Asset Management Plan

Township of Pelee

2022

This Asset Management Program was prepared by:

psdcitywide

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

Key Statistics

Replacement cost of asset portfolio
$79 million

Replacement cost of infrastructure per household
$211,202 (2021)

Percentage of assets in fair or better condition
29%

Percentage of assets with assessed condition data
65%

Annual capital infrastructure deficit
$1.9 million

Recommended timeframe for eliminating annual infrastructure deficit
20 Years

Target reinvestment rate
2.8%

Actual reinvestment rate
0.4%

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

Scope

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

This AMP include the following asset categories:

Asset Category

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

With the development of this AMP the Township of Pelee 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 current and proposed levels of service and growth that must be met by July 1, 2024 and 2025.

Findings

The overall replacement cost of the asset categories included in this AMP totals $79 million. 29% of all assets analysed in this AMP are in fair or better condition and assessed condition data was available for 65% of assets. For the remaining 35% of assets, assessed condition data was unavailable, and asset age was used to approximate condition – a data gap that persists in most municipalities. Generally, age misstates the true condition of assets, making assessments essential to accurate asset management planning, and a recurring recommendation in this AMP.

The development of a long-term, sustainable financial plan requires an analysis of whole lifecycle costs. This AMP uses a combination of proactive lifecycle strategies (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 $2.2 million. Based on a historical analysis of sustainable capital funding sources, the Township is committing approximately $308,000 towards capital projects or reserves per year. As a result, there is currently an annual funding gap of $1.9 million.

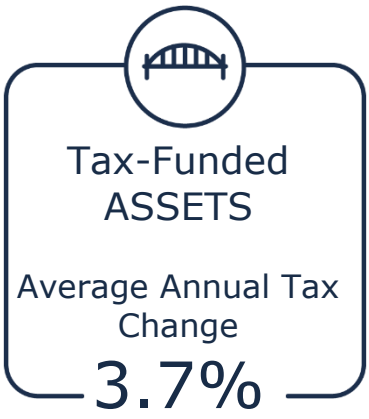
It is important to note that this AMP represents a snapshot in time and is based on the best available processes, data, and information at the

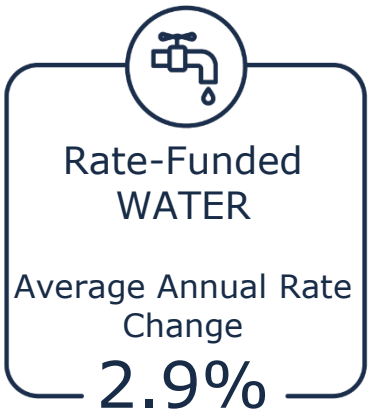
Township. Strategic asset management planning is an ongoing and dynamic process that requires continuous improvement and dedicated resources.

Average Annual Requirements Per Household

Recommendations

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





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 & Context

Key Insights

- The goal of asset management is to minimize the lifecycle costs of delivering infrastructure services, manage the associated risks, while maximizing the value ratepayers receive from the asset portfolio

- The Township's asset management policy provides clear direction to staff on their roles and responsibilities regarding asset management

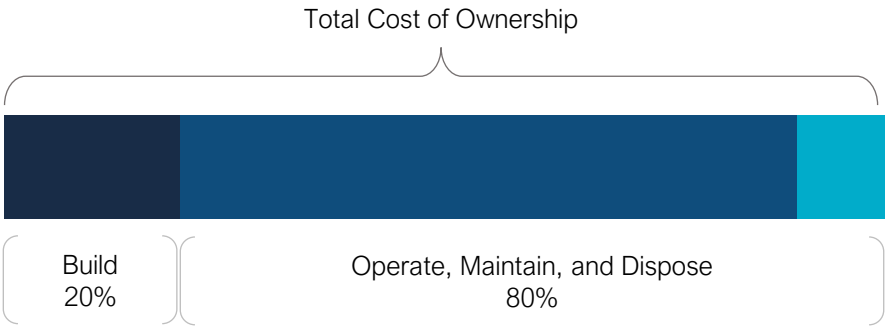
- An asset management plan is a living document that should be updated regularly to inform long-term planning

- Ontario Regulation 588/17 outlines several key milestone and requirements for asset management plans in Ontario between July 1, 2022 and 2025

1.1An Overview of Asset Management

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

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



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

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

1.1.1 Asset Management Policy

An asset management policy represents a statement of the principles guiding the 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 as part of the asset management program.

The Township adopted a Strategic Asset Management Policy on June 25, 2019 in accordance with Ontario Regulation 588/17.

The objectives of the policy include:

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

1.1.2 Asset Management Strategy

An asset management strategy outlines the translation of organizational objectives into asset management objectives and provides a strategic overview of the activities required to meet these objectives. It provides greater detail than the policy on how the Township plans to achieve asset management objectives through planned activities and decision-making criteria.
The Township's Asset Management Policy contains many of the key components of an asset management strategy and may be expanded on in future revisions or as part of a separate strategic document.

1.1.3 Asset Management Plan

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

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

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

1.2Key Concepts in Asset Management

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

1.2.1 Lifecycle Management Strategies

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

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

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

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

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

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

1.2.2 Risk Management Strategies

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

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

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

1.2.3 Levels of Service

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

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

Community Levels of Service

Community levels of service are a simple, plain language description or measure of the service that the community receives. For core asset categories (roads, bridges and culverts, water, wastewater, storm sewer) the Province, through O. Reg. 588/17, has provided qualitative descriptions that are required to be included in

this AMP. For non-core asset categories, the Township has determined the qualitative descriptions that will be used to determine the community level of service provided. These descriptions can be found in the Levels of Service subsection within each asset category.

Technical Levels of Service

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

For core asset categories (roads, bridges and culverts, water, wastewater, storm sewer) the Province, through O. Reg. 588/17, has provided technical metrics that are required to be included in this AMP. For non-core asset categories, the Township has determined the technical metrics that will be used to determine the technical level of service provided. These metrics can be found in the Levels of Service subsection within each asset category.

Current and Proposed Levels of Service

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

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

1.3Ontario 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

1.3.1 O. Reg. 588/17 Compliance Review

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

Requirement	O. Reg. Section	AMP Section Reference	Status
Summary of assets in each category	S.5(2), 3(i)	4.1.1 - 5.1.1	Complete
Replacement cost of assets in each category	S.5(2), 3(ii)	4.1.1 - 5.1.1	Complete
Average age of assets in each category	S.5(2), 3(iii)	4.1.3 - 5.1.3	Complete
Condition of core assets in each category	S.5(2), 3(iv)	4.1.2 – 5.1.2	Complete
Description of Township's approach to assessing the condition of assets in each category	S.5(2), 3(v)	4.1.2 – 5.1.2	Complete
Current levels of service in each category	S.5(2), 1(i-ii)	4.1.6 - 5.1.6	Complete for core assets
Current performance measures in each category	S.5(2), 2	4.1.6 - 5.1.6	Complete for core assets
Lifecycle activities needed to maintain current levels of service for 10 years	S.5(2), 4	4.1.4 - 5.1.4	Complete for core assets
Costs of providing lifecycle activities for 10 years	S.5(2), 4	Appendix A	Complete
Growth assumptions	S.5(2), 5(i-ii) S.5(2), 6(i-vi)	6.1-6.2	Complete

2 Scope and Methodology

Key Insights

- This asset management plan includes 8 asset 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

2.1Asset Categories Included in this AMP

This asset management plan for the Township of Pelee is produced in compliance with Ontario Regulation 588/17. The July 2024 deadline under the regulation requires analysis of both core and non-core assets.

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

Asset Category	Source of Funding
Road Network	Tax Levy
Bridges & Culverts	
Storm Network	
Buildings	
Vehicles	
Equipment	
Land Improvements	
Water Network	User-Funded

2.2Deriving Replacement Costs

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

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

User-defined costs based on reliable sources are a reasonably accurate and reliable way to determine asset replacement costs. Cost inflation is typically used in the absence of reliable replacement cost data. It is a reliable method for recently purchased and/or constructed assets where the total cost is reflective of the actual

costs that the Township incurred. As assets age, and new products and technologies become available, cost inflation becomes a less reliable method.

2.3 Estimated Useful Life and Service Life Remaining

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

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

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

2.4 Reinvestment Rate

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

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

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

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

2.5Deriving Asset Condition

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

A condition assessment rating system provides a standardized descriptive framework that allows comparative benchmarking across the Township's asset portfolio. The table below outlines the condition rating system used in this AMP to determine asset condition. This rating system is aligned with the Canadian Core Public Infrastructure Survey which is used to develop the Canadian Infrastructure Report Card. When assessed condition data is not available, service life remaining is used to approximate asset condition.

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

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

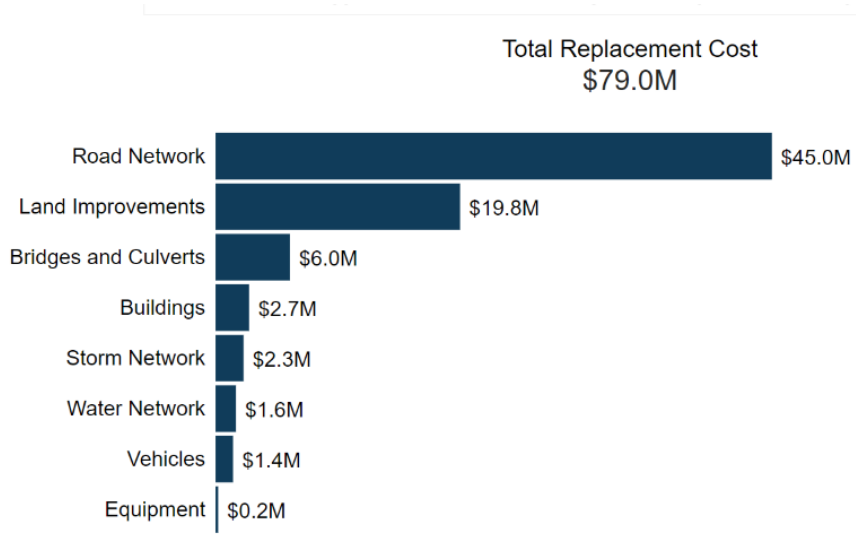
3 Portfolio Overview

Key Insights

- The total replacement cost of the Township's asset portfolio is $79 million
- The Township's target re-investment rate is 2.8%, and the actual re-investment rate is 0.4%, contributing to an expanding infrastructure deficit
- 29% of all assets are in fair or better condition
- 50% of assets are projected to require replacement in the next 10 years
- Average annual capital requirements total $2.2 million per year across all assets

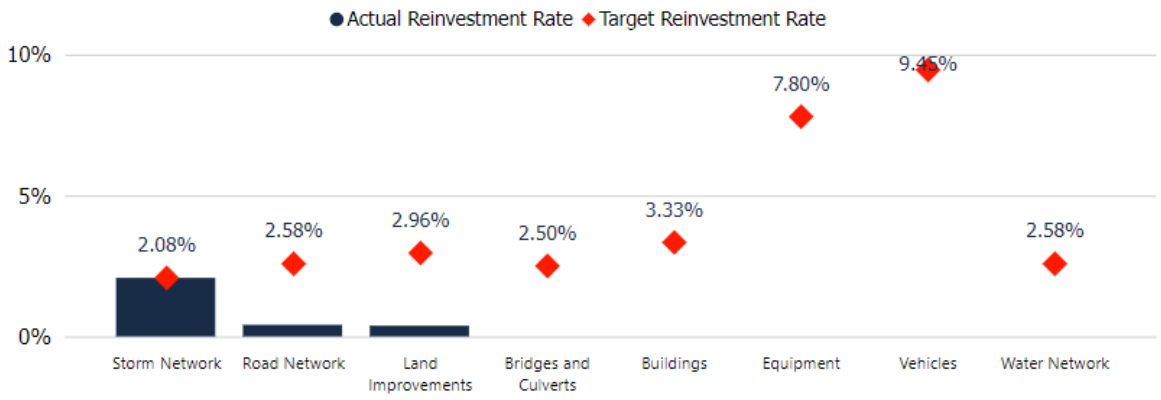
3.1 Total Replacement Cost of Asset Portfolio

The asset categories analyzed in this AMP have a total replacement cost of $79 million based on inventory data from 2021. This total was determined based on a combination of user-defined costs and historical cost inflation. This estimate reflects replacement of historical assets with similar, not necessarily identical, assets available for procurement today.



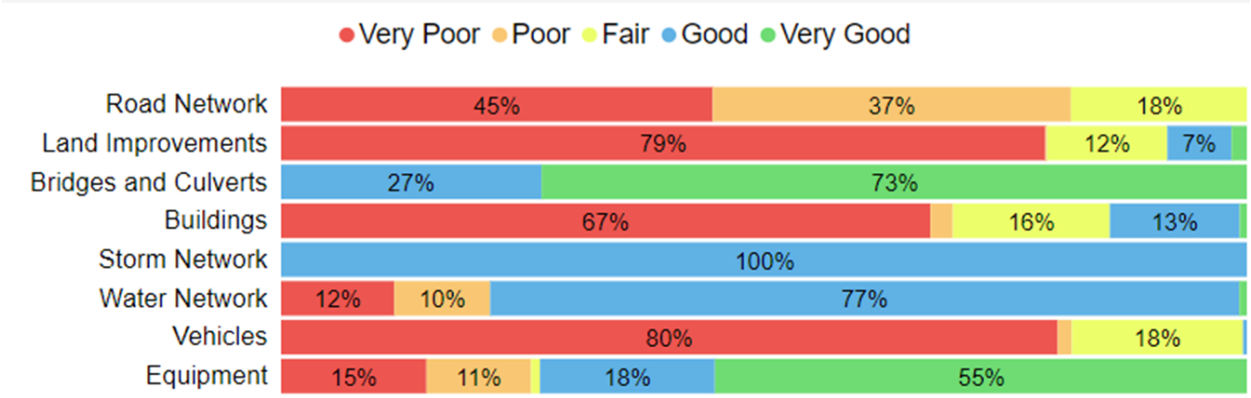
3.2 Target vs. Actual Reinvestment Rate

The graph below depicts funding gaps or surpluses by comparing target vs actual reinvestment rate. To meet the long-term replacement needs, the Township should be allocating approximately $2.2 million annually, for a target reinvestment rate of 2.8%. Actual annual spending on infrastructure totals approximately $308,000, for an actual reinvestment rate of 0.4%.


Actual Reinvestment Rate
Target Reinvestment Rate
10%
5%
0%
2.08%
2.58%
2.96%
2.50%
3.33%
7.80%
9.45%
2.58%
Storm Network
Road Network
Land Improvements
Bridges and Culverts
Buildings
Equipment
Vehicles
Water Network

3.3Condition of Asset Portfolio

The current condition of the assets is central to all asset management planning. Collectively, 29% of assets in Pelee are in fair or better condition. This estimate relies on both age-based and field condition data.



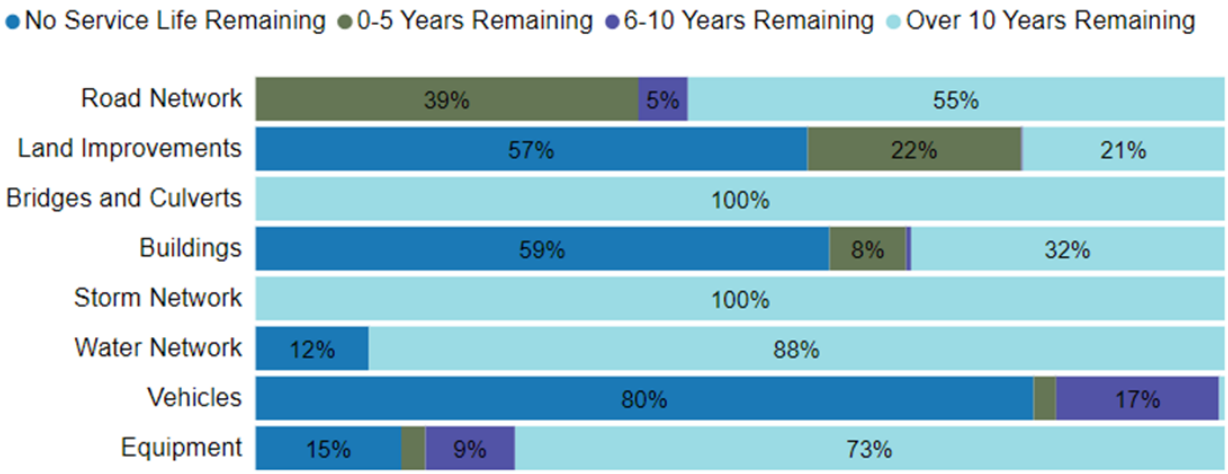
This AMP relies on assessed condition data for 65% of assets; for the remaining portfolio, age is used as an approximation of condition. Assessed condition data is invaluable in asset management planning as it reflects the true condition of the asset and its ability to perform its functions. The table below identifies the source of condition data used throughout this AMP.

Asset Category	Asset Segment	% of Assets with Assessed Condition	Source of Condition Data
Road Network	Roads	100%	Staff assessements 2022
Bridges & Culverts	Bridges	100%	2020 OSIM Report
	Structural Culverts	95%	2020 OSIM Report
Storm Network	All	0%	Age-based
Buildings	All	0%	Age-based
Equipment	All	0%	Age-based
Vehicles	All	0%	Age-based
Land Improvements	All	0%	Age-based
Water Network	All	0%	Age-based

3.4Service Life Remaining

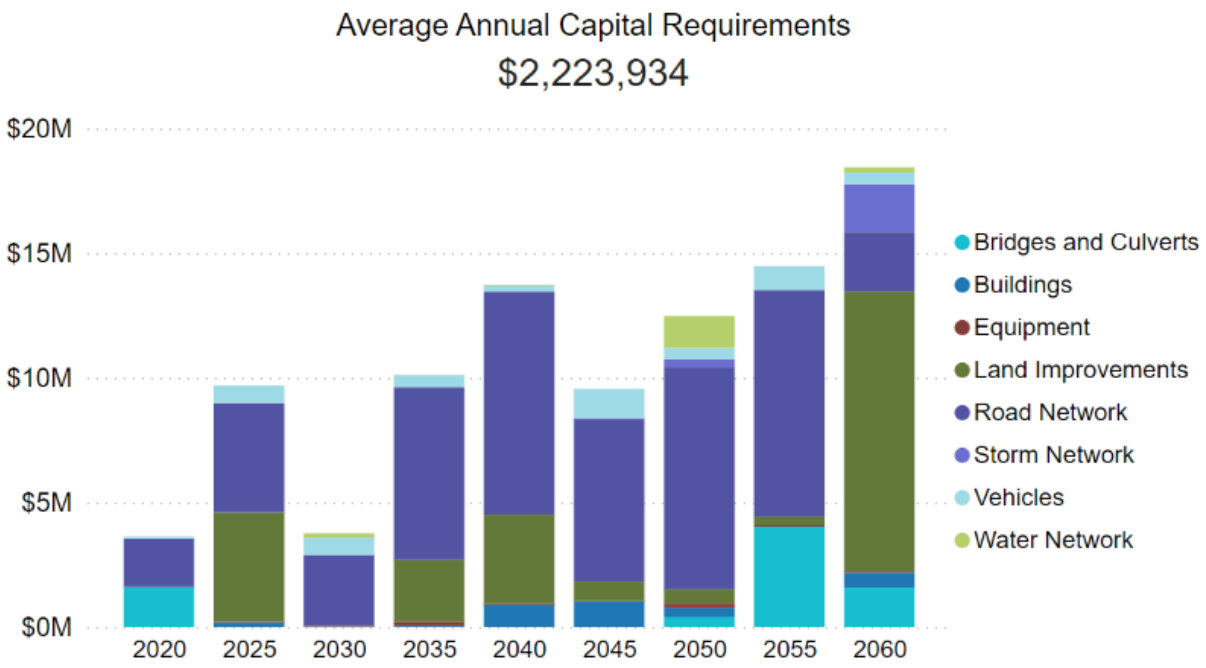
Based on asset age, available assessed condition data and estimated useful life, 50% of the Township's assets will require replacement within the next 10 years,

assuming an end of life replacement scenario. Capital requirements over the next 10 years are identified in Appendix A.



3.5Forecasted 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 40 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.


Average Annual Capital Requirements
$2,223,934
$20M
$15M
$10M
$5M
$0M
2020
2025
2030
2035
2040
2045
2050
2055
2060
Bridges and Culverts
Buildings
Equipment
Land Improvements
Road Network
Storm Network
Vehicles
Water Network

4 Analysis of Tax-funded Assets

Key Insights

- Tax-funded assets are valued at $77.3 million
- 28.3% of tax-funded assets are in fair or better condition
- The average annual capital requirement to sustain the current level of service for tax-funded assets is approximately $2.18 million
- Critical assets should be evaluated to determine appropriate risk mitigation activities and treatment options

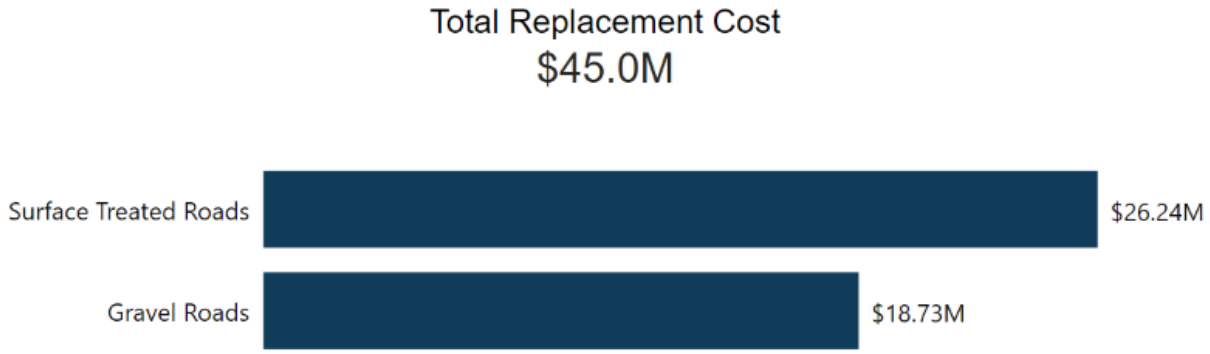
4.1Road Network

The road network is a critical component of the provision of safe and efficient transportation services and represents the highest value asset category in the Township's asset portfolio. It includes all municipally owned and maintained roadways.

4.1.1 Asset Inventory & Replacement Cost

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

Asset Segment	Quantity	Replacement Cost Method	Total Replacement Cost
Gravel Roads	37.45 Length(km)	User-Defined Cost	$18,725,000
Surface Treated Roads	32.8 Length (km)	User-Defined Cost	$26,240,000
			$44,965,000



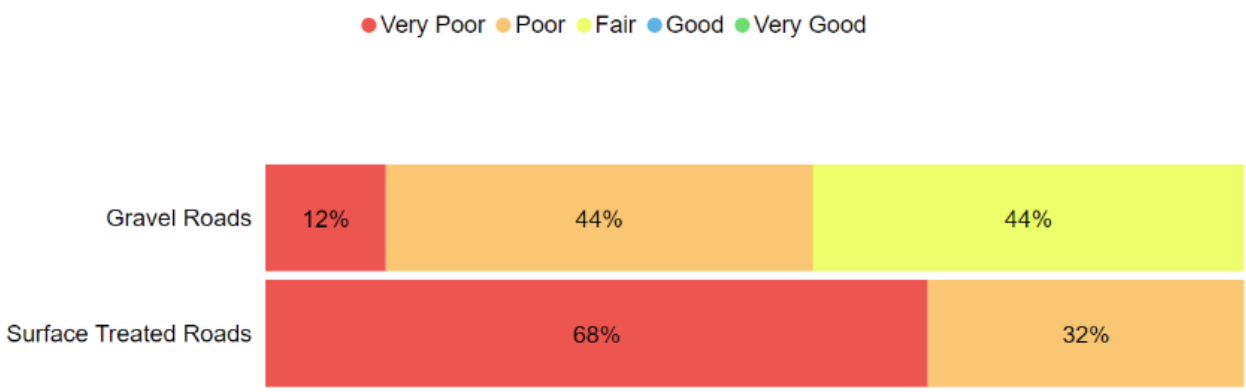
Each asset's replacement cost should be reviewed periodically to determine whether adjustments are needed to more accurate represent realistic capital requirements.

4.1.2 Asset Condition

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

Asset Segment	Average Condition (%)	Average Condition Rating	Condition Source
Gravel Roads	46%	Fair	100% Assessed
Surface Treated Roads	24%	Poor	94% Assessed
	35%	**Poor**	**100% Assessed**

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

Current Approach to Condition Assessment

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

- A Road Needs Study was completed in 2009 that included a detailed assessment of the condition of each road segment.

- Another Road Needs Study was completed 5 years ago by external contractors. It is a challenge to complete these assessments continuously because of budget constraints.
- Road patrols are completed by internal staff based on the minimum maintenance standards.

4.1.3 Estimated Useful Life & Average Age

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

Asset Segment	Estimated Useful Life (Years)	Average Age (Years)	Average Service Life Remaining (Years)
Gravel Roads	50 Years	60 Years	5 Years
Surface Treated Roads	41 Years	33 Years	7 Years
		49 Years	6 Years

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

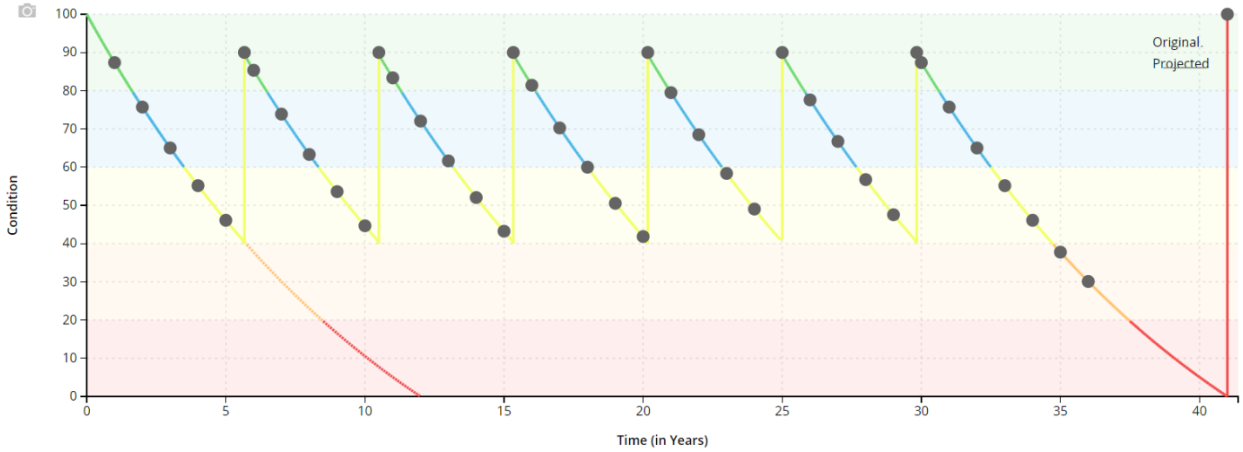
4.1.4 Lifecycle Management Strategy

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

Activity Type	Description of Current Strategy
Operations and Maintenance	The operations and maintence program employed by the Township includes pothole maintenance, grading as needed for gravel road, as well as roadside mowing and snow removal for all roads.
Rehabilitation and Replacement	Historically, rehabilitation activities included single surface treatments for surface treated roads, depending on budget availability. Additionally, when a significant budget for road rehabilitation or reconstruction is needed, the prioritization is usually evalutaed by staff and council support is needed.

The following lifecycle strategies have been developed as a proposed proactive approach to managing the lifecycle of surface treated 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.

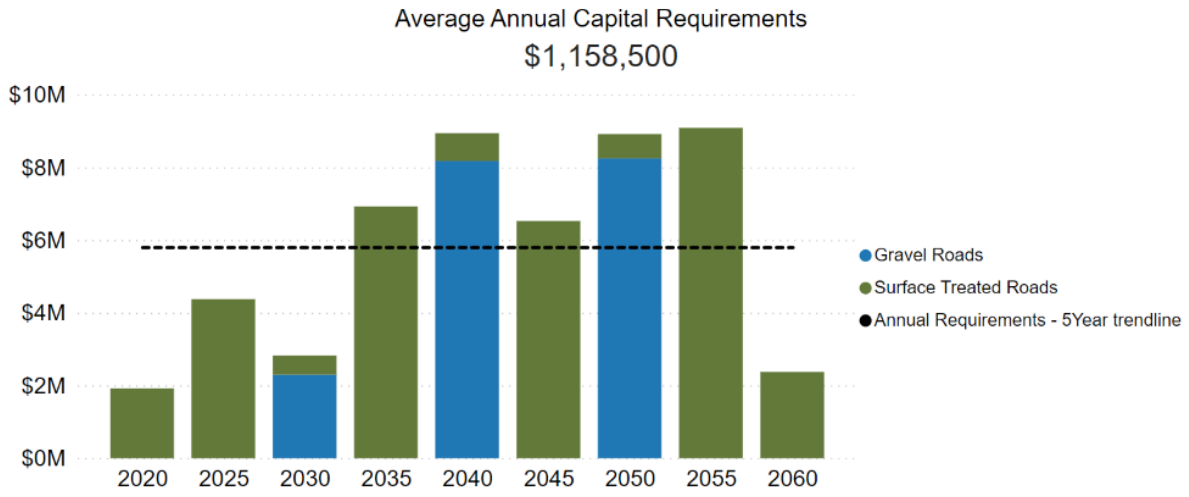
Surface Treated Roads		
Event Name	**Event Class**	**Event Trigger**
Potholes Maintenance	Maintenance	Every Year
Double Surface Treatment	Rehabilitation	30 Condition
Full Reconstruction	Replacement	0 Condition



Forecasted Capital Requirements

Based on the lifecycle strategies identified previously for surface treated 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 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 40 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.



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

4.1.5 Risk & Criticality

Risk Matrix

The following risk matrix provides a visual representation of the relationship between the probability of failure and the consequence of failure for the assets within this asset category based on 2021 inventory data. See Appendix C for the criteria used to determine the risk rating of each asset.

Consequence	Probability 1	2	3	4	5
5	0 Assets - $0.00	0 Assets - $0.00	0 Assets - $0.00	0 Assets - $0.00	1 Asset 2.10 km $1,680,000.00
4	8 Assets 10.20 km $8,160,000.00	0 Assets - $0.00	6 Assets 9.15 km $4,575,000.00	11 Assets 13.35 km $6,675,000.00	16 Assets 27.75 km $19,650,000.00
3	1 Asset 0.40 km $320,000.00	0 Assets - $0.00	4 Assets 2.35 km $1,175,000.00	7 Assets 3.00 km $1,500,000.00	5 Assets 1.95 km $1,230,000.00
2	0 Assets - $0.00	0 Assets - $0.00	0 Assets - $0.00	0 Assets - $0.00	0 Assets - $0.00
1	0 Assets - $0.00	0 Assets - $0.00	0 Assets - $0.00	0 Assets - $0.00	0 Assets - $0.00

This is a high-level model developed for the purposes of this AMP and 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 the road network are documented below:

Probability of Failure (POF)	Consequence of Failure (COF)
Condition (Economic)	Replacement Cost (Financial)
	Road Type (Social)

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.

Risks to Current Asset Management Strategies

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

Asset Condition Data and Lifecycle Management Strategies

The Township has invested in PSD CityWide™ and is working towards developing asset lifecycle strategies. However, as of now no formal lifecycle strategy has been adopted. The last formal condition assessment scores are outdated. This AMP relies on updated staff assessments.

Climate Change & Extreme Weather Events

Flooding and extreme weather events like increased freeze and thaw cycles can cause damage the Township's roads. lake levels and storm/wind intensity have caused roads to wash out due to heavy rainfall.

Growth and Tourism

The roads within the Township are receiving greater volumes of traffic due to the increase in tourist volumes and greater ferry capacities, resulting in faster deterioration of roads.

Infrastructure Installation and Design

The roads within the Township were not initially designed to handle the traffic volumes and traffic loads they are currently receiving. Furthermore, some road bases around the Township were not constructed properly when they were built.

Infrastructure Re-investment

The Township is always looking for acquiring grants/additional external funding for the Road Network capital projects. Furthermore, the tax revenues are dependent on the population which is minor compared to the number of road users that are mainly tourists.

Organizational Capacity

The Township is challenged by staff capacity limitation (one or two staff) due to its geographic location and financial constraints.

4.1.6 Levels of Service

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

Community Levels of Service

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

Service Attribute	Qualitative Description	Current LOS (2021)
Scope	Description, which may include maps, of the road network in the Township and its level of connectivity	See Appendix B
Quality	Description or images that illustrate the different levels of road class pavement condition	The Township completed a staff assessment for the 2021 inventory data. Every road section received a condition score, rating the condition of the surface of the road on a scale of 0-100. (0-20) Road surface exhibits significant deterioration and requires reconstruction immediately (20-40) Road surface exhibits moderate to significant deterioration and requires rehabilitation immediately (40-60) Road surface is in fair condition. Resurfacing will be required in the next 1-5 years. (60-80) Road surface is in good condition. Resurfacing will be required in the next 6-10 years. (80-100) Road surface condition is very good. No road needs have been identified in the next 10 years.

Technical Levels of Service

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

Service Attribute	Technical Metric	Current LOS (2021)
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
	Lane-km of local roads (MMS classes 5 and 6) per land area (km/km^2)	3.36
Quality	Average pavement condition index for paved roads in the Township	Poor
	Average surface condition for unpaved roads in the Township (e.g. excellent, good, fair, poor)	Fair
Performance	Capital reinvestment rate	0.41%

4.1.7 Recommendations

Asset Inventory

- Review roads and supporting infrastructure inventory to determine whether all municipal assets within these asset segments have been accounted for.
- Adopt a review cycle to update the replacement costs with recent market pricing.

Condition Assessment Strategies

- Enhance the current assessment frequency and consider adopting attributes such as the adjusted Pavement Condition Index, Riding Comfort, Utilization Rates, and Drainage Adequacy

Lifecycle Management Strategies

- Implement the identified lifecycle management strategies for surface treated roads to realize potential cost avoidance and maintain a high quality of road pavement condition.
- Evaluate the efficacy of the Township's lifecycle management strategies at regular intervals to determine the impact cost, condition and risk. This could be done by updating the condition assessment data whenever new data becomes available and rerunning the capital projections and risk reports.

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 or data availability.

Levels of Service

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

4.2Bridges & Culverts

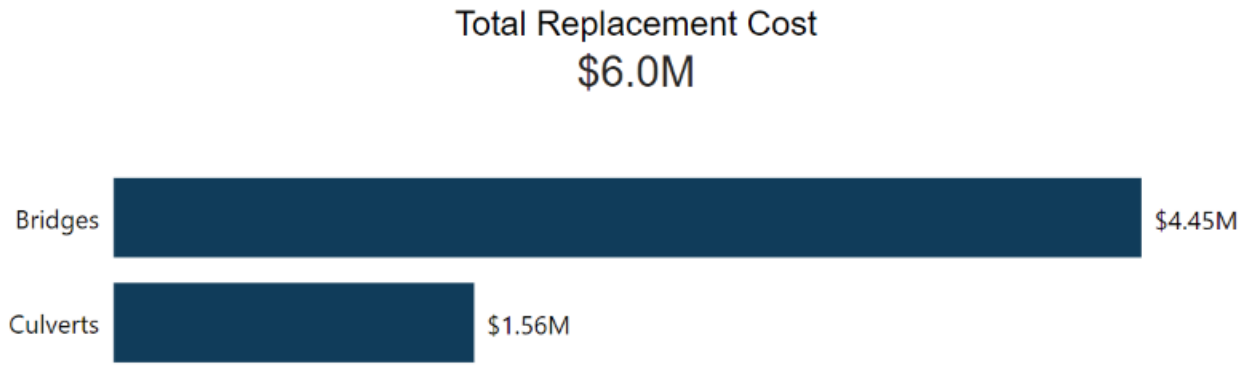
The Township's bridges and culverts comprises of 12 structures that have a span of 3 meters or more and are therefore categorized as a bridge or a structural culvert asset.

The Department of Public Works is responsible for the maintenance of all bridges and culverts located across municipal roads with the goal of keeping structures in an adequate state of repair and minimizing service disruptions.

4.2.1 Asset Inventory & Replacement Cost

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

Asset Segment	Quantity	Replacement Cost Method	Total Replacement Cost
Bridges	6	User-Defined Cost	$4,452,055
Culverts	6	User-Defined Cost	$1,560,929
			$6,012,984



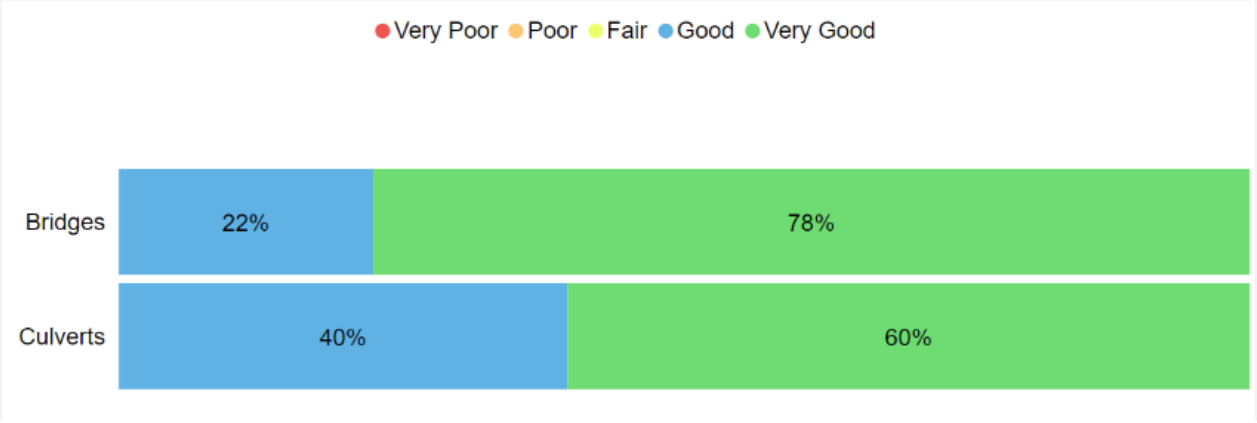
Each asset's replacement cost should be reviewed periodically to determine whether adjustments are needed to more accurate represent realistic capital requirements.

4.2.2 Asset Condition

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

Asset Segment	Average Condition (%)	Average Condition Rating	Condition Source
Bridges	81%	Very Good	100% Assessed
Culverts	77%	Good	100% Assessed
	79%	**Good**	**100% Assessed**

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

Current Approach to Condition Assessment

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

4.2.3 Estimated Useful Life & Average Age

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

Asset Segment	Estimated Useful Life (Years)	Average Age (Years)	Average Service Life Remaining (Years)
Bridges	40	71 Years	33 Years
Structural Culverts	40	71 Years	30 Years
	40	**71 Years**	**31 Years**

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

4.2.4 Lifecycle Management Strategy

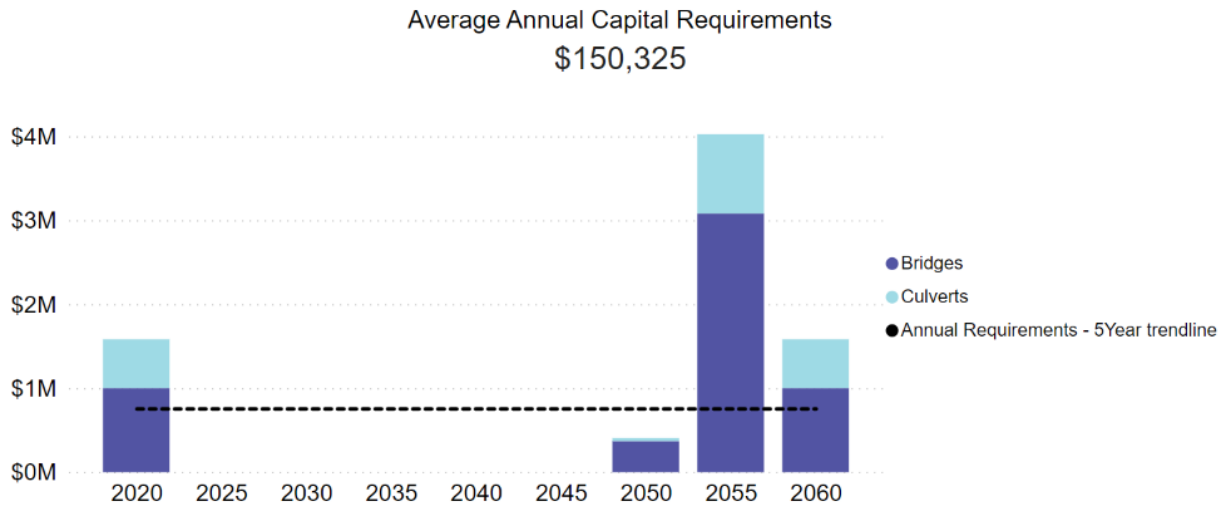
The condition or performance of most assets will deteriorate over time. To ensure that municipal assets are performing as expected and meeting the needs of customers, it is important to establish a lifecycle management strategy to proactively manage asset deterioration.

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

Activity Type	Description of Current Strategy
Operations and Maintenance	Bridge deck cleaning is completed annually on an as-needed basis.
Rehabilitation and Replacement	All lifecycle activities are driven by the results of mandated structural inspections competed according to the Ontario Structure Inspection Manual (OSIM). However, no actual rehabilitation activities have been completed in the last 35 years. The bridges are usually replaced when they are due for replacement.

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 40 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.



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

4.2.5 Risk & Criticality

Risk Matrix

The following risk matrix provides a visual representation of the relationship between the probability of failure and the consequence of failure for the assets within this asset category based on 2021 inventory data. See Appendix C for the criteria used to determine the risk rating of each asset.

Consequence	1	2	3	4	5
5	4 Assets 4.00 unit(s) $3,150,684.92	2 Assets 2.00 unit(s) $1,518,000.00	0 Assets - $0.00	0 Assets - $0.00	0 Assets - $0.00
4	4 Assets 4.00 unit(s) $1,243,188.05	0 Assets - $0.00	0 Assets - $0.00	0 Assets - $0.00	0 Assets - $0.00
3	0 Assets - $0.00	2 Assets 2.00 unit(s) $101,111.11	0 Assets - $0.00	0 Assets - $0.00	0 Assets - $0.00
2	0 Assets - $0.00	0 Assets - $0.00	0 Assets - $0.00	0 Assets - $0.00	0 Assets - $0.00
1	0 Assets - $0.00	0 Assets - $0.00	0 Assets - $0.00	0 Assets - $0.00	0 Assets - $0.00

Probability

This is a high-level model developed for the purposes of this AMP and 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 (Economic)	Replacement Cost (Financial)

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.

Risks to Current Asset Management Strategies

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

Asset Condition Data and Lifecycle Management Strategies

The Township has invested in PSD CityWide™ and is working towards developing asset lifecycle strategies. However, as of now no formal lifecycle strategy has been adopted.

Climate Change & Extreme Weather Events

Flooding and extreme weather events can cause damage the Township's bridges and culverts. High water volumes can cause erosion to the aforementioned structures.

Growth and Tourism

The roads within the Township are receiving greater volumes of traffic due to the increase in tourist volumes and greater ferry capacities, resulting in faster deterioration of wearing surface of bridges and culverts.

Infrastructure Installation and Design

The bridges and culverts within the Township were not initially designed to handle the traffic volumes and traffic loads they are currently receiving.

Infrastructure Re-investment

The Township is always looking for acquiring grants/additional external funding for the capital projects related to bridges and culverts. Furthermore, the tax revenues are dependent on the population which is minor compared to the number of road users that are mainly tourists.

Organizational Capacity

The Township is challenged by staff capacity limitation (one or two staff) due to its geographic location and financial constraints.

4.2.6 Levels of Service

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

Community Levels of Service

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

Service Attribute	Qualitative Description	Current LOS (2021)
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. Most types of vehicles, including heavy transport, motor vehicles, emergency vehicles and cyclists can cross them without restriction.
Safe & Regulatory	Description of the OSIM inspection process	External contractor (Stantec) completes OSIM inspections every 2 years providing detailed condition information for the Township's bridges and structural culverts.
Quality	Description or images of the condition of bridges and culverts and how this would affect use of the bridges and culverts	See Appendix B

Technical Levels of Service

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

Service Attribute	Technical Metric	Current LOS (2021)
Scope	% of bridges in the Township with loading or dimensional restrictions	0%
Quality	% of bridges inspected every two years	100%
	Average bridge condition index value for bridges in the Township	81
	Average bridge condition index value for structural culverts in the Township	77
Performance	Capital re-investment rate	0%

4.2.7 Recommendations

Data Review/Validation

- Continue to review and validate inventory data, assessed condition data and replacement costs for all bridges and structural culverts upon the completion of OSIM inspections every 2 years.

Lifecycle Management Strategies

- This AMP includes capital costs associated with the reconstruction and rehabilitation of bridges and culverts. The Township should start to identify projected capital rehabilitation and renewal costs for bridges and culverts while integrating the findings of the OSIM inspections into long-term planning.

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 or data availability.

Levels of Service

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

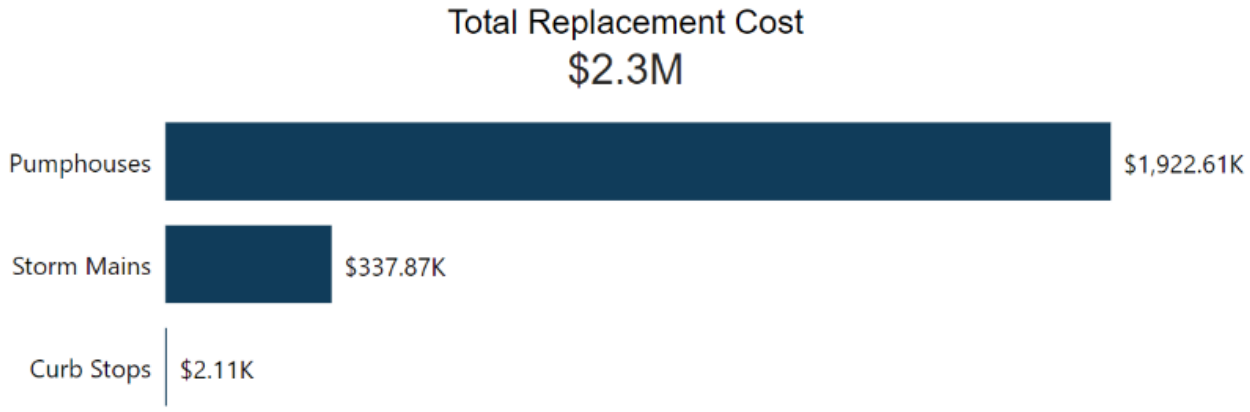
4.3 Storm Network

The Township is responsible for owning and maintaining a Storm Network of two segments of storm mains, curbs stops, and pumphouses.

4.3.1 Asset Inventory & Replacement Cost

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

Asset Segment	Quantity	Replacement Cost Method	Total Replacement Cost
Curb Stop	1	CPI Tables	$2,112
Pumphouses	3	User-Defined Cost	$1,922,611
Storm Mains	2	CPI Tables	$337,872
			$2,262,595



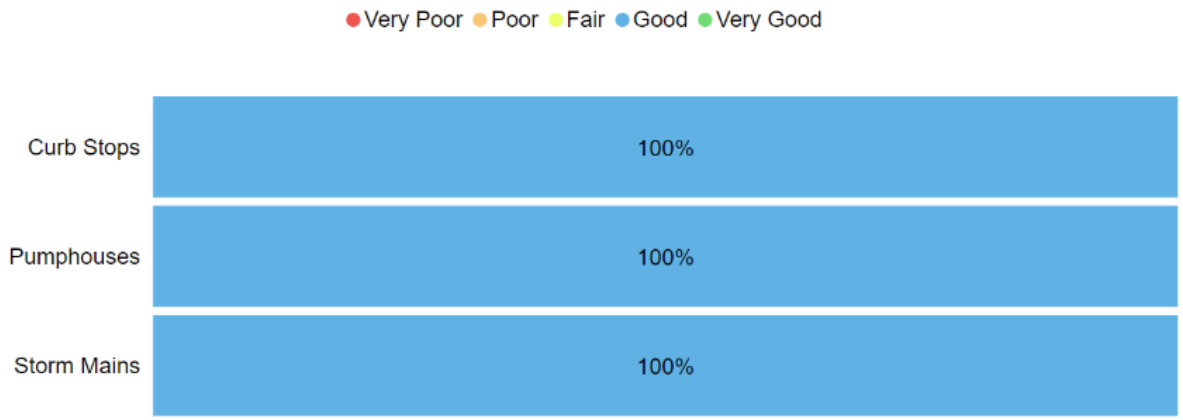
Each asset's replacement cost should be reviewed periodically to determine whether adjustments are needed to more accurate represent realistic capital requirements.

4.3.2 Asset Condition

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

Asset Segment	Average Condition (%)	Average Condition Rating	Condition Source
Curb Stop	80%	Very Good	100% Age Based
Pumphouses	80%	Very Good	100% Age Based
Storm Mains	76%	Good	100% Age Based
	78%	**Good**	**100% Age Based**

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

Current Approach to Condition Assessment

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

- Pumphouses and motors are inspected on an annual basis, resulting in identifying the upgrades and maintenance work required.

4.3.3 Estimated Useful Life & Average Age

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

Asset Segment	Estimated Useful Life (Years)	Average Age (Years)	Average Service Life Remaining (Years)
Curb Stop	40 Years	8 Years	32 Years
Pumphouses	50 Years	10 Years	40 Years
Storm Mains	40 Years	12 Years	28 Years
		10 Years	**35 Years**

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

4.3.4 Lifecycle Management Strategy

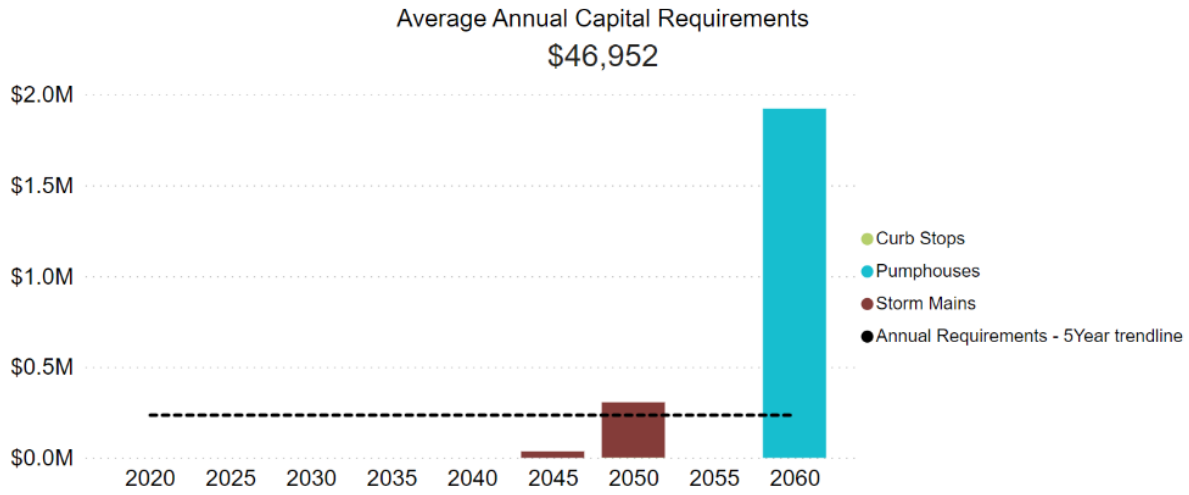
The condition or performance of most assets will deteriorate over time. To ensure that municipal assets are performing as expected and meeting the needs of customers, it is important to establish a lifecycle management strategy to proactively manage asset deterioration.

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

Activity Type	Description of Current Strategy
Maintenance	The maintenance work required is identified as part of the annual inspection process. These activities are carried after being identified.
Rehabiltion and Replacement	The rehabilitation and replacement activities are identifies as part of the annual inspection process. The value for money and feasibility of these activities is then analyzed by Council.

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 40 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.



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

4.3.5 Risk & Criticality

Risk Matrix

The following risk matrix provides a visual representation of the relationship between the probability of failure and the consequence of failure for the assets within this asset category based on 2021 inventory data. See Appendix C for the criteria used to determine the risk rating of each asset.

Consequence	Probability 1	2	3	4	5
5	3 Assets 3.00 unit(s) $1,922,610.99	0 Assets - $0.00	0 Assets - $0.00	0 Assets - $0.00	0 Assets - $0.00
4	0 Assets - $0.00	1 Asset 1.00 unit(s) $302,961.00	0 Assets - $0.00	0 Assets - $0.00	0 Assets - $0.00
3	0 Assets - $0.00	1 Asset 1.00 unit(s) $34,911.00	0 Assets - $0.00	0 Assets - $0.00	0 Assets - $0.00
2	0 Assets - $0.00	0 Assets - $0.00	0 Assets - $0.00	0 Assets - $0.00	0 Assets - $0.00
1	0 Assets - $0.00	1 Asset 1.00 unit(s) $2,112.00	0 Assets - $0.00	0 Assets - $0.00	0 Assets - $0.00

This is a high-level model developed for the purposes of this AMP and 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 the Storm Network are documented below:

Probability of Failure (POF)	Consequence of Failure (COF)
Condition (Economic)	Replacement Cost (Financial)

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.

Risks to Current Asset Management Strategies

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

Aging Infrastructure

The Storm Network in the Township has never been replaced before, resulting in many storm sewer assets reaching the end of their useful life, or having already exceeded their useful life. Most of the system was built in the 1980's and 1990's.

Asset Data & Information

There is a lack of confidence in the available segmentation of assets, especially the linear assets.

Lifecycle Management Strategies

Historically, the lifecycle management strategy for the Storm Network was considered more reactive than proactive. It is a challenge to find the right balance between maintenance, capital rehabilitation, and the replacement of assets.

Infrastructure Design & Extreme Weather Events

Across the Township, a significant number of storm sewer pipes and pump stations may require upgrades to be able to accommodate for the increased rainfalls due to climate change.

Capital Funding Strategies

Major capital rehabilitation projects for the Storm Network will be heavily reliant on the availability of grant funding opportunities. When grants are not available, Storm Network rehabilitation/replacement projects may be deferred.

4.3.6 Levels of Service

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

Community Levels of Service

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

Service Attribute	Qualitative Description	Current LOS (2021)
Scope	Description, which may include map, of the user groups or areas of the Township that are protected from flooding, including the extent of protection provided by the municipal storm sewer system	See Appendix B

Technical Levels of Service

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

Service Attribute	Technical Metric	Current LOS (2021)
Scope	% of properties in Township resilient to a 100-year storm	25%
	% of the municipal storm sewer management system resilient to a 5-year storm	25%
Quality	% of the stormwater Network that is in good or very good condition	100%
	% of the stormwater Network that is in poor or very poor condition	0%
Performance	Capital reinvestment rate	2.08%

4.3.7 Recommendations

Asset Inventory

- The Township's Storm Network inventory should get segmented/componentized to better reflect assets that have unique useful lives and unique lifecycle management strategies. The development of a comprehensive inventory of the Storm Network should be priority.

Condition Assessment Strategies

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

Risk Management Strategies

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

Lifecycle Management Strategies

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

Levels of Service

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

4.4Buildings

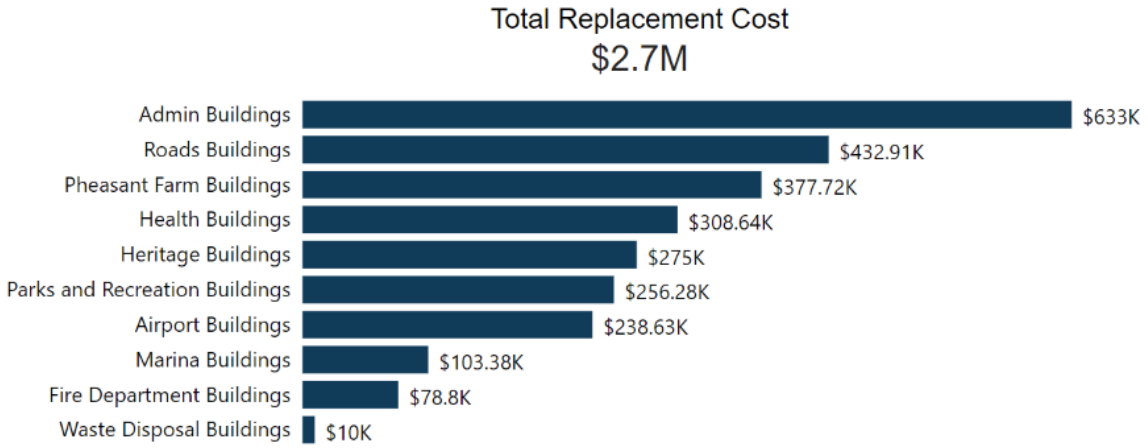
The Township of Pelee owns and maintains several facilities and recreation centres that provide key services to the community. These include:

- Admin Buildings
- Airport Buildings
- Fire Department Buildings
- Health Buildings
- Heritage Buildings
- Marina Buildings
- Parks and Recreation Buildings
- Pheasant Farm Buildings
- Roads Buildings
- Waste Disposal Buildings

4.4.1 Asset Inventory & Replacement Cost

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

Asset Segment	Quantity	Replacement Cost Method	Total Replacement Cost
Admin Buildings	1	User-Defined Cost	$633,000
Airport Buildings	3	CPI Tables / User-Defined Cost	$238,625
Fire Department Buildings	1	User-Defined Cost	$78,800
Health Buildings	1	CPI Tables	$308,644
Heritage Buildings	1	User-Defined Cost	$275,000
Marina Buildings	4	CPI Tables / User-Defined Cost	$103,380
Parks and Recreation Buildings	6	CPI Tables	$256,279
Pheasant Farm Buildings	7	CPI Tables / User-Defined Cost	$377,723
Roads Buildings	2	CPI Tables	$432,913
Waste Disposal Buildings	1	User-Defined Cost	$10,000
			$2,714,364



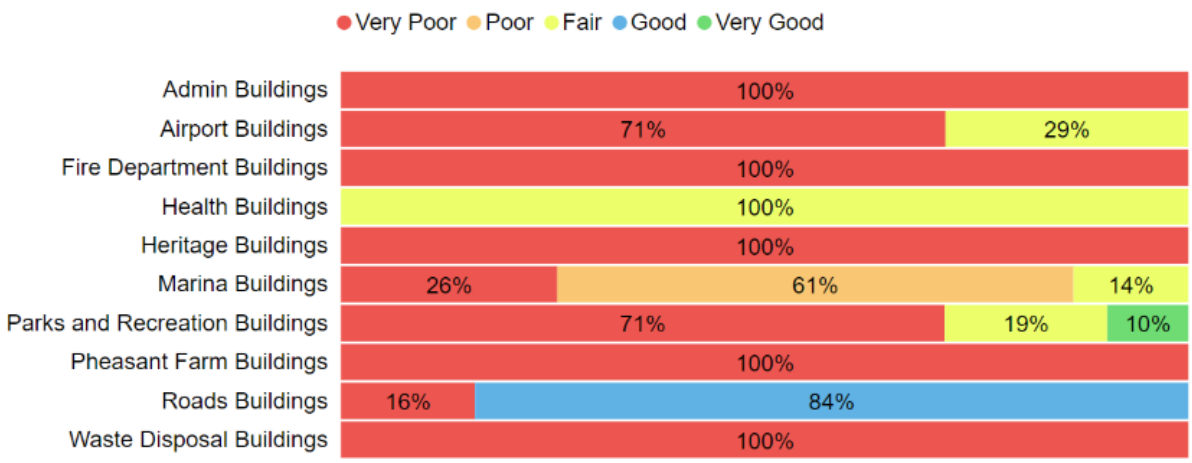
Each asset's replacement cost should be reviewed periodically to determine whether adjustments are needed to more accurate represent realistic capital requirements.

4.4.2 Asset Condition

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

Asset Segment	Average Condition (%)	Average Condition Rating	Condition Source
Admin Buildings	0%	Very Poor	100% Age-Based
Airport Buildings	14%	Very Poor	100% Age-Based
Fire Department Buildings	0%	Very Poor	100% Age-Based
Health Buildings	44%	Fair	100% Age-Based
Heritage Buildings	0%	Very Poor	100% Age-Based
Marina Buildings	25%	Poor	100% Age-Based
Parks and Recreation Buildings	22%	Poor	100% Age-Based
Pheasant Farm Buildings	1%	Very Poor	100% Age-Based
Roads Buildings	55%	Fair	100% Age-Based
Waste Disposal Buildings	0%	Very Poor	100% Age-Based
	16%	**Very Poor**	**100% Age-Based**

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

Current Approach to Condition Assessment

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

- Staff complete regular inspections on buildings. These inspections are mainly related to Health and Safety.

4.4.3 Estimated Useful Life & Average Age

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

Asset Segment	Estimated Useful Life (Years)	Average Age (Years)	Average Service Life Remaining (Years)
Admin Buildings	25 Years	66 Years	-41 Years
Airport Buildings	30 Years	39 Years	-9 Years
Fire Department Buildings	50 Years	71 Years	-21 Years
Health Buildings	50 Years	28 Years	22 Years
Heritage Buildings	25 Years	110 Years	-85 Years
Marina Buildings	35 Years	27 Years	7 Years
Parks and Recreation Buildings	37 Years	21 Years	16 Years
Pheasant Farm Buildings	24 Years	31 Years	-7 Years
Roads Buildings	35 Years	24 Years	10 Years
Waste Disposal Buildings	25 Years	131 Years	-106 Years
		38 Years	**-6 Years**

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

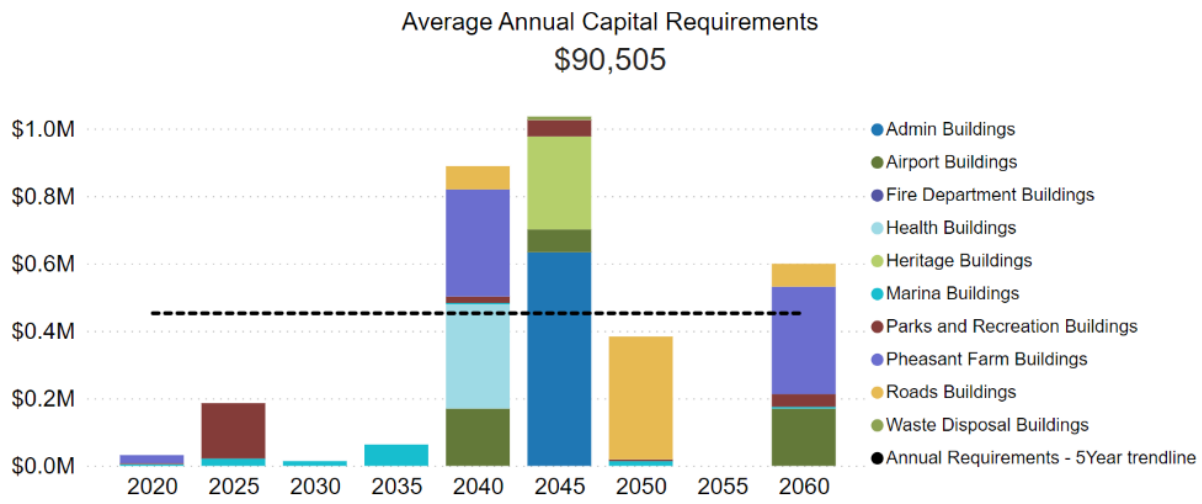
4.4.4 Lifecycle Management Strategy

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

Activity Type	Description of Current Strategy
Maintenance and Rehabilitation	Municipal buildings are subject to regular inspections to identify structural deficiencies that require additional attention.
Replacement	Components of facilities are usually replaced when they fail.

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 40 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.



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

4.4.5 Risk & Criticality

The Buildings category 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 risk and criticality associated to assets within this category.

4.4.6 Levels of Service

The Buildings category 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.

4.4.7 Recommendations

Asset Inventory

- The Township's asset inventory contains a single or a few assets for all facilities. Facilities consist of several separate capital components that have unique estimated useful lives and require asset-specific lifecycle strategies. Staff should work towards a component-based inventory of all facilities to allow for component-based lifecycle planning.

Condition Assessment Strategies

- A comprehensive structural assessment of all Buildings is highly recommended to gain a better understanding of the overall heath and condition of each facility to identify accurate short- and long-term capital requirements.

Risk Management Strategies

- Work towards developing risk models and adjust according to an evolving understanding of the probability and consequences of asset failure.

Levels of Service

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

4.5Vehicles

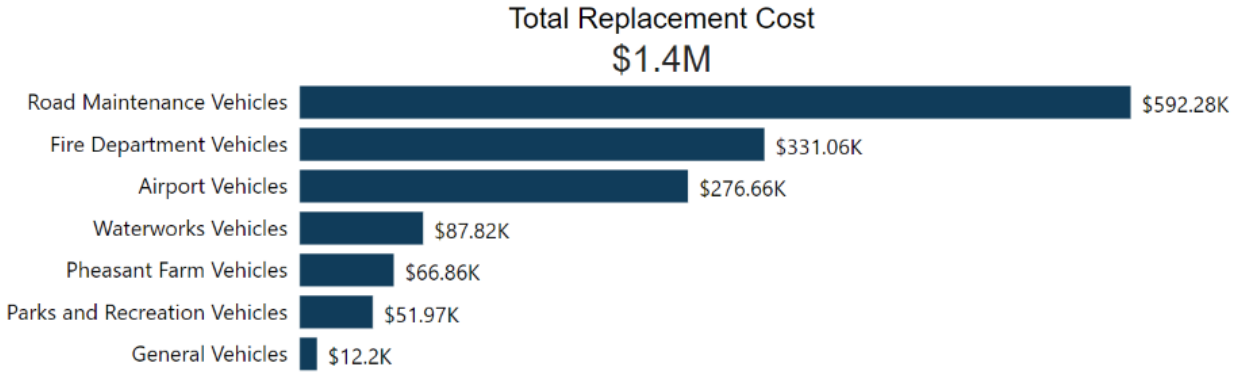
Vehicles allow staff to efficiently deliver municipal services. Municipal vehicles are used to support several service areas. These assets are grouped using the following segments:

- Airport Vehicles
- Fire Department Vehicles
- General Vehicles
- Parks and Recreation Vehicles
- Pheasant Farm Vehicles
- Road Maintenance Vehicles
- Waterworks Vehicles

4.5.1 Asset Inventory & Replacement Cost

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

Asset Segment	Quantity	Replacement Cost Method	Total Replacement Cost
Airport Vehicles	2	CPI Tables	$276,657
Fire Department Vehicles	4	User-Defined Cost, CPI Tables	$331,059
General Vehicles	1	CPI Tables	$12,195
Parks and Recreation Vehicles	2	CPI Tables	$51,972
Pheasant Farm Vehicles	2	User-Defined Cost, CPI Tables	$66,857
Road Maintenance Vehicles	13	User-Defined Cost, CPI Tables	$592,284
Waterworks Vehicles	3	User-Defined Cost, CPI Tables	$87,820
			$1,418,844



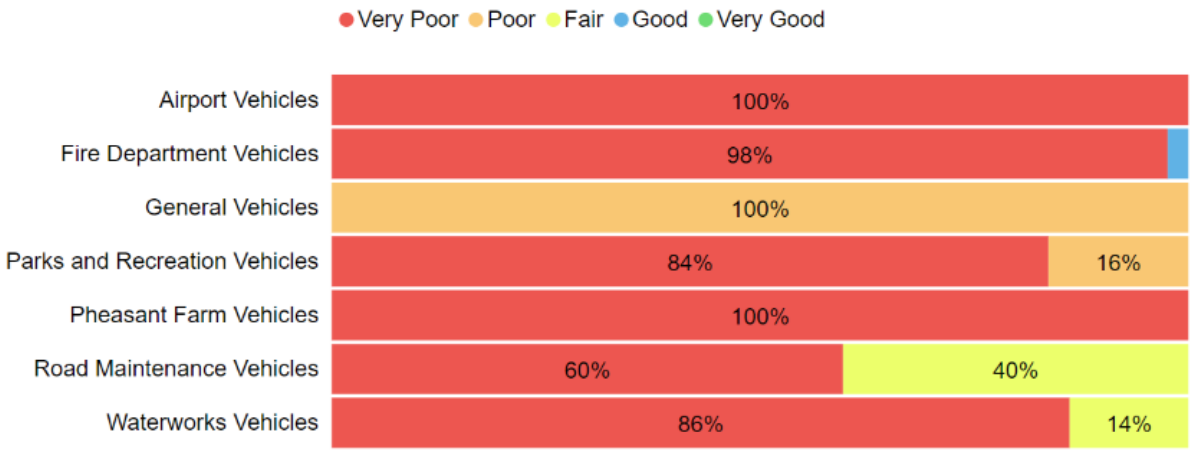
Each asset's replacement cost should be reviewed periodically to determine whether adjustments are needed to more accurate represent realistic capital requirements.

4.5.2 Asset Condition

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

Asset Segment	Average Condition (%)	Average Condition Rating	Condition Source
Airport Vehicles	0%	Very Poor	100% Age Based
Fire Department Vehicles	2%	Very Poor	100% Age Based
General Vehicles	36%	Poor	100% Age Based
Parks and Recreation Vehicles	4%	Very Poor	100% Age Based
Pheasant Farm Vehicles	0%	Very Poor	100% Age Based
Road Maintenance Vehicles	21%	Poor	100% Age Based
Waterworks Vehicles	7%	Very Poor	100% Age Based
	10%	**Very Poor**	**100% Age Based**

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 of the vehicles.

Current Approach to Condition Assessment

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

- Staff complete regular visual inspections of vehicles to ensure they are in state of adequate repair

4.5.3 Estimated Useful Life & Average Age

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

Asset Segment	Estimated Useful Life (Years)	Average Age (Years)	Average Service Life Remaining (Years)
Airport Vehicles	10 Years	24 Years	-14 Years
Fire Department Vehicles	12 Years	16 Years	-4 Years
General Vehicles	8 Years	5 Years	3 Years
Parks and Recreation Vehicles	8 Years	12 Years	4 Years
Pheasant Farm Vehicles	8 Years	39 Years	-31 Years
Road Maintenance Vehicles	11 Years	22 Years	-12 Years
Waterworks Vehicles	9 Years	12 Years	-3 Years
		20 Years	**-10 Years**

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

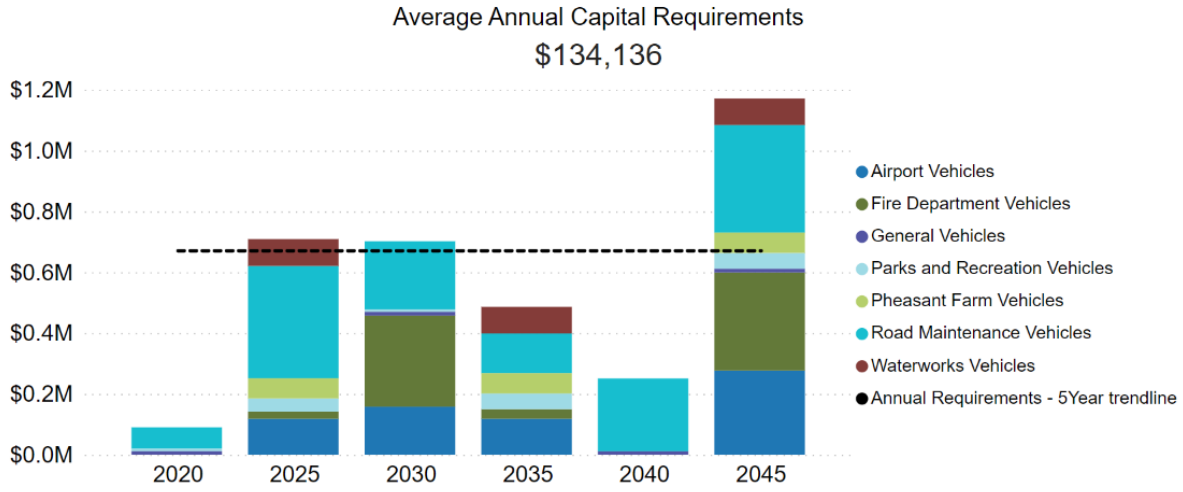
4.5.4 Lifecycle Management Strategy

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

Activity Type	Description of Current Strategy
Maintenance and Rehabilitation	Visual inspections completed and documented daily.
	Annual preventative maintenance activities completed where possible.
Replacement	Vehicle replacements are based on insurance policies and standards, especially for fire vehicles.
	Vehicle age is driving factor when determining appropriate treatment options.

Forecasted Capital Requirements

The following graph forecasts long-term capital requirements. The annual capital requirement represents the average amount per year that the Township should allocate towards funding rehabilitation and replacement needs. The following graph identifies capital requirements over the next 25 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.



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

4.5.5 Risk & Criticality

The Vehicles category 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 risk and criticality associated to assets within this category.

4.5.6 Levels of Service

The Vehicles category 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.

4.5.7 Recommendations

Replacement Costs

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

Condition Assessment Strategies

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

Risk Management Strategies

- Work towards developing risk models and adjust these models according to an evolving understanding of the probability and consequences of asset failure.

Levels of Service

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

4.6Equipment

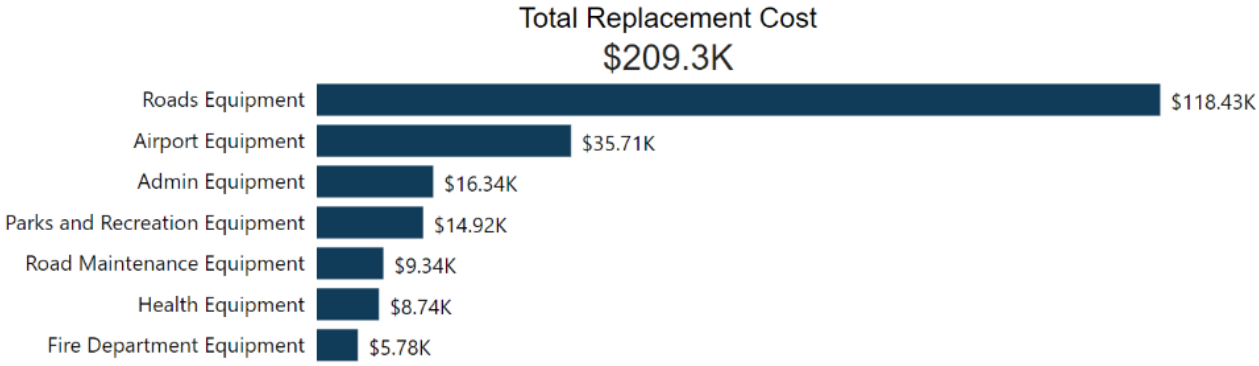
In order to maintain the high quality of public infrastructure and support the delivery of core services, Township staff own and employ various types of equipment. This includes:

- Admin Equipment
- Airport Equipment
- Fire Department Equipment
- Health Equipment
- Parks and Recreation Equipment
- Road Maintenance Equipment
- Road Equipment

4.6.1 Asset Inventory & Replacement Cost

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

Asset Segment	Quantity	Replacement Cost Method	Total Replacement Cost
Admin Equipment	2	CPI Tables	$16,340
Airport Equipment	2	CPI Tables	$35,706
Fire Department Equipment	1	CPI Tables	$5,780
Health Equipment	1	CPI Tables	$8,740
Parks and Recreation Equipment	4	CPI Tables	$14,915
Road Maintenance Equipment	1	CPI Tables	$9,340
Road Equipment	5	User-Defined Cost, CPI Tables	$118,429
			$209,250



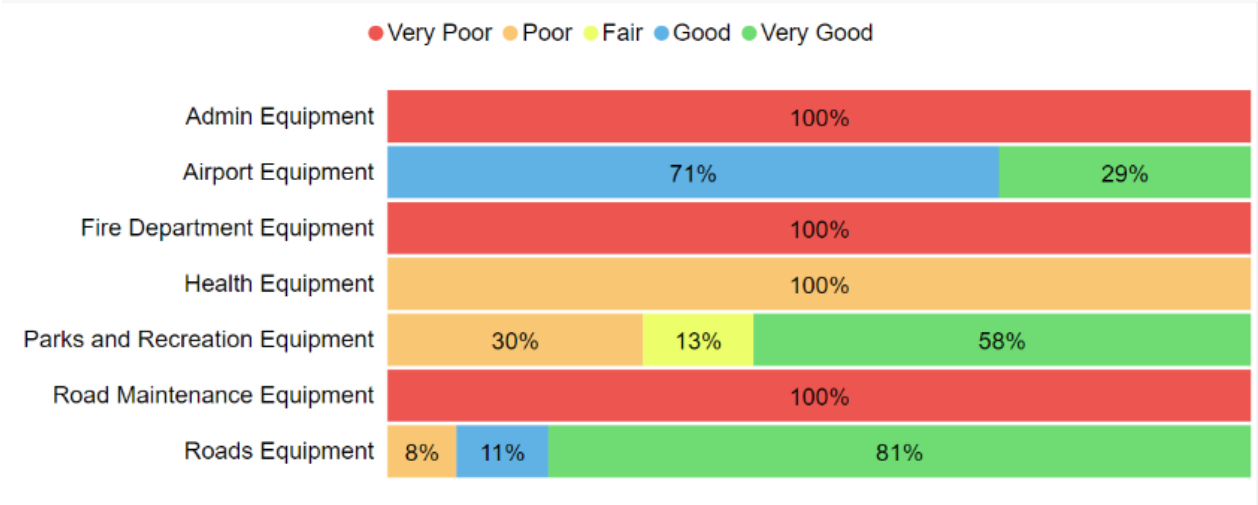
Each asset's replacement cost should be reviewed periodically to determine whether adjustments are needed to more accurate represent realistic capital requirements.

4.6.2 Asset Condition

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

Asset Segment	Average Condition (%)	Average Condition Rating	Condition Source
Admin Equipment	0%	Very Poor	100% Age-Based
Airport Equipment	83%	Very Good	100% Age-Based
Fire Department Equipment	0%	Very Poor	100% Age-Based
Health Equipment	39%	Poor	100% Age-Based
Parks and Recreation Equipment	64%	Good	100% Age-Based
Road Maintenance Equipment	0%	Very Poor	100% Age-Based
Road Equipment	90%	Very Good	100% Age-Based
	40%	**Fair**	**100% Age-Based**

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 monitor the average condition of all assets. If the average condition declines, staff should re-evaluate their lifecycle management strategy to determine what combination of maintenance, rehabilitation and replacement activities is required to increase the overall condition of the machinery and equipment.

Current Approach to Condition Assessment

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

- Staff complete regular inspections of their equipment based on standards defined by regulatory and insurance requirements.

4.6.3 Estimated Useful Life & Average Age

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

Asset Segment	Estimated Useful Life (Years)	Average Age (Years)	Average Service Life Remaining (Years)
Admin Equipment	5 Years	8 Years	-3 Years
Airport Equipment	17 Years	3 Years	15 Years
Fire Department Equipment	10 Years	12 Years	-2 Years
Health Equipment	15 Years	9 Years	6 Years
Parks and Recreation Equipment	11 Years	5 Years	6 Years
Road Maintenance Equipment	10 Years	10 Years	0 Years
Road Equipment	17 Years	4 Years	14 Years
		6 Years	**7 Years**

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

4.6.4 Lifecycle Management Strategy

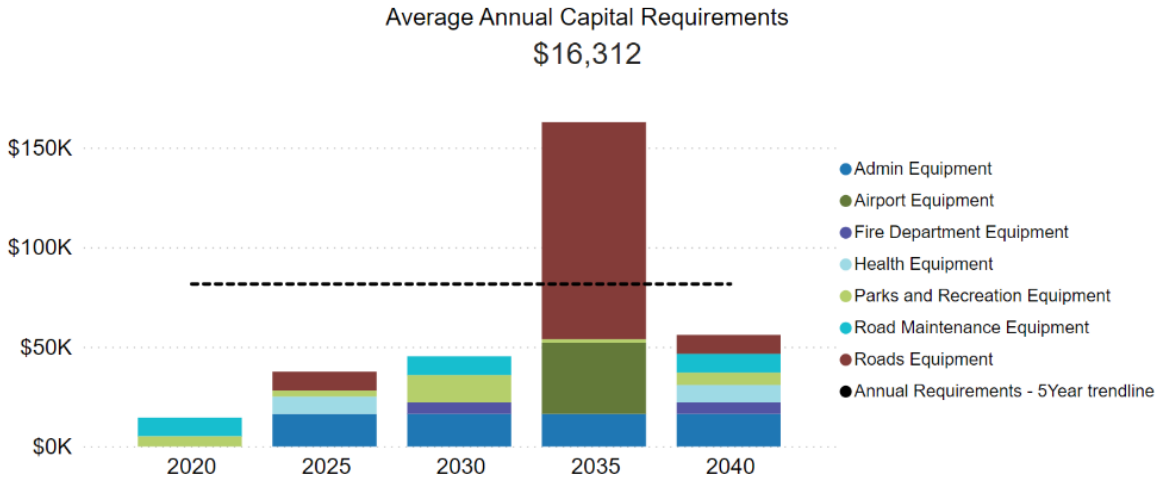
The condition or performance of most assets will deteriorate over time. To ensure that municipal assets are performing as expected and meeting the needs of customers, it is important to establish a lifecycle management strategy to proactively manage asset deterioration.

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

Activity Type	Description of Current Strategy
Maintenance/ Rehabilitation	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.
	Equipment is maintained according to insurance recommended actions and supplemented by the expertise of municipal staff.
Replacement	The replacement of equipment depends on deficiencies identified by operators that may impact their ability to complete required tasks.

Forecasted Capital Requirements

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



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

4.6.5 Risk & Criticality

The Equipment category 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 risk and criticality associated to assets within this category.

4.6.6 Levels of Service

The Equipment category 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.

4.6.7 Recommendations

Replacement Costs

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

Condition Assessment Strategies

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

Risk Management Strategies

- Work towards developing risk models and adjust these models according to an evolving understanding of the probability and consequences of asset failure.

Levels of Service

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

4.7Land Improvements

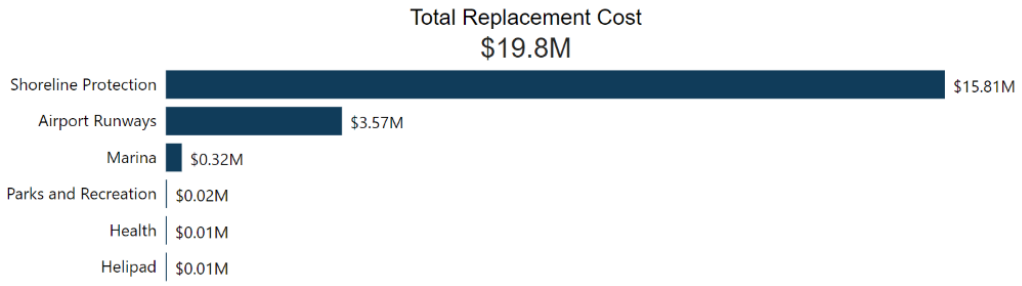
The Township of Pelee owns a number of assets that are considered Land Improvements. This category includes:

- Airport Runways
- Health
- Helipad
- Marina
- Parks and Recreation
- Shoreline Protection

4.7.1 Asset Inventory & Replacement Cost

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

Asset Segment	Quantity	Replacement Cost Method	Total Replacement Cost
Airport Runways	2	CPI Tables	$3,574,426
Health	1	CPI Tables	$13,946
Helipad	1	CPI Tables	$12,059
Marina	1	CPI Tables	$322,197
Parks and Recreation	1	CPI Tables	$22,511
Shoreline Protection	18,851 Length (m), Quantity	CPI Tables	$15,814,852
			$19,759,991



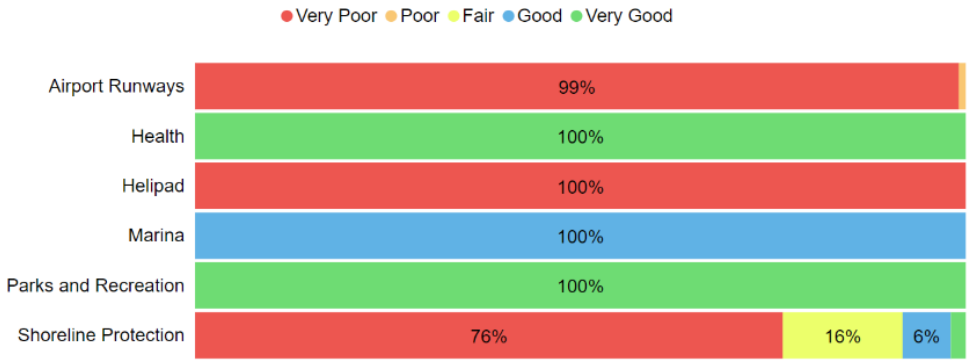
Each asset's replacement cost should be reviewed periodically to determine whether adjustments are needed to more accurate represent realistic capital requirements.

4.7.2 Asset Condition

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

Asset Segment	Average Condition (%)	Average Condition Rating	Condition Source
Airport Runways	0%	Very Poor	100% Age-Based
Health	82%	Very Good	100% Age-Based
Helipad	0%	Very Poor	100% Age-Based
Marina	75%	Good	100% Age-Based
Parks and Recreation	84%	Very Good	100% Age-Based
Shoreline Protection	16%	Very Poor	100% Age-Based
	43%	**Fair**	**100% Age-Based**

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 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 of the land improvements.

Current Approach to Condition Assessment

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

- No formal condition score is applied to the land improvement assets.

4.7.3 Estimated Useful Life & Average Age

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

Asset Segment	Estimated Useful Life (Years)	Average Age (Years)	Average Service Life Remaining (Years)
Airport Runways	20 Years	19 Years	1 Year
Health	20 Years	4 Years	16 Years
Helipad	12 Years	15 Years	-3 Years
Marina	40 Years	10 Years	30 Years
Parks and Recreation	25 Years	4 Years	21 Years
Shoreline Protection	40 Years	26 Years	14 Years
		22 Years	**13 Years**

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

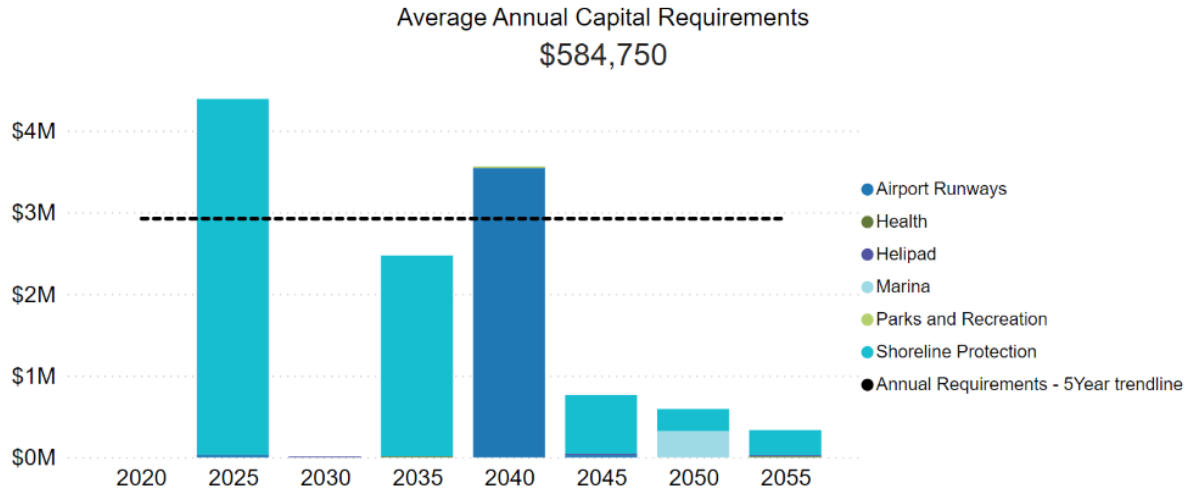
4.7.4 Lifecycle Management Strategy

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

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

Forecasted Capital Requirements

The following graph forecasts long-term capital requirements. The annual capital requirement represents the average amount per year that the Township should allocate towards funding rehabilitation and replacement needs. The following graph identifies capital requirements over the next 35 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.



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

4.7.5 Risk & Criticality

The Land Improvements category 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 risk and criticality associated to assets within this category.

4.7.6 Levels of Service

The Land Improvements category 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.

4.7.7 Recommendations

Replacement Costs

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

Condition Assessment Strategies

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

Risk Management Strategies

- Work towards developing risk models and adjust these models according to an evolving understanding of the probability and consequences of asset failure.

Levels of Service

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

5 Analysis of Rate-funded Assets

Key Insights

- Rate-funded assets are valued at $1.6 million
- 78% of rate-funded assets are in fair or better condition
- The average annual capital requirement to sustain the current level of service for rate-funded assets is approximately $42,455

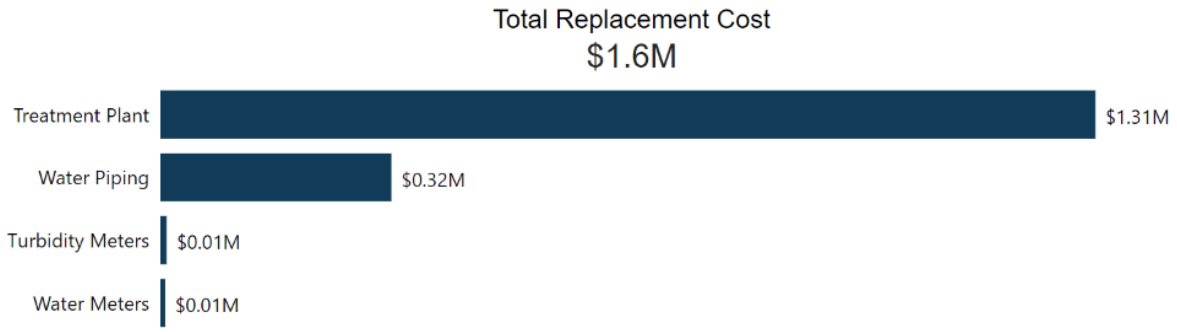
5.1 Water Network

The Township's Water Network inventory is managed in CityWide™, and comprises of 7 unique assets, including 1.45 kilometres of water mains, treatment plants, water meters, and turbidity meters.

5.1.1 Asset Inventory & Replacement Cost

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

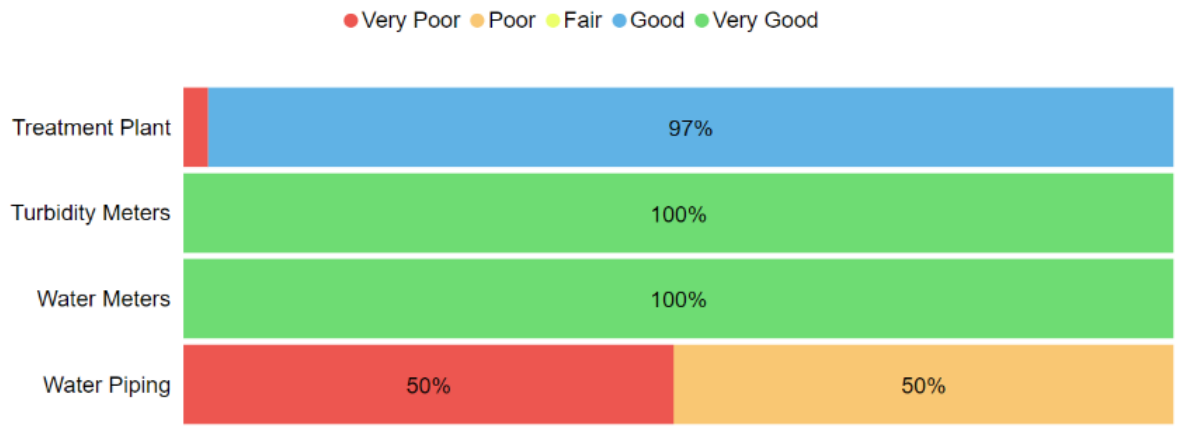
Asset Segment	Quantity	Replacement Cost Method	Total Replacement Cost
Treatment Plant	3	User-Defined Cost / CPI Tables	$1,308,206
Water Piping	1.45 Length (km)	User-Defined Cost / CPI Tables	$323,097
Water Meters	19	User-Defined Cost	$6,773
Turbidity Meter	1	User-Defined Cost	$8,717
			$1,646,793



5.1.2 Asset Condition

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

Asset Segment	Average Condition (%)	Average Condition Rating	Condition Source
Treatment Plant	70%	Good	100% Age Based
Water Piping	15%	Very Poor	50% Assessed
Water Meters	83%	Very Good	100% Age Based
Turbidity Meter	96%	Very Good	100% Age Based
	66%	**Good**	**90 % Age Based**



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

Current Approach to Condition Assessment

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

- Aside from the inspections required under O. Reg. 170/3, there are no formal condition assessment programs in place for the Water Network.

5.1.3 Estimated Useful Life & Average Age

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

Asset Segment	Estimated Useful Life (Years)	Average Age (Years)	Average Service Life Remaining (Years)
Treatment Plant	30	29 Years	1 Year
Water Piping	40	43 Years	-3 Years
Water Meters	25	4 Years	21 Years
Turbidity Meter	15	1 Year	14 Years
		25 Years	**5 Years**

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

5.1.4 Lifecycle Management Strategy

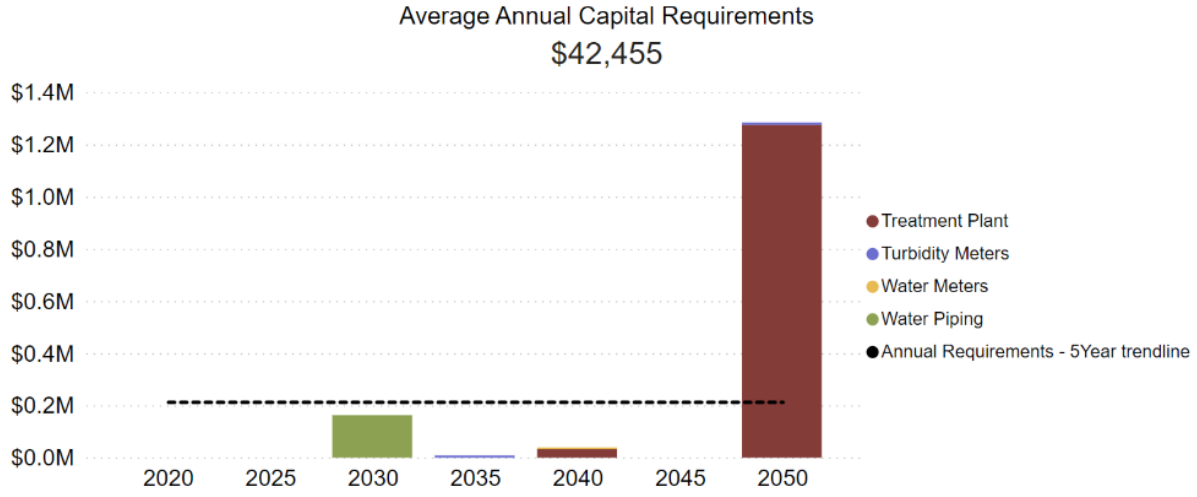
The condition or performance of most assets will deteriorate over time. To ensure that municipal assets are performing as expected and meeting the needs of customers, it is important to establish a lifecycle management strategy to proactively manage asset deterioration.

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

Activity Type	Description of Current Strategy
Maintenance	The maintenance work required is identified as part of the regular inspection process. These activities are carried after being identified.
Rehabilitation & Replacement	The rehabilitation and replacement activities are identified as part of the regular inspection process. The value for money and feasibility of these activities is then analyzed by sttaff and Council.

Forecasted Capital Requirements

Based on the current Water Network inventory, and assuming end-of-life replacement for all assets, the graph below provides a 30-year forecast. This projection is used as it ensures that every asset has gone through one full iteration of replacement and does not include assets that may be required for growth.



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

5.1.5 Risk & Criticality

Risk Matrix

The following risk matrix provides a visual representation of the relationship between the probability of failure and the consequence of failure for the assets within this asset category based on 2021 inventory data. See Appendix C for the criteria used to determine the risk rating of each asset.

Consequence	1	2	3	4	5
5	0 Assets - $0.00	1 Asset 2.00 unit(s) $1,275,406.00	0 Assets - $0.00	0 Assets - $0.00	0 Assets - $0.00
4	0 Assets - $0.00	0 Assets - $0.00	0 Assets - $0.00	0 Assets - $0.00	1 Asset 0.05 km $160,000.00
3	1 Asset 1.00 unit(s) $8,717.00	0 Assets - $0.00	0 Assets - $0.00	1 Asset 1.40 km $163,097.00	1 Asset 1.00 unit(s) $32,800.00
2	1 Asset 19.00 unit(s) $6,773.00	0 Assets - $0.00	0 Assets - $0.00	0 Assets - $0.00	0 Assets - $0.00
1	0 Assets - $0.00	0 Assets - $0.00	0 Assets - $0.00	0 Assets - $0.00	0 Assets - $0.00

Probability

This is a high-level model developed for the purposes of this AMP and 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 the road network are documented below:

Probability of Failure (POF)	Consequence of Failure (COF)
Condition (Economic)	Replacement Cost (Financial)
	Pipe Diameter (Social)[1]

The identification of critical assets allows the Township to determine appropriate risk mitigation strategies and treatment options. Risk mitigation may include asset-

[1] Used for pipes only.

specific lifecycle strategies, condition assessment strategies, or simply the need to collect better asset data.

Risks to Current Asset Management Strategies

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

Aging Infrastructure
The Water Network in the Township has never been replaced before, resulting in many water assets reaching the end of their useful life, or having already exceeded their useful life. Most of the system was built between the 1960's and 1990's.

Asset Data & Information

There is a lack of confidence in the available segmentation of assets, especially the linear assets.

Lifecycle Management Strategies
Historically, the lifecycle management strategy for the Water Network was considered more reactive than proactive. It is a challenge to find the right balance between maintenance, capital rehabilitation, and the replacement of assets.

Capital Funding Strategies
Major capital rehabilitation projects for the Water Network will be heavily reliant on the availability of grant funding opportunities. When grants are not available, Water Network rehabilitation/replacement projects may be deferred.

5.1.6 Levels of Service

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

Community Levels of Service

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

Service Attribute	Qualitative Description	Current LOS (2021)
Scope	Description, which may include maps, of the user groups or areas of the Township that are connected to the municipal Water Network	Appendix B
	Description, which may include maps, of the user groups or areas of the Township that have fire flow	There are no Hydrants in the Township. A fill station for the fire truck is available.
Reliability	Description of boil water advisories and service interruptions	There has been 1 water boil advisory reported due to testing error

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 (2021)
Scope	% of properties connected to the municipal Water Network	Residential:3.5% Commercial: 40.5%
	% of properties where fire flow is available	0%
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 Network	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 Network	0
	# of customer complaints per year	1
Performance	Capital re-investment rate	0%

5.1.7 Recommendations

Asset Inventory

- Refine, segment, and consolidate asset data into the central asset inventory to ensure all relevant assets are accounted for.
- Review and revise replacement costs and critical asset attribute data on a regular basis.

Condition Assessment Strategies

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

Risk Management Strategies

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

Levels of Service

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

6 Impacts of Growth

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

- The costs of growth should be considered in long-term funding strategies that are designed to maintain the current level of service

6.1 Description of Growth Assumptions

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

6.1.1 Township of Pelee Official Plan (2011)

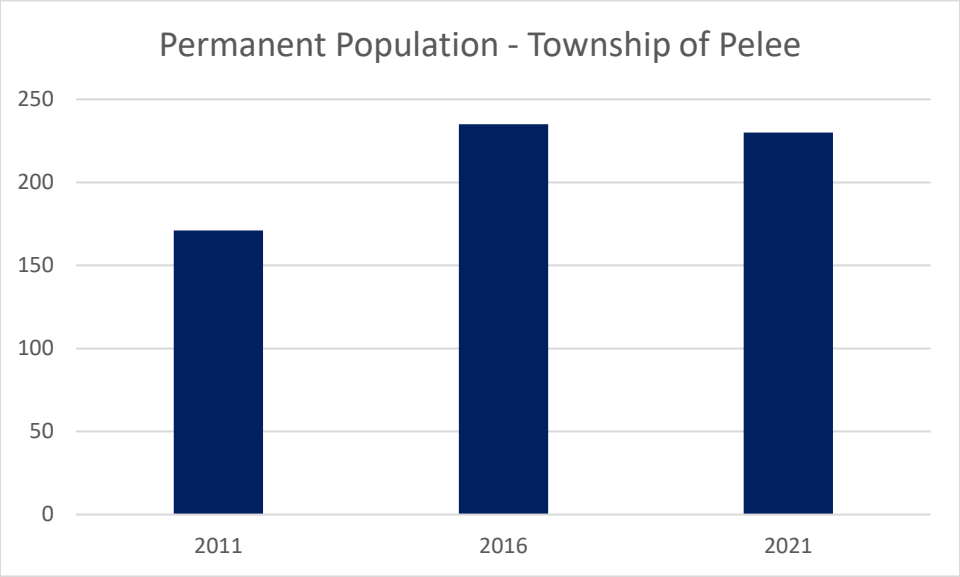
The Township of Pelee adopted an Official Plan to develop a foundation for decisions making, and to establish the pattern which development within the Township should follow. The general purpose of the Official Plan for the Township of Pelee is to set out objectives and policies to guide future development and change within the Township. The Plan addresses future land use and its regulation, municipal services and related economic, social and environmental issues. Within this general purpose, the Plan has the following specific purposes:

- To guide Council in its decision-making in matters of planning, natural heritage, economic development and public works;
- To provide the public with a clear statement of Council's intentions for the future of the Township, and with a degree of certainty about this future;
- To promote a logical and orderly pattern of future development;
- To avoid or minimize future land use conflicts;
- To allocate land for various purposes adequate to meet the future needs of the community;
- To assist the planning of services by the Township and by other public and private bodies.
- To help implement provincial policies at the local level

According to the plan, Pelee needs a permanent population to sustain it as a community and to provide continuity of stewardship. The permanent population of Pelee, and particularly permanent families with children, has experienced a general decline since 1913 and is now at a critical level. The Township needs a reversal in this population trend over the planning period in order to survive and flourish as a community. To achieve this, significant improvements to the economic base and the supporting servicing infrastructure of the Township are necessary. In turn, these must be achieved in a manner consistent with protecting the natural environment which is the basis for much of the Township's current and intended future economy.

According to Canada's Census data, the population in Pelee increased by 34.5% between 2011 and 2021. However, a slight decrease in the population was recorded

between 2016 and 2021. The current permanent population is 230 people as seen below.



6.2 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 AMP. While the addition of residential units will add to the existing assessment base and offset some of the costs associated with growth, the Township will need to review the lifecycle costs of growth-related infrastructure. These costs should be considered in long-term funding strategies that are designed to, at a minimum, maintain the current level of service.

7 Financial Strategy

7.1 Financial Strategy Overview

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

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

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

b. Annual grants

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

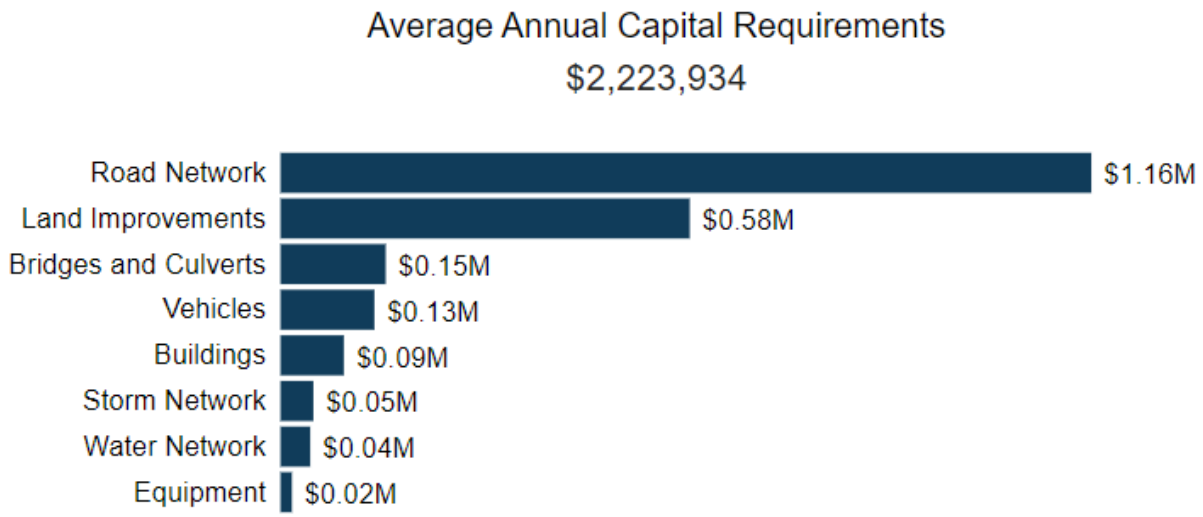
If the financial plan component results in a funding shortfall, the Province requires the inclusion of a specific plan as to how the impact of the shortfall will be managed. In determining the legitimacy of a funding shortfall, the Province may evaluate a Township's approach to the following:

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

7.1.1 Annual Requirements & Capital Funding

Annual Requirements

The annual requirements represent the amount the Township should allocate annually to each asset category to meet replacement needs as they arise, prevent infrastructure backlogs and achieve long-term sustainability. In total, the Township must allocate approximately $2.2 million annually to address capital requirements for the assets included in this AMP.



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

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

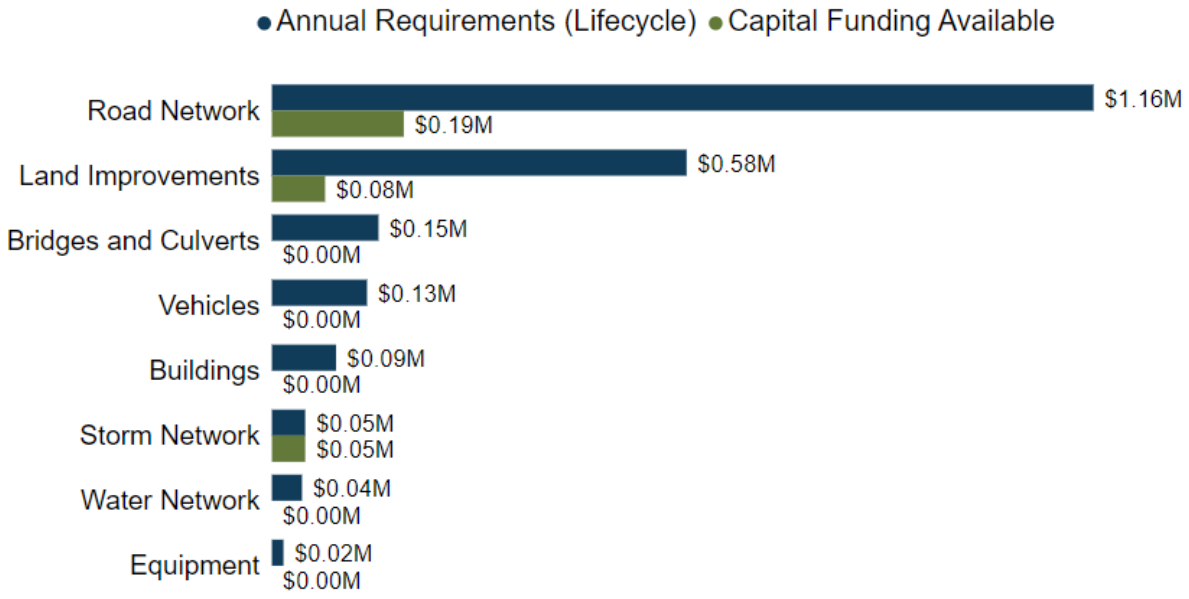
1. **Replacement Only Scenario**: Based on the assumption that assets deteriorate and – without regularly scheduled maintenance and rehabilitation – are replaced at the end of their service life.
2. **Lifecycle Strategy Scenario**: Based on the assumption that lifecycle activities are performed at strategic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

Asset Category	Annual Requirements (Replacement Only)	Annual Requirements (Lifecycle Strategy)	Difference
Road Network	$2,561,000	$1,159,000	$1,403,000

The implementation of a proactive lifecycle strategy for roads leads to a potential annual cost avoidance of $1.4 million for the Road Network. This represents an overall reduction of the annual requirements for the Road Network category by 58%. As the lifecycle strategy scenario represents the lowest cost option available to the Township, we have used these annual requirements in the development of the financial strategy.

Annual Funding Available

Based on a historical analysis of sustainable capital funding sources, the Township is committing approximately $308,000 towards capital projects per year. Given the annual capital requirement of $2.2 million, there is currently a funding gap of $1.9 million annually.



7.2 Funding Objective

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

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

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

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

7.3 Financial Profile: Tax Funded Assets

7.3.1 Current Funding Position

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

Asset Category	Avg. Annual Requirement	Annual Funding Available				Annual Deficit
		Taxes	Gas Tax	OCIF	Total Available	
Bridges and Culverts	$150,000				$0	$150,000
Buildings	$91,000				$0	$91,000
Land Improvements	$585,000	$75,000			$75,000	$510,000
Equipment	$16,000				$0	$0
Road Network	$1,159,000	$122,000	$14,000	$50,000	$186,000	$973,000
Vehicles	$134,000				$0	$134,000
Storm Network	$47,000	$47,000			$47,000	$0
	$2,182,000	**$244,000**	**$14,000**	**$50,000**	**$308,000**	**$1,874,000**

The average annual investment requirement for the above categories is approximately $2.2 million. Annual revenue currently allocated to these assets for capital purposes is approximately $308,000 leaving an annual deficit of about $1874,000. Put differently, these infrastructure categories are currently funded at 14.1% of their long-term requirements.

7.3.2 Full Funding Requirements

In 2020, the Township of Pelee has annual tax revenues of $1.8 million. As illustrated in the following table, without consideration of any other sources of revenue or cost containment strategies, full funding would require the following tax change over time:

Asset Category	Tax Change Required for Full Funding
Bridges & Culverts	8.5%
Buildings	5.1%
Land Improvements	28.8%
Equipment	0.9%
Road Network	54.9%
Vehicles	7.6%
Storm Network	0.0%
	105.8%

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

a) Pelee's debt payments for these asset categories will be increasing by $13,000 over the next 5 years, but will be decreasing by $36,000 overall over the next 20 years.

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

	Without Capturing Changes				With Capturing Changes			
	5 Years	10 Years	15 Years	20 Years	5 Years	10 Years	15 Years	20 Years
Infrastructure Deficit	$1,874,000	$1,874,000	$1,874,000	$1,874,000	$1,874,000	$1,874,000	$1,874,000	$1,874,000
Change in Debt Costs	n/a	n/a	n/a	n/a	$13,000	$(36,000)	$(36,000)	$(36,000)
Change in OCIF Grants	$-	$-	$-	$-	$-	$-	$-	$-
Resulting Infrastructure Deficit Closure Time:	**5**	**10**	**15**	**20**	**5**	**10**	**15**	**20**
Tax Increase Required	105.7%	105.7%	105.7%	105.7%	106.5%	103.7%	103.7%	103.7%
Annually:	**15.6%**	**7.5%**	**5.0%**	**3.7%**	**15.7%**	**7.4%**	**4.9%**	**3.7%**

7.3.3 Financial Strategy Recommendations

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

a) when realized, reallocating the debt cost reductions to the infrastructure deficit as outlined above.
b) increasing tax revenue by 3.7% each year for the next 20 years solely for the purpose of phasing in full funding to the asset categories covered in this section of the AMP.
c) adjusting tax revenue increases in future year(s) when allocations to CapEx exceed or fail to meet budgeted amounts.
d) allocating the current gas tax and OCIF revenue as outlined previously.
e) allocating the scheduled OCIF grant increases to the infrastructure deficit as they occur.
f) reallocating appropriate revenue from categories in a surplus position to those in a deficit position.
g) increasing existing and future infrastructure budgets by the applicable inflation index on an annual basis in addition to the deficit phase-in.

Notes:

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

Although this option achieves full CapEx funding on an annual basis in 20 years and provides financial sustainability over the period modeled, the recommendations do require prioritizing capital projects to fit the resulting annual funding available. Current data shows a pent-up investment demand of $1.4 million for Buildings, $22,000 for Equipment, $1 million for Vehicles, and $11.3 million for Land Improvements.

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

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

7.4 Financial Profile: Rate Funded Assets

7.4.1 Current Funding Position

The following tables show, by asset category, Pelee'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	Gas Tax	OCIF	Total Available	
Water Network	$42,455	$33,808	$0	$0	$0	$42,455
	$42,455	**$33,808**	**$0**	**$0**	**$0**	**$42,455**

The average annual investment requirement for the above categories is about $43,000. The annual revenue currently allocated to these assets for capital purposes is null leaving an annual deficit of around $43,000. Put differently, these infrastructure categories are currently funded at 0% of their long-term requirements.

7.4.2 Full Funding Requirements

In 2020, Pelee annual water revenues of about $34,000. As illustrated in the table below, without consideration of any other sources of revenue, full funding would require the following changes over time:

Asset Category	Rate Change Required for Full Funding
Water Network	125.6%

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

	Water Network			
	5 Years	10 Years	15 Years	20 Years
Infrastructure Deficit	$687,000	$687,000	$687,000	$687,000
Change in Debt Cost	$(1,000)	$(16,200)	$(17,000)	$(17,000)
Tax Increase Required	122.6%	77.7%	75.3%	75.3%
Annually:	**17.4%**	**6.0%**	**3.9%**	**2.9%**

7.4.3 Financial Strategy Recommendations

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

a) when realized, reallocating the debt cost reductions to the infrastructure deficit as outlined above.
b) increasing rate revenues by 2.9% for Water Services each year for the next 20 years.
c) these rate revenue increases are solely for the purpose of phasing in full funding to the respective asset categories covered in this AMP.
d) increasing existing and future infrastructure budgets by the applicable inflation index on an annual basis in addition to the deficit phase-in.

Notes:

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

Although this strategy achieves full CapEx funding for rate-funded assets over 20 years, the recommendation does require prioritizing capital projects to fit the annual funding available. Current data shows a pent-up investment demand of $192,800 for the Water Network.

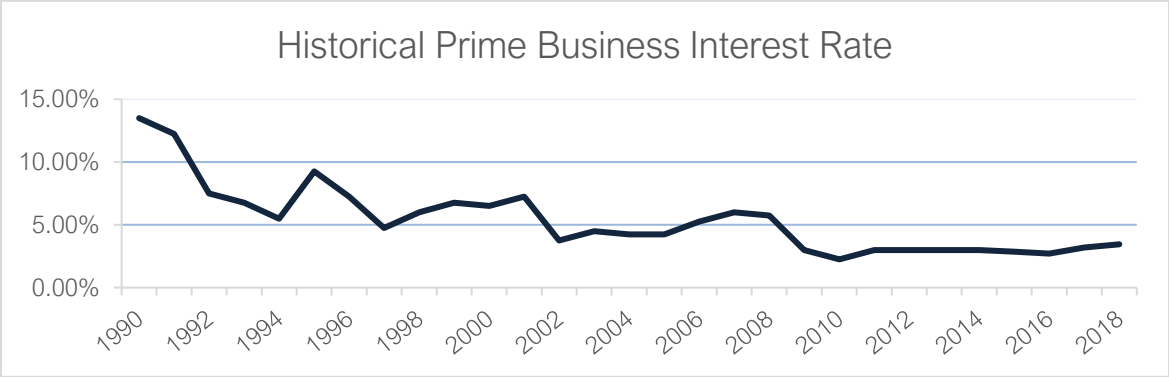
Prioritizing future projects will require the current data to be replaced by condition-based data. Although our recommendations include no further use of debt, the results of the condition-based analysis may require otherwise.

7.5Use 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%[3] 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:



[3] 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 Pelee has historically used debt for investing in the asset categories as listed. There is currently $539,000 of debt outstanding for the assets covered by this AMP with corresponding principal and interest payments of $53,000, well within its provincially prescribed maximum of $2,454,000.

Asset Category	Current Debt Outstanding	Use of Debt in the Last Five Years				
		2016	2017	2018	2019	2020
Road Network	$0	$0	$0	$0	$0	$0
Land Improvements	$0	$0	$0	$0	$0	$0
Bridges & Culverts	$0	$0	$0	$0	$0	$0
Vehicles	$0	$0	$0	$0	$0	$0
Buildings	$296,000	$0	$0	$0	$0	$0
Storm Network	$0	$0	$0	$0	$0	$0
Equipment	$100,000	$0	$0	$0	$0	$0
Total Tax Funded:	**$396,000**	**$0**	**$0**	**$0**	**$0**	**$0**
Water Network	$143,0000	$0	$0	$0	$0	$0
Total Rate Funded:	**$143,000**	**$0**	**$0**	**$0**	**$0**	**$0**

Asset Category	Principal & Interest Payments in the Next Ten Years						
	2020	2021	2022	2023	2024	2025	2030
Road Network	$0	$0	$0	$0	$0	$0	$0
Land Improvements	$0	$0	$0	$0	$0	$0	$0
Bridges & Culverts	$0	$0	$0	$0	$0	$0	$0
Vehicles	$0	$0	$0	$0	$0	$0	$0
Buildings	$23,000	$36,000	$36,000	$36,000	$36,000	$36,000	$0
Storm Network	$0	$0	$0	$0	$0	$0	$0
Equipment	$13,000	$13,000	$13,000	$13,000	$13,000	$13,000	$0
Total Tax Funded	**$36,000**	**$49,000**	**$49,000**	**$49,000**	**$49,000**	**$49,000**	**$49,000**
Water Network	$17,000	$16,000	$16,000	$16,000	$16,000	$16,000	$800
Total Rate Funded:	**$17,000**	**$16,000**	**$16,000**	**$16,000**	**$16,000**	**$16,000**	**$800**

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

7.6Use of Reserves

7.6.1 Available Reserves

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

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

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

Asset Category	Balance on December 31, 2021
Road Network	$504,000
Land Improvements	$129,000
Bridges & Culverts	$0
Vehicles	$0
Buildings	$31,000
Storm Network	$0
Equipment	$41,000
Total Tax Funded	**$705,000**
Water Network	$81,000
Total Rate Funded:	**$81,000**

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

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

These reserves are available for use by applicable asset categories during the phase-in period to full funding. This coupled with Pelee's judicious use of debt in the past, allows the scenarios to assume that, if required, available reserves and debt capacity can be used for high priority and emergency infrastructure investments in the short- to medium-term.

7.6.2 Recommendation

In 2025, Ontario Regulation 588/17 will require Pelee to integrate proposed levels of service for all asset categories in its asset management plan update. We recommend that future planning should reflect adjustments to service levels and their impacts on reserve balances.

8 Appendices

Key Insights

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

Appendix A: 10-Year Capital Requirements

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

Road Network

Asset Segment	Backlog	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
Gravel Roads	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Surface Treated Roads	$0	$318,000	$1,600,000	$0	$0	$4,000,000	$318,000	$60,000	$0	$0	$0
	$0	**$318,000**	**$1,600,000**	**$0**	**$0**	**$4,000,000**	**$318,000**	**$60,000**	**$0**	**$0**	**$0**

Bridges & Culverts

Asset Segment	Backlog	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
Bridges	$0	$0	$1,000,000	$0	$0	$0	$0	$0	$0	$0	$0
Culverts	$0	$0	$0	$583,000	$0	$0	$0	$0	$0	$0	$0
	$0	**$0**	**$1,000,000**	**$583,000**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**

Storm Network											
Asset Segment	Backlog	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
Curb Stop	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Pumphouses	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Storm Mains	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
	$0	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**

Buildings											
Asset Segment	Backlog	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
Admin Buildings	$633,000	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Airport Buildings	$5,776	$0	$0	$0	$0	$0	$0	$164,400	$0	$0	$0
Fire Department Buildings	$78,800	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Health Buildings	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Heritage Buildings	$275,000	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Marina Buildings	$0	$0	$0	$0	$4,782	$0	$21,600	$0	$0	$0	$0
Parks and Recreation Buildings	$15,059	$3,247	$0	$0	$0	$0	$164,231	$0	$0	$0	$0
Pheasant Farm Buildings	$353,853	$0	$0	$0	$13,374	$10,496	$0	$0	$0	$0	$0
Roads Buildings	$68,449	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Waste Disposal Buildings	$10,000	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
	$1,439,937	**$3,247**	**$0**	**$0**	**$18,156**	**$10,496**	**$185,831**	**$164,400**	**$0**	**$0**	**$0**

Equipment											
Asset Segment	Backlog	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
Admin Equipment	$16,340	$0	$0	$0	$0	$0	$16,340	$0	$0	$0	$0
Airport Equipment	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Fire Department Equipment	$5,780	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Health Equipment	$0	$0	$0	$0	$0	$0	$0	$0	$8,740	$0	$0
Parks and Recreation Equipment	$0	$0	$0	$0	$1,903	$3,314	$0	$0	$1,103	$1,903	$0
Road Maintenance Equipment	$0	$0	$9,340	$0	$0	$0	$0	$0	$0	$0	$0
Road Equipment	$0	$0	$0	$0	$0	$0	$0	$0	$9,483	$0	$0
	$22,120	**$0**	**$9,340**	**$0**	**$1,903**	**$3,314**	**$16,340**	**$0**	**$19,326**	**$1,903**	**$0**

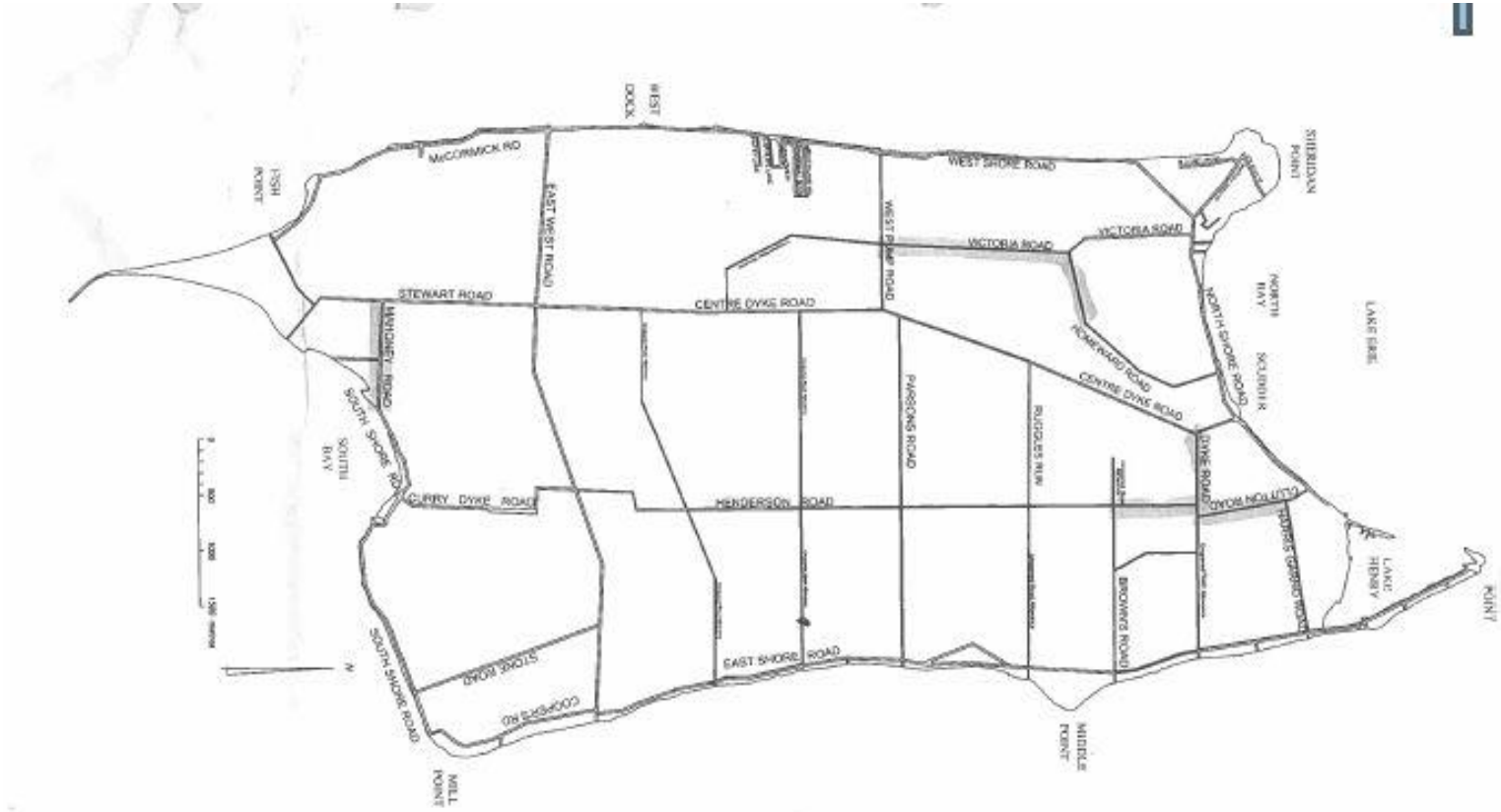
Vehicles											
Asset Segment	Backlog	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
Airport Vehicles	$276,657	$0	$0	$0	$0	$0	$0	$0	$0	$118,695	$0
Fire Department Vehicles	$323,059	$0	$0	$0	$0	$0	$0	$0	$0	$23,059	$0
General Vehicles	$0	$0	$0	$0	$0	$12,195	$0	$0	$0	$0	$0
Parks and Recreation Vehicles	$43,478	$0	$0	$0	$8,494	$0	$0	$0	$0	$43,478	$0
Pheasant Farm Vehicles	$66,857	$0	$0	$0	$0	$0	$0	$0	$0	$66,857	$0
Road Maintenance Vehicles	$283,675	$63,144	$6,617	$0	$0	$0	$0	$0	$0	$130,228	$238,848
Waterworks Vehicles	$75,625	$0	$0	$0	$0	$0	$0	$12,195	$0	$75,625	$0
	$1,069,351	**$63,144**	**$6,617**	**$0**	**$8,494**	**$12,195**	**$0**	**$12,195**	**$0**	**$457,942**	**$238,848**

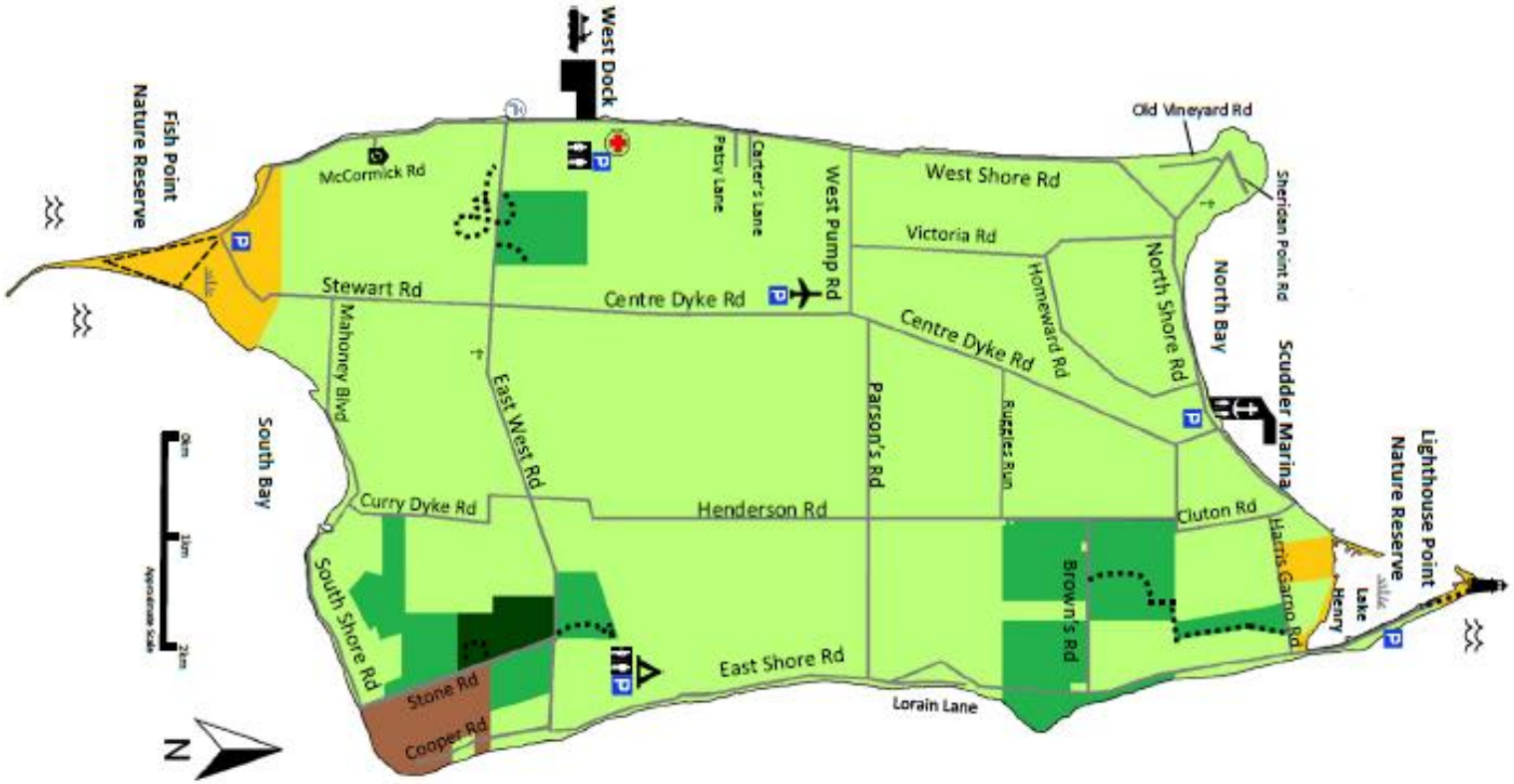
Land Improvements											
Asset Segment	Backlog	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
Airport Runways	$3,541,845	$0	$0	$0	$0	$0	$0	$0	$0	$32,581	$0
Health	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Helipad	$12,059	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Marina	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Parks and Recreation	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Shoreline Protection	$7,703,507	$0	$0	$0	$0	$0	$1,681,875	$2,674,191	$0	$0	$0
	$11,257,411	**$0**	**$0**	**$0**	**$0**	**$0**	**$1,681,875**	**$2,674,191**	**$0**	**$32,581**	**$0**

Water Network											
Asset Segment	Backlog	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
Treatment Plant	$32,800	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Water Piping	$160,000	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Water Meters	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Turbidity Meter	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Total:	**$192,800**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**

Appendix B: Level of Service Maps

Road Network Maps




Lighthouse Point
Nature Reserve
Lake
Henry
Harris Garno Rd
Old Vineyard Rd
Sheridan Point Rd
Scudder Marina
North Bay
North Shore Rd
West Shore Rd
Cluton Rd
Brown's Rd
Victoria Rd
Homeward Rd
Ruggles Run
Centre Dyke Rd
Parson's Rd
West Pump Rd
Carter's Lane
Petty Lane
West Dock
Henderson Rd
East Shore Rd
Lorain Lane
McCormick Rd
Stewart Rd
Centre Dyke Rd
East West Rd
Mahoney Blvd
Curry Dyke Rd
South Shore Rd
Stone Rd
Cooper Rd
South Bay
Fish Point
Nature Reserve
N

2.6 BRIDGES/CULVERTS CONDITION INDEX (BCI)/(CCI)

The bridges/culverts Condition Index (BCI) / (CCI) is a single value rating (0 to 100) calculated for each structure and is an overall indication of the structure's condition. The purpose of calculating a bridges/culverts condition index is to:

- Compare BCIs/CCIs for all structures in the inventory to priorities repair and maintenance programs,
- Provide future indication of the rate of deterioration by comparing current and previous BCIs/CCIs for the same bridges/culverts structure.

The BCI/CCI was calculated using different weightings for various bridges/culverts elements (deck, superstructure, substructure and barrier) as indicted in the following formula:

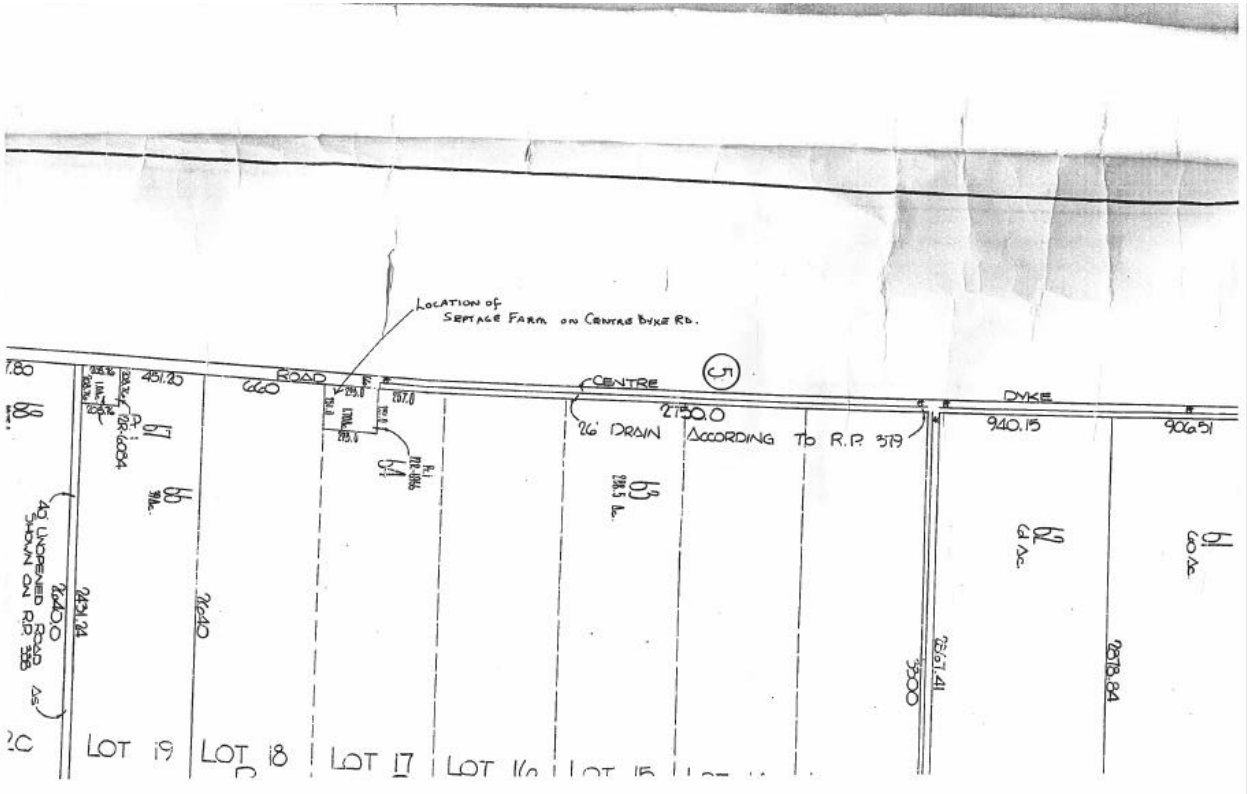
$$BCI_p = 100\ [1 - (35\%\ C_{deck} + 35\%\ C_{beams} + 15\ \%\ C_{substructure} + 15\%\ C_{barrier})]$$

Where C_x = % of Element x in Poor Condition (written as decimal)

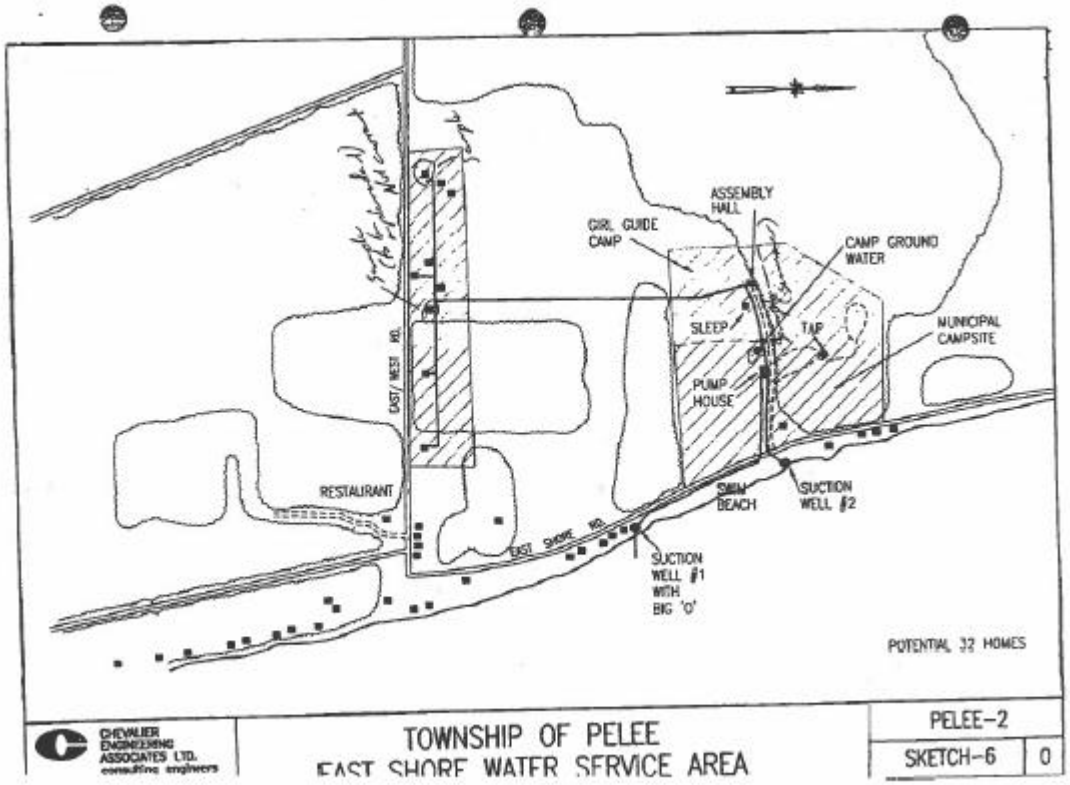
For structure where it does not contain any beams, the C_{beams} is assigned a value same as C_{deck} in the inventory.

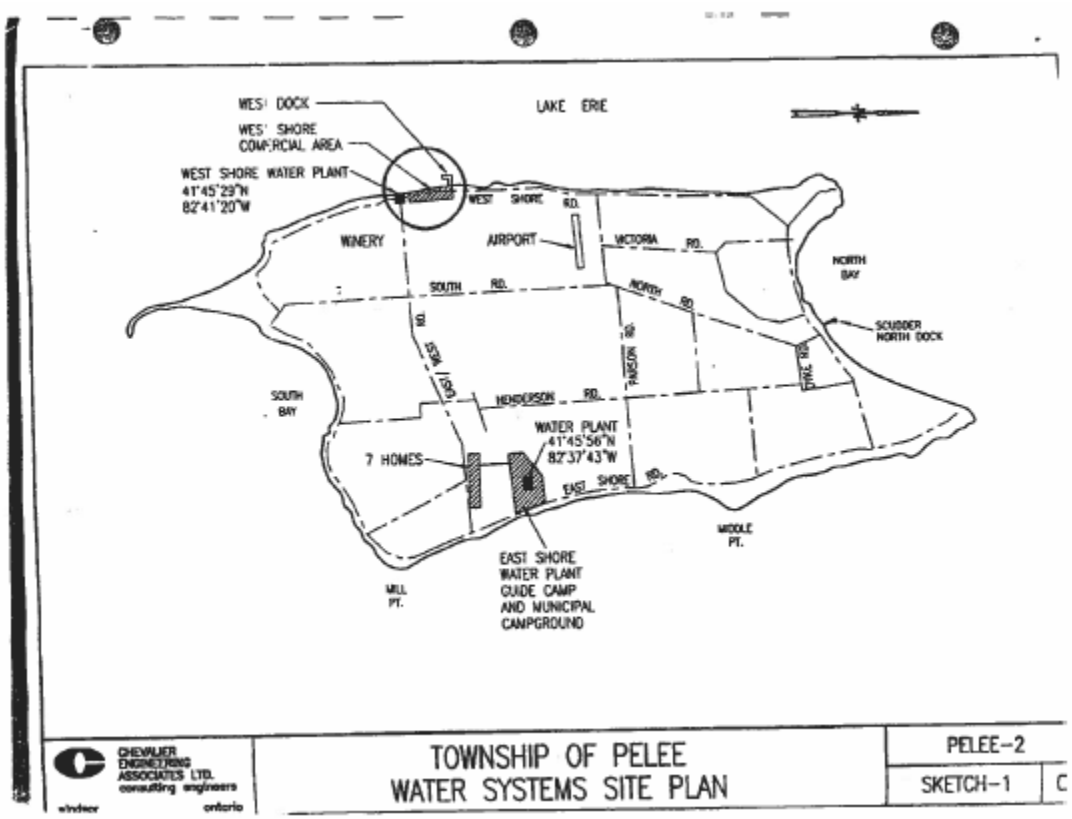
The bridges/culverts Condition Index (BCI) / (CCI) calculated for each structure is shown in APPENDIX D.

Storm Network Maps



Water Network Maps


ASSEMBLY HALL
GIRL GUIDE CAMP
CAMP GROUND WATER
SLEEP
TAP
MUNICIPAL CAMPSITE
PUMP HOUSE
EAST/WEST RD.
RESTAURANT
SWIM BEACH
SUCTION WELL #2
EAST SHORE RD.
SUCTION WELL #1 WITH BIG 'O'
POTENTIAL 32 HOMES
CHEVALIER ENGINEERING ASSOCIATES LTD. consulting engineers
TOWNSHIP OF PELEE
EAST SHORE WATER SERVICE AREA
PELEE-2
SKETCH-6
0


WEST DOCK
WEST SHORE COMMERCIAL AREA
WEST SHORE WATER PLANT
41°45'29"N
82°41'20"W
LAKE ERIE
WEST SHORE RD.
WINERY
AIRPORT
VICTORIA RD.
NORTH BAY
SOUTH RD.
NORTH RD.
SCUDDER NORTH DOCK
WEST RD.
PARSONS RD.
TWIN RD.
SOUTH BAY
HENDERSON RD.
WATER PLANT
41°45'56"N
82°37'43"W
7 HOMES
EAST SHORE RD.
MIDDLE PT.
EAST SHORE WATER PLANT GUIDE CAMP AND MUNICIPAL CAMPGROUND
MILL PT.
CHEVALIER ENGINEERING ASSOCIATES LTD.
consulting engineers
windsor
ontario
TOWNSHIP OF PELEE
WATER SYSTEMS SITE PLAN
PELEE-2
SKETCH-1

"WEST SHORE WATER SYSTEM"

1- BUSINESS
2- HOUSE
3- HOUSE
4- BUSINESS
5- HOUSE
6- HOUSE
7- BUSINESS
8- BUSINESS
9- BUSINESS
10- BUSINESS
11- BUSINESS
12. BUSINESS
13. BUSINESS
14. BUSINESS
15. BUSINESS
16. HOUSE
17. BUSINESS
18. BUSINESS
19. BUSINESS
20. BUSINESS

Appendix C: Risk Rating Criteria

Probability of Failure

Asset Category	Risk Criteria	Criteria Weighting	Value/Range	Probability of Failure Score
All Assets	Condition	100%	0-19	5
			20-39	4
			40-59	3
			60-79	2
			80-100	1

Consequence of Failure

Asset Category	Risk Classification	Risk Criteria	Value/Range	Consequence of Failure Score
Road Network	Economic (80%)	Replacement Cost (100%)	$0-5,000	1
			$5,001-30,000	2
			$30,001-100,000	3
			$100,001-350,000	4
			$350,001+	5
	Social (20%)	Road Type (100%)	Gravel/Soil	1
			Surface Treated	3
Water Network (Linear)	Economic (80%)	Replacement Cost (100%)	$0-5,000	1
			$5,001-30,000	2
			$30,001-100,000	3
			$100,001-350,000	4
			$350,001+	5
	Social (20%)	Pipe Diameter (100%)	100 mm	1
			300 mm	4
All Other Assets	Economic (80%)	Replacement Cost (100%)	$0-5,000	1
			$5,001-30,000	2
			$30,001-100,000	3
			$100,001-350,000	4
			$350,001+	5

Appendix D: Condition Assessment Guidelines

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

Condition data is vital to the development of data-driven asset management strategies. Without accurate and reliable asset data, there may be little confidence in asset management decision-making which can lead to premature asset failure, service disruption and suboptimal investment strategies. To prevent these outcomes, the 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