Township of Hamilton

2025

Asset Management Plan

This Asset Management Plan was prepared by:

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

Key Statistics

Replacement cost of asset portfolio

$278 million

Percentage of assets in fair or better condition

87%

Annual capital infrastructure deficit

$5.7 million

Recommended timeframe for eliminating annual infrastructure deficit

20 Years

Actual reinvestment rate for Tax Funded

1.04%

Actual reinvestment rate for Water Rate Funded

0.19%

Proposed Level of Service for Tax Funding

Target Increase 2.5%

Proposed Level of Service for Water Rate Funding

Target Increase 2.9%

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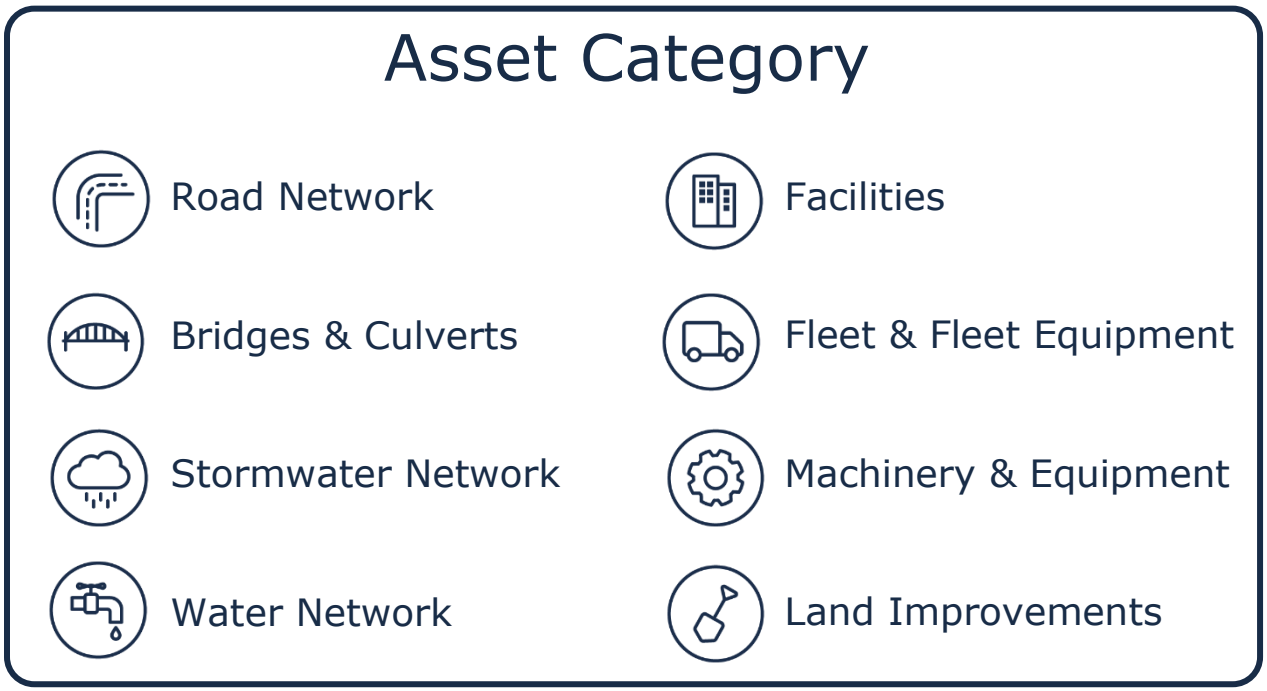
Executive Summary

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 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 includes the following asset categories:



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, 2025.

Findings

The Township of Hamilton has infrastructure with an overall replacement cost $278 million. 87% of all assets analysed are in fair or better condition and assessed condition data was available for 86% of assets. For the remaining 14% of assets, assessed condition data was unavailable, a data gap that persists in most municipalities, and asset age was used to approximate condition.

The development of a long-term, sustainable financial plan requires an analysis of whole lifecycle costs. This AMP uses a combination of proactive lifecycle strategies (roads) and replacement-only strategies 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 $8.2 million.

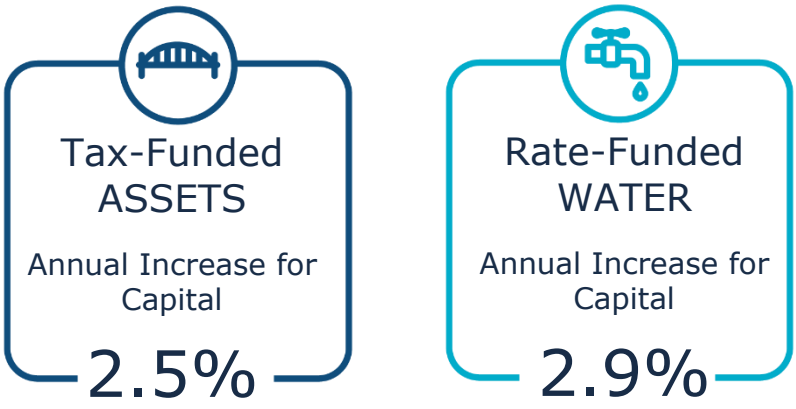
Based on a historical analysis of sustainable capital funding sources, the Township is committing approximately $2.5 million towards capital projects or reserves per year. As a result, there is currently an annual funding gap of $5.7 million.

The Township of Hamilton is not alone in having an annual funding gap as this is a persistent issue among many municipalities across Canada.

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.

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 for Tax-Funded Assets and a 20-year plan for Rate-Funded Water Assets:



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. When procuring external studies on assets ensure there is clear reference to the Asset ID for ease of upload to the asset management software.
- Utilize risk scores to assist in prioritizing capital projects

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.

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

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.

Foundational Documents

In the municipal asset management terminology can be confusing, especially when different organizations and jurisdictions use terms like strategy, plan, framework, and system interchangeably. To provide clarity, here's a breakdown that distinguishes between key asset management documents and concepts, aligned with best practices in municipal governance.

Strategic Plan

The strategic plan has a direct, and cascading impact on asset management planning and reporting, making it a foundational element. Developing alignment with corporate goals and objectives through service delivery and lifecycle management ensures the Town has line of sight to achieve their strategic objectives.

Strategic Asset Management Policy

An asset management policy represents a statement of the principles guiding the Township's approach to asset management activities as well as their commitment. It aligns with the organization and provides clear direction to municipal staff on their roles and responsibilities. The Township adopted a Strategic Asset Management Policy on March 19th, 2019, in accordance with Ontario Regulation 588/17.

Asset Management Plan

The asset management plan presents the outcomes of the Township's asset management program and identifies the resource requirements to maintain the current asset inventory. This 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.

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.

Requirement	2019	2022	2024	2025
1. Strategic Asset Management Policy	✓		✓	
2. Asset Management Plans		✓	✓	✓
State of infrastructure for core assets		✓		
State of infrastructure for all assets			✓	✓
Current levels of service for core assets		✓		
Current levels of service for all assets			✓	
Proposed levels of service for all assets				✓
Lifecycle costs associated with current levels of service		✓	✓	
Lifecycle costs associated with proposed levels of service				✓
Growth impacts		✓	✓	✓
Financial strategy				✓

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.

Asset Hierarchy and Data Classification

Asset hierarchy illustrates the relationship between individual assets and their components, and a wider, more expansive network and system. How assets are grouped in a hierarchy structure can impact how data is interpreted. Key category details are summarized at the asset segment level.

Replacement Costs

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

User-Defined Cost and Cost/Unit: Based on costs provided by municipal staff which could include average costs from recent contracts; data from engineering reports and assessments; staff estimates based on knowledge and experience

Cost Inflation/CPI Tables: Historical cost of the asset is inflated based on Consumer Price Index or Non-Residential Building Construction Price Index

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

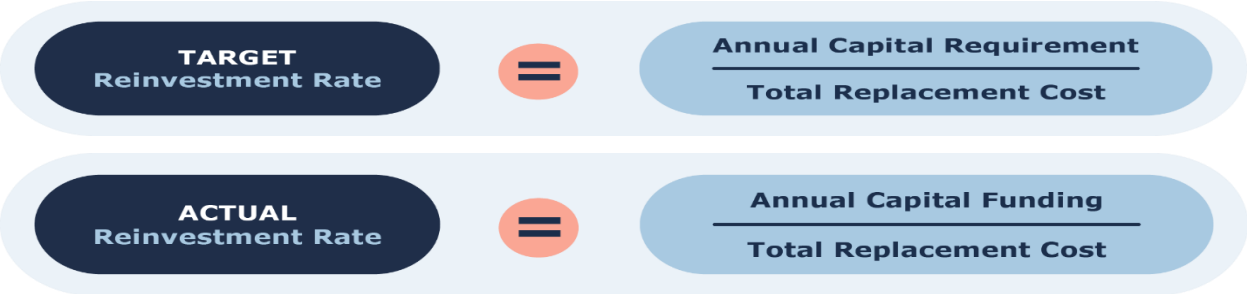
Estimated Useful Life & Service Life Remaining

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:

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. The reinvestment rate is calculated as follows:



By comparing the actual vs. target reinvestment rate the Township can determine the extent of any existing funding gap.

Asset Condition

Accurate and reliable condition data helps to prevent premature and costly rehabilitation or replacement and ensures that lifecycle activities occur at the right time to maximize asset value and useful life. A condition assessment rating system provides a standardized descriptive framework that allows comparative benchmarking across the Township's asset portfolio.

The table below outlines the condition rating system used to determine asset condition. This rating system is aligned with the Canadian Infrastructure Report Card. When assessed condition data is not available, age and EUL are 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 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 J: Condition Assessment Guidelines includes additional information on the role of asset condition data and provides basic guidelines for the development of a condition assessment program.

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 residents, it is important to establish a lifecycle management strategy to proactively manage asset deterioration.

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

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

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

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

Risk Management Strategies

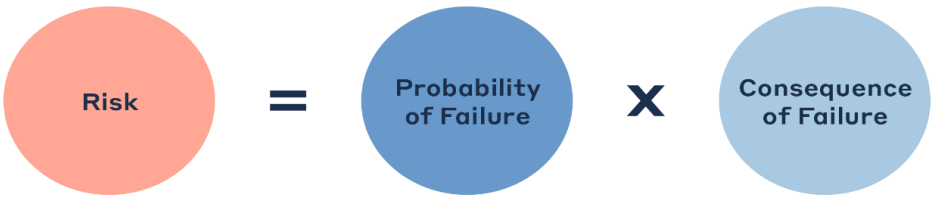
This AMP uses a combination of qualitative and quantitative methods to help prioritize infrastructure investments. This approach supports more informed decision-making by recognizing that not all assets have the same role in delivering essential services.

Qualitative Approach to Risk

The qualitative risk assessment involves the documentation of risks to the delivery of services that the municipality faces given the current state of the infrastructure and asset management strategies. These risks can be understood as corporate level risks.

Quantitative Approach to Risk

Asset risk is defined using the following formula:



The probability of failure relates to the likelihood that an asset will fail at a given time. The probability of failure focuses on two highly imperative impacts for risk assessment – structural and functional impacts. Structural impacts are related to the structural aspects of an asset such as load carrying capacity, condition, or

breaks; whereas the functional impacts can include parameters, slope, traffic count, and other impacts that can affect the performance of an asset.

The consequence of failure describes the overall effect that an asset's failure will have on an organization's asset management goals. Consequences of failure can range from non-eventful to impactful.

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.

Climate Change

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

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

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

The changing climate poses a significant risk to the Canadian economy, society, environment, and infrastructure. 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. To achieve the sustainable delivery of services, climate change considerations should be incorporated into asset management practices.

Impacts of Growth

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.

As growth-related assets are constructed or acquired, they should be integrated into the Township's asset management program. While the addition of residential units will add to the existing assessment base and offset some of the costs associated with growth, the Township will need to review the lifecycle costs of

growth-related infrastructure, and these costs should be considered in long-term funding strategies.

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, 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, water, wastewater, stormwater) the province, through O. Reg. 588/17, has provided technical metrics.

Current and Proposed Levels of Service

In developing an effective asset management plan, it is imperative to establish clear levels of service across key service areas to ensure the efficient and sustainable delivery of municipal services. The Township established current levels of service as well as proposed levels of service over a 10-year period, in accordance with O. Reg. 588/17.

Proposed levels of service are realistic and achievable within the timeframe outlined by the Township. They were determined with consideration of a variety of community expectations, fiscal capacity, regulatory requirements, corporate goals, and long-term sustainability. The Township will identify a lifecycle management and financial strategy which will allow these targets to be achieved.

Annual Review

The annual review must address the municipality's progress in implementing its asset management plan, any factors impeding the municipality's ability to implement its asset management plan as well as a strategy to address any of the identified factors.

Community Profile

The Township of Hamilton is a lower-tier municipality situated in Northumberland County, Ontario, Canada. Known for its scenic landscapes and vibrant rural character, Township of Hamilton lies between Lake Ontario and Rice Lake, offering a picturesque mix of farmland, woodlands, and shoreline communities. It is celebrated for its small-town charm, strong agricultural roots, and access to nature.

Township of Hamilton spans 256.03 km² and includes communities such as Baltimore, Bewdley, Camborne, Cold Springs, Harwood, and Gores Landing. The Township features gently rolling hills, fertile agricultural land, and several conservation and recreation areas, making it a desirable location for outdoor enthusiasts and families seeking a quieter lifestyle.

Census Characteristic	Township of Hamilton[1]	Ontario
Population 2021	11,059	14,223,942
Population Change 2016-2021	1.1%	5.8%
Total Private Dwellings	4,685	5,929,250
Population Density	43.2/km^2	15.9/km^2
Land Area	256.03 km^2	892,411.76 km^2

The Township has a predominantly older population, with the median age of 50.6 years being higher than the provincial average. Despite its aging demographic, Township of Hamilton continues to attract new residents due to its natural beauty, peaceful setting, and proximity to larger urban centres such as Cobourg and Port Hope.

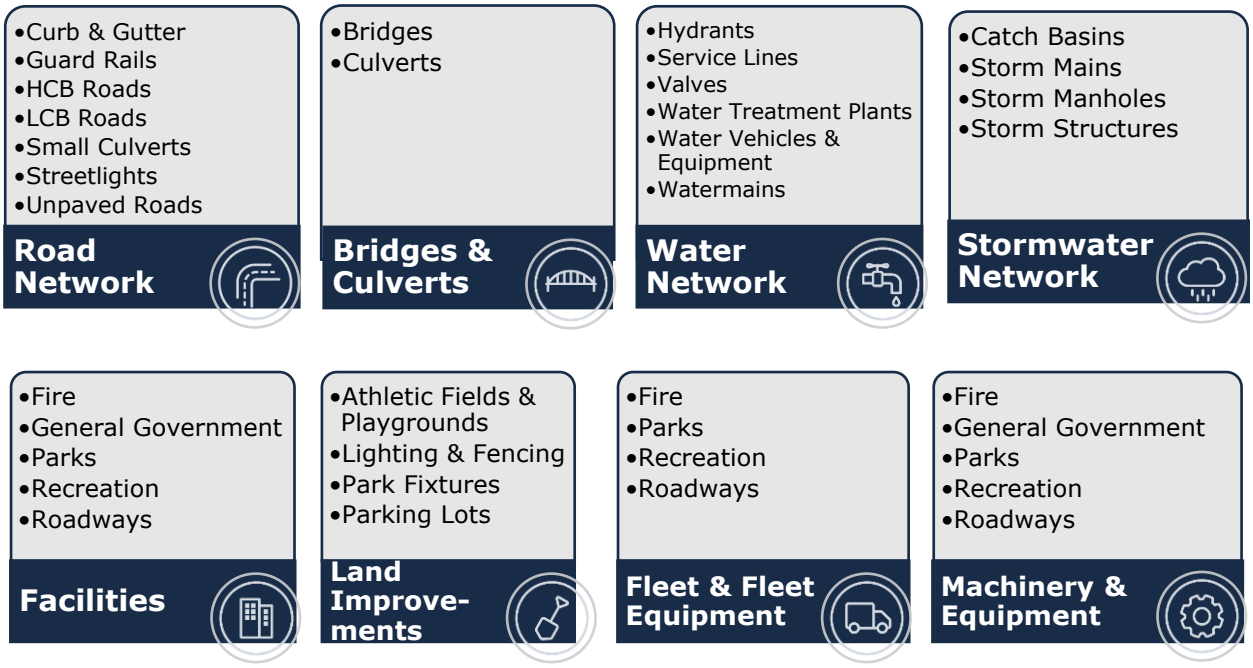
The Township of Hamilton supports a mix of agriculture, tourism, and local services. The agricultural sector includes crop farming and livestock operations, with a growing emphasis on sustainable practices. Meanwhile, natural attractions like Rice Lake, Ganaraska Forest, and local trails bolster a modest but growing tourism sector. The Township also hosts seasonal festivals and community events that foster a strong sense of local identity.

Public amenities include schools, churches, libraries, recreational facilities, and municipal services, all contributing to a high quality of life. The Township of Hamilton's commitment to preserving its rural character, investing in essential infrastructure, and supporting community well-being continues to make it an attractive place to live, work, and explore.

[1] Statistics Canada. (2023). *Census Profile, 2021 Census of Population: Township of Hamilton, Ontario*.

Inventory & Cost

The Township's inventory has an asset hierarchy of categories and segments as outlined below where the dark blue headings are the categories and the listings in grey are the segments.

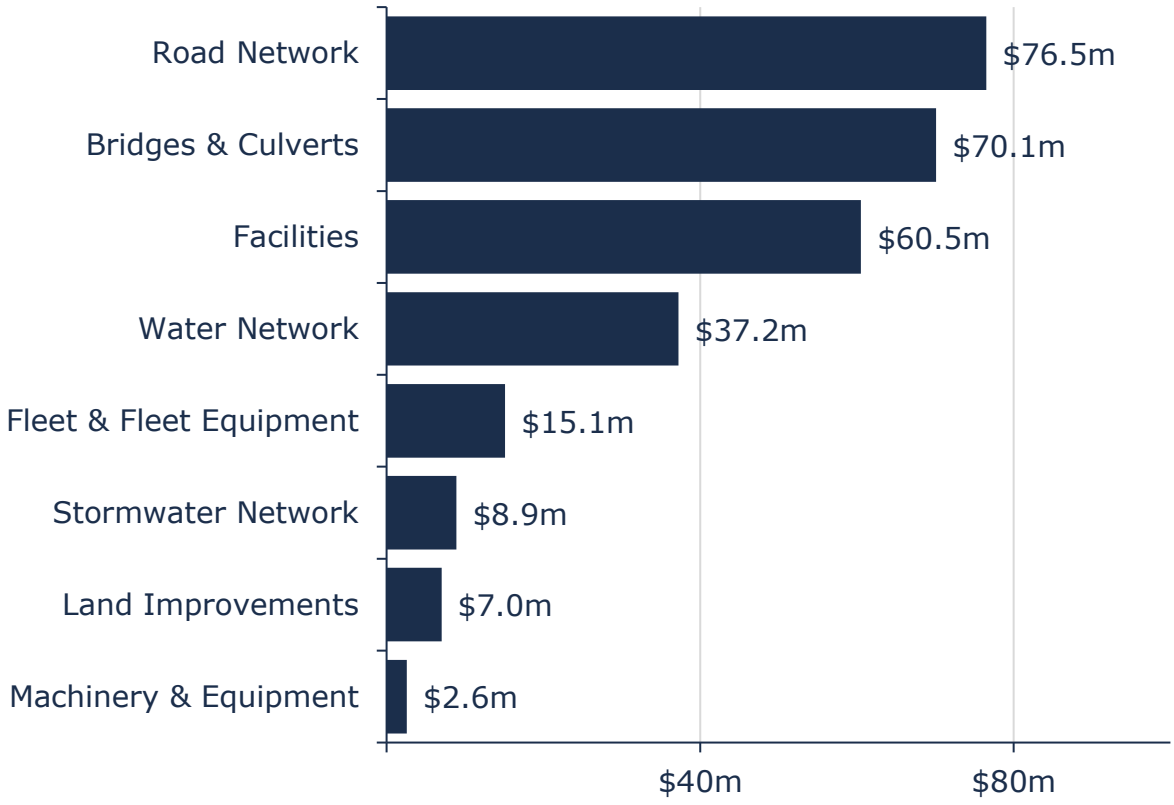


State of the Infrastructure

Asset Category	Replacement Cost	Asset Condition	Service Trend
Road Network	$76,492,979	Good (67%)	↘
Bridges & Culverts	$70,115,721	Good (67%)	↘
Storm Water Network	$8,908,708	Very Good (88%)	↘
Facilities	$60,519,101	Good (65%)	↘
Fleet & Fleet Equipment	$15,125,531	Fair (40%)	↘
Land Improvements	$7,019,110	Fair (53%)	↘
Machinery & Equipment	$2,597,209	Fair (43%)	↘
Water Network	$37,232,222	Fair (58%)	↘
Overall	**$278,010,581**	**Good (65%)**	↘

Total Replacement Cost

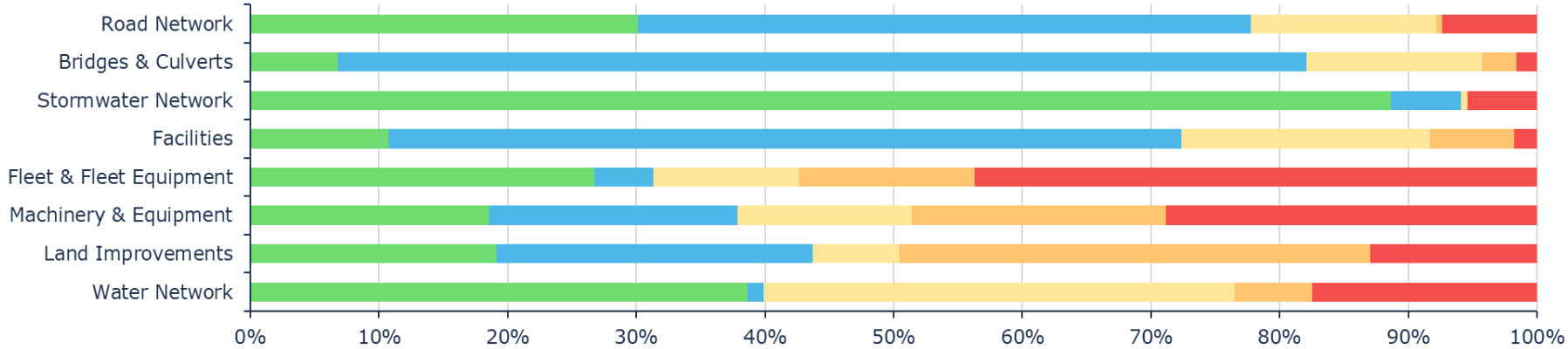
The asset categories analysed in this AMP have a total replacement cost of $278 million based on inventory data up to the end of 2024. This total was determined based on a combination of user-defined costs and historical cost inflation. This estimate reflects replacement of historical assets with similar, not necessarily identical, assets available for procurement today.



Condition & Age

Condition of Asset Portfolio

The current condition of the assets is central to all asset management planning. Collectively, 87% of assets in the Township of Hamilton are in fair or better condition. This estimate relies on both age-based and field condition data.



	Water Network	Land Improvements	Machinery & Equipment	Fleet & Fleet Equipment	Facilities	Stormwater Network	Bridges & Culverts	Road Network
Very Good	$14.4m	$1.3m	$481k	$4.0m	$6.5m	$7.9m	$4.8m	$23.0m
Good	$458k	$1.7m	$502k	$690k	$37.3m	$489k	$52.8m	$36.4m
Fair	$13.6m	$469k	$352k	$1.7m	$11.7m	$44k	$9.6m	$11.0m
Poor	$2.3m	$2.6m	$512k	$2.1m	$4.0m		$1.9m	$368k
Very Poor	$6.5m	$910k	$750k	$6.6m	$1.1m	$483k	$1.1m	$5.6m

This AMP relies on assessed condition data for 87% 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.

Service Life Remaining

Based on asset age, available assessed condition data and estimated useful life, 35% of the Township's assets will require replacement within the next 10 years. Details of the capital requirements are identified in each asset section and are based on the proposed levels of service 10-year financial plan.

Risk & Criticality

Qualitative Risk

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

Capital Funding Strategies

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

Climate Change & Extreme Weather

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

Lifecycle Management Strategies & Aging Infrastructure

The current lifecycle management strategy for all asset categories is considered more reactive than proactive. It is a challenge to find the right balance between maintenance, capital rehabilitation, and the replacement of assets.

Asset Data & Information

There is a lack of confidence in the available inventory data and condition data. Staff have been prioritizing data refinement efforts to combine data sets into a single inventory. Staff find it a continuous challenge to organize and manage all the separate data sources for a single asset or category of assets

Quantitative Risk

The overall risk breakdown for The Township of Hamilton's asset inventory is portrayed in the figure below. Reviewing the list of very high-risk assets to evaluate how best to mitigate the level of risk the Township is experiencing will help advance their asset management program.

1 - 4 Very Low	5 - 7 Low	8 - 9 Moderate	10 - 14 High	15 - 25 Very High
$54,418,119 (20%)	$89,709,420 (32%)	$32,975,245 (12%)	$28,343,647 (10%)	$72,564,151 (26%)

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

Climate & Growth

Township of Hamilton Climate Profile

The Township of Hamilton, located in Northumberland County between Lake Ontario and Rice Lake, experiences a humid continental climate. This climate is characterized by warm, humid summers and cold, snowy winters. The township's proximity to Lake Ontario moderates its climate, influencing seasonal temperatures and precipitation patterns.:

Higher Average Annual Temperature:

- Between the years 1971 and 2000 the annual average temperature was 6.7 ºC
- Under a high emissions scenario, the annual average temperatures are projected to increase by 9.6 ºC by the year 2050 and 13.5 ºC by the end of the century.[2]

Increase in Total Annual Precipitation:

- Under a high emissions scenario, the Township of Hamilton is projected to experience an 12% increase in precipitation for the year 2051 to 2080 period and a 17% increase by the end of the century.

Increase in Frequency of Extreme Weather Events:

- The Township of Hamilton, like much of Eastern Ontario, has experienced more frequent extreme weather events in recent years, including intense rainfall and windstorms.
- Climate projections for the region indicate an increasing frequency and severity of these events due to changing atmospheric patterns and rising temperatures.

Impacts of Growth

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 more effectively plan for new infrastructure, and the upgrade or disposal of existing infrastructure. Increases or

[2] ClimateData.ca

decreases in demand can affect what assets are needed and what level of service meets the needs of the community.

Township of Hamilton Official Plan (November 2010)

The Township of Hamilton Official Plan was adopted by Council on November 16, 2010, and subsequently approved by the Ministry of Municipal Affairs and Housing on August 28, 2012. The Plan provides long-term guidance for managing growth, protecting natural and cultural heritage, supporting economic development, and ensuring a high quality of life for residents.

The Vision Statement within the Plan envisions Township of Hamilton as "a self-reliant, fiscally sound municipality striving for positive growth, a sustainable infrastructure with socially responsible and accessible services that promote a safe, healthy and family friendly lifestyle".

Population trends and projections included in the Plan are as follows:

Census Population				
Year	**2011**	**2016**	**2021**	**2031**
Township of Hamilton	10,700	10,942	11,059	*12,080[3]
% Change	-	2.2	1.1	
Province of Ontario	12,851,821	13,448,494	14,223,942	
% Change		4.6	5.8	

*Indicates projected population

As indicated above, the Township's population has grown modestly since 2011 and at a slower rate than the Province of Ontario. The Township's Official Plan directs population growth to designated settlement areas which include existing residential developments of the Baltimore and Camborne areas. Where residential development occurs outside of settlement areas, the Official Plan directs that the landscapes quality and rural nature shall be maintained. Throughout the Township the requirement for municipal services to support new residential development is to be carefully monitored, with private services considered.

Northumberland County Official Plan (November 2016)

The Township of Hamilton is a lower-tier municipality within Northumberland County and is subject to the policies of the Northumberland County Official Plan, which was approved by the Ontario Municipal Board on November 23, 2016, and sets out a policy framework extending to the year 2034. The Plan focuses on managing growth that crosses municipal boundaries, such as population distribution, economic development, infrastructure planning, and environmental protection.

For the Township of Hamilton, the County Official Plan projects moderate growth across population, employment, and housing:

[3] Township of Hamilton. *Official Plan*. By-law 2010-24. Adopted November 16, 2010

This can be seen below:

Township of Hamilton			
Year	**2034**	**2036**	**2041**
Population (Projection)	(12,359)	(13,788)	(15,574)
Population Increase	1,287	1,429	1,786
Employment Increase	328	356	499
Household Forecast	502		

These projections position the township of Hamilton as a municipality expected to accommodate approximately 7.1% of the County's total growth in both population and employment between 2011 and 2034.

In terms of land use policy, the County Official Plan identifies a Major Employment Area Special Policy Area within the Township of Hamilton. Approximately 90 hectares of land located north and west of the Highway 401 and Burnham Street interchange are considered suitable in principle for employment-focused development. These lands are recognized in Section C2.6 of the Plan and are intended to support manufacturing, warehousing, and related uses, subject to future local Official Plan amendments and servicing requirements.

The County Plan emphasizes that such areas should be comprehensively developed and fully serviced by municipal sewer and water infrastructure. The long-term intent is to attract diverse employment opportunities and support regional economic growth, while maintaining compatibility with adjacent uses and minimizing environmental impacts.

Impact of Growth on Lifecycle Activities

As the municipality's population is expected to remain the same with potential moderate increases and declines in the coming years, demand will evolve, and it is likely that funding will need to be reprioritized. As growth-related assets are constructed, retired, or acquired, they should be integrated into the AMP. Furthermore, the municipality 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 maintain the current level of service.

Levels of Service

The Township adopted a Strategic Plan in 2023 effective for 2023 - 2026. The purpose of a Strategic Plan is to guide the decisions and actions of Council and the municipal administration in a way that will shape the direction of the community and be attuned to the needs of the Township's residents and businesses. The Strategic Plan has a major influence on the Township's course of action over a four-to-six-year period.

The Strategic Plan cites the following Vision and Mission Statements:

Vision: "Township of Hamilton – making life better every day by creating a vibrant and sustainable township we are all proud to call home."

Mission: "To provide effective and efficient services delivered through accountability and respect to promote the social, economic and environmental priorities of our community."

Council and staff identified five **Strategic Priorities** that need to be addressed to meet the Township's Vision and Mission Statements while supporting its core values:

- People: Our people are at the heart of our efforts to deliver quality services to our residents and community. We are committed to enabling our staff to be engaged and supported in the work that they do and in their professional and personal lives by establishing an inclusive, positive, innovative, progressive, and united workspace culture.
- Community: The Township is committed to building a strong community
- Effective Governance: To deliver efficient and cost-effective governance in a timely manner through leadership and respect—administer with an unbiased view.
- Environment: To provide sustainable growth while protecting the natural features of the Township.
- Physical Assets: To acquire and maintain necessities used to provide services to the Township.
- Recreation, Culture, and Social Well-being: To promote a social & healthy environment made available for a wide variety of activities in clean, efficient, functional facilities and parks.

The four pillars are supported directly (i.e., Physical Asset) or indirectly through the development of an asset management plan.

Current Levels of Service

The Township of Hamilton has defined their current levels of service for each infrastructure category by breaking it down into 3 service attributes scope, quality / reliability and sustainable. Each of these attributes are defined as follows:

Scope – Is a description of the services being provided and the assets that are utilized to provide the services.

Quality / Reliability – Is a description of how condition is measured as well as the current average condition of the assets utilized to provide the services. Also, for each asset category there are additional reliability measures included.

Sustainable – Is a description of how the Township will ensure long-term sustainability with an emphasis on affordability and is measured utilizing risk and financial parameters.

Based on an analysis of each asset category the current level of service is provided in each asset section.

Proposed Levels of Service

Through a comprehensive assessment proposed levels of service for the Township have been developed. To ensure long-term sustainability and overall achievability the following were utilized / developed as part of the analysis.

Stakeholder Engagement – Regularly engage with stakeholders to gather feedback and communicate changes transparently.

Data-Driven Decision Making – Use data analytics to inform decision-making processes and identify areas for improvement.

Flexibility and Adaptability – Design the methodology to be flexible, allowing for adjustments based on evolving priorities.

Continuous Improvement – Establish a process for continuous review and improvement of the LOS methodology itself.

Scenarios

The scenarios that were used to analyse The Township of Hamilton's inventory were run for 100-years to ensure all the lifecycles were included at least once. They are also all based on the data available in the asset management system which outlines estimated useful life and condition as well as replacement costs which all the results are based on.

Scenario 1: Current Lifecycle Activities

Purpose: This scenario examines the current state of the infrastructure based on existing lifecycle practices. It looks at how the infrastructure is currently being maintained, the condition it's in, and projects the amount of annual investment need to be made in each asset category.

Key Focus: The condition of the infrastructure and the annual investment levels based on currently identified lifecycles.

Outcome: This scenario provides a baseline for understanding how the infrastructure is currently being maintained. It helps identify whether there are any gaps between current practices and long-term sustainability goals.

Scenario 2: Current Capital Reinvestment Rate

Purpose: This scenario builds upon the current capital reinvestment rate, where the total amount of investment being made into capital improvements (like replacement or major repairs) remains the same. In this scenario, the focus is on the impact that current investment levels have on the condition of the infrastructure over time.

Key Focus: The annual investment stays constant, and the condition of the infrastructure is evaluated based on that level of reinvestment.

Outcome: This helps to see if the current capital reinvestment rate is enough to maintain the infrastructure in a sustainable way over the long term, or if it's falling short and leading to degradation in condition.

Results

Scenario 1: Current Lifecycle Activities - this scenario utilizes the current lifecycle activities outlined as current practice within each asset category. The condition and annual investment were then determined.

The table below summarizes the results of each asset category and overall.

Asset Category	Current Average Condition	Projected Average Condition	Funding Required
Road Network	Good (67%)	Good (78%)	$2,421,979
Bridges & Culverts	Good (67%)	Very Good (84%)	$1,725,826
Stormwater Network	Very Good (88%)	Good (79%)	$147,890
Facilities	Good (65%)	Very Good (85%)	$1,777,343
Fleet & Fleet Equipment	Fair (40%)	Very Good (80%)	$821,176
Machinery & Equipment	Fair (43%)	Very Good (85%)	$308,691
Land Improvements	Fair (53%)	Very Good (80%)	$289,764
Water Network	Fair (58%)	Very Good (80%)	$783,862
Overall	**Good (65%)**	**Very Good (82%)**	**$8,276,531**

Scenario 2: Current Capital Reinvestment Rate - this scenario utilizes the current capital reinvestment within each asset category. The current annual investment was held, and the condition was determined.

The table below summarizes the results of each asset category and overall.

Asset Category	Current Average Condition	Projected Average Condition	Funding Required
Road Network	Good (67%)	Good (60%)	$1,625,315
Bridges & Culverts	Good (67%)	Very Poor (3%)	$52,000
Stormwater Network	Very Good (88%)	Fair (52%)	$40,500
Facilities	Good (65%)	Very Poor (5%)	$166,000
Fleet & Fleet Equipment	Fair (40%)	Poor (32%)	$424,324
Machinery & Equipment	Fair (43%)	Poor (33%)	$163,376
Land Improvements	Fair (53%)	Very Poor (0%)	$0
Water Network	Fair (58%)	Very Poor (18%)	$70,220
Overall	**Good (65%)**	**Poor (25%)**	**$2,541,735**

Proposed Level of Service Summary

The Township of Hamilton is taking a strategic approach to ensuring the long-term sustainability of its municipal services. By focusing on the condition of the assets used to provide these services, the Township is aiming to balance service quality with cost-efficiency. This practical approach will help prevent over-investment in

infrastructure that may not be sustainable while also ensuring that the community's needs are met.

The Township is making significant strides in improving the accuracy of its asset management system, which is crucial for better decision-making regarding capital requirements and long-term sustainability.

By targeting the lifecycle activity target reinvestment rate for the proposed level of service, the Township has targeted maintaining it's assets in very good condition.

Financial Management

Financial Strategy

Each year, the Township of Hamilton makes important investments in its infrastructure's maintenance, renewal, rehabilitation, and replacement to ensure assets remain in a state of good repair. However, spending needs typically exceed fiscal capacity. In fact, most municipalities continue to struggle with annual infrastructure deficits. Achieving full-funding for infrastructure programs will take many years and should be phased-in gradually to reduce burden on the community.

This financial strategy is designed for the Township's existing asset portfolio and is premised on two key inputs: the average annual capital requirements and the average annual funding typically available for capital purposes. The annual requirements are based on the replacement cost of assets and their serviceable life, and the target proposed level of service. This figure is calculated for each individual asset and aggregated to develop category-level values.

The annual funding available is determined by the amount of revenue that is allocated consistently to reserves for capital purposes. For the Township of Hamilton, the approved 2025 values were used to project available funding going forward.

Only reliable and predictable sources of funding are used to benchmark funds that may be available on any given year. The funding sources include:

- Revenue from taxation allocated to reserves for capital purposes
- Revenue from water and wastewater rates allocated to capital reserves
- The Canada Community Building Fund (CCBF), formerly the federal Gas Tax Fund
- The Ontario Community Infrastructure Fund (OCIF)

Although provincial and federal infrastructure programs can change with evolving policy, CCBF, OCIF, and OMPF are considered as permanent and predictable.

Use of Debt

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

- the ability to stabilize tax & user rates when dealing with variable and sometimes uncontrollable factors
- equitable distribution of the cost/benefits of infrastructure over its useful life
- a secure source of funding
- flexibility in cash flow management

Debt management policies and procedures with limitations and monitoring practices should be considered when reviewing debt as a funding option. In efforts to mitigate increasing commodity prices and inflation, interest rates have been rising. Sustainable funding models that include debt need to incorporate the now current realized risk of rising interest rates.

Use of Reserves

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

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

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

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

These are the balances currently available in reserves for use by applicable asset categories during the phase in period to full funding. The ending balance is December 31, 2024.

Applicable AMP Category	Reserve Balance
Road Network	$1,763,649
Bridges & Culverts	$615,042
Stormwater Network	$185,450
Facilities	$689,102
Fleet & Fleet Equipment	$400,448
Machinery & Equipment	$311,078
Water Network	$347,826
Total	**$4,312,595**

Annual Capital 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.

The table below outlines the total average annual capital requirements for existing assets in each asset category. Based on the proposed levels of service selected for all asset categories

Asset Category	Projected Average Condition	Funding Required
Road Network	Good (78%)	$2,421,979
Bridges & Culverts	Very Good (84%)	$1,725,826
Stormwater Network	Good (79%)	$147,890
Facilities	Very Good (85%)	$1,777,343
Fleet & Fleet Equipment	Very Good (80%)	$821,176
Machinery & Equipment	Very Good (85%)	$308,691
Land Improvements	Very Good (80%)	$289,764
Water Network	Very Good (80%)	$783,862
Overall	**Very Good (82%)**	**$8,276,531**

Current Funding Levels

The table below summarizes how current funding levels compare with funding required for each asset category. At existing levels, the Township is funding 31% of its annual capital requirements for all infrastructure analyzed. This creates a total annual funding deficit of $5.7 million.

Asset Category	Annual Funding Requirement	Annual Funding Available	Annual Deficit
Road Network	$2,421,979	$1,625,315	$796,664
Bridges & Culverts	$1,725,826	$52,000	$1,673,826
Stormwater Network	$147,890	$40,500	$107,390
Facilities	$1,777,343	$166,000	$1,611,343
Fleet & Fleet Equipment	$821,176	$424,324	$396,852
Machinery & Equipment	$308,691	$163,376	$145,315
Land Improvements	$289,764	-	$289,764
Water Network	$783,862	$70,220	$713,642
Overall	**$8,276,531**	**$2,541,735**	**$5,734,797**

Closing the Gap

Eliminating annual infrastructure funding shortfalls is a difficult and long-term endeavour for municipalities. Considering the Township's current funding position, it will require many years to reach full funding for current assets.

This section outlines how the Township can close the annual funding deficits using own-source revenue streams, i.e., property taxation and utility rates. Funding 100% of annual capital requirements ensures that major capital events, including

replacements, are completed as required. Under this scenario, projects are unlikely to be deferred to future years. This delivers the proposed level of service.

Full Funding Requirements Tax Revenues

In 2025, the Township will have an annual tax revenue of $10,573,956. As illustrated in the following table, without consideration of any other sources of revenue or cost containment strategies, full funding would require a 46.8% tax change over time.

While shorter phase-in periods may place too high a burden on taxpayers, a phase-in period beyond 20 years may see a continued deterioration of infrastructure, leading to larger backlogs. Several scenarios have been developed using phase-in periods ranging from five to twenty years this is outlined it the table below.

Phase In Period	5 Years	10 Years	15 Years	20 Years
% Increase in Annual Taxation	8.1%	4.0%	2.9%	2.5%

Full Funding Requirements Water Rate Revenues

For 2025, Township of Hamilton forecasted water rate revenues total $927,751. Annual capital requirements for the water network total $783,862, against available funding of $70,220. This creates a funding deficit of $713,642. To close this annual gap, the Township's water revenues would need to increase.

As with tax revenues, short phase-in periods may require excessive rate increases, whereas more protracted timeframes may lead to larger backlogs and more unpredictable spending on emergency repairs and replacements.

Phase In Period	5 Years	10 Years	15 Years	20 Years
% Increase in Annual Water Rate	12.1%	6.0%	4.0%	2.9%

Ten-Year Financial Plan

The Township is working with a clear long-term financial strategy aimed at reaching sustainable funding levels for its tax-funded assets and water services. Sustainable level of funding for tax funded assets in 2044 and water rates within 20 years the Township is still operating with an infrastructure deficit. The tables below show a 10-year capital projection for each asset category with proposed funding.

Tax Rate	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034
Road Network	$1.6m	$831k	$519k	$729k	$2.1m	$1.1m	$2.1m	$1.1m	$2.1m	$1.0m
Bridges & Culverts	$300k	$1.3m	-	$1.3m	-	$1.0m	-	$1.0m	-	$1.1m
Stormwater Network	$204k	$30k	$50k	$145k	$60k	$50k	$50k	$50k	$50k	-
Facilities	$15k	$405k	$50k	$125k	$110k	$100k	$150k	$100k	$50k	$115k
Fleet & Fleet Equipment	$867k	$685k	$601k	$746k	$1.0m	$713k	$668k	$1.6m	$1.3m	$1.2m
Machinery & Equipment	$46k	$111k	$200k	$42k	$139k	$30k	$37k	$38k	$32k	$168k
Land Improvements	-	-	-	-	-	-	-	-	-	-
Total	**$3.0m**	**$3.3m**	**$1.4m**	**$3.1m**	**$3.4m**	**$3.0m**	**$3.0m**	**$3.9m**	**$3.6m**	**$3.6m**
Proposed Funding	$2.5m	$2.7m	$3.0m	$3.3m	$3.6m	$3.9m	$4.2m	$4.5m	$4.8m	$5.1m

Water Rate	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034
Water Network	$135k	$1.0m	$1.3m	$1.4m	$407k	$97k	$167k	$1.5m	$37k	$357k
Proposed Funding	$70k	$97k	$125k	$153k	$183k	$213k	$244k	$276k	$309k	$342k

Recommendations

Review feasibility of adopting a full-funding scenario that achieve 100% of average annual requirements for the asset categories analyzed. This involves:

- Implementing an additional 2.5% annual tax increase over a 20-year phase-in period and allocating the full increase in revenue toward capital expenditures
- Implementing an additional 2.9% rate increase for water over a 20-year period
- Continued allocation of OCIF and CCBF funding as previously outlined

NOTE: Although difficult to capture, inflation costs, supply chain issues, and fluctuations in commodity prices will also influence capital expenditures.

Continuously review, refine, and calibrate lifecycle and risk profiles to better reflect actual practices and improve capital projections. In particular:

- the timing of various lifecycle events, the triggers for treatment, anticipated impacts of each treatment, and costs
- the various attributes used to estimate the likelihood and consequence of asset failures, and their respective weightings

Asset management planning is highly sensitive to replacement costs. Periodically update replacement costs based on recent projects, invoices, or estimates, as well as condition assessments, or any other technical reports and studies. Material and labour costs can fluctuate due to local, regional, and broader market trends, and substantially so during major world events. Accurately estimating the replacement cost of like-for-like assets can be challenging. Ideally, several recent projects over multiple years should be used.

Like replacement costs, an asset's established serviceable life can have dramatic impacts on all projections and analyses, including condition, long-range forecasting, and financial recommendations. Periodically reviewing and updating these values to better reflect in-field performance and staff judgement is recommended.

Risk models can play an important role in identifying high-value assets, and developing an action plan which may include repair, rehabilitation, replacement, or further evaluation through condition assessments. As a result, project selection and the development of multi-year capital plans can become more strategic and objective. Initial models have been built into Citywide for all asset groups. As the data evolves and new attribute information is obtained, these models should also be refined and updated.

The annual review requirement in O.reg. 588/17 the Township must address their progress in implementing its asset management plan, any factors impeding the ability to implement its asset management plan as well as a strategy to address any of the identified factors.

Appendix A: Road Network

The road network is a critical component of the provision of safe and efficient transportation services. It includes all municipally owned and maintained roadways in addition to supporting roadside infrastructure including sidewalks, curbs and gutters, and streetlights.

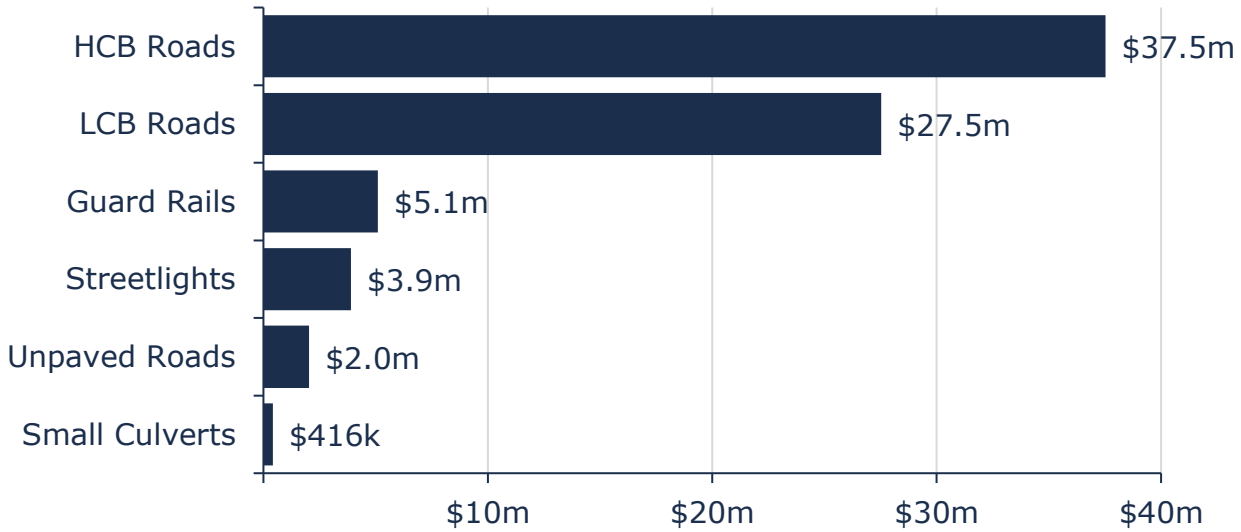
The Township's roads and sidewalks are maintained by the Public Works department who is also responsible for winter snow clearing, ice control and snow removal operations.

The road network has 89% of the assets condition assessed and the remainder is utilizing age-based condition.

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.

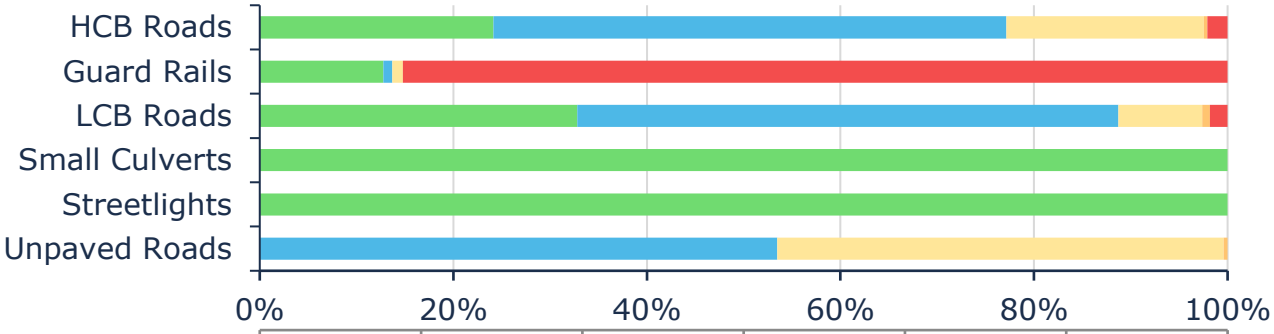
Asset Segment	Quantity	Replacement Cost
Guard Rails	9,050	$5,103,601
HCB Roads	123	$37,520,889
LCB Roads	145	$27,523,537
Small Culverts	9	$416,047
Streetlights	316	$3,895,499
Unpaved Roads	31	$2,033,706
Total		**$76,492,979**



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

Asset Condition & Age

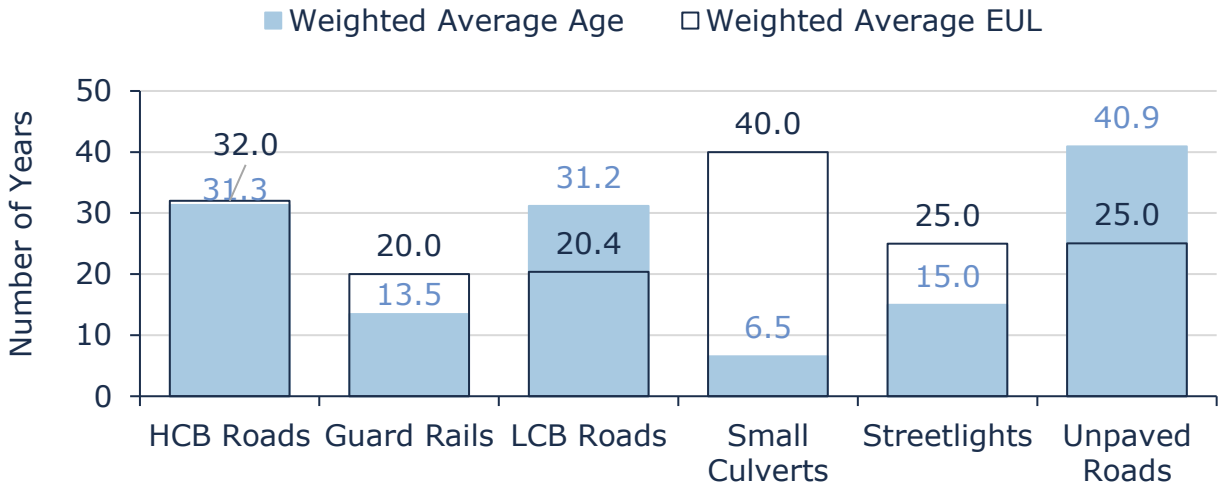
The average condition (%) is a weighted value based on replacement cost. The graph below visually illustrates the average condition for each asset segment on a very good to very poor.



	Unpaved Roads	Streetlights	Small Culverts	LCB Roads	Guard Rails	HCB Roads
Very Good		$3.9m	$416k	$9.0m	$651k	$9.1m
Good	$1.1m			$15.4m	$49k	$19.9m
Fair	$938k			$2.4m	$55k	$7.7m
Poor	$8k			$219k		$140k
Very Poor				$505k	$4.3m	$782k

To ensure that the municipality's road network continues to provide an acceptable level of service, the municipality 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 more confidently determine the remaining service life of assets and identify the most cost-effective approach to managing assets. The following describes the Township's current approach:

- A Road Needs Study was completed in 2024 by an external contractor that included a detailed assessment of the condition of each road segment
- Public works staff complete road patrols to identify any maintenance or rehabilitation requirements

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

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 residents, it is important to establish a lifecycle management strategy to proactively manage asset deterioration. The following table outlines the Township's current lifecycle management strategy.

Event Class	Description
Maintenance & Testing	Sign reflectivity testing is performed annually in accordance with Minimum Maintenance Standards (MMS) Regulation 239/02
	Route and Seal, Slurry Seals, Micro-surfacing, and Pothole Patching maintenance activities are performed on an as-needed basis
	The Municipality carries out road shouldering on an annual basis
	The Municipality conducts several seasonal maintenance activities. Summer maintenance activities include ditching and clearing, grading, re-gravelling, dust control, and line painting. Winter maintenance activities include snow plowing and salting.
Rehabilitation	Rehabilitation activities such as Pulverize & Pave, Mill & Overlay, Single Surface Treatment, and Double Surface Treatment are performed proactively to extend the life of the road surface until the road base requires full reconstruction also.
Replacement	Major road repair and reconstruction are prioritized by pavement conditions, traffic volume, public input, recommendations from 2024 Road Needs Study, and staff judgement.
	Asset replacements are coordinated with other underground assets renewal whenever reasonably possible.

Risk & Criticality

The following risk breakdown 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 2024 inventory data.

1 - 4 Very Low $26,193,475 (34%)	5 - 7 Low $33,925,412 (44%)	8 - 9 Moderate $8,247,697 (11%)	10 - 14 High $7,180,482 (9%)	15 - 25 Very High $945,914 (1%)

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

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

For Paved Roads

Probability of Failure (PoF)	Consequence of Failure (CoF)
Condition (80%)	AM Segment (LCB & HCB) (50%)
% Service life remaining (20%)	Number of Lanes (25%)
	Road Class (25%)

All other roadside assets

Probability of Failure (PoF)	Consequence of Failure (CoF)
Condition (50%)	Replacement Cost (100%)
% Service life remaining (50%)	

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

Levels of Service

The framework created by the Township for levels of service is a valuable tool for assessing and managing the performance of their assets and/or services provided by their assets. Proposed levels of service for the Township have been developed through engagement with Township staff.

Current 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.

Community LOS		Service Attribute	Technical LOS	
Description, which may include maps, of the road network in the Township and its level of connectivity	See Appendix I: Level of Service Maps	Scope	Replacement Cost	$76,492,979
			Quantity (km of roads)	299
			Lane-km of arterial roads (MMS classes 1 and 2) per land area (km/km^2)	0 lane-km / 256 km^2
			Lane-km of collector roads (MMS classes 3 and 4) per land area (km/km^2)	182 lane-km / 256 km^2
			Lane-km of local roads (MMS classes 5 and 6) per land area (km/km^2)	117 lane-km / 256 km^2
Description or images that illustrate the different levels of road class pavement condition	The Township completed a Road Needs Study in 2024 in coordination with D.M. Wills. Every road section received a surface condition rating (0-10) and a condition rating (0-100). The condition rating is derived from a mix of other point ratings that consider alignment, surface condition, surface width, level of service, structural adequacy, drainage, and maintenance demands.	Quality /Reliable	Average pavement condition index for paved roads in the Township	HCB: 68% LCB: 73%
			Average surface condition for unpaved roads in the Township (e.g., excellent, good, fair, poor)	Fair
			Average Condition	67%
			% Condition > Fair	67%
			% Condition poor and very poor	13%
General	Services will be provided to ensure long-term sustainability for the Municipality	Sustainable	% Risk that is High and Very High	10%
			Annual reinvestment	$1,625,315
			Capital reinvestment rate	2.12%

Proposed Levels of Service

The scenarios that were used to analyse the Township of Hamilton inventory were run for 100-years to ensure all the lifecycles were included at least once. They are also all based on the data available in the asset management system which outlines estimated useful life and condition as well as replacement costs which all the results are based on.

Scenario 1: Current Lifecycle Activities - this scenario utilizes the current lifecycle activities outlined as current practice within each asset category. The condition and annual investment were then determined.

Scenario 2: Current Capital Reinvestment Rate - this scenario utilizes the current capital reinvestment within each asset category. The current annual investment was held, and the condition was determined.

The table below outlines the results for each scenario for the Road Network.

Scenarios	Replacement Cost	Average Condition	Annual Capital Reinvestment
Scenario 1 – Lifecycle	$76,492,979	Good (78%)	$2,421,979
Scenario 2 - Capital Investment Rate	$76,492,979	Good (60%)	$1,625,315

10-Year Capital Forecast

Below is the projected ten-year capital forecast needed to maintain the road network at a condition greater than fair.

Segments	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034
Road Network	$1.6m	$831k	$519k	$729k	$2.1m	$1.1m	$2.1m	$1.1m	$2.1m	$1.0m

Gravel roads are not included in this forecast as they are managed through the operations and considered to never need replacement due to the preventative maintenance activities performed.

Appendix B: Bridges & Culverts

Bridges & Culverts represent a critical portion of the transportation services provided to the community. The Township is responsible for the operations and capital upkeep of bridge and culverts. There are a total of 91 structures in inventory.

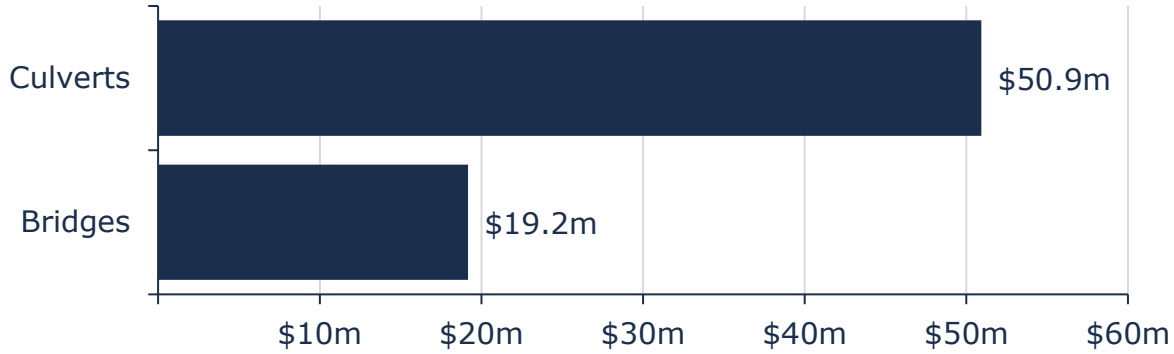
The Department of Public Works is responsible for the maintenance of all bridges and culverts located across municipal roads with the goal of keeping structures in an adequate state of repair and minimizing service disruptions.

The bridges and culverts are all condition assessed.

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 & Culverts inventory.

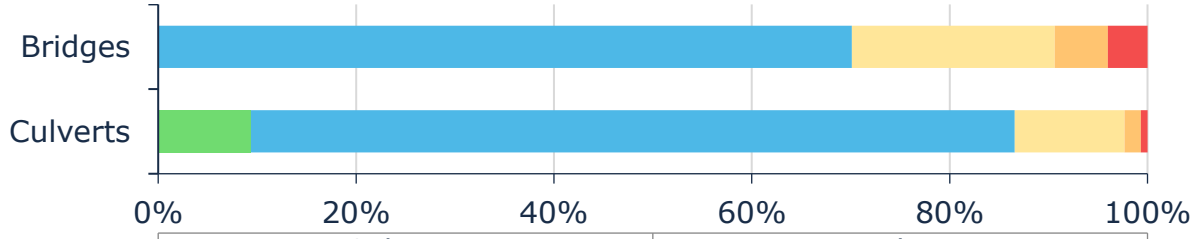
Asset Segment	Quantity	Replacement Cost
Bridges	20	$19,179,250
Culverts	71	$50,936,471
Total		**$70,115,721**



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

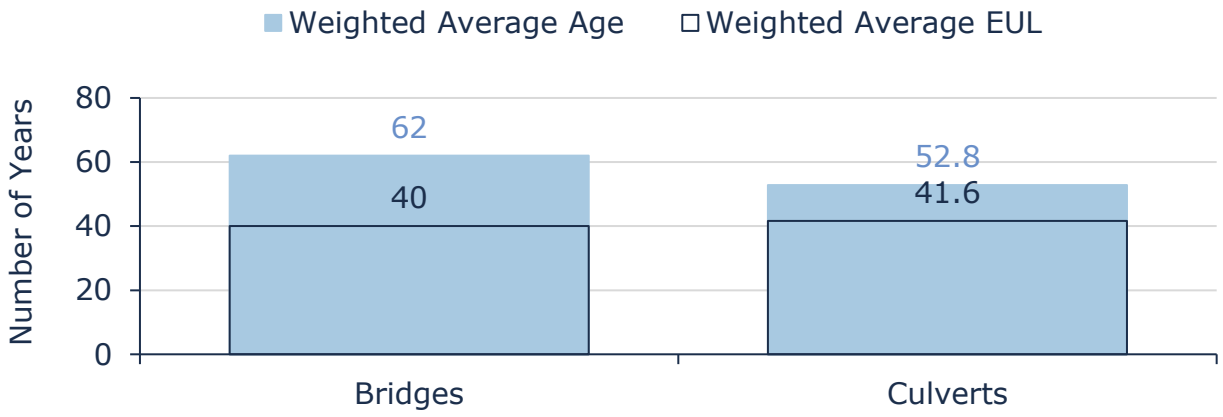
Asset Condition & Age

The average condition (%) is a weighted value based on replacement cost. The graph below visually illustrates the average condition for each asset segment on a very good to very poor.



	Culverts	Bridges
Very Good	$4.8m	
Good	$39.3m	$13.5m
Fair	$5.6m	$3.9m
Poor	$840k	$1.0m
Very Poor	$350k	$767k

To ensure that the Township's bridges and 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 supports more accurate estimation of asset's remaining service life of assets which assists with effective capital planning. Each year condition assessments of half of all the bridges and culverts with a span greater than or equal to 3 meters are completed. This ensures that each bridge and

culvert asset is assessed every 2 years in accordance with the Ontario Structure Inspection Manual (OSIM).

Staff visually inspect bridges and culverts on a regular basis, between OSIM inspections, to ensure that the assets are structurally and functionally sound.

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	75-100
Good	70-75
Fair	60-70
Poor	50-60
Very Poor	0-49

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 residents, it is important to establish a lifecycle management strategy to proactively manage asset deterioration.

Activity Type	Description of Current Strategy
Maintenance, Rehabilitation & Replacement	All lifecycle activities are driven by the results of mandated structural inspections completed according to the Ontario Structure Inspection Manual (OSIM). This includes recommended rehabilitations projects. Report recommendations are appended to assets in the asset management software and represented in this report's findings.
Rehabilitation	Data, including recommended rehabilitation activities, dates, and estimated costs, in this report is as per OSIM

Risk & Criticality

The following risk breakdown 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 2024 inventory data.

1 - 4 Very Low	5 - 7 Low	8 - 9 Moderate	10 - 14 High	15 - 25 Very High
- (0%)	$9,700,000 (14%)	$100,000 (<1%)	$4,020,000 (6%)	$56,295,721 (80%)

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 stormwater network are documented below:

Probability of Failure (PoF)	Consequence of Failure (CoF)
Condition (80%)	Replacement Cost (100%)
% Service life remaining (20%)	

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.

Levels of Service

The framework created by the Township for levels of service is a valuable tool for assessing and managing the performance of their assets and/or services provided by their assets. Proposed levels of service for the Township have been developed through engagement with Township staff.

Current 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 LOS		Service Attribute	Technical LOS	
Description of the traffic that is supported by municipal bridges (e.g., heavy transport vehicles, motor vehicles, emergency vehicles, pedestrians, cyclists).	Bridges and structural culverts are a key component of the municipal transportation network. Only a few 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.	Scope	Replacement Cost	$70,115,721
			Quantity (Bridges)	20
			Quantity (Structural Culverts)	71
			% of bridges in the Municipality with loading or dimensional restrictions	20%
Description or images of the condition of bridges & culverts and how this would affect the use of the bridges & culverts	Every structure is given a condition rating from 0-100 Very Good (75-100 Good (70-75) Fair (60-70) Poor (50-60) Very Poor (0-50)	Quality / Reliability	Average bridge condition index value for bridges in the Municipality	Fair (56%)
			Average bridge condition index value for structural culverts in the Municipality	Good (64%)
			% Condition > Fair	62%
			% Condition poor and very poor	38%
General	Services will be provided to ensure long-term sustainability for the Municipality	Sustainable	% Risk that is High and Very High	86%
			Annual reinvestment	$52,000
			Capital reinvestment rate	0.07%

Proposed Levels of Service

The scenarios that were used to analyse the Township of Hamilton inventory were run for 100-years to ensure all the lifecycles were included at least once. They are also all based on the data available in the asset management system which outlines estimated useful life and condition as well as replacement costs which all the results are based on.

Scenario 1: Current Lifecycle Activities - this scenario utilizes the current lifecycle activities outlined as current practice within each asset category. The condition and annual investment were then determined.

Scenario 2: Current Capital Reinvestment Rate - this scenario utilizes the current capital reinvestment within each asset category. The current annual investment was held, and the condition was determined.

The table below outlines the results for each scenario for the bridges and culverts.

Scenarios	Replacement Cost	Average Condition	Annual Capital Reinvestment
Scenario 1 – Lifecycle*	$70,115,721	Very Good (84%)	$1,725,826
Scenario 2 - Current Capital Investment Rate*	$70,115,721	Very Poor (3%)	$52,000

10-Year Capital Forecast

Below is the projected ten-year capital forecast needed to maintain the bridges & culverts.

Segments	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034
Bridges & Culverts	$300k	$1.3m	-	$1.3m	-	$1.0m	-	$1.0m	-	$1.1m

Appendix C: Stormwater Network

The Township is responsible for the operations and capital upkeep of the stormwater network which consists of storm mains, manholes, catch basins, and storm structures (storm management ponds, oil grit separators, and storm drains).

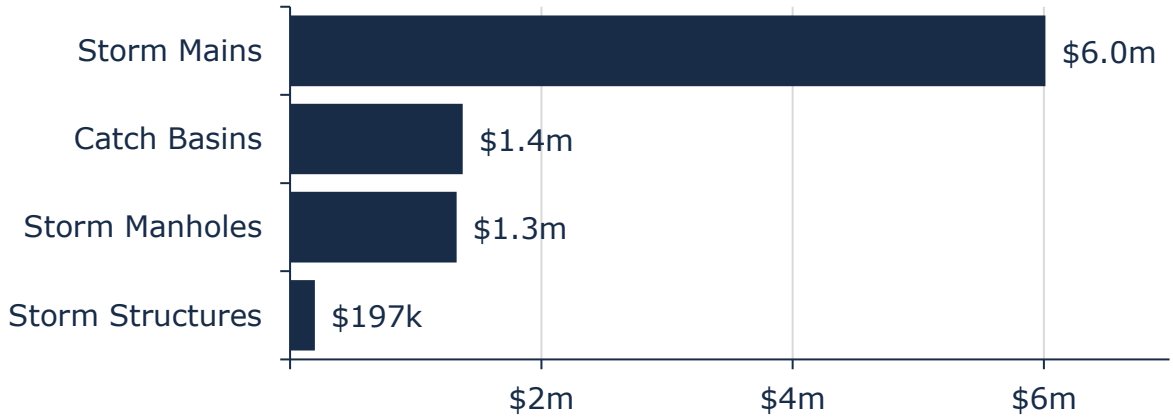
Storm structure mostly consists of storm-ceptors which are used to capture trash, debris, oils, and suspended solids from storm runoff. Staff are working towards improving the accuracy and reliability of their stormwater network asset information to improve long-term asset management planning.

The stormwater network has 5% of the assets condition assessed and the remainder is utilizing age-based condition.

Asset Inventory & Costs

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

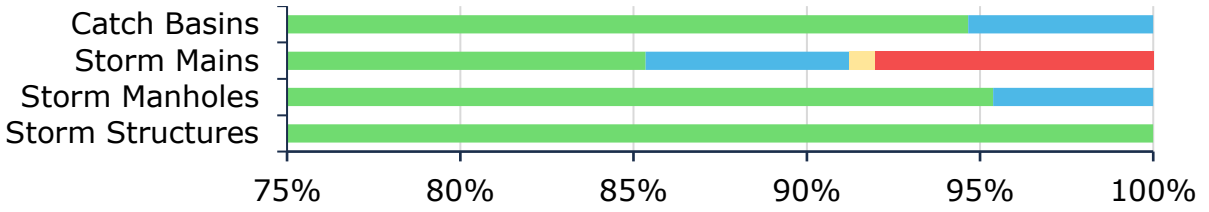
Asset Segment	Quantity	Replacement Cost
Catch Basins	316	$1,374,720
Storm Mains	15,661m	$6,012,603
Storm Manholes	173	$1,324,661
Storm Structures	4	$196,724
Total		**$8,908,708**



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

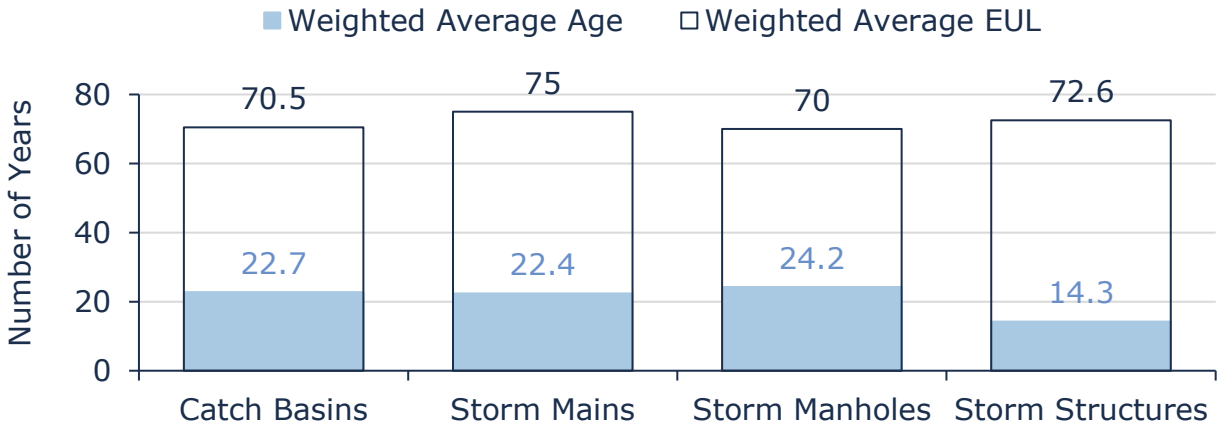
Asset Condition & Age

The average condition (%) is a weighted value based on replacement cost. The graph below visually illustrates the average condition for each asset segment on a very good to very poor.



	Storm Structures	Storm Manholes	Storm Mains	Catch Basins
Very Good	$197k	$1.3m	$5.1m	$1.3m
Good		$61k	$354k	$73k
Fair			$44k	
Poor				
Very Poor			$483k	

To ensure that the Township's stormwater 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 stormwater network.



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

Current Approach to Condition Assessment

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

- There are no formal condition assessment programs in place for the stormwater network
- As the Township refines the available asset inventory for the stormwater network a regular assessment cycle should be established

The following rating criteria is used to determine the current condition of storm water 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

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 residents, it is important to establish a lifecycle management strategy to proactively manage asset deterioration. The following table outlines the Township's current lifecycle management strategy.

Activity Type	Description of Current Strategy
Maintenance	Primary maintenance activities include catch basin cleaning and stormwater flushing. Staff are in the process of developing a dedicated program for their preventative maintenance and have recently increased their operating budget to do so effectively.
	Closed Circuit Television Video (CCTV) inspections are completed on a project-by-project basis, and the information from those inspections is used to drive capital plans.
	Storm structures such as stormwater management ponds undergo regular maintenance activities such as debris removal and clearing of vegetation.
Rehabilitation/ Replacement	Staff are currently in the process of developing a Stormwater Master Plan (for the Baltimore area) to identify flow patterns, drainage issues, and capacity issues.
	Stormwater mains are typically replaced/reconstructed at end-of-life and/or in coordination with other asset replacements (road, water). Trenchless relining has not been a viable option for stormwater mains in the past.

Risk & Criticality

The following risk breakdown 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 2024 inventory data.

1 - 4 Very Low	5 - 7 Low	8 - 9 Moderate	10 - 14 High	15 - 25 Very High
$6,993,572 (79%)	$1,515,898 (17%)	$145,018 (2%)	$224,449 (3%)	$29,772 (<1%)

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 stormwater network are documented below:

Storm Mains

Probability of Failure (PoF)	Consequence of Failure (CoF)
Condition (50%)	Diameter (80%)
% Service life remaining (50%)	Asset Material (20%)

Non-Linear

Probability of Failure (PoF)	Consequence of Failure (CoF)
Condition (50%)	Replacement Cost (100%)
% Service life remaining (50%)	

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

Levels of Service

The framework created by the Township for levels of service is a valuable tool for assessing and managing the performance of their assets and/or services provided by their assets. Proposed levels of service for the Township have been developed through engagement with Township staff.

Current Levels of Service

The following table identify the Township's current level of service for the stormwater 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.

Community LOS		Service Attribute	Technical LOS	
Description, which may include map, of the user groups or areas of the municipality that are protected from flooding, including the extent of protection provided by the municipal storm sewer system	Most of the Township's landscape is comprised of rural countryside and agricultural land where stormwater runoff is conveyed through a series of rural ditches and culverts. Urban developments include commercial, industrial, and residential areas that are designed with an urban road right-of-way cross section and may be serviced by storm sewers and facilities.	Scope	Replacement Cost	$8,908,708
			Quantity (Meters of main)	15,661m
			% of properties in municipality resilient to a 100-year storm	TBD
			% of the municipal storm sewer management system resilient to a 5-year storm	20%
Description of the condition of the storm network	Condition Description • Very Good - Fit for the future • Good - Adequate for now • Fair - Requires attention • Poor - Increased potential of affecting service • Very Poor - Unfit for sustained service	Quality / Reliability	Average Condition	Very Good (88%)
			% Condition > Fair	95%
			% Condition poor and very poor	5%
General	Services will be provided to ensure long-term sustainability for the Municipality	Sustainable	% Risk that is High and Very High	3%
			Annual reinvestment	$40,500
			Capital reinvestment rate	0.45%

Proposed Levels of Service

The scenarios that were used to analyse Hamilton inventory were run for 100-years to ensure all the lifecycles were included at least once. They are also all based on the data available in the asset management system which outlines estimated useful life and condition as well as replacement costs which all the results are based on.

Scenario 1: Current Lifecycle Activities - this scenario utilizes the current lifecycle activities outlined as current practice within each asset category. The condition and annual investment were then determined.

Scenario 2: Current Capital Reinvestment Rate - this scenario utilizes the current capital reinvestment within each asset category. The current annual investment was held, and the condition was determined.

The table below outlines the results for each scenario for the Stormwater Network.

Scenarios	Replacement Cost	Average Condition	Annual Capital Reinvestment
Scenario 1 – Lifecycle	$8,908,708	Good (79%)	$147,890
Scenario 2 - Current Capital Investment Rate	$8,908,708	Fair (52%)	$40,500

10-Year Capital Forecast

Below is the projected ten-year capital forecast needed to maintain the stormwater network.

Segments	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034
Stormwater Network	$204k	$30k	$50k	$145k	$60k	$50k	$50k	$50k	$50k	-

Appendix D: Facilities

The Township is responsible for the operations and capital upkeep of several facilities used both for municipal operations and public services. Facilities include:

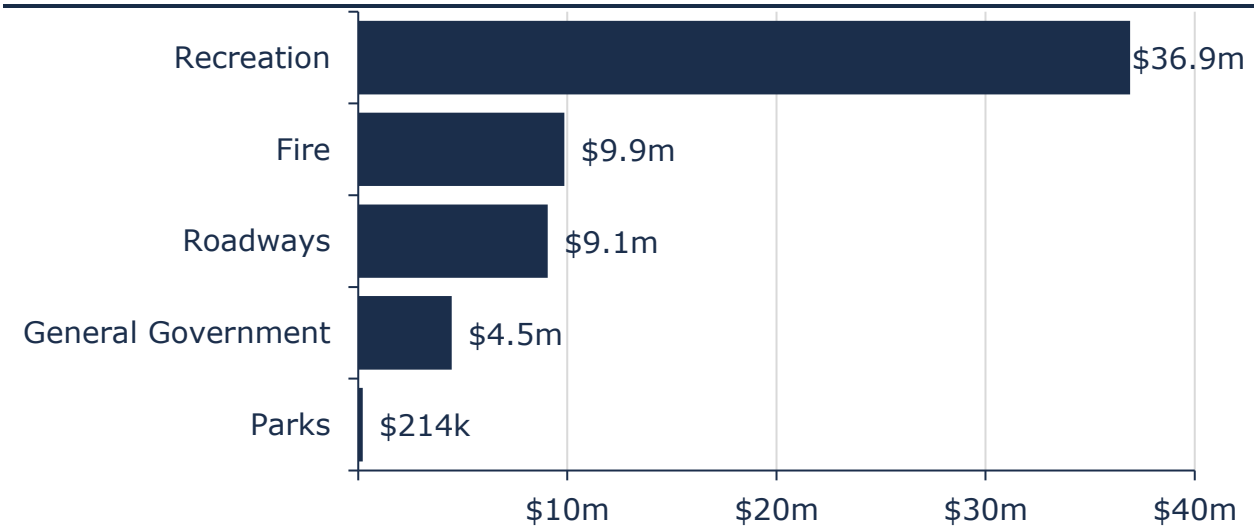
- Fire
- General Government
- Parks
- Recreation
- Roadways

The facilities have 94% of the assets condition assessed and the remainder is age-based condition.

Asset Inventory & Costs

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

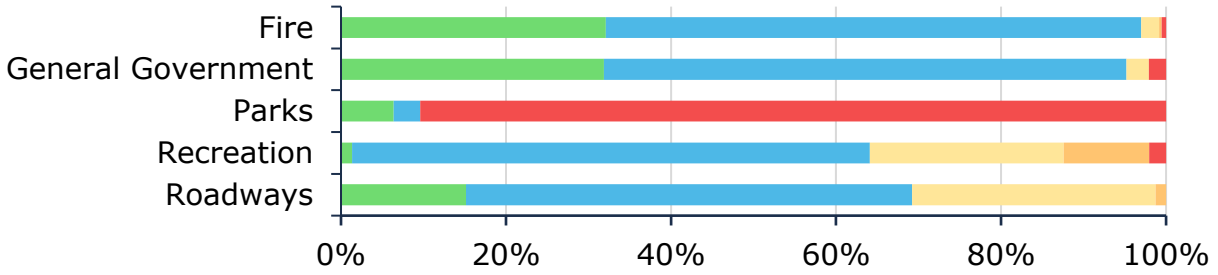
Asset Segment	Quantity	Replacement Cost
Fire	5	$9,860,860
General Government	1	$4,473,580
Parks	1	$213,816
Recreation	5	$36,913,069
Roadways	4	$9,057,776
Total		**$60,519,101**



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

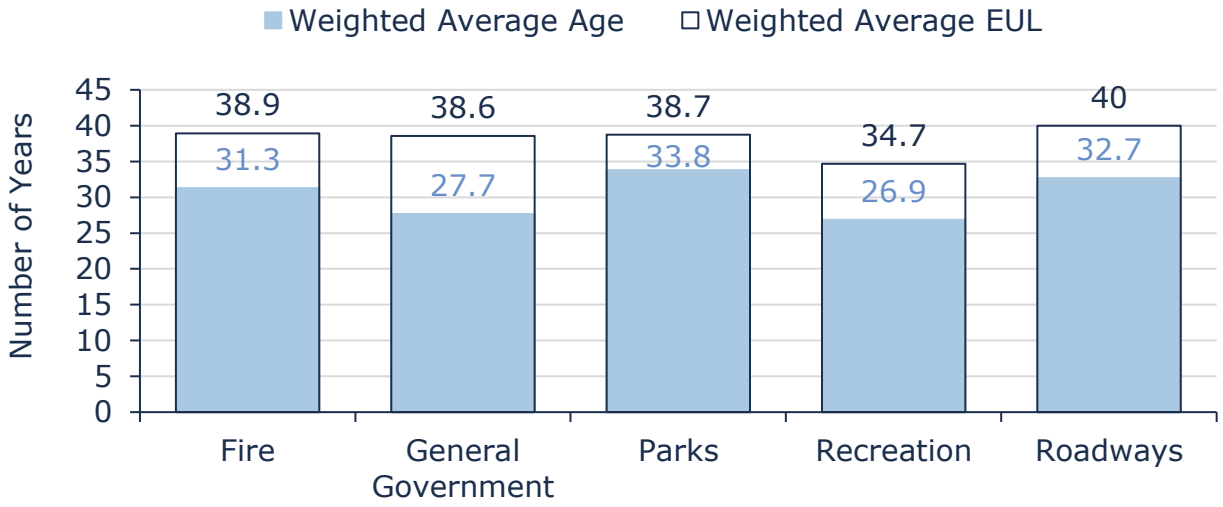
Asset Condition & Age

The average condition (%) is a weighted value based on replacement cost. The graph below visually illustrates the average condition for each asset segment on a very good to very poor.



	Roadways	Recreation	Parks	General Government	Fire
Very Good	$1.4m	$500k	$14k	$1.4m	$3.2m
Good	$4.9m	$23.2m	$7k	$2.8m	$6.4m
Fair	$2.7m	$8.7m		$122k	$213k
Poor	$114k	$3.8m			$31k
Very Poor		$752k	$193k	$93k	$53k

To ensure that the Township's facilities 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 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 more confidently determine the remaining service life of assets and identify the most cost-effective approach to managing assets.

There are no formal condition assessment programs in place for facilities. The following rating criteria is used to determine the current condition of facilities assets and forecast future capital requirements:

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

Asset Management Strategies

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 residents, it is important to establish a lifecycle management strategy to proactively manage asset deterioration. The following table outlines the Township's current lifecycle management strategy.

Event Class	Description
Maintenance & Testing	Heating Ventilation and Air Conditioning (HVAC) units across the Township's facilities are inspected quarterly by Carmichael Engineering. Identified deficiencies are detailed in reports to the Township.
	Elevators across the Townships facilities are inspected semi-annually by Bruce Elevators and annually by the Technical Standards and Safety Association (TSSA). Bruce Elevators provides inspection reports which identify any found deficiencies and recommendations for their remediation.
	Fire Alarms and sprinklers are regularly inspected and tested.
Rehabilitation	The Township's Accessibility Advisory Committee submits accessibility concerns and related improvement requests to the Township. These are reviewed and actioned as appropriate and feasible.
Replacement	Within each Facility there are a variety of building components (i.e., windows, doors, roofs) which require replacement at different times due to varying in-service dates and estimated useful lives. When determining if replacement is appropriate, staff consider the asset's risk to occupant health and safety, legislative compliance, cost, and construction feasibility of rehabilitation as an alternative, and cost of replacement. Most capital replacement projects are planned one year in advance. Capital budgets are determined annually.

Risk & Criticality

The following risk breakdown 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 2024 inventory data.

1 - 4	5 - 7	8 - 9	10 - 14	15 - 25
Very Low	**Low**	**Moderate**	**High**	**Very High**
$3,846,647	$26,057,383	$17,545,875	$8,100,359	$4,968,837
(6%)	(43%)	(29%)	(13%)	(8%)

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 stormwater network are documented below:

Probability of Failure (PoF)	Consequence of Failure (CoF)
Condition (50%)	Replacement Cost (80%)
% Service life remaining (50%)	Function 51A (20%)

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.

Levels of Service

The framework created by the Township for levels of service is a valuable tool for assessing and managing the performance of their assets and/or services provided by their assets. Proposed levels of service for the Township have been developed through engagement with Township staff.

Current Levels of Service

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

Community LOS		Service Attribute	Technical LOS	
Description of the services provided by municipal buildings	Services provided by municipal facilities are based on the types of facilities outlined below: Fire General Government Parks Recreation Roadways	Scope	Replacement Cost	$58,485,811
			Average Age	30.5
			Average EUL	38.2
			Quantity (#of facilities)	16
Description of the condition of municipal buildings	Condition Description • Very Good - Fit for the future • Good - Adequate for now • Fair - Requires attention • Poor - Increased potential of affecting service • Very Poor - Unfit for sustained service	Quality / Reliability	Average Condition	Good (65%)
			% Condition > Fair	92%
			% Condition poor and very poor	8%
General	Services will be provided to ensure long-term sustainability for the Municipality	Sustainable	% Risk that is High and Very High	21%
			Annual reinvestment	$166,000
			Capital reinvestment rate	0.28%

Proposed Levels of Service

The scenarios that were used to analyse The Township of Hamilton's inventory were run for 100-years to ensure all the lifecycles were included at least once. They are also all based on the data available in the asset management system which outlines estimated useful life and condition as well as replacement costs which all the results are based on.

Scenario 1: Current Lifecycle Activities - this scenario utilizes the current lifecycle activities outlined as current practice within each asset category. The condition and annual investment were then determined.

Scenario 2: Current Capital Reinvestment Rate - this scenario utilizes the current capital reinvestment within each asset category. The current annual investment was held, and the condition was determined.

The table below outlines the results for each scenario for the municipal facilities.

Scenarios	Replacement Cost	Average Condition	Annual Capital Reinvestment
Scenario 1 – Lifecycle	$58,485,811	Very Good (85%)	$1,777,343
Scenario 2 - Current Capital Investment Rate	$58,485,811	Very Poor (5%)	$166,000

10-Year Capital Forecast

There are no capital requirements in projected ten-year capital forecast needed to maintain the facilities at a condition greater than fair.

Segments	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034
Facilities	$15k	$405k	$50k	$125k	$110k	$100k	$150k	$100k	$50k	$115k

Appendix E: Fleet & Fleet Equipment

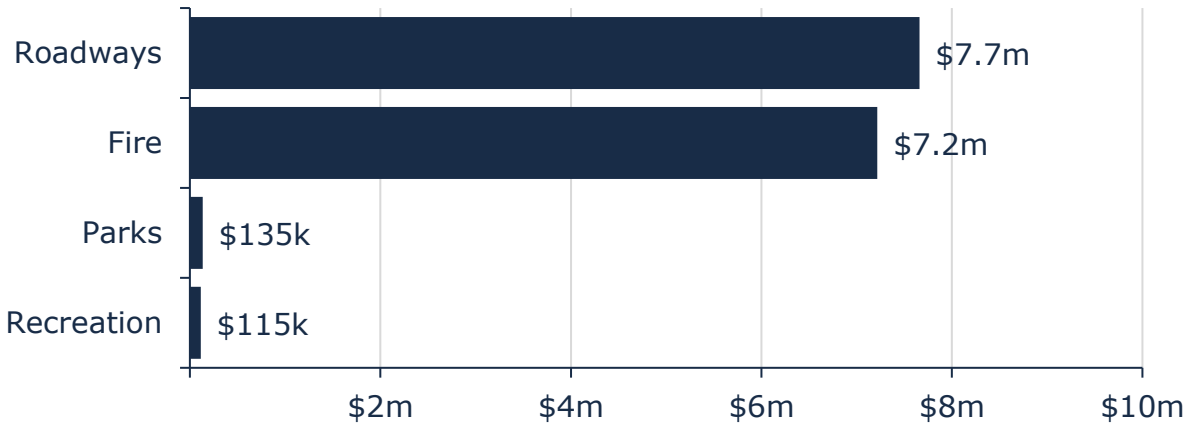
The Township owns a variety of fleet and fleet equipment assets that are central to the Townships daily operations. For reporting purposes these assets have been segmented based on similar function.

The fleet and fleet equipment has 84% of the assets condition assessed and the remainder uses age-based condition.

Asset Inventory & Costs

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

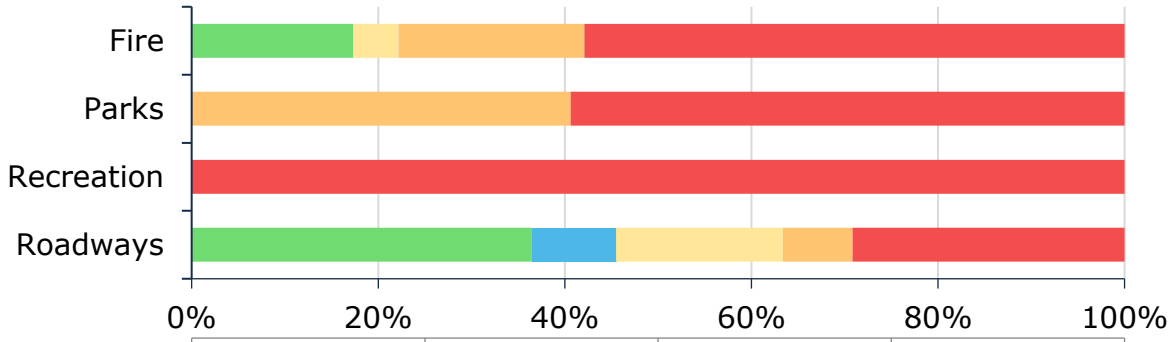
Asset Segment	Quantity	Replacement Cost
Fire	17	$7,217,441
Parks	2	$134,760
Recreation	3	$115,000
Roadways	33	$7,658,330
		$15,125,531



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

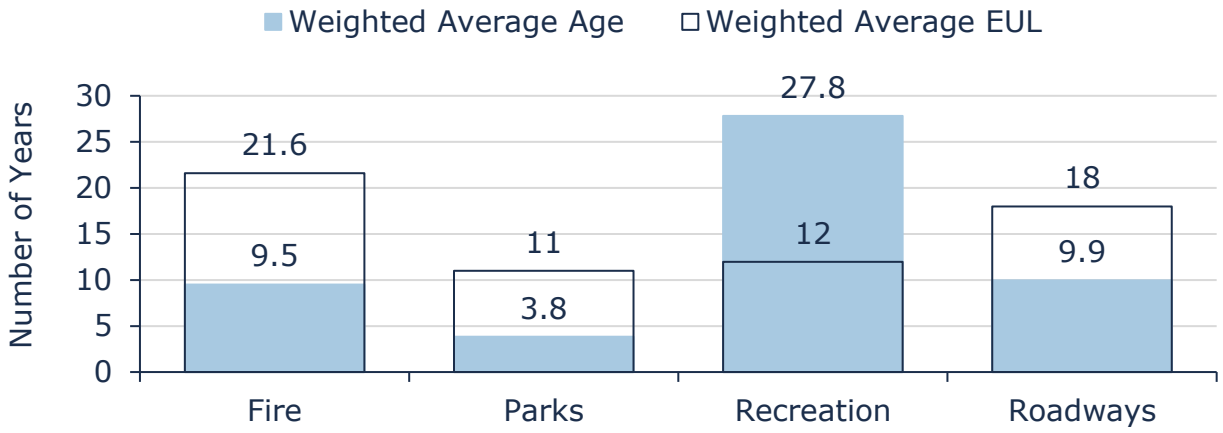
Asset Condition & Age

The average condition (%) is a weighted value based on replacement cost. The graph below visually illustrates the average condition for each asset segment on a very good to very poor scale.



	Roadways	Recreation	Parks	Fire
Very Good	$2.8m			$1.3m
Good	$690k			
Fair	$1.4m			$350k
Poor	$573k		$55k	$1.4m
Very Poor	$2.2m	$115k	$80k	$4.2m

To ensure that the Township's Fleet & Fleet Equipment 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 Fleet & Fleet 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 more confidently determine the remaining service life of assets and identify the most cost-effective approach to managing assets. There are no formal condition assessment programs in place for the Fleet & Fleet Equipment assets.

The following rating criteria is used to determine the current condition of Fleet & Fleet Equipment assets and forecast future capital requirements:

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

Asset Management Strategies

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 residents, it is important to establish a lifecycle management strategy to proactively manage asset deterioration. The following table outlines the Township's current lifecycle management strategy.

Event Class	Description
Maintenance & Inspection	A staff mechanic completes regular maintenance and inspection for the Township's fleet and fleet equipment assets. Maintenance schedules are as per manufacturer's recommendations with additional maintenance completed as needed based on mileage or hours of use.
	The Township's mechanic completes annual safety as required by the Ministry of Transportation of Ontario (MTO).
	All work is completed by the Township's staff mechanic unless the work is covered under warranty.
	Assets are reviewed for condition on a regular basis and for the purpose of asset management reporting.
Fire Fleet Maintenance & Inspection	Maintenance requirements for fire fleet assets are most often based on the National Fire Protection Association (NFPA) requirements.
	A staff mechanic completes regular maintenance and inspection for the Township's fire fleet and equipment assets that are not considered an emergency vehicle.
Rehabilitation	Rehabilitations are considered on a case-by-case basis; generally fleet assets are infrequently rehabilitated.
Replacement	Replacement decisions consider the asset's age, condition, and maintenance cost and history (i.e., if there is a trend of increasing maintenance).
	Replacement also considers the utility of the existing asset against the utility of potential replacements. For example, if a new fleet asset has multiple functions and can thereby replace multiple existing assets, replacement may be favourable even if the existing assets are functional.

Event Class	Description
Fire Fleet Replacement	The replacement of fire fleet and fleet equipment assets is a two-step consideration process. First, it is determined if the asset is governed by NFPA (1) and if so when replacement is required. Next, for assets not governed by NFPA or for assets not yet at the NFPA required replacement date staff review the decision matrix which assesses the following: • Asset condition: Asset is deemed good (no immediate investment required), repair (immediate investment needed), or replace (asset reliability may be low; replacement is needed) • Asset Type: criticality to provision of protective services • Redundancy: Availability of back-up assets in the event of failure of the primary asset. • Trade in Value: Value expected upon trade-in of the existing asset. • Delivery time: expected time for the delivery of a replacement of the subject asset.

Risk & Criticality

The following risk breakdown 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 2024 inventory data.

1 - 4 Very Low	5 - 7 Low	8 - 9 Moderate	10 - 14 High	15 - 25 Very High
$3,206,628 (21%)	$2,320,760 (15%)	$1,090,702 (7%)	$2,799,441 (19%)	$5,708,000 (38%)

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 fleet and fleet equipment are documented below:

Probability of Failure (PoF)	Consequence of Failure (CoF)
Condition (50%)	Replacement Cost (80%)
% Service life remaining (50%)	Segment (20%)

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.

Levels of Service

The framework created by the Township for levels of service is a valuable tool for assessing and managing the performance of their assets and/or services provided by their assets. Proposed levels of service for the Township have been developed through engagement with Township staff.

Current Levels of Service

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

Community LOS		Service Attribute	Technical LOS	
Description of the services provided by municipal vehicles	Service provided by municipal vehicles are based on the assets outlined below: Fire Parks Recreation Roadways	Scope	Replacement Cost	$15,125,531
			Average Age	12.8
			Average EUL	15.7
			Quantity (assets)	55
Description of the condition of fleet and fleet equipment	Condition Description • Very Good - Fit for the future • Good - Adequate for now • Fair - Requires attention • Poor - Increased potential of affecting service • Very Poor - Unfit for sustained service	Quality / Reliability	Average Condition	Fair (40%)
			% Condition > Fair	43%
			% Condition poor and very poor	57%
General	Services will be provided to ensure long-term sustainability for the Municipality	Sustainable	% Risk that is High and Very High	57%
			Annual reinvestment	$424,324
			Capital reinvestment rate	2.81%

Proposed Levels of Service

The scenarios that were used to analyse The Township of Hamilton's inventory were run for 100-years to ensure all the lifecycles were included at least once. They are also all based on the data available in the asset management system which outlines estimated useful life and condition as well as replacement costs which all the results are based on.

Scenario 1: Current Lifecycle Activities - this scenario utilizes the current lifecycle activities outlined as current practice within each asset category. The condition and annual investment were then determined.

Scenario 2: Current Capital Reinvestment Rate - this scenario utilizes the current capital reinvestment within each asset category. The current annual investment was held, and the condition was determined.

The table below outlines the results for each scenario for the municipal Fleet & Fleet Equipment.

Scenarios	Replacement Cost	Average Condition	Annual Capital Reinvestment
Scenario 1 – Lifecycle	$15,125,531	Very Good (80%)	$821,176
Scenario 2 - Current Capital Investment Rate	$15,125,531	Poor (32%)	$424,324

10-Year Capital Forecast

There are no capital requirements in the projected ten-year capital forecast needed to maintain the municipal Fleet & Fleet Equipment.

Segments	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034
Fleet & Fleet Equipment	$867k	$685k	$601k	$746k	$1.0m	$713k	$668k	$1.6m	$1.3m	$1.2m

Appendix F: Machinery & Equipment

Machinery and equipment assets are diverse and serve various functions to the Municipality.

The following segments are within the machinery and equipment category, and can be defined as follows:

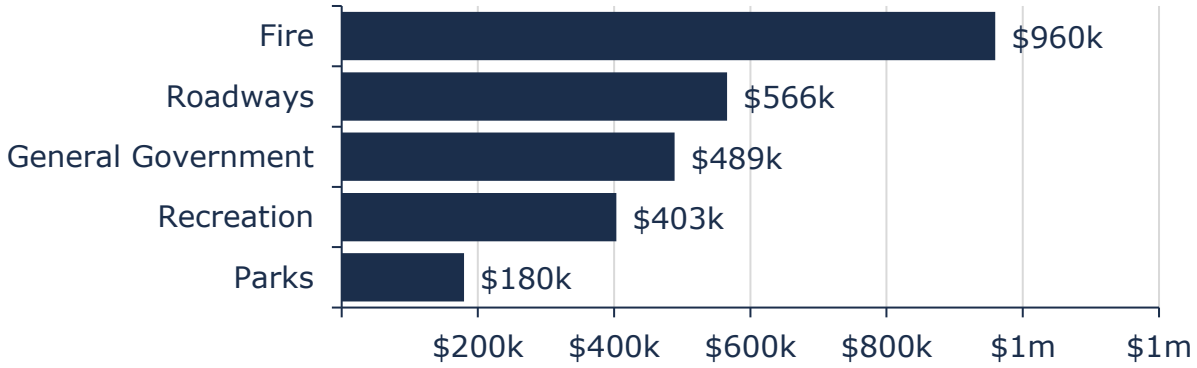
- General Government: software and hardware (i.e., tablets, communications) used to support the Township's operations.
- Parks: various equipment to maintain parks (i.e., lawn mowers)
- Recreation: a diverse array of assets including security systems, and re-fueling systems used to support the operational of recreation programs and infrastructure.
- Roadways: primarily larger machinery and equipment assets including fuel management system and water tanks that serve important functions to daily road operations.
- Fire: Various equipment used to protect employees from fire dangers and to assist in emergency response.

The machinery and equipment have 77% of the assets condition assessed and the remainder utilizes age-based condition.

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.

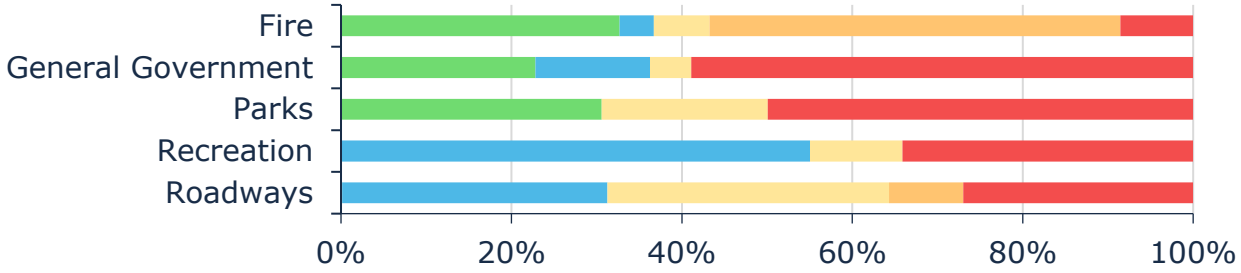
Asset Segment	Quantity	Replacement Cost
Fire	60	$959,608
General Government	16	$488,832
Parks	5	$179,760
Recreation	253	$403,233
Roadways	27	$565,776
Total		**$2,597,209**



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

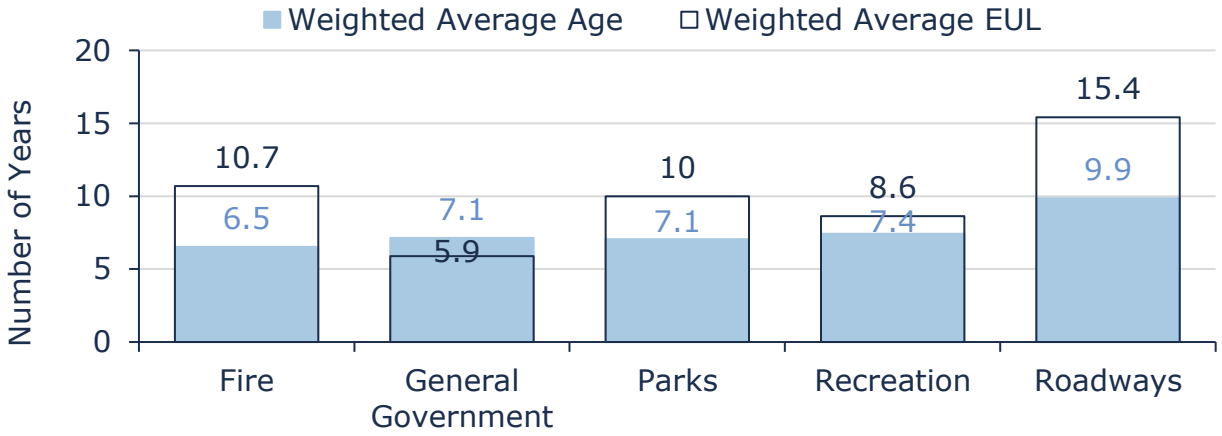
Asset Condition & Age

The average condition (%) is a weighted value based on replacement cost. The graph below visually illustrates the average condition for each asset segment on a very good to very poor.



	Roadways	Recreation	Parks	General Government	Fire
Very Good			$55k	$112k	$314k
Good	$176k	$222k		$66k	$38k
Fair	$187k	$44k	$35k	$24k	$63k
Poor	$49k				$463k
Very Poor	$153k	$138k	$90k	$288k	$82k

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. The graph below displays the average weighted age in comparison to the weighted average estimated useful life for each asset segment.



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 more confidently determine the remaining service life of assets and identify the most cost-effective approach to managing assets. There are no formal condition assessment programs in place for the machinery and equipment. The following rating criteria is used to determine the current condition of machinery and equipment assets and forecast future capital requirements:

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

Asset Management Strategies

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 residents, it is important to establish a lifecycle management strategy to proactively manage asset deterioration. The following table outlines the Township's current lifecycle management strategy.

Event Class	Description
Maintenance & Inspection	The Township's staff complete basic maintenance and inspection on small machinery and equipment assets. .
	An external contractor is used to service ice resurfaces, tractors, and lawn mowers.
	The operating budget for machinery and equipment assets is departmentally based.
	There are no formal maintenance or rehab programs currently in place for IT equipment. However, lower-requirement, older assets are re-assigned where appropriate when upgrades occur
Fire Machinery & Equipment Maintenance & Inspection	Maintenance requirements for fire machinery and equipment assets are most often based on the National Fire Protection Association (NFPA) requirements.
	Self-contained breathing apparatus (SCBA) equipment, thermal imaging equipment, water storage, and jaws of life assets are tested for performance by a third party.
Replacement	The annual capital budget for machinery and equipment assets varies by year based on departmentally identified capital needs.
	Asset replacement decisions primarily consider asset condition and criticality.
	Considerations for replacing IT equipment include age, compatibility with the current environment, possible future need, cost/benefit ratio, and current standards.

Event Class	Description
	For IT assets, the Township is planning to move to a 3-year replacement schedule where devices are replaced as the typical 3-year warranty expires.
Fire Replacement	Replacement decisions consider anticipated expected life of each asset, performance trends from annual testing, and the cost effectiveness of repairing an asset or replacing it.
	Generally, all assets are retained if they meet NFPA regulations and/or pass annual testing.

Risk & Criticality

The following risk breakdown 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 2024 inventory data.

1 - 4	5 - 7	8 - 9	10 - 14	15 - 25
Very Low	**Low**	**Moderate**	**High**	**Very High**
$1,203,091	$494,665	$196,680	$426,167	$276,606
(46%)	(19%)	(8%)	(16%)	(11%)

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 machinery and equipment assets are documented below:

Probability of Failure (PoF)	Consequence of Failure (CoF)
Condition (50%)	Replacement Cost (80%)
% Service life remaining (50%)	Segment (20%)

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.

Levels of Service

The framework created by the Township for levels of service is a valuable tool for assessing and managing the performance of their assets and/or services provided by their assets. Proposed levels of service for the Township have been developed through engagement with Township staff.

Current Levels of Service

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

Community LOS		Service Attribute	Technical LOS	
Description of the services provided by machinery and equipment	Service provided by municipal machinery & equipment are based on the assets outlined below: Fire General Government Parks Recreation Roadways	Scope	Replacement Cost	$2,597,209
			Average Age	7.6
			Average EUL	10.1
			Quantity (assets)	361
Description of the condition of machinery and equipment	Condition Description • Very Good - Fit for the future • Good - Adequate for now • Fair - Requires attention • Poor - Increased potential of affecting service • Very Poor - Unfit for sustained service	Quality / Reliability	Average Condition	Fair (43%)
			% Condition > Fair	46%
			% Condition poor and very poor	35%
General	Services will be provided to ensure long-term sustainability for the Municipality	Sustainable	% Risk that is High and Very High	27%
			Annual reinvestment	$163,376
			Capital reinvestment rate	6.29%

Proposed Levels of Service

The scenarios that were used to analyse The Township of Hamilton's inventory were run for 100-years to ensure all the lifecycles were included at least once. They are also all based on the data available in the asset management system which outlines estimated useful life and condition as well as replacement costs which all the results are based on.

Scenario 1: Current Lifecycle Activities - this scenario utilizes the current lifecycle activities outlined as current practice within each asset category. The condition and annual investment were then determined.

Scenario 2: Current Capital Reinvestment Rate - this scenario utilizes the current capital reinvestment within each asset category. The current annual investment was held, and the condition was determined.

The table below outlines the results for each scenario for the machinery & equipment assets.

Scenarios	Replacement Cost	Average Condition	Annual Capital Reinvestment
Scenario 1 – Lifecycle	$2,597,209	Very Good (85%)	$308,691
Scenario 2 - Current Capital Investment Rate	$2,597,209	Fair (33%)	$163,376

10-Year Capital Forecast

Below is the projected ten-year capital forecast needed to maintain the machinery & equipment at a condition greater than fair.

Segments	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034
Machinery & Equipment	$46k	$111k	$200k	$42k	$139k	$30k	$37k	$38k	$32k	$168k

Appendix G: Land Improvements

The Township is responsible for the operations and capital upkeep of a diverse array of land improvement assets.

For reporting purposes these assets have been segmented based on similar function. These segments, and examples of common assets included in them, is detailed below:

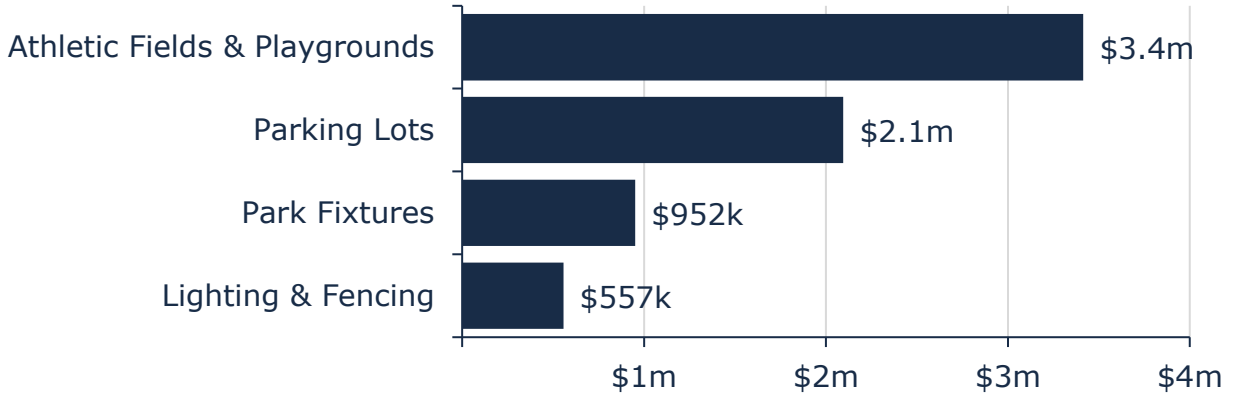
- Athletic Fields & Playgrounds: outdoor playgrounds and play equipment, outdoor playing courts and fields.
- Lighting & Fencing: outdoor lighting
- Park Fixtures: benches, picnic tables, waste receptables, boardwalk and retaining walls.
- Parking Lots: parking lots associated with buildings and parks.

The land improvements have 89% of the assets condition assessed and the remainder are age-based condition.

Asset Inventory & Costs

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

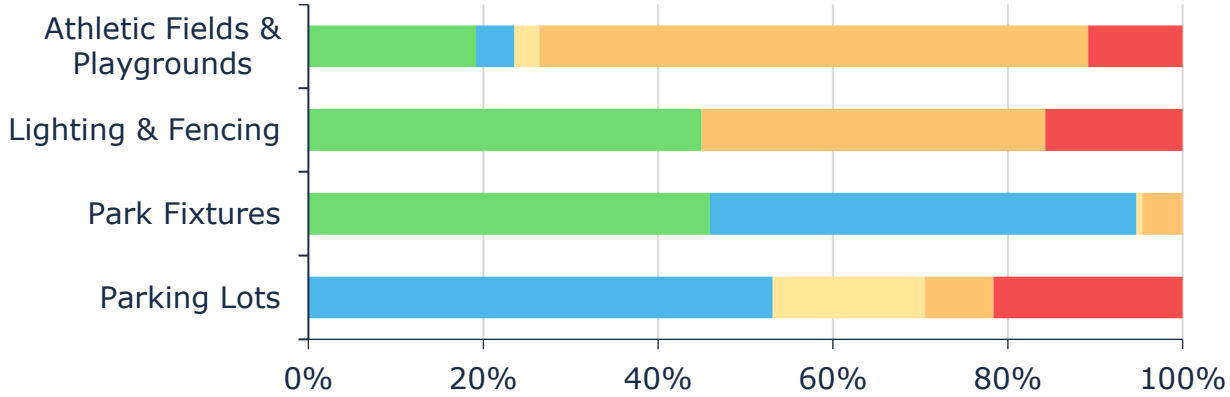
Asset Segment	Quantity	Replacement Cost
Athletic Fields & Playgrounds	8	$3,414,530
Lighting & Fencing	9	$557,462
Park Fixtures	100	$951,854
Parking Lots	11	$2,095,264
Total		**$7,019,110**



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

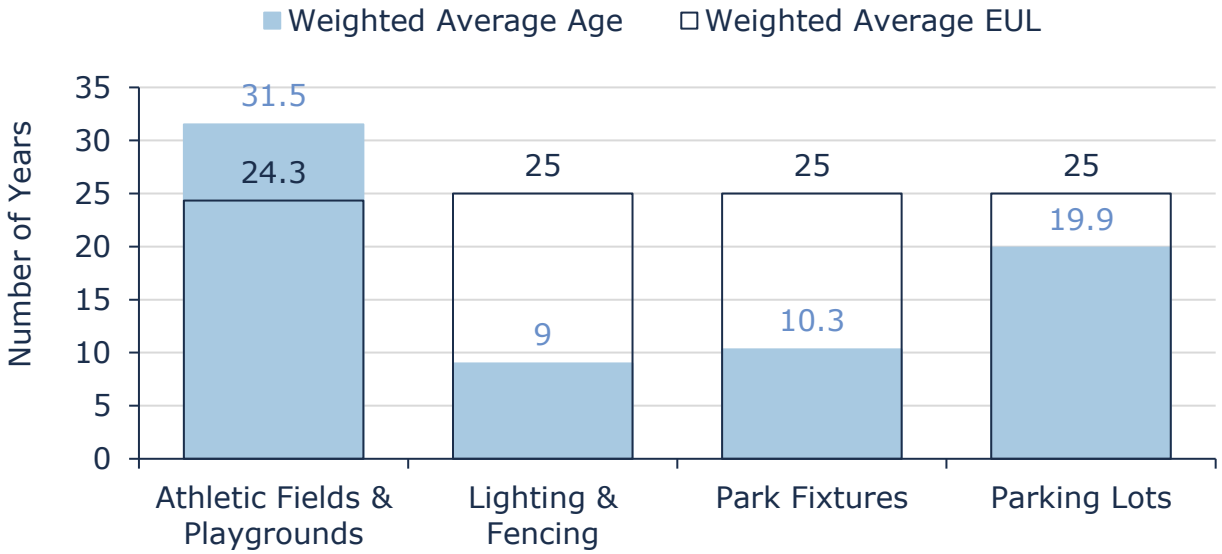
Asset Condition & Age

The average condition (%) is a weighted value based on replacement cost. The graph below visually illustrates the average condition for each asset segment on a very good to very poor.



	Parking Lots	Park Fixtures	Lighting & Fencing	Athletic Fields & Playgrounds
Very Good		$437k	$251k	$655k
Good	$1.1m	$464k		$150k
Fair	$364k	$7k		$98k
Poor	$165k	$44k	$219k	$2.1m
Very Poor	$454k		$88k	$369k

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. The graph below displays the average weighted age in comparison to the weighted average estimated useful life for each asset segment.



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

The Townships playgrounds are inspected monthly by a Canadian Standards Act (CSA) certified staff member. Inspections focus on safety and were last completed in August 2022. Identified safety issues are repaired by Parks and Recreation staff.

While land improvement assets are monitored except for playgrounds there are no formal condition assessment programs in place. Staff mostly rely on age to determine a proxy of condition. The following rating criteria is used to determine the current condition of land improvement assets and forecast future capital requirements:

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

Asset Management Strategies

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 residents, it is important to establish a lifecycle management strategy to proactively manage asset deterioration. The following table outlines the Township's current lifecycle management strategy.

Event Class	Description
Maintenance & Inspection	The Townships playgrounds are inspected monthly by a Canadian Standards Act (CSA) certified staff member. Inspections focus on safety and were last completed in August 2022. Identified safety issues are repaired by Parks and Recreation staff.
	Staff complete regular visual inspection on ball diamonds and tennis courts. Identified deficiencies are noted and put on a list to repair.
Rehabilitation	Tennis courts are resurfaced as needed based on their age and/or condition.
Replacement	Asset replacement decisions consider the assets condition and expected future utility alongside its rate of use and the volume of public complaints regarding the assets condition, safety, and/or suitability. These factors are considered alongside the replacement cost. Asset capital replacements and rehabilitation activities are informally planned about 8 years in advance.

Risk & Criticality

The following risk breakdown 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 2024 inventory data.

1 - 4	5 - 7	8 - 9	10 - 14	15 - 25
Very Low	**Low**	**Moderate**	**High**	**Very High**
$1,885,476	$556,036	$765,962	$2,168,828	$1,642,808
(27%)	(8%)	(11%)	(31%)	(23%)

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 stormwater network are documented below:

Probability of Failure (PoF)	Consequence of Failure (CoF)
Condition (50%)	Replacement Cost (80%)
% Service life remaining (50%)	Segment (20%)

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.

Levels of Service

The framework created by the Township for levels of service is a valuable tool for assessing and managing the performance of their assets and/or services provided by their assets. Proposed levels of service for the Township have been developed through engagement with Township staff.

Current Levels of Service

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

Community LOS		Service Attribute	Technical LOS	
Description of the services provided by municipal land improvements	Services provided by municipal land improvements are based on the assets outlined below: • Athletic Fields & Playgrounds • Lighting & Fencing • Park Fixtures • Parking Lots	Scope	Replacement Cost	$7,019,110
			Average Age	17.7
			Average EUL	24.8
			Quantity (assets)	128
Description of the condition of land improvements	Condition Description • Very Good - Fit for the future • Good - Adequate for now • Fair - Requires attention • Poor - Increased potential of affecting service • Very Poor - Unfit for sustained service	Quality / Reliability	Average Condition	Fair (53%)
			% Condition > Fair	53%
			% Condition poor and very poor	35%
General	Services will be provided to ensure long-term sustainability for the Municipality	Sustainable	% Risk that is High and Very High	54%
			Annual reinvestment	$0
			Capital reinvestment rate	0.00%

Proposed Levels of Service

The scenarios that were used to analyse The Township of Hamilton's inventory were run for 100-years to ensure all the lifecycles were included at least once. They are also all based on the data available in the asset management system which outlines estimated useful life and condition as well as replacement costs which all the results are based on.

Scenario 1: Current Lifecycle Activities - this scenario utilizes the current lifecycle activities outlined as current practice within each asset category. The condition and annual investment were then determined.

Scenario 2: Current Capital Reinvestment Rate - this scenario utilizes the current capital reinvestment within each asset category. The current annual investment was held, and the condition was determined.

The table below outlines the results for each scenario for the land improvement assets.

Scenarios	Replacement Cost	Average Condition	Annual Capital Reinvestment
Scenario 1 – Lifecycle	$7,019,110	Very Good (80%)	$289,764
Scenario 2 - Current Capital Investment Rate	$7,019,110	Very poor (0%)	$0

10-Year Capital Forecast

As part of the 10-year plan, there are no lifecycle activities scheduled for the land improvements.

Appendix H: Water Network

The Township is responsible for maintaining a water network that is comprised of watermains, water treatment plants, and other supportive water infrastructure like valves, service lines, the water vehicle and equipment, and hydrants. The Waterworks department is responsible for the management and operation of the Camborne and Creighton Heights (Baltimore) Water Treatment Plant and distribution system along with supporting infrastructure. Lakefront Utility Services Inc (LUSI), an external operating authority, is responsible for the Buttersfield Distribution System.

As the operating authority for the Township of Hamilton's drinking water systems, the Waterworks department is committed to providing safe drinking water to consumers, in compliance with the Drinking Water Act.

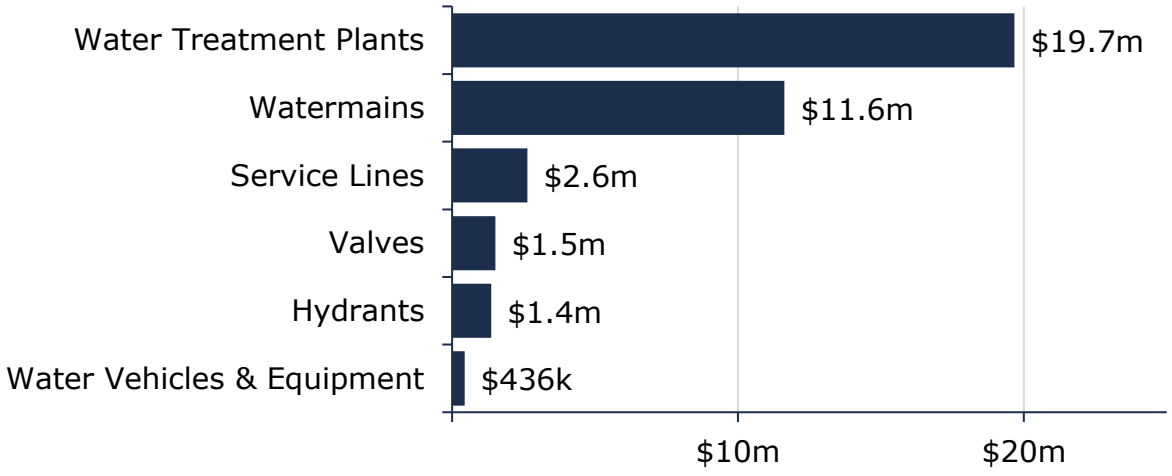
The water network has 59% of the assets condition assessed and the remainder are age-based condition.

Asset Inventory & Costs

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

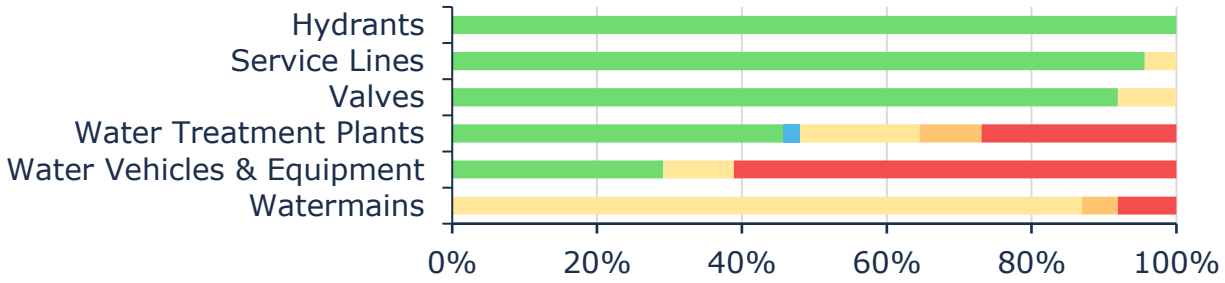
Asset Segment	Quantity	Replacement Cost
Hydrants	90	$1,363,440
Service Lines	583	$2,632,788
Valves	100	$1,513,545
Water Treatment Plants	2	$19,096,891
Water Vehicles & Equipment	94	$435,675
Watermains	21,664 m	$11,618,140
Total		**$37,232,222**

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



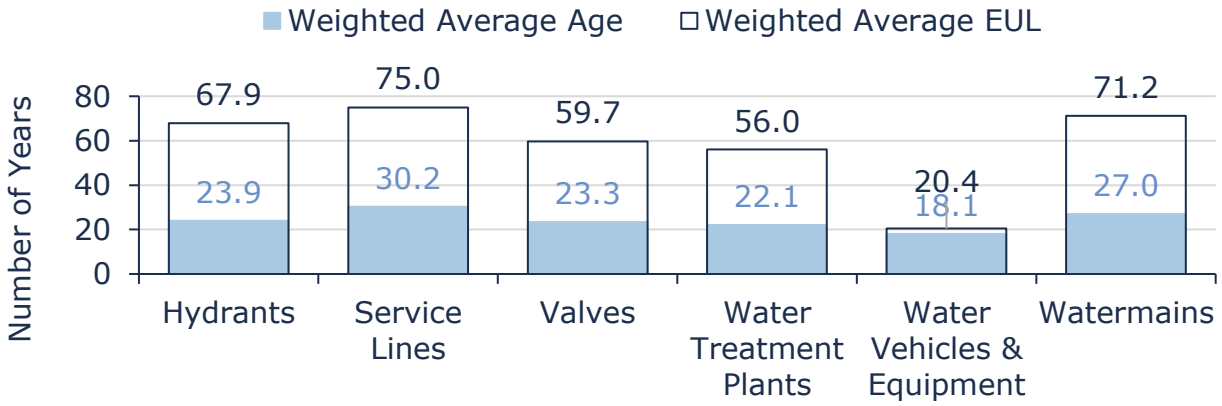
Asset Condition & Age

The average condition (%) is a weighted value based on replacement cost. The graph below visually illustrates the average condition for each asset segment on a very good to very poor scale.



	Watermains	Water Vehicles & Equipment	Water Treatment Plants	Valves	Service Lines	Hydrants
Very Good		$127k	$9.0m	$1.4m	$2.5m	$1.4m
Good			$458k			
Fair	$10.1m	$43k	$3.2m	$122k	$115k	
Poor	$574k		$1.7m			
Very Poor	$942k	$266k	$5.3m			

To ensure that the Township's water network continues to provide an acceptable level of service, the Township should monitor the average condition of all assets. If the average condition declines, staff should re-evaluate their lifecycle management strategy to determine what combination of maintenance, rehabilitation and replacement activities is required to increase the overall condition of the water network. The graph below displays the average weighted age in comparison to the weighted average estimated useful life for each asset segment.



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

Staff perform visual inspections on water assets on a regular basis. When assessing condition, staff primarily rely on the number of water main breaks, service leaks, pipe material, and age.

Health and Safety inspections are conducted monthly, by third-party contractors, for water buildings and structures.

Pumping stations are inspected by in-house mechanics annually; their inspection includes the generator, electrical components, and overall structural integrity of the pump house. The water vehicle is inspected and serviced in accordance with Commercial Vehicle Operators Registration (CVOR) requirements.

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

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

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 residents, it is important to establish a lifecycle management strategy to proactively manage asset deterioration. The following table outlines the Township's current lifecycle management strategy.

Event Class	Description
Maintenance & Testing	Main flushing occurs throughout the year to prevent static water in dead-end areas. In Camborne and Creighton Heights, flushing is typically done once per month.
	Valve turning is completed annually; in larger areas, such as Creighton, approximately 35% of the valves are exercised annually.
	Periodic pressure testing is performed to identify deficiencies and potential leaks.
	The water treatment plant and pumping stations are maintained on a regular basis, with a proactive maintenance program that complies with the Safe Drinking Water Act, 2002.
Rehabilitation & Replacement	Staff developed a water systems capital needs assessment report which identified all rehabilitation and replacement needs of linear and vertical assets. These have been incorporated into this asset management report for more accurate capital projections.

Event Class	Description
	Replacement of watermains is typically coordinated with road reconstruction and renewal whenever reasonably possible. Trenchless relining is not typically a viable option as much of the Township's mains are plastic or polyvinyl chloride (PVC).
	Staff also prioritize looping watermains to reduce dead ends.

Risk & Criticality

The following risk breakdown 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 2024 inventory data.

1 - 4	5 - 7	8 - 9	10 - 14	15 - 25
Very Low	**Low**	**Moderate**	**High**	**Very High**
$11,089,230 (30%)	$15,139,266 (41%)	$4,883,312 (13%)	$3,423,921 (9%)	$2,696,493 (7%)

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 water network are documented below:

Water Mains

Probability of Failure (PoF)	Consequence of Failure (CoF)
Condition (50%)	Pipe Diameter (80%)
% Service life remaining (50%)	Asset Material (20%)

Non-Linear

Probability of Failure (PoF)	Consequence of Failure (CoF)
Condition (50%)	Replacement Cost (100%)
% Service life remaining (50%)	

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

Levels of Service

The framework created by the Township for levels of service is a valuable tool for assessing and managing the performance of their assets and/or services provided by their assets. Proposed levels of service for the Township have been developed through engagement with Township staff.

Current Levels of Service

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

Community LOS		Service Attribute	Technical LOS	
Description, which may include maps, of the user groups or areas of the municipality that are connected to the municipal water system	See Appendix I: Level of Service Maps	Scope	Replacement Cost	$37,232,222
			Water mains Average Age	27.0
			Water mains Average EUL	71.2
			Quantity (meters of main)	21,664m
			Treatment Plant Average Age	22.2
			Treatment Plant Average EUL	56
			Quantity (# of Plants)	2
Description, which may include maps, of the user groups or areas of the municipality that have fire flow	See Appendix I: Level of Service Maps		% of properties connected to the municipal water system	59% for Camborne 50% for Creighton Heights
			% of properties where fire flow is available	0% for Camborne 50% for Creighton Heights
Description of boil water advisories and service interruptions	The Township has not experienced any service interruptions in 2021.	Quality / Reliability	# of connection-days per year where a boil water advisory notice is in place compared to the total number of properties connected to the municipal water system	0
			# of connection-days per year where water is not available to water main breaks compared to the total number of properties connected to the municipal water system	0

Community LOS		Service Attribute	Technical LOS	
Description of the condition of the water network	Condition Description • Very Good - Fit for the future • Good - Adequate for now • Fair - Requires attention • Poor - Increased potential of affecting service • Very Poor - Unfit for sustained service		Average Condition	Fair (51%)
			% Condition > Fair	67%
			% Condition poor and very poor	4%
General	Services will be provided to ensure long-term sustainability for the Municipality	Sustainable	% Risk that is High and Very High	20%
			Annual reinvestment	$70,220
			Capital reinvestment rate	0.19%

Proposed Levels of Service

The scenarios that were used to analyse The Township of Hamilton's inventory were run for 100-years to ensure all the lifecycles were included at least once. They are also all based on the data available in the asset management system which outlines estimated useful life and condition as well as replacement costs which all the results are based on.

Scenario 1: Current Lifecycle Activities - this scenario utilizes the current lifecycle activities outlined as current practice within each asset category. The condition and annual investment were then determined.

Scenario 2: Current Capital Reinvestment Rate - this scenario utilizes the current capital reinvestment within each asset category. The current annual investment was held, and the condition was determined.

The table below outlines the results for each scenario for the water network.

Scenarios	Replacement Cost	Average Condition	Annual Capital Reinvestment
Scenario 1 – Lifecycle	$37,232,222	Very Good (80%)	$783,862
Scenario 2 - Current Capital Investment Rate	$37,232,222	Very Poor (18%)	$70,220

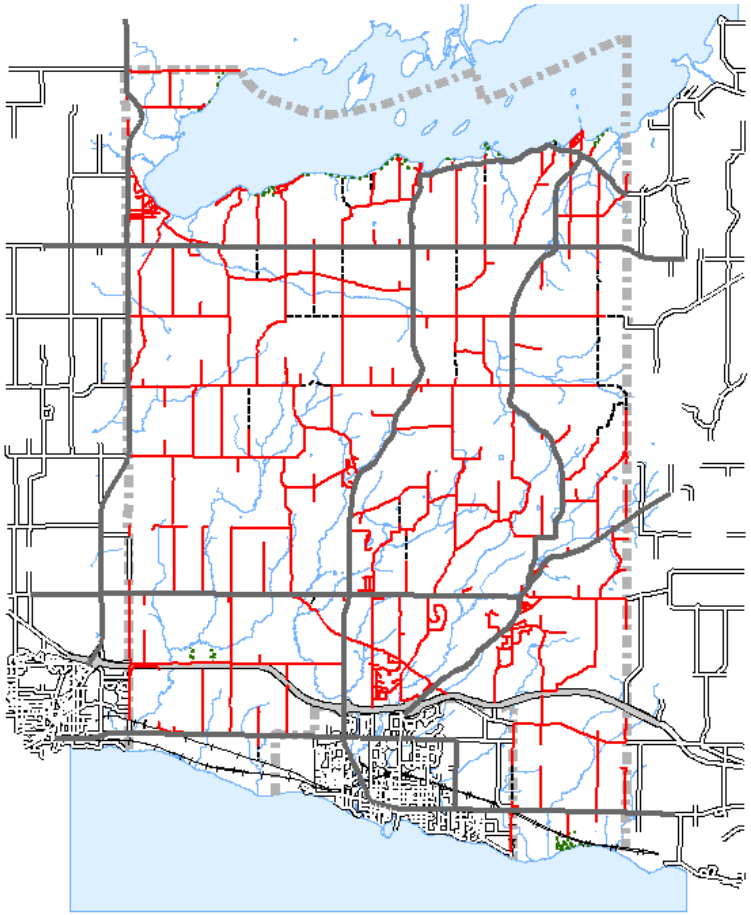
10-Year Capital Forecast

Below is the projected ten-year capital forecast needed to maintain the water network.

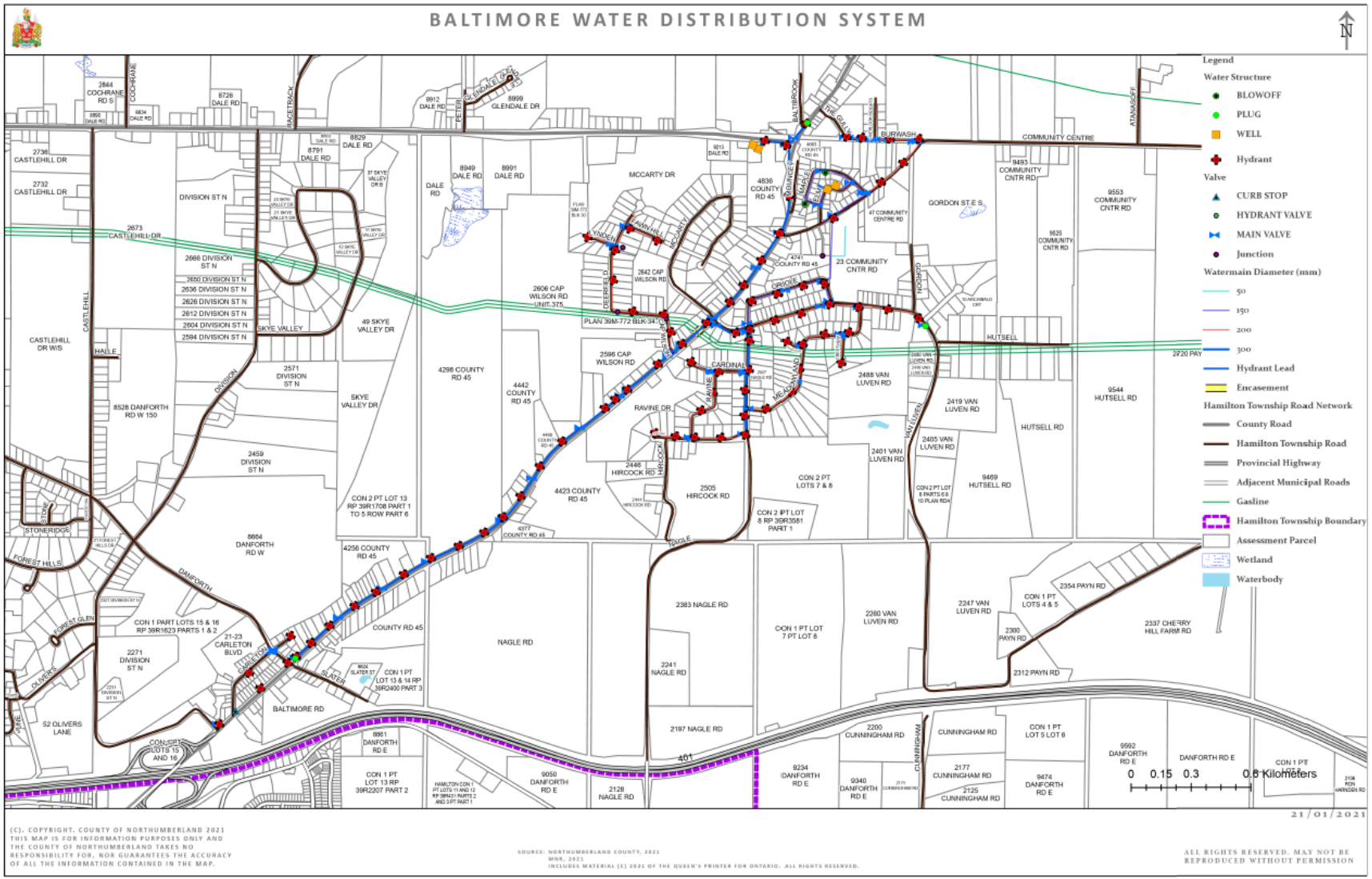
Segments	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034
Water Network	$135k	$1.0m	$1.3m	$1.4m	$407k	$97k	$167k	$1.5m	$37k	$357k

Appendix I: Level of Service Maps

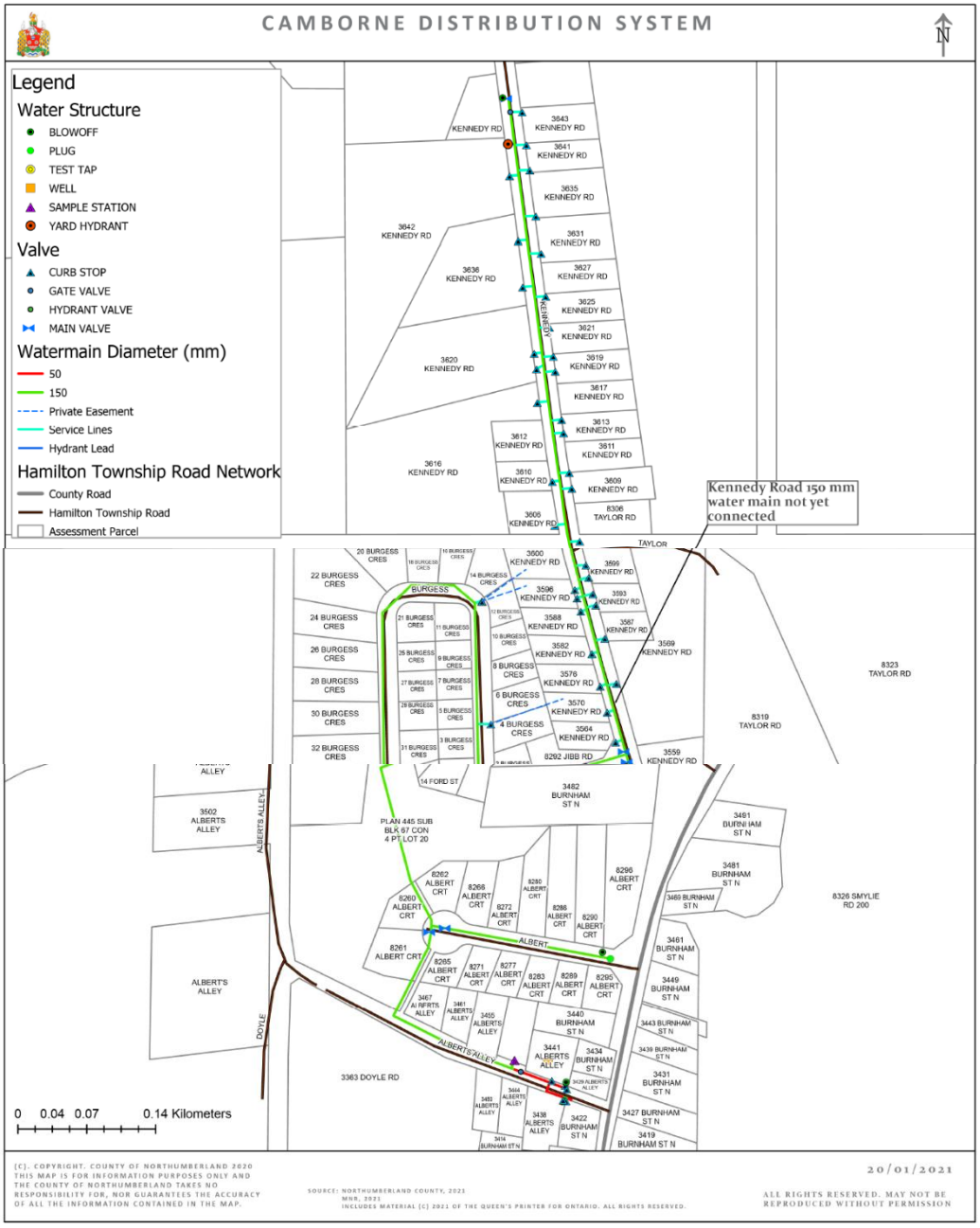
Road Network Map



Water Network Map – Part 1



Water Network Map – Part 2



Appendix J: 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