Asset Management Plan

Township of Horton

2022

This Asset Management Program was prepared by:

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

Key Statistics

Replacement cost of asset portfolio
$40 million

Replacement cost of infrastructure per household
$26,892 (2021)

Percentage of assets in fair or better condition
85%

Percentage of assets with assessed condition data
88%

Annual capital infrastructure deficit
$744 thousand

Recommended time frame for eliminating annual infrastructure deficit
15 Years

Target reinvestment rate
3%

Actual reinvestment rate
1.11%

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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

The current practices and strategies that are in place at the Township to manage public infrastructure and makes recommendations where further refinement is possible. 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 detailed in the further sections:

Asset Category

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

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

Findings

The overall replacement cost of the Township's asset categories total $40 million. 85% of all assets analysed are in fair or better condition and assessed condition data was available for 88% of the assets. For the remaining 12% 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 throughout.

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

To meet capital replacement and rehabilitation needs for existing infrastructure, prevent infrastructure backlogs, and achieve long-term sustainability, the Township's average annual capital requirement totals $1.19 million. Based on a historical analysis of sustainable capital funding sources, the Township is committing approximately $443,500 towards capital projects or reserves per year. As a result, there is currently an annual funding gap of $744,000.

It is important to note that these numbers represent a snapshot in time and are 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/rate change required to eliminate the Township's infrastructure deficit based on a 15-year plan is 2%.

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 residents receive from the asset portfolio
- The Township's asset management policy provides clear direction to staff on their roles and responsibilities regarding asset management
- An asset management plan is a living document that should be updated regularly to inform long-term planning
- Ontario Regulation 588/17 outlines several key milestone and requirements for asset management plans in Ontario between July 1, 2022 and 2025

1.2 Horton Township Community Profile

Horton Township is in the Eastern Ontario region west of Ottawa along the Ontario-Quebec border. It spans across the Ottawa River and the Bonnechere River. The table below shows the census characteristics of Horton and the province.

Census Characteristic	Horton Township	Ontario
Population 2021	3,182	14,223,942
Population Change 2016-2021	10.2	5.8
Total Private Dwellings	1,486	5,929,250
Population Density	20.1/km^2	15.9/km^2
Land Area in Square Kilometers	158.02 km^2	892,411.76 km^2

The Township surrounds the neighbouring Town of Renfrew, which was originally part of Horton Township, and is now part of Renfrew County.

The region was settled in the early 1820's and was incorporated as a Township in 1850. The first road in Horton Township was called Opeongo Line and provided the opportunity for cargo and passengers to disembark from boats towards the interior of the Ottawa Valley.

The Ottawa River, several large lakes and Bonnechere River create a natural tourist attraction for cottagers and day trippers from the City of Ottawa. Due to its proximity to the city, Horton Township has also become a popular residence for retirees and commuters.

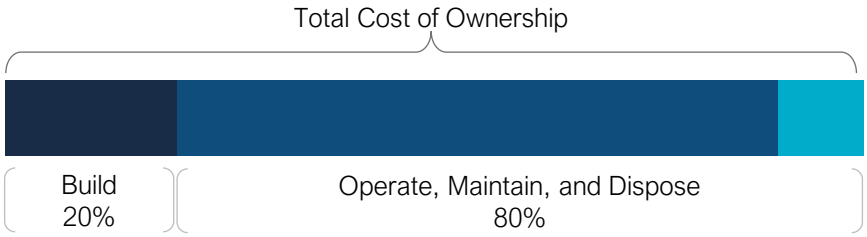
Horton is a small yet strong agricultural community, and with cultural roots from Holland, there are a variety of niche products available. The number of home-based businesses has increased in the Township recently.

With the completion of Hwy #17, a four-lane highway running to Arnprior, Horton will continue to grow as a desirable destination for those seeking a rural lifestyle with the benefits of working in the urban center in neighbouring Ottawa.

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 residents 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 analysis of this asset management plan focuses 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 a broader asset management program. The industry-standard approach and sequence to developing a practical asset management program begins with a Strategic Plan, followed by an Asset Management Policy and an Asset Management Strategy, concluding with an Asset Management Plan.

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

1.3.1 Asset Management Policy

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

The Township adopted By-law No. 2019-26 "A By-law to Adopt an Asset Management Strategy Policy" on April, 2019 in accordance with Ontario Regulation 588/17. The objectives of the policy include:

- To provide leadership and commitment to the development and implementation of the Township's asset management program.
- To guide the Township by using a consistent framework across the organization, to facilitate logical and evidence-based decision-making for the management of assets and to support the delivery of services now and in the future.
- To demonstrate to all stakeholder's transparency and accountability of the decision-making processes of strategic plans, budget, service levels and risks.
- To meet legislative requirements
- To endeavour to align with the Township's Strategic Policy.

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

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

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

1.4 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 specific 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.

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. 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 as well as the likelihood of that failure, risk management strategies can identify critical assets, and determine where maintenance efforts, and spending, should be focused.

There is a high-level evaluation of asset risk and criticality within each asset category. 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 services 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 & Culverts, Water, Wastewater, Stormwater) the province, through O. Reg. 588/17, has provided qualitative descriptions that are required to be included. For non-core asset categories, the Township has determined the qualitative descriptions that will be used to determine the community level of service provided. These descriptions can be found in the Levels of Service subsection within each asset category.

Technical Levels of Service

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

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

Current and Proposed Levels of Service

The Township's focus has been 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 Horton Township Climate Profile

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 may experience the following trends:

Higher Average Annual Temperature:

- Between the years 1981 and 2010 the annual average temperature was 5.7 ºC
- Under a high emissions scenario, the annual average temperatures are projected to increase by 2.1 ºC by the year 2050 and over 5 ºC by the end of the century.

Increase in Total Annual Precipitation:

- Under a high emissions scenario, Horton is projected to experience an 7% increase in precipitation by the year 2050 and a 14% 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.
- In some areas, extreme weather events will occur with greater frequency and severity than others especially those impacted by Great Lake winds.

1.5.2 Ottawa River Watershed

The Ottawa River is the second largest river in eastern Canada, it extends 1271 km (780 miles) with a 140,000 km2 (34,600,000 acres) watershed.

Most of the river is located within the Canadian Shield, the continent-spanning highland underlain by Precambrian age bedrock, that supports hundreds of thousands of lakes and constitutes the world's greatest concentration of freshwater. The volume of water in the Ottawa River is equivalent to the volume of water in all of western Europe.

Given the vast size of the Ottawa River Watershed and the number of people who live here, it is no surprise that the river is under pressure from many different activities. However, if we are to preserve and protect the ecological health of the river system, we must begin to understand and predict what the cumulative impacts of our actions are and find solutions that enable our future generations to safely eat fish and drink water from the river.

The major watershed-scale pressures that are currently threatening the ecological health of the river are:

- Dams
- Municipal / Industrial Wastewater
- Urban Stormwater
- Agriculture
- Floodplain and Shoreline Development
- Wetland Destruction

The physical impacts of climate change are most noticeable from: flooding, extreme weather events such as windstorms and tornados, and/or rising water levels eroding shorelines and natural spaces. Erosion and flooding pose a threat to the surrounding built infrastructure such as park assets, bridges, and roads

1.5.3 Integrating 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:

- Current levels of service
- Inventory analysis
- Lifecycle activities to sustain LOS
- Cost of lifecycle activities
- Population and employment forecasts
- Discussion of growth impacts

2024

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

2025

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

- Proposed levels of service for next 10 years
- Updated inventory analysis
- Lifecycle management strategy
- Financial strategy and addressing shortfalls
- 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 - 10	Complete
Replacement cost of assets in each category	S.5(2), 3(ii)	4 - 10	Complete
Average age of assets in each category	S.5(2), 3(iii)	4 - 10	Complete
Condition of assets in each category	S.5(2), 3(iv)	4 - 10	Complete
Description of municipality's approach to assessing the condition of assets in each category	S.5(2), 3(v)	4 - 10	Complete
Current levels of service in each category	S.5(2), 1(i-ii)	4 - 10	Complete
Current performance measures in each category	S.5(2), 2	4 - 10	Complete
Lifecycle activities needed to maintain current levels of service for 10 years	S.5(2), 4	4 - 10	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)	11	Complete

2 Scope and Methodology

2.1 Key Insights

- Horton Township has 7 tax funded asset categories
- The source and recency of replacement costs impacts the accuracy and reliability of asset portfolio valuation
- Accurate and reliable condition data helps to prevent premature and costly rehabilitation or replacement and ensures that lifecycle activities occur at the right time to maximize asset value and useful life

2.2 Asset Categories

Horton Township developed their asset management program in compliance with Ontario Regulation 588/17. The state of the infrastructure for the Township's asset portfolio, establishes current levels of service and the associated technical and customer oriented key performance indicators (KPIs), outlines lifecycle strategies for optimal asset management and performance, and provides financial strategies to reach sustainability for the asset categories listed below.

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

2.3 Deriving Replacement Costs

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

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

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

2.4 Estimated Useful Life and Service Life Remaining

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

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

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

2.5 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. When assessed condition data is not available, service life remaining is used to approximate asset condition.

Condition	Description	Criteria	Service Life Remaining (%)
Very Good	Fit for the future	Well maintained, good condition, new or recently rehabilitated	80-100
Good	Adequate for now	Acceptable, generally approaching mid-stage of expected service life	60-80
Fair	Requires attention	Signs of deterioration, some elements exhibit significant deficiencies	40-60
Poor	Increased 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 performed for each asset category 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.

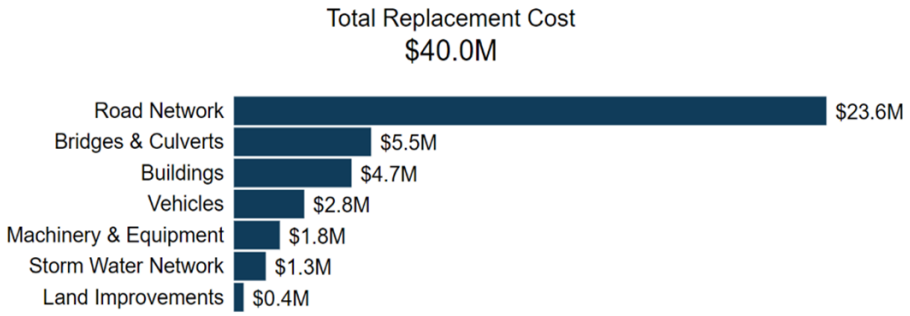
3 Portfolio Overview

3.1 Key Insights

- The total replacement cost of the Township's asset portfolio is $40 million
- The Township's target re-investment rate is 3%, and the actual re-investment rate is 1.11%, contributing to an expanding infrastructure deficit
- 85% of all assets are in fair or better condition

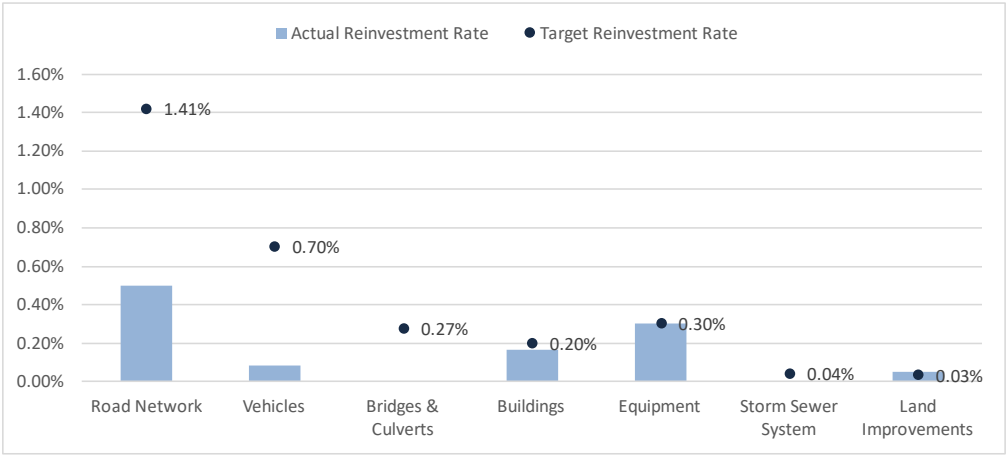
3.2 Total Replacement Cost of Asset Portfolio

The asset categories analysed have a total replacement cost of $39.9 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.



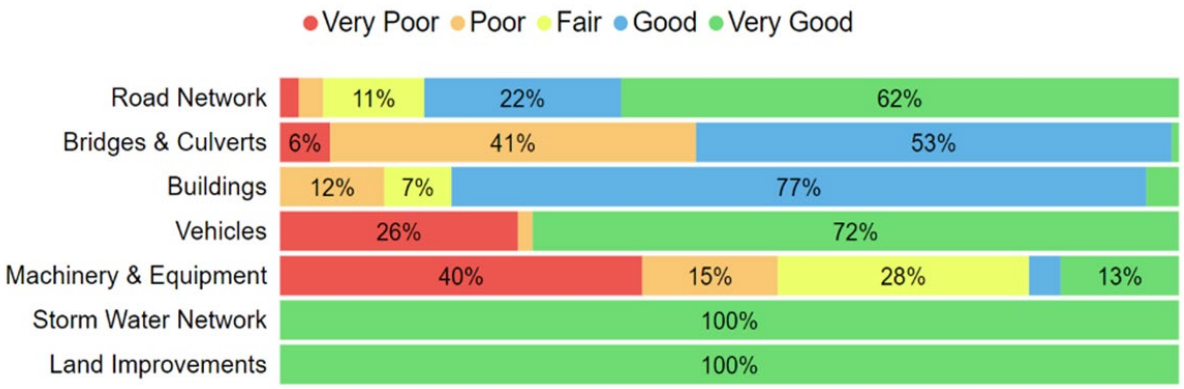
3.3 Target vs. Actual Reinvestment Rate

The graph below depicts funding gaps or surpluses by comparing target vs actual reinvestment rate. To meet the long-term replacement needs, the Township should be allocating approximately $1.19 million annually, for a target reinvestment rate of 3.0%. Actual annual spending on infrastructure totals approximately $443,500, for an actual reinvestment rate of 1.11%.



3.4 Condition of Asset Portfolio

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

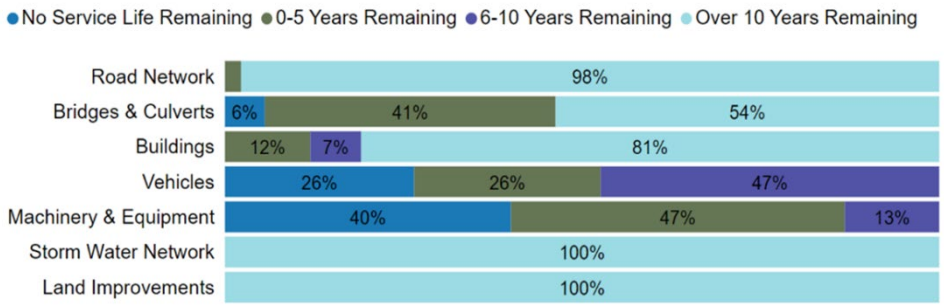


Assessed condition data was available for 88% of assets; for the remaining portfolio, age is used as an approximation of condition. Assessed condition data is invaluable in asset management planning as it reflects the true condition of the asset and its ability to perform its functions. The table below identifies the source of condition data available for each asset category.

Asset Category	Asset Segment	% of Assets with Assessed Condition	Source of Condition Data
Road Network	Paved & Gravel Roads	100%	2021 Staff Assessments
Bridges & Culverts	Culverts	98%	2021 Staff Assessments
Stormwater Network	All	100%	Engineering Assessment
Buildings	All	100%	2017 Building Condition Study
Equipment	All	47%	2021 Staff Assessments
Vehicles	All	100%	CVOR Annual Assessments
Land Improvements	All	25%	Staff Assessments
Road Network	Signs & Streetlights	0%	N/A

3.5 Service Life Remaining

Based on asset age, available assessed condition data and estimated useful life, 30% of the Township's assets will require replacement within the next 10 years. Capital requirements over the next 10 years are identified in Appendix B.



3.6 Risk & Criticality

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

Growth

The Township is experiencing significant growth. Population and employment growth increases the demand on municipal services and potentially decrease the lifecycle of certain assets. As the population continues to grow, the Township must prioritize expanding its capacity to serve a larger population.

Funding

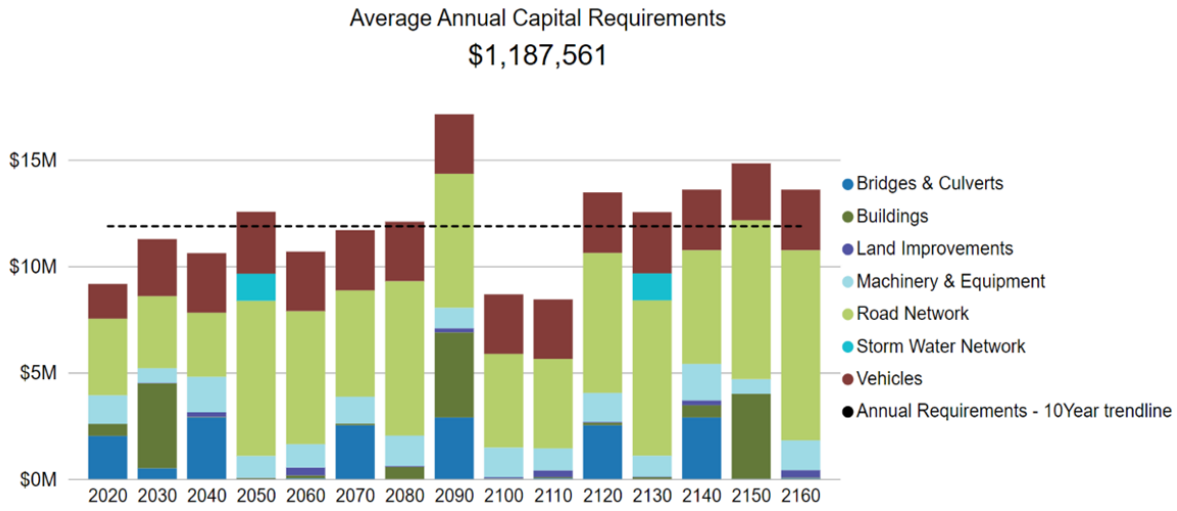
Major capital rehabilitation and replacement projects are often entirely dependant on the availability of grant funding opportunities. When grants are not available, rehabilitation and replacement projects may be deferred.

Organizational Capacity

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 data is regularly reviewed and updated.

3.7 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 140 years. This projection is used as it ensures that every asset has gone through one full iteration of replacement, this does not include any lifecycle activity potential savings. The forecasted requirements are aggregated into 10-year groupings.



4 Road Network

4.1 Key Insights

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

The Township's roads are maintained by the Public Works department who is also responsible for winter snow clearing, ice control and snow removal operations. The state of the infrastructure for the road network is summarized in the following table.

Replacement Cost	Condition	Financial Capacity	
$23.5 million	Good (79%)	Annual Requirement:	$565,300
		Funding Available:	$200,200
		Annual Deficit:	$365,100

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

Service Attribute	Level of Service Statement
Scope	The road network service is accessible to the whole community in sufficient capacity (meets traffic demands) and is available under all weather conditions.
Quality	The road network is in good condition with minimal unplanned service interruptions and road closures.

4.2 Asset Inventory & Cost

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

Asset Segment	Quantity	Replacement Cost	Annual Capital Requirement
Gravel	51,490m	$4,051,524	$27,593
HCB (Asphalt)	35,630m	$18,084,450	$471,941
LCB (Surface Treatment)	3,240m	$1,221,480	$53,880
Signs	386	$88,780	$5,919
Streetlights	20	$89,500	$5,967
		$23,535,734	**$565,299**

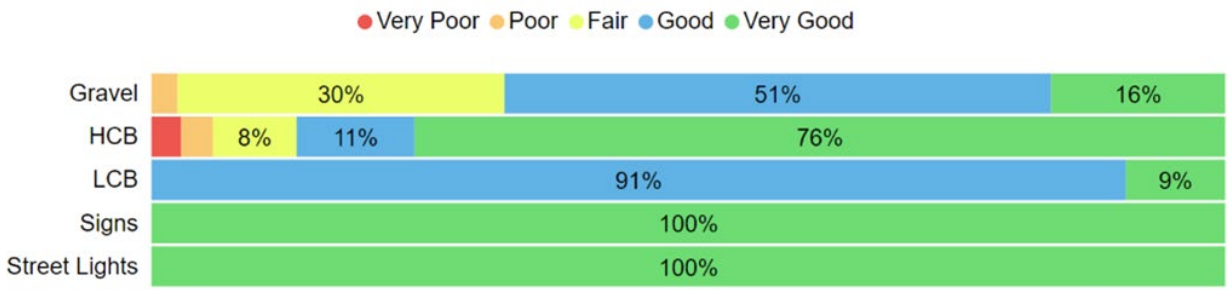
Each asset's replacement cost should be reviewed periodically to determine whether adjustments are needed to more accurate represent realistic capital requirements.

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
Gravel	50	19.0	Good 66%
HCB (Asphalt)	30	24.8	Very Good 82%
LCB (Surface Treatment)	20	9.5	Good 68%
Signs	15	3.6	Very Good 97%
Streetlights	15	3.6	Very Good 97%
		6.2	**Good 79%**

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



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

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 them. The following describes the municipality's current approach:

- A Road Needs Study was completed in 2017 that included a detailed assessment of the condition of each road segment.
- An annual staff assessment of all road segments was completed in 2021
- Utilize the Road Surface Optimization, Preservation and Developmental Policy to ensure adequate levels of service and life cycle objectives are maintained.

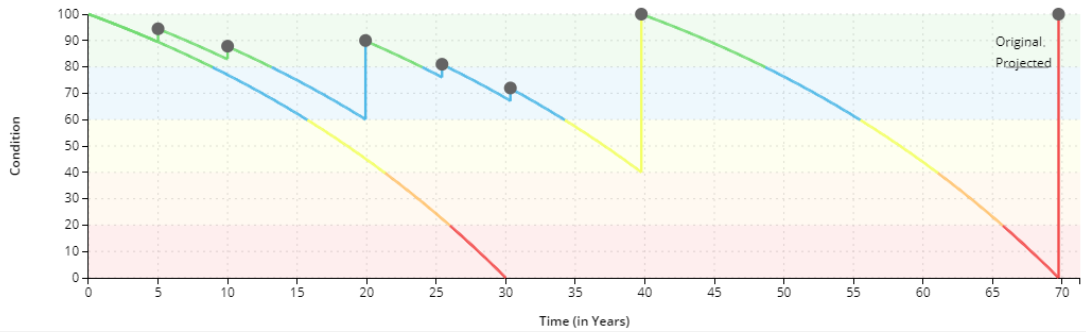
4.4 Lifecycle Management Strategy

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.

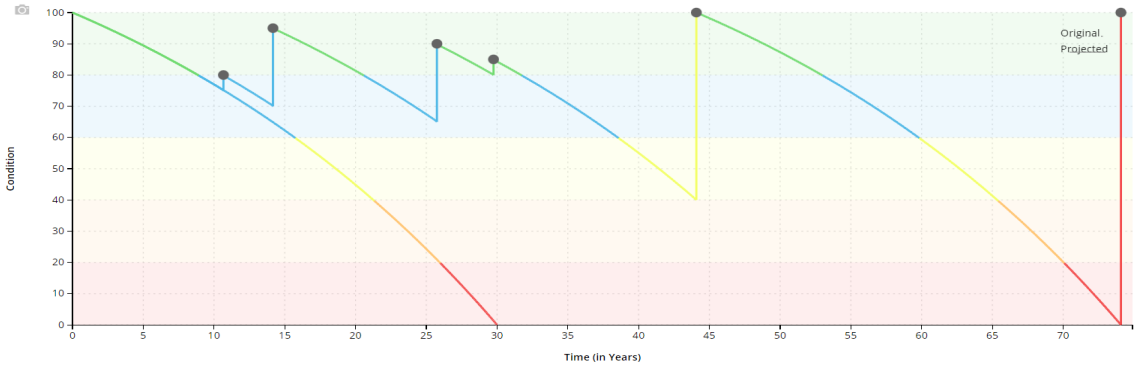
The following lifecycle strategies have been developed as a proactive approach to managing the lifecycle of LCB and HCB roads. The Township's lifecycle strategy will consider the specifications outlined in the Township's Road Surface Optimization, Preservation and Developmental Policy.

For HCB (Asphalt) roads the profiles were separated to incorporate different interventions based on traffic counts.

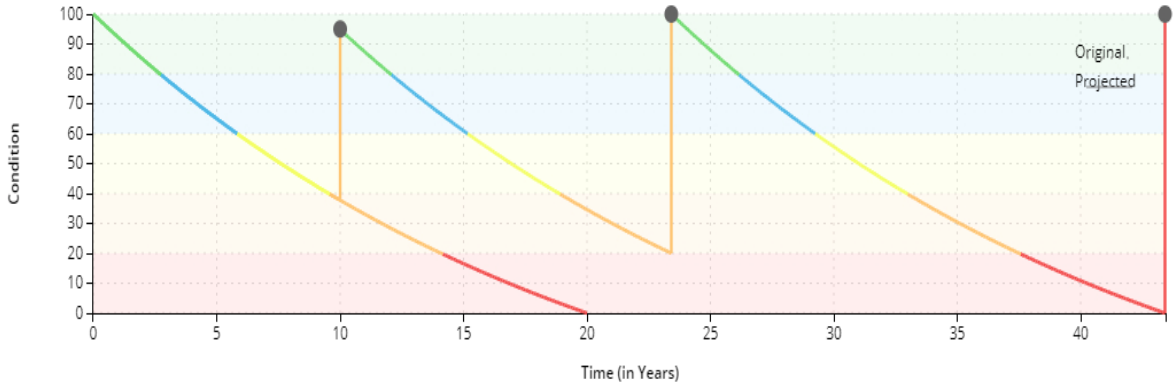
HCB <400 AADT		
Event Name	**Event Class**	**Event Trigger**
Crack Sealing	Maintenance	5 Years (Repeated)
Cape Seal	Rehabilitation	60 Condition
Single Lift Re-surfacing	Rehabilitation	40 - 50 Condition
Full Reconstruction	Replacement	0 – 40 Condition



HCB >=400 AADT		
Event Name	**Event Class**	**Event Trigger**
Fog Sealing	Maintenance	75 - 85 Condition
Micro Surfacing	Rehabilitation	70 - 80 Condition
Scratch Coat / Asphalt Overlay	Rehabilitation	65 - 70 Condition
Shave and Pave	Rehabilitation	40 – 50 Condition
Full Reconstruction	Replacement	0 – 40 Condition



LCB		
Event Name	**Event Class**	**Event Trigger**
Single Surface Treatment	Rehabilitation	40 - 50 Years
Double Surface Treatment	Rehabilitation	20 – 30 Condition
Full Reconstruction	Replacement	0 - 40 Condition

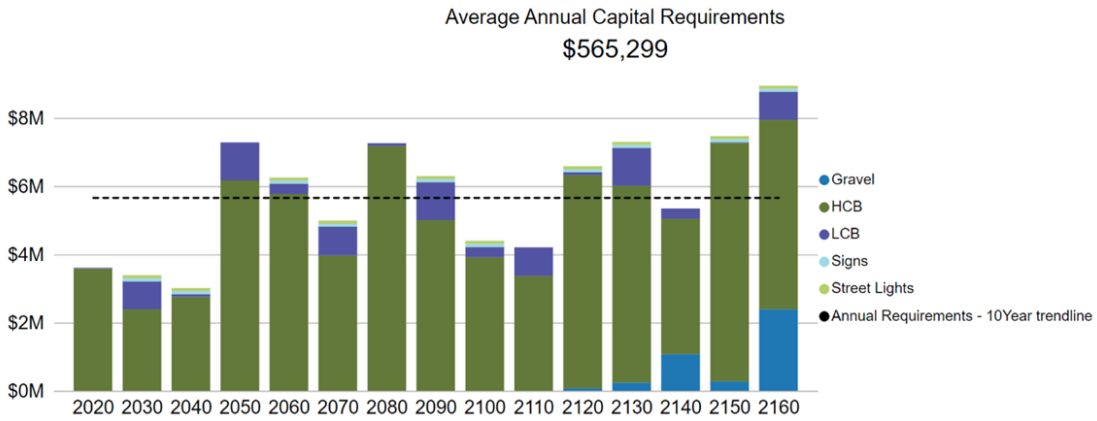


Gravel road life cycles are managed through non-capital activities such as grading annually as needed, dust suppression annually as needed, and re-gravelling (adding 50mm – 100mm of M gravel) approximately every 7 years as needed. Only the full reconstruction is included in the capital requirement.

4.4.1 Forecasted Capital Requirements

Based on the lifecycle strategies identified previously for HCB and LCB 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 80 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.

4.5 Risk & Criticality

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

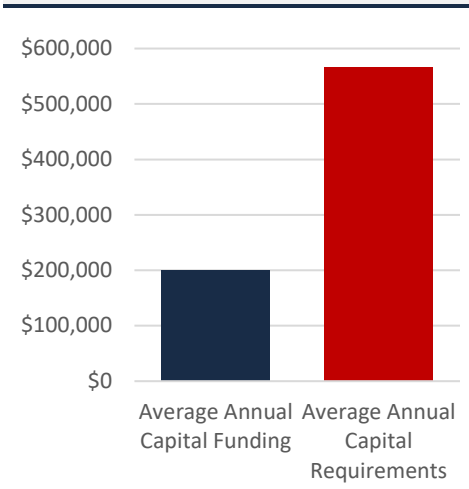
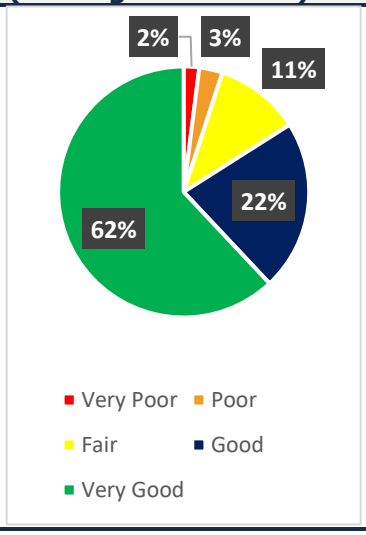
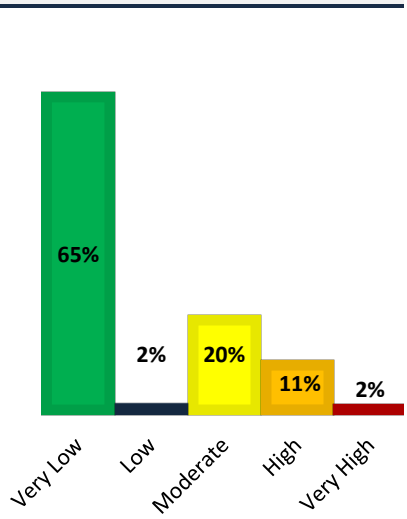
Township staff should review and adjust the risk model to reflect an evolving understanding of both the probability and consequences of asset failure. The asset-specific attributes that municipal staff utilize to define and prioritize the criticality of the road network are:

Probability of Failure (POF)	Consequence of Failure (COF)
Condition	Replacement Cost (Economic)
	Road Class (Operational)
	Segment (surface Type) (Operational)

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.

4.6 Levels of Service

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

Cost	Performance (Average Condition)	Risk
		

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

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	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)	0.42
	Lane-km of local roads (MMS classes 5 and 6) per land area (km/km^2)	0.68
Quality	Average pavement condition index for paved roads in the municipality	HCB 82% LCB 68%
	Average surface condition for unpaved roads in the municipality (e.g. excellent, good, fair, poor)	Good
Performance	% of roads inspected within the last five years	100%
	Operating costs for winter control maintenance of roadways per lane kilometre	613.5

4.7 Recommendations

Condition Assessment Strategies

- Implement the identified lifecycle management strategies for HCB and LCB roads to realize potential cost avoidance and maintain a high quality of road pavement condition.
- Evaluate the efficacy of the Township's lifecycle management strategies at regular intervals to determine the impacts to cost, condition, and risk.

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 & Culverts represent a critical portion of the transportation services provided to the community. The County of Renfrew is responsible for the maintenance of all bridges and structural culverts located across municipal roads.

Horton Township is responsible and has ownership of culverts that are less than 3 meters. The Township has the goal of keeping culverts in a good state of repair and minimizing service disruptions.

The state of the infrastructure for bridges and culverts is summarized in the following table.

Replacement Cost	Condition	Financial Capacity	
$5.46 million	Fair (55%)	Annual Requirement:	$109,200
		Funding Available:	$0
		Annual Deficit:	$109,200

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

Service Attribute	Level of Service Statement
Scope	Culverts have sufficient capacity (to convey water for road drainage) and are available under all weather conditions.
Quality	Culverts are in good condition with minimal unplanned service interruptions and closures.

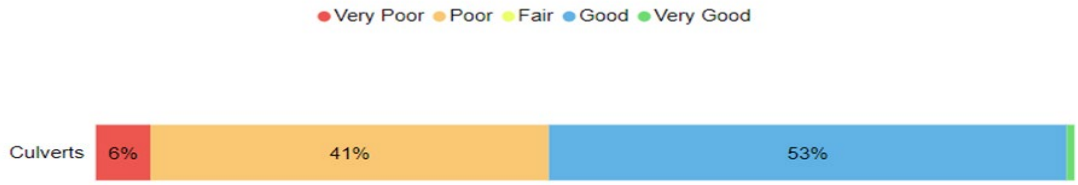
5.2 Asset Inventory & Costs

The Township has 164 culverts with a replacement cost of $5.46 million. The annual requirement is $109,200.

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

Culverts have an average condition of 55% with an estimated useful life of 50 years and an average age of 11.6 years The graph shows the average condition (%) with a weighted value on replacement cost with a scale of very good to very poor.



To ensure culvert assets 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.

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 them. Condition assessments comprise of visual inspections that are conducted annually by Township staff. The following rating criteria is used to determine the current condition of culverts and forecast future capital requirements:

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

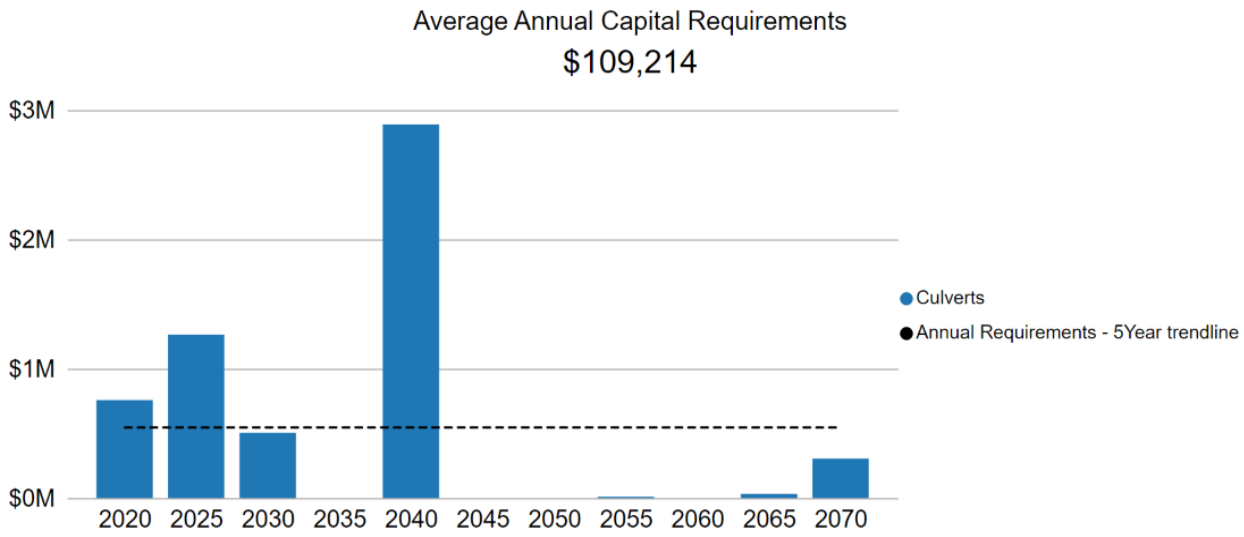
5.4 Lifecycle Management Strategy

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 staff inspections and aligned with the roadway condition needs
Inspection	Annual inspection, this process is set to be changed to biennial

5.4.1 Forecasted Capital Requirements

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

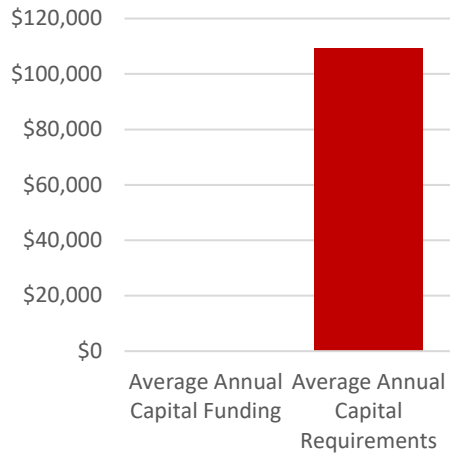
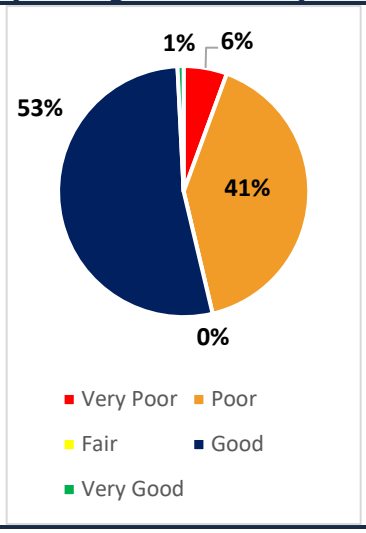
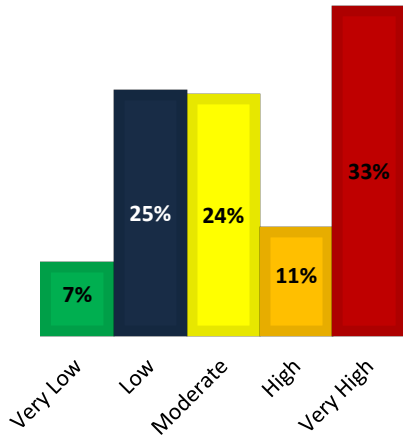
5.5 Risk & Criticality

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

The identification of critical assets allows the Township to determine appropriate risk mitigation strategies and treatment options.

5.6 Levels of Service

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

Cost	Performance (Average Condition)	Risk
		

The metrics that are required as part of O. Reg. 588/17 do not apply to these Township assets as they are less than 3-meter spans they don't meet the OSIM definition of a bridge.

5.7 Recommendations

Data Review/Validation

- Develop a methodology to obtain inventory data, assessed condition data and replacement costs for culverts.

Financial Strategies

- Dedicating a capital fund to culvert replacements to ensure the asset category performance can increase and risk levels can be reduced.

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.

6 Storm Water Network

6.1 Key Insights

The Township is responsible for owning and maintaining a stormwater network in the community of Thompsonhill, the remainder of the Township's storm water management is using grassed ditches. The state of the infrastructure for the stormwater network is summarized in the following table.

Replacement Cost	Condition	Financial Capacity	
$1.27 million	Very Good (84%)	Annual Requirement:	$16,955
		Funding Available:	$0
		Annual Deficit:	$16,955

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

Service Attribute	Level of Service Statement
Scope	The storm water network service reliable and adequately sized to protect the community from flooding
Quality	The stormwater network is in good condition with minimal flooding events.

6.2 Asset Inventory & Cost

The table below includes the quantity, total replacement cost and annual capital requirements of each asset segment in the storm water network inventory.

Asset Segment	Quantity	Replacement Cost	Annual Capital Requirement
Catchbasin	43	$344,000	$4,587
Ditch Inlet	6	$19,200	$256
Storm Main	1136.9 (m)	$847,410	$11,299
Storm Main Connection	84.6 (m)	$59,839	$798
Twin flat-grate	1	$1,200	$16
		$1,271,648	**$16,955**

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
Catchbasin	75	42.0	Very Good 82%
Ditch Inlet	75	42.0	Very Good 82%
Storm Main	75	39.0	Very Good 85%
Storm Main Connection	75	39.0	Very Good 85%
Twin flat-grate	75	42.0	Very Good 82%
Average		41.7	Very Good 84%

To ensure that the Township's storm 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 storm 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.

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. The following describes the municipality's current approach:

- Visual inspections are conducted by Township staff.
- CCTV inspections are conducted by contractor once a road reconstruction is identified prior to the design phase.

6.4 Lifecycle Management Strategy

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

Activity Type	Description of Current Strategy
Maintenance	Primary activities include a yearly flush and clean of the entire system
	CCTV inspections and cleaning is completed as budget becomes available and this information is used to drive forward rehabilitation and replacement plans
Rehabilitation	Grate replacements are conducted on an as needed basis.
Replacement	Aligned with Road Reconstruction

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, for the storm water network and for the Township's storm water system it is $16,955. 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

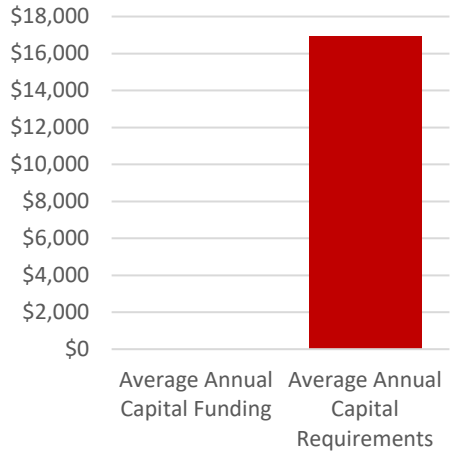
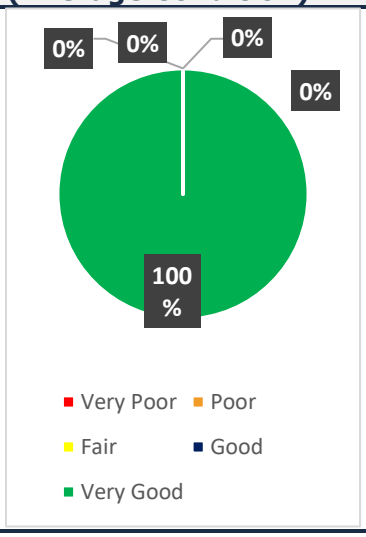
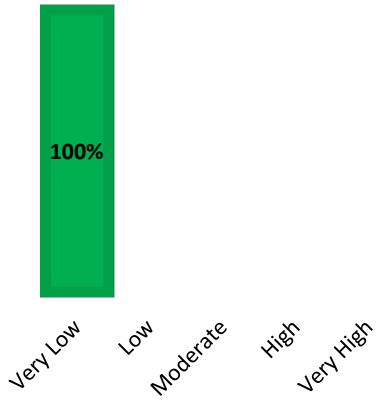
The risk matrix provides a visual representation of the relationship between the probability of asset failure and the consequences based on 2022 inventory data. See Appendix D for the criteria used to determine the risk rating of each asset.

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

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

6.6 Levels of Service

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

6.6.1 Community Levels of Service

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

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

6.6.2 Technical Levels of Service

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

Service Attribute	Technical Metric	Current LOS (2021)
Scope	% Properties in municipality resilient to a 100-year storm	100%
	% The municipal stormwater management system is resilient to a 5-year storm	100%

6.7 Recommendations

Risk Management Strategies

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

Lifecycle Management Strategies

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

Levels of Service

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

7 Buildings

7.1 Key Insights

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

- administrative office
- fire station
- public works garage and storage sheds
- community centre and arena

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

Replacement Cost	Condition	Financial Capacity	
$4.68 million	Good (62%)	Annual Requirement:	$80,313
		Funding Available:	$66,223
		Annual Deficit:	$14,090

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

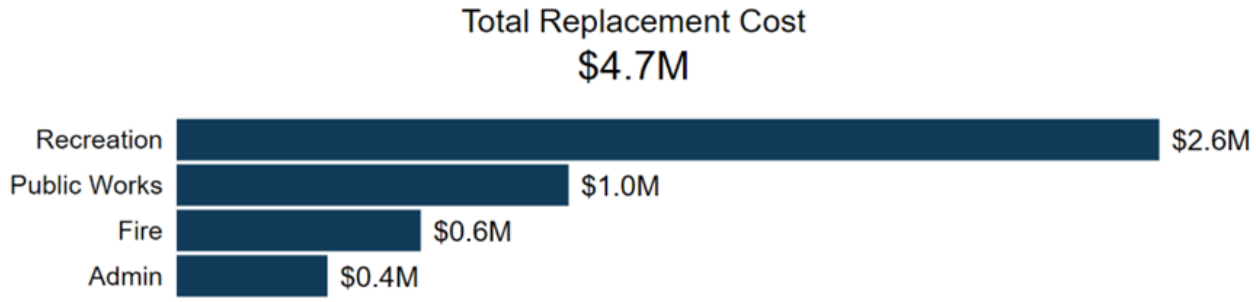
Service Attribute	Level of Service Statement
Scope	To provide safe, clean buildings with an accessible user experience.
Quality	The buildings are in good condition

7.2 Asset Inventory & Cost

The table below includes the quantity, total replacement cost, and annual capital requirements of each asset segment in the Township's buildings inventory. Buildings are currently a single asset that includes the complete replacement value.

Asset Segment	Quantity	Replacement Cost	Annual Capital Requirement
Admin	1	$399,000	$6,650
Fire	1	$646,000	$10,767
Public Works	6	$1,036,960	$17,558
Recreation	4	$2,599,501	$45,338
		$4,681,461	**$80,313**

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

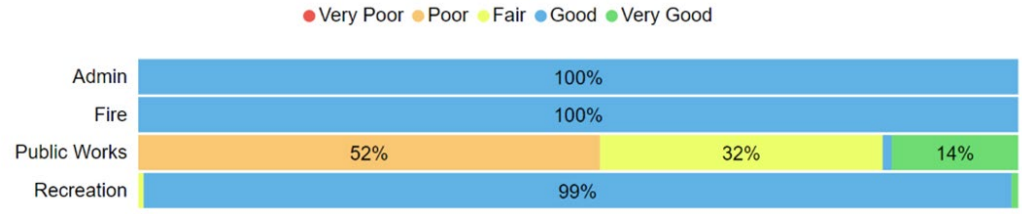


7.3 Asset Condition & Age

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 (Years)	Average Age (Years)	Average Condition
Admin	60	66.0	Good 66%
Fire	60	38.0	Good 66%
Public Works	25 - 60	22.8	Fair 47%
Recreation	10 - 60	12.3	Good 66%
Average		**24.2**	**Good 62%**

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



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

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

7.3.1 Current Approach to Condition Assessment

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

- Inspections are conducted monthly by the Joint Health & Safety Committee
- A building assessment was conducted by third-party in 2014.

7.4 Lifecycle Management Strategy

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

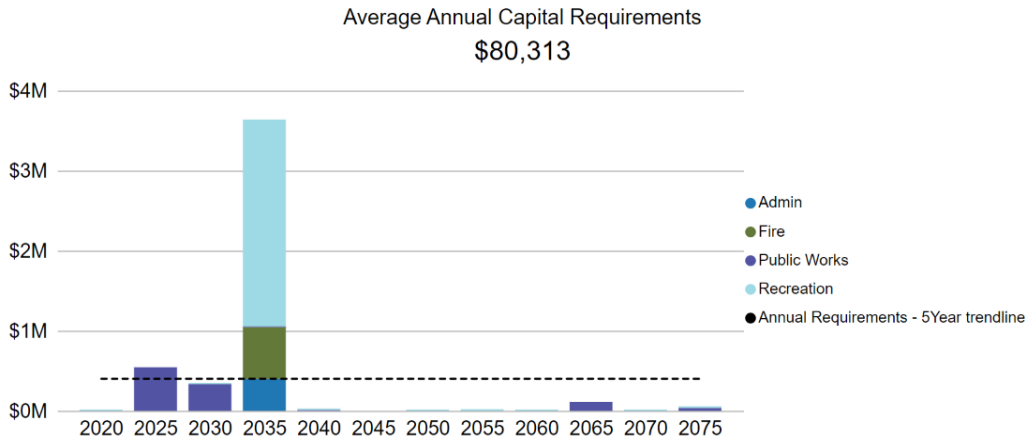
Activity Type	Description of Current Strategy
Operations & Maintenance	Municipal buildings are subject to regular inspections to identify health & safety requirements and any visual defects.
Renewal & Rehabilitation	Depends on Grant and Upper Tier Funding opportuntiites for major rehabilitation
Replacement	Assessments are completed reactively based on compliance with regulations such as TSSA. The building audit is used to prioritize.

Componentizing buildings to better reflect the different life expectancies and costs of the many components of a building will help to better manage the assets. There are many systems that break down a building into smaller systems with varying degrees of detail that are recommended and implemented by municipalities.

7.4.1 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 60 years. This projection is used as it ensures that every asset has gone through one full iteration of replacement. The forecasted requirements are aggregated into 5-year bins and the trend line represents the average annual 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.

There are large budget years within the table due to the Township's building inventory having single assets per facility. There are no plans by the Township to completely replace any existing buildings and as such only general maintenance and repairs are planned over the next 10 years. Priority will be given to improving the data and condition of individual building components.

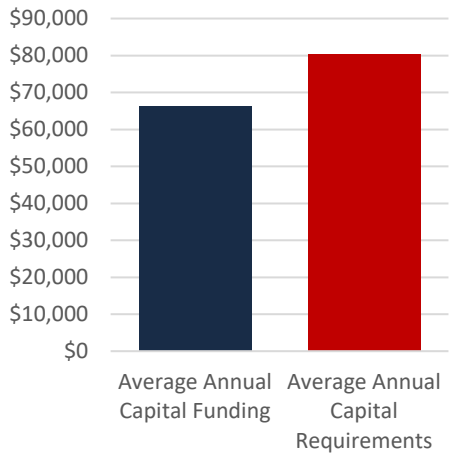
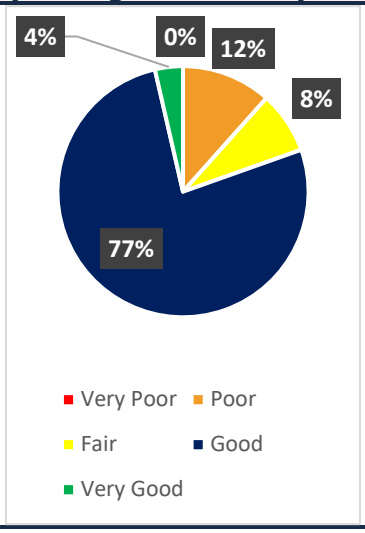
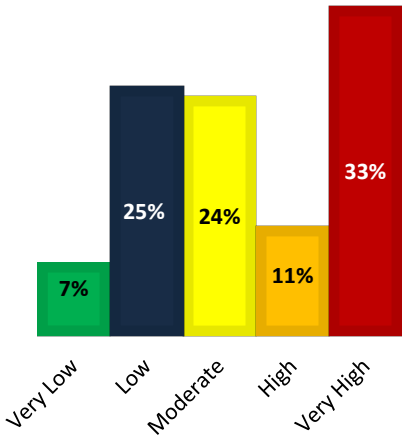
7.5 Risk & Criticality

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

This is a high-level model that Township staff should review and adjust the risk model 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

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

Cost	Performance (Average Condition)	Risk
		

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

7.6.1 Community Levels of Service

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

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

7.6.2 Technical Levels of Service

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

Service Attribute	Technical Metric	Current LOS (2020)
Scope	Square metres of indoor recreation facilities per 1,000 households	0.675
Quality	Average facility condition index value for facilities in the municipality	Good (76%)

7.7 Recommendations

Asset Inventory

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

Replacement Costs

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

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.
- Review risk models on a regular basis and adjust according to an evolving understanding of the probability and consequences of asset failure.

Levels of Service

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

8 Machinery & Equipment

8.1 Key Insights

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

- Fire Equipment to support emergency services
- Fleet Equipment to support transportation services
- Recreation and rink equipment
- Office furniture and equipment

Keeping machinery & equipment in an adequate state of repair is important to maintain a high level of service. The state of the infrastructure for the machinery and equipment is summarized in the following table.

Replacement Cost	Condition	Financial Capacity	
$1.83 million	Poor (55%)	Annual Requirement:	$121,613
		Funding Available:	$121,494
		Annual Deficit:	$119

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

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

8.2 Asset Inventory & Cost

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	Total Replacement Cost	Annual Capital Requirement
Admin	167	$39,477	$3,948
Fire	1,344	$626,689	$41,779
Public Works	47	$985,554	$58,089
Recreation	1,020	$177,975	$17,798
		$1,829,695	**$121,613**

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

8.3 Asset Condition & Age

The table below identifies the current average condition, average age and estimated useful life data 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
Admin	10	8.0	Good 60%
Fire	15	15.5	Fair 41%
Public Works	8 - 25	7.9	Poor 32%
Recreation	10	12.0	Very Poor 2%
	Average	**11.8**	**Poor 33%**

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

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 municipality's current approach:

- Staff complete annual safety inspections of fire machinery & equipment to ensure they are in state of adequate repair according to NFPA standards
- Internal maintenance and inspection are conducted for equipment.
- There are no formal condition assessment programs in place

8.4 Lifecycle Management Strategy

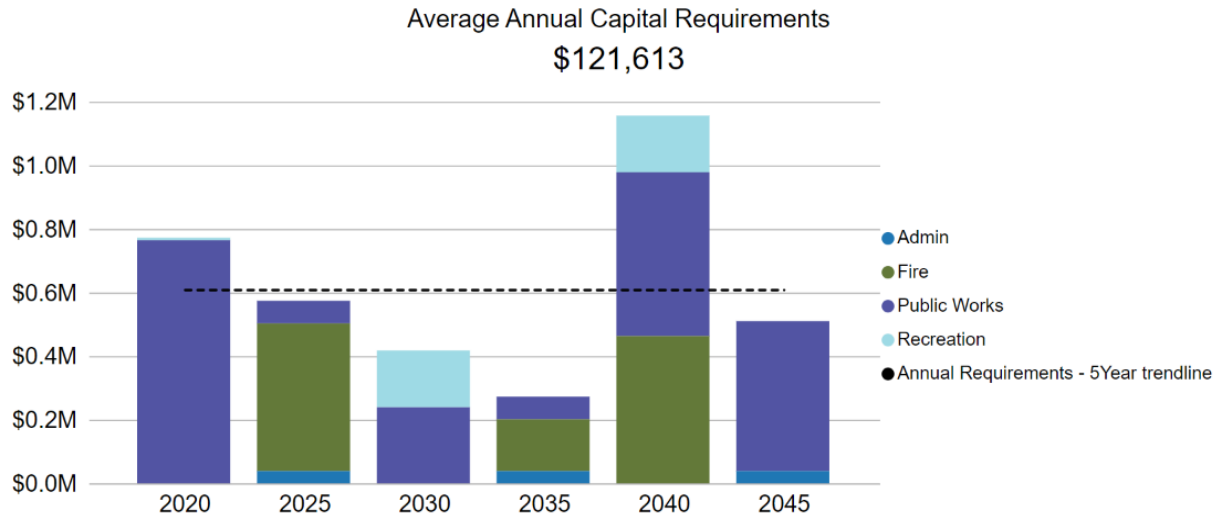
The condition or performance of most assets will deteriorate over time. To ensure that municipal assets are performing as expected and meeting the needs of customers, it is important to establish a lifecycle management strategy to proactively manage asset deterioration.

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 & equipment is maintained according to manufacturer recommended actions and supplemented by the expertise of municipal staff
Replacement	The replacement of machinery & equipment depends on deficiencies identified by operators that may impact their ability to complete required tasks

8.4.1 Forecasted Capital Requirements

The long-term capital requirements are forecasted over the next 25 years at $121,613. The annual capital requirement represents the average amount per year that the Township should allocate towards funding rehabilitation and replacement needs.



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

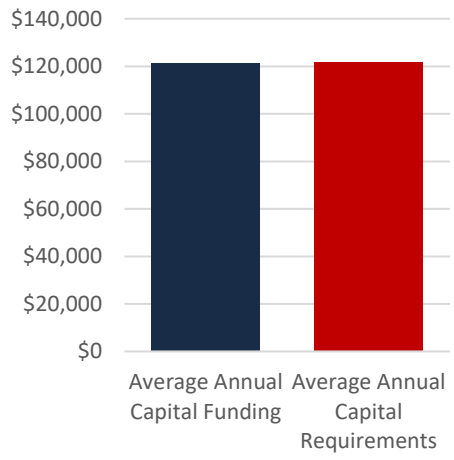
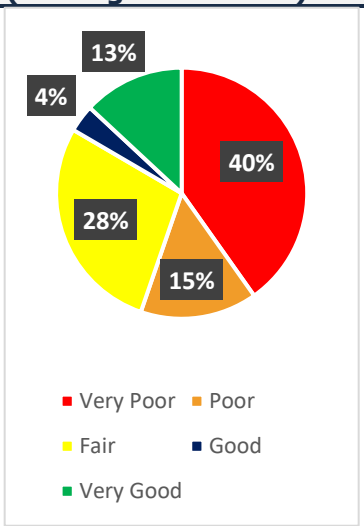
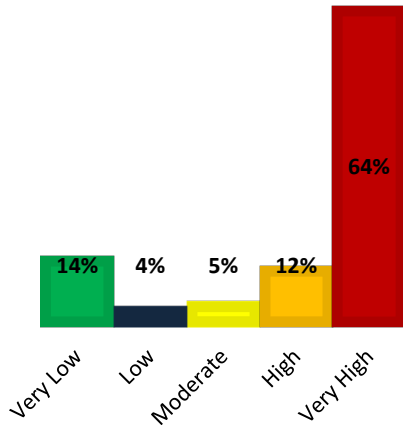
8.5 Risk & Criticality

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

This is a high-level model that Township staff should review and adjust 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.

8.6 Levels of Service

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

Cost	Performance (Average Condition)	Risk
		

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

8.6.1 Community Levels of Service

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

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

8.6.2 Technical Levels of Service

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

Service Attribute	Technical Metric	Current LOS (2021)
Scope	Average condition of equipment (e.g. very good, good, fair, poor, very poor)	Poor

8.7 Recommendations

Replacement Costs

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

Condition Assessment Strategies

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

Levels of Service

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

9 Vehicles

9.1 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
- tandem axle trucks for heavy commercial activities
- fire rescue vehicles to provide emergency services
- light duty trucks
- lawn tractors to support parks and roadside maintenance

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

Replacement Cost	Condition	Financial Capacity	
$2.79 million	Good (65%)	Annual Requirement:	$281,303
		Funding Available:	$34,640
		Annual Deficit:	$246,663

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

Service Attribute	Level of Service Statement
Scope	The vehicles service has planned maintenance activities to reduce unnecessary breakdowns, minimize vehicle downtime and optimize performance to ensure sustainability.
Quality	The vehicles are in good condition with minimal unplanned service interruptions

9.2 Asset Inventory & Cost

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	Total Replacement Cost	Annual Capital Requirement
Fire	5	$1,205,521	$120,552
Public Works	9	$1,589,476	$160,751
	Total	**$2,794,997**	**$281,303**

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

9.3 Asset Condition & Age

The table below identifies the current average condition, average age and estimated useful life data 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
Fire	10	14.2	Fair 40%
Public Works	7 - 12	4.3	Very Good 84%
	Average	**7.9**	**Good 65%**

To ensure that the Township's Vehicles continues to provide an acceptable level of service, the Township should monitor the average condition of individual assets. If the 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.

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 municipality's current approach:

- Staff complete annual safety inspections on all CVOR vehicles
- A condition assessment of vehicles was conducted in 2017.The mileage of vehicles is used as a proxy to determine remaining useful life and relative vehicle condition except for the Fire Department

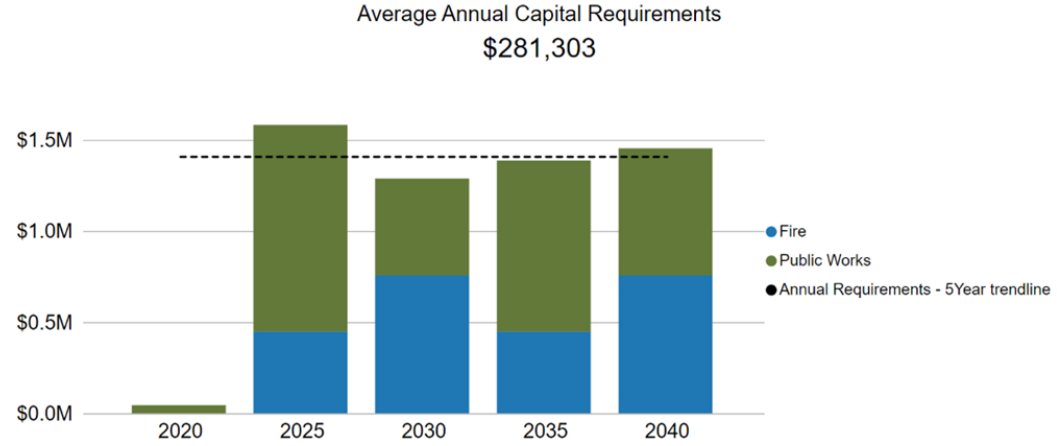
9.4 Lifecycle Management Strategy

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

Activity Type	Description of Current Strategy
Maintenance / Rehabilitation	Visual inspections completed and documented daily; fluids inspected at every fuel stop; tires inspected monthly
	Annual preventative maintenance activities include system components check and additional detailed inspections
Replacement	Vehicle age, kilometres and annual repair costs are taken into consideration when determining appropriate treatment options

9.4.1 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 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.

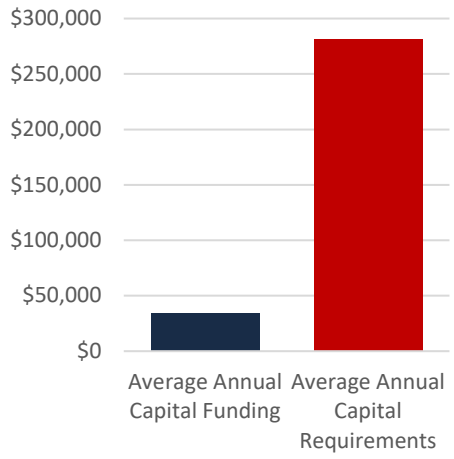
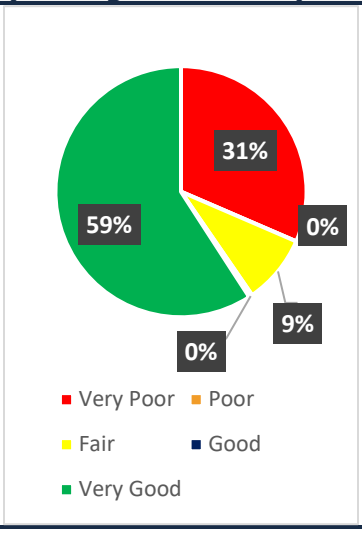
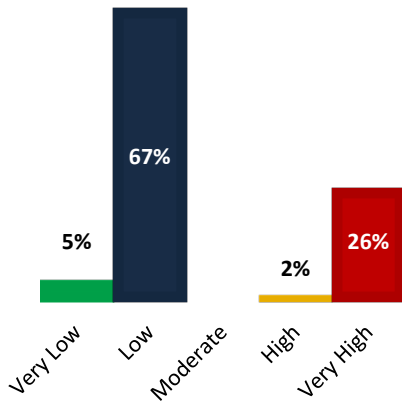
9.5 Risk & Criticality

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 2020 inventory data. See Appendix D for the criteria used to determine the risk rating of each asset.

This is a high-level model that Township staff should review and adjust 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.

9.6 Levels of Service

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

Cost	Performance (Average Condition)	Risk
		

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

9.6.1 Community Levels of Service

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

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

9.6.2 Technical Levels of Service

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

Service Attribute	Technical Metric	Current LOS (2021)
Scope	# of light duty vehicles per 1,000 households	2
	# of heavy duty vehicles per 1,000 households	2

Quality	Average condition of vehicles (e.g. very good, good, fair, poor, very poor)	Good

9.7 Recommendations

Condition Assessment Strategies

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

Risk Management Strategies

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

Levels of Service

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

10 Land Improvements

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

- Parking lots
- Fencing
- Sports fields
- Boat docks
- Washroom

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

Replacement Cost	Condition	Financial Capacity	
$386,536	Very Good (98%)	Annual Requirement:	$12,864
		Funding Available:	$20,890
		Annual Deficit/Surplus:	$(8,526)

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

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

10.1 Asset Inventory & Cost

The table below includes the quantity, 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
Public Works	2	$128,422	$5,137
Recreation	6.7 m2, 6 Assets	$258,114	$7,727
		$386,536	**$12,864**

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

10.2 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
Public Works	25	6.1	Very Good 98%
Recreation	20 - 50	5.9	Very Good 99%
Average:		**6.0**	**Very Good 98%**

To ensure that the Township's Land Improvements continues to provide an acceptable level of service, the Township should monitor the average condition of all assets.

10.2.1 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 municipality's current approach:

- Joint Health & Safety Committee staff complete monthly visual inspections of land improvements assets to ensure they are in state of adequate repair
- There are no formal condition assessment programs in place for land improvements

10.3 Lifecycle Management Strategy

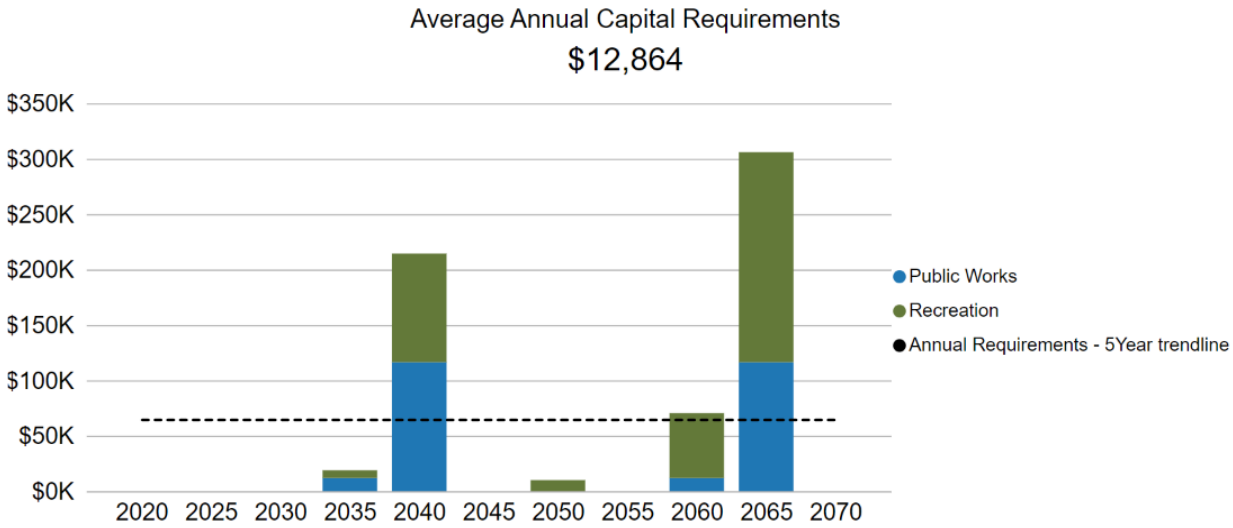
The condition or performance of most assets will deteriorate over time. To ensure that municipal assets are performing as expected and meeting the needs of customers, it is important to establish a lifecycle management strategy to proactively manage asset deterioration.

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

Activity Type	Description of Current Strategy
Maintenance, Rehabilitation & Replacement	The Land Improvements asset category includes several unique asset types and lifecycle requirements are dealt with on a case-by-case basis
	Scheduled maintainence including lawn care, dock inspections and spetic pumping are conducted sesonally.

10.3.1 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 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.

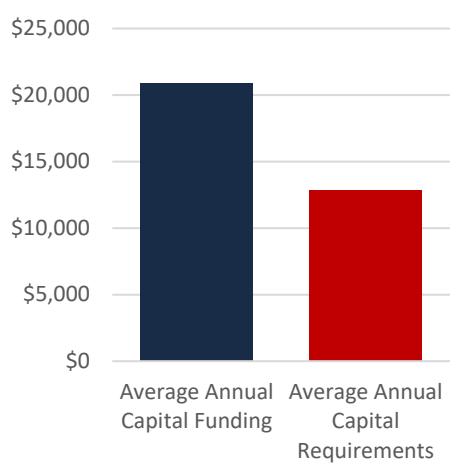
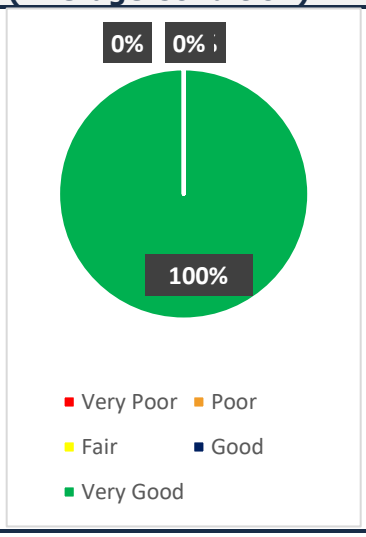
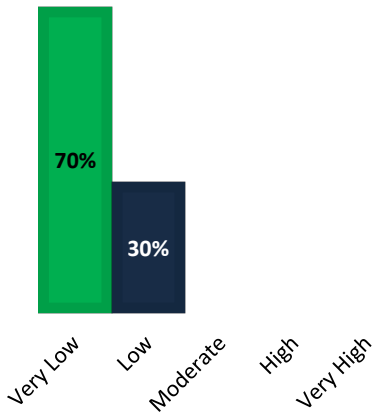
10.4 Risk & Criticality

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

This is a high-level model that Township staff should review and adjust 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.

10.5 Levels of Service

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

Cost	Performance (Average Condition)	Risk
		

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

10.5.1 Community Levels of Service

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

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

10.5.2 Technical Levels of Service

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

Service Attribute	Technical Metric	Current LOS (2021)
Scope	Square metres of outdoor recreation facility space per 1,000 households	2.3
Quality	Average condition of outdoor recreational facilities in the municipality (e.g. very good, good, fair, poor, very poor)	Very Good

10.6 Recommendations

Replacement Costs

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

Risk Management Strategies

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

Levels of Service

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

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
- Significant population and housing growth is expected to continue
- 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, and the upgrade or disposal of existing infrastructure. Increases or decreases in demand can affect what assets are needed and what level of service meets the needs of the community.

11.3 Projected Growth

The Township has experienced significant growth in the area from 2016 till 2021. Over this period the population grew by 10.2% or 1.7% per year. Most notably, the completion of Highway 17 twinning between 2025-2027 will provide easy access for commuters seeking an urban paycheque and continue to drive the projected residential population growth.

As part of Renfrew County's Official Plan, the Township of Horton anticipates applications for rural lands to be severed and used as year-round residential development. The current population of the Township is 3,182 in 2021 which has nearly surpassed the official plan's higher bracket estimate of 3,189 residents by 2031, indicating a significant under-estimate in the residential growth within Horton.

Since 2016 the Township has also seen a 7.3% increase in private dwellings from 1385 to 1486. This growth is expected to at a minimum continue or increase and will have a significant impact on the Township's infrastructure.

11.4 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 inventory. 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.

In collaboration with the County and all lower tiers the Township has initiated a Joint Transportation Master Plan in 2022. This study will provide key information that will assist the Township in their asset management planning.

12 Financial Strategy

12.1 Key Insights

- The Township is committing approximately $443,491 towards capital projects per year from sustainable revenue sources

- Given the annual capital requirement of $1,187,561, there is currently a funding gap of $744,070 annually

- For tax-funded assets, it is recommended to increasing tax revenues by 2% each year for the next 15 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 of Horton 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 presents 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:
    - Existing assets
    - Existing service levels
    - Requirements of contemplated changes in service levels (none identified for this plan)
    - Requirements of anticipated growth (none identified for this plan)
2. Use of traditional sources of municipal funds:
    - Tax levies
    - Reserves
    - Debt
3. Use of non-traditional sources of municipal funds:
    - Reallocated budgets
    - Partnerships
    - Procurement methods
4. Use of Senior Government Funds:
    - Canada Community-Building Fund (CCBF)
    - Annual grants

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

If the financial plan component results in a funding shortfall, the province requires the inclusion of a specific plan as to how the impact of the shortfall will be managed.

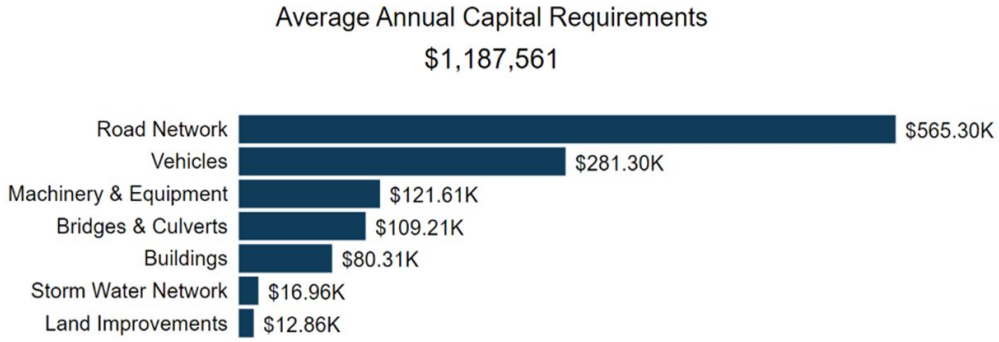
In determining the legitimacy of a funding shortfall, the province may evaluate the Township's approach to the following:

- To reduce financial requirements, consideration has been given to revising service levels downward.
- 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 $1.19 million annually to address capital requirements.



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

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

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	$756,805	$565,299	$191,506

The implementation of a proactive lifecycle strategy for roads leads to a potential annual cost avoidance of $191,506 for the Road Network. This represents an overall reduction of the annual requirements by 16%.

As the lifecycle strategy scenario represents the lowest cost option available to the Township, we have used these annual requirements in the development of the financial strategy.

12.3.2 Annual Funding Available

Based on a historical analysis of sustainable capital funding sources, the Township is committing approximately $443,491 towards capital projects per year from sustainable revenue sources. Given the annual capital requirement of $1,187,561, there is currently a funding gap of $744,070 annually.

12.4 Funding Objective

We have developed a scenario that would enable the Township to achieve full funding within 15 years for all **Tax Funded Assets:** Road Network, Storm water Network, Bridges & Culverts, Buildings, Machinery & Equipment, Land Improvements, and Vehicles. For each scenario developed we have included strategies, where applicable, regarding the use of cost containment and funding opportunities.

12.5 Financial Profile

12.5.1 Current Funding Position

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

Asset Category	Avg. Annual Requirement	Annual Funding Available				Annual Deficit
		Taxes	CCBF	OCIF	Total Available	
Road Network	565,299	$51,395	$91,562	$57,287	$200,244	365,055
Vehicles	281,303	$34,640	-	-	$34,640	246,663
Bridges & Culverts	109,214	-	-	-	-	109,214
Buildings	80,313	$66,223	-	-	$66,223	14,090
Equipment	121,613	$121,494	-	-	$121,494	119
Storm Water System	16,955	-	-	-	-	16,955
Land Improvements	12,864	$20,890	-	-	$20,890	(8,027)
	1,187,561	**$294,642**	**$91,562**	**$57,287**	**$443,491**	**$744,070**

The average annual capital requirement for the above categories is $1.19 million. Annual revenue currently allocated to these assets for capital purposes is $443,491 leaving an annual deficit of $744,070.

Put differently, these infrastructure categories are currently funded at 37% of their long-term requirements.

12.5.2 Full Funding Requirements

In 2021, the Township of Horton has annual tax revenues of $2.5 million. As illustrated in the following table, without consideration of any other sources of revenue or cost containment strategies, full funding would require the following tax change over time:

Asset Category	Tax Change Required for Full Funding
Road Network	14.6%
Vehicles	9.9%
Bridges & Culverts	4.4%
Buildings	0.6%
Equipment	0.0%
Storm Sewer System	0.7%
Land Improvements	-0.3%
	29.9%

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

- Horton's debt payments for these asset categories will be decreasing by $29k over the next 10 years

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

	Without Capturing Changes				With Capturing Changes			
	5 Years	**10 Years**	**15 Years**	**20 Years**	**5 Years**	**10 Years**	**15 Years**	**20 Years**
Infrastructure Deficit	744,070	744,070	744,070	744,070	744,070	744,070	744,070	744,070
Change in Debt Costs	N/A	N/A	N/A	N/A	-	(28,798)	(28,798)	(28,798)
Change in OCIF Grants	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Resulting Infrastructure Deficit	744,070	744,070	744,070	744,070	744,070	715,272	715,272	715,272
Tax Increase Required	29.8%	29.8%	29.8%	29.8%	29.8%	28.6%	28.6%	28.6%
Annually	6.0%	3.0%	2.0%	1.5%	6.0%	2.9%	1.9%	1.4%

12.5.3 Financial Strategy Recommendations

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

- when realized, reallocating the debt cost reductions of $28,798 to the infrastructure deficit as outlined above.
- increasing tax revenues by 2% each year for the next 15 years solely for the purpose of phasing in full funding to the asset categories.
- allocating the current CCBC and OCIF revenue as outlined previously.
- increasing existing and future infrastructure budgets by the applicable inflation index on an annual basis in addition to the deficit phase-in.

Notes:

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

Although this option achieves full funding on an annual basis in 15 years and provides financial sustainability over the period modeled, the recommendations do require prioritizing capital projects to fit the resulting annual funding available.

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 Use of Debt

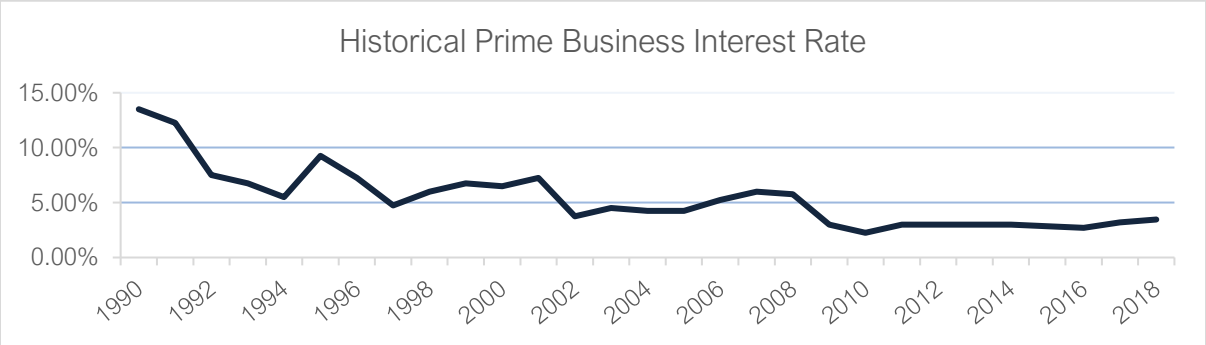
For reference purposes, the following table outlines the premium paid on a project if financed by debt. For example, a $1M project financed at 3.0%[2] over 15 years would result in a 26% premium or $260,000 of increased costs due to interest payments. For simplicity, the table does not consider the time value of money or the effect of inflation on delayed projects.

[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. Depending on the outcome of this review, there may be changes that impact its availability.

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

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:



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.
As of December 31, 2021, there was $263k of debt outstanding with corresponding principal and interest payments of $29k, well within its provincially prescribed maximum.

Asset Category	Principal & Interest Payments in the Next Ten Years						
	2022	2023	2024	2025	2026	2027	2032
Road Network	28,798	28,798	28,798	28,798	28,798	28,798	-

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

12.7 Use of Reserves

12.7.1 Available Reserves

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

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

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

Asset Category	Balance on December 31, 2021
Road Network	11,246
Vehicles	118,521
Bridges & Culverts	-
Buildings	301,939
Equipment	166,240
Storm Sewer System	-
Land Improvements	195,935
Total Tax Funded:	**793,881**

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

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

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

12.8 Recommendation

In 2025, Ontario Regulation 588/17 will require Horton to integrate proposed levels of service for all asset categories in an 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

13.2 Appendix A: Infrastructure Report Card

Asset Category	Replacement Cost (millions)	Asset Condition	Financial Capacity	
Road Network	$23.5	Good (79%)	Annual Requirement:	$565,300
			Funding Available:	$200,200
			Annual Deficit:	$365,100
Bridges & Culverts	$5.46	Fair (55%)	Annual Requirement:	$109,200
			Funding Available:	$0
			Annual Deficit:	$109,200
Stormwater Network	$1.27	Very Good (84%)	Annual Requirement:	$16,955
			Funding Available:	$0
			Annual Deficit:	$16,955
Buildings	$4.68	Good (62%)	Annual Requirement:	$80,313
			Funding Available:	$66,223
			Annual Deficit:	$14,090
Machinery & Equipment	$1.83	Poor (55%)	Annual Requirement:	$121,613
			Funding Available:	$121,494
			Annual Deficit:	$119
Vehicles	$2.79	Good (65%)	Annual Requirement:	$281,303
			Funding Available:	$34,640
			Annual Deficit:	$246,663
Land Improvements	$0.39	Very Good (98%)	Annual Requirement:	$12,864
			Funding Available:	$20,890
			Annual Deficit/Surplus:	$(8,526)
Overall	$40	Good (71%)	Annual Requirement:	$1,187,561
			Funding Available:	$443,491
			Annual Deficit:	$744,070

13.3 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.

Road Network

Asset Segment	Backlog	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031
Gravel	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
HCB	$0	$1,575,736	$0	$452,400	$0	$0	$82,940	$1,474,450	$0	$366,080	$0
LCB	$0	$0	$0	$0	$0	$0	$19,500	$0	$0	$0	$0
Signs	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Streetlight	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Total:	**$0**	**$1,575,736**	**$0**	**$452,400**	**$0**	**$0**	**$102,440**	**$1,474,450**	**$0**	**$366,080**	**$0**

Bridges & Culverts

Asset Segment	Backlog	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031
Culverts	$0	$252,790	$252,790	$252,790	$252,790	$252,790	$252,790	$252,790	$252,790	$252,790	$252,790
Total:	**$0**	**$252,790**	**$252,790**	**$252,790**	**$252,790**	**$252,790**	**$252,790**	**$252,790**	**$252,790**	**$252,790**	**$252,790**

Stormwater Network

Asset Segment	Backlog	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031
Catch basin	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Ditch Inlet	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Storm Main	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Storm Main Connection	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Twin flat-grate	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Total:	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**

Buildings

Asset Segment	Backlog	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031
Admin	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Fire	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Public Works	$0	$0	$0	$0	$0	$544,000	$0	$0	$0	$0	$333,000
Recreation	$0	$0	$0	$16,191	$0	$0	$0	$0	$0	$0	$0
Total:	**$0**	**$0**	**$0**	**$16,191**	**$0**	**$544,000**	**$0**	**$0**	**$0**	**$0**	**$333,000**

Machinery & Equipment

Asset Segment	Backlog	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031
Admin	$0	$0	$0	$0	$39,477	$0	$0	$0	$0	$0	$0
Fire	$162,690	$0	$0	$0	$380,021	$0	$0	$13,560	$70,418	$0	$0
Public Works	$0	$400,000	$5,000	$359,819	$37,000	$13,895	$11,840	$0	$8,000	$125,000	$0
Recreation	$170,351	$0	$0	$7,624	$0	$0	$0	$0	$0	$0	$0
Total:	**$333,041**	**$400,000**	**$5,000**	**$367,443**	**$456,498**	**$13,895**	**$11,840**	**$13,560**	**$78,418**	**$125,000**	**$0**

Vehicles

Asset Segment	Backlog	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031
Fire	$695,442	$0	$0	$0	$0	$0	$0	$0	$448,241	$0	$61,838
Public Works	$45,000	$0	$44,837	$0	$0	$75,000	$610,000	$403,356	$45,000	$111,257	$300,026
Total:	**$740,442**	**$0**	**$44,837**	**$0**	**$0**	**$75,000**	**$610,000**	**$403,356**	**$493,241**	**$111,257**	**$361,864**

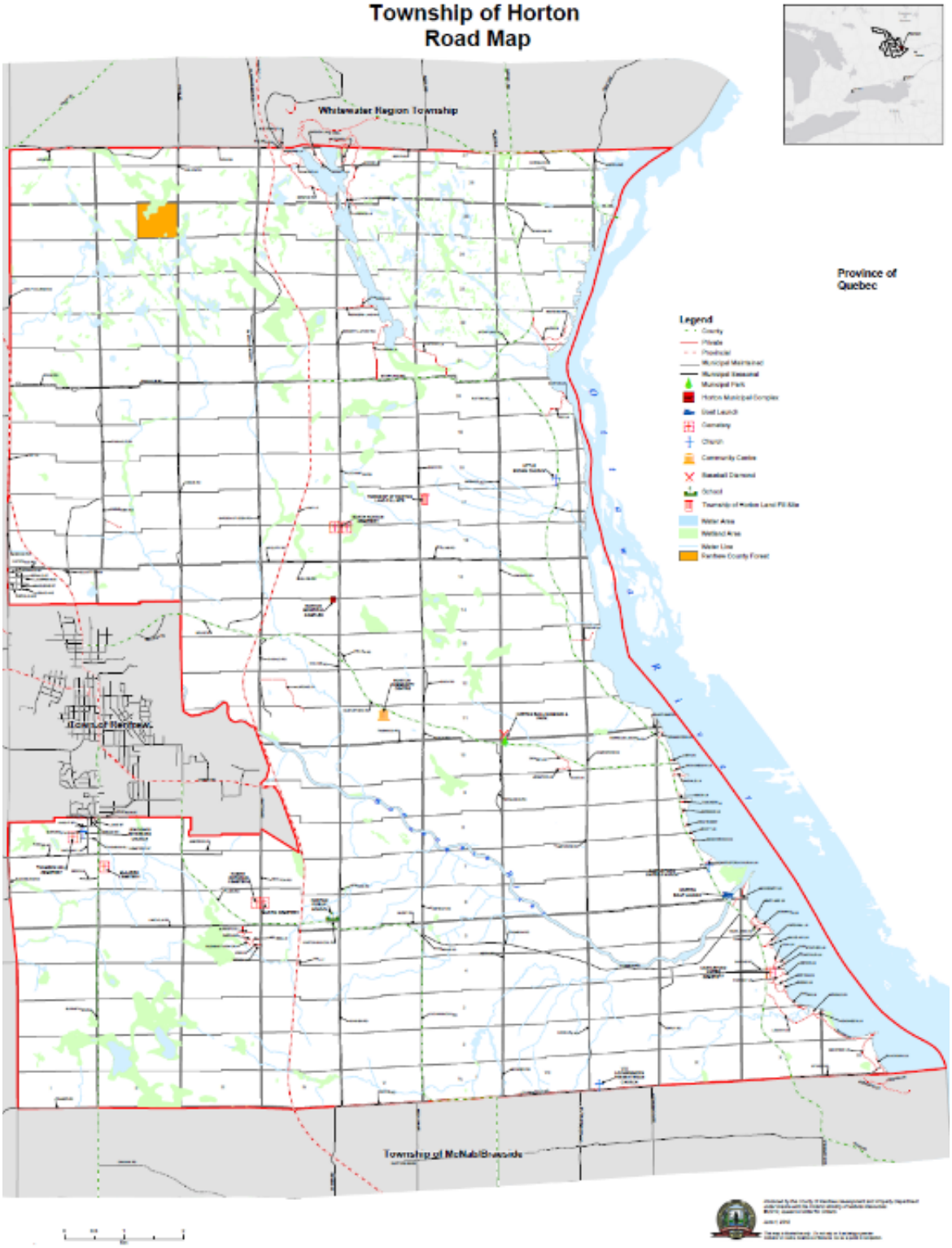
Land Improvements

Asset Segment	Backlog	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031
Public Works	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Recreation	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Total:	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**

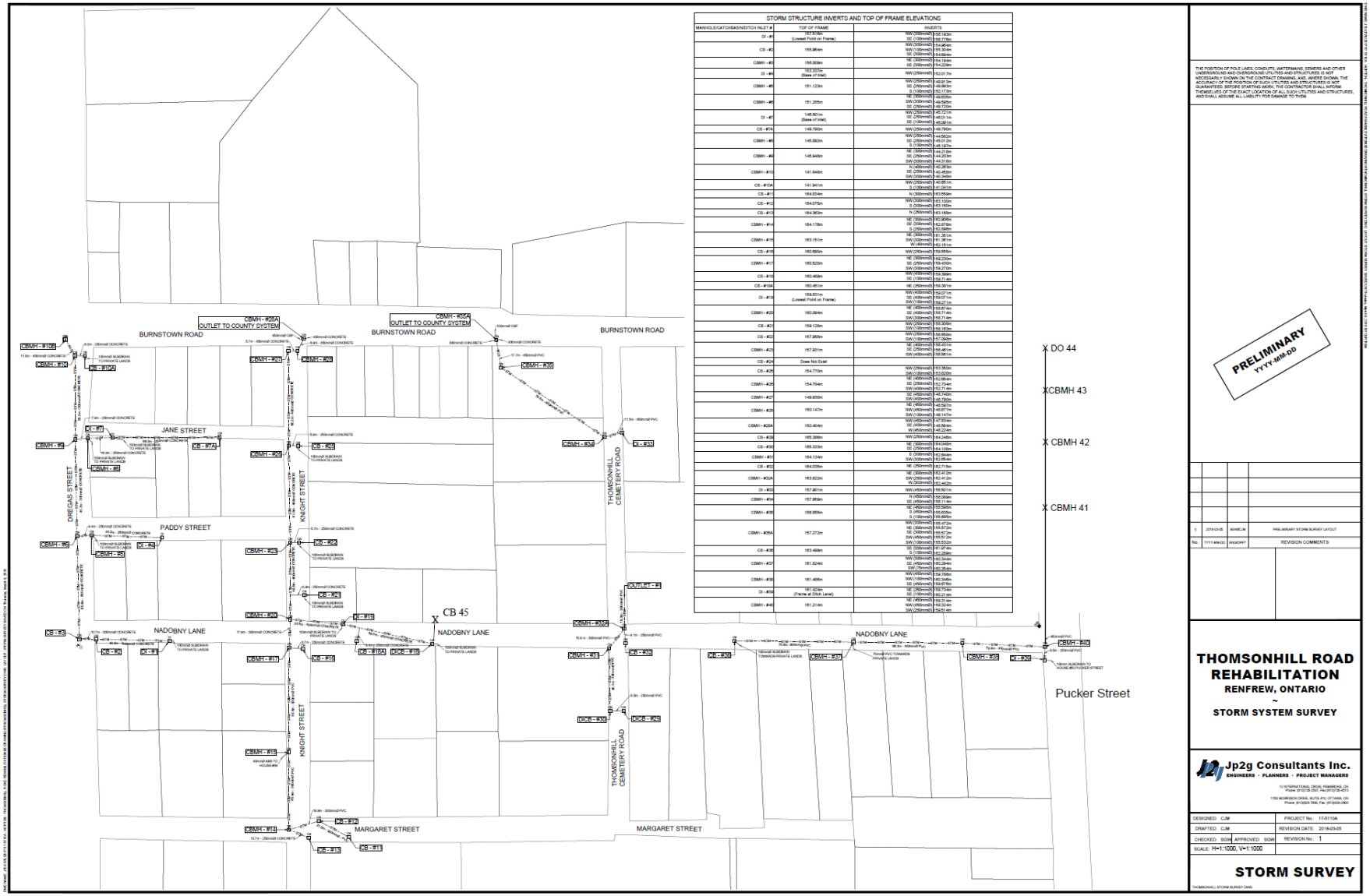
All Asset Categories

Asset Segment	Backlog	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031
Bridges & Culverts	$0	$252,790	$252,790	$252,790	$252,790	$252,790	$252,790	$252,790	$252,790	$252,790	$252,790
Buildings	$0	$0	$0	$16,191	$0	$544,000	$0	$0	$0	$0	$333,000
Land Improvements	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Equipment	$333,041	$400,000	$5,000	$367,443	$456,498	$13,895	$11,840	$13,560	$78,418	$125,000	$0
Road Network	$0	$1,575,736	$0	$452,400	$0	$0	$102,440	$1,474,450	$0	$366,080	$0
Storm Water Network	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Vehicles	$740,442	$0	$44,837	$0	$0	$75,000	$610,000	$403,356	$493,241	$111,257	$361,864
Total	**$1,073,483**	**$2,228,526**	**$302,627**	**$1,088,824**	**$709,288**	**$885,685**	**$977,070**	**$2,144,156**	**$824,449**	**$855,127**	**$947,654**

13.4 Appendix C: Level of Service Maps



Stormwater Location Map



13.5 Appendix D: Risk Rating Criteria

Roads

	Criteria	Weighting	Sub-Criteria	Weighting	Value / Range	Risk Range
COF	Economic	70%	Replacement Cost	100%	0 - 5,000 5,000 – 20,000 20,000 - 50,000 50,000 – 100,000 >100,000	1 - Insignificant 2 - Minor 3 - Moderate 4 - Major 5 - Severe
	Operational	30%	Service Class	50%	3 4 5/6	4 - Major 3 - Moderate 2 - Minor
			Surface Type	50%	Gravel LCB HCB	2 - Minor 3 - Moderate 5 - Severe
POF	Structural	100%	Assessed Condition	100%	80 - 100 60 - 79 40 - 59 20 - 39 0 - 19	1 - Rare 2 - Unlikely 3 - Possible 4 - Likely 5 - Almost Certain

Culverts

	Criteria	Weighting	Sub-Criteria	Weighting	Value / Range	Risk Range
COF	Economic	70%	Replacement Cost	50%	0 - 5,000 5,000 – 20,000 20,000 - 50,000 50,000 – 100,000 >100,000	1 - Insignificant 2 - Minor 3 - Moderate 4 - Major 5 - Severe
			Length(m)	50%	1 – 10 10 - -20 >20	2 - Minor 3 - Moderate 5 - Severe
	Operational	30%	Service Class	50%	3 4 5/6	4 - Major 3 - Moderate 2 - Minor
			Total Span MM	50%	0 - 500 500 - 1500 1500 – 2900	2 - Minor 3 - Moderate 5 - Severe
POF	Structural	100%	Assessed Condition	100%	80 - 100 60 - 79 40 - 59 20 - 39 0 - 19	1 - Rare 2 - Unlikely 3 - Possible 4 - Likely 5 - Almost Certain

Machinery & Equipment

	Criteria	Weighting	Sub-Criteria	Weighting	Value / Range	Risk Range
COF	Economic	70%	Replacement Cost	100%	0 - 5,000 5,000 – 20,000 20,000 - 50,000 50,000 – 100,000 >100,000	1 - Insignificant 2 - Minor 3 - Moderate 4 - Major 5 - Severe
	Operational	30%	Segment	100%	Recreation All Others Fleet Fire Equipment	2 - Minor 3 – Moderate 4 - Major 5 - Severe
POF	Structural	100%	Assessed Condition	100%	80 - 100 60 - 79 40 - 59 20 - 39 0 - 19	1 - Rare 2 - Unlikely 3 - Possible 4 - Likely 5 - Almost Certain

All Other Categories and/or Segments

Including signs, streetlights, storm water network, vehicles, buildings, and land improvements

	Criteria	Weighting	Sub-Criteria	Weighting	Value / Range	Risk Range
COF	Economic	100%	Replacement Cost	100%	0 - 5,000 5,000 – 20,000 20,000 - 50,000 50,000 – 100,000 >100,000	1 - Insignificant 2 - Minor 3 - Moderate 4 - Major 5 - Severe
POF	Structural	100%	Condition	100%	80 - 100 60 - 79 40 - 59 20 - 39 0 - 19	1 - Rare 2 - Unlikely 3 - Possible 4 - Likely 5 - Almost Certain

13.6 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