2024
ASSET MANAGEMENT PLAN

MUNICIPALITY OF
HURON
SHORES

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 Huron Shores total $181 million. 87% of all assets analysed are in fair or better condition and assessed condition data was available for 95% of all assets. For the remaining assets, assessed condition data was unavailable, and asset age was used to approximate condition – a data gap that persists in most municipalities. Generally, age misstates the true condition of assets, making assessments essential to accurate asset management planning, and a recurring recommendation.

The development of a long-term, sustainable financial plan requires an analysis of whole lifecycle costs. Using a combination of proactive lifecycle strategies (roads) and replacement only strategies (all other assets) 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 infrastructure backlogs, and achieve long-term sustainability, the Municipality's average annual capital requirement totals $3.31 million. Based on a historical analysis of sustainable capital funding sources, the Municipality is committing approximately $1.85 million towards capital projects or reserves per year. As a result, the Municipality is funding 56% of its annual capital requirements. This creates a total annual funding deficit of $1.46 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 close annual deficits for capital contributions from tax revenues for asset needs, it is recommended the Municipality review the feasibility of implementing a 1.9% increase in revenues annually over a 15-year phase-in period, to be allocated to capital in addition to the $1.85 million allocated.

In addition to annual needs, there is also an infrastructure backlog of $2.2 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.

Most municipalities 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.
- Development of key performance indicators for all infrastructure programs to establish benchmark data to calibrate levels of service.

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 Municipality of Huron Shores Asset Management Plan (AMP) was developed by PSD Citywide Ltd. in accordance with Ontario Regulation 588/17 ("O. Reg 588/17"). It contains a comprehensive analysis of the Municipality'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
Strategic 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 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 municipal services.

Asset Category	Source of Funding
Road Network	Tax Levy
Bridges & Culverts	Tax Levy
Storm Sewer Network	Tax Levy
Buildings	Tax Levy
Machinery & Equipment	Tax Levy
Vehicles	Tax Levy

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, constraints, 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 breakdown. 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 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. Developing alignment with corporate goals and objectives through to service delivery and lifecycle management ensures the Municipality has line of sight to achieve their strategic objectives.

Asset Management Policy

An asset management policy represents a statement of the principles guiding the Municipality's approach to asset management activities as well as their commitment. It aligns with the organization and provides clear direction to municipal staff on their roles and responsibilities.

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.

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 Classifications

	AM Category	AM Segment
Core	Roads Network	Asphalt Roads Gravel Roads Surface Treated Roads Streetlights
	Bridges and Culverts	Structural Culverts Non-Structural Culverts Bridges
	Storm Sewer System	Mains
Non-Core	Vehicles	General Government Planning and Development Protection Services Recreation and Cultural Services Transportation Services
	Machinery & Equipment	General Government Planning and Development Protection Services Recreation and Cultural Services Transportation Services
	Buildings	General Government Planning and Development Protection Services Recreation and Cultural Services Transportation Services

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

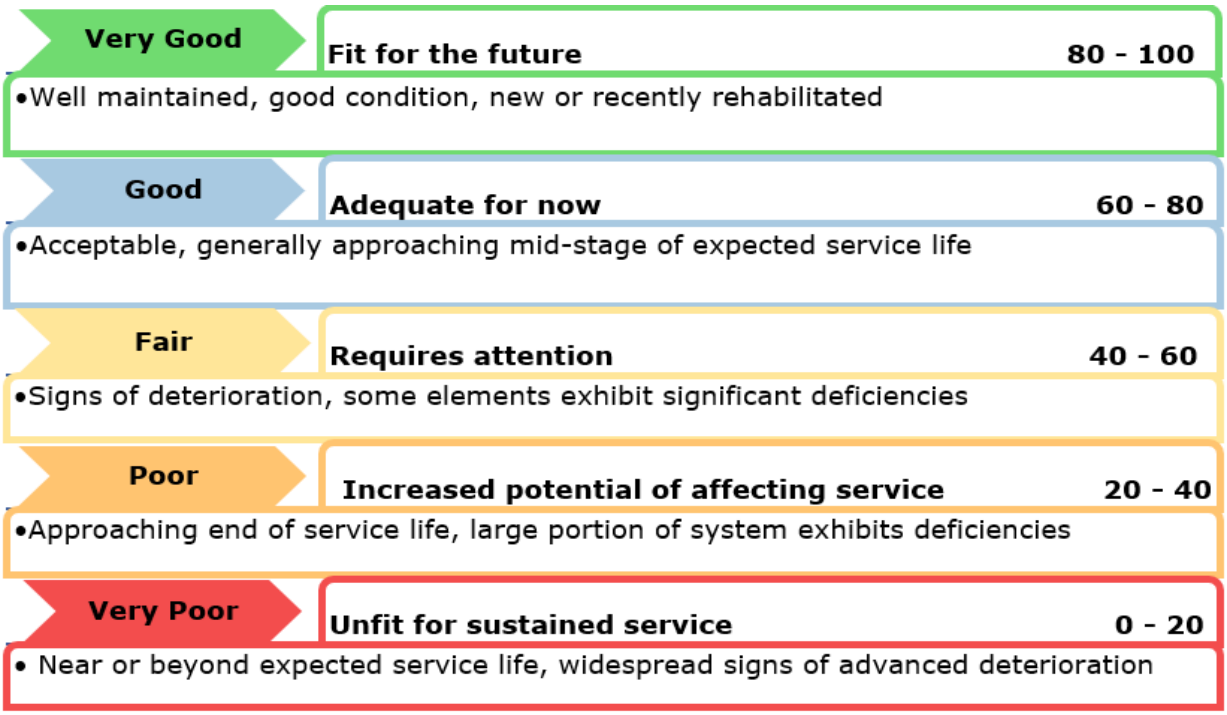
Asset Condition

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 Huron Shores.

Figure 2 Standard Condition Rating Scale



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

Lifecycle Management Strategies

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

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

There are several field intervention activities that are available to extend the life of an asset. These activities can be generally placed into one of three categories: maintenance, rehabilitation, and replacement. The 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

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

Risk Management Strategies

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

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

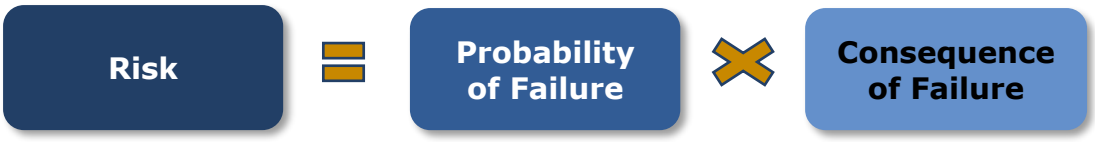
Qualitative Approach to Risk

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

Quantitative Approach to Risk

Asset risk is defined using the following formula:

Figure 4 Risk Equation



The probability of failure relates to the likelihood that an asset will fail at a given time. The probability of failure focuses on two highly imperative impacts for risk assessment – structural and functional impacts. Structural impacts are related to the structural aspects of an asset such as load carrying capacity, condition, or breaks; whereas the functional impacts can include parameters, slope, traffic count, and other impacts that can affect the performance of an asset.

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

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

Levels of Service

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

These metrics include the technical and community level of service metrics that are required as part of Ontario Regulation 588/17 as well as additional performance measures that the Municipality has selected in accordance with best practices. The Municipality measures the level of service provided at two levels: Community Levels of Service, and Technical Levels of Service.

Community Levels of Service

Community levels of service are a simple, plain language description or measure of the service that the community receives. The Municipality has determined the qualitative descriptions that will be used to determine the community level of service provided. These descriptions can be found in the Levels of Service subsection within each asset category.

Technical Levels of Service

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

Current and Proposed Levels of Service

The Municipality is focused on measuring the current level of service provided to the community. Once current levels of service have been measured, the Municipality plans to establish proposed levels of service over a 10-year period, in accordance with Ontario Regulation 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 levels of service have been established, and prior to July 2025, the Municipality must identify a lifecycle management and financial strategy within which these targets can 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.

Integration Climate Change and Asset Management

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

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

Impacts of Growth

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

As growth-related assets are constructed or acquired, they should be integrated into Huron Shores' asset management program. While the addition of residential units will add to the existing assessment base and offset some of the costs associated with growth, the 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, maintain the current level of service.

Reinvestment Rate

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

Portfolio Overview

Community Profile

The Municipality of Huron Shores is a single-tier municipality, part of the Algoma District, which is located along the North Channel of Lake Huron in Northern Ontario.

Huron Shores was incorporated on January 1, 1999, as part of a province-wide initiative in Ontario to streamline and strengthen local governance. This incorporation involved merging the Corporation of the Villages of Iron Bridge, The Corporation of the Township of Thessalon, The Corporation of the Township of Thompson, The Corporation of Townships of Day and Bright Additional, along with portions of the geographic township of Bright and the geographic township of Gladstone. The amalgamation aimed to reduce administrative costs and improve the delivery of services by consolidating smaller municipalities into larger, more financially viable entities.

The Municipality of Huron Shores is characterized by its expansive natural landscapes, which include a mix of forested areas, lakes, and a shoreline stretching along Lake Huron. This geographical diversity supports a variety of wildlife and offers various recreational opportunities, making it an attractive destination for outdoor enthusiasts. The Municipality benefits from its scenic routes, which are popular for hiking, biking, and scenic drives, particularly during the summer and fall seasons. Additionally, the area's historic sites and cultural landmarks enhance its rural charm.

Economic demand in Huron Shores is largely driven by tourism, particularly with visitors attracted to the area's natural settings and recreational opportunities. This boosts local businesses and seasonal industries. Additionally, real estate is a significant factor, as the scenic beauty and tranquility of the area draw people looking for vacation homes or peaceful permanent residences. The Municipality's focus on maintaining its environmental assets and quality of life also attracts retirees and families seeking a quieter lifestyle away from urban centers.

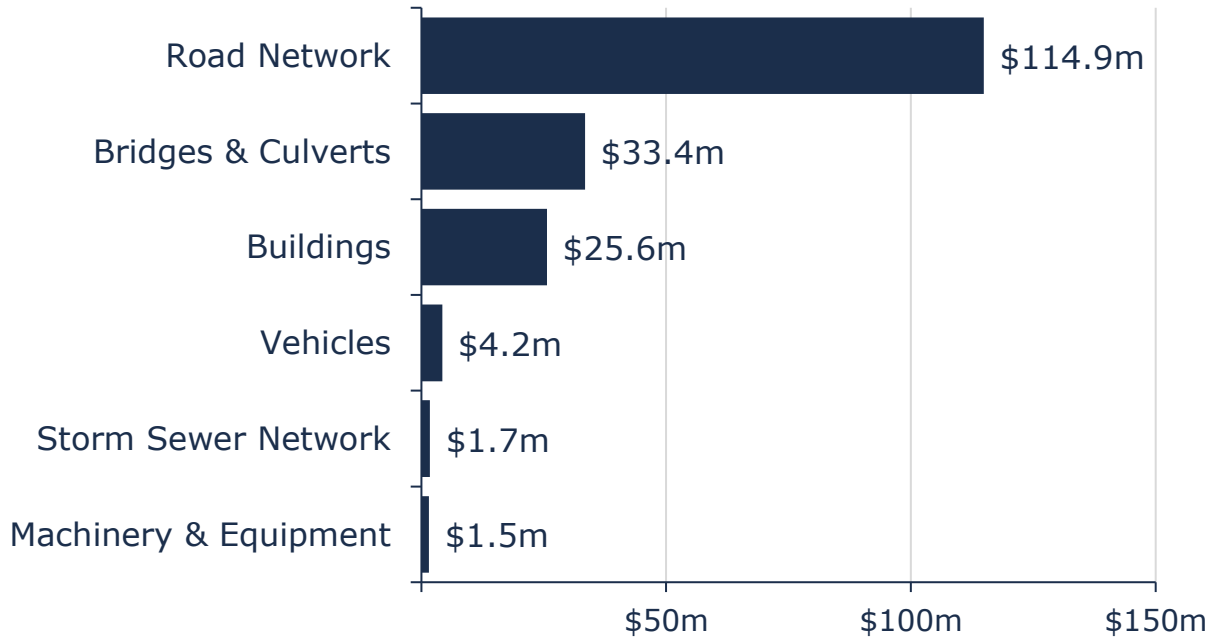
State of the Infrastructure

Asset Category	Replacement Cost	Asset Condition	Financial Capacity	
Road Network	$114,913,898	Fair (52%)	Annual Requirement:	$1,232,485
			Funding Available:	$1,089,498
			Annual Deficit:	**$142,987**
Bridges & Culverts	$33,400,638	Fair (58%)	Annual Requirement:	$982,387
			Funding Available:	$590,000
			Annual Deficit:	**$392,387**
Storm Sewer Network	$1,746,065	Fair (48%)	Annual Requirement:	$23,281
			Funding Available:	$0
			Annual Deficit:	**$23,281**
Buildings	$25,625,252	Good (74%)	Annual Requirement:	$588,978
			Funding Available:	$100,710
			Annual Deficit:	**$488,268**
Machinery & Equipment	$1,545,601	Fair (51%)	Annual Requirement:	$142,241
			Funding Available:	$18,725
			Annual Deficit:	**$123,516**
Vehicles	$4,242,879	Good (78%)	Annual Requirement:	$341,132
			Funding Available:	$46,695
			Annual Deficit:	**$294,437**
Overall	$181,474,333	Fair (57%)	Annual Requirement:	$3,310,504
			Funding Available:	$1,845,628
			Annual Deficit:	**$1,464,876**

Replacement Cost

All Huron Shores' asset categories have a total replacement cost of $181 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 Asset Portfolio Replacement Value

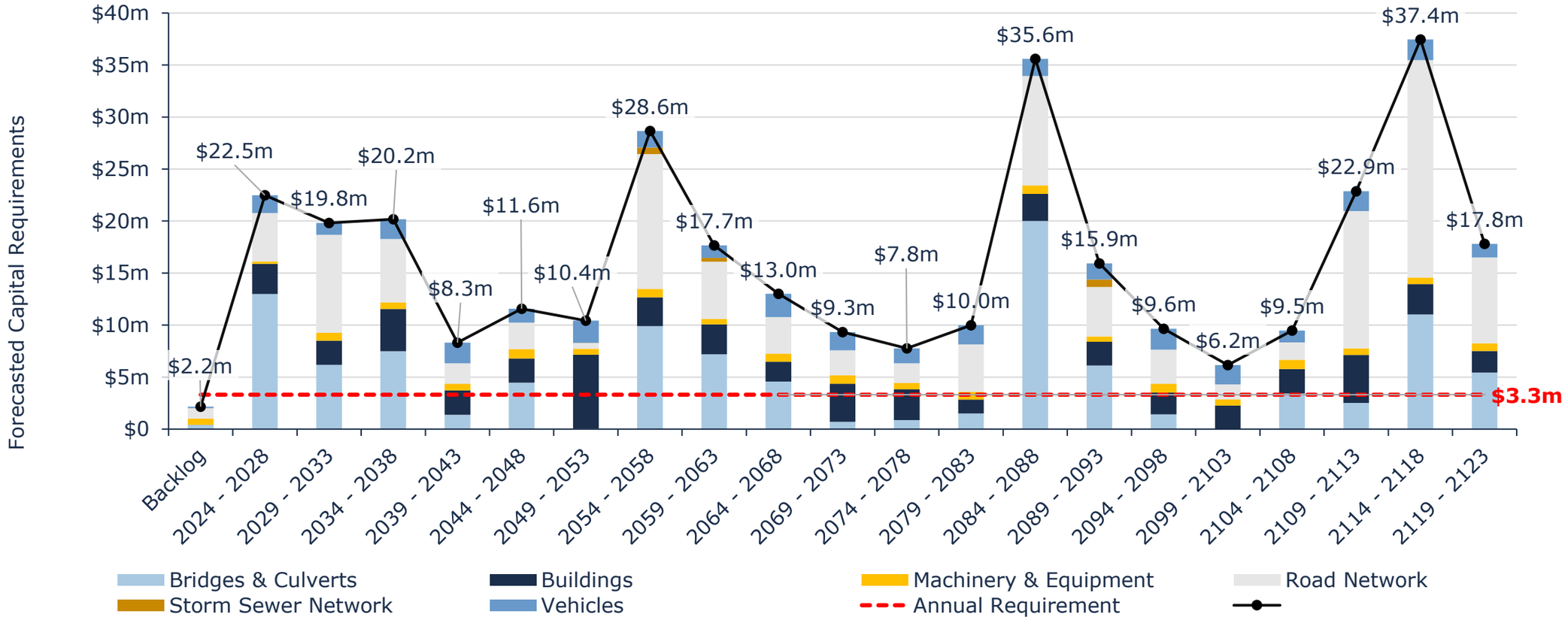


Forecasted Capital Requirements

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, $3.3 million is required each year to remain current with capital replacement needs for Huron Shores' 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 $181 million, this represents an annual target reinvestment rate of 1.8%.

Figure 6 Forecasted Capital Requirements



The chart also illustrates a backlog of $2.2 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 both 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, 87% of assets in Huron Shores are in fair or better condition. This estimate relies on both age-based and field condition data.

Assessed condition data is available for the inventory in the road network, bridges and culverts as well as buildings; 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, 23% 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

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

Capital Funding Strategies

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

Lifecycle Management Strategies & Aging Infrastructure

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

Climate Change & Extreme Weather

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

Growth

Growth is a lessor concern it is the changing demographics; rural community is changing to retirees and former city residents with different service expectations.

The overall asset risk breakdown for Huron Shores asset inventory is portrayed in the figure below.

Figure 7 Overall Asset Risk Breakdown

1 - 4 Very Low	5 - 7 Low	8 - 9 Moderate	10 - 14 High	15 - 25 Very High
$14,038,809 (8%)	$23,807,282 (13%)	$73,502,043 (41%)	$30,777,060 (17%)	$39,349,139 (22%)

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 Huron Shores asset management program.

Levels of Service

Levels of service are a measure of the quality and scope of the services that municipal infrastructure provides to the community. Both quantitative and qualitative metrics are used to measure the current level of service.

Strategic Plan

Huron Shores strategic plan is currently in development in conjunction with a Recreation Master Plan. The strategic plan will focus on a five-year horizon, providing the Municipality's vision and key directions to shape the programs and services of Huron Shores.

Service Delivery Values

As a guide to developing and measuring service delivery, service delivery values were identified that align staff work practices with community expectations.

Figure 8 Service Delivery Values

Scope	•The assets that are used to provide services to the community and how they are defined
Quality	•Services are provided with minimal disruption and are available to customers in line with needs and expectations.
Performance	•Services are designed to be used efficiently and long-term plans are in place to ensure that they are available to all customers into the future.

All the community and technical levels of service will meet regulatory requirements for each asset category outlined in the appendix.

Huron Shores Climate Profile

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

Higher Average Annual Temperature:

- Between the years 1971 and 2000 the annual average temperature was 4.9 ºC
- Under a high emissions scenario, the annual average temperatures are projected to increase by 4.8 ºC by the year 2050 and over 6.5 ºC by the end of the century.

Increase in Total Annual Precipitation:

- Under a high emissions scenario, Huron Shores is projected to experience an 12% increase in precipitation by the year 2051 and a 16% increase by the end of the century.

Increase in Frequency of Extreme Weather Events:

- It is expected that the frequency and severity of extreme weather events will change.
- In some areas, extreme weather events will occur with greater frequency and severity than others especially those impacted by Great Lake winds.

Lake Huron

The Great Lakes are one of the largest sources of fresh water on earth, containing 21 percent of the world's surface freshwater. There are 35 million people living in the Great Lakes watershed and Lake Huron is the second largest of the Great Lakes. The area of Lake Huron Watershed is approximately 131,100 km^2. The physical impacts of climate change are most noticeable from: flooding, extreme weather events such as windstorms and tornados, and/or rising water levels eroding shorelines and natural spaces. Erosion and flooding pose a threat to the surrounding built infrastructure such as park assets, bridges, and roads.

Communities located in the Great Lakes region may experience more severe windstorms or tornados because of climate change, causing damage to both the natural and built environment.

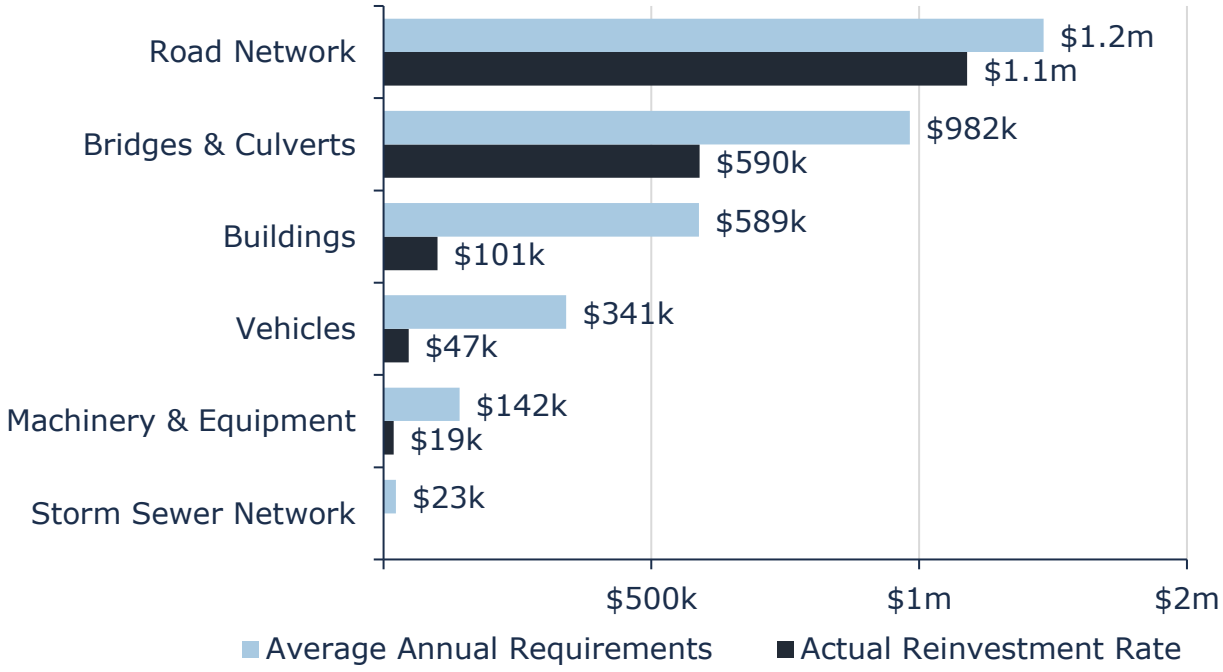
Public health and safety depend on the stability and predictability of the ecosystem in the Great Lakes watershed. The quality of water is threatened by anthropogenic climate change because of blue-green algae blooms, soil erosion, and agricultural, stormwater, and wastewater runoff. The safety of

the public is threatened by the physical impacts of flooding such as flooding and erosion. In some cases, homeowners located near the lakeshore are already at risk of losing their homes.

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 $3.3 million annually, for a target reinvestment rate of 1.8%. Actual annual spending on infrastructure totals approximately $1.8 million, for an actual reinvestment rate of 1.0%.

Figure 9 Average Annual Capital Requirements vs. Actual Capital Reinvestment by Category



Impacts of Growth

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

Table 3 Huron Shores & Ontario Census Information

Census Characteristic[1]	Huron Shores	Ontario
Population 2021	1,860	14,223,942
Population Change 2016-2021	11.8%	5.8%
Total Private Dwellings	1,171	5,929,250
Population Density	4.1/km^2	15.9/km^2
Land Area	451.87 km^2	892,411.76 km^2

Huron Shores Official Plan (December 2011)

The purpose of the Official Plan for the Municipality of Huron Shores, approved with modifications on December 16, 2011, is to outline goals, objectives, policies, and implementation measures for development over the next 20 years, from 2007 to 2027. It aims to consider the impacts on the social, economic, and natural environments of the municipality. This plan serves as a comprehensive guide for sustainable community development, ensuring that growth is managed in a way that balances development needs with environmental preservation and social well-being.

The Official Plan focuses on maintaining an adequate land supply for diverse uses, providing a range of housing options to meet demographic needs, and designating land uses for optimal community benefit. It emphasizes servicing developments adequately with infrastructure and public services, protecting sensitive land uses from conflicts, and conserving natural heritage. Additionally, the plan promotes economic growth by supporting existing businesses and encouraging new small enterprises. It also includes environmental efforts to clean up and repurpose contaminated sites, ensuring growth is both balanced and sustainable.

The strategic approach detailed in Huron Shores' development guidelines concentrates growth within established settlement areas, along lakefronts, and in rural areas. This strategy is designed to leverage the existing infrastructure and public services to accommodate a stable or slightly growing population. By focusing development in these areas, the plan aims to enhance the community's resource base, expand outdoor recreational and tourism opportunities, and broaden the housing options available. This targeted growth approach helps maintain the Municipality's rural character while ensuring that development is both manageable and sustainable, preventing unplanned sprawl and maximizing the use of land already supported by necessary amenities. The Official Plan for the Municipality of

[1] Statistics Canada. 2023. (table). Census Profile. 2021 Census of Population. Statistics Canada Catalogue no. 98-316-X2021001. Ottawa. Released November 15, 2023. https://www12.statcan.gc.ca /census-ecensement/2021/dp-pd/prof/index.cfm?Lang=E (accessed September 7, 2024).

Huron Shores projects that the population will increase to between 1,800 and 2,000 residents over the next 20 years.

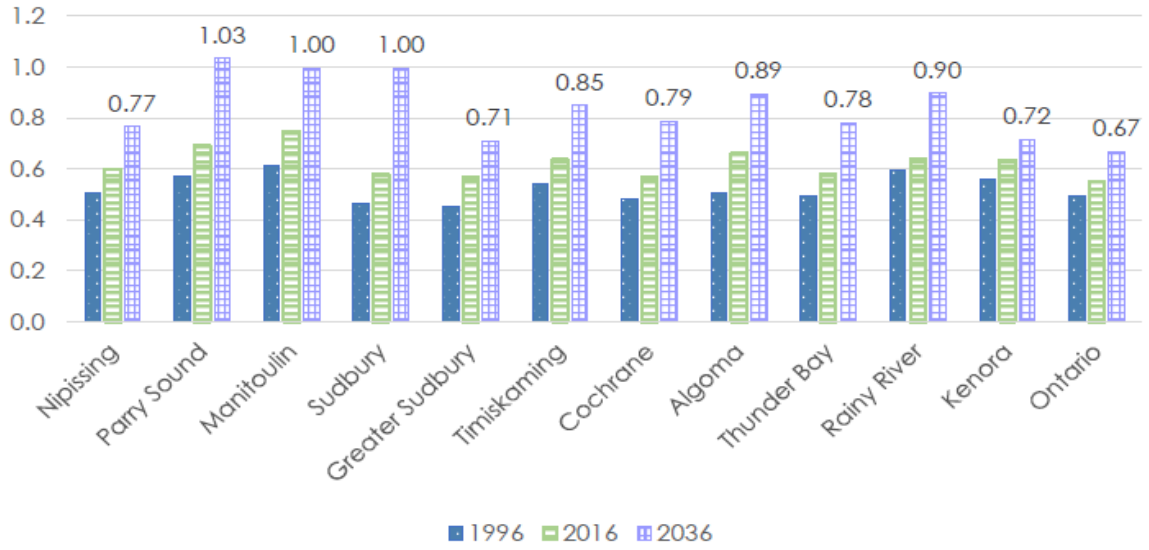
Regional Growth

In 2021 the Come North Conference Report was produced by FedNor and the Government of Canada. The document describes short, medium, and long-term objectives for all communities in Northern Ontario as it relates to population growth.

According to the report all 11 Census Districts in Northern Ontario (Nipissing, Parry Sound, Manitoulin, Sudbury, Greater Sudbury, Timiskaming, Algoma, Thunder Bay, Rainy River, Kenora) are currently experiencing the following trends: population decline, population aging, or labour shortages. The report highlights a risk of these communities becoming economically unsustainable unless population retention and attraction numbers improve. The risk is the result of the dependency ratio increasing. The dependency ratio is the ratio of people unable to support themselves without assistance; people between the ages of 0 and 14 and 64 and older.

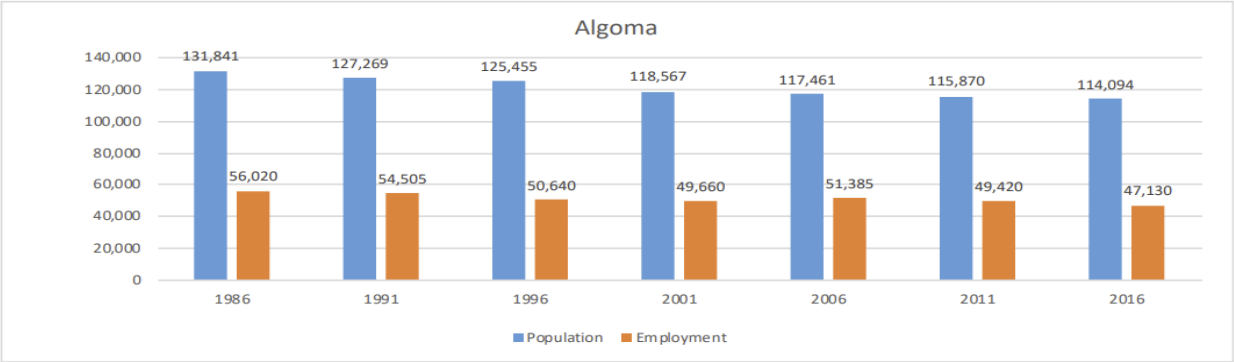
The goal is to achieve a dependency ratio of 0.5. In 1996, every Census District was at or near the goal by 2016; there were no districts that were below and more than half had a ratio more than 0.6. The following graph displays the dependency ratio for each Census District in 1996 and 2016 along with a projected ratio for the year 2036.

Figure 10 Population Dependency Ratios



The Municipality of Huron Shores is found in the Algoma district, which is expected to reach a dependency ratio of 0.89. The population trends overall in the Algoma District are in decline. The following graph from the 2019 Northern Projections Algoma District Human Capital Series report by the Northern Policy Institute, displays the population trends from 1986 to 2016.

Figure 11 Population vs Employment Numbers



The following table, found in the same report, shows population projections in the Algoma District for the years 2013 to 2041.

Table 4 Algoma District Population Projections

Year	Ages 0-19	Ages 20-64	Ages 65+	Total
2021	22,134	62,834	30,235	115,203
2026	22,011	57,265	33,958	113,234
2031	21,493	53,390	36,393	111,276
2036	20,820	51,849	36,718	109,387
2041	20,332	51,375	35,974	107,681

The most recent census data from 2021, shows a slight increase in the population, reaching a total of 113,777. According to census data, a significant population increase is seen in the population of 65 and older and a decrease within the population of ages 20 to 64; thus further increasing the dependency ratio.

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.

Planning for forecasted population growth may require the expansion of existing infrastructure and services. As growth-related assets are constructed or acquired, they should be integrated into the Municipality's AMP. While the addition of residential units will add to the existing assessment base and offset some of the costs associated with growth, the 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, maintain the current level of service.

Financial Strategy

Financial Strategy Overview

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

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

The annual funding typically available is determined by averaging historical capital expenditures on infrastructure, inclusive of any allocations to reserves for capital purposes. For Huron Shores, the proposed capital allocations in 2024, for the tax funded projections and for water, were used to project available funding.

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

- Revenue from property taxation allocated to reserves for capital purposes
- The Canada Community Benefits Fund (CCBF), formerly the Federal Gas Tax Fund
- The Ontario Community Infrastructure Fund (OCIF)

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

Annual Capital Requirements

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. 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 costs that are realized through strategic rehabilitation and renewal. The development of these strategies allows for a comparison of potential cost avoidance.

The following table compares two scenarios:

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

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

Table 5 Road Network Annual Capital Requirement Comparison

Asset Segment	Annual Requirements (Replacement Only)	Annual Requirements (Lifecycle Strategy)	Difference
Asphalt Roads	$7,478	$7,478	$0
Surface Treated Roads	$2,734,507	$1,105,456	$1,629,051
Streetlights	$119,551	$119,551	$0
Total	**$2,861,536**	**$1,232,485**	**$1,629,051**

The implementation of a proactive lifecycle strategy for surface treated roads, leads to a potential annual cost avoidance of approximately $1.6 million. This represents a 57% reduction of the annual capital requirement for the Road Network.

Gravel roads lifecycle costs are not considered capital and with the maintenance performed on the roads. They are considered to never require replacement. As such they are not included in the calculations for the annual requirements.

Table 6 outlines the total average annual capital requirements for existing assets in each asset category. Based on a replacement cost of $181 million, annual capital requirements total approximately $3.3 million for all the asset categories analysed.

The table also illustrates the system-generated, equivalent target reinvestment rate (TRR), calculated by dividing the annual capital requirements by the total replacement cost of each category. The cumulative target reinvestment for these categories is estimated at 1.8%.

Table 6 Average Annual Capital Requirements

Asset Category	Replacement Cost	Annual Capital Requirements	Target Reinvestment Rate
Road Network	$114,913,898	$1,232,485	1.07%
Bridges & Culverts	$33,400,638	$982,387	2.94%
Storm Sewer Network	$1,746,065	$23,281	1.33%
Buildings	$25,625,252	$588,978	2.30%
Machinery & Equipment	$1,545,601	$142,241	9.20%
Vehicles	$4,242,879	$341,132	8.04%
Total	**$181,474,333**	**$3,310,504**	**1.8%**

Although there is no industry standard guide on optimal annual investment in infrastructure, the Target Reinvestment Rates above provide a useful benchmark for organizations. In 2016, the Canadian Infrastructure Report Card (CIRC) produced an assessment of the health of municipal infrastructure as reported by cities and communities across Canada. The CIRC remains a joint project produced by several organizations, including the Federation of Canadian Municipalities (FCM), the Canadian Society of Civil Engineers (CSCE), the Canadian Network of Asset Managers (CNAM), and the Canadian Public Works Association (CPWA).

The 2016 version of the report card also contained recommended reinvestment rates that can also serve as benchmarks for municipalities. The CIRC suggest that, if increased, these reinvestment rates can "stop the deterioration of municipal infrastructure." The report card contains both a range for reinvestment rates that outlines the lower and upper recommended levels, as well as current municipal averages.

Current Funding Levels

Table 7 summarizes how current capital funding levels compare with funding required for each asset category. At existing levels, the Municipality is funding 56% of its annual capital requirements for all infrastructure analyzed. This creates a total annual funding deficit of $1.46 million.

Table 7 Current Funding Position vs Required Funding

Asset Category	Annual Capital Requirements	Annual Funding Available	Annual Deficit	Funding Level
Road Network	$1,232,485	$1,089,498	$142,987	88%
Bridges & Culverts	$982,387	$590,000	$392,387	60%
Storm Sewer Network	$23,281	$0	$23,281	0%
Buildings	$588,978	$100,710	$488,268	17%
Machinery & Equipment	$142,241	$18,725	$123,516	13%
Vehicles	$341,132	$46,695	$294,437	14%
Total	**$3,310,504**	**$1,845,628**	**$1,464,876**	**56%**

Closing the Gap

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

This section outlines how the Municipality of Huron Shores can close the annual funding deficits using own-source revenue streams, i.e., property taxation and without the use of additional debt for existing assets.

Full Funding Requirements Tax Revenues

In 2024, Huron Shores will have an annual tax revenue of $4.4 million. As illustrated in the following table, without consideration of any other sources of revenue or cost containment strategies, full funding would require a 33.1% tax change over time.

To achieve this increase, several scenarios have been developed using phase-in periods ranging from five to twenty years. Shorter phase-in periods may place too high a burden on taxpayers, whereas a phase-in period beyond 20 years may see a continued deterioration of infrastructure, leading to larger backlogs.

Table 8 Phasing in Annual Tax Increases

Total % Increase Needed in Annual Property Taxation Revenues	Phase-in Period			
	5 Years	10 Years	15 Years	20 Years
33.1%	5.9%	2.9%	1.9%	1.4%

Funding 100% of annual capital requirements ensures that major capital events, including replacements, are completed as required. Under this scenario, projects are unlikely to be deferred to future years. This delivers

the highest asset performance and customer levels of service. Reallocating debt payments as they become available is a financial strategy that Huron Shores has considered utilizing once their loans have been paid.

Use of Debt

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

Table 9 Premiums for Debt Financing 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%

Recommendations and Key Considerations

Financial Strategies

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

- implementing a 1.9% annual tax increase over a 15-year phase-in period and allocating the full increase in revenue towards capital funding
- continued allocation of OCIF and CCBF funding as previously outlined
- using risk frameworks and staff judgement to prioritize projects, particularly to aid in elimination of existing infrastructure backlogs

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

Asset Data

1. Continuously review, refine, and calibrate lifecycle and risk profiles to better reflect actual practices and improve capital projections. In particular:
   - the timing of various lifecycle events, the triggers for treatment, anticipated impacts of each treatment, and costs
   - the various attributes used to estimate the likelihood and consequence of asset failures, and their respective weightings
2. Asset management planning is highly sensitive to replacement costs. Periodically update replacement costs based on recent projects, invoices, or estimates, as well as condition assessments, or any other technical reports and studies. Material and labour costs can fluctuate due to local, regional, and broader market trends, and substantially so during major world events. Accurately estimating the replacement cost of like-for-like assets can be challenging. Ideally, several recent projects over multiple years should be used. Staff judgement and historical data can help attenuate extreme and temporary fluctuations in cost estimates and keep them realistic.
3. Like replacement costs, an asset's established serviceable life can have dramatic impacts on all projections and analyses, including long-range forecasting and financial recommendations. Periodically reviewing and updating these values to better reflect in-field performance and staff judgement is recommended.

Risk and Levels of Service

1. Risk models and matrices can play an important role in identifying high-value assets, and developing an action plan which may include repair, rehabilitation, replacement, or further evaluation through updated condition assessments. As a result, project selection and the development of multi-year capital plans can become more strategic and objective. Initial models have been built into Citywide for all asset groups. As the data evolves and new attribute information is obtained, these models should also be refined and updated.
2. Data on current performance should be centralized and tracked to support any calibration of service levels ahead of O. Reg's 2025 requirements on proposed levels of service.
3. Staff should monitor evolving local, regional, and environmental trends to identify factors that may shape the demand and delivery of infrastructure programs. These can include population growth, and the nature of population growth; climate change and extreme weather events; and economic conditions and the local tax base. This data can also be used to review and revise service level targets.

Appendix A: Road Network

State of the Infrastructure

Huron Shores' road network comprises the largest share of its infrastructure portfolio, with a current replacement cost of $114.9 million, distributed primarily between asphalt, surface treatment, and gravel roads.

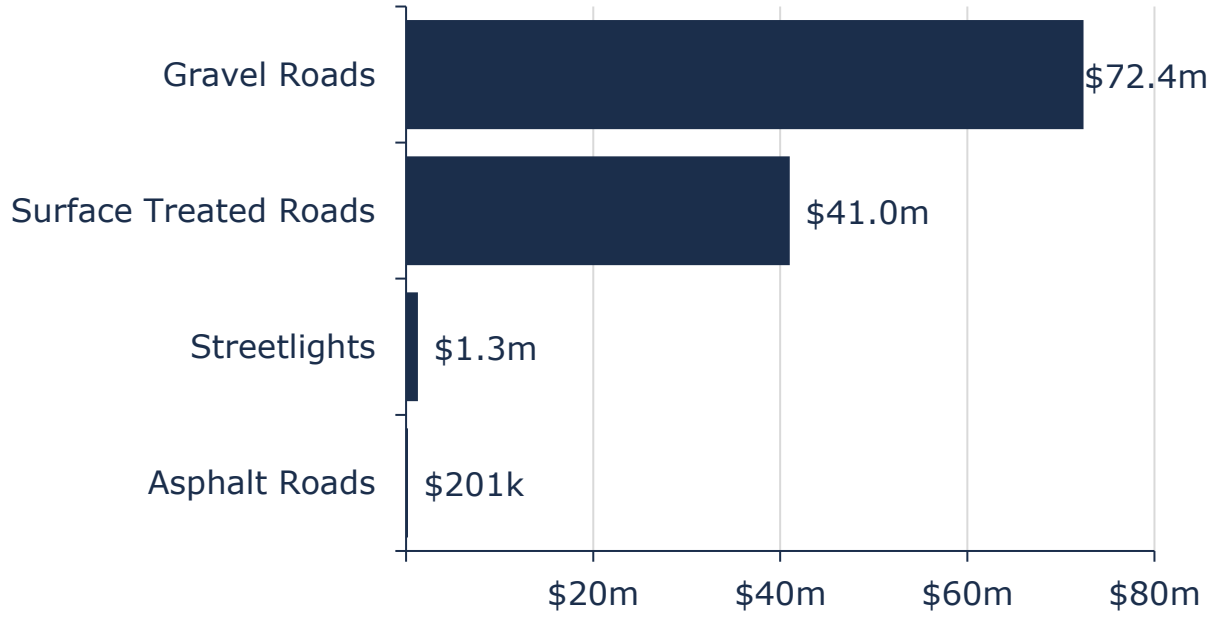
The state of the infrastructure for the road network is summarized below.

Replacement Cost	Condition	Financial Capacity	
$114.9 million	Fair (52%)	Annual Requirement:	$1,232,485
		Funding Available:	$1,089,498
		Annual Deficit:	$142,987

Inventory & Valuation

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

Figure 12 Road Network Replacement Value by Segment

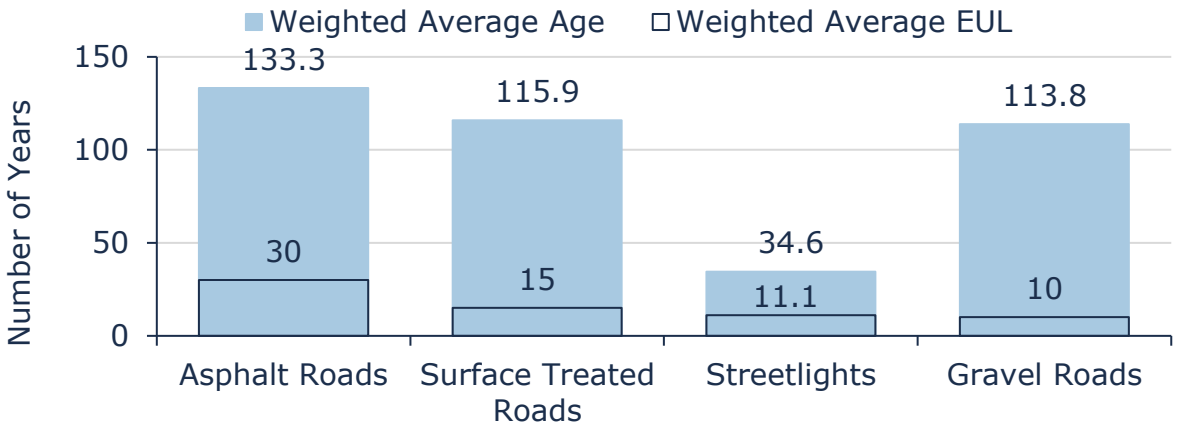


Each asset's replacement cost should be reviewed periodically to determine whether adjustments are needed to more accurately represent realistic capital requirements.

Asset Condition & Age

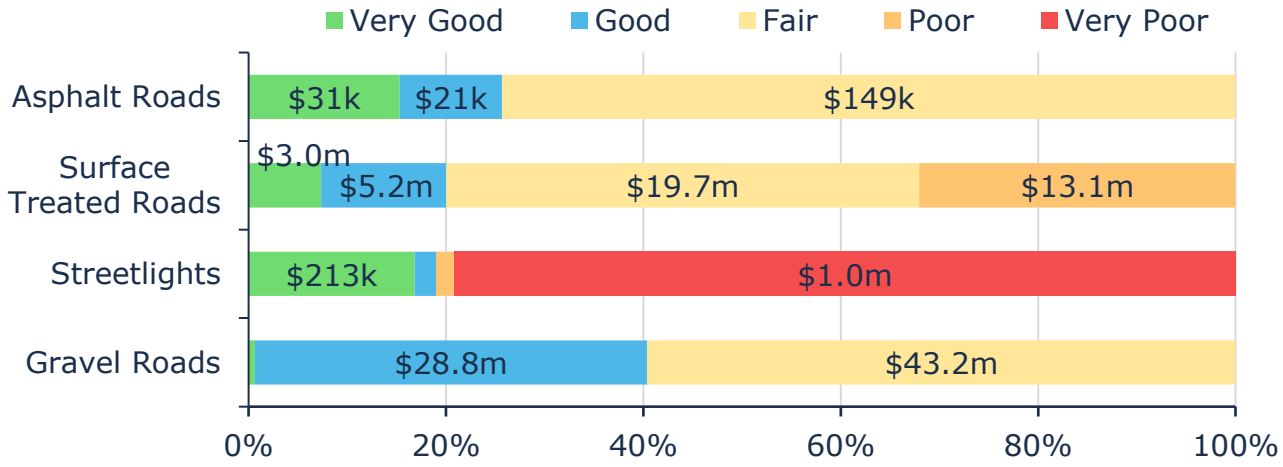
The graph below identifies the average age, and the estimated useful life for each asset segment. It is all weighted by replacement cost.

Figure 13 Road Network Average Age vs Average EUL



The analysis shows that, based on in-service dates, all assets continue to remain in operation beyond their expected useful life. The graph below visually illustrates the average condition for each asset segment on a very good to very poor scale.

Figure 14 Road Network Condition Breakdown



To ensure that Huron Shores' roads 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 roads.

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

Current Approach to Condition Assessment

Accurate and reliable condition data allows staff to determine the remaining service life of assets and identify the most cost-effective approach to managing assets. The Municipality is currently developing their approach to assessing their road assets in the field. The condition scale for roads utilized is from 0 to 100 from Very Poor to Very Good.

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 the tables below 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.

Table 10 Asphalt Road Current Lifecycle Strategy

Activity Type	Description of Current Strategy
Maintenance	• Routine street sweeping and road assessments are performed by internal staff. • Pothole patching yearly from spring to fall seasons as needed.
Rehabilitation / Replacement	• Conversion of asphalt roads to surface treated roads through milling and strengthening the road base

Table 11 Surface Treated Road Current Lifecycle Strategy

Activity Type	Description of Current Strategy
Maintenance	• Routine street sweeping and road assessments are performed by internal staff. • Road study is conducted by external consultant every five years. • Pothole patching yearly from spring to fall as needed. • Chip sealing is performed periodically.
Rehabilitation	• Milling and strengthening of road base is performed when the roads past the asset life span. • Single surface treatment is performed when the roads reach fair condition after mill and pave. • double surface treatment may be performed based on the traffic count and type of traffic.
Replacement	• Reconstruction is considered with signs of surface failures or to meet increased traffic requirements.

Figure 15 LCB Road Lifecycle Model

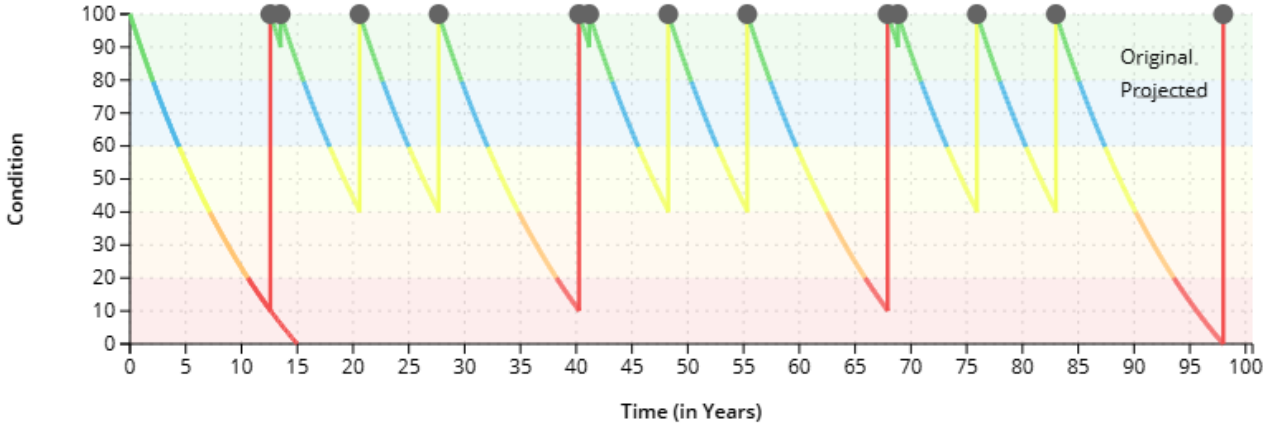


Figure 16 Gravel Road Lifecycle Model

Activity Type	Description of Current Strategy
Maintenance	• Re-gravelling is applied annually as needed. • Calcium Chloride is applied as dust suppressant annually. • Grading is performed multiple times per year as needed. • Ditching/mowing/brushing are performed annually over a period of 5 years. • 2 inches of gravel is applied every 4 years on each road segment
Rehabilitation	• Gravel roads are perpetually maintained.
Replacement	• Gravel roads generally do not require conventional asset replacement events.

Forecasted Capital Requirements

Figure 17 illustrates the cyclical short-, medium- and long-term infrastructure rehabilitation and replacement requirements for the Municipality's road network. This analysis was run until 2123 to capture at least one iteration of replacement for the longest-lived asset in the asset register.

Huron Shores' average annual requirements (red dotted line) total $1.2 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 long-term financial planning. They are based on asset replacement costs, age analysis, and condition data when available, as well as lifecycle modeling (roads only identified above).

Figure 17 Road Network Forecasted Capital Replacement Requirements

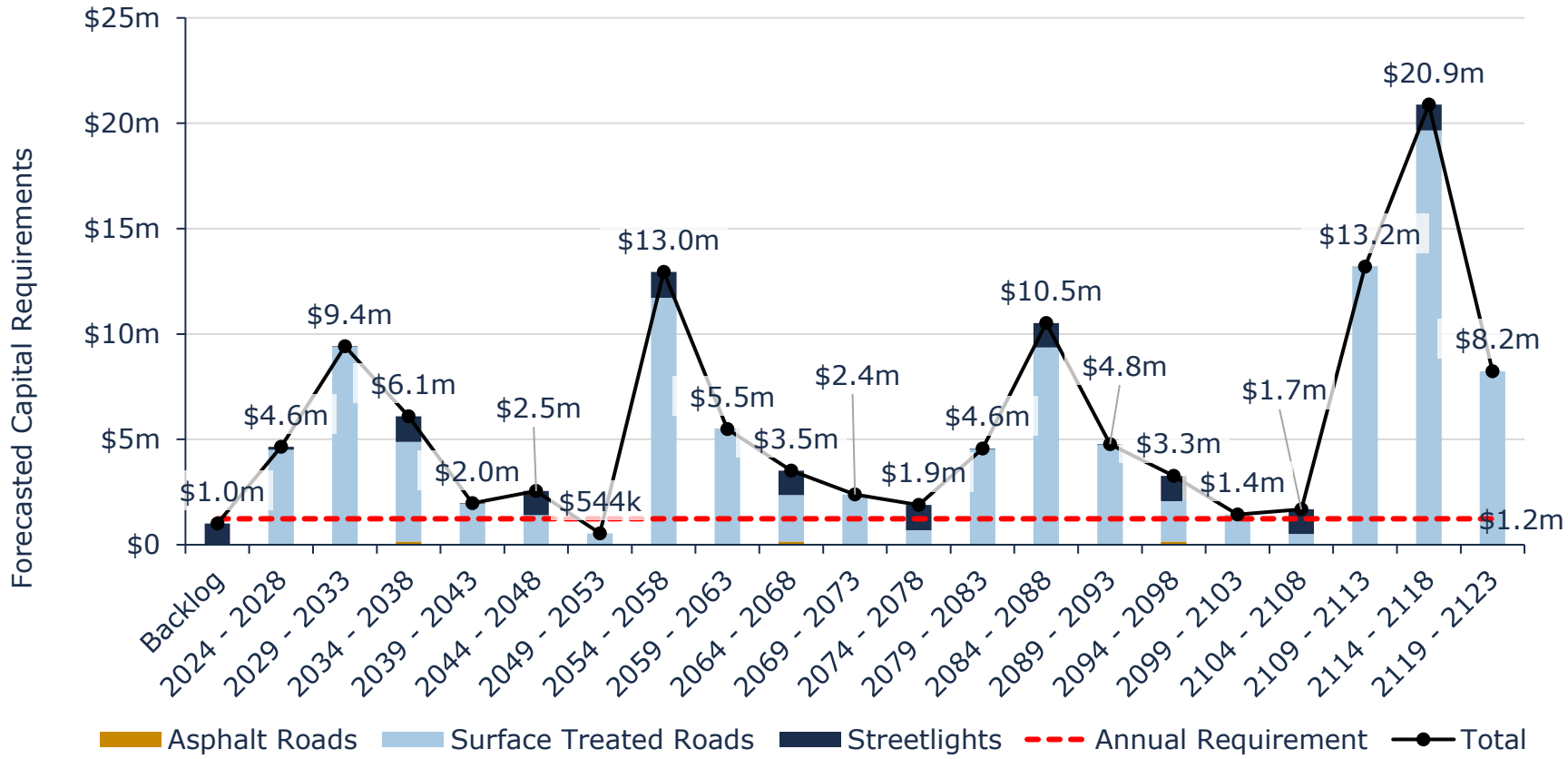


Table 12 below summarizes the projected cost of lifecycle activities (rehabilitation and replacement) that may need to be undertaken over the next 10 years to support current levels of service. These projections are generated in Citywide and rely on the data available in the asset register.

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 12 Road Network System-generated 10-Year Capital Costs

Segment	Backlog	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033
Asphalt Roads	-	-	-	-	-	-	-	-	-	-	$18k
Surface Treated Roads	-	-	-	-	$816k	$3.7m	$3.4m	$666k	$4.1m	$963k	$276k
Streetlights	$1.0m	$23k	-	-	-	$113k	-	$8k	-	$8k	$12k
Total	$1.0m	$23k	-	-	$816k	$3.8m	$3.4m	$674k	$4.1m	$970k	$305k

Risk & Criticality

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

Figure 18 Road Network Risk Breakdown

1 - 4	5 - 7	8 - 9	10 - 14	15 - 25
Very Low	Low	Moderate	High	Very High
$263,507	$10,551,461	$67,172,950	$23,256,740	$13,669,240
(<1%)	(9%)	(58%)	(20%)	(12%)

This is a high-level model developed by municipal staff and it 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.

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, condition and risk year-over-year, Huron Shores will be able to evaluate how their services/assets are trending. The Municipality will use this data to set a target level of service. The tables that follow summarize Huron Shores' 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 13 Road Network Community Levels of Service

Service Attribute	Qualitative Description	Current LOS
Scope	Description, which may include maps, of the road network in the Municipality and its level of connectivity	The Municipality currently owns and manages 10.7 lane-km of asphalt, 161.85 lane-km of surface treated roads, and 283.6 lane-km of gravel roads. The Municipality is connected to Highway 17/Trans-Canada Highway. See Figure 18 for road network map.
Quality	Description or images that illustrate the different levels of road class pavement condition.	See condition data in Figure 2 Huron Shores' road network comprises only local roads (MMS Class 5 and 6).
Performance	General	Services will be provided to ensure sustainability for the Municipality

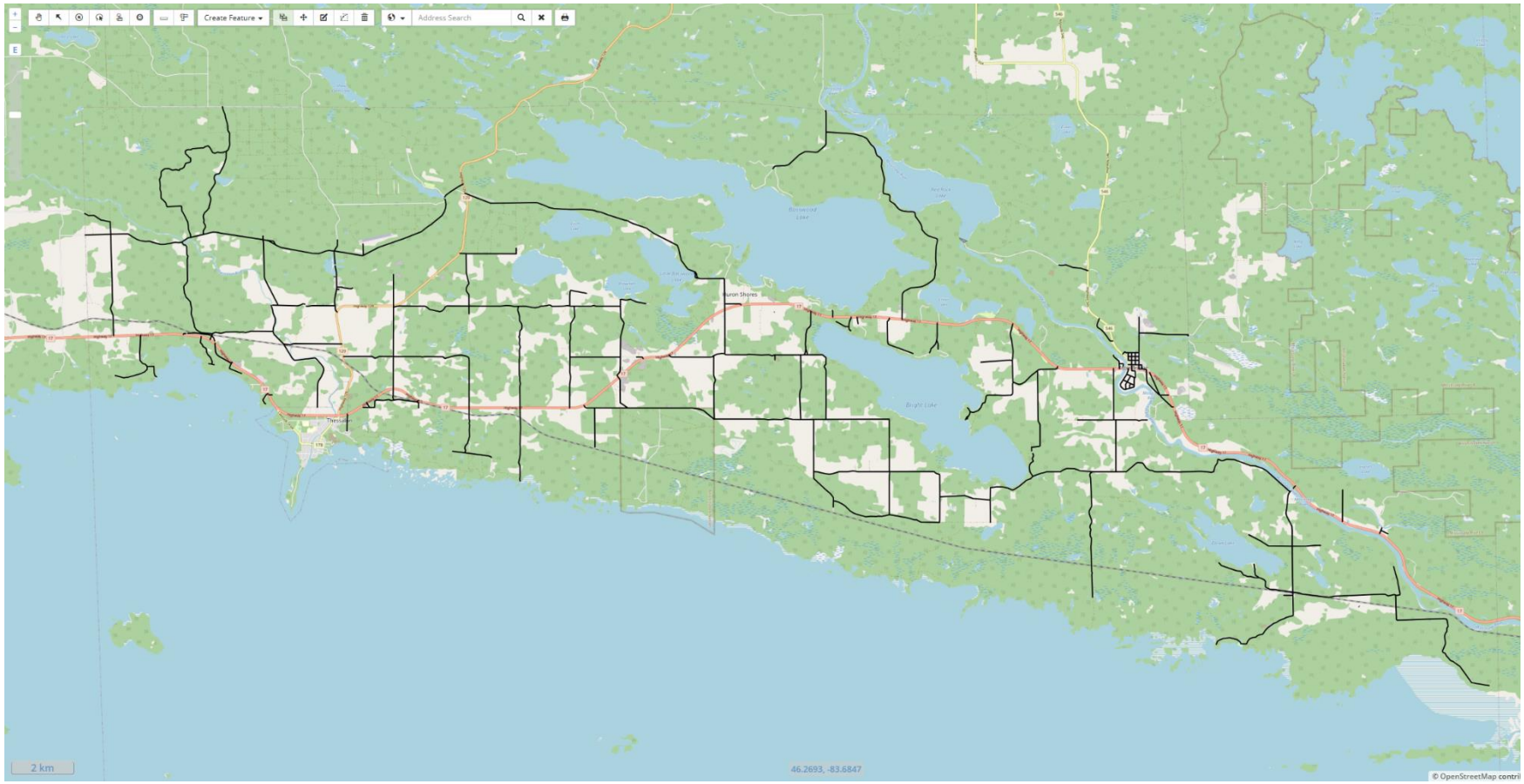
Technical Levels of Service

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

Table 14 Road Network Technical Levels of Service

Service Attribute	Technical Metric	Current LOS
Scope	Lane-km of arterial roads (MMS classes 1 and 2) per land area (km/km2)	0
	Lane-km of collector roads (MMS classes 3 and 4) per land area (km/km2)	0
	Lane-km of local roads (MMS classes 5 and 6) per land area (km/km2)	1.01
Quality	Average pavement condition for paved roads in the Municipality	63%
	Average surface condition for unpaved roads in the Municipality (e.g. excellent, good, fair, poor)	Fair
Performance	% Risk that is High and Very High	32%
	Actual capital reinvestment rate	0.95%

Figure 19 Road Network Map



Appendix B: Bridges & Culverts

State of the Infrastructure

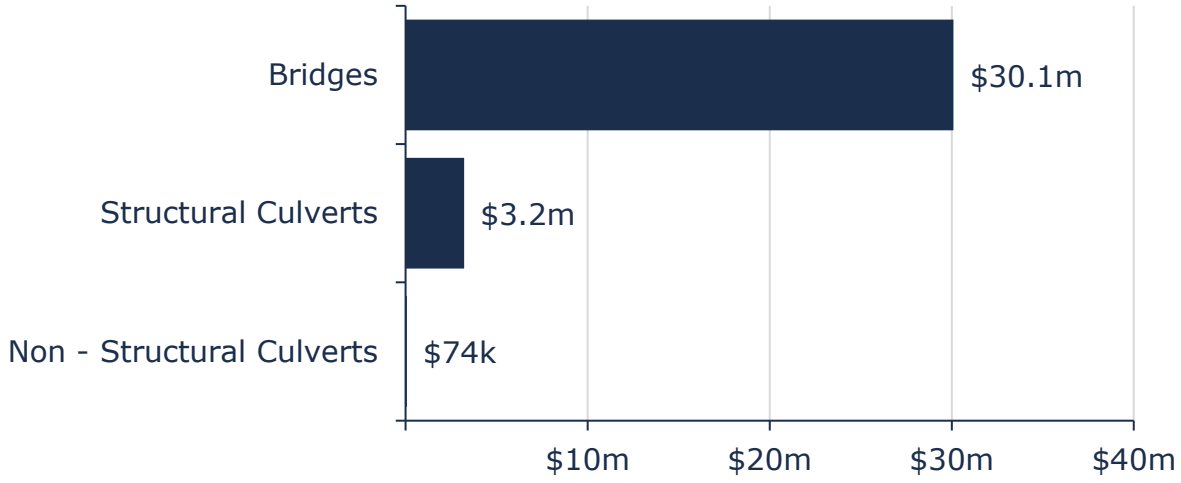
Bridges & culverts represent a critical portion of the transportation services provided to the community. The state of the infrastructure for bridges & culverts is summarized in the following table.

Replacement Cost	Condition	Financial Capacity	
$33.4 million	Fair (58%)	Annual Requirement:	$982,387
		Funding Available:	$590,000
		Annual Deficit:	$392,387

Inventory & Valuation

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

Figure 20 Bridges & Culverts Replacement Cost

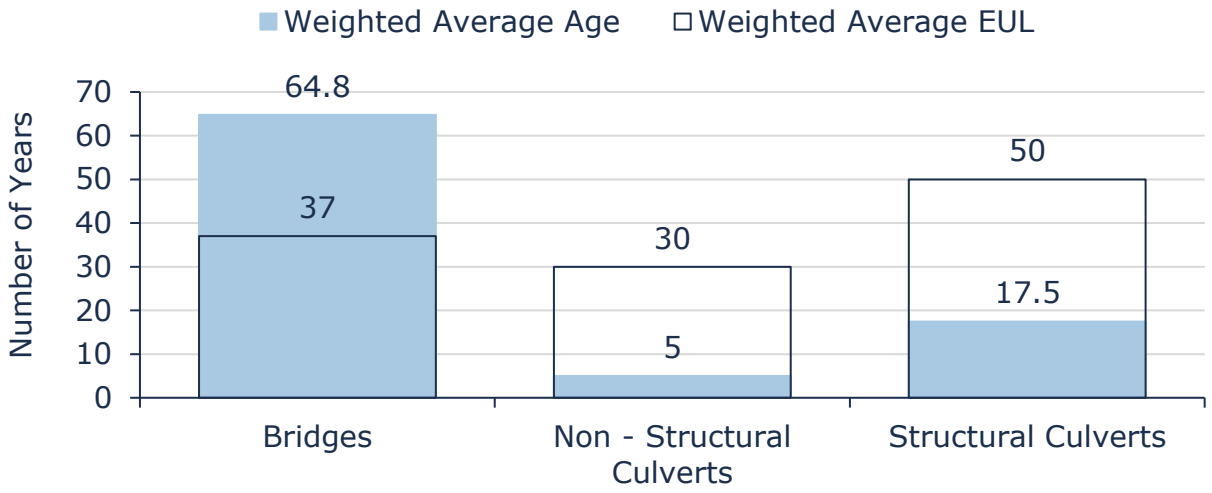


Each asset's replacement cost should be reviewed periodically to determine whether adjustments are needed. This can be included in the Ontario Structures Inspection Manual (OSIM) inspections as the replacement cost is part of the calculation for the bridge condition index (BCI).

Asset Condition & Age

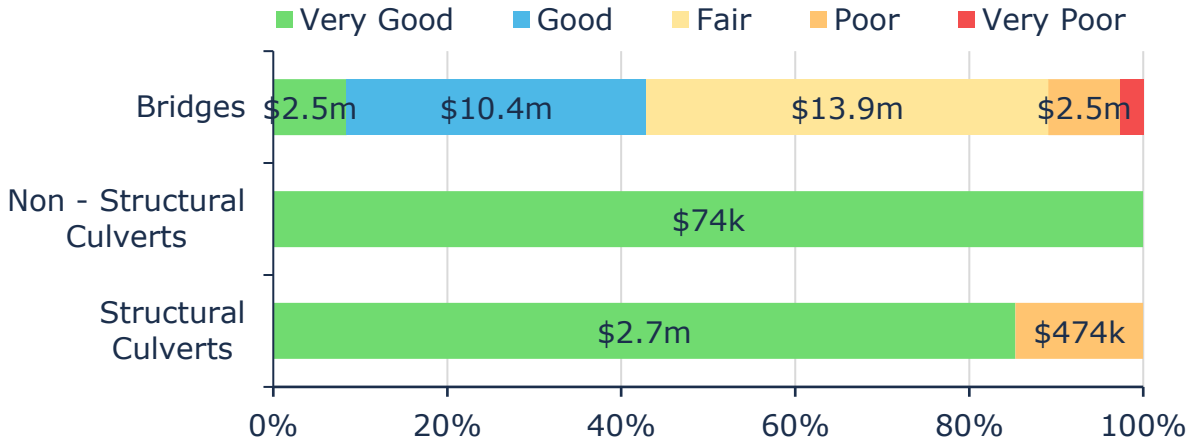
The graph below identifies the average age and the estimated useful life for each asset segment in the bridges & culverts inventory. The values are weighted based on replacement cost.

Figure 21 Bridges & Culverts 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 22 Bridges & Culverts Condition Breakdown



To ensure that the Municipality's bridges & 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

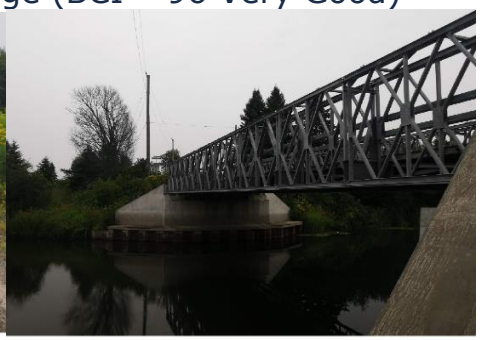
Accurate and reliable condition data allows staff to determine the remaining service life of assets and identify the most cost-effective approach to managing assets. Huron Shores' current approach is to assess all bridges and structural culverts every 2 years in accordance with the Ontario Structure Inspection Manual (OSIM). The most recent assessment was

completed in 2023 by Tulloch Engineering. The condition scale for bridges and culverts utilized is from 0 to 100 from Very Poor to Very Good.

Figure 23 Bridge & Culvert Condition Images

Municipal Structure #6 – Midway Bridge (BCI – 96 Very Good)

Looking East Across The Structure



North Elevation

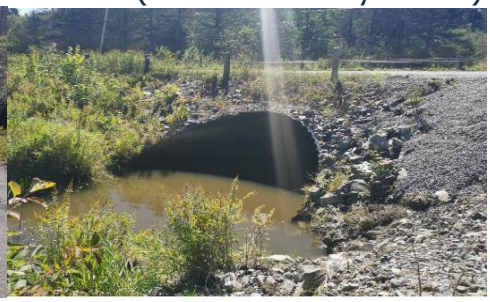
Municipal Structure #17 – Potomac Bridge (BCI – 34 Poor)

Looking South Across Structure

East Elevation

Municipal Structure #16 – Cameron Culvert (BCI – 87 Very Good)

Looking East Across The Structure



South Elevation

Municipal Structure #20 – Dayton Road Culvert #1 (BCI – 30 Poor)

Looking North Across The Structure

West Elevation

Lifecycle Management Strategy

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

Table 15 Bridges & Culverts Current Lifecycle Strategy

Activity Type	Description of Current Strategy
Maintenance	• Sweeping, mowing and deck washing is performed annually.
Rehabilitation/ Replacement	• All lifecycle activities are driven by the recommendations of the Ontario Structure Inspection Manual; however, bridge type, location and type of traffic are taken into consideration as well. • Replacement prioritization is based on the risk associated to the condition assessed by OSIM, the service life, the availability of detour, length of detour and type of traffic.

Forecasted Capital Requirements

Figure 24 illustrates the cyclical short-, medium- and long-term infrastructure rehabilitation and replacement requirements for the Municipality's bridges & culverts. These projections 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.

The analysis was run until 2073 to capture at least one iteration of replacement for the longest-lived asset in the asset register. Huron Shores' average annual requirements (red dotted line) for bridges & culverts total $982 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.

Figure 24 Bridges & Culverts Forecasted Capital Replacement Requirements

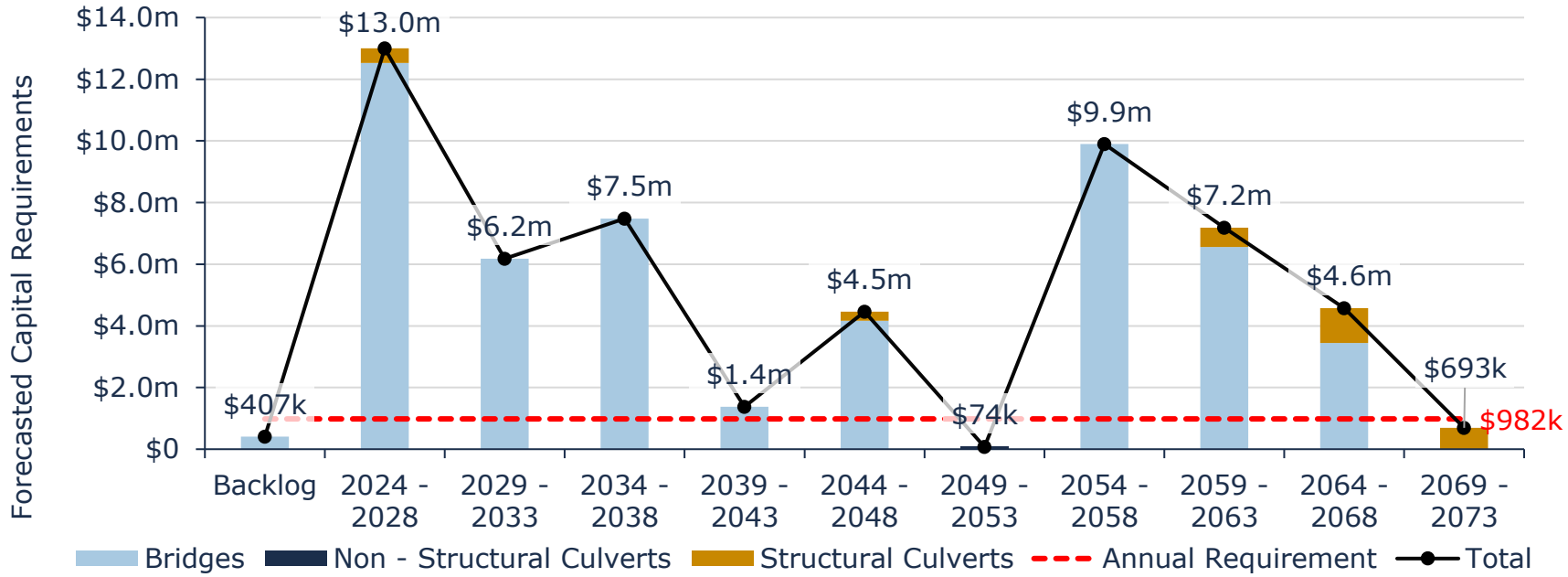


Table 16 below summarizes the projected cost of lifecycle activities (as previously described) that may need to be undertaken over the next 10 years to support current levels of service. These are represented at the major asset level.

Table 16 Bridges & Culverts System-Generated 10-year Capital Costs

Segment	Backlog	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033
Bridges	$407k	$2.3m	$1.7m	$7.4m	$1.1m	-	$2.8m	-	$1.9m	-	$1.4m
Non–Structural Culverts	-	-	-	-	-	-	-	-	-	-	-
Structural Culverts	-	-	$237k	$237k	-	-	-	-	-	-	-
Total	$407k	$2.3m	$2.0m	$7.6m	$1.1m	-	$2.8m	-	$1.9m	-	$1.4m

These projections are generated based on the data available in the asset register. Assessed condition data and replacement costs were used to assist in forecasting replacement needs for bridges and structural culverts.

Risk & Criticality

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

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.

Figure 25 Bridges & Culverts Risk Breakdown

1 - 4 Very Low	5 - 7 Low	8 - 9 Moderate	10 - 14 High	15 - 25 Very High
$592,159 (2%)	$4,769,158 (14%)	$4,995,000 (15%)	- (0%)	$23,044,321 (69%)

Levels of Service

The following tables identify the Municipality's metrics to identify their current level of service for the bridges and culverts. By comparing the cost, condition and risk year-over-year, Huron Shores 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 bridges & culverts.

Table 17 Bridges & Culverts Community Levels of Service

Service Attribute	Qualitative Description	Current LOS
Scope	Description of the traffic that is supported by municipal bridges (e.g., heavy transport vehicles, motor vehicles, emergency vehicles, pedestrians, cyclists).	Most of the Municipality's bridges support all traffic types. However, some bridges carry load restrictions (see below), and others are limited to pedestrian traffic (structure #18).
Quality	Description or images of the condition of bridges and culverts and how this would affect use of the bridges and culverts.	See Figure 23 Bridge and Culvert Condition Images
Performance	General	Services will be provided to ensure sustainability for the Municipality

Technical Levels of Service

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

Table 18 Bridges & Culverts Technical Levels of Service

Service Attribute	Technical Metric	Current LOS
Scope	Percentage of bridges in the Municipality with loading or dimensional restrictions.	34%, based on 8 bridges and culverts with load restrictions
Quality	For bridges in the Municipality, the average bridge condition index value.	Fair (55%)
	For structural culverts in the Municipality, the average bridge condition index value.	Very Good (87%)
Performance	% Risk that is High and Very High	69%
	Actual capital reinvestment rate	1.77%

Appendix C: Storm Sewer Network

State of the Infrastructure

The Municipality is responsible for approximately 2.16 kilometres of storm sewer mains. The state of the infrastructure for the storm sewer network is summarized in the following table.

Replacement Cost	Condition	Financial Capacity	
$1.7 million	Fair (48%)	Annual Requirement:	$23,281
		Funding Available:	$0
		Annual Deficit:	$23,281

Inventory & Valuation

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

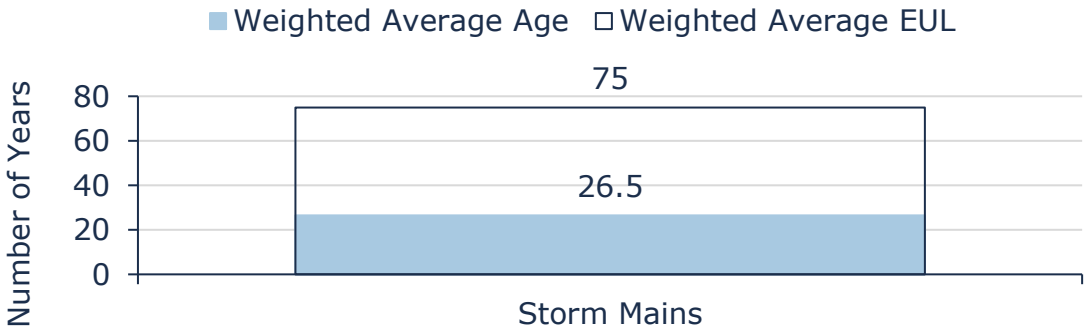
Figure 26 Storm Sewer Network Replacement Cost

Each asset's replacement cost should be reviewed periodically to determine whether adjustments are needed.

Asset Condition & Age

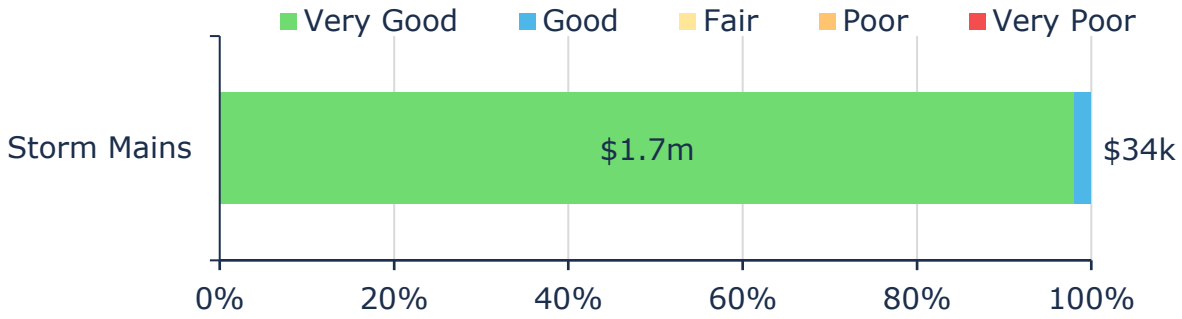
The graph below identifies the average age and the estimated useful life for each asset segment in the storm sewer network. The values are weighted based on replacement cost.

Figure 27 Storm Sewer Network 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 28 Storm Sewer Network Condition Breakdown



To ensure that the Municipality's storm sewer network continues 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. The Municipality is planning to perform CCTV assessments every five years. However, assessments are currently conducted on an as-needed basis. Age-based condition is utilized for asset management purposes. The condition scale for storm sewer assets is from 0 to 100 from Very Poor to Very Good.

Lifecycle Management Strategy

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

Table 19 Storm Sewer Network Current Lifecycle Strategy

Activity Type	Description of Current Strategy
Maintenance	Storms sewers are flushed as needed and when budget allows
Rehabilitation/ Replacement	• Most sewer main replacement are reactive, when failures occur, or if warranted by the main's defect history. • The strategy for corrugated steel pipes is end-of-life replacement.

Forecasted Capital Requirements

Figure 29 illustrates the cyclical short-, medium- and long-term infrastructure rehabilitation and replacement requirements for the Municipality's storm sewer network. These projections 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.

The analysis was run until 2093 to capture at least one iteration of replacement for the longest-lived asset in the asset register. Huron Shores' average annual requirements (red dotted line) for the storm sewer network total $23 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.

Figure 29 Storm Sewer Network Forecasted Capital Replacement Requirements

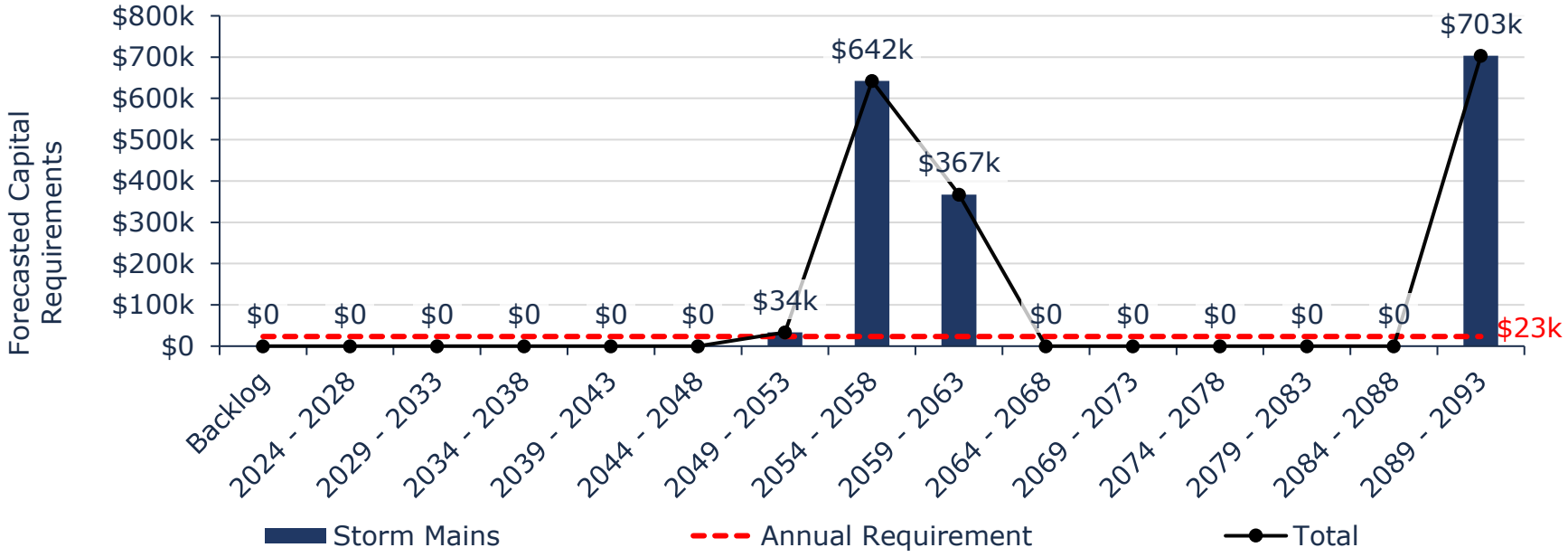


Table 20 below summarizes the projected cost of lifecycle activities (as previously described) that may need to be undertaken over the next 10 years to support current levels of service. These are represented at the major asset level.

Table 20 Storm Sewer Network System-generated 10-Year Capital Costs

Segment	Backlog	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033
Storm Mains	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Total	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0

These projections are generated based on the data available in the asset register. Aged-based condition data and replacement costs were used to assist in forecasting replacement needs for the storm sewer network.

Risk & Criticality

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

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.

Figure 30 Storm Sewer Network Risk Breakdown

1 - 4 Very Low	5 - 7 Low	8 - 9 Moderate	10 - 14 High	15 - 25 Very High
$703,139 (40%)	$272,789 (16%)	- (0%)	$770,137 (44%)	- (0%)

Levels of Service

The following tables identify the Municipality's metrics to identify their current level of service for the storm sewer network. By comparing the cost, condition and risk year-over-year, Huron Shores 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 the storm sewer network.

Table 21 Storm Sewer Network Community Levels of Service

Service Attribute	Qualitative Description	Current LOS
Scope	Description, which may include maps, of the user groups or areas of the Municipality that are protected from flooding, including the extent of the protection provided by the municipal stormwater management system.	The existing storm water collection system is located on Clarissa, John, East, King, Bridge Street, Chiblow Lake Road and Warnock Road. The current storm sewer system is sized based on a twenty-five (25) year design storm using the Iron Bridge storm data.
Quality	Description of the condition of the storm sewer system	Condition Description • Very Good - Fit for the future • Good - Adequate for now • Fair - Requires attention • Poor - Increased potential of affecting service • Very Poor - Unfit for sustained service"
Performance	General	Services will be provided to ensure sustainability for the Municipality

Technical Levels of Service

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

Table 22 Storm Sewer Network Technical Levels of Service

Service Attribute	Technical Metric	Current LOS
Scope	Percentage of properties in municipality resilient to a 100-year storm.	100%
	Percentage of the municipal stormwater management system resilient to a 5-year storm.	100%
Quality	Average condition	Fair (48%)
Performance	% Risk that is High and Very High	44%
	Capital reinvestment rate	0%

Appendix D: Buildings

State of the Infrastructure

Huron Shores owns and maintains several buildings that provide key services to the community. These include:

- Community Centres and Halls
- 2 Fire Stations
- Town Hall
- Waste Sites
- Public Works Storage
- Library, museum and parks buildings

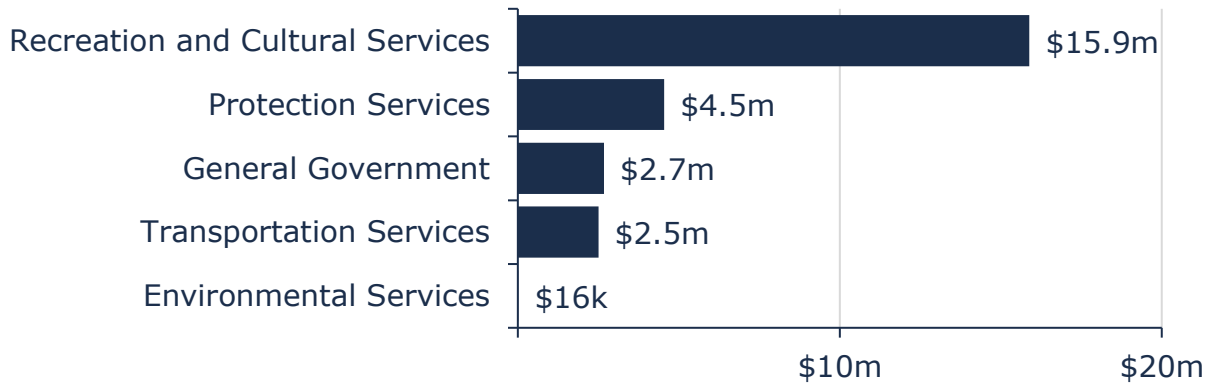
The state of the infrastructure for the buildings is summarized in the following table.

Replacement Cost	Condition	Financial Capacity	
$25.6 million	Good (74%)	Annual Requirement:	$588,978
		Funding Available:	$100,710
		Annual Deficit:	$488,268

Inventory & Valuation

The graph below displays the total replacement cost of each asset segment in Huron Shores' buildings inventory. As the Municipality had a complete componentization of their buildings in 2023 their inventory tracks buildings as components individual replacement.

Figure 31 Buildings Replacement Cost

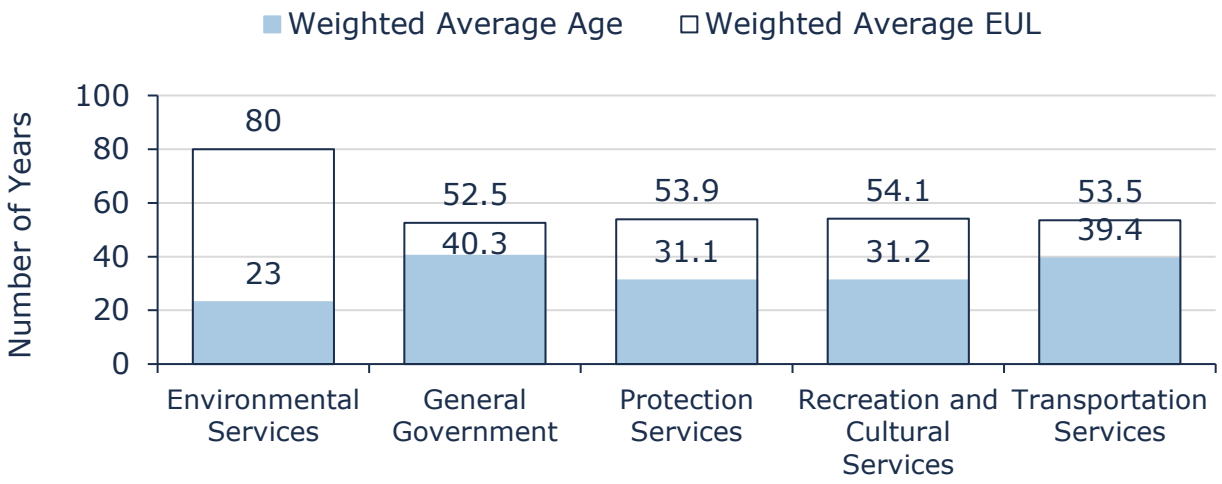


Each asset's replacement cost should be reviewed periodically to determine whether adjustments are needed to represent capital requirements more accurately.

Asset Condition & Age

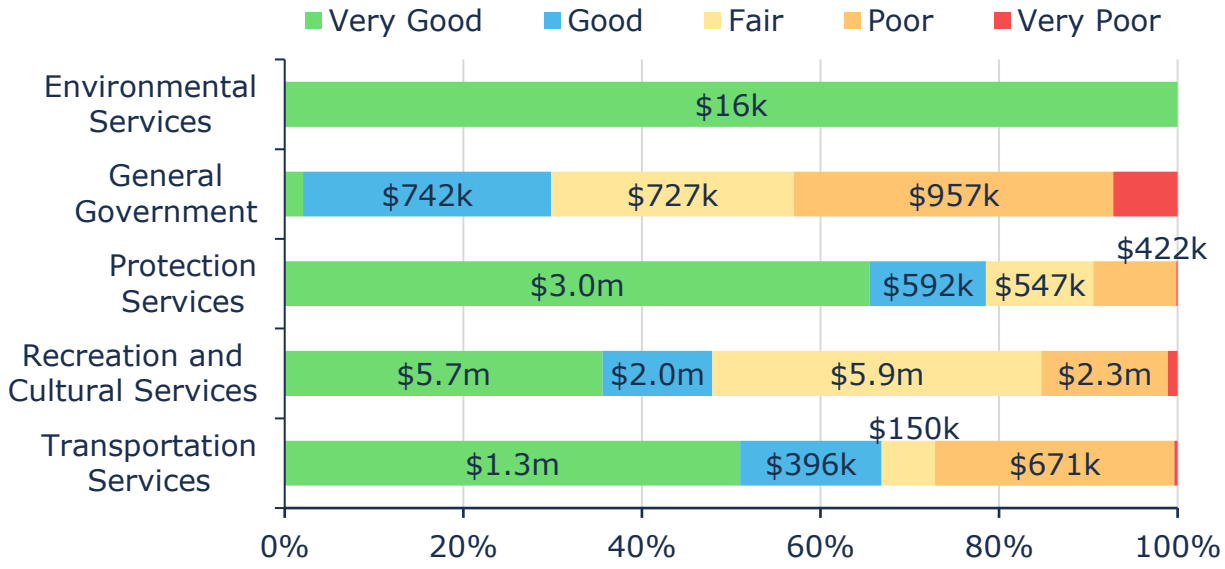
The graph below identifies the average age, and the estimated useful life for each asset segment. The values are weighted based on replacement cost.

Figure 32 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 33 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. Full condition assessment and componentization of the inventory was completed by ABSI in 2023.

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.

Table 23 Buildings Current Lifecycle Strategy

Activity Type	Description of Current Strategy
Maintenance and Preventative Maintenance	• The Municipality's building maintenance staff performs monthly visual inspections. • Building assets are maintained by the buildings staff on routine basis or as needed. • Visual inspections related to fire extinguishers, HVAC, and firehalls are carried out on monthly basis, considering the health and safety measures. • The community centres, the museum, and library are subjected to monthly health and safety inspections and continual cleaning. • Sprinkler systems in the community centres are inspected every six months. • Elevators as inspected on monthly basis.
Rehabilitation/ Replacement	• Assessments are completed strategically and based on the condition and performance of the asset, recommending component upgrades and replacements. • Replacement/rehabilitation is prioritized, considering costs, health and safety, life expectancy, and its usefulness for the Municipality. • Building management is primarily reactive.

Forecasted Capital Requirements

The annual capital requirement represents the average amount per year that Huron Shores should allocate towards funding rehabilitation and replacement needs. The following graph identifies capital requirements over the next 70 years. This projection is used as it ensures that every asset has gone through one full iteration of replacement. The forecasted requirements are aggregated into 5-year bins and the trend line represents the average capital requirements at $589 thousand.

Figure 34 Buildings Forecasted Capital Replacement Requirements

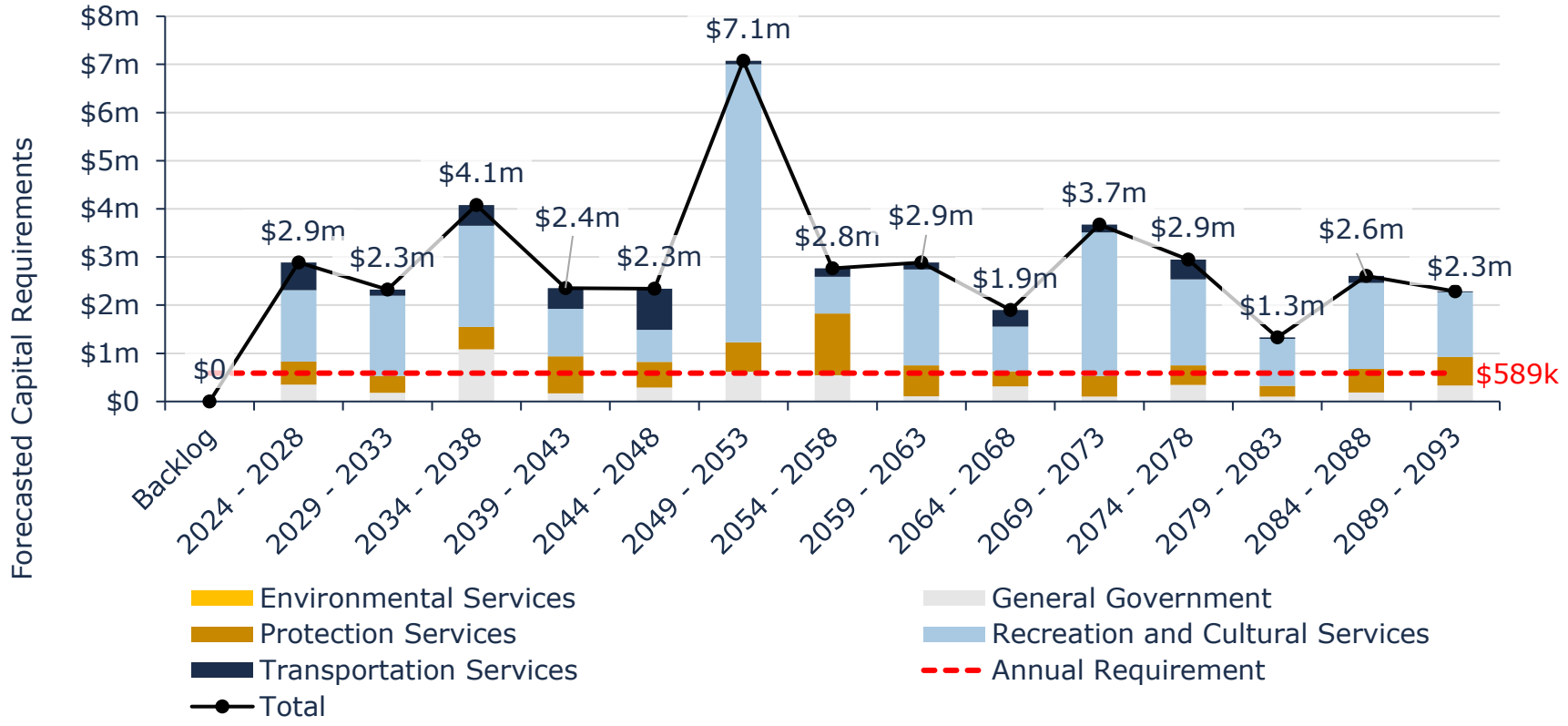


Table 24 below summarizes the projected cost of lifecycle activities (capital activities only) that may need to be undertaken over the next 10 years to support current levels of service.

Table 24 Buildings System-Generated 10-Year Capital Costs

Segment	Backlog	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033
Environmental Services	-	-	-	-	-	-	-	-	-	-	-
General Government	-	$244k	$26k	$44k	$11k	$23k	$9k	$100k	$18k	$9k	$46k
Protection Services	-	$249k	$105k	$74k	$28k	$25k	$28k	$123k	$25k	$103k	$74k
Recreation & Cultural Services	-	$818k	$230k	$231k	$44k	$158k	$17k	$352k	$244k	$100k	$952k
Transportation Services	-	$455k	-	$95k	-	$24k	-	$78k	-	$14k	$33k
Total	-	$1.8m	$361k	$444k	$84k	$230k	$53k	$652k	$287k	$227k	$1.1m

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

Risk & Criticality

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

Figure 35 Buildings Risk Breakdown

1 - 4	5 - 7	8 - 9	10 - 14	15 - 25
Very Low	**Low**	**Moderate**	**High**	**Very High**
$11,016,764 (43%)	$4,799,121 (19%)	$1,334,093 (5%)	$6,479,074 (25%)	$1,996,200 (8%)

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, condition and risk year-over-year, the Municipality will be able to evaluate how their services/assets are trending.

Community Levels of Service

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

Table 25 Buildings Community Levels of Service

Service Attribute	Qualitative Description	Current LOS
Scope	Description of the services being provided	Buildings that provide services to the community include: • 4 Community Centres and halls • 2 Fire Stations • Town Hall • Waste Sites • Public Works Storage • Library, museum and parks buildings
Quality	Description of the condition of municipal buildings	Condition Description • Very Good - Fit for the future • Good - Adequate for now • Fair - Requires attention • Poor - Increased potential of affecting service • Very Poor - Unfit for sustained service
Performance	General	Services will be provided to ensure sustainability for the Municipality

Technical Levels of Service

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

Table 26 Buildings Technical Levels of Service

Service Attribute	Technical Metric	Current LOS
Scope	Quantity (square feet)	67,257
Quality	Average condition	Good (74%)
Performance	% Risk that is High and Very High	33%
	Capital reinvestment rate	0.39%

Appendix E: Machinery & Equipment

State of the Infrastructure

To maintain the quality stewardship of Huron Shores' infrastructure and support the delivery of services, the municipality owns and employs various types of equipment. This includes:

- General government services (office and IT) equipment
- Fire services equipment
- Transportation services equipment
- Recreation services equipment
- Planning and development services equipment

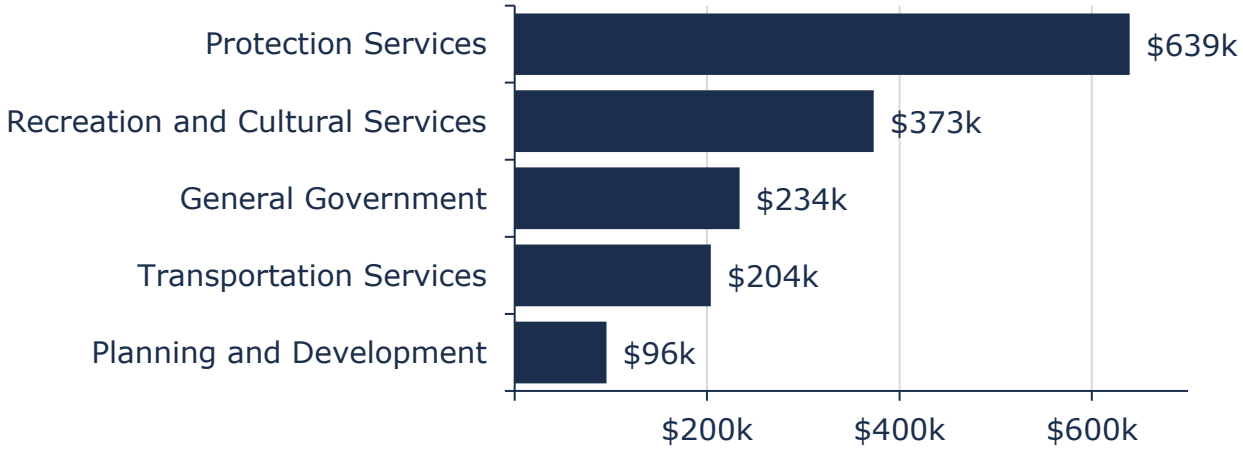
The state of the infrastructure for equipment is summarized in the following table.

Replacement Cost	Condition	Financial Capacity	
$1.5 million	Fair (51%)	Annual Requirement:	$142,241
		Funding Available:	$18,725
		Annual Deficit:	$123,516

Inventory & Valuation

The graph below displays the total replacement cost of each asset segment in the Huron Shores' equipment inventory.

Figure 36 Machinery & Equipment Replacement Costs

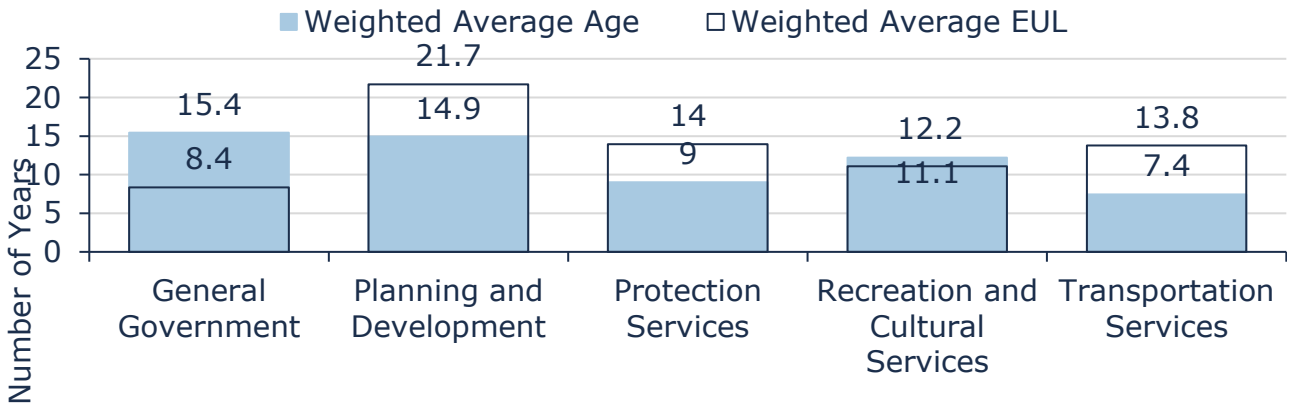


Each asset's replacement cost should be reviewed periodically to determine whether adjustments are needed to more accurate represent capital requirements.

Asset Condition & Age

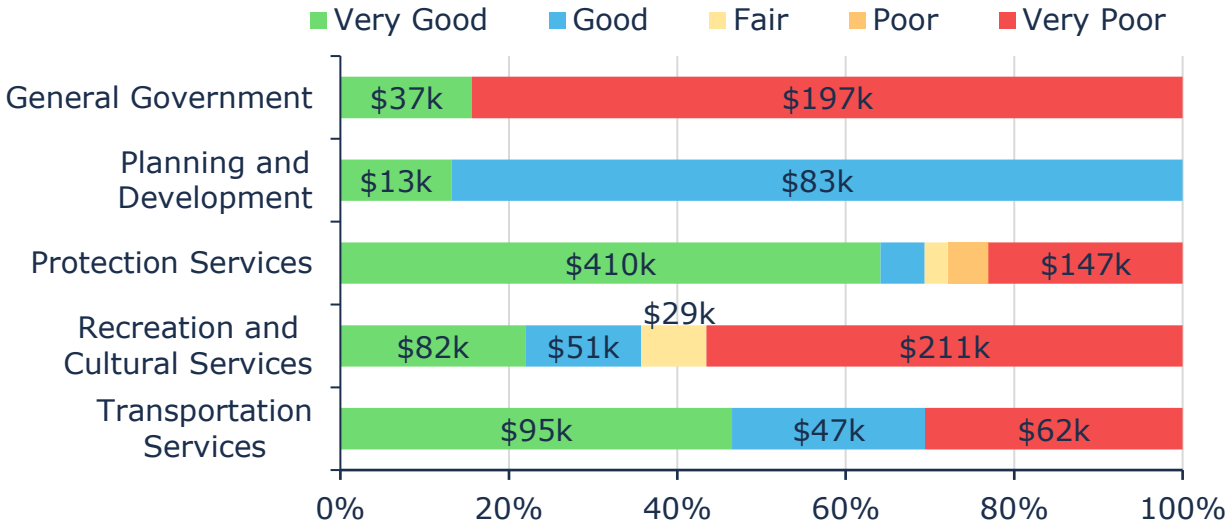
The graph below identifies the average age and the estimated useful life for each asset segment. The values are weighted based on replacement cost.

Figure 37 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 38 Machinery & Equipment Condition Breakdown



To ensure that the Municipality's equipment continues to provide an acceptable level of service, Huron Shores 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.

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.

Table 27 Machinery & Equipment Current Lifecycle Strategy

Activity Type	Description of Current Strategy
Maintenance	• Public works snowplows are maintained and inspected on an annual basis. This includes replacement of chutes, blades, pins, and other components. • Bunker gear is inspected routinely by staff, and every six months by the manufacturer, as per NFPA standards. Monthly night maintenance is performed as issues are identified. • Generators, portable pumps, are tested annually for certification. Generator's gas is checked once a month. Cylinders and cascade cylinders are tested every five years for certification. • Defibrillators are checked monthly to ensure proper functioning. • Self Contained Breathing Apparatus (SCBA) have an annual inspection and are hydrostatically tested. Staff perform visual inspections monthly. • Radio equipment is inspected during use and issues are reported as they arise. • CO_2 testers and the air filling machines are tested and sampled every six months to ensure proper working order. • Computer maintenance is usually done in-house, outside consultants mostly act as support.
Rehabilitation/ Replacement	• Most of the machinery and equipment assets are replaced at end of life, unless defects or issues warrant earlier replacements. • The replacement of these assets is based on the service life remaining and available budget.

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 $142 thousand.

Figure 39 Machinery & Equipment Forecasted Capital Replacement Requirements

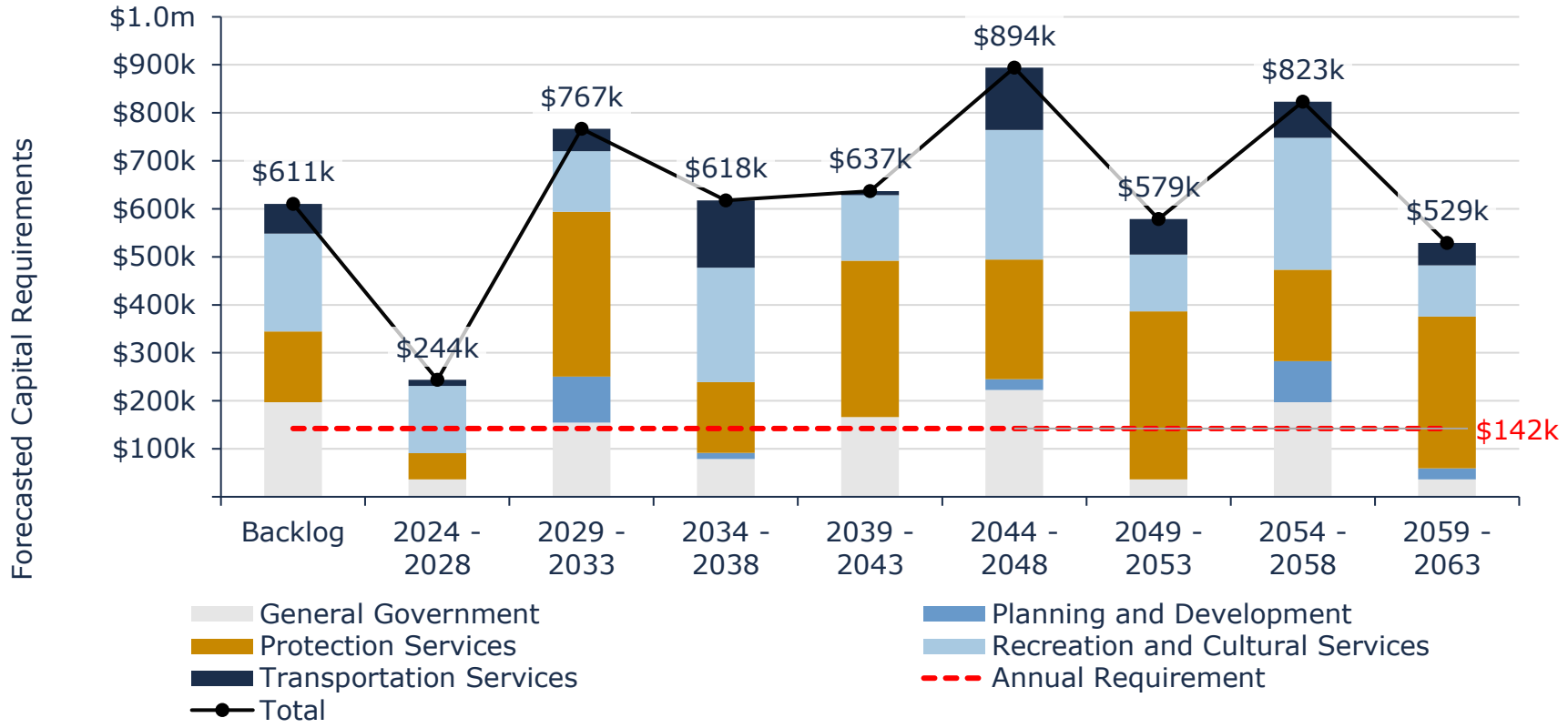


Table 28 below summarizes the projected cost of lifecycle activities (capital replacement only) that may need to be undertaken over the next 10 years to support current levels of service. These projections are generated in Citywide and rely on the data available in the asset register.

Table 28 Machinery & Equipment System-Generated 10-Year Capital Costs

Segment	Backlog	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033
General Government	$197k	-	-	-	$11k	$25k	-	-	-	$155k	-
Planning & Development	-	-	-	-	-	-	$10k	$44k	-	$39k	$2k
Protection Services	$147k	-	-	$39k	$8k	$8k	$27k	$277k	$16k	$2k	$21k
Recreation and Cultural Services	$204k	$7k	$16k	$19k	$4k	$93k	$31k	-	$65k	$20k	$10k
Transportation Services	$62k	-	-	$8k	-	$4k	$47k	-	-	-	-
Total	$611k	$7k	$16k	$66k	$23k	$130k	$115k	$321k	$81k	$217k	$33k

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

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.

Figure 40 Machinery & Equipment Risk Breakdown

1 - 4 Very Low $927,607 (60%)	5 - 7 Low $617,994 (40%)	8 - 9 Moderate - (0%)	10 - 14 High - (0%)	15 - 25 Very High - (0%)

Levels of Service

By comparing the cost, condition and risk year-over-year, Huron Shores 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 equipment are outlined below:

Table 29 Machinery & Equipment Community Levels of Service

Service Attribute	Qualitative Description	Current LOS
Scope	Description of the services provided by machinery and equipment	The municipality owns and employs various types of equipment. This includes: • General government services (office and IT) equipment • Fire services equipment • Transportation services equipment • Recreation services equipment • Planning and development services equipment
Quality	Description of the condition of machinery and equipment	Condition Description • Very Good - Fit for the future • Good - Adequate for now • Fair - Requires attention • Poor - Increased potential of affecting service • Very Poor - Unfit for sustained service
Performance	General	Services will be provided to ensure sustainability for the Municipality

Technical Levels of Service

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

Table 30 Machinery & Equipment Technical Levels of Service

Service Attribute	Technical Metric	Current LOS
Scope	Quantity	136
Quality	Average condition	Fair (51%)
Performance	% Risk that is High and Very High	0%
	Capital reinvestment rate	1.21%

Appendix F: 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:

- Protection Services
- Transportation vehicles

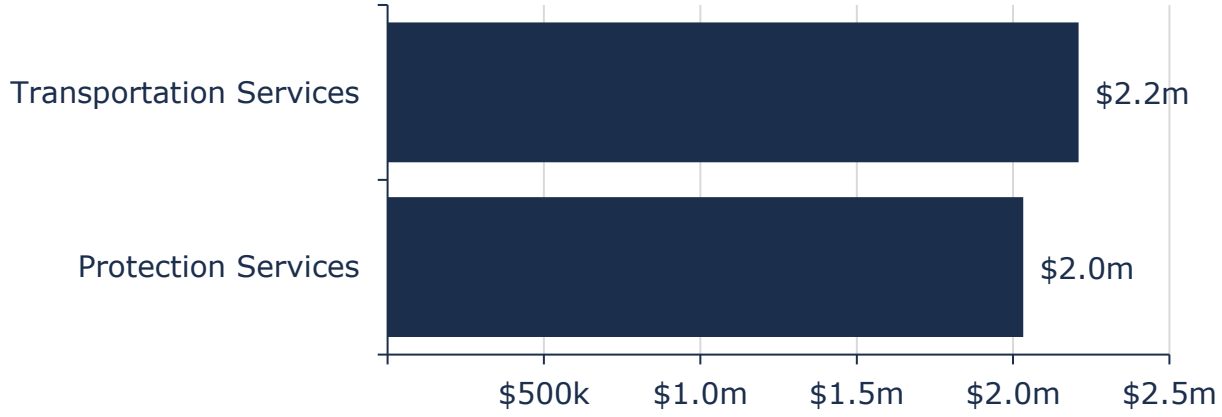
The state of the infrastructure for the vehicles is summarized in the following table.

Replacement Cost	Condition	Financial Capacity	
$4.2 million	Good (78%)	Annual Requirement:	$341,132
		Funding Available:	$46,695
		Annual Deficit:	$294,437

Inventory & Valuation

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

Figure 41 Vehicle Replacement Costs

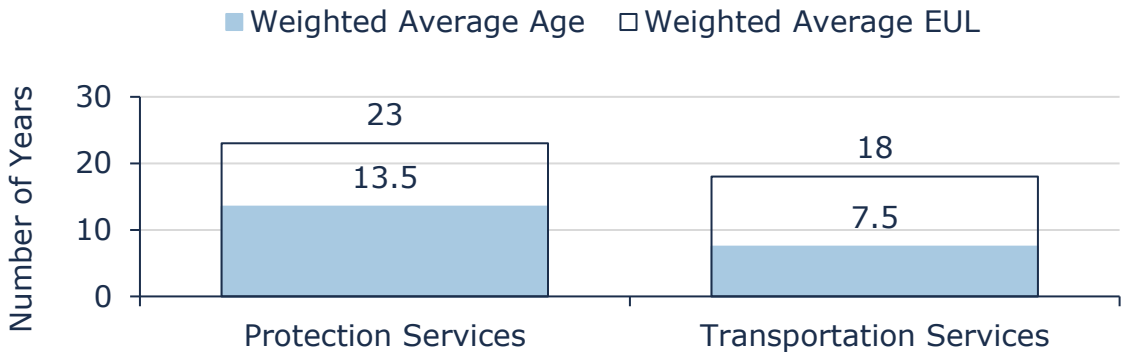


Each asset's replacement cost should be reviewed periodically to determine whether adjustments are needed to represent capital requirements more accurately.

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.

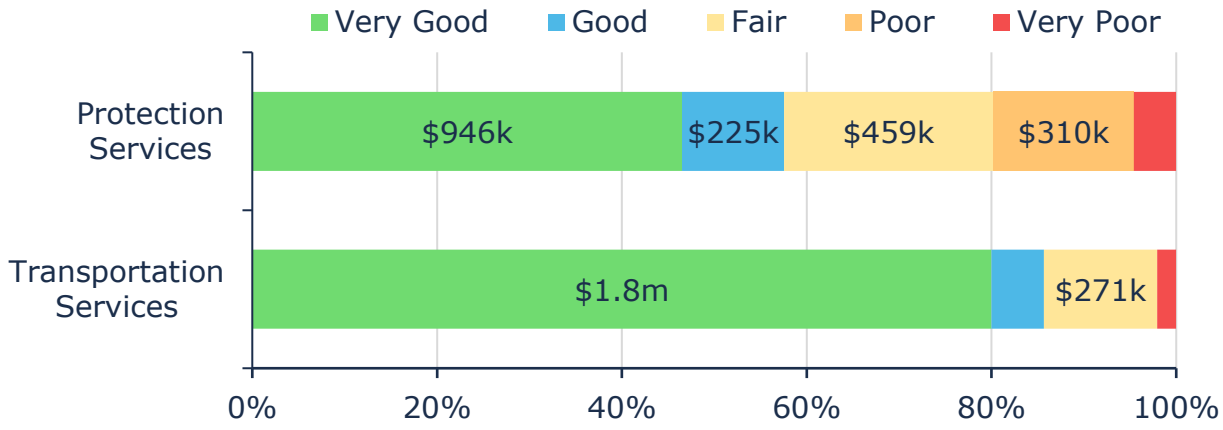
Figure 42 Vehicles Average Age vs Average EUL



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 43 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. The Municipality doesn't have a formal condition assessment program in place to assess the condition of the vehicle assets. Age is used to guide spending decisions, including identifying candidates for further review and inspections.

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.

Table 31 Vehicles current lifecycle strategy

Activity Type	Description of Current Strategy
Maintenance	• Maintenance is done externally based on vehicle mileage or when an issue arises. • Tire changes, fluid top up, minor component changes, such as wipers, are completed externally on an as needed basis. Certain specialty parts, such as electronics or sensors, have been cited to be scarce at times. • Commercial Vehicle Operator's Registration (CVOR) vehicles are inspected and maintained by an external, certified mechanic. Oil changes occur when required, mileage is typically used as an indicator. • Non-CVOR vehicles have routine oil changes based on mileage. A mechanic completes a 50-point inspection during this time and recommends repairs, such as replacing brakes or tires. • Fire apparatus on trucks have annual pump testing from emergency vehicle technicians. Pump functionality is tested on a weekly basis in house.
Rehabilitation/ Replacement	• Most fleet have a replacement cycle of 10 years, generally considering the condition of the vehicle. • Condition and budget are the main considerations when prioritizing replacements. Consistent and known mechanical issues are also factored in. • The Municipality employs a combination of proactive maintenance, utilize internal staff, and contracted work.

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 20 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 $341 thousand.

Figure 44 Vehicle Forecasted Capital Replacement Requirements

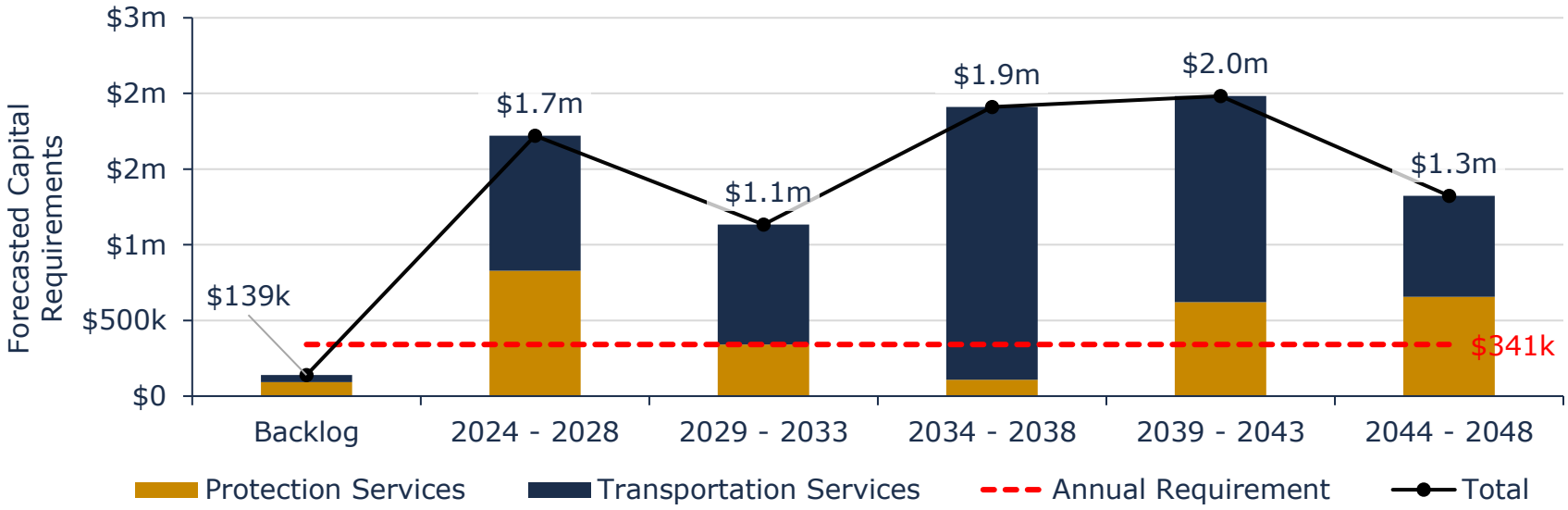


Table 32 below summarizes the projected cost of lifecycle activities (capital replacement only) that may need to be undertaken over the next 10 years to support current levels of service. These projections rely on the data available in the asset register.

Table 32 Vehicles System-Generated 10-Year Capital Costs

Segment	Backlog	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033
Protection Services	$93k	-	$440k	-	$59k	$329k	$49k	-	-	$67k	$225k
Transportation Services	$46k	$137k	$271k	$137k	$137k	$210k	$183k	-	$137k	$262k	$210k
Total	$139k	$137k	$711k	$137k	$196k	$539k	$232k	-	$137k	$330k	$435k

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

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 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.

Figure 45 Vehicles Risk Breakdown

1 - 4 Very Low	5 - 7 Low	8 - 9 Moderate	10 - 14 High	15 - 25 Very High
$535,633 (13%)	$2,796,759 (66%)	- (0%)	$271,109 (6%)	$639,378 (15%)

Levels of Service

By comparing the cost, 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 vehicles are outlined below:

Table 33 Vehicles Community Levels of Service

Service Attribute	Qualitative Description	Current LOS
Scope	Description of the services provided by municipal vehicles	Vehicles allow staff to efficiently deliver municipal services and personnel.
Quality	Description of the condition of machinery and equipment	Condition Description • Very Good - Fit for the future • Good - Adequate for now • Fair - Requires attention • Poor - Increased potential of affecting service • Very Poor - Unfit for sustained service
Performance	General	Services will be provided to ensure sustainability for the Municipality

Technical Levels of Service

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

Table 34 Vehicles Technical Levels of Service

Service Attribute	Technical Metric	Current LOS
Scope	Quantity	21
Quality	Average condition	Good (78%)
Performance	% Risk that is High and Very High	21%
	Capital reinvestment rate	1.1%

Appendix G: 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 H: 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

Probability of Failure			
Criteria	**Sub-Criteria**	**Value/ Range**	**Score**
Structural (80%)	Condition	0-19	5 - Almost Certain
		20-39	4 - Likely
		40-59	3 - Possible
		60-79	2 - Unlikely
		80-100	1 - Rare
Functional (20%)	Service Life Remaining (50%)	<10%	5 - Almost Certain
		10 - 20%	4 - Likely
		20 - 30%	3 - Possible
		30 - 40%	2 - Unlikely
		40%+	1 - Rare
	Traffic Range (V.P.D.) (50%)	0 - 49	2 - Unlikely
		50 – 199	3 - Possible
		200 - 399	4 - Likely

Consequence of Failure			
Criteria	**Sub-Criteria**	**Value/Range**	**Score**
Economic (65%)	AMP Segment	Gravel Roads	2 - Minor
		Asphalt and Surface Treated Roads	4 - Major
Social (20%)	Road Class	Class 1	5 - Almost Certain
		Class 2	4 - Likely
		Class 3	3 - Possible
		Class 4	2 - Unlikely
		Class 5 & 6	1 - Rare
Health and Safety (15%)	Speed Limit	0-19	1 - Rare
		20-39	2 - Unlikely
		40-59	3 - Possible
		60-79	4 - Likely
		80-100	5 - Almost Certain

Risk Frameworks – Bridges & Culverts, Machinery & Equipment, Vehicles

Probability of Failure			
Criteria	**Sub-Criteria**	**Value/ Range**	**Score**
Structural (60%)	Condition	0-19	5 - Almost Certain
		20-39	4 - Likely
		40-59	3 - Possible
		60-79	2 - Unlikely
		80-100	1 - Rare
Functional (40%)	Service Life Remaining	<10%	5 - Almost Certain
		10 - 20%	4 - Likely
		20 - 30%	3 - Possible
		30 - 40%	2 - Unlikely
		40%+	1 - Rare

Consequence of Failure			
Criteria	**Sub-Criteria**	**Value/Range**	**Score**
Economic (100%)	Replacement Cost	$300,000+	5 - Severe
		$225,000 - $299,999	4 - Major
		$150,000 - $224,999	3 – Moderate
		$75,000 - $149,999	2 – Minor
		< $75,000	1 - Insignificant

Risk Frameworks – Storm Sewer Network

Probability of Failure			
Criteria	**Sub-Criteria**	**Value/ Range**	**Score**
Structural (60%)	Condition	0-19	5 - Almost Certain
		20-39	4 - Likely
		40-59	3 - Possible
		60-79	2 - Unlikely
		80-100	1 - Rare
Functional (40%)	Service Life Remaining	<10%	5 - Almost Certain
		10 - 20%	4 - Likely
		20 - 30%	3 - Possible
		30 - 40%	2 - Unlikely
		40%+	1 - Rare

Consequence of Failure			
Criteria	**Sub-Criteria**	**Value/Range**	**Score**
Economic (100%)	Diameter	900 mm	5 - Severe
		600 – 750 mm	4 - Major
		400 – 500 mm	3 - Moderate
		350 – 375 mm	2 - Minor

Risk Frameworks – Buildings

Probability of Failure			
Criteria	**Sub-Criteria**	**Value/ Range**	**Score**
Structural (80%)	Condition	< 1.10	5 - Almost Certain
		1.10 – 2.10	4 - Likely
		2.10 – 3.10	3 - Possible
		3.10 – 4.10	2 - Unlikely
		4.10+	1 - Rare
Functional (20%)	Service Life Remaining	<10%	5 - Almost Certain
		10 - 20%	4 - Likely
		20 - 30%	3 - Possible
		30 - 40%	2 - Unlikely
		40%+	1 - Rare

Consequence of Failure			
Criteria	**Sub-Criteria**	**Value/Range**	**Score**
Economic (50%)	Replacement Cost	$300,000+	5 - Severe
		$225,000 - $299,999	4 - Major
		$150,000 - $224,999	3 – Moderate
		$75,000 - $149,999	2 – Minor
		< $75,000	1 - Insignificant
Operational (50%)	Surface Type	Equipment & Furnishings	2 – Minor
		Interiors, Special construction and demolition, Sitework	3 – Moderate
		Shell, Services	4 - Major
		Substructure	5 - Severe