assets is approximately $1.7 million
- Critical assets should be evaluated to determine appropriate risk mitigation activities and treatment options

5.1 Water Network

The Municipality owns watermain infrastructure in four separate communities Brucefield, Brussels, Seaforth/Egmondville, and Vanastra.

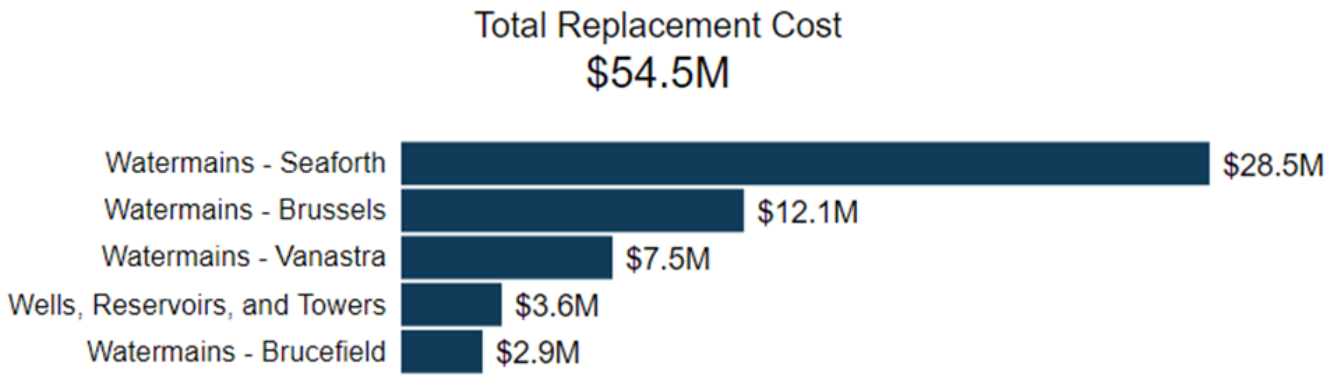
The table below outlines high-level service indicators for the Water Network.

Cost	Performance (Average Condition)	Risk
		

5.1.1 Asset Inventory & Replacement Cost

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

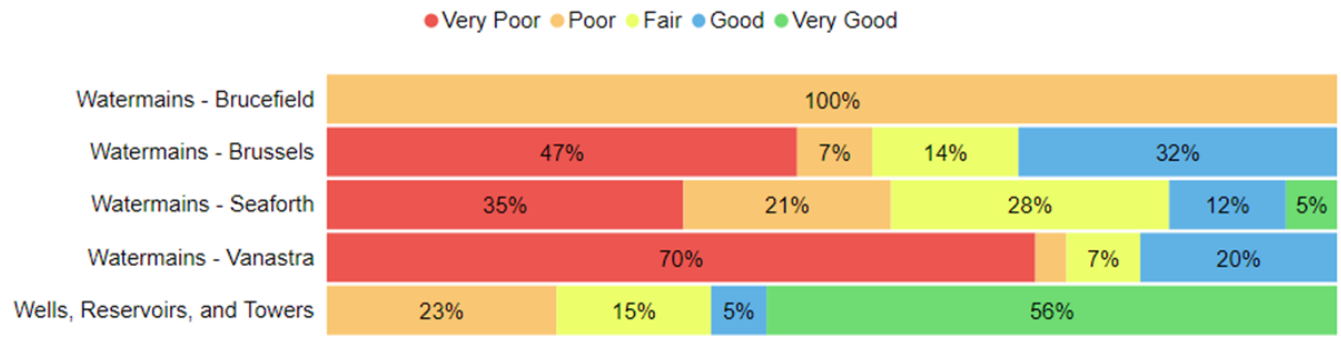
Asset Segment	Quantity	Replacement Cost	Annual Capital Requirement
Watermains - Brucefield	3,341 Length (m)	$2,883,283	$38,444
Watermains - Brussels	12,354 Length (m)	$12,101,594	$195,362
Watermains - Seaforth	28,467 Length (m)	$28,529,192	$480,921
Watermains - Vanastra	7,179 Length (m)	$7,470,022	$136,039
Wells, Reservoirs and Towers	7 (139 components)	$3,558,569	$56,160
	Total:	**$54,542,660**	**$906,926**



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
Watermains - Brucefield	38%	Poor	100% Assessed
Watermains - Brussels	43%	Fair	100% Assessed
Watermains - Seaforth	41%	Fair	95% Assessed
Watermains - Vanastra	32%	Poor	100% Assessed
Wells, Reservoirs and Towers	95%	Very Good	100% Assessed
	44%	**Fair**	**95% Assessed**



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

Current Approach to Condition Assessment

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

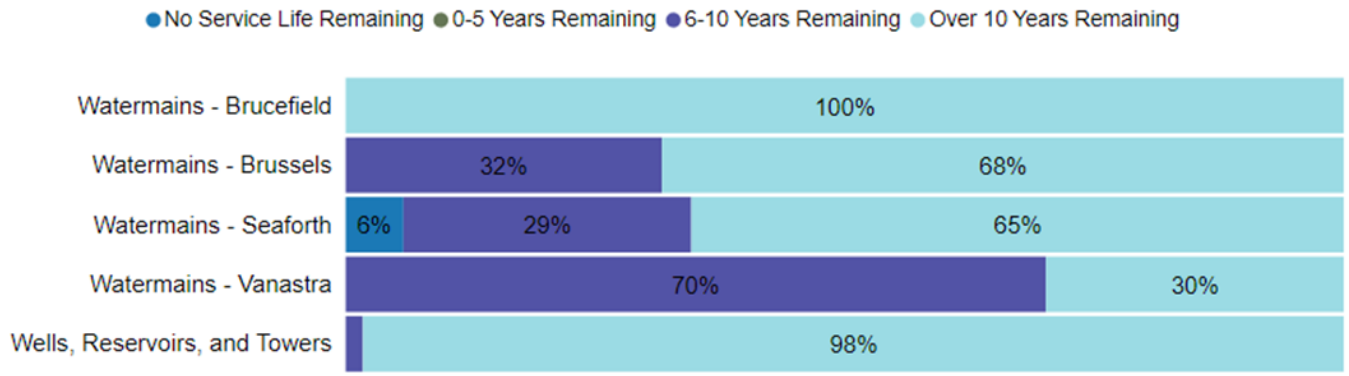
- The Municipality's condition assessment program utilizes age, break history, pipe material, location to approximate asset condition. However, these factors are not weighted consistently across the network.
- Water towers are proactively assessed as per Drinking Water Quality Management Standard (DWQMS). The next assessment is expected in 5 years

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.

Notably, installation records prior to 1980 are difficult to obtain, and in some cases, municipal staff completed renewal projects with little record keeping completed.

Asset Segment	Estimated Useful Life (Years)	Average Age (Years)
Watermains - Brucefield	75 years	46.0
Watermains - Brussels	50-75 years	35.3
Watermains - Seaforth	50-90 years	42.3
Watermains - Vanastra	50-90 years	59.3
Wells, Reservoirs and Towers	50-75 years	37.4
	Average:	**40.3**



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

5.1.4 Lifecycle Management Strategy

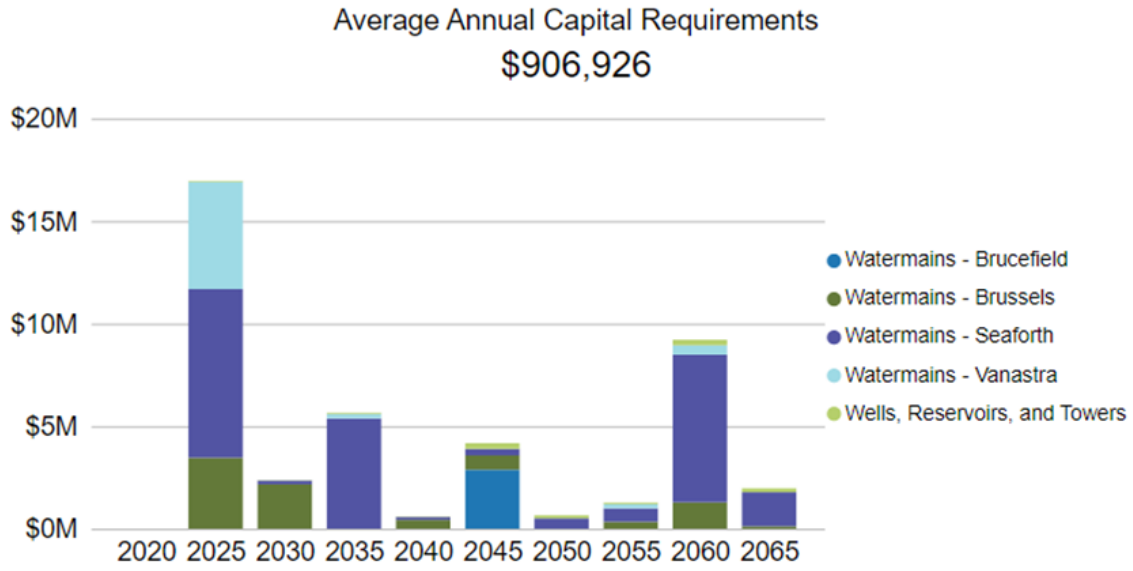
The condition or performance of most assets will deteriorate over time. To ensure that municipal assets are performing as expected and meeting the needs of customers, it is important to establish a lifecycle management strategy to proactively manage asset deterioration.

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

Activity Type	Description of Current Strategy
Maintenance	Watermains are flushed twice per year
	Valves are exercised annually
	Hydrant maintenance work is completed as identified and required
Rehabilitation & Replacement	In the absence of mid-lifecycle rehabilitative events, most mains are simply maintained with the goal of full replacement once it reaches its end-of-life. A 10-year planning horizon is undertaken but is subject to change
	Replacement timing is coordinated with other asset (road, storm, sanitary, etc.) reconstruction and renewal whenever reasonably possible

Forecasted Capital Requirements

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



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

5.1.5 Risk & Criticality

Risk Matrix

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

Risks to Current Asset Management Strategies

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

Regulatory and Community Expectations

The Municipality faces the challenge of balancing costs and expectations from users and regulators. Users expect high quality water services, but the demands must be agreed and costs acceptable to the overall community. Regulatory requirements can also shift from time to time, so it is essential to maintain a high grade and standard.

Climate Change & Extreme Weather Events

The Municipality has experienced periods of cold spells resulting in increased instances of frozen water services. To alleviate the issue partially, the Municipality has asked residents to keep the water running at the tap. This increases the amount of water needed to be treated as well. Frozen water services also pose an inconvenience to homeowners and tenants and can result in property damage due to burst pipes and damaged plumbing, as well as expensive plumbing costs.

5.1.6 Levels of Service

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

Community Levels of Service

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

Service Attribute	Qualitative Description	Current LOS (2020)
Scope	Description, which may include maps, of the user groups or areas of the municipality that are connected to the municipal water system	See Appendix B
	Description, which may include maps, of the user groups or areas of the municipality that have fire flow	See Appendix B
Reliability	Description of boil water advisories and service interruptions	Property owners in the affected community are notified of any boil water advisories and the cause of the interruption.

Technical Levels of Service

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

Service Attribute	Technical Metric	Current LOS (2020)
Scope	% of properties connected to the municipal water system	45%
	% of properties where fire flow is available	44%
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	0.53%

5.1.7 Recommendations

Asset Inventory

- Review recent tenders and vendor quotes to ensure replacement costs reflect the true, current-day value of replacements.

Condition Assessment Strategies

- Identify condition assessment strategies for high value and high-risk water network assets.
- Develop proxy condition scores for watermains, considering historical breaks, material, age, and other indicators of failure.

Risk Management Strategies

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

Levels of Service

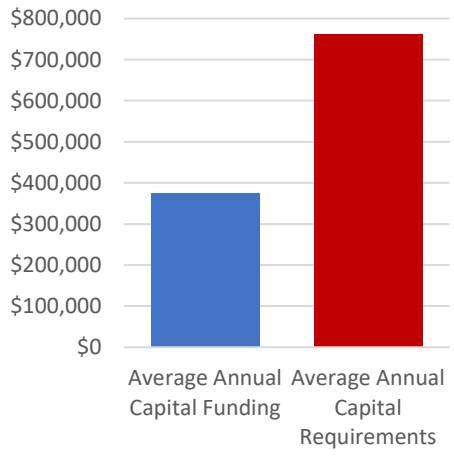
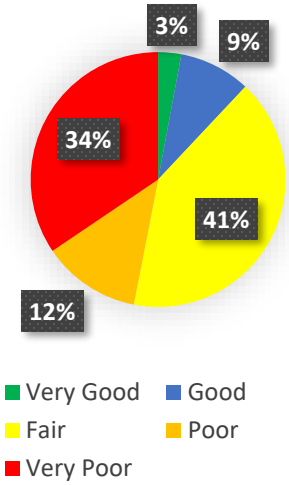
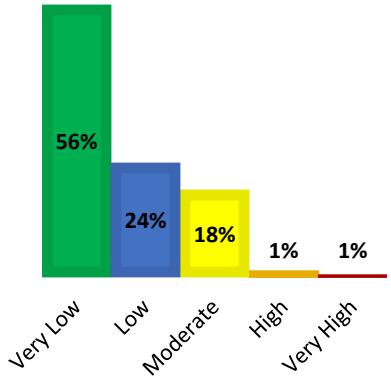
- Continue to measure current levels of service in accordance with the metrics that the Municipality has established in this AMP. Additional metrics can be established as they are determined to provide meaningful and reliable inputs into asset management planning.
- Work towards identifying proposed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

5.2 Sanitary Sewer Network

The sewer services provided by the Municipality are overseen by the Environmental Services department. The department is responsible for the following:

- Brussels Pumping Station and Treatment Plant
- Seaforth Treatment Plant, Pumping Station, and Lagoon
- Vanastra Treatment Plan
- Sanitary Mains of various sizes
- Related equipment tied to sanitary assets

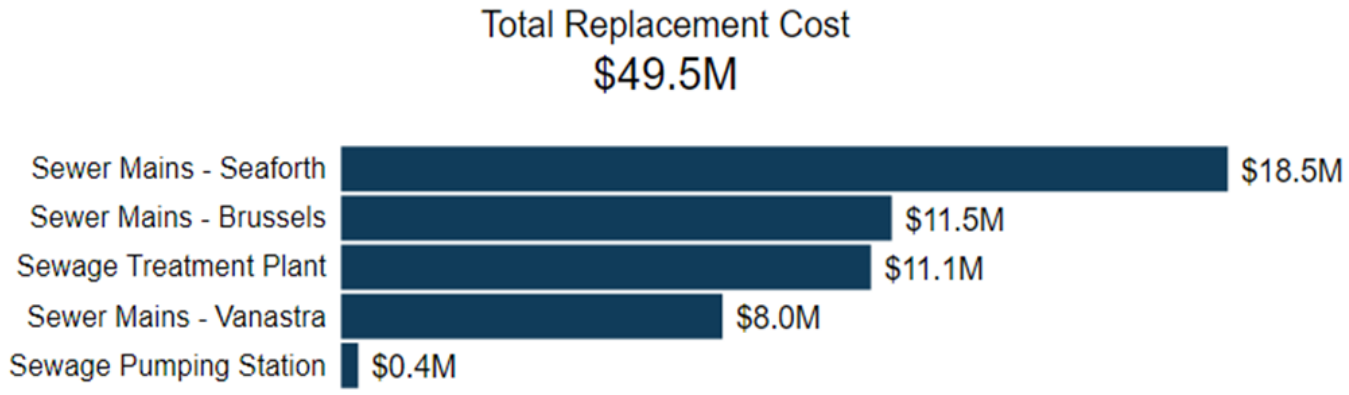
The table below outlines high-level service indicators for the Sanitary Sewer Network.

Cost	Performance (Average Condition)	Risk
		

5.2.1 Asset Inventory & Replacement Cost

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

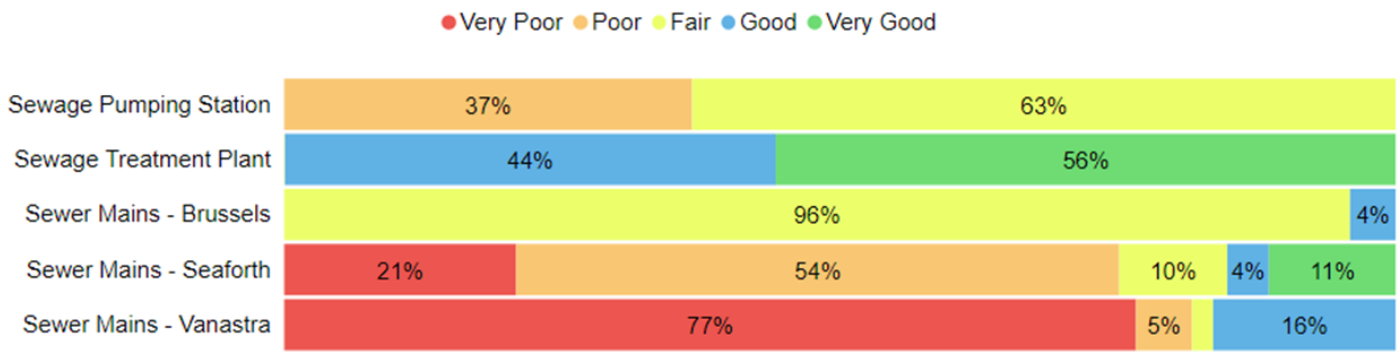
Asset Segment	Quantity	Replacement Cost	Annual Capital Requirement
Sewage Pumping Station	2 (27 components)	$365,322	$8,045
Sewage Treatment Plant	3 (183 components)	$11,080,074	$180,517
Sewer Mains - Brussels	10,767 Length (m)	$11,514,197	$157,636
Sewer Mains - Seaforth	16,629 Length (m)	$18,540,752	$288,737
Sewer Mains - Vanastra	7,273 Length (m)	$7,978,392	$125,929
	Total:	**$49,478,737**	**$760,864**



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
Sewage Pumping Station	90%	Very Good	100% Assessed
Sewage Treatment Plant	98%	Very Good	100% Assessed
Sewer Mains - Brussels	58%	Fair	100% Assessed
Sewer Mains - Seaforth	43%	Fair	90% Assessed
Sewer Mains - Vanastra	25%	Poor	100% Assessed
	56%	**Fair**	**96% Assessed**



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

Current Approach to Condition Assessment

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

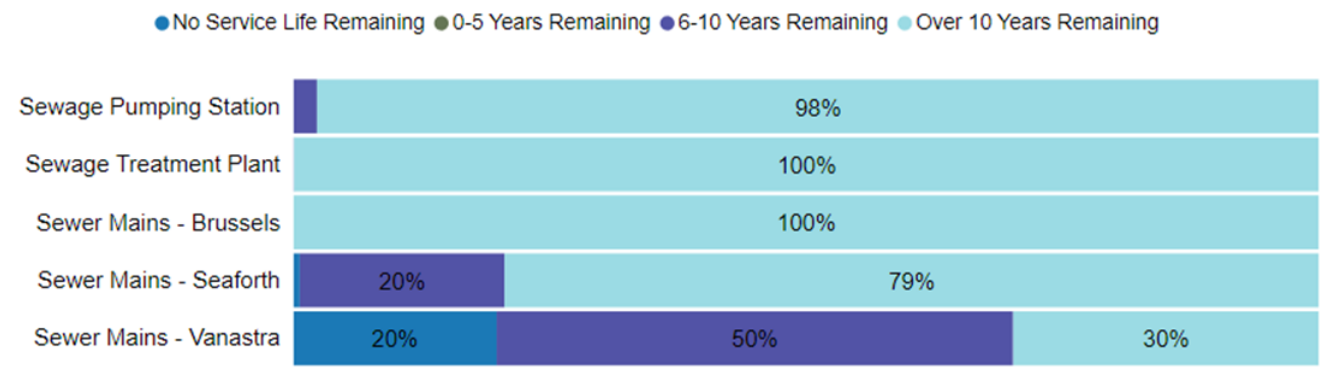
- Closed-circuit television (CCTV) are generally only undertaken prior to reconstruction related work, otherwise, no formal condition assessment programs are in place for the Sanitary Network

- If high flow rates have been identified, additional inspections are considered including visual inspections, CCTV, or smoke tests
- Manholes are visually inspected periodically

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)
Sewage Pumping Station	50 years	34.3
Sewage Treatment Plant	3-100 years	38.0
Sewer Mains - Brussels	60-75 years	37.9
Sewer Mains - Seaforth	50-90 years	39.9
Sewer Mains - Vanastra	60-90 years	62.1
		41.1



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

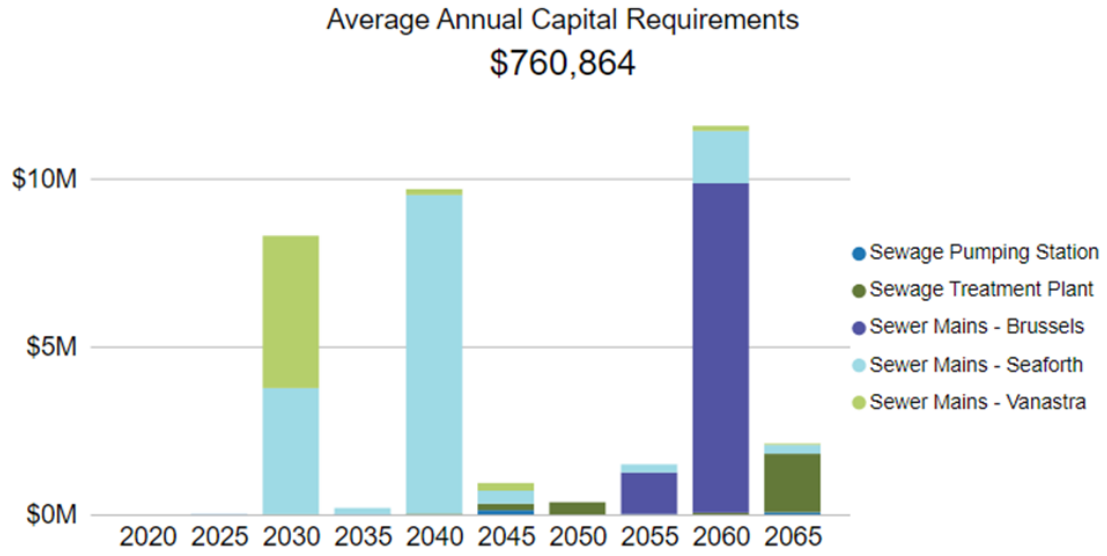
The condition or performance of most assets will deteriorate over time. To ensure that municipal assets are performing as expected and meeting the needs of customers, it is important to establish a lifecycle management strategy to proactively manage asset deterioration.

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

Activity Type	Description of Current Strategy
Maintenance	Flushing is completed for the entire sanitary network every 3 years. However, areas prone to blockages or issues are flushed more regularly (e.g. annually)
	Leakage issues are fixed upon identification
Rehabilitation & Replacement	In the absence of mid-lifecycle rehabilitative events, most sanitary assets are simply maintained with the goal of full replacement once it reaches its end-of-life. A 5-year capital planning horizon is currently in place

Forecasted Capital Requirements

The following graph forecasts long-term capital requirements, consolidated to 5-year increments. The annual capital requirement represents the average amount per year that the Municipality 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 A.

5.2.5 Risk & Criticality

Risk Matrix

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

Risks to Current Asset Management Strategies

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

Growth and Capacity

The Municipality is expected to grow and develop from an influx of people and employment. This will require expansion and upgrades to existing sanitary services. Without these upgrades, growth may be limited.

Capital Funding Strategies

Funding for sanitary sewer systems is heavily dependant on the availability of grant funding opportunities. Uncertainty in grant funding poses a challenge for planning. When grants are not available, necessary upkeep and maintenance activities may need to be deferred.

5.2.6 Levels of Service

The following tables identify the Municipality'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 Municipality has selected for this AMP.

Community Levels of Service

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

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

Service Attribute	Qualitative Description	Current LOS (2020)
		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.
	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 (2020)
Scope	% of properties connected to the municipal wastewater system	38%
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	N/A
	# 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	0.76%

5.2.7 Recommendations

Asset Inventory

- Review recent tenders and vendor quotes to ensure replacement costs reflect the true, current-day value of replacements.

Condition Assessment Strategies

- Identify condition assessment strategies for high value and high-risk sanitary sewer 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 Municipality's lifecycle management strategies at regular intervals to determine the impact cost, condition, and risk.

Levels of Service

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

6 Impacts of Growth

Key Insights

- Understanding the key drivers of growth and demand will allow the Municipality to plan for new infrastructure more effectively, and the upgrade or disposal of existing infrastructure
- Moderate population and employment growth is expected
- The costs of growth should be considered in long-term funding strategies that are designed to maintain the current level of service

6.1 Description of Growth Assumptions

The demand for infrastructure and services will change over time based on a combination of internal and external factors. Understanding the key drivers of growth and demand will allow the Municipality to plan for new infrastructure more effectively, 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 Huron East Official Plan (July 2003 – Consolidated July 2020)

The Municipality adopted an Official Plan to address matters of local planning interest. The Official Plan is a planning document for the purpose of guiding the future development of the Municipality of Huron East.

The Official Plan has been approved by Council as of July 29, 2003, as By-Law #55-2003. The consolidated document presented as of July 2020 includes subsequent amendments made since 2003.

The Official Plan designates Primary Settlement Areas, Secondary Settlement Areas, and Tertiary Settlement Areas. Primary Settlement Areas are communities with full municipal water & sewer services and are intended to be the primary location for growth and development. These areas include Seaforth, Brussels, Vanastra, and the lands South of Seaforth (Bridges). Secondary Settlement Areas are communities of villages and hamlets that have partial municipal services and are intended to accommodate limited amount of residential growth. These areas include Brucefield, Egmondville, Molesworth, and the lands South of Clinton. Tertiary Settlement Areas are villages and hamlets serviced by individual or privately operated communal on-site services and development in these areas will be small-scale and limited to infilling and rounding out. These areas include Cranbrook, Dublin, Ethel, Graham Survey, Harpurhey, Henfryn, Kippen, St. Columban, Walton, and Winthrop.

The Municipality will endeavor to direct population growth according to settlement area type as outlined in the table below:

Settlement Area Type	Allocated Growth
Primary Settlement Area	65%
Secondary Settlement Area	20%
Tertiary Settlement Area	15%

6.1.2 County of Huron Official Plan: 5 Year Review Proposed Changes (February 2021)

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 following table outlines the population and employment forecasts allocated to Huron East.

Year	Population	Employment
2016	9,138	6,287
2021	9,231	6,351
2026	9,339	6,425
2031	9,416	6,478
2036	9,416	6,478
2041	9,370	6,446

6.2 Impact of Growth on Lifecycle Activities

By July 1, 2025, the Municipality's asset management plan must include a discussion of how the assumptions regarding future changes in population and economic activity informed the preparation of the lifecycle management and financial strategy.

Planning for forecasted population growth may require the expansion of existing infrastructure and services. As growth-related assets are constructed or acquired, they should be integrated into the Municipality's AMP. While the addition of residential units will add to the existing assessment base and offset some of the costs associated with growth, the Municipality will need to review the lifecycle costs of growth-related infrastructure. These costs should be considered in long-term funding strategies that are designed to, at a minimum, maintain the current level of service.

7 Financial Strategy

Key Insights

- The Municipality is committing approximately $2,435,000 towards capital projects per year from sustainable revenue sources
- Given the annual capital requirement of $7,965,000, there is currently a funding gap of $5,531,000 annually
- For tax-funded assets, we recommend increasing tax revenues by 4.2% 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 1.3% annually for the next 20 years to achieve a sustainable level of funding
- For the Water Network, we recommend increasing rate revenues by 2.2% 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 a long-term financial plan (LTFP). The development of a comprehensive financial plan will allow the Municipality of Huron East to identify the financial resources required for sustainable asset management based on existing asset inventories, desired levels of service, and projected growth requirements.

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

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

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

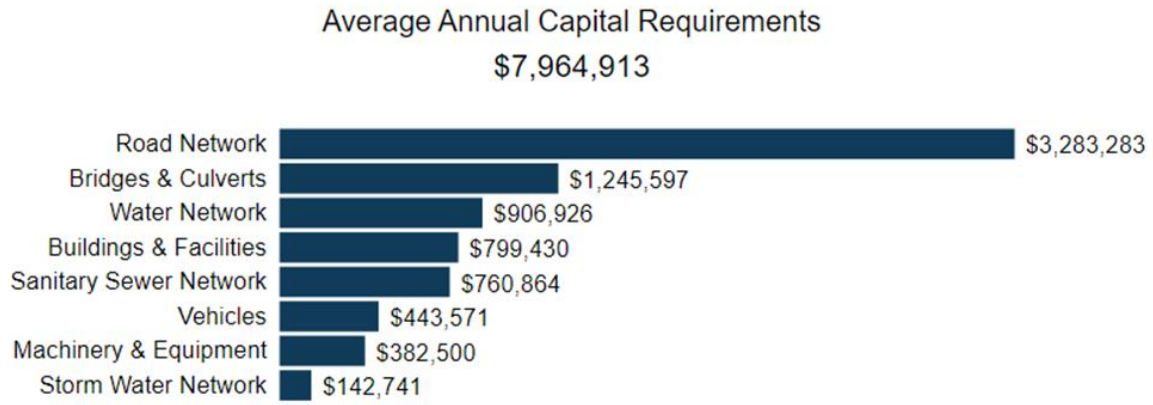
1. In order to reduce financial requirements, consideration has been given to revising service levels downward.
2. All asset management and financial strategies have been considered. For example:
    a. If a zero-debt policy is in place, is it warranted? If not, the use of debt should be considered.

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

7.1.1 Annual Requirements & Capital Funding

Annual Requirements

The annual requirements represent the amount the Municipality should allocate annually to each asset category to meet replacement needs as they arise, prevent infrastructure backlogs, and achieve long-term sustainability. In total, the Municipality must allocate approximately $7.96 million annually to address capital requirements for the assets included in this AMP.



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

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

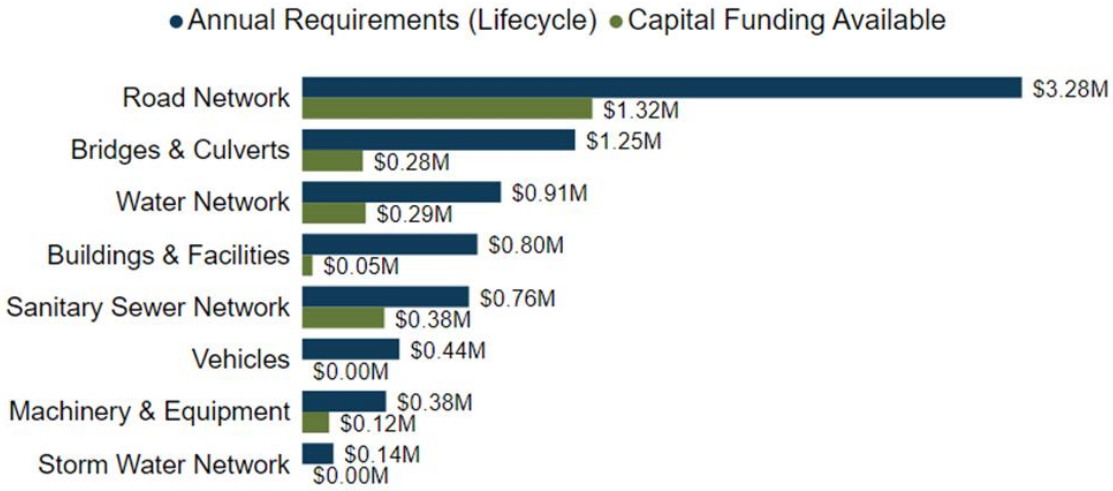
1. **Replacement Only Scenario**: Based on the assumption that assets deteriorate and – without regularly scheduled maintenance and rehabilitation – are replaced at the end of their service life.
2. **Lifecycle Strategy Scenario**: Based on the assumption that lifecycle activities are performed at strategic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

Asset Category	Annual Requirements (Replacement Only)	Annual Requirements (Lifecycle Strategy)	Difference
Road Network	$5,642,648	$3,283,283	$2,359,365

The implementation of a proactive lifecycle strategy for roads leads to a potential annual cost avoidance of $2,359,365 for the Road Network. This represents an overall reduction of the annual requirements for the category by 42%. As the lifecycle strategy scenario represents the lowest cost option available to the Municipality, we have used these annual requirements in the development of the financial strategy.

Annual Funding Available

Based on a historical analysis of sustainable capital funding sources, the Municipality is committing approximately $2,435,000 towards capital projects per year. Given the annual capital requirement of $7,965,000, there is currently a funding gap of $5,531,000 annually.



7.2 Funding Objective

We have developed a scenario that would enable Huron East 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, Equipment, and Vehicles
2. **Rate-Funded Assets:** Water Network, Sanitary Sewer Network

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

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

7.3 Financial Profile: Tax Funded Assets

7.3.1 Current Funding Position

The following tables show, by asset category, Huron East's average annual asset capital expenditure (CapEx) requirements, current funding positions, and funding increases required to achieve full funding on assets funded by taxes.

Asset Category	Avg. Annual Requirement	Annual Funding Available				Annual Deficit
		Taxes	Gas Tax	OCIF	Total Available	
Bridges & Culverts	1,246,000	-	277,000	-	277,000	969,000
Buildings & Facilities	799,000	47,000	-	-	47,000	752,000
Machinery & Equipment	383,000	123,000	-	-	123,000	260,000
Road Network	3,283,000	892,000	-	432,000	1,324,000	1,959,000
Storm Water Network	143,000	-	-	-	-	143,000
Vehicles	444,000	-	-	-	-	444,000
	6,298,000	**1,062,000**	**227,000**	**432,000**	**1,771,000**	**4.527,000**

The average annual investment requirement for the above categories is $6.3 million (MM). Annual revenue currently allocated to these assets for capital purposes is $1.8MM leaving an annual deficit of $4.5MM. Put differently, these infrastructure categories are currently funded at 28% of their long-term requirements.

The Municipality has significant reserves in place, which provides certainty in the short-term. Although the infrastructure deficit is high, reserves are available to offset this gap.

7.3.2 Full Funding Requirements

In 2020, Municipality of Huron East has annual tax revenues of $5.1MM. 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
Bridges & Culverts	19%
Buildings & Facilities	14.7%
Machinery & Equipment	5.1%
Road Network	38.4%
Storm Water Network	2.8%
Vehicles	8.7%
	88.7%

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

a) Huron East's formula based OCIF grant is scheduled to remain the same from $431,716 in 2020 to $431,716 in 2021.
b) Huron East's debt payments for these asset categories will be decreasing by $62,000 over the next 5 years and by $0 over the next 10 years. Although not shown in the table, debt payment decreases will be $172,000 and $16,000 over the next 15 and 20 years respectively.

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

	Without Capturing Changes				**With Capturing Changes**			
	5 Years	**10 Years**	**15 Years**	**20 Years**	**5 Years**	**10 Years**	**15 Years**	**20 Years**
Infrastructure Deficit	4,527,000	4,527,000	4,527,000	4,527,000	4,527,000	4,527,000	4,527,000	4,527,000
Change in Debt Costs	N/A	N/A	N/A	N/A	-(62,000)	-(62,000)	-(62,000)	-(62,000)
Change in OCIF Grants	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Resulting Infrastructure Deficit	4,527,000	4,527,000	4,527,000	4,527,000	4,465,000	4,465,000	4,465,000	4,465,000
Tax Increase Required	88.8%	88.8%	88.8%	88.8%	87.6%	87.6%	84.2%	83.9%
Annually	**17.8%**	**8.9%**	**5.9%**	**4.4%**	**17.5%**	**8.8%**	**5.6%**	**4.2%**

7.3.3 Financial Strategy Recommendations

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

a) when realized, reallocating the debt cost reductions to the infrastructure deficit as outlined above.
b) increasing tax revenue by 4.2% each year for the next 20 years solely for the purpose of phasing in full funding to the asset categories covered in this section of the AMP.
c) allocating the current gas tax and OCIF revenue as outlined previously.
d) allocating the scheduled OCIF grant increases to the infrastructure deficit as they occur.
e) reallocating appropriate revenue from categories in a surplus position to those in a deficit position.
f) increasing existing and future infrastructure budgets by the applicable inflation index on an annual basis in addition to the deficit phase-in.

Notes:

1. As in the past, periodic senior government infrastructure funding will most likely be available during the phase-in period. By Provincial AMP rules, this periodic funding cannot be incorporated into an AMP unless there are firm commitments in place. We have included OCIF formula-based funding, if applicable since this funding is a multi-year commitment[3].
2. We realize that raising tax revenues by the amounts recommended above for infrastructure purposes will be very difficult to do. However, considering a longer phase-in window may have even greater consequences in terms of infrastructure failure.

Although this option achieves full CapEx funding on an annual basis in 20 years and provides financial sustainability over the period modeled, the recommendations do require prioritizing capital projects to fit the resulting annual funding available. Current data shows a pent-up investment demand of $3,283,283 for the Road Network, $1,245,595 for Bridges & Culverts, $799,430 for the Buildings & Facilities, $382,500 for Machinery & Equipment, $142,741 for Storm Water Network and $443,571 for Vehicles.

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

[3] The Municipality should take advantage of all available grant funding programs and transfers from other levels of government. While OCIF has historically been considered a sustainable source of funding, the program is currently undergoing review by the provincial government. This review may impact its availability.

7.4 Financial Profile: Rate Funded Assets

7.4.1 Current Funding Position

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

Asset Category	Avg. Annual Requirement	Annual Funding Available				Annual Deficit
		Rates	Gas Tax	OCIF	Total Available	
Water Network	907,000	290,000	-	-	290,000	617,000
Sanitary Sewer Network	761,000	375,000	-	-	375,000	386,000
	1,668,000	**665,000**	**-**	**-**	**665,000**	**1,003,000**

The average annual investment requirement for the above categories is $1.668MM. Annual revenue currently allocated to these assets for capital purposes is $665K leaving an annual deficit of $1.003MM. Put differently, these infrastructure categories are currently funded at 40% of their long-term requirements.

7.4.2 Full Funding Requirements

In 2020, Huron East had annual sanitary revenues of $1.5MM and annual water revenues of $1.4MM. As illustrated in the table below, without consideration of any other sources of revenue, full funding would require the following changes over time:

Asset Category	Rate Change Required for Full Funding
Water Network	44.1%
Sanitary Sewer Network	25.3%

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

	Water Network				Sanitary Sewer Network			
	5 Years	10 Years	15 Years	20 Years	5 Years	10 Years	15 Years	20 Years
Infrastructure Deficit	617,000	617,000	617,000	617,000	386,000	386,000	386,000	386,000
Rate Increase Required	44.1%	44.1%	44.1%	44.1%	25.3%	25.3%	25.3%	25.3%

Annually:	**8.8%**	**4.4%**	**2.9%**	**2.2%**	**5.1%**	**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 CapEx being achieved over 20 years by:

a) when realized, reallocating the debt cost reductions to the infrastructure deficit as outlined above.
b) increasing rate revenues by 2.2% for the Water Network, & 1.3% for the Sanitary Sewer Network each year for the next 20 years.
c) These rate revenue increases are solely for the purpose of phasing in full funding to the respective asset categories covered in this AMP.
d) increasing existing and future infrastructure budgets by the applicable inflation index on an annual basis in addition to the deficit phase-in.

Notes:

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

Although this strategy achieves full CapEx funding for rate-funded assets over 20 years, the recommendation does require prioritizing capital projects to fit the annual funding available. Current data shows a pent-up investment demand of $1,659,720 for the Water Network and $1,699,226 for the Sanitary Sewer Network.

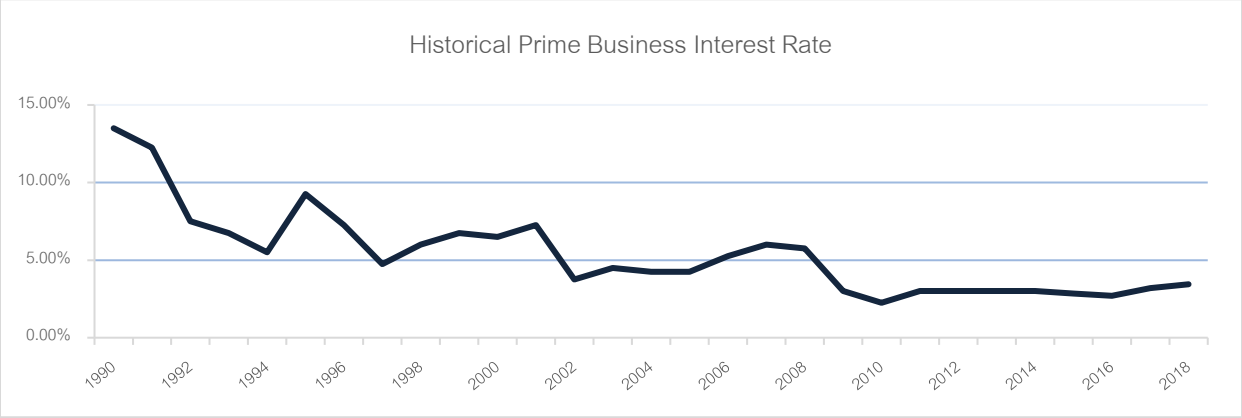
Prioritizing future projects will require the current data to be replaced by condition-based data. Although our recommendations include no further use of debt, the results of the condition-based analysis may require otherwise.

7.5 Use of Debt

For reference purposes, the following table outlines the premium paid on a project if financed by debt. For example, a $1M project financed at 3.0%[4] over 15 years would result in a 26% premium or $260,000 of increased costs due to interest payments. For simplicity, the table does not consider the time value of money or the effect of inflation on delayed projects.

Interest Rate	Number of Years Financed					
	5	10	15	20	25	30
7.0%	22%	42%	65%	89%	115%	142%
6.5%	20%	39%	60%	82%	105%	130%
6.0%	19%	36%	54%	74%	96%	118%
5.5%	17%	33%	49%	67%	86%	106%
5.0%	15%	30%	45%	60%	77%	95%
4.5%	14%	26%	40%	54%	69%	84%
4.0%	12%	23%	35%	47%	60%	73%
3.5%	11%	20%	30%	41%	52%	63%
3.0%	9%	17%	26%	34%	44%	53%
2.5%	8%	14%	21%	28%	36%	43%
2.0%	6%	11%	17%	22%	28%	34%
1.5%	5%	8%	12%	16%	21%	25%
1.0%	3%	6%	8%	11%	14%	16%
0.5%	2%	3%	4%	5%	7%	8%
0.0%	0%	0%	0%	0%	0%	0%

It should be noted that current interest rates are near all-time lows. Sustainable funding models that include debt need to incorporate the risk of rising interest rates. The following graph shows where historical lending rates have been:



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

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

The following tables outline how Huron East has historically used debt for investing in the asset categories as listed. There is currently $1,810,000 of debt outstanding for the assets covered by this AMP with corresponding principal and interest payments of $250,000, well within its provincially prescribed maximum of $3,758,625.

Asset Category	Current Debt Outstanding	Use of Debt in the Last Five Years				
		2016	2017	2018	2019	2020
Bridges & Culverts	0	0	0	0	0	0
Buildings	936,000	0	0	0	0	0
Equipment	26,000	0	0	0	0	0
Road Network	848,000	0	0	0	0	848,000
Storm Water Network	0	0	0	0	0	0
Vehicles	0	0	0	0	0	0
Total Tax Funded:	**1,810,000**	**0**	**0**	**0**	**0**	**848,000**
Water Network	0	0	0	0	0	0
Sanitary Sewer Network	0	0	0	0	0	0
Total Rate Funded:	**0**	**0**	**0**	**0**	**0**	**0**

Asset Category	Principal & Interest Payments in the Next Ten Years						
	2020	2021	2022	2023	2024	2025	2030
Bridges & Culverts	0	0	0	0	0	0	0
Buildings	197,000	97,000	97,000	97,000	97,000	97,000	97,000
Equipment	53,000	26,000	0	0	0	0	0
Road Network	0	91,000	91,000	91,000	91,000	91,000	91,000
Storm Water Network	0	0	0	0	0	0	0
Vehicles	0	0	0	0	0	0	0
Total Tax Funded:	**250,000**	**214,000**	**188,000**	**188,000**	**188,000**	**188,000**	**188,000**
Water Network	0	0	0	0	0	0	0
Sanitary Sewer Network	0	0	0	0	0	0	0
Total Rate Funded:	**0**	**0**	**0**	**0**	**0**	**0**	**0**

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

7.6 Use of Reserves

7.6.1 Available Reserves

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

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

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

Asset Category	Balance on December 31, 2020
Bridges & Culverts	1,665,000
Buildings	672,000
Equipment	392,000
Road Network	38,000
Storm Water Network	38,000
Vehicles	126,000
Total Tax Funded:	**2,931,000**
Water Network	2,954,000
Sanitary Sewer Network	5,601,000
Total Rate Funded:	**8,555,000**

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

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

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

8 Appendices

Key Insights

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

Appendix A: 10-Year Capital Requirements

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

Road Network

Asset Segment	Backlog	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029
Rural - Paved	$0	$1,362,800	$1,842,912	$480,000	$2,203,720	$509,280	$1,263,720	$798,000	$4,175,428	$1,200,000	$1,740,000
Rural - Tar & Chip Surface	$457,083	$0	$136,000	$0	$204,000	$0	$0	$0	$87,723	$0	$1,188,000
Sidewalks	$84,262	$0	$0	$0	$0	$0	$258,666	$0	$0	$0	$0
Urban - Paved	$2,713,920	$0	$0	$0	$5,566,000	$3,920,800	$0	$0	$0	$0	$0
	$3,255,265	**$1,362,800**	**$1,978,912**	**$480,000**	**$7,973,720**	**$4,430,080**	**$1,522,386**	**$798,000**	**$4,263,151**	**$1,200,000**	**$2,928,000**

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	$1,416,100
Culverts	$0	$0	$0	$0	$0	$0	$251,600	$271,358	$0	$0	$0
	$0	**$0**	**$0**	**$0**	**$0**	**$0**	**$251,600**	**$271,358**	**$0**	**$0**	**$1,416,100**

Storm Water Network

Asset Segment	Backlog	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029
Storm Drains	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
	$0	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**

Buildings											
Asset Segment	Backlog	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029
General Government	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Health Services	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Protection Services	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Recreation & Cultural Services	$0	$0	$0	$0	$0	$0	$0	$0	$0	$5,491	$38,450
Seaforth PUC Trusts	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Transportation Services	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
	$0	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$5,491**	**$38,450**

Equipment											
Asset Segment	Backlog	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029
Environmental Services	$0	$0	$0	$0	$0	$0	$6,000	$0	$0	$0	$0
General Government	$0	$0	$0	$34,000	$128,000	$8,000	$235,000	$14,000	$218,000	$16,000	$0
Health Services	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Protection Services	$0	$0	$0	$0	$0	$10,000	$0	$0	$0	$0	$56,200
Recreation & Cultural Services	$0	$0	$17,000	$0	$0	$30,000	$18,000	$17,000	$0	$18,000	$105,000
Transportation Services	$0	$0	$0	$0	$17,000	$0	$527,000	$0	$570,000	$1,397,000	$0
	$0	**$0**	**$17,000**	**$34,000**	**$145,000**	**$48,000**	**$786,000**	**$31,000**	**$788,000**	**$1,431,000**	**$161,200**

Vehicles											
Asset Segment	Backlog	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029
Fire	$0	$0	$0	$0	$0	$1,005,000	$0	$0	$0	$0	$2,505,000
Heavy Trucks	$0	$0	$0	$150,000	$0	$0	$0	$0	$600,000	$0	$150,000
Light Trucks	$0	$0	$37,000	$37,000	$0	$296,000	$0	$0	$37,000	$37,000	$37,000
	$0	**$0**	**$37,000**	**$187,000**	**$0**	**$1,301,000**	**$0**	**$0**	**$637,000**	**$37,000**	**$2,692,000**

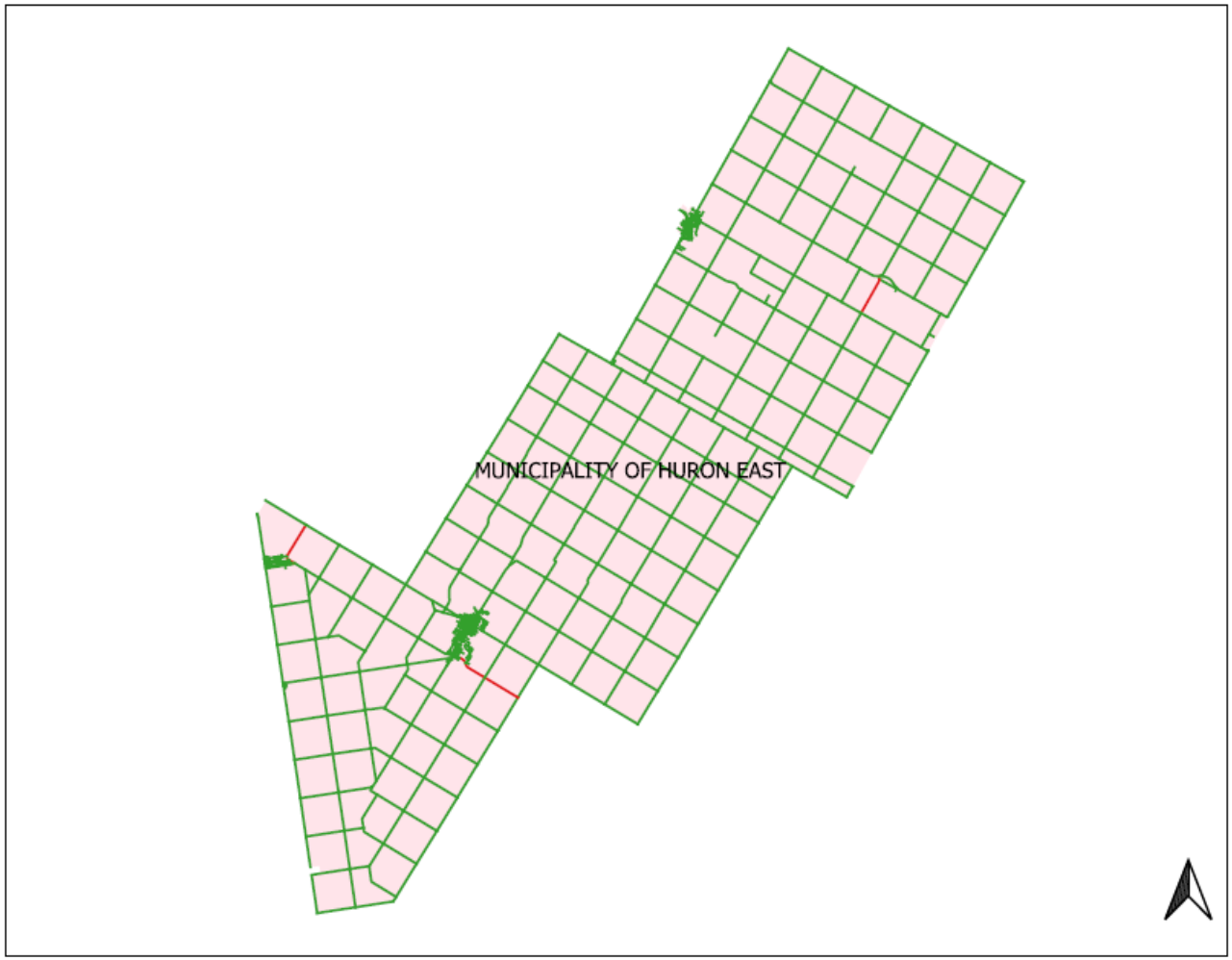
Water Network											
Asset Segment	Backlog	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029
Watermains - Brucefield	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$3,465,668
Watermains - Brussels	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$3,465,668
Watermains - Seaforth	$1,659,720	$0	$0	$0	$0	$0	$0	$0	$0	$0	$8,221,553
Watermains - Vanastra	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$5,237,148
Wells, Reservoirs, and Towers	$0	$0	$0	$0	$0	$0	$0	$0	$0	$1,926	$40,436
	$1,659,720	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$20,390,037**

Sanitary Sewer Network											
Asset Segment	Backlog	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029
Sewage Pumping Station	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$8,407
Sewage Treatment Plant	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Sewer Mains - Brussels	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Sewer Mains - Seaforth	$118,156	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Sewer Mains - Vanastra	$1,581,070	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
	$1,699,226	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$8,407**

All Asset Categories											
Asset Segment	Backlog	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029
Road Network	$3,255,265	$1,362,800	$1,978,912	$480,000	$7,973,720	$4,430,080	$1,522,386	$798,000	$4,263,151	$1,200,000	$2,928,000
Bridges & Culverts	$0	$0	$0	$0	$0	$0	$251,600	$271,358	$0	$0	$1,416,100
Storm Water Network	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Buildings	$0	$0	$0	$0	$0	$0	$0	$0	$0	$5,491	$38,450
Equipment	$0	$0	$17,000	$34,000	$145,000	$48,000	$786,000	$31,000	$788,000	$1,431,000	$161,200
Vehicles	$0	$0	$37,000	$187,000	$0	$1,301,000	$0	$0	$637,000	$37,000	$2,692,000
Water Network	$1,659,720	$0	$0	$0	$0	$0	$0	$0	$0	$0	$20,390,037
Sanitary Sewer Network	$1,699,226	$0	$0	$0	$0	$0	$0	$0	$0	$0	$8,407
	$6,614,211	**$1,362,800**	**$2,032,912**	**$701,000**	**$8,118,720**	**$5,779,080**	**$2,559,986**	**$1,100,358**	**$5,688,151**	**$2,673,491**	**$27,634,194**

Appendix B: Level of Service Maps

Huron East Road Network



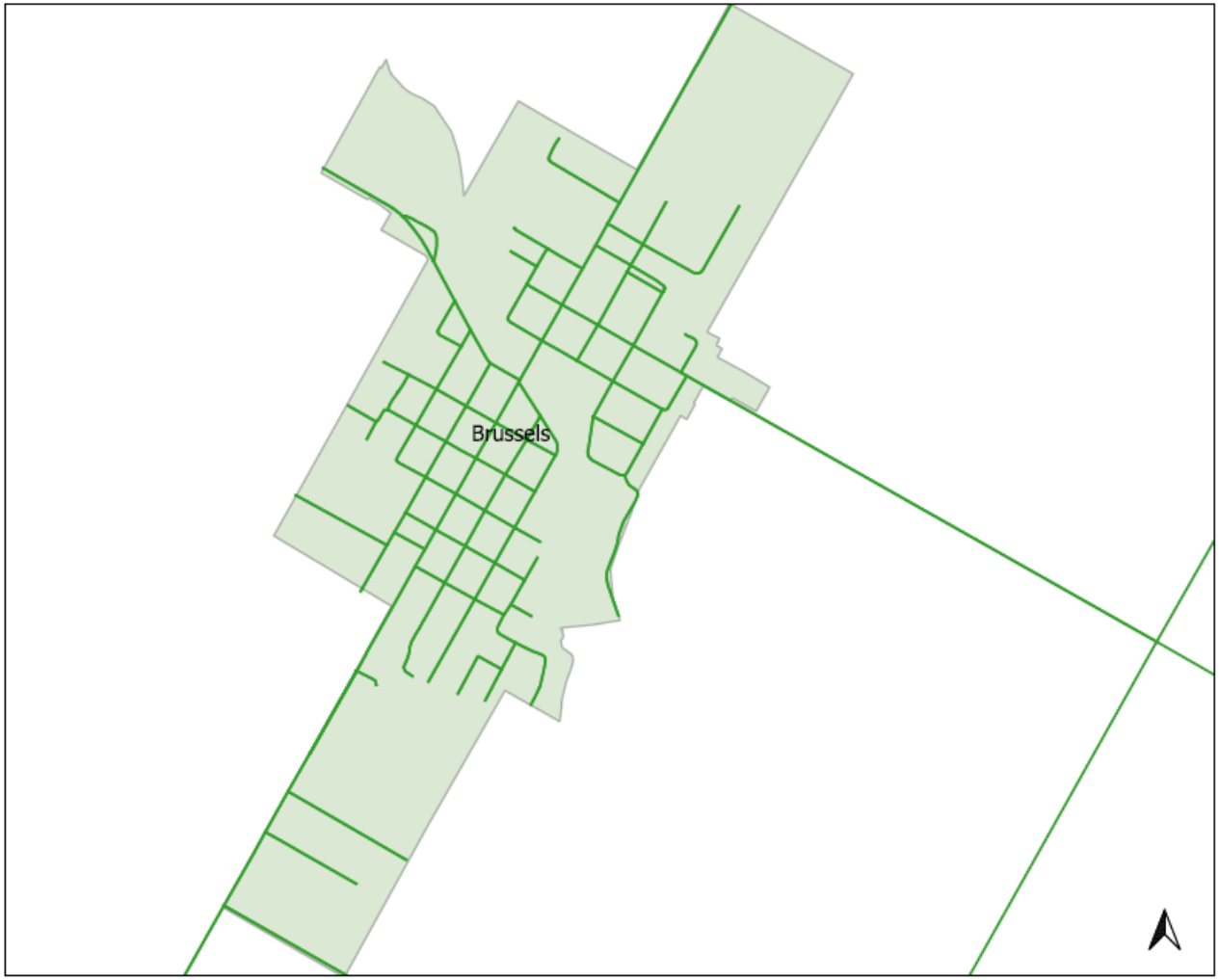
Legend

Roads Inventory [822]
- Class 3 [4]
- Class 4 [818]
- Other [0]
- Municipal Boundary

0 5,000 10,000 m

Produced by: PSD Citywide

Brussels Roads



Legend

Brussels Roads [123]

Class 4 [123]

Other [0]

Urban_Area

0 250 500 m

Produced by: PSD Citywide

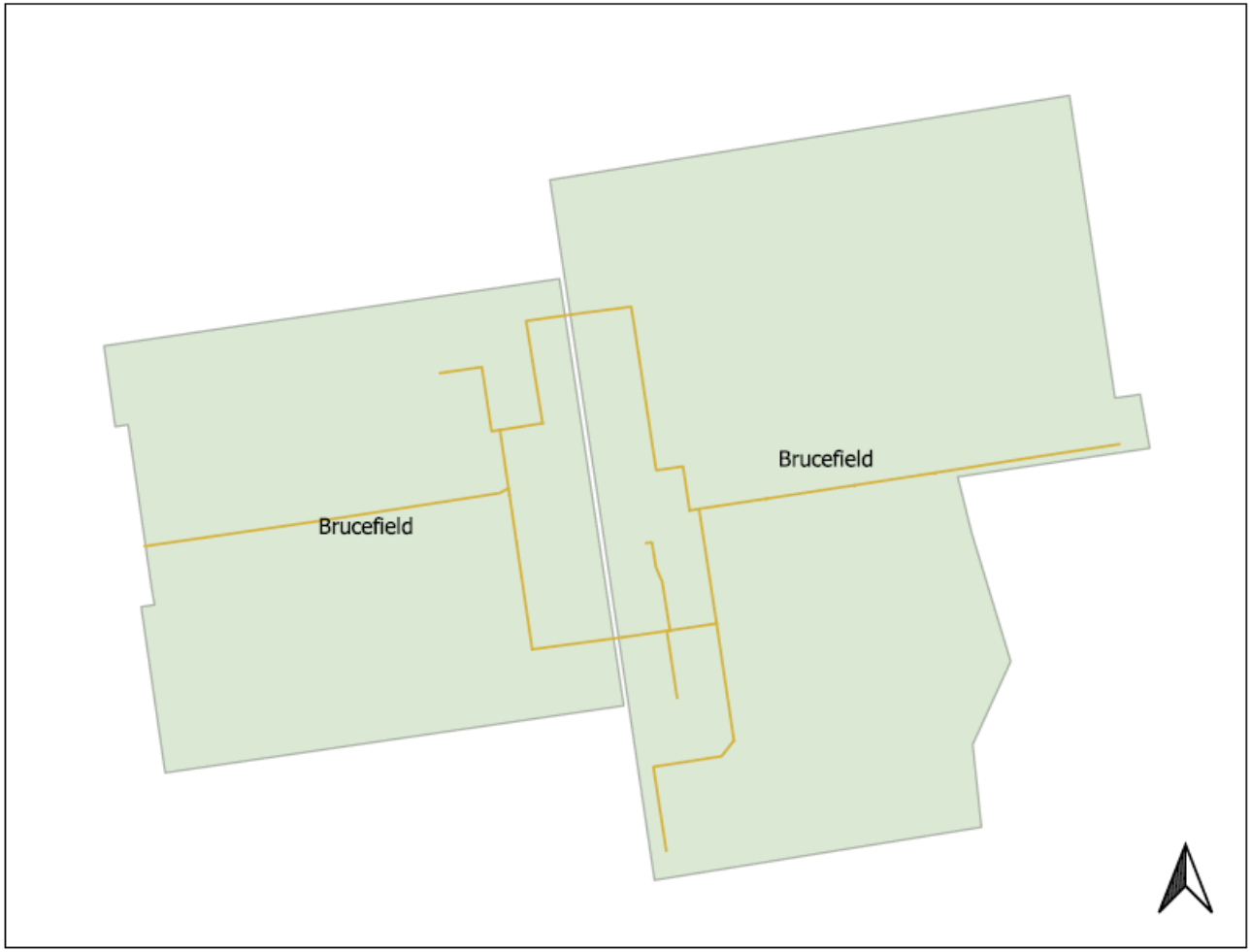
Seaforth Roads

Produced by: PSD Citywide

Vanastra Roads

Produced by: PSD Citywide

Brucefield Water Network



Legend

Brucefield Water Mains [21]
- Unknown Diameter [0]
- 100mm and under [21]
- 150mm [0]
- 200mm [0]
- 250mm [0]
- 300mm [0]
- Urban_Area

0 500 1,000 m

Produced by: PSD Citywide

Seaforth Water Network

Legend

- Urban_Area

SeaforthWaterMains [431]

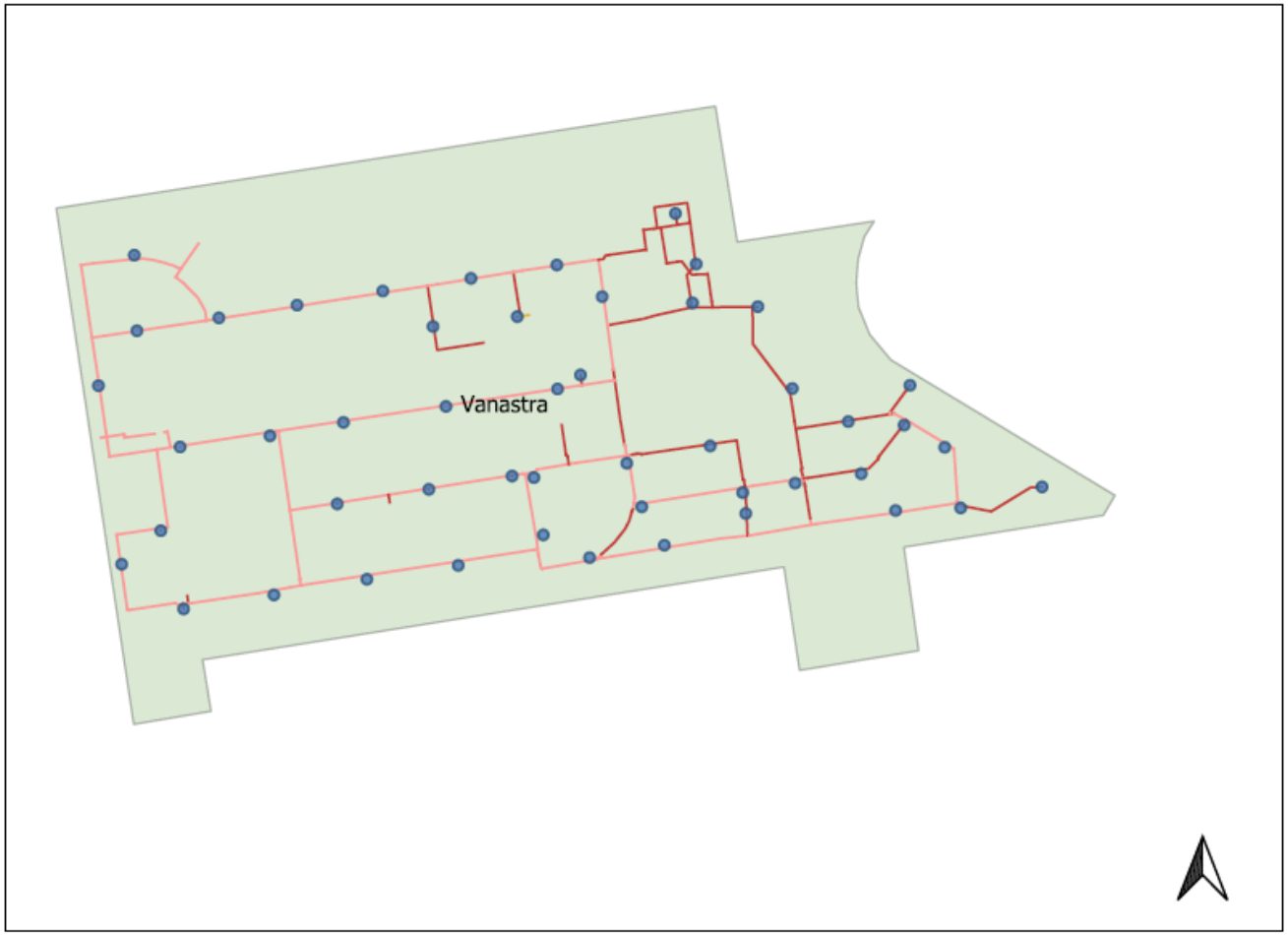
- Unknown Diameter [33]
- 100mm and under [12]
- 150mm [259]
- 200mm [54]
- 250mm [72]
- 300mm [1]

SeaforthHydrants [119]

0 250 500 m

Produced by: PSD Citywide

Vanastra Water Network



Legend

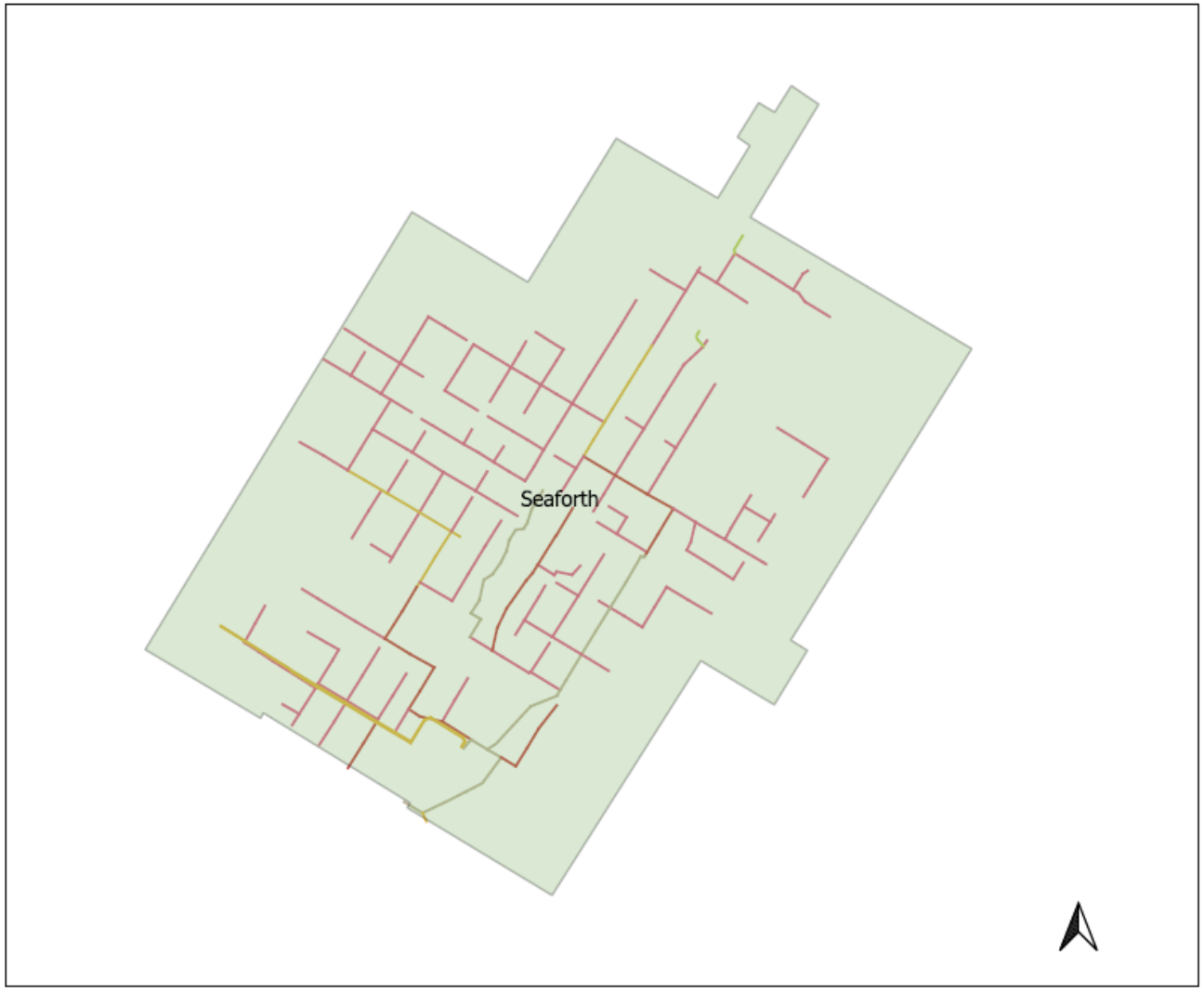
- VanastraHydrants [49]

VanastraWtrMains [164]

- Unknown Diameter [0]
- 100mm and under [1]
- 150mm [75]
- 200mm [88]
- 250mm [0]
- 300mm [0]
- Urban_Area

0 100 200 m

Seaforth Sanitary Network



Legend

- Urban_Area

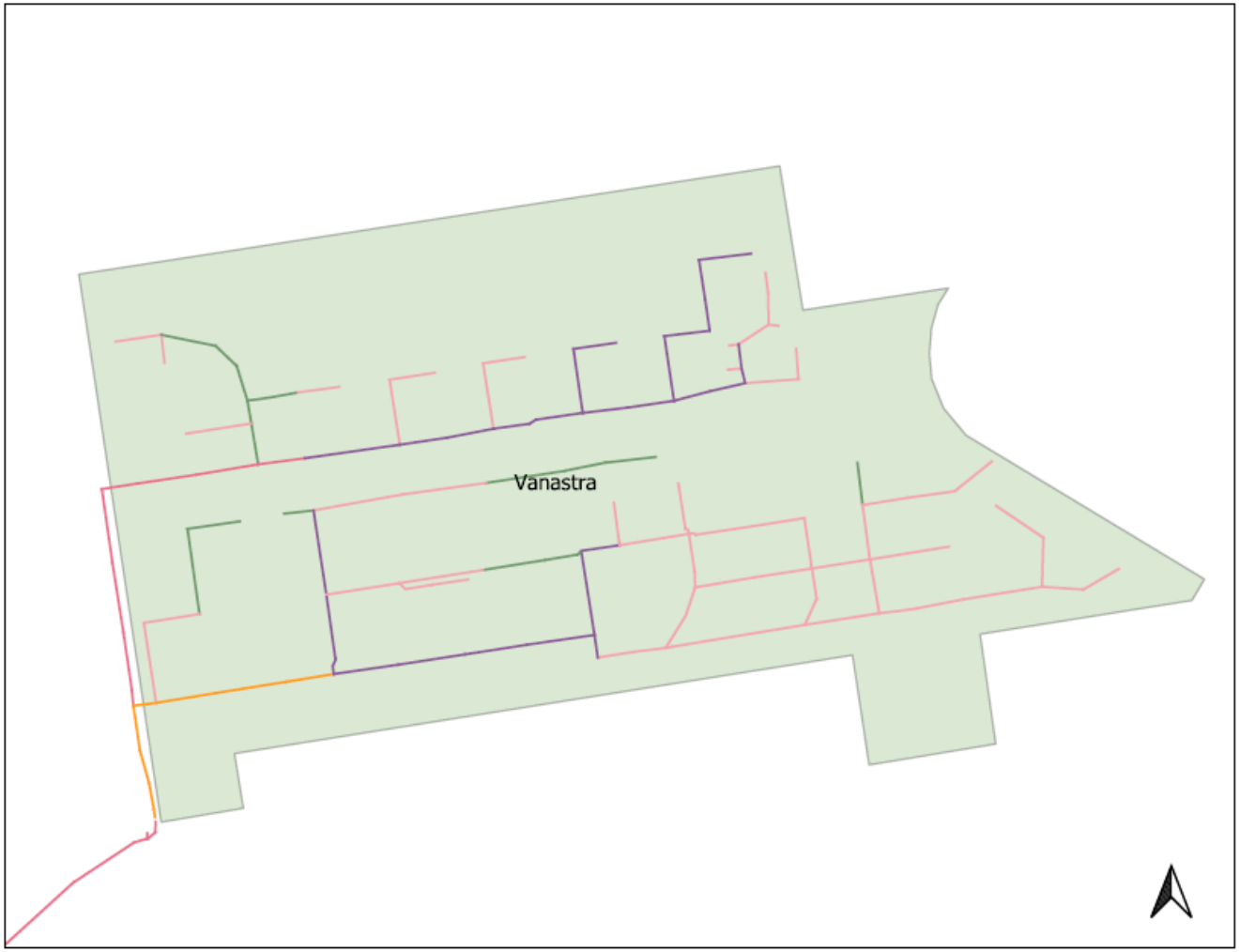
SeaforthSanMains [282]

- Unknown Diameter [0]
- 150mm [2]
- 200mm [192]
- 250mm [29]
- 300mm-375mm [30]
- 400mm-600mm [29]

0 250 500 m

Produced by: PSD Citywide

Vanastra Sanitary Network



Legend

VanastraSanMains [132]
- Unknown Diameter [0]
- 150mm [16]
- 200mm [62]
- 250mm [29]
- 300mm-375mm [17]
- 400mm-600mm [8]
- Urban_Area

0 100 200 m

Produced by: PSD Citywide

Seaforth Storm Network

Legend

- Urban_Area
- Seaforth Storm Sewer Mains [272]
  - Unknown Diameter [28]
  - 100mm-125mm [39]
  - 150mm-200mm [43]
  - 250mm-300mm [96]
  - 350mm-450mm [32]
  - 500mm-750mm [28]

0 250 500 m

Produced by: PSD Citywide

Vanastra Storm Network

Legend

- Vanastra Storm Sewer Main [182]
- Unknown Diameter [19]
- 100mm-125mm [1]
- 150mm-200mm [65]
- 250mm-300mm [57]
- 350mm-450mm [22]
- 500mm-750mm [11]
- Urban_Area

0 100 200 m

Produced by: PSD Citywide

Images of Bridge in Poor Condition
Bridge Road (M3)
Inspected: June 12th, 2020

Facing East

North Railing – Broken Rails

Soffit

South Elevation

Images of Culvert in Good Condition
Manley Line (M24)
Inspected: June 12th, 2020

Facing North

West Elevation

Barrel Facing East


East Elevation

Appendix C: Risk Rating Criteria

Probability of Failure

Asset Category	Risk Criteria	Criteria Weighting	Value/Range	Probability of Failure Score
Road Network (Roads)	Condition	30%	80 – 100	1
			60 – 79	2
			40 – 59	3
			20 – 39	4
			0 – 19	5
	Service Life Remaining (Years)	50%	20+	1
			10 – 20	2
			5 – 10	3
			1 – 5	4
			0 – 1	5
	Ride Comfort Rating	20%	80 – 100	1
			60 – 79	2
			40 – 59	3
			20 – 39	4
			0 – 19	5
Bridges & Culverts	Condition	25%	99+	1
			70 – 99	2
			60 – 70	3
			30 – 60	4
			0 – 30	5
	Service Life Remaining (Years)	50%	40+	1
			10 – 40	2
			5 – 10	3
			1 – 5	4
			0 – 1	5
	Load Limit (tonnes)	25%	25+	1
			20 – 25	2

Asset Category	Risk Criteria	Criteria Weighting	Value/Range	Probability of Failure Score
			15 – 20	3
			6 – 15	4
			1 – 6	5
Stormwater Mains	Condition	20%	99+	1
			70 – 99	2
			60 – 70	3
			30 – 60	4
			0 – 30	5
	Service Life Remaining (Years)	40%	45+	1
			25 – 45	2
			10 – 25	3
			1 – 10	4
			0 – 1	5
	Material	35%	PVC	1
			CONC	3
			PVC/Clay	3
			CSP	4
			Clay	5
	Slope (%)	5%	1+	1
			0.75 – 1	2
			0.5 – 0.75	3
			0.25 – 0.5	4
			0 – 0.25	5
Buildings, Parks	Condition	100%	80-100	1
			60-79	2
			40-59	3
			20-39	4
			0-19	5
Equipment, Vehicles	Condition	80%	80-100	1
			60-79	2
			40-59	3

Asset Category	Risk Criteria	Criteria Weighting	Value/Range	Probability of Failure Score
			20-39	4
			0-19	5
	Service Life Remaining (Years)	20%	20+	1
			10 – 20	2
			5 – 10	3
			1 – 5	4
			0 – 1	5
Water Mains	Condition	50%	80-100	1
			60-79	2
			40-59	3
			20-39	4
			0-19	5
	Pipe Material	40%	PVC	1
			Copper	2
			Cast/PVC	3
			Ductile/PVC	3
			Ductile Iron	3
			Cast Iron	4
			Ductile/Cast Iron	4
	Watermain Repairs	10%	0 – 1	1
			2 – 4	2
			5 – 6	3
			7 – 8	4
			More than 8	5
Sanitary Mains	Condition	30%	80-100	1
			60-79	2
			40-59	3
			20-39	4
			0-19	5
	Service Life	30%	45+	1
			25 – 45	2

Asset Category	Risk Criteria	Criteria Weighting	Value/Range	Probability of Failure Score
	Remaining (Years)		10 – 25	3
			1 – 10	4
			0 – 1	5
	Material	30%	PVC	1
			AC	3
			CONC	4
			Concrete	4
			Clay	5
	Slope (%)	10%	1+	1
			0.75 – 1	2
			0.5 – 0.75	3
			0.25 – 0.5	4
			0 – 0.25	5

Consequence of Failure

Asset Category	Risk Classification	Risk Criteria	Value/Range	Consequence of Failure Score
Road Network (Roads)	Economic (45%)	Cost/m (100%)	0 – 150	1
			150 – 300	2
			300 – 500	3
			500 – 1000	4
			1000+	5
	Social (20%)	AADT Ranges (60%)	0 – 49	1
			50 – 199	2
			200 – 399	3
			400 – 999	4
			999+	5
		Segment (40%)	Urban – Paved	2
			Urban – Road Base	2
			Rural – Gravel	3
			Rural – Tar & Chip	4
			Rural – Paved	4
	Health and Safety (30%)	Road Speed Range (100%)	< 50km	1
			50km – 59km	2
			60km – 80km	4
	Strategic (10%)	Underground Assets (100%)	No	1
			Yes	4
Bridges & Culverts	Economic (35%)	Replacement Cost (100%)	$0 – $100,000	1
			$100,000 – $300,000	2
			$300,000 – $600,000	3
			$600,000 – $1,000,000	4
			$1,000,000+	5
	Social (5%)	Detour Length km (100%)	0 – 1	1
			1 – 5	2
			5 – 10	3
			10 – 15	4
			15+	5

Asset Category	Risk Classification	Risk Criteria	Value/Range	Consequence of Failure Score
	Health and Safety (30%)	AADT Ranges (100%)	0 – 49	1
			50 – 199	2
			200 – 399	3
			400 – 999	4
			999+	5
	Operational (30%)	Main Deficiency (100%)	Rough Riding Surface	1
			Minor Defect	2
			Settlement / Movement	3
			Excessive Deformations	4
			Carrying Capacity	5
			Pedestrian / Vehicle Hazard	5
Storm Water Network	Economic (40%)	Cost / m (100%)	0 – 300	1
			300 – 500	2
			500 – 700	3
			700 – 1000	4
			1000+	5
	Operational (5%)	AADT Ranges (100%)	0 – 49	1
			50 – 199	2
			200 – 399	3
			400 – 999	4
			999+	5
	Social (15%)	Diameter in mm (50%)	0 – 300	1
			301 – 450	2
			451 – 600	3
			601 – 900	4
			900+	5
		Storm Sewer – Surcharge/Blockage (50%)	0 -1	1
			2	2
			3 – 4	3
			5 – 6	4
			6+	5

Asset Category	Risk Classification	Risk Criteria	Value/Range	Consequence of Failure Score
	Health and Safety (40%)	Proximity to Critical Services (100%)	Rural	1
			Commercial/Residential	2
			Major Commercial/Industrial	3
			Schools	4
			Medical/Care Facilities	5
Buildings	Economic (70%)	Replacement Cost (100%)	$0 - $50,000	1
			$50,000 – $200,000	2
			$200,000 – $1,000,000	3
			$1,000,000 – $5,000,000	4
			$5,000,000+	5
	Strategic (30%)	Zoning (10%)	Open Space	1
			Open Sapce Floodway	1
			Industrial	2
			Community Facility	3
			Community Facility & Residential Low Density	4
		Department (90%)	No Department	1
			Administration	2
			Recreation	3
			Public Works	4
			Water & Sewer	4
			Fire	5
Parks	Economic (40%)	Replacement Cost (100%)	$0 – $5,000	1
			$5,000 – $10,000	2
			$10,000 – $30,000	3
			$30,000 – $50,000	4
			$50,0000+	5
	Strategic (60%)	Park Type (100%)	Open Space	1
			Parkette	2
			Ball Park	3
			Sports Field	3
			Chapel	4

Asset Category	Risk Classification	Risk Criteria	Value/Range	Consequence of Failure Score
			Community Park	4
			Pool	5
Equipment	Economic (70%)	Replacement Cost (100%)	$0 – $2,000	1
			$2,000 – $5,000	2
			$5,000 – $10,000	3
			$10,000 – $50,000	4
			$50,000+	5
	Strategic (30%)	Type (100%)	Admin / Furniture	2
			IT	2
			Parks	3
			Tourism	3
			Motorized	4
			Road Operations	4
			Fire	5
			Health & Safety	5
Vehicles	Economic (60%)	Replaceemnt Cost (100%)	$0 – $25,000	1
			$25,000 – $75,000	2
			$75,000 – $150,000	3
			$150,000 – $250,000	4
			$250,000+	5
	Operational (10%)	CVOR Restriction (100%)	No	1
			Yes	4
	Strategic (30%)	Department (100%)	No Department	1
			Administration	1
			Recreation	2
			Public Works	3
			Water & Sewer	3
			Fire	5
Water Mains	Economic (40%)	Cost / m (100%)	0 – 300	1
			300 – 400	2
			400 – 500	3
			500 – 900	4

Asset Category	Risk Classification	Risk Criteria	Value/Range	Consequence of Failure Score
			900+	5
	Operational (5%)	AADT Ranges (100%)	0 – 49	1
			50 – 199	2
			200 – 399	3
			400 – 999	4
			999+	5
	Social (15%)	Diameter in mm (100%)	0 – 50	1
			51 – 100	2
			101 – 150	3
			151 – 200	4
			200+	5
	Health and Safety (40%)	Proximity to Critical Services (100%)	Rural	1
			Commercial/Residential	2
			Major Commercial/Industrial	3
			Schools	4
			Medical/Care Facilities	5
Sanitary Mains	Economic (35%)	Cost / m (100%)	0 – 150	1
			150 – 300	2
			300 – 500	3
			500 – 1000	4
			1000+	5
	Operational (15%)	AADT Ranges (5%)	0 – 49	1
			50 – 199	2
			200 – 399	3
			400 – 999	4
			999+	5
		Type (95%)	Gravity	2
			Forcemain	4
	Social (20%)	Diamter in mm (50%)	0 – 150	1
			151 – 250	2
			251 – 350	3
			351 – 450	4

Asset Category	Risk Classification	Risk Criteria	Value/Range	Consequence of Failure Score
			450+	5
		Sanitary Sewer – Surcharge/Blockage (50%)	1	1
			2	2
			3 – 4	3
			5 – 6	4
			6+	5
	Health and Safety (30%)	Proximity to Critical Services (100%)	Rural	1
			Commercial/Residential	2
			Major Commercial/Industrial	3
			Schools	4
			Medical/Care Facilities	5

Appendix D: Condition Assessment Guidelines

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

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

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

Role of Asset Condition Data

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

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

Guidelines for Condition Assessment

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

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

Developing a Condition Assessment Schedule

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

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

Facility Condition Index

The facility condition index (FCI) relies on two data points to express the condition of an asset or component: the cost of all deferred maintenance projects and the current replacement value of the asset or component. Expressed as a ratio (0.00-1.00), FCI is calculated as:

$$FCI = 1 - \frac{Current\ maintenance, repair, and\ replacement\ deficiencies\ (\$)}{Current\ replacement\ value\ (\$)}$$

The greater the FCI, the better. It can be used across the asset hierarchy, i.e., for both the facility as a whole and components within it. While the FCI itself is a numerical indicator, how it is mapped to descriptive condition ratings (e.g., good, or poor), can be subjective and depend on the municipality's risk tolerance. In general, an FCI below 70% indicates significant disrepair and the need for major investments.