AMP 2018

The 2018 Asset Management Plan for the

Township of Huron-Kinloss

Overall Grade **B**	**Infrastructure Report Card** **The Township of Huron-Kinloss**			
Asset Category	Asset Health (Condition)	Financial Capacity	Overall Grade	Comments
Road Network	**C**	**B**	**B**	Only 17% of the municipality's Road Network is in Very Good or Good condition. The average annual revenue required to sustain Huron-Kinloss's Road totals approximately **$2,037,000**. Based on Huron-Kinloss's current annual funding of **$1,732,000**, there is an annual **deficit of $305,000**.
Bridges & Culverts	**A**	**F**	**C**	87% of the municipality's Bridges & Culverts are in Very Good or Good condition. The average annual revenue required to sustain Huron-Kinloss's Bridges & Culverts totals approximately **$797,000**. Based on Huron-Kinloss's current annual funding of **$306,000** there is an annual **deficit of $491,000**.
Water Network	**A**	**A**	**A**	78% of the municipality's Water Network is in Very Good or Good condition. The average annual revenue required to sustain Huron-Kinloss's Water Network totals approximately **$939,000**. Based on Huron-Kinloss's current annual funding of **$865,000**, there is an annual **deficit of $74,000**.
Sanitary Sewer Network	**B**	**F**	**D**	67% of the municipality's Sanitary Sewer Network is in Very Good to Good condition. The average annual revenue required to sustain Huron-Kinloss's Sanitary Sewer Network totals approximately **$442,000**. Based on Huron-Kinloss's current annual funding of **$2,000**, there is an annual **deficit of $440,000**.
Storm Sewer Network	**A**	**F**	**C**	98% of the municipality's Storm Sewer Network is in Very Good to Good condition. The average annual revenue required to sustain Huron-Kinloss's Storm Sewer Network totals approximately **$101,000**. Based on Huron-Kinloss's current annual funding of **$0**, there is an annual **deficit of $101,000**.

Buildings	**C**	**D**	**C**	Only 24% of the municipality's Buildings assets are in Very Good to Good condition. The average annual revenue required to sustain Huron-Kinloss's Buildings totals approximately **$237,000**. Based on Huron-Kinloss's current annual funding of **$134,000**, there is an annual **deficit of $103,000**.
Machinery & Equipment	**C**	**F**	**D**	Only 22% of the municipality's Machinery & Equipment is in Very Good to Good condition. The average annual revenue required to sustain Huron-Kinloss's Machinery & Equipment totals approximately **$223,000**. Based on Huron-Kinloss's current annual funding of **$75,000**, there is an annual **deficit of $148,000**.
Land Improvements	**B**	**A**	**A**	64% of the municipality's Land Improvements are in Very Good to Good condition. The average annual revenue required to sustain Huron-Kinloss's Land Improvements totals approximately **$70,000**. Based on Huron-Kinloss's current annual funding of **$217,000**, there is an annual **surplus of $147,000**.
Fleet	**C**	**C**	**C**	39% of the municipality's Fleet are in Very Good to Good condition. The average annual revenue required to sustain Huron-Kinloss's Fleet totals approximately **$429,000**. Based on Huron-Kinloss's current annual funding of **$256,000**, there is an annual **deficit of $173,000**.

Note: Infrastructure Report Card Rating System Description is located in Appendix A.

Executive Summary

Municipal infrastructure provides the foundation for the economic, social and environmental health and growth of a community. We rely on roads, bridges, water systems and parks everyday to facilitate the movement of goods and people, deliver clean drinking water and provide a high quality of life. Municipalities across Canada are responsible for ensuring that these critical services and vital infrastructure are accessible and reliable. Municipalities own and manage nearly 60% of all public infrastructure in the country. However, due to aging infrastructure and as a consequence of declining senior government grants, municipalities are struggling to meet desired levels of service. Developing a viable solution requires a strategic, innovative and sustainable solution.

As part of Public Sector Digest's (PSD) Asset Management Roadmap the Township of Huron-Kinloss 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.

This comprehensive asset management plan (AMP) serves as the culmination of all activities undertaken as part of the Roadmap. It is an indispensable guide to asset management planning and investment into the future. Asset management is critical to extracting the highest total value from public assets at the lowest lifecycle cost. This AMP outlines both the existing state of municipal infrastructure and the Township's financial capacity to sustain existing infrastructure into the future. Furthermore, it details the outcomes of each step of the Roadmap and provides recommendations for maintaining and continuing to develop the Township's asset management program.

As analyzed in this asset management plan, the Township of Huron-Kinloss's infrastructure portfolio comprises the following Asset Categories: Road Network, Bridges & Culverts, Water Network, Sanitary Sewer Network, Storm Sewer Network, Buildings, Machinery & Equipment, Land Improvements and Fleet. The replacement cost of the Township's asset portfolio is estimated to be approximately $185 million.

Based on updated replacement costs, and a combination of assessed and age-based condition data, 61% of assets, with a valuation of $113 million, are in Very Good to Good condition; 23% are in Poor to Very Poor condition with a valuation of $43 million. Over 70% of the assets analyzed in this AMP have at least 10 years of useful life remaining. However, 13%, with a valuation of $24 million, remain in operation beyond their estimated useful life and require immediate attention.

In order for an AMP to be effective, it must be integrated with financial planning and long-term budgeting. The development of a comprehensive financial plan will allow the municipality to identify the financial resources required for sustainable asset management

based on existing asset inventories, desired levels of service, and projected growth requirements.

The Township's infrastructure backlog represents the investment needed today to meet previously deferred replacement needs and bring municipal assets to a state of good repair. Currently, the municipality has a combined infrastructure backlog of $23.2 million.

In order to reduce the infrastructure backlog and meet annual requirements to sustain the Township's assets, a financial strategy was developed. The following table outlines the annual infrastructure deficit identified:

Funding Source	Annual Requirement	Funding Available	Annual Deficit
Tax-Funded Assets	$3,894,000	$2,720,000	$1,174,000
Rate-Funded Assets	$1,381,000	$867,000	$514,000

The following two tables compare the total and average annual tax/rate change required to eliminate the Township's infrastructure deficit and achieve full funding across all asset categories:

Funding Source	Years Until Full Funding	Total Tax/Rate Change	Average Annual Tax/Rate Change
Tax-Funded Assets (All)	15 Years	13.9%	0.9%
Sanitary Sewer Network	20 Years	112.5%	5.6%
Water Network	5 Years	4.2%	0.8%

For tax-funded assets, we recommend a 15-year plan to achieve full funding by:

a) increasing tax revenues by 0.9% each year for the next 15 years solely for the purpose of phasing in full funding to the asset categories covered in this section of the AMP
b) allocating the current gas tax and OCIF revenue as outlined
c) allocating the scheduled OCIF grant increases to the infrastructure deficit as they occur
d) reallocating appropriate revenue from categories in a surplus position to those in a deficit position.
e) increasing existing and future infrastructure budgets by the applicable inflation index on an annual basis in addition to the deficit phase-in

There are separate financial strategies for each rate-funded asset. For the Sanitary Sewer Network, we recommend a 20-year plan to achieve full funding by:

a) increasing rate revenues by 5.6% each year for the next 20 years solely for the purpose of phasing in full funding
b) increasing future infrastructure budgets by the applicable inflation index on an annual basis

For the Water Network we recommend a 5-year plan to achieve full funding by:

a) increasing rate revenues by 0.8% each year for the next 5 years solely for the purpose of phasing in full funding
b) increasing future infrastructure budgets by the applicable inflation index on an annual basis

These recommendations are based on maintaining the existing system of billing whereby two water systems (Lucknow and Ripley) pay extra annual fees for capital projects and two systems (Whitechurch and Lakeshore) pay for capital projects at the time that their water distribution system is upgraded. The latter approach is unique in the Canadian municipal sector and is not considered to be a suitable path towards the sustainable funding of infrastructure. Over time, we recommend that the appropriate long-term capital charges be annualized for all system users.

Although our financial strategies allow the municipalities to meet its long-term funding requirements and reach fiscal sustainability, injection of additional revenues will be required to mitigate existing infrastructure backlogs.

With the release of Ontario Regulation 588/17, Ontario municipalities are responsible for implementing a wide range of asset management planning strategies and initiatives. With the completion of the Roadmap and the delivery of the AMP, the Township of Huron-Kinloss is well-positioned to achieve regulatory compliance in advance of the timeline proposed by the Province.

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1.0 Introduction & Context

1.1 What is asset management?

Canadian municipalities are responsible for managing and maintaining a broad range of infrastructure assets for the purpose of providing value and adequate services to their citizens. This includes: roads and bridges, to facilitate movement; water, sewer and storm sewer systems to provide clean drinking water and dispose of waste or excessive rainfall; and buildings, facilities and parks to provide community and recreational spaces. The provision of these services requires a vast and costly network of infrastructure assets. Planning for the sustainability of these assets requires a systematic and comprehensive plan for maintaining, rehabilitating and replacing infrastructure at the lowest cost to the organization and its stakeholders.

Until recently, most public-sector organizations have taken an ad-hoc and informal approach to the management of infrastructure assets. Many organizations lacked a basic understanding of what they owned, where it was located, what it was worth and what condition it was in. As a result, there has been widespread mismanagement of municipal assets, often contributing to the rapid deterioration of critical infrastructure. Municipal asset management is comprised of a series of processes and practices designed to manage all assets effectively and sustainably.

The goal of a municipality engaged in asset management is to minimize the lifecycle costs of owning, operating, and maintaining assets, at an acceptable level of risk, while continuously delivering established levels of service for present and future customers. This encompasses the planning, design, construction, operation and maintenance of infrastructure used to provide municipal services. By implementing asset management processes, infrastructure needs can be prioritized over time, while ensuring timely investments to minimize repair and rehabilitation costs and maintain municipal assets now and into the future.

1.2 What are the benefits of asset management?

The Township of Huron-Kinloss owns and manages a diverse portfolio of assets to provide residents, businesses, employees and visitors with safe access to important services, such as transportation, recreation, culture, economic development and much more. As such, it is critical that the municipality manage these assets optimally in order to produce the highest total value for taxpayers. This report will assist the municipality in the pursuit of judicious asset management of its capital assets.

Implementing the key principles and best practices of asset management can lead to a significant overhaul of organizational processes, practices and procedures. Prior to implementing these changes, an overview of the benefits of asset management is useful

to understand why this organizational change is valuable and how it will improve outcomes for all stakeholders. The following infographic outlines why an organization should engage in the development of a robust and sustainable asset management program.

Table 1 Benefits of Asset Management

Benefits of Asset Management	
	Good governance and increased accountability
	Data-driven decision-making
	Enhanced sustainability of infrastructure
	Improved level of service and quality of life
	Accurate forecasting of infrastructure replacement and enhancement needs
	Compliance with federal and provincial regulations

1.3 What is an asset management plan?

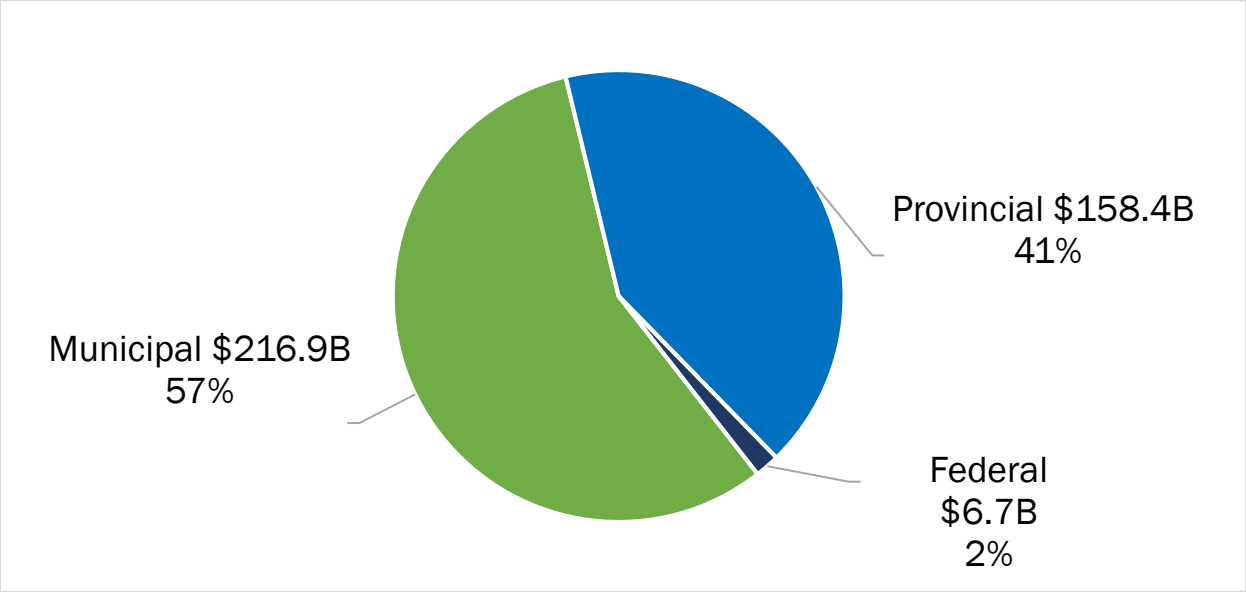
An asset management plan (AMP) is a strategic planning document that outlines key asset data and identifies the resources and funding required to meet organizational objectives. This AMP was developed to support the Township of Huron-Kinloss's vision for its asset management practice and programs. It provides key asset data and information about the municipality's infrastructure portfolio, asset inventory and replacement costs. This document also includes a detailed analysis of this data to determine optimized asset management strategies, the current state of infrastructure, the municipality's capital investment framework, and financial strategies to achieve fiscal sustainability while reducing and eventually eliminating funding gaps.

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

1.4 Infrastructure Ownership in Canada

Across Canada, the municipal share of public infrastructure increased from 22% in 1955 to nearly 60% in 2013. The federal government's share of critical infrastructure stock, including roads, water and wastewater, declined by nearly 80% in value since 1963.

Figure 1 Municipal Share of Public Infrastructure



Ontario's municipalities own and manage more infrastructure assets in the province than both the provincial and federal government combined. The asset portfolios managed by Ontario's municipalities are also highly diverse. The Township of Huron-Kinloss's capital asset portfolio, as analyzed in this AMP is valued at $185 million. The municipality relies on these assets to provide residents, businesses, employees and visitors with safe access to important services, such as transportation, recreation, culture, economic development and much more. As such, it is critical that the municipality manage these assets optimally in order to produce the highest total value for taxpayers. This AMP will assist the municipality in the pursuit of judicious asset management of its capital assets.

1.5 Ontario Regulation 588/17

Recently, the Ontario Government has moved from incentivizing proper asset management planning – through the provision of resources like the *Building Together Guide* and asset management capacity building funding – to regulating proper asset management planning. Asset management has evolved from what began as an accounting exercise via PSAB 3150 to a holistic informed approach to infrastructure management.

Recognizing the progress that has been made to date, the Ontario Government passed the Infrastructure for Jobs and Prosperity Act (IJPA) in 2015, thereby launching the

process of regulating asset management planning at the local level. As with any effort to regulate, it was important to the province to standardize planning processes while taking into consideration the differences in capacity and asset management maturity across municipalities. Consultations with municipal stakeholders took place over the summer months of 2016, with the province collecting feedback on its proposed regulation from municipalities of all shapes and sizes.

The update to the IJPA came into force on January 1, 2017 as O. Reg. 588/17. The requirements and their proposed timelines are listed in the following table.

Table 2 O. Reg. 588/17 Requirements

	Completion Date	Requirements
Phase 1 (Core Infrastructure Assets)	July 1, 2021	1. Current Levels of Service 2. Inventory Analysis 3. Estimated Cost and Lifecycle Activities Required to Sustain Current Levels of Service 4. **Population over 25,000**: Population and Employment Forecasts and Estimated Costs to Service Growth for the Next 10 Years
Phase 2 (All Infrastructure Assets)	July 1, 2023	1. Same Requirements as Phase 1 expanded to all infrastructure assets
Phase 3	July 1, 2024	1. Proposed Levels of Service for the Next 10 Years 2. Updated Inventory Analysis 3. Lifecycle Management Strategy 4. Financial Strategy 5. Addressing Shortfalls **6. Population Under 25,000:** Discussion of How Growth Assumptions Impacted the Lifecycle Management and Financial Strategy

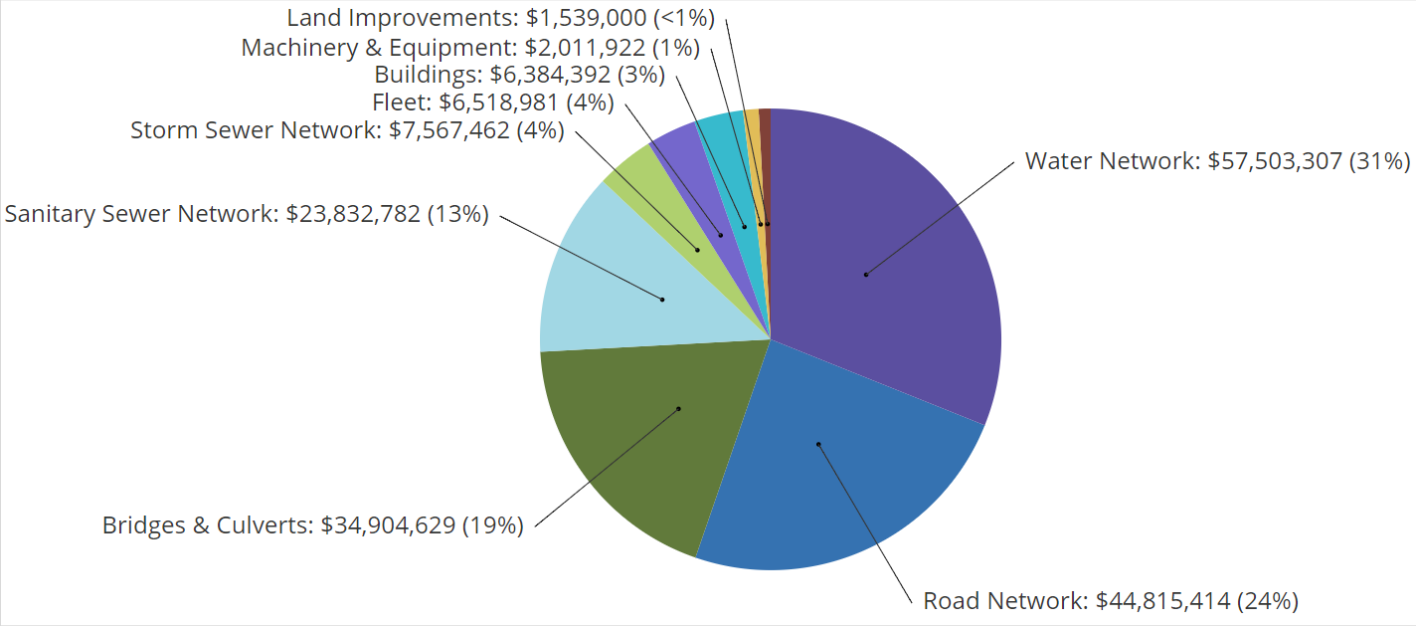
2.0 Asset Portfolio Overview

In this section, we aggregate technical and financial data across all Asset Categories analyzed in this AMP and summarize the state of the infrastructure using key asset-level and financial indicators. These indicators will provide a high-level picture of the assets that the municipality owns, historical trends in infrastructure investment and the condition and estimated useful life remaining for the municipality's assets. This data will be used as a starting point to conduct more detailed analyses on individual Asset Categories.

2.1 Asset Valuation – All Asset Categories

The asset categories analyzed in this AMP for the municipality had a total 2018 asset valuation of $185 million, of which the Water Network comprised 31%, followed by the Road Network at 24%.

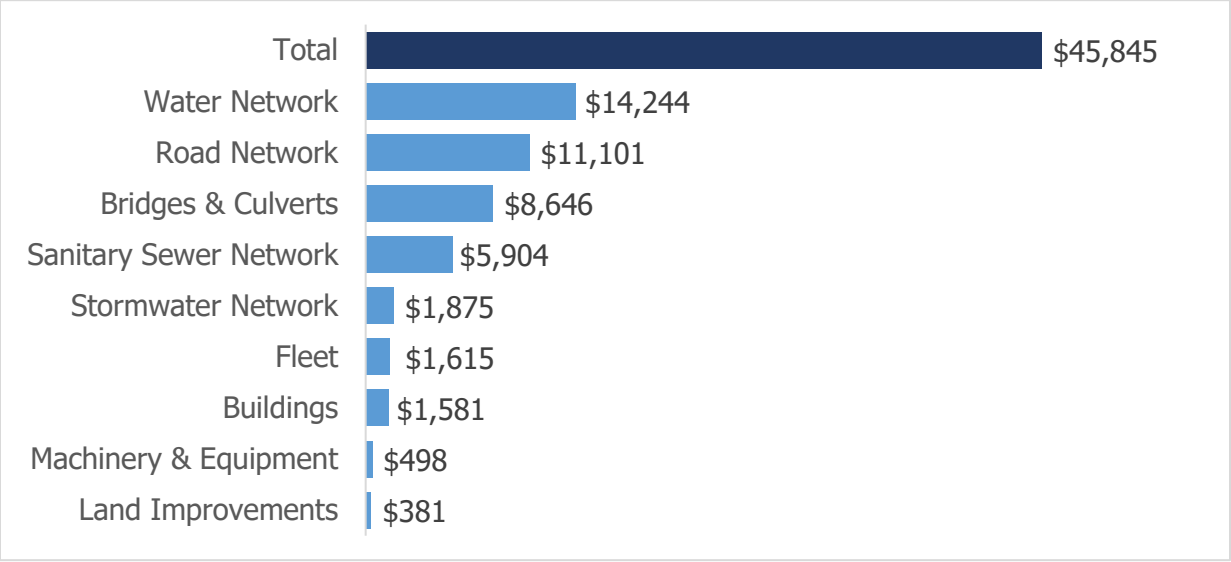
Figure 2 Asset Replacement Value - All Asset Categories



2.2 Household Asset Ownership

Asset ownership per household totals $45,845 based on 4,037 households.

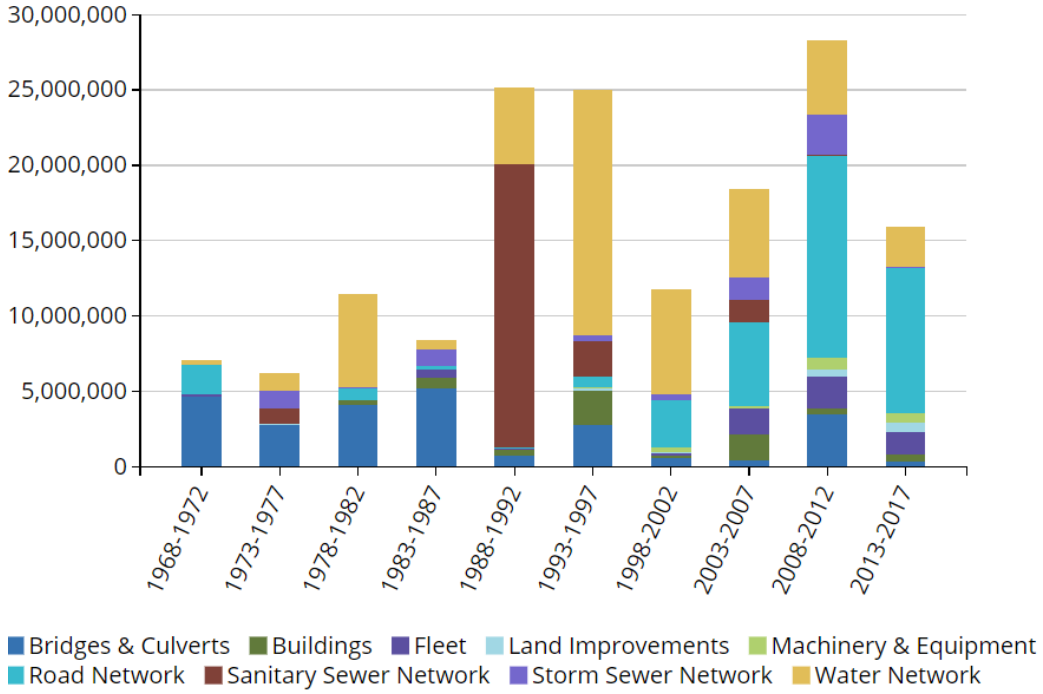
Figure 3 Household Asset Ownership – All Asset Categories



2.3 Historical Investment in Infrastructure

Using 2018 replacement costs, **Figure 4** illustrates the historical investments made in the Asset Categories analyzed in this AMP since 1968.

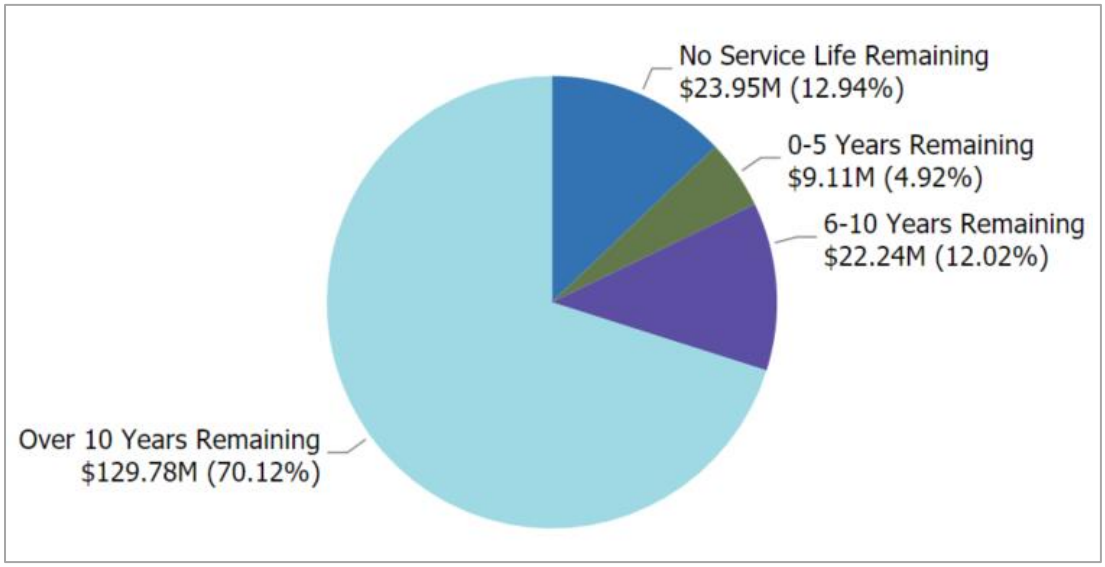
Figure 4 Historical Investment in Infrastructure - All Asset Categories



2.4 Remaining Service Life

While age is not a precise indicator of an asset's health, in the absence of assessed condition assessment data, it can serve as a high-level, meaningful approximation and help guide replacement needs and facilitate strategic budgeting. **Figure 5** shows the distribution of assets based on remaining service life.

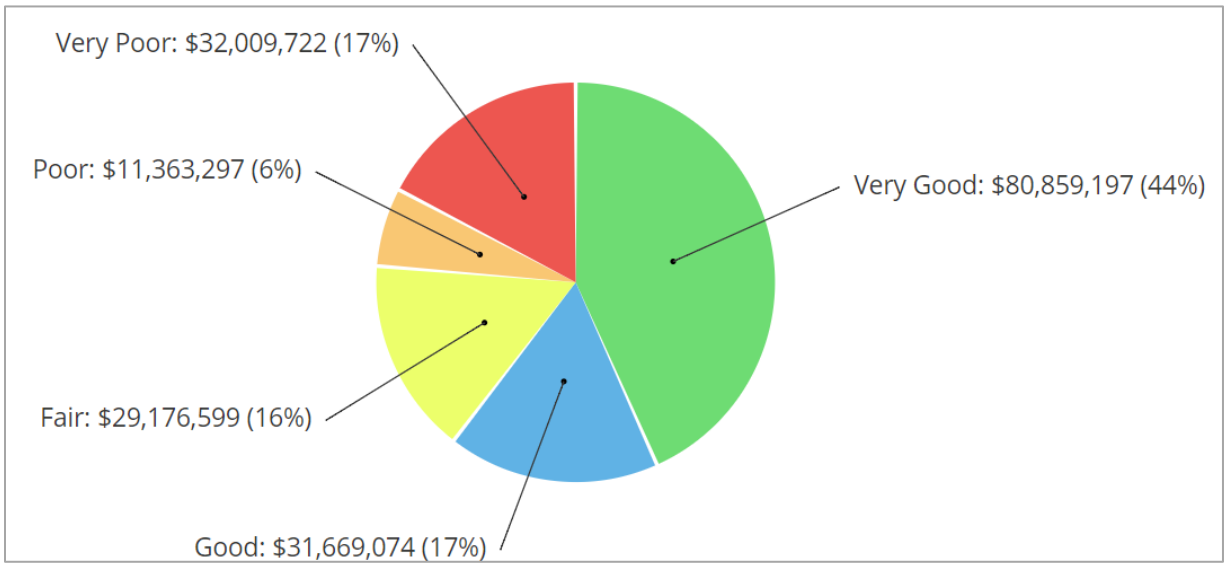
Figure 5 Remaining Service Life - All Asset Categories



2.5 Overall Asset Condition

Based on 2018 replacement costs, and a combination of assessed and age-based condition data, 61 % of all assets, with a valuation of $113 million, are in good to very good condition; 23% are in poor to very poor condition, with a valuation of $43 million.

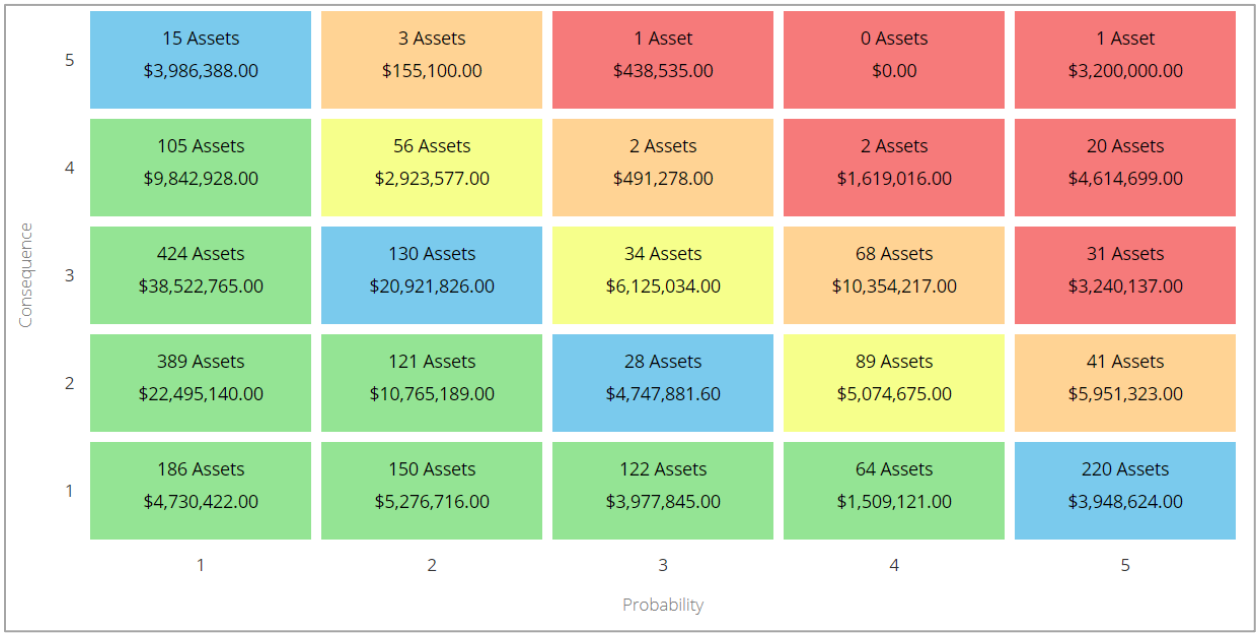
Figure 6 Asset Condition – All Asset Categories



2.6 Overall Asset Risk Profile

Traditionally, municipalities have prioritized capital projects according to a "worst-first" approach, in which the assets in the worst condition are the highest priority for rehabilitation or replacement. However, this approach fails to account for the fact that some assets are more important to the delivery of vital services and the provision of critical infrastructure than others. As a result, many assets that should be prioritized to prevent service disruption, are left to deteriorate. The risk matrix in **Figure 7** helps to prioritize capital projects based on both the probability and consequence of failure.

Figure 7 Overall Asset Risk Profile

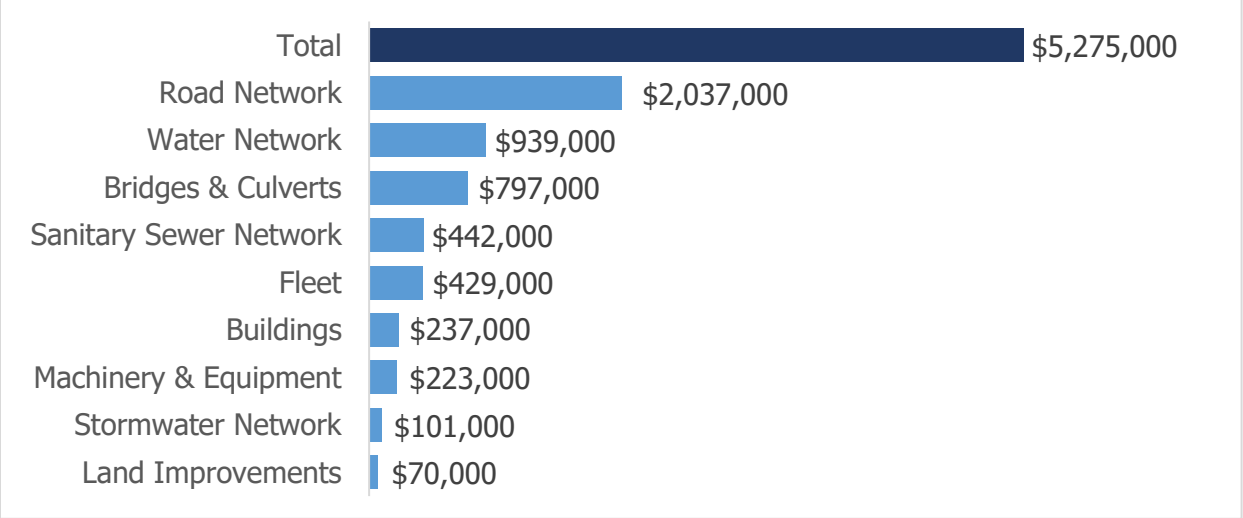


3.0 Financial Overview

3.1 Annual Requirements

The annual requirements represent the amount the municipality should allocate annually to each of its Asset Categories to meet replacement needs as they arise, prevent infrastructure backlogs and achieve long-term sustainability. In total, the municipality must allocate approximately $5.3 million annually to address capital requirements for the assets included in this AMP.

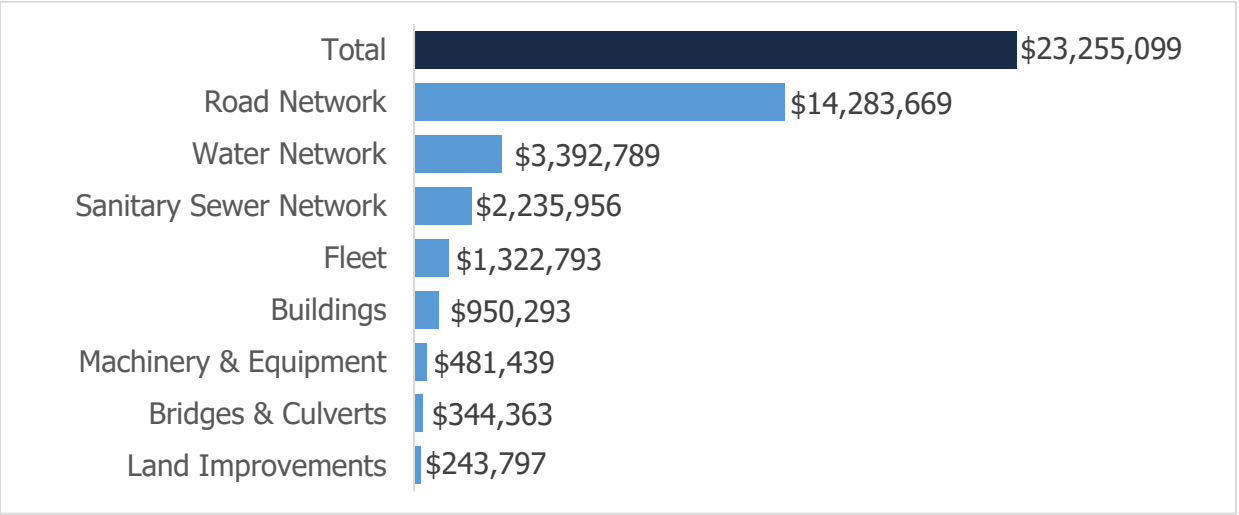
Figure 8 Annual Requirements by Asset Category



3.2 Infrastructure Backlog

The municipality has a combined infrastructure backlog of $23.3 million. The backlog represents the investment needed today to meet previously deferred replacement needs.

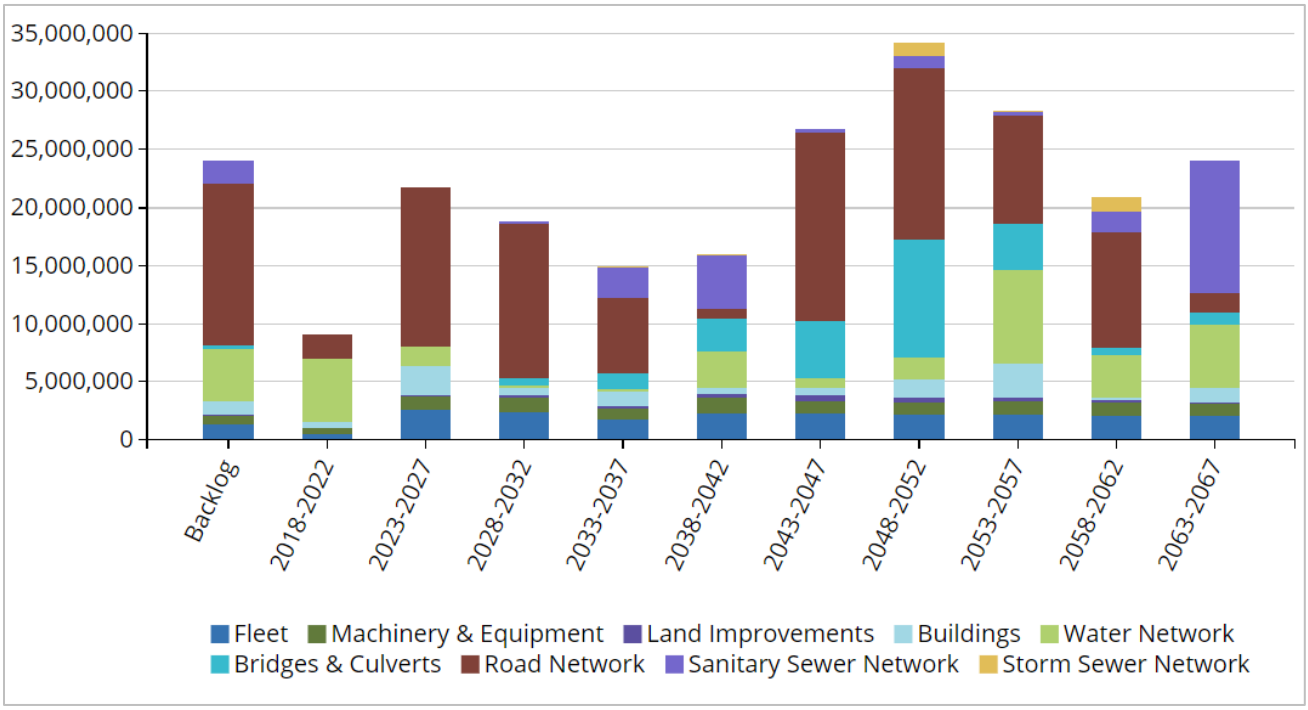
Figure 9 Infrastructure Backlog - All Asset Categories



3.3 Asset Replacement Requirements

In this section, we illustrate the aggregate short-, medium-, and long-term infrastructure spending requirements for the municipality's Asset Categories. The backlog is the total investment in infrastructure that was deferred over previous years or decades. In the absence of observed data, the backlog represents the value of assets that remain in operation beyond their useful life.

Figure 10 Replacement Profile - All Asset Categories – End-of-Life Replacement



4.0 Data and Methodology

The municipality's dataset for the Asset Categories analyzed in this AMP are maintained in a centralized asset inventory. This inventory includes key asset attributes and financial data, such as historical costs, in-service dates, field inspection data, asset health, and replacement costs.

4.1 Condition Data

Assets deteriorate in condition over time. Municipalities generally implement a straight-line amortization approach to model the deterioration of their capital assets and use age-based data to estimate an asset's remaining useful life. However, this approach is often a poor representation of an asset's actual condition and rate of deterioration. In the absence of condition data and customized deterioration curves, age-based estimates can be a useful approximation of when future field intervention activities and investment is required.

As available, actual field condition data was used to make recommendations more meaningful and representative of the municipality's state of infrastructure. The value of condition data cannot be overstated as it provides a more accurate representation of the state of infrastructure than does age alone.

As part of PSD's Roadmap, the Township was encouraged to collect condition data for as many Asset Categories and components as possible. Township staff were provided with condition assessment protocols to ensure the consistent and uniform collection of data in addition to data gathering templates to store all assessed data for upload to the main asset inventory.

4.1.1 Source of Condition Data by Asset Category

Table 3 provides an overview of the source of condition data for major components within each Asset Category. The Data Maturity Rating is calculated as follows:

- Segments with only age-based condition receive a baseline rating of 50%
- Segments with a mixture of age-based and assessed condition are calculated using the following formula:
  - $\mathbf{0.5} + (\%\ \boldsymbol{of\ assets\ with\ assessed\ condition} \times \mathbf{0.5}) \times \mathbf{100}$

Note: Capturing assessed condition is far more critical for major Asset Categories (roads, bridges, water, sewer, storm etc.) than for minor Asset Categories (Fleet, Machinery & Equipment, IT etc.). For the purposes of the Roadmap, the municipality focused on collecting condition data for only major Asset Categories. In the future, the municipality may wish to perform more detailed condition assessments on minor asset categories.

Table 3 Source of Condition Data – All Asset Categories

Asset Category	Segment	Source of Condition Data	Data Maturity Rating
Road Network	Paved	65% Assessed	**83%**
Bridges & Culverts	Bridges	97% Assessed	**99%**
Water Network	All	Age-based	**50%**
Sanitary Sewer Network	All	Age-based	**50%**
Storm Sewer Network	All	Age-based	**50%**
Buildings	All	Age-based	**50%**
Machinery & Equipment	All	18% Assessed	**59%**
Land Improvements	All	16% Assessed	**58%**
Fleet	All	Age-based	**50%**
	Data Maturity Rating:		**61%**

4.2 Asset Attribute Data

While asset condition data is perhaps the most important piece of data to collect, additional asset data is required to support asset management strategy development and decision-making. Asset attribute data provides greater context and clarity to the state of an asset and allows for the development of robust risk and lifecycle management strategies to prioritize projects and ultimately extend the life of assets.

Table 4 lists the asset attributes that PSD recommends collecting for major Asset Categories and the percentage of data available in the CityWide database for each attribute. This only includes core asset categories.

Table 4 Asset Attribute Data – Major Asset Categories

Asset Category	Asset Attribute	% Completion in Asset Inventory
Road Network (Paved Roads)	Surface Width (m)	**100%**
	Length (m)	**100%**
	Road Class	**84%**
	Surface Material	**100%**
	Design Class	**100%**
Water Network (Water Mains)	Length (m)	**100%**
	Pipe Diameter (mm)	**87%**
	Material	**99%**
Sanitary Sewer Network (Sanitary Mains)	Length (m)	**100%**
	Material	**100%**
	Pipe Diameter (mm)	**100%**
Storm Sewer Network (Storm Mains)	Length (m)	**100%**
	Pipe Diameter (mm)	**97%**
	Material	**100%**
	Data Maturity Rating:	**93%**

4.3 Financial Data

In this AMP, the average annual requirement is the amount, based on current replacement costs, that the Township should set aside annually so that assets can be replaced upon reaching the end of their lifecycle.

To determine current funding capacity, all existing sources of funding are identified and combined to enumerate the total available funding. These figures are then assessed against the average annual requirements, and are used to calculate the annual funding shortfall and additional financial strategies.

In addition to the annual shortfall, the majority of municipalities face significant infrastructure backlogs. The infrastructure backlog is the accrued financial investment needed in the short-term to bring the assets to a state of good repair. This amount is identified for each Asset Category.

4.3.1 Replacement Costs

Developing an asset investment strategy requires an estimation of the cost to replace assets that have reached the end of their service life. The replacement cost considers the replacement of an asset with a similar, but not necessarily identical, asset available in the current marketplace.

There are a range of methods to determine asset replacement costs – some more accurate and reliable than others.

- **Cost/Unit** – Cost is based on replacement cost/unit provided by the municipality
- **User-Defined Cost** – Cost is based on replacement costs provided by the municipality
- **CPI/NRBCPI** – Historical cost is inflated based on Consumer Price Index tables
- **Flat Rate Inflation** – Historical cost is inflated by the same percentage each year up to the current year

4.3.2 Source of Replacement Cost by Asset Category

Table 5 provides an overview of the source of replacement costs for major components within each Asset Category.

The Data Maturity Rating is based on a ranking of each replacement cost source based on accuracy and reliability. Where there are multiple replacement cost sources for an Asset Category, the Data Maturity Rating is a weighted average according to the following weighted ratings:

- Cost/Unit – A (100%)
- User-Defined Cost – A (100%)
- CPI/NRBCPI – C (50%)
- Flat Rate Inflation – D (25%)

Table 5 Source of Replacement Cost - All Asset Categories

Asset Category	Asset Segment	Replacement Cost Source	Data Maturity Rating
Road Network	Tar/Chip & Hot Mix	100% Cost/Unit	**100%**
Bridges & Culverts	Bridges	100% User-Defined Cost	**100%**
	Culverts	90% User-Defined Cost 10% CPI	**95%**
Water Network	Watermains	81% Cost/Unit 19% CPI	**91%**
Sanitary Sewer Network	Sanitary Sewer Mains	98% Cost/Unit 2% CPI	**99%**
Storm Sewer Network	Storm Sewer Mains	91% Cost/Unit 9% CPI Tables	**96%**
Buildings	All	98% CPI 2% User-Defined	**51%**
Machinery & Equipment	All	100% CPI	**50%**
Land Improvements	All	100% CPI	**50%**
Fleet	All	100% CPI	**50%**
	Data Maturity Rating:		**78%**

4.4 Data Maturity Rating

In the initial stage of the Roadmap, PSD performed a gap analysis on the state of the Township's asset inventory. This analysis provided a detailed look at the available data and allowed PSD to make recommendations concerning the data that should be collected to enable advanced analysis and stronger asset management decision-making. Data collection and management can be an incredibly resource-intensive and time-consuming process. However, it is one of the most important phases in the Roadmap and should be an area of focus moving forward.

Table 6 breaks down the Township's Overall Data Maturity Rating by Asset Category and the following data types:

- **Assessed Condition** – percentage of assets with assessed condition data available in CityWide database
- **Attributes** – percentage of recommended asset attribute data available in CityWide database

- **Replacement Cost** – The average of the data maturity rating assigned in **Table 5** based on the replacement cost source used in CityWide

Table 6 Data Maturity Rating

Asset Category	Assessed Condition	Attributes	Replacement Cost	Overall Rating
Road Network	83%	97%	100%	**93%**
Bridges & Culverts	99%	-	100%	**100%**
Water Network	50%	95%	95%	**80%**
Sanitary Sewer Network	50%	100%	91%	**80%**
Storm Sewer Network	50%	99%	99%	**83%**
Buildings	50%	-	96%	**73%**
Machinery & Equipment	59%	-	51%	**55%**
Land Improvements	58%	-	50%	**54%**
Fleet	50%	-	50%	**50%**
	Overall Data Maturity Rating:			**74%**
	Overall Data Maturity Rating – Core Assets Only:			**87%**

After the completion of the Roadmap, the Township achieved an overall data maturity rating of 74%. However, for core assets (Road Network, Bridges & Culverts, Water Network, Sanitary Sewer Network, Storm Sewer Network), the Township achieved an overall data maturity rating of 87%. In order to increase or sustain a high-level of data maturity, the Township should put in place strategies and practices to facilitate continuous data collection and database maintenance. These strategies will be discussed in greater detail in **Section 6.4**.

4.5 Limitations and Assumptions

Several limitations continue to persist as municipalities advance their asset management practices:

- As available, we use field condition assessment data to illustrate the state of infrastructure and develop the requisite financial strategies. However, in the absence of observed data, we rely on the age of assets and their estimated useful life to estimate their physical condition.

- A second limitation is the use of inflation measures, for example using CPI/NRBCPI to inflate historical costs in the absence of actual replacement costs. While a reasonable approximation, the use of such multipliers may not be reflective of market prices and may over- or understate the value of a municipality's infrastructure portfolio and the resulting capital requirements.

- Our calculations and recommendations will reflect the best available data at the time this AMP was developed.

- The focus of this plan is restricted to capital expenditures and does not capture O&M (operating and maintenance) expenditures on infrastructure.

5.0 State of Local Infrastructure

The State of Local Infrastructure provides a summary of Huron-Kinloss's asset portfolio in 2018. This overview is divided into the following sections:

Asset Inventory & Replacement Cost

The asset inventory contains a comprehensive list of all capital assets, which are organized by **Category** and **Segment**.

Categories include groups of assets that provide similar services to the community (E.g. Road Network, Water Network, Machinery & Equipment)

Segments are divided into groups of assets that perform similar functions within each Category (e.g. Hydrants, Standpipes, Water Connections, Water Mains).

The asset inventory listing in each Category includes the following details for each Segment:

1. **Quantity –** unit of measure (kilometres, metres, units etc.)

2. **Replacement Cost Method** – describes how the replacement cost was determined using one of the following methods:
    a. Cost/Unit – Cost is based on replacement cost/unit provided by the municipality
    b. User-Defined Cost – Cost is based on replacement costs provided by the municipality
    c. CPI Tables – Historical cost of assets is inflated based on the Consumer Price Index or the Non-residential Building Construction Price Index

3. **Replacement Cost** – the total estimated cost to replace the asset

Current Asset Condition

As available, actual field condition data has been used to make recommendations more meaningful and representative of the Township's current state of infrastructure. The value of this condition data cannot be overstated as it provides a more accurate representation of the state of infrastructure than does age alone.

This section identifies whether each segment's condition data is based on assessed condition or age-based estimates of condition. It also identifies each segment's average condition rating and the percentage of service life remaining

This AMP uses the following rating scale to determine asset condition, developed as part of the Canadian Infrastructure Report Card.

Table 7 Canadian Infrastructure Report Card - Rating Scale for Asset Condition

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

Estimated Useful Life & Average Age

Each asset is assigned an **Estimated Useful Life** according to the length of time that an asset is expected to remain in-service before requiring full replacement. This section identifies the Estimated Useful Life for each Segment in addition to the average age of assets that are currently in-service.

This section also includes the average age of assets by Segment. This data is based on the In-Service Dates provided for each asset in the Township's asset inventory.

Risk & Criticality

With a limited amount of capital funding available to municipalities, staff must regularly make decisions about which lifecycle activities are required and which can be deferred at the lowest risk to the organization.

Ensuring that capital spending is allocated to the assets and projects with the highest risk of failure requires the development of a risk model that provides a quantitative risk rating for each asset.

For the purposes of this analysis:

$$Risk = Probability\ of\ Failure(PoF) \times Consequence\ of\ Failure(CoF)$$

This section identifies the data that has been used to determine the risk rating that has been assessed for each asset.

The risk matrix included in this section provide a visual representation of the level of risk in each Asset Category. Individual assets are grouped based on both their Consequence of Failure (1-5) and Probability of Failure (1-5). The assets located closer to the bottom-left of the matrix (green boxes) are less likely to fail and have lesser consequences for the municipality if they do fail. The assets located closer to the top-right of the matrix

(red boxes) are at the greatest risk of failure and will have far greater consequences for the municipality if they do.

Lifecycle Management

In this section, the lifecycle management strategy for each Asset Category has been identified. This details the municipality's approach to the maintenance, rehabilitation and replacement of existing infrastructure.

This can include both asset specific strategies where detailed lifecycle strategies are defined for an entire asset type (E.g. Tar/Chip Surface Roads), or more general strategies for the management of the entire category of assets.

Forecasted Capital Requirements

In this section, we illustrate the short, medium, and long-term infrastructure spending requirements for the Township's infrastructure

The forecasted capital requirements are based on an "end-of-life replacement" strategy in which assets are presumed to simply be replaced once they reach the end of their estimated useful life.

The year-range of each graph is adjusted to include at least one full lifecycle of all assets within the Asset Category.

This section also contains information pertaining to each category's infrastructure backlog. The backlog is the aggregate investment in infrastructure that was deferred over previous years or decades. In the absence of observed data, the backlog represents the value of assets that remain in operation beyond their useful life.

Appendix B includes the lifecycle activities that would need to be undertaken for each of the next ten years to maintain the current level of service. However, these tables do not include medium- and long-term capital requirements to replace infrastructure that will require attention beyond this ten-year period.

Current Levels of Service

This section identifies that framework that has been developed to determine the current level of service provided by each Asset Category.

The framework includes both technical metrics and qualitative descriptions that measure both technical and community levels of service. The current framework includes measures that have been outlined in O. Reg. 588/17 in addition to performance measures identified by the municipality as worth measuring ad evaluating.

The Township is working towards collecting the data required to complete this framework and will include this in future iterations of their AMP.

5.1 Road Network

5.1.1 Asset Inventory & Replacement Cost

The following table provides the quantity and total replacement cost of the Township's Road Network inventory. Gravel roads have been included as they comprise a significant portion of the Township's road network. However, the lifecycle management strategies for these assets consist of perpetual maintenance activities and do not require capital costs for rehabilitation activities or end-of-life replacement. These operational costs will not be considered in the financial strategy for this AMP.

All replacement costs/unit have been determined based on average costs incurred as part of recent engineering contracts.

Table 8 Asset Inventory - Road Network

Asset Segment	Quantity	Replacement Cost Method	Total Replacement Cost
Gravel	412 km	Not Planned for Replacement	n/a
Hot Mix Surface	215 km	Cost/Unit	$35,766,250
Sidewalks	12,166 m	Cost/Unit	$912,450
Signs	27 units	CPI Tables	$205,399
Streetlights	602 units	CPI Tables	$698,485
Tar/Chip Surface	41 km	Cost/Unit	$7,232,830
		Total:	**$44,815,413**

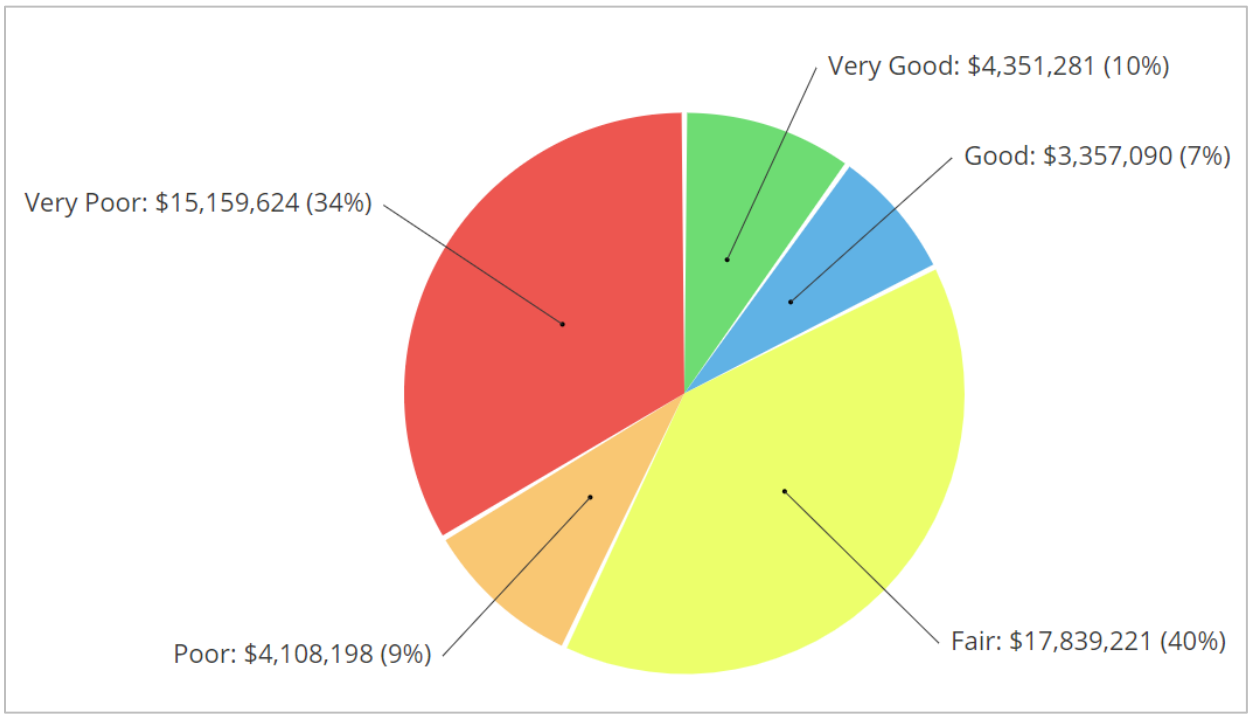
5.1.2 Current Asset Condition

The following table details the source of condition data as well as the average condition rating and the average percentage of service life remaining for each asset type.

Table 9 Current Asset Condition - Road Network

Asset Segment	Condition Source	Average Condition	% of Service Life Remaining
Hot Mix Surface	Internal Assessment (2003-2017) & Age-based	Fair	45%
Sidewalks	Age-based	Poor	23%
Signs	Age-based	Poor	38%
Streetlights	Age-based	Fair	40%
Tar/Chip Surface	Internal Assessment (2003-2017) & Age-based	Poor	17%
	Overall:	**Poor**	**39%**

Figure 11 Current Asset Condition - Road Network



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

5.1.3 Estimated Useful Life & Average Age

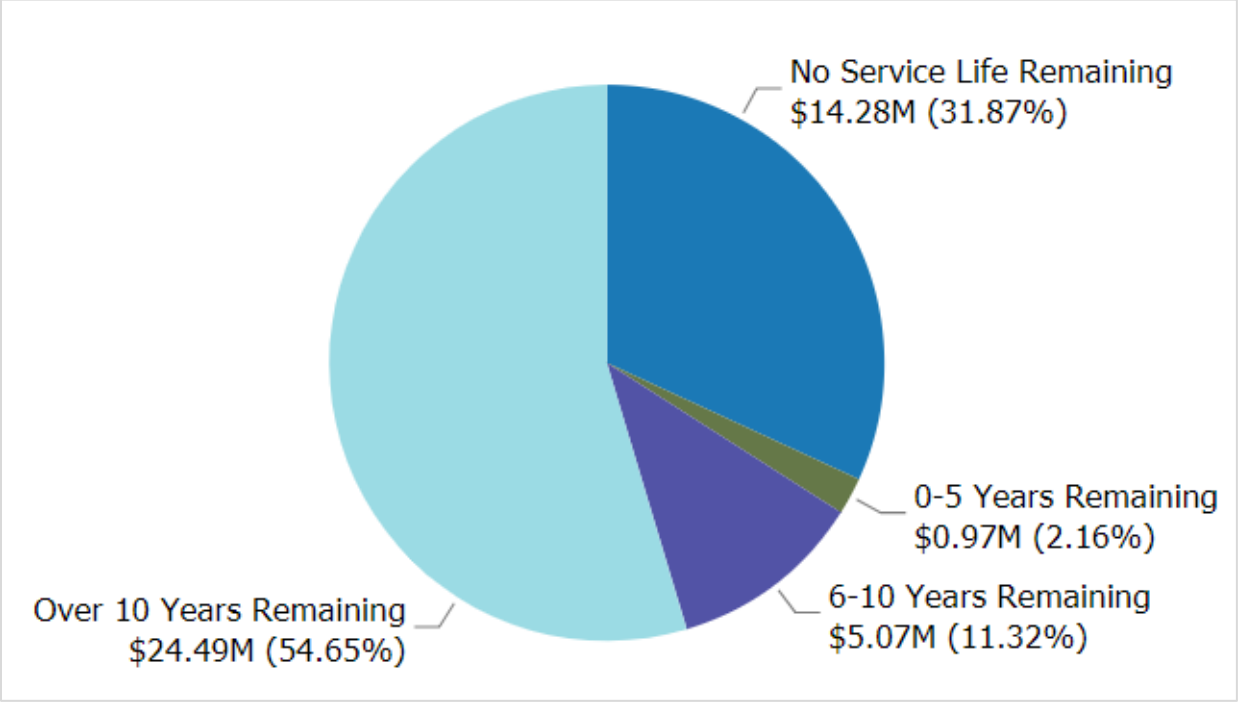
The estimated useful life for Road Network assets has been assigned according to a combination of established industry standards and staff knowledge.

Table 10 Service Life Remaining - Road Network

Asset Segment	Estimated Useful Life	Average Age
Hot Mix Surface	20	29 Years
Sidewalks	40	36 Years
Signs	10	6 Years
Streetlights	15	9 Years
Tar/Chip Surface	14	58 Years

The following pie chart identifies the percentage of assets, by replacement value, that have surpassed their estimated service life and how close all other assets are to approaching their projected replacement date.

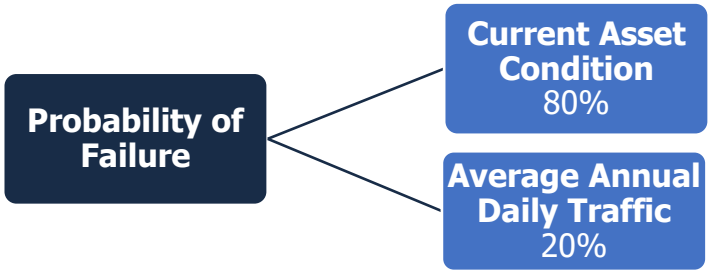
Figure 12 Service Life Remaining - Road Network



5.1.4 Risk & Criticality

Probability of Failure

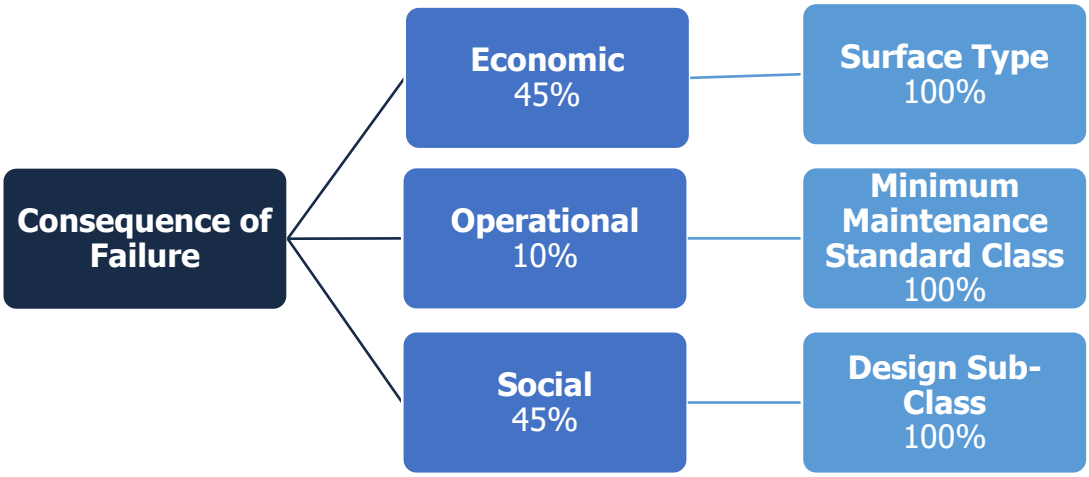
The following hierarchy identifies the risk parameters used to calculate the probability of failure for Hot Mix and Tar/Chip road surfaces.



All other Road Network assets use Current Asset Condition to determine the probability of failure.

Consequence of Failure

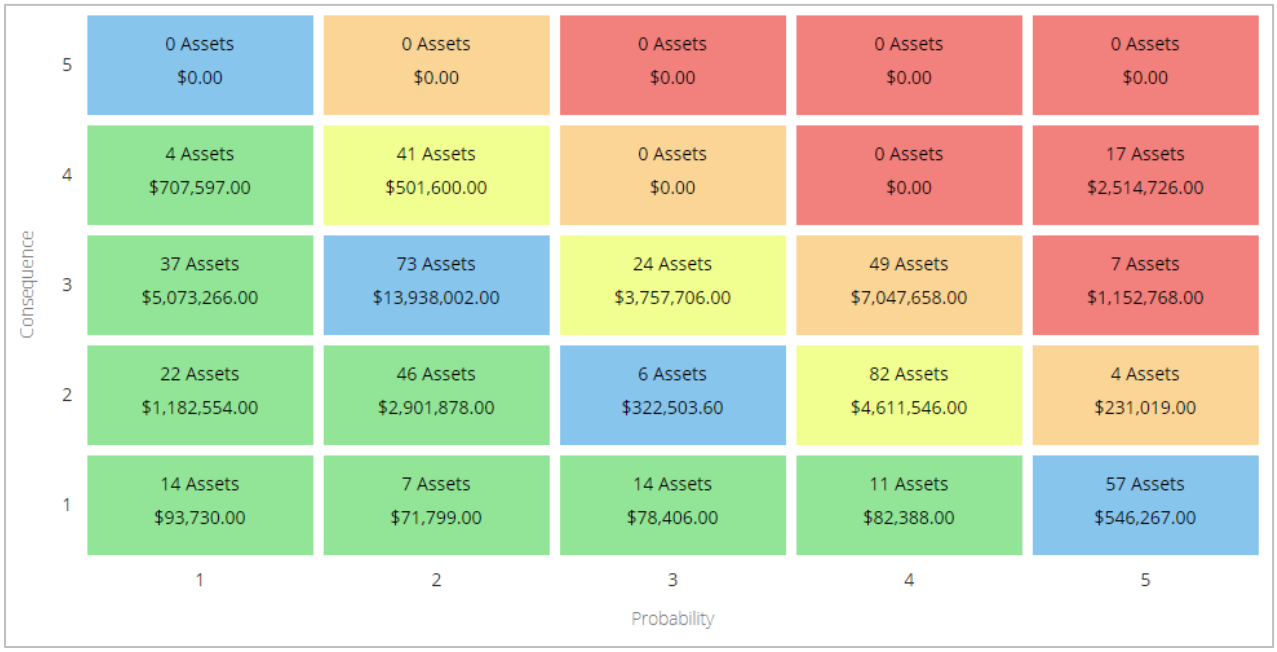
The following hierarchy identifies the risk parameters used to calculate the consequence of failure for Hot Mix and Tar/Chip road surfaces.



All other Road Network assets use Replacement Cost as the primary indicator used to determine their consequence of failure.

Risk Matrix

Using the above risk parameters, the following matrix visualizes the risk rating for each asset by multiplying the consequence and the probability of failure.



5.1.5 Lifecycle Management

Hot Mix and Tar/Chip Roads

The Township's lifecycle management strategy for Hot Mix and Tar/Chip Roads is currently under internal review and a detailed strategy including maintenance, rehabilitation and replacement activities will be developed in the near future.

For Hot Mix Roads, the lifecycle strategy will likely include a combination of crack sealing and re-surfacing events that combine to extend the life of all road surfaces at the lowest total cost.

The Township does not have many Tar/Chip Surface Roads, and some may be considered candidates for upgrade to a Hot Mix Surface once replacement is required. This will be assessed by Township staff on a case-by-case basis moving forward. For roads that are not candidates for upgrade, a routine re-surfacing program will be established that extends the life of these assets at the lowest cost.

As the Township's understanding of the current cost, risk and performance of their assets evolve, these strategies should be reviewed to determine whether they are achieving the lowest total cost of ownership while still achieving the expected level of service.

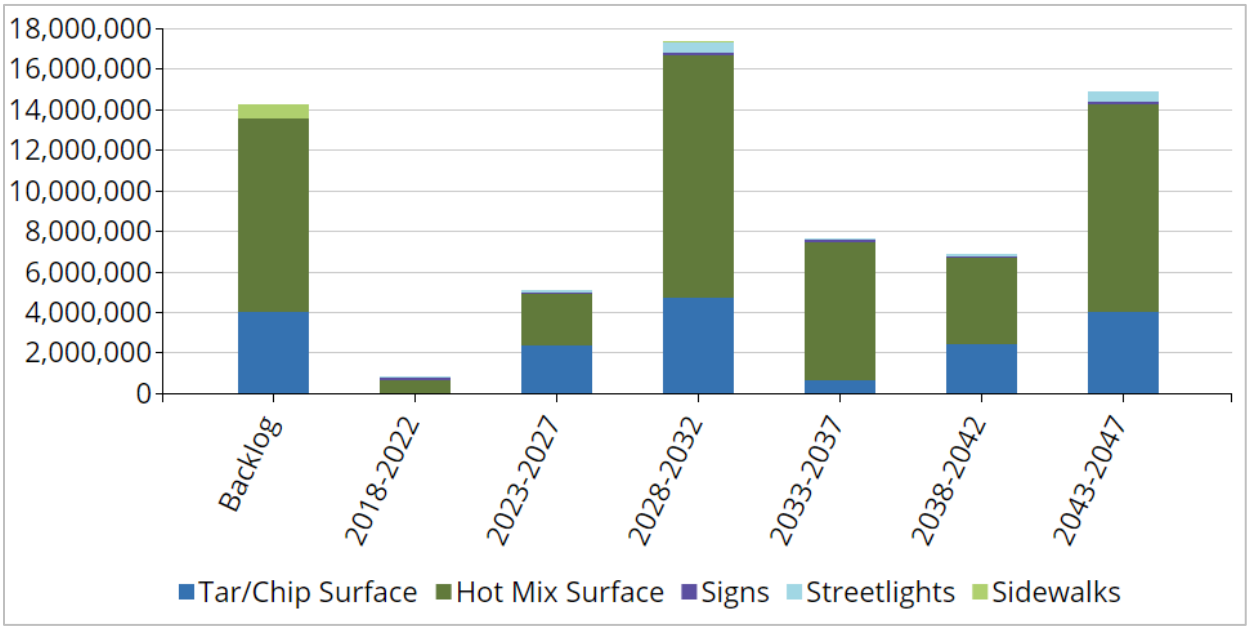
Road Network (Other)

All other Road Network assets do not require a detailed lifecycle management strategy and will be managed as deficiencies are identified and maintenance or replacement is required. In most cases these assets will simply be replaced at the end of their service life.

5.1.6 Forecasted Capital Requirements

The following bar chart forecasts the capital requirements for rehabilitation and replacement of the Road Network.

Figure 13 Forecasted Capital Requirements - Road Network



The projected capital expenditures that will need to be undertaken over the next 10 years to maintain the current levels of service can be found in Appendix B.

5.1.7 Current Levels of Service

Technical Levels of Service

The following table outlines the metrics that will be used to determine the technical levels of service provided by the Road Network. This data will be gathered and included as part of a future iteration of the Township's AMP.

Core Value(s)	Technical Metric	Current LOS
Accessible & Reliable	Lane-km of arterial roads (MMS classes 1 and 2) per land area (km/km^2)	TBD
	Lane-km of collector roads (MMS classes 3 and 4) per land area (km/km^2)	TBD
	Lane-km of local roads (MMS classes 5 and 6) per land area (km/km2)	TBD
Safe & Regulatory	% of sidewalks inspected according to MMS	TBD
	% of road network inspected according to MMS	TBD
	% of stop signs inspected for reflectivity	TBD

Core Value(s)	Technical Metric	Current LOS
Affordable	O&M costs for paved roads / lane-km (excluding winter control)	TBD
	O&M costs for unpaved roads / lane-km (excluding winter control)	TBD
Sustainable	% of paved roads in good or very good condition	TBD
	Average pavement condition index for paved roads in the municipality	TBD
	Average surface condition for unpaved roads in the municipality	TBD

Community Levels of Service

The following table outlines the metrics that will be used to determine the community levels of service provided by the Road Network. This data will be gathered and included as part of a future iteration of the Township's AMP.

Core Value(s)	Qualitative Description	Current LOS
Accessible & Reliable	Description, which may include maps, of the road network in the municipality and its level of connectivity	TBD
Safe & Regulatory	Description of minimum maintenance standards for road network (road surfaces and sidewalks)	TBD
Affordable	What is the O&M cost to maintain the road network per household?	TBD
Sustainable	Description or images that illustrate the different levels of road class pavement condition	TBD

5.1.8 Recommendations

- The Township should develop and implement a routine condition assessment schedule for road surfaces. As assessed condition data is gathered, it should be uploaded into the Township's asset inventory to more allow for a more accurate forecast of lifecycle events and capital requirements. In time the condition assessment program should be expanded to incorporate all other Road Network.

- Considering the current condition and remaining service life for the Township's Road Network, staff should consider re-evaluating the lifecycle strategies that are being used to manage road surfaces. A more proactive strategy may be required to increase the overall level of service.

- Current levels of service should be measured according to the technical and community levels of service metrics established by the Township. These metrics should be tracked regularly to identify trends and opportunities to improve the service being provided. In time, a proposed level of service should be identified and accompanied by both a lifecycle management and financial strategy

- The municipality is underfunding its long-term requirements on an annual basis. See **Section 8.0** for a detailed financial strategy designed to achieve long-term funding requirements.

5.2 Bridges & Culverts

5.2.1 Asset Inventory & Replacement Cost

The following table provides the quantity and total replacement cost of the Township's Bridges & Culverts inventory. The culvert inventory includes only those culverts that have a span greater than or equal to 3 metres and are required to be inspected according to the Ontario Structure Inspection Manual.

All user-defined costs have been determined based on the results of the Township's most recent OSIM inspection.

Table 11 Asset Inventory - Bridges & Culverts

Asset Segment	Quantity	Replacement Cost Method	Total Replacement Cost
Bridges	42 units	User-Defined Cost	$22,030,737
Culverts	49 units	User-Defined Cost	$12,873,892
		Total:	**$34,904,629**

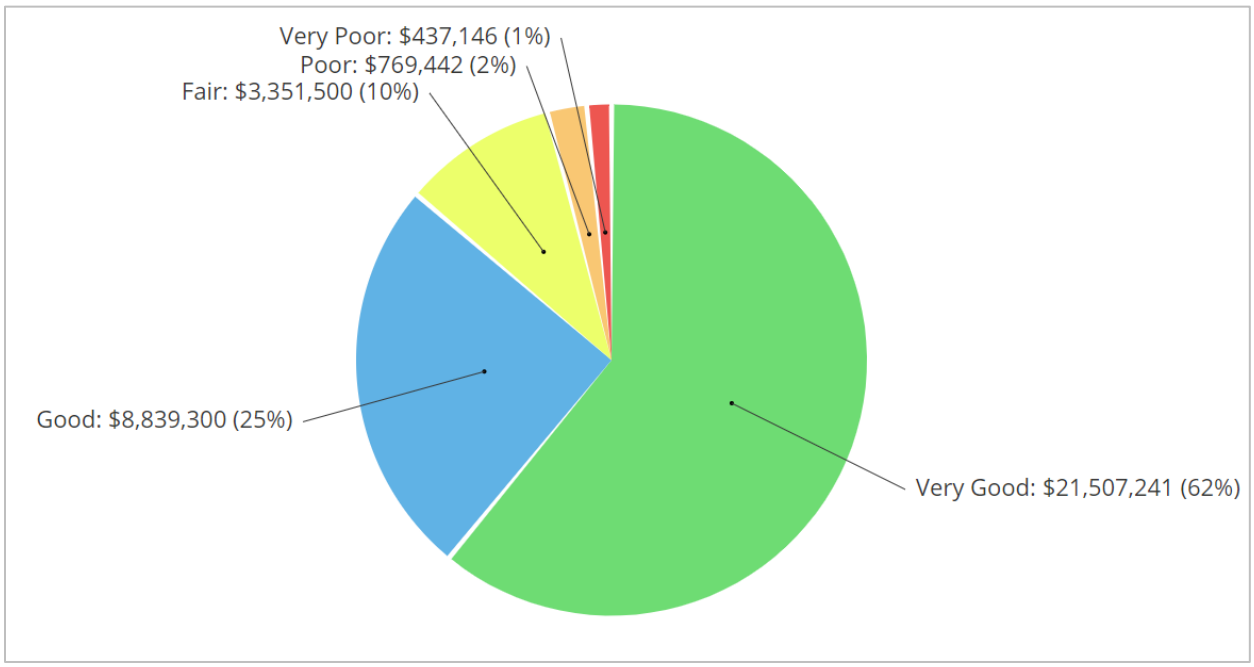
5.2.2 Current Asset Condition

The following table details the source of condition data as well as the average condition rating and the average percentage of service life remaining for each asset type.

Table 12 Current Asset Condition - Bridges & Culverts

Asset Segment	Condition Source	Average Condition	% of Service Life Remaining
Bridges	External Assessment (OSIM)	Good	74%
Culverts	External Assessment (OSIM)	Good	71%
	Overall:	**Good**	**72%**

Figure 14 Current Asset Condition - Bridges & Culverts



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

5.2.3 Estimated Useful Life & Average Asset Age

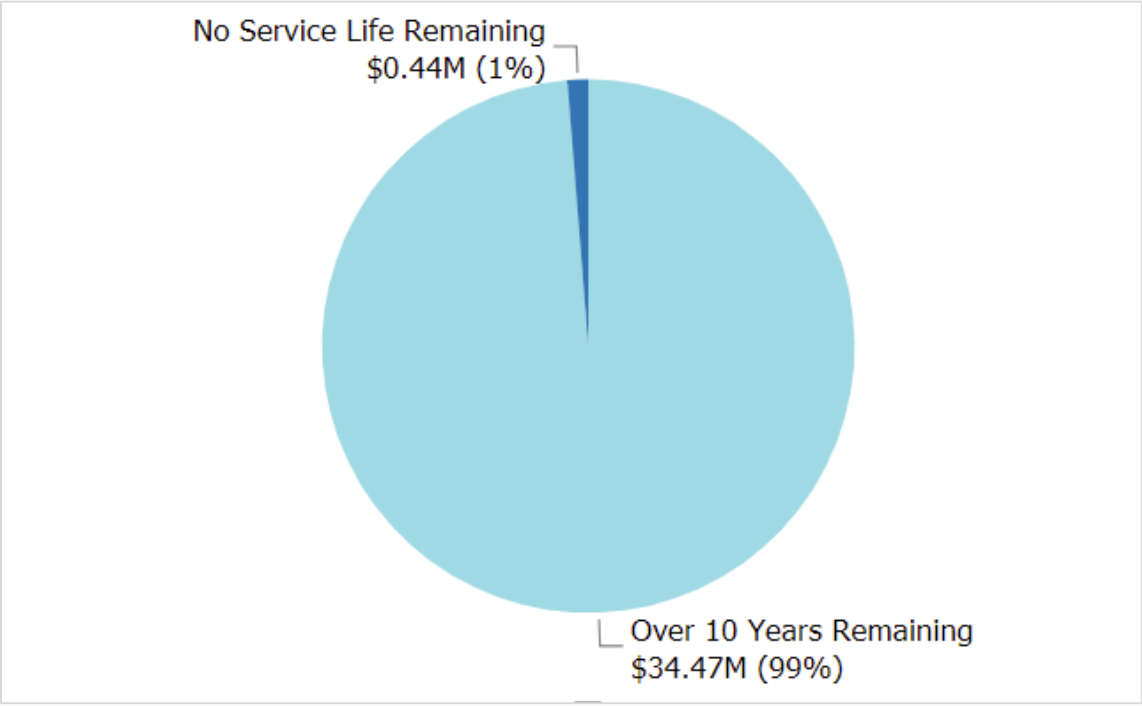
The estimated useful life for Bridges & Culverts has been assigned according to a combination of established industry standards and staff knowledge.

Table 13 Service Life Remaining - Bridges & Culverts

Asset Segment	Estimated Useful Life	Average Age
Bridges	30-80	43 Years
Culverts	50-80	40 Years

The following pie chart identifies the percentage of assets, by replacement value, that have surpassed their estimated service life and how close all other assets are to approaching their projected replacement date.

Figure 15 Service Life Remaining - Bridges & Culverts



5.2.4 Risk & Criticality

Probability of Failure

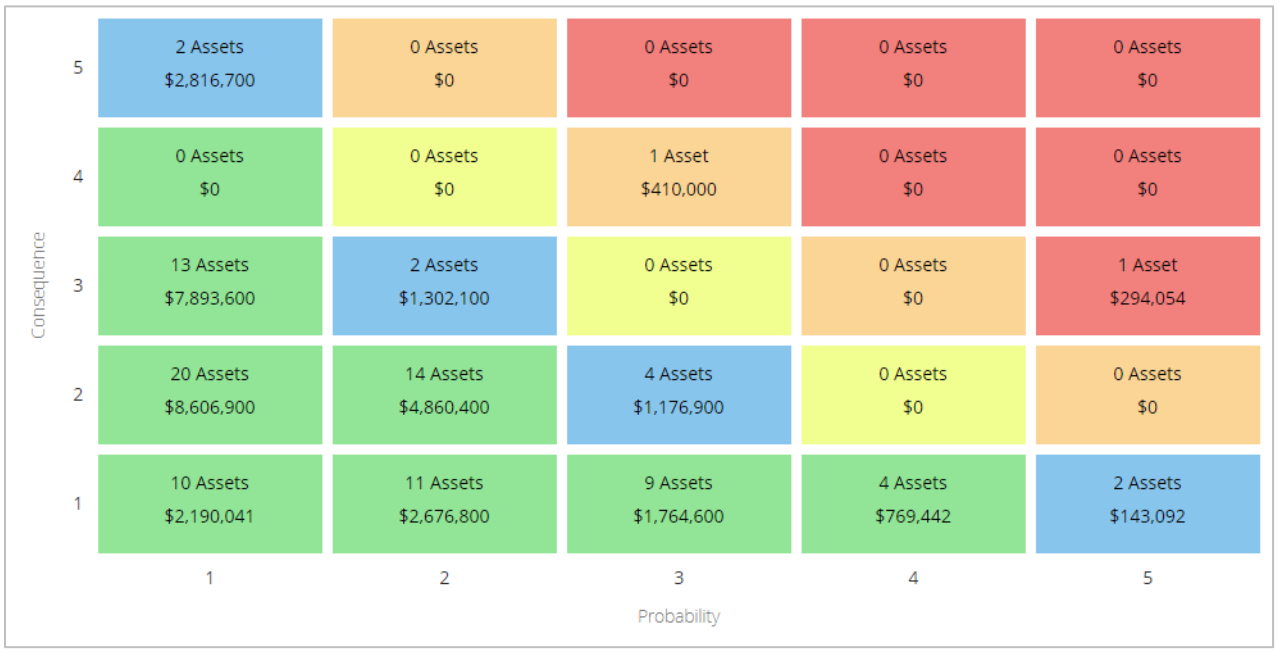
The following hierarchy identifies the risk parameters used to calculate the probability of failure for Bridges & Culverts.

Consequence of Failure

The following hierarchy identifies the risk parameters used to calculate the consequence of failure for Bridges & Culverts.

Risk Matrix

Using the above risk parameters, the following matrix visualizes the risk rating for each asset by multiplying the consequence and the probability of failure.



5.2.5 Lifecycle Management

The following lifecycle management strategies identify the current approach of Public Works staff to maintenance, rehabilitation and replacement of existing infrastructure. These strategies have been determined to be an effective management approach to maintain the current level of service expected by the community.

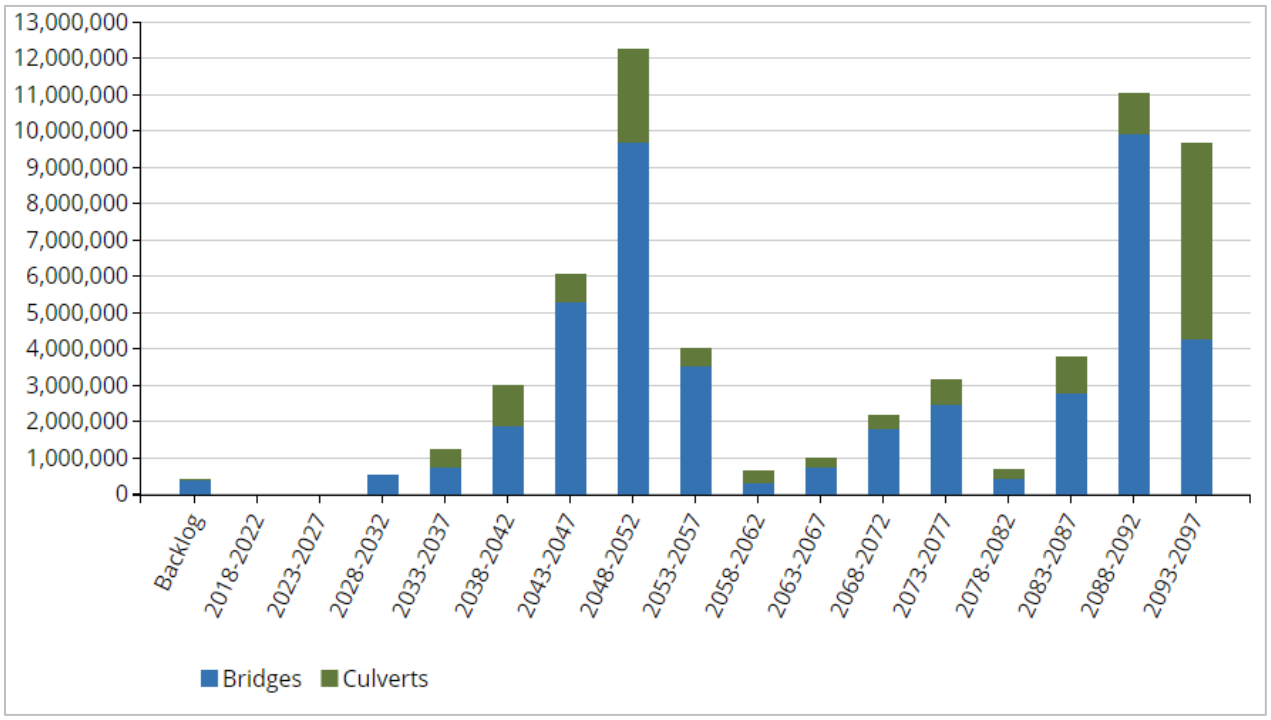
In Ontario, the Ontario Structure Inspection Manual dictates how regularly municipal bridges and culverts with a span of over 3 metres should be inspected. Every 2 years municipalities are required to have a licensed structure inspector perform a detailed inspection of each structure that meets the criteria. Upon the completion of this biannual inspection the municipality is provided with a report detailing the current condition of each structure and the lifecycle activities required to maintain, rehabilitate or even replace when necessary.

Township staff rely on the findings in this report to identify required lifecycle activities over short- and long-term timeframes. These inspections will continue, and staff will endeavour to carry out all recommended lifecycle activities according to the inspection report provided.

5.2.6 Forecasted Capital Requirements

The following bar chart forecasts the capital requirements for rehabilitation and replacement of the Bridges & Culverts.

Figure 16 Forecasted Capital Requirements - Bridges & Culverts



The projected capital expenditures that will need to be undertaken over the next 10 years to maintain the current levels of service can be found in Appendix B.

5.2.7 Current Levels of Service

Technical Levels of Service

The following table outlines the metrics that will be used to determine the technical levels of service provided by the Bridges & Culverts. This data will be gathered and included as part of a future iteration of the Township's AMP.

Core Value(s)	Technical Metric	Current LOS
Accessible & Reliable	% of bridges in the municipality with loading or dimensional restrictions	TBD
	# of unplanned bridge closures	TBD
Safe & Regulatory	% of bridges inspected every two years	TBD
Affordable	O&M costs for bridges & culverts / m2	TBD

Core Value(s)	Technical Metric	Current LOS
Sustainable	Average bridge condition index value for bridges in the municipality	TBD
	Average bridge condition index value for structural culverts in the municipality	TBD

Community Levels of Service

The following table outlines the metrics that will be used to determine the community levels of service provided by the Bridges & Culverts. This data will be gathered and included as part of a future iteration of the Township's AMP.

Core Value(s)	Qualitative Description	Current LOS
Accessible & Reliable	Description of the traffic that is supported by municipal bridges (e.g. heavy transport vehicles, motor vehicles, emergency vehicles, pedestrians, cyclists)	TBD
Safe & Regulatory	Description of the OSIM inspection process	TBD
Affordable	What is the O&M cost to maintain bridges and culverts per household?	TBD
Sustainable	Description or images of the condition of culverts and how this would affect use of the culverts	TBD
	Description of the OSIM inspection process	TBD

5.2.8 Recommendations

- The Township should continue to inspect Bridges & Culverts with a span greater than or equal to 3 metres according to the requirements outlined in the Ontario Structure Inspection Manual. Basic inspections are to be completed every 2 years and more "enhanced" inspections every 6 years.

- As condition assessments are completed, this data should be uploaded into the asset inventory and be incorporated into asset management planning and decision-making

- The lifecycle management strategy for Bridges & Culverts should continue to be driven by the recommendations by the engineers that complete routine OSIM inspections

- Current levels of service should be measured according to the technical and community levels of service metrics established by the Township. These metrics should be tracked regularly to identify trends and opportunities to improve the service being provided. In time, a proposed level of service should be identified and accompanied by both a lifecycle management and financial strategy.

- The municipality is underfunding its long-term requirements on an annual basis. See Section 8.0 for a detailed financial strategy designed to achieve long-term funding requirements.

5.3 Water Network

5.3.1 Asset Inventory & Replacement Cost

The following table provides the quantity and total replacement cost of the Township's Water Network.

The replacement cost/unit for water mains has been determined based on average costs incurred as part of recent engineering contracts. Water mains have been assigned a per metre replacement cost based on the pipe material and diameter that it is expected to be replaced with. All water mains with an unknown diameter have used CPI tables to inflate their historical cost to today's value.

The quantities for some of the segments below include the total number of major components, but not necessarily the overall quantity of each. For example, Standpipes includes separate asset listings for electrical services, fencing, and the structure itself.

Table 14 Asset Inventory - Water Network

Asset Segment	Quantity	Replacement Cost Method	Total Replacement Cost
Hydrants	441 units	CPI Tables	$2,238,873
Standpipes	6 units	CPI Tables	$4,332,435
Water Connections	9 units	CPI Tables	$680,359
Water Mains	89,260 m	Cost/Unit & CPI Tables	$43,544,545
Water Pumphouses	66 units	CPI Tables	$6,177,863
Water Wells	13 units	CPI Tables	$529,232
		Total:	**$57,503,307**

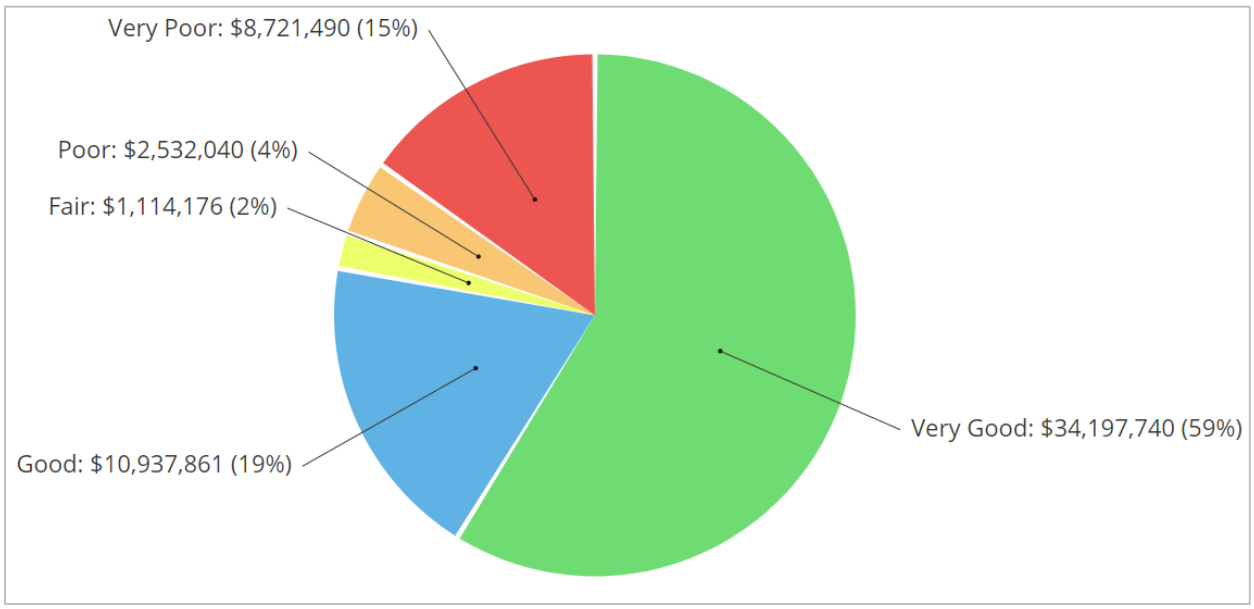
5.3.2 Current Asset Condition

The following table details the source of condition data as well as the average condition rating and the average percentage of service life remaining for each asset type.

Table 15 Current Asset Condition - Water Network

Asset Segment	Condition Source	Average Condition	% of Service Life Remaining
Hydrants	Age-based	Fair	47%
Standpipes	Age-based	Poor	30%
Water Connections	Age-based	Good	75%
Water Mains	Age-based	Good	88%
Water Pumphouses	Age-based	Poor	39%
Water Wells	Age-based	Fair	56%
	Overall:	**Good**	**81%**

Figure 17 Current Asset Condition - Water Network



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

5.3.3 Estimated Useful Life & Average Asset Age

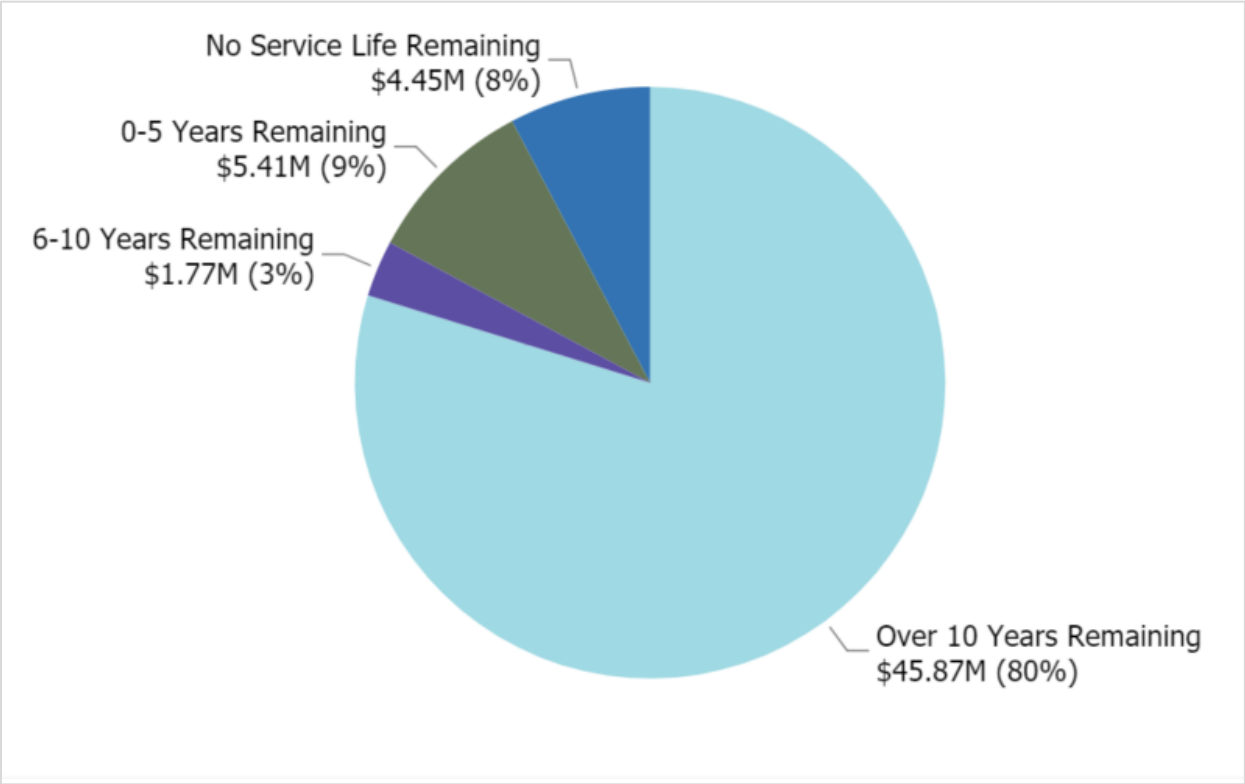
The estimated useful life for Water Network has been assigned according to a combination of established industry standards and staff knowledge.

Table 16 Service Life Remaining - Water Network

Asset Segment	Estimated Useful Life	Average Asset Age
Hydrants	30-75	28 Years
Standpipes	20-90	32 Years
Water Connections	75	19 Years
Water Mains	75	25 Years
Water Pumphouses	20-75	27 Years
Water Wells	20-50	22 Years

The following pie chart identifies the percentage of assets, by replacement value, that have surpassed their estimated service life and how close all other assets are to approaching their projected replacement date.

Figure 18 Service Life Remaining - Water Network



5.3.4 Risk & Criticality

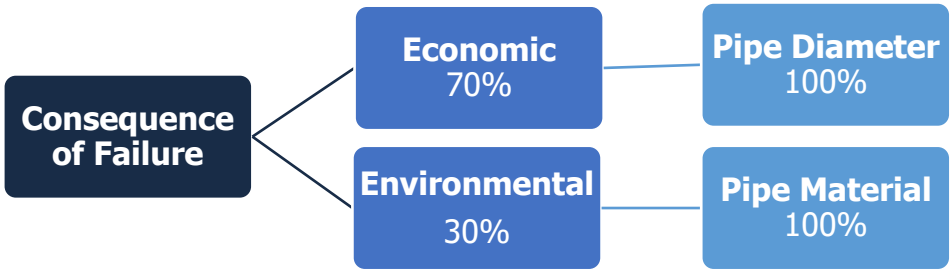
Probability of Failure

The following hierarchy identifies the risk parameters used to calculate the probability of failure for Water Mains and other Water Network assets.

All other Water Network assets use Current Asset Condition to determine the probability of failure.

Consequence of Failure

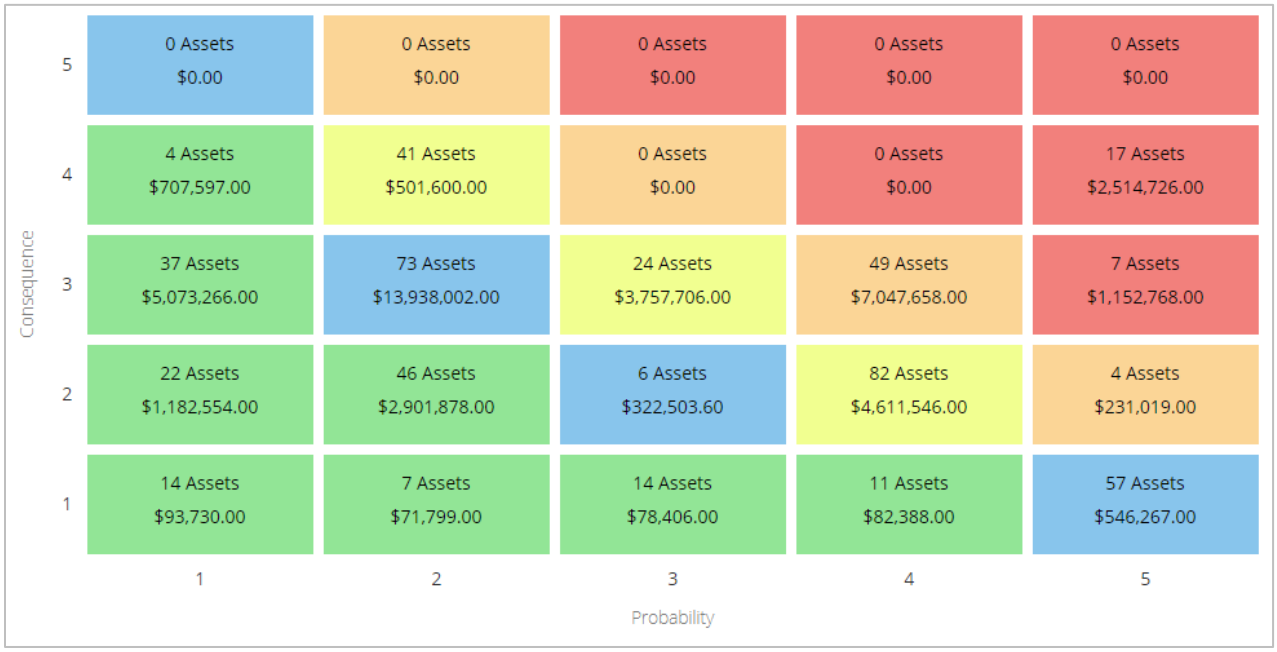
The following hierarchy identifies the risk parameters used to calculate the consequence of failure for Water Mains.



All other Water Network assets use Replacement Cost as the primary indicator used to determine their consequence of failure.

Risk Matrix

Using the above risk parameters, the following matrix visualizes the risk rating for each asset by multiplying the consequence and the probability of failure.



5.3.5 Lifecycle Management

The Township of Huron-Kinloss has outlined its approach to water infrastructure maintenance, rehabilitation and renewal as part of its Drinking Water Quality Management System (DWQMS). It has been prepared to meet the requirements of the Municipal Drinking Water Licensing Program and the Safe Drinking Water Act. Operational Plans have been developed for each of the four municipal water systems, which are maintained by Veolia Water Canada.

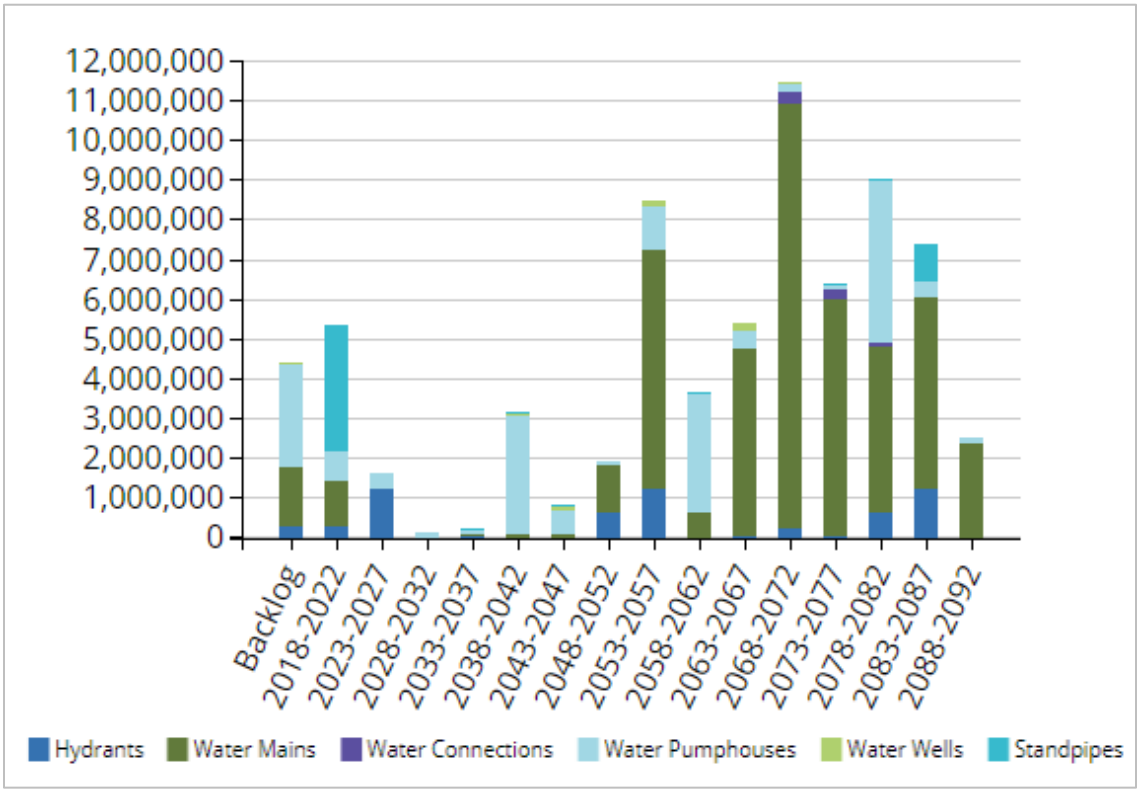
This assists in ensuring the infrastructure required is in place and is adequately maintained or plans for improvement are in place for continued safe drinking water to be provided to the customer.

Monitoring of the effectiveness of the maintenance, rehabilitation, and renewal programs is a requirement of the DWQMS, and is carried out by monitoring the maintenance work order system and assessing the amount of planned versus unplanned.

5.3.6 Forecasted Capital Requirements

The following bar chart forecasts the capital requirements for rehabilitation and replacement of the Water Network.

Figure 19 Forecasted Capital Requirements - Water Network



The projected capital expenditures that will need to be undertaken over the next 10 years to maintain the current levels of service can be found in Appendix B.

5.3.7 Current Levels of Service

Technical Levels of Service

The following table outlines the metrics that will be used to determine the technical levels of service provided by the Water Network. This data will be gathered and included as part of a future iteration of the Township's AMP.

Core Value(s)	Technical Metric	Current LOS
Accessible & Reliable	% of properties connected to the municipal water system	TBD
	# of connection-days per year due to water main breaks compared to the total number of properties connected to the municipal water system	TBD
	% of properties where fire flow is available	TBD
Safe & Regulatory	# 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	TBD
	# of water quality customer complaints	TBD
Affordable	(Average annual residential water bill / average household income) * 100	TBD
	O&M Cost (includes treatment and distribution)/ pipe km length	TBD
Sustainable	% of the water distribution system that is in good or very good condition	TBD
	% of water treatment system that is in good or very good condition	TBD

Community Levels of Service

The following table outlines the metrics that will be used to determine the community levels of service provided by the Water Network. This data will be gathered and included as part of a future iteration of the Township's AMP.

Core Value(s)	Qualitative Description	Current LOS
Accessible & Reliable	Description, which may include maps, of the user groups or areas of the municipality that are connected to the municipal water system	TBD
	Description, which may include maps, of the user groups or areas of the municipality that have fire flow	TBD
Safe & Regulatory	Description of boil water advisories and service interruptions	TBD
Affordable	What is the annual residential water bill?	TBD
Sustainable	When was the last time that the Water System AMP was reviewed?	TBD

5.3.8 Recommendations

- The Township should continue to update the DWQMS to ensure that the Water Network meets all regulatory requirements. Where deficiencies and opportunities are identified, the Township should identify a lifecycle management strategy that combines maintenance, rehabilitation and replacement activities that aim to maintain the current level of service provided.

- Current levels of service should be measured according to the technical and community levels of service metrics established by the Township. These metrics should be tracked regularly to identify trends and opportunities to improve the service being provided. In time, a proposed level of service should be identified and accompanied by both a lifecycle management and financial strategy.

- The municipality is underfunding its long-term requirements on an annual basis. See **Section 8.0** for a detailed financial strategy designed to achieve long-term funding requirements.

5.4 Sanitary Sewer Network

5.4.1 Asset Inventory & Replacement Cost

The following table provides the quantity and total replacement cost of the Township's Sanitary Sewer Network.

The replacement cost/unit for sewer mains has been determined based on average costs incurred as part of recent engineering contracts. Water mains have been assigned a per metre replacement cost based on the pipe material and diameter that it is expected to be replaced with. All sewer mains with an unknown diameter have used CPI tables to inflate their historical cost to today's value.

Table 17 Asset Inventory - Sanitary Sewer Network

Asset Segment	Quantity	Replacement Cost Method	Total Replacement Cost
Lagoons	23 units	CPI Tables	$5,748,918
Sanitary Laterals	1,065 m	CPI Tables	$2,142,438
Sanitary Sewer Mains	26,645	Cost/Unit & CPI Tables	$13,933,364
Sewage Pumping Stations	10 units	CPI Tables	$2,008,062
		Total:	**$23,832,782**

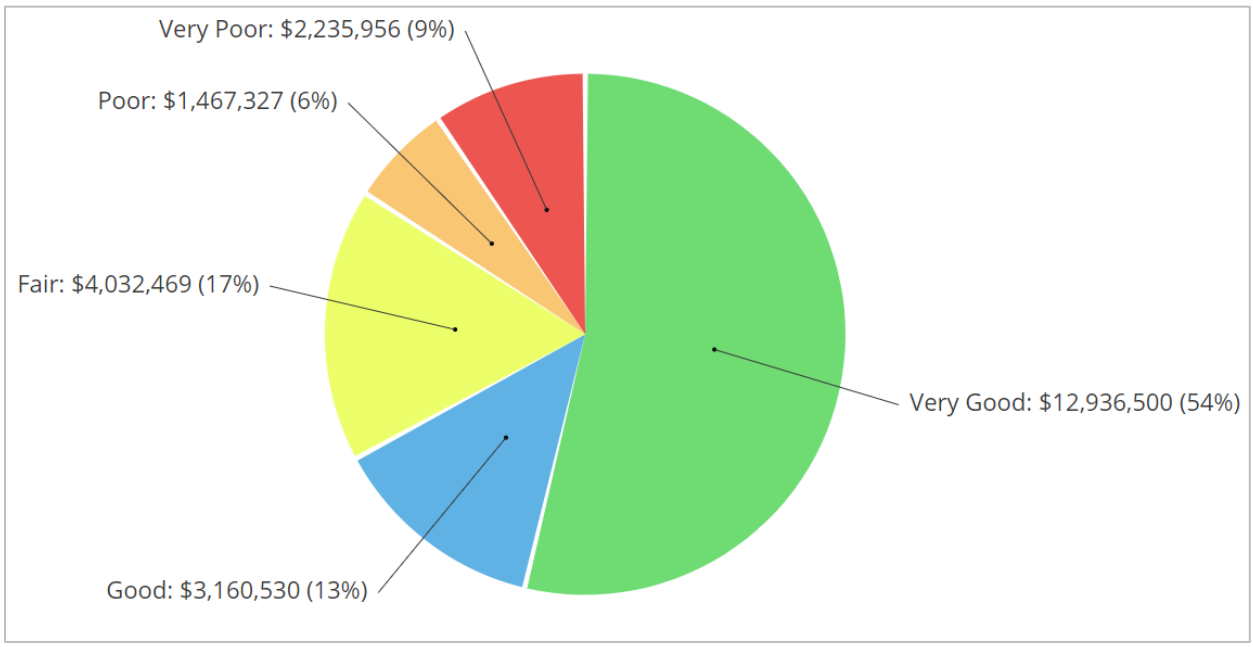
5.4.2 Current Asset Condition

The following table details the source of condition data as well as the average condition rating and the average percentage of service life remaining for each asset type.

Table 18 Current Asset Condition - Sanitary Sewer Network

Asset Segment	Condition Source	Average Condition	% of Service Life Remaining
Lagoons	Age-based	Poor	22%
Sanitary Laterals	Age-based	Good	65%
Sanitary Sewer Mains	Age-based	Very Good	93%
Sanitary Pumping Stations	Age-based	Poor	37%
	Overall:	**Good**	**87%**

Figure 20 Current Asset Condition - Sanitary Sewer Network



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

5.4.3 Estimated Useful Life & Average Asset Age

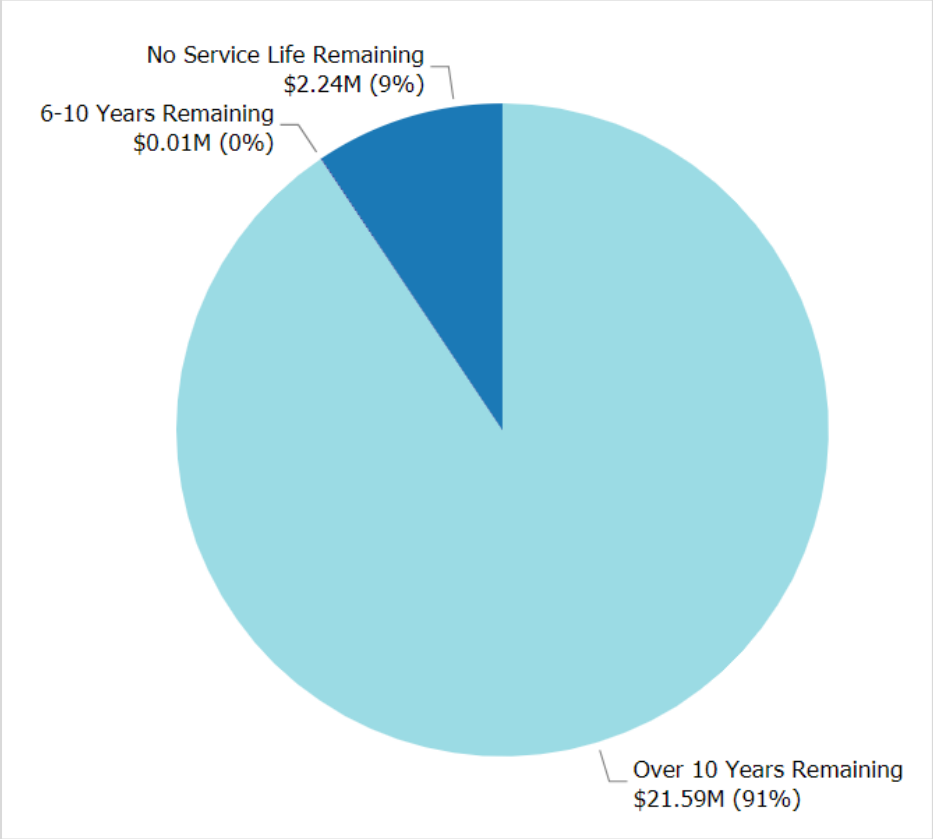
The estimated useful life for Sanitary Sewer Network has been assigned according to a combination of established industry standards and staff knowledge.

Table 19 Service Life Remaining - Sanitary Sewer Network

Asset Segment	Estimated Useful Life	Average Asset Age
Lagoons	20-50	26 Years
Sanitary Laterals	75	27 Years
Sanitary Sewer Mains	75	26 Years
Sanitary Pumping Stations	20-50	23 Years

The following pie chart identifies the percentage of assets, by replacement value, that have surpassed their estimated service life and how close all other assets are to approaching their projected replacement date.

Figure 21 Service Life Remaining - Sanitary Sewer Network



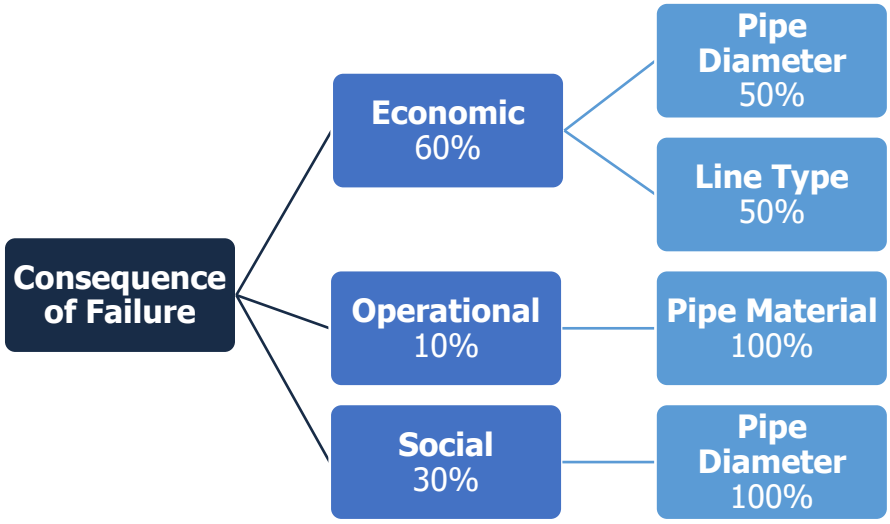
5.4.4 Risk & Criticality

Probability of Failure

The following hierarchy identifies the risk parameters used to calculate the probability of failure for all Sanitary Sewer Network assets.

Consequence of Failure

The following hierarchy identifies the risk parameters used to calculate the consequence of failure for Sanitary Sewer Mains.



All other Sanitary Sewer Network assets use Replacement Cost as the primary indicator used to determine their consequence of failure.

Risk Matrix

Using the above risk parameters, the following matrix visualizes the risk rating for each asset by multiplying the consequence and the probability of failure.

Consequence	1	2	3	4	5
5	0 Assets $0	0 Assets $0	0 Assets $0	0 Assets $0	0 Assets $0
4	2 Assets $90,300	1 Asset $1,117,612	0 Assets $0	1 Asset $1,297,560	0 Assets $0
3	44 Assets $2,412,050	9 Assets $927,822	2 Assets $1,475,477	0 Assets $0	0 Assets $0
2	233 Assets $10,206,834	14 Assets $1,021,979	6 Assets $1,955,490	0 Assets $0	2 Assets $700,504
1	7 Assets $227,316	3 Assets $93,117	5 Assets $601,502	2 Assets $169,767	13 Assets $1,535,452

Probability

5.4.5 Lifecycle Management

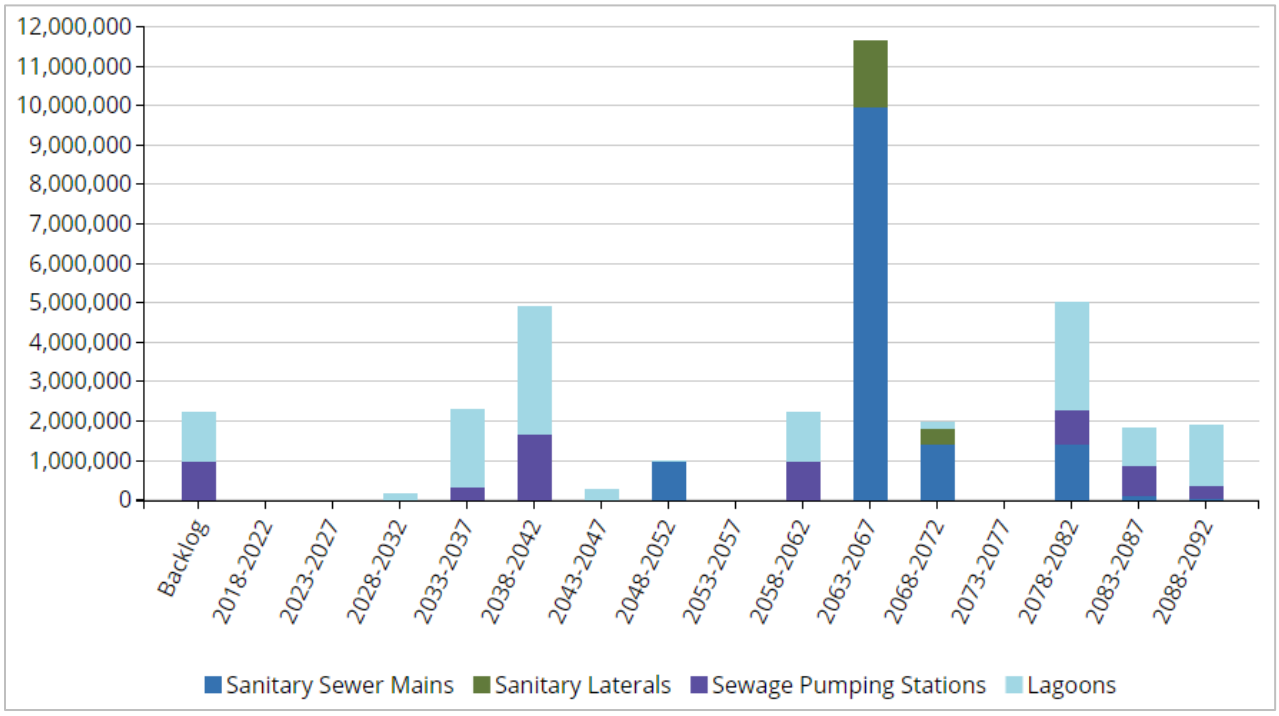
The Township's Sanitary Sewer Network is operated by Veolia Water Canada. Veolia is responsible for managing the day-to-day operations of all sewage treatment and distribution assets. The operator is responsible for identifying lifecycle needs of all infrastructure and communicating with Township staff when maintenance, rehabilitation and replacement activities are required. Each year an annual report is completed detailing key performance indicators, operational problems, corrective actions and maintenance activities.

The Township is responsible for providing capital funds to complete required rehabilitation and replacement activities as they are identified.

5.4.6 Forecasted Capital Requirements

The following bar chart forecasts the capital requirements for rehabilitation and replacement of the Sanitary Sewer Network.

Figure 22 Forecasted Capital Requirements - Sanitary Sewer Network



The projected capital expenditures that will need to be undertaken over the next 10 years to maintain the current levels of service can be found in Appendix B.

5.4.7 Current Levels of Service

Technical Levels of Service

The following table outlines the metrics that will be used to determine the technical levels of service provided by the Sanitary Sewer Network. This data will be gathered and included as part of a future iteration of the Township's AMP.

Core Value(s)	Technical Metric	Current LOS
Accessible & Reliable	% of properties connected to the municipal wastewater system	TBD
	# of sanitary sewer backups	TBD
Safe & Regulatory	# 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	TBD
	# of connection-days per year due to wastewater backups compared to the total number of properties connected to the municipal wastewater system	TBD
	# of effluent violations per year due to wastewater discharge compared to the total number of properties connected to the municipal wastewater system	TBD
Affordable	(Average annual residential sewer bill / average household income) * 100	TBD
	O&M Cost (includes treatment and collection) / km pipe length	TBD
Sustainable	% of the wastewater collection that is in good or very good condition	TBD
	% of the wastewater treatment that is in good or very good condition	TBD

Community Levels of Service

The following table outlines the metrics that will be used to determine the community levels of service provided by the Sanitary Sewer Network. This data will be gathered and included as part of a future iteration of the Township's AMP.

Core Value(s)	Qualitative Description	Current LOS
Accessible & Reliable	Description, which may include maps, of the user groups or areas of the municipality that are connected to the municipal sanitary sewer network	TBD
Safe & Regulatory	Description of how combined sewers in the sanitary sewer network are designed with overflow structures in place which allow overflow during storm events to prevent backups into homes	TBD
	Description of the frequency and volume of overflows in combined sewers in the sanitary sewer network that occur in habitable areas or beaches	TBD
	Description of how stormwater can get into sanitary sewers, causing sewage to overflow into streets or backup into homes	TBD
	Description of how sanitary sewers are designed to be resilient to avoid events described in paragraph 3	TBD
	Description of the effluent that is discharged from sewage treatment plants in the sanitary sewer network	TBD
Affordable	What is the amount of the annual residential sewer bill?	TBD
Sustainable	When was the last time that the Sanitary Sewer Network AMP was reviewed?	TBD

5.4.8 Recommendations

- The Township should develop and implement a routine condition assessment schedule for the Sanitary Sewer Network. Sanitary mains are considered to be in a good state of repair, meaning assessments may only be beneficial on components that are beginning to approach their end of life or have been identified as problem areas. Lagoons and Pumping Stations have been identified as being in "Poor" condition. These assets should be assessed to better understand lifecycle requirements.

- Current levels of service should be measured according to the technical and community levels of service metrics established by the Township. These metrics should be tracked regularly to identify trends and opportunities to improve the service being provided. In time, a proposed level of service should be identified and accompanied by both a lifecycle management and financial strategy.

- The municipality is underfunding its long-term requirements on an annual basis. See **Section 8.0** for a detailed financial strategy designed to achieve long-term funding requirements.

5.5 Storm Sewer Network

5.5.1 Asset Inventory & Replacement Cost

The following table provides the quantity and total replacement cost of the Township's Storm Sewer Network.

The replacement cost/unit for storm sewer mains has been determined based on average costs incurred as part of recent engineering contracts. Storm sewer mains have been assigned a per metre replacement cost based on the pipe material and diameter that it is expected to be replaced with. All storm sewer mains with an unknown diameter have used CPI tables to inflate their historical cost to today's value.

Table 20 Asset Inventory - Storm Sewer Network

Asset Segment	Quantity	Replacement Cost Method	Total Replacement Cost
Storm Sewer Mains	17,201 metres	Cost/Unit & CPI Tables	$7,567,462
		Total:	**$7,567,462**

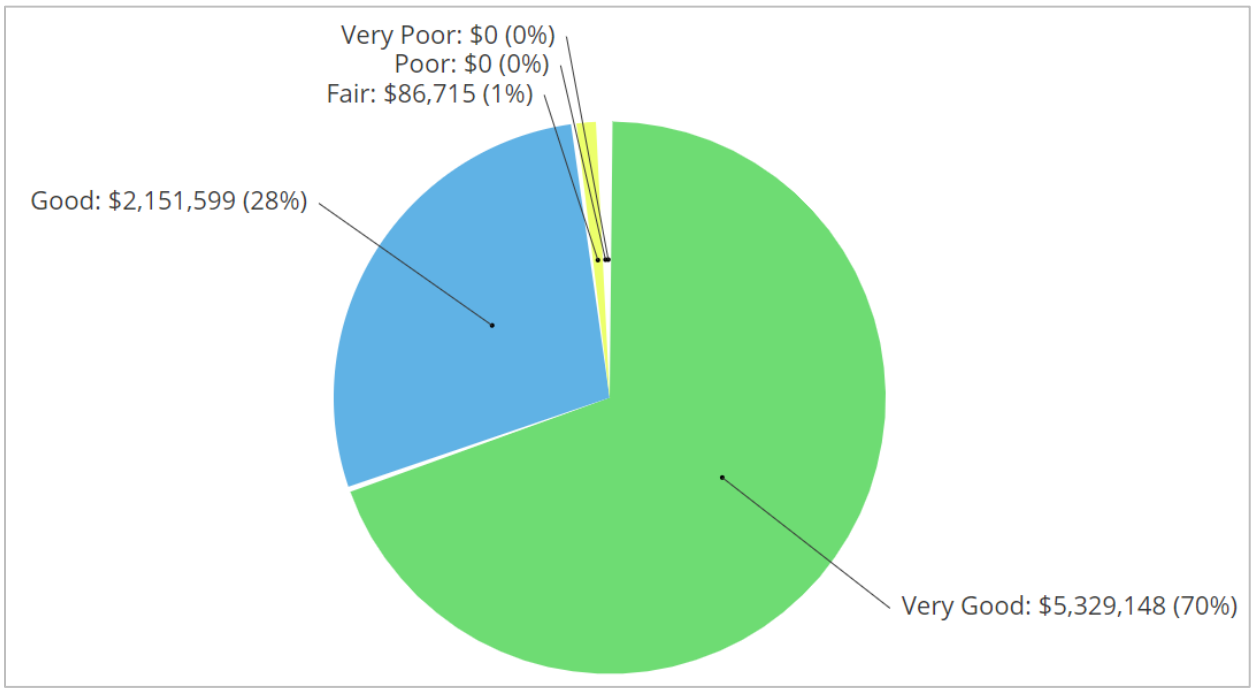
5.5.2 Current Asset Condition

The following table details the source of condition data as well as the average condition rating and the average percentage of service life remaining for each asset type.

Table 21 Current Asset Condition - Storm Sewer Network

Asset Segment	Condition Source	Average Condition	% of Service Life Remaining
Storm Sewer Mains	Age-based	Very Good	94%
	Overall:	**Very Good**	**94%**

Figure 23 Current Asset Condition - Storm Sewer Network



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

5.5.3 Estimated Useful Life & Average Asset Age

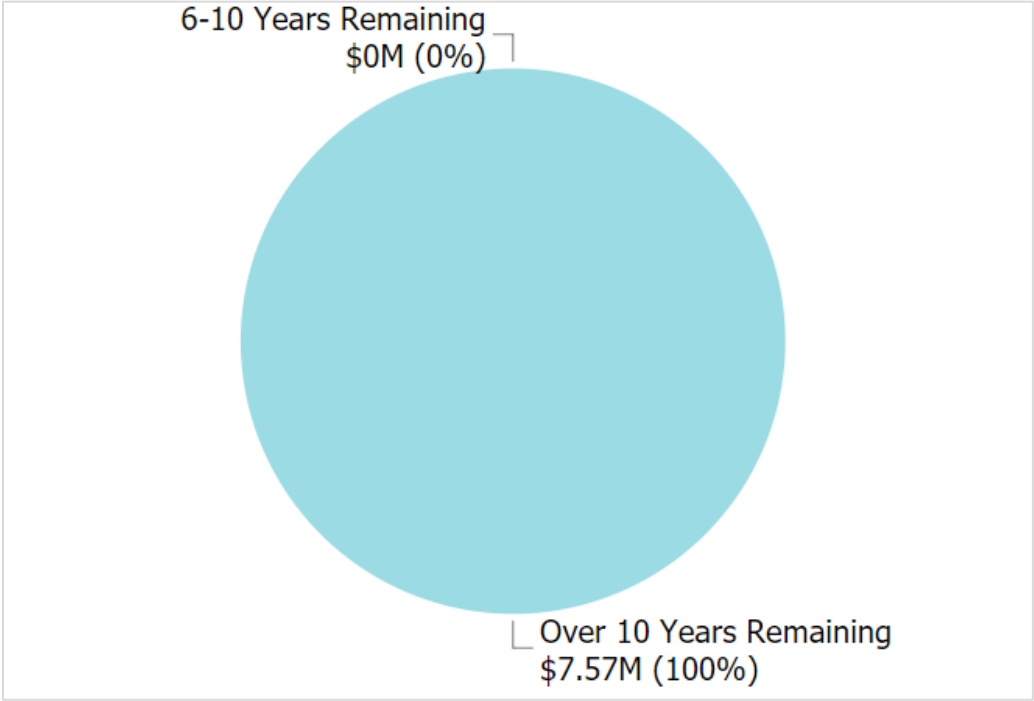
The estimated useful life for Storm Sewer Network has been assigned according to a combination of established industry standards and staff knowledge.

Table 22 Service Life Remaining - Storm Sewer Network

Asset Segment	Estimated Useful Life	Average Asset Age
Storm Sewer Mains	75	20 Years

The following pie chart identifies the percentage of assets, by replacement value, that have surpassed their estimated service life and how close all other assets are to approaching their projected replacement date.

Figure 24 Service Life Remaining - Storm Sewer Network



5.5.4 Risk & Criticality

Probability of Failure

The following hierarchy identifies the risk parameters used to calculate the probability of failure for all Storm Sewer Network assets.

Consequence of Failure

The following hierarchy identifies the risk parameters used to calculate the consequence of failure for Storm Sewer Mains.

Risk Matrix

Using the above risk parameters, the following matrix visualizes the risk rating for each asset by multiplying the consequence and the probability of failure.

5.5.5 Lifecycle Management

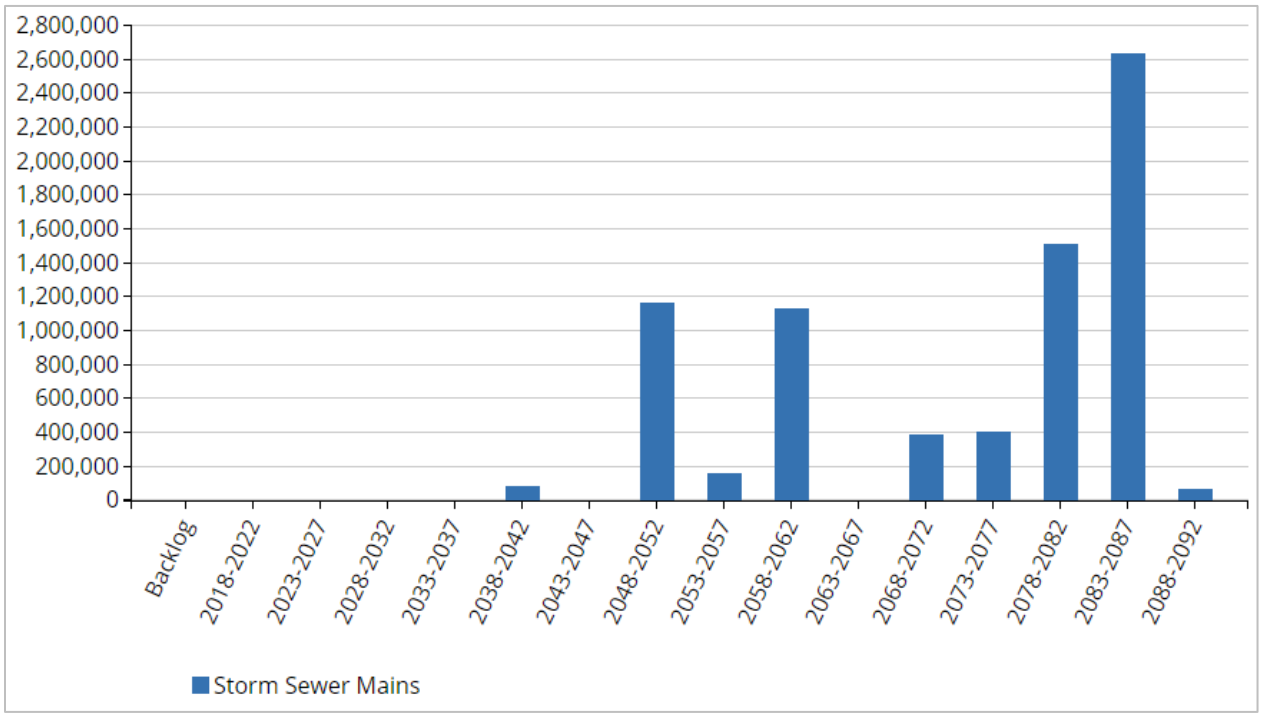
The lifecycle management strategies used to determine the maintenance, rehabilitation and replacement of the Storm Sewer Network are currently under review. Staff characterize their current strategy as more reactive than proactive.

The lifecycle management strategies that are developed should endeavour to maintain or increase the current level of service provided to the community and will be reviewed prior to the development of the Township's next AMP as required by Ontario Regulation 588/17.

5.5.6 Forecasted Capital Requirements

The following bar chart forecasts the capital requirements for rehabilitation and replacement of the Storm Sewer Network.

Figure 25 Forecasted Capital Requirements - Storm Sewer Network



The projected capital expenditures that will need to be undertaken over the next 10 years to maintain the current levels of service can be found in Appendix B.

5.5.7 Current Levels of Service

Technical Levels of Service

The following table outlines the metrics that will be used to determine the technical levels of service provided by the Storm Sewer Network. This data will be gathered and included as part of a future iteration of the Township's AMP.

Core Value(s)	Technical Metric	Current LOS
Accessible & Reliable	% of catch basins cleaned	TBD
Safe & Regulatory	% of properties in municipality resilient to a 100-year storm	TBD
	% of the municipal stormwater management system resilient to a 5-year storm	TBD
Affordable	O&M Cost / km of stormsewer and urban ditches	TBD
Sustainable	% of the stormwater system that is in good or very good condition	TBD
	Stormwater System AMP reviewed annually	TBD

Community Levels of Service

The following table outlines the metrics that will be used to determine the community levels of service provided by the Storm Sewer Network. This data will be gathered and included as part of a future iteration of the Township's AMP.

Core Value(s)	Qualitative Description	Current LOS
Accessible & Reliable	Description, which may include maps, of the user groups or areas of the municipality that are protected from flooding, including the extent of protection provided by the municipal stormwater management system	TBD
Safe & Regulatory	What level of storm intensity is the municipal stormwater network designed to handle (e.g. 1 in 5-year)?	TBD
Affordable	What is the O&M cost to maintain the stormwater network per household?	TBD

Core Value(s)	Qualitative Description	Current LOS
Sustainable	When was the last time that the Stormwater System AMP was reviewed?	TBD

5.5.8 Recommendations

- The Township should develop and implement a routine condition assessment schedule for the Storm Sewer Network. Storm Mains are considered to be in a good state of repair, meaning assessments may only be beneficial on components that are beginning to approach their end of life or have been identified as problem areas.

- Current levels of service should be measured according to the technical and community levels of service metrics established by the Township. These metrics should be tracked regularly to identify trends and opportunities to improve the service being provided. In time, a proposed level of service should be identified and accompanied by both a lifecycle management and financial strategy.

- The municipality is underfunding its long-term requirements on an annual basis. See **Section 8.0** for a detailed financial strategy designed to achieve long-term funding requirements.

5.6 Buildings

5.6.1 Asset Inventory & Replacement Cost

The following table provides the quantity and total replacement cost of the Township's Buildings inventory.

All replacement costs have been determined through the inflation of each assets historical cost to today's value.

The quantities for some of the segments below include the total number of major components, but not necessarily the overall quantity of each. For example, the Municipal Office/Town Hall includes 18 separate components including the roof, flooring and any major additions.

Table 23 Asset Inventory - Buildings

Asset Segment	Quantity	Replacement Cost Method	Total Replacement Cost
4H Livestock Shelter	1 unit	CPI Tables	$33,603
Community Centre & Arena	59 units	CPI Tables	$2,833,644
Fire Hall	2 units	CPI Tables	$673,259
Gazebo	1 unit	CPI Tables	$8,157
Lawn Bowl Building	1 unit	CPI Tables	$4,177
Mausoleum	1 unit	CPI Tables	$30,000
Medical Centre	5 units	CPI Tables	$191,733
Miscellaneous	2 units	CPI Tables	$16,528
Municipal Office/Town Hall	18 units	CPI Tables	$1,088,088
Pavillion	4 units	CPI Tables	$91,274
Picnic Pavillion	1 unit	CPI Tables	$65,285
Point Clark Lighthouse	1 unit	CPI Tables	$10,671
Ripley Public Library	3 units	CPI Tables	$140,662
Shed/Building Storage	6 units	CPI Tables	$1,105,729
Washroom	6 units	CPI Tables	$88,043
Whitechurch Hall	1 unit	CPI Tables	$3,539
		Total:	**$6,384,392**

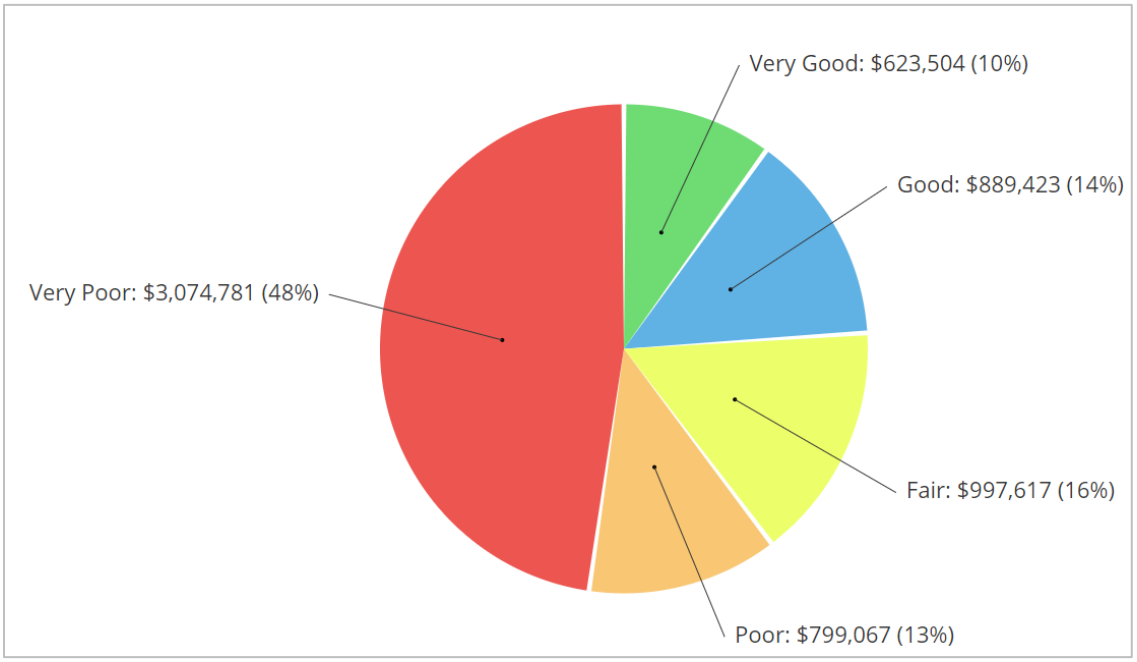
5.6.2 Current Asset Condition

The following table details the source of condition data as well as the average condition rating and the average percentage of service life remaining for each asset type.

Table 24 Current Asset Condition - Buildings

Asset Segment	Condition Source	Average Condition	% of Service Life Remaining
4H Livestock Shelter	Age-Based	Very Good	96%
Community Centre & Arena	Age-Based	Good	64%
Fire Hall	Age-Based	Good	72%
Gazebo	Age-Based	Poor	35%
Lawn Bowl Building	Age-Based	Good	76%
Mausoleum	Age-Based	Very Poor	0%
Medical Centre	Age-Based	Very Good	81%
Miscellaneous	Age-Based	Very Good	87%
Municipal Office/Town Hall	Age-Based	Good	75%
Pavillion	Age-Based	Poor	20%
Picnic Pavillion	Age-Based	Very Good	96%
Point Clark Lighthouse	Age-Based	Very Good	87%
Ripley Public Library	Age-Based	Fair	53%
Shed/Building Storage	Age-Based	Poor	39%
Washroom	Age-Based	Fair	50%
Whitechurch Hall	Age-Based	Very Good	97%
	Overall:	**Good**	**63%**

Figure 26 Current Asset Condition - Buildings



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

5.6.3 Estimated Useful Life & Average Asset Age

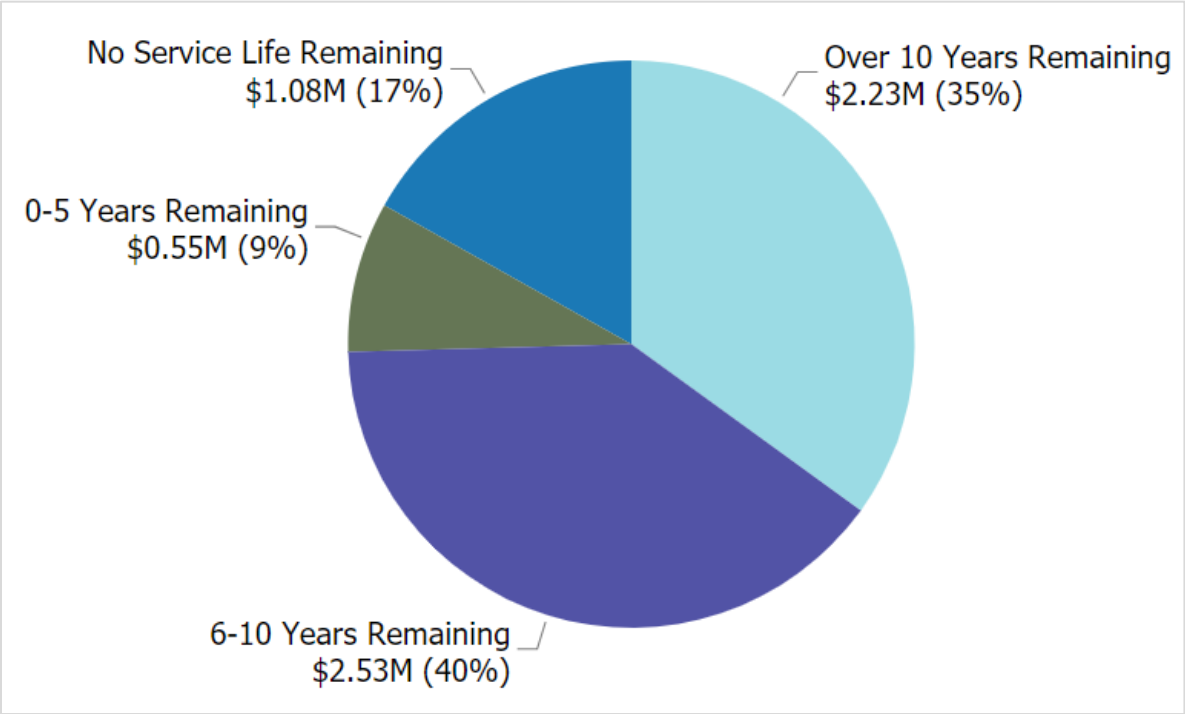
The estimated useful life for Buildings has been assigned according to a combination of established industry standards and staff knowledge.

Table 25 Service Life Remaining - Buildings

Asset Segment	Estimated Useful Life	Average Asset Age
4H Livestock Shelter	30	1 Year
Community Centre & Arena	15-30	7 Years
Fire Hall	30	9 Years
Gazebo	30	20 Years
Lawn Bowl Building	20-30	5 Years
Mausoleum	30	68 Years
Medical Centre	30	6 Years
Miscellaneous	20	3 Years
Municipal Office/Town Hall	15-30	7 Years
Pavillion	20-30	25 Years
Picnic Pavillion	30	1 Year
Point Clark Lighthouse	20	3 Years
Ripley Public Library	20-30	14 Years
Shed/Building Storage	20-30	20 Years
Washroom	30	15 Years
Whitechurch Hall	20-30	1 Year

The following pie chart identifies the percentage of assets, by replacement value, that have surpassed their estimated service life and how close all other assets are to approaching their projected replacement date.

Figure 27 Service Life Remaining - Buildings



5.6.4 Risk & Criticality

Probability of Failure

The following hierarchy identifies the risk parameters used to calculate the probability of failure for Buildings.

Consequence of Failure

The following hierarchy identifies the risk parameters used to calculate the consequence of failure for Buildings.

Risk Matrix

Using the above risk parameters, the following matrix visualizes the risk rating for each asset by multiplying the consequence and the probability of failure.

5.6.5 Lifecycle Management

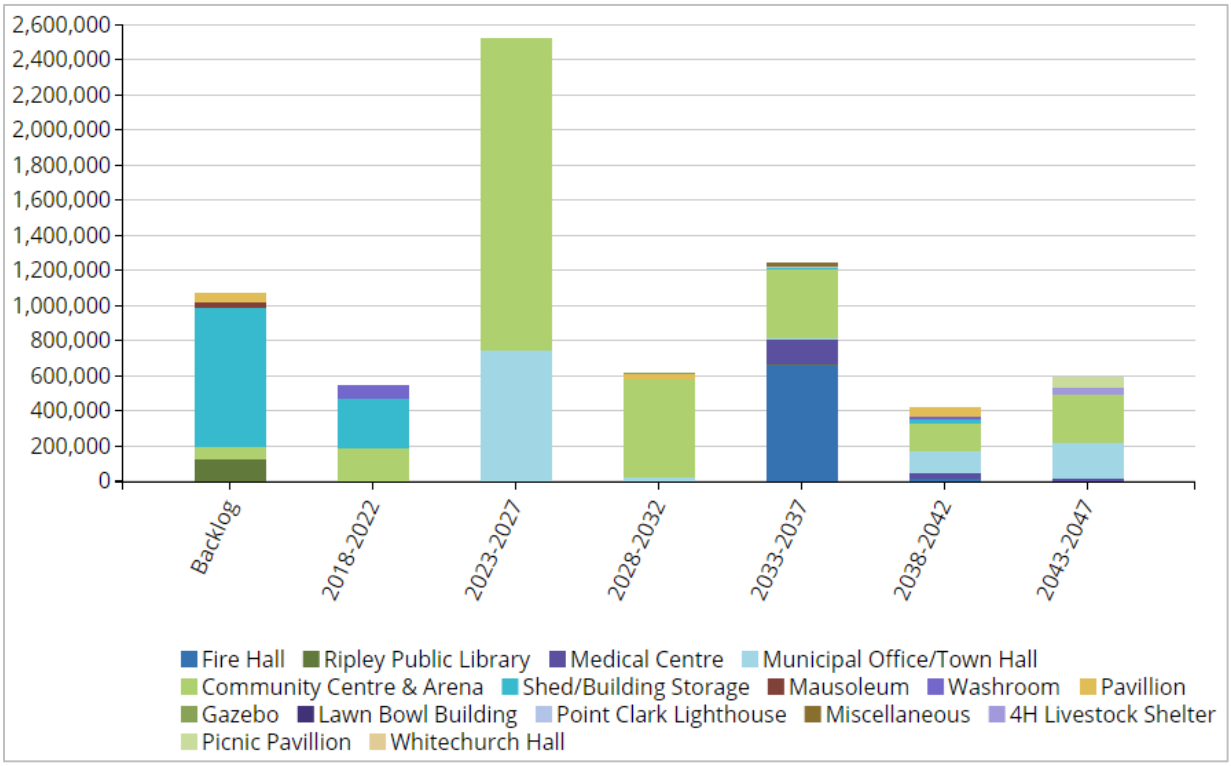
The lifecycle management strategies used to determine the maintenance, rehabilitation and replacement of Buildings are currently under review. Staff characterize their current strategy as more reactive than proactive.

The lifecycle management strategies that are developed should endeavour to maintain or increase the current level of service provided to the community and will be reviewed prior to the development of the Township's next AMP as required by Ontario Regulation 588/17.

5.6.6 Forecasted Capital Requirements

The following bar chart forecasts the capital requirements for rehabilitation and replacement of the Buildings.

Figure 28 Forecasted Capital Requirements - Buildings



The projected capital expenditures that will need to be undertaken over the next 10 years to maintain the current levels of service can be found in Appendix B.

5.6.7 Current Levels of Service

Technical Levels of Service

The Township is working towards identifying the performance metrics that will be used to measure the current level of service provided by the inventory of Buildings. These technical levels of service will be included in the Township's AMP prior to the deadline of July 1, 2023 that has been outlined for non-core asset categories in O. Reg. 588/17.

Community Levels of Service

The Township is working towards identifying the qualitative descriptions that will be used to measure the current level of service provided by the inventory of Buildings. These community levels of service will be included in the Township's AMP prior to the deadline of July 1, 2023 that has been outlined for non-core asset categories in O. Reg. 588/17.

5.6.8 Recommendations

- The Township should develop and implement a routine condition assessment schedule for Buildings. While many buildings are considered to be in a good state of repair, there are a handful of structures that are beginning to approach their end of life. The Gazebo, Mausoleum, Pavillion and Shed/Building Storage should be assessed by staff to determine whether there are any immediate lifecycle requirements.

- The Township should work to identify the performance metrics and qualitative descriptions that will be used to measure current levels of service for Buildings. These metrics and descriptions should be developed prior to the development of the Township's next AMP

- The municipality is underfunding its long-term requirements on an annual basis. See **Section 8.0** for a detailed financial strategy designed to achieve long-term funding requirements.

5.7 Machinery & Equipment

5.7.1 Asset Inventory & Replacement Cost

The following table provides the quantity and total replacement cost of the Township's Machinery & Equipment inventory.

All replacement costs have been determined through the inflation of each assets historical cost to today's value.

Table 26 Asset Inventory - Machinery & Equipment

Asset Segment	Quantity	Replacement Cost Method	Total Replacement Cost
Arena Equipment	13 units	CPI Tables	$36,706
Fire Fighting Apparatus	79 units	CPI Tables	$254,117
Furniture & Fixtures	1,343 units	CPI Tables	$261,337
General - Electronic Equipment	87 units	CPI Tables	$308,301
Generators/Large Equipment	7 units	CPI Tables	$246,031
Parks Equipment	70 units	CPI Tables	$579,374
Small Tools	7 units	CPI Tables	$42,928
WTP - Electronic Equipment	17 units	CPI Tables	$283,128
		Total:	**$2,011,922**

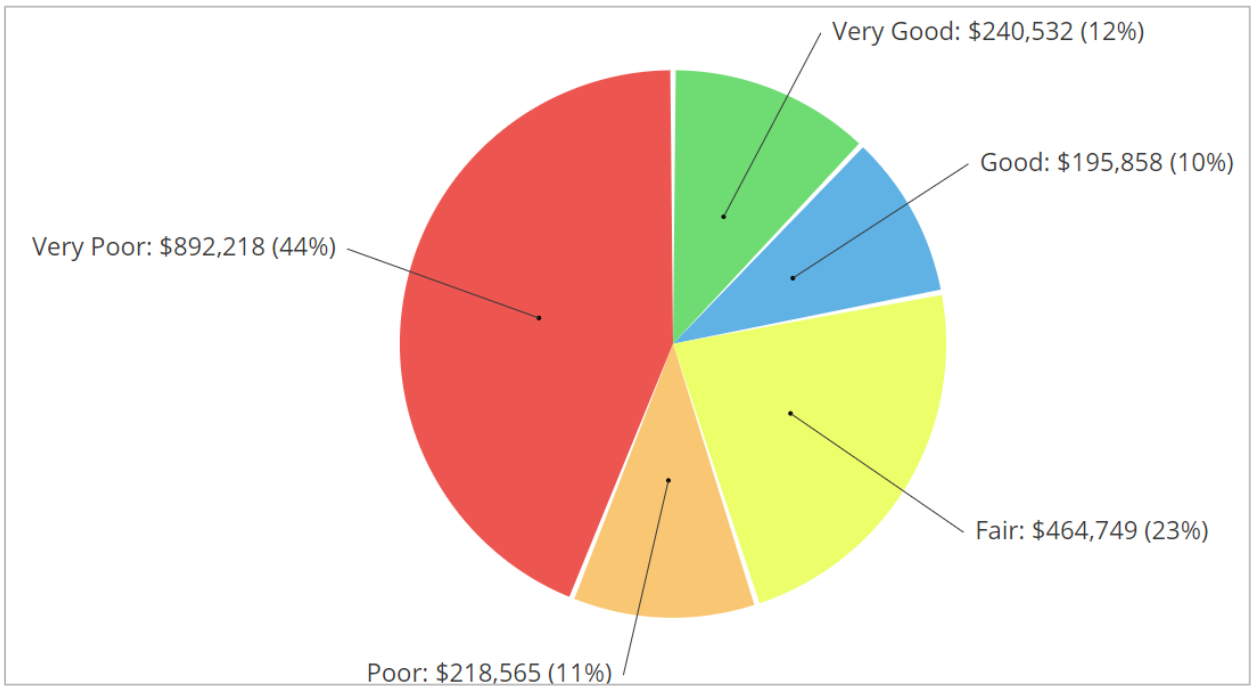
5.7.2 Current Asset Condition

The following table details the source of condition data as well as the average condition rating and the average percentage of service life remaining for each asset type.

Table 27 Current Asset Condition - Machinery & Equipment

Asset Segment	Condition Source	Average Condition	% of Service Life Remaining
Arena Equipment	Age-based	Very Good	92%
Fire Fighting Apparatus	Age-based	Fair	59%
Furniture & Fixtures	Age-based	Fair	47%
General - Electronic Equipment	Age-based	Poor	24%
Generators/Large Equipment	Age-based	Poor	39%
Parks Equipment	Internal Assessment & Age-based	Poor	35%
Small Tools	Age-based	Very Poor	9%
WTP - Electronic Equipment	Age-based	Very Poor	8%
	Overall:	**Poor**	**36%**

Figure 29 Current Asset Condition - Machinery & Equipment



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

5.7.3 Estimated Useful Life & Average Asset Age

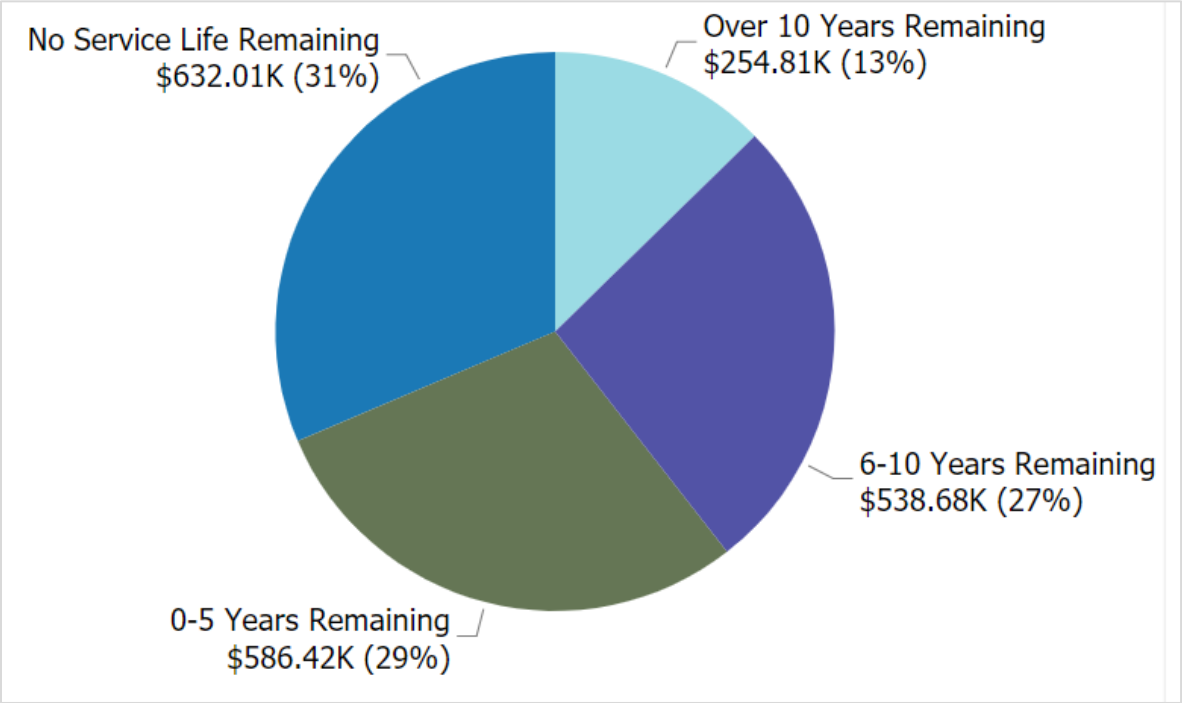
The estimated useful life for Machinery & Equipment has been assigned according to a combination of established industry standards and staff knowledge.

Table 28 Service Life Remaining - Machinery & Equipment

Asset Segment	Estimated Useful Life	Average Asset Age
Arena Equipment	20	2 Years
Fire Fighting Apparatus	10	4 Years
Furniture & Fixtures	10-15	10 Years
General - Electronic Equipment	5-10	7 Years
Generators/Large Equipment	20	12 Years
Parks Equipment	15	16 Years
Small Tools	5	9 Years
WTP - Electronic Equipment	5	8 Years

The following pie chart identifies the percentage of assets, by replacement value, that have surpassed their estimated service life and how close all other assets are to approaching their projected replacement date.

Figure 30 Service Life Remaining - Machinery & Equipment



5.7.4 Risk & Criticality

Probability of Failure

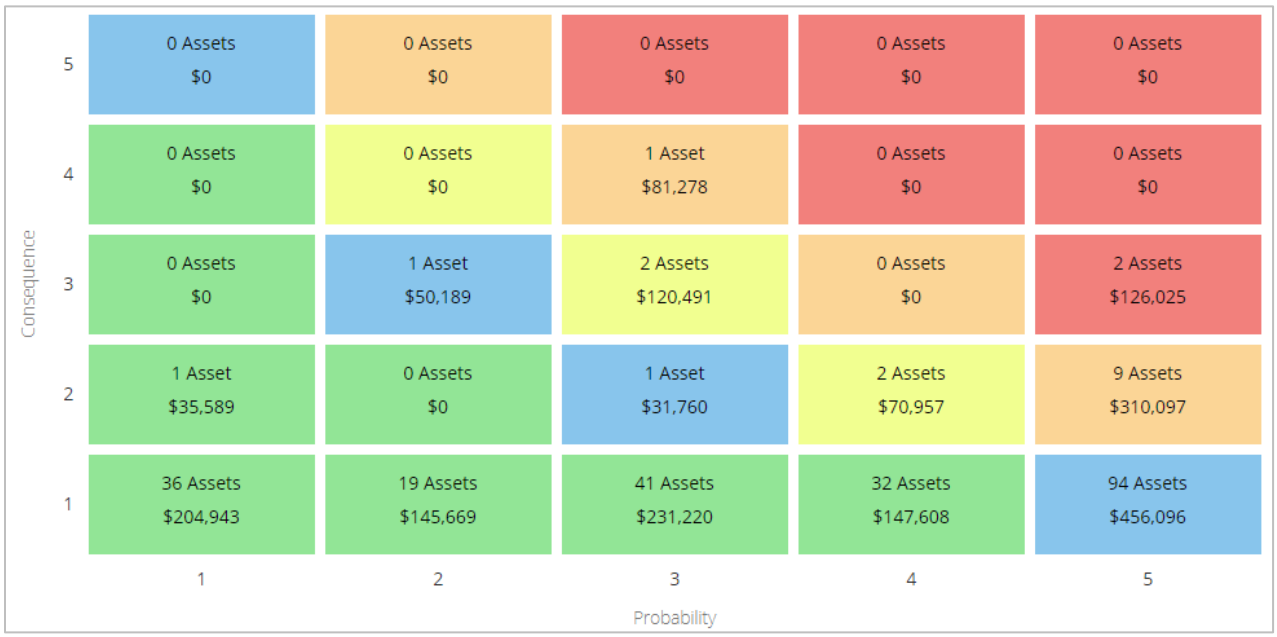
The following hierarchy identifies the risk parameters used to calculate the probability of failure for Machinery & Equipment.

Consequence of Failure

The following hierarchy identifies the risk parameters used to calculate the consequence of failure for Machinery & Equipment.

Risk Matrix

Using the above risk parameters, the following matrix visualizes the risk rating for each asset by multiplying the consequence and the probability of failure.



5.7.5 Lifecycle Management

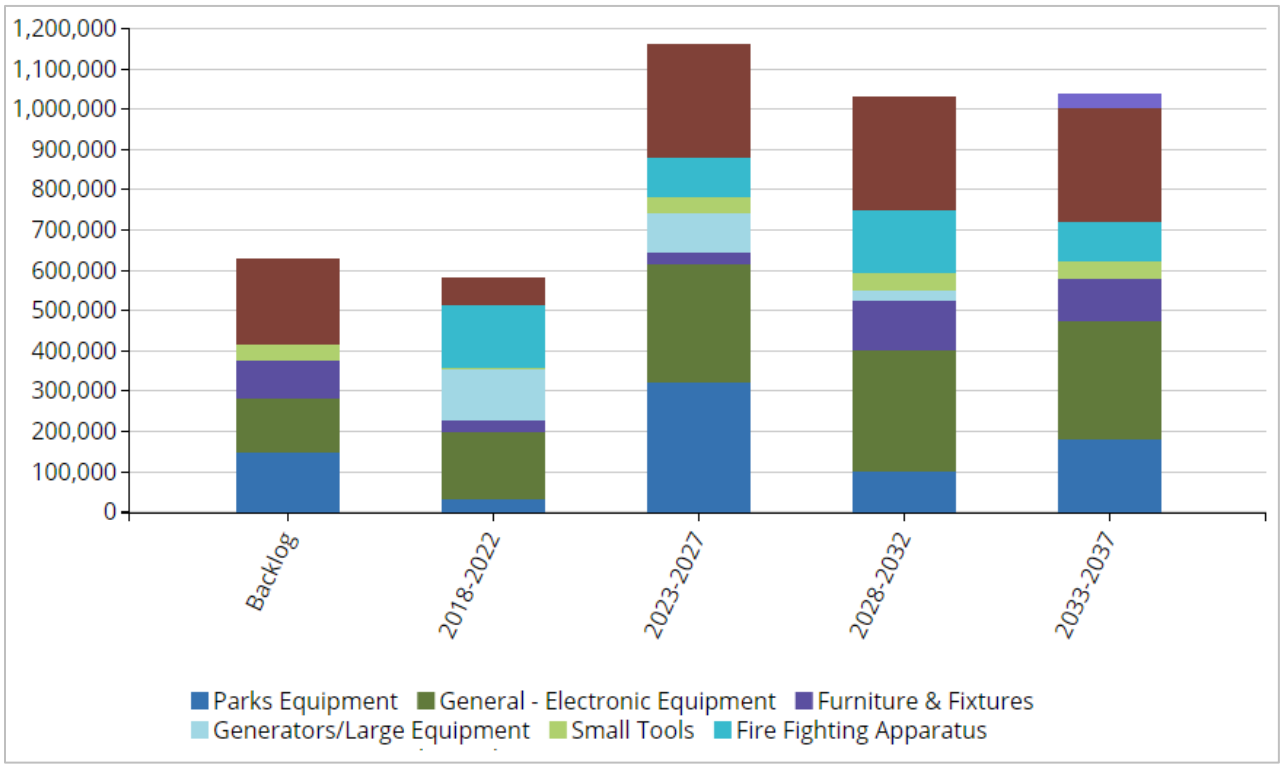
The lifecycle management strategies used to determine the maintenance, rehabilitation and replacement of Machinery & Equipment are currently under review. Staff characterize their current strategy as more reactive than proactive.

The lifecycle management strategies that are developed should endeavour to maintain or increase the current level of service provided to the community and will be reviewed prior to the development of the Township's next AMP as required by Ontario Regulation 588/17.

5.7.6 Forecasted Capital Requirements

The following bar chart forecasts the capital requirements for rehabilitation and replacement of the Machinery & Equipment.

Figure 31 Forecasted Capital Requirements - Machinery & Equipment



The projected capital expenditures that will need to be undertaken over the next 10 years to maintain the current levels of service can be found in Appendix B.

5.7.7 Current Levels of Service

Technical Levels of Service

The Township is working towards identifying the performance metrics that will be used to measure the current level of service provided by Machinery & Equipment assets. These technical levels of service will be included in the Township's AMP prior to the deadline of July 1, 2023 that has been outlined for non-core asset categories in O. Reg. 588/17.

Community Levels of Service

The Township is working towards identifying the qualitative descriptions that will be used to measure the current level of service provided by Machinery & Equipment assets. These community levels of service will be included in the Township's AMP prior to the deadline of July 1, 2023 that has been outlined for non-core asset categories in O. Reg. 588/17.

5.7.8 Recommendations

- The Township should develop and implement a routine condition assessment schedule for Machinery & Equipment. At this time 55% of assets are considered to be in 'Very Poor' or 'Poor" condition. These assets should be assessed by staff to determine whether there are any immediate lifecycle requirements.

- The Township should work to identify the performance metrics and qualitative descriptions that will be used to measure current levels of service for Machinery & Equipment. These metrics and descriptions should be developed prior to the development of the Township's next AMP

- The municipality is underfunding its long-term requirements on an annual basis. See **Section 8.0** for a detailed financial strategy designed to achieve long-term funding requirements.

5.8 Land Improvements

5.8.1 Asset Inventory & Replacement Cost

The following table provides the quantity and total replacement cost of the Township's Land Improvements inventory.

All replacement costs have been determined through the inflation of each assets historical cost to today's value.

Table 29 Asset Inventory - Land Improvements

Asset Segment	Quantity	Replacement Cost Method	Total Replacement Cost
Athletic Fields/Courts	14 units	CPI Tables	$507,646
Landscaping	11 units	CPI Tables	$127,411
Miscellaneous	37 units	CPI Tables	$185,688
Municipal Drains	12 units	CPI Tables	$468,425
Parking Lots	3 units	CPI Tables	$124,927
Retaining Walls/Planters	2 units	CPI Tables	$15,201
Sculptures/Structures	3 units	CPI Tables	$37,880
Trails	18 units	CPI Tables	$71,822
		Total:	**$1,539,000**

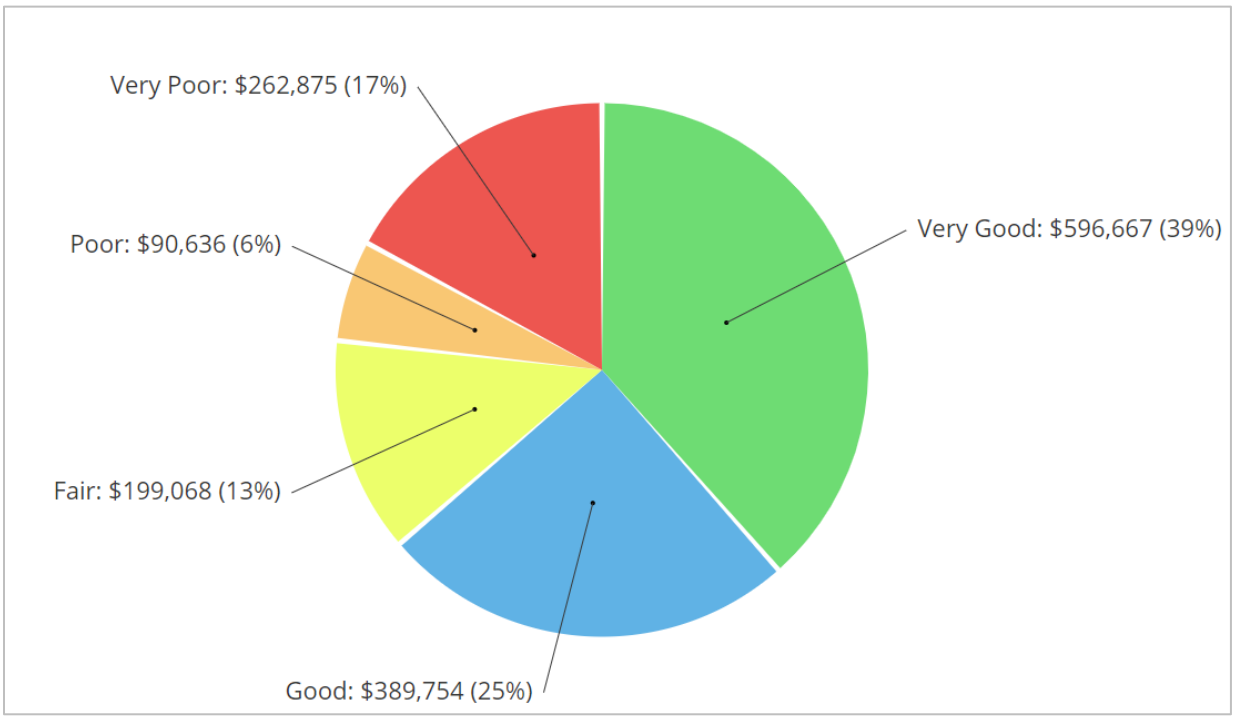
5.8.2 Current Asset Condition

The following table details the source of condition data as well as the average condition rating and the average percentage of service life remaining for each asset type.

Table 30 Current Asset Condition - Land Improvements

Asset Segment	Condition Source	Average Condition	% of Service Life Remaining
Athletic Fields/Courts	Internal Assessment & Age-based	Poor	35%
Landscaping	Internal Assessment & Age-based	Good	68%
Miscellaneous	Age-based	Very Good	80%
Municipal Drains	Age-based	Good	69%
Parking Lots	Age-based	Good	68%
Retaining Walls/Planters	Internal Assessment & Age-based	Good	70%
Sculptures/Structures	Age-based	Very Good	82%
Trails	Age-based	Good	73%
	Overall:	**Good**	**63%**

Figure 32 Current Asset Condition - Land Improvements



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

5.8.3 Estimated Useful Life & Average Asset Age

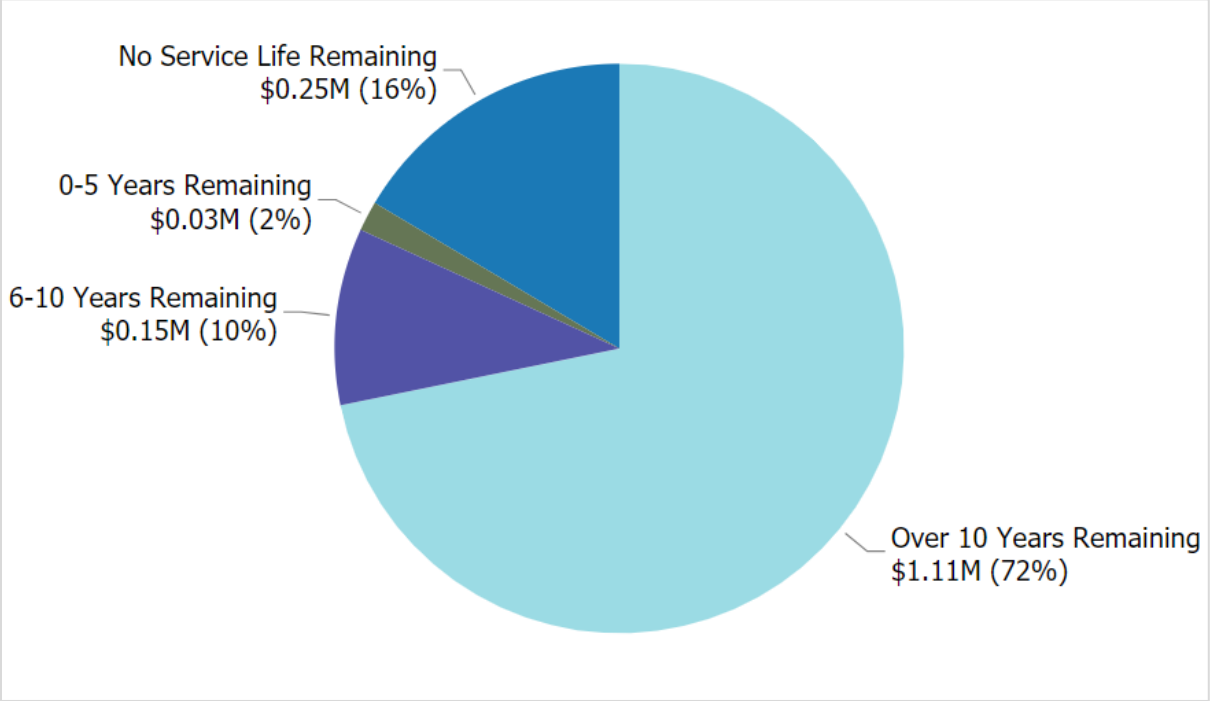
The estimated useful life for Land Improvements has been assigned according to a combination of established industry standards and staff knowledge.

Table 31 Service Life Remaining - Land Improvements

Asset Segment	Estimated Useful Life	Average Asset Age
Athletic Fields/Courts	20	17 Years
Landscaping	10	9 Years
Miscellaneous	10-15	5 Years
Municipal Drains	5-10	7 Years
Parking Lots	20	7 Years
Retaining Walls/Planters	15	8 Years
Sculptures/Structures	5	4 Years
Trails	5	8 Years

The following pie chart identifies the percentage of assets, by replacement value, that have surpassed their estimated service life and how close all other assets are to approaching their projected replacement date.

Figure 33 Service Life Remaining - Land Improvements



5.8.4 Risk & Criticality

Probability of Failure

The following hierarchy identifies the risk parameters used to calculate the probability of failure for Land Improvements.

Consequence of Failure

The following hierarchy identifies the risk parameters used to calculate the consequence of failure for Land Improvements.

Risk Matrix

Using the above risk parameters, the following matrix visualizes the risk rating for each asset by multiplying the consequence and the probability of failure.

5.8.5 Lifecycle Management

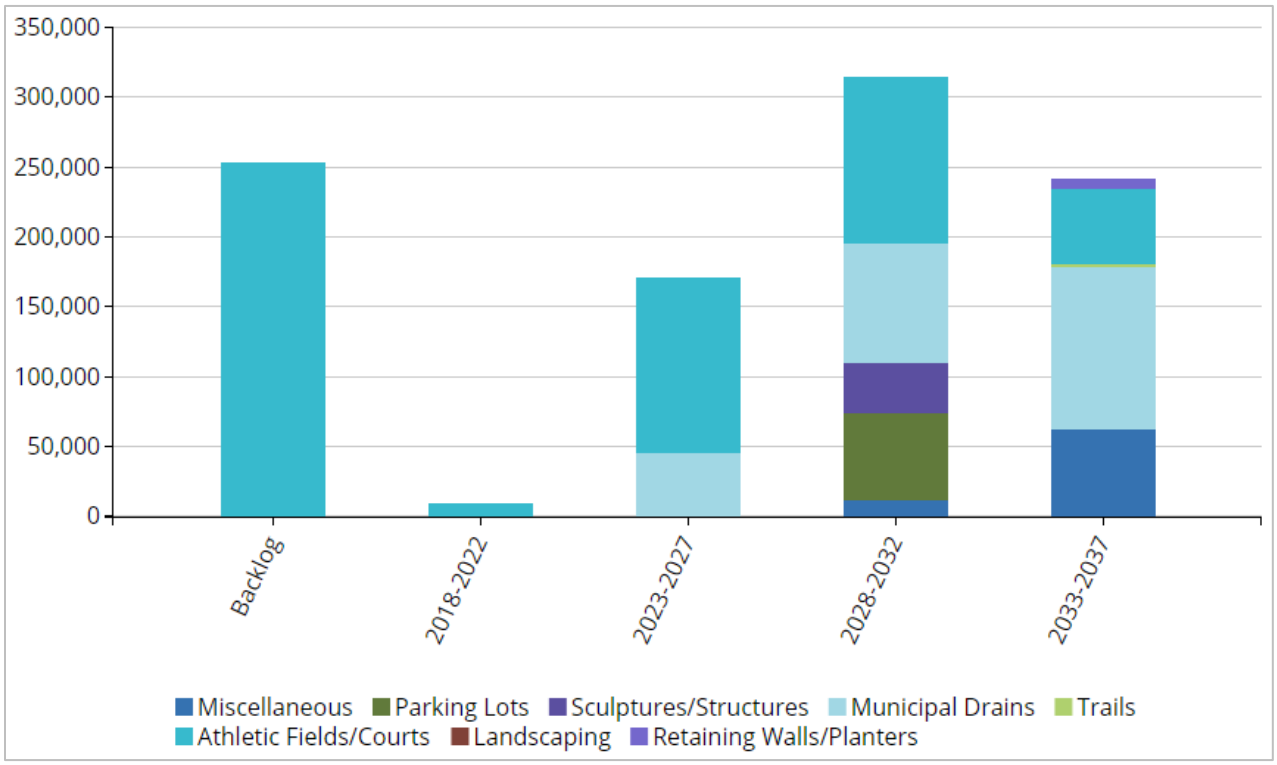
The lifecycle management strategies used to determine the maintenance, rehabilitation and replacement of Land Improvements are currently under review. Staff characterize their current strategy as more reactive than proactive.

The lifecycle management strategies that are developed should endeavour to maintain or increase the current level of service provided to the community and will be reviewed prior to the development of the Township's next AMP as required by Ontario Regulation 588/17.

5.8.6 Forecasted Capital Requirements

The following bar chart forecasts the capital requirements for rehabilitation and replacement of the Land Improvements.

Figure 34 Forecasted Capital Requirements - Land Improvements



The projected capital expenditures that will need to be undertaken over the next 10 years to maintain the current levels of service can be found in Appendix B.

5.8.7 Current Levels of Service

Technical Levels of Service

The Township is working towards identifying the performance metrics that will be used to measure the current level of service provided by Land Improvements. These technical levels of service will be included in the Township's AMP prior to the deadline of July 1, 2023 that has been outlined for non-core asset categories in O. Reg. 588/17.

Community Levels of Service

The Township is working towards identifying the qualitative descriptions that will be used to measure the current level of service provided by Land Improvements. These community levels of service will be included in the Township's AMP prior to the deadline of July 1, 2023 that has been outlined for non-core asset categories in O. Reg. 588/17.

5.8.8 Recommendations

- The Township should develop and implement a routine condition assessment schedule for Land Improvements. While many assets are considered to be in a good state of repair, Athletic Fields/Courts have been given a condition rating of 'Poor" based on a combination of age-based estimates and assessed condition. These assets should be assessed by staff to determine whether there are any immediate lifecycle requirements.

- The Township should work to identify the performance metrics and qualitative descriptions that will be used to measure current levels of service for Land Improvements. These metrics and descriptions should be developed prior to the development of the Township's next AMP

- The municipality is underfunding its long-term requirements on an annual basis. See Section 8.0 for a detailed financial strategy designed to achieve long-term funding requirements.

5.9 Fleet

5.9.1 Asset Inventory & Replacement Cost

The following table provides the quantity and total replacement cost of the Township's Fleet inventory.

All replacement costs have been determined through the inflation of each assets historical cost to today's value.

Table 32 Asset Inventory - Fleet

Asset Segment	Quantity	Replacement Cost Method	Total Replacement Cost
Fire Vehicles	4 units	CPI Tables	$1,294,116
Heavy Vehicles	31 units	CPI Tables	$4,549,303
Light Vehicles	26 units	CPI Tables	$573,844
Olympia	2 units	CPI Tables	$101,718
		Total:	**$6,518,981**

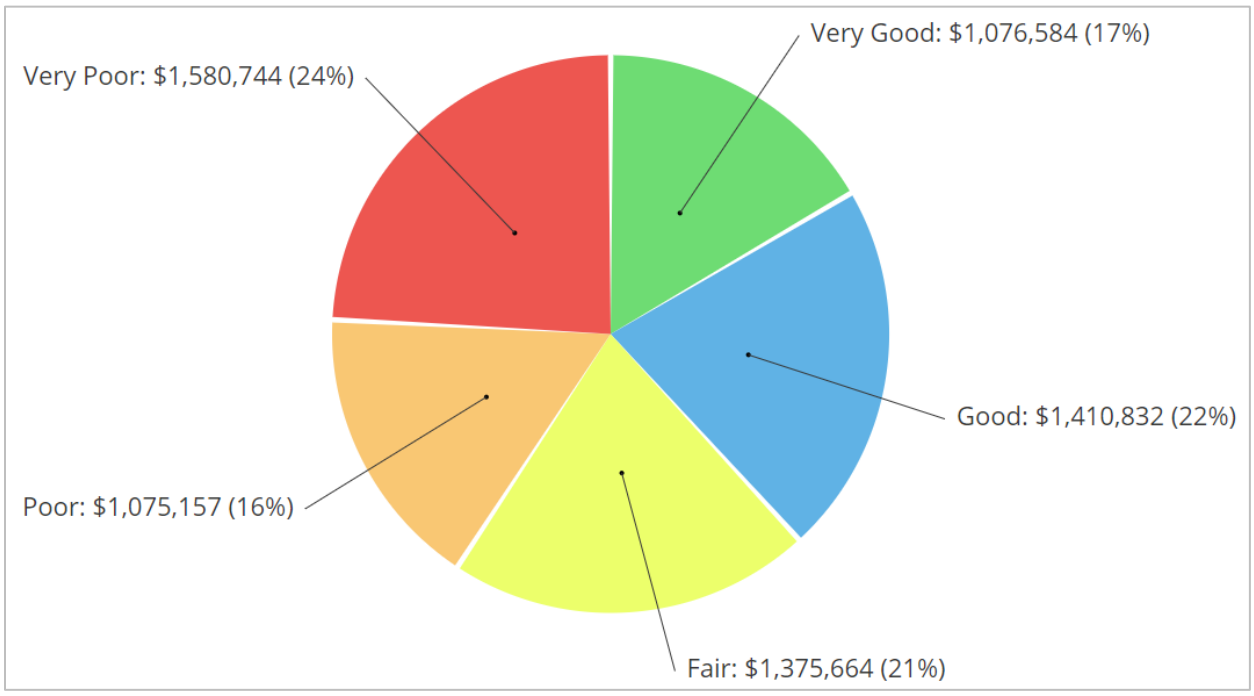
5.9.2 Current Asset Condition

The following table details the source of condition data as well as the average condition rating and the average percentage of service life remaining for each asset type.

Table 33 Current Asset Condition - Fleet

Asset Segment	Condition Source	Average Condition	% of Service Life Remaining
Fire Vehicles	Age-based	Fair	53%
Heavy Vehicles	Age-based	Fair	43%
Light Vehicles	Age-based	Very Poor	13%
Olympia	Age-based	Poor	23%
	Overall:	**Poor**	**31%**

Figure 35 Current Asset Condition - Fleet



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

5.9.3 Estimated Useful Life & Average Asset Age

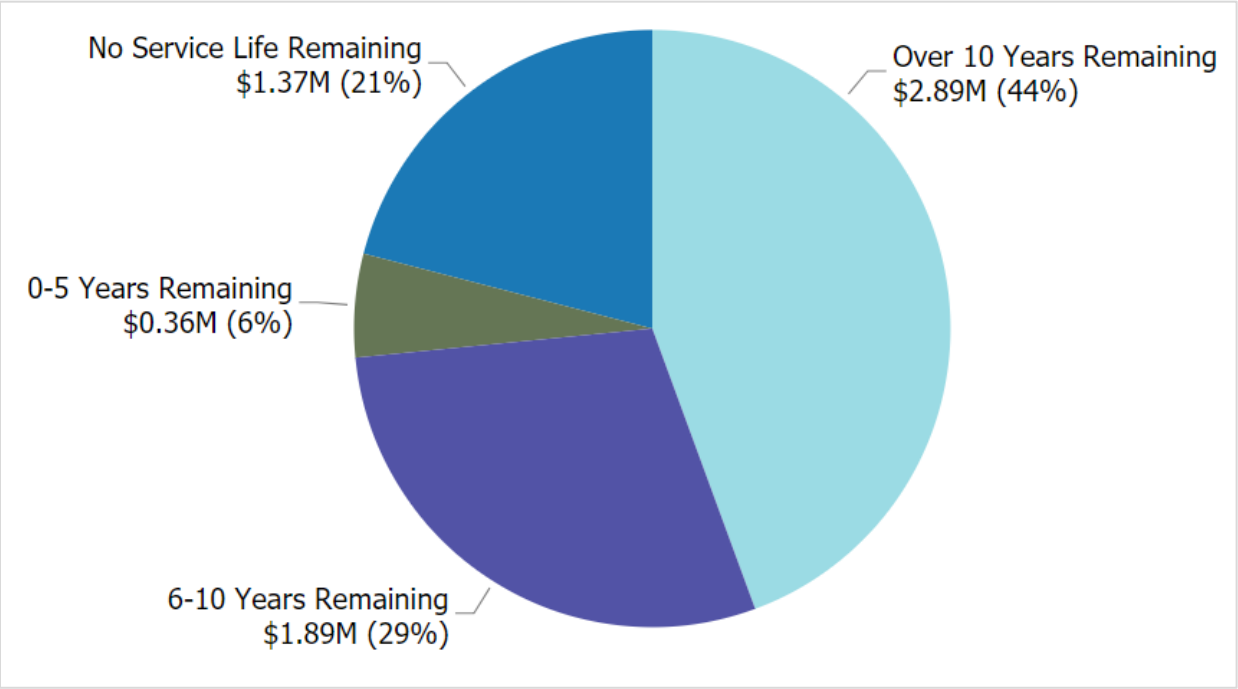
The estimated useful life for Fleet has been assigned according to a combination of established industry standards and staff knowledge.

Table 34 Service Life Remaining - Fleet

Asset Segment	Estimated Useful Life	Average Asset Age
Fire Vehicles	15-20	8 Years
Heavy Vehicles	8-20	14 Years
Light Vehicles	5	11 Years
Olympia	15	14 Years

The following pie chart identifies the percentage of assets, by replacement value, that have surpassed their estimated service life and how close all other assets are to approaching their projected replacement date.

Figure 36 Service Life Remaining - Fleet



5.9.4 Risk & Criticality

Probability of Failure

The following hierarchy identifies the risk parameters used to calculate the probability of failure for Fleet.

Consequence of Failure

The following hierarchy identifies the risk parameters used to calculate the consequence of failure for Fleet.

Risk Matrix

Using the above risk parameters, the following matrix visualizes the risk rating for each asset by multiplying the consequence and the probability of failure.

5.9.5 Lifecycle Management

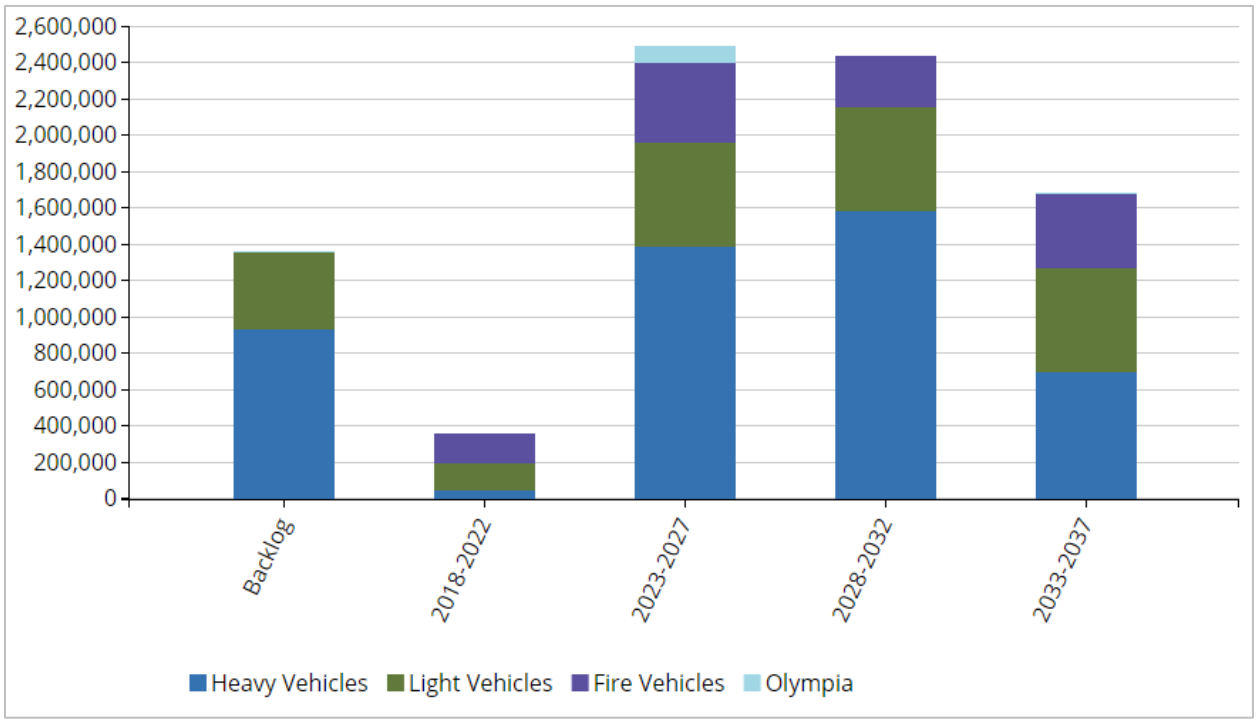
The lifecycle management strategies used to determine the maintenance, rehabilitation and replacement of Fleet are currently under review. Staff characterize their current strategy as more reactive than proactive.

The lifecycle management strategies that are developed should endeavour to maintain or increase the current level of service provided to the community and will be reviewed prior to the development of the Township's next AMP as required by Ontario Regulation 588/17.

5.9.6 Forecasted Capital Requirements

The following bar chart forecasts the capital requirements for rehabilitation and replacement of the Fleet.

Figure 37 Forecasted Capital Requirements - Fleet



The projected capital expenditures that will need to be undertaken over the next 10 years to maintain the current levels of service can be found in Appendix B.

5.9.7 Current Levels of Service

Technical Levels of Service

The Township is working towards identifying the performance metrics that will be used to measure the current level of service provided by Fleet assets. These technical levels of service will be included in the Township's AMP prior to the deadline of July 1, 2023 that has been outlined for non-core asset categories in O. Reg. 588/17.

Community Levels of Service

The Township is working towards identifying the qualitative descriptions that will be used to measure the current level of service provided by Fleet assets. These community levels of service will be included in the Township's AMP prior to the deadline of July 1, 2023 that has been outlined for non-core asset categories in O. Reg. 588/17.

5.9.8 Recommendations

- The Township should develop and implement a routine condition assessment schedule for Fleet assets. With an average condition rating of Poor base on age-based estimates, all fleet assets should be inspected to determine if there are any immediate lifecycle requirements

- The Township should work to identify the performance metrics and qualitative descriptions that will be used to measure current levels of service for Fleet. These metrics and descriptions should be developed prior to the development of the Township's next AMP

- The municipality is underfunding its long-term requirements on an annual basis. See **Section 8.0** for a detailed financial strategy designed to achieve long-term funding requirements.

6.0 Asset Management Strategies

After outlining the State of Local Infrastructure, the next step of an AMP is to identify the procedures and practices that will support the Township's organizational objectives, and derive maximum value from its assets. Good asset management requires a focus on continuous program improvement based on industry best practice. This involves strategies for data collection and condition assessment, strategies for the analysis of collected data (lifecycle and risk) and strategies for performance measurement (levels of service).

This section contains information and best practices that will inform the Township's asset management strategies, outline Roadmap activities and their deliverables, and provide strategic recommendations for the continuous improvement of program activities and outputs.

6.1 Non-Infrastructure Solutions & Requirements

The municipality should explore, as requested through the provincial requirements, which non-infrastructure solutions should be incorporated into the budgets for its infrastructure services. Non-infrastructure solutions are such items as studies, policies, condition assessments, consultation exercises, etc., that could potentially extend the life of assets or lower total asset program costs in the future without a direct investment into the infrastructure.

Typical solutions for a municipality include linking the asset management plan to the strategic plan, growth and demand management studies, infrastructure master plans, better integrated infrastructure and land use planning, public consultation on levels of service and condition assessment programs. As part of future asset management plans, a review of these requirements should take place, and resources should be dedicated to these items.

It is recommended, under this category of solutions, that the municipality develop and implement holistic condition assessment programs for all Asset Categories. This will advance the understanding of infrastructure needs, improve budget prioritization methodologies and provide a clearer path of what is required to achieve sustainable infrastructure programs.

6.2 State of Maturity Report

6.2.1 Introduction

Improving your asset management practices requires a structured and coordinated approach to the individual components of an asset management program. As a first step, it is important to gauge the current state of practice related to asset management at the municipality. A thorough gap analysis helps to determine where to focus efforts in order to build a strong asset management program. In other words, you need to know where you stand before you can figure out the best way to move forward.

The first phase of PSD's Roadmap involved a comprehensive, organization-wide assessment of asset management programs and practices within the Township. The development of the State of Maturity Report involved two key components: the Asset Management Self-Assessment Test (AMSAT) and a series of stakeholder interviews. The final State of Maturity Report outlined the organization's overall state of maturity, proficiency ratings along the six key components of asset management, and recommendations to improve the Township's asset management program.

6.2.2 Asset Management Self-Assessment Test

The Asset Management Self-Assessment Test, implemented in a survey format, relies on a series of questions across specific categories that have been established through international standards and best practice identified as the requirements of a successful asset management program. The results of the AMSAT are then aggregated to provide a performance rating (Basic, Intermediate, Advanced) across six key components. The following table summarizes the Township's results and compares them to the national average of communities surveyed:

Table 35 AMSAT Results

Asset Management Component	Proficiency Level	National Average
Organizational Cognisance	Intermediate	Intermediate
Organizational Capacity	Basic	Intermediate
Infrastructure Data/Information	Basic	Intermediate
Asset Management Strategies	Basic	Basic
Financial Strategies	Intermediate	Basic
Level of Service	Basic	Basic

6.2.3 Stakeholder Interviews

As a supplement to the AMSAT, additional information was gathered through a series of in-depth interviews with departmental staff who are either directly involved in or support the delivery of an Asset Category. The results were used for clarification of the features of the organization's asset management program along with who is responsible for managing and delivering the activities involved in the asset management process. The interviewed departments included:

1. Administraton
2. Clerk's Department
3. Community Services
4. Emergency Services
5. Financial Management
6. Public Works

6.2.4 Highlights from the State of Maturity Report

Workshop Date: May 31st, 2017

Organizational Cognizance

Huron-Kinloss' asset management program has been elevated as a priority through council's decision to invest in the Asset Management Roadmap initiative, a demonstration of the understanding that asset management requires an expansive breadth and depth of knowledge and expertise. Council have also endorsed sustainable infrastructure management practices through the *Official Plan for the Township of Huron-Kinloss* and *Our Future Huron-Kinloss Sustainability Plan*.

Organizational Capacity

Without additional staff resources, the municipality will have to rely on a balance of internal staff and industry consultants to further develop the asset management program and ensure that existing staff resources are not stretched beyond their feasible limits.

Asset Management Strategies

In general, across all asset categories, life cycle activity analysis is performed in Huron-Kinloss at the project planning stage and not at the network need analysis stage within the municipality. In other words, the above strategies are applied quite well at the project planning stage (1 to 2-year horizon); however, there is very little documentation in place regarding these processes. In addition, the strategies are currently not extended to the 5- or 10-year budget cycle and there is no consistent framework developed.

Financial Strategies

The financial strategies within Huron-Kinloss are currently developing. While there has been reasonable analysis of short- and long-term capital and operating/maintenance requirements for capital assets it is premised on an incomplete understanding of overall asset performance given the absence of field condition records for most asset categories.

Levels of Service

Similar to most municipalities throughout Canada, there are currently no holistic level of service models in place at the municipality for the various capital asset categories.

6.2.5 Advancing the Township's State of Maturity

Municipal asset management is an ever-evolving discipline that requires organizations to adapt to emerging regulations and continue to advance internal capabilities. The five key competencies above are areas that the Township should continue to evaluate on a regular basis to determine what areas are seeing advances and which need additional attention.

6.3 Asset Management Policy

6.3.1 Introduction

An asset management policy is a written statement that formally expresses the intentions and outlines the direction of an organization committed to asset management. When endorsed by Council it represents an official commitment to the key principles of asset management, and a pledge to undertake activities that contribute to a holistic, comprehensive and sustainable asset management program. The policy clearly states program objectives, alignment with strategic plans, the key components of an asset management program and the roles and responsibilities of key personnel. In practice, it provides a framework for the delegation of decision-making, eliminates misunderstandings, reduces uncertainties and enables goals and objectives to be met.

6.3.2 AM Policy

As part of PSD's Roadmap, senior management worked alongside PSD staff to develop a corporate asset management policy that meets the requirements outlined in O. Reg. 588/17. The policy was passed on October 16th, 2017 and includes the following details:

Coverage:

This policy shall cover all assets owned by the Township of Huron-Kinloss.

Policy Statement:

a) The Township will implement a municipal asset management program through all departments. The program will promote lifecycle and risk management of all assets, with the goal of achieving the lowest total cost of ownership while meeting desired levels of service.

b) The Township will develop and maintain an asset inventory of all capital assets which includes unique id, description, location information, value (both historical and replacement), performance characteristics and/or condition, estimated remaining life and estimated repair, rehabilitation or replacement date; and estimated cost for the repair, rehabilitation or replacement.

c) The Township will develop an asset management plan that incorporates all infrastructure categories and asset that meet the capitalization threshold outlined in the organization's Tangible Capital Asset Policy, and it will be updated on a biennial basis to promote, document and communicate continuous improvement.

d) The Township will implement continuous improvement protocols and adopt best practices regarding asset management planning, including:

   i. Complete and Accurate Asset Data
   ii. Condition Assessment Protocols
   iii. Risk and Criticality Models
   iv. Lifecycle Management
   v. Financial Strategy Development
   vi. Level of Service Framework

e) The Township will integrate asset management practices with its long-term financial planning and budgeting strategies. This includes the development of financial plans that determine the level of funding required to achieve short-term operating and maintenance needs, in addition to long-term funding needs to replace and/or renew assets based on full lifecycle costing.

f) The Township will develop performance metrics and reporting tools to transparently communicate and display the current state of asset management practice.

g) The Township will consider the risks and vulnerabilities of infrastructure assets to climate change and the actions that may be required including, but not limited to, anticipated costs that could arise from these impacts, adaptation opportunities, mitigation approaches, disaster planning and contingency funding.

h) The Township will align all asset management planning with the Province of Ontario's land-use planning framework, including any relevant policy statements issued under section 3(1) of the *Planning Act*; shall conform with the provincial plans that are in effect on that date; and, shall be consistent with all municipal official plans.

i) The Township will coordinate planning between interrelated infrastructure assets with separate ownership structures by pursuing collaborative opportunities with neighbouring municipalities and jointly-owned municipal bodies wherever viable and beneficial.

j) The Township will provide opportunities for municipal residents and other interested parties to provide input into asset management planning wherever and whenever possible.

Purpose:

The purpose of this policy is to ensure the development of the Township's asset management program, including roles and responsibilities, to facilitate logical and informed decision-making for the management of the Township's infrastructure, and to support the delivery of sustainable community services.

By using sound asset management practices, the Township can ensure that all infrastructure assets meet performance levels and continue to provide desired service levels in the most efficient and effective manner.

This policy demonstrates an organization-wide commitment to the good stewardship of infrastructure assets, and the adoption of best practices regarding asset management planning.

Background:

Asset management refers to the policies, practices and procedures that combine to make the best possible decisions regarding the building, operating, maintaining, renewing, replacing and disposing of infrastructure assets. Furthermore, asset management is an organization-wide process that involves the coordination of activities across multiple

departments. As such, it is useful to implement a structured and coordinated approach to outlining the activities, roles and responsibilities required of organizational actors and the key principles that should guide all asset management decision-making.

A comprehensive and holistic approach to asset management will ensure service levels are being delivered in the most efficient and effective manner, and that due regard and process are applied to the long-term management and stewardship of the Township's capital infrastructure assets. In addition, it will align the Township with provincial and national standards and regulations enabling the organization to take full advantage of available grant funding opportunities.

The approval of this policy is an important step towards integrating the Township's strategic mission, vision and goals with its asset management program, and ensuring that vital services and critical infrastructure are maintained and provided to the community at all times.

Alignment with the Township's Strategic Direction:

This policy aligns with the organizational objectives and key strategic documents of the Township of Huron-Kinloss, including: *The Official Plan for the Township of Huron-Kinloss* and *Our Future Huron-Kinloss Sustainability Plan*.

The Official Plan for the Township of Huron Kinloss:
1.3 Huron-Kinloss celebrates a unique mix of welcoming communities and natural beauty.

1.4 a) To maintain and enhance the Township as a vibrant, caring, progressive community, rich in its diversity of amenities, with quality of life and economic prosperity strived for throughout the Township's communities.

1.4 p) To ensure the cost-effective provision and maintenance of transportation systems and municipal services, as required to service existing and future residents and businesses.

4.1 – The Township is committed to managing and establishing an efficient, cost-effective and multifaceted transportation network capable of serving the local community and visitors.

4.2 - To promote an improved system of arterial, collector and local roads which provide for the safe and efficient movement of local and through traffic.

Our Future Huron-Kinloss Sustainability Plan:
Our Mission: Support the communities of today to inspire the generations of tomorrow.

P5.3 – Continue to keep roads and transportation infrastructure well maintained and seek opportunities for continuous improvement.

P5.4 – Develop and maintain a Comprehensive Capital Asset Management Plan to be financially prepared to meet future infrastructure needs.

Roles and Responsibilities:

Council

- Approve the asset management policy and direction of the asset management program
- Approve future amendments to the asset management policy
- Establish and monitor levels of service

Senior Management Team

- Will provide corporate oversight to goals and directions and ensure the asset management program aligns with the Township's strategic plan.
- Ensure that adequate resources are available
- Track, analyze and report on asset management program benefits

Project Lead (Treasurer)

- Provide organization-wide leadership in asset management practices and concepts
- Provide departmental staff coordination
- Coordinate and track asset management program implementation and progress

Departmental Staff

- Utilize the new business processes and technology tools
- Participate in implementation task teams as part of the asset management development
- Provide support and direction for asset management practices within their department

Key Principles:

The Township shall consider the following principles as outlined in section 3 of the *Infrastructure for Jobs and Prosperity Act, 2015*, when making decisions regarding asset management:

a) Infrastructure planning and investment should take a long-term view, and decision-makers should take into account the needs of citizens by being mindful of, among other things, demographic and economic trends.

b) Infrastructure planning and investment should take into account any applicable budgets or fiscal plans.

c) Infrastructure priorities should be clearly identified in order to better inform investment decisions respecting infrastructure.

d) Infrastructure planning and investment should ensure the continued provision of core public services, such as health care and education.

e) Infrastructure planning and investment should promote economic competitiveness, productivity, job creation and training opportunities.

f) Infrastructure planning and investment should ensure that the health and safety of workers involved in the construction and maintenance of infrastructure assets is protected.

g) Infrastructure planning and investment should foster innovation by creating opportunities to make use of innovative technologies, services and practices, particularly where doing so would utilize technology, techniques and practices developed in Ontario.

h) Infrastructure planning and investment should be evidence based and transparent, and, subject to any restrictions or prohibitions under an Act or otherwise by law on the collection, use or disclosure of information,
   i. investment decisions respecting infrastructure should be made on the basis of information that is either publicly available or is made available to the public, and
   ii. information with implications for infrastructure planning should be shared between the Township and broader public sector entities, and should factor into investment decisions respecting infrastructure.

i) Where provincial or municipal plans or strategies have been established in Ontario, under an Act or otherwise, but do not bind or apply to the Township, as the case may be, the Township should nevertheless be mindful of those plans and strategies and make investment decisions respecting infrastructure that support them, to the extent that they are relevant.

j) Infrastructure planning and investment should promote accessibility for persons with disabilities.

k) Infrastructure planning and investment should minimize the impact of infrastructure on the environment and respect and help maintain ecological and biological diversity, and infrastructure should be designed to be resilient to the effects of climate change.

l) Infrastructure planning and investment should endeavour to make use of acceptable recycled aggregates.

m) Infrastructure planning and investment should promote community benefits, being the supplementary social and economic benefits arising from an infrastructure project that are intended to improve the well-being of a community affected by the project, such as local job creation and training opportunities, improvement of public space within the community, and any specific benefits identified by the community.

6.4 Asset Inventory Data

6.4.1 Introduction

An asset management program is only as strong as the data and information available in an organization's asset inventory. Without detailed and accurate asset data, the ability to analyze and evaluate the Township's state of the infrastructure is limited. Data gathering is a resource-intensive process, requiring sufficient human resources capacity and a significant amount of time to develop and maintain. However, committing resources to data collection will result in exponential benefits to the Township's asset management program. Better data results in greater data confidence and ultimately more reliable asset management and financial strategies.

6.4.2 Assessing Data Maturity

As a starting point, it is critical to understand the current state of your data collection practices. From there it is possible to develop techniques and strategies that ensure that your asset management program is being supported by detailed, consistent and complete data. A detailed data maturity assessment will evaluate and analyze the state of your organization's data collecting practices. This will help to identify what asset component data has been collected and what needs to be collected in order to increase the quality of your data and allow for more accurate and advanced analysis. **Section 4.4** contains a detailed assessment of the Township's Overall Data Maturity.

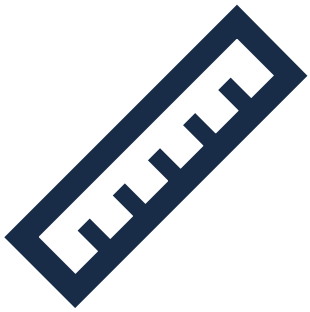
6.4.3 Ongoing Data Collection

Without plans in place for the ongoing collection of asset data and information the ability of an organization to undertake advanced forecasting and analysis will be limited. It is critical that the Township continue to provide resources for the continuing collection of data and the regular updating and maintenance of the Township's asset registry.

6.4.4 Recommendations

- Implement programs and protocols for the continuous collection and maintenance of asset data
- Centralize and consolidate all infrastructure related data (inventory, condition, needs, prioritized requirements, financial data and GIS data) into the CityWide software database, the main asset registry database
- Implement a data governance policy that outlines a consistent corporate approach to database maintenance and management including data handling procedures, roles and responsibilities

6.5 Condition Assessment Programs & Protocols



6.5.1 Introduction

The foundation of good asset management practice is comprehensive and reliable information on the current condition of your infrastructure. Municipalities need to have a clear understanding of the performance and condition of their assets, and all management decisions regarding future expenditures and field activities should be based on this knowledge.

Asset condition is a measure of the physical state of an asset or the ability of an asset to meet its required utility or level of service. An incomplete or limited understanding about the condition of a given asset can lead to substandard asset management decision-making. While there will be a point where asset rehabilitation or replacement is beneficial, it is important that field intervention activities are conducted at the optimal time to maximize the value of existing assets, and to reduce the threat of service disruption. Accurate and reliable condition data will help to prevent premature and costly rehabilitative or replacement activities, and ensure that lifecycle activities occur at the right time to maximize asset value and useful life.

6.5.2 Establishing Condition Assessment Programs & Protocols

In practice, integrating condition assessments into your asset management program requires a systematic and coordinated approach to asset data collection. Standardized condition assessment protocols and data gathering templates will ensure that all collected asset data is comprehensive and comparable. Ultimately, this will lead to increased confidence in the quality of your data and provide a stronger basis for decision-making. Condition assessment protocols serve as a guide for field employees responsible for

collecting condition data. This document includes all component and asset level data required, element listing and code guidelines as well as specific instructions for determining asset condition.

Condition assessment can involve different forms of analysis including subjective opinion, mathematical models, or variations thereof, and can be completed through a very detailed or very cursory approach. When establishing the condition of an entire Asset Category, the cursory approach (metrics such as very good, good, fair, poor, very poor) is used. This will be a less expensive and time-consuming approach when applied to thousands of assets, yet will still provide actionable data. Condition ratings derived from this model use the grading system described in the following table:

Table 36 Canadian Infrastructure Report Card 2016 - Condition Grading System

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

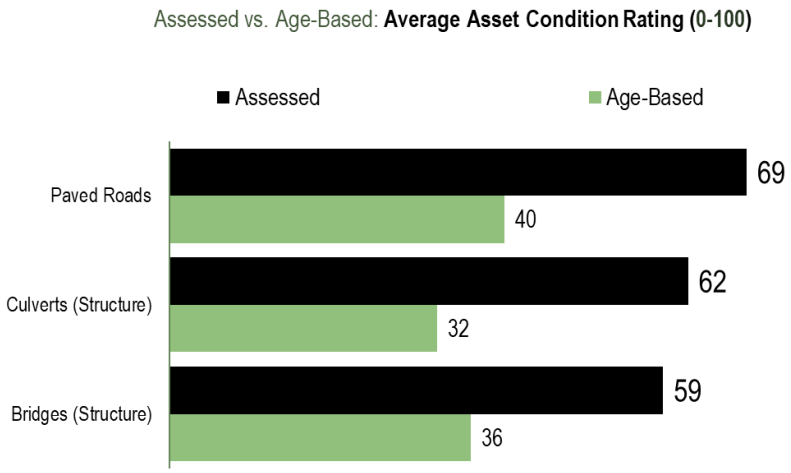
6.5.3 Assessed Condition Data vs. Age-based Data

Measuring asset condition can be a time consuming, labour-intensive and costly practice. However, there is strong evidence that the benefits of implementing condition assessment protocols will outweigh any additional costs. In 2015, PSD published a study in partnership with the Association of Municipalities of Ontario (AMO). The report, *The State of Ontario's Roads and Bridges: An Analysis of 93 Municipalities*, enumerated the infrastructure deficits, annual investment gaps, and the physical state of roads, bridges and culverts with a 2013 replacement value of $28 billion.

A critical finding of the report was the dramatic difference in the condition profile of the assets when comparing age-based estimates and actual field inspection observations. For each Asset Category, field data based condition ratings were significantly higher than age-based condition ratings, with paved roads, culverts, and bridges showing an increase in score (0-100) of +29, +30, and +23 points respectively (**Figure 38**). In other words, age-based measurements may be underestimating the condition of assets by as much as

30%. The implication of this finding is that municipalities are making asset management decisions based on inaccurate data, and as a result, are likely making ineffective lifecycle maintenance and replacement decisions.

Figure 38 Assessed vs Age-based Condition Rating



This report represents a strong statistical justification for the use of condition assessments over age-based estimates. Not only will condition-based data provide a more accurate representation of asset condition, it will also provide a stronger basis for making asset management decisions and achieving the lowest total cost of ownership.

6.5.4 PSD's Condition Assessment Programs and Protocols

Workshop Date: June 27th, 2017

On June 27th, 2017 PSD staff held an on-site workshop to guide Township staff in gathering condition data and asset attribute data for all major Asset Categories. The delivery of this workshop included hands-on training displaying how to effectively capture and store condition data as well as guidance for determining asset condition.

The Condition Assessment Protocol Package included internal condition assessment protocols for the following Asset Categories:

1. **Buildings**
2. **Parks & Natural Areas**
3. **Road Network**
4. **Watermains**

The Township was also provided with Request for Proposal (RFP) specifications if condition assessments were preferred to be conducted by external consultant. These specifications were included for the following Asset Categories:

1. **Buildings**
2. **Parks & Natural Areas**
3. **CCTV Sanitary**
4. **Road Network**
5. **Zoom Sewers**

After this workshop, the Township was given the task of collecting as much relevant and useful asset data as possible within the Roadmap project scope. The collection of additional data allows for more advanced evaluation and analysis of lifecycle and financial requirements. Throughout the Roadmap, PSD worked alongside the Township to ensure that data was collected as per their recommendations, and uploaded into the asset inventory in the proper format.

6.5.5 Recommendations

- Work towards gathering assessed condition on the Township's entire network of infrastructure assets and implementing routine condition assessment protocols for all Asset Categories that were not completed during the Roadmap
- All future asset condition assessments should be synchronised with CityWide records in order for captured overall condition ratings to be stored within the CityWide database
- The use of zoom camera should be explored as an alternative inspection process for the wastewater and storm sewer mains

6.6 Risk Management and Project Prioritization

6.6.1 Introduction

For an organization that manages a vast and diverse inventory of capital assets deciding which capital projects to fund can be an intimidating task. There is rarely enough money available to complete all required infrastructure projects. Generally, infrastructure needs exceed municipal financial resources and capacity. This resource scarcity means projects and investments must be prioritized according to their relative importance and risk of failure in order to ensure vital services and critical infrastructure continue to be provided to the community.

Traditionally, municipalities have prioritized capital projects according to a "worst-first" approach, in which the assets in the worst condition are the highest priority for rehabilitation or replacement. However, this approach fails to account for the fact that

some assets are more important to the delivery of vital services and the provision of critical infrastructure than others. As a result, many assets that should be prioritized to prevent service disruption, are left to deteriorate

6.6.2 Risk Management

A municipality's assets are often the leading edge of its exposure to external risk. As such, it is important that policies, processes and procedures are put in place in order to manage and mitigate organizational risk exposure. Minimizing risk exposure, and using a risk-based analysis to drive asset management decision-making and capital project prioritization helps to prevent consequential asset failure and major service disruption. A robust risk management framework allows you to determine the probability and consequence of failure at both the Asset Category and individual asset level, and use that data to optimize capital funding decisions.

6.6.3 Economic, Social and Environmental Risks

The creation of a robust risk management framework requires the development of risk profiles that take into account three different types of risk: economic, social and environmental. This is often referred to as the "triple bottom line" of assets. These three types of risk can be defined as follows:

Table 37 Trible Bottom Line of Asset Risk

	Economic	The monetary consequences of asset failure for the organization and its customers
	Social	The consequences of asset failure on the social dimensions of the community
	Environmental	The consequence of asset failure on an asset's surrounding environment

6.6.4 Calculating Asset Risk

Integrating a risk management framework into your asset management program requires the translation of risk potential into a quantifiable format. This will allow you to compare and analyze individual assets across your entire asset portfolio. From an asset management perspective, risk is a function of the probability of failure and, the consequence of failure.

$$Risk = Probability\ of\ Failure(PoF) \times Consequence\ of\ Failure(CoF)$$

The following table defines both the probability of failure and consequence of failure and the data that is used to calculate them.

Table 38 Risk Equation Explanation

	Probability of Failure	Consequence of Failure
Definition	The probability of failure directly correlates to the condition of the asset.	The consequence of failure relates to the economic, social and environmental impact of failure.
Data/Parameters	• Asset condition • % of asset life consumed • Known operational issues • Other parameters contributing to asset deterioration (e.g. traffic counts, soil types)	• **Economic**: Cost of rehabilitation or replacement • **Social**: Number of people or critical service affected • **Environmental**: Impact of failure on surrounding environment

The strength of a risk management framework depends on the reliability and availability of asset attribute data. The integration of meaningful asset attribute data that represents the economic, social and environmental risks will provide increased confidence in capital project decision-making and support evidence-based budget deliberations. While more data does not necessarily mean better outcomes, the careful selection of risk parameters that take into account the triple bottom line of assets, can optimize asset management decision-making.

6.6.5 Risk Report Summary

Workshop Date: October 31st, 2017

On October 31st, 2017 PSD delivered a workshop on developing a risk management framework in the Township of Huron-Kinloss. PSD worked alongside staff at the Township to develop risk parameters that allow for the calculation of both the consequence and probability of asset failure. The following table summarizes which asset types had customized risk profiles developed and uploaded into the CityWide database.

Table 39 Overview of Risk Models Developed by Asset Category

Asset Category	Asset Type	Risk Parameters
Road Network	Road Surface (Hot Mix & Tar/Chip)	Condition AADT Ranges Surface Type MMS Class Design Sub-Class
Sanitary Sewer Network	Sanitary Mains	Condition Pipe Material Pipe Diameter Line Type
Storm Sewer Network	Storm Sewer Mains	Condition Pipe Diameter
Water Network	Water Mains	Condition Pipe Material Pipe Diameter

6.6.6 Project Prioritization

One of the benefits of implementing a risk management framework is that it allows you to prioritize capital projects based on the greatest risk of failure. This is not always the asset that is in the worst condition. The implementation of the developed risk management framework enables the municipality to create reports that rank assets according to the highest risk and consequence of failure.

6.6.7 Asset Category Risk Matrices

Once both the probability of failure and the consequence of failure has been calculated for each asset the results can be aggregated to obtain a high-level view of asset risk at an organizational level and for each major Asset Category. Risk matrices provide a valuable overview of asset risk and serve as an important medium to communicate where, and to what extent, risk is present within your asset portfolio.

The following matrices provide a visual representation of the level of risk in each Asset Category. Individual assets are grouped based on both their **Consequence of Failure (1-5)** and **Probability of Failure (1-5)**. The assets located closer to the bottom-left of the matrix (green boxes) are less likely to fail and have lesser consequences for the municipality if they do fail. The assets located closer to the top-right of the matrix (red boxes) are at the greatest risk of failure and will have far greater consequences for the municipality if they do.

6.6.8 Recommendations

- Complete risk model development and assessment for minor Asset Categories including fleet, IT, Land Improvements etc.

6.7 Lifecycle Activity Framework

6.7.1 Introduction

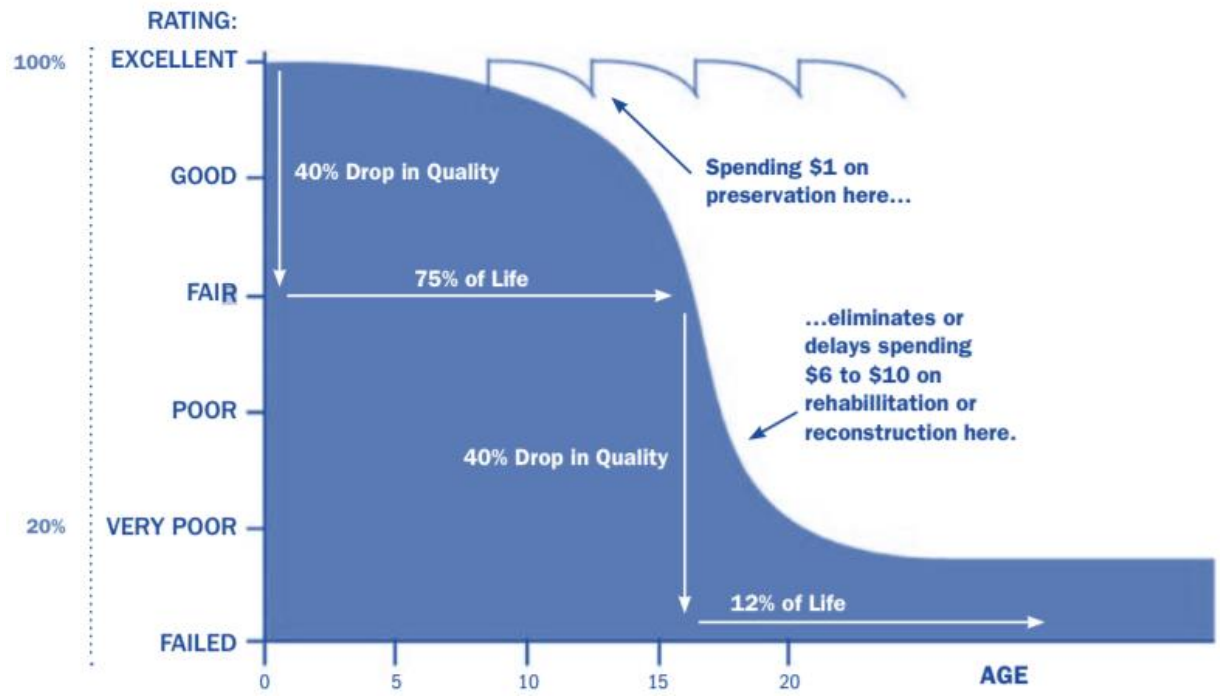
The condition or performance of most assets will deteriorate over time. This process is affected by a range of factors including an asset's characteristics, location, utilization, maintenance history and environment. This deterioration has a negative effect on the ability of an asset to fulfill its intended function, and may be characterized by increased cost, risk and even service disruption. In order to ensure that municipal assets are performing as expected and meeting the needs of your customers, it is important to establish a strategy to proactively manage the deterioration of your assets.

6.7.2 Lifecycle Activity Management

Lifecycle activity management is the practice of managing the deterioration of your assets through the implementation of a maintenance, rehabilitation and replacement strategy. An asset lifecycle strategy will ensure that you are doing the right thing to the right asset at the right time. Effective lifecycle activity management can extend the service life of assets and ensure that assets continue to meet service and performance requirements at the lowest total cost of ownership.

Figure 39 provides an example of the benefits of lifecycle activity management over the service life of an asset.

Figure 39 Deterioration Curve Outlining Benefits of Lifecycle Activities (Canadian Infrastructure Report Card 2016)



6.7.3 Developing a Lifecycle Activity Strategy

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

Table 40 Cost of Lifecycle Activity Types

Activity Type	Description	Example	Cost
Preventative Maintenance	Any activities that prevent defects or deteriorations from occurring	(Roads) Crack Seal	$
Rehabilitation	Any activities that rectify defects or deficiencies that are already present and may be affecting asset performance	(Roads) Mill & Resurface	$$
Reconstruction	Asset end-of-life activities that often involve the complete replacement of assets	(Roads) Surface Reconstruction	$$$

Depending on initial lifecycle management strategies, asset performance can be sustained through a combination of preventative maintenance and rehabilitation, but at some point reconstruction or replacement is required. Understanding what effect these activities will have on the lifecycle of an asset, and their cost, will enable you to make better decisions about caring for your assets.

6.7.4 Lifecycle Strategy and Asset Profile Development

Workshop Date: October 31st, 2017

On October 31st, 2017, PSD consultants and Township of Huron-Kinloss staff collaborated to develop customized lifecycle strategies that optimize maintenance, rehabilitation and replacement activities for major infrastructure assets. At this time the Township is working towards the development and implementation of asset specific lifecycle activity strategies. These will be developed and included in future version of the Township's AMP to meet O. Reg. 588/17 requirements.

6.7.5 Recommendations

- Develop lifecycle strategies for core Asset Categories including roads, bridges, water, sewer, and storm
- Integrate lifecycle strategies based on any upcoming studies or reports (e.g. Road Needs Study, OSIM inspections)
- Update asset-specific deterioration curves as more reliable and accurate data becomes available

6.8 Growth and Demand

6.8.1 Introduction

Growth is a critical demand driver of service provision. As such, the municipality must not only account for the lifecycle cost of its existing asset portfolio, but also those of any anticipated capital projects. Demand forecasting is full of variability and uncertainty. While there is no way to be certain that forecasts are accurate, it is still critical to develop strategies that attempt to understand growth requirements. A careful examination of growth trends will provide meaningful data that should be considered alongside existing asset funding requirements in the development of an asset investment strategy.

6.8.2 Population and Employment Projections

Table 41 Population and Employment Projections (Township of Huron-Kinloss Official Plan, 2016)

Year	Population (persons)	Employment (jobs)
2016	7,189	647
2021	7,397	666
2026	7,700	693
2031	8,008	721
2036	8,321	749

The Township expects modest growth to continue at a relatively constant rate until 2036.

6.8.3 Household Projections

Table 42 Household Projections (Township of Huron-Kinloss Official Plan, 2016)

Year	Households (dwellings)
2016	4,170
2021	4,391
2026	4,656
2031	4,931
2036	5,217

Despite modest population growth the Township expects the number of households to increase until 2036. This is due to the expectation of the average size of households trending down on average

6.8.4 Demand and Levels of Service

While assessing growth is oftentimes simply a matter of collecting historical data and using measured trends to predict future growth, demand requires a slightly different approach. Both quantitative and qualitative indicators will be necessary to measure how demand is trending, and where adjustments to service delivery and asset investment may be required.

Demand is closely linked to the municipality's levels of service. As such, there will be some overlap between the development of a levels of service framework and demand analysis. Identifying and measuring technical levels of service that measure service utilization may provide sufficient data to identify and project general service trends (e.g. # of Hours of Treated Water Storage Capacity at Average Day Demand).

Obtaining qualitative data on service demand provides context to any quantitative data. A public engagement strategy can be employed as part of the level of service framework or separately to gain further insight into how individual residents are using provided services and their level of satisfaction.

6.8.5 Recommendations

- Consider the design and implemention of a network-wide demand analysis to identify rate of service utilization and customer preferences
- Integrate growth and demand forecasts into long-term asset management investment strategy
- Identify which estimated capital expenditures and significant operating costs would be related to new construction and upgraded capacity of existing assets to meet growth demands

6.9 Climate Change

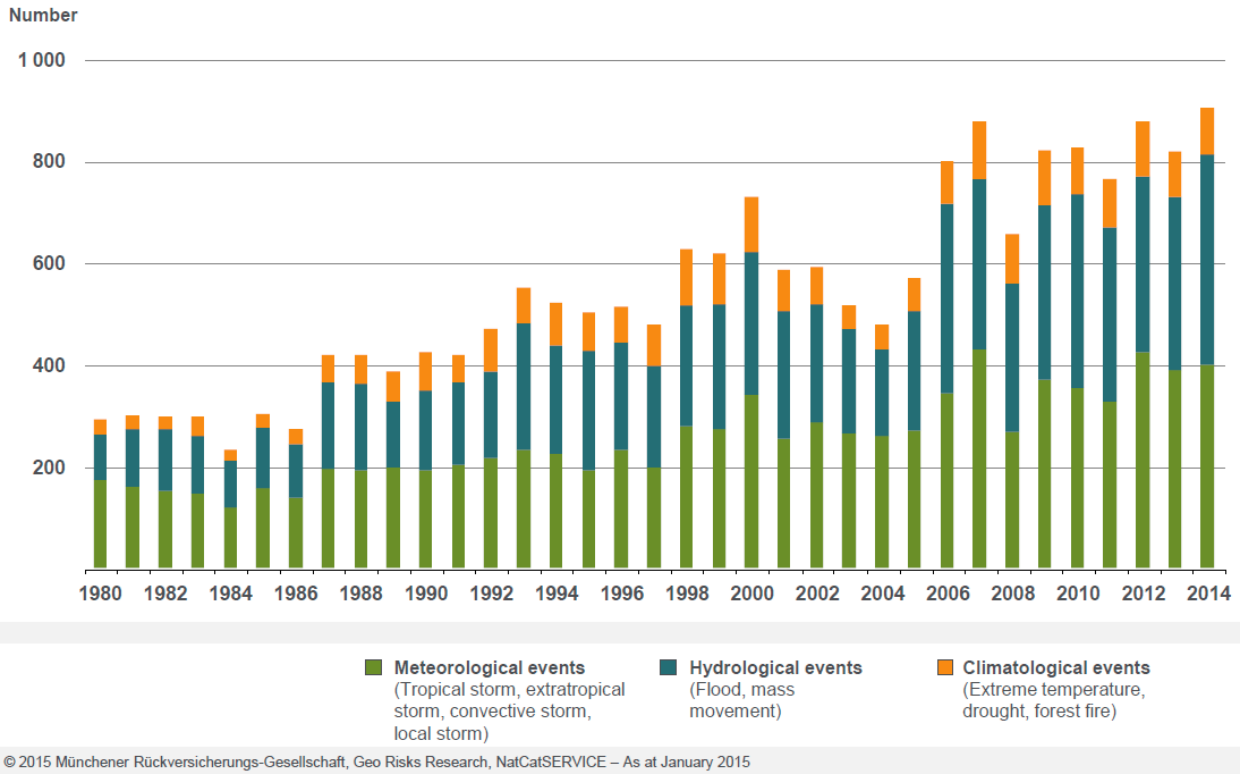
6.9.1 Introduction

The impacts of climate change present a momentous challenge to municipal infrastructure. As temperatures and sea levels rise, and extreme weather events occur with greater frequency, it is critical that municipalities attempt to understand the emerging threat of climate change and develop strategies to ensure that vital services and critical infrastructure continue to operate as expected. This will require consideration of four key factors of climate change (exposure, vulnerability, resilience and adaptation) at every stage of an asset's lifecycle.

6.9.2 Threat of Climate Change

Globally, there has been a significant increase in weather-related loss events resulting in property damage and/or bodily injury (**Figure 40**). Municipal infrastructure is at particular risk to meteorological, hydrological and climatological events leading to an increasing rate of asset deterioration, failure and service disruption.

Figure 40 Weather related loss events worldwide 1980-2014



According to *Canada's Sixth National Report on Climate Change 2014* the type of climate threats that are most likely to impact the Township's infrastructure include:

Higher Average Annual Temperature

- Between 1948 and 2012, the annual average air surface temperature over Canada's landmass has increased by about 1.7ºC, approximately twice the global average.
- Average summer temperatures to rise by 2-4ºC with more warming in the winter
- Increase in instances of heatwaves
- Increase in average rainfall

Increase in Total Annual Precipitation

- There will be significant changes in precipitation between seasons, with winters becoming wetter and summer becoming drier
- Increased rate of ice and windstorms

Increase in Frequency of Extreme Weather Events

- It is expected that the frequency and severity of extreme weather events will change
- In some geographical areas, extreme weather events will occur with greater frequency and severity than others

6.9.3 Exposure & Vulnerability

Climate change exposure is the nature and degree to which a system is exposed to significant climate variations. Exposure is a combination of the probable range of a climate stressor and the physical characteristics of a geographical location. For example, for a coastal facility, its height above sea level correlates to the exposure of the asset to rising sea levels caused by the onset of climate change. Understanding the exposure of existing infrastructure, and integrating climate change exposure into the planning and design process of asset management is a critical step towards minimizing the impacts the expected threats of climate change.

The Intergovernmental Panel on Climate Change (IPCC) defines vulnerability as "the degree to which a system is susceptible, and unable to cope with, adverse effects of climate change, including climate variability and extremes". Vulnerability considers the structural strength, integrity and function of assets or asset systems in terms of the potential for damage or functional disruption as a result of climate stressors.

6.9.4 Resilience & Adaptation

Resilience is used to refer to the capacity of a system to absorb disturbance without losing essential function. In the context of physical assets or asset systems, it is the ability of a system to continue to operate as a result of a built-in redundancy. For example, a Road Network's ability to operate despite the loss of a single road or bridge, or the relative ease with which it can be replaced. The context for resilience is a combination of physical constraints on repair or replacement, socio-economic limitations and system redundancy.

The IPCC defines adaptation as "the adjustment in natural or human systems in response to actual or expected climatic stimuli or their effects, which moderates harm or exploits beneficial opportunities". Adaptive strategies fall into three categories: protect, accommodate and retreat. In a coastal region, a protection strategy might aim to protect assets from flooding by constructing hard or soft structures by installing sea walls, beach nourishment or wetland restoration. Accommodation may call for preparing for periodic flooding by having operational plans inplace. Retreat involves no attempt to protect the asset. Under these conditions a facility or structure may be abandoned completely. Although applied specifically to coastal examples, these adaptive strategies may be generalised to all types of asset and asset geographical locations.

6.9.5 Expected Impact of Climate Change on Infrastructure

The International Institute for Sustainable Development identified the following impacts of climate change on municipal infrastructure in Canada:

Table 43 Impacts of Climate Change on Infrastructure (International Institute for Sustainable Development)

	Greater frequency of freeze-thaw cycles leading to thermal cracking, rutting, frost heave and thaw weakening
	Soil instability, ground movement and slope instability
	Triggered instability of embankments and pavement structures
	Shortened life expectancy of highways, roads and rail
	Drier conditions affecting the lifecycle of bridges and culverts
	Reduced structural integrity of building components through mechanical, chemical and biological degradation
	Increased corrosion and mold growth
	Damaged or flooded structures
	Reduced service life and functionality of components and systems
	Increased repair, maintenance, reserve fund contingencies and energy costs
	Increased water demand and pressure on infrastructure
	Loss of potable water
	Increased risk of flooding; storm sewer infrastructure more frequently exceeded
	Rupture of drinking water lines, sewage lines and sewage storage tanks
	Saltwater intrusion in groundwater aquifers

6.9.6 Recommendations

- Consider the impact of climate change on the estimated useful life of all assets
- Adjust lifecycle activity strategies for assets that are particularly exposed or vulnerable to the impacts of climate change
- Develop policies that outline a commitment to consider the impact of climate change on existing infrastructure and future development
- Include climate change considerations into the design and planning phase of asset lifecycle
- Integrate impacts of climate change into risk management frameworks
- Develop disaster mitigation plans in the event of infrastructure failure

7.0 Levels of Service Framework

7.1.1 Introduction

The primary responsibility of a municipality is to ensure that they are providing adequate and sustainable services to their community. This outcome is generally supported by organizational objectives, mission statements and official plans that outline the rationale for these activities.

To ensure that organizational objectives align with expected service outcomes, it is necessary to develop a process for the systematic measurement, monitoring and evaluation of an organization's level of service. A level of service can be defined as a description of the service output for an activity or service area against which performance may be measured. To put it simply, a level of service is a measure of what a municipality is providing to its community.

7.1.2 Balancing Cost, Risk and Performance

Managing levels of service involves balancing three key factors: cost, performance and risk. Any decision to increase or decrease the provided levels of service will have an impact on each factor. For example, increasing a level of service will lead to higher costs, but this should lead to a decrease in risk and an increase in asset performance. Whereas a decrease to a level of service will mean lower costs but an increase in risk and a decrease in asset performance. As a result, managing your levels of service is all about understanding the trade-offs involved and aligning cost, performance and risk with both your organizational objectives and the desires of community stakeholders. This is one of the more challenging aspects of an asset management program.

7.1.3 Levels of Service Framework

Performance measurement is a key component of an effective level of service strategy. It allows you to analyze how well you are meeting the needs and expectations of your

stakeholders, and identify where there are gaps that need to be addressed. Developing realistic levels of service using meaningful key performance indicators (KPIs) is instrumental in managing citizen expectations, identifying areas requiring higher investments, driving organizational performance and securing the highest value for money from public assets.

To facilitate this process, it is useful to develop a framework for tracking and evaluating the levels of service being provided. This will require the translation of organizational objectives and expected service outcomes into key performance indicators that reflect evolving demand on infrastructure, the organization's fiscal capacity and overall organizational objectives. A centralized database that outlines levels of service along with the KPIs that will allow you to assess whether a level of service is being met will assist with this process. The Township should then collect data on its current performance for the chosen KPIs and establish targets that reflect the current fiscal capacity of the municipality, its corporate and strategic goals, and changes in demographics that may place additional demand on service areas.

7.1.4 Guiding Principles and Core Values

As a guide to developing and measuring levels of service, it is useful to understand what the public values in the provision of municipal services. **Table 44** provides an overview of the values that the municipality should strive to accommodate when delivering services to the public. These are based on the values that the public generally expects to be delivered when a service is being provided to them.

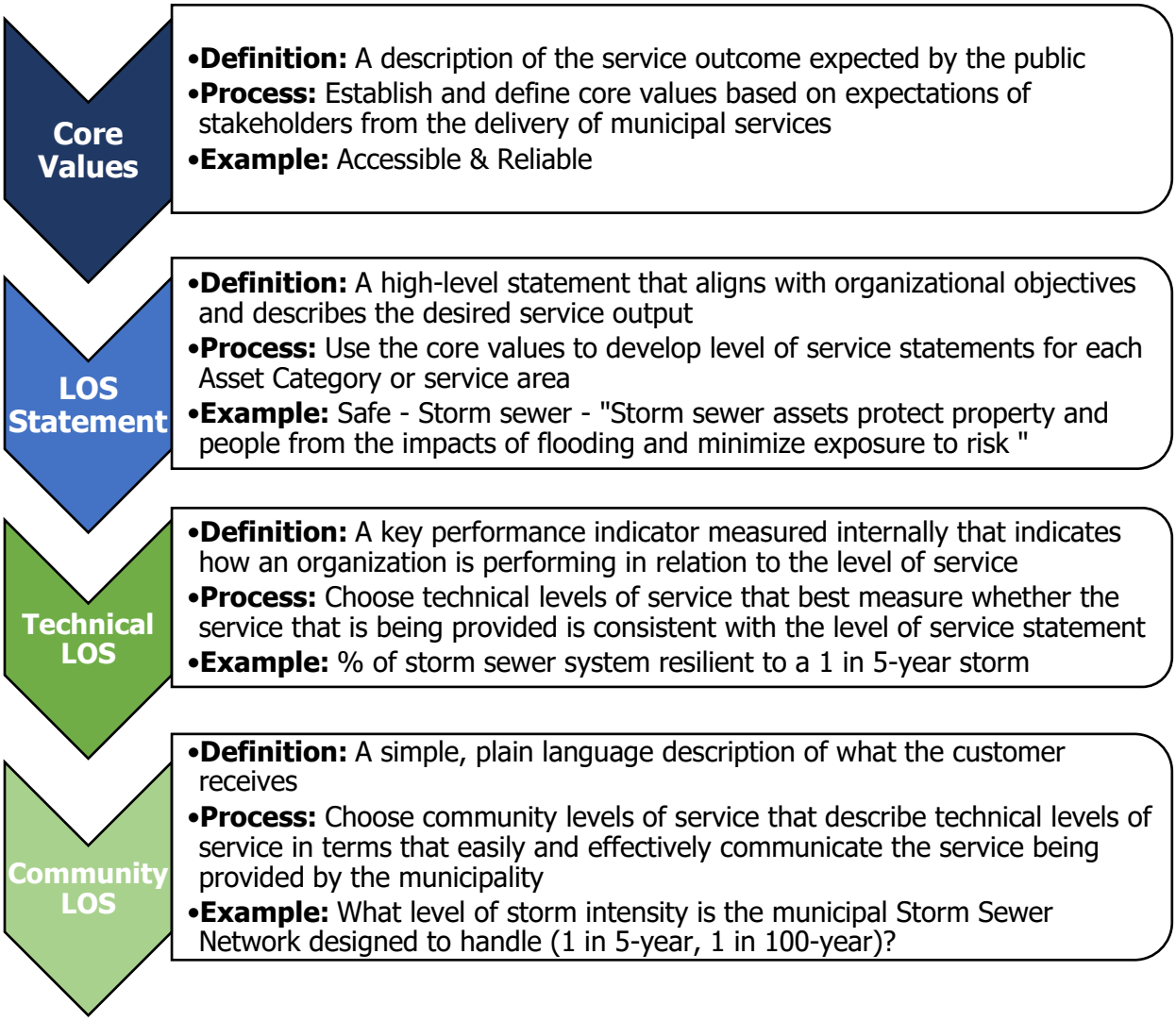
Table 44 Core Values Guiding Levels of Service

Value	Description
Accessible	Services are available and accessible for customers who require them.
Reliable	Services are provided with minimal service disruption and are available to customers in line with needs and expectations.
Safe	Services are delivered such that they minimize health, safety and security risks.
Regulatory	Services meet regulatory requirements of all levels of government.
Affordable	Services are suitable for the intended function (fit for purpose).
Sustainable	Services are designed to be used efficiently and long-term plans are in place to ensure that they are available to all customers into the future.

7.1.5 Defining and Establishing Levels of Service

Figure 41 provides a basic guide to establishing levels of service.

Figure 41 Guide to Establishing Levels of Service



7.1.6 Selecting Technical Levels of Service

Deciding which KPIs to use when establishing technical levels of service is not a science, but there are a few key considerations to take into account. A good rule to follow in determining the best indicators is to use **SMART** system developed by the Institute of Public Works Engineering Australasia:

KPIs should cover a **Specific** aspect of service, be **Measurable**, and have a clear plan for achieving targets (**Achievable**). They should also be **Relevant** to the level of service and strategic objective, and have a clear timeframe for when targets will be achieved (**Timebound**).

7.1.7 Levels of Service Workshop

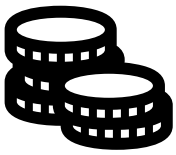
Workshop Date: August 23rd, 2018

On August 23rd, 2018 PSD met with Township staff to develop a customized levels of service framework. The initial presentation and discussion covered the importance of levels of service in an asset management program and the role that it should play in decision-making moving forward. From there the workshop focused on developing meaningful level of service statements, technical and customer levels of service (included in the State of Local Infrastructure) that take into consideration the availability of data and the ability of these indicators to provide actionable data.

The Workshop concluded with an interview of Township staff on the various internal and external factors and trends that may affect their ability to provide expected levels of service in the future. The results of this interview are summarized in the following section.

7.2 Trends Impacting Levels of Service

The provision of desired levels of service is not simply a matter of proper asset management. There are a wide range of internal and external factors that may impact the ability of a municipality to provide reliable public services. As part of the Levels of Service Workshop, PSD interviewed Township staff to gain greater insight into the challenges and opportunities facing the municipality now and into the future. The following sections summarize the results of this interview:



Fiscal Capacity

Maintaining municipal infrastructure and providing desired levels of service requires the allocation of adequate financial resources. Fiscal capacity and budget constraints are a constant concern for staff across all departments attempting to manage the maintenance and rehabilitation of municipal infrastructure, and they certainly impact the level of service being provided to the community. While there is a keen understanding of the benefits of a proactive approach to managing the lifecycle of infrastructure assets, there simply is not enough funding to engage in more proactive maintenance, rehabilitation and replacement activities. Interviewed staff expect that their activities and ability to provide services will always be restricted by fiscal capacity. Managing the infrastructure deficit is a key concern, not only for Huron-Kinloss, but all municipalities.

In particular, staff consider stormwater infrastructure as the asset category most affected by limited capital funding. As stormwater assets are tax-funded instead of rate-funded it can be difficult to convince Council and the community that it is a priority as it typically

goes unnoticed by the general public unless there is a significant service interruption. Rate-funded assets (water and sanitary) on the other hand, tend to be much easier to fund as rate-based fees can be adjusted to provide adequate funding that meets operational and capital requirements.

Municipalities typically have few means at their disposal to raise adequate and sustainable funding to meet both operational and capital requirements. As a result, they are heavily dependent on both provincial and federal grant programs to maintain and replace municipal infrastructure. Any fluctuations in annual grant funding secured can have a dramatic impact on provided services. In recent years, the Township has had moderate success with available grant funding opportunities and is in the process of applying for Ontario Community Infrastructure Fund (OCIF) Top-up funding to replace one of their standpipes. While the Township has been unsuccessful in applying for the same project in previous years, they remain optimistic that their chances have improved this year. Like many municipalities across Canada the Township has been fortunate to receive funding from the Federation of Canadian Municipalities (FCM) through the Municipal Asset Management Program (MAMP) which has helped to fund their ongoing Asset Management Roadmap.

Aging Infrastructure

The condition and performance of municipal infrastructure assets directly correlates to the quality of services a municipality can deliver to its residents. Aging and deteriorating assets increasingly remain in service past their estimated service lives due to a lack of fiscal capacity to replace or rehabilitate as needed. The age of infrastructure in Huron-Kinloss varies depending on their location (Lucknow, Ripley or any other community) within the municipality. In general, there is nothing that stands out as particularly old and in need of immediate replacement. Staff hope that through the judicious use of asset management planning they can anticipate and prioritize capital projects in advance of significant deterioration.

Climate Change and Weather Events

Forecasting for infrastructure needs based on climate change remains an imprecise science. However, it is clear that broader environmental and weather patterns have a direct impact on the reliability of critical infrastructure services. As such, it is important that the impacts of weather events on municipal infrastructure are accounted for in the development of asset management plans and lifecycle strategies.

The impact of weather events on infrastructure varies based on location and topography. For example, staff tend to identify higher rates of flooding on the lake shore as water levels in the lake fluctuate over the course of a given year. There is also a high risk of flooding in Lucknow as a result of its location and the design of stormwater infrastructure.

In recent years the Township's water table level has been much higher than usual which further contributes to the potential of surface flooding.

In an effort to address these concerns the Township has recently received money from FCM to develop a Community Climate Change Action Plan. While organizational strategies to address climate change are currently at a basic level, staff are optimistic that this Action Plan in combination with a recent flood mapping study, will help to provide better data, practices and processes to accommodate the impacts of extreme weather events.

Demographic Change and Expected Growth

Municipal demographics can also serve as an infrastructure demand driver, and as a result, can change how a municipality decides to allocate its resources. Population growth is also a significant demand driver for existing assets and may require the municipality to construct new infrastructure to parallel community expectations. The Township has experienced modest growth since the last Federal Census was completed and this is supported by the recent Development Charge Study as well.

In order to meet desired levels of service it is critical that all asset management planning and strategies are developed with growth in mind. This includes the impact of population growth on the lifecycle activities required to maintain municipal infrastructure that can accommodate a larger population and workforce.

Community Expectations

The general public will often have their own opinions about how a public service should be delivered. Municipal staff are tasked with balancing requests from the public with the reality of available funding to provide the best service possible at the lowest total cost. This can be a difficult task as there is often a significant gap between expectations and reality. Township staff remarked that there has been a noticeable increase in service expectations in recent years. In an effort to accommodate these expectations staff have tried to be more transparent about how municipal funds are spent. Managing these expectations can be a tricky task, but it can also be made easier through the development of a level of service framework and the use of community and technical levels of service to better communicate the scope and resources required to provide adequate services to the community.

Organizational Change and Capacity

Managing municipal assets and delivering public services requires adequate organizational capacity. The availability of staff to facilitate these projects is a concern for many municipalities. Township staff remarked that there has been some expanded capacity (Project Manager, Asset Management Coordinator) but this has been accompanied by an increasing

workload across the organization. It is common for one staff member to have two or more roles or major responsibilities within the organization.

In addition to existing staff capacity, succession planning is one of the key challenges that an aging municipal workforce faces as senior staff progress towards possible retirement or relocation. The loss of knowledge and experience that accompanies staff departures can have a dramatic impact on the ability of an organization to continue operations and provide services at the level that has previously been expected. Over the past year the Township has seen the departure of the long-time Director of Public Works. While this is typically a difficult position to replace, the Township has been fortunate to hire a new Director with significant experience in municipal infrastructure management. While there is some additional turnover expected among the senior management team, staff feel like they are well equipped to anticipate and prepare for this eventuality.

7.3 Recommendations

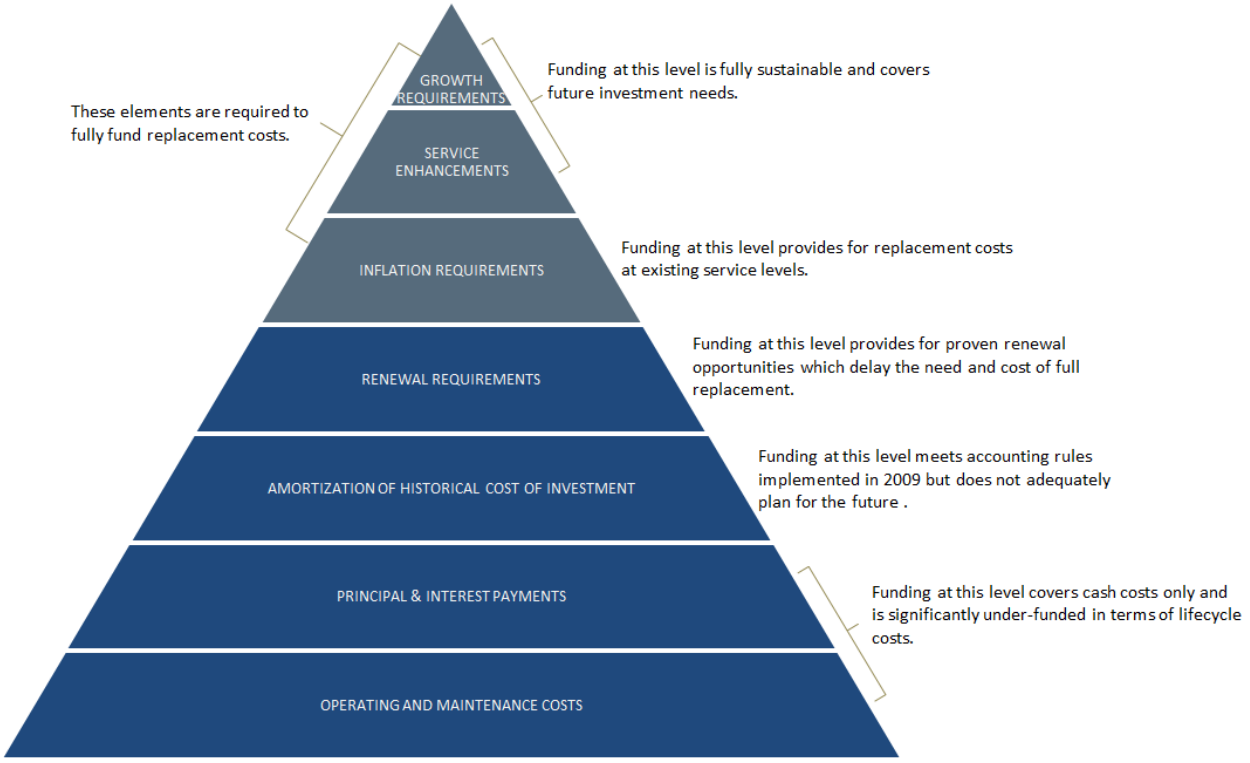
- Begin to measure current levels of service as part of a comprehensive performance measurement framework
- Once current levels of service have been measured, establish target levels of service
- Evaluate levels of service on an annual basis and adjust targets in collaboration with Council in an effort to balance community expectations, cost, risk and performance
- Communicate provided levels of service with the public and engage in public consultation to identify emerging perceptions and priorities

8.0 Financial Strategy

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

8.1 Financial Strategy Overview

The following pyramid depicts the various cost elements and resulting funding levels that should be incorporated into a financial strategy based on best practices.



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

1. The financial requirements for:
    a. Existing assets
    b. Existing service levels
    c. Requirements of contemplated changes in service levels (none identified for this plan)
    d. Requirements of anticipated growth (none identified for this plan)

2. Use of traditional sources of municipal funds:
    a. Tax levies
    b. User fees
    c. Reserves
    d. Debt
    e. Development charges

3. Use of non-traditional sources of municipal funds:
    a. Reallocated budgets
    b. Partnerships
    c. Procurement methods

4. Use of Senior Government Funds:
    a. Gas tax
    b. Annual grants

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

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

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

This financial strategy includes recommendations that avoid long-term funding deficits.

8.2 Funding Objective

We have developed a scenario that would enable Huron-Kinloss to achieve full funding within 5 to 20 years for the following assets:

1. **Tax Funded Assets**: Road Network, Bridges & Culverts, Storm Sewer Network, Machinery & Equipment, Buildings, Land Improvements and Fleet

2. **Rate Funded Assets**: Sanitary Sewer Network, Water Network

Note: For the purposes of this financial strategy, we have excluded the category of gravel roads since gravel roads are a perpetual maintenance asset and end of life replacement calculations do not normally apply. If gravel roads are maintained properly, they, in essence, could last forever.

8.3 Financial Profile: Tax Funded Assets

8.3.1 Current Funding Position – End of Life Scenario

Table 45 and **Table 46** outline, by asset category, Huron-Kinloss' average annual asset investment requirements, current funding positions, and funding increases required to achieve full funding on assets funded by taxes.

Table 45 Summary of Infrastructure Requirements & Current Funding Available

Asset Category	Average Annual Investment Required	2018 Annual Funding Available					Annual Deficit/Surplus
		Taxes	Gas Tax	OCIF	Taxes to Reserves	Total Funding Available	
Road Network	2,037,000	1,508,000	0	174,000	50,000	1,732,000	305,000
Bridges & Culverts	797,000	90,000	216,000	0	0	306,000	491,000
Storm Sewer Network	101,000	0	0	0	0	0	101,000
Machinery & Equipment	223,000	75,000	0	0	0	75,000	148,000
Buildings	237,000	134,000	0	0	0	134,000	103,000
Land Improvements	70,000	217,000	0	0	0	217,000	-147,000
Fleet	429,000	220,000	0	0	36,000	256,000	173,000
Total:	**3,894,000**	**2,244,000**	**216,000**	**174,000**	**86,000**	**2,720,000**	**1,174,000**

Under the end of life replacement scenario, the average annual capital requirement for the above categories is $3,894,000. Annual revenue currently allocated to these assets for capital purposes is $2,720,000 leaving an annual deficit of $1,174,000. To put it another way, under an end of life scenario, these infrastructure classes are currently funded at 70% of their long-term capital requirements.

8.3.2 Full Funding Requirements

In 2018, Huron-Kinloss had annual tax revenues of $7,730,000. As illustrated in **Table 46**, without consideration of any other sources of revenue or cost containment strategies, full funding would require the following tax change over time:

Table 46 Tax Change Required for Full Funding

Asset Category	Tax Change Required for Full Funding
Road Network	3.9%
Bridges & Culverts	6.4%
Stormwater Network	1.3%
Machinery & Equipment	1.9%
Buildings & Facilities	1.3%
Land Improvements	-1.9%
Fleet	2.2%
Total:	**15.1%**

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

a) Huron-Kinloss' formula based OCIF grant is scheduled to grow from $174,000 in 2018 to $274,000 in 2019.

Our analysis of this scenario includes capturing the above changes and allocating them to the infrastructure deficit outlined above.

Table 47 outlines this concept and presents a number of options:

Table 47 Effect of Changes in OCIF Funding and Reallocating Decreases in Debt Costs

	Without Capturing Changes				With Capturing Changes			
	5 Years	10 Years	15 Years	20 Years	5 Years	10 Years	15 Years	20 Years
Infrastructure Deficit	1,174,000	1,174,000	1,174,000	1,174,000	1,174,000	1,174,000	1,174,000	1,174,000
Change in Debt Costs	0	0	0	0	0	0	0	0
Change in OCIF Grants	0	0	0	0	-99,000	-99,000	-99,000	-99,000
Resulting Infrastructure Deficit:	**1,174,000**	**1,174,000**	**1,174,000**	**1,174,000**	**1,075,000**	**1,075,000**	**1,075,000**	**1,075,000**
Resulting Tax Increase Required	15.2%	15.2%	15.2%	15.2%	13.9%	13.9%	13.9%	13.9%
Annually:	3.0%	1.5%	1.0%	0.8%	2.8%	1.4%	0.9%	0.7%

8.3.3 Financial Strategy Recommendations

Considering all of the above information, we recommend the 15-year option in **Table 47**. This involves full funding being achieved over 15 years by:

f) increasing tax revenues by 0.9% each year for the next 15 years solely for the purpose of phasing in full funding to the asset categories covered in this section of the AMP

g) allocating the current gas tax and OCIF revenue as recommended (see note below)

h) allocating the scheduled OCIF grant increases to the infrastructure deficit as they occur

i) reallocating appropriate revenue from categories in a surplus position to those in a deficit position.

j) 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 a financial strategy unless there are firm

commitments in place. We have included OCIF formula-based funding, if applicable, since this funding is a multi-year commitment.

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

Although this option achieves full funding on an annual basis in 15 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 $14,283,000 for the Road Network, $481,000 for Machinery & Equipment, $950,000 for Buildings, $244,000 for Land Improvements, $1,323,000 for Fleet, $344,000 for Bridges & Culverts.

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.

8.4 Financial Profile: Rate Funded Assets

8.4.1 Current Funding Position

Table 48 and **Table 49** outline, by Asset Category, Huron-Kinloss' average annual capital requirements, current funding positions and funding increases required to achieve full funding on assets funded by rates.

Table 48 Summary of Infrastructure Requirements & Current Funding Available

Asset Category	Average Annual Investment Required	2018 Annual Funding Available				Annual Deficit/Surplus
		Rates	Less: Allocated to Operations	Other	Total Funding Available	
Sanitary Sewer Network	442,000	391,000	-389,000	0	2,000	440,000
Water Network	939,000	1,768,000	-903,000	0	865,000	74,000
Total:	**1,381,000**	**2,159,000**	**-1,292,000**	**0**	**867,000**	**514,000**

Under the end of life replacement scenario, the average annual capital requirement for the Water Network and Sanitary Sewer Network is $1,381,000. Annual revenue currently allocated to these assets for capital purposes is $867,000 leaving an annual deficit of

$514,000. To put it another way, these infrastructure categories are currently funded at 62% of their long-term capital requirements.

In 2018, Huron-Kinloss has annual sanitary revenues of $391,000 and annual water revenues of $1,768,000. As illustrated in **Table 49**, without consideration of any other sources of revenue, full funding would require the following changes over time:

Table 49 Rate Increase Required for Full Funding

Asset Category	Tax Change Required for Full Funding
Wastewater Network	112.5%
Water Network	4.2%

The following table outlines strategies to achieve full funding between 5-20 years for both the Wastewater Network and Water Network:

Table 50 Allocation Without Change in Costs

	Wastewater Network				Water Network			
	5 Years	10 Years	15 Years	20 Years	5 Years	10 Years	15 Years	20 Years
Infrastructure Deficit	440,000	440,000	440,000	440,000	74,000	74,000	74,000	74,000
Change in Debt Costs	0	0	0	0	0	0	0	0
Change in OCIF Grants	0	0	0	0	0	0	0	0
Resulting Infrastructure Deficit:	**440,000**	**440,000**	**440,000**	**440,000**	**74,000**	**74,000**	**74,000**	**74,000**
Resulting Rate Increase Required	112.5%	112.5%	112.5%	112.5%	4.2%	4.2%	4.2%	4.2%
Annually:	**22.5%**	**11.3%**	**7.5%**	**5.6%**	**0.8%**	**0.4%**	**0.3%**	**0.2%**

8.4.2 Financial Strategy Recommendations

Considering all of the above information, we recommend the following:

For Wastewater Network:
We recommend the 20-year option. This involves full funding being achieved over 20 years by:

c) increasing rate revenues by 5.6% each year for the next 20 years solely for the purpose of phasing in full funding
d) increasing future infrastructure budgets by the applicable inflation index on an annual basis

For Water Network:

We recommend the 5-year option. This involves full funding being achieved over 5 years by:

c) increasing rate revenues by 0.8% each year for the next 5 years solely for the purpose of phasing in full funding
d) increasing future infrastructure budgets by the applicable inflation index on an annual basis

Notes:

1. These recommendations are based on maintaining the existing system of billing whereby two water systems (Lucknow and Ripley) pay extra annual fees for capital projects and two systems (Whitechurch and Lakeshore) pay for capital projects at the time that their water distribution system is upgraded. The latter approach is unique in the Canadian municipal sector and is not considered to be a suitable path towards the sustainable funding of infrastructure. As a result, we have not included the one-time charge of $999,000 to users of the Whitechurch and Lakeshore water systems in 2018 to pay for capital upgrades.

   Over time, we recommend that the appropriate long-term capital charges be annualized for all system users.

2. 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 a financial strategy 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. 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.

4. Any increase in rates required for operations would be in addition to the above recommendations.

Although this option achieves full funding on an annual basis and provides financial sustainability over the period modeled, the recommendations do require prioritizing

capital projects to fit the resulting annual funding available. Current data shows a pent-up investment demand of $2,236,000 for the Sanitary Sewer network and $3,394,000 for the Water Network. Prioritizing future projects will require the current data to be replaced by assessed condition data. Although our recommendations include no further use of debt, the results of the condition-based analysis may require otherwise.

8.5 Use of Debt

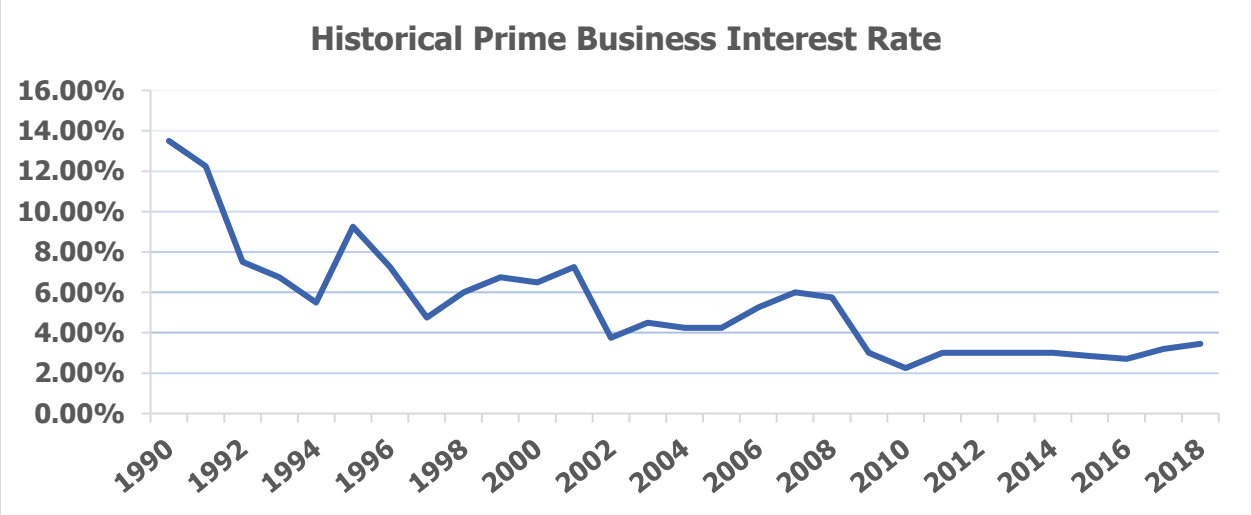
For reference purposes, the following table outlines the premium paid on a project if financed by debt. For example, a $1M project financed at 3.0%[1] over 15 years would result in a 26% premium or $260,000 of increased costs due to interest payments. For simplicity, the table does not take into account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

Table 51 Total Interest Paid as a % of Project Costs

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%

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

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:



Huron-Kinloss has no outstanding debt at this time.

8.6 Use of Reserves

8.6.1 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, **Table 52** outlines the details of the reserves currently available to Huron-Kinloss.

Table 52 Summary of Reserves Available

Asset Category	Balance at December 31, 2017
Road Network	1,180,000
Bridges & Culverts	1,073,000
Stormwater Network	0
Machinery & Equipment	12,000
Buildings & Facilities	5,000
Land Improvements	4,000
Fleet	739,000
Total Tax Funded:	**3,013,000**
Wastewater Network	452,000
Water Network	4,940,000
Total Rate Funded:	**5,392,000**

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

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

The reserves in **Table 52** are available for use by applicable asset categories during the phase-in period to full funding. This coupled with Huron-Kinloss' 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.

8.6.2 Recommendation

As Huron-Kinloss updates its AMP and expands it to include other asset categories, we recommend that future planning should include determining what its long-term reserve balance requirements are and a plan to achieve such balances.

Appendix A: Infrastructure Report Card Description

Table 53 Infrastructure Report Card Description

Financial Capacity		A municipality's financial capacity grade is determined by the level of funding available (0-100%) for each Asset Category for the purpose of meeting the average annual investment requirements.
Asset Health		Using either field inspection data as available or age-based data, the asset health component of the report card uses condition (0-100%) to estimate how capable assets are in performing their required functions. We use replacement cost to determine the weight of each condition group within the Asset Category.
Letter Grade	Rating	Description
A	Very Good	The asset is functioning and performing well; only normal preventive maintenance is required. The municipality is fully prepared for its long-term replacement needs based on its existing infrastructure portfolio.
B	Good	The municipality is well prepared to fund its long-term replacement needs but requires additional funding strategies in the short-term to begin to increase its reserves.
C	Fair	The asset's performance or function has started to degrade and repair/rehabilitation is required to minimize lifecycle cost. The municipality is underpreparing to fund its long-term infrastructure needs. The replacement of assets in the short- and medium-term will likely be deferred to future years.
D	Poor	The asset's performance and function is below the desired level and immediate repair/rehabilitation is required. The municipality is not well prepared to fund its replacement needs in the short-, medium- or long-term. Asset replacements will be deferred and levels of service may be reduced.
F	Very Poor	The municipality is significantly underfunding its short-term, medium-term, and long-term infrastructure requirements based on existing funds allocation. Asset replacements will be deferred indefinitely. The municipality may have to divest some of its assets (e.g., bridge closures, arena closures) and levels of service will be reduced significantly.

Table 54 Asset Health Grading Scale

Letter Grade	Rating	Description
A	Excellent	Asset is new or recently rehabilitated
B	Good	Asset is no longer new, but is fulfilling its function. Preventive maintenance is beneficial at this stage.
C	Fair	Deterioration is evident but asset continues to full its function. Preventive maintenance is beneficial at this stage.
D	Poor	Significant deterioration is evident and service is at risk.
F	Very Poor	Asset is beyond expected life and has deteriorated to the point that it may no longer be fit to fulfill its function.

Table 55 Financial Capacity Grade Scale

Letter Grade	Rating	Funding percent	Timing Requirements	Description
A	Excellent	90-100 percent	☑ Short Term ☑Medium Term ☑Long Term	The municipality is fully prepared for its short-, medium- and long-term replacement needs based on existing infrastructure portfolio.
B	Good	70-89 percent	☑Short Term ☑Medium Term ☒Long Term	The municipality is well prepared to fund its short-term and medium-term replacement needs but requires additional funding strategies in the long-term to begin to increase its reserves.
C	Fair	60-69 percent	☑Short Term ☒Medium Term ☒Long Term	The municipality is underprepared to fund its medium- to long-term infrastructure needs. The replacement of assets in the medium-term will likely be deferred to future years.
D	Poor	40-59 percent	☒/☑ Short Term ☒Medium Term ☒Long Term	The municipality is not well prepared to fund its replacement needs in the short-, medium- or long-term. Asset replacements will be deferred and levels of service may be reduced.
F	Very Poor	0-39 percent	☒Short Term ☒Medium Term ☒Long Term	The municipality is significantly underfunding its short-term, medium-term, and long-term infrastructure requirements based on existing funds allocation. Asset replacements will be deferred indefinitely. The municipality may have to divest some of its assets (e.g., bridge closures, arena closures) and levels of service will be reduced significantly.

Appendix B: Lifecycle Activity Requirements

The following tables identify the cost of capital lifecycle activities that would need to be undertaken to maintain the current level of service provided by the Township's infrastructure. This data includes end-of-life replacement activities only.

Road Network

Asset Segment	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027
Hot Mix Surface	$0	$0	$698,140	$0	$0	$61,104	$2,397,782	$45,024	$0	$0
Sidewalks	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Signs	$5,885	$6,004	$6,398	$0	$70,906	$0	$0	$110,381	$4,855	$0
Streetlights	$75,808	$0	$1,244	$0	$15,004	$461	$83,729	$0	$0	$0
Tar/Chip Surface	$0	$0	$0	$26,800	$0	$671,000	$187,332	$0	$0	$1,570,632
Total:	**$81,693**	**$6,004**	**$705,782**	**$26,800**	**$85,910**	**$732,565**	**$2,668,843**	**$155,405**	**$4,855**	**$1,570,632**

Bridges & Culverts

Asset Segment	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027
Bridges	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Culverts	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Total:	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**

Water Network

Asset Segment	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027
Hydrants	$0	$0	$0	$0	$321,257	$0	$0	$1,245,058	$0	$0
Standpipes	$0	$26,229	$0	$3,200,000	$0	$0	$0	$0	$0	$0
Water Mains	$0	$0	$0	$0	$1,131,197	$0	$0	$0	$0	$0
Water Pumphouses	$0	$722,241	$0	$0	$0	$10,359	$0	$38,346	$245,268	$114,341
Water Wells	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Total:	**$0**	**$748,470**	**$0**	**$3,200,000**	**$1,452,454**	**$10,359**	**$0**	**$1,283,404**	**$245,268**	**$114,341**

Sanitary Sewer Network

Asset Segment	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027
Lagoons	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Sanitary Laterals	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Sanitary Sewer Mains	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Sewage Pumping Stations	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Total:	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0

Storm Sewer Network

Asset Segment	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027
Storm Sewer Mains	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Total:	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0

Buildings

Asset Segment	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027
4H Livestock Shelter	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Community Centre & Arena	$0	$0	$191,404	$0	$0	$0	$1,504,969	$16,403	$197,947	$57,456
Fire Hall	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Gazebo	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Lawn Bowl Building	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Mausoleum	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Medical Centre	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Miscellaneous	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Municipal Office/Town Hall	$0	$0	$0	$0	$0	$0	$0	$146,077	$0	$604,568
Pavillion	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Picnic Pavillion	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Point Clark Lighthouse	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Ripley Public Library	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Shed/Building Storage	$0	$285,088	$0	$0	$0	$0	$0	$0	$0	$0
Washroom	$48,037	$0	$0	$0	$23,009	$0	$0	$0	$0	$0

Whitechurch Hall	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Total:	**$48,037**	**$285,088**	**$191,404**	**$0**	**$23,009**	**$0**	**$1,504,969**	**$162,480**	**$197,947**	**$662,024**

Machinery & Equipment

Asset Segment	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027
Arena Equipment	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Fire Fighting Apparatus	$0	$28,105	$38,913	$31,854	$58,311	$18,972	$0	$20,440	$17,105	$40,417
Furniture & Fixtures	$0	$3,025	$0	$10,430	$16,575	$21,443	$9,110	$0	$0	$0
General - Electronic Equipment	$50,725	$27,071	$37,739	$19,369	$31,520	$184,896	$10,766	$45,445	$19,369	$31,520
Generators/Large Equipment	$0	$0	$0	$56,373	$69,652	$0	$0	$10,655	$0	$84,530
Parks Equipment	$0	$0	$28,766	$0	$3,816	$62,117	$17,806	$0	$238,281	$5,959
Small Tools	$0	$0	$0	$3,472	$0	$39,456	$0	$0	$3,472	$0
WTP - Electronic Equipment	$0	$34,065	$0	$0	$35,589	$213,474	$34,065	$0	$0	$35,589
Total:	**$50,725**	**$92,266**	**$105,418**	**$121,498**	**$215,463**	**$540,358**	**$71,747**	**$76,540**	**$278,227**	**$198,015**

Land Improvements

Asset Segment	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027
Athletic Fields/Courts	$0	$0	$9,539	$0	$0	$44,805	$0	$0	$80,893	$0
Landscaping	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Miscellaneous	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Municipal Drains	$0	$0	$0	$0	$0	$16,600	$0	$28,727	$0	$0
Parking Lots	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Retaining Walls/Planters	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Sculptures/Structures	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Trails	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Total:	**$0**	**$0**	**$9,539**	**$0**	**$0**	**$61,405**	**$0**	**$28,727**	**$80,893**	**$0**

Fleet

Asset Segment	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027
Fire Vehicles	$0	$0	$165,018	$0	$0	$0	$438,535	$0	$0	$0

Heavy Vehicles	$49,252	$0	$0	$0	$0	$378,758	$321,456	$345,971	$264,983	$78,872
Light Vehicles	$0	$28,972	$23,774	$97,731	$0	$423,367	$28,972	$23,774	$97,731	$0
Olympia	$0	$0	$0	$0	$0	$0	$95,853	$0	$0	$0
Total:	**$49,252**	**$28,972**	**$188,792**	**$97,731**	**$0**	**$802,125**	**$884,816**	**$369,745**	**$362,714**	**$78,872**

Cumulative Total (All Assets)

Asset Category	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027
Road Network	$81,693	$6,004	$705,782	$26,800	$85,910	$732,565	$2,668,843	$155,405	$4,855	$1,570,632
Bridges & Culverts	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Water Network	$0	$748,470	$0	$3,200,000	$1,452,454	$10,359	$0	$1,283,404	$245,268	$114,341
Sanitary Sewer Network	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Storm Sewer Network	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Buildings	$48,037	$285,088	$191,404	$0	$23,009	$0	$1,504,969	$162,480	$197,947	$662,024
Machinery & Equipment	$50,725	$92,266	$105,418	$121,498	$215,463	$540,358	$71,747	$76,540	$278,227	$198,015
Land Improvements	$0	$0	$9,539	$0	$0	$61,405	$0	$28,727	$80,893	$0
Fleet	$49,252	$28,972	$188,792	$97,731	$0	$802,125	$884,816	$369,745	$362,714	$78,872
Total:	**$229,707**	**$1,160,800**	**$1,200,935**	**$3,446,029**	**$1,776,836**	**$2,146,812**	**$5,130,375**	**$2,076,301**	**$1,169,904**	**$2,623,884**