Asset Management Plan

Township of Machin

2021

This Asset Management Program was prepared by:

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

Key Statistics

Replacement cost of asset portfolio
$41.3 million

Replacement cost of infrastructure per household
$65,380 (2021)

Percentage of assets in fair or better condition
54%

Percentage of assets with assessed condition data
24%

Annual capital infrastructure deficit
$911,100

Recommended timeframe for eliminating annual infrastructure deficit
20 Years

Target reinvestment rate
3.5%

Actual reinvestment rate
1.3%

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Executive Summary

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

Scope

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

The following asset categories are addressed in further sections:

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

Findings

The overall replacement cost of the asset categories owned by Machin totals $41.3 million. 54% of all assets analysed are in fair or better condition and assessed condition data was available for 24% of assets. For the remaining 76% 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.

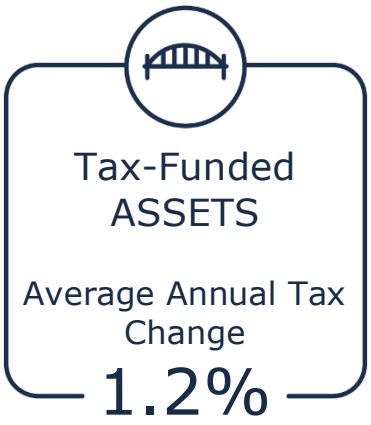
The development of a long-term, sustainable financial plan requires an analysis of whole lifecycle costs. Using a combination of proactive lifecycle strategies (roads) and replacement only strategies (all other assets) determine the lowest cost option to maintain the current levels of service.

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 $1.45 million. Based on a historical analysis of sustainable capital funding sources, the Township is committing approximately $541,335 towards capital projects or reserves per year. As a result, there is currently an annual funding gap of $911,100.

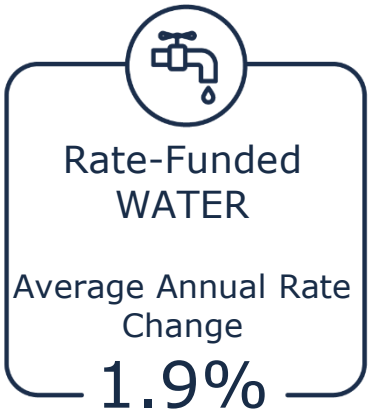
It is important to note that this represents a snapshot in time and is based on the best available processes, data, and information at the Township. Strategic asset management planning is an ongoing and dynamic process that requires continuous improvement and dedicated resources.

Recommendations

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



The annual rate change needed to adress the funding gap for the water network extended over 40 years is:



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

1.1 Key Insights

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

1.2 Machin Community Profile

The Township of Machin is in the Kenora District west of Dryden, made up of three communities all located on or near beautiful Eagle Lake. Eagle River, Minnitaki, and Vermilion Bay are all located in the heart of Sunset Country on the Trans Canada Highway.

Census Characteristic	Machin	Ontario
Population 2021	1,012	14,223,942
Population Change 2016-2021	4.2	5.8
Total Private Dwellings	632	5,929,250
Population Density	3.5/km^2	15.9/km^2
Land Area	290.14 km^2	892,411.76 km^2

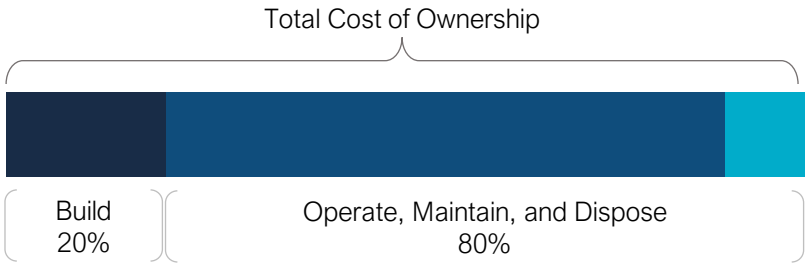
Located directly off the Trans-Canada Highway, you can't travel through the Kenora District, or across Canada, without passing by Machin. Viewed as a "Hub", the Township resides in the heart of northwestern Ontario. With entrances at Highway 17, Highway 105, and Highway 594, all travelers must pass by Machin when heading North, South, East, or West.

Cradling the North shore of world-famous Eagle Lake, Machin has something for everyone. Our residents and visitors both enjoy the outdoor adventures like fishing, hiking, water sports, snow machining, horseback riding, collecting wild edibles, and many more outdoor pursuits.

1.3 An Overview of Asset Management

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

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



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

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

1.3.1 Asset Management Policy

An asset management policy represents a statement of the principles guiding the Town'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 council approved the Strategic Asset Management Policy on June 24, 2019 in accordance with Ontario Regulation 588/17.

The purpose of the policy is to provide leadership in and commitment to the development and implementation of the Municipality's asset management program. It is intended to guide the consistent use of asset management across the organization, to facilitate logical and evidence-based decision-making for the management of municipal infrastructure assets and to support the delivery of sustainable community services now and in the future.

1.3.2 Asset Management Strategy

An asset management strategy outlines the translation of organizational objectives into asset management objectives and provides a strategic overview of the activities required to meet these objectives. It provides greater detail than the policy on how the Town 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.

1.3.3 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.

1.4 Key Concepts in Asset Management

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

1.4.1 Lifecycle Management Strategies

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

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

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

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

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

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

1.4.2 Risk Management Strategies

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

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

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

1.4.3 Levels of Service

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

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

Community Levels of Service

Community levels of service are a simple, plain language description or measure of the service that the community receives. For core asset categories (roads, bridges and culverts, water, wastewater, stormwater) the Province, through O. Reg. 588/17, has provided qualitative descriptions that are required. For non-core asset categories, the Township has until July 1, 2024 to determine the community levels of service.

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, stormwater) the Province, through O. Reg. 588/17, has provided technical metrics that are required. For non-core asset categories, the Township has until July 1, 2024 to determine the technical levels of service.

Current and Proposed Levels of Service

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

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

1.5 Climate Change

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

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

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

flooding, cold extremes, warm extremes, wildfires, and record minimum arctic sea ice extent.

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

1.5.1 Machin Climate Profile

The Township of Machin is in Eastern Ontario in the Kenora District west of Dryden. The Township is expected to experience notable effects of climate change which include higher average annual temperatures, an increase in total annual precipitation, and an increase in the frequency and severity of extreme events. According to Climatedata.ca – a collaboration supported by Environment and Climate Change Canada (ECCC) – the Township of Machin may experience the following trends:

Higher Average Annual Temperature:

- Between the years 1981 and 2010 the annual average temperature was 2.8 ºC
- Under a high emissions scenario, the annual average temperatures are projected to increase by 1.8 ºC by the year 2050 and over 5.5 ºC by the end of the century.

Increase in Total Annual Precipitation:

- Under a high emissions scenario, Machin is projected to experience an 6% increase in precipitation by the year 2050 and a 12% increase by the end of the century.

Increase in Frequency of Extreme Weather Events:

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

1.5.2 Integration Climate change and Asset Management

Asset management practices aim to deliver sustainable service delivery - the delivery of services to residents today without compromising the services and well-being of future residents. Climate change threatens sustainable service delivery by reducing the useful life of an asset and increasing the risk of asset failure. Desired

levels of service can be more difficult to achieve because of climate change impacts such as flooding, high heat, drought, and more frequent and intense storms.

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

1.6 Ontario Regulation 588/17

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

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

2019

Strategic Asset Management Policy

2022

Asset Management Plan for Core Assets with the following components:

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

2024

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

2025

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

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

1.6.1 O. Reg. 588/17 Compliance Review

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

Requirement	O. Reg. Section	AMP Section Reference	Status
Summary of assets in each category	S.5(2), 3(i)	4 - 11	Complete
Replacement cost of assets in each category	S.5(2), 3(ii)	4 - 11	Complete
Average age of assets in each category	S.5(2), 3(iii)	4 - 11	Complete
Condition of core assets in each category	S.5(2), 3(iv)	4 - 11	Complete
Description of municipality's approach to assessing the condition of assets in each category	S.5(2), 3(v)	4 - 11	Complete
Current levels of service in each category	S.5(2), 1(i-ii)	4 - 11	Complete for Core Assets Only
Current performance measures in each category	S.5(2), 2	4 - 11	Complete for Core Assets Only
Lifecycle activities needed to maintain current levels of service for 10 years	S.5(2), 4	4 - 11	Complete
Costs of providing lifecycle activities for 10 years	S.5(2), 4	Appendix B	Complete
Growth assumptions	S.5(2), 5(i-ii) S.5(2), 6(i-vi)	12	Complete

2 Scope and Methodology

2.1 Key Insights

- Machin has 7 different asset categories with a replacement cost of $41.3 million
- 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 that lifecycle activities occur at the right time to maximize asset value and useful life

2.2 Asset Categories

To ensure compliance with Ontario Regulation 588/17 the July 2022 deadline under the regulation requires analysis of only core assets (roads, bridges and culverts, water, wastewater, and stormwater). Where the July 2025 requires analysis of all other assets.

The state of the infrastructure for the Township's asset portfolio listed below. For core infrastructure each category section 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 core asset categories.

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

2.3 Deriving Replacement Costs

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

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

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

2.4 Estimated Useful Life and Service Life Remaining

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

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

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

2.5 Reinvestment Rate

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

The reinvestment rate is calculated as follows:

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

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

2.6 Deriving Asset Condition

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

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

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

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

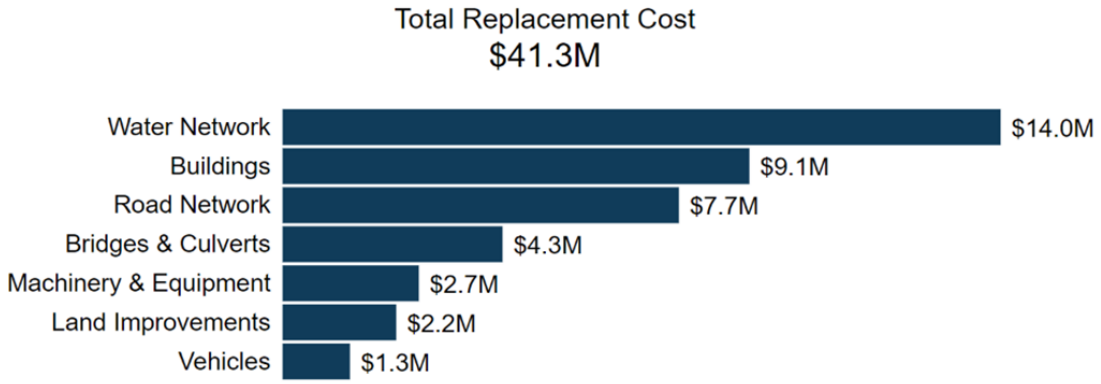
3 Portfolio Overview

3.1 Key Insights

- The total replacement cost of the Township's asset portfolio is $41.3 million
- The Township's target re-investment rate is 3.5%, and the actual re-investment rate is 1.3%, contributing to an expanding infrastructure deficit
- 54% of all assets are in fair or better condition
- 54% of assets are projected to require rehabilitation / replacement in the next 10 years
- Average annual capital requirements total $1.45 million per year across all assets

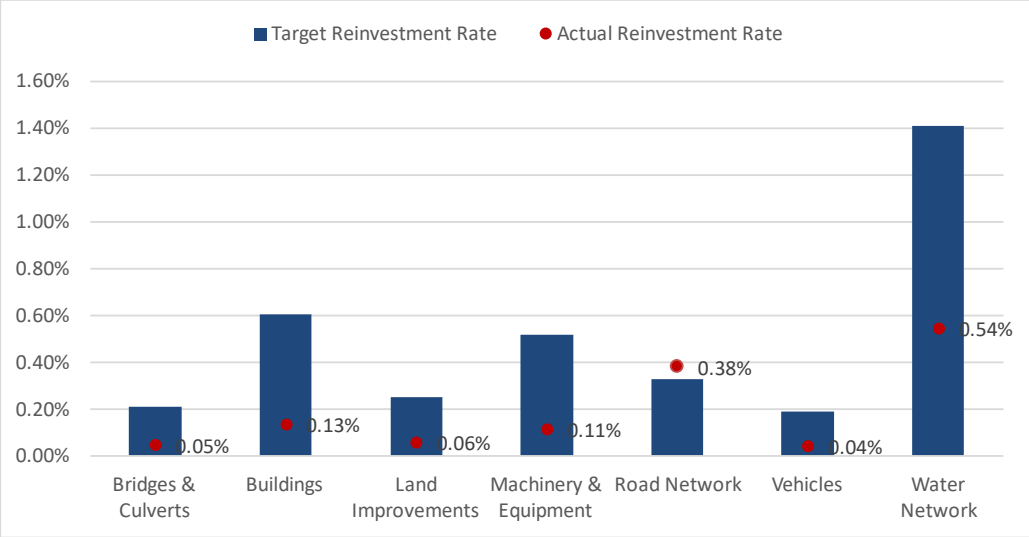
3.2 Total Replacement Cost of Asset Portfolio

The asset categories have a total replacement cost of $41.3 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.



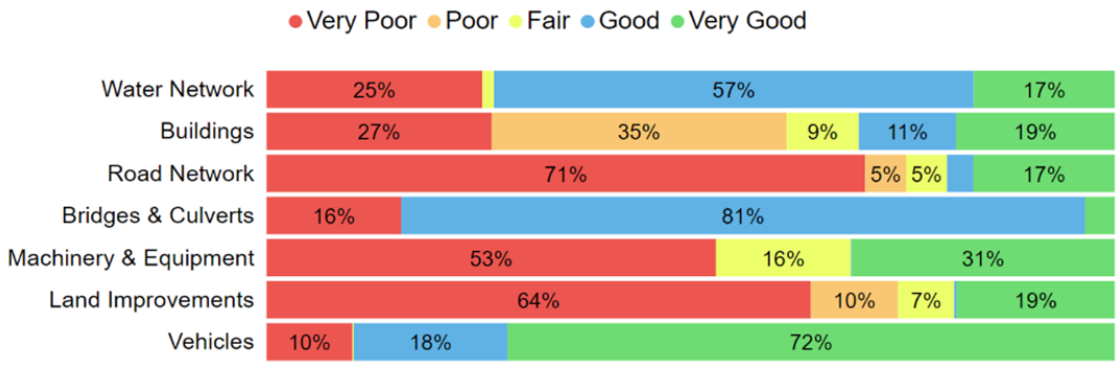
3.3 Target vs. Actual Reinvestment Rate

The graph below depicts funding gaps or surpluses by comparing target vs actual reinvestment rates. To meet the long-term replacement needs, the Township should be allocating approximately $1.45 million annually, for a target reinvestment rate of 3.5%. Actual annual spending on infrastructure totals approximately $541,335 for an actual reinvestment rate of 1.3%.



3.4 Condition of Asset Portfolio

The current condition of the assets is central to all asset management planning. Collectively, 54% of assets in Machin are in fair or better condition. This estimate relies on both age-based and field condition data.



Assessed condition data is available for 24% of assets; for the remaining portfolio, age is used as an approximation of condition. Assessed condition data is invaluable in asset management planning as it reflects the true condition of the asset and its ability to perform its functions. The table below identifies the source of condition data.

Asset Category	% of Assets with Assessed Condition	Source of Condition Data
Bridges & Culverts	78% Assessed	2021 OSIM Report
Road Network	84% Assessed	2007 Road Study
All other Categories	100% Age-based	None

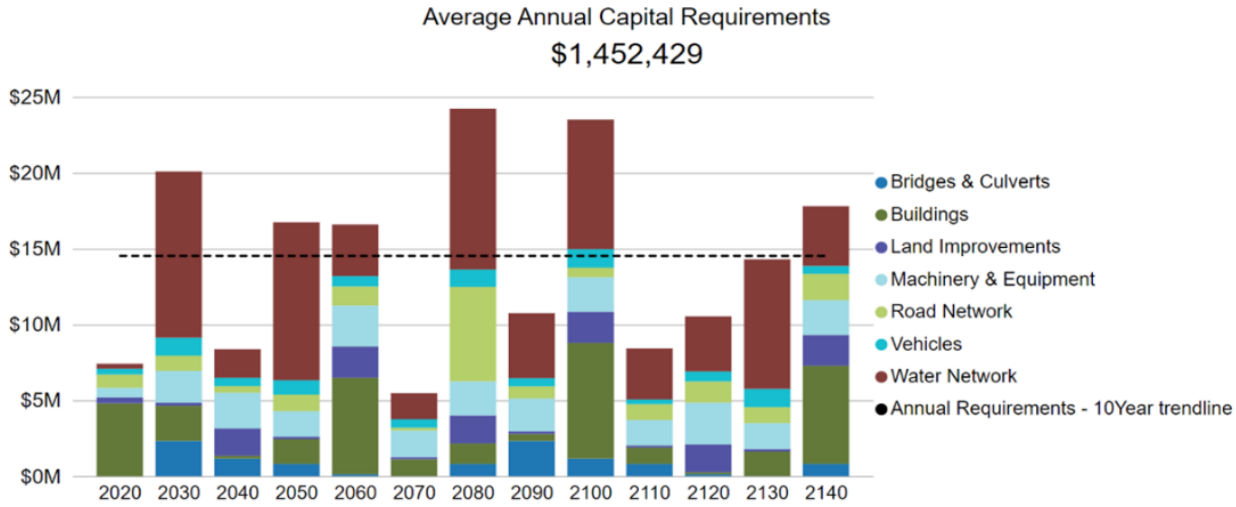
3.5 Service Life Remaining

Based on asset age, available assessed condition data and estimated useful life, 56% of the Township's assets will require rehabilitation or replacement within the next 10 years. Capital requirements over the next 10 years are identified in Appendix B.

3.6 Forecasted Capital Requirements

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

The following graph identifies capital requirements over the next 120 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 10-year groupings and the trend line represents the average 10-year capital requirements.



3.7 Risk & Criticality

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

Organizational Capacity and Cognizance

Both short- and long-term planning requires the regular collection of infrastructure data to support asset management decision-making. Staff find it a continuous challenge to dedicate resources and time towards data collection and condition assessments to ensure that asset condition and asset attribute data is regularly reviewed and updated.

Lifecycle Management Strategies

The current lifecycle management strategy for all asset categories is considered more reactive than proactive. It is a challenge to find the right balance between maintenance, capital rehabilitation, and the replacement of assets. Staff hope to develop better defined strategies that will extend asset lifecycles and result in a lower total cost to the Town. These strategies will require sustainable annual funding to minimize the deferral of capital works

Asset Data & Information

There is a lack of confidence in the available inventory data and condition data. Staff find it a continuous challenge to dedicate resources and time towards data collection and condition assessments to ensure that condition and asset attribute data is regularly reviewed and updated.

4 Road Network

4.1 Key Insights

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

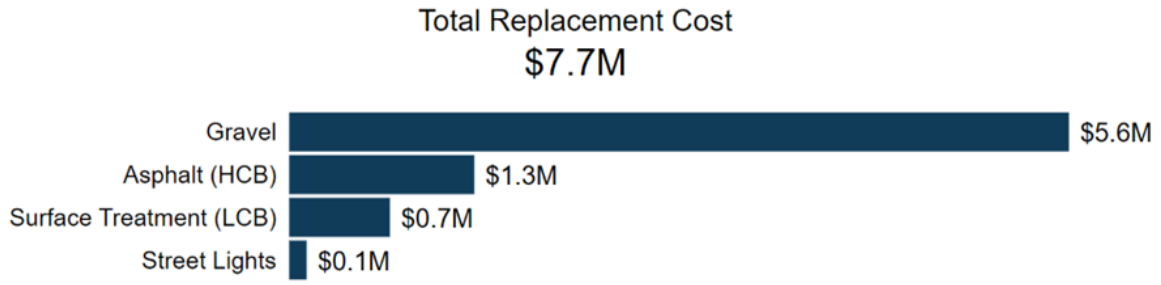
The state of the infrastructure for the road network is summarized in the following table.

Replacement Cost	Condition	Financial Capacity	
$7.7 million	Poor (22%)	Annual Requirement:	$136,100
		Funding Available:	$156,980
		Annual Deficit/Surplus:	$(20,880)

4.2 Asset Inventory & Costs

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

Asset Segment	Quantity	Replacement Cost	Annual Capital Requirement
Asphalt (HCB)	6,608 m	$1,321,591	$37,291
Gravel	79,500 m	$5,565,018	$70,619
Street Lights	65	$124,255	$8,284
Surface Treatment (LCB)	6,537.5 m	$719,118	$19,908
Total		**$7,729,981**	**$136,102**



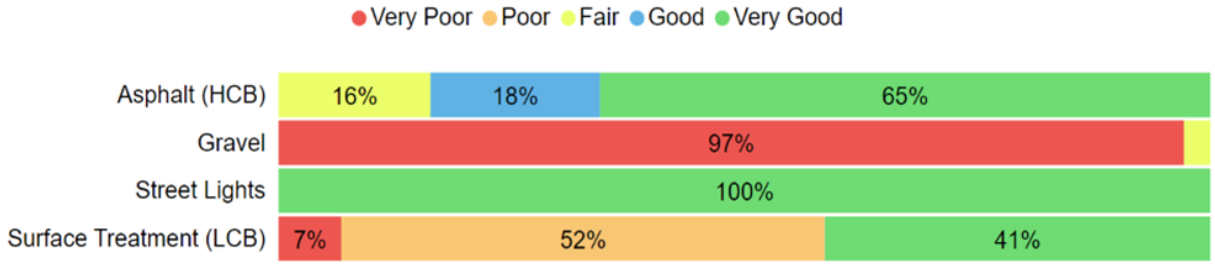
Each asset's replacement cost should be reviewed periodically to determine whether adjustments are needed to more accurate represent realistic capital requirements.

4.3 Asset Condition & Age

The table below identifies the current average condition, the average age, and the estimated useful life for each asset segment. The average condition (%) is a weighted value based on replacement cost.

Asset Segment	Estimated Useful Life (Years)	Average Age (Years)	Average Condition
Asphalt (HCB)	30 Years	41 Years 4 Months	82% (Very Good)
Gravel	25 Years	52 Years 4 Months	3% (Very Poor)
Street Lights	15 Years	7 Years 6 Months	87% (Very Good)
Surface Treatment (LCB)	30 Years	56 Years 6 Months	56% (Fair)
Average		41 Years 4 Months	**22% (Poor)**

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



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

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

4.3.1 Current Approach to Condition Assessment

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

- A Road assessment was completed in 2007 that included a detailed assessment of the condition of each paved road segment and 2001 for gravel roads.

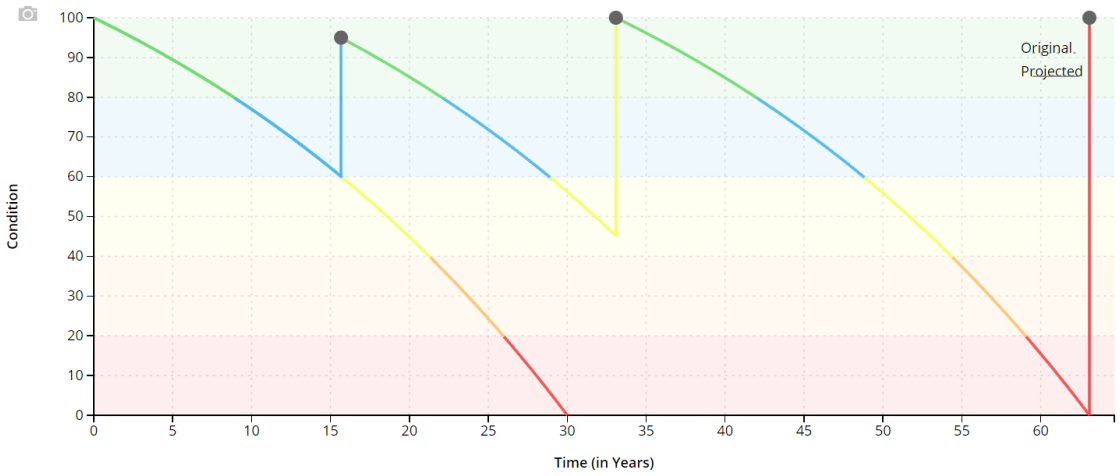
The rating criteria is used to determine the current condition of road segments and forecast future capital requirements is:

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

4.4 Lifecycle Management Strategy

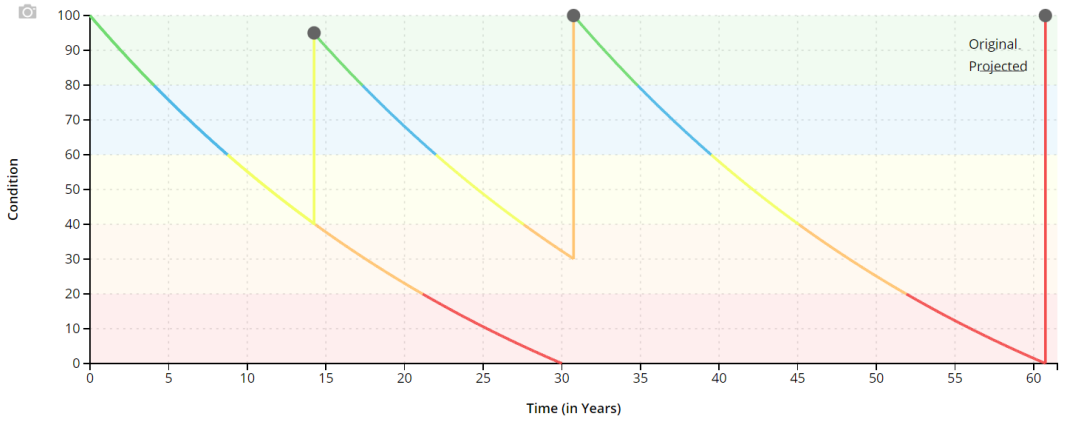
The condition or performance of most assets will deteriorate over time. This process is affected by a range of factors including an asset's characteristics, location, utilization, maintenance history and environment. The following lifecycle strategies have been developed as a proactive approach to managing the lifecycle of Township owned roads. Instead of allowing the roads to deteriorate until replacement is required, strategic rehabilitation is expected to extend the service life of roads at a lower total cost.

Asphalt Roads(HCB)		
Event Name	**Event Class**	**Event Trigger**
Surface Mill & Pave	Rehabilitation	60 condition
Major Rehabilitation	Rehabilitation	45 condition
Full Reconstruction	Replacement	0 condition

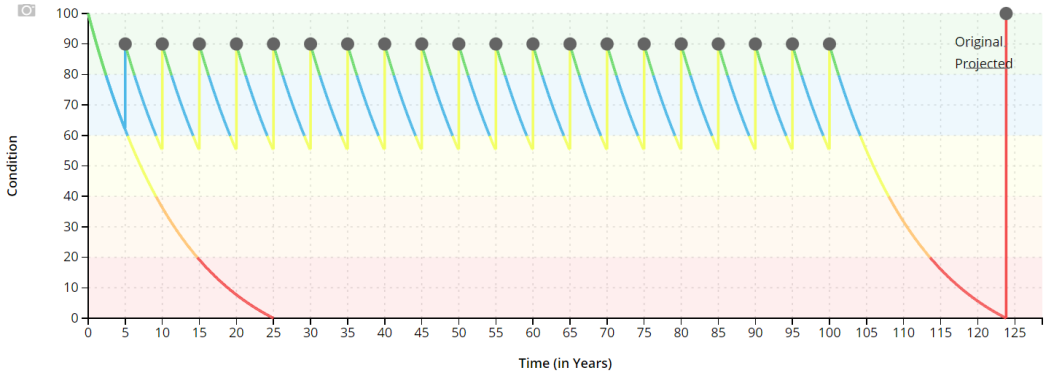


Surface Treated Roads

Event Name	Event Class	Event Trigger
Single Surface Treatment (SST)	Rehabilitation	40 condition
Double Surface Treatment (DST)	Rehabilitation	30 condition
Full Reconstruction	Replacement	0 condition



The Township has developed a gravel road program that resurfaces the road with 50mm of granular A every five years.

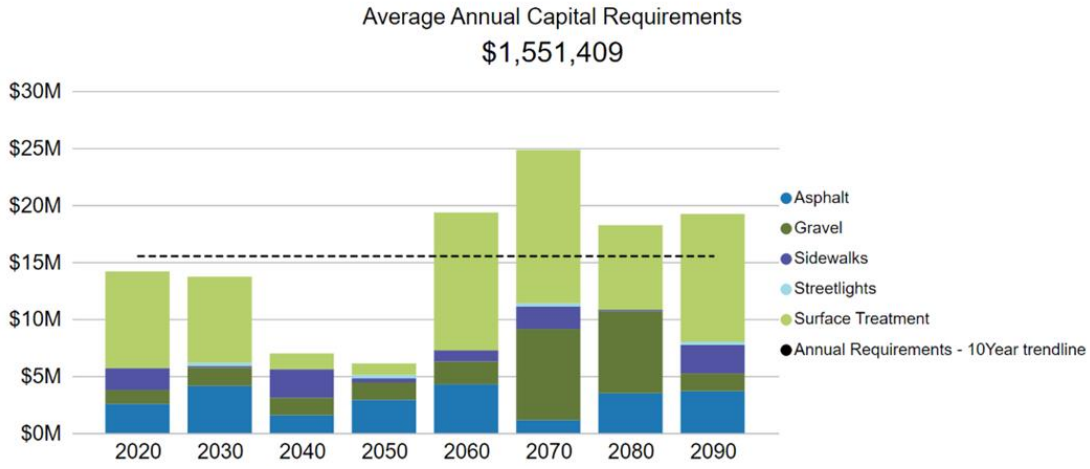


4.4.1 Forecasted Capital Requirements

Based on the lifecycle strategies identified previously for roads, and assuming the end-of-life replacement of all other assets in this category, the following graph forecasts capital requirements for the road network.

The 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 70 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 10-year groupings and the trend line represents the average 10-year capital requirements.



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

4.5 Risk & Criticality

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

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

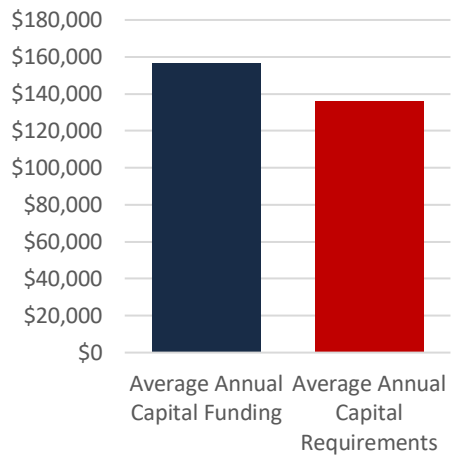
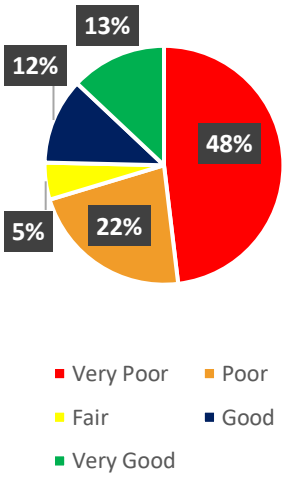
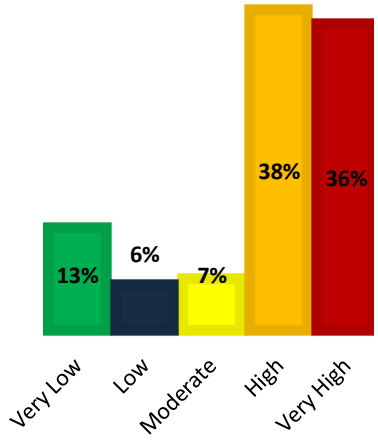
The asset-specific attributes that municipal staff utilize to define and prioritize the criticality of the road network are documented below:

Probability of Failure (POF)	Consequence of Failure (COF)
Condition (Structural)	Replacement Cost (Economic)
Service Life Remaining (Functional)	Traffic Counts (Operational 50%)
	Surface Type (Operational 50%)

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

4.6 Levels of Service

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

Cost	Performance (Average Condition)	Risk
		

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

4.6.1 Community Levels of Service

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

Service Attribute	Qualitative Description	Current LOS (2021)
Scope	Description, which may include maps, of the road network in the municipality and its level of connectivity	Machin is a divided Township that is connected by Highway 17. The land between the east and west portions of Machin is called Kenora Unmanaged See Appendix C
Quality	Description or images that illustrate the different levels of road class pavement condition	The Township staff provide surface condition with a rating as follows: 0 – 20 Very Poor 20 – 40 Poor 40 – 60 Fair 60 – 80 Good 80 – 100 Very Good

4.6.2 Technical Levels of Service

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

Service Attribute	Technical Metric	Current LOS (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)	0.32
Quality	Average pavement condition index for paved roads in the municipality	Asphalt = 82 Surface Treatment = 56
	Average surface condition for unpaved roads in the municipality (e.g. excellent, good, fair, poor)	Poor

4.7 Recommendations

Condition Assessment Strategies

- The roads condition assessment program needs to be updated and all roads need to be re-assessed

Risk Management Strategies

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

Levels of Service

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

5 Bridges & Culverts

5.1 Key Insights

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

Replacement Cost	Condition	Financial Capacity	
$4.29 million	Fair (58%)	Annual Requirement:	$87,240
		Funding Available:	$19,060
		Annual Deficit:	$68,180

5.2 Asset Inventory & Costs

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

Asset Segment	Quantity	Replacement Cost	Annual Capital Requirement
Bridges	4	$3,350,477	$55,841
Culverts	156	$941,859	$31,395
Total		**$4,292,336**	**$87,237**

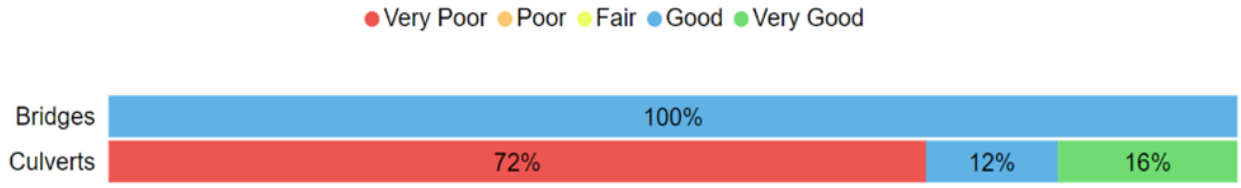
Each asset's replacement cost should be reviewed periodically to determine whether adjustments are needed to more accurate represent realistic capital requirements.

5.3 Asset Condition & Age

The table below identifies the current average condition, the average age, and the estimated useful life for each asset segment. The average condition (%) is a weighted value based on replacement cost.

Asset Segment	Estimated Useful Life (Years)	Average Age (Years)	Average Condition
Bridges	60	59.25	68% (Good)
Culverts	30	49.83	25% (Poor)
Average		**50.08**	**58% (Fair)**

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



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

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

5.3.1 Current Approach to Condition Assessment

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

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

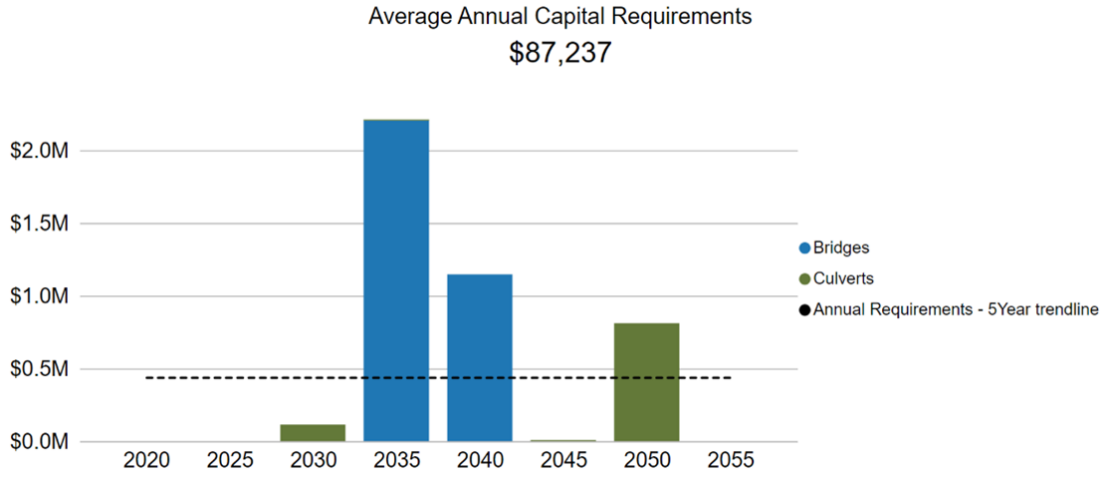
5.4 Lifecycle Management Strategy

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

Activity Type	Description of Current Strategy
Maintenance, Rehabilitation and Replacement	All lifecycle activities are driven by the results of mandated structural inspections competed according to the OSIM
Inspection	The most recent inspection report was completed in 2021 by JML Engineering

5.4.1 Forecasted Capital Requirements

The following graph forecasts long-term capital requirements. The annual capital requirement represents the average amount per year that the Township should allocate towards funding rehabilitation and replacement needs. The following graph identifies capital requirements over the next 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 groupings and the trend line represents the average 5-year capital requirements.



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

5.5 Risk & Criticality

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

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

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

Probability of Failure (POF)	Consequence of Failure (COF)
Condition	Replacement Cost (Economic)
Service Life Remaining	Capacity – Load Limit (Operational 50%)
	Detour Length (Operational 50%)

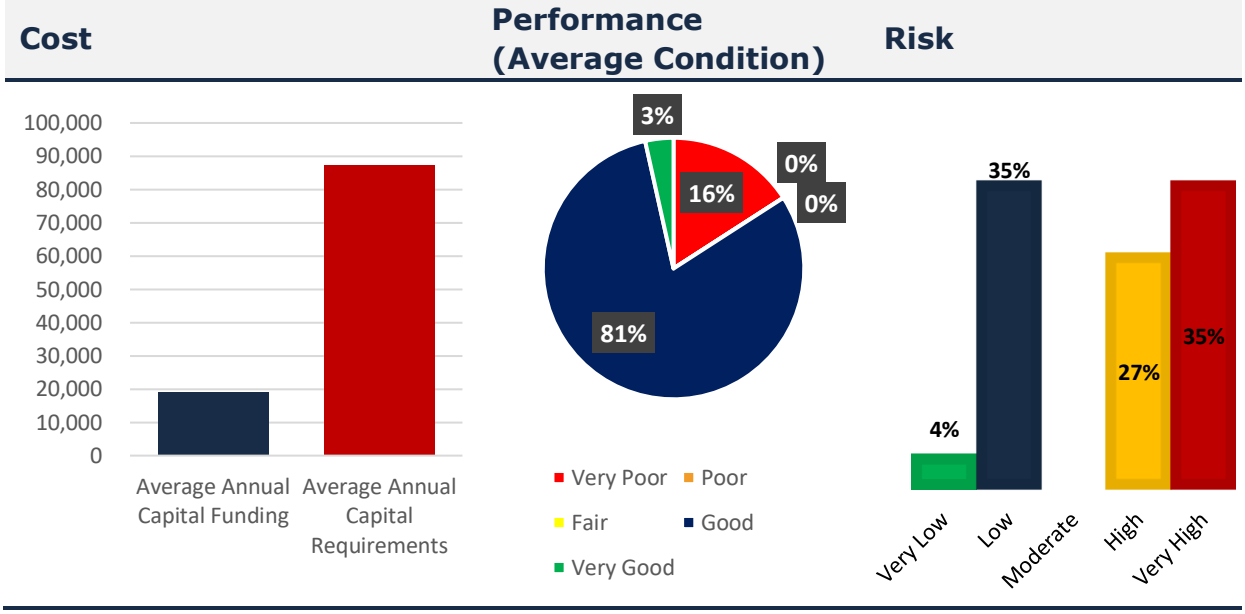
And for culverts:

Probability of Failure (POF)	Consequence of Failure (COF)
Condition	Replacement Cost (Economic)
Service Life Remaining	Traffic Counts (Operational 50%)
	Diameter (Operational 50%)

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

5.6 Levels of Service

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



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

5.6.1 Community Levels of Service

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

Service Attribute	Qualitative Description	Current LOS (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. None of the Town's structures have loading or dimensional restrictions meaning that most types of vehicles, including heavy transport, emergency vehicles, and cyclists can cross them without restriction.
Quality	Description or images of the condition of bridges and culverts and how this would affect use of the bridges and culverts	See Appendix C

5.6.2 Technical Levels of Service

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

Service Attribute	Technical Metric	Current LOS (2021)
Scope	% of bridges in the Town with loading or dimensional restrictions	0%
Quality	Average bridge condition index value for bridges in the Town	68
	Average bridge condition index value for structural culverts in the Town	None

5.7 Recommendations

Data Review/Validation

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

Risk Management Strategies

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

Lifecycle Management Strategies

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

Levels of Service

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

6 Buildings

6.1 Key Insights

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

- administrative offices
- medical clinics
- senior centres
- fire stations
- arena and recreation centres

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

Replacement Cost	Condition	Financial Capacity	
$9.1 million	Poor (37%)	Annual Requirement:	$250,580
		Funding Available:	$54,740
		Annual Deficit:	$195,840

6.2 Asset Inventory & Costs

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

Asset Segment	Quantity	Replacement Cost	Annual Capital Requirement
Environmental	3	$26,967	$1,140
Fire	3	$952,210	$23,845
General Government	3	$823,574	$20,740
Health	2	$605,302	$15,133
Recreation	12	$6,281,938	$178,906
Transportation	5	$413,120	$10,819
Total		**$9,103,111**	**$250,582**

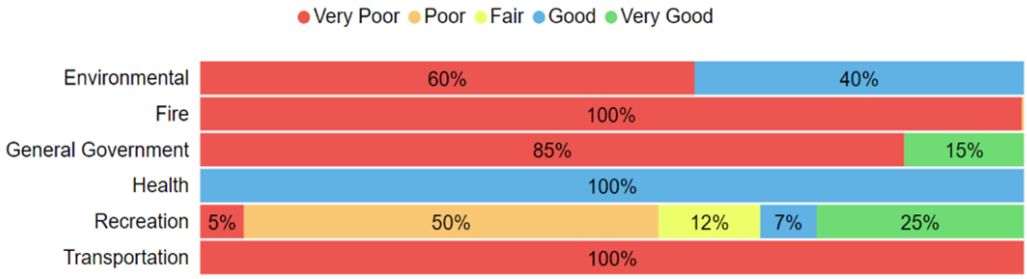
Each asset's replacement cost should be reviewed periodically to determine whether adjustments are needed to more accurate represent realistic capital requirements.

6.3 Asset Condition & Age

The table below identifies the current average condition, the average age, and the estimated useful life for each asset segment. The average condition (%) is a weighted value based on replacement cost.

Asset Segment	Estimated Useful Life (Years)	Average Age (Years)	Average Condition
Environmental	20 - 25 Years	28 Years 6 Months	29% (Poor)
Fire	25 - 40 Years	48 Years 6 Months	0% (Very Poor)
General Government	25 - 40 Years	43 Years	14% (Very Poor)
Health	40 Years	30 Years 6 Months	65% (Good)
Recreation	20 - 40 Years	20 Years	46% (Fair)
Transportation	20 - 40 Years	54 Years 6 Months	0% (Very Poor)
Average		31 Years 1 Month	75% (Good)

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



To ensure that the Township's buildings 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.

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

6.3.1 Current Approach to Condition Assessment

Accurate and reliable condition data allows staff to determine the remaining service life of assets and identify the most cost-effective approach to managing assets. The Township's current approach is staff identify deficiencies, repairs and replacements needed.

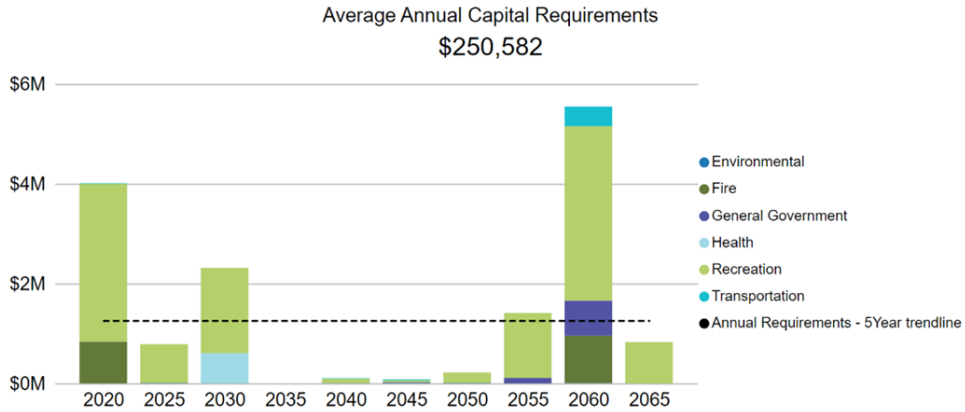
6.4 Lifecycle Management Strategy

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

Activity Type	Description of Current Strategy
Maintenance / Rehabilitation	The maintenance of buildings is dealt with on a case-by-case emergency basis
Replacement	As a supplement to the knowledge and expertise of municipal staff the Township regularly works with contractors

6.4.1 Forecasted Capital Requirements

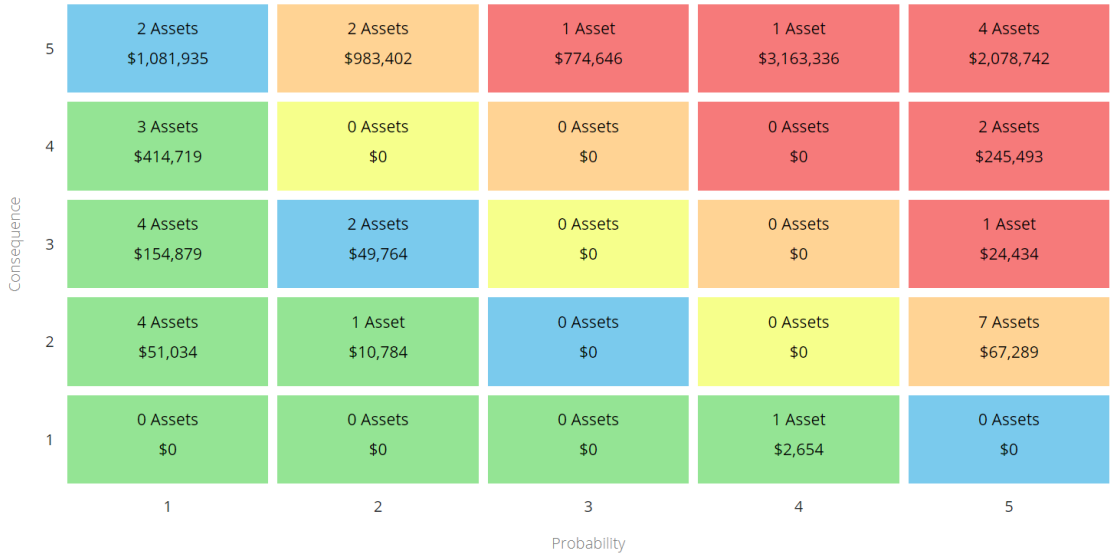
The annual capital requirement represents the average amount per year that the Township should allocate towards funding rehabilitation and replacement needs. The following graph identifies capital requirements over the next 45 years. This projection is used as it ensures that every asset has gone through one full iteration of replacement. The forecasted requirements are aggregated into 5-years and the trend line represents the average 5-year capital requirements.



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

6.5 Risk & Criticality

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



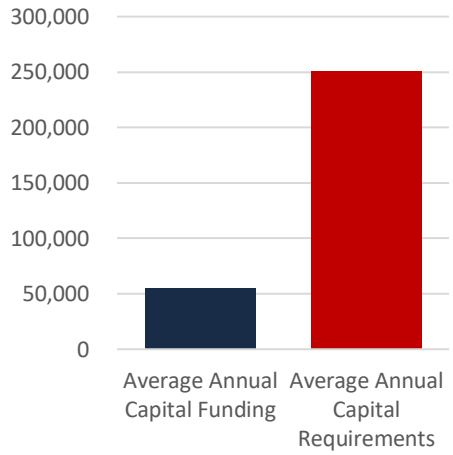
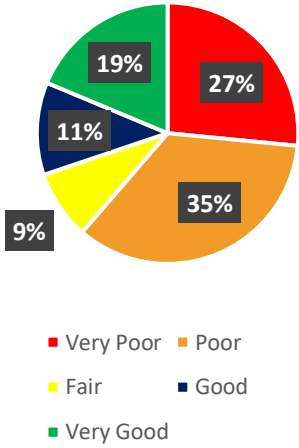
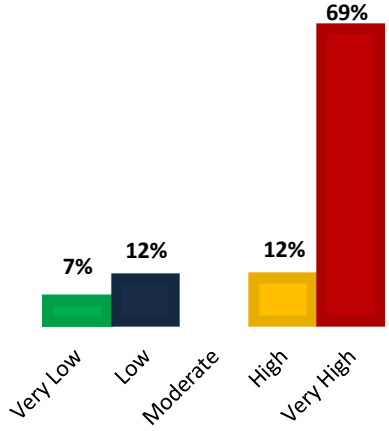
This is a high-level model developed by Township staff and should be reviewed and adjusted to reflect an evolving understanding of both the probability and consequences of asset failure.

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

6.6 Levels of Service

Buildings are considered a non-core asset category and 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.

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

Cost	Performance (Average Condition)	Risk
		

6.7 Recommendations

Asset Inventory

- The Township's asset inventory contains a single record for some 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 and inventory consistency.

Condition Assessment Strategies

- The Township should implement regular condition assessments for all facilities to better inform short- and long-term capital requirements.

Risk Management Strategies

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

Levels of Service

- The Township should develop metrics that are determined to provide meaningful and reliable inputs into asset management planning and begin measuring them to meet the July 1, 2024, regulation deadline.

7 Vehicles

7.1 Key Insights

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

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

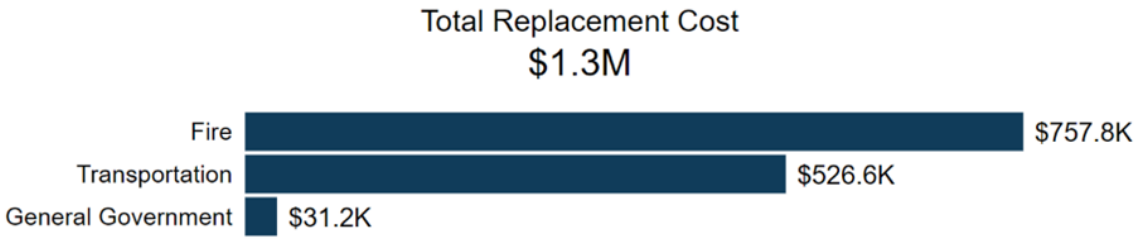
The state of the infrastructure for the vehicles is summarized in the following table.

Replacement Cost	Condition	Financial Capacity	
$1.3 million	Good (75%)	Annual Requirement:	$78,525
		Funding Available:	$17,150
		Annual Deficit:	$61,375

7.2 Asset Inventory & Costs

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

Asset Segment	Quantity	Replacement Cost	Annual Capital Requirement
Fire	5	$757,817	$33,212
General Government	1	$31,162	$2,597
Transportation	9	$526,588	$42,716
Total		**$1,315,567**	**$78,525**



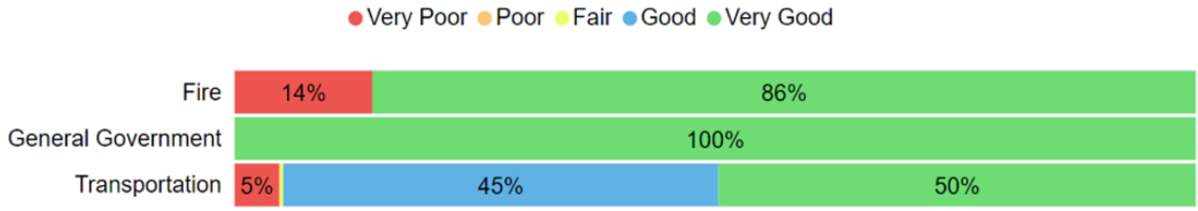
Each asset's replacement cost should be reviewed periodically to determine whether adjustments are needed to more accurate represent realistic capital requirements.

7.3 Asset Condition & Age

The table below identifies the current average condition, the average age, and the estimated useful life for each asset segment. The average condition (%) is a weighted value based on replacement cost.

Asset Segment	Estimated Useful Life	Average Age	Average Condition
Fire	15 - 25 Years	15 Years 1 Month	72% (Good)
General Government	12 Years	4 Years 6 Months	93% (Very Good)
Transportation	8 - 15 Years	8 Years 8 Months	78% (Good)
Average:		10 Years 7 Months	**68% (Good)**

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.

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

7.3.1 Current Approach to Condition Assessment

Accurate and reliable condition data allows staff to determine the remaining service life of assets and identify the most cost-effective approach to managing assets. The Township's current approach relies on staff completing regular visual inspections of vehicles to ensure they are in state of adequate repair prior to operation. The rating criteria used to determine the current condition and forecast future capital requirements is consistent with all other asset categories at 0 – 100.

7.4 Lifecycle Management Strategy

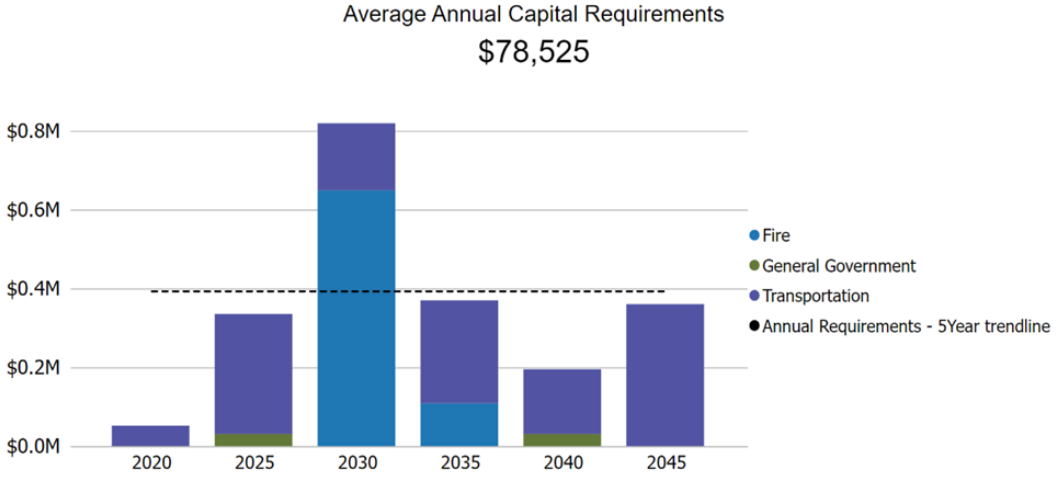
The condition or performance of assets will deteriorate over time. To ensure that municipal vehicles are performing as expected and meeting the needs of customers, it is important to establish a lifecycle management strategy to proactively manage asset deterioration.

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

Activity Type	Description of Current Strategy
Maintenance / Rehabilitation	Visual inspections completed and documented daily
	Every 4-7000km includes an inspection and oil change
	Annual CVOR annual inspection by a licensed mechanic
Replacement	Vehicle replacements are based on age, kilometres and annual repair costs are taken into consideration when determining appropriate treatment options

7.4.1 Forecasted Capital Requirements

The annual capital requirement represents the average amount per year that the Township should allocate towards funding rehabilitation and replacement needs. The following graph identifies capital requirements over the next 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 and the trend line represents the average 5-year capital requirements.



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

7.5 Risk & Criticality

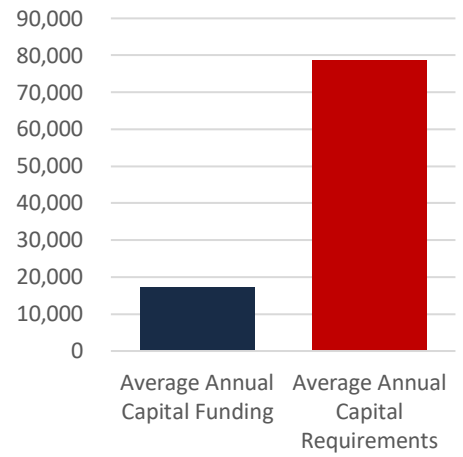
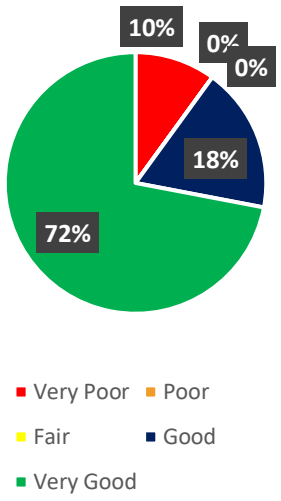
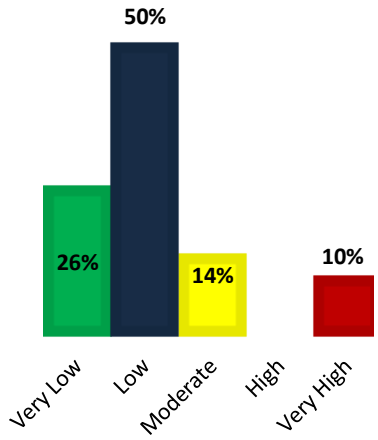
The risk matrix provides a visual representation of the relationship between the probability of failure and the consequence of failure for the assets within this asset category based on 2021 inventory data. See Appendix D for the criteria used to determine the risk rating of each asset.

This is a high-level model developed by the Township staff and should be reviewed and adjusted to reflect an evolving understanding of both the probability and consequences of asset failure. The identification of critical assets allows the Township to determine appropriate risk mitigation strategies and treatment options. Risk mitigation may include asset-specific lifecycle strategies, condition assessment strategies, or simply the need to collect better asset data.

7.6 Levels of Service

Vehicles are considered a non-core asset category. As such, the Township has until July 1, 2024, to determine the qualitative descriptions and technical metrics that measure the current level of service provided.

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

Cost	Performance (Average Condition)	Risk
		

7.7 Recommendations

Condition Assessment Strategies

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

Risk Management Strategies

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

Levels of Service

- The Township should develop metrics that are determined to provide meaningful and reliable inputs into asset management planning and begin measuring them to meet the July 1, 2024, regulation deadline.

8 Machinery & Equipment

8.1 Key Insights

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

- Computer hardware, software, and phone systems to support all Township services
- Landscaping equipment to maintain public parks
- Fire equipment to support the delivery of emergency services
- Plows and sand hoppers to provide winter control activities
- Facility and park equipment to enable the provision of recreational services

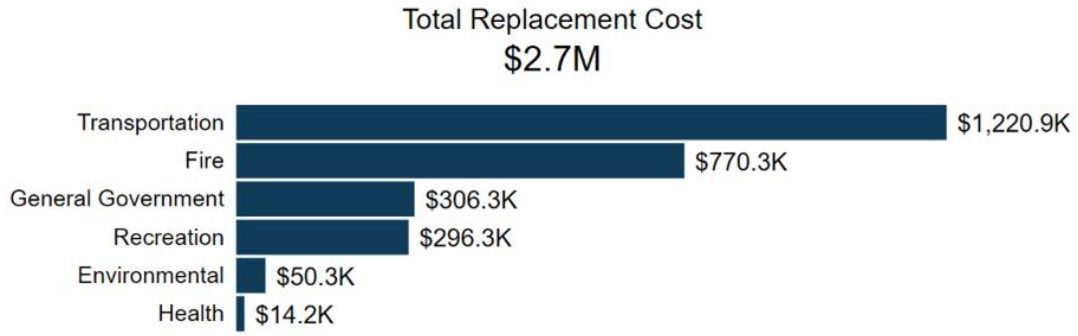
The state of the infrastructure for the machinery and equipment is summarized in the following table.

Replacement Cost	Condition	Financial Capacity	
$2.66 million	Poor (37%)	Annual Requirement:	$214,316
		Funding Available:	$46,815
		Annual Deficit:	$167,501

8.2 Asset Inventory & Costs

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

Asset Segment	Quantity	Replacement Cost	Annual Capital Requirement
Environmental	1	$50,301	$2,012
Fire	32	$770,252	$74,464
General Government	12	$306,325	$39,410
Health	2	$14,210	$1,421
Recreation	13	$296,259	$25,201
Transportation	14	$1,220,919	$71,809
Total		**$2,658,267**	**$214,316**



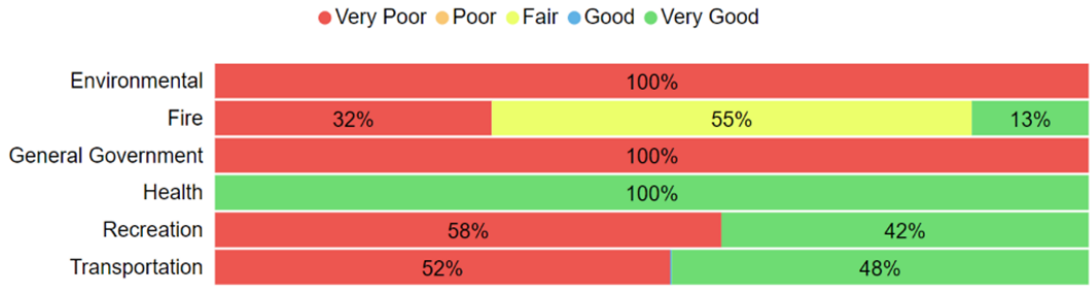
Each asset's replacement cost should be reviewed periodically to determine whether adjustments are needed to more accurate represent realistic capital requirements.

8.3 Asset Condition & Age

The 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	Estimated Useful Life	Average Age (Years)	Average Condition
Environmental	25 Years	46 Years 6 Months	0% (Very Poor)
Fire	10 - 25 Years	16 Years	37% (Poor)
General Government	3 - 15 Years	24 Years	0% (Very Poor)
Health	10 Years	5 Years	87% (Very Good)
Recreation	10 -15 Years	14 Years 7 Months	40% (Fair)
Transportation	15 - 20 Years	22 Years 9 Months	46% (Fair)
Average:		19 Years 1 Month	**37% (Poor)**

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



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

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

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

8.3.1 Current Approach to Condition Assessment

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

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

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

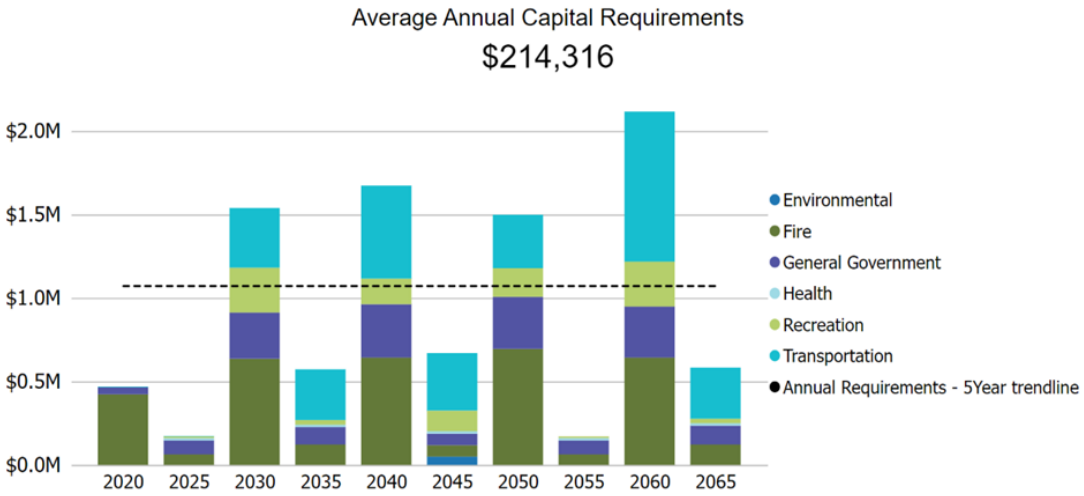
8.4 Lifecycle Management Strategy

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

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

8.4.1 Forecasted Capital Requirements

The following graph identifies capital requirements over the next 45 years. This projection is used as it ensures that every asset has gone through one full iteration of replacement. The forecasted requirements are aggregated into 5-year bins and the trend line represents the average 5-year capital requirements.



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

8.5 Risk & Criticality

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

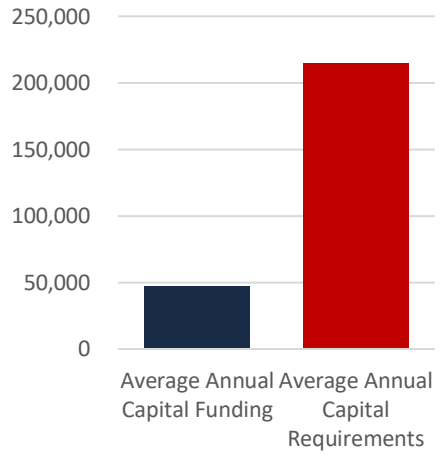
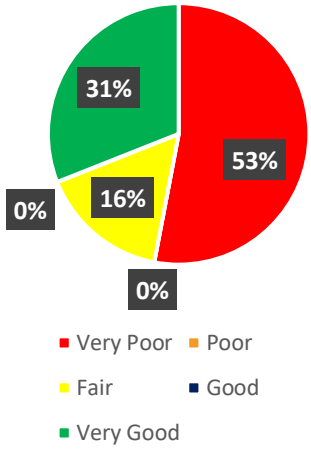
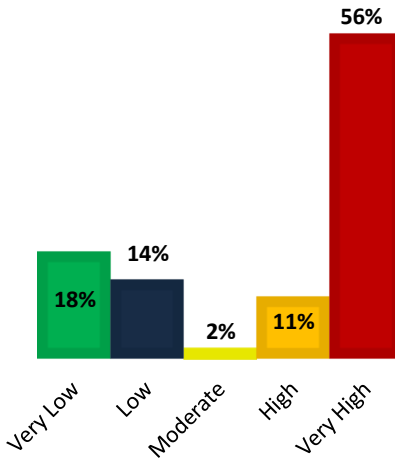
This is a high-level model developed by Township staff and should be reviewed and adjusted to reflect an evolving understanding of both the probability and consequences of asset failure.

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

8.6 Levels of Service

Machinery and equipment are considered a non-core asset category. As such, the Township has until July 1, 2024, to determine the qualitative descriptions and technical metrics that measure the current level of service provided.

The following table identifies the Township's general level of service.

Cost	Performance (Average Condition)	Risk
		

8.7 Recommendations

Replacement Costs

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

Condition Assessment Strategies

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

Risk Management Strategies

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

Levels of Service

- The Township should develop metrics that are determined to provide meaningful and reliable inputs into asset management planning and begin measuring them to meet the July 1, 2024, regulation deadline.

9 Land Improvements

9.1 Key Insights

The Township of Machin owns a small number of assets that are considered land improvements. This category includes:

- Parking lots for municipal facilities
- Sports fields and signage
- Miscellaneous landscaping and other assets

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

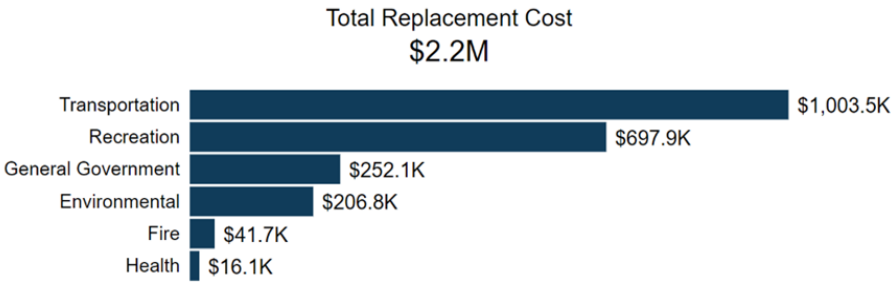
Replacement Cost	Condition	Financial Capacity	
$2.2 million	Poor (24%)	Annual Requirement:	$104,771
		Funding Available:	$22,886
		Annual Deficit:	$81,885

9.2 Asset Inventory & Costs

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

Asset Segment	Quantity	Replacement Cost	Annual Capital Requirement
Environmental	7	$206,835	$9,902
Fire	4	$41,685	$2,084
General Government	16	$252,079	$12,318
Health	1	$16,083	$804
Recreation	19	$697,890	$29,489
Transportation	4002 m & 10	$1,003,466	$50,173
Total		**$2,218,038**	**$104,771**

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

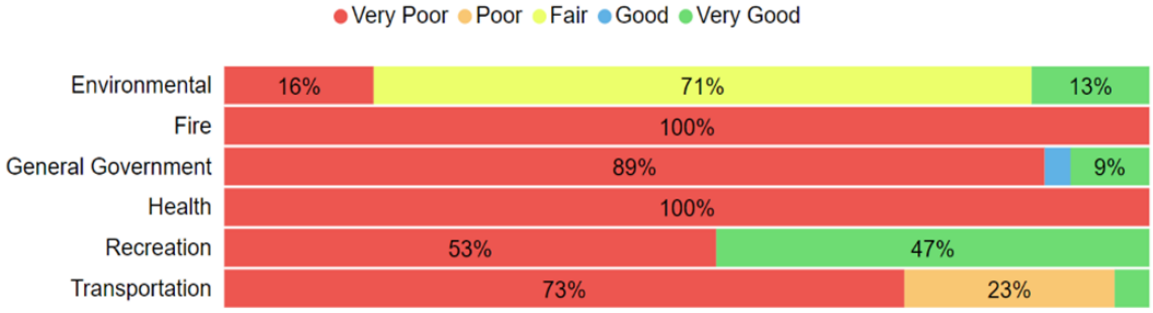


9.3 Asset Condition & Age

The table below identifies the current average condition, the average age, and the estimated useful life for each asset segment. The average condition (%) is a weighted value based on replacement cost.

Asset Segment	Estimated Useful Life	Average Age (Years)	Average Condition
Environmental	20 - 30 Years	21 Years 6 Months	51% (Fair)
Fire	20 Years	46 Years 3 Months	0% (Very Poor)
General Government	20 - 30 Years	53 Years 6 Months	9% (Very Poor)
Health	20 Years	30 Years 6 Months	0% (Very Poor)
Recreation	20 - 40 Years	25 Years	46% (Fair)
Transportation	20 Years	44 Years 2 Months	8% (Very Poor)
Average:		**37 Years 6 Months**	**24% (Poor)**

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

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

9.3.1 Current Approach to Condition Assessment

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

- There are no formal condition assessment programs in place for land improvements

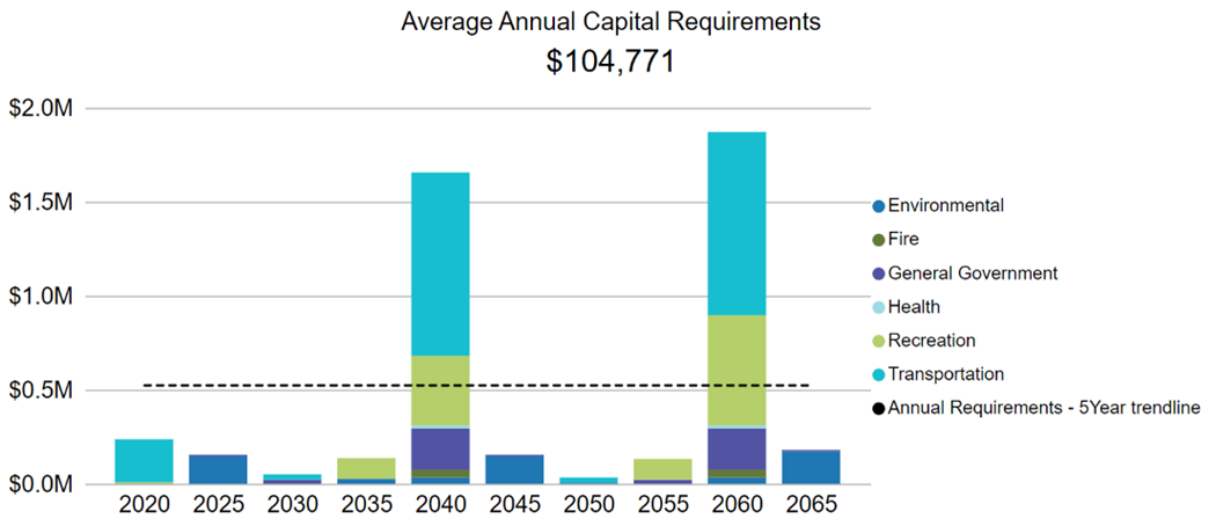
9.4 Lifecycle Management Strategy

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

Activity Type	Description of Current Strategy
Maintenance, Rehabilitation & Replacement	The Land improvements asset category includes several unique asset types and lifecycle requirements are dealt with on a case-by-case basis

9.4.1 Forecasted Capital Requirements

The following graph identifies capital requirements over the next 45 years. This projection is used as it ensures that every asset has gone through one full iteration of replacement. The forecasted requirements are aggregated into 5-year bins and the trend line represents the average 5-year capital requirements.



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

9.5 Risk & Criticality

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

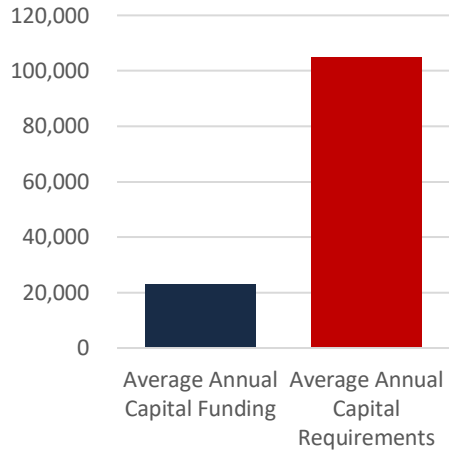
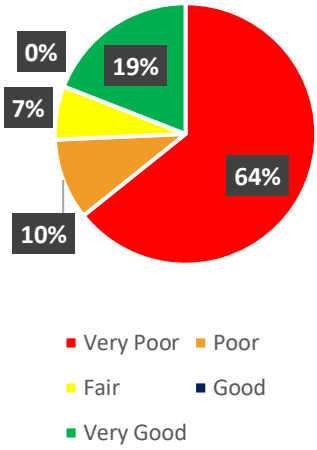
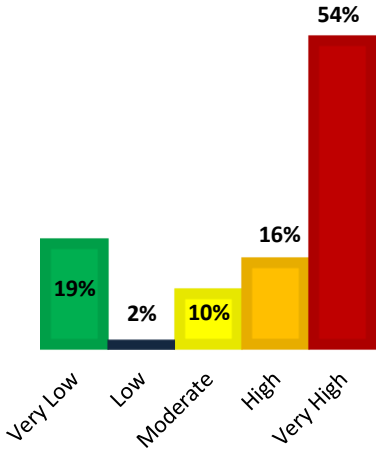
This is a high-level model developed by Township staff and should be reviewed and adjusted to reflect an evolving understanding of both the probability and consequences of asset failure.

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

9.6 Levels of Service

Land improvements are considered a non-core asset category. As such, the Township has until July 1, 2024, to determine the qualitative descriptions and technical metrics that measure the current level of service provided.

The following tables identify the Township's general level of service.

Cost	Performance (Average Condition)	Risk
		

9.7 Recommendations

Replacement Costs

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

Condition Assessment Strategies

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

Risk Management Strategies

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

Levels of Service

- The Township should develop metrics that are determined to provide meaningful and reliable inputs into asset management planning and begin measuring them to meet the July 1, 2024, regulation deadline.

10 Water Network

10.1 Key Insights

The water services provided by the Township are overseen by the Water department. The department is responsible for the following:

- Water Treatment Plant at 4 Bay Street
- Water Distribution System

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

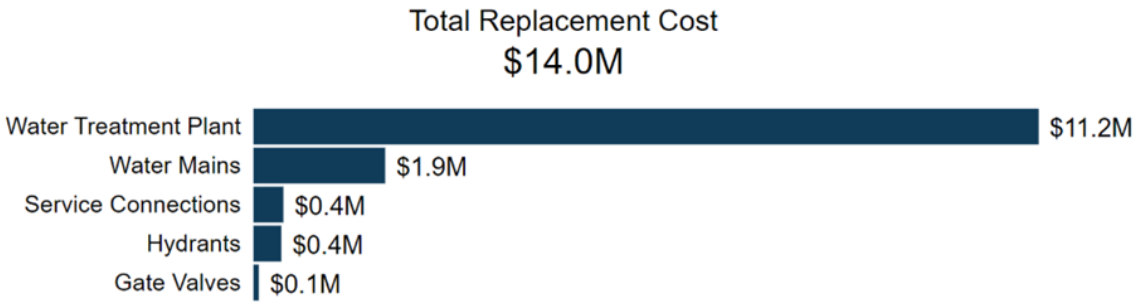
Replacement Cost	Condition	Financial Capacity	
$14 million	Good (66%)	Annual Requirement:	$580,894
		Funding Available:	$223,707
		Annual Deficit:	$357,187

10.2 Asset Inventory & Costs

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

Asset Segment	Quantity	Replacement Cost	Annual Capital Requirement
Gate Valves	65	$79,491	$1,325
Hydrants	50	$399,431	$6,657
Service Connections	154	$430,273	$7,171
Water Mains	7526.6 m	$1,882,029	$62,734
Water Treatment Plant	50	$11,210,964	$503,007
Total		**$14,002,188**	**$580,894**

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

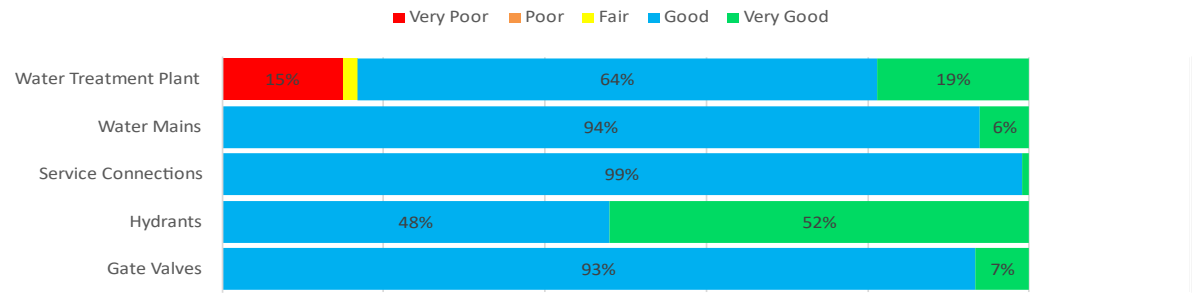


10.3 Asset Condition & Age

The table below identifies the current average condition, the average age, and the estimated useful life for each asset segment. The average condition (%) is a weighted value based on replacement cost.

Asset Segment	Estimated Useful Life	Average Age	Average Condition
Gate Valves	60 Years	43 Years 9 Months	67% (Good)
Hydrants	60 Years	38 Years 10 Months	82% (Very Good)
Service Connections	60 Years	43 Years 9 Months	65% (Good)
Water Mains	60 Years	43 Years 9 Months	68% (Good)
Water Treatment Plant	10 - 50 Years	17 Years 1 Month	65% (Good)
Average:		**33 Years 9 Months**	**66% (Good)**

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



To ensure that the Township's water network continues to provide an acceptable level of service, the Township should monitor the average condition of all assets. If the average condition declines, staff should re-evaluate 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.

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

10.3.1 Current Approach to Condition Assessment

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

- Staff primarily rely on the age and material of water mains to determine the projected condition of water mains
- The only formal condition assessment program in place for the water distribution system is the annual hydrant inspection / system flushing program
- The Treatment Plant operators perform daily rounds and repair and/or rehabilitation is based on their recommendations

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

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

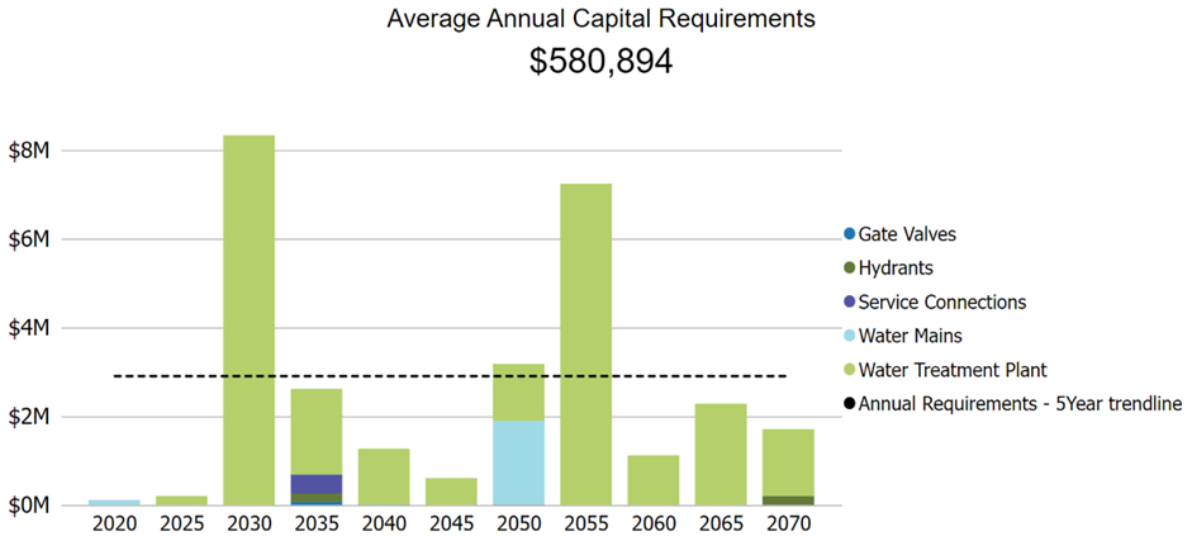
10.4 Lifecycle Management Strategy

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

Activity Type	Description of Current Strategy
Maintenance	Main flushing is completed once a year using in-house resources with the hydrant inspection program
Replacement	Mains are simply maintained with the goal of full replacement once it reaches its end-of-life
	Replacement activities are identified based on an analysis of the main break rate as well as any coloured water complaints received

10.4.1 Forecasted Capital Requirements

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



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

10.5 Risk & Criticality

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

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

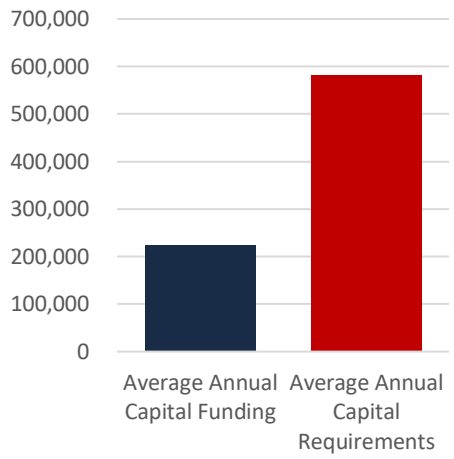
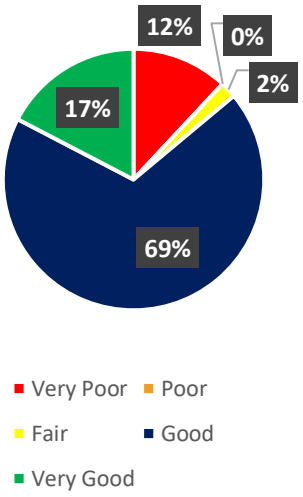
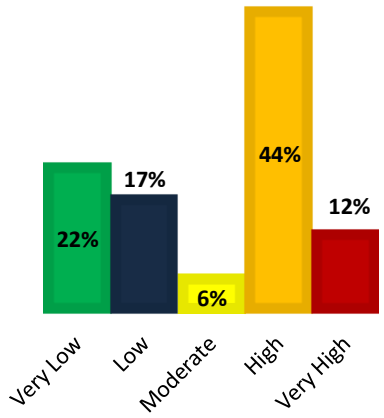
The asset-specific attributes that municipal staff utilize to define and prioritize the criticality of the water network are documented below:

Probability of Failure (POF)	Consequence of Failure (COF)
Condition (Structural)	Replacement Cost (Financial 70%)
Service Life Remaining (Functional)	Pipe Diameter (Operational 15%)
	Traffic Counts (Operational 15%)

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

10.6 Levels of Service

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

Cost	Performance (Average Condition)	Risk
		

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

10.6.1 Community Levels of Service

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

Service Attribute	Qualitative Description	Current LOS (2021)
Scope	Description, which may include maps, of the user groups or areas of the municipality that are connected to the municipal water system	Vermillion Bay has a municipally owned and operated water system
	Description, which may include maps, of the user groups or areas of the municipality that have fire flow	Vermillion Bay is the only area with municipal water which also provides fire flows
Reliability	Description of boil water advisories and service interruptions	In 2020 and 2021 there were no boil water advisories or watermain breaks

10.6.2 Technical Levels of Service

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

Service Attribute	Technical Metric	Current LOS (2021)
Scope	% of properties connected to the municipal water system	23%
	% of properties where fire flow is available	23%
Reliability	# of connection-days per year where a boil water advisory notice is in place compared to the total number of properties connected to the municipal water system	0
	# of connection-days per year where water is not available due to water main breaks compared to the total number of properties connected to the municipal water system	0

10.7 Recommendations

Replacement Costs

- 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 water network assets.

Risk Management Strategies

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

Levels of Service

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

11 Impacts of Growth

11.1 Key Insights

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

11.2 Description of Growth Assumptions

The demand for infrastructure and services will change over time based on a combination of internal and external factors. Understanding the key drivers of growth and demand will allow the Township to plan for new infrastructure, as well as the upgrade or 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.

11.2.1 Machin Strategic Plan (2017 - 2022)

The Township strategic vision is:

"Machin will be known as an innovative and growing community that is diverse in culture, people and its economy, offering a safe place where quality of life can be enjoyed in a beautiful setting."

The Township of Machin has a strategic mission that states:

"To promote a diversified community and economy based on sustainability by strengthening and enhancing community infrastructure, services and activities, while engaging people and celebrating Machin as a beautiful and safe place to play, live and learn."

The population in Machin from 2006 to 2011 declined 4.4%, however since then the population has been on incline increasing by 8.2% from 2011 to 2021. The Township is currently working on promoting infilling within the community as well as a subdivision development project to redevelop the old airport property.

11.3 Impact of Growth on Lifecycle Activities

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

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

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

12 Financial Strategy

12.1 Key Insights

- The Township is committing approximately $541,335 towards capital projects per year
- Given the annual capital requirement of $1,452,430, there is currently a funding gap of $911,094 annually
- For tax-funded assets, we recommend increasing tax revenues by 1.2% each year for the next 20 years to achieve a sustainable level of funding
- For the water network, increasing rate revenues by 1.9% annually for the next 40 years to achieve a sustainable level of funding

12.2 Financial Strategy Overview

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

A financial plan was developed 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 currently identified)
    d. Requirements of anticipated growth (none identified for this plan)
2. Use of traditional sources of municipal funds:
    a. Tax levies
    b. User fees
    c. Reserves
    d. Debt
3. Use of non-traditional sources of municipal funds:
    a. Reallocated budgets
    b. Partnerships
    c. Procurement methods
4. Use of Senior Government Funds:
    a. Canada Community Building Fund (CCBF)
    b. Annual grants

Note: Periodic grants are 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.

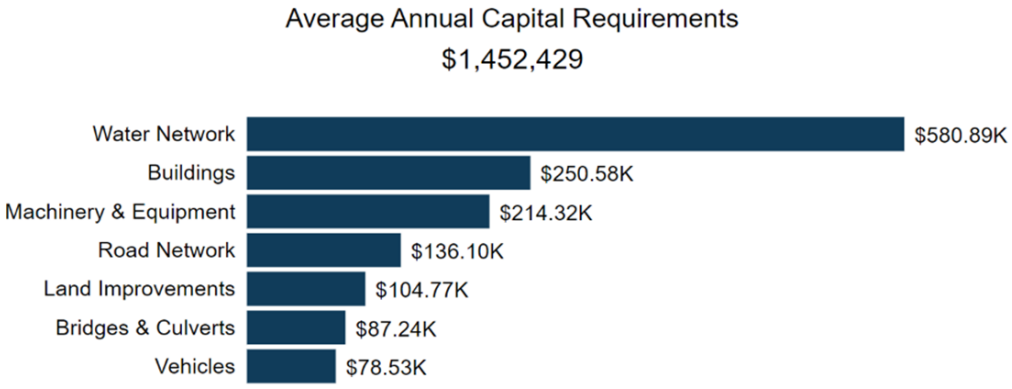
If the financial plan results in a funding shortfall, the province requires the inclusion of a specific plan as to how the shortfall will be managed. In determining the legitimacy of a funding shortfall, the province may evaluate an approach to the following:

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

12.3 Annual Requirements & Capital Funding

12.3.1 Annual Requirements

The annual requirements represent the amount the Township should allocate annually to each asset category to meet replacement needs as they arise, prevent infrastructure backlogs, and achieve long-term sustainability. In total, the Township must allocate approximately $1.45 million annually to address capital requirements for the asset inventory.



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. 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:

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

Asset Category	Annual Requirements (Replacement Only)	Annual Requirements (Lifecycle Strategy)	Difference
Road Network	$298,908	$136,102	$162,806

The implementation of a proactive lifecycle strategy for roads leads to a potential annual cost avoidance of approximately $162,800 for the road network. This represents an overall reduction of the annual requirements by 54%. As the lifecycle strategy scenario represents the lowest cost option available to the Township, we have used this annual requirement in the development of the financial strategy.

Annual Funding Available

Based on a historical analysis of sustainable capital funding sources, the Township is committing approximately $849,078 towards capital projects per year from sustainable revenue sources. Given the annual capital requirement of $1,452,429, there is currently a funding gap of $603,351 annually.

12.4 Funding Objective

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

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

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

12.5 Financial Profile – Tax Funded Assets

12.5.1 Current Funding Position

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

Asset Category	Avg. Annual Requirement	Annual Funding Available				Annual Deficit / Surplus
		Taxes	CCBF	OCIF	Total Available	
Bridges & Culverts	87,237	19,056	-	-	19,056	68,181
Buildings	250,582	54,737	-	-	54,737	195,845
Land Improvements	104,771	22,886	-	-	22,886	81,885
Machinery & Equipment	214,316	46,815	-	-	46,815	167,501
Road Network	136,102	29,730	-	127,251	156,981	-20,879
Vehicles	78,525	17,153	-	-	17,153	61,372
	871,534	**190,377**	**-**	**127,251**	**317,628**	**553,906**

The average annual investment requirement for the above categories is $871,500. Annual revenue currently allocated to these assets for capital purposes is $317,600 leaving an annual deficit of $553,900. Put differently, these infrastructure categories are currently funded at 36% of their long-term requirements.

12.5.2 Full Funding Requirements

In 2022, Township of Machin will have an annual tax revenue of $2,026,800. 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	3.4%
Buildings	9.7%
Land Improvements	4.0%
Machinery & Equipment	8.3%
Road Network	-1.0%
Vehicles	3.0%
	27.4%

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

	5 Years	10 Years	15 Years	20 Years
Infrastructure Deficit	553,906	553,906	553,906	553,906
Change in Debt Costs	-	-	-	-
Change in OCIF Grants	-	-	-	-
Resulting Infrastructure Deficit:	**553,906**	**553,906**	**553,906**	**553,906**
Tax Increase Required	27.3%	27.3%	27.3%	27.3%
Annual	**5.0%**	**2.4%**	**1.6%**	**1.2%**

12.5.3 Financial Strategy Recommendations

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

- increasing tax revenues by 1.2% each year for the next 20 years solely for the purpose of phasing in full funding to the tax funded asset categories
- allocating the current CCBF and OCIF revenue as outlined previously.
- should the scheduled OCIF grant increase, the Township should reduce the annual tax increase by an amount equal to the grant increase as it occurs.
- reallocating appropriate revenue from categories in a surplus position to those in a deficit position.
- increasing existing and future infrastructure budgets by the applicable inflation index on an annual basis in addition to the deficit phase-in.

Notes:

1. As in the past, periodic senior government infrastructure funding will most likely be available during the phase-in period. By Provincial AMP rules, this periodic funding cannot be incorporated into an AMP unless there are firm commitments in place. We have included OCIF formula-based funding since this funding is a multi-year commitment[1].
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.

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

Although this option achieves full capital 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.

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.

12.6 Financial Profile: Rate Funded Assets

12.6.1 Current Funding Position

The following tables shows Machin's average annual asset capital expenditure requirements, current funding positions, and funding increases required to achieve full funding on water network assets funded by user rates.

Asset Category	Avg. Annual Requirement	Annual Funding Available				Annual Deficit / Surplus
		Rates	Green Stream	CCBF	Total Available	
Water Network	580,894	0	162,116	61,591	223,707	357,187

The average annual capital requirement for the water network is $580,890. Annual revenue currently allocated to the Water Network for capital purposes is $223,707 leaving an annual deficit of $357,187. Put differently, this infrastructure category is currently funded at 38.5% of the long-term requirements.

12.6.2 Full Funding Requirements

In 2022, Machin had budgeted annual Water Network revenues of $307,740. 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
Water Network	116.1%

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 40 years:

	5 Years	10 Years	20 Years	40 Years
Infrastructure Deficit	357,187	357,187	357,187	357,187
Rate Increase Required	116.1%	116.1%	116.1%	116.1%
Annual	**16.7%**	**8.0%**	**3.9%**	**1.9%**

12.6.3 Financial Strategy Recommendations

Considering the above information, we recommend the 20-year option for the water network, however, raising the water rates by 3.9% annually for infrastructure only (in addition to the rate study recommendations of 2% for operations) staff are recommending extending the phase in. This plan is extending the implementation of full capital funding being achieved over 40 years by:

- increasing rate revenues by 1.9% for the Water Network each year for the next 40 years.
- these rate revenue increases are solely for the purpose of phasing in full capital funding.
- 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. 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.

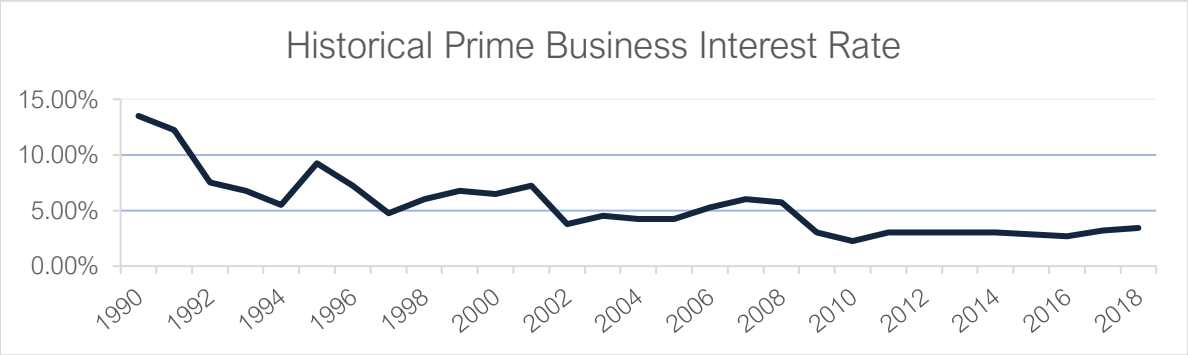
Although this strategy achieves full capital funding for rate-funded assets over 40 years, the recommendation does require prioritizing capital projects to fit the annual funding available. Prioritizing future projects will require the current data to be replaced by condition-based data. Although our recommendations include no further use of debt, the results of the condition-based analysis may require otherwise.

12.7 Use of Debt

For reference purposes, the following table outlines the premium paid on a project if financed by debt. For example, a $1M project financed at 3.0%[2] 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:



[2] 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 Machin has historically used debt for investing in the asset categories as listed.

Asset Category	Current Debt Outstanding	Use of Debt in the Last Five Years				
		2017	2018	2019	2020	2021
Water Network	847,000	-	-	-	-	-

Asset Category	Principal & Interest Payments in the Next Ten Years						
	2022	2023	2024	2025	2026	2027	2032
Water Network	$86,514	$86,282	$86,045	81,627	$77,383	$77,383	$66,328

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

12.8 Use of Reserves

12.8.1 Available Reserves

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

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

The table below outlines the details of the reserves currently available to fund capital assets.

Reserve Name	Balance on December 31, 2020
Buildings	$162,020
Machinery & Equipment	$245,261
Road Network	$245,261
Land Improvements	$10,401
Bridges & Culverts	$122,630
Vehicles	$-
Total Tax Funded:	**$769,903**
Water Network	$226,831

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

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

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

12.9 Recommendation

In 2025, Ontario Regulation 588/17 will require Machin 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.

13 Appendices

13.1 Key Insights

- Appendix A includes a one-page report card with an overview of key data from each asset category

- Appendix B identifies projected 10-year capital requirements for each asset category

- Appendix C includes several maps that have been used to visualize the current level of service

- Appendix D identifies the criteria used to calculate risk for each asset category

- Appendix E provides additional guidance on the development of a condition assessment program

Appendix A: Infrastructure Report Card

Asset Category	Replacement Cost (millions)	Asset Condition	Financial Capacity	
Road Network	$7.7	Poor (22%)	Annual Requirement:	$136,100
			Funding Available:	$156,980
			Annual Deficit/Surplus:	**$(20,880)**
Bridges & Culverts	$4.29	Fair (58%)	Annual Requirement:	$87,240
			Funding Available:	$19,060
			Annual Deficit:	**$68,180**
Buildings	$9.1	Poor (37%)	Annual Requirement:	$250,580
			Funding Available:	$54,740
			Annual Deficit:	**$195,840**
Vehicles	$1.3	Good (75%)	Annual Requirement:	$78,525
			Funding Available:	$17,150
			Annual Deficit:	**$61,375**
Machinery & Equipment	$2.66	Poor (37%)	Annual Requirement:	$214,316
			Funding Available:	$46,815
			Annual Deficit:	**$167,501**
Land Improvements	$2.2	Poor (24%)	Annual Requirement:	$104,771
			Funding Available:	$22,886
			Annual Deficit:	**$81,885**
Water Network	$14	Good (66%)	Annual Requirement:	$580,894
			Funding Available:	$223,707
			Annual Deficit:	**$357,187**
Overall	$41.3	Good (71%)	Annual Requirement:	$1,452,429
			Funding Available:	$849,078
			Annual Deficit:	**$603,351**

Appendix B: 10-Year Capital Requirements

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

Summary

Segment	Backlog	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
Bridges & Culverts	$682,000	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Buildings	$1,581,027	$834,932	$0	$3,165,990	$0	$0	$774,646	$0	$0	$10,784	$0
Land Improvements	$1,423,301	$0	$228,080	$0	$0	$147,093	$0	$0	$6,977	$0	$0
Machinery & Equipment	$1,404,884	$3,398	$0	$373,377	$63,620	$28,942	$57,624	$23,006	$50,051	$28,942	$35,290
Road Network	$0	$81,140	$181,029	$74,947	$144,484	$136,326	$0	$11,197	$10,744	$124,987	$136,326
Vehicles	$133,350	$0	$0	$2,010	$50,009	$188,505	$0	$0	$91,284	$55,780	$0
Water Network	$3,448,132	$0	$115,165	$0	$0	$192,299	$11,388	$0	$0	$0	$7,228,570
Total	**$8,672,693**	**$919,470**	**$524,273**	**$3,616,324**	**$258,113**	**$693,166**	**$843,659**	**$34,204**	**$159,055**	**$220,493**	**$7,400,187**

Road Network

Segment	Backlog	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
Asphalt (HCB)	$0	$0	$79,237	$3,747	$93,715	$0	$0	$0	$0	$0	$0
Gravel	$0	$0	$11,197	$10,744	$732	$136,326	$0	$11,197	$10,744	$732	$136,326
Street Lights	$0	$0	$0	$0	$0	$0	$0	$0	$0	$124,255	$0
Surface Treatment (LCB)	$0	$81,140	$90,594	$60,456	$50,036	$0	$0	$0	$0	$0	$0
Total:	**$0**	**$81,140**	**$181,029**	**$74,947**	**$144,484**	**$136,326**	**$0**	**$11,197**	**$10,744**	**$124,987**	**$136,326**

Bridges & Culverts											
Segment	**Backlog**	**2021**	**2022**	**2023**	**2024**	**2025**	**2026**	**2027**	**2028**	**2029**	**2030**
Bridges	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Culverts	$682,000	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Total:	**$682,000**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**

Buildings											
Segment	**Backlog**	**2021**	**2022**	**2023**	**2024**	**2025**	**2026**	**2027**	**2028**	**2029**	**2030**
Environmental	$16,184	$0	$0	$0	$0	$0	$0	$0	$0	$10,784	$0
Fire	$114,624	$834,932	$0	$2,654	$0	$0	$0	$0	$0	$0	$0
General Government	$704,097	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Health	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Recreation	$333,003	$0	$0	$3,163,336	$0	$0	$774,646	$0	$0	$0	$0
Transportation	$413,120	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Total:	**$1,581,027**	**$834,932**	**$0**	**$3,165,990**	**$0**	**$0**	**$774,646**	**$0**	**$0**	**$10,784**	**$0**

Machinery & Equipment											
Segment	**Backlog**	**2021**	**2022**	**2023**	**2024**	**2025**	**2026**	**2027**	**2028**	**2029**	**2030**
Environmental	$50,301	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Fire	$244,002	$0	$0	$373,377	$49,784	$0	$34,265	$0	$29,666	$0	$21,453
General Government	$306,325	$0	$0	$0	$13,837	$28,942	$18,319	$13,837	$8,283	$28,942	$13,837
Health	$0	$0	$0	$0	$0	$0	$5,041	$9,170	$0	$0	$0
Recreation	$171,732	$0	$0	$0	$0	$0	$0	$0	$9,829	$0	$0
Transportation	$632,524	$3,398	$0	$0	$0	$0	$0	$0	$2,272	$0	$0
Total:	**$1,404,884**	**$3,398**	**$0**	**$373,377**	**$63,620**	**$28,942**	**$57,624**	**$23,006**	**$50,051**	**$28,942**	**$35,290**

Vehicles

Segment	Backlog	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
Fire	$108,732	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
General Government	$0	$0	$0	$0	$0	$0	$0	$0	$0	$31,162	$0
Transportation	$24,618	$0	$0	$2,010	$50,009	$188,505	$0	$0	$91,284	$24,618	$0
Total:	**$133,350**	**$0**	**$0**	**$2,010**	**$50,009**	**$188,505**	**$0**	**$0**	**$91,284**	**$55,780**	**$0**

Land Improvements

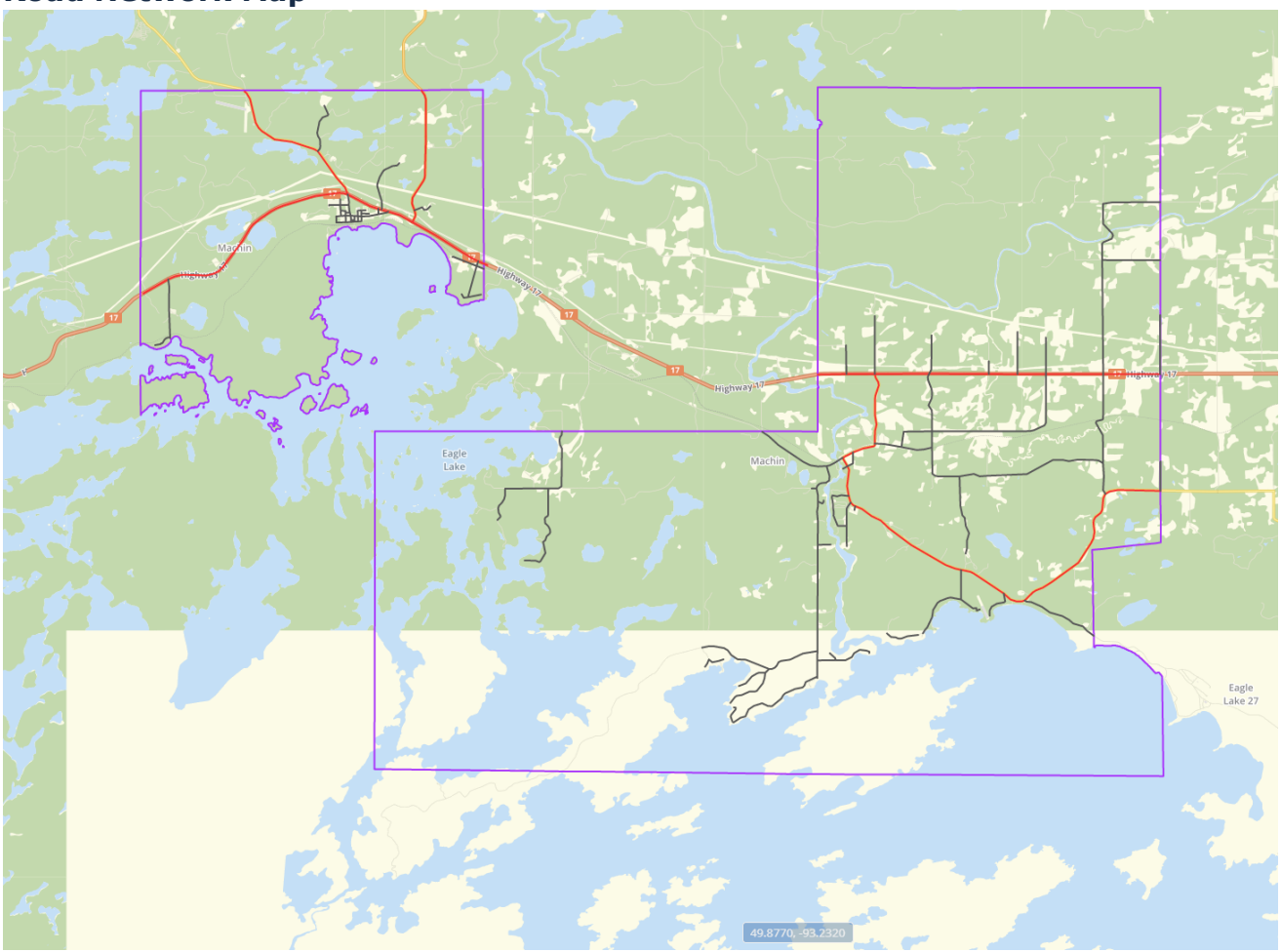
Segment	Backlog	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
Environmental	$33,383	$0	$0	$0	$0	$147,093	$0	$0	$0	$0	$0
Fire	$41,685	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
General Government	$223,539	$0	$0	$0	$0	$0	$0	$0	$6,977	$0	$0
Health	$16,083	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Recreation	$371,113	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Transportation	$737,498	$0	$228,080	$0	$0	$0	$0	$0	$0	$0	$0
Total:	**$1,423,301**	**$0**	**$228,080**	**$0**	**$0**	**$147,093**	**$0**	**$0**	**$6,977**	**$0**	**$0**

Water Network

Segment	Backlog	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
Gate Valves	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Hydrants	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Service Connections	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Water Mains	$1,766,864	$0	$115,165	$0	$0	$0	$0	$0	$0	$0	$0
Water Treatment Plant	$1,681,268	$0	$0	$0	$0	$192,299	$11,388	$0	$0	$0	$7,228,570
Total:	**$3,448,132**	**$0**	**$115,165**	**$0**	**$0**	**$192,299**	**$11,388**	**$0**	**$0**	**$0**	**$7,228,570**

Appendix C: Level of Service Maps

Road Network Map



Images of Bridge in Good Condition

Photo 3: Upstream elevation.

Photo 4: Downstream elevation.

Appendix D: Risk Rating Criteria

Asset Category	Asset Segment	Risk Criteria	Criteria	Weighting (%)	Sub-Criteria	Weighting (%)	Value/Range	Score
General / Corporate		COF	Economic	100%	Replacement Cost	100%	0 - 5,000 5,000 - 20,000 20,000 - 100,000 100,000 - 250,000 >250,000	1 - Insignificant 2 - Minor 3 - Moderate 4 - Major 5 - Severe
		POF	Structural	60%	Age Based Condition	100%	80 - 100 60 - 79 40 - 59 20 - 39 0 - 19	1 - Rare 2 - Unlikely 3 - Possible 4 - Likely 5 - Almost Certain
			Functional	40%	Service Life Remaining	100%	> 40 20 - 30 10 - 20 1 - 10 < 1	1 - Rare 2 - Unlikely 3 - Possible 4 - Likely 5 - Almost Certain

Asset Category	Asset Segment	Risk Criteria	Criteria	Weighting (%)	Sub-Criteria	Weighting (%)	Value/Range	Score
Bridges & Culverts	Bridges	COF	Economic	70%	Replacement Cost	100%	0 - 5,000 5,000 - 20,000 20,000 - 100,000 100,000 - 250,000 >250,000	1 - Insignificant 2 - Minor 3 - Moderate 4 - Major 5 - Severe
			Operational	30	Capacity – Load Limit	50%	No Yes	1 – Insignificant 4 - Major
					Detour Length	50%	< 10km 10km to 20km > 20km	2 - Unlikely 3 - Possible 4 - Likely
		POF	Structural	60%	Assessed Condition	100%	80 - 100 60 - 79 40 - 59 20 - 39 0 - 19	1 - Rare 2 - Unlikely 3 - Possible 4 - Likely 5 - Almost Certain
			Functional	40%	Service Life Remaining	100%	> 40 20 - 30 10 - 20 1 - 10 < 1	1 - Rare 2 - Unlikely 3 - Possible 4 - Likely 5 - Almost Certain

Asset Category	Asset Segment	Risk Criteria	Criteria	Weighting (%)	Sub-Criteria	Weighting (%)	Value/Range	Score
Bridges & Culverts Continued	Culverts	COF	Economic	70%	Replacement Cost	100%	0 - 5,000 5,000 - 20,000 20,000 - 100,000 100,000 - 250,000 >250,000	1 - Insignificant 2 - Minor 3 - Moderate 4 - Major 5 - Severe
			Operational	30%	Traffic Range	50%	Non-Maintained 0-49 50-199 200-399	1 - Insignificant 2 - Minor 3 - Moderate 4 - Major
					Width/Diameter	50%	<=500mm <=750mm <=1500mm <=2000mm <=3000mm	1 - Insignificant 2 - Minor 3 – Moderate 4 - Major 5 - Severe
		POF	Structural	60%	Assessed Condition	100%	80 - 100 60 - 79 40 - 59 20 - 39 0 - 19	1 - Rare 2 - Unlikely 3 - Possible 4 - Likely 5 - Almost Certain
			Functional	40%	Service Life Remaining	100%	> 40 20 - 30 10 - 20 1 - 10 < 1	1 - Rare 2 - Unlikely 3 - Possible 4 - Likely 5 - Almost Certain

Asset Category	Asset Segment	Risk Criteria	Criteria	Weighting (%)	Sub-Criteria	Weighting (%)	Value/Range	Score
Road Network	Roads	COF	Economic	70%	Replacement Cost	100%	0 - 25,000 25,000 - 50,000 50,000 - 100,000 100,000 - 250,000 >250,000	1 - Insignificant 2 - Minor 3 - Moderate 4 - Major 5 - Severe
			Operational	30%	Traffic Range	50%	Non-Maintained 0-49 50-199 200-399	1 - Insignificant 2 - Minor 3 - Moderate 4 - Major
					Surface Type	50%	Gravel Surface Treatment Asphalt	2 – Minor 3 – Moderate 4 - Major
		POF	Structural	60%	Assessed Condition	100%	80 - 100 60 - 79 40 - 59 20 - 39 0 - 19	1 - Rare 2 - Unlikely 3 - Possible 4 - Likely 5 - Almost Certain
			Functional	40%	Service Life Remaining	100%	> 40 20 - 30 10 - 20 1 - 10 < 1	1 - Rare 2 - Unlikely 3 - Possible 4 - Likely 5 - Almost Certain

Asset Category	Asset Segment	Risk Criteria	Criteria	Weighting (%)	Sub-Criteria	Weighting (%)	Value/Range	Score
Water Network	Watermains	COF	Economic	70%	Replacement Cost	100%	0 - 5,000 5,000 - 20,000 20,000 - 100,000 100,000 - 250,000 >250,000	1 - Insignificant 2 - Minor 3 - Moderate 4 - Major 5 - Severe
			Operational	30%	Traffic Range	50%	Non-Maintained 0-49 50-199 200-399	1 - Insignificant 2 - Minor 3 - Moderate 4 - Major
					Width/Diameter	50%	<=100mm <=200mm <=300mm <=400mm <=600mm	1 - Insignificant 2 - Minor 3 – Moderate 4 - Major 5 - Severe
		POF	Structural	60%	Assessed Condition	100%	80 - 100 60 - 79 40 - 59 20 - 39 0 - 19	1 - Rare 2 - Unlikely 3 - Possible 4 - Likely 5 - Almost Certain
			Functional	40%	Service Life Remaining	100%	> 40 20 - 30 10 - 20 1 - 10 < 1	1 - Rare 2 - Unlikely 3 - Possible 4 - Likely 5 - Almost Certain

Appendix E: Condition Assessment Guidelines

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

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

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

Role of Asset Condition Data

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

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

Guidelines for Condition Assessment

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

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

Developing a Condition Assessment Schedule

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

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