Asset Management Plan

Township of Southwold

2022

Adopted by Council September 26, 2022

This Asset Management Program was prepared by:

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

Key Statistics

Replacement cost of asset portfolio
$112.4 million

Replacement cost of infrastructure per household
$63,884 (2021)

Percentage of assets in fair or better condition
70%

Percentage of assets with assessed condition data
34%

Annual capital infrastructure deficit
$167 thousand

Recommended timeframe for eliminating annual infrastructure deficit
5 Years

Target reinvestment rate
2.67%

Actual reinvestment rate
2.52%

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Executive Summary

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

Scope

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

The following asset categories are addressed in further sections:

Asset Categories

- Road Network
- Bridges & Culverts
- Vehicles
- Buildings
- Land Improvements
- Machinery & Equipment
- Sanitary Network
- Water Network

The Township has achieved compliance with O. Reg. 588/17 to the extent of the requirements that must be completed by July 1, 2022. There are additional requirements concerning general infrastructure, proposed levels of service and growth that must be met by July 1, 2024 and 2025.

Findings

The overall replacement cost of the asset categories owned by Southwold totals $112.4 million. 70% of all assets analysed are in fair or better condition and assessed condition data was available for 34% of assets. For the remaining 66% of assets, assessed condition data was unavailable, and asset age was used to approximate condition – a data gap that persists in most municipalities.

The development of a long-term, sustainable financial plan requires an analysis of whole lifecycle costs. By using a combination of proactive lifecycle strategies (roads) and replacement only strategies (all other assets) to determine the lowest cost option to maintain the current level of service.

To meet capital replacement and rehabilitation needs for existing infrastructure, prevent infrastructure backlogs, and achieve long-term sustainability, the Township's average annual capital requirement totals $3.0 million. Based on a historical analysis of sustainable capital funding sources, the Township is committing approximately $2.83 million towards capital projects or reserves per year. As a result, there is currently an annual funding gap of $167 thousand.

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

Recommendations

A financial strategy was developed to address the annual capital funding gap. The annual tax funded assets are currently fully funded in Southwold. The water rate change required to eliminate the Township's infrastructure deficit based on a 5-year plan is 0.4% annually. The sanitary rate is currently in a deficit, however, as the network is new the connections are still being installed. Once residents are utilizing the system at the levels forecasted in the rates, the system will be fully funded. It is recommended to monitor the progress.

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

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

1 Introduction

1.1 Key Insights

- The goal of asset management is to minimize the lifecycle costs of delivering infrastructure services, manage the associated risks, while maximizing the value ratepayers receive from the asset portfolio
- The Township's asset management policy provides clear direction to staff on their roles and responsibilities regarding asset management
- An asset management plan is a living document that should be updated regularly to inform long-term planning

1.2 Southwold Community Profile

Census Characteristic	Southwold	Ontario
Population 2021	4,851	14,223,942
Population Change 2016-2021	9.7	5.8
Total Private Dwellings	1,760	5,929,250
Population Density	16.1/km^2	15.9/km^2
Land Area	301.38 km^2	892,411.76 km^2

The township of Southwold is situated in Southwestern Ontario, within Elgin County and borders the north shore of Lake Erie and the Thames River. It is part of the London census metropolitan area. The township was named in 1793 after Suffolk, England, and became incorporated as a municipality in 1852. It is home to Southwold Earthworks National Historic Site, a rare, fortified village of Neutral Iroquois who inhabited the area from 1500 – 1650 AD.

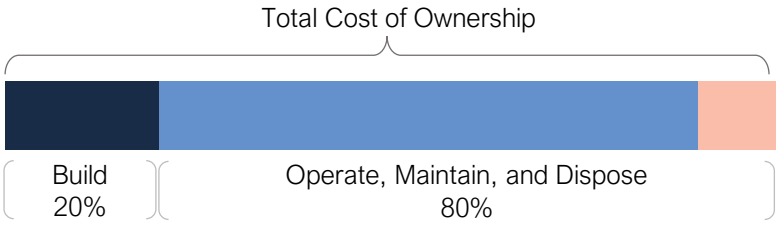
The township sits on rich soil beds that primarily produce corn and soybean agricultural products. Agriculture areas are protected, and the township discourages non-agricultural uses to help preserve the intended land use and prevent conflict between farm and non-farm uses. Southwold also services The City of Toronto's waste management needs from the Green Lane Environmental Landfill, which was purchased in 2010.

Southwold's transportation network consists of linkages that service the movement of people and goods more broadly to Southwestern Ontario using HWY 401, HWY 3 and Highway 4.

1.3 An Overview of Asset Management

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

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



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

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

1.3.1 Asset Management Policy

An asset management policy represents a statement of the principles guiding the Township's approach to asset management activities. It aligns with the organizational strategic plan and provides clear direction to municipal staff on their roles and responsibilities. The Township Council resolution number 2019-262 approved the Strategic Asset Management Policy on June 24th, 2019, in accordance with Ontario Regulation 588/17. The objectives of the policy include the following:

- Prioritizing the need for existing and future assets to effectively deliver services
- Supporting sustainability and economic development
- Maintaining prudent financial planning and decision making

1.3.2 Asset Management Strategy

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

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

1.4 Key Concepts in Asset Management

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

1.4.1 Lifecycle Management Strategies

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

To ensure that municipal assets are performing as expected and meeting the needs of customers, it is important to establish a lifecycle management strategy to proactively manage asset deterioration. There are several field intervention activities that are available to extend the life of an asset. These activities can be generally placed into one of three categories: maintenance, rehabilitation, and replacement. The following table provides a description of each type of activity and the general difference in cost.

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

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

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

1.4.2 Risk Management Strategies

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

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

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

1.4.3 Levels of Service

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

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

Community Levels of Service

Community levels of service are a simple, plain language description or measure of the service that the community receives. For core asset categories the province, through O. Reg. 588/17, has provided qualitative descriptions that are required. For non-core asset categories, the Township must determine the qualitative descriptions that will be used by July 1, 2024. These descriptions can be found in the Levels of Service subsection within each asset category.

Technical Levels of Service

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

For core asset categories the province, through O. Reg. 588/17, has provided technical metrics that are required. For non-core asset categories, the Township must determine the technical metrics that will be used by July 1, 2024. The metrics can be found in the Levels of Service subsection within each asset category.

Current and Proposed Levels of Service

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

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

1.5 Climate Change

Climate change can cause severe impacts on human and natural systems around the world. The effects of climate change include increasing temperatures, higher levels of precipitation, droughts, and extreme weather events. In 2019, Canada's Changing Climate Report (CCCR 2019) was released by Environment and Climate Change Canada (ECCC).

The report revealed that between 1948 and 2016, the average temperature increase across Canada was 1.7°C; moreover, during this period, Northern Canada experienced a 2.3°C increase. The temperature increase in Canada has doubled that of the global average. If emissions are not significantly reduced, the temperature could increase by 6.3°C in Canada by the year 2100 compared to 2005 levels. Observed precipitation changes in Canada include an increase of approximately 20% between 1948 and 2012.

By the late 21st century, the projected increase could reach an additional 24%. During the summer months, some regions in Southern Canada are expected to experience periods of drought at a higher rate. Extreme weather events and climate conditions are more common across Canada. Recorded events include droughts, flooding, cold extremes, warm extremes, wildfires, and record minimum arctic sea ice extent.

The changing climate poses a significant risk to the Canadian economy, society, environment, and infrastructure. The impacts on infrastructure are often a result of climate-related extremes such as droughts, floods, higher frequency of freeze-thaw cycles, extended periods of high temperatures, high winds, and wildfires. Physical infrastructure is vulnerable to damage and increased wear when exposed to these extreme events and climate variabilities. Canadian Municipalities are faced with the responsibility to protect their local economy, citizens, environment, and physical assets.

1.5.1 Southwold Climate Profile

The Township of Southwold is in southwestern Ontario in the County of Elgin, on the north shore of Lake Erie. The Township is expected to experience notable effects of climate change which include higher average annual temperatures, an increase in total annual precipitation, and an increase in the frequency and severity of extreme events. According to Climatedata.ca – a collaboration supported by Environment and Climate Change Canada (ECCC) – the Township of Southwold may experience the following trends:

Higher Average Annual Temperature:

- Between the years 1981 and 2010 the annual average temperature was 8.57ºC
- Under a high emissions scenario, the annual average temperatures are projected to increase to 10.7ºC by the year 2050 and increase an additional 3.1ºC by the end of the century.

Increase in Total Annual Precipitation:

- Under a high emissions scenario, Southwold is projected to experience an 8% increase in precipitation by the year 2050 and a 15% increase by the end of the century.

Increase in Frequency of Extreme Weather Events:

- It is expected that the frequency and severity of extreme weather events will change.

1.5.2 Lake Erie

The Great Lakes are one of the largest sources of fresh water on earth, containing 21 percent of the world's surface freshwater. There are 35 million people living in the Great Lakes watershed and nearly one-third are within the Lake Erie watershed. The physical impacts of climate change are most noticeable from: flooding, extreme weather events such as windstorms and tornados, and/or rising water levels eroding shorelines and natural spaces. Erosion and flooding pose a threat to the surrounding built infrastructure such as park assets, bridges, and roads. Communities located in the Great Lakes region may experience more severe windstorms or tornados as a result of climate change, causing damage to both the natural and built environment.

Public health and safety depend on the stability and predictability of the ecosystem in the Great Lakes watershed. The quality of water is threatened by anthropogenic climate change as a result of blue-green algae blooms, soil erosion, and agricultural, stormwater, and wastewater runoff. These phenomena put undue stress on regional water filtering and treatment systems. The safety of the public is threatened by the physical impacts of flooding such as flooding and erosion. In some cases, homeowners located near the lakeshore are already at risk of losing their homes.

1.5.3 Integration Climate change and Asset Management

Asset management practices aim to deliver sustainable service delivery - the delivery of services to residents today without compromising the services and well-being of future residents. Climate change threatens sustainable service delivery by

reducing the useful life of an asset and increasing the risk of asset failure. Desired levels of service can be more difficult to achieve because of climate change impacts such as flooding, high heat, drought, and more frequent and intense storms.

To achieve the sustainable delivery of services, climate change considerations should be incorporated into asset management practices. The integration of asset management and climate change adaptation observes industry best practices and enables the development of a holistic approach to risk management.

1.6 Ontario Regulation 588/17

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

2019

Strategic Asset Management Policy

2022

Asset Management Plan for Core Assets with the following components:

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

2024

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

2025

Asset Management Plan for All Assets with the following additional components:

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

1.6.1 O. Reg. 588/17 Compliance Review

The following table identifies the requirements outlined in Ontario Regulation 588/17 for municipalities to meet by July 1, 2024. Next to each requirement a page or section reference is included in addition to any necessary commentary.

Requirement	O. Reg. Section	AMP Section Reference	Status
Summary of assets in each category	S.5(2), 3(i)	4 - 12	Complete
Replacement cost of assets in each category	S.5(2), 3(ii)	4 - 12	Complete
Average age of assets in each category	S.5(2), 3(iii)	4 - 12	Complete
Condition of assets in each category	S.5(2), 3(iv)	4 - 12	Complete
Description of municipality's approach to assessing the condition of assets in each category	S.5(2), 3(v)	4 - 12	Complete
Current levels of service in each category	S.5(2), 1(i-ii)	4 - 12	Complete
Current performance measures in each category	S.5(2), 2	4 - 12	Complete
Lifecycle activities needed to maintain current levels of service for 10 years	S.5(2), 4	4 - 12	Complete
Costs of providing lifecycle activities for 10 years	S.5(2), 4	Appendix B	Complete
Growth assumptions	S.5(2), 5(i-ii) S.5(2), 6(i-vi)	13	Complete

2 Scope and Methodology

2.1 Key Insights

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

2.2 Asset Categories

To ensure compliance with Ontario Regulation 588/17 the July 2022 deadline under the regulation requires analysis of only core assets (roads, bridges and culverts, water, wastewater, and stormwater). Where the July 2024 requires analysis of all other assets.

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

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

2.3 Deriving Replacement Costs

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

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

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

2.4 Estimated Useful Life and Service Life Remaining

The estimated useful life (EUL) of an asset is the period over which the Township expects the asset to be available for use and remain in service before requiring replacement or disposal. The EUL for each asset was assigned according to the knowledge and expertise of municipal staff and supplemented by existing industry standards when necessary.

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

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

2.5 Reinvestment Rate

As assets age and deteriorate they require additional investment to maintain a state of good repair. The reinvestment of capital funds, through asset renewal or replacement, is necessary to sustain an adequate level of service. The reinvestment rate is a measurement of available or required funding relative to the total replacement cost. By comparing the actual vs. target reinvestment rate the Township can determine the extent of any existing funding gap.

The reinvestment rate is calculated as follows:

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

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

2.6 Deriving Asset Condition

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

A condition assessment rating system provides a standardized descriptive framework that allows comparative benchmarking across the Township's asset portfolio. The table below outlines the condition rating system used to determine asset condition. This rating system is aligned with the Canadian Core Public Infrastructure Survey which is used to develop the Canadian Infrastructure Report Card.

Condition	Description	Criteria	Service Life Remaining (%)
Very Good	Fit for the future	Well maintained, good condition, new or recently rehabilitated	80-100
Good	Adequate for now	Acceptable, generally approaching mid-stage of expected service life	60-80
Fair	Requires attention	Signs of deterioration, some elements exhibit significant deficiencies	40-60
Poor	Increasing potential of affecting service	Approaching end of service life, condition below standard, large portion of system exhibits significant deterioration	20-40
Very Poor	Unfit for sustained service	Near or beyond expected service life, widespread signs of advanced deterioration, some assets may be unusable	0-20

The analysis is based on assessed condition data only as available. In the absence of assessed condition data, asset age is used as a proxy to determine asset condition. Appendix E includes additional information on the role of asset condition data and provides basic guidelines for the development of a condition assessment program.

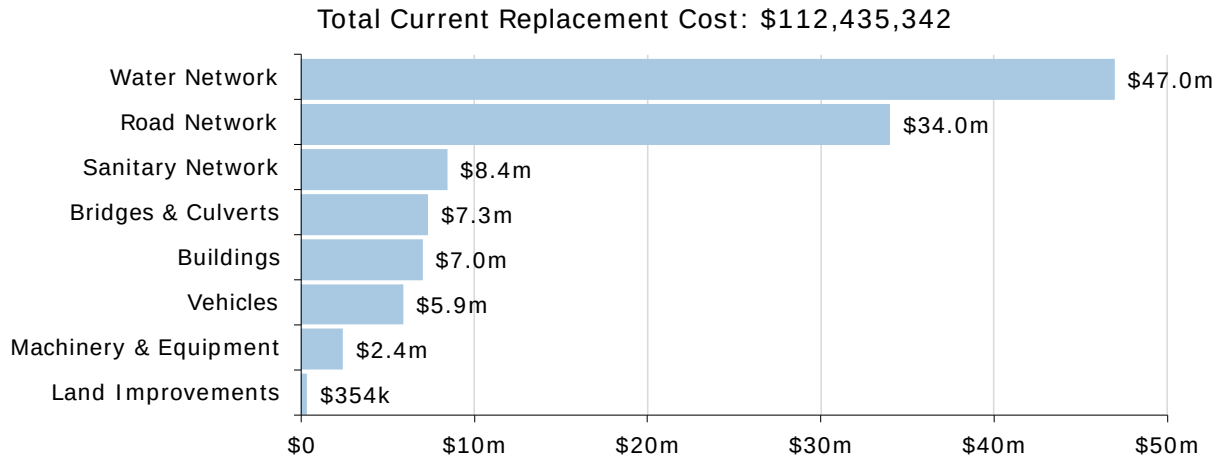
3 Portfolio Overview

3.1 Key Insights

- The total replacement cost of the Township's asset portfolio is $112.4 million
- The Township's target re-investment rate is 2.67%, and the actual re-investment rate is 2.52%,
- 85% of all assets are in fair or better condition
- 31% of assets are projected to require rehabilitation / replacement in the next 10 years
- Average annual capital requirements total $3.0 million per year across all asset categories

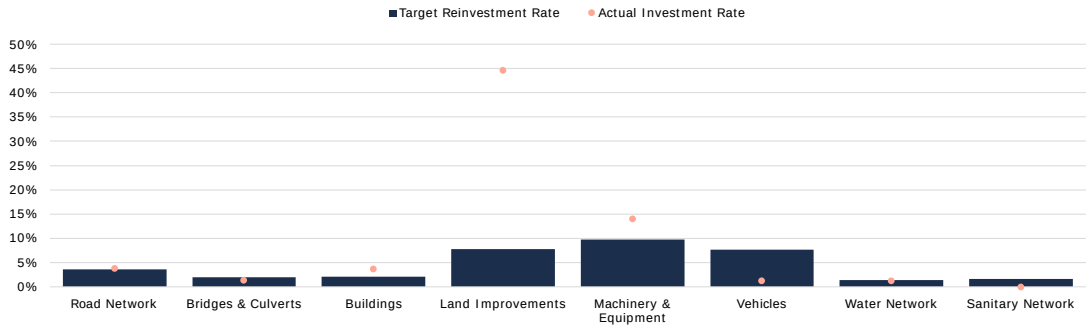
3.2 Total Replacement Cost of Asset Portfolio

The asset categories have a total replacement cost of $112.4 million based on inventory data from 2022. This total was determined based on a combination of user-defined costs and historical cost inflation. This estimate reflects replacement of historical assets with similar, not necessarily identical, assets available for procurement today.



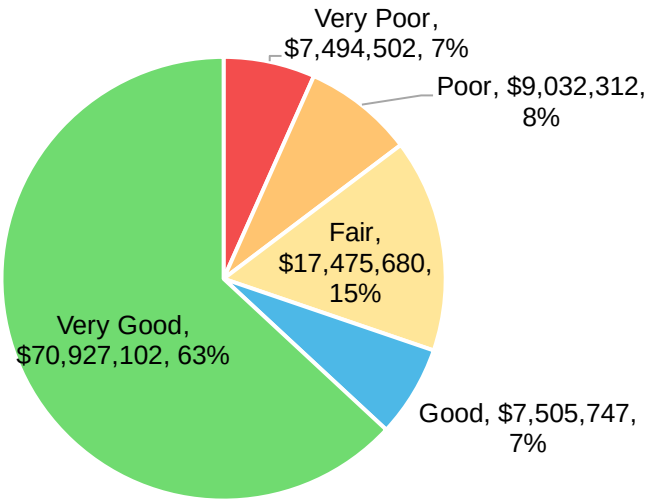
3.3 Target vs. Actual Reinvestment Rate

The graph below depicts funding gaps or surpluses by comparing target vs actual reinvestment rate. To meet the long-term replacement needs, the Township should be allocating approximately $3.0 million annually, for a target reinvestment rate of 2.67%. Actual annual spending on infrastructure totals approximately $2.83 million, for an actual reinvestment rate of 2.52%.



3.4 Condition of Asset Portfolio

The current condition of the assets is central to all asset management planning. Collectively, 85% of assets in Southwold are in fair or better condition. This estimate relies on both age-based and field condition data.



Assessed condition data is available for 34% of assets; for the remaining portfolio, age is used as an approximation of condition. Assessed condition data is invaluable in asset management planning as it reflects the true condition of the asset and its ability to perform its functions.

The table below identifies the source of condition data.

Asset Category	% of Assets with Assessed Condition	Source of Condition Data
Road Network	90%	2019 CD Watters Study
Bridges & Culverts	87%	2020 Spriet Associates
Buildings	8%	2016 Valco Real Estate Appraisals
All other Categories	0%	No Assessments

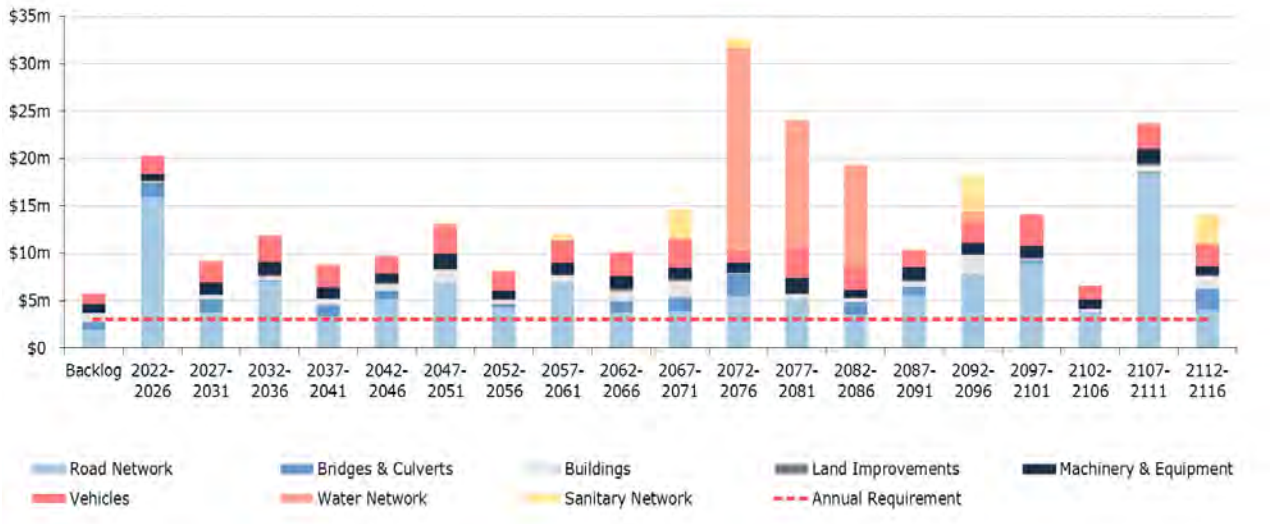
3.5 Service Life Remaining

Based on asset age, available assessed condition data and estimated useful life, 31% of the Township's assets will require rehabilitation / replacement within the next 10 years. Capital requirements over the next 10 years are identified in Appendix B.

3.6 Forecasted Capital Requirements

The development of a long-term capital forecast should include both asset rehabilitation and replacement requirements. With the development of asset-specific lifecycle strategies that include the timing and cost of future capital events, the Township can produce an accurate long-term capital forecast.

The following graph identifies capital requirements over the next 90 years. This projection is used as it ensures that every asset has gone through one full iteration of replacement. The forecasted requirements are aggregated into 5-year bins and the trend line represents the average annual capital requirements.



3.7 Risk & Criticality

The Township has noted key trends, challenges, and risks to service delivery that they are currently facing:

Climate Change & Extreme Weather

Asset deterioration is accelerated due to extreme weather, which in some cases can cause unexpected failures. Freeze-thaw cycles, ice jams, and surface flooding from extreme rainfall have been experienced by the Township in recent years. These events make long-term planning difficult and can result in a lower level of service.

Asset Data & Information

There is a lack of confidence in the available inventory data and condition data. Staff have been prioritizing data refinement efforts to increase the accuracy and reliability of asset data and information. Staff find it a continuous challenge to dedicate resources and time towards data collection and condition assessments to ensure that condition and asset attribute data is regularly reviewed and updated.

4 Road Network

4.1 Key Insights

The road network is a critical component of the provision of safe and efficient transportation services and represents the highest value asset category in the Township's tax funded asset portfolio. It includes all municipally owned and maintained roadways in addition to supporting roadside infrastructure including sidewalks, guardrails, and streetlights.

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

The state of the infrastructure for the road network is summarized in the following table.

Replacement Cost	Condition	Financial Capacity	
$34,009,427	Fair (56%)	Annual Requirement:	$1,207,818
		Funding Available:	$1,282,824
		Annual Deficit:	($181,181)

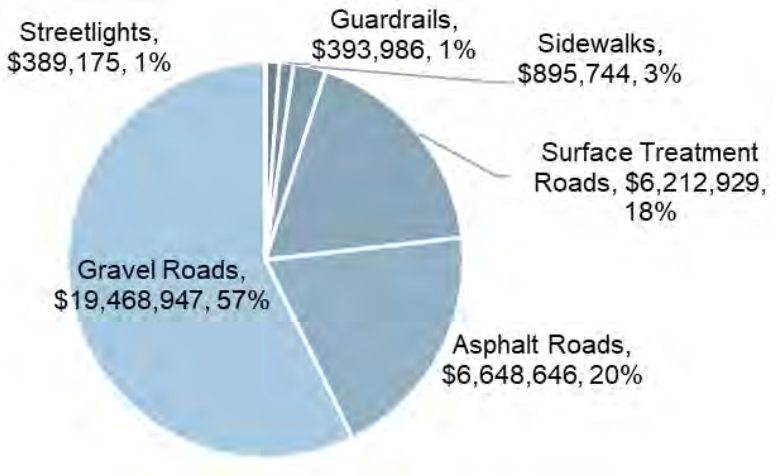
The following level of service statements are a key driving force behind the Township's asset management planning:

Service Attribute	Level of Service Statement
Reliability & Responsiveness	The roads are almost always available for use, in good condition and meet regulatory requirements

4.2 Asset Inventory & Costs

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

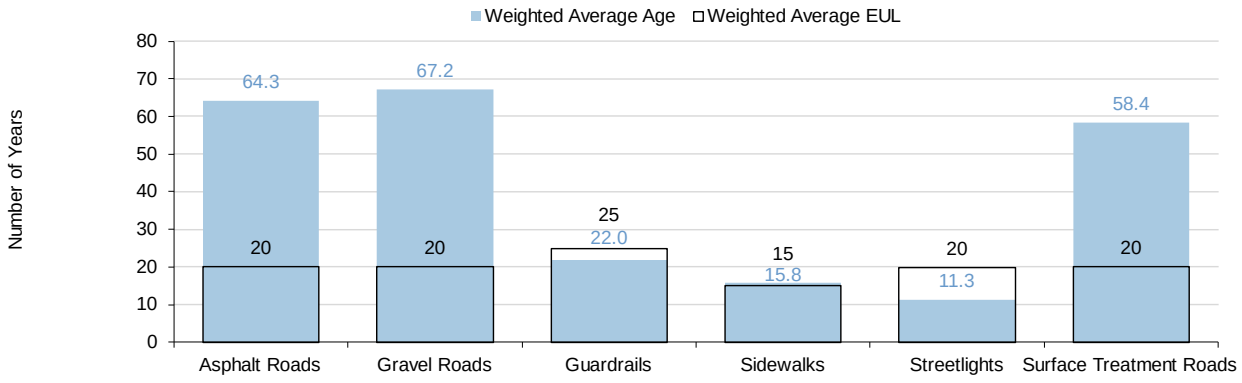
Asset Segment	Quantity	Replacement Cost
Asphalt Roads	21,986m	$6,648,646
Gravel Roads	142,516m	$19,468,947
Guardrails	5,804m	$393,986
Sidewalks	7,779m	$895,744
Streetlights	227	$389,175
Surface Treatment Roads	3,260m	$6,212,929
Total		**$34,009,427**



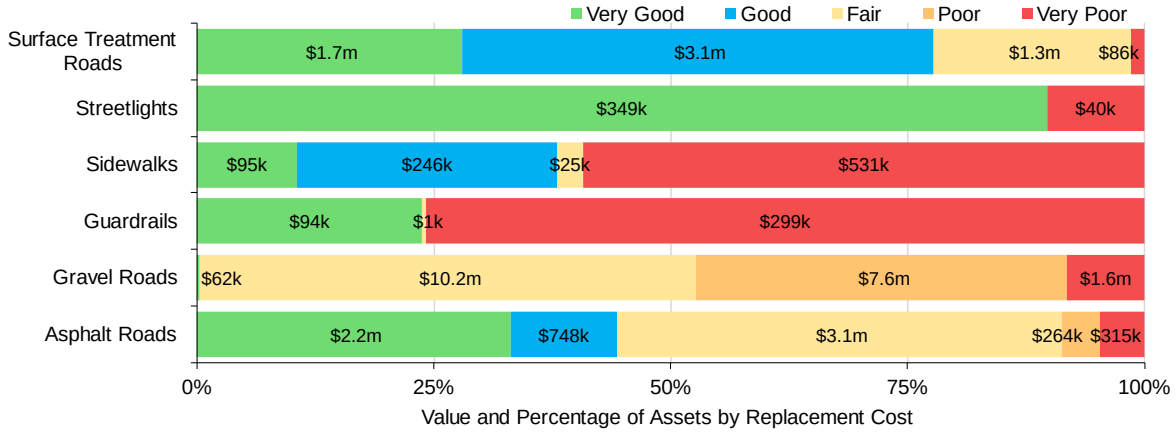
Each asset's replacement cost should be reviewed periodically to determine whether adjustments are needed to more accurate represent realistic capital requirements.

4.3 Asset Condition & Age

The graph below identifies the average age, and the estimated useful life for each asset segment. It is all weighted by replacement cost.



The graph below visually illustrates the average condition for each asset segment on a very good to very poor scale.



To ensure that the Township's roads 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 roads.

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

4.3.1 Current Approach to Condition Assessment

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

- The roads are assessed by staff annually to set priorities based on the current state
- Roads needs studies are completed every 5 years by external consultants

The rating criteria is used to determine the current condition of road segments and forecast future capital requirements is:

Condition	Rating
Very Good	80-100
Good	60-80
Fair	40-60
Poor	20-40
Very Poor	0-20

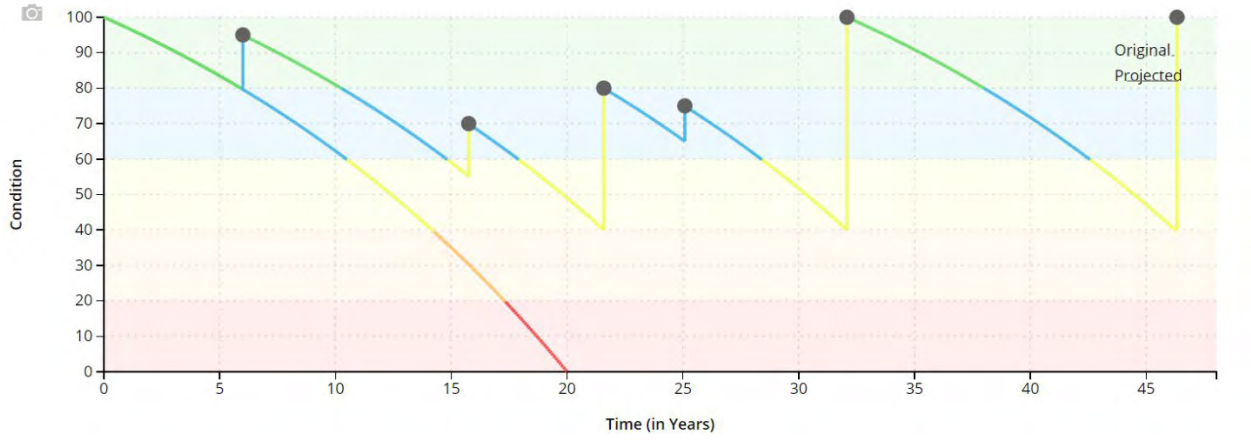
4.4 Lifecycle Management Strategy

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

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

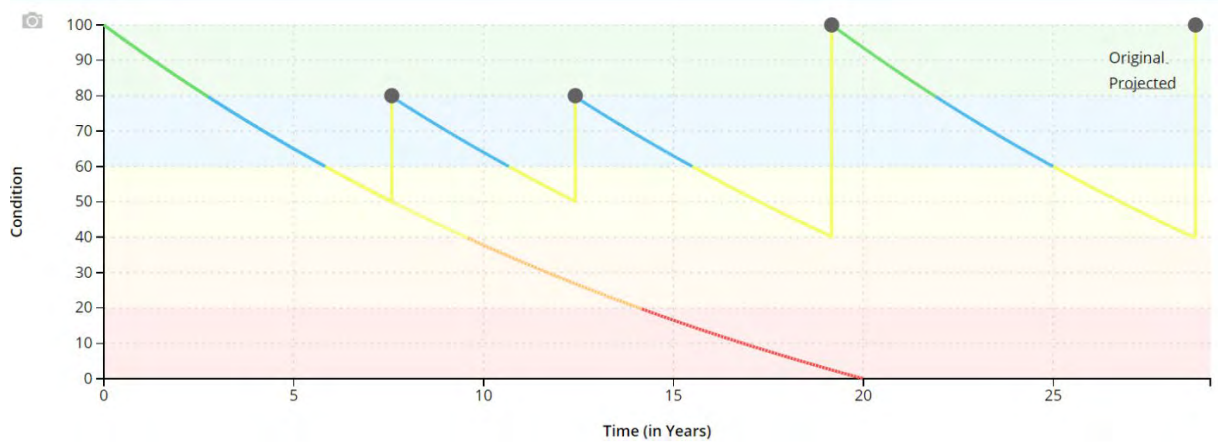
Asphalt Roads

Event Name	Event Class	Event Trigger
Crack Sealing	Maintenance	6 years & 65 condition
Microsurfacing	Preventative Maintenance	55 condition
Surface Mill & Pave	Rehabilitation	40 condition
Full depth Mill & Pave	Rehabilitation	40 condition
Full Reconstruction	Replacement	40 condition



Surface Treatment Roads

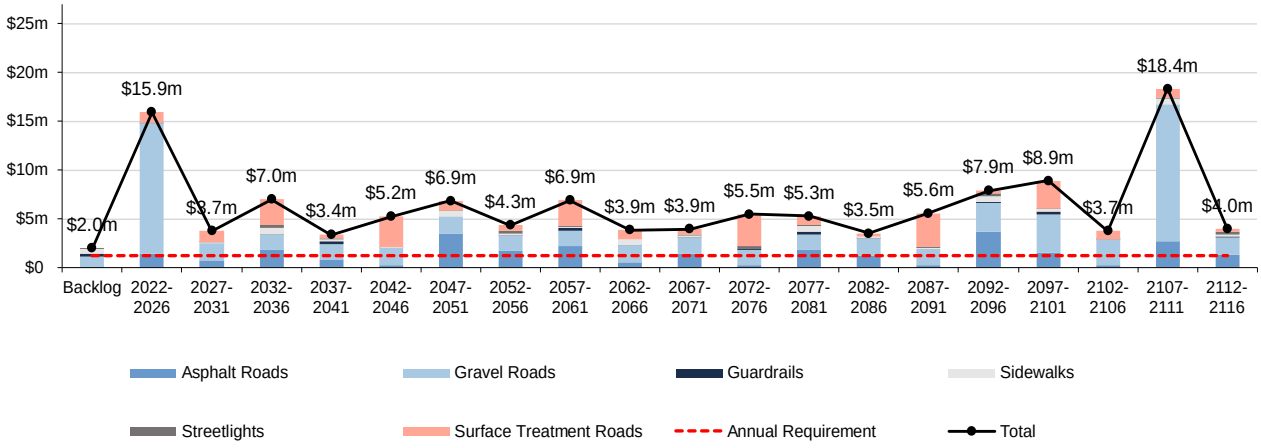
Event Name	Event Class	Event Trigger
Single Surface Treatment (SST)	Rehabilitation	50 – 55 condition
Double Surface Treatment (DST)	Rehabilitation	40 – 45 condtion
Full Reconstruction	Replacement	40 condition



The Township has developed a gravel road program that adds 50-60mm of compacted gravel and shouldering every 4 years which is captured as a capital expense. When the condition of the road reaches 40 condition the Township will fully replace the road section.

4.4.1 Forecasted Capital Requirements

Based on the lifecycle strategies identified previously for roads, and assuming the end-of-life replacement of all other assets in this category, the following graph forecasts capital requirements for the road network. The annual capital requirement represents the average amount per year that the Township should allocate towards funding rehabilitation and replacement needs. The following projection is used as it ensures that every asset has gone through one full iteration of replacement. The forecasted requirements are aggregated into 5-year bins and the trend line represents the average annual capital requirement. For the road network the annual capital requirement is $1.2 million



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

4.5 Risk & Criticality

The following risk matrix provides a visual representation of the relationship between the probability of failure and the consequence of failure for the assets within this asset category based on 2022 inventory data. See Appendix D for the criteria used to determine the risk rating of each asset.

This is a high-level model developed by Township staff and it should be reviewed and adjusted to reflect an evolving understanding of both the probability and consequences of asset failure.

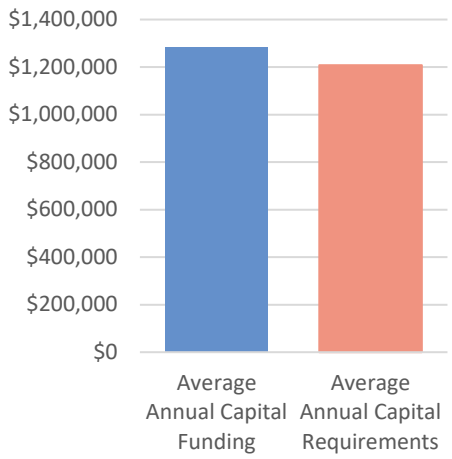
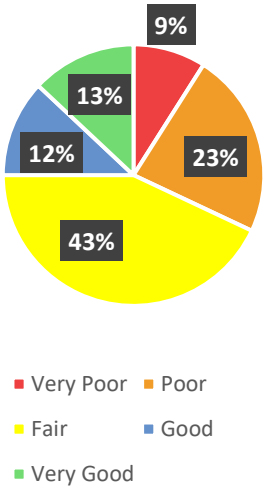
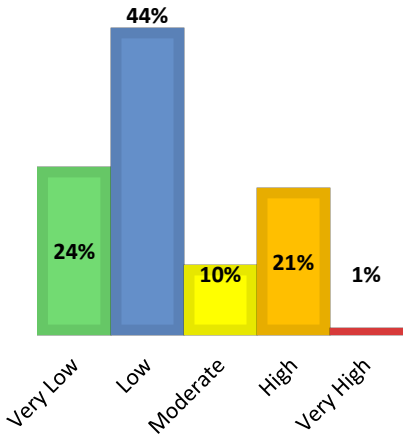
The asset-specific attributes that municipal staff utilize to define and prioritize the criticality of the road network are documented below:

Probability of Failure (POF)	Consequence of Failure (COF)
Condition (Structural)	Replacement Cost (Economic)
Service Life Remaining (Functional)	Surface Type (Operational)

The identification of critical assets allows the Township to determine appropriate risk mitigation strategies and treatment options. Risk mitigation may include asset-specific lifecycle strategies, condition assessment strategies, or simply the need to collect better asset data.

4.6 Levels of Service

The following tables identify the Township's current level of service for the roads.

Cost	Performance (Average Condition)	Risk
		

These metrics include the technical and community level of service metrics that are required as part of O. Reg. 588/17 as well as any additional performance measures that the Township has selected.

4.6.1 Community Levels of Service

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

Service Attribute	Qualitative Description	Current LOS
Scope	Description, which may include maps, of the road network in the municipality and its level of connectivity	See Appendix C
Quality	Description or images that illustrate the different levels of road class pavement condition	The surface condition with a rating as follows: 0 – 20 Very Poor 20 – 40 Poor 40 – 60 Fair 60 – 80 Good 80 – 100 Very Good

Service Attribute	Qualitative Description	Current LOS
Reliability	Roads are almost always available for use	Documented road closures and durations
Responsiveness	Roads meet regulatory requirements	YES

4.6.2 Technical Levels of Service

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

Service Attribute	Technical Metric	Current LOS
Scope	Lane-km of arterial roads (MMS classes 1 and 2) per land area (km/km^2)	0
	Lane-km of collector roads (MMS classes 3 and 4) per land area (km/km^2)	0.56
	Lane-km of local roads (MMS classes 5 and 6) per land area (km/km^2)	0.93
Quality	Average pavement condition index for paved roads in the municipality	Asphalt = 73 Tar & Chip = 60
	Average surface condition for unpaved roads in the municipality (e.g. excellent, good, fair, poor)	Fair
Reliability	# of unplanned road closures	0
Responsiveness	Percentage of identified compliance issues with Ontario Regulation 239/02: Minimum Maintenance Standards for Municipal Highways that are resolved within the specified timeframe.	100%

4.7 Recommendations

Asset Inventory

- Review road culverts and sidewalk inventory to determine whether all municipal assets within these asset segments have been accounted for.
- The sidewalk inventory includes several pooled assets that should be broken into discrete segments to allow for detailed planning and analysis.

Risk Management Strategies

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

Levels of Service

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

5 Bridges & Culverts

5.1 Key Insights

Bridges and culverts represent a critical portion of the transportation services provided to the community. The roads department is responsible for the maintenance of all bridges and culverts located across municipal roads. The state of the infrastructure for bridges and culverts is summarized in the following table.

Replacement Cost	Condition	Financial Capacity	
$7,329,427	Good (71%)	Annual Requirement:	$146,589
		Funding Available:	$100,000
		Annual Deficit:	$46,589

The following level of service statements are a key driving force behind the Township's asset management planning:

Service Attribute	Level of Service Statement
Performance	The bridges and culverts are in good condition with minimal unplanned service interruptions and closures.

5.2 Asset Inventory & Costs

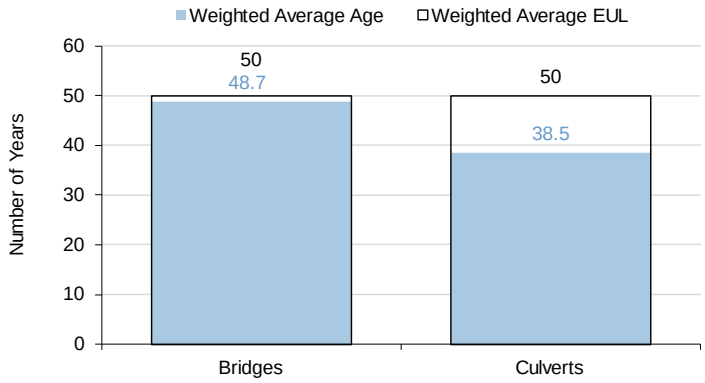
The table below includes the quantity, total replacement cost and annual capital requirements of each asset segment in the Township's bridges and culverts inventory.

Asset Segment	Quantity	Replacement Cost	Annual Capital Requirement
Bridges	57m	$3,716,194	$74,324
Culverts	324m	$3,613,233	$72,265
Total		**$7,329,427**	**$146,589**

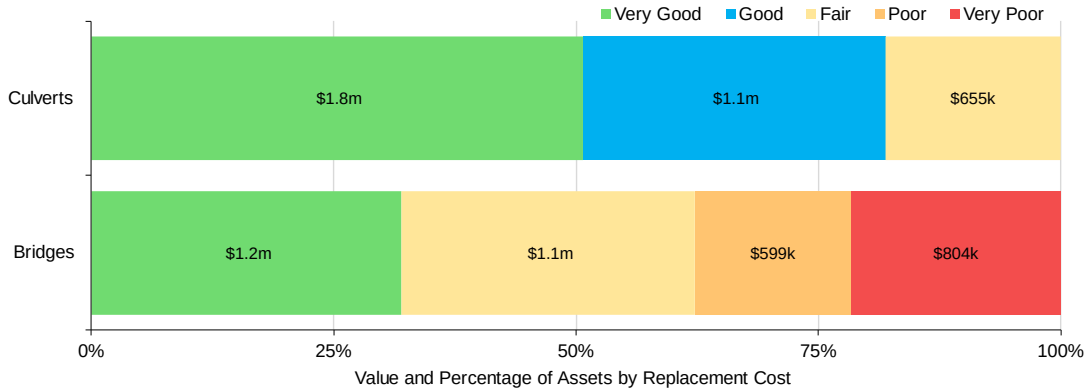
Each asset's replacement cost should be reviewed periodically to determine whether adjustments are needed to more accurate represent realistic capital requirements.

5.3 Asset Condition & Age

The graph below identifies the average age and the estimated useful life for each asset segment. The values are weighted value based on replacement cost.



The graph below visually illustrates the average condition for each asset segment on a very good to very poor scale.



To ensure that the Township's Bridges & Culverts continue to provide an acceptable level of service, the staff should monitor the average condition of all assets. If the average condition declines, the Township 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 and culverts.

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

5.3.1 Current Approach to Condition Assessment

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

- Condition assessments of all bridges and culverts with a span greater than or equal to 3 meters are completed every 2 years in accordance with the Ontario Structure Inspection Manual (OSIM)
- Culverts with a diameter / span of 1 meter to less than 3 meters are inspected every 5 years by internal staff

5.4 Lifecycle Management Strategy

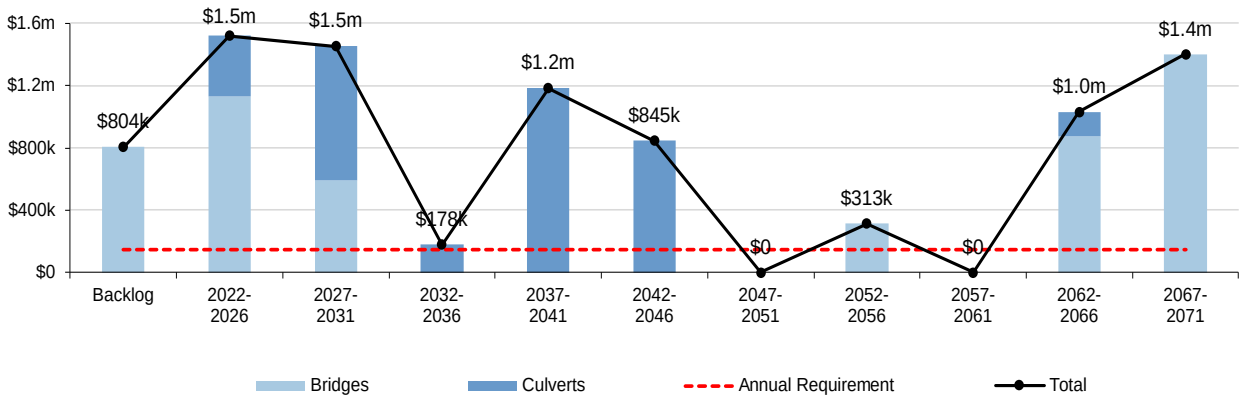
The condition or performance of most assets will deteriorate over time. To ensure that municipal assets are performing as expected and meeting the needs of customers, it is important to establish a lifecycle management strategy to proactively manage asset deterioration.

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

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

5.4.1 Forecasted Capital Requirements

The following graph forecasts long-term capital requirements. The annual capital requirement represents the average amount per year that the Township should allocate towards funding rehabilitation and replacement needs. The following graph identifies capital requirements over the next 50 years. This projection is used as it ensures that every asset has gone through one full iteration of replacement. The forecasted requirements are aggregated into 5-year bins and the trend line represents the average annual capital requirements. For Bridges and culverts the average annual capital requirement is $146,589.



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

5.5 Risk & Criticality

The risk matrix provides a visual representation of the relationship between the probability of failure and the consequence of failure for the assets within this asset category based on 2022 inventory data. See Appendix D for the criteria used to determine the risk rating of each asset.

This is a high-level model developed by Township staff should review and adjust the risk model to reflect an evolving understanding of both the probability and consequences of asset failure.

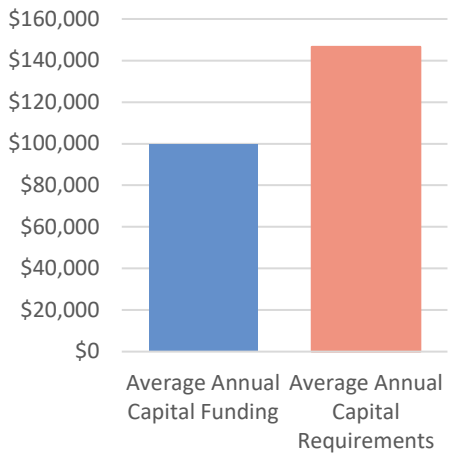
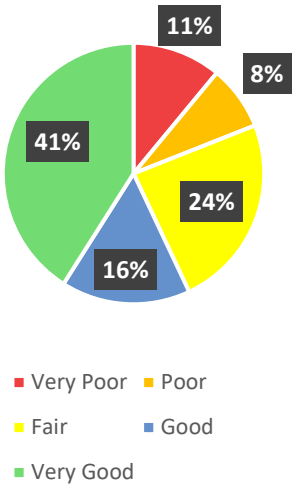
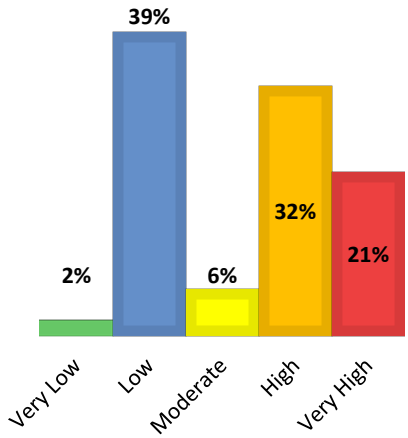
The asset-specific attributes that municipal staff utilize to define and prioritize the criticality of bridges and culverts are documented below:

Probability of Failure (POF)	Consequence of Failure (COF)
Condition	Replacement Cost (60% Economic)
Service Life Remaining	Span / Diameter (20%Operational)
	AADT (20% Social 50%)
	Detour Distance (20% Social 50%)

The identification of critical assets allows the Township to determine risk mitigation strategies and treatment options. Risk mitigation may include asset-specific lifecycle strategies, condition assessment strategies, or simply the need to collect better asset data.

5.6 Levels of Service

The following tables identify the Township's current level of service for bridges and culverts.

Cost	Performance (Average Condition)	Risk
		

The metrics included below are the technical and community level of service metrics that are required as part of O. Reg. 588/17 as well as any additional performance measures that the Township has selected.

5.6.1 Community Levels of Service

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

Service Attribute	Qualitative Description	Current LOS
Scope	Description of the traffic that is supported by municipal bridges (e.g. heavy transport vehicles, motor vehicles, emergency vehicles, pedestrians, cyclists)	Bridges and structural culverts are a key component of the municipal transportation network.
Quality	Description or images of the condition of bridges and culverts and how this would affect use of the bridges and culverts	See Appendix C

5.6.2 Technical Levels of Service

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

Service Attribute	Technical Metric	Current LOS
Scope	% of bridges in the Town with loading or dimensional restrictions	0
Quality	Average bridge condition index value for bridges	67
	Average bridge condition index value for structural culverts	75
Performance	# of unplanned bridge closures	0
	% of bridges inspected within the last two years	100

5.7 Recommendations

Risk Management Strategies

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

Lifecycle Management Strategies

- The Township should work towards identifying projected capital rehabilitation and renewal costs for bridges and culverts and integrating these costs into long-term planning.

Levels of Service

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

6 Buildings

6.1 Key Insights

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

- administrative offices
- fire stations
- public works garages and storage sheds
- medical centre
- a strip mall
- a community complex

The state of the infrastructure for the buildings and facilities is summarized in the following table.

Replacement Cost	Condition	Financial Capacity	
$7,013,262	Good (77%)	Annual Requirement:	$147,138
		Funding Available:	$260,000
		Annual Deficit:	($112,862)

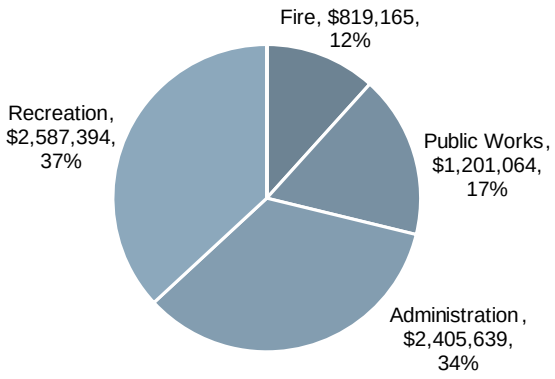
The following core values and level of service statements are a key driving force behind the Township's asset management planning:

Service Attribute	Level of Service Statement
Performance	To provide safe, clean buildings with an accessible user experience in good condition.

6.2 Asset Inventory & Costs

The table below includes the quantity, total replacement cost and annual capital requirements of each asset segment in the Township's buildings inventory.

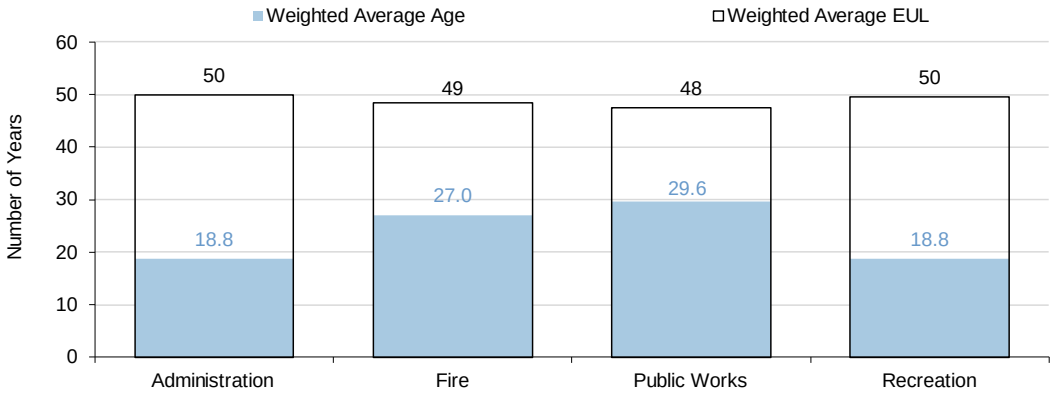
Asset Segment	Quantity	Replacement Cost	Annual Capital Requirement
Admin	5	$2,405,639	$48,113
Fire	5	$819,165	$19,410
Public Works	6	$1,201,064	$26,501
Recreation	15	$2,587,394	$53,114
Total		**$7,013,262**	**$147,138**



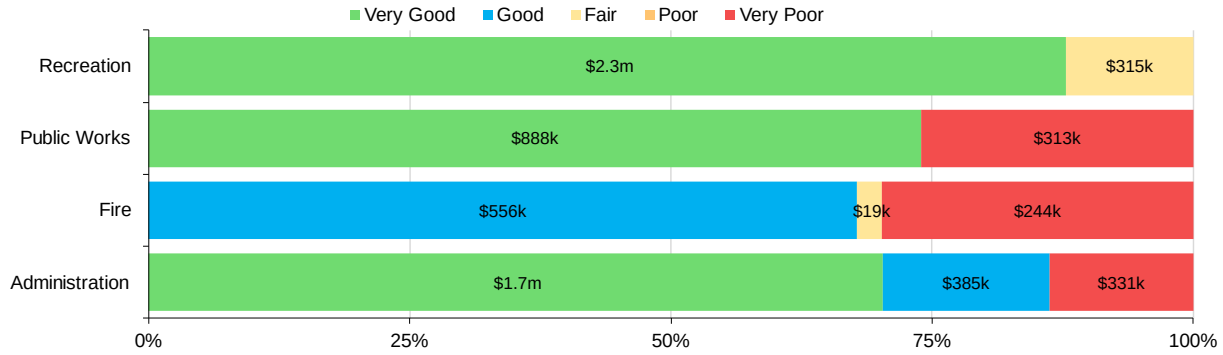
Each asset's replacement cost should be reviewed periodically to determine whether adjustments are needed to more accurate represent realistic capital requirements.

6.3 Asset Condition & Age

The graph below identifies the average age, and the estimated useful life for each asset segment. The values are weighted based on replacement cost.



The graph below visually illustrates the average condition for each asset segment on a very good to very poor.



To ensure that the Township's buildings 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 buildings.

Each asset's estimated useful life should also be reviewed to determine whether adjustments need to be made to better align with the observed service life.

6.3.1 Current Approach to Condition Assessment

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

- Monthly inspections are performed by staff using a condition label of good, fair and poor

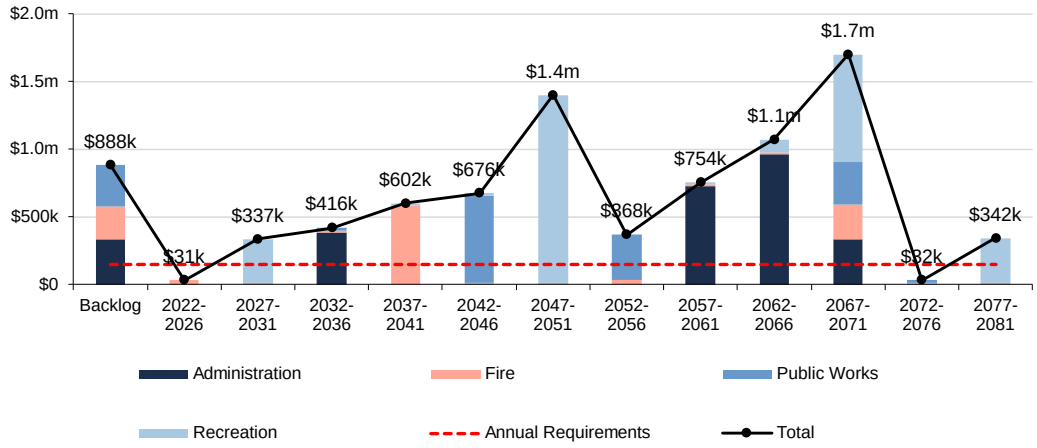
6.4 Lifecycle Management Strategy

To ensure that municipal assets are performing as expected and meeting the needs of customers, it is important to establish a lifecycle management strategy to proactively manage asset deterioration. Increasing the asset inventory over time to provide better details for alignment with lifecycle needs of typical building systems. The following table outlines the Township's current lifecycle management strategy.

Activity Type	Description of Current Strategy
Maintenance / Rehabilitation	Municipal buildings are subject to regular inspections to identify needs
	Maintenance of buildings is dealt with on a case-by-case basis
Replacement	Assessments will be completed strategically as buildings approach their end-of-life to determine whether replacement or rehabilitation is appropriate

6.4.1 Forecasted Capital Requirements

The annual capital requirement represents the average amount per year that the Township should allocate towards funding rehabilitation and replacement needs. The following graph identifies capital requirements over the next 60 years. This projection is used as it ensures that every asset has gone through one full iteration of replacement. The forecasted requirements are aggregated into 5-year bins and the trend line represents the average capital requirements at $147,138.



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

6.5 Risk & Criticality

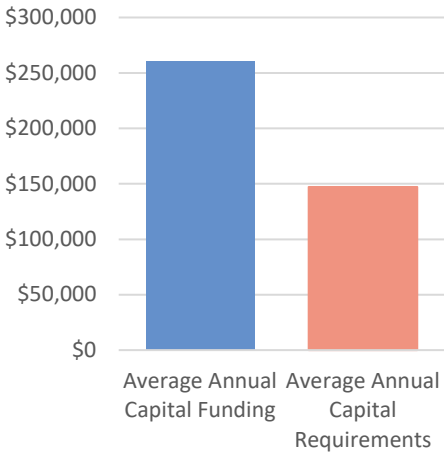
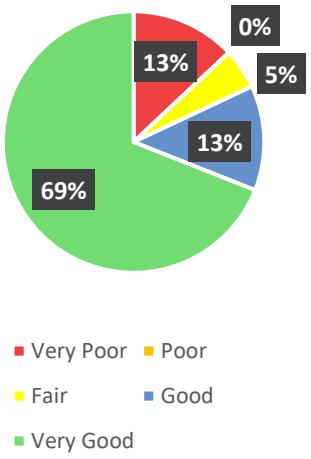
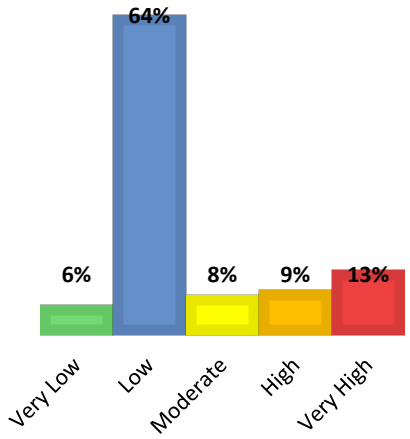
The risk matrix provides a visual representation of the relationship between the probability of failure and the consequence of failure for the assets within this asset category based on 2022 inventory data. See Appendix D for the criteria used to determine the risk rating of each asset.

This is a high-level model developed by Township staff and should be reviewed and adjusted to reflect an evolving understanding of both the probability and consequences of asset failure.

The identification of critical assets allows the Township to determine risk mitigation strategies and treatment options. Risk mitigation may include asset-specific lifecycle strategies, condition assessment strategies, or simply the need to collect better asset data.

6.6 Levels of Service

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

Cost	Performance (Average Condition)	Risk
		

Buildings are considered a non-core asset category as such, the Township has until July 1, 2024, to determine the community levels of service and technical metrics that measure the current level of service provided, the regulation does not specify what they need to be. To meet the July 1, 2024 requirements the Township has outlined the community and technical levels of service that will be measured in the following sections.

6.6.1 Community Levels of Service

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

Service Attribute	Qualitative Description	Current LOS (2021)
Scope	Description, which may include maps, of the types of facilities that the municipality operates and maintains	See Appendix C

6.6.2 Technical Levels of Service

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

Service Attribute	Technical Metric	Current LOS (2021)
Scope	Square metres of indoor recreation facilities per 1,000 households	0.05
Quality	Average facility condition index value for facilities in the municipality	Good
Performance	% of buildings and facilities inspected per year	95

6.7 Recommendations

Asset Inventory

- The Township's asset inventory contains a high-level breakdown of building components. Staff should work towards a more detailed component-based inventory of all buildings to allow for component-based lifecycle planning and inventory consistency.

Replacement Costs

- Gather accurate replacement costs and update on a regular basis to ensure the accuracy of capital projections.

Risk Management Strategies

- Implement risk-based decision-making as part of asset management planning and budgeting processes. This should include the regular review of high-risk assets to determine appropriate risk mitigation strategies.

Levels of Service

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

7 Land Improvements

7.1 Key Insights

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

- Parking lots
- Sports fields
- Fencing
- Multi-activity pad

The state of the infrastructure for the land improvements is summarized in the following table.

Replacement Cost	Condition	Financial Capacity	
$353,727	Fair (48%)	Annual Requirement:	$27,467
		Funding Available:	$158,142
		Annual Deficit:	($130,675)

The following level of service statements are a key driving force behind the Township's asset management planning:

Service Attribute	Level of Service Statement
Scope	The land improvements meet safety and accessibility standards
Quality	The land improvements are in good condition

7.2 Asset Inventory & Costs

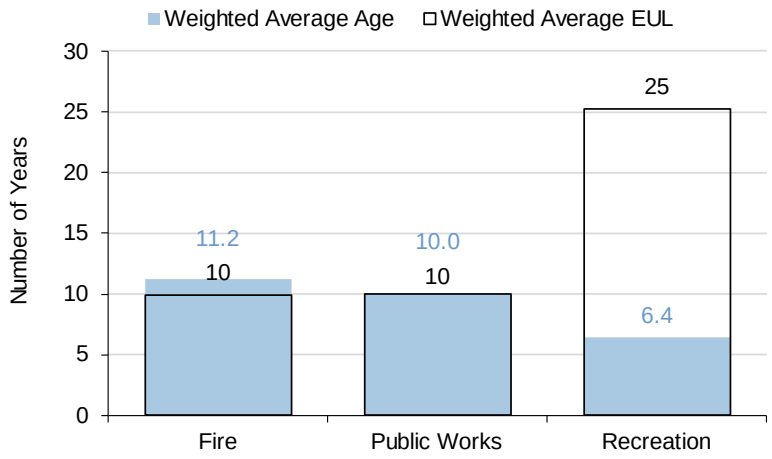
The table below includes the quantity, total replacement cost and annual capital requirements of each asset segment in the Township's land improvement inventory.

Asset Segment	Quantity	Replacement Cost	Annual Capital Requirement
Fire	3	$76,267	$7,912
Public Works	1	$8,601	$860
Recreation	8	$268,859	$18,696
		$353,727	**$27,467**

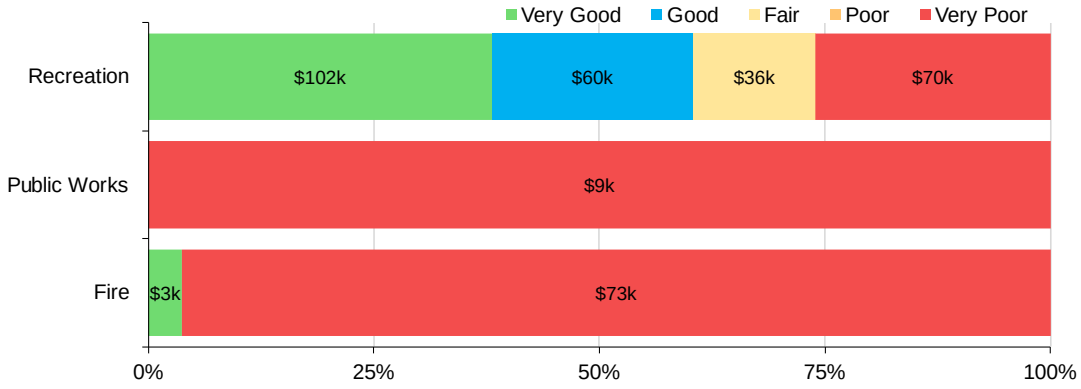
Each asset's replacement cost should be reviewed periodically to determine whether adjustments are needed to more accurate represent realistic capital requirements.

7.3 Asset Condition & Age

The graph below identifies the average age, and the estimated useful life for each asset segment. The values are weighted based on replacement cost.



The graph below visually illustrates the average condition for each asset segment on a very good to very poor.



To ensure that the Township's land improvements 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.

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

7.3.1 Current Approach to Condition Assessment

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

- Regular maintenance and checks performed by internal staff

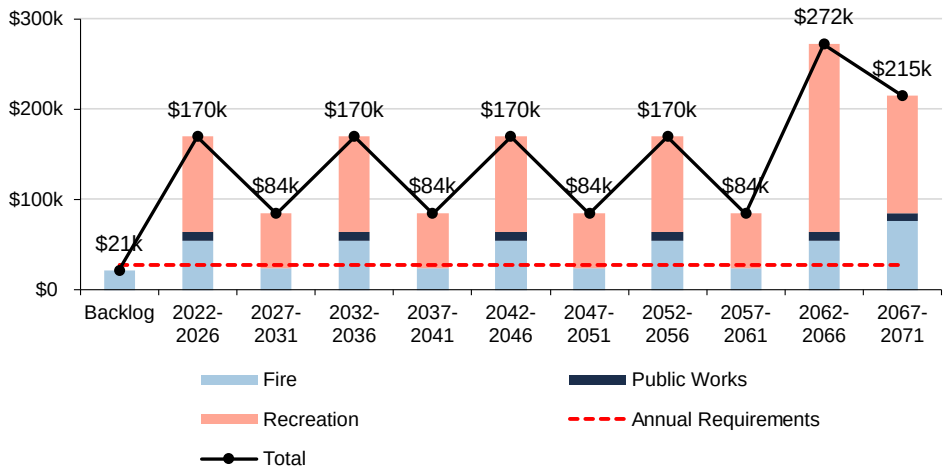
7.4 Lifecycle Management Strategy

To ensure that Township assets are performing as expected and meeting the needs of residents, it is important to establish a lifecycle management strategy to proactively manage asset deterioration. The following table outlines the Township's current lifecycle management strategy.

Activity Type	Description of Current Strategy
Maintenance, Rehabilitation & Replacement	Assessments are completed regularly to determine maintenance work required

7.4.1 Forecasted Capital Requirements

The annual capital requirement represents the average amount per year that the Township should allocate towards funding rehabilitation and replacement needs. The following graph identifies capital requirements over the next 5 years. This projection is used as it ensures that every asset has gone through one full iteration of replacement. The forecasted requirements are aggregated into 5-year bins and the trend line represents the average annual capital requirements which are $229,480.



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

7.5 Risk & Criticality

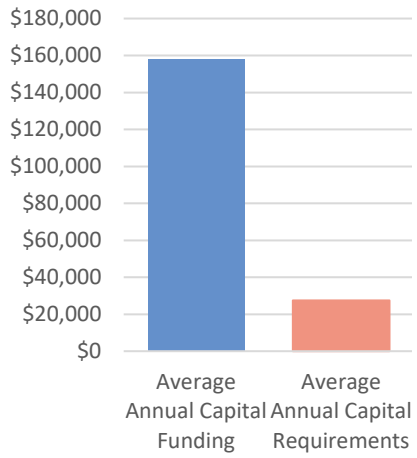
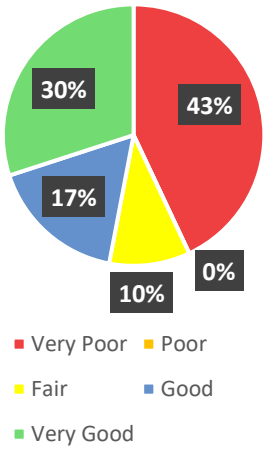
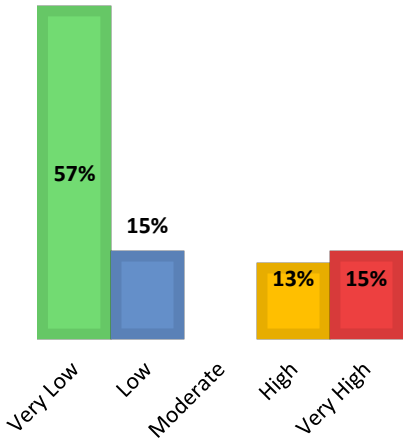
The risk matrix provides a visual representation of the relationship between the probability of failure and the consequence of failure for the assets within this asset category based on 2022 inventory data. See Appendix D for the criteria used to determine the risk rating of each asset.

This is a high-level model developed by Township staff and should be reviewed and adjusted to reflect an evolving understanding of both the probability and consequences of asset failure.

The identification of critical assets allows the Township to determine risk mitigation strategies and treatment options. Risk mitigation may include asset-specific lifecycle strategies, condition assessment strategies, or simply the need to collect better asset data.

7.6 Levels of Service

The table below outlines high-level service indicators for Land Improvements.

Cost	Performance (Average Condition)	Risk
		

Land Improvements are considered a non-core asset category. As such, the Township has until July 1, 2024, to determine the qualitative descriptions and technical metrics that measure the current level of service provided. To meet the July 1, 2024, requirements the Township has outlined the community and technical levels of service that will be measured in the following sections.

7.6.1 Community Levels of Service

The following table outlines the qualitative descriptions that determine the community levels of service provided by land improvement assets in the Township.

Service Attribute	Qualitative Description	Current LOS (2021)
Scope	Description, which may include maps, of the outdoor recreational facilities that the municipality operates and maintains	See Appendix C

7.6.2 Technical Levels of Service

The following table outlines the quantitative metrics that determine the technical level of service provided by machinery and equipment in the municipality.

Service Attribute	Technical Metric	Current LOS (2021)
Scope	Square metres of outdoor recreation facility space per 1,000 households	300
Quality	Average condition of outdoor recreational facilities in the municipality (e.g. very good, good, fair, poor, very poor)	Good
Performance	Parkland in Municipality as percentage of total area of Municipality	0.1%

7.7 Recommendations

Replacement Costs

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

Risk Management Strategies

- Implement risk-based decision-making as part of asset management planning and budgeting processes. This should include the regular review of high-risk assets to determine appropriate risk mitigation strategies.

Levels of Service

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

8 Vehicles

8.1 Key Insights

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

- tandem axle trucks for winter control activities
- fire rescue vehicles to provide emergency services
- pick-up trucks to support the maintenance of all departments

The state of the infrastructure for the vehicles is summarized in the following table.

Replacement Cost	Condition	Financial Capacity	
$5,893,394	Fair (46%)	Annual Requirement:	$450,050
		Funding Available:	$340,000
		Annual Deficit:	$110,050

The following level of service statements are a key driving force behind the Township's asset management planning:

Service Attribute	Level of Service Statement
Quality	The vehicles are in fair condition with minimal unplanned service interruptions

8.2 Asset Inventory & Costs

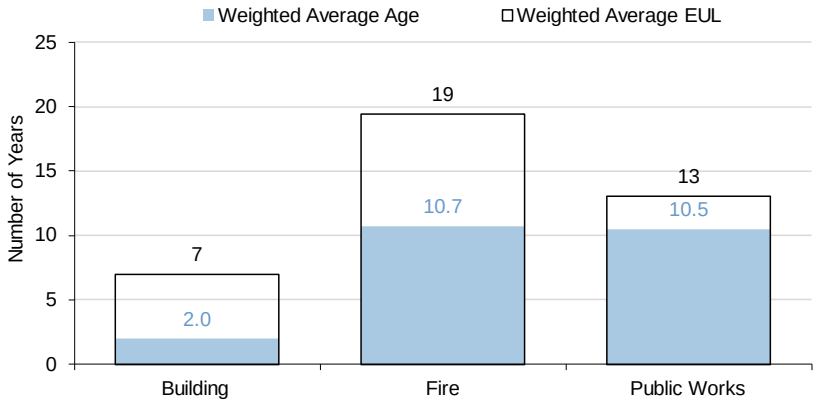
The table below includes the quantity, total replacement cost and annual capital requirements of each asset segment in the Township's vehicle inventory.

Asset Segment	Quantity	Replacement Cost	Annual Capital Requirement
Buildings	1	$40,278	$5,754
Fire	7	$1,916,906	$102,347
Public Works	35	$3,936,210	$341,949
Total		**$5,893,394**	**$450,050**

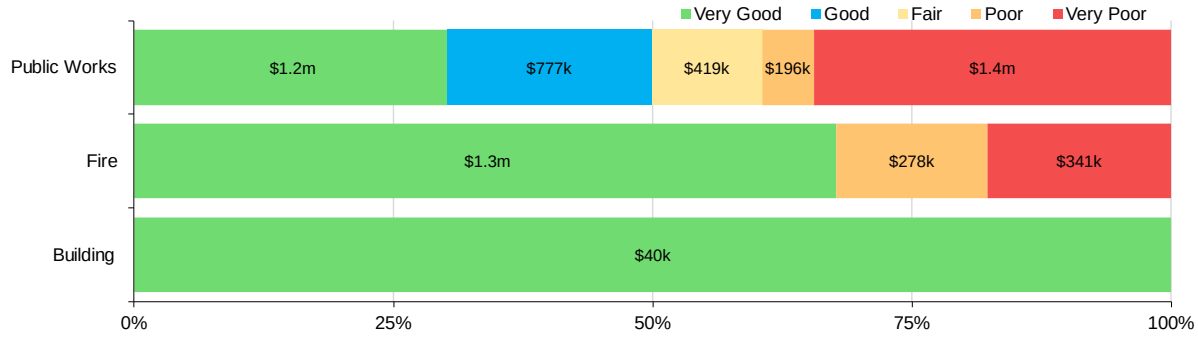
Each asset's replacement cost should be reviewed periodically to determine whether adjustments are needed to more accurate represent realistic capital requirements.

8.3 Asset Condition & Age

The graph below identifies the average age and the estimated useful life for each asset segment. The values are weighted based on replacement cost.



The graph below visually illustrates the average condition for each asset segment on a very good to very poor scale.



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

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

8.3.1 Current Approach to Condition Assessment

Accurate and reliable condition data allows staff to determine the remaining service life of assets and identify the most cost-effective approach to managing assets. The Township's current approach is staff complete daily pre-use visual inspections of vehicles to ensure they are in state of adequate repair prior to operation. CVOR vehicles are all inspected annual as per MTO requirements.

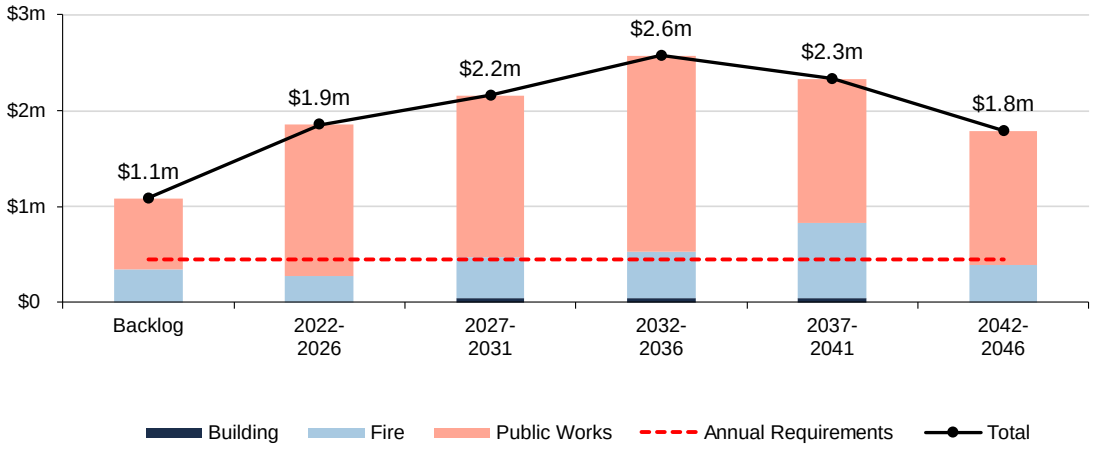
8.4 Lifecycle Management Strategy

The condition or performance of assets will deteriorate over time, to ensure vehicles are performing as expected, it is important to establish a lifecycle management strategy to proactively manage asset deterioration. The following table outlines the Township's current lifecycle management strategy.

Activity Type	Description of Current Strategy
Maintenance / Rehabilitation	Visual inspections completed and documented daily
	Every 4-7000km includes an inspection and oil changed
Replacement	Vehicle replacements are based on age, usage and annual repair costs are all considered when determining appropriate treatment options

8.4.1 Forecasted Capital Requirements

The annual capital requirement represents the average amount per year that the Township should allocate towards funding rehabilitation and replacement needs. The following graph identifies capital requirements over the next 20 years. This projection is used as it ensures that every asset has gone through one full iteration of replacement. The forecasted requirements are aggregated into 5-year bins and the trend line represents the average annual capital requirements at $450,050.



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

8.5 Risk & Criticality

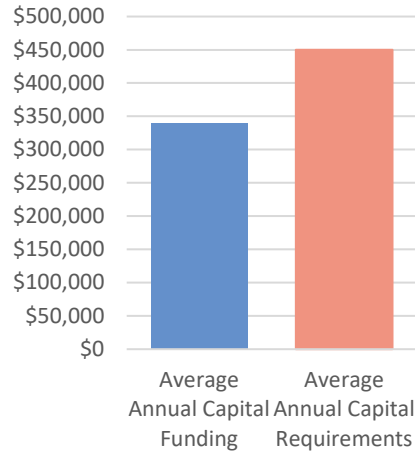
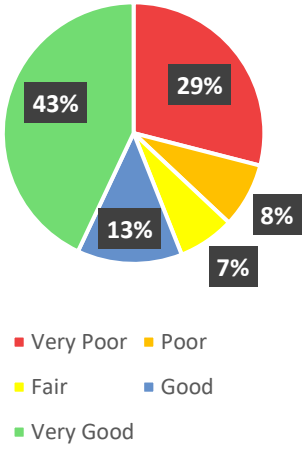
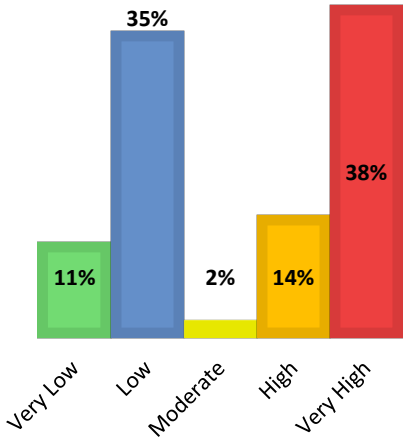
The risk matrix provides a visual representation of the relationship between the probability of failure and the consequence of failure for the assets within this asset category based on 2022 inventory data. See Appendix D for the criteria used to determine the risk rating of each asset.

This is a high-level model developed by the Township staff and should be reviewed and adjusted to reflect an evolving understanding of both the probability and consequences of asset failure.

The identification of critical assets allows the Township to determine appropriate risk mitigation strategies and treatment options. Risk mitigation may include asset-specific lifecycle strategies, condition assessment strategies, or simply the need to collect better asset data.

8.6 Levels of Service

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

Cost	Performance (Average Condition)	Risk
		

Vehicles are considered a non-core asset category. As such, the Township has until July 1, 2024, to determine the qualitative descriptions and technical metrics that measure the current level of service provided. To meet the July 1, 2024, requirements the Township has outlined the community and technical levels of service that will be measured in the following sections.

8.6.1 Community Levels of Service

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

Service Attribute	Qualitative Description	Current LOS (2021)
Scope	Description or images of the types of vehicles (e.g. light, medium and heavy-duty) that the municipality operates and the services that they help to provide to the community	See Appendix C

8.6.2 Technical Levels of Service

The following table outlines the quantitative metrics that determine the technical level of service provided by machinery and equipment in the municipality.

Service Attribute	Technical Metric	Current LOS (2021)
Scope	# of light duty vehicles per 1,000 households	0.011
	# of heavy duty vehicles per 1,000 households	0.016
Quality	Average condition of vehicles (e.g. very good, good, fair, poor, very poor)	Good
Performance	% of regulated MTO maintenance inspections complete	100

8.7 Recommendations

Replacement Costs

- Gather accurate replacement costs and update on a regular basis to ensure the accuracy of capital projections.

Condition Assessment Strategies

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

Risk Management Strategies

- Implement risk-based decision-making as part of asset management planning and budgeting processes. This should include the regular review of high-risk assets to determine appropriate risk mitigation strategies.

Levels of Service

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

9 Machinery & Equipment

9.1 Key Insights

To maintain the quality stewardship of Southwold's infrastructure and support the delivery of services, Township staff own and employ various types of machinery and equipment. This includes:

- Computer hardware, software, and phone systems to support all Township services
- Landscaping equipment to maintain public parks
- Fire equipment to support the delivery of emergency services
- Public Works equipment to support transportation services
- Equipment and furniture to enable the provision of recreational services

The state of the infrastructure for the machinery and equipment is summarized in the following table.

Replacement Cost	Condition	Financial Capacity	
$2,430,527	Fair (57%)	Annual Requirement:	$236,841
		Funding Available:	$75,000
		Annual Deficit:	$77,550

The following level of service statements are a key driving force behind the Township's asset management planning:

Service Attribute	Level of Service Statement
Scope	The machinery and equipment service provides suitable material for staff to perform their duties effectively
Quality	The machinery and equipment are in good condition with minimal unplanned service interruptions.

9.2 Asset Inventory & Costs

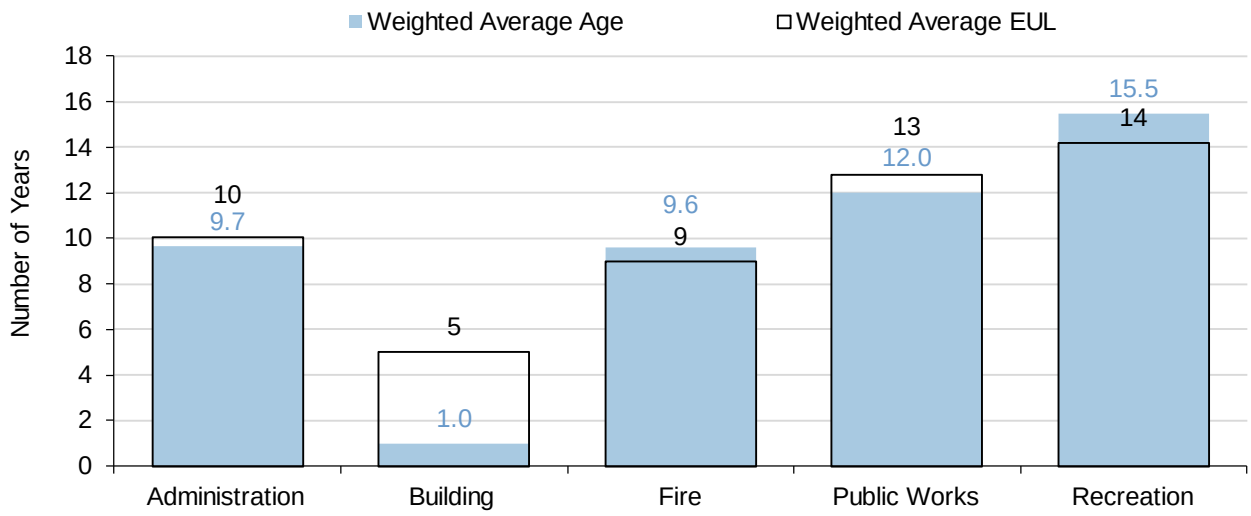
The table below includes the quantity, total replacement cost and annual capital requirements of each asset segment in the Township's machinery and equipment inventory.

Asset Segment	Quantity	Replacement Cost	Annual Capital Requirement
Administration	29	$170,058	$23,542
Building	1	$4,260	$852
Fire	319	$787,111	$97,394
Public Works	55	$342,460	$29,540
Recreation	5,927	$1,126,638	$85,514
Total		**$2,430,527**	**$236,841**

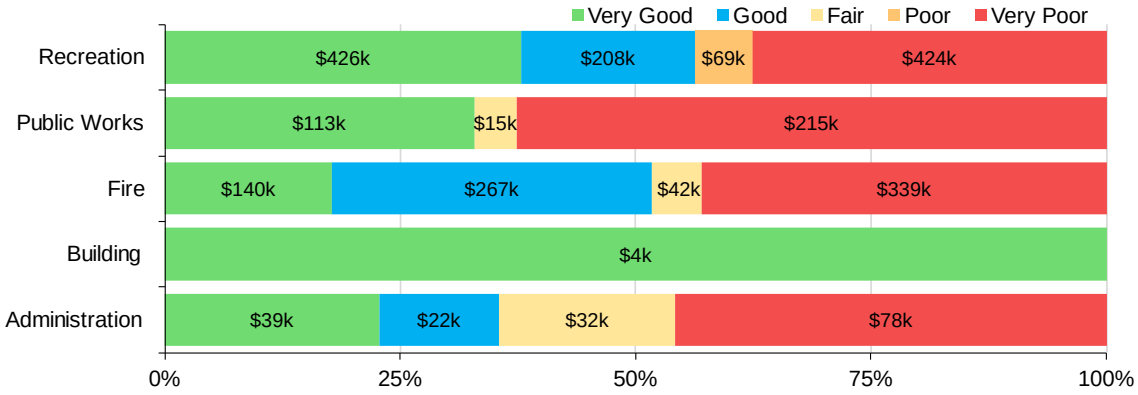
Each asset's replacement cost should be reviewed periodically to determine whether adjustments are needed to more accurate represent realistic capital requirements.

9.3 Asset Condition & Age

The graph below identifies the average age and the estimated useful life for each asset segment. The values are weighted based on replacement cost.



The graph below visually illustrates the average condition for each asset segment on a very good to very poor scale.



To ensure that the Township's machinery and equipment continues to provide an acceptable level of service, the Township should continue to monitor the average condition. 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.

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

9.3.1 Current Approach to Condition Assessment

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

- Staff complete regular visual inspections of machinery and equipment to ensure they are in state of adequate repair
- The broad range of types of equipment included in this category, there are some types with very established assessments (i.e. Fire Equipment) but also many don't have any assessment procedures

Th rating criteria used to determine the current condition and forecast future capital requirements is consistent throughout all asset categories with a scale of 0 - 100.

9.4 Lifecycle Management Strategy

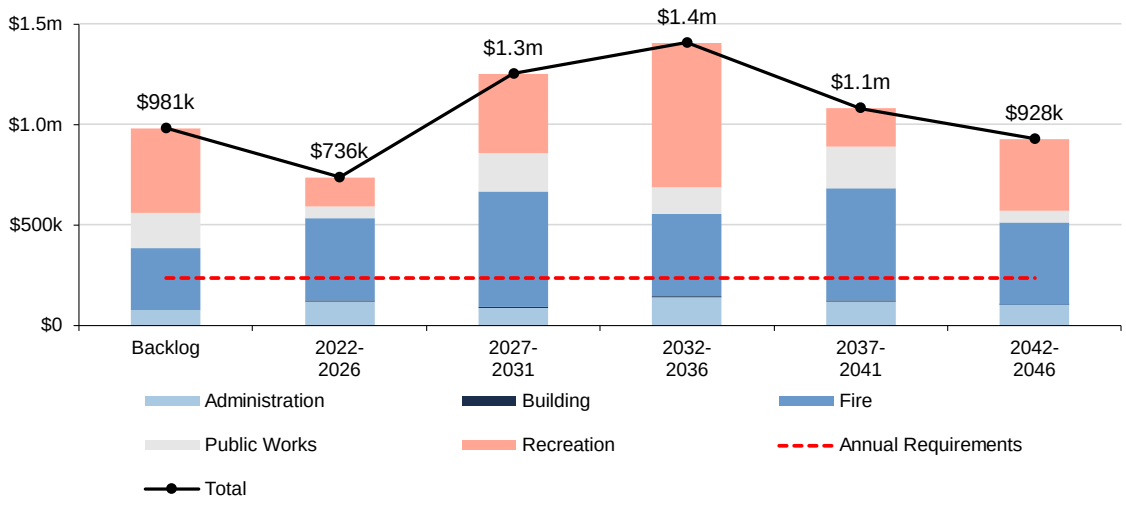
The condition or performance of most assets will deteriorate over time. To ensure that municipal assets are performing as expected and meeting the needs of customers, it is important to establish a lifecycle management strategy to proactively manage asset deterioration.

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

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

9.4.1 Forecasted Capital Requirements

The following graph identifies capital requirements over the next 30 years. This projection is used as it ensures that every asset has gone through one full iteration of replacement. The forecasted requirements are aggregated into 5-year bins and the trend line represents the average annual capital requirements at $128,550.



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

9.5 Risk & Criticality

The risk matrix provides a visual representation of the relationship between the probability of failure and the consequence of failure for the assets within this asset category based on 2022 inventory data. See Appendix D for the criteria used to determine the risk rating of each asset.

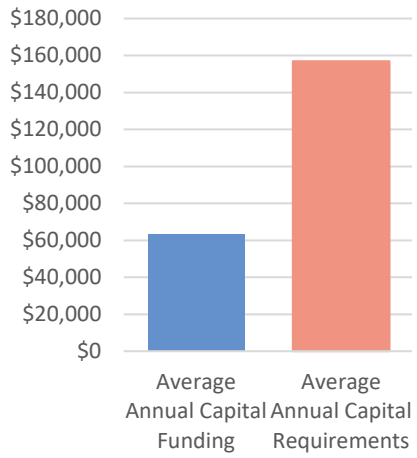
This is a high-level model developed by Township staff and should be reviewed and adjusted to reflect an evolving understanding of both the probability and consequences of asset failure.

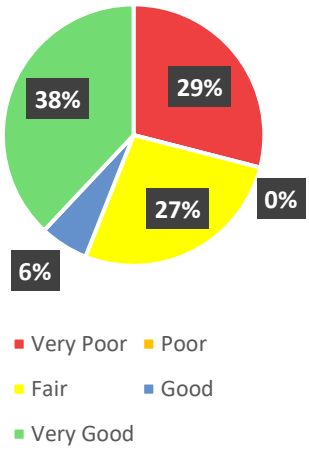
The identification of critical assets allows the Township to determine appropriate risk mitigation strategies and treatment options. Risk mitigation may include asset-specific lifecycle strategies, condition assessment strategies, or simply the need to collect better asset data.

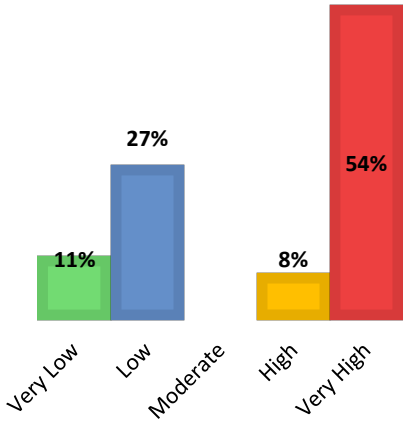
9.6 Levels of Service

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

Cost	Performance (Average Condition)	Risk







Equipment is considered a non-core asset category. As such, the Township has until July 1, 2024, to determine the qualitative descriptions and technical metrics that measure the current level of service provided. To meet the July 1, 2024 requirements the Township has outlined the community and technical levels of service that will be measured in the following sections.

9.6.1 Community Levels of Service

The following table outlines the qualitative description that determine the community levels of service provided by machinery and equipment in the Township.

Service Attribute	Qualitative Description	Current LOS (2021)
Scope	Description or images of the types of equipment that the municipality operates and the services that they help to provide to the community	See Appendix C

9.6.2 Technical Levels of Service

The following table outlines the quantitative metrics that determine the technical level of service provided by machinery and equipment in the municipality.

Service Attribute	Technical Metric	Current LOS (2021)
Quality	Average condition of equipment (e.g. very good, good, fair, poor, very poor)	Fair
Performance	# of FTEs supporting IT service requests	0.25

9.7 Recommendations

Replacement Costs

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

Condition Assessment Strategies

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

Risk Management Strategies

- Implement risk-based decision-making as part of asset management planning and budgeting processes. This should include the regular review of high-risk assets to determine appropriate risk mitigation strategies.

Levels of Service

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

10 Water Network

10.1 Key Insights

The water services provided by the Township are overseen by the Ontario Clean Water Agency (OCWA). The public works department works with OCWA to ensure the responsible management for the following:

- Water Treatment Plant
- Distribution System

The state of the infrastructure for the water network is summarized in the following table:

Replacement Cost	Condition	Financial Capacity	
$46,962,608	Very Good (96%)	Annual Requirement:	$645,773
		Funding Available:	$614,715
		Annual Deficit:	$31,058

The following level of service statements are a key driving force behind the Township's asset management planning:

Service Attribute	Level of Service Statement
Scope	Municipal water is accessible to the community in sufficient capacity (does not exceed maximum use.
Quality	The water network is in good condition with minimal unplanned service interruptions due to main breaks and boil water advisories.

10.2 Asset Inventory & Costs

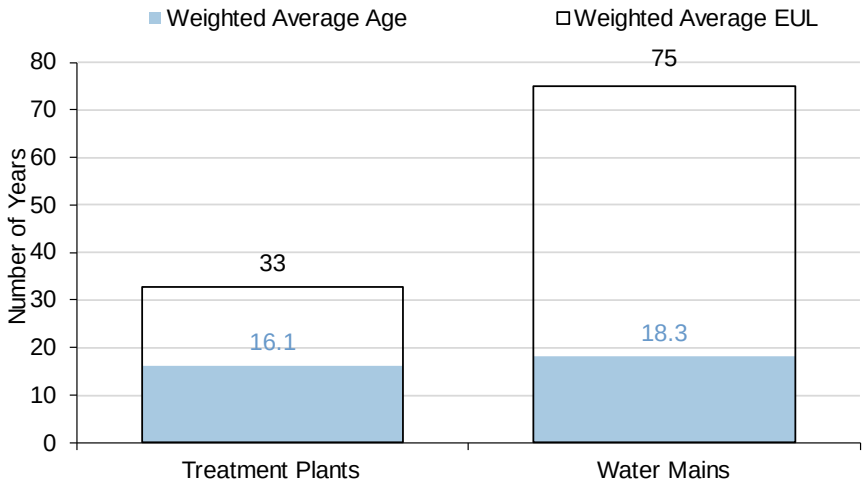
The table below includes the quantity, replacement cost method, and annual capital requirements of each asset segment in the Township's water network inventory.

Asset Segment	Quantity	Replacement Cost	Annual Requirement
Treatment Plants	1	$487,134	$26,100
Water Mains	246.8km	$46,475,474	$619,673
Total		**$46,962,608**	**$645,773**

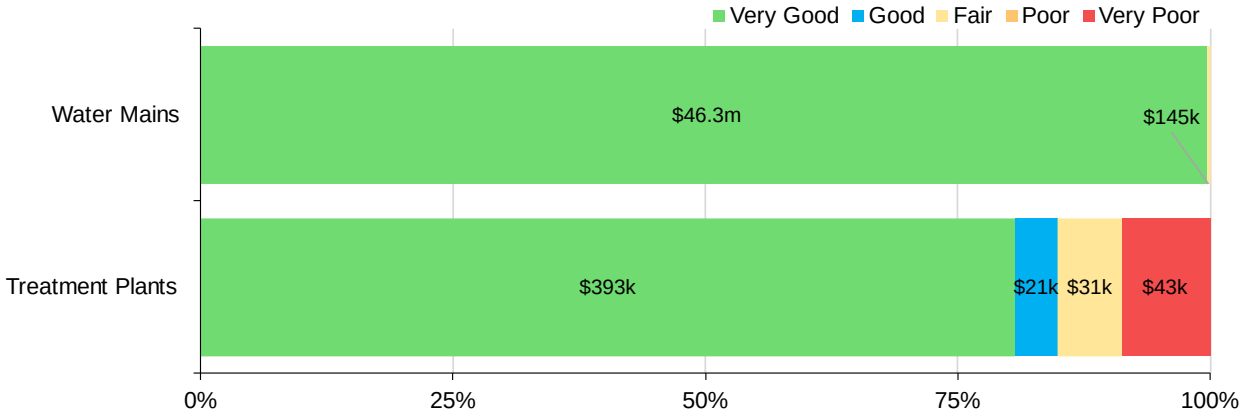
Each asset's replacement cost should be reviewed periodically to determine whether adjustments are needed to more accurate represent realistic capital requirements.

10.3 Asset Condition & Age

The graph below identifies the average age, and the estimated useful life for each asset segment. The values are weighted based on replacement cost.



The graph below visually illustrates the average condition for each asset segment on a very good to very poor scale.



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 the lifecycle management strategy to determine what combination of activities is required to increase the overall condition of the water network.

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

10.3.1 Current Approach to Condition Assessment

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

- For watermains staff rely on the age, material, and break history to estimate the condition of water mains
- A leak detection program is also under review

The following rating criteria is used to determine the current condition of water network assets and forecast future capital requirements:

Condition	Rating
Very Good	80-100
Good	60-80
Fair	40-60
Poor	20-40
Very Poor	0-20

10.4 Lifecycle Management Strategy

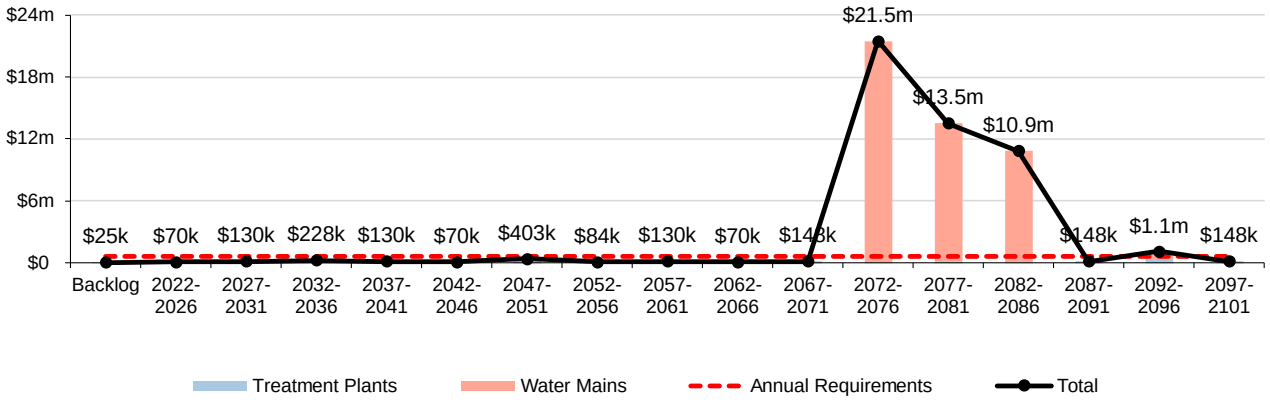
The condition or performance of most assets will deteriorate over time. To ensure that municipal assets are performing as expected and meeting the needs of customers, it is important to establish a lifecycle management strategy to proactively manage asset deterioration. The following table outlines the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

Activity Type	Description of Current Strategy
Maintenance	Main flushing is completed on the network
Replacement	Replacement activities are identified based on an analysis of the main break rate as well as any issues identified during regular maintenance activities

10.4.1 Forecasted Capital Requirements

The following graph forecasts long-term capital requirements. The annual capital requirement represents the average amount per year that the Township should allocate towards funding rehabilitation and replacement needs. The following graph identifies capital requirements over the next 90 years. This projection is used as it ensures that every asset has gone through one full iteration of replacement. The

forecasted requirements are aggregated into 5-year bins and the trend line represents the average annual capital requirements at $645,773.



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

10.5 Risk & Criticality

The following risk matrix provides a visual representation of the relationship between the probability of failure and the consequence of failure for the assets within this asset category based on 2022 inventory data. See Appendix D for the criteria used to determine the risk rating of each asset.

This is a high-level model developed by Township staff and should be reviewed and adjusted to reflect an evolving understanding of both the probability and consequences of asset failure.

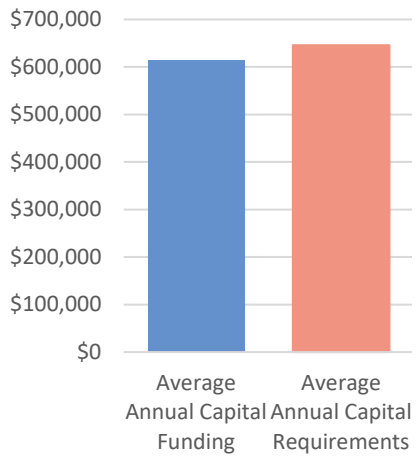
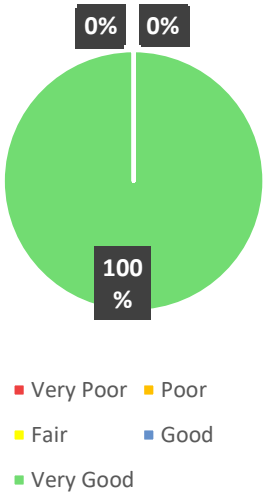
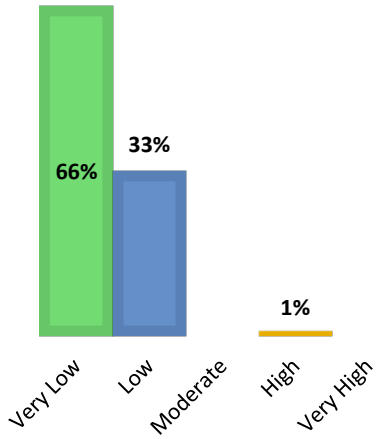
The asset-specific attributes that municipal staff utilize to define and prioritize the criticality of the water network are documented below:

Probability of Failure (POF)	Consequence of Failure (COF)
Condition (80% Structural 75%)	Replacement Cost (Economic 75%)
Historical Watermain Breaks (80% Structural 25%)	Diameter (Social 25%)
Service Life Remaining (20% Functional)	

The identification of critical assets allows the Township to determine appropriate risk mitigation strategies and treatment options. Risk mitigation may include asset-specific lifecycle strategies, condition assessment strategies, or simply the need to collect better asset data.

10.6 Levels of Service

The following tables identify the Township's current level of service for water network.

Cost	Performance (Average Condition)	Risk
		

These metrics include the technical and community level of service metrics that are required as part of O. Reg. 588/17 as well as any additional performance measures that the Township has selected.

10.6.1 Community Levels of Service

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

Service Attribute	Qualitative Description	Current LOS
Scope	Description, which may include maps, of the user groups or areas of the municipality that are connected to the municipal water system	See Appendix C
	Description, which may include maps, of the user groups or areas of the municipality that have fire flow	See Appendix C
Reliability	Description of boil water advisories and service interruptions	There is a log that details all events

10.6.2 Technical Levels of Service

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

Service Attribute	Technical Metric	Current LOS
Scope	% of properties connected to the municipal water system	87%
	% of properties where fire flow is available	87%
Reliability	# of connection-days per year where a boil water advisory notice is in place compared to the total number of properties connected to the municipal water system	0
	# of connection-days per year where water is not available due to water main breaks compared to the total number of properties connected to the municipal water system	0
Performance	Water loss %	20%
	Number of water main breaks / km of water main	0.00405

10.7 Recommendations

Asset Inventory

- The water main assets are the only distribution asset, consider including other components i.e. hydrants , valves, etc.

Replacement Costs

- Gather accurate replacement costs and update on a regular basis to ensure the accuracy of capital projections.

Risk Management Strategies

- Implement risk-based decision-making as part of asset management planning and budgeting processes. This should include the regular review of high-risk assets to determine appropriate risk mitigation strategies.

Levels of Service

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

11 Sanitary Network

11.1 Key Insights

The Sanitary Network provided by the Township are overseen by the public works department with OCWA (Ontario Clean Water Agency). The department is responsible for the following:

- Wastewater treatment plants
- Sanitary collection system

The state of the infrastructure for the sanitary network is summarized in the following table.

Replacement Cost	Condition	Financial Capacity	
$8,442,970	Very Good (99%)	Annual Requirement:	$135,802
		Funding Available:	$0
		Annual Deficit:	$135,802

The following level of service statements are a key driving force behind the Township's asset management planning.

Service Attribute	Level of Service Statement
Scope	The sanitary network is accessible to the community in sufficient capacity.
Quality	The sewer network is in good condition with minimal unplanned service interruptions due to backups and effluent violations.

11.2 Asset Inventory & Costs

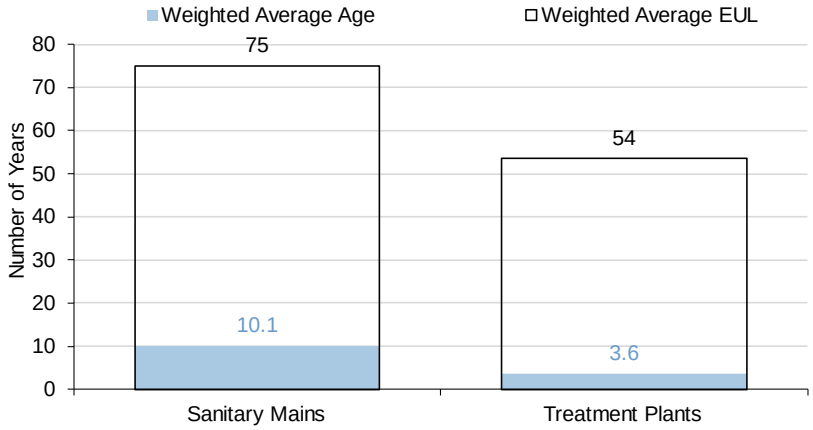
The table below includes the quantity, replacement cost and annual capital requirement for each asset segment in the Township's sanitary network inventory.

Asset Segment	Quantity	Replacement Cost	Annual Capital Requirement
Sanitary Mains	2,358m	$4,688,297	$62,511
Treatment Plants	2	$3,754,673	$73,291
Total		**$8,442,970**	**$135,802**

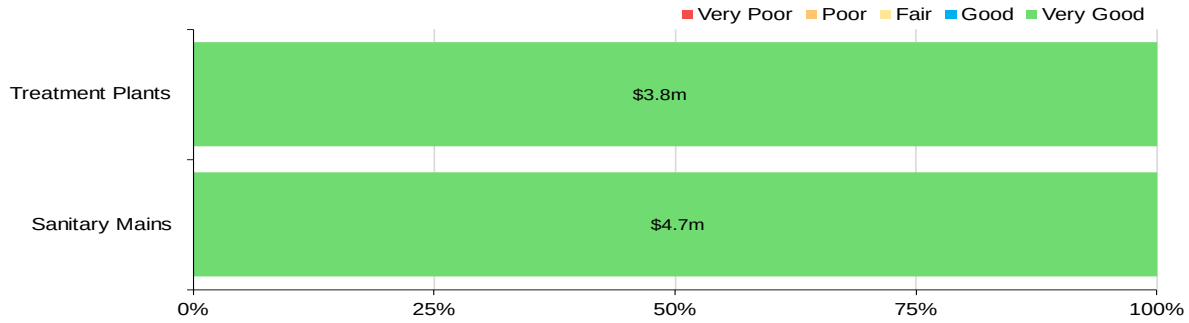
Each asset's replacement cost should be reviewed periodically to determine whether adjustments are needed to more accurate represent realistic capital requirements.

11.3 Asset Condition & Age

The graph below identifies the average age, and the estimated useful life for each asset segment. The values are weighted based on replacement cost.



The graph below visually illustrates the average condition for each asset segment on a very good to very poor scale.



To ensure that the Township's sanitary 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 activities is required to increase the overall condition of the sanitary network.

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

11.3.1 Current Approach to Condition Assessment

Accurate and reliable condition data allows staff to determine the remaining service life of assets and identify the most cost-effective approach to managing assets. The Township's current approach is to have OCWA manages all condition assessments and make recommendations. The rating criteria used to determine the current condition of sewer network assets and forecast future capital requirements is the same as other categories 0-100.

11.4 Lifecycle Management Strategy

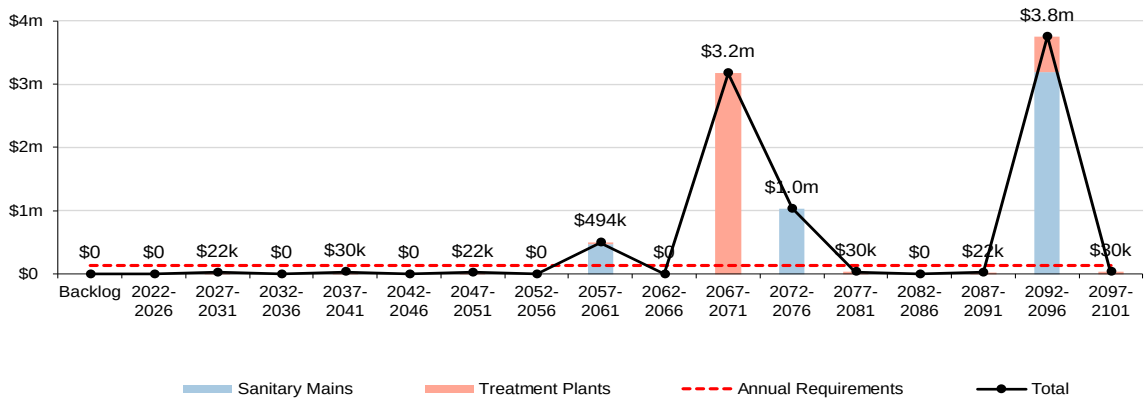
The condition or performance of most assets will deteriorate over time. To ensure that municipal assets are performing as expected and meeting the needs of customers, it is important to establish a lifecycle management strategy to proactively manage asset deterioration. The following table outlines the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

Activity Type	Description of Current Strategy
Maintenance	Main flushing and PACP CCTV Inspection 20 years
Replacement	In the absence of mid-lifecycle rehabilitative events, assets are simply maintained with the goal of full replacement once it reaches its end-of-life.

11.4.1 Forecasted Capital Requirements

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

The following graph identifies capital requirements over the next 90 years. This projection is used as it ensures that every asset has gone through one full iteration of replacement. The forecasted requirements are aggregated into 5-year bins and the trend line represents the average annual capital requirements at $135,802.



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

11.5 Risk & Criticality

The following risk matrix provides a visual representation of the relationship between the probability of failure and the consequence of failure for the assets within this asset category based on 2022 inventory data. See Appendix D for the criteria used to determine the risk rating of each asset.

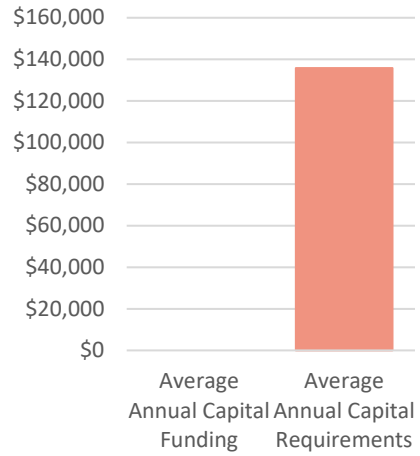
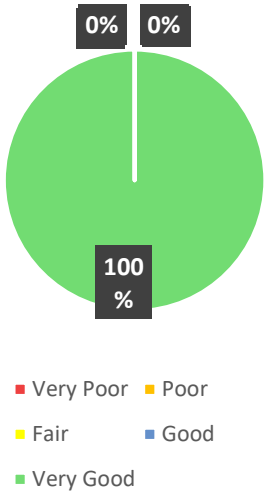
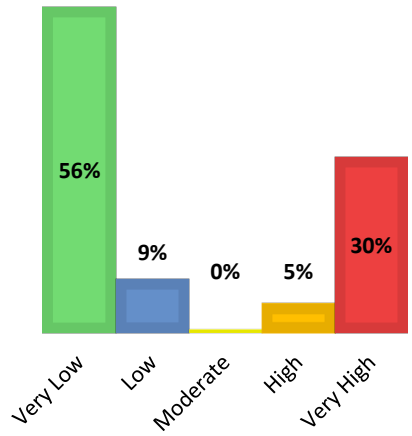
This is a high-level model developed by Township staff and should be reviewed and adjusted to reflect an evolving understanding of both the probability and consequences of asset failure. The asset-specific attributes that municipal staff utilize to define and prioritize the criticality of the sanitary network are documented below:

Probability of Failure (POF)	Consequence of Failure (COF)
Condition (Structural 60%)	Replacement Cost (Economic 75%)
Remaining Service Life (Functional 40%)	Diameter (Operational 25%)

The identification of critical assets allows the Township to determine appropriate risk mitigation strategies and treatment options. Risk mitigation may include asset-specific lifecycle strategies, condition assessment strategies, or simply the need to collect better asset data.

11.6 Levels of Service

The following tables identify the Township's current level of service for the sanitary network.

Cost	Performance (Average Condition)	Risk
		

These metrics include the technical and community level of service metrics that are required as part of O. Reg. 588/17.

11.6.1 Community Levels of Service

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

Service Attribute	Qualitative Description	Current LOS
Scope	Description, which may include maps, of the user groups or areas of the municipality that are connected to the municipal wastewater system	A sanitary collection system with pipes and manholes conveys the wastewater by gravity to a treatment plant with secondary treatment. There is a system for Ferndale/Lynhurst as well as Talbotville.
Reliability	Description of how combined sewers in the municipal wastewater system are designed with overflow structures in place which allow overflow during storm events to prevent backups into homes	The Township does not own any combined sewers
	Description of the frequency and volume of overflows in combined sewers in the municipal wastewater system that occur in habitable areas or beaches	The Township does not own any combined sewers
	Description of how stormwater can get into sanitary sewers in the municipal wastewater system, causing sewage to overflow into streets or backup into homes	Stormwater can enter into sanitary sewers due to cracks in sanitary mains or through indirect connections (e.g. weeping tiles). In the case of heavy rainfall events, sanitary sewers may experience a volume of water and sewage that exceeds its designed capacity.
	Description of how sanitary sewers in the municipal wastewater system are designed to be resilient to stormwater infiltration	The Township follows a series of design standards that integrate servicing requirements and land use considerations when constructing, they also are sealed when constructed.
	Description of the effluent that is discharged from sewage treatment plants in the municipal wastewater system	Effluent refers to water pollution that is discharged from a wastewater treatment plant, and may include suspended solids, total phosphorous and biological oxygen demand. The Environmental Compliance Approval (ECA) identifies the effluent criteria for municipal wastewater treatment plants.

11.6.2 Technical Levels of Service

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

Service Attribute	Technical Metric	Current LOS
Scope	% of properties connected to the municipal wastewater system	15%
Reliability	# of events per year where combined sewer flow in the municipal wastewater system exceeds system capacity compared to the total number of properties connected to the municipal wastewater system	0
	# of connection-days per year having wastewater backups compared to the total number of properties connected to the municipal wastewater system	0
	# of effluent violations per year due to wastewater discharge compared to the total number of properties connected to the municipal wastewater system	0
Performance	Average daily wastewater flows	84.6
	Volume of reportable spills per year (ML)	0

11.7 Recommendations

Risk Management Strategies

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

Levels of Service

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

12 Impacts of Growth

12.1 Key Insights

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

12.2 Description of Growth Assumptions

The demand for infrastructure and services will change over time based on a combination of internal and external factors. Understanding the key drivers of growth and demand will allow the Township to plan for new infrastructure, as well as the upgrade or dispose of existing infrastructure. Increases or decreases in demand can affect what assets are needed and what level of service meets the needs of the community.

12.2.1 Southwold Official Plan (November 2021)

The Township recently adopted a new Official Plan to ensure conformance with the provincial and upper tier documents, and address matters of local planning interest. The Official Plan is a planning document for the purpose of guiding the future development of the Township of Southwold from 2021 to 2041. The Official Plan has been approved at County of Elgin as of February 22, 2022.

The Settlement Area policies apply to the Township's villages and hamlets. The Settlement Policy Area designation is intended to be the areas of the Town where growth will be focused in order to optimize the use of public services and infrastructure, and to minimize outward sprawl of development into areas of natural resources and natural heritage. Most of the Township's future growth will be in Talbotville, Shedden, Fingal and North Port Stanley where access or planned access to public infrastructure including water and sanitary exist.

The majority of non-residential growth will be directed to the Town's employment areas in Talbotville and Shedden in accordance with the policies of the Municipality's Municipal Comprehensive ReviewThe former Ford St. Thomas Assembly Plant site is anticipated for future redevelopment for employment. In addition, council continues to provide protection of The City of Toronto's waste disposal facility from incompatible land uses in the region.

12.2.2 Projected Growth

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

The following table outlines the population and employment forecasts allocated to Southwold, according to the 2016 Census.

	2016	2021	2031	2041
Total Housing Unit Forecast	1,630	1,730	2,280	2,780
Historical & Forecast Total Population	4,570	4,800	5,940	6,640

12.3 Impact of Growth on Lifecycle Activities

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

Planning for forecasted population growth may require the expansion of existing infrastructure and services. As growth-related assets are constructed or acquired, they should be integrated into the Township's asset management program.

While the addition of residential units will add to the existing assessment base and offset some of the costs associated with growth, the Township will need to review the lifecycle costs of growth-related infrastructure.

13 Financial Strategy

13.1 Key Insights

- The Township is committing approximately $2,830,618 towards capital projects per year from sustainable revenue sources
- Given the annual capital requirement of $2,997,477, there is currently a funding gap of $166,860 annually
- For tax-funded assets, we recommend reallocating asset categories that are in surplus to categories in deficit
- For the water network, we recommend increasing rate revenues by 0.4% annually for the next 5 years to achieve a sustainable level of funding
- For the sanitary network, we recommend continuing to monitor the customer connections and system use to ensure revenues are reaching the forecasted values during the 10 year implementation period

13.2 Financial Strategy Overview

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

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

1. The financial requirements for:
    a. Existing assets
    b. Existing service levels
    c. Requirements of contemplated changes in service levels (none identified for this plan)
    d. Requirements of anticipated growth (none identified for this plan)
2. Use of traditional sources of municipal funds:
    a. Tax levies
    b. User fees
    c. Reserves
    d. Debt

3. Use of non-traditional sources of municipal funds:
    a. Reallocated budgets
    b. Partnerships
    c. Procurement methods
4. Use of Senior Government Funds:
    a. Canada Community Building Fund (CCBF)
    b. Annual grants

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

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

1. 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.

13.3 Annual Requirements & Capital Funding

13.3.1 Annual Requirements

The annual requirements represent the amount the Township should allocate annually to each asset category to meet replacement needs as they arise, prevent infrastructure backlogs, and achieve long-term sustainability. In total, the Township allocation is approximately $3 million annually.

For most asset categories the annual requirement has been calculated based on a "replacement only" scenario, in which capital costs are only incurred at the construction and replacement of each asset. However, for the road network, lifecycle management strategies have been developed to identify capital costs that are realized through strategic rehabilitation and renewal.

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

The development of these strategies allows for a comparison of potential cost avoidance if the strategies were to be implemented. The following table compares two scenarios for the road network:

Asset Category	Annual Requirements (Replacement Only)	Annual Requirements (Lifecycle Strategy)
Road Network	$1,713,787	$1,207,818

The implementation of a proactive lifecycle strategy for roads leads to a potential annual cost avoidance of approximately $505,970 for the road network. This represents an overall reduction of the annual requirements by 30%. As the lifecycle strategy scenario represents the lowest cost option available to the Township, we have used this annual requirement in the development of the financial strategy.

13.3.2 Annual Funding Available

Based on a historical analysis of sustainable capital funding sources, the Township is committing approximately $2,830,618 towards capital projects per year from sustainable revenue sources. Given the annual capital requirement of $2,997,477, there is currently a funding gap of $166,860 annually.

13.4 Funding Objective

A scenario has been developed that would enable Southwold to achieve full funding within 1 to 20 years for the following assets:

1. **Tax Funded Assets:** Road Network, Bridges & Culverts, Stormwater Network, Buildings, Waste Management, Machinery & Equipment, & Vehicles
2. **Rate Funded Assets:** Water Network, & Sanitary Network

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

13.5 Financial Profile: Tax Funded Assets

13.5.1 Current Funding Position

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

Asset Category	Avg. Annual Requirement	Annual Funding Available					Annual Deficit / Surplus
		Taxes	CCBF	OCIF	Green Lane	Total	
Road Network	1,200,000	870k	140k	273k		1283k	-82,824
Bridges & Culverts	147,000	100k				100k	47,000
Buildings	147,000	260k				260k	-113,000
Land Improvements	27,000				158k	158k	-131,142
Machinery & Equipment	237,000	115k			225k	340k	-103,000
Vehicles	450,000	75k				75k	375,000
	2.208m	**1.03m**	**334k**	**101k**		**2.216m**	**-7,966**

Tax funded infrastructure categories are currently funded at 100% of their long-term requirements.

13.5.2 Full Funding Requirements

In 2022, Township of Southwold will have an annual tax revenue of 4,454,788 and for capital replacement like for like tax funded infrastructure categories are currently funded at 100% of their long-term requirements.

13.5.3 Financial Strategy Recommendations

Considering all the above information, we recommend prioritizing future projects to fit within the funding envelop and replacing the current data with condition-based data. Although our recommendations include no further use of debt, the results of the condition-based analysis may require otherwise.

13.6 Financial Profile: Rate Funded Assets

13.6.1 Current Funding Position

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

Asset Category	Avg. Annual Requirement	Annual Funding Available				Annual Deficit
		Rates	CCBF	OCIF	Total	
Water Network	645,773	614,715	0	0	614,715	31,058
Sanitary Network	135,802	0	0	0	0	135,802
	781,575	**614,715**	**0**	**0**	**614,715**	**166,860**

The average annual investment requirement for the above categories is $781,575. Currently with the funds allocated to the Water Network the asset category is 95% funded and with the fund allocated to the sanitary network the asset category is 0% funded.

13.6.2 Full Funding Requirements

In 2022, Township of Southwold has annual water network revenues of $1.7 million. Without consideration of any other sources of revenue or cost containment strategies, full funding would require a 1.8% rate change over time.

In the following table, we have expanded the above scenario to present multiple options. Due to the small increase required we commend a 5-year phase in.

Water Network				
	5 Years	**10 Years**	**15 Years**	**20 Years**
Infrastructure Deficit	31,058	31,058	31,058	31,058
Rate Revenue Increase Required	1.8%	1.8%	1.8%	1.8%
Annually	**0.4%**	**0.2%**	**0.1%**	**0.1%**

In 2022, the Township has annual sanitary network revenues of $94,000. The system is very new and currently with the number of customer connections an operating funding shortfall is currently compounding. However, when the current rates were designed the number of customer connections and system use is forecasted to reach full funding by 2031. Current connection numbers are 92 in 2022, 222 in 2023 and expected to reach 902 by 2031.

13.6.3 Financial Strategy Recommendations

Considering the above information, we recommend the 5-year option for the water network & monitoring the connections are aligning with the forecasted numbers in the sanitary network over the next 10 years.

This involves full capital funding being achieved over 10 years by:

a) increasing rate revenues by 0.4% for the water network each year for the next 5 years.
b) the rate revenues increasing for the sanitary network through additional connections each year for the next 10 years.
c) these rate revenue increases are solely for the purpose of phasing in full funding to the respective rate funded asset categories.
d) increasing existing and future infrastructure budgets by the applicable inflation index on an annual basis in addition to the deficit phase-in.

Notes:

1. As in the past, periodic senior government infrastructure funding will most likely be available during the phase-in period. This periodic funding should not be incorporated into an AMP unless there are firm commitments in place.
2. Any increase in rates required for operations would be in addition to the above recommendations.

Although this strategy achieves full capital funding for rate-funded assets over 10 years, the recommendation does require prioritizing capital projects to fit the annual funding available.

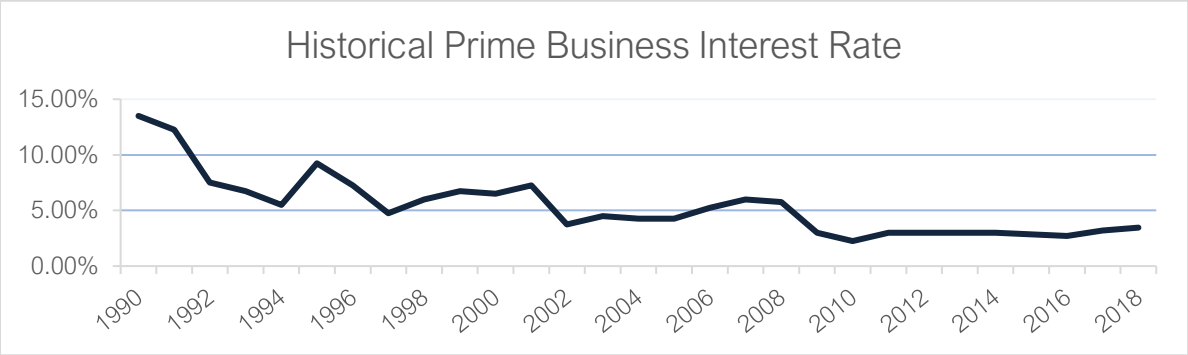
Prioritizing future projects will require the current data to be replaced by condition-based data. The recommendations include no further use of debt, the results of the condition-based analysis may require otherwise.

13.7 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 consider the time value of money or the effect of inflation on delayed projects.

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

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



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

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

The following tables outline how Southwold has historically used debt for investing in the asset categories as listed.

Asset Category	Current Debt Outstanding	Use of Debt in the Last Five Years				
		2017	2018	2019	2020	2021
Buildings	60,000	-	100,000	-	-	-
Sanitary Network	1,655,354	-	-	-	-	-
Total	**1,715,354**	-	-	-	-	-

Asset Category	Principal & Interest Payments in the Next Ten Years						
	2021	2022	2023	2024	2025	2026	2031
Buildings	10,000	10,000	10,000	10,000	10,000	10,000	-
Sanitary Network	130,530	130,530	130,530	130,530	130,530	130,530	130,530
Total	140,530	140,530	140,530	140,530	140,530	140,530	130,530

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

13.8 Use of Reserves

13.8.1 Available Reserves

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

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

The table below outlines the details of the reserves currently available to Township's asset categories.

Asset Category	Balance on December 31, 2021
GG - Building Renewal	$53,110
Fire - Apparatus	$760,572
Fire - Building Renewal	$371,925
Fire - Major Equipment	$64,177
Roads - Building Renewal	$412,098
Roads - Road Construction	$1,120,679
Roads - Bridges & Culvert	$576,764
Roads - Sidewalks	$90,000
Roads - Street Lights	$130,685
Health - Building Renewal	$114,902
Parks - Equipment	$4,362
Keystone - Building Renew	$99,409
Library - Building Renewal	$103,750
Total Tax Funded:	**$3,902,433**

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

- breadth of services provided
- age and condition of infrastructure
- use and level of debt
- economic conditions and outlook
- internal reserve and debt policies.

These reserves are available for use by applicable asset categories during the phase-in period to full funding. This coupled with Southwold' 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.

13.9 Recommendation

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

14 Appendices

14.1 Key Insights

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

Appendix A: Infrastructure Report Card

Asset Category	Replacement Cost	Asset Condition	Financial Capacity	
Road Network	$34,009,427	Fair (56%)	Annual Requirement:	$1,207,818
			Funding Available:	$1,282,824
			Annual Deficit:	($181,181)
Bridges & Culverts	$7,329,427	Good (71%)	Annual Requirement:	$146,589
			Funding Available:	$100,000
			Annual Deficit:	$46,589
Buildings	$7,013,262	Good (77%)	Annual Requirement:	$147,138
			Funding Available:	$260,000
			Annual Deficit:	($112,862)
Land Improvements	$353,727	Fair (48%)	Annual Requirement:	$27,467
			Funding Available:	$158,142
			Annual Deficit:	($130,675)
Vehicles	$5,893,394	Fair (46%)	Annual Requirement:	$450,050
			Funding Available:	$340,000
			Annual Deficit:	$110,050
Machinery & Equipment	$2,430,527	Fair (57%)	Annual Requirement:	$236,841
			Funding Available:	$75,000
			Annual Deficit:	$77,550
Water Network	$46,962,608	Very Good (96%)	Annual Requirement:	$645,773
			Funding Available:	$614,715
			Annual Deficit:	$31,058
Sanitary Network	$8,442,970	Very Good (99%)	Annual Requirement:	$134,350
			Funding Available:	$0
			Annual Deficit:	$134,350
Overall	$112,435,342	Good (78%)	Annual Requirement:	$2,996,026
			Funding Available:	$2,830,681
			Annual Deficit:	$165,345

Appendix B: 10-Year Capital Requirements

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

Category	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031
Road Network	$926,940	$1,274,308	$1,314,120	$3,767,658	$1,724,600	$69,920	$937,600	$98,400	$1,187,233	$1,378,440
Bridges & Culverts	$-	$210,649	$4,090,639	$90,181	$-	$434,649	$-	$-	$-	$22,482
Water Network	$-	$153,895	$562,531	$18,383	$16,510	$-	$15,589	$184,911	$1,044,154	$4,393
Buildings	$130,368	$75,798	$22,725	$38,319	$41,947	$8,957	$128,032	$19,190	$28,370	$33,562
Sanitary Network	$-	$-	$-	$-	$-	$-	$-	$-	$-	$9,698
Stormwater Network	$-	$-	$-	$-	$-	$-	$-	$-	$-	$-
Machinery & Equipment	$17,422	$352,318	$42,740	$-	$33,563	$48,881	$122,697	$88,771	$27,874	$81,325
Vehicles	$-	$38,445	$121,063	$410,183	$-	$174,514	$161,406	$-	$218,742	$-
Waste Management	$-	$217,132	$217,132	$217,132	$217,132	$217,132	$217,132	$217,132	$217,132	$217,132
Total	**$1,074,730**	**$2,322,545**	**$6,370,950**	**$4,541,856**	**$2,033,752**	**$954,053**	**$1,582,456**	**$608,404**	**$2,723,505**	**$1,747,032**

Road Network

Segment	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031
Asphalt	$436k	$868k	$318k	$836k	$1.6m	$56k	$554k	$0	$35k	$60k
Curb & Gutter	$0	$0	$0	$0	$0	$0	$0	$0	$245k	$0
Gravel	$389k	$349k	$483k	$329k	$0	$0	$0	$92k	$524k	$970k
Sidewalks	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Streetlights	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Tar & Chip	$102k	$58k	$513k	$2.6m	$170k	$14k	$384k	$6k	$384k	$348k
Total:	**$927k**	**$1.3m**	**$1.3m**	**$3.8m**	**$1.7m**	**$70k**	**$938k**	**$98k**	**$1.2m**	**$1.4m**

Bridges & Culverts										
Segment	**2022**	**2023**	**2024**	**2025**	**2026**	**2027**	**2028**	**2029**	**2030**	**2031**
Culverts	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Bridges	$0	$211k	$4.1m	$90k	$0	$435k	$0	$0	$0	$22k
Total:	**$0**	**$211k**	**$4.1m**	**$90k**	**$0**	**$435k**	**$0**	**$0**	**$0**	**$22k**

Stormwater Network										
Segment	**2022**	**2023**	**2024**	**2025**	**2026**	**2027**	**2028**	**2029**	**2030**	**2031**
Catchbasins	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Storm Mains	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Storm Manholes	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Total:	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**

Buildings										
Segment	**2022**	**2023**	**2024**	**2025**	**2026**	**2027**	**2028**	**2029**	**2030**	**2031**
Admin	$0	$7k	$7k	$0	$0	$2k	$0	$0	$8k	$0
Fire	$0	$24k	$0	$0	$0	$0	$28k	$0	$0	$20k
Health	$0	$23k	$0	$38k	$5k	$0	$0	$0	$0	$6k
Public Works	$0	$3k	$0	$0	$0	$0	$31k	$0	$0	$0
Recreation	$130k	$19k	$15k	$0	$36k	$7k	$69k	$19k	$20k	$7k
Total:	**$130k**	**$76k**	**$23k**	**$38k**	**$42k**	**$9k**	**$128k**	**$19k**	**$28k**	**$34k**

Waste Management										
Segment	**2022**	**2023**	**2024**	**2025**	**2026**	**2027**	**2028**	**2029**	**2030**	**2031**
Landfill	$0	$217k	$217k	$217k	$217k	$217k	$217k	$217k	$217k	$217k
Total:	**$0**	**$217k**	**$217k**	**$217k**	**$217k**	**$217k**	**$217k**	**$217k**	**$217k**	**$217k**

Machinery & Equipment										
Segment	**2022**	**2023**	**2024**	**2025**	**2026**	**2027**	**2028**	**2029**	**2030**	**2031**
Fire	$0	$0	$0	$0	$0	$0	$18k	$89k	$0	$0
IT	$0	$0	$0	$0	$9k	$49k	$0	$0	$0	$9k
Public Works	$0	$343k	$0	$0	$0	$0	$0	$0	$0	$72k
Recreation	$17k	$9k	$43k	$0	$25k	$0	$104k	$0	$28k	$0
Total:	**$17k**	**$352k**	**$43k**	**$0**	**$34k**	**$49k**	**$123k**	**$89k**	**$28k**	**$81k**

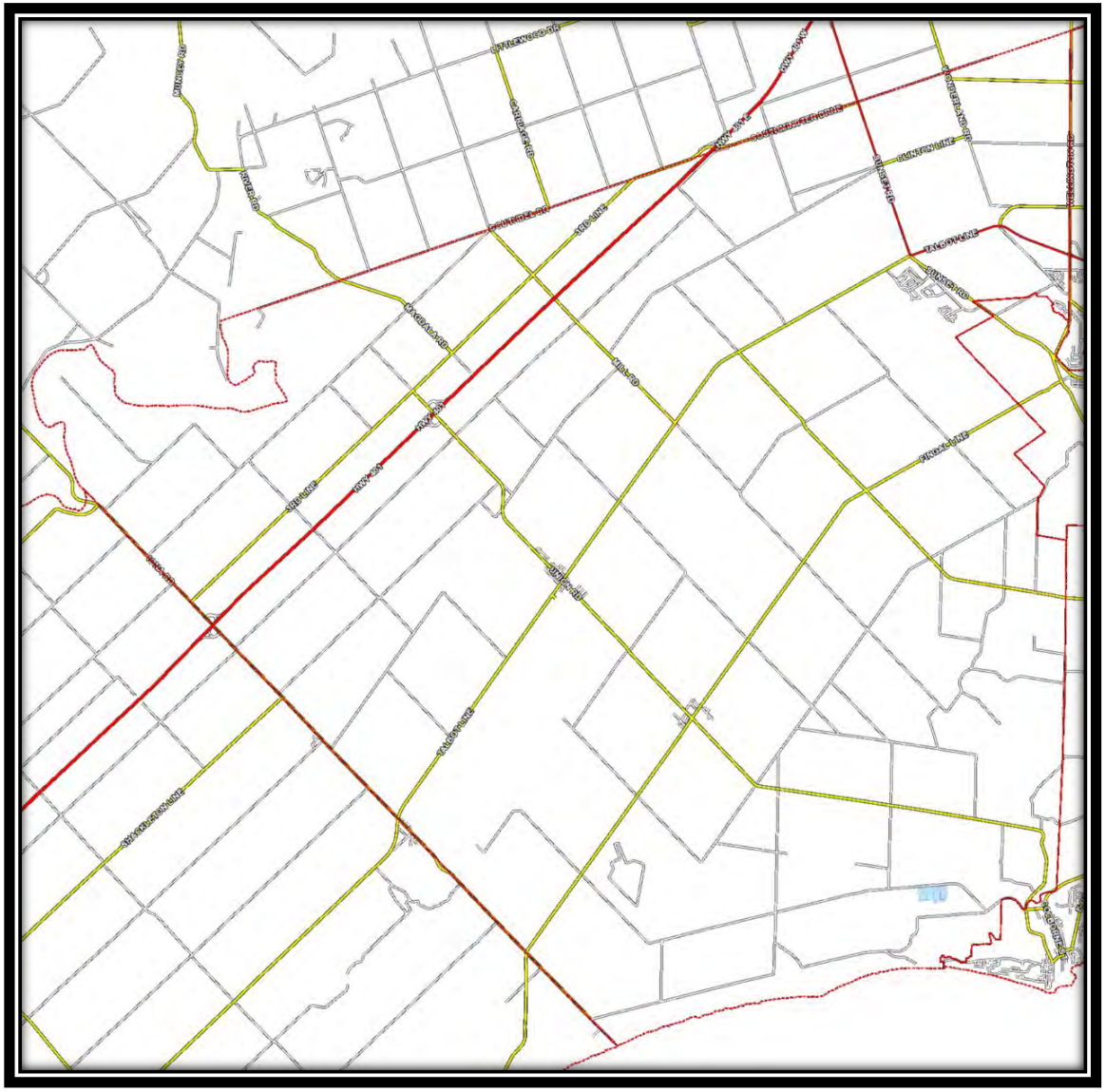
Vehicles										
Segment	**2022**	**2023**	**2024**	**2025**	**2026**	**2027**	**2028**	**2029**	**2030**	**2031**
Buildings	$0	$0	$0	$0	$0	$35k	$0	$0	$0	$0
Fire	$0	$0	$121k	$130k	$0	$0	$123k	$0	$92k	$0
Public Works	$0	$38k	$0	$280k	$0	$140k	$38k	$0	$126k	$0
Total:	**$0**	**$38k**	**$121k**	**$410k**	**$0**	**$175k**	**$161k**	**$0**	**$219k**	**$0**

Water Network										
Segment	**2022**	**2023**	**2024**	**2025**	**2026**	**2027**	**2028**	**2029**	**2030**	**2031**
Fire Water Supply Line	$0	$0	$0	$0	$0	$0	$0	$0	$1.0m	$0
Small Water Systems	$0	$0	$0	$9k	$0	$0	$0	$0	$0	$0
Treatment Plant	$0	$154k	$391k	$10k	$17k	$0	$16k	$145k	$19k	$4k
Water Mains	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Water Services	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Water Storage Tank	$0	$0	$171k	$0	$0	$0	$0	$39k	$0	$0
Total:	**$0**	**$154k**	**$563k**	**$18k**	**$17k**	**$0**	**$16k**	**$185k**	**$1.0m**	**$4k**

Sanitary Network										
Segment	**2022**	**2023**	**2024**	**2025**	**2026**	**2027**	**2028**	**2029**	**2030**	**2031**
Forcemain	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Lagoons	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Sanitary Mains	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Sanitary Manholes	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Wastewater Pumping Station	$0	$0	$0	$0	$0	$0	$0	$0	$0	$10k
Total:	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$10k**

Appendix C: Level of Service Maps

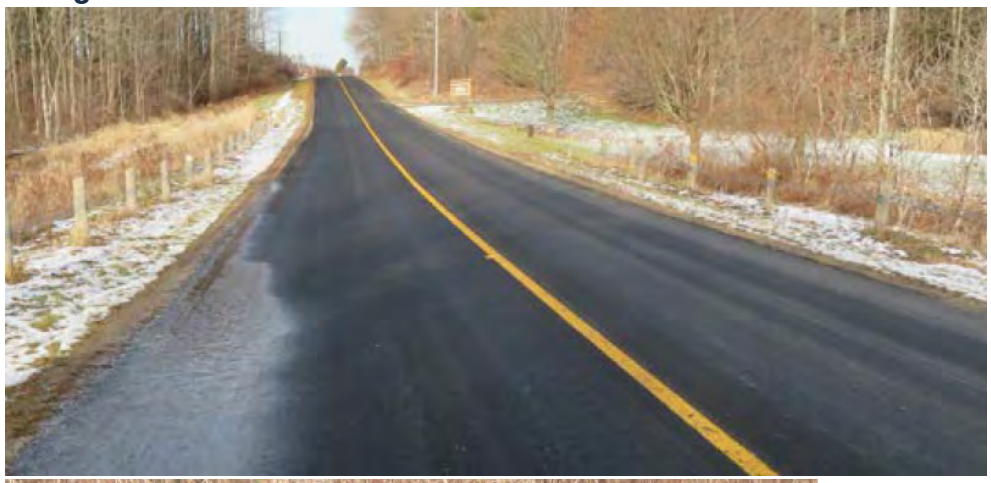
Road Network Map



Images of Bridge in Good Condition

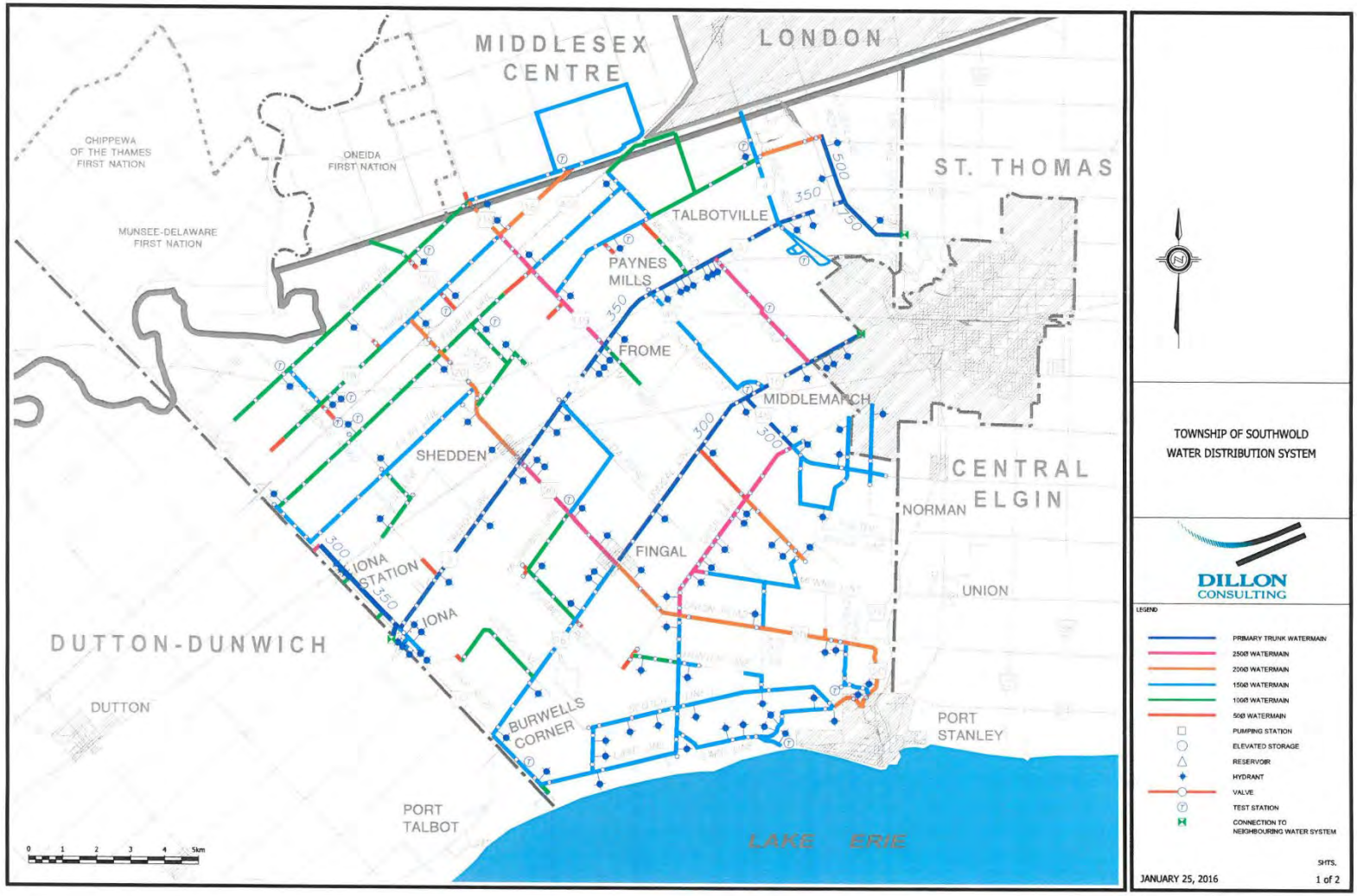
Images of Bridge in Poor Condition

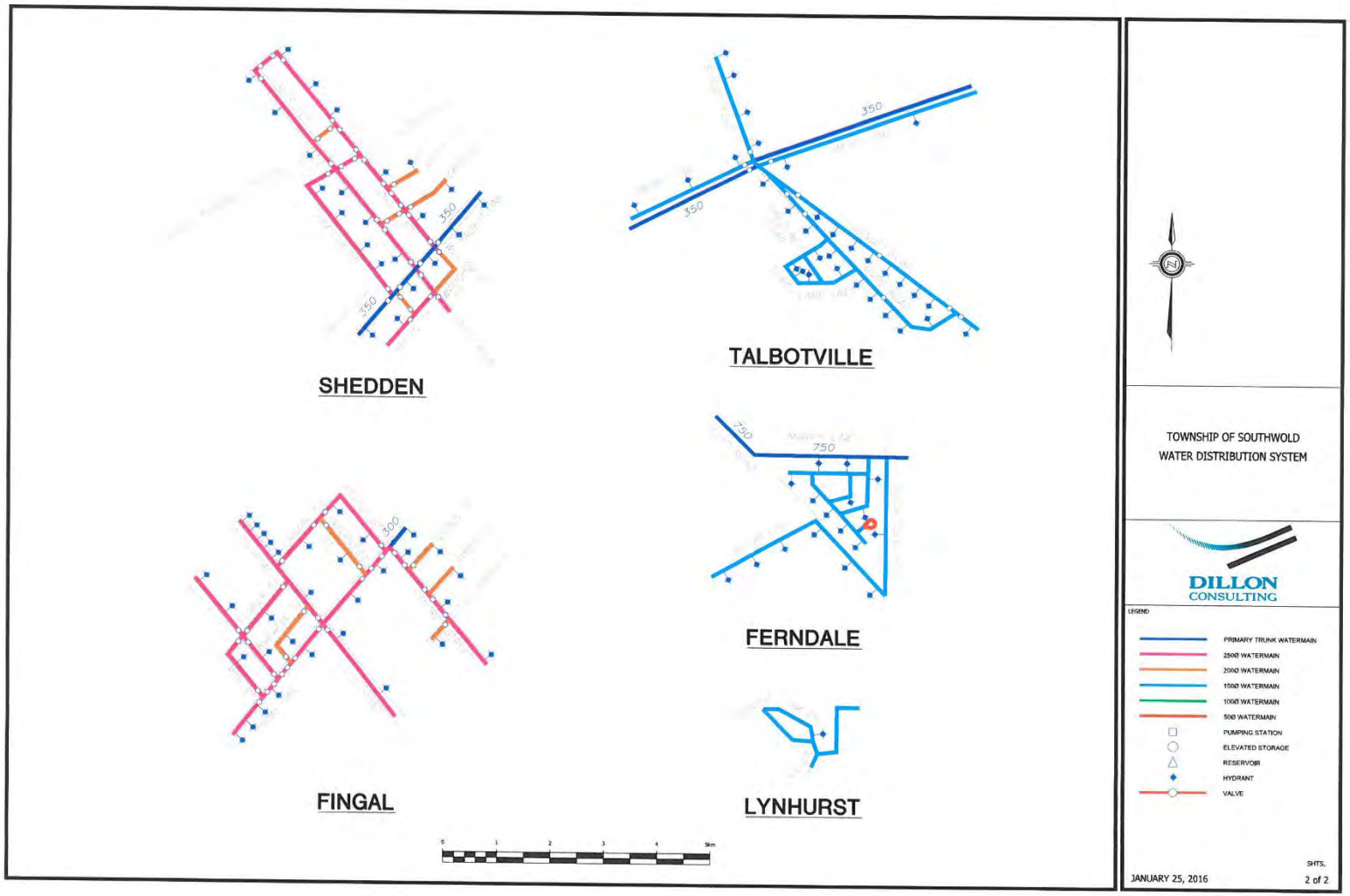
Images of Culvert in Good Condition



Images of Culvert in Fair Condition

Water System Network Maps




SHEDDEN
TALBOTVILLE
FERNDALE
FINGAL
LYNHURST
TOWNSHIP OF SOUTHWOLD
WATER DISTRIBUTION SYSTEM
DILLON
CONSULTING
LEGEND
PRIMARY TRUNK WATERMAIN
250Ø WATERMAIN
200Ø WATERMAIN
150Ø WATERMAIN
100Ø WATERMAIN
50Ø WATERMAIN
PUMPING STATION
ELEVATED STORAGE
RESERVOIR
HYDRANT
VALVE
JANUARY 25, 2016
SHTS.
2 of 2

Appendix D: Risk Rating Criteria

Asset Category	Asset Segment	Risk Criteria	Criteria	Weighting (%)	Sub-Criteria	Weighting (%)	Value/Range	Score
General / Corporate		COF	Economic	100%	Replacement Cost	100%	0 - 5,000 5,000 - 20,000 20,000 - 50,000 50,000 - 100,000 >100,000	1 - Insignificant 2 - Minor 3 - Moderate 4 - Major 5 - Severe
		POF	Structural	60%	Age Based Condition	100%	80 - 100 60 - 79 40 - 59 20 - 39 0 - 19	1 - Rare 2 - Unlikely 3 - Possible 4 - Likely 5 - Almost Certain
			Functional	40%	Service Life Remaining	100%	> 40 20 - 30 10 - 20 1 - 10 < 1	1 - Rare 2 - Unlikely 3 - Possible 4 - Likely 5 - Almost Certain

Asset Category	Asset Segment	Risk Criteria	Criteria	Weighting (%)	Sub-Criteria	Weighting (%)	Value/Range	Score
Bridges & Culverts	Bridges	COF	Economic	100%	Replacement Cost	100%	0 - 5,000 5,000 - 20,000 20,000 - 50,000 50,000 - 100,000 >100,000	1 - Insignificant 2 - Minor 3 - Moderate 4 - Major 5 - Severe
		POF	Structural	60%	Assessed Condition	100%	80 - 100 60 - 79 40 - 59 20 - 39 0 - 19	1 - Rare 2 - Unlikely 3 - Possible 4 - Likely 5 - Almost Certain
			Functional	40%	Service Life Remaining	100%	> 40 20 - 30 10 - 20 1 - 10 < 1	1 - Rare 2 - Unlikely 3 - Possible 4 - Likely 5 - Almost Certain
	Culverts	COF	Economic	50%	Replacement Cost	100%	0 - 5,000 5,000 - 20,000 20,000 - 50,000 50,000 - 100,000 >100,000	1 - Insignificant 2 - Minor 3 - Moderate 4 - Major 5 - Severe
			Operational	50%	Surface Type	50%	Gravel Tar & Chip Asphalt	2 - Minor 3 - Moderate 4 - Major
					Diameter	50%	<3m >3M and equal to	2 - Minor 4 - Major
		POF	Structural	60%	Condition	100%	80 - 100 60 - 79 40 - 59 20 - 39 0 - 19	1 - Rare 2 - Unlikely 3 - Possible 4 - Likely 5 - Almost Certain
			Functional	40%	Service Life Remaining	100%	> 40 20 - 30 10 - 20 1 - 10 < 1	1 - Rare 2 - Unlikely 3 - Possible 4 - Likely 5 - Almost Certain

Asset Category	Asset Segment	Risk Criteria	Criteria	Weighting (%)	Sub-Criteria	Weighting (%)	Value/Range	Score
Road Network	Roads	COF	Economic	50%	Replacement Cost	100%	0 - 5,000 5,000 - 20,000 20,000 - 50,000 50,000 - 100,000 >100,000	1 - Insignificant 2 - Minor 3 - Moderate 4 - Major 5 - Severe
			Operational	50%	Surface Type	100%	Gravel Surface Treatment Asphalt	2 - Minor 3 - Moderate 4 - Major
		POF	Structural	60%	Assessed Condition	100%	80 - 100 60 - 79 40 - 59 20 - 39 0 - 19	1 - Rare 2 - Unlikely 3 - Possible 4 - Likely 5 - Almost Certain
			Functional	40%	Service Life Remaining	100%	> 40 20 - 30 10 - 20 1 - 10 < 1	1 - Rare 2 - Unlikely 3 - Possible 4 - Likely 5 - Almost Certain

Asset Category	Asset Segment	Risk Criteria	Criteria	Weighting (%)	Sub-Criteria	Weighting (%)	Value/Range	Score
Stormwater Network	Catchbasin / Manholes	COF	Economic	70%	Replacement Cost	100%	0 - 5,000 5,000 - 20,000 20,000 - 50,000 50,000 - 100,000 >100,000	1 - Insignificant 2 - Minor 3 - Moderate 4 - Major 5 - Severe
			Operational	30%	Surface Type	100%	Gravel Tar & Chip Asphalt	2 – Minor 3 – Moderate 4 – Major
		POF	Structural	60%	Assessed Condition	100%	80 - 100 60 - 79 40 - 59 20 - 39 0 - 19	1 - Rare 2 - Unlikely 3 - Possible 4 - Likely 5 - Almost Certain
			Functional	40%	Service Life Remaining	100%	> 40 20 - 30 10 - 20 1 - 10 < 1	1 - Rare 2 - Unlikely 3 - Possible 4 - Likely 5 - Almost Certain

Asset Category	Asset Segment	Risk Criteria	Criteria	Weighting (%)	Sub-Criteria	Weighting (%)	Value/Range	Score
Stormwater Network Continued	Storm Mains	COF	Economic	50%	Replacement Cost	100%	0 - 5,000 5,000 - 20,000 20,000 - 50,000 50,000 - 100,000 >100,000	1 - Insignificant 2 - Minor 3 - Moderate 4 - Major 5 - Severe
			Operational	50%	Surface Type	50%	Gravel Tar & Chip Asphalt	2 – Minor 3 – Moderate 4 – Major
					Diameter	50%	200 250 375 & 400 >450 & < 700 >700	1 - Insignificant 2 - Minor 3 - Moderate 4 - Major 5 - Severe
		POF	Structural	60%	Assessed Condition	100%	80 - 100 60 - 79 40 - 59 20 - 39 0 - 19	1 - Rare 2 - Unlikely 3 - Possible 4 - Likely 5 - Almost Certain
			Functional	40%	Service Life Remaining	100%	> 40 20 - 30 10 - 20 1 - 10 < 1	1 - Rare 2 - Unlikely 3 - Possible 4 - Likely 5 - Almost Certain

Asset Category	Asset Segment	Risk Criteria	Criteria	Weighting (%)	Sub-Criteria	Weighting (%)	Value/Range	Score
Sanitary Network	Sanitary Mains	COF	Economic	50%	Replacement Cost	100%	0 - 5,000 5,000 - 20,000 20,000 - 50,000 50,000 - 100,000 >100,000	1 - Insignificant 2 - Minor 3 - Moderate 4 - Major 5 - Severe
			Operational	50%	Surface Type	50%	Gravel Tar & Chip Asphalt	2 – Minor 3 – Moderate 4 – Major
					Diameter	50%	200 250 375 & 400 >450 & < 700 >700	1 - Insignificant 2 - Minor 3 - Moderate 4 - Major 5 - Severe
		POF	Structural	60%	Assessed Condition	100%	80 - 100 60 - 79 40 - 59 20 - 39 0 - 19	1 - Rare 2 - Unlikely 3 - Possible 4 - Likely 5 - Almost Certain
			Functional	40%	Service Life Remaining	100%	> 40 20 - 30 10 - 20 1 - 10 < 1	1 - Rare 2 - Unlikely 3 - Possible 4 - Likely 5 - Almost Certain

Asset Category	Asset Segment	Risk Criteria	Criteria	Weighting (%)	Sub-Criteria	Weighting (%)	Value/Range	Score
Sanitary Network Continued	Rest of the System	COF	Economic	70%	Replacement Cost	100%	0 - 5,000 5,000 - 20,000 20,000 - 50,000 50,000 - 100,000 >100,000	1 - Insignificant 2 - Minor 3 - Moderate 4 - Major 5 - Severe
			Operational	30%	System Segments	100%	Manholes Lagoon, Mains & Forcemains Pumping Stations	2 - Minor 4 - Major 5 - Severe
		POF	Structural	60%	Assessed Condition	100%	80 - 100 60 - 79 40 - 59 20 - 39 0 - 19	1 - Rare 2 - Unlikely 3 - Possible 4 - Likely 5 - Almost Certain
			Functional	40%	Service Life Remaining	100%	> 40 20 - 30 10 - 20 1 - 10 < 1	1 - Rare 2 - Unlikely 3 - Possible 4 - Likely 5 - Almost Certain

Asset Category	Asset Segment	Risk Criteria	Criteria	Weighting (%)	Sub-Criteria	Weighting (%)	Value/Range	Score
Water Network	Water Mains / Water Services	COF	Economic	70%	Replacement Cost	100%	0 - 5,000 5,000 - 20,000 20,000 - 50,000 50,000 - 100,000 >100,000	1 - Insignificant 2 - Minor 3 - Moderate 4 - Major 5 - Severe
			Operational	30%	Diameter	50%	> 100 100 - 150 150 - 300 300 - 400 > 400	1 - Insignificant 2 - Minor 3 - Moderate 4 - Major 5 - Severe
		POF	Structural	60%	Assessed Condition	100%	80 - 100 60 - 79 40 - 59 20 - 39 0 - 19	1 - Rare 2 - Unlikely 3 - Possible 4 - Likely 5 - Almost Certain
			Functional	40%	Service Life Remaining	100%	> 40 20 - 30 10 - 20 1 - 10 < 1	1 - Rare 2 - Unlikely 3 - Possible 4 - Likely 5 - Almost Certain

Asset Category	Asset Segment	Risk Criteria	Criteria	Weighting (%)	Sub-Criteria	Weighting (%)	Value/Range	Score
Water Network Continued	Rest of the System	COF	Economic	70%	Replacement Cost	100%	0 - 5,000 5,000 - 20,000 20,000 - 50,000 50,000 - 100,000 >100,000	1 - Insignificant 2 - Minor 3 - Moderate 4 - Major 5 - Severe
			Operational	30%	System Segments	100%	Services Small Water Systems Webbwood Fire Sup. Storage & Mains Treatment Plant	1 - Insignificant 2 - Minor 3 - Moderate 4 - Major 5 - Severe
		POF	Structural	60%	Assessed Condition	100%	80 - 100 60 - 79 40 - 59 20 - 39 0 - 19	1 - Rare 2 - Unlikely 3 - Possible 4 - Likely 5 - Almost Certain
			Functional	40%	Service Life Remaining	100%	> 40 20 - 30 10 - 20 1 - 10 < 1	1 - Rare 2 - Unlikely 3 - Possible 4 - Likely 5 - Almost Certain

Appendix E: Condition Assessment Guidelines

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

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

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

Role of Asset Condition Data

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

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

Guidelines for Condition Assessment

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

Condition assessments must include a quantitative or qualitative assessment of the current condition of the asset, collected according to specified condition rating

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

Developing a Condition Assessment Schedule

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

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