2024

Municipality of Hastings Highlands

Asset Management Plan

Hastings Highlands
Beautiful By Nature

This Asset Management Program was prepared by:

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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 services. The goal of asset management is to balance delivering critical services in a cost-effective manner. This involves the development and implementation of asset management strategies and long-term financial planning.

The overall replacement cost of the asset categories owned by Hastings Highlands total $161 million. 54% of all assets analysed are in fair or better condition. Assessed condition data was available for all road and bridge assets. For the remaining assets, assessed condition data was unavailable, and asset age was used to approximate condition. Generally, age misstates the true condition of assets, making assessments essential to accurate asset management planning, and a recurring recommendation.

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

To meet capital replacement and rehabilitation needs for existing infrastructure, prevent future infrastructure backlogs, and achieve long-term sustainability, the Municipality's average annual capital requirement totals $6.6 million. Based on a historical analysis of sustainable capital funding sources, the Municipality is committing approximately $2.2 million towards capital projects or reserves per year. As a result, the Municipality is funding 33% of its annual capital requirements. This creates a total annual funding deficit of $4.4 million.

Addressing annual infrastructure funding shortfalls is a difficult and long-term endeavour for municipalities. Considering the Municipality's current funding position, it will require many years to reach full funding for current assets. Short phase-in periods to meet these funding targets may place too high a burden on taxpayers too quickly, whereas a phase-in period beyond 20 years may see a continued deterioration of infrastructure, leading to larger backlogs.

To address annual deficits in capital contributions from tax revenues for asset needs, it is recommended that the Municipality assess the feasibility of implementing a 2.9% annual increase in revenues, which would equate to an additional $258,456 in 2023 tax dollars. This increase would be phased in over a 15-year period.

In addition to annual needs, there is also an infrastructure backlog of $12.3 million, comprising assets that remain in service beyond their estimated useful life. It is highly unlikely that all such assets are in a state of disrepair, requiring immediate replacements or full reconstruction. This makes targeted and consistent condition assessments integral to refining long-term replacement and backlog estimates.

Risk frameworks and levels of service targets can then be used to prioritize projects and help select the right lifecycle intervention for the right asset at the right time—

including replacement or full reconstruction. The Municipality has developed preliminary risk models which are integrated with its asset register. These models can produce risk matrices that classify assets based on their risk profiles.

Hastings Highlands' previous Plan included the total closure and post-closure liability costs for the landfill sites. However, this plan excludes these landfill-related costs for the following reasons:

1. **Nature of Landfill Assets**: The AMP primarily addresses assets that involve capital costs and replacement, such as buildings and machinery. Landfills, being land-based and lacking physical structures that require replacement, do not align with the typical scope of capital asset management.
2. **Specialized Management Needs**: The management of landfills involves distinct operational, environmental, and regulatory requirements that are not focused on capital replacement. Instead, they are centered on long-term environmental management, compliance, and monitoring.
3. **Lifecycle and Cost Structure**: The lifecycle costs of landfills, including closure and post-closure liability, are managed through separate financial structures and regulatory frameworks, distinct from the capital costs and replacement planning covered in this AMP.

The current AMP therefore excludes the costs associated with the total closure and post-closure liabilities for the 9 landfill sites—comprising 7 landfills and 2 transfer stations. These costs are addressed through separate financial plans and environmental management strategies.

Annual Reports for each waste location are submitted to the Ministry of the Environment, Conservation and Parks each year to meet the reporting requirements of the Environmental Compliance Approval (ECA). These reports are prepared in accordance with the *Groundwater and Surface Water: Technical Guidance Document*, also known as the 'WDS Technical Guidance.'

For detailed information on Hastings Highlands' waste disposal sites, please refer to these annual reports.

Most municipalities in Ontario, and across Canada, continue to struggle with meeting infrastructure demands. This challenge was created over many decades and will take many years to overcome. To this end, several recommendations should be considered, including:

- Continuous and dedicated improvement to the Municipality's infrastructure datasets, which form the foundation for all analysis, including financial projections and needs.
- Continuous refinements to the risk and lifecycle models as additional data becomes available. This will aid in prioritizing projects and creating more strategic long-term capital budgets.
- Management of key performance indicators for all infrastructure programs to establish benchmark data to calibrate levels of service targets for 2025 regulatory requirements.
- Continue conducting network-wide assessments to ensure condition information remains reliable.

The Municipality has taken important steps in building its asset management program, including developing a more complete and accurate asset register—a substantial initiative. Continuous improvement to this inventory will be essential in maintaining momentum, supporting long-term financial planning, and delivering affordable service levels to the community.

About this Document

The Hastings Highlands Asset Management Plan was developed in accordance with Ontario Regulation 588/17 ("O. Reg 588/17"). It contains a comprehensive analysis of Hastings Highlands's infrastructure portfolio. This is a living document that should be updated regularly as additional asset and financial data becomes available.

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. Along with creating better performing organizations, more livable 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.

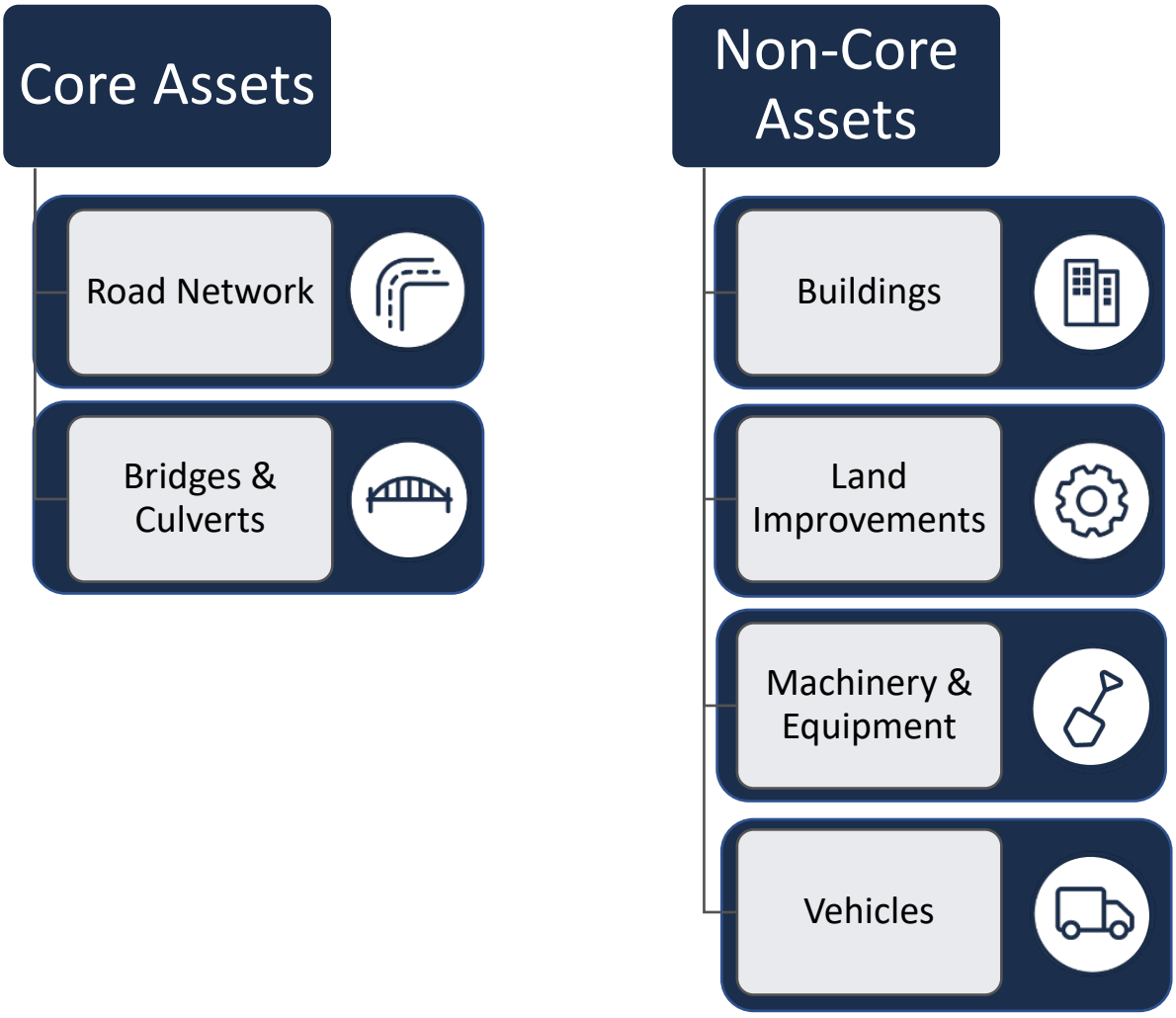
Table 1 Ontario Regulation 588/17 Requirements and Reporting Deadlines

Requirement	2019	2022	2024	2025
Asset Management Policy	●		●	
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				●

Scope

The scope of this document is to identify the current practices and strategies that are in place to manage the public infrastructure and to make recommendations where they can be further refined. Through the implementation of sound asset management strategies, the Municipality can ensure that public infrastructure is managed to support the sustainable delivery of services.

The following asset categories are addressed in further detail in the Appendix.



Limitations and Constraints

The asset management program development required substantial effort by staff, it was developed based on best-available data, and is subject to the following broad limitations, constrains, and assumptions:

- The analysis is highly sensitive to several critical data fields, including an asset's estimated useful life, replacement cost, quantity, and in-service date. Inaccuracies or imprecisions in any of these fields can have substantial and cascading impacts on all reporting and analytics.
- User-defined and unit cost estimates, based typically on staff judgment, recent projects, or established through completion of technical studies, offer the most precise approximations of current replacement costs. When this isn't possible, historical costs incurred at the time of asset acquisition or construction can be inflated to present day. This approach, while sometimes necessary, can produce inaccurate estimates.
- In the absence of condition assessment data, age was used to estimate asset condition ratings. This approach can result in an over- or understatement of asset needs. As a result, financial requirements generated through this approach can differ from those produced by in-field assessments.
- The risk models are designed to support objective project prioritization and selection. However, in addition to the inherent limitations that all models face, they also require availability of important asset attribute data to ensure that asset risk ratings are valid, and assets are properly stratified within the risk matrix. Missing attribute data can misclassify assets.

These limitations have a direct impact on most of the analysis presented, including condition summaries, age profiles, long-term replacement and rehabilitation forecasts, and shorter term, 10-year forecasts that are generated from Citywide, the Municipality's primary asset management system.

These challenges are quite common and require long-term commitment and sustained effort by staff. As the Municipality's asset management program evolves and advances, the quality of future AMPs and other core documents that support asset management will continue to increase.

An Overview of Asset Management

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

Foundational Documents

In the municipal sector, 'asset management strategy' and 'asset management plan' are often used interchangeably. Other concepts such as 'asset management framework', 'asset management system', and 'strategic asset management plan' further add to the confusion; lack of consistency in the industry on the purpose and definition of these elements offers little clarity. To make a clear distinction between the policy, strategy, and the plan see the following sections for detailed descriptions of the document types.

Strategic Plan

The strategic plan has a direct, and cascading impact on asset management planning and reporting, making it a foundational element. At the beginning of each term, Council holds strategic planning exercises and discussions to identify major initiatives and administrative improvements it wishes to achieve during its tenure. Staff then identify the scope, resources, timing & other logistical matters associated with proposed initiatives.

Asset Management Policy

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

Hastings Highlands approved policy FIN-09 "Finance Policy – Strategic Asset Management Policy" on June 26th, 2019, in accordance with Ontario Regulation 588/17.

The stated objectives of the policy are to:

- Develop and maintain inventories of its Municipal Infrastructure;
- Maintain and manage Municipal Infrastructure to support public safety, community well-being and community goals;
- Monitor standards and service levels to ensure that they meet and support the Municipality's goals, plans and policies;
- Establish asset replacement strategies using full-life cycle costing principles;
- Plan financially for the appropriate level of maintenance of assets to deliver service levels and extend the useful life of assets while meeting all statutory requirements; and
- Plan for and provide stable long term funding to replace and/or renew and/or decommission Municipal Infrastructure.

The policy provides a foundation for the development of an asset management program within the Municipality. It covers key components that define a comprehensive asset management policy:

- The policy's objectives dictate the use of asset management and data management practices to ensure all assets meet the expected levels and provide the desired levels of service in the most efficient and effective manner;
- The policy commits to, where appropriate, incorporating asset management in the Municipality's other plans;
- There are formally defined roles and responsibilities of internal staff;
- The key principles include the use of a cost/benefit analysis in the management of risk; and
- The policy statements are well defined.

Asset Management Strategy

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

Asset Management Plan

The asset management plan is often identified as a key output within the strategy. The AMP has a sharp focus on the current state of the Municipality's asset portfolio, and its approach to managing and funding individual asset groups. It is tactical in nature and provides a snapshot in time.

Key Technical Concepts

Effective asset management integrates several key components, including data management, lifecycle management, risk management, and levels of service.

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.

Table 2 Asset Hierarchy

Asset Class	AM Category	AM Segment
Infrastructure	Road Network	Gravel Roads HCB Roads LCB Roads Streetlights Maynooth Downtown Sidewalks Streetlights
	Bridges & Culverts	Bridges Culverts
General Capital	Buildings	Protection Public Works Recreation
	Land Improvements	Fields, Courts & Rinks Outdoor Structures Play Structures
	Machinery & Equipment	Administration Communication Towers Environmental Protection Public Works
	Vehicles	Public Works Protection

Replacement Costs

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

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

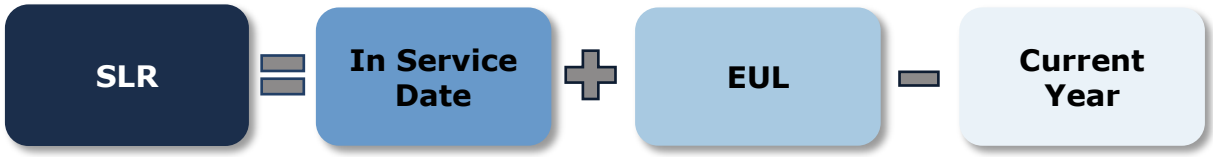
User-defined costs based on reliable sources are a reasonably accurate and reliable way to determine asset replacement costs. Cost inflation is typically used in the absence of reliable replacement cost data. It is a reliable method for recently purchased and/or constructed assets where the total cost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

Estimated Useful Life and Service Life Remaining

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

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

Figure 1: Service Life Remaining Calculation

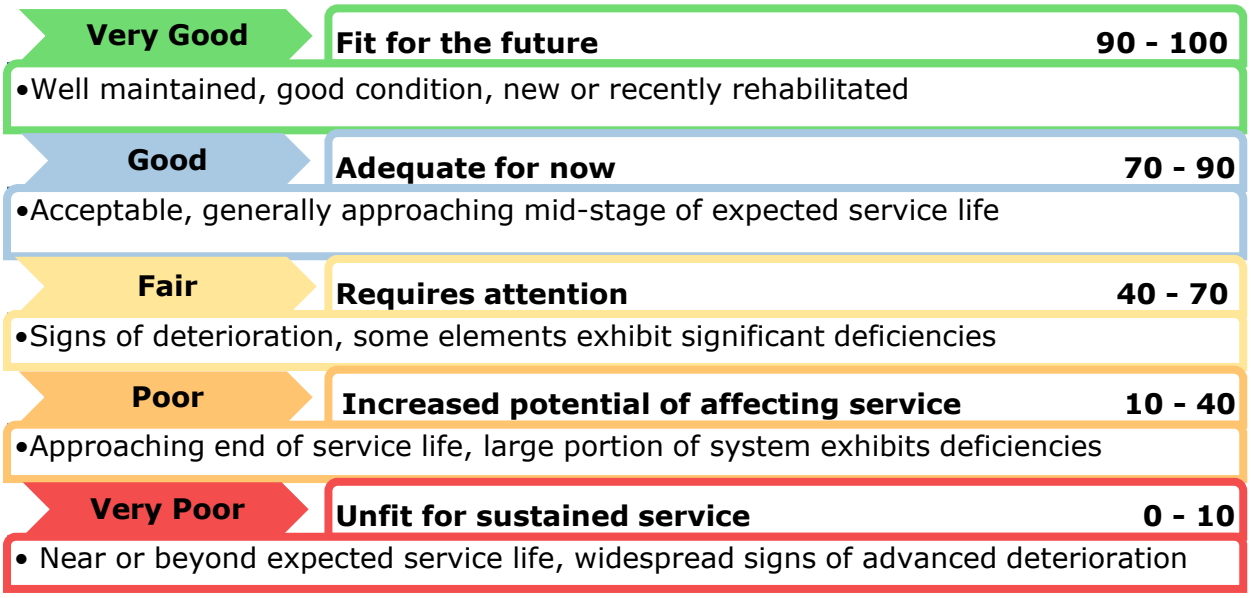


Asset Condition

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

A condition assessment rating system provides a standardized descriptive framework that allows comparative benchmarking across the Municipality's asset portfolio. The figure below outlines the condition rating system used to determine asset condition for all assets in Hastings Highlands.

Figure 2: Standard Condition Rating Scale



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

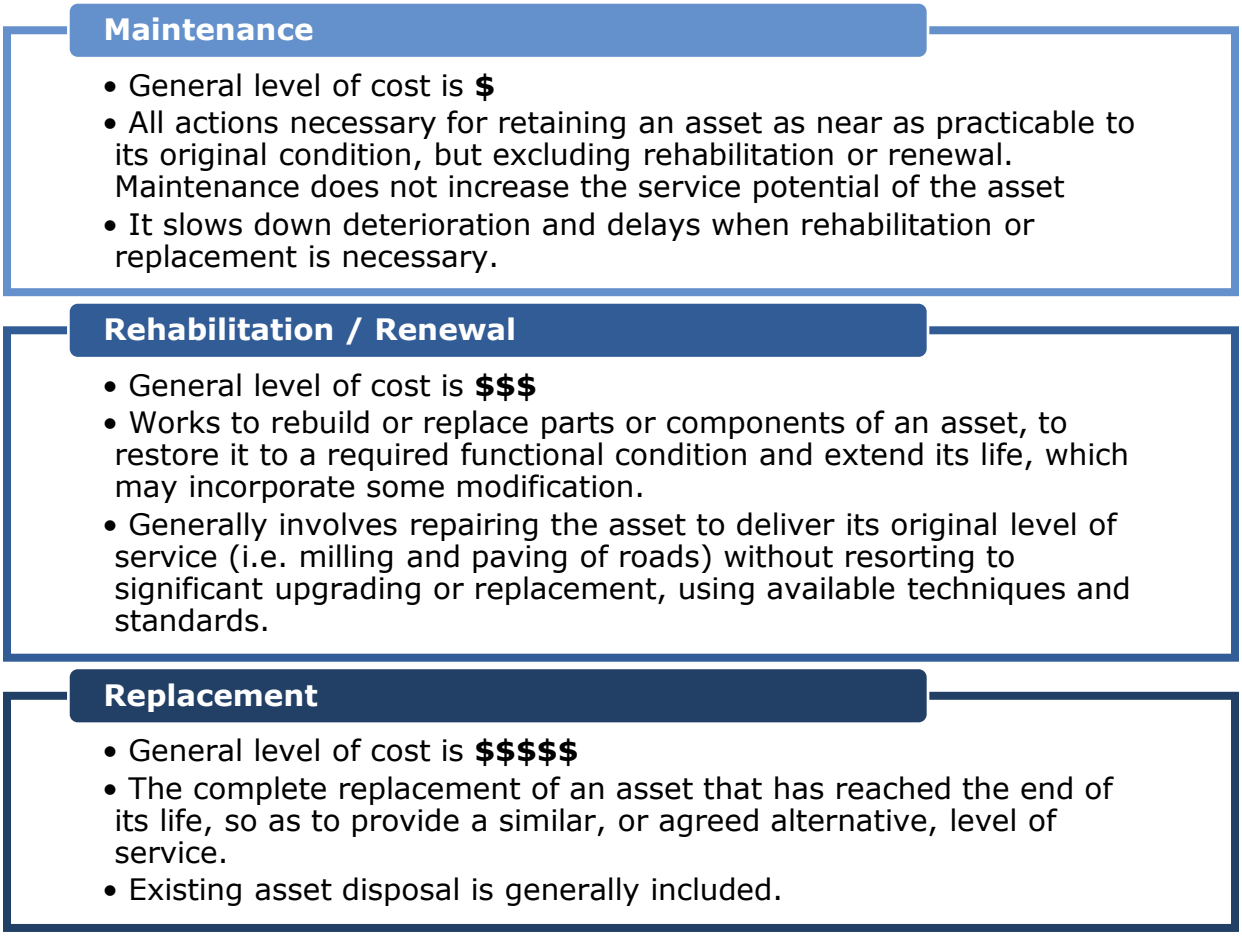
To ensure that municipal assets are performing as expected and meeting the needs of customers, it is important to establish a lifecycle management strategy to proactively manage asset deterioration.

There are several field intervention activities that are available to extend the life of an asset. These activities can be generally placed into one of three categories: maintenance, rehabilitation, and replacement. Figure 3 provides a description of each type of activity and the general difference in cost.

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

Figure 3: Lifecyle Management Typical Interventions



Risk Management Strategies

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

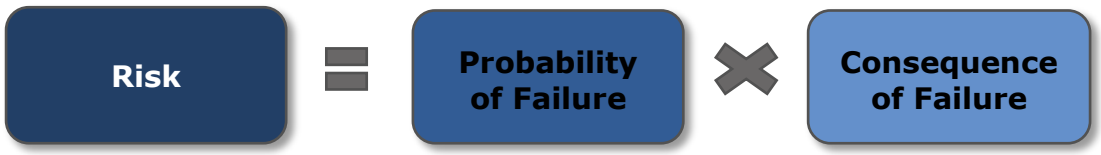
By identifying the various impacts of asset failure and the likelihood that it will fail, risk management strategies can identify critical assets, and determine where maintenance efforts, and spending, should be focused.

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

Risk is a product of two variables: the probability that an asset will fail, and the resulting consequences of that failure event. It can be a qualitative measurement,

(low, medium, high) or quantitative measurement (1-5), that can be used to rank assets and projects, identify appropriate lifecycle strategies, optimize short- and long-term budgets, minimize service disruptions, and maintain public health and safety.

Figure 4: Risk Equation



Probability of Failure

Several factors can help decision-makers estimate the probability or likelihood of an asset's failure, including its condition, age, previous performance history, and exposure to extreme weather events, such as flooding and ice jams—both a growing concern for municipalities in Canada.

Consequence of Failure

Estimating criticality also requires identifying the types of consequences that the organization and community may face from an asset's failure, and the magnitude of those consequences. Consequences of asset failure will vary across the infrastructure portfolio; the failure of some assets may result primarily in high direct financial cost but may pose limited risk to the community. Other assets may have a relatively minor financial value, but any downtime may pose significant health and safety hazards to residents. See Appendix M: Risk Rating Criteria for definitions and the developed risk models.

Levels of Service

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

At this stage, three strategic levels of service are measured for every asset category, and they are:

- Financial –targeted reinvestment rate compared to the actual current reinvestment rate.
- Performance – this is the condition breakdown for the asset category.
- Risk – this is the risk profile for the asset category.

Only those LOS that are required under O. Reg for core asset categories are included in addition to the strategic LOS.

Community Levels of Service

Community LOS are a simple, plain language description or measure of the service that the community receives. For core asset categories, the Province, through O. Reg. 588/17, has provided qualitative descriptions that are required.

For non-core asset categories, the Municipality must determine the qualitative descriptions that will be used. The community LOS can be found in the Levels of Service subsection within each asset category section.

Technical Levels of Service

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

For core asset categories, the Province, through O. Reg. 588/17, has provided technical metrics that are required. For non-core asset categories, the Municipality determined the technical metrics that will be used. The metrics can be found in the LOS subsection within each asset category.

Current and Proposed Levels of Service

Hastings Highlands is focused on measuring the current LOS provided to the community. Once current LOS have been measured and trended, the Municipality plans to establish their proposed LOS over a 10-year period, in accordance with O. Reg. 588/17.

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

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.

Hastings Highlands Climate Profile

Hastings Highlands is a municipality in Ontario, located east of Algonquin Park and west of the City of Ottawa, in Hastings County. The Municipality is expected to experience notable effects of climate change which include higher average annual temperatures, and an increase in total annual precipitation. According to Climatedata.ca, a collaboration supported by Environment and Climate Change Canada (ECCC), the Municipality may experience the following trends:

Higher Average Annual Temperature:

- Between the years 1971 and 2000 the annual average temperature was 4.2ºC
- Under a high emissions scenario, the annual average temperatures are projected to be 6.9ºC by the year 2050, 8.9ºC for the 2051-2080 period, and 10.7ºC by the end of this century.

Increase in Total Annual Precipitation:

- Under a high emissions scenario, Hastings Highlands is projected to experience a 13% increase in precipitation by the year 2080 and a 18% increase by the end of the century.

Increase in Frequency of Extreme Weather Events:

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

Consideration of Climate Change with Asset Management Strategies

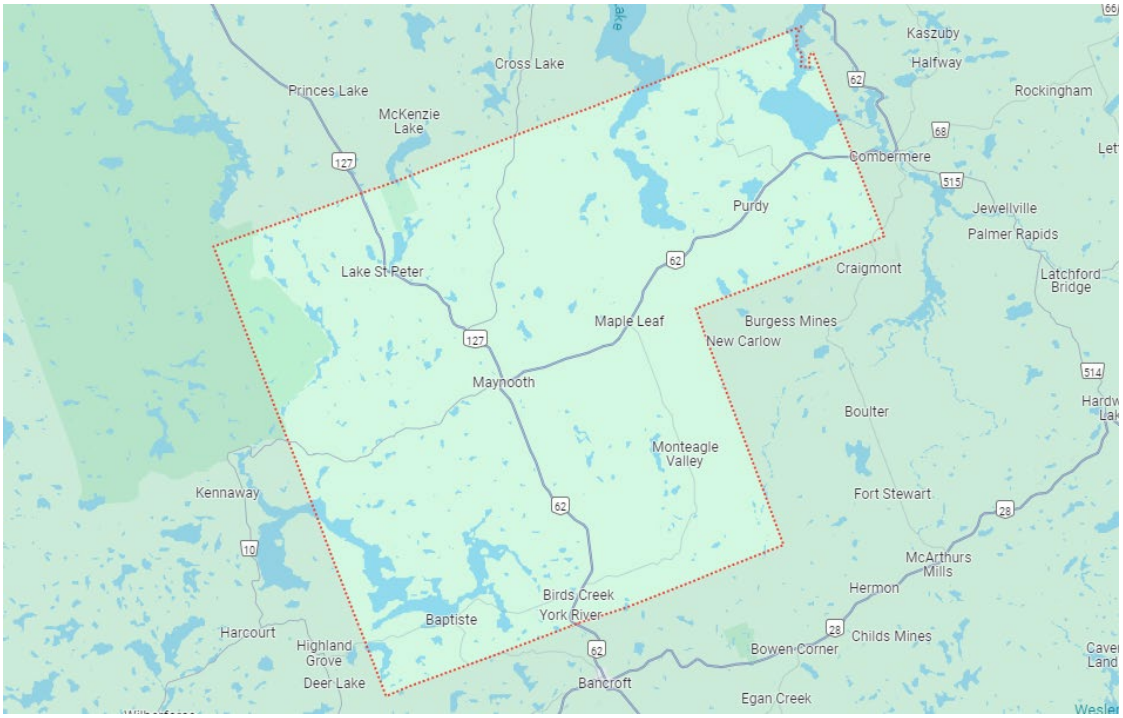
Asset management practices aim to deliver sustainable service delivery - providing services to residents today without compromising the services and well-being of future residents. Climate change threatens sustainable service delivery by reducing the useful life of assets and increasing the risk of asset failure. Achieving desired levels of service can become more challenging due to climate change impacts such as flooding, high heat, drought, and more frequent and intense storms.

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

Portfolio Overview

Community Profile

Hastings Highlands is located East of Algonquin Park and West of the City of Ottawa, in Hastings County. The Municipality consists predominantly of rural areas, along with several semi-urban settlements scattered throughout its territory.



The natural landscapes of forests, lakes, and rivers in Hastings Highlands provide plentiful opportunities for outdoor activities like hiking, fishing, camping, and boating. Various communities and hamlets across the county boast unique character and a strong sense of community. Local festivals and events throughout the year celebrate the area's rich cultural heritage. Economically, Hastings Highlands thrives on industries such as forestry, tourism, agriculture, and small businesses, which not only sustain its local identity but also contribute to a vibrant community life.

The current municipality of Hastings Highlands was incorporated on January 1, 2001, by amalgamating the former townships of Bangor, Wicklow and McClure, Herschel and Monteagle.

Located in the northernmost portion of Hastings County, the Municipality comprises the communities of Baptiste, Bell Rapids, Birds Creek, Centreview,

Graphite, Greenview, Hickey Settlement, Hughes, Hybla, Lake St. Peter, Maple Leaf, Maynooth Station, McAlpine Corners, McGarry Flats, Monteagle Valley, Musclow, Purdy, Scotch Bush, Scott Settlement and York River.

In the 2021 Census of Population conducted by Statistics Canada, the demographics for Hastings Highlands are as follows:

Table 3 Hastings Highlands & Ontario Census Information

Census Characteristic	Hastings Highlands	Hastings County	Ontario
Population 2021	4,385	145,746	14,223,942
Population Change 2016-2021	+7.5%	+6.8%	5.8%
Total Private Dwellings	3,529	68,518	5,929,250
Population Density	4.5/ km2	24.2/ km2	15.9/km^2
Land Area	966.58 km2	6,013.35 km2	892,411.76 km^2

State of the Infrastructure

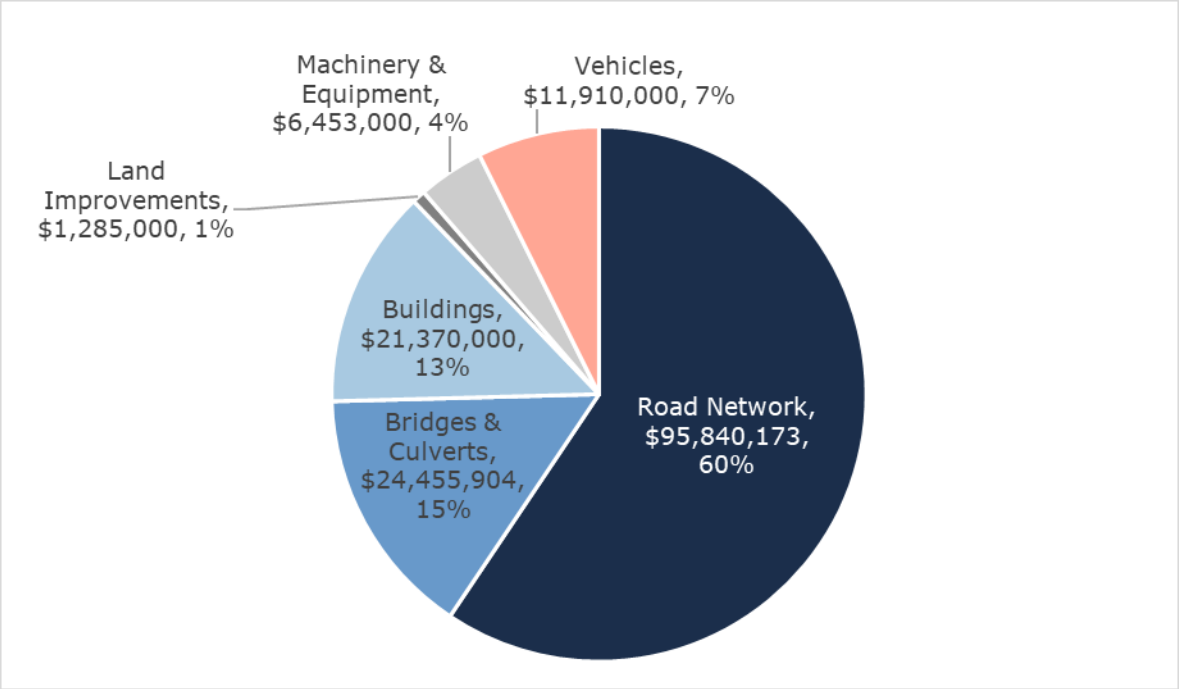
Table 4 Hastings Highlands State of the Infrastructure

Asset Category	Replacement Cost	Asset Condition	Financial Capacity		% funded by Hastings Highlands
Road Network	$95,840,173	Fair (50%)	Annual Requirement:	$4,334,000	26%
			Funding Available:	$1,134,095	
			Annual Deficit:	$3,199,904	
Bridges & Culverts	$24,455,904	Fair (66%)	Annual Requirement:	$610,000	49%
			Funding Available:	$300,000	
			Annual Deficit:	$310,000	
Buildings	$21,370,000	Poor (38%)	Annual Requirement:	$428,000	4%
			Funding Available:	$18,200	
			Annual Deficit:	$409,800	
Land Improvements	$1,285,000	Fair (44%)	Annual Requirement:	$64,000	0%
			Funding Available:	$0	
			Annual Deficit:	$64,000	
Vehicles	$11,910,000	Poor (34%)	Annual Requirement:	$802,000	55%
			Funding Available:	$440,000	
			Annual Deficit:	$362,000	
Machinery & Equipment	$6,453,000	Poor (25%)	Annual Requirement:	$356,000	77%
			Funding Available:	$275,000	
			Annual Deficit:	$81,000	
Overall	**$161,314,077**	**Fair (49%)**	**Annual Requirement:**	**$6,594,000**	**33%**
			Funding Available:	**$2,167,295**	
			Annual Deficit:	**$4,426,704**	

Replacement Cost

All Hastings Highlands's asset categories have a total replacement cost of $161 million based on available inventory data. 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.

Figure 5: Portfolio Replacement Value

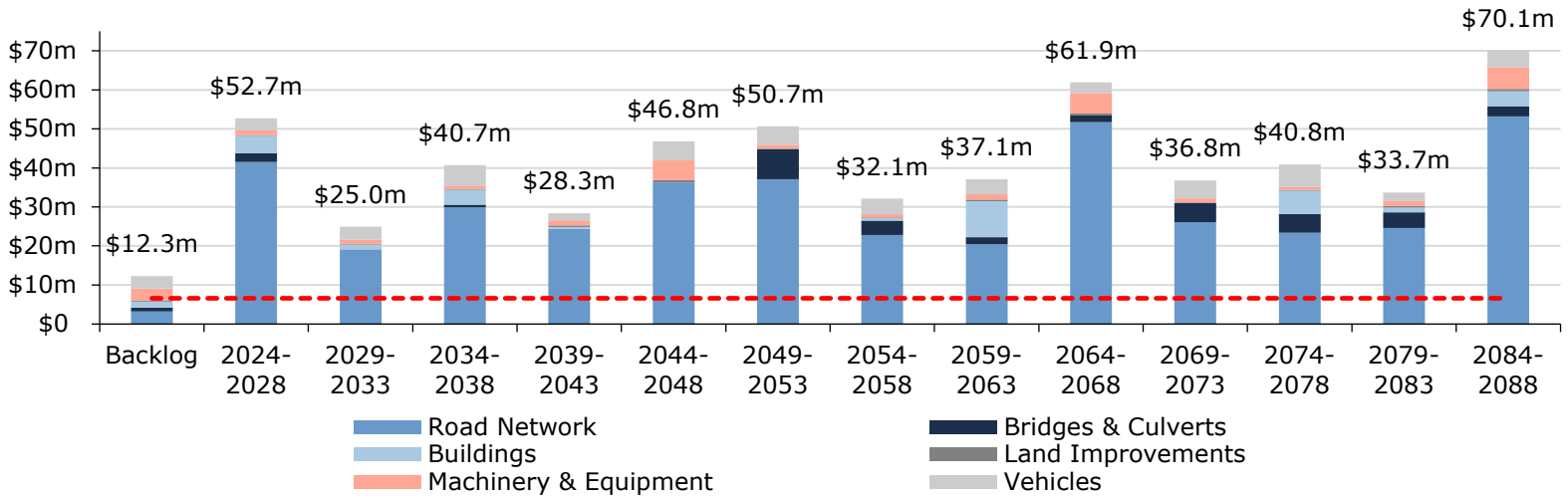


Forecasted Capital Requirements

Aging assets require maintenance, rehabilitation, and replacement. Figure 6 below illustrates the cyclical short-, medium- and long-term infrastructure replacement requirements for all asset categories analyzed. On average, $6.6 million is required each year to remain current with capital replacement needs for Hastings Highlands's asset portfolio (red dotted line).

Although actual spending may fluctuate substantially from year to year, this figure is a useful benchmark for annual capital expenditure targets (or allocations to reserves) to ensure projects are not deferred and replacement needs are met as they arise. This figure relies on age and available condition data. Based on the current replacement cost of the portfolio, estimated at $161 million, this represents an annual target reinvestment rate of 4.1%. To maintain and replace assets effectively, Hastings Highlands should aim to allocate an average of 4.1% of the portfolio's total value each year, which amounts to approximately $6.6 million annually. Maintaining this average reinvestment rate will ensure the ongoing functionality and longevity of the asset portfolio, mitigating the risk of asset deterioration, and avoiding substantial future expenditures for major repairs or replacements.

Figure 6: Forecasted Capital Requirements



The chart also illustrates a backlog of $12.3 million, comprising assets that remain in service beyond their estimated useful life. It is unlikely that all such assets are in a state of disrepair, requiring immediate replacements or major renewals. This makes targeted and consistent condition assessments integral.

Risk frameworks, proactive lifecycle strategies, and levels of service targets can then be used to prioritize projects, continuously refine estimates for backlogs and ongoing capital needs and help select the right treatment for each asset.

Condition of Asset Portfolio

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

Assessed condition data is available for the road network, and bridges and culverts; 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, 42% of the Municipality's assets will require rehabilitation/replacement within the next 10 years. Details of the capital requirements are identified in each asset section.

Risk & Criticality

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

Organizational Capacity and Cognizance

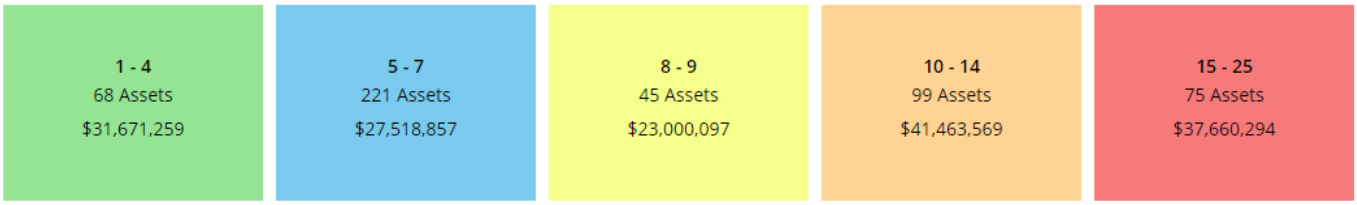
Both short- and long-term planning requires the regular collection of infrastructure data to support asset management decision-making. If organizational stakeholders, including management, staff, and relevant departments, lack a clear understanding of the principles, processes, and importance of asset management, it can lead to inadequate resource allocation and decision-making. Securing commitment and buy-in from organizational leadership to prioritize asset management as a strategic initiative can enable the Municipality to foster a culture of effective asset management.

Asset Data & Information

Due to the 2001 amalgamation of former Townships, there is uncertainty about the accuracy of the inventory data, especially regarding the in-service dates for certain infrastructure asset categories. Staff plan to focus on improving data collection in the future to enhance the accuracy and reliability of asset information. This effort will enable staff to develop informed, data-driven strategies to effectively address infrastructure needs.

The overall asset risk breakdown for Hastings Highlands's asset inventory is portrayed in the figure below.

Figure 7: Overall Asset Risk Breakdown

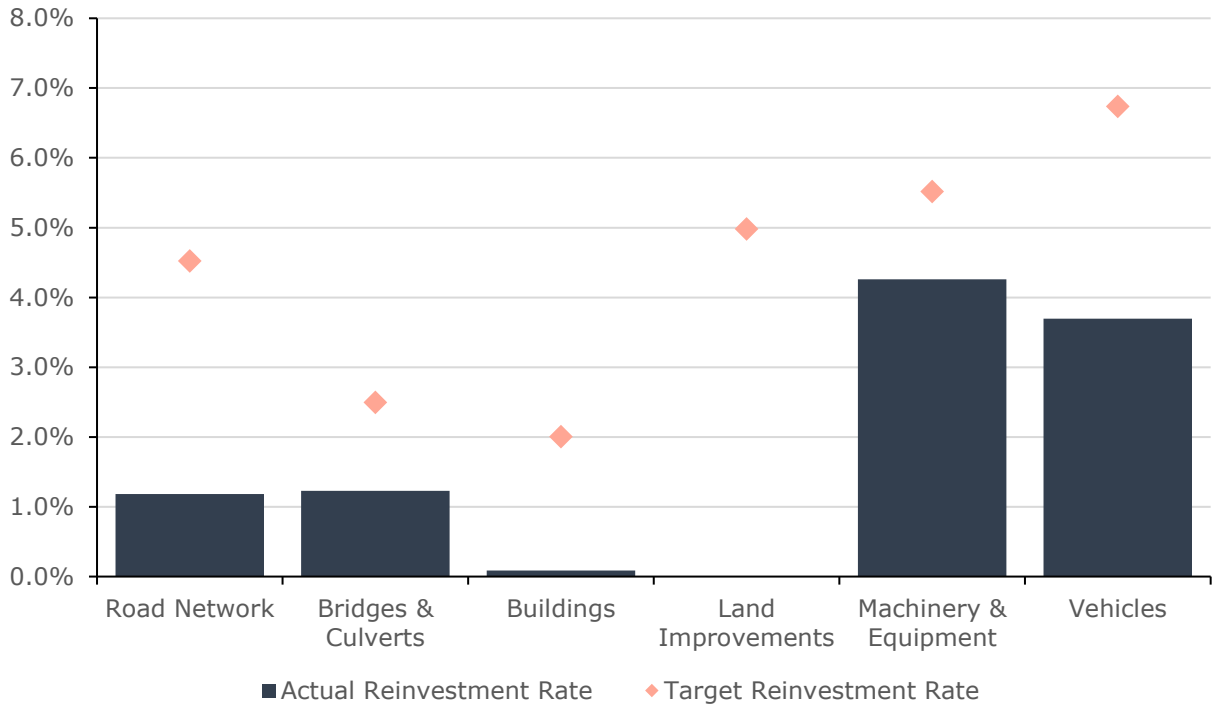


Reviewing the list of very high-risk assets to evaluate how best to mitigate the level of risk the Municipality is experiencing will help advance Hastings Highlands's asset management program.

Reinvestment Rate

The graph below depicts funding gaps or surpluses by comparing target vs actual reinvestment rate. To meet the long-term replacement needs, the Municipality is recommended to be allocating approximately $6.6 million annually, for a target reinvestment rate of 4.1%. Actual annual spending on infrastructure totals approximately $2.2 million, for an actual reinvestment rate of 1.3%.

Figure 8: Target vs Actual Reinvestment Rates



Financial Strategy

Financial Strategy Overview

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

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

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

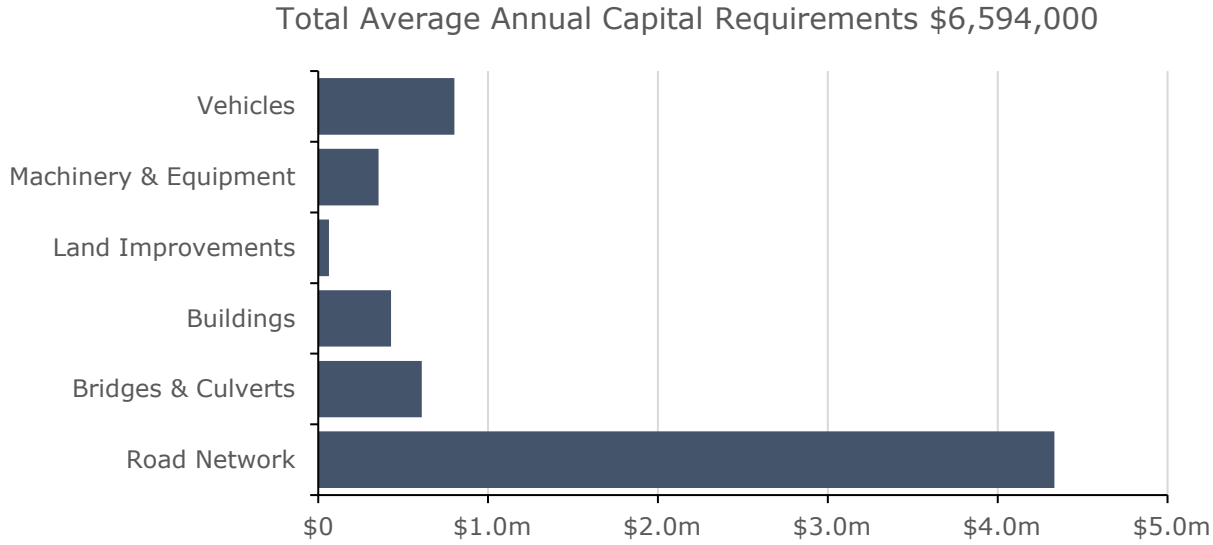
Note: Periodic grants are normally not included due to Provincial requirements for firm commitments. However, if moving a specific project forward is wholly dependent on receiving a one-time grant, the replacement cost included in the financial strategy is the net of such grant being received.

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

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

Annual Requirements & Capital Funding

The annual requirements represent the amount the Municipality should allocate annually to each asset category to meet replacement needs as they arise, prevent infrastructure backlogs and achieve long-term sustainability. In total, the Municipality must allocate approximately $6.6 million annually to address capital requirements for the assets included in this AMP.



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

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

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

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

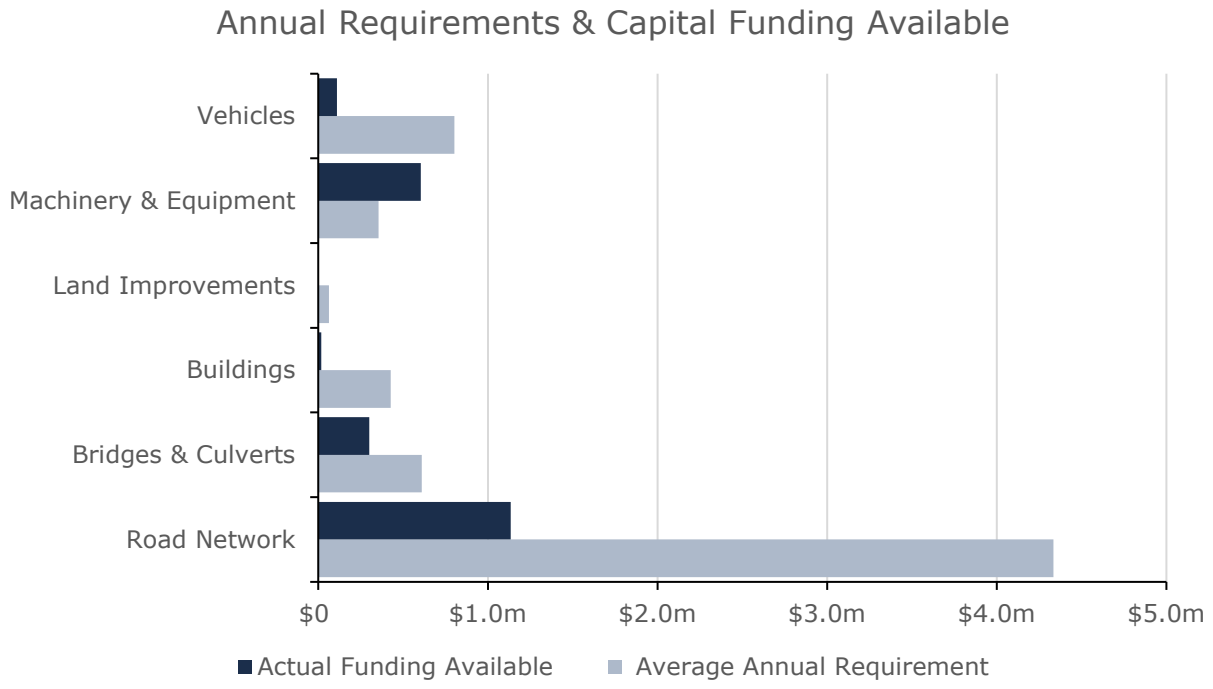
Table 5 Road Network Annual Capital Requirement Comparison

Asset Category	Annual Requirements (Replacement Only)	Annual Requirements (Lifecycle Strategy)	Difference
Road Network	$5,016,000	$4,334,000	$682,063

The implementation of a proactive lifecycle strategy for roads leads to a potential annual cost avoidance of $682,063 for the Road Network. This represents an overall reduction of the annual requirements for the category by 14%. As the lifecycle strategy scenario represents the lowest cost option available to the Municipality, we have used these annual requirements in the development of the financial strategy.

Annual Funding Available

Based on a historical analysis of sustainable capital funding sources, the Municipality is committing approximately $2.2 million towards capital projects per year. Given the annual capital requirement of $6.6 million, there is currently a funding gap of $4.4 million annually.



Funding Objective

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

- **Tax Funded Assets:** Road Network, Bridges & Culverts, Buildings, Machinery & Equipment, Land Improvements, Vehicles

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

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

Financial Profile: Tax Funded Assets

Current Funding Position

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

Table 6: Taxes: Required Funding vs Current Funding Position

Asset Category	Avg. Annual Requirement	Annual Funding Available					Annual Deficit
		Taxes	CCBF	OCIF	Capital Reserve Allocation	Total Available	
Road Network	$4,334,000	$300,000	$268,120	$265,975	$300,000	$1,134,096	$3,199,904
Bridges & Culverts	$610,063				$300,000	$300,000	$310,063
Buildings & Facilities	$428,300				$18,200	$18,200	$410,100
Land Improvements	$64,250						$64,250
Machinery & Equipment	$355,850				$275,000	$275,000	$80,850
Vehicles	$801,917				$440,000	$440,000	$361,917
	$6,594,380	**$300,000**	**$268,120**	**$265,975**	**$1,333,200**	**$2,167,296**	**$4,427,084**

The average annual investment requirement for the above categories is $6,594,380. Annual revenue currently allocated to these assets for capital purposes is $2,167,296 leaving an annual deficit of $4,427,084. Put differently, these infrastructure categories are currently funded at 32.9% of their long-term requirements.

Full Funding Requirements

In 2023, the Municipality of Hastings Highlands had annual tax revenues of $8,094,077. As illustrated in the following table, without consideration of any other sources of revenue or cost containment strategies, full funding would require the following tax change over time:

Asset Category	Tax Change Required for Full Funding
Road Network	39.5%
Bridges & Culverts	3.8%
Buildings	5.1%
Land Improvements	0.8%
Machinery & Equipment	1.0%
Vehicles	4.5%
	54.7%

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

- Hastings Highlands's formula based Ontario Community Infrastructure Fund (OCIF) grant is scheduled to decrease by $39,980 in 2024.
- Hastings Highlands's debt payments for these asset categories will be decreasing by $209,996 by 2027.

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

Table 7: Phasing in Annual Tax Increases

	Without Capturing Changes				With Capturing Changes			
	5 Years	10 Years	15 Years	20 Years	5 Years	10 Years	15 Years	20 Years
Infrastructure Deficit	$4,427,084	$4,427,084	$4,427,084	$4,427,084	$4,427,084	$4,427,084	$4,427,084	$4,427,084
Change in Debt Costs	N/A	N/A	N/A	N/A	($209,996)	($209,996)	($209,996)	($209,996)
Change in OCIF Grants	N/A	N/A	N/A	N/A	$39,980	$39,980	$39,980	$39,980
Resulting Infrastructure Deficit:	$4,427,084	$4,427,084	$4,427,084	$4,427,084	$4,257,068	$4,257,068	$4,257,068	$4,257,068
Tax Increase Required	54.7%	54.7%	54.7%	54.7%	52.6%	52.6%	52.6%	52.6%
Annually:	**9.2%**	**4.5%**	**3.0%**	**2.3%**	**8.9%**	**4.4%**	**2.9%**	**2.2%**

Financial Strategy Recommendations

Considering all the above information, we recommend the 15-year option that includes capturing changes from reallocating debt costs to the infrastructure deficit. This involves full funding being achieved over 15 years by:

a) when realized, reallocating the debt cost reductions of $209,996 to the infrastructure deficit as outlined above.
b) increasing tax revenues by 2.9% each year for the next 15 years, which would equate to $258,456 in 2023 dollars, solely for the purpose of phasing in full funding to the asset categories covered in this section of the AMP.
c) allocating the current Canada Community-Building Fund (Formerly known as Gas Tax Fund) and OCIF revenue as outlined previously.
d) increasing existing and future infrastructure budgets by the applicable inflation index on an annual basis in addition to the deficit phase-in.

Notes:

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

Although this option achieves full funding on an annual basis in 20 years and provides financial sustainability over the period modeled, the recommendations do require prioritizing capital projects to fit the resulting annual funding available. Current data shows a pent-up investment demand of $140,000 for the Road Network, $26,000 for the Storm Water Network, $6,400,000 for Buildings, $557,000 for Machinery & Equipment, and $6,200,000 for Vehicles.

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

[1] The Municipality should take advantage of all available grant funding programs and transfers from other levels of government. While OCIF has historically been considered a sustainable source of funding, the program is currently undergoing review by the provincial government. Depending on the outcome of this review, there may be changes that impact its availability.

Use of Debt

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

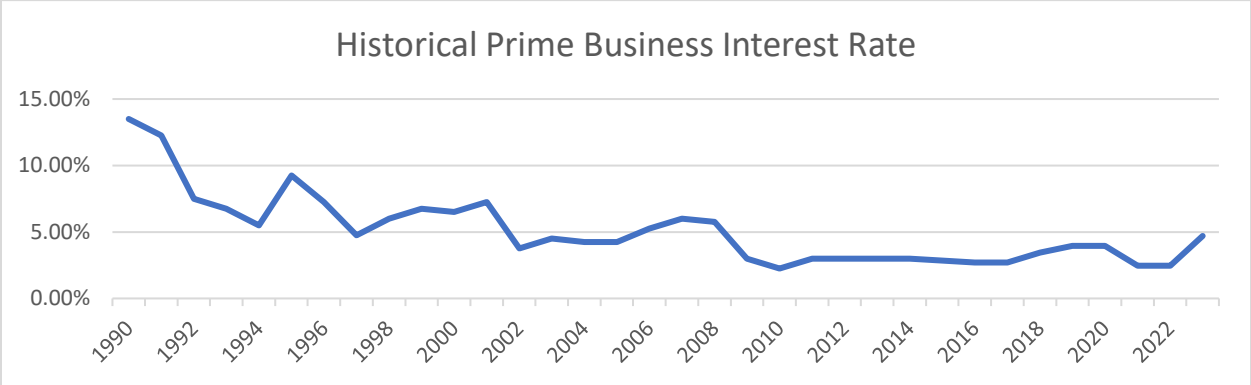
a) the ability to stabilize tax & user rates when dealing with variable and sometimes uncontrollable factors

b) equitable distribution of the cost/benefits of infrastructure over its useful life

c) a secure source of funding

d) 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. The following graph shows the historical changes to the lending rates:



A change in 15-year rates from 5% to 7% would change the premium from 45% to 65%. Such a change would have a significant impact on a financial plan.

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

Interest Rate	Number of Years Financed					
	5	10	15	20	25	30
7.0%	22%	42%	65%	89%	115%	142%
6.5%	20%	39%	60%	82%	105%	130%
6.0%	19%	36%	54%	74%	96%	118%
5.5%	17%	33%	49%	67%	86%	106%
5.0%	15%	30%	45%	60%	77%	95%
4.5%	14%	26%	40%	54%	69%	84%
4.0%	12%	23%	35%	47%	60%	73%
3.5%	11%	20%	30%	41%	52%	63%
3.0%	9%	17%	26%	34%	44%	53%
2.5%	8%	14%	21%	28%	36%	43%
2.0%	6%	11%	17%	22%	28%	34%
1.5%	5%	8%	12%	16%	21%	25%
1.0%	3%	6%	8%	11%	14%	16%
0.5%	2%	3%	4%	5%	7%	8%
0.0%	0%	0%	0%	0%	0%	0%

[2] Current municipal Infrastructure Ontario rates for 15-year money is 4.03%.

The following tables outline how Hastings Highlands has historically used debt for investing in the asset categories as listed. There is currently $499,884 of debt outstanding for the assets covered by this AMP with corresponding principal and interest payments of $209,996, well within its provincially prescribed maximum of $5,366,000.

Asset Category	Current Debt Outstanding	Use of Debt in the Last Five Years				
		2018	2019	2020	2021	2022
Road Network	$193,284					
Bridges & Culverts						
Buildings & Facilities	$306,600					
Machinery & Equipment						
Land Improvements						
Vehicles						
Total Tax Funded:	**$499,884**	**0**	**0**	**0**	**0**	**0**

Asset Category	Principal & Interest Payments in the Next Ten Years							
	2023	2024	2025	2026	2027	2028	2029	2030
Road Network	$100,672	$100,672	$100,672					
Bridges & Culverts								
Buildings & Facilities	$109,324	$109,324	$109,324	$109,324				
Machinery & Equipment								
Land Improvements								
Vehicles								
Total Tax Funded:	**$209,996**	**$209,996**	**$209,996**	**$109,324**	**0**	**0**	**0**	

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

Use of Reserves

Available Reserves

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

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

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

Asset Category	Balance at December 31, 2023
Road Network	$462,870
Bridges & Culverts	$812,617
Buildings	$441,935
Land Improvements	$372,638
Machinery & Equipment	$1,520,379
Vehicles	$30,902
Total Tax Funded:	**$3,641,340**

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

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

These reserves are available for use by applicable asset categories during the phase-in period to full funding. This coupled with Hastings Highlands's judicious use of debt in the past, allows the scenarios to assume that, if required, available

reserves and debt capacity can be used for high priority and emergency infrastructure investments in the short- to medium-term.

Recommendation

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

Recommendations

Asset Data

- Address Gaps in Historical Data: Due to the 2001 amalgamation of former Townships, there are gaps in the in-service dates for some bridges, roads, and land improvements, with certain historical data not existing. To improve the accuracy of the asset management plan, it is recommended that a comprehensive review and effort be undertaken to estimate or reconstruct these missing in-service dates where possible. Engaging historical records and consulting with previous municipal officials may aid in filling these gaps.
- Complete Asset Inventory: There are currently missing assets that have not been captured in the existing inventory. To ensure a complete and accurate asset management plan, it is recommended to conduct a thorough inventory audit. This audit should include field inspections and cross-referencing with historical records to identify and document all assets that may have been previously overlooked.

Condition Assessment Strategies

- Continue conducting network-wide assessments to ensure that condition information remains accurate and up to date. The Municipality has approved building condition assessments to be conducted in 2024, which will provide essential insights into the performance of municipal buildings. This proactive approach is crucial for prioritizing maintenance and repair efforts, optimizing resource allocation, and extending the lifespan of assets. To enhance the effectiveness of the asset management plan, it is recommended that this approach be extended to other asset categories that currently lack condition assessments. Regular evaluations will support efficient and cost-effective operation of infrastructure and equipment, ensuring long-term sustainability.

Lifecycle Management Strategies

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

Risk Management Strategies

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

Levels of Service

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

Appendix A: Road Network

State of the Infrastructure

Hastings Highland's Road Network comprises the largest share of its infrastructure portfolio, with a current replacement cost of $95.8 million, distributed among Asphalt (HCB), Surface-Treated (LCB), Gravel roads, and the Maynooth Downtown revitalization. The Municipality also owns and manages other supporting infrastructure and capital assets, including streetlights and sidewalks.

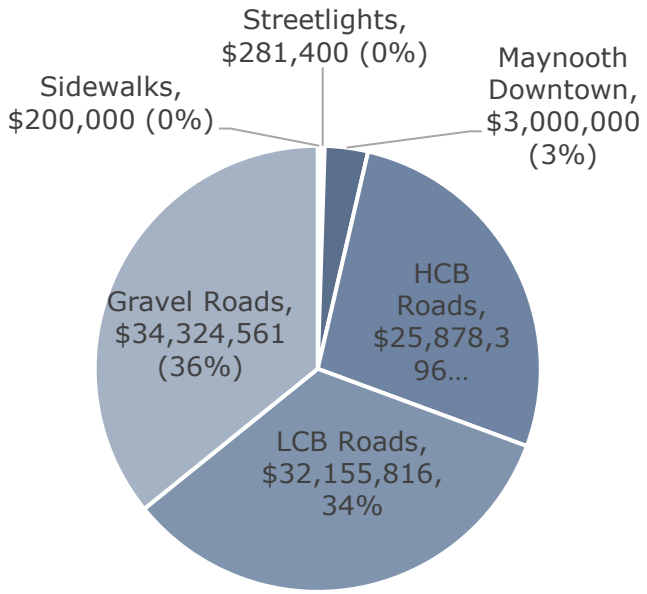
The state of the infrastructure for the road network is summarized below.

Replacement Cost	Condition	Financial Capacity	
		Annual Requirement:	$4,334,000
$95,840,000	Fair (50%)	Funding Available:	$1,134,095
		Annual Deficit:	$3,199,904

Inventory & Valuation

The figure below displays the replacement cost of each asset segment in the Municipality's Road inventory.

Figure 9: Road Network Replacement Value

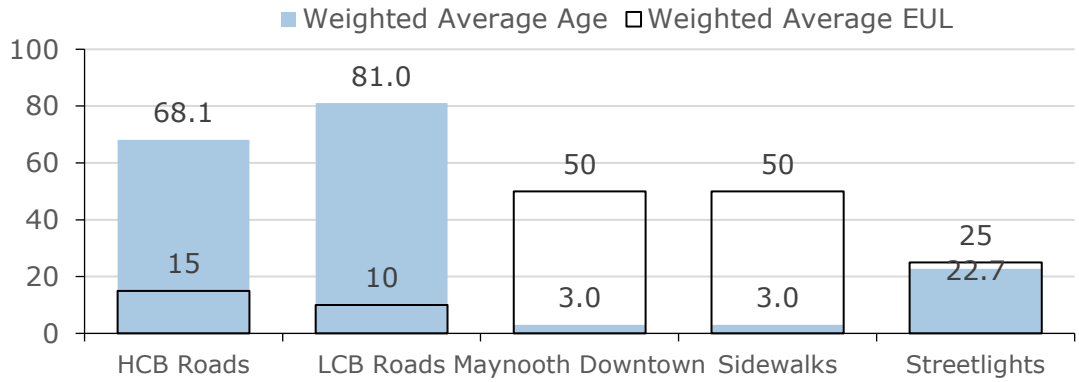


Each asset's replacement cost should be reviewed periodically to determine whether adjustments are needed to more accurate represent realistic capital requirements.

Asset Condition & Age

The graph below identifies the average age, and the estimated useful life for each asset segment[3]. The values are weighted based on replacement cost.

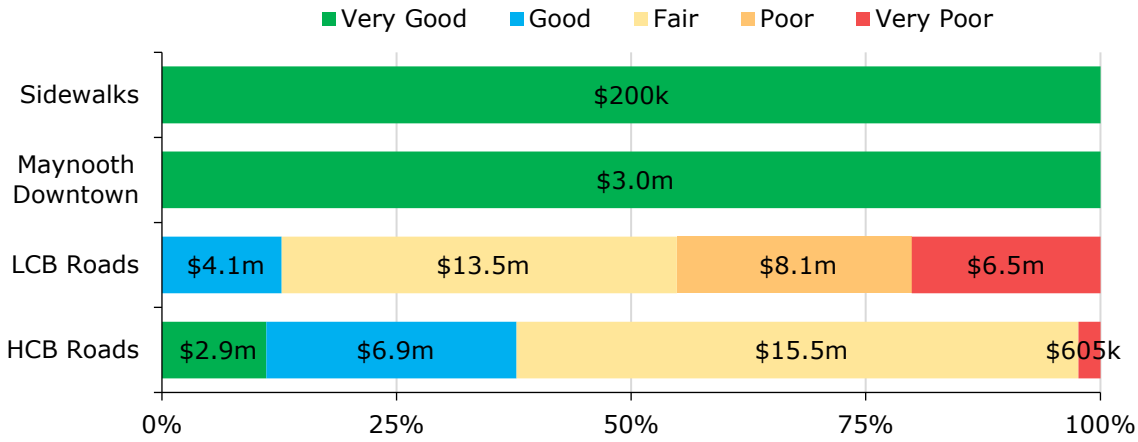
Figure 10: Road Network Average Age vs Average EUL



The analysis shows that, based on in-service dates, roads continue to remain in operation beyond their expected useful life. This is due to the life cycle management strategies currently being utilized.

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

Figure 11: Road Network Condition Breakdown



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.

[3] Gravel roads undergo perpetual operating and maintenance activities. If maintained properly, they can theoretically have a limitless service life

Current Approach to Condition Assessment

Accurate and reliable condition data allows staff to determine the remaining service life of assets and identify the most cost-effective approach to managing assets. The Municipality conducts comprehensive road needs assessments every 5-10 years that serve to evaluate the current condition of road infrastructure, identify areas requiring maintenance or rehabilitation, and inform future investment decisions. The last roads needs assessment was completed in 2022 by D.M. Wills Associates Limited. Roads needs assessments aid the Municipality in efficiently allocating resources, optimizing maintenance schedules, developing a 5-year plan for rehabilitation/replacement, and ensuring the continued safety and functionality of the transportation network.

Lifecycle Management Strategy

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

The following lifecycle strategies shown in Figure 12 have been developed as a proactive approach to managing the lifecycle of municipally owned roads. Instead of allowing the roads to deteriorate until replacement is required, strategic rehabilitation is expected to extend the service life of roads at a lower total cost.

In addition to these strategies, the municipality is conducting gravel crushing, ditching, brushing, and culvert installations in-house to further reduce total costs of maintenance and rehabilitation activities.

Figure 12: Road Network Current Lifecycle Strategy

Maintenance

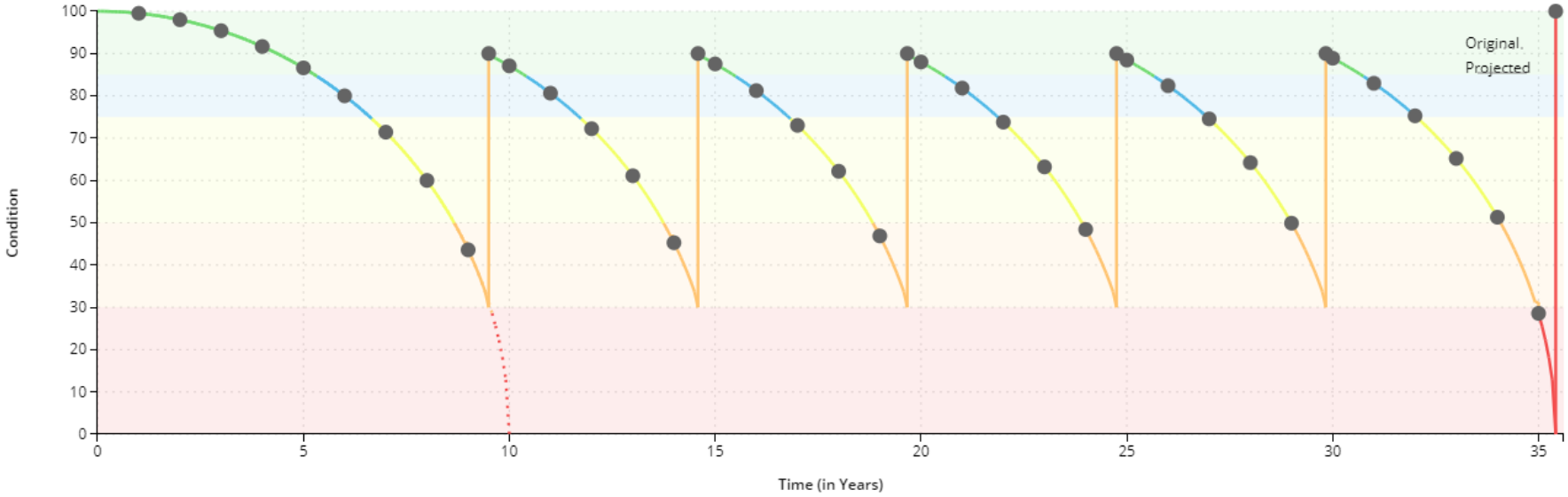
- Deficiency repairs as required from patrols for minimum maintenance standards such as patching, shoulder grading, etc.
- Winter control activities such as 24 hrs monitoring on highways, salt and sand, and snowplow

Rehabilitation / Renewal / Replacement

- Road rehabilitation projects are planned and executed in alignment with the Roads Needs Study
- Five-year road plans are formulated using the Roads Needs Study, available traffic count data, current road surface conditions, maintenance program costs for preserving surface quality, and considerations of risk and liability.

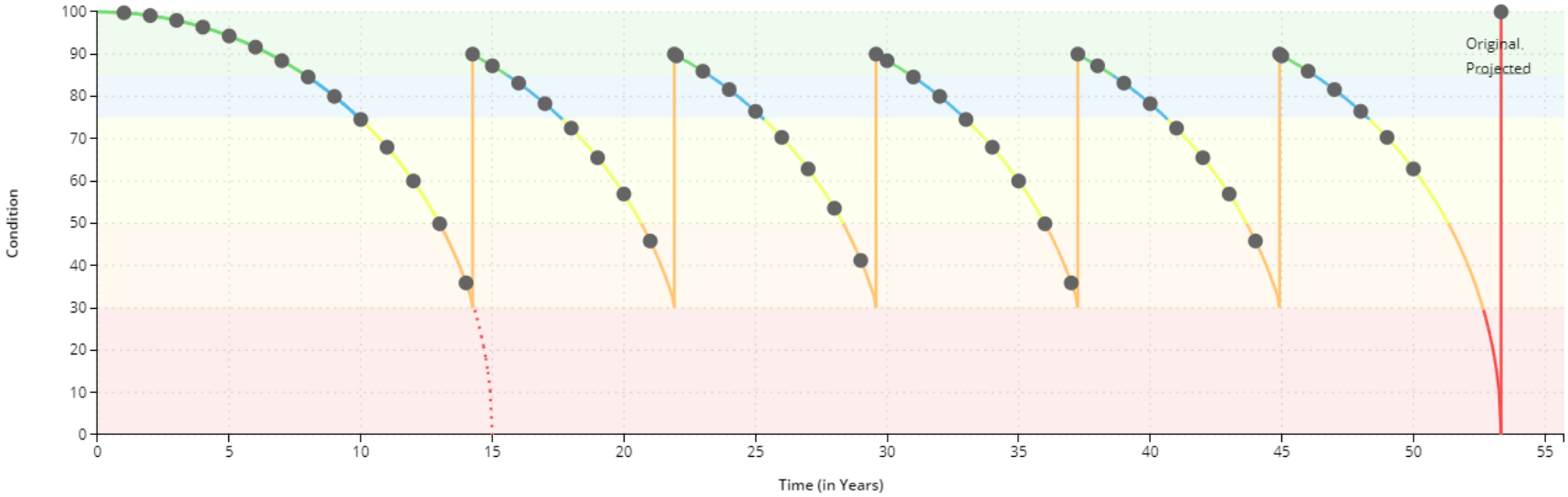
Pavement Condition Index scores, staff judgment, traffic loads, and opportunity to bundle projects help inform the optimal lifecycle intervention, ranging from pothole repairs to overlays and potential replacements. Lifecycle models used to estimate the savings to annual capital requirement are shown below in Figure 13 for Paved (LCB) roads, and Figure 14 for Asphalt (HCB) Roads.

Figure 13: Paved Roads (LCB) Road Lifecycle Model



LCB Roads		
Event Name	**Event Class**	**Event Trigger**
Patching	Maintenance	Annual event
Single Lift Treatment	Rehabilitation	Condition at 30%
Full Reconstruction	Replacement	Condition at 0%

Figure 14: Asphalt Roads (HCB) Road Lifecycle Model



HCB Roads		
Event Name	**Event Class**	**Event Trigger**
Patching	Maintenance	Annual event
Hot mix resurfacing	Rehabilitation	Condition at 30%
Full Reconstruction	Replacement	Condition at 0%

Forecasted Capital Requirements

Figure 15 illustrates the cyclical short-, medium- and long-term infrastructure rehabilitation and replacement requirements for the Municipality's road network. Based on the lifecycle strategies identified previously for HCB and LCB roads, and assuming the end-of-life replacement of all other assets in this category, the following graph forecasts capital requirements for the road network. This analysis was run until 2078 to capture at least one iteration of replacement for the longest-lived asset in the asset register.

Hastings Highlands's average annual requirements (red dotted line) total $4.3 million for all assets in the road network. Although actual spending may fluctuate substantially from year to year, this figure is a useful benchmark value for annual capital expenditure targets (or allocations to reserves) to ensure projects are not deferred and replacement needs are met as they arise. The chart illustrates capital needs through the forecast period in 5-year intervals.

The projections are designed to provide a long-term, portfolio-level overview of capital needs and should be used to support improved financial planning over several decades. They are based on asset replacement costs, age analysis, and condition data when available, as well as lifecycle modeling (roads only identified above).

Figure 15: Road Network Forecasted Capital Replacement Requirements

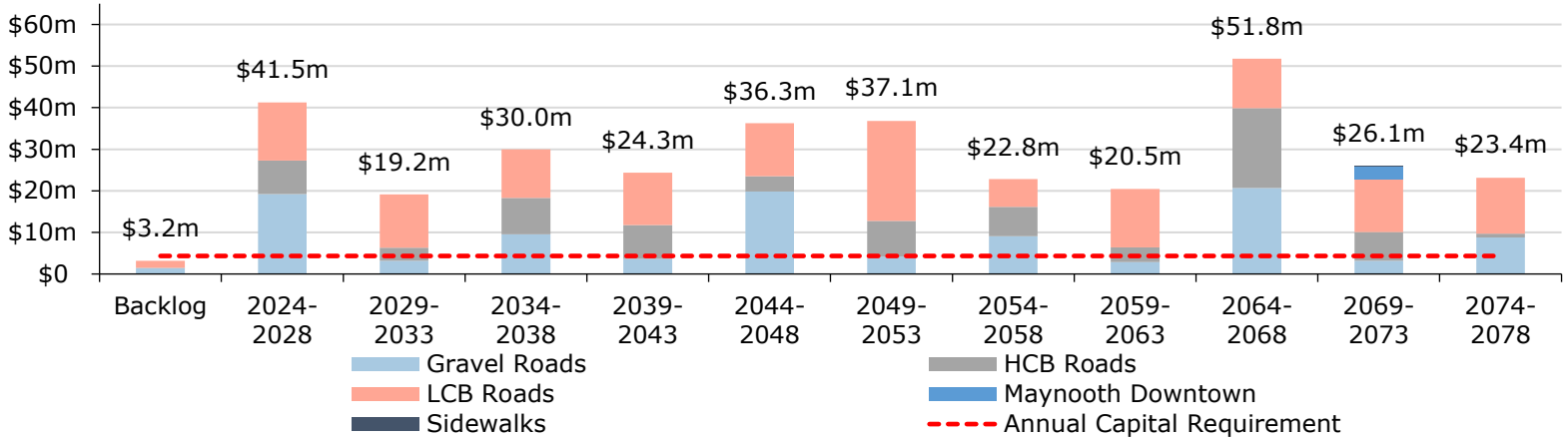


Table 10 below summarizes the projected cost of lifecycle activities (rehabilitation and replacement) that may need to be undertaken over the next 10 years to support current levels of service. These projections are generated in Citywide and rely on the data available in the asset register.

These projections can be different from actual capital forecasts. Consistent data updates, especially condition, will improve the alignment between the system-generated expenditure requirements, and the Municipality's capital expenditure forecasts.

Table 8 Road Network System-generated 10-Year Capital Costs

Segment	Total	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033
HCB Roads	$11.3m	$555k	$1.5m	$564k	$4.0m	$1.5m	$1.3m	$358k	$0	$0	$1.5m
LCB Roads	$26.8m	$6.8m	$4.4m	$2.2m	$670k	$0	$3.4m	$4.3m	$1.3m	$1.5m	$2.2m
Maynooth Downtown	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Sidewalks	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Streetlights	$248k	$0	$0	$244k	$0	$0	$0	$0	$0	$0	$4k
Total	**$38.3m**	**$7.3m**	**$5.8m**	**$3.0m**	**$4.7m**	**$1.5m**	**$4.7m**	**$4.7m**	**$1.3m**	**$1.5m**	**$3.7m**

Risk & Criticality

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

Figure 16: Road Network Risk Matrix

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

Risks to Current Asset Management Strategies

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

Asset Data Confidence

There is a lack of confidence in the available inventory data, specifically in the accuracy of the Average Annual Daily Traffic (AADT) data captured in the Roads Needs Study. To mitigate these risks, the municipality should regularly review and update AADT data. Staff plan to prioritize data refinement efforts to increase the accuracy and reliability of asset data and information. Once completed, staff can confidently develop data-driven strategies to address infrastructure needs.

Climate Change & Extreme Weather Events

Climate change introduces significant impacts through rising temperatures, which can further accelerate the deterioration of road surfaces and weaken their foundations. Flooding and extreme weather events, including increased freeze and thaw cycles, can cause substantial damage to the municipality's roads. For instance, freezing rain followed by rapid freezing can cause ice to expand within cracks and potholes in the pavement, worsening existing pavement issues and increasing the need for repairs or resurfacing. This ongoing cycle of damage and repair can ultimately strain municipal resources and elevate maintenance costs.

Hastings Highlands HH Road 62

The Municipality has assumed approximately 30 kilometers of HH Road 62, previously known as Provincial Highway 62. According to Ministry of Transportation specifications, the cost to fully rehabilitate this road is estimated at $24 million as of 2024. Currently, this estimated cost far exceeds the municipality's funding capacity. The substantial funding gap affects the road's condition and its ability to serve its intended purpose effectively. Despite exploring various financial resources, the municipality has determined that it cannot secure the necessary funds for this project on its own. As a result, the Municipality is actively seeking external financial support to bridge this funding gap and achieve the required road rehabilitation.

Levels of Service

The following tables identify the Municipality's metrics to identify their current level of service for the roads. By comparing the cost, performance (average condition) and risk year-over-year, Hastings Highlands will be able to evaluate how their services/assets are trending. The Municipality will use this data to set a target level of service and determine proposed levels for the regulation by 2025. The tables that follow summarize Hastings Highlands's current levels of service.

Community Levels of Service

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

Table 9 Road Network Community Levels of Service

Values	Qualitative Description	Current LOS (2023)
Cost Efficient	Description, which may include maps, of the road network in the Municipality and its level of connectivity	See Appendix J.
Sustainable	Description or images that illustrate the different levels of road class pavement condition	See Figure 2 for the description of road condition.

Technical Levels of Service

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

Table 10 Road Network Technical Levels of Service

Service Attribute	Technical Metric	Curent LOS (2023)
Scope	Lane-km of arterial roads (MMS classes 1 and 2) per land area in the municipality (km/km^2)	0 lane km/km^2
	Lane-km of collector roads (MMS classes 3 and 4) per land area in the municipality (km/km^2)	0.44 lane km/km^2
	Lane-km of local roads (MMS classes 5 and 6) per land area in the municipality (km/km^2)	0.57 lane km/km^2
Quality	Average pavement condition index for paved roads in the municipality	78.5
	Average surface condition for unpaved roads in the municipality	49
Performance	Actual Capital Reinvestment Rate (Annual) – Target Reinvestment Rate (Annual)	1.2% - 4.5%

Appendix B: Bridges & Culverts

State of the Infrastructure

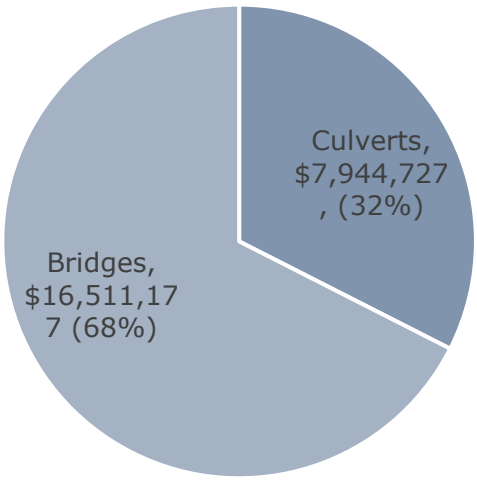
Bridges and culverts (B&C) represent a critical portion of the transportation services provided to the community. The state of the infrastructure for bridges and culverts is summarized in the following table.

Replacement Cost	Condition	Financial Capacity	
$24,456,000	Fair (66%)	Annual Requirement:	$610,000
		Funding Available:	$300,000
		Annual Deficit:	$310,000

Inventory & Valuation

Figure 17 below displays the replacement cost of each asset segment in the Municipality's bridges and culverts inventory.

Figure 17 Bridges & Culverts Replacement Cost

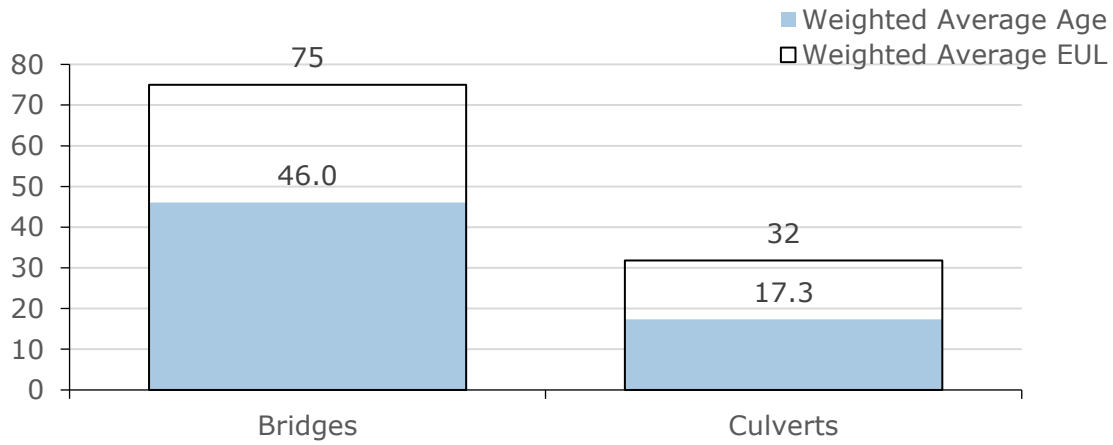


Each asset's replacement cost should be reviewed periodically to determine whether adjustments are needed. This can be included in the Ontario Structures Inspection Manual (OSIM) inspections as the replacement cost is part of the calculation for the bridge condition index (BCI).

Asset Condition & Age

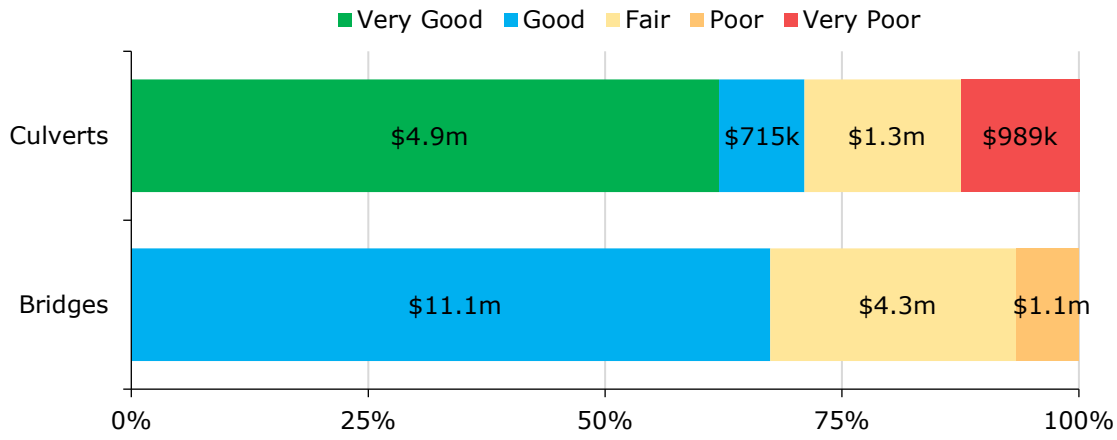
The graph below identifies the average age and the estimated useful life for each asset segment. The values are weighted based on replacement cost.

Figure 18: B&C Average Age vs Average EUL



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

Figure 19: B&C Condition Breakdown



To ensure that the Municipality's bridges and culverts continue to provide an acceptable level of service, the staff should monitor the average condition of all assets. Each asset's estimated useful life should also be reviewed periodically to determine whether adjustments need to be made to better align with the observed length of service life for each asset type.

Current Approach to Condition Assessment

Accurate and reliable condition data allows staff to determine the remaining service life of assets and identify the most cost-effective approach to managing assets. Hastings Highlands' current approach is to assess the 12 bridges and 11 culverts every 2 years in accordance with the Ontario Structure Inspection Manual (OSIM). The most recent assessment was completed in 2023 by Ainley Group.

Lifecycle Management Strategy

The condition or performance of most assets will deteriorate over time. To ensure that municipal assets are performing as expected and meeting the needs of customers, it is important to establish a lifecycle management strategy to proactively manage asset deterioration. Figure 20 outlines Hastings Highlands' current lifecycle management strategy.

Figure 20: B&C Current Lifecycle Strategy

Maintenance

- All maintenance and repair activities are driven by the results of inspections competed according to the Ontario Structure Inspection Manual (OSIM)
- OSIM recommendations are taken into consideration during the development of the 5-year plan, and are dependent on available funding

Rehabilitation / Renewal / Replacement

- Replacement activities are incorporated into 5-year plan occurs upon OSIM recommendation, and are subjected to the availability of funding

Forecasted Capital Requirements

Figure 21 illustrates the cyclical short-, medium- and long-term infrastructure rehabilitation and replacement requirements for the Municipality's bridges and culverts. These projections are based on asset replacement costs, age analysis, and condition data. They are designed to provide a long-term, portfolio-level overview of capital needs and should be used to support improved financial planning over several decades.

The following analysis was run until 2103 and the resulting graph identifies capital requirements over the next 80 years. Hastings Highlands's average annual requirements (red dotted line) for bridges and culverts total $610 thousand. Although actual spending may fluctuate substantially from year to year, this figure is a useful benchmark value for annual capital expenditure targets (or allocations to reserves) to ensure projects are not deferred and replacement needs are met as they arise.

OSIM condition assessments and a robust risk framework will ensure that high-criticality assets receive proper and timely lifecycle intervention, including rehabilitation and replacement activities.

Figure 21: B&C Forecasted Capital Replacement Requirements

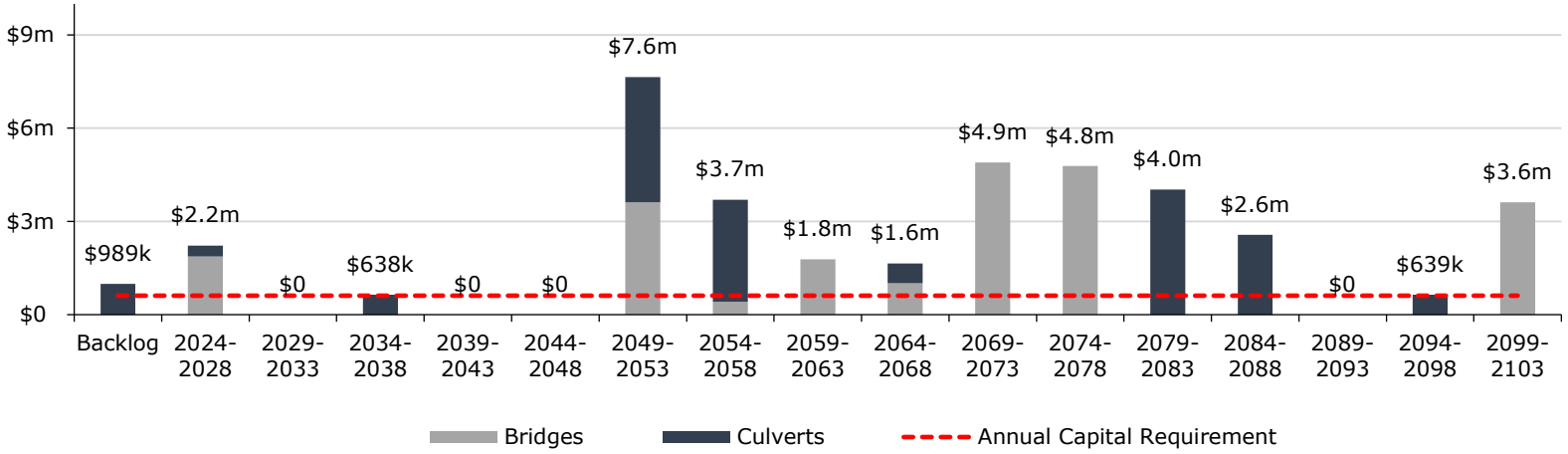


Table 13 below summarizes the projected cost of lifecycle activities (as previously described) that may need to be undertaken over the next 10 years to support current levels of service. These projections, outlined in the municipality's 5-year plan, are derived from the OSIM recommendations and are represented at the major asset level.

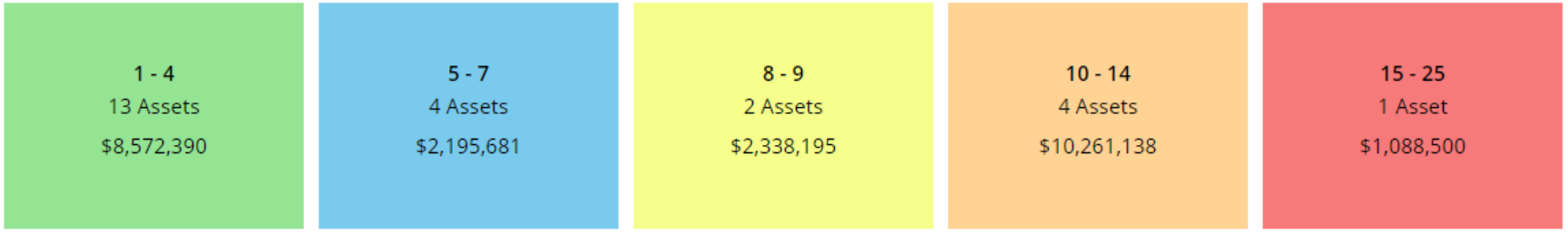
Table 11 B&C System-generated 10-Year Capital Costs

Segment	Total	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033
Bridges	$1.9m	$350k	$0	$550k	$425k	$550k	$0	$0	$0	$0	$0
Culverts	$350k	$0	$150k	$0	$200k	$0	$0	$0	$0	$0	$0
Total	**$2.2m**	**$350k**	**$150k**	**$550k**	**$625k**	**$550k**	**$0**	**$0**	**$0**	**$0**	**$0**

Risk & Criticality

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

Figure 22: B&C Risk Matrix



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

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

Risks to Current Asset Management Strategies

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

Climate Change & Extreme Weather Events

Various bridges and Culverts were severely damaged during the major flooding in 2019. Following that, the municipality was partially reimbursed for the restoration of bridges and culverts impacted by the flood by the Municipal Disaster Recovery Assistance Program. Flooding and extreme weather causes damage to multiple components of the Municipality's bridges including the deck, superstructure, substructure, and approaches. The rising levels of freshwater and the increased frequency and intensity of precipitation events are likely to increase the deterioration of bridge components. Staff should identify and monitor effected bridges and culverts. The Municipality also should prioritize infrastructure maintenance, rehabilitation, and replacement based on susceptibility to climate impacts.

Levels of Service

The following tables identify the Municipality's metrics to identify their current level of service for the bridges and culverts. The Municipality will use this data to set a target level of service and determine proposed levels for the regulation by 2025.

Community Levels of Service

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

Table 12 B&C Community Levels of Service

Service Attribute	Qualitative Description	Current LOS (2023)
Scope	Description of the traffic that is supported by municipal bridges (e.g. heavy transport, motor, emergency vehicles, pedestrians, cyclists)	The bridges within the Municipality accomodate a variety of traffic, acting as essential connections both within Hastings Highlands and for travel between other municipalities. They support a broad spectrum of vehicles, including large agricultural machinery, heavy transport trucks, motor vehicles, emergency vehicles, as well as cyclists and pedestrians. The Boulter Road Bridge has a loading restriction in place, which limits the types and weights of vehicles that can safely cross it.
Quality	Description or images of the condition of bridges and culverts and how this would affect use of the bridges and culverts	See Appendix J.

Technical Levels of Service

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

Table 13 B&C Technical Levels of Service

Service Attribute	Technical Metric	Current LOS (2023)
Scope	% of bridges in the municipality with loading or dimensional restrictions	8%
Quality	Average bridge condition index value for bridges in the municipality	67.9
	Average bridge condition index value for structural culverts in the municipality	74.9
Performance	Actual Capital Reinvestment Rate (Annual) – Target Reinvestment Rate (Annual)	1.2% - 2.5%

Appendix F: Buildings

State of the Infrastructure

Hastings Highlands owns and maintains several facilities that provide key services to the community. These include:

- Protection buildings such as two fire stations in Hastings Highlands, as well as stations in Monteagle Valley, Maynooth, Centreview.
- Public Works buildings such as the Operations yard and attached administration building
- Recreation facilities such as the Lake St. Peter Community Centre, Herschel Community Centre, Birds Creek Community Centre, Maynooth Rink Building and Bangor Community Centre

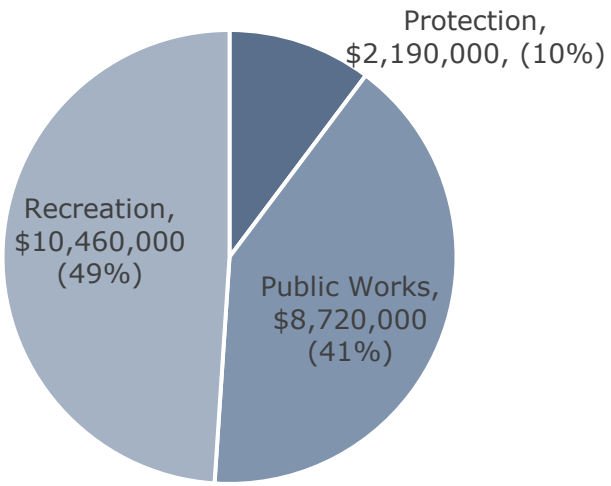
The state of the infrastructure for the buildings and facilities is summarized in the following table.

Replacement Cost	Condition	Financial Capacity	
$21,370,000	Fair (38%)	Annual Requirement:	$428,000
		Funding Available:	$18,200
		Annual Deficit:	$409,800

Inventory & Valuation

The graph below displays the total replacement cost of each asset segment in Hastings Highlands's buildings inventory. As the Municipality has not had a complete componentization of their buildings their inventory tracks buildings as a main asset with some small as replaced componentization.

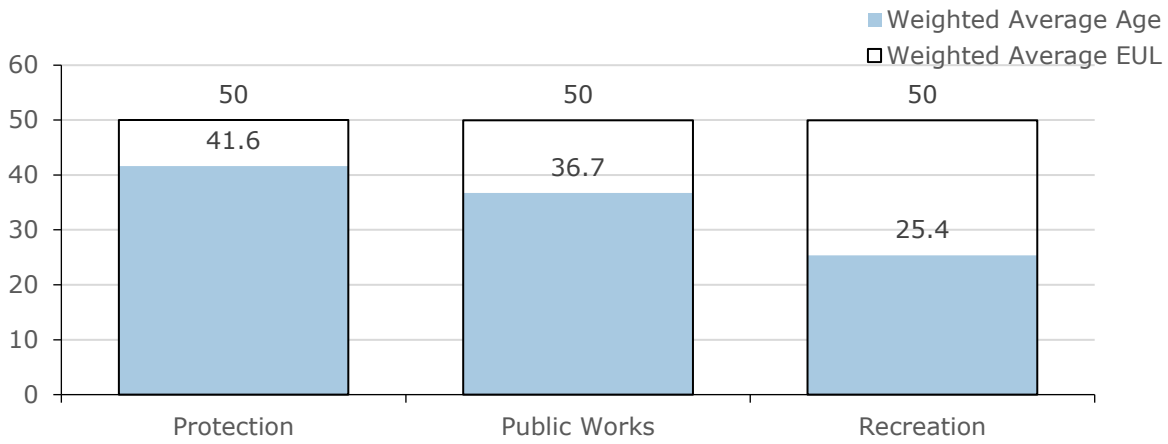
Figure 41: Buildings Replacement Cost



Asset Condition & Age

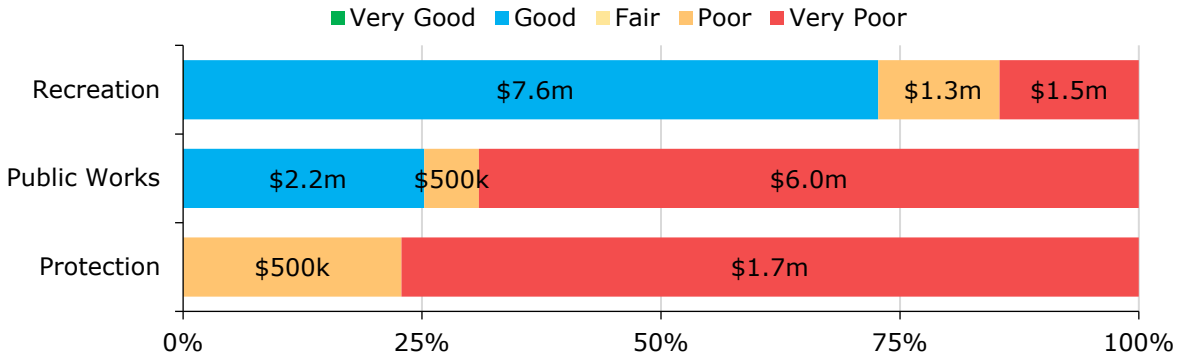
The graph below identifies the average age, and the estimated useful life for each asset segment. The values are weighted based on replacement cost.

Figure 42: Buildings Average Age vs Average EUL



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

Figure 23: Buildings Condition Breakdown



To ensure that the municipal buildings continue 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 buildings.

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

Current Approach to Condition Assessment

Accurate and reliable condition data allows staff to determine the remaining service life of assets and identify the most cost-effective approach to managing assets. The municipality has their budget approved for getting 15 of their key facilities assessed by fall 2024. Based on the results, the municipality is planning to conduct these

Building Condition Assessments every 5-10 years. These condition assessment strategies will also be included in the municipality's 5-year planning horizon.

Fire Halls are subject to mandated inspections to ensure compliance with safety regulations and standards, as well as for ensuring that the facilities are equipped to effectively respond to emergencies.

Other facilities are subjected to regular inspections of health & safety requirements as well as structural deficiencies that require additional attention.

Lifecycle Management Strategy

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

Figure 24: Buildings Current Lifecycle Strategy

Maintenance / Rehabilitation / Replacement
• Buildings are repaired as needed, addressing deficiencies identified by experts, staff, or residents, contingent on available funding. Immediate attention is given to urgent issues. •Heating systems and other component systems are repaired or replaced promptly on an as-needed basis • Building rehabilitation and replacement is facilitated through grant funding

Forecasted Capital Requirements

The annual capital requirement represents the average amount per year that Hastings Highlands should allocate towards funding rehabilitation and replacement needs. The following graph identifies capital requirements over the next 50 years. This projection is used as it ensures that every asset has gone through one full iteration of replacement. The forecasted requirements are aggregated into 5-year bins and the trend line represents the average capital requirements at $428 thousand.

Figure 25: Buildings Forecasted Capital Replacement Requirements

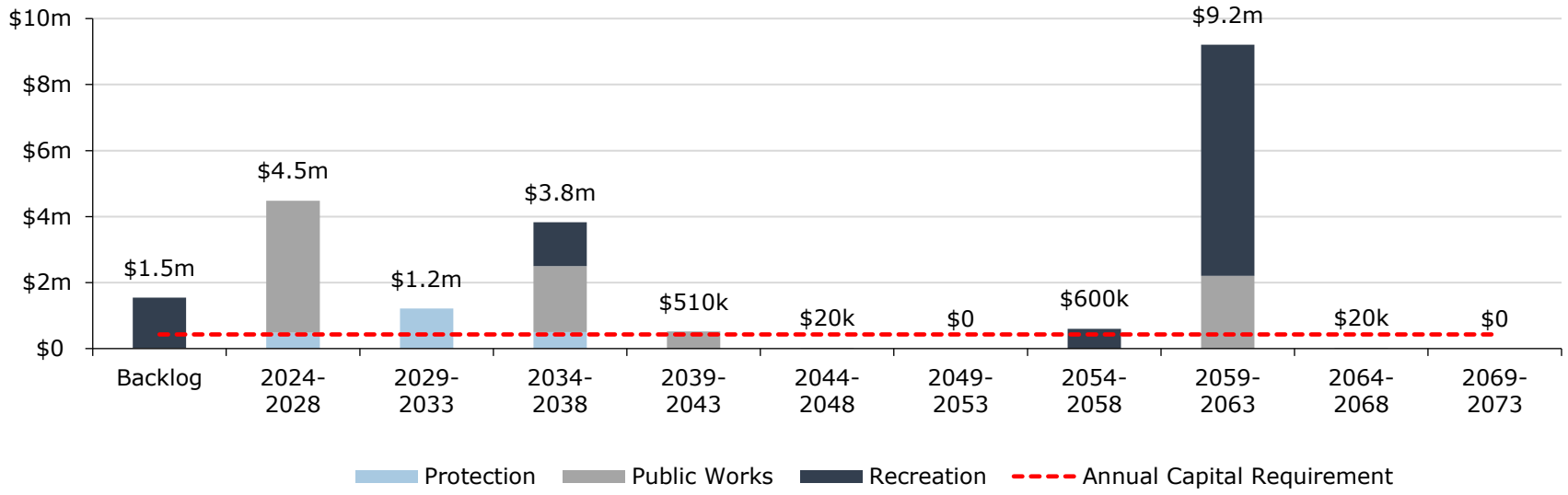


Table 25 below summarizes the projected cost of lifecycle activities (capital activities only) that may need to be undertaken over the next 10 years to support current levels of service.

Table 14 Buildings System-Generated 10-Year Capital Costs

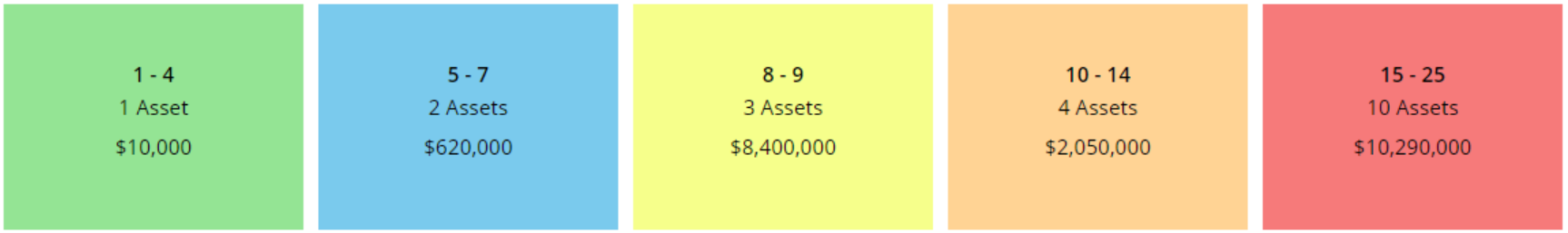
Segment	Total	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033
Protection	$1.7m	$0	$0	$0	$480k	$0	$0	$480k	$0	$730k	$0
Public Works	$4.0m	$2.0m	$2.0m	$0	$0	$0	$0	$0	$0	$0	$0
Recreation	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Total	**$5.7m**	**$2.0m**	**$2.0m**	**$0**	**$480k**	**$0**	**$0**	**$480k**	**$0**	**$730k**	**$0**

These projections are generated in Citywide and rely on the data available in the asset register, which was limited to asset age, replacement cost, and useful life.

Risk & Criticality

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

Figure 26: Buildings Risk Matrix



This is a high-level model that has been developed based on information currently available and should be reviewed and adjusted to reflect an evolving understanding of both the probability and consequences of asset failure. T

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

Risks to Current Asset Management Strategies

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

Lifecycle Management Strategies

The lack of condition assessments poses a challenge in planning the lifecycle activities. Therefore, the nature of lifecycle activities is reactive. However, to address that, the municipality is in the process of getting their facilities assessed in 2024 and plan to incorporate periodic condition assessments into their asset management practice.

Levels of Service

By comparing the cost, performance (average condition) and risk year-over-year, the Municipality will be able to evaluate how their services/assets are trending. The Municipality will use this data to set a target level of service and determine proposed levels for the regulation by 2025.

Community Levels of Service

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

Values	Technical Metric	Current LOS (2023)
Scope	Description of the current condition of municipal buildings and the plans that are in place to maintain or improve the provided level of service	The overall condition of the buildings in the Municipality are fair. Municipality staff are currently in the planning stages of implementing formal building condition assessments to identify required maintenance and rehabilitation activities to ensure the state of the buildings remains in adequate condition

Technical Levels of Service

The quantitative metrics that determine the technical level of service provided by the buildings in Hastings Highlands are going to be the analysis of reinvestment rates, asset performance (condition breakdown) and asset risk levels.

Table 15 Buildings Technical Levels of Service

Values	Technical Metric	Current LOS (2023)
Scope	Average Condition Rating	Poor (38%)
	Average Risk Rating	Very High (15.4)
Performance	Actual Capital Reinvestment Rate (Annual) – Target Reinvestment Rate (Annual)	0.1% - 2.0%

Appendix G: Land Improvements

State of the Infrastructure

Hastings Highlands's land improvement infrastructure is made up of playground equipment, outdoor ice rinks in Birds Creek, Maynooth and Lake St Peter, a ball diamond in Birds Creek including lighting, pergolas and picnic shelters, as well as general improvements such as fencing.

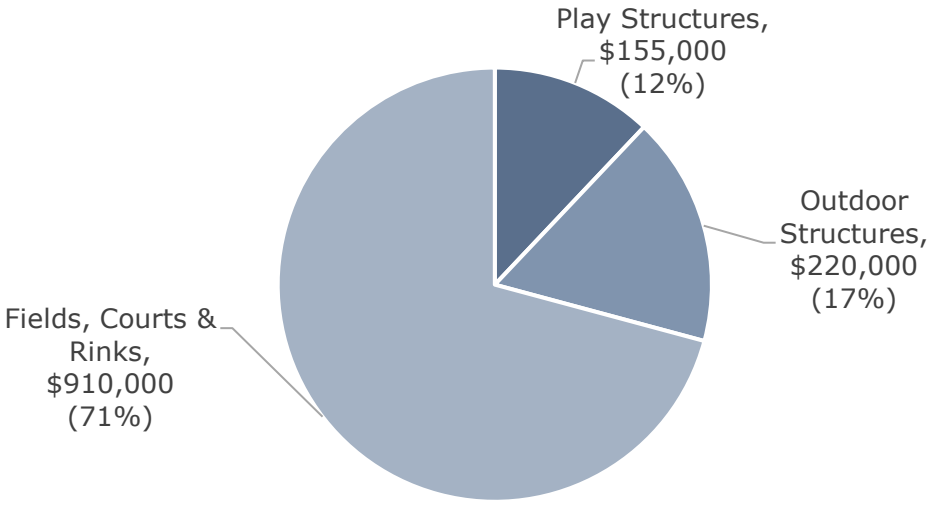
The state of the infrastructure for the land improvements is summarized in the following table.

Replacement Cost	Condition	Financial Capacity	
$1,285,000	Fair (44%)	Annual Requirement:	$64,000
		Funding Available:	$0
		Annual Deficit:	$64,000

Asset Inventory & Valuation

The graph below displays the replacement cost of each asset segment in the Municipality's land improvement inventory.

Figure 27: Land Improvements Replacement Cost

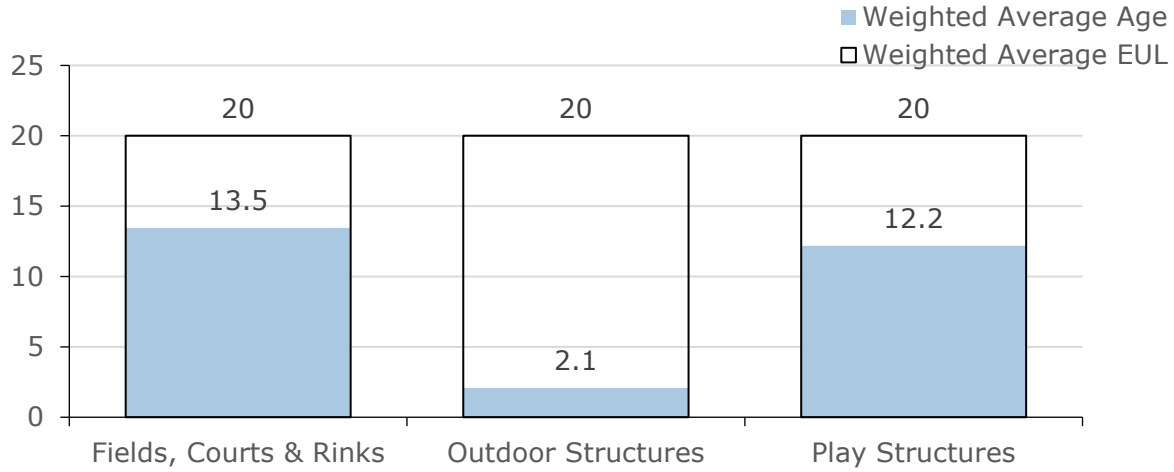


Each asset's replacement cost should be reviewed periodically to determine whether adjustments are needed to represent capital requirements more accurately.

Asset Condition & Age

The graph below identifies the average age, and the estimated useful life for each asset segment. The values are weighted based on replacement cost.

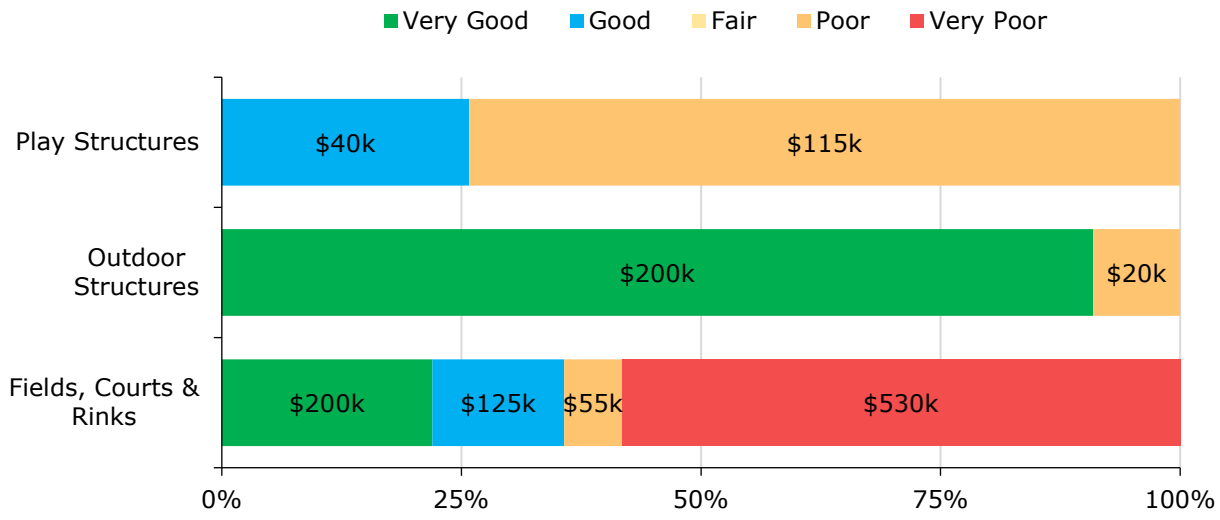
Figure 28: Land Improvements Average Age vs Average EUL



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.

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

Figure 29: Land Improvement Condition Breakdown



To ensure that the Municipality's land improvements continue 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 activities is required to increase the overall condition of the land improvements.

Current Approach to Condition Assessment

Accurate and reliable condition data allows staff to determine the remaining service life of assets and identify the most cost-effective approach to managing assets. Due to the varied nature of the asset category the assets are managed individually. The Municipality employs an external contractor to conduct thorough inspections for its playground structures in accordance with CAN/CSA Z614 standards. Internal staff conducts visual inspections and routine maintenance based on resident complaints. This approach ensures the safety, functionality, and accessibility of Municipality playgrounds and parks, promoting enjoyable recreational experiences for residents and visitors alike.

Lifecycle Management Strategy

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

Figure 30: Land Improvements Current Lifecycle Strategy

Maintenance / Rehabilitation / Replacement

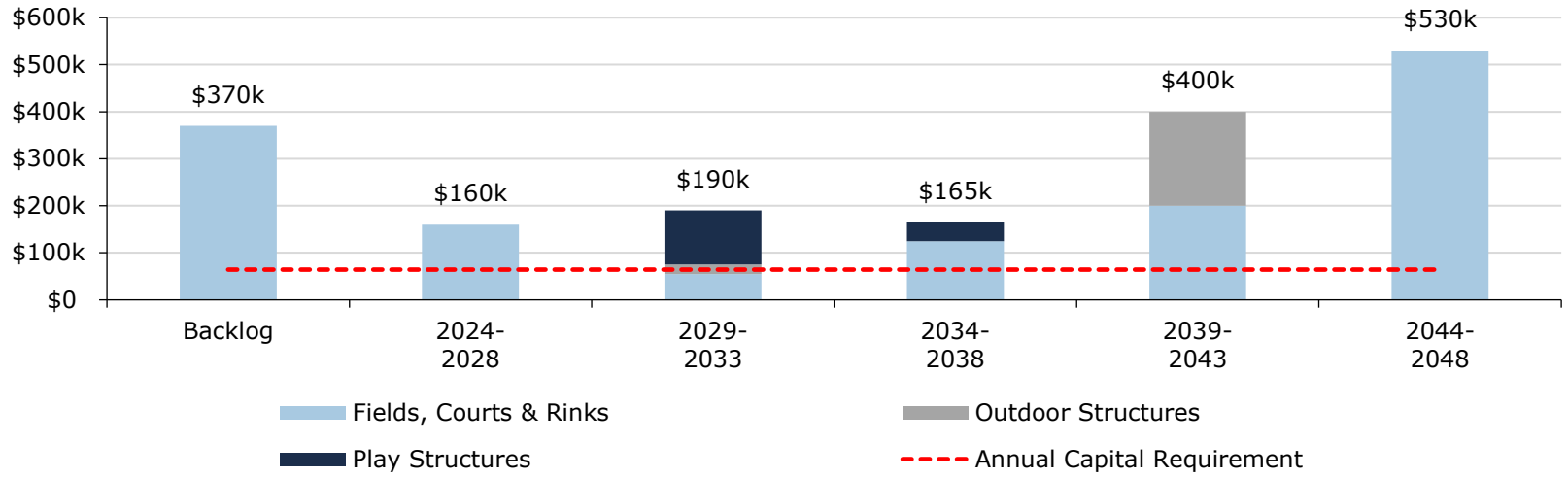
- This asset category's lifecycle requirements are dealt with on a case-by-case basis.
- Rehabilitation and replacement of land improvement assets are facilitated through grant funding

Forecasted Capital Requirements

Figure 50 illustrates the cyclical short-, medium- and long-term infrastructure replacement requirements for the Municipality's land improvement infrastructure. This analysis was run until 2048 to capture at least one iteration of replacement for the longest-lived asset in the asset register. Hastings Highlands's average annual requirements (red dotted line) total $64 thousand for all land improvement assets. Although actual spending may fluctuate substantially from year to year, this figure is a useful benchmark value for annual capital expenditure targets (or allocations to reserves) to ensure projects are not deferred and replacement needs are met as they arise.

These projections and estimates are based on asset replacement costs and age analysis. They are designed to provide a long-term, portfolio-level overview of capital needs and should be used to support improved financial planning over several decades.

Figure 50: Land Improvements Forecasted Capital Replacement Requirements



It is unlikely that all land improvement assets need to be replaced as forecasted. Coordinated projects may help drive replacements and rehabilitations.

Table 27 below summarizes the projected cost of lifecycle activities (capital replacement only) that will need to be undertaken over the next 10 years to support current levels of service. These projections are generated in Citywide and rely on the data available in the asset register, which was limited to asset age, replacement cost, and useful life.

Table 16 Land Improvements System-Generated 10-Year Capital Costs

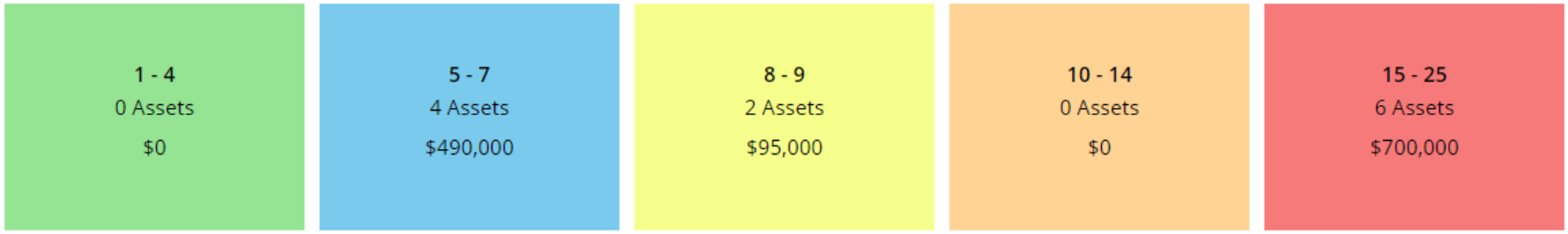
Segment	Total	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033
Fields, Courts & Rinks	$215k	$0	$0	$0	$160k	$0	$0	$55k	$0	$0	$0
Outdoor Structures	$20k	$0	$0	$0	$0	$0	$0	$20k	$0	$0	$0
Play Structures	$115k	$0	$0	$0	$0	$0	$115k	$0	$0	$0	$0
Total	**$350k**	**$0**	**$0**	**$0**	**$160k**	**$0**	**$115k**	**$75k**	**$0**	**$0**	**$0**

Consistent data updates, especially condition, will improve the alignment between the system-generated expenditure requirements, and the Municipality's capital expenditure forecasts.

Risk & Criticality

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

Figure 51: Land Improvement Risk Matrix



This is a high-level model that has been developed based on information currently available and should be reviewed and adjusted to reflect an evolving understanding of both the probability and consequences of asset failure.

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

Risks to Current Asset Management Strategies

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

Organizational Capacity

Both short- and long-term planning requires the regular collection of infrastructure data to support asset management decision-making. Staff find it a continuous challenge to dedicate resources and time towards conducting condition assessments to ensure that asset attribute data is regularly reviewed and updated. A standardized approach to data gathering and condition assessments with achievable goals may help to enable the Municipality to regularly update their asset data and information.

Levels of Service

The following tables identify Hastings Highlands's metrics to identify the current level of service for the land improvement assets. By comparing the cost, performance (average condition) and risk year-over-year the Municipality will be able to evaluate how their services/assets are trending. Hastings Highlands will use this data to set a target level of service and determine proposed levels for the regulation by 2025.

Community Levels of Service

The following table outlines the quantitative metrics that determine the community level of service provided by the municipal Land Improvements.

Values	Technical Metric	Current LOS (2023)
Scope	Description of the current condition of land improvement assets and the plans that are in place to maintain or improve the provided level of service	The overall condition of the asset category is Fair. The Municipality is focused on maintaining its land improvement assets with a clear plan for future development. Staff are preparing to integrate these assets into their 5-year planning strategy. Efforts will also continue to secure grant funding for upgrades to amenities including playgrounds, fields, and rinks, to ensure these community assets remain high-quality and beneficial for residents.

Technical Levels of Service

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

Table 17 Land Improvements Technical Levels of Service

Values	Technical Metric	Current LOS (2023)
Scope	Average Condition Rating	Fair (44%)
	Average Risk Rating	High (14.6)
Performance	Actual Capital Reinvestment Rate (Annual) – Target Reinvestment Rate (Annual)	0% - 5.0%

Appendix H: Machinery & Equipment

State of the Infrastructure

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

- Computers, servers, and phone systems to support municipal services
- Loaders, graders and steamers to support roadway maintenance
- Equipment for the fire department to effectively respond to emergencies, such as SCBA equipment, radios, harnesses, and fire hoses
- Landfill compactor and other equipment for solid waste disposal
- Communication Towers for wireless communication within the Municipality

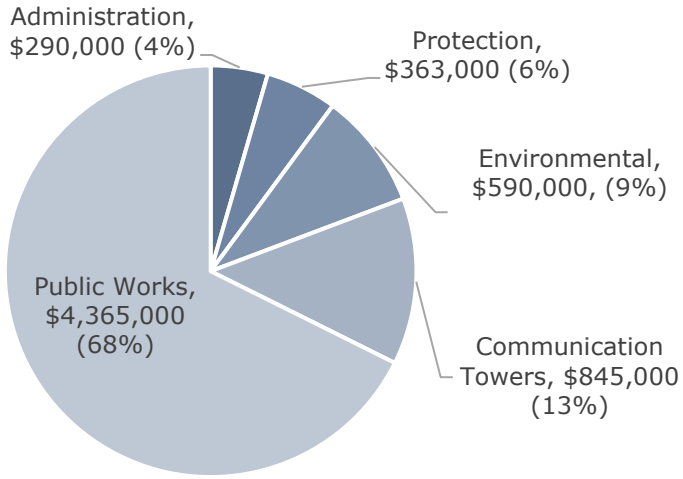
The state of the infrastructure for equipment is summarized in the following table.

Replacement Cost	Condition	Financial Capacity	
$6,453,000	Poor (25%)	Annual Requirement:	$356,000
		Funding Available:	$275,000
		Annual Deficit:	$81,000

Inventory & Valuation

The graph below displays the total replacement cost of each asset segment in the Hastings Highlands's equipment inventory.

Figure 31: Machinery & Equipment Replacement Costs

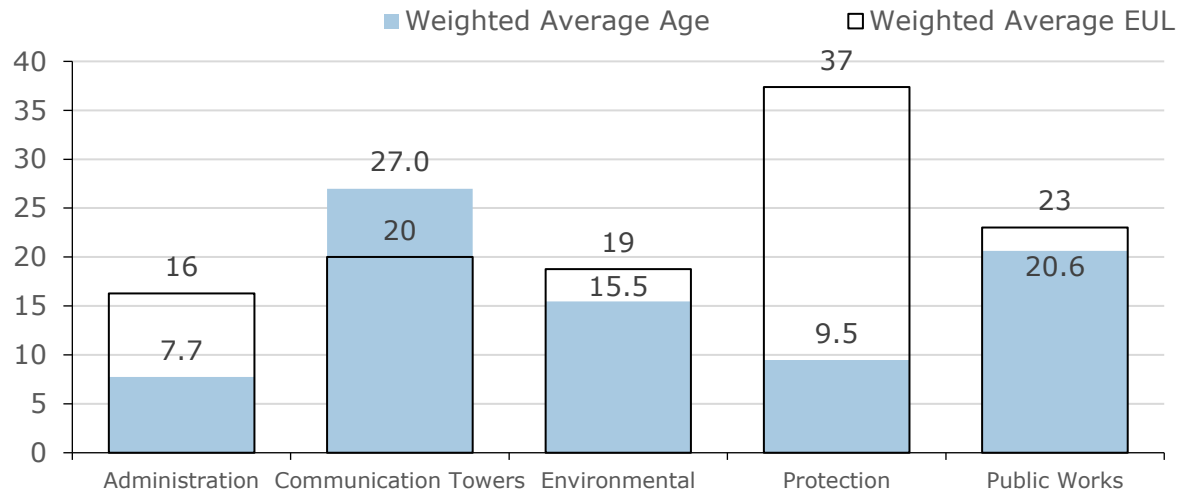


Each asset's replacement cost should be reviewed periodically to determine whether adjustments are needed to more accurate represent capital requirements.

Asset Condition & Age

The graph below identifies the average age and the estimated useful life for each asset segment. The values are weighted based on replacement cost.

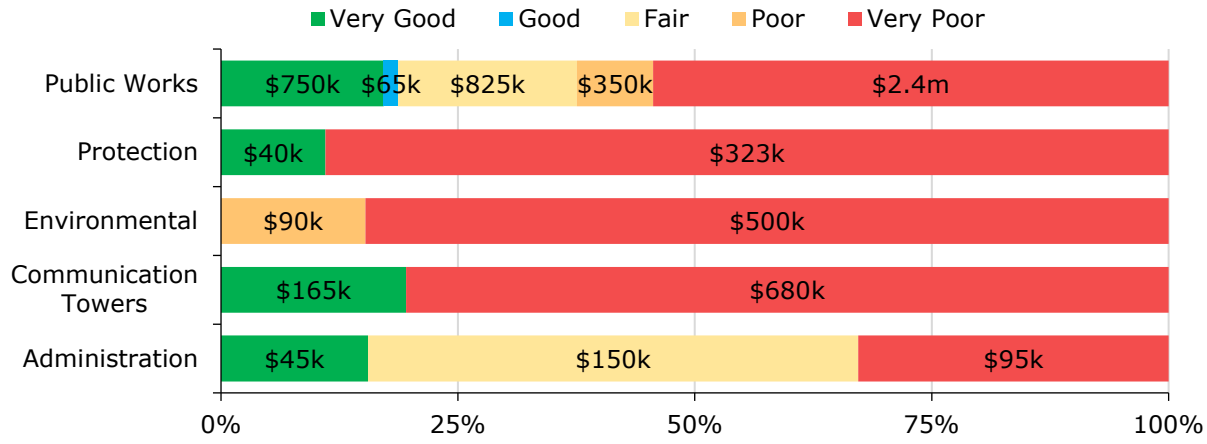
Figure 32: Machinery & Equipment Average Age vs Average EUL



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.

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

Figure 33: Machinery & Equipment Condition Breakdown



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

Current Approach to Condition Assessment

Accurate and reliable condition data allows staff to determine the remaining service life of assets and identify the most cost-effective approach to managing assets. The current approach is varied because of the broad range of types of equipment included in this category. Assets are evaluated on a case-by-case basis, with inspections tailored to each asset type and conducted in accordance with OEM recommendations as necessary. Additionally, SCBA equipment is subject to monthly testing.

Lifecycle Management Strategy

The condition or performance of most assets will deteriorate over time. To ensure that municipal assets are performing as expected and meet the needs of customers, it is important to establish a lifecycle management strategy to proactively manage asset deterioration. Council endorses the municipality staff's cost-effective strategy of acquiring pre-owned graders and other equipment for rehabilitation by in-house mechanics. This initiative will enable the municipality to procure equipment that is otherwise challenging and costly to obtain.

Figure 34: Machinery & Equipment Current Lifecycle Strategy

Maintenance / Rehabilitation / Replacement

- Equipment maintenance adheres to manufacturer recommendations and is supplemented by staff expertise when necessary.
- Fire station equipment undergoes regular maintenance as per manufacturer guidelines.
- SCBA equipment is replaced either at the end of its useful life as mandated by standards, or earlier based on staff recommendations following monthly inspections.

Forecasted Capital Requirements

The following graph identifies capital requirements over the next 40 years. This projection is used as it ensures that every asset has gone through one full iteration of replacement. The forecasted requirements are aggregated into 5-year bins and the trend line represents the average annual capital requirements at $356 thousand.

Figure 35: Machinery & Equipment Forecasted Capital Replacement Requirements

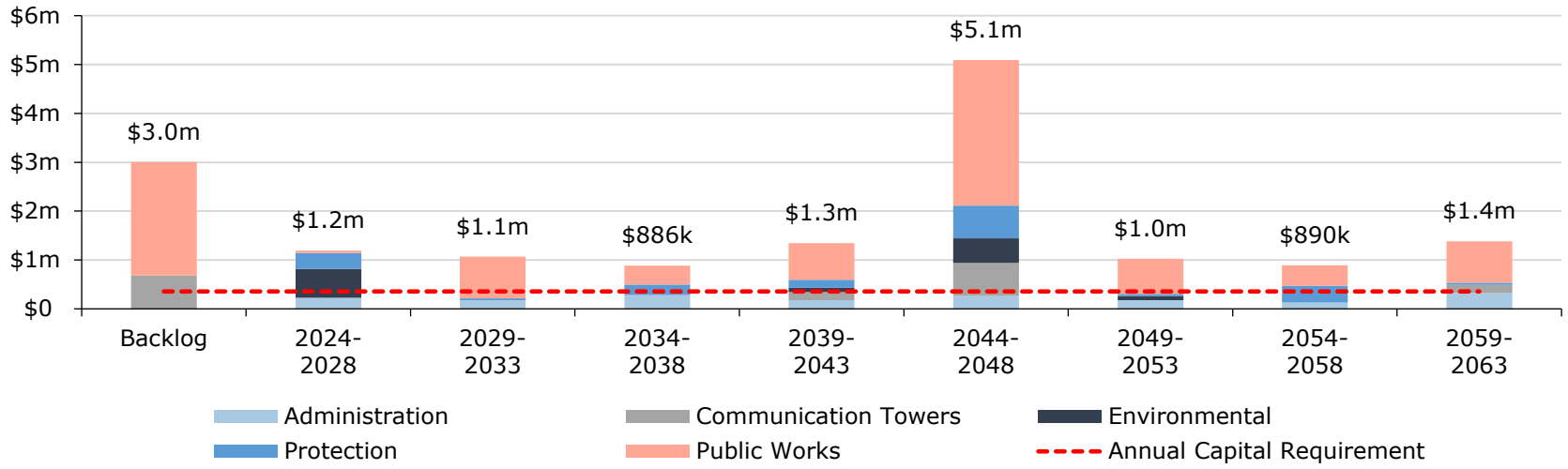


Table 29 below summarizes the projected cost of lifecycle activities (capital replacement only) that may need to be undertaken over the next 10 years to support current levels of service. These projections are generated in Citywide and rely on the data available in the asset register.

Table 18 Machinery & Equipment System-Generated 10-Year Capital Costs

Segment	Total	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033
Administration	$402k	$95k	$0	$0	$0	$131k	$0	$0	$0	$176k	$0
Communication Towers	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Environmental	$590k	$0	$0	$500k	$0	$90k	$0	$0	$0	$0	$0
Protection	$363k	$248k	$75k	$0	$0	$0	$0	$0	$0	$0	$40k
Public Works	$900k	$0	$50k	$0	$0	$0	$0	$0	$220k	$500k	$130k
Total	**$2.3m**	**$343k**	**$125k**	**$500k**	**$0**	**$221k**	**$0**	**$0**	**$220k**	**$676k**	**$170k**

As no assessed condition data was available for the equipment, only age was used to determine forthcoming replacement needs. These projections can be different from actual capital forecasts. Consistent data updates, especially condition, will improve the alignment between the system-generated expenditure requirements, and the Municipality's capital expenditure forecasts.

Risk & Criticality

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

Figure 36: Machinery & Equipment Risk Matrix

This is a high-level model that has been developed based on information currently available and should be reviewed and adjusted to reflect an evolving understanding of both the probability and consequences of asset failure.

Levels of Service

By comparing the cost, performance (average condition) and risk year-over-year, Hastings Highlands will be able to evaluate how their services/assets are trending. The Municipality will use this data to set a target level of service and determine proposed levels for the regulation by 2025.

Community Levels of Service

The following table outlines the qualitative metrics that determine the community level of service provided by equipment.

Values	Technical Metric	Current LOS (2023)
Scope	Description of the lifecycle activities (maintenance, rehabilitation and replacement) performed on municipal equipment and machinery	The Municipality employs a cost-effective strategy for managing its equipment and machinery lifecycle, focusing on maintenance, rehabilitation, and replacement. A key aspect of this strategy involves purchasing used graders and other equipment, which are then rehabilitated by in-house mechanics. This approach not only conserves capital funds but also addresses the challenges of procuring new equipment.

Technical Levels of Service

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

Table 19 Machinery & Equipment Technical Levels of Service

Values	Technical Metric	Current LOS (2023)
Scope	Average Condition Rating	Poor (25%)
	Average Risk Rating	Very High (18.9)
Performance	Actual Capital Reinvestment Rate (Annual) – Target Reinvestment Rate (Annual)	4.3% - 5.5%

Appendix I: Vehicles

State of the Infrastructure

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

- Public Works vehicles for road maintenance and winter control activities
- Protection vehicles for emergency fire services

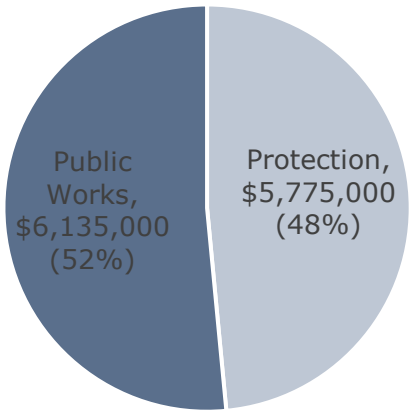
The state of the infrastructure for the vehicles is summarized in the following table.

Replacement Cost	Condition	Financial Capacity	
$11,910,000	Poor (34%)	Annual Requirement:	$802,000
		Funding Available:	$440,000
		Annual Deficit:	$362,000

Inventory & Valuation

The graph below displays the total replacement cost of each asset segment in the vehicle inventory.

Figure 37: Vehicle Replacement Costs

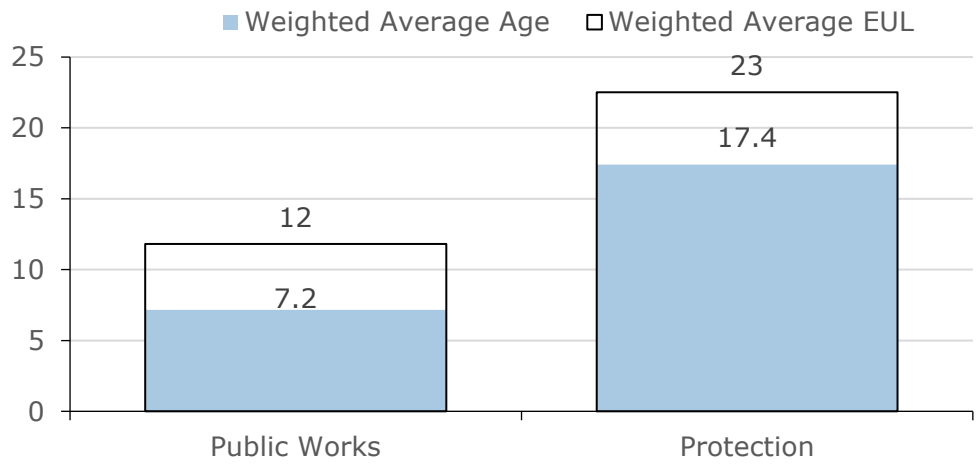


Each asset's replacement cost should be reviewed periodically to determine whether adjustments are needed to represent capital requirements more accurately.

Asset Condition & Age

The graph below identifies the average age and the estimated useful life for each asset segment. The values are weighted based on replacement cost.

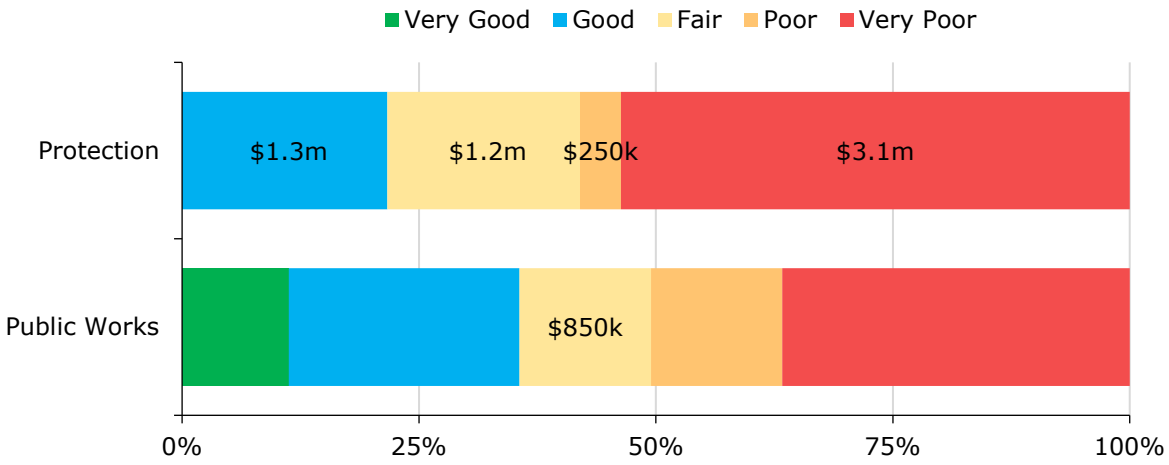
Figure 38: Vehicles Average Age vs Average EUL



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.

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

Figure 60: Vehicles Condition Breakdown



To ensure that the Municipality's vehicles continue 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 vehicles.

Current Approach to Condition Assessment

Accurate and reliable condition data allows staff to determine the remaining service life of assets and identify the most cost-effective approach to managing assets. An example of the municipality's current approach is to conduct daily circle checks prior to each use.

Lifecycle Management Strategy

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

Figure 61: Vehicles Current Lifecycle Strategy

Maintenance / Rehabilitation / Replacement

- Licensed mechanics conduct servicing in-house and major repairs are undertaken by a third party subcontractor
- The maintenance of fire vehicles, including Fire Station pumpers and tankers, adheres to regulatory requirements and best practices. These essential vehicles are replaced every 20 years and are serviced annually to ensure they meet performance standards.
- Vehicles are replaced according to age, condition, and staff recommendations, subject to Council approval.

Forecasted Capital Requirements

The annual capital requirement represents the average amount per year that the Municipality should allocate towards funding rehabilitation and replacement needs. The following graph identifies capital requirements over the next 30 years. This projection is used as it ensures that every asset has gone through one full iteration of replacement. The forecasted requirements are aggregated into 5-year bins and the trend line represents the average annual capital requirements at $802 thousand.

Figure 39: Vehicle Forecasted Capital Replacement Requirements

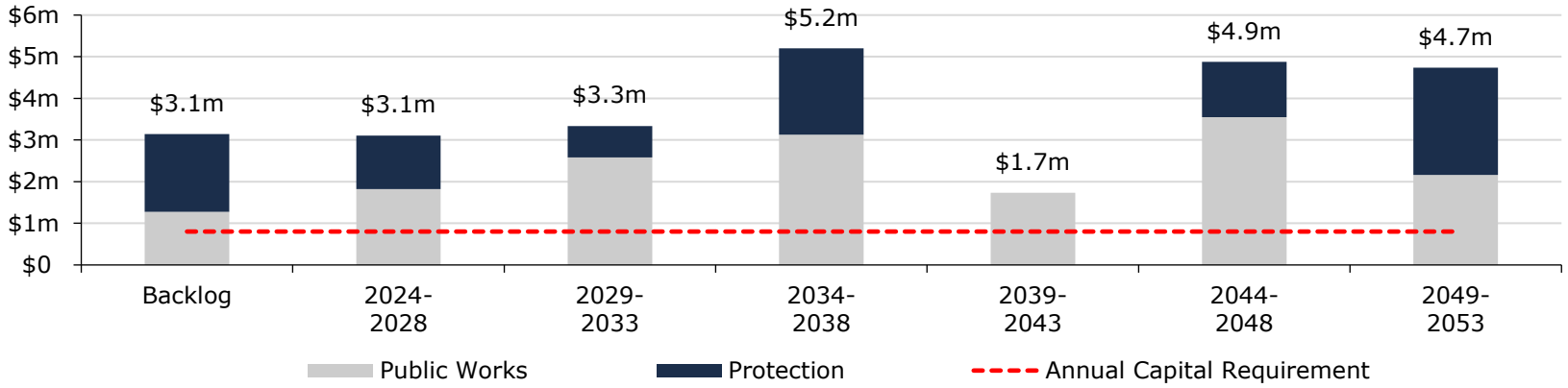


Table 31 below summarizes the projected cost of lifecycle activities (capital replacement only) that may need to be undertaken over the next 10 years to support current levels of service. These projections are generated in Citywide and rely on the data available in the asset register.

Table 20 Vehicles System-Generated 10-Year Capital Costs

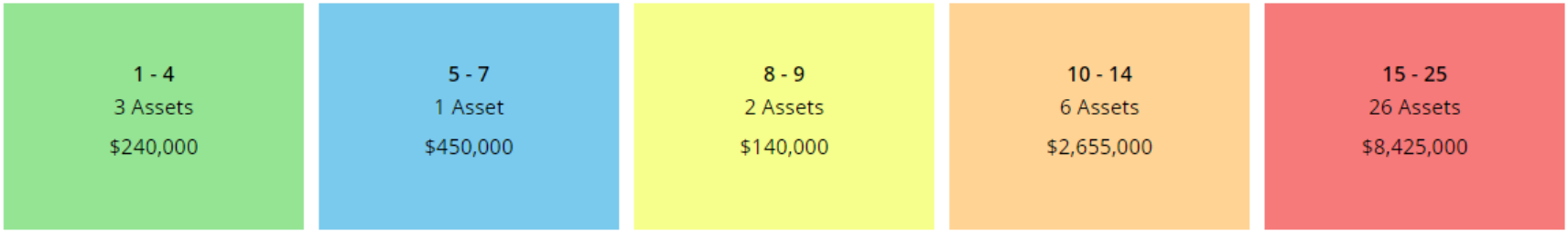
Segment	Total	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033
Public Works	$4.4m	$550k	$425k	$425k	$425k	$0	$425k	$645k	$0	$515k	$1.0m
Protection	$2.0m	$0	$980k	$0	$250k	$50k	$0	$250k	$0	$0	$500k
Total	**$6.4m**	**$550k**	**$1.4m**	**$425k**	**$675k**	**$50k**	**$425k**	**$895k**	**$0**	**$515k**	**$1.5m**

As no assessed condition data was available for the vehicles, only age was used to determine forthcoming replacement needs. These projections can be different from actual capital forecasts. Consistent data updates, especially condition, will improve the alignment between the system-generated expenditure requirements, and the Municipality's capital expenditure forecasts.

Risk & Criticality

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

Figure 40: Vehicles Risk Matrix



This is a high-level model that has been developed based on information currently available and should be reviewed and adjusted to reflect an evolving understanding of both the probability and consequences of asset failure.

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

Levels of Service

By comparing the cost, performance (average condition) and risk year-over-year, the Municipality will be able to evaluate how their services/assets are trending. The Municipality will use this data to set a target level of service and determine proposed levels for the regulation by 2025.

Community Levels of Service

The qualitative descriptions that determine the community levels of service provided by municipal vehicles are based on the service usage outlined below:

Values	Technical Metric	Current LOS (2023)
Scope	Description of the lifecycle activities (maintenance, rehabilitation and replacement) performed on municipal vehicles	The Municipality's vehicle replacement strategy has shifted from replacing the oldest asset first to prioritizing the oldest asset in the worst condition, ensuring timely replacements to maintain reliability and safety. Efforts are made to budget for annual replacements to sustain vehicle performance. For specialized vehicles, such as fire trucks, the Municipality endeavors regulatory requirements and best practices, replacing them every 20 years and performing annual servicing to uphold performance and safety standards.

Technical Levels of Service

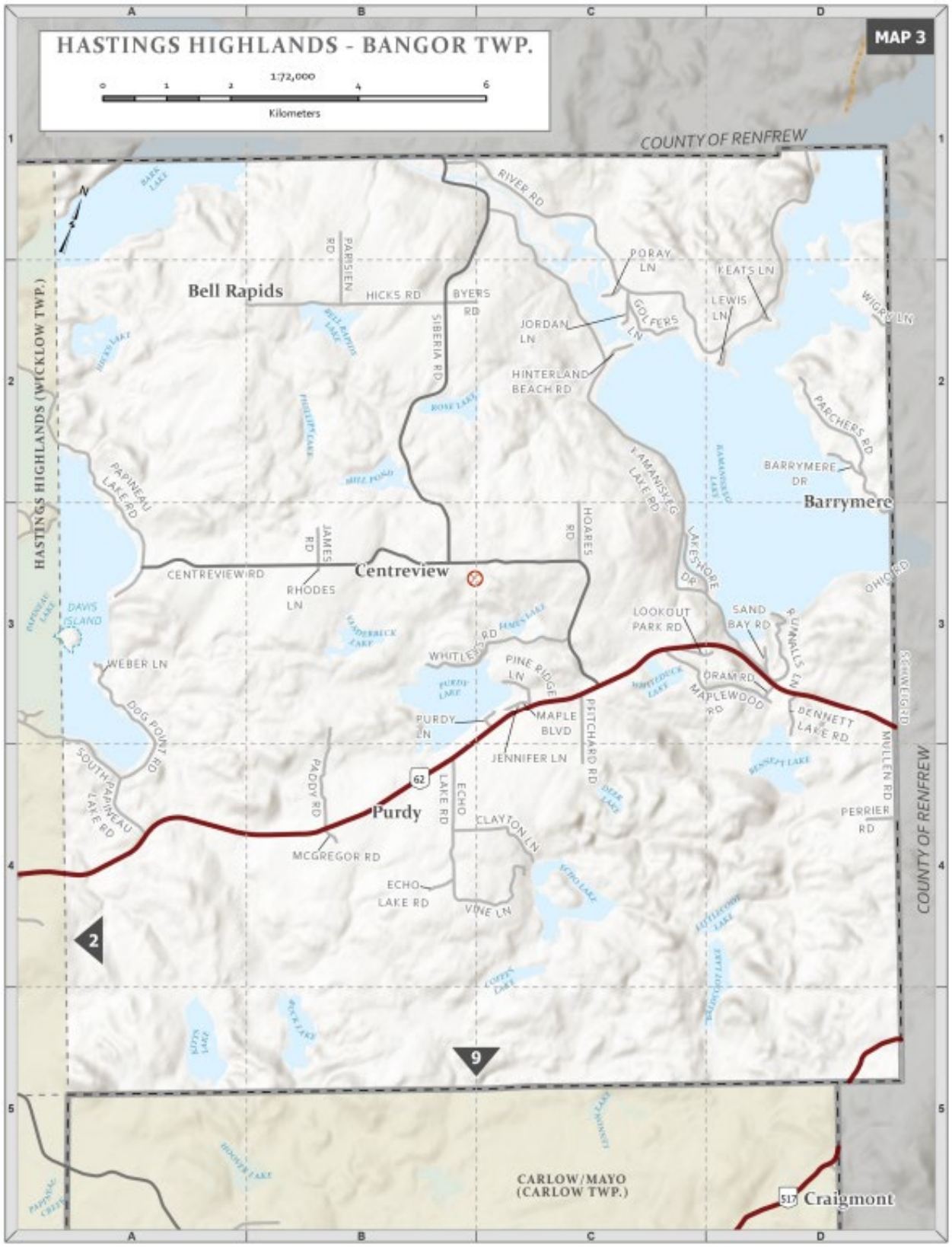
The following table outlines the quantitative metrics that determine the technical level of service provided by vehicles.

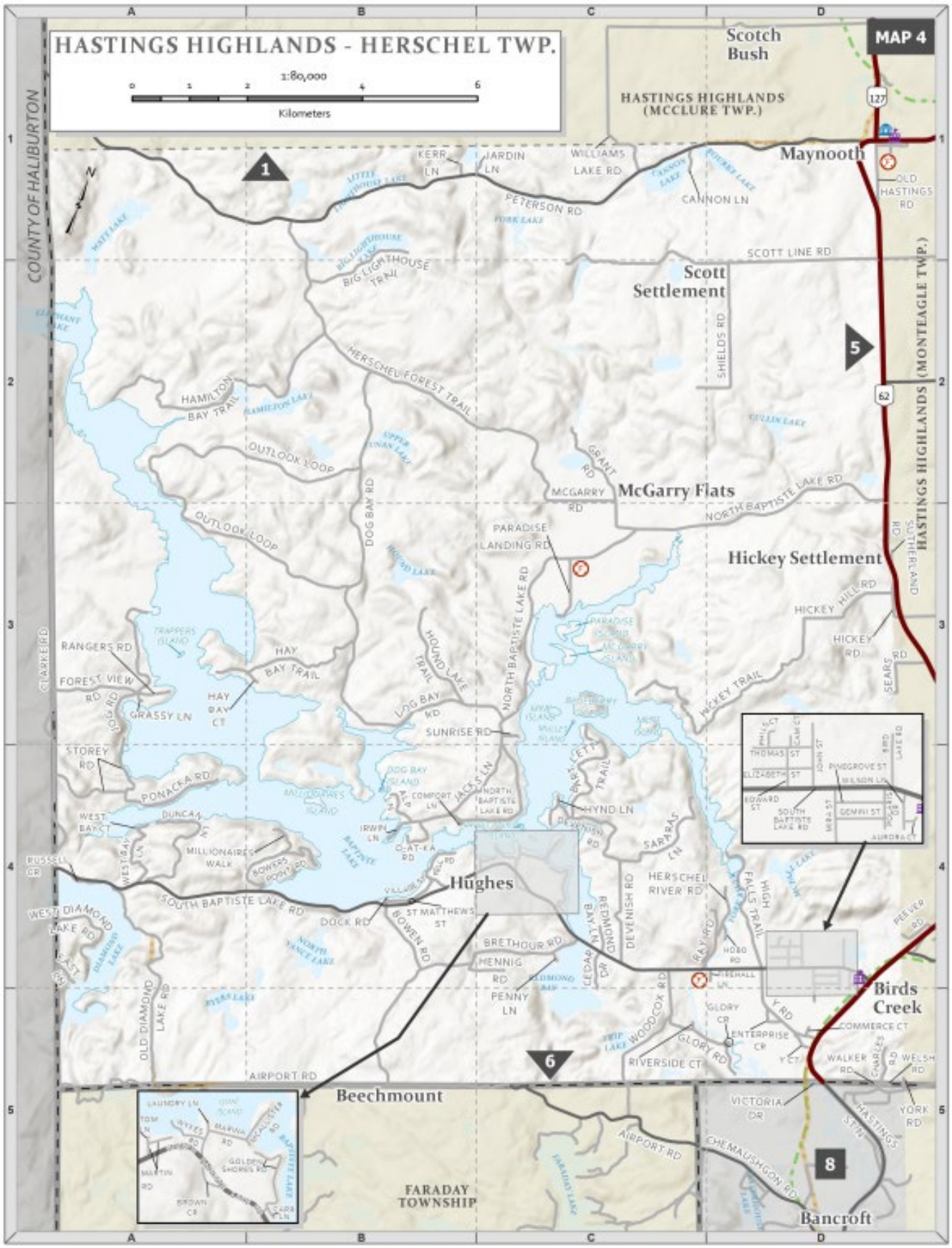
Table 21 Vehicles Technical Levels of Service

Values	Technical Metric	Current LOS (2023)
Scope	Average Condition Rating	Poor (34%)
	Average Risk Rating	Very High (17.9)
Performance	Actual Capital Reinvestment Rate (Annual) – Target Reinvestment Rate (Annual)	3.7% - 6.7%

Appendix J: Levels of Service Maps

Road Network Maps




HASTINGS HIGHLANDS - HERSCHEL TWP.
1:80,000
0 1 2 4 6
Kilometers
MAP 4
COUNTY OF HALIBURTON
HASTINGS HIGHLANDS (MONTEAGLE TWP.)
HASTINGS HIGHLANDS (MCCLURE TWP.)
Scotch Bush
Maynooth
Scott Settlement
McGarry Flats
Hickey Settlement
Hughes
Beechmount
Birds Creek
Bancroft
FARADAY TOWNSHIP
PETERSON RD
SCOTT LINE RD
HERSCHEL FOREST TRAIL
OUTLOOK LOOP
DOG BAY RD
NORTH BAPTISTE LAKE RD
PARADISE LANDING RD
HICKEY HILL RD
HICKEY RD
HICKEY TRAIL
HOUND LAKE TRAIL
SUNRISE RD
SOUTH BAPTISTE LAKE RD
DOCK RD
AIRPORT RD
HERSCHEL RIVER RD
HIGH FALLS TRAIL
BRETHOUR RD
HENNIG RD
PENNY LN
RIVERSIDE CT
GLORY RD
ENTERPRISE CR
COMMERCE CT
WALKER RD
VICTORIA DR
CHEMAUSHGON RD
HASTINGS
YORK RD
WELSH RD
OLD DIAMOND LAKE RD
WEST DIAMOND LAKE RD
EAST DIAMOND LAKE RD
RANGERS RD
FOREST VIEW RD
GRASSY LN
HAY BAY TRAIL
HAY BAY CT
STOREY RD
PONACKA RD
DUNCAN CT
WEST BAY CT
MILLIONAIRES WALK
BOWERS POINT RD
BOWEN RD
ST MATTHEWS ST
HYND LN
SARARAS LN
DEVENISH RD
REDMOND BAY LN
CEDAR LN
WOODCOX RD
CANNON LN
WILLIAMS LAKE RD
KERR LN
JARDIN LN
OLD HASTINGS RD
SHIELDS RD
GRANT RD
MCGARRY RD
SEARS RD
SUTHERLAND RD
CLARKE RD
LOG BAY RD
BIG LIGHTHOUSE TRAIL
HAMILTON BAY TRAIL
RUSSELL CR
MILLIONAIRES WALK
COMFORT LN
JACKS LN
IRWIN LN
O-AT-KA RD
BAY CITY TRAIL
PINEGROVE ST
GEMINI ST
AURORA CT
LAUNDRY LN
MARINA RD
GOLDEN SHORES RD
MARTIN RD
BROWN CR
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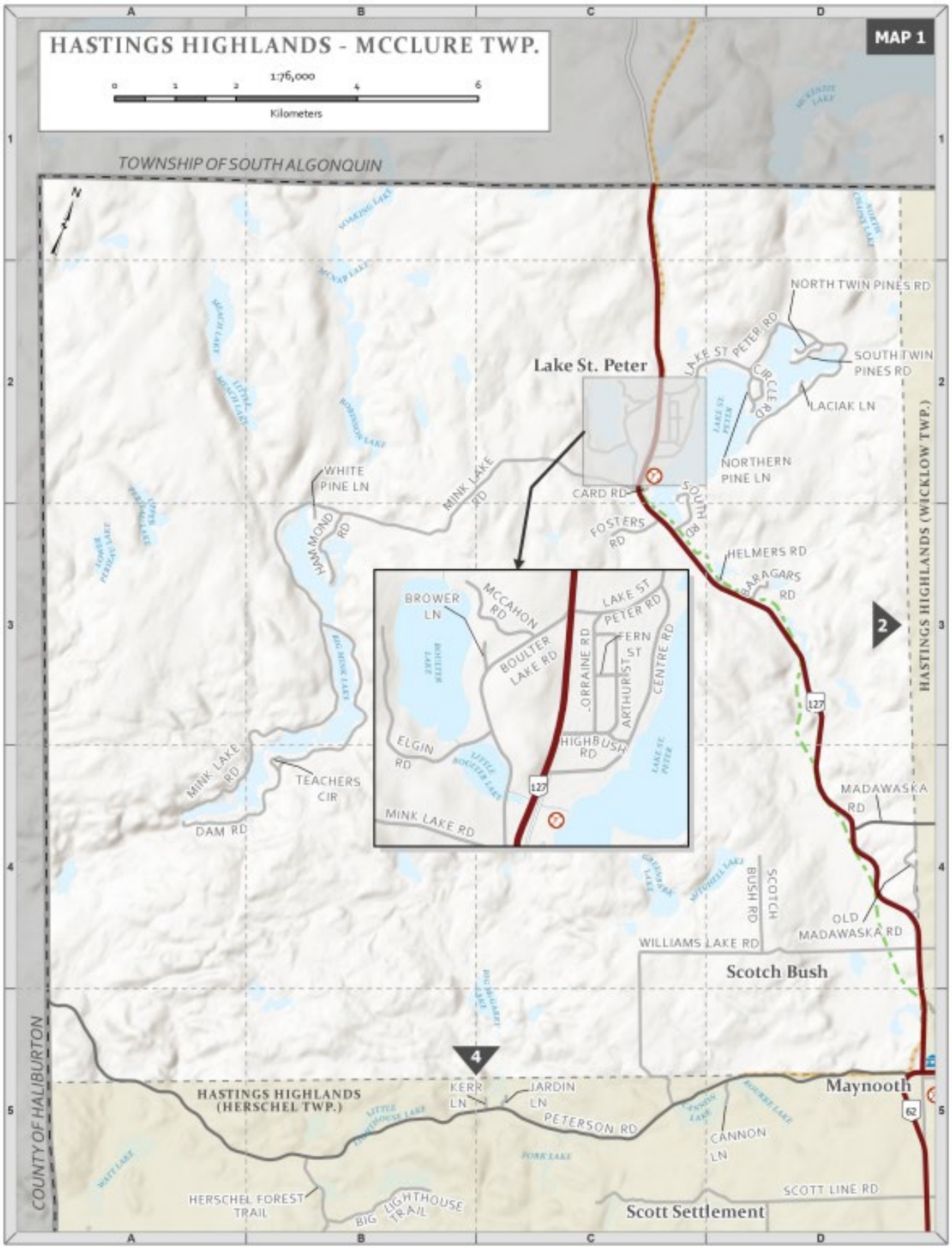
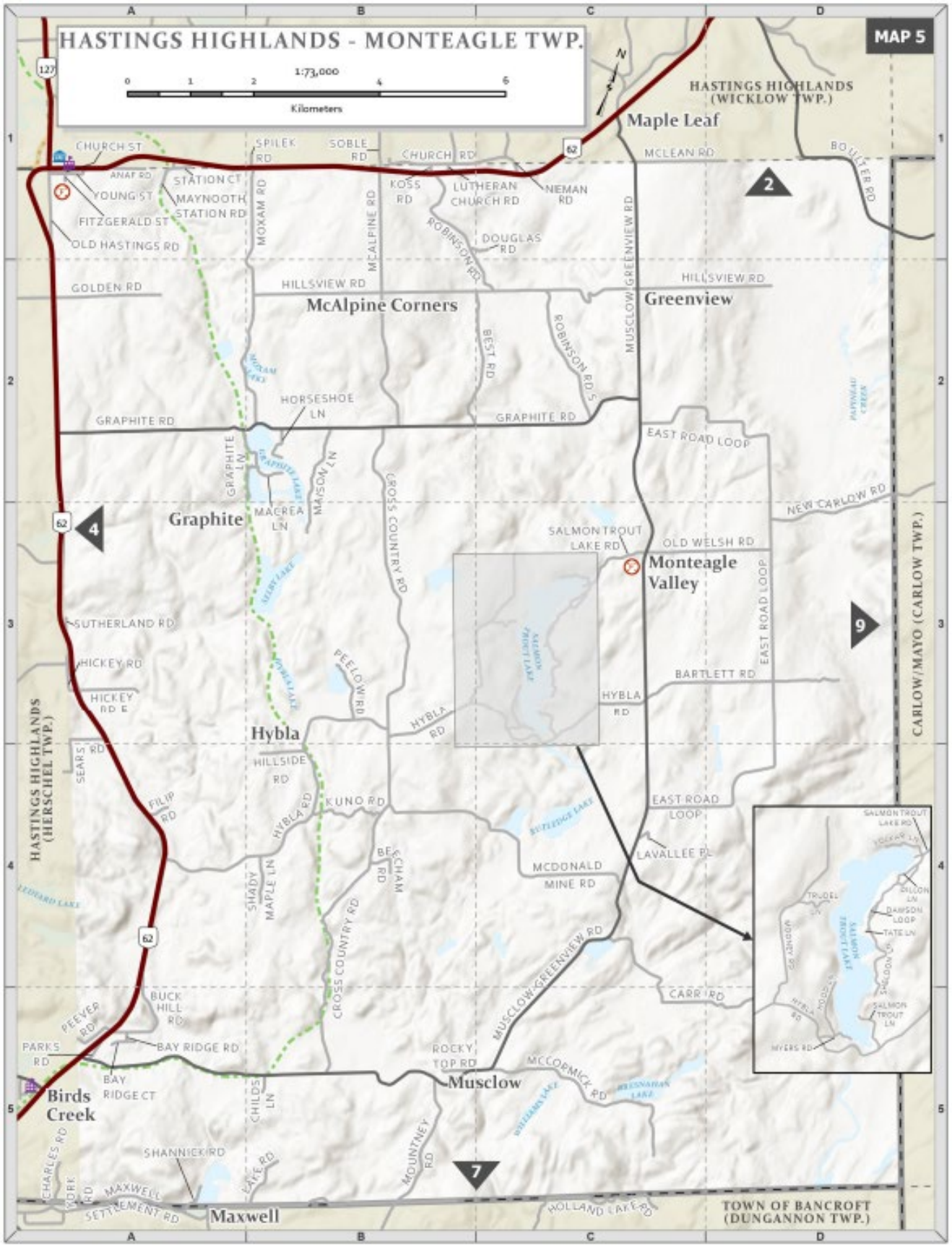

HASTINGS HIGHLANDS - MCCLURE TWP.
1:76,000
0 1 2 4 6
Kilometers
MAP 1
TOWNSHIP OF SOUTH ALGONQUIN
HASTINGS HIGHLANDS (WICKLOW TWP.)
COUNTY OF HALIBURTON
HASTINGS HIGHLANDS (HERSCHEL TWP.)
Lake St. Peter
Scotch Bush
Maynooth
Scott Settlement
NORTH TWIN PINES RD
SOUTH TWIN PINES RD
LAKE ST PETER RD
CIRCLE RD
LACIAK LN
NORTHERN PINE LN
WHITE PINE LN
MINK LAKE RD
CARD RD
SOUTH RD
FOSTERS RD
HAMMOND RD
HELMERS RD
BARAGARS RD
BROWER LN
MCCAHON RD
BOULTER LAKE RD
LAKE ST PETER RD
FERN ST
ARTHUR ST
LORRAINE RD
CENTRE RD
HIGHBUSH RD
ELGIN RD
TEACHERS CIR
DAM RD
MADAWASKA RD
SCOTCH BUSH RD
OLD MADAWASKA RD
WILLIAMS LAKE RD
KERR LN
JARDIN LN
PETERSON RD
CANNON LN
HERSCHEL FOREST TRAIL
BIG LIGHTHOUSE TRAIL
SCOTT LINE RD
127
62
2
4


HASTINGS HIGHLANDS - MONTEAGLE TWP.
MAP 5
1:73,000
Kilometers
HASTINGS HIGHLANDS (WICKLOW TWP.)
Maple Leaf
McAlpine Corners
Greenview
Graphite
Monteagle Valley
Hybla
Musclow
Birds Creek
Maxwell
HASTINGS HIGHLANDS (HERSCHEL TWP.)
CARLOW/MAYO (CARLOW TWP.)
TOWN OF BANCROFT (DUNGANNON TWP.)
CHURCH ST
STATION CT
YOUNG ST
MAYNOOTH STATION RD
FITZGERALD ST
OLD HASTINGS RD
GOLDEN RD
HILLSVIEW RD
GRAPHITE RD
HORSESHOE LN
MACREA LN
SUTHERLAND RD
HICKEY RD
HICKEY RD E
SEARS RD
FILIP RD
HILLSIDE RD
KUNO RD
HYBLA RD
PEELOW RD
BARTLETT RD
EAST ROAD LOOP
NEW CARLOW RD
OLD WELSH RD
SALMON TROUT LAKE RD
LAVALLEE PL
MCDONALD MINE RD
CARR RD
MUSCLOW-GREENVIEW RD
ROCKY TOP RD
MCCORMICK RD
BUCK HILL RD
PEEVER RD
PARKS RD
BAY RIDGE RD
BAY RIDGE CT
SHANNICK RD
MAXWELL SETTLEMENT RD
HOLLAND LAKE RD
MCLEAN RD
LUTHERAN CHURCH RD
NIEMAN RD
KOSS RD
DOUGLAS RD
ROBINSON RD
BEST RD
MUSCLOW-GREENVIEW RD
CROSS COUNTRY RD
MOUNTNEY RD
CHILDS LN
SHADY MAPLE LN
BEECHAM RD
MASON LN
GRAPHITE LN
EAST ROAD LOOP
MCALPINE RD
MOKAM RD
SPILEK RD
SOBLE RD
CHURCH RD
BOULTER RD
2
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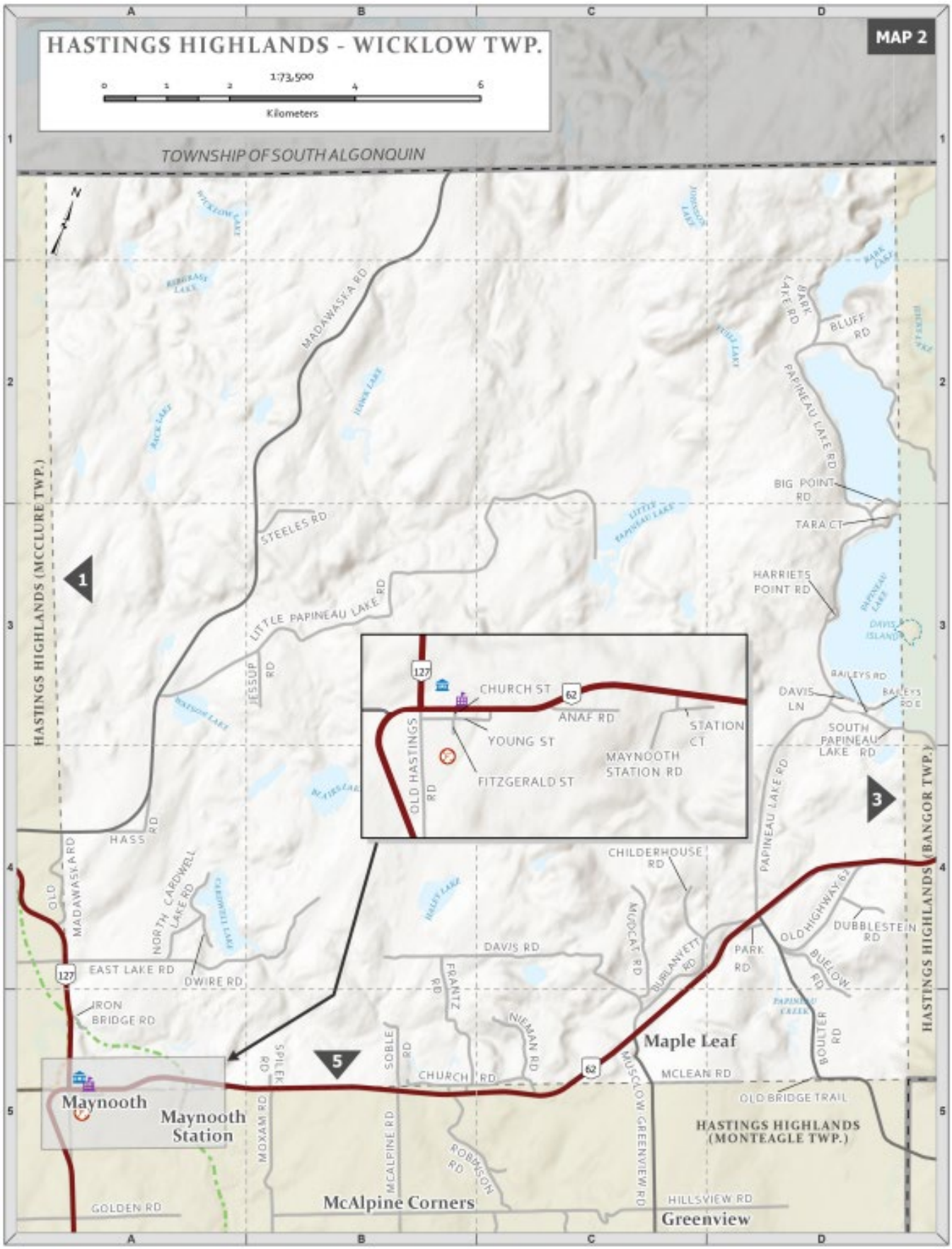
7
9
62
127

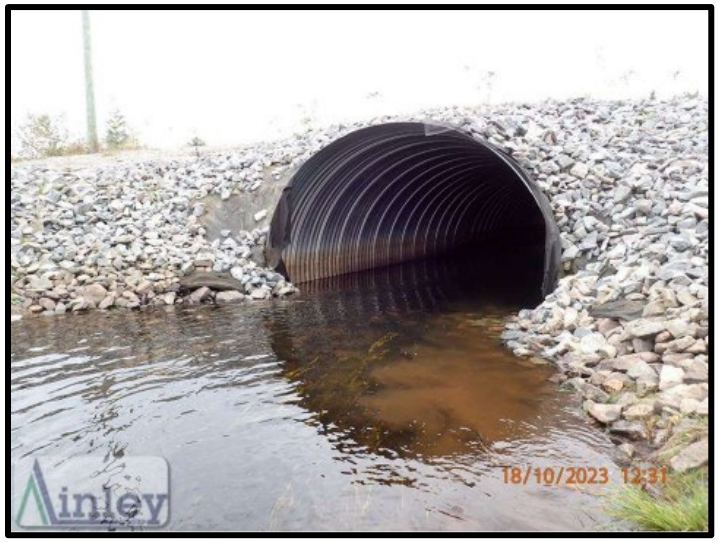

HASTINGS HIGHLANDS - WICKLOW TWP.
MAP 2
1:73,500
0 1 2 4 6
Kilometers
TOWNSHIP OF SOUTH ALGONQUIN
HASTINGS HIGHLANDS (MCCLURE TWP.)
HASTINGS HIGHLANDS (BANGOR TWP.)
HASTINGS HIGHLANDS (MONTEAGLE TWP.)
MADAWASKA RD
STEELES RD
LITTLE PAPINEAU LAKE RD
JESSUP RD
HASS RD
OLD MADAWASKA RD
NORTH CARDWELL LAKE RD
EAST LAKE RD
DWIRE RD
IRON BRIDGE RD
BIG POINT RD
TARA CT
HARRIETS POINT RD
BAILEYS RD
DAVIS LN
SOUTH PAPINEAU LAKE RD
PAPINEAU LAKE RD
BARK LAKE RD
BLUFF RD
CHILDERHOUSE RD
DAVIS RD
FRANTZ RD
NIEMAN RD
MUSCAT RD
BURLANEETY RD
PARK RD
OLD HIGHWAY 62
DUBBLESTEIN RD
BUELOW RD
BOLTON RD
MCLEAN RD
OLD BRIDGE TRAIL
MUSCLOW GREENVIEW RD
HILLSVIEW RD
Greenview
Maple Leaf
CHURCH RD
SOBLE RD
SPILEK RD
MOXAM RD
MCALPINE RD
ROBINSON RD
McAlpine Corners
GOLDEN RD
Maynooth
Maynooth Station
CHURCH ST
ANAF RD
STATION CT
YOUNG ST
FITZGERALD ST
MAYNOOTH STATION RD
OLD HASTINGS RD
1
3
5
62
127

Bridges & Culverts Images

The condition scale for bridges & culverts utilized is from 0 to 100 from Very Poor to Very Good. See the following images as examples of a bridge and structural culvert in Good condition, as well as a bridge and structural culvert in Fair condition.

Siberia Road Bridge (BCI = 73.5 Good)

William Lake Road Culvert (BCI = 94.6 Very Good)



Papineau Lake Road Bridge (BCI = 43.8 Fair)

South Papineau Lake Road Culvert (BCI = 45.3 Fair)

Appendix K: Impacts of Growth

Description of Growth Assumptions

Hastings Highlands' goals and objectives for future growth are informed by Hastings County's Official Plan.

Understanding the key drivers of growth and demand will allow the Municipality to more effectively plan for new infrastructure, as well as the upgrade or disposal of existing infrastructure. The costs of growth should be considered in long-term funding strategies designed to maintain the current level of service.

The 2018 Official Plan – Hastings County

The county's most recent plan, adopted in December 2017, implements the provincial policy statement by considering and balancing numerous factors and interests in the management of land uses, infrastructure, and natural resources within the county. This approach aims to provide economic opportunities and prosperity for its residents.

Under a medium growth scenario, the 2011-2036 forecasts for Hastings Highlands as outlined in Hastings County's official plan are as follows:

	2011	2036
Permanent Population	4450	4690
Permanent Households	1830	2080
Seasonal Population	5675	6490
Seasonal Dwellings	1550	1775
Employment	385	465
Employment Activity Rate	8.7%	9.9%

The recent growth within the Municipality does not align with the forecasts from the Official Plan or the most recent 2021 census data. There has been a significant increase in new building activity since the Covid-19 pandemic. During this period, many seasonal residents opted to extend their stays or transitioned to becoming permanent year-round residents. Consequently, there has been an increased demand for municipal services supported by the municipality's infrastructure assets.

The 2024 – 2027 Strategic Plan – the Municipality of Hastings Highlands

The Municipality's 2024 – 2027 strategic plan outlines the following strategic priorities to guide their development over the next several years.

- Ensure Financial Stability
- Rationalize Infrastructure
    - Goal: Safeguard the Municipality's Assets
    - Action: Regularly update and implement the municipal asset management plan
- Build Our Community, and
- Cultivate Exceptional Service and Governance

To achieve these goals, the municipality will leverage asset management practices, enabling data-driven decisions to prioritize infrastructure planning and maintenance.

Impact of Growth on Lifecycle Activities

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

As the Municipality's population is expected to increase moderately 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, at a minimum, to maintain the current level of service.

Appendix L: 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 Municipality'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 Municipality'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 Municipality 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 Municipality 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 Municipality 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 Municipality 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:

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

Appendix M: Risk Rating Criteria

Risk Definitions

Risk	Integrating a risk management framework into your asset management program requires the translation of risk potential into a quantifiable format. This will allow you to compare and analyze individual assets across your entire asset portfolio. Asset risk is typically defined using the following formula: **Risk = Probability of Failure (POF) x Consequence of Failure (COF)**
Probability of Failure (POF)	The probability of failure relates to the likelihood that an asset will fail at a given time. The current physical condition and service life remaining are two commonly used risk parameters in determining this likelihood.
POF - Structural	The likelihood of asset failure due to aspects of an asset such as load carrying capacity, condition or breaks
POF - Functional	The likelihood of asset failure due to its performance
POF - Range	**1 - Rare 2 - Unlikely 3 - Possible 4 - Likely 5 - Almost Certain**
Consequences of Failure (COF)	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: a small diameter water main break in a subdivision may cause several rate payers to be without water service for a short time. However, a larger trunk water main may break outside a hospital, leading to significantly higher consequences.
COF - Financial	The monetary consequences of asset failure for the organization and its customers
COF - Social	The consequences of asset failure on the social dimensions of the community
COF - Environmental	The consequence of asset failure on an asset's surrounding environment
COF - Operational	The consequence of asset failure on the Municipality's day-to-day operations
COF - Health & safety	The consequence of asset failure on the health and well-being of the community
COF - Economic	The consequence of asset failure on strategic planning
COF - Range	**1 - Insignificant 2 - Minor 3 - Moderate 4 - Major 5 - Severe**

Risk Frameworks

Road Network – Paved (HCB/LCB) Roads

Probability of Failure			
Criteria	**Sub-Criteria**	**Value/ Range**	**Score**
Performance	Asset Condition	0-29	5 - Almost Certain
		30-49	4 - Likely
		50-74	3 - Possible
		75-84	2 - Unlikely
		85-100	1 - Rare

Consequence of Failure			
Criteria	**Sub-Criteria**	**Value/Range**	**Score**
Financial (60%)	Replacement Cost	>$5,000,000	5 – Severe
		$1,000,000	4 – Major
		$500,000	3 - Moderate
		$250,000	2 – Minor
		<$50,000	1 – Insignificant
Social (20%)	AADT – 50%	>2000	5 – Severe
		600	4 – Major
		400	3 – Moderate
		200	2 – Minor
		<50	1 – Insignificant
	Road Class - 50%	Arterial	5 – Severe
		Collector	3 – Moderate
		Local	2 – Minor
Health & Safety (20%)	Speed Limit	>80	5 – Severe
		70	4 – Major
		60	3 – Moderate
		50	2 – Minor
		<40	1 – Insignificant

Bridges & Culverts

Probability of Failure			
Criteria	**Sub-Criteria**	**Value/Range**	**Score**
Performance	Asset Condition	0	5 - Almost Certain
		20	4 - Likely
		40	3 - Possible
		60	2 - Unlikely
		80	1 - Rare

Consequence of Failure			
Criteria	**Sub-Criteria**	**Value/Range**	**Score**
Financial 80%	Replacement Cost	>$4,500,000	5 - Severe
		$1,000,000	4 - Major
		$500,000	3 - Moderate
		$250,000	2 - Minor
		<$100,000	1 - Insignificant

Buildings

Probability of Failure			
Criteria	**Sub-Criteria**	**Value/Range**	**Score**
Performance	Asset Condition	0	5 - Almost Certain
		20	4 - Likely
		40	3 - Possible
		60	2 - Unlikely
		80	1 - Rare

Consequence of Failure			
Criteria	**Sub-Criteria**	**Value/Range**	**Score**
Financial 80%	Replacement Cost	>$1,000,000	5 - Severe
		$750,000	4 - Major
		$500,000	3 - Moderate
		$250,000	2 - Minor
		<$100,000	1 - Insignificant
Social 20%	Asset Segment	Public Works	5 - Severe
		Protection	4 - Major
		Recreation	3 - Moderate

Land Improvements

Probability of Failure			
Criteria	**Sub-Criteria**	**Value/Range**	**Score**
Performance	Asset Condition	0	5 - Almost Certain
		20	4 - Likely
		40	3 - Possible
		60	2 - Unlikely
		80	1 - Rare

Consequence of Failure			
Criteria	**Sub-Criteria**	**Value/Range**	**Score**
Financial 80%	Replacement Cost	$1,000,000	5 - Severe
		$150,000	4 - Major
		$50,000	3 - Moderate
		$25,000	2 - Minor
		$10,000	1 - Insignificant

Machinery & Equipment

Probability of Failure			
Criteria	**Sub-Criteria**	**Value/Range**	**Score**
Performance	Asset Condition	0	5 - Almost Certain
		20	4 - Likely
		40	3 - Possible
		60	2 - Unlikely
		80	1 - Rare

Consequence of Failure			
Criteria	**Sub-Criteria**	**Value/Range**	**Score**
Financial 80%	Replacement Cost	$500,000	5 - Severe
		$125,000	4 - Major
		$75,000	3 - Moderate
		$25,000	2 - Minor
		$0	1 - Insignificant

Vehicles

Probability of Failure			
Criteria	**Sub-Criteria**	**Value/Range**	**Score**
Performance	Asset Condition	0	5 - Almost Certain
		20	4 - Likely
		40	3 - Possible
		60	2 - Unlikely
		80	1 - Rare

Consequence of Failure			
Criteria	**Sub-Criteria**	**Value/Range**	**Score**
Financial 80%	Replacement Cost	$750,000	5 - Severe
		$125,000	4 - Major
		$75,000	3 - Moderate
		$25,000	2 - Minor
		$0	1 - Insignificant
Social 20%	Department	Public Works	5 - Severe
		Protection	4 - Major