THE CORPORATION OF THE TOWNSHIP OF AUGUSTA
BY-LAW NUMBER 3655-2023

BEING A BY-LAW TO ADOPT AN ASSET MANAGEMENT PLAN FOR THE CORPORATION OF THE TOWNSHIP OF AUGUSTA

WHEREAS section 11 (2) of the Municipal Act S.O. 2001 as amended provides that a lower-tier municipality may pass By-Laws respecting the financial management of the municipality and its local boards; and

WHEREAS the municipality of Augusta desires to adopt an Asset Management Plan for the purposes of future planning for the Corporation;

NOW THEREFORE the Council of the Corporation of the Township of Augusta hereby enacts as follows that:

1. **THAT** the Asset Management Plan attached hereto as Schedule "A" be adopted effective September 25th, 2023.

2. **THAT** Council of the Corporation of the Township Augusta shall discuss the Asset Management Plan annually during the Budget process, to determine if amendments are required to the infrastructure priorities;

3. **THAT** all other By-Laws inconsistent herewith are hereby repealed.

Read a first, second, and third time and finally passed this 25th day of September 2023.

MAYOR

CLERK

Asset Management Plan

Township of Augusta

2024

This Asset Management Plan was prepared by:

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

Key Statistics

Replacement cost of asset portfolio
$155.7 million

Replacement cost of infrastructure per household
$51,131 (2021)

Percentage of assets in fair or better condition
31%

Percentage of assets with assessed condition data
7%

Annual capital infrastructure deficit
$3.7 million

Recommended timeframe for eliminating annual infrastructure deficit
20 Years

Target reinvestment rate
2.5%

Actual reinvestment rate
1.1%

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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

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

This AMP include the following asset categories:

Asset Category

- Road Network
- Bridges & Culverts
- Fleet
- Buildings
- Land Improvements
- Machinery & Equipment

With the development of this AMP 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 asset categories included in this AMP totals $155.7 million. 31% of all assets analysed in this AMP are in fair or better condition and assessed condition data was available for 7% of assets. For the remaining 93% of assets, assessed condition data was unavailable, and asset age was used to approximate condition – a data gap that persists in most municipalities. Generally, age misstates the true condition of assets, making assessments essential to accurate asset management planning, and a recurring recommendation in this AMP.

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

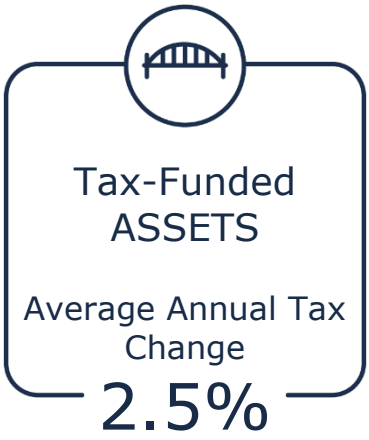
To meet capital replacement and rehabilitation needs for existing infrastructure, prevent infrastructure backlogs, and achieve long-term sustainability, the Township's average annual capital requirement totals $5.4 million. Based on a historical analysis of sustainable capital funding sources, the Township is committing approximately $1.8 million towards capital projects or reserves per year. As a result, there is currently an annual funding gap of $3.7 million approximately.

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

Average Annual Requirement Per Household

Recommendations

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



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

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

1 Introduction & Context

Key Insights

- The Township of Augusta is a small municipality in the United Counties of Leeds and Grenville of Eastern Ontario
- The goal of asset management is to minimize the lifecycle costs of delivering infrastructure services, manage the associated risks, while maximizing the value ratepayers receive from the asset portfolio
- The Township's asset management policy provides clear direction to staff on their roles and responsibilities regarding asset management
- An asset management plan is a living document that should be updated regularly to inform long-term planning
- Ontario Regulation 588/17 outlines several key milestone and requirements for asset management plans in Ontario between July 1, 2019, and 2025

1.1 Augusta Community Profile

Census Characteristic	Township of Augusta	Ontario
Population 2021	7,386	14,223,942
Population Change 2016-2021	0.4	5.8
Total Private Dwellings	3,046	5,929,250
Population Density	23.5	15.9
Land Area	313.77	892,411.76

The Township of Augusta is in the United Counties of Leeds and Grenville of Eastern Ontario. The Township is situated at one-hour south of Ottawa along the Saint Lawrence River. Augusta comprises of communities of Algonquin, Domville, Maitland, Maynard, North Augusta and Reobuck. The Township is split into two parts by Highway 401.

Augusta is one of the oldest townships in Ontario where the hamlets and villages were established prior to the 1900s. Many historical homes and buildings in use today were built by the early settlers. Many residents in the Township are the descendants of the settlers and most residents only speak English.

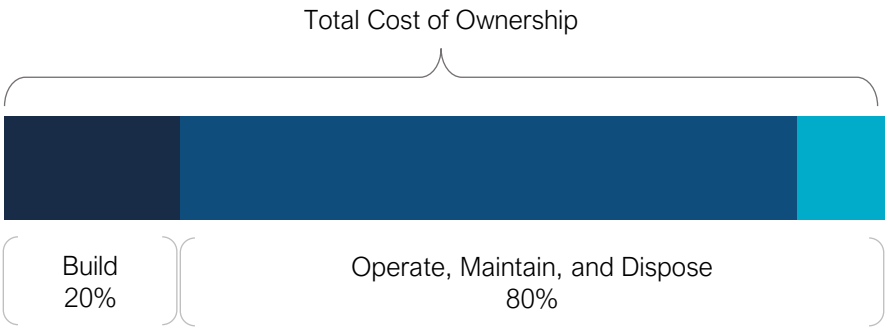
Agriculture has been the major critical economic sector of the Township for a long history and the protection of the agricultural resource is still considered a priority. A mix of commercial, service industries, agriculture and tourism comprise the current economic base of the Township. Augusta is one of the only two sites of Ontario are permitted for heavy industrial uses. The Township now focuses on encourage new economic growth and new employment generation while sustaining existing economic strengths.

The population growth from 2016 to 2021 of the Township is insignificant however its aging population which above the provincial average drives the demand of the Township. Municipal staff have identified the transportation network as the primary infrastructure priority. Currently, the Township is investing and planning on the road network every year. Staff are aiming to maintain the level of service through a series of rehabilitation and replacement projects.

1.2 An Overview of Asset Management

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

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



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

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

1.2.1 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.

1.2.2 Asset Management Strategy

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

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

1.2.3 Asset Management Plan

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

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

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

1.3 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.

1.3.1 Lifecycle Management Strategies

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

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

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

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

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

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

1.3.2 Risk Management Strategies

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

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

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

1.3.3 Levels of Service

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

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

Community Levels of Service

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

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

Technical Levels of Service

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

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

Current and Proposed Levels of Service

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

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

1.4 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, Environment and Climate Change Canada (ECCC) released Canada's Changing Climate Report (CCCR 2019).

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 elevated 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.

1.4.1 Augusta Climate Profile

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

Higher Average Annual Temperature:

1. Between the years 1981 and 2010 the annual average temperature was 6.6 ºC

2. Under a high emissions scenario, the annual average temperatures are projected to increase by 2.7 ºC by the year 2050 and over 6.5 ºC by the end of the century.

Increase in Total Annual Precipitation:

3. Under a high emissions scenario, Augusta is projected to experience an 12% increase in precipitation by the year 2080 and a 17% increase by the end of the century.

Increase in Frequency of Extreme Weather Events:

4. It is expected that the frequency and severity of extreme weather events will change.
5. In some areas, extreme weather events will occur with greater frequency and severity than others.
6. In some areas, the winter freeze-thaw cycles during December to February are projected to increase while freeze-thaw cycles in spring and fall are projected to decrease.

1.4.2 South Nation River Watershed

South Nation River Watershed is in South Nation Conservation (SNC) and SNC's area includes Leeds and Grenville, Stormont, Dundas and Glengarry, Prescott-Russell, and the City of Ottawa. South Nation River Watershed is approximately 4200 km^2, which flows from Brockville to Plantagenet and later discharges into the Ottawa River. It also includes several streams that flow into the St. Lawrence River. SNC takes samples to analyse watershed health and report to the public on a 5-year cycle.

SNC monitors water levels and weather forecasts continuously as part of the Flooding Forecasting and Warming Program across the South Nation River Watershed. The major impacts of climate change in Augusta are identified as flooding and drought. As temperatures are projected to be warmer, on-going snow melt and increasing precipitation can cause high water levels as well as flood events and erosion in the low-lying areas. This poses a threat to the surrounding built infrastructure such as riverbanks, park assets, bridges, buildings, and roads. Low rainfall and persistent hot temperatures in the summer can cause low water levels and the drought events. This may cause service disruption to the communities, limitations on agriculture activities and damages the ecological conditions of the watershed.

Public health and safety depend on the stability and predictability of the ecosystem in the South Nation River watershed. The quality of water is threatened by

anthropogenic climate change because of blue-green algae blooms, soil erosion, and agricultural, stormwater, and wastewater runoff. These phenomena put undue stress on regional water filtering and treatment systems. The safety of the public is threatened by the physical impacts of flooding such as flooding and erosion. In some cases, homeowners located near the shore are already at risk of losing their homes.

1.4.3 Integration Climate change and Asset Management

Asset management practices aim to deliver sustainable service delivery - the delivery of services to residents today without compromising the services and well-being of future residents. Climate change threatens sustainable service delivery by reducing the useful life of an asset and increasing the risk of asset failure. Desired levels of service can be more difficult to achieve because of climate change impacts such as flooding, high heat, drought, and more frequent and intense storms.

To achieve the sustainable delivery of services, climate change considerations should be incorporated into asset management practices. The integration of asset management and climate change adaptation observes industry best practices and enables the development of an integrated approach to risk management. The Township has developed a website page to provide the most current and update date information for water level conditions to the public. The United Counties of Leeds and Grenville is working on the development of climate change strategy. These programs will further advance the Township’s capacity to develop asset management strategies that incorporate climate change mitigation and adaptation considerations.

1.5 Ontario Regulation 588/17

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

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

2019

Strategic Asset Management Policy

2022

Asset Management Plan for Core Assets with the following components:

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

2024

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

2025

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

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

1.5.1 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)	4.1.1 – 4.6.1	Complete
Replacement cost of assets in each category	S.5(2), 3(ii)	4.1.1 - 4.6.1	Complete
Average age of assets in each category	S.5(2), 3(iii)	4.1.3 - 4.6.3	Complete
Condition of core assets in each category	S.5(2), 3(iv)	4.1.2 – 4.6.2	Complete
Description of municipality's approach to assessing the condition of assets in each category	S.5(2), 3(v)	4.1.2 – 4.6.2	Complete
Current levels of service in each category	S.5(2), 1(i-ii)	4.1.6 - 4.6.6	Complete
Current performance measures in each category	S.5(2), 2	4.1.6 - 4.6.6	Complete
Lifecycle activities needed to maintain current levels of service for 10 years	S.5(2), 4	4.1.4 - 4.6.4	Complete
Costs of providing lifecycle activities for 10 years	S.5(2), 4	Appendix A	Complete
Growth assumptions	S.5(2), 5(i-ii) S.5(2), 6(i-vi)	5.1-5.2	Complete

2 Scope and Methodology

Key Insights

- This asset management plan includes 6 asset categories which are all tax-funded
- 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

2.1 Asset Categories Included in this AMP

This asset management plan for the Township of Augusta is produced in compliance with Ontario Regulation 588/17. The July 2024 deadline under the regulation—the second of three AMPs—requires analysis of all the assets.

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

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

2.2 Deriving Replacement Costs

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

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

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

2.3 Estimated Useful Life and Service Life Remaining

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

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

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

2.4 Reinvestment Rate

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

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

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

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

2.5 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 in this AMP to determine asset condition. This rating system is aligned with the Canadian Core Public Infrastructure Survey which is used to develop the Canadian Infrastructure Report Card. When assessed condition data is not available, service life remaining is used to approximate asset condition.

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

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

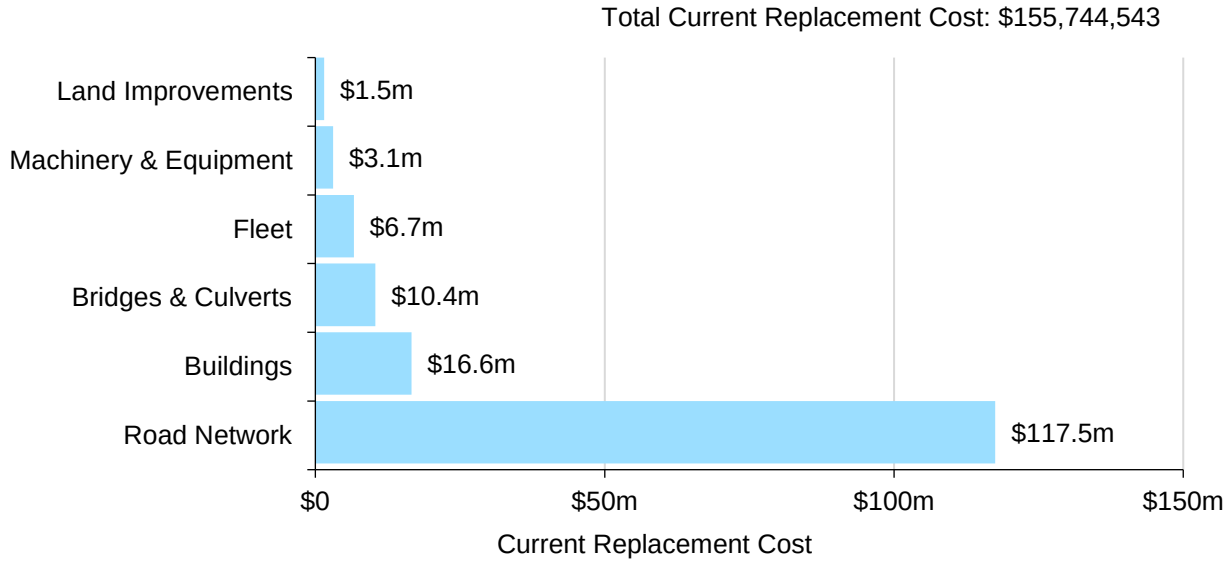
3 Portfolio Overview

Key Insights

- The total replacement cost of the Township's asset portfolio is $155.7 million
- The Township's target re-investment rate is 3.5%, and the actual re-investment rate is 1.1%, contributing to an expanding infrastructure deficit
- 31% of all assets are in fair or better condition
- 13% of assets are projected to require replacement in the next 10 years
- Average annual capital requirements total $5.4 million per year across all assets

3.1 Total Replacement Cost of Asset Portfolio

The asset categories analysed in this AMP have a total replacement cost of $155.7 million based on inventory data from 2022. This total was determined based on a combination of user-defined costs and historical cost inflation. This estimate reflects replacement of historical assets with similar, not necessarily identical, assets available for procurement today.

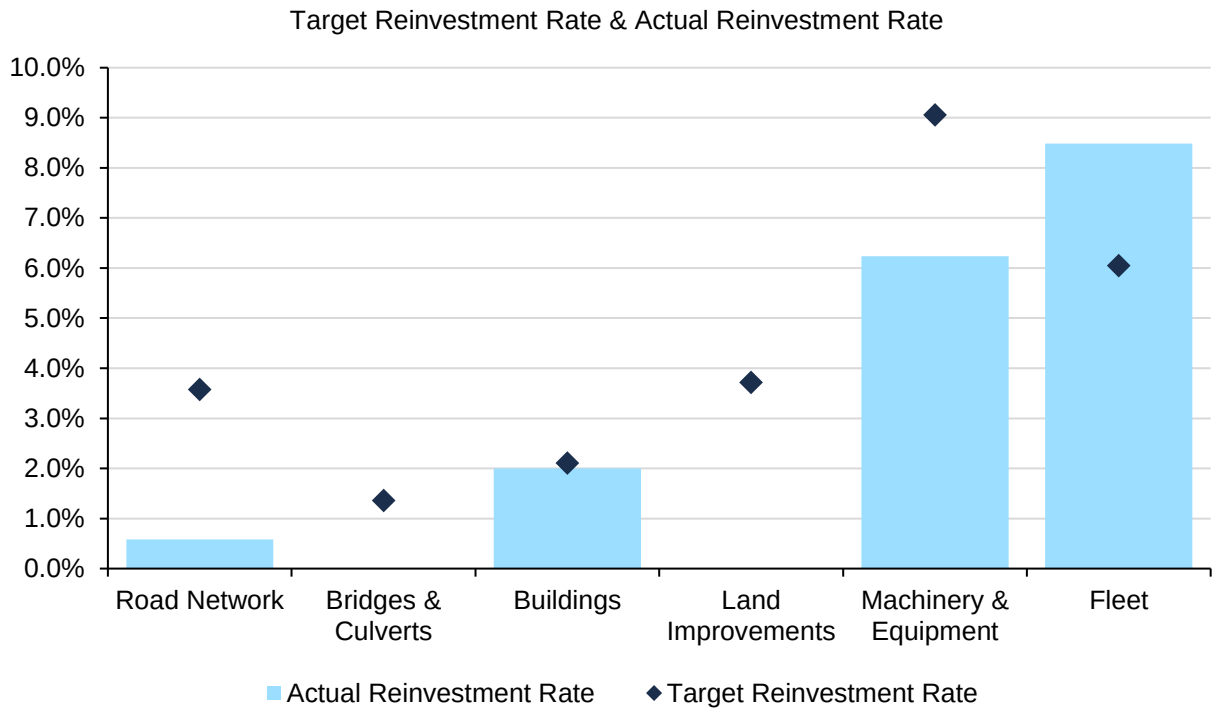


The following table identifies the methods employed to determine replacement costs across each asset category:

Asset Category	Replacement Cost Method	
	User-Defined	Notes
Road Network	100%	Data from 2023 Road Needs Study and Staff Estimates
Bridges & Culverts	100%	Data from 2018 and 2022 OSIM reports, Staff Estimates
Buildings	84%	Fire buildings are all user-defined and public works are largely user-defined
Machinery & Equipment	88%	Fire equipment are all user-defined and public works equipmentare largely user-defined
Fleet	89%	Fire fleet are all user-defined and other fleet are largely user-defined
Land Improvements	52%	Data from Staff Estimates or by CPI tables
Overall	**97%**	

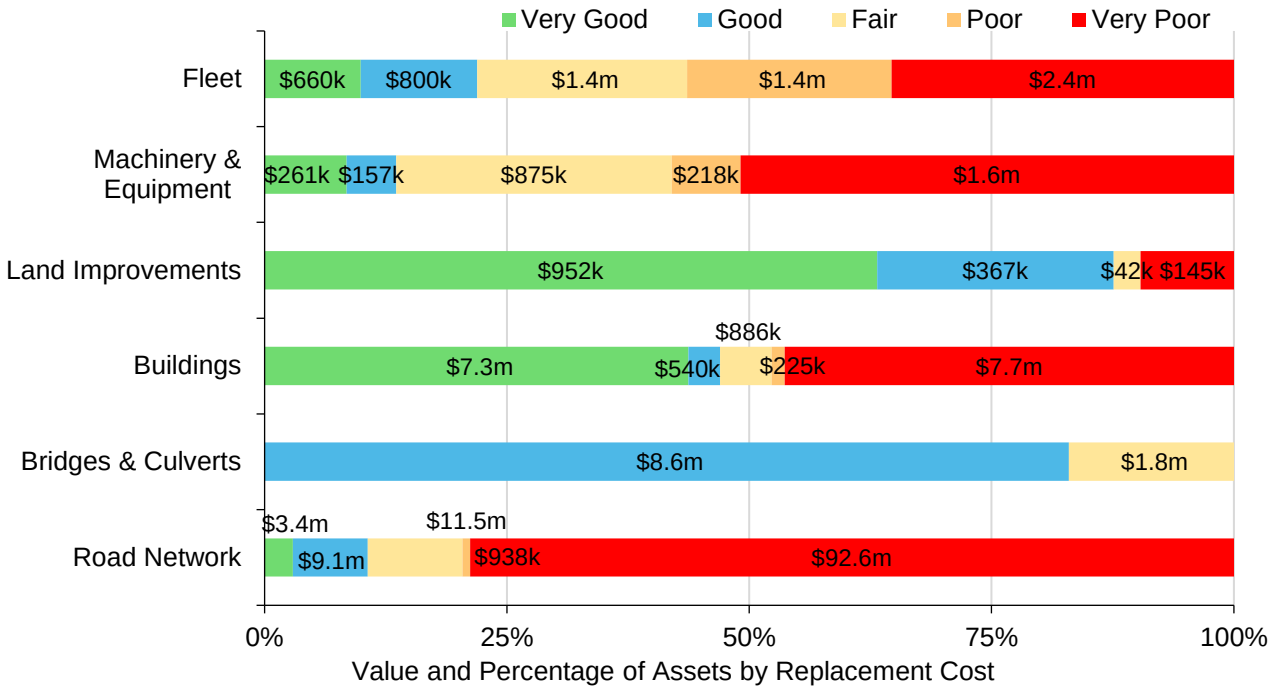
3.2 Target vs. Actual Reinvestment Rate

The graph below depicts funding gaps or surpluses by comparing target vs actual reinvestment rate. To meet the long-term replacement needs, the Township should be allocating approximately $5.4 million annually, for a target reinvestment rate of 3.5%. Actual annual spending on infrastructure totals approximately $1.77 million, for an actual reinvestment rate of 1.1%.



3.3 Condition of Asset Portfolio

The current condition of the assets is central to all asset management planning. Collectively, 31% of assets in Augusta are in fair or better condition. This estimate relies on both age-based and field condition data.



This AMP relies on assessed condition data for 7% of assets; for the remaining portfolio, age is used as an approximation of condition. Assessed condition data is invaluable in asset management planning as it reflects the true condition of the asset and its ability to perform its functions. The table below identifies the source of condition data used throughout this AMP.

Asset Category	Asset Segment	% of Assets with Assessed Condition	Source of Condition Data
Road Network	Paved Roads	0%	N/A
	Gravel Roads	0%	N/A
	Drainage Culverts	100%	Staff inspection and assessment
Bridges & Culverts	Bridges	100%	2022 OSIM Report
	Structural Culverts	100%	2022 OSIM Report
Buildings	All	0%	N/A
Machinery & Equipment	All	0%	N/A
Vehicles	All	0%	N/A
Land Improvements	All	0%	N/A

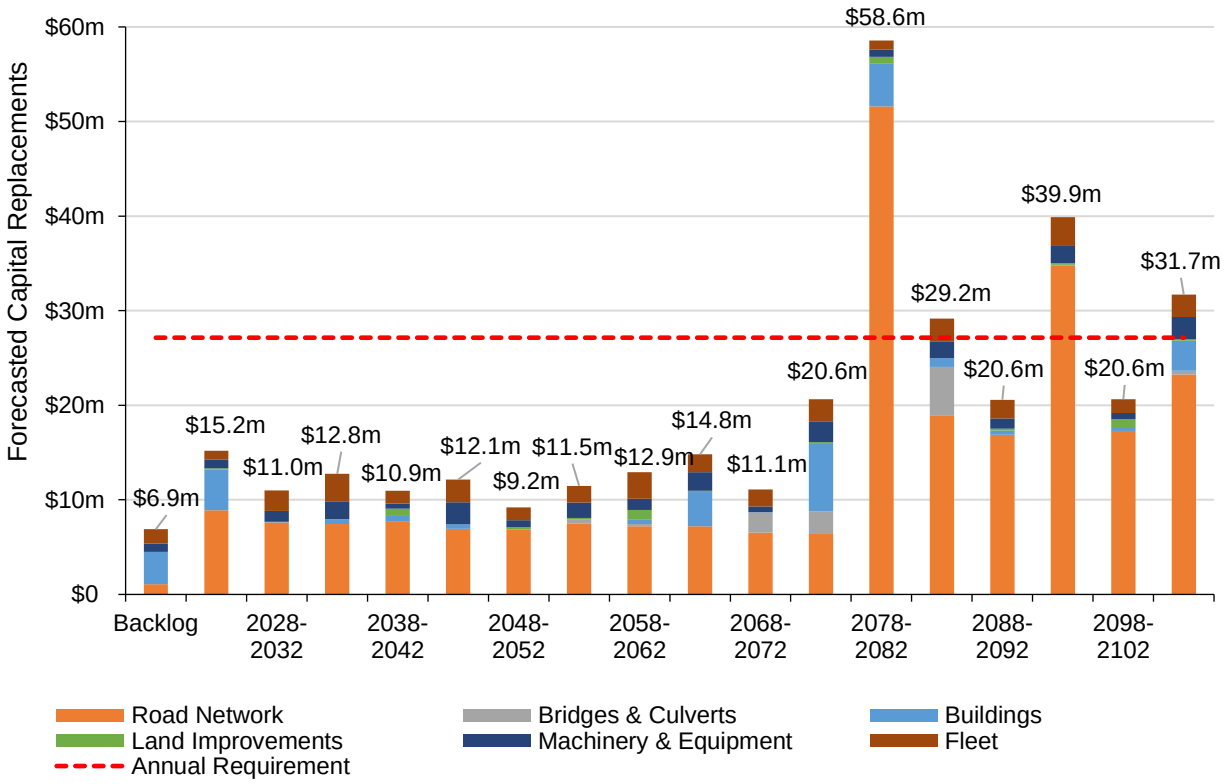
3.4 Service Life Remaining

Based on asset age, available assessed condition data and estimated useful life, 13% of the Township's assets will require replacement within the next 10 years. Capital requirements over the next 10 years are identified in Appendix A.

3.5 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 until 2107. 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. Current backlog for all the assets has reaches $6.9 million where buildings and fleet are the largest contributors. The average annual capital requirement for all assets is $5.4 million.



4 Analysis of Tax-funded Assets

Key Insights

- Tax-funded assets are valued at $155.7 million
- 31% of tax-funded assets are in fair or better condition
- The average annual capital requirement to sustain the current level of service for tax-funded assets is approximately $5.4 million
- Critical assets should be evaluated to determine appropriate risk mitigation activities and treatment options

4.1 Road Network

The road network is a critical component of the provision of safe and efficient transportation services and represents the highest value asset category in the Township's asset portfolio. It includes all municipally owned and maintained roadways in addition to supporting roadside infrastructure including catch basins, streetlights, road signs and drainage culverts with span less than 3 metre.

The Township's roads and the roadside assets are maintained by the Public Works department who is also responsible for 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	
$117.5 million	Very Poor (16%)	Annual Requirement:	$4.2 million
		Funding Available:	$681,000
		Annual Deficit:	$3.5 million

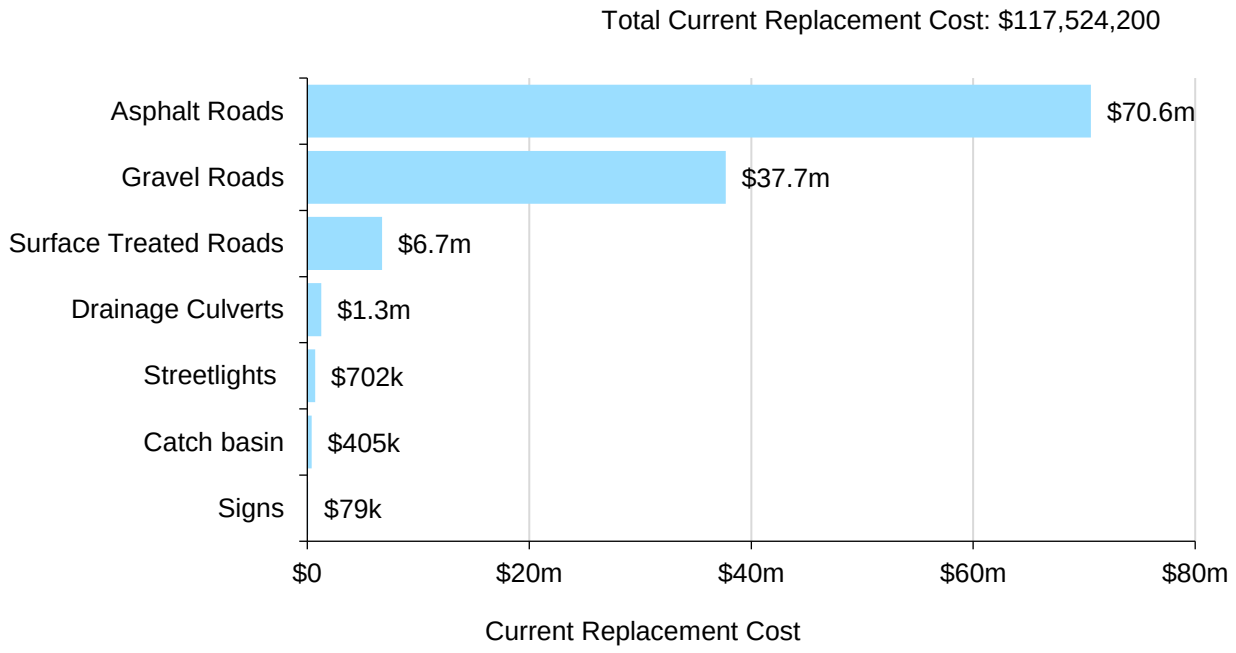
The following core values and level of service statements are a key driving force behind the Township's asset management planning:

Service Attribute	Level of Service Statement
Scope	The road network service is conveniently accessible to the whole community in sufficient capacity (meets traffic demands) and is available under all weather conditions.
Performance	The transportation services provided by the road network are provided in a sustainably affordable manner, taking into account long-term requirements.

4.1.1 Asset Inventory & Costs

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

Asset Segment	Quantity	Replacement Cost	Annual Capital Requirement
Asphalt Roads	114 km[1]	$70,613,000	$2,798,000
Catch basin	50	$405,000	$21,000
Drainage Culverts (< 3 metres)	426	$1,272,000	$55,000
Gravel Roads	79 km[1]	$37,710,000	$640,000
Signs	661	$79,000	$11,000
Streetlights	234	$702,000	$35,000
Surface Treated Roads	12 km[1]	$6,744,000	$642,000
Total		**$117,524,000**	**$4,202,000**



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

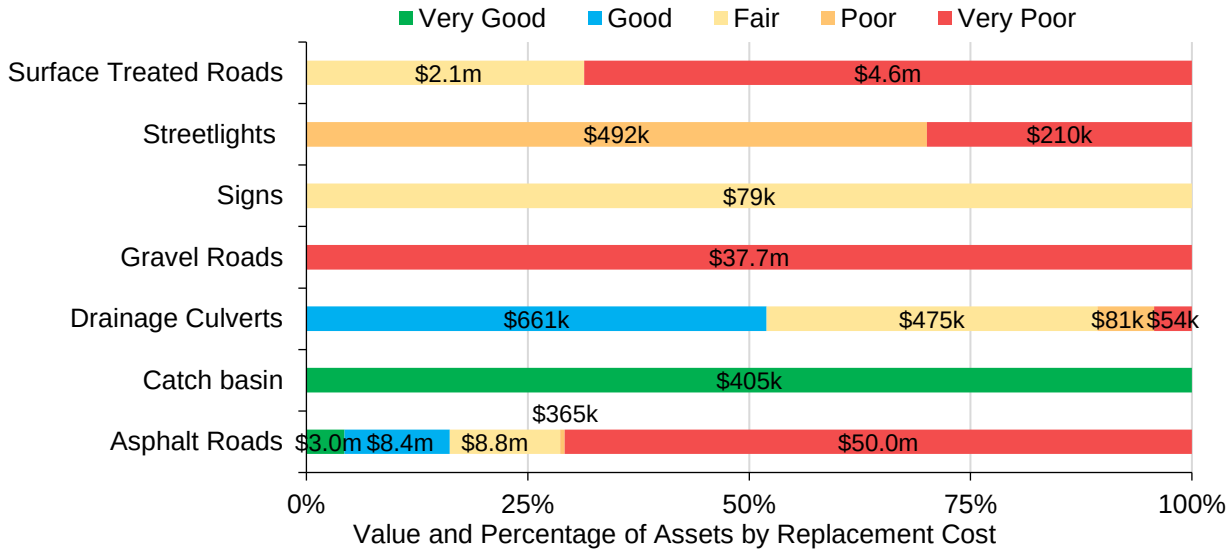
[1] According to 2023 Road Needs Study, the Township owns 111.46 km of HCB roads, 11.45 km of LCB roads and 86.23km of gravel roads. The Township is working towards refining the inventory and reduce the discrepancies between current inventory and the road needs study.

4.1.2 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 [2]
Asphalt Roads	15	14.4	23% (Poor)
Catch basin	20	1.9	90% (Very Good)
Drainage Culverts (< 3 metres)	27	14.3	51% (Fair)
Gravel Roads	20	44.7	0% (Very Poor)[3]
Signs	7	2.0	57% (Fair)
Streetlights	20	18.0	25% (Poor)
Surface Treated Roads	7	5.7	17% (Very Poor)
Average			16% (Very Poor)

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



[2] The condition for all roads is all age-based condition and the staff are currently working towards matching and uploading assessed condition in 2023 Road Needs Study with the inventory.

[3] The aged-based condition is not a good indicator for gravel roads because gravel roads are perpetually re-stoned every 5 years.

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

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

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 more confidently. The following describes the Township's current approach:

- A Road Needs Study is completed by external consultant every 5 to 7 years
- The latest road needs study was completed in 2016 by 4 Roads Management Services Inc.
- The next road needs study for the Township will be completed in 2023
- Road patrols are performed regularly based on road class by in-house staff

  Streetlights are inspected by municipal staff and repaired as needed by external contractors

In this AMP the following rating criteria is used to determine the current condition of road segments and forecast future capital requirements:

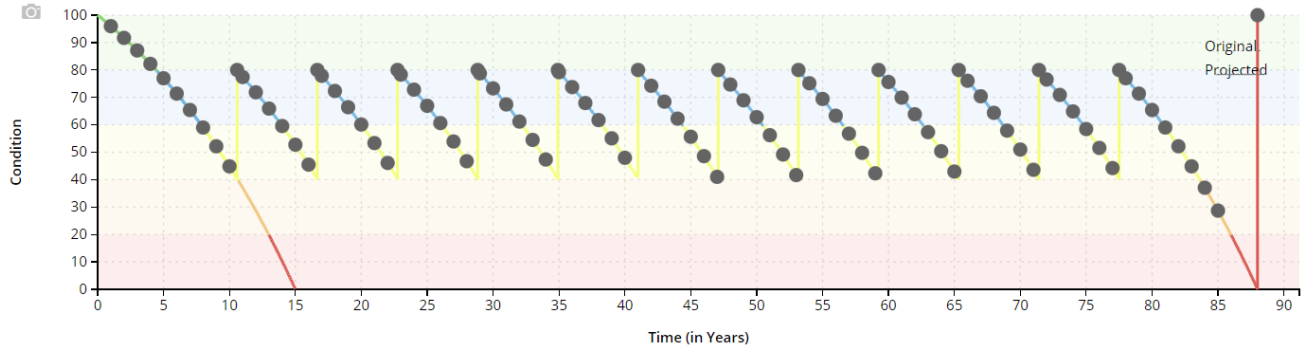
Condition	Rating
Very Good	80-100
Good	60-80
Fair	40-60
Poor	20-40
Very Poor	0-20

4.1.3 Lifecycle Management Strategy

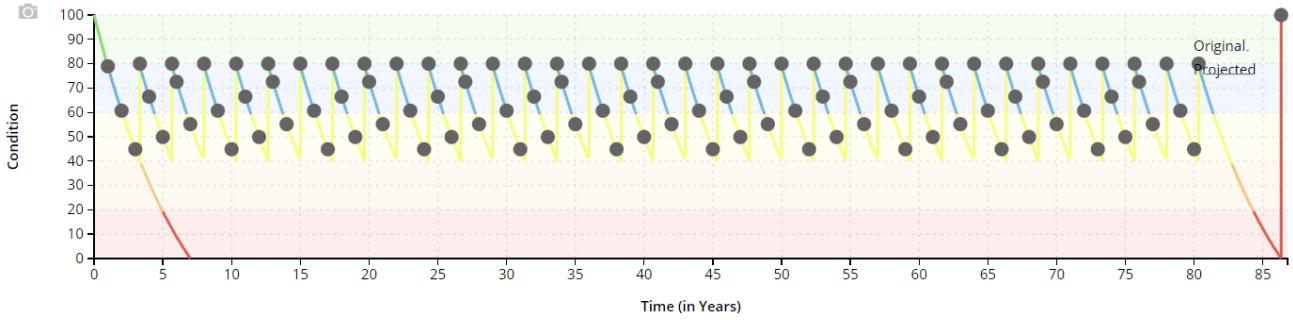
The condition or performance of most assets will deteriorate over time. This process is affected by a range of factors including an asset's characteristics, location, utilization, maintenance history and environment.

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

Paved Roads (Asphalt Roads)		
Event Name	**Event Class**	**Event Trigger**
Crack Sealing	Preventative Maintenance	Annually
Patching	Preventative Maintenance	Annually
Asphalt Overlay	Rehabilitation	40% Condition
Full Reconstruction	Replacement	Reach 80 Years with 40% Condition



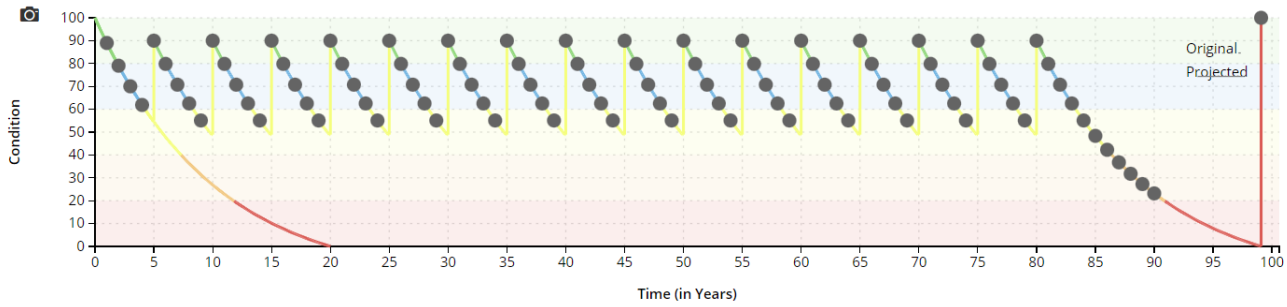
Paved Roads (Surface Treated Roads)		
Event Name	**Event Class**	**Event Trigger**
Crack Sealing	Preventative Maintenance	Annually
Patching	Preventative Maintenance	Annually
Surface Treatment	Rehabilitation	40% Condition
Full Reconstruction	Replacement	Reach 80 Years with 40% Condition



The following table outlines the Township's current lifecycle management strategy that are not included in the tables above for Paved roads.

Activity Type	Description of Current Strategy
Maintenance	Regular maintenance, including sweeping, cleaning, and grass mowing is performed on a regular basis
	Patching and crack sealing are performed annually on the paved roads with identified deficiencies
Rehabilitation	Approximately of 8 inches of hot mix and gravel is overlayed on asphalt roads based on staff assessment and road condition
	Surface treatments are applied to the surface treated roads based on staff assessment and road condition
Replacement	The full replacement of paved roads depends on its condition, traffic counts and staff expertise

Gravel Roads		
Event Name	**Event Class**	**Event Trigger**
Dust Suppression	Maintenance	Annually
Re-graveling	Rehabilitation	Every 5 Years (Repeated)
Full Reconstruction	Replacement	Reach 80 Years with 40% Condition



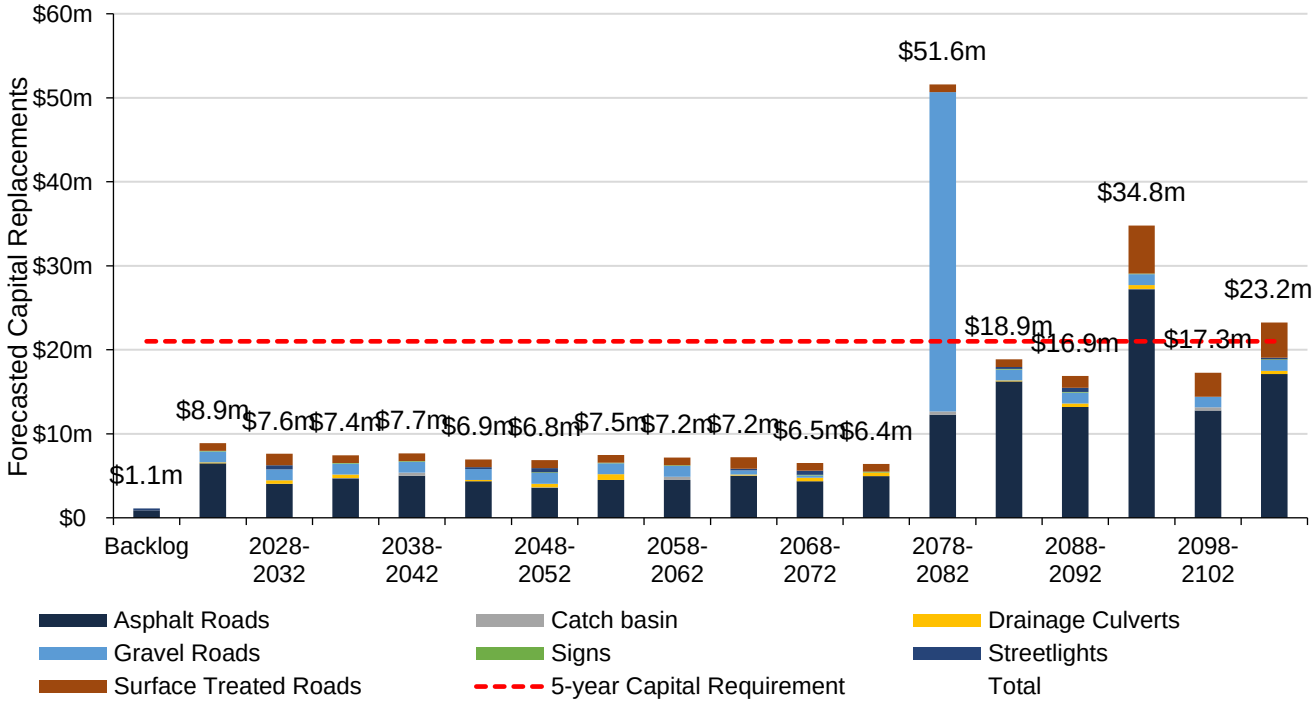
The following table outlines the Township's current lifecycle management strategy that are not included in the tables above for Gravel roads.

Activity Type	Description of Current Strategy
Maintenance	Dust Suppression is applied on gravel roads on an annual basis by external contractors
	Grading is performed by municipal staff on as-needed basis
Rehabilitation	A minimum of 2-3 mm of compacted gravel is applied on gravel roads on a 4-to-5-year cycle
Replacement	The full replacement of gravel roads depends on its condition, traffic counts and staff expertise

Forecasted Capital Requirements

Based on the lifecycle strategies identified previously for Asphalt roads and Gravel 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 until 2107. 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. Current backlog for the road network is $1.1 million and the annual capital requirement is $4.2 million.

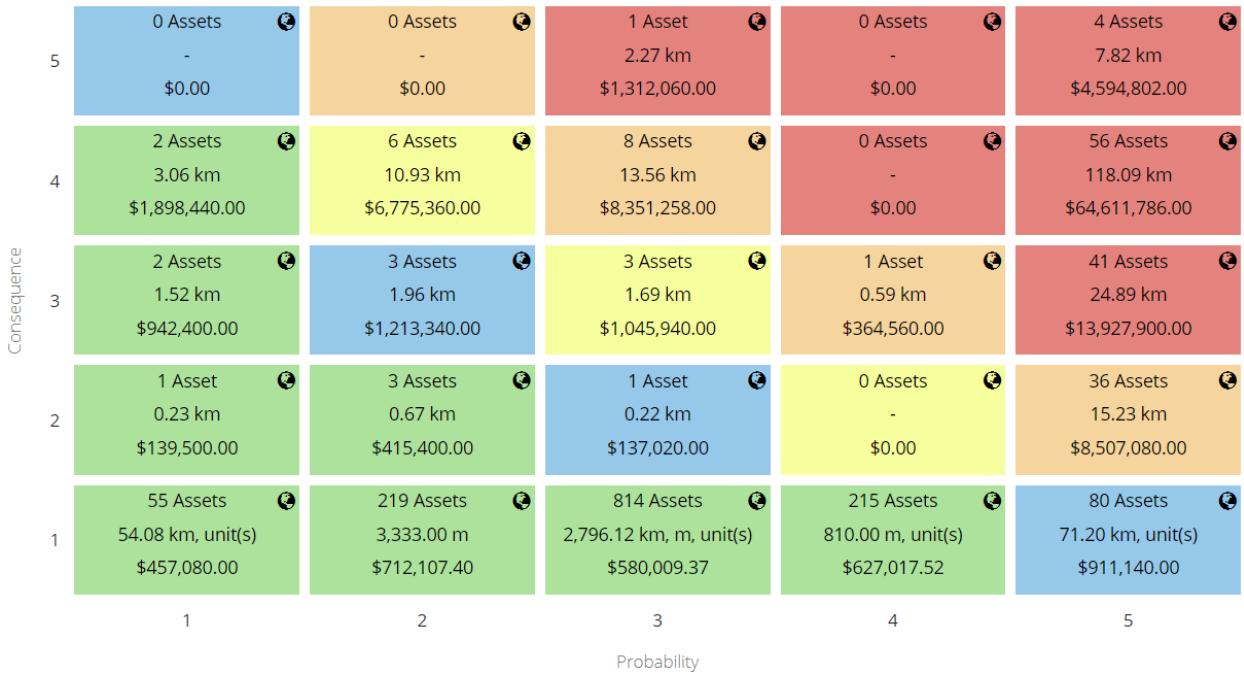


The projected cost of lifecycle activities that will need to be undertaken over the next 10 years to maintain the current level of service can be found in Appendix A.

4.1.4 Risk & Criticality

Risk Matrix

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



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

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

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

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

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

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

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

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

Risks to Current Asset Management Strategies

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

Climate Change & Extreme Events

Increasing temperatures and extreme hot days can soften the top layers of asphalt roads which leading to faster deterioration of the roads. In addition, flooding caused by severe rainfalls can damage paved surface and washout the gravel. past designs of drainage culverts have been inadequate, which further increases the probability of flooding. As a result, higher maintenance and rehabilitation requirements are expected to maintain the same level of service, to avoid complaints, liabilities, and larger capital spending. To improve asset resiliency, staff should identify the critical areas and improve drainage through enhanced lifecycle strategies.

Capital Funding Strategies

Due to supply chain uncertainty, the market prices have increased considerably with extended wait times. Major capital rehabilitation projects for roads are dependant on the availability of grant funding opportunities. When grants are not available, roadway projects may be deferred. The Township can consider developing an annual capital funding strategy by utilizing the roadway condition from regular road patrols. The annual capital funding strategy could reduce dependency on grant funding and help prevent deferral of capital works.

4.1.5 Levels of Service

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

Community Levels of Service

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

Service Attribute	Qualitative Description	Current LOS (2022)
Scope	The road network is reliable and provides reasonable access to properties throughout the Township	See Appendix B
Quality	The road network is managed cost-effectively with long-term plans in place to meet the established level of service	The Township will complete a Road Management Study in 2023 in coordination with Greer Galloway Consulting Engineers. The Condition Ratings, developed through the scoring in the Inventory Manual, classify roads as "Now", "1 to 5" or "6 to 10" year needs for reconstruction. "0 Years" Needs - These sections of road warrant immediate improvements due to a significant deficiency or particularly poor condition. "1-5 Years" Needs - These sections of road are typically in in poor condition or rapidly deteriorating condition and are anticipated to need either reconstruction or resurfacing within the next 5 years based on the review of their current conditions. "6-10 Years" Needs - These sections of road are anticipated to need either reconstruction or resurfacing within the next 6 to 10 years based on the review of their current conditions.

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 (2022)
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)	0.50
	Lane-km of local roads (MMS classes 5 and 6) per land area (km/km^2)	0.17
Quality	Average pavement condition index for paved roads in the Township	HCB: 23% LCB: 17%
	Average surface condition for unpaved roads in the Township (e.g., excellent, good, fair, poor)	Very poor
Affordability	Capital reinvestment rate	0.6%

4.1.6 Recommendations

Asset Inventory

- Review road inventory to determine whether all municipal assets within these asset segments have been accounted for.
- Continue to update the unit replacement costs which reflect current tender pricing and review the estimated useful life values of the roadside infrastructure to ensure they match the true service life.

Condition Assessment Strategies

- The last comprehensive assessment of the road network was completed in 2023 however the assessed conditions are not uploaded in the Citywide. The Township should continue completing a detailed assessment of all roads every 4 to 5 years and upload to Citywide on a regular basis.
- Consider developing a condition rating criteria that utilizes the routine inspection records for roads and roadside infrastructure.

Lifecycle Management Strategies

- Implement the identified lifecycle management strategies for asphalt roads and surface treated roads to realize potential cost avoidance and maintain a high quality of road pavement condition.
- Evaluate the efficacy of the Township’s lifecycle management strategies at regular intervals to determine the impact cost, condition, and risk.

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.

4.2 Bridges & Culverts

Bridges and culverts represent a critical portion of the transportation services provided to the community. The Department of Public Works is responsible for the maintenance of all bridges and structural culverts located across municipal roads with the goal of keeping structures in an adequate 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	
$10.4 million	Good (63%)	Annual Requirement:	$141,000
		Funding Available:	$0
		Annual Deficit:	$141,000

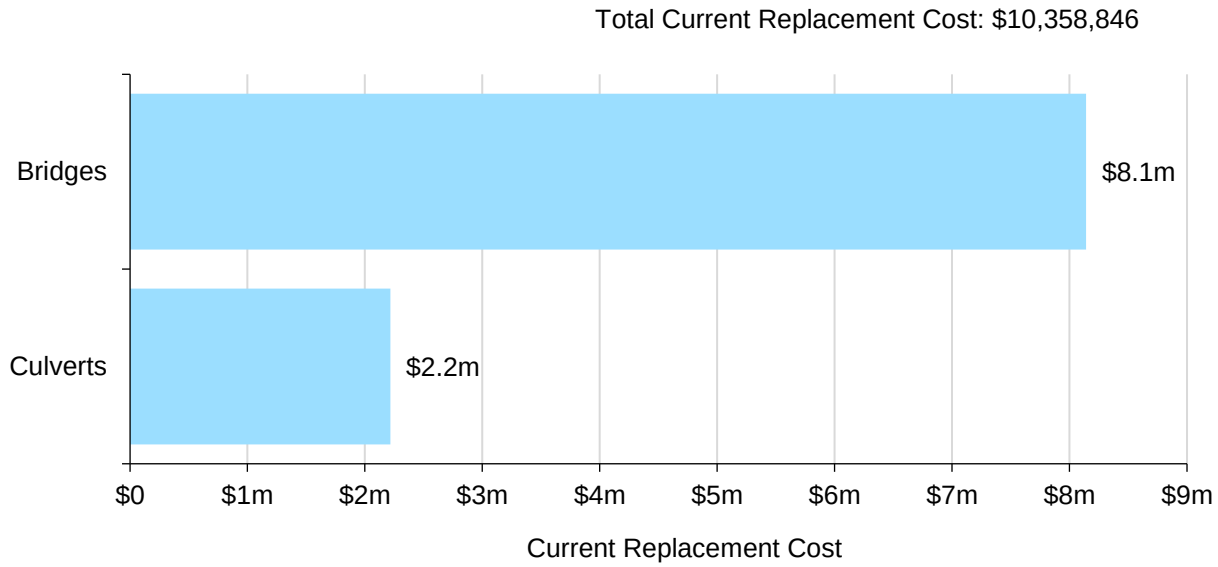
The following core values and level of service statements are a key driving force behind the Township's asset management planning:

Service Attribute	Level of Service Statement
Scope	Bridges and culverts are conveniently accessible to the whole community in sufficient capacity (meets traffic demands) and are available under all weather conditions. None of the bridges and culverts in the Township has loading restrictions.
Performance	The transportation services provided by the bridges and culverts are provided in a sustainably affordable manner with minimal unplanned service interruptions and closures.

4.2.1 Asset Inventory & Costs

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

Asset Segment	Quantity	Replacement Cost	Annual Capital Requirement
Bridges	6	$8,141,000	$109,000
Culverts	6	$2,217,000	$32,000
Total		**$10,359,000**	**$141,000**



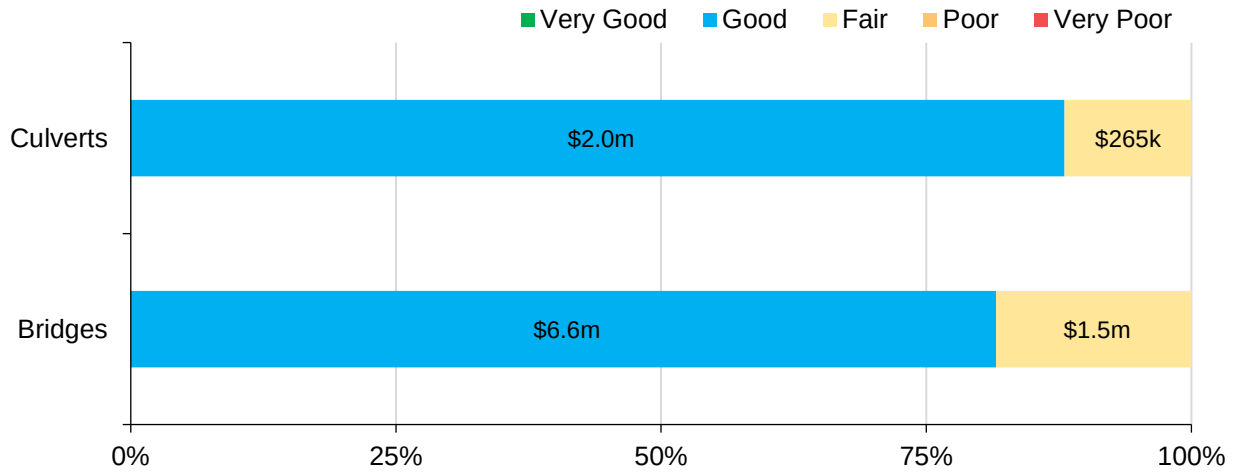
Each asset's replacement cost should be reviewed periodically to determine whether adjustments are needed to more accurate represent realistic capital requirements.

4.2.2 Asset Condition & Age

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

Asset Segment	Estimated Useful Life (Years)	Average Age (Years)	Average Condition
Bridges	75	47.6	62% (Good)
Culverts	70	42.1	65% (Good)
Average			**63% (Good)**

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



Value and Percentage of Assets by Replacement Cost

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

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

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 more confidently. The following describes the Township's current approach:

- Condition assessments of all bridges and culverts with a span greater than or equal to 3 meters are completed every 2 years in accordance with the Ontario Structure Inspection Manual (OSIM)
- Internal inspections are completed on as needed basis, and it is mainly driven by complaints or incidents

In this AMP, the following rating criteria is used to determine the current condition of bridges and 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

4.2.3 Lifecycle Management Strategy

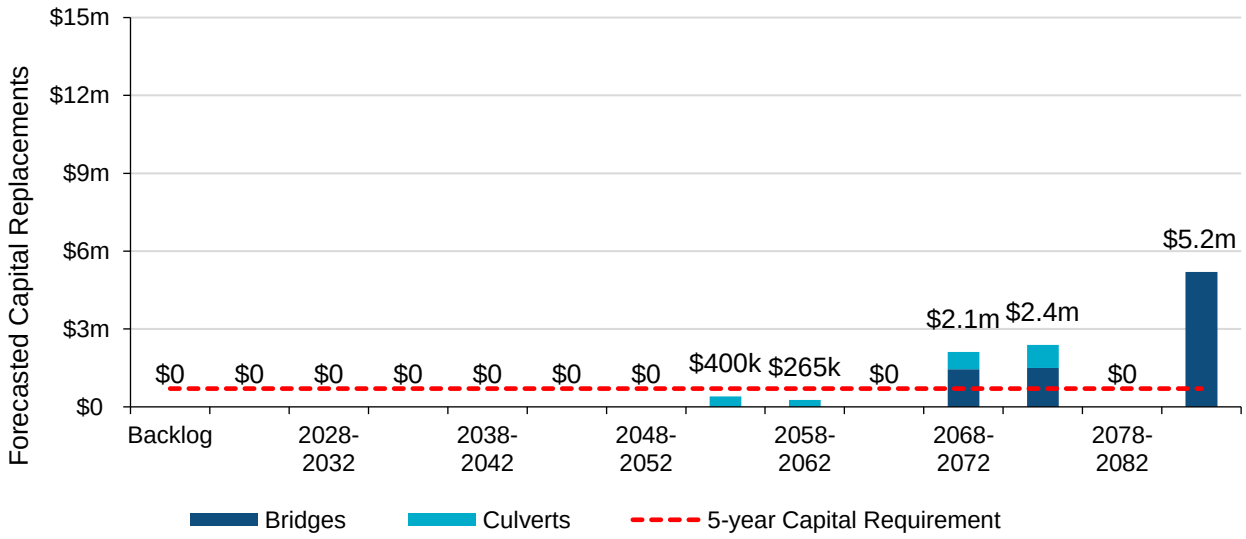
The condition or performance of most assets will deteriorate over time. To ensure that municipal assets are performing as expected and meeting the needs of customers, it is important to establish a lifecycle management strategy to proactively manage asset deterioration.

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

Activity Type	Description of Current Strategy
Maintenance, Rehabilitation and Replacement	Sweeping, deck washing, and removal of vegetation are completed twice a year by municipal staff
	Removal of overburden are completed as needed by municipal staff
	All rehabilitation and replacement activities are driven by the recomendations of mandated structural inspections competed according to the Ontario Structure Inspection Manual (OSIM)
Inspection	The most recent OSIM report was completed in 2022 by The Greer Galloway Group Inc. Engineering Consultants

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 until 2087. 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 annual capital requirement for the bridges & culverts is $141,000.



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

4.2.4 Risk & Criticality

Risk Matrix

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

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

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

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

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

Risks to Current Asset Management Strategies

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

Infrastructure Design

As the sizes of equipment and machinery becomes bigger and wider, the past design of the bridges may not be sufficient for the agriculture equipment crossing. In this case, higher maintenance and rehabilitation requirements are expected to repair the damaged bridges and ensure they are in good condition. An enhanced proactive strategy can help to extend the service life of structures and better capital planning.

Wildlife and Environment Uncertainty

Beavers in the Township are attracted to build dams in culverts and other drainage structures to create ponds. However, the beaver dams constrict stream flowing, limit the capacity for water and increase the probability of flooding. As a result, it requires high maintenance costs and adequate staff to maintain the culverts and remove the beaver dams regularly. Incorporating a monitoring and maintenance program for all culverts in the critical areas with an annual capital plan can further support infrastructure resiliency and help mitigate the risk.

Capital Funding Strategies

Major capital rehabilitation projects for bridges and culverts are entirely dependant on the availability of grant funding opportunities. The Township should continue to complete regular inspections according to the Ontario Structural Inspections Manual (OSIMs) and utilize the assessment recommendations for the development of lifecycle strategies and capital planning. The Township should consider updating asset replacement costs and event costs on a cyclical basis to improve the effectiveness of capital planning.

4.2.5 Levels of Service

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

Community Levels of Service

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

Service Attribute	Qualitative Description	Current LOS (2022)
Scope	Bridges and culverts provide reliable access to the road network for vehicles and/or pedestrians	Bridges and structural culverts are a key component of the municipal transportation network. None of the Township's structures have loading or dimensional restrictions meaning that most types of vehicles, including heavy transport, motor vehicles, emergency vehicles and cyclists can cross them without restriction.
Quality	Bridges and culverts are managed cost-effectively with long-term plans in place to meet the established level of service	Refer to 4.2.3 for lifecycle strategies. See Appendix B for the images of bridges and culverts with different conditions.

Technical Levels of Service

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

Service Attribute	Technical Metric	Current LOS (2022)
Scope	% of bridges in the Township with loading or dimensional restrictions	0%
Quality	Average bridge condition index value for bridges in the Township	62
	Average bridge condition index value for structural culverts in the Township	65
Affordability	Capital re-investment rate	0%

4.2.6 Recommendations

Data Review/Validation

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

Risk Management Strategies

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

Lifecycle Management Strategies

- This AMP only includes capital costs associated with the reconstruction of bridges and culverts. The Township should work towards identifying projected capital rehabilitation and renewal costs for bridges and culverts and integrating these costs into long-term planning.

Levels of Service

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

4.3 Buildings

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

- Admin buildings and salt dome
- Fire halls
- Public works garages and storage sheds
- Community centres and recreation buildings

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

Replacement Cost	Condition	Financial Capacity	
$16.6 million	Fair (48%)	Annual Requirement:	$350,000
		Funding Available:	$332,000
		Annual Deficit:	$18,000

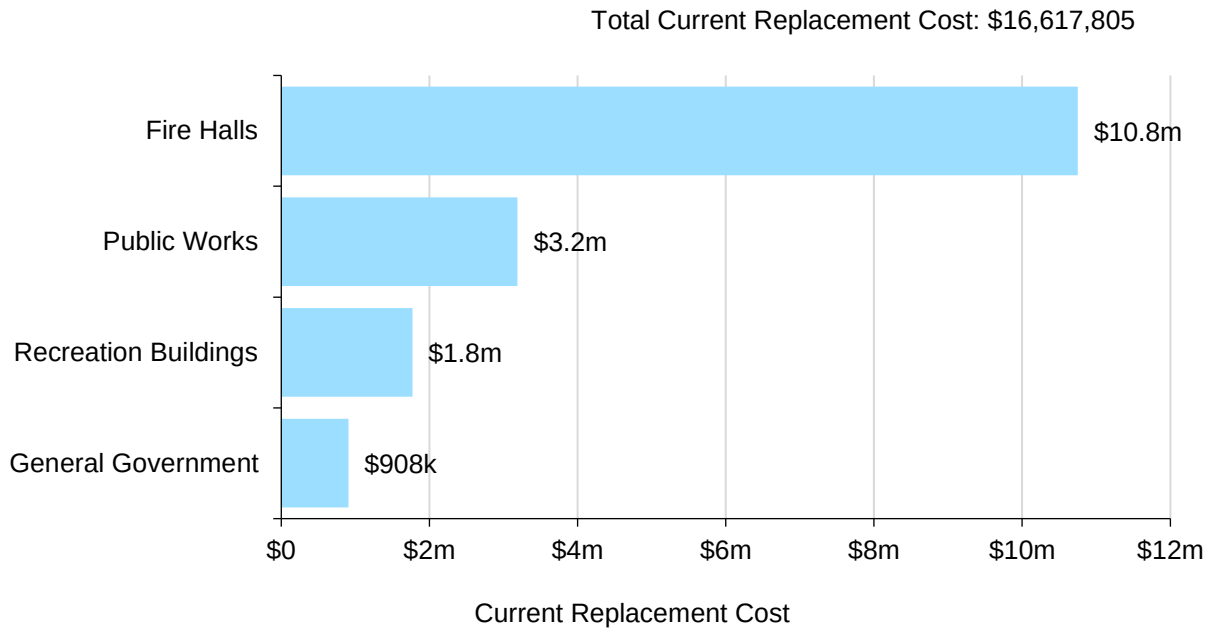
The following core values and level of service statements are a key driving force behind the Township's asset management planning:

Service Attribute	Level of Service Statement
Performance	Buildings and facilities are safe for occupants and do not cause a hazard to the public. The services provided by buildings and facilities are managed in a sustainably affordable manner, taking into account long-term requirements.

4.3.1 Asset Inventory & Costs

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

Asset Segment	No. of Facility	Replacement Cost	Annual Capital Requirement
Fire Halls	2	$10,750,000	$195,000
General Government	1	$908,000	$23,000
Public Works	6	$3,190,000	$93,000
Recreation Buildings	8	$1,771,000	$38,000
Total		**$16,618,000**	**$350,000**



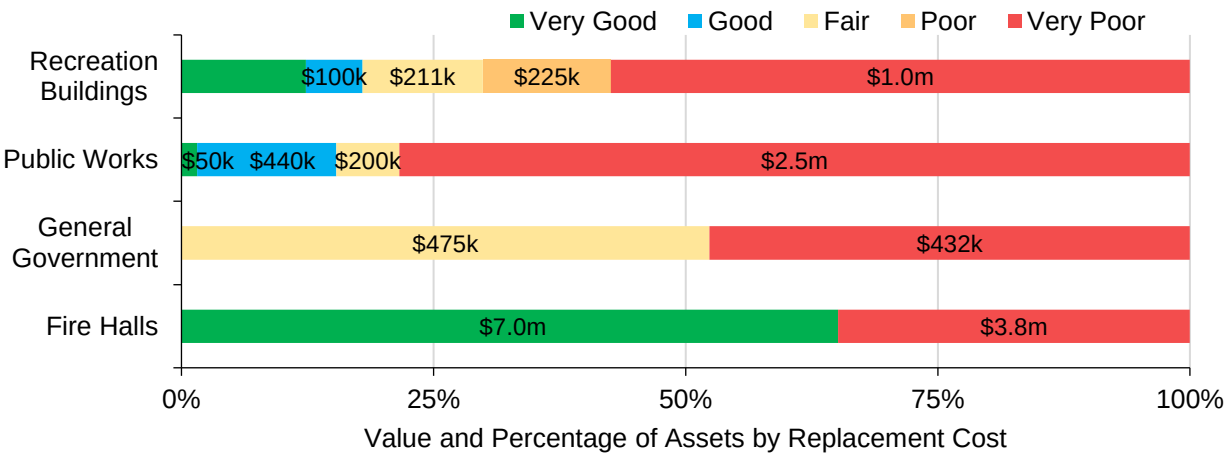
Each asset's replacement cost should be reviewed periodically to determine whether adjustments are needed to more accurate represent realistic capital requirements.

4.3.2 Asset Condition & 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
Fire Halls	55	19.4	63% (Good)
General Government	40	34.6	30% (Poor)
Public Works	36	44.7	14% (Very Poor)
Recreation Buildings	47	37.4	24% (Poor)
Average			**48% (Fair)**

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



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

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

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 more confidently. The following describes the Township's current approach:

- Health and safety inspections on buildings are performed by in-house staff on the need basis. However, structural defects are not included in the inspections
- Currently, there is no formal condition assessment programs in place for buildings

In this AMP the following rating criteria is used to determine the current condition of road segments and forecast future capital requirements:

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

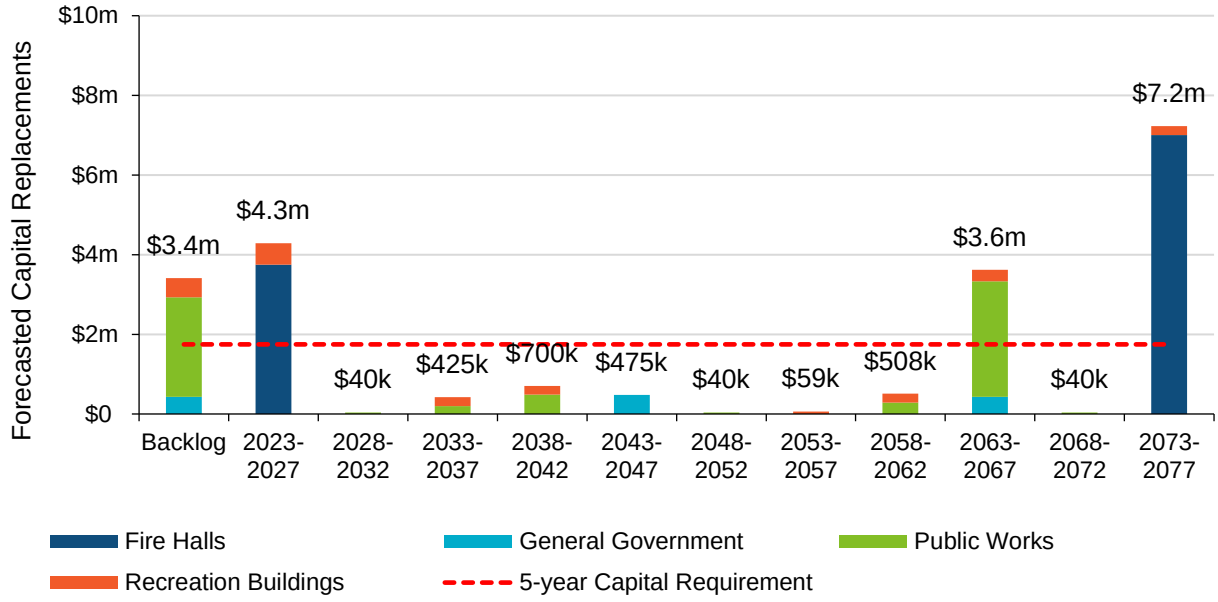
4.3.3 Lifecycle Management Strategy

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	Municipal buildings are subject to regular inspections to compliant with health & safety requirements
	Air quality testing are completed by external contractor every 2 to 3 years
	Water testing are completed by municipal staff on a monthly basis
	Back-up generators testing are completed by municipal staff on an annual basis
Replacement	Assessments are completed strategically as buildings approach their end-of-life to determine whether replacement or rehabilitation is appropriate

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 until 2077. 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. Current backlog for buildings is $3.4 million and the annual capital requirement is $350,000.



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

4.3.4 Risk & Criticality

Risk Matrix

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

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

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

Probability of Failure (POF)	Consequence of Failure (COF)
Condition	Replacement Cost (Economic)
	Building Types (Health & Safety)

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

Risks to Current Asset Management Strategies

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

Aging Infrastructure & Capital Funding Strategies
Many building assets in the Township are reaching the end of their estimated useful life. Several buildings require replacements of major components in the coming years. Major capital rehabilitation projects for buildings will be heavily reliant on the availability of grant funding opportunities. An annual capital funding strategy can be helpful to prevent deferral of capital works.

Asset Information & Lifecycle Management Strategies
The estimated useful life for most building assets is age-based. Condition-based estimated useful life can be determined by completing a detailed assessment for all building components. This can increase confidence in the development of data-driven strategies to address infrastructure needs, prioritize the inspections/maintenance activities. An enhanced proactive strategy can extend the service life of assets with lower funding requirement.

Growth
The buildings and facilities including the parking lot in the Township are reaching the capacity. Population growth increases the demand, and the community expectation becomes higher on buildings and facilities. The Township must prioritize expanding its capacity to serve a larger population. Developing a comprehensive long-term capital plan with considerations for growth can be helpful to minimize dependency on grant funding and increase the capacity.

4.3.5 Levels of Service

The following tables identify the Township's current level of service for buildings. These metrics include the technical and community level of service metrics that the Township has selected for this AMP.

Community Levels of Service

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

Service Attribute	Qualitative Description	Current LOS (2022)
Safe & Regulatory	Facilities are safe for occupants and do not cause a hazard to the public	See Section 4.3.3
Performance	There are long-term plans in place for the renewal and replacement of all facilities	See Section 4.3.3

Technical Levels of Service

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

Service Attribute	Technical Metric	Current LOS (2022)
Scope	Gross square footage of general government buildings owned and leased	4,248 sq ft
	Gross square footage of public works buildings owned and leased	25,107 sq ft
	Gross square footage of recreation buildings owned and leased	32,173 sq ft
	Gross square footage of fire halls owned and leased	21,053 sq ft
Affordability	Annual capital reinvestment rate	2%
	% of assets in poor or very poor condition	48%
	% of assets in good or very good condition	47%

4.3.6 Recommendations

Asset Inventory

- There are several buildings with a single record in the inventory. Staff should work towards a component-based inventory of all facilities to allow for component-based lifecycle planning.
- Improvements on existing buildings, such as renovations, are tracked as separate assets, rather than tagging this information on the existing asset. Going forward the Township should update the condition and value to reflect all additions and upgrades.

Replacement Costs

- Several replacement costs for buildings were based on the inflation of historical costs. These costs should be evaluated to determine their accuracy and reliability. The Township may consider using insurance records or third-party assessments to better account for the true building replacement cost.

Condition Assessment Strategies

- The Township should implement and expand the scope of regular condition assessments for all buildings 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

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

4.4 Fleet

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

- Fire rescue vehicles to provide emergency services
- Large and small trucks to support the maintenance of the transportation network and address service requests for Environmental Services and Parks & Recreation

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

Replacement Cost	Condition	Financial Capacity	
$6.7 million	Poor (35%)	Annual Requirement:	$403,000
		Funding Available:	$565,000
		Annual Deficit:	-$162,000

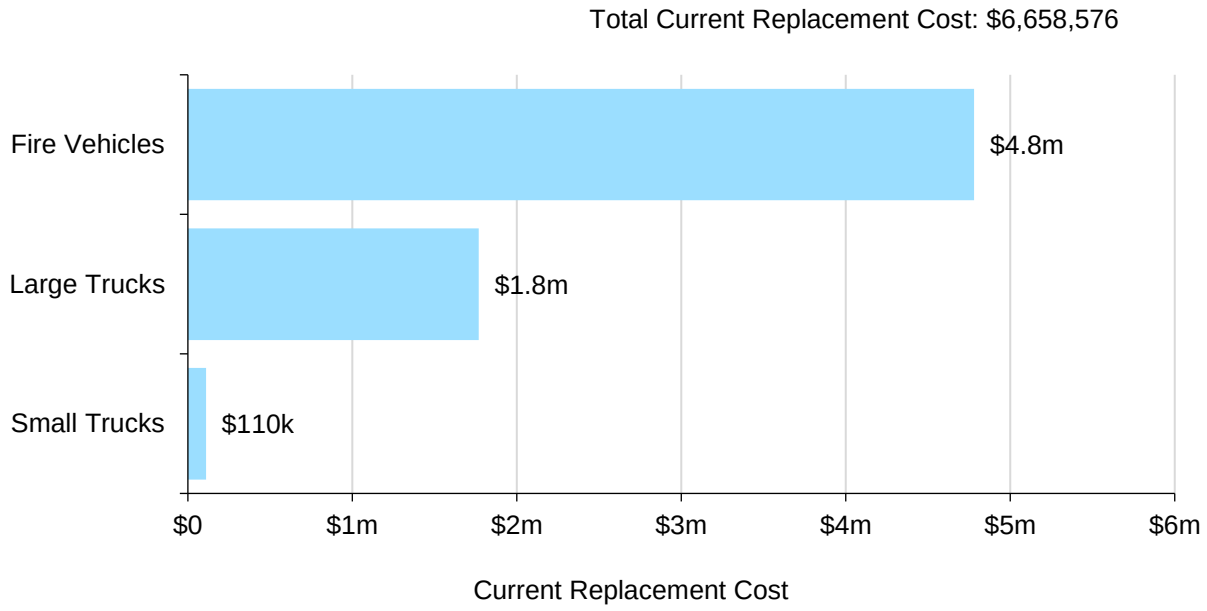
The following core values and level of service statements are a key driving force behind the Township's asset management planning:

Service Attribute	Level of Service Statement
Performance	The vehicles owned by the Township are in good repair and are available for use during service hours. Fleet operations and services are managed cost-effectively with long-term plans in place for the renewal and replacement.

4.4.1 Asset Inventory & Costs

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

Asset Segment	Quantity	Replacement Cost Method	Total Replacement Cost
Fire Vehicles	11[4]	User-Defined Cost	$4,780,000
Large Trucks	9	User-Defined Cost	$1,769,000
Small Trucks	2	User-Defined Cost	$110,000
			$6,659,000



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

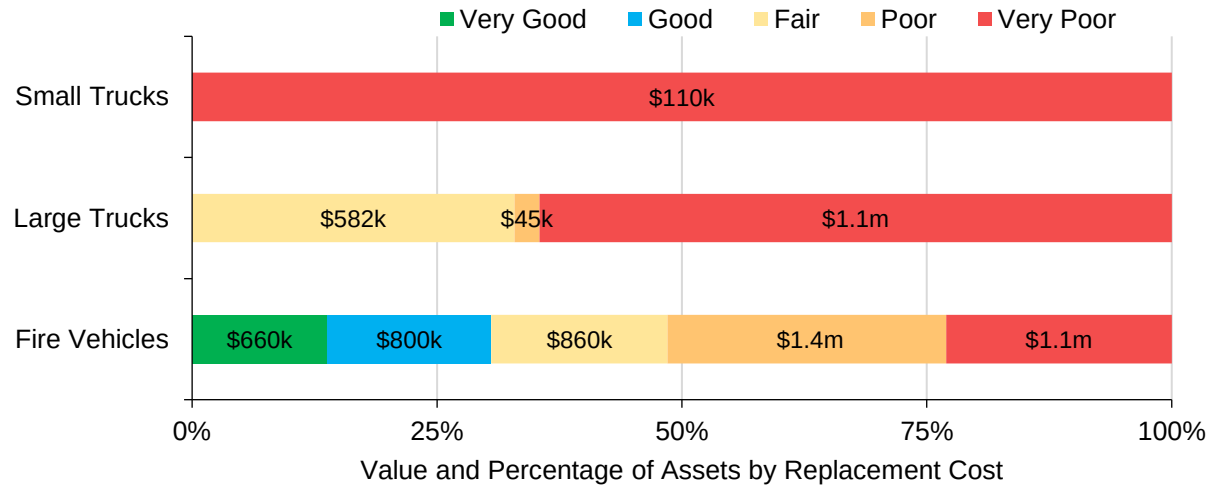
[4] The township owns 12 vehicles in total including one heritage vehicle for showcase. The heritage vehicle is not included in the AMP because it is not planned for replacement.

4.4.2 Asset Condition & Age

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

Asset Segment	Estimated Useful Life (Years)	Average Age (Years)	Average Condition
Fire Vehicles	22	11.7	44% (Fair)
Large Trucks	11	10.2	15% (Very Poor)
Small Trucks	7	11.0	0% (Very Poor)
Average			35% (Poor)

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



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

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

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 more confidently. The following describes the Township's current approach:

- Regular visual inspections of vehicles utilized safety books and MTO checklist are completed by municipal staff to ensure they are in state of adequate repair prior to operation
- Safety inspections of the vehicles are completed by in-house staff on an annual basis
- Annual safety inspection and monthly operational inspections are completed for fire vehicles

In this AMP the following rating criteria is used to determine the current condition of road segments and forecast future capital requirements:

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

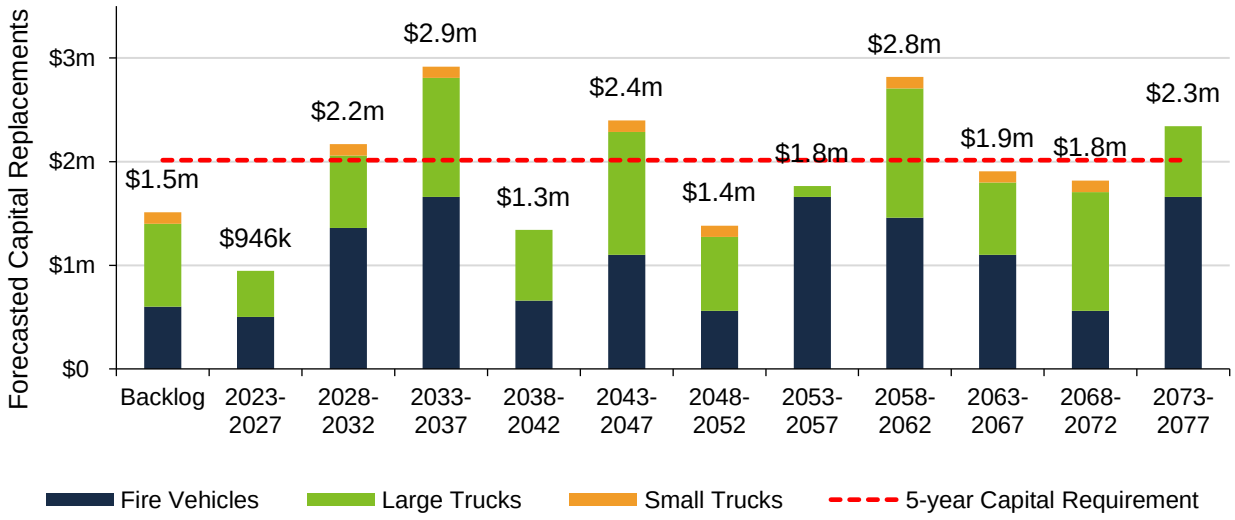
4.4.3 Lifecycle Management Strategy

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	Visual inspections based on MTO checklist and safety book completed during regular circle checks
	Regular maintenance, mostly identified defects and deficiencies are repaired and rehabilitated by in-house mechanic
	Safety inspetions, oil and lubes checks, and pumping testing are completed on an annual basis for fire vehicles
	Operational inspections for fire vehicles are completed monthly by internal staff
Replacement	Fire trucks with pump or carrying water are replaced based on Fire Underwriters Survey Schedule
	Other vehicles are replaced based on maintenance costs, service histroy, parts avaialbility, and technicians' recommendations

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 until 2077. 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 A.

4.4.4 Risk & Criticality

Risk Matrix

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

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

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

Probability of Failure (POF)	Consequence of Failure (COF)
Condition	Replacement Cost (Economic)
	Fleet Type (Health & Safety)

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

Risks to Current Asset Management Strategies

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

Staff Capacity & Public Expectation
The residents in the Township have increased demand on parks and recreation services. This requires the Township to expand the capacity of vehicles and staff to provide services. Furthermore, since safety is a major concern of the residents, the Township needs to consider replace the vehicles more proactively. Staff are working towards developing a comprehensive long-term capital plan with considerations for growth and public expectation.

4.4.5 Levels of Service

The following tables identify the Township's current level of service for fleet. These metrics include the technical and community level of service metrics that the Township has selected for this AMP.

Community Levels of Service

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

Service Attribute	Qualitative Description	Current LOS (2022)
Accessibility & Reliability	Vehicles are in good repair and are available for use during service hours	See Section 4.4.3
Performance	There are long-term plans in place for the renewal and replacement of all vehicles	See Section 4.4.3

Technical Levels of Service

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

Service Attribute	Technical Metric	Current LOS (2022)
Scope	Number of unscheduled repairs and service	0%
	% of Assets where Age > Useful Life	14%
Affordability	Annual capital reinvestment rate	8.5%

4.4.6 Recommendations

Replacement Costs

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

Condition Assessment Strategies

- Consider a vehicle rating system to better estimate the remaining service life of each vehicle.
- Review assets that have surpassed their estimated useful life to determine if immediate replacement is required or whether these assets are expected to remain in-service. Adjust the service life and/or condition ratings for these assets accordingly.

Risk Management Strategies

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

Levels of Service

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

4.5 Machinery & Equipment

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:

- Public works equipment to provide winter control activities and maintain recreation services
- Fire equipment to support the delivery of emergency services
- Office equipment to support administration services

Keeping machinery and 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	
$3.1 million	Poor (28%)	Annual Requirement:	$279,000
		Funding Available:	$192,000
		Annual Deficit:	$87,000

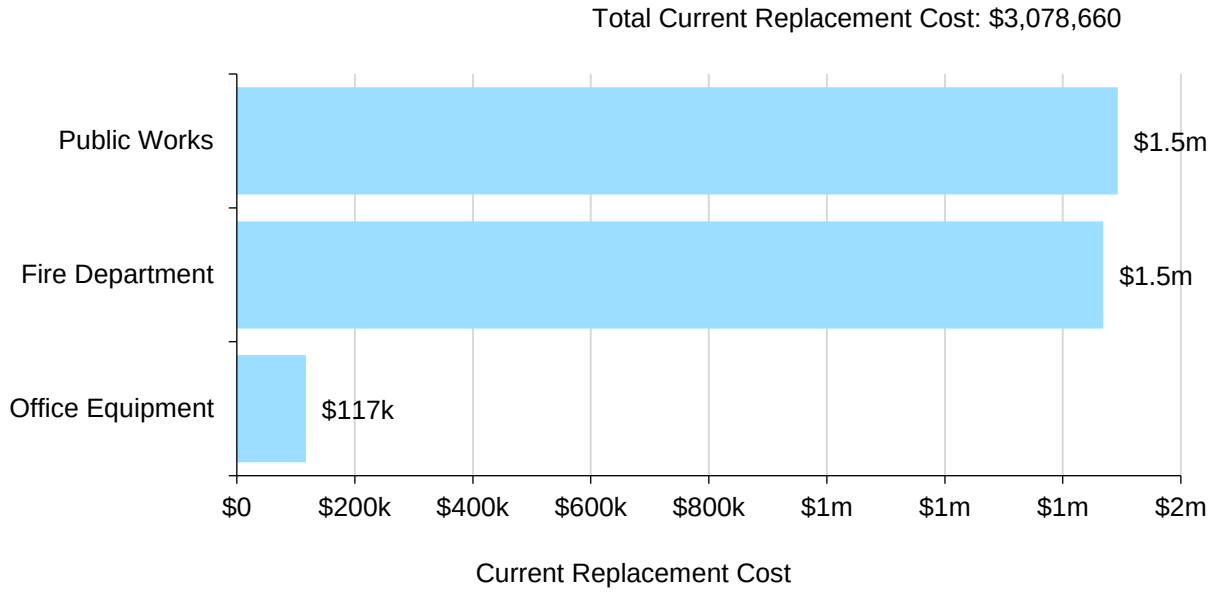
The following core values and level of service statements are a key driving force behind the Township's asset management planning:

Service Attribute	Level of Service Statement
Performance	Equipment is safe for use by staff and adheres to regulatory requirements. Equipment operations and services are managed cost-effectively with long-term plans in place for the renewal and replacement.

4.5.1 Asset Inventory & Costs

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

Asset Segment	Quantity	Replacement Cost	Annual Capital Requirement
Fire Department	1,068	$1,468,000[5]	$110,000
Office Equipment	9	$117,000	$18,000
Public Works	14	$1,493,000	$151,000
Total		**$3,079,000**	**$279,000**



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

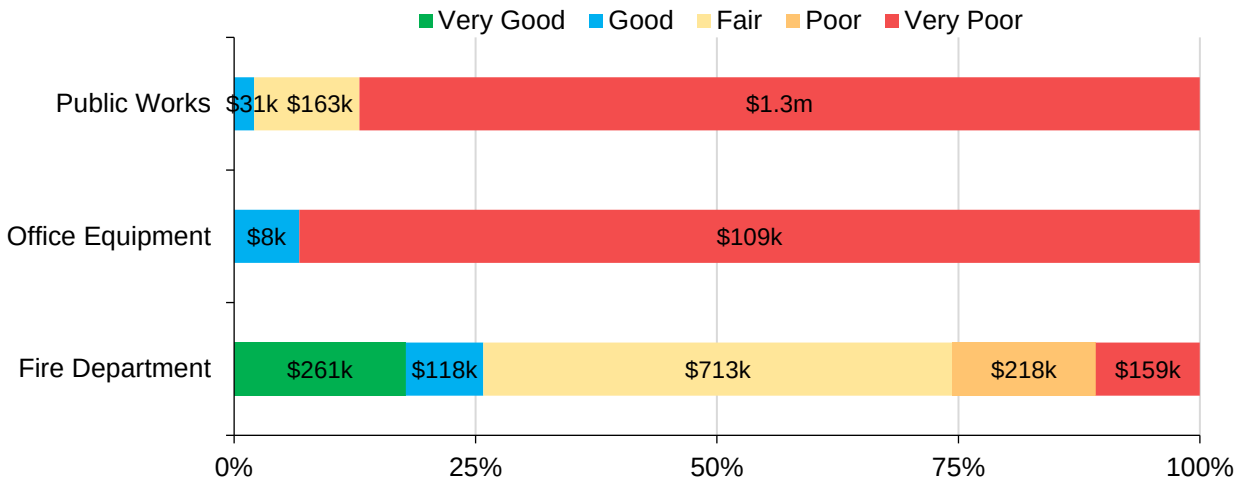
[5] The total replacement cost for all fire machinery and equipment owned by the Township is $2.1 million. The Township is currently working towards refining the inventory to ensure all fire equipment are included in the inventory.

4.5.2 Asset Condition & Age

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

Asset Segment	Estimated Useful Life (Years)	Average Age (Years)	Average Condition
Fire Department	15	6.4	50% (Fair)
Office Equipment	7	10.2	4% (Very Poor)
Public Works	10	12.6	9% (Very Poor)
Average			28% (Poor)

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



Value and Percentage of Assets by Replacement Cost

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

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.

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 more confidently. The following describes the Township's current approach:

- Monthly operational inspections are completed for machinery and equipment in Fire Department
- Visual inspections of machinery and equipment in other departments are completed prior to operation
- There are no formal condition assessment programs in place

In this AMP the following rating criteria is used to determine the current condition of road segments and forecast future capital requirements:

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

4.5.3 Lifecycle Management Strategy

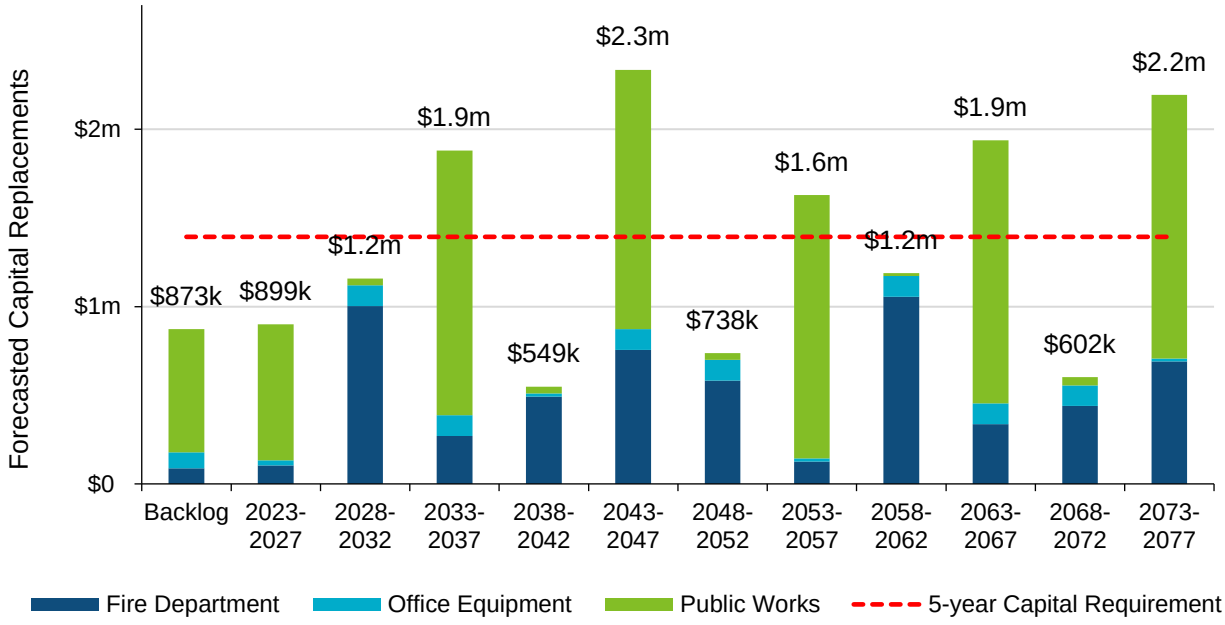
The condition or performance of most assets will deteriorate over time. To ensure that municipal assets are performing as expected and meeting the needs of customers, it is important to establish a lifecycle management strategy to proactively manage asset deterioration.

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

Activity Type	Description of Current Strategy
Maintenance/ Rehabilitation	Fire Services equipment is subject to a much more rigorous inspection and maintenance program compared to most other departments
	Defects and deficiencies in machinery and equipment for other department identified in regular checks are repaired and rehabilitated by in-house mechanician
	Regular maintenance including oil change, plow maintenance, light replacements are completed as-needed
Replacement	The replacement of machinery and equipment depends on identified deficiencies, equipment ages, and technicians' recommendations

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 until 2077. 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. Current backlog for Machinery and Equipment is $873,000 and the annual capital requirement is $279,000.



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

4.5.4 Risk & Criticality

Risk Matrix

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

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

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

Probability of Failure (POF)	Consequence of Failure (COF)
Condition	Replacement Cost (Economic)
	Machinery & Equipment (Health & Safety)

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

Risks to Current Asset Management Strategies

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

Asset Data
There is no formal condition assessment program currently in place. The Township should consider developing a formal condition assessment program and utilizing the information to provide a condition rating to the assets. Once completed, there will be greater confidence in the development of data-driven strategy to address infrastructure needs and avoid failure during operation.

4.5.5 Levels of Service

The following tables identify the Township's current level of service for machinery & equipment. These metrics include the technical and community level of service metrics that the Township has selected for this AMP.

Community Levels of Service

The following table outlines the qualitative descriptions that determine the community levels of service provided by machinery & equipment.

Service Attribute	Qualitative Description	Current LOS (2022)
Safe & Regulatory	Equipment is safe for use by staff and adheres to regulatory requirements	See Section 4.5.3
Performance	Equipment operations and services are managed cost-effectively with long-term plans in place for the renewal and replacement	See Section 4.5.3

Technical Levels of Service

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

Service Attribute	Technical Metric	Current LOS (2022)
Safe & Regulatory	% of Assets where Age > Useful Life	13%
Affordability	Annual capital reinvestment rate	6.2%
	% of assets in poor or very poor condition	58%
	% of assets in good or very good condition	14%

4.5.6 Recommendations

Replacement Costs

- Review machinery and equipment inventory to determine whether all capital assets within these asset segments have been accounted for.
- Several replacement costs used in this AMP 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. Consider developing the condition rating criteria and document the condition rating of the assets for rehabilitation / replacement projection.
- Review assets that have surpassed their estimated useful life to determine if immediate replacement is required or whether these assets are expected to remain in-service. Adjust the service life and/or condition ratings for these assets accordingly.

Risk Management Strategies

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

Levels of Service

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

4.6 Land Improvements

The Township of Augusta owns several assets that are considered land improvements. This category includes:

- Landfill sites
- Sports fields and ballpark
- Trail and lookout site
- Recreation hall and other assets

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

Replacement Cost	Condition	Financial Capacity	
$1.5 million	Good (74%)	Annual Requirement:	$56,000
		Funding Available:	$0
		Annual Deficit:	$56,000

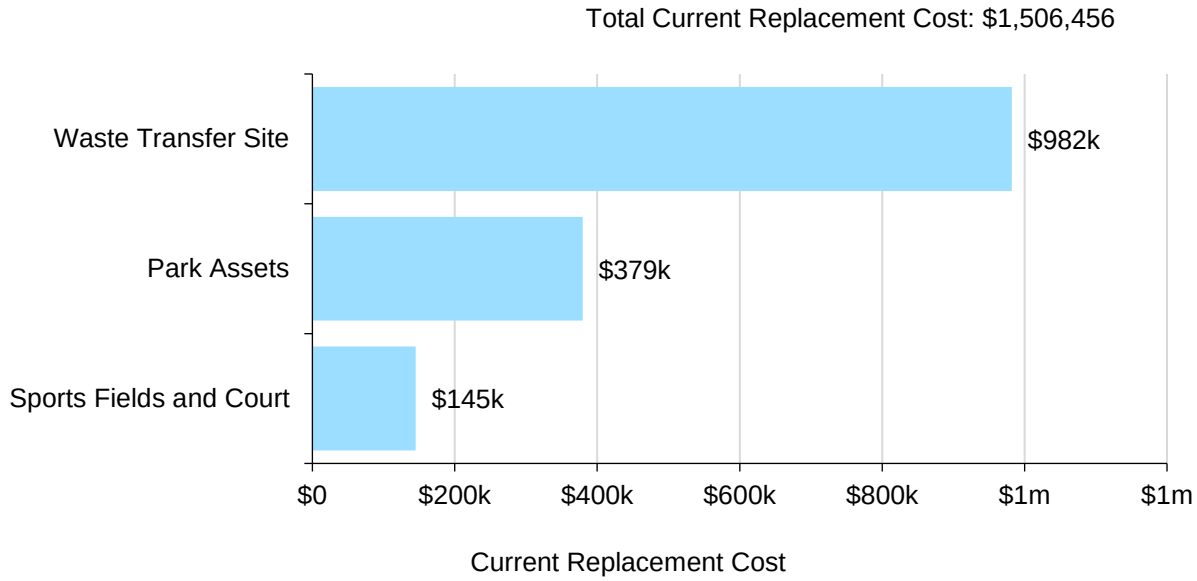
The following core values and level of service statements are a key driving force behind the Township's asset management planning:

Service Attribute	Level of Service Statement
Performance	Parks and landfill provide adequate physical access and are available for their defined use. Land improvements are managed cost-effectively with long-term plans in place for the renewal and replacement.

4.6.1 Asset Inventory & Costs

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

Asset Segment	No. of Facility	Replacement Cost	Annual Capital Requirement
Park Assets	7	$379,000	$12,000
Sports Fields and Court	2	$145,000	$4,000
Waste Transfer Site	2	$982,000	$40,000
Total		**$1,506,000**	**$56,000**



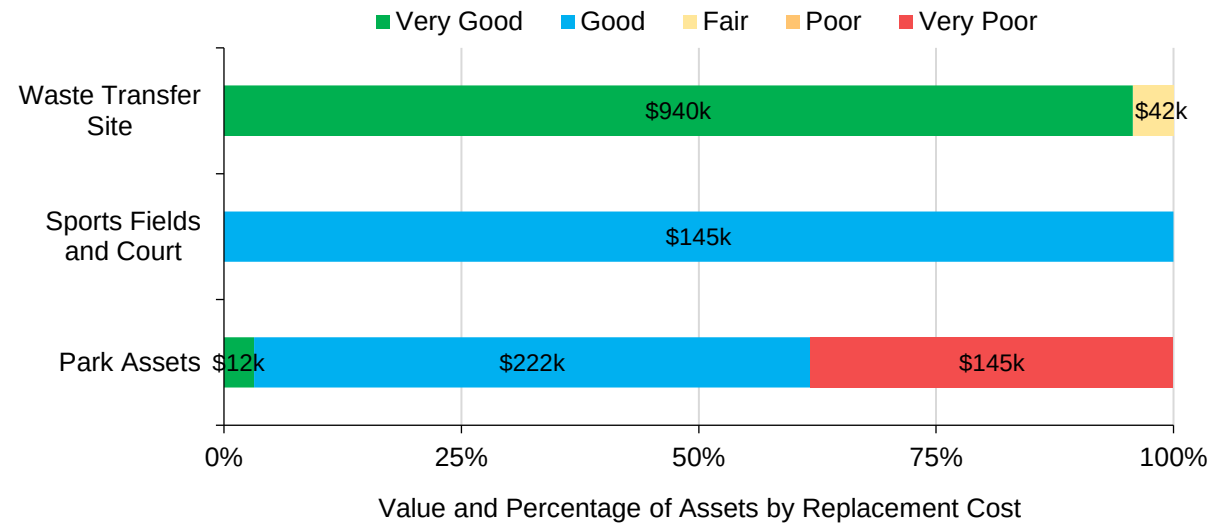
Each asset's replacement cost should be reviewed periodically to determine whether adjustments are needed to more accurate represent realistic capital requirements.

4.6.2 Asset Condition & 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
Park Assets	35	18.2	48% (Fair)
Sports Fields and Court	40	12.0	68% (Good)
Waste Transfer Site	24	3.1	85% (Very Good)
Average			74% (Good)

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



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

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.

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 more confidently. The following describes the Township's current approach:

- Playground structures are inspected by in-house staff monthly for CSA compliance
- Staff complete regular 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

In this AMP the following rating criteria is used to determine the current condition of road segments and forecast future capital requirements:

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

4.6.3 Lifecycle Management Strategy

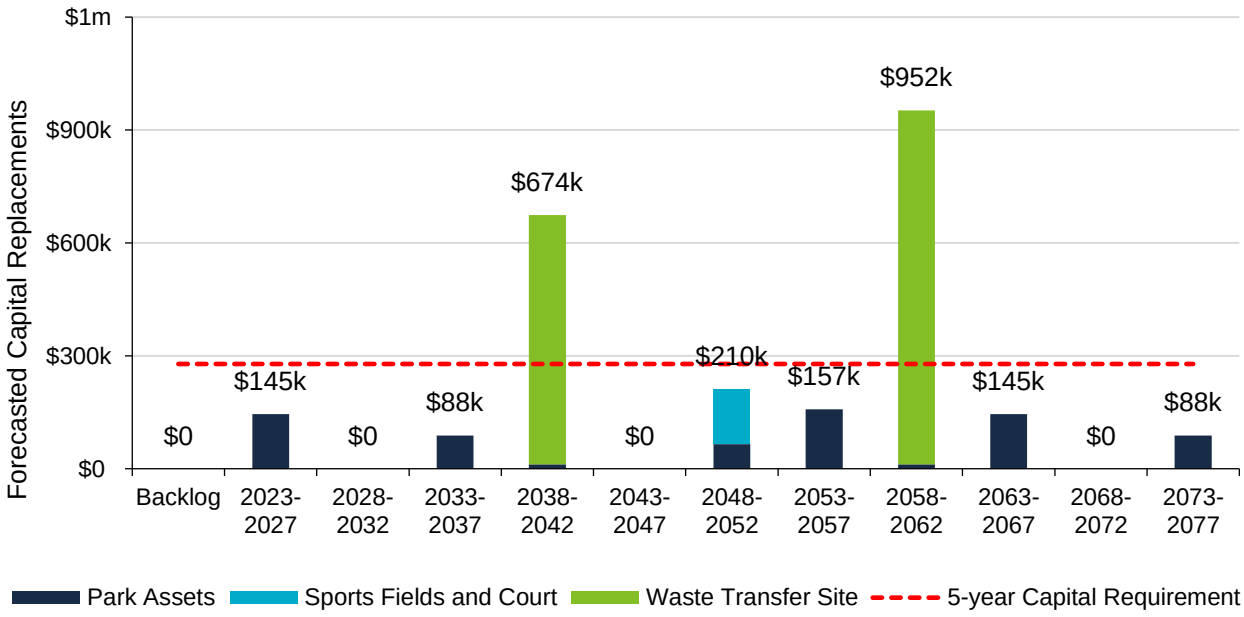
The condition or performance of most assets will deteriorate over time. To ensure that municipal assets are performing as expected and meeting the needs of customers, it is important to establish a lifecycle management strategy to proactively manage asset deterioration.

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

Activity Type	Description of Current Strategy
Maintenance / Rehabilitation	Maintenance for land improvement assets including mowing and landscaping are performed on a regular basis
	Weekly inspection and maintenance for playground equipment are performed to abide by the regulations
Replacement	Assets with lower value are not replaced until they reach their end-of-life. Capital projects are dependent on funding availability.

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 until 2077. 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 annual capital requirement for land improvements is $56,000.



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

4.6.4 Risk & Criticality

Risk Matrix

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

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

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

Probability of Failure (POF)	Consequence of Failure (COF)
Condition	Replacement Cost (Economic)
	Asset Type (Health & Safety)

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

Risks to Current Asset Management Strategies

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

Demographic Change
In the recent years, some young generations moved out due to job opportunities and the aging population continues to grow. This demographic change in population also indicate the change in the community expectations on parks and land improvements. The Township must prioritize accessibility to serve the aging population. Developing a comprehensive long-term capital plan with considerations for the change can be helpful to minimize dependency on grant funding and provide desired services.

4.6.5 Levels of Service

The following tables identify the Township's current level of service for machinery & equipment. These metrics include the technical and community level of service metrics that the Township has selected for this AMP.

Community Levels of Service

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

Service Attribute	Qualitative Description	Current LOS (2022)
Safe & Regulatory	Parks and landfill provide adequate physical access and are available for their defined use within prescribed working hours	See Section 4.6.3
Performance	Land improvements is managed cost-effectively with long-term plans in place to meet the established level of service	See Section 4.6.3

Technical Levels of Service

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

Service Attribute	Technical Metric	Current LOS (2022)
Affordability	Annual capital reinvestment rate	0%
	% of assets in poor or very poor condition	10%
	% of assets in good or very good condition	88%

4.6.6 Recommendations

Replacement Costs

- Review land improvements inventory to determine whether all capital assets within these asset segments have been accounted for.
- Several replacement costs used in this AMP 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.
- The estimated useful life values should be reviewed to ensure they match the true service life of the assets.

Condition Assessment Strategies

- Identify condition assessment strategies for high value and high-risk assets. Consider developing the condition rating criteria and document the condition rating of the assets for rehabilitation / replacement projection.

Risk Management Strategies

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

Levels of Service

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

5 Impacts of Growth

Key Insights

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

5.1 Description of Growth Assumptions

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

5.1.1 Augusta Official Plan (May 2012)

The Township of Augusta's Official Plan is an essential planning document intended to manage future growth and guide land use in the Township. It ensures the decision-making process for growth and development implementation reflects community values to develop sustainable communities. The document planning horizon spans 20 years, covering it to the year 2029. The official plan is due for a review which is to be initiated in 2023.

The Official Plan with the Ministry of Municipal Affairs and Housing modifications is in full force and effect as of May 25, 2012. The Official Plan was prepared by the Township of Augusta in partnership with the residents of the Township, its community organizations, the provincial government, and its agencies through public consultation. The policies and guiding principles stated in the Plan assist and direct the future decision making to achieve the Township's Vision which is to develop a balanced sustainable environment and communities with respect to the unique historical, cultural, and natural heritage.

Under the current Official Plan, the Township is to direct 60% of new development to the villages, hamlets, and settlement areas rather than the rural area. Such land use patterns are to maintain and protect the landscape and identity of the Rural Policy Area. The Township continues to regard the quality and quantity of the groundwater supply with any development application.

The following table outlines population, private dwellings, and employment changes to the Township between 2011-2021 from Statistics Canada, for which the Township will be required to provide services.

Year	Population	Private Dwellings	Employment
2021	7,386	3,046	3,515
2016	7,353	3,004	3,525
2011	7,430	2,921	N/A

5.1.2 Official Plan for the United Counties of Leeds and Grenville (July 2015)

The United Counties of Leeds and Grenville Official Plan was adopted by Counties Council on July 23, 2015. The consolidation of the Official Plan includes all approvals to September 1, 2022. The Official Plan directs County growth management and land use decisions by providing upper-tier land use planning guidance for the Counties' ten member municipalities. The planning horizon spans 20 years, covering it from 2012 to 2031.

The population and employment growth of the counties and local municipalities is projected to reach 75,960 persons and 16,760 jobs by 2031. The plan states that the modest population growth and declined employment is caused by the recent recession and a shift way from manufacturing in eastern Ontario and throughout the province. The Plan establishes the population and employment forecasts for Township of Augusta to 2031 as the following: Population 7,820, Employment 1,100.

5.2 Impact of Growth on Lifecycle Activities

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

The Strategic Plan for Augusta has indicated the visions as maintaining sustainable infrastructure, thriving business community, providing fiscally responsible practices, supporting balanced and sustainable growth as well as providing gathering places and ensuring effective communications.

The Township will ensure the waste disposal services, stormwater management, transport pathways, utilities and emergency services are planned and developed to provide for the growth targets outlined in the Official Plan. As growth-related assets are constructed or acquired, they should be integrated into the Township's AMP. While the addition of residential units will add to the existing assessment base and offset some of the costs associated with growth, the Township will need to review the lifecycle costs of growth-related infrastructure. These costs should be considered in long-term funding strategies that are designed to, at a minimum, maintain the current level of service.

6 Financial Strategy

Key Insights

- The Township is committing approximately $1.8 million towards capital projects per year from sustainable revenue sources
- Given the annual capital requirement of $5.4 million, there is currently a funding gap of $3.7 million annually
- For tax-funded assets, we recommend increasing tax revenues by 2.5% each year for the next 20 years to achieve a sustainable level of funding

6.1 Financial Strategy Overview

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

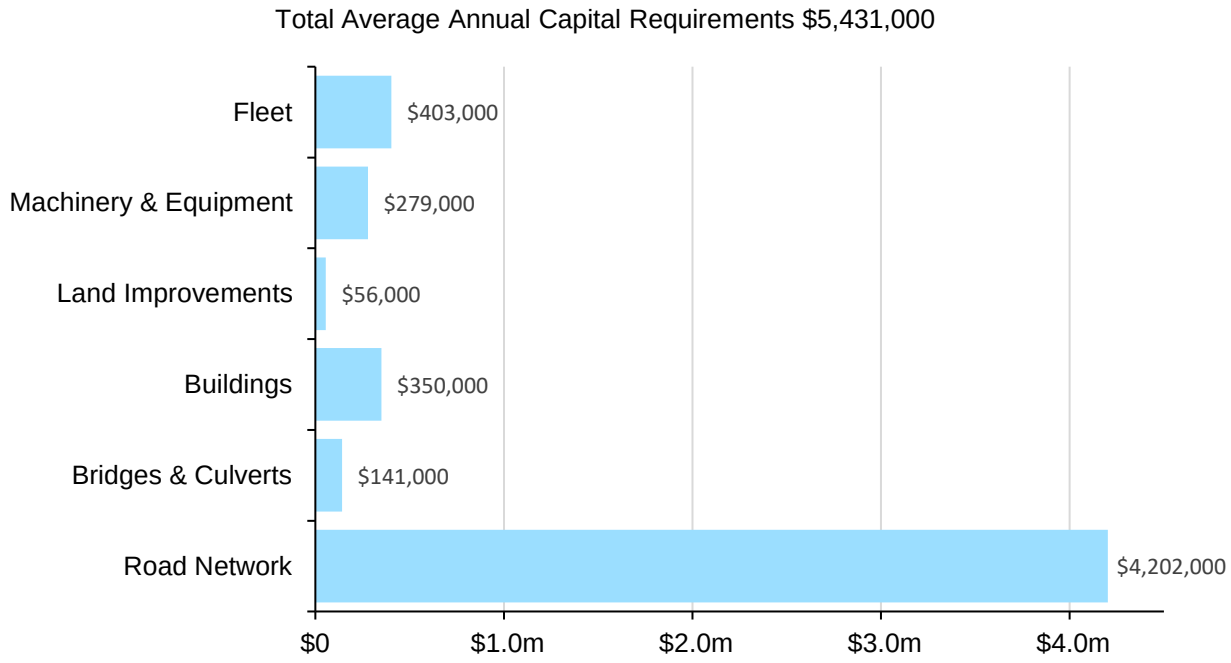
This report develops such a financial plan by presenting several scenarios for consideration and culminating with final recommendations. As outlined below, the scenarios presented model different combinations of the following components:

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

6.1.1 Annual Requirements & Capital Funding

Annual Requirements

The annual requirements represent the amount the Township should allocate annually to each asset category to meet replacement needs as they arise, prevent infrastructure backlogs, and achieve long-term sustainability. In total, the Township must allocate approximately $5.4 million annually to address capital requirements for the assets included in this AMP.



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

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

1. **Replacement Only Scenario**: Based on the assumption that assets deteriorate and – without regularly scheduled maintenance and rehabilitation – are replaced at the end of their service life.

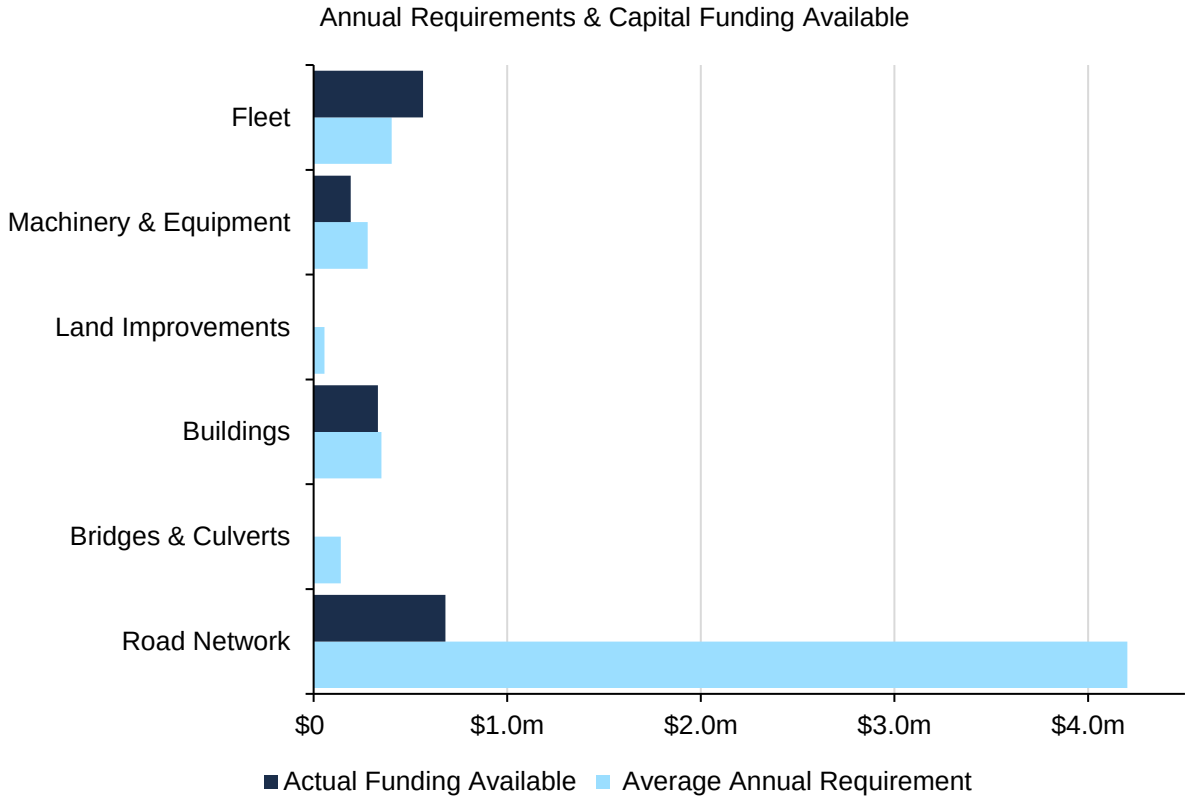
2. **Lifecycle Strategy Scenario**: Based on the assumption that lifecycle activities are performed at strategic intervals to extend the service life of assets until replacement is required.

Asset Category	Annual Requirements (Replacement Only)	Annual Requirements (Lifecycle Strategy)	Difference
Road Network	$7,678,000	$4,202,000	$3,476,000

The implementation of a proactive lifecycle strategy for roads leads to a potential annual cost avoidance of $3,476,000 for the road network. This represents an overall reduction of the annual requirements by 45%. As the lifecycle strategy scenario represents the lowest cost option available to the Township, we have used this annual requirement in the development of the financial strategy.

Annual Funding Available

Based on a historical analysis of sustainable capital funding sources, the Township is committing approximately $1.77 million towards capital projects per year from sustainable revenue sources. Given the annual capital requirement of $5.43 million, there is currently a funding gap of $3.66 million annually.



6.2 Funding Objective

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

Road Network, Bridges & Culverts, Buildings, Machinery & Equipment, Land Improvements and Fleet.

For each scenario developed we have included strategies, where applicable, regarding the use of cost containment and funding opportunities. Refer to 6.3.2 for detail.

6.3 Financial Profile: Tax Funded Assets

6.3.1 Current Funding Position

The following tables show, by asset category, Augusta's average annual asset capital expenditure (Capex) 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	
Bridges & Culverts	$141,000					$141,000
Buildings	$350,000	$332,000			$332,000	$18,000
Land Improvements	$56,000					$56,000
Machinery & Equipment	$279,000	$192,000			192,000	$87,000
Road Network	$4,202,000	$277,000	$243,000	$161,000	681,000	$3,521,000
Fleet	$403,000	$565,000			565,000	-$162,000
Total	**$5,431,000**	**$1,366,000**	**$243,000**	**$161,000**	**$1,770,000**	**$3,661,000**

The average annual investment requirement for the above categories is $5,431,000. Annual revenue currently allocated to these assets for capital purposes is $1,770,000 leaving an annual deficit of $3,661,000. Put differently, these infrastructure categories are currently funded at 33% of their long-term requirements.

6.3.2 Full Funding Requirements

In 2023, Township of Augusta has annual tax revenues of $5,665,000. As illustrated in the following table, without consideration of any other sources of revenue or cost containment strategies, full funding would require the following tax change over time:

Asset Category	Tax Change Required for Full Funding
Bridges & Culverts	2.5%
Buildings	0.3%
Land Improvements	1.0%
Machinery & Equipment	1.5%
Road Network	62.2%
Fleet	-2.9%
	64.6%

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

> Augusta's debt payments for these asset categories will be decreasing by $220 thousand over the next 20 years.

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

	Without Capturing Changes				With Capturing Changes			
	5 Years	**10 Years**	**15 Years**	**20 Years**	**5 Years**	**10 Years**	**15 Years**	**20 Years**
Infrastructure Deficit	$3,661,000	$3,661,000	$3,661,000	$3,661,000	$3,661,000	$3,661,000	$3,661,000	$3,661,000
Change in Debt Costs	N/A	N/A	N/A	N/A	0	0	0	-$220,000
Resulting Infrastructure Deficit	$3,661,000	$3,661,000	$3,661,000	$3,661,000	$3,661,000	$3,661,000	$3,661,000	$3,661,000
Tax Increase Required	64.6%	64.6%	64.6%	64.6%	64.6%	64.6%	64.6%	60.7%
Annually	**10.5%**	**5.2%**	**3.4%**	**2.6%**	**10.5%**	**5.2%**	**3.4%**	**2.5%**

6.3.3 Financial Strategy Recommendations

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

a) Increasing tax revenues by 2.5% each year for the next 20 years solely for the purpose of phasing in full funding to the asset categories covered in this section of the AMP.
b) Allocating the current Canada Community Building Fund (CCBF) and OCIF revenue as outlined previously.
c) Reallocating appropriate revenue from categories in a surplus position to those in a deficit position.
d) Increasing existing and future infrastructure budgets by the applicable inflation index on an annual basis in addition to the deficit phase-in.
e) When realized, reallocating the debt cost reductions of $220 thousand to the infrastructure deficit as outlined above.

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[6].
2. We realize that raising tax revenues by the amounts recommended above for infrastructure purposes will be very difficult to do. However, considering a longer phase-in window may have even greater consequences in terms of infrastructure failure.

Although this option achieves full Capex funding on an annual basis in 20 years and provides financial sustainability over the period modeled, the recommendations do require prioritizing capital projects to fit the resulting annual funding available. Current data shows a capital requirement backlog of $1.1 million for the Road Network, $3.4 million for Buildings, $1.5 million for Fleet and $873 thousand for Machinery & Equipment

[6] 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.

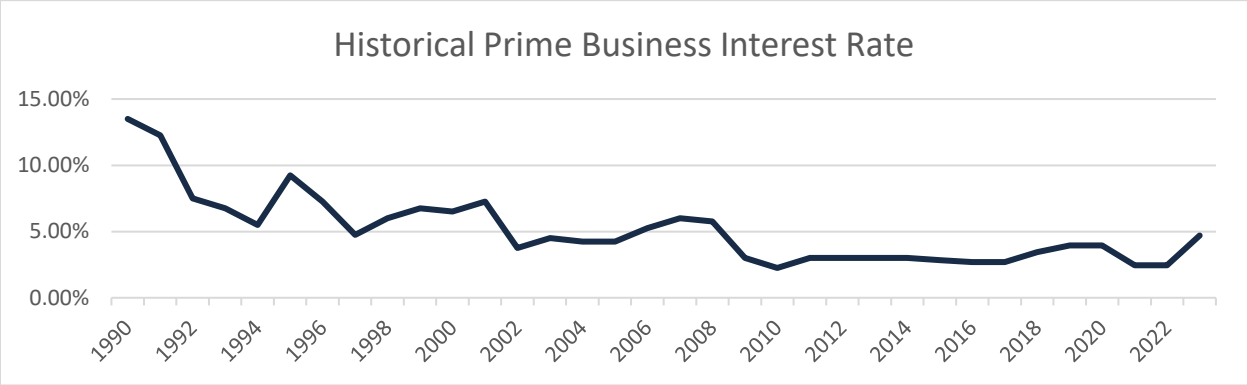
Prioritizing future projects will require the current data to be replaced by condition-based data. Although our recommendations include no further use of debt, the results of the condition-based analysis may require otherwise.

6.4 Use of Debt

Debt can be strategically utilized as a funding source within the long-term financial plan. The benefits of leveraging debt for infrastructure planning include:

a) the ability to stabilize tax and user rates when dealing with variable and uncontrollable factors,
b) equitable distribution of the cost and benefits of infrastructure over its useful life,
c) a secure source of funding,
d) the ability to proceed with projects sooner than waiting to save enough in cash or grants to pay for the project all at once and,
e) flexibility in cash flow management.

However, there needs to be consideration given to the fact that interest rates have been rising. To mitigate increasing commodity prices and inflation, interest rates have increased quickly and therefore, sustainable funding models that include debt need to incorporate the realized risk of increasing rates. The following graph shows the historical changes to lending rates:



A change in 15-year rates from 4% to 6% would change the premium from 35% to 54%. Such a change would have a significant impact on a financial plan.

For reference purposes, the following table outlines the premium paid on a project if financed by debt. For example, a $1M project financed at 4.0%[7] over 15 years would result in a 35% premium or $350,000 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.

[7] As of February 2023, the municipal Infrastructure Ontario rates for 15-year money is 4.3%.

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%

The following tables outline how Augusta has historically used debt for investing in the asset categories as listed. There is currently $2.916 million of debt outstanding for the assets covered by this AMP with corresponding principal and interest payments of $220 thousand, well within its provincially prescribed maximum of $1.194 million.

Asset Category	Current Debt Outstanding	Use of Debt in the Last Five Years				
		2017	2018	2019	2020	2021
Bridges & Culverts						
Buildings	$2,916,000				$3,400,000	
Road Network						
Machinery & Equipment						
Land Improvements						
Fleet						
Total Tax Funded:	**$2,916,000**	**0**	**0**	**0**	**$3,400,000**	**0**

Asset Category	Principal & Interest Payments in the Next Ten Years						
	2022	2023	2024	2025	2026	2027	2032
Road Network	0	0	0	0	0	0	0
Bridges & Culverts	0	0	0	0	0	0	0
Buildings	$220,000	$220,000	$220,000	$220,000	$220,000	$220,000	$220,000
Machinery & Equipment	0	0	0	0	0	0	0
Land Improvements	0	0	0	0	0	0	0
Fleet	0	0	0	0	0	0	0
Total Tax Funded:	**$220,000**	**$220,000**	**$220,000**	**$220,000**	**$220,000**	**$220,000**	**$220,000**

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

6.5 Use of Reserves

6.5.1 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 Augusta.

Asset Category	Balance on December 31, 2022
Bridges & Culverts	$400,000
Buildings	$500,000
Land Improvements	$0
Machinery & Equipment	$351,000
Road Network	$1,501,000
Fleet	$81,000
Total Tax Funded:	**$2,833,000**

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

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

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

6.5.2 Recommendation

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

7 Appendices

Key Insights

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

Appendix A: 10-Year Capital Requirements

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

Road Network											
Asset Segment	Backlog	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032
Asphalt Roads	$888k	$1.1m	$570k	$3.4m	$771k	$659k	$465k	$1.2m	$1.1m	$453k	$771k
Catch basin	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Drainage Culverts	$0	$0	$0	$0	$52k	$74k	$1k	$0	$8k	$415k	$0
Gravel Roads	$0	$93k	$93k	$918k	$93k	$93k	$93k	$93k	$918k	$93k	$93k
Signs	$0	$0	$0	$0	$0	$79k	$0	$0	$0	$0	$0
Streetlights	$210k	$0	$0	$0	$0	$0	$0	$0	$492k	$0	$0
Surface Treated Roads	$0	$449k	$10k	$449k	$10k	$10k	$449k	$10k	$449k	$10k	$449k
	$1.1m	**$1.6m**	**$673k**	**$4.8m**	**$925k**	**$915k**	**$1.0m**	**$1.3m**	**$3.0m**	**$970k**	**$1.3m**

Bridges & Culverts											
Asset Segment	Backlog	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032
Bridges	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Culverts	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
	$0	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**

Buildings											
Asset Segment	Backlog	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032
Fire Halls	$0	$0	$0	$0	$0	$3.8m	$0	$0	$0	$0	$0
General Government	$432k	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Public Works	$2.5m	$0	$0	$0	$0	$0	$0	$0	$40k	$0	$0
Recreation Buildings	$475k	$541k	$0	$0	$0	$0	$0	$0	$0	$0	$0
	$3.4m	**$541k**	**$0**	**$0**	**$0**	**$3.8m**	**$0**	**$0**	**$40k**	**$0**	**$0**

Machinery & Equipment											
Asset Segment	Backlog	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032
Fire Department	$89k	$0	$10k	$80k	$10k	$4k	$401k	$46k	$183k	$363k	$10k
Office Equipment	$89k	$19k	$771	$0	$8k	$0	$9k	$0	$100k	$9k	$0
Public Works	$695k	$176k	$428k	$0	$9k	$154k	$31k	$0	$6k	$0	$0
	$873k	**$196k**	**$439k**	**$80k**	**$27k**	**$158k**	**$440k**	**$46k**	**$290k**	**$372k**	**$10k**

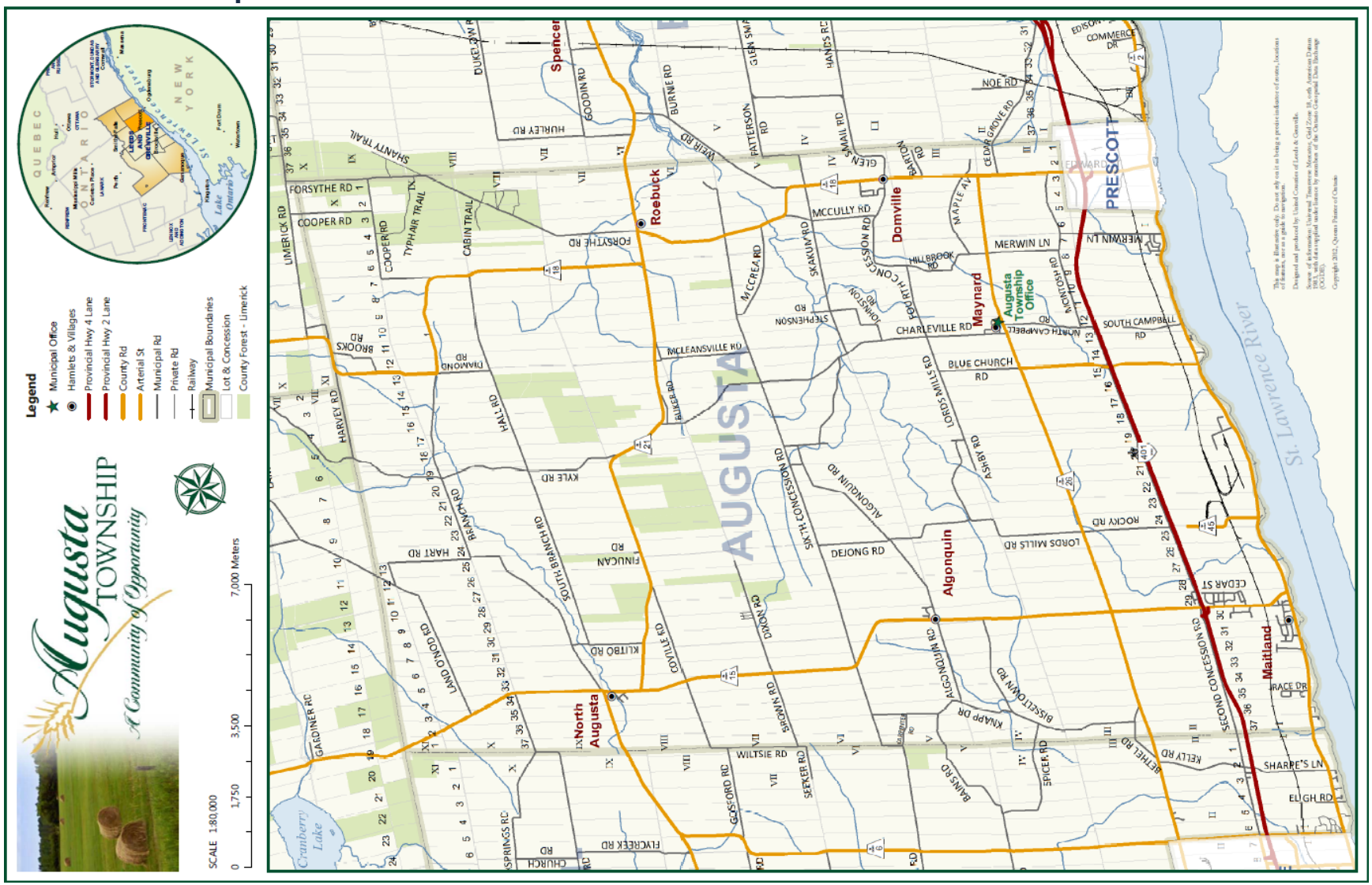
Fleet											
Asset Segment	Backlog	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032
Fire Vehicles	$600k	$0	$0	$0	$0	$500k	$60k	$0	$1.3m	$0	$0
Large Trucks	$800k	$286k	$55k	$45k	$0	$60k	$522k	$0	$75k	$55k	$45k
Small Trucks	$110k	$0	$0	$0	$0	$0	$0	$0	$110k	$0	$0
	$1.5m	**$286k**	**$55k**	**$45k**	**$0**	**$560k**	**$582k**	**$0**	**$1.5m**	**$55k**	**$45k**

Land Improvements											
Asset Segment	Backlog	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032
Park Assets	$0	$0	$0	$0	$0	$145k	$0	$0	$0	$0	$0
Sports Fields and Court	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Waste Transfer Site	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
	$0	**$0**	**$0**	**$0**	**$0**	**$145k**	**$0**	**$0**	**$0**	**$0**	**$0**

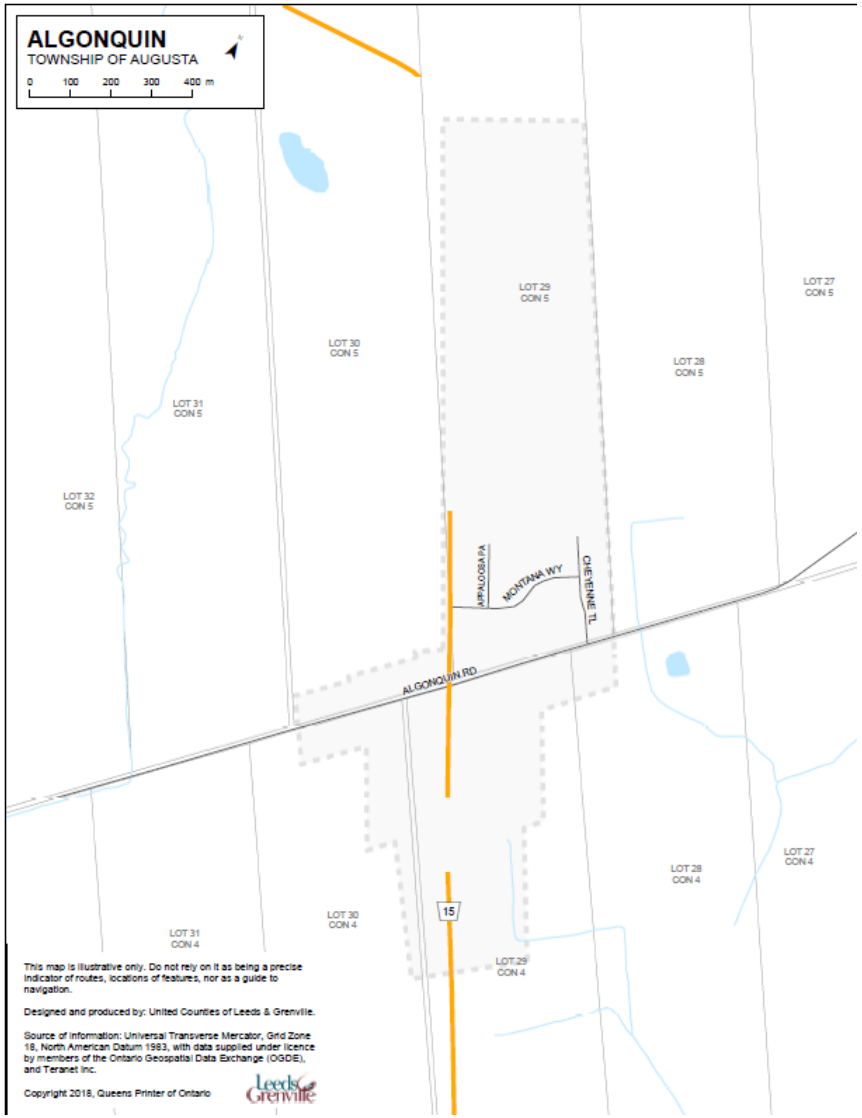
All Asset Categories											
Asset Segment	Backlog	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032
Road Network	$27.1m	$1.6m	$673k	$4.8m	$925k	$915k	$1.0m	$1.3m	$3.0m	$970k	$1.3m
Bridges & Culverts	$1.1m	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Buildings	$0	$541k	$0	$0	$0	$3.8m	$0	$0	$40k	$0	$0
Land Improvements	$3.4m	$0	$0	$0	$0	$145k	$0	$0	$0	$0	$0
Machinery & Equipment	$0	$196k	$439k	$80k	$27k	$158k	$440k	$46k	$290k	$372k	$10k
Fleet	$873k	$286k	$55k	$45k	$0	$560k	$582k	$0	$1.5m	$55k	$45k
	$13.2m	**$2.6m**	**$1.2m**	**$4.9m**	**$952k**	**$5.5m**	**$2.0m**	**$1.4m**	**$4.8m**	**$1.4m**	**$1.4m**

Appendix B: Level of Service Maps

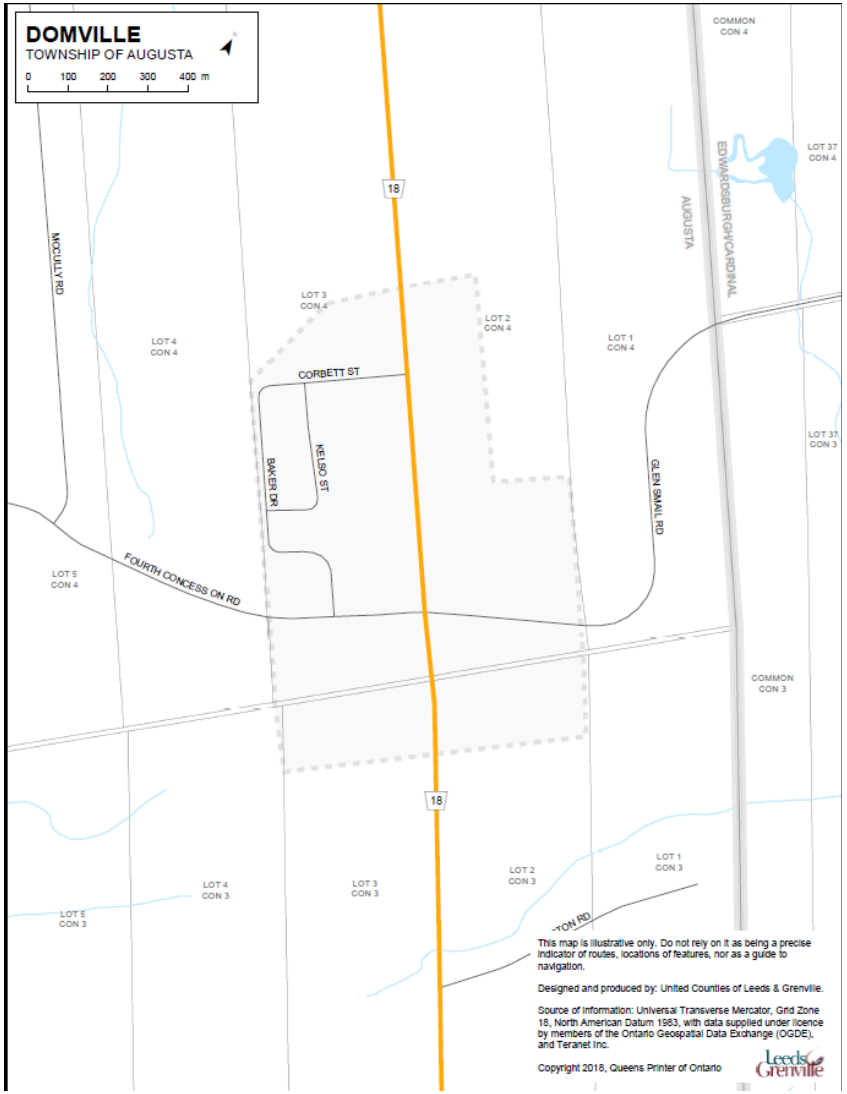
Road Network Map



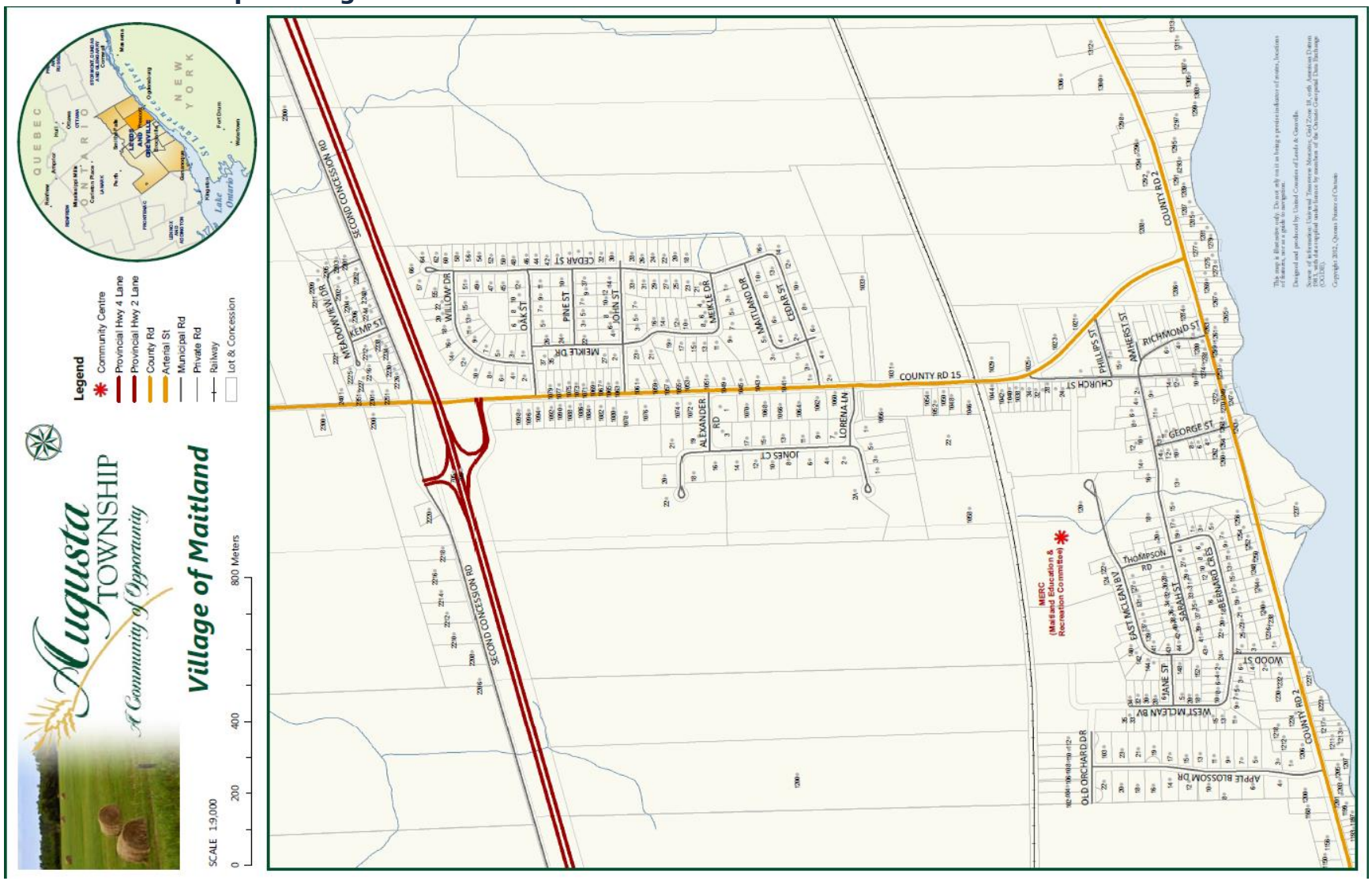
Road Network Map – Algonquin



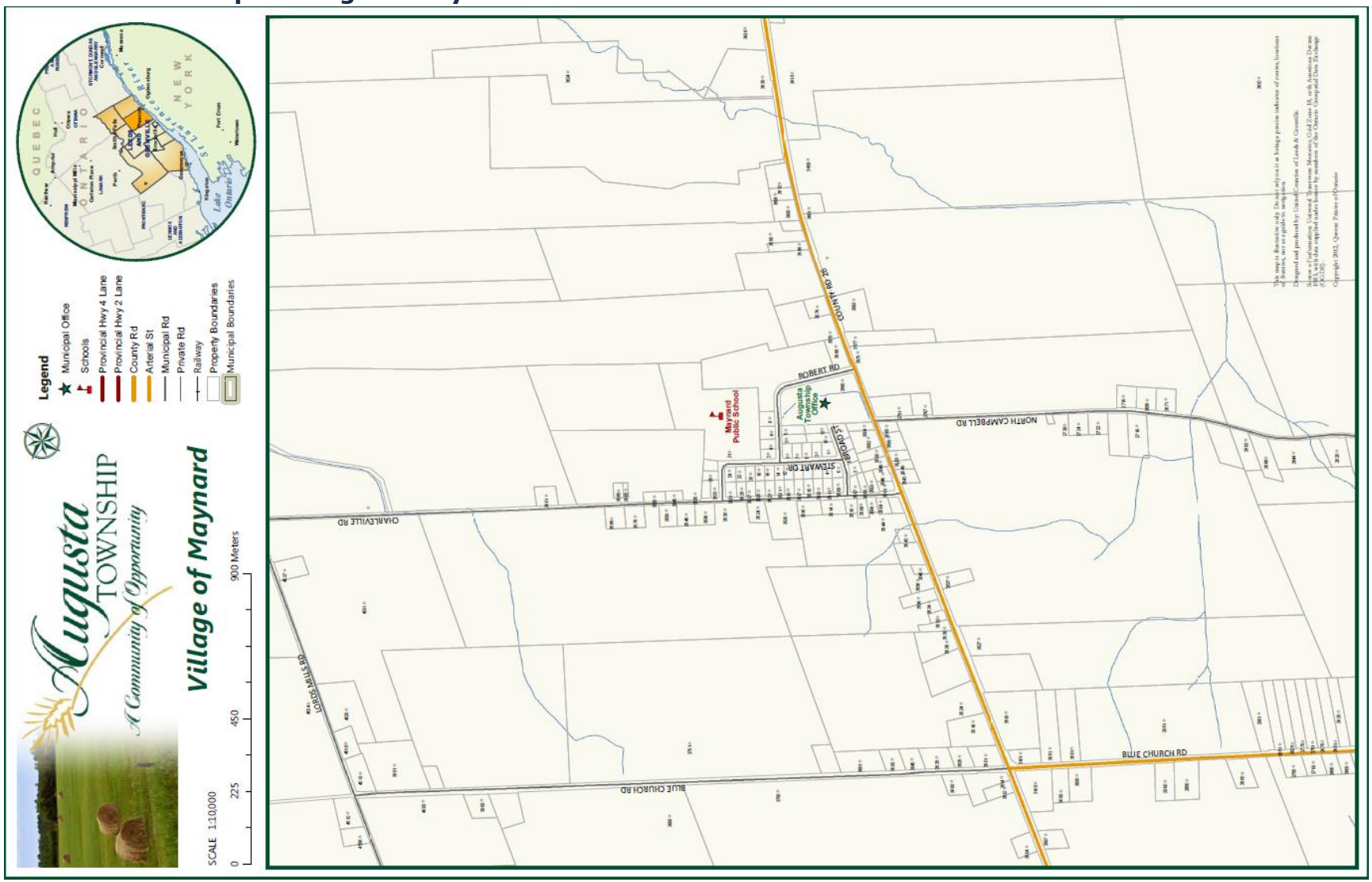
Road Network Map - Domville



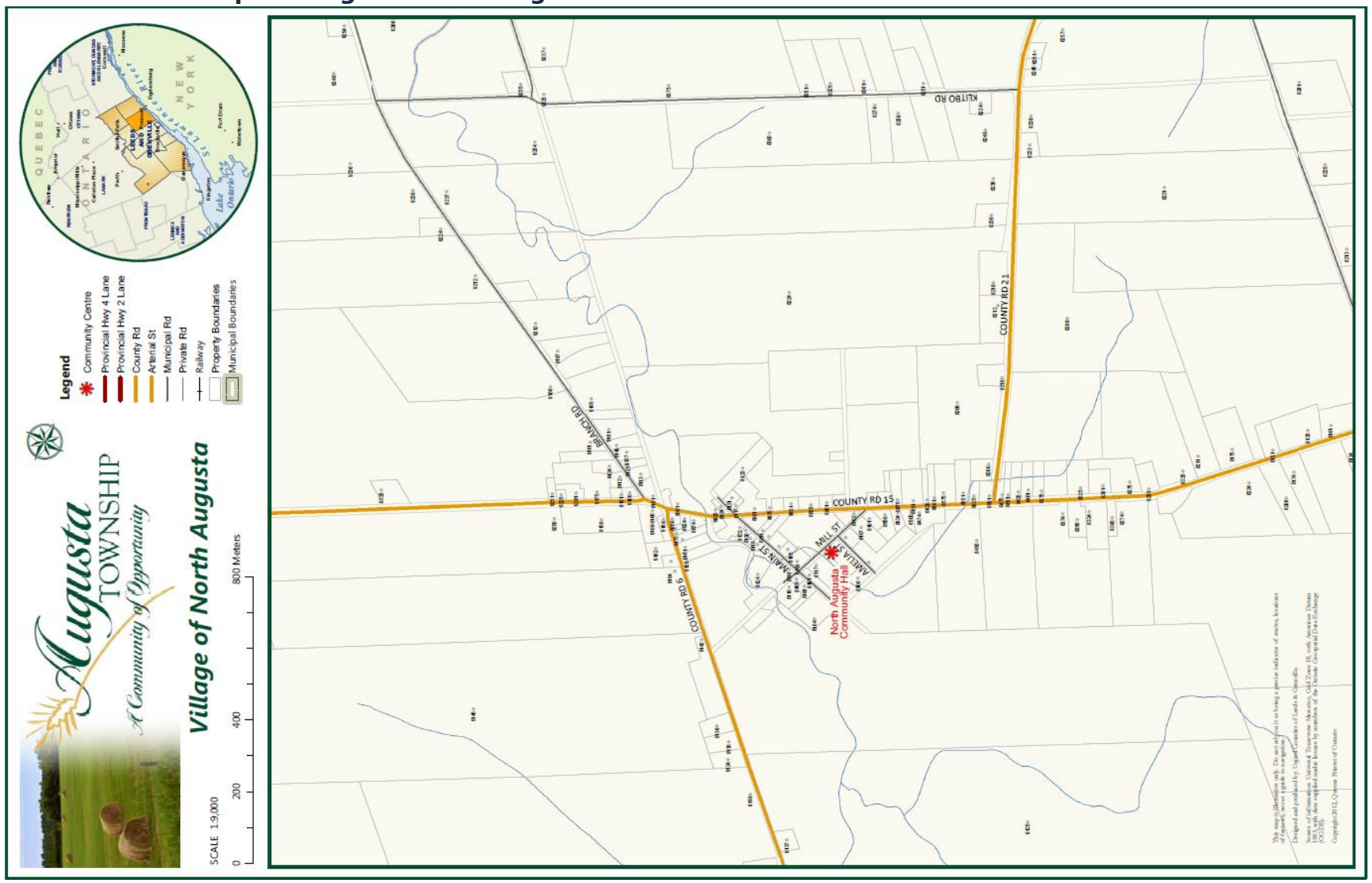
Road Network Map – Village of Maitland



Road Network Map – Village of Maynard



Road Network Map – Village of North Augusta



Images of Bridge in Good Condition

Kemptville Creek Bridge No. 2 – Kyle Road
Inspected: May 18th, 2022

Photo 1: Approach Looking South

Photo 2: West Elevation Looking South

Photo 3: Asphalt on Concrete Deck

Photo 4: Damage to Concrete Railing Posts

Photo 5: Northeast Embankment

Photo 6: Stream Looking East

Images of Culvert in Fair Condition

Kemptville Creek Bridge No. 3 – Diamond Road
Inspected: May 18th, 2022

Photo 1: Approach Looking North

Photo 2: Section Loss at Concrete Deck

Photo 3: Exposed Rebar at Barrier

Photo 4: Cracking at Soffit

Photo 5: Minor Cracks and Honeycombing Near Bearing Seat

Photo 6: North Abutment

Appendix C: Risk Rating Criteria

Probability of Failure

Asset Category	Risk Criteria	Criteria Weighting	Value/Range	Probability of Failure Score
Road Network (Roads, Streetligths, Signs), Bridges & Culverts, Fleet, Buildings, Machinery & Equipment, Land Improvements	Condition	100%	80-100	1
			60-79	2
			40-59	3
			20-39	4
			0-19	5
Road Network (Catch basin)	Condition	80%	80-100	1
			60-79	2
			40-59	3
			20-39	4
			0-19	5
	Material	20%	Concrete	3
			Metal	4
Road Network (Drainage Culverts)	Condition	80%	80-100	1
			60-79	2
			40-59	3
			20-39	4
			0-19	5
	Material	20%	HDPE	2
			Concrete	3
			Corrugated Steel	4

Consequence of Failure

Asset Category	Risk Classification	Risk Criteria	Value/Range	Consequence of Failure Score
Road Network (Roads)	Economic (100%)	Replacement Cost (100%)	0-$100,000	1
			$100,000-$250,000	2
			$250,000-$500,000	3
			$500,000-$1,000,000	4
			$1,000,000+	5
	Social (70%)	Road Class (100%)	6	2
			5	3
			4	5
			3	5
Bridges & Culverts	Economic (100%)	Replacement Cost (100%)	0-$100,000	1
			$100,000-$250,000	2
			$250,000-$500,000	3
			$500,000-$1,000,000	4
			$1,000,000+	5
Fleet	Economic (75%)	Replacement Cost (100%)	$0-$50,000	1
			$50,000-$100,000	2
			$100,000-$250,000	3
			$250,000-$500,000	4
			$500,000+	5
	Health & Safety (25%)	Vehicles Type (100%)	Small Trucks	2
			Large Trucks	4
			Fire Trucks	5

Asset Category	Risk Classification	Risk Criteria	Value/Range	Consequence of Failure Score
Machinery & Equipment	Economic (75%)	Replacement Cost (100%)	$0-$50,000	1
			$50,000-$100,000	2
			$100,000-$250,000	3
			$250,000-$500,000	4
			$500,000+	5
	Operational (25%)	Equipment Type (100%)	Office Equipment	3
			Public Works	5
			Fire Department	5
Buildings	Economic (75%)	Replacement Cost (100%)	0-$100,000	1
			$100,000-$250,000	2
			$250,000-$500,000	3
			$500,000-$1,000,000	4
			$1,000,000+	5
	Health & Safety (25%)	Vehicles Type (100%)	Small Trucks	2
			Large Trucks	4
			Fire Trucks	5
Land Improvements	Economic (100%)	Replacement Cost (100%)	$0-$50,000	1
			$50,000-$100,000	2
			$100,000-$250,000	3
			$250,000-$500,000	4
			$500,000+	5
	Health & Safety	Asset Types (100%)	Park Assets	2
			Sports Fields & Court	3
			Waste Transfer Site	4
Road Network (other)	Economic (100%)	Replacement Cost (100%)	0-$100,000	1
			$100,000-$250,000	2
			$250,000-$500,000	3
			$500,000-$1,000,000	4
			$1,000,000+	5

Appendix D: Condition Assessment Guidelines

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

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

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

Role of Asset Condition Data

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

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

Guidelines for Condition Assessment

Whether completed by external consultants or internal staff, condition assessments should be completed in a structured and repeatable fashion, according to consistent and objective assessment criteria. Without proper guidelines for the completion of

condition assessments there can be little confidence in the validity of condition data and asset management strategies based on this data.

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

Developing a Condition Assessment Schedule

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

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