Municipality of Huron Shores

Asset Management Plan

2022

The preparation of this project was carried out with assistance from the Government of Canada and the Federation of Canadian Municipalities. Notwithstanding this support, the views expressed are the personal views of the authors, and the Federation of Canadian Municipalities and the Government of Canada accept no responsibility for them.”

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Executive Summary

This asset management plan (AMP) for the Municipality of Huron Shores is developed in accordance with Ontario Regulation 588/17 (“O. Reg”). It includes key elements of an industry-standard and regulation compliant AMP, including state of the infrastructure, lifecycle, risk, and levels of service. Although not required through O. Reg, a financial strategy has also been developed to provide a path for the Municipality to address infrastructure funding gaps over the long term.

The scope of this AMP comprises three core asset categories, namely: Road Network, Bridges and Culverts, and Stormwater. Although non-core assets are not analyzed in detail in this iteration of the Municipality’s AMP, current lifecycle management approaches for these asset categories are outlined.

The current replacement cost of all assets distributed across these asset categories totals $65 million. At 50% of the total portfolio, bridges and culverts form the largest share of the Municipality’s asset portfolio. These estimates were derived using user-defined costing, as well as inflation of historical or original costs to current date.

Based on both assessed condition and age-based analysis, 51% of the Municipality’s infrastructure portfolio is in poor to very poor condition. Keeping assets in fair or better condition is typically more cost-effective than addressing assets needs when they enter the latter stages of their lifecycle or a drop to a lower condition rating, e.g., poor or worse.

Infrastructure assets require investments through their lifecycle, including minor and preventative maintenance, rehabilitation, and eventual replacement. These target investment levels, or average annual capital requirements, are distributed across the lifecycle of the asset. The objective is to ensure that when assets do reach the end of their useful life, sufficient funding is available to replace them in order to minimize service disruption. The annual requirements are directly proportional to the value of the infrastructure portfolio and the average useful life of individual assets contained within it.

Based on a replacement cost of $65 million, Huron Shores’ average annual requirements total approximately $2 million for the three core asset categories analyzed. This would allow the Municipality to remain current with capital replacement needs for its asset portfolio.

Although capital replacement needs are substantial across the forecasting horizon of 60 years, peaking at $19 million between 2026 and 2030, proactive lifecycle management and risk-based project prioritization will extend the serviceability of assets beyond their estimated useful life and allow the Municipality to maximize its own-source revenue and senior government funding programs. In addition to ongoing investment needs, the Municipality also has an infrastructure backlog of $2.4 million, comprising assets that remain in service beyond their intended lifespan.

Currently, the Municipality is allocating $1.3 million for capital purposes to its core infrastructure. This includes own-source revenue from taxation, as well as funding from senior government programs. This creates an annual funding deficit of $0.68 million.

Eliminating annual infrastructure funding shortfalls remains a substantial challenge for municipalities across Canada. Infrastructure has been built over many decades; however, investments in maintaining it in a state of good repair through its lifecycle have not been sufficient. Considering the Municipality's current funding position, it will require many years to reach full funding.

In 2021, Huron Shores' annual tax revenues totalled $3,487,106. To close the infrastructure deficit for its core asset classes alone, we recommend that the Municipality review the feasibility of enacting an annual tax increase of 1.73% over a phase-in period of 10 years. This approach requires the Municipality to also 'capture' and reallocate forecasted reductions in debt repayments over the same time period toward annual infrastructure needs.

Enacting tax increases is a difficult endeavour. Often, senior government programs are available to supplement capital programs. Our approach to full funding, however, relies only on permanent and predictable sources of funding, rather than one-time capital injections. These include revenue from taxation, the Canada Community Benefits Fund (formerly the federal Gas Tax Fund), and the Ontario Community Infrastructure Fund.

The use of risk frameworks and levels of service frameworks is essential in prioritizing projects, making the best use of limited funding, and in optimizing any increase in financial capacity. We recommend that the Municipality develop these frameworks to build a systematic, and documented understanding of asset criticality for its entire infrastructure portfolio, and guide investments through performance targets that align with community needs, priorities, and expectations.

About this document

This asset management plan (AMP) for the Municipality of Huron Shores was developed in accordance with Ontario Regulation 588/17 (“O. Reg 588/17”). It contains a comprehensive analysis of Huron Shores’ infrastructure assets, and includes the following sections:

- State of Infrastructure
- Lifecycle Strategies
- Levels of Service
- Financial Strategies

The primary scope of the AMP includes three core asset categories and identifies the resource requirements needed to achieve a defined level of service. These categories are roads, bridges and structural culverts, and stormwater. Some analysis is also provided for buildings and facilities.

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

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 ratepayers receive from the asset portfolio.

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

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

Key Technical Concepts in Asset Management

Effective asset management integrates several key components, including lifecycle management, risk management, and levels of service. These concepts are applied throughout this asset management plan and are described below in greater detail.

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 following table provides a description of each type of activity and the general difference in cost.

Table 1 Lifecycle Management: Typical Lifecycle 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	$$$$
Replacement/ Reconstruction	Asset end-of-life activities that often involve the complete replacement of assets	Full Reconstruction	$$$$$$

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 outlined in this AMP. Developing and implementing a proactive lifecycle strategy will help staff to

determine which activities to perform on an asset and when they should be performed to maximize useful life at the lowest total cost of ownership.

Risk and Criticality

Risk is a product of two variables: the probability that an asset will fail, and the resulting consequences of that failure event. It can be a qualitative measurement, (low, medium, high) or quantitative measurement (1-5), that can be used to rank assets and projects, identify appropriate lifecycle strategies, optimize short- and long-term budgets, minimize service disruptions, and maintain public health and safety.

The approach used in this AMP relies on a quantitative measurement of risk associated with each asset. The probability and consequence of failure are each scored from 1 to 5, producing a minimum risk index of 1 for the lowest risk assets, and a maximum risk index of 25 for the highest risk assets.

Probability of Failure

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

Consequence of Failure

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

Table 2 illustrates the various types of consequences that can be integrated in developing risk and criticality models for each asset category and segments within. We note that these consequences are common, but not exhaustive.

Table 2 Risk Analysis: Types of Consequences of Failure

Type of Consequence	Description
Direct Financial	Direct financial consequences are typically measured as the replacement costs of the asset(s) affected by the failure event, including interdependent infrastructure.
Economic	Economic impacts of asset failure may include disruption to local economic activity and commerce, business closures, service disruptions, etc. Whereas direct financial impacts can be seen immediately or estimated within hours or days, economic impacts can take weeks, months and years to emerge, and may persist for even longer.
Socio-political	Socio-political impacts are more difficult to quantify, and may include inconvenience to the public and key community stakeholders, adverse media coverage, and reputational damage to the community and the Municipality.
Environmental	Environnemental consequences can inclue pollution, erosion, sedimentation, habitat damage, etc.
Public Health and Safety	Adverse health and safety impacts may include injury or death, or impeded access to critical services.
Strategic	These include the effects of an asset's failure on the community's long-term strategic objectives, including economic development, business attraction, etc.

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

Levels of Service

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

The Municipality measures the level of service provided at two levels: Community Levels of Service, and Technical Levels of Service. At this stage, only those LOS that are required under O. Reg are included.

Community Levels of Service

Community levels of service are a simple, plain language description or measure of the service that the community receives. For core asset categories (Roads, Bridges & Culverts, Stormwater) the Province, through O. Reg. 588/17, has provided qualitative descriptions that are required to be included in this AMP.

Technical Levels of Service

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

For core asset categories (Roads, Bridges & Culverts, and Stormwater) the province, through O. Reg. 588/17, has provided technical metrics that are required to be included in this AMP.

Current and Proposed Levels of Service

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

Proposed levels of service should be realistic and achievable within the timeframe outlined by the 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 which allows these targets to be achieved.

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. The reinvestment rate is calculated as follows:

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

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

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

Table 3 Standard Condition Rating Scale

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

The analysis in this AMP is based on assessed condition data only as available. In the absence of assessed condition data, asset age is used as a proxy to determine asset condition.

Foundational Documents in Asset Management

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. We make a clear distinction between the policy, strategy, and the plan.

Asset Management Policy

An asset management policy represents a statement of the principles guiding the Municipality’s approach to asset management activities. It aligns with the organizational strategic plan and provides clear direction to municipal staff on their roles and responsibilities as part of the asset management program. All municipalities were required to develop and adopt an asset management policy in 2019 in compliance with O. Reg 588/17.

Asset Management Strategy

An asset management strategy is typically a higher-level document, focusing on business processes and organizational practices. It is a roadmap that includes key initiatives with recommended timelines that lead to higher state of asset management maturity. It is intended to convert the asset management policy from a set of formal, institutionalized, but philosophical commitments into specific actions. While not a static document, the strategy should not evolve and change frequently—unlike the asset management plan. The strategy provides a long-term outlook on the overall asset management program development and strengthening key elements of its framework.

Asset Management Plan

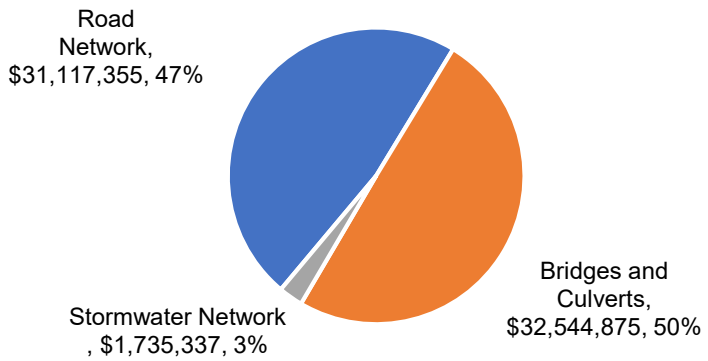
The asset management plan is often identified as a key output within the strategy. The AMP has a sharp focus on the current state of the Municipality’s asset portfolio, and its approach to managing and funding individual service areas or asset groups. It is tactical in nature and provides a snapshot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

The strategic plan has a direct, and cascading impact on asset management planning and reporting, making it a foundational element. Many municipalities begin with an asset management plan. However, without the preceding documents, the AMP operates in a vacuum.

Portfolio Overview

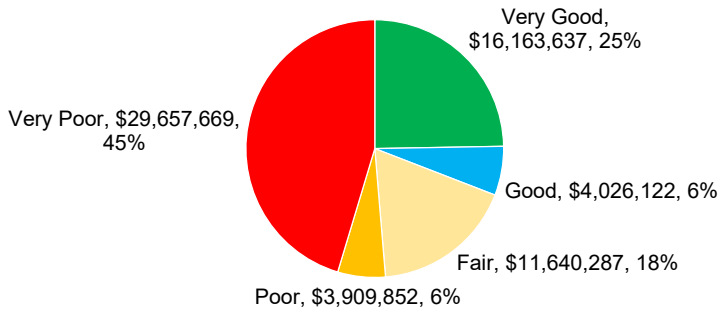
The three core asset categories analyzed in this asset management plan have a total current replacement cost of approximately $65 million. This estimate was derived using user-defined costing, as well as inflation of historical or original costs to current date. Figure 1 illustrates the replacement cost of each asset category; at 50% of the total portfolio, bridges and culverts form the largest share of the Municipality's asset portfolio.

Figure 1 Current Replacement Cost by Core Asset Category



Based on both assessed condition and age-based analysis, 51% of the Municipality's infrastructure portfolio is in poor to very poor condition. Keeping assets in fair or better condition is typically more cost-effective than addressing assets needs when they enter the latter stages of their lifecycle or a drop to a lower condition rating, e.g., poor or worse.

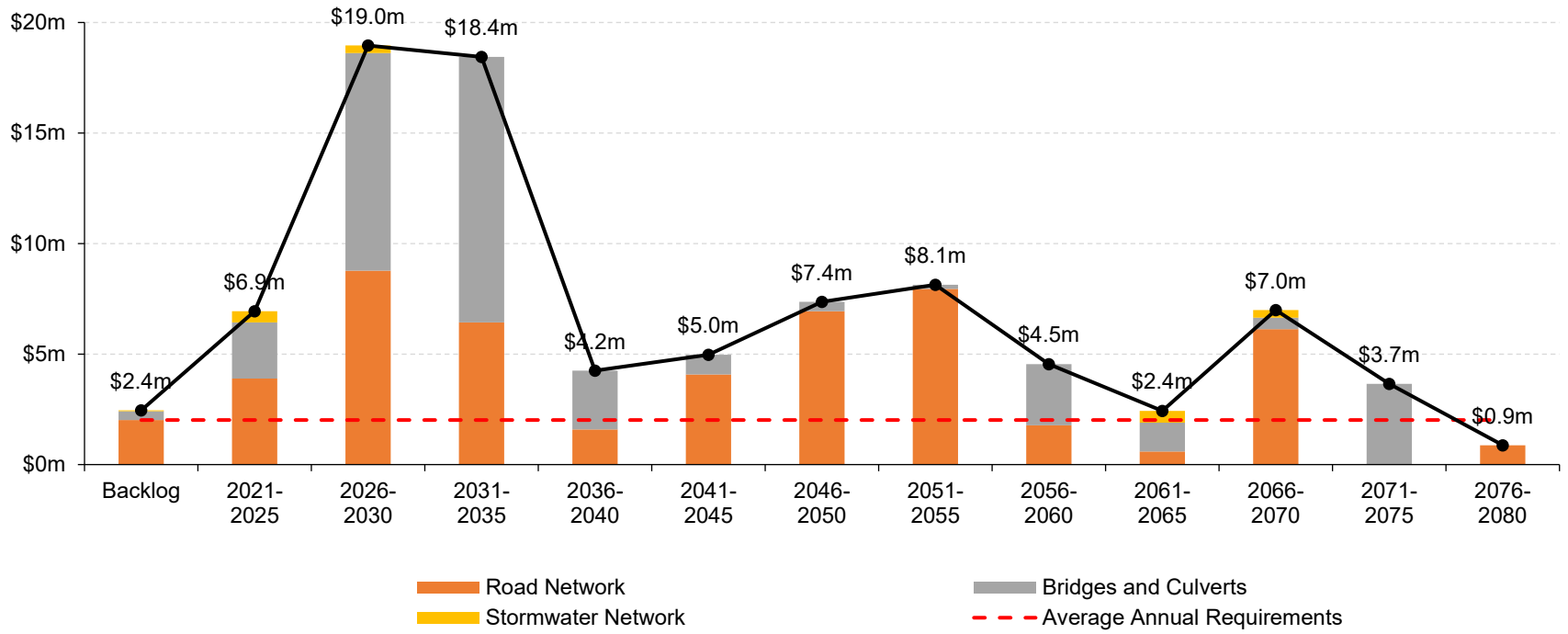
Figure 2 Asset Condition - All Assets



Aging assets require maintenance, rehabilitation, and replacement. Figure 3 below illustrates the cyclical short-, medium- and long-term infrastructure replacement requirements for the three core asset categories. On average, $2 million is required each year to remain current with capital replacement needs for the Municipality's asset portfolio (average annual requirements). Although capital replacement needs are substantial across the forecasting horizon of 60 years, peaking at $19 million between 2026 and 2030, proactive lifecycle management and risk-based project prioritization will extend the serviceability of assets beyond their estimated useful life and allow the Municipality to maximize its own-source revenue and senior government funding programs.

The figure also illustrates an infrastructure backlog of $2.4 million, comprising assets that remain in service beyond their intended lifespan.

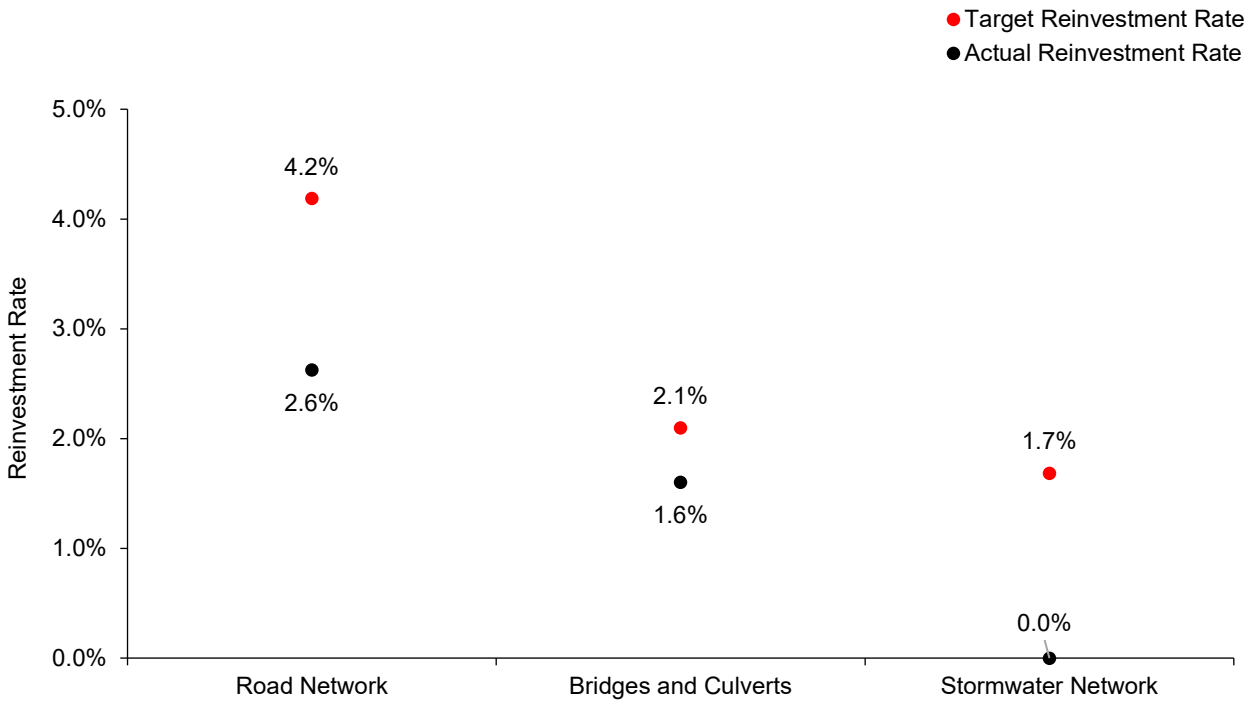
Figure 3 Capital Replacement Needs - 2022-2121



The graph below depicts funding gaps by comparing target vs. actual reinvestment rates for each asset category. To meet the long-term replacement needs, the Municipality should be allocating approximately $2 million annually, for a target reinvestment rate of 3.1% of the total current replacement value of its infrastructure portfolio.

Actual annual spending on infrastructure totals approximately $1.3 million, for an actual reinvestment rate of 2.0%.

Figure 4 Target vs. Actual Reinvestment Rates



State of the Infrastructure

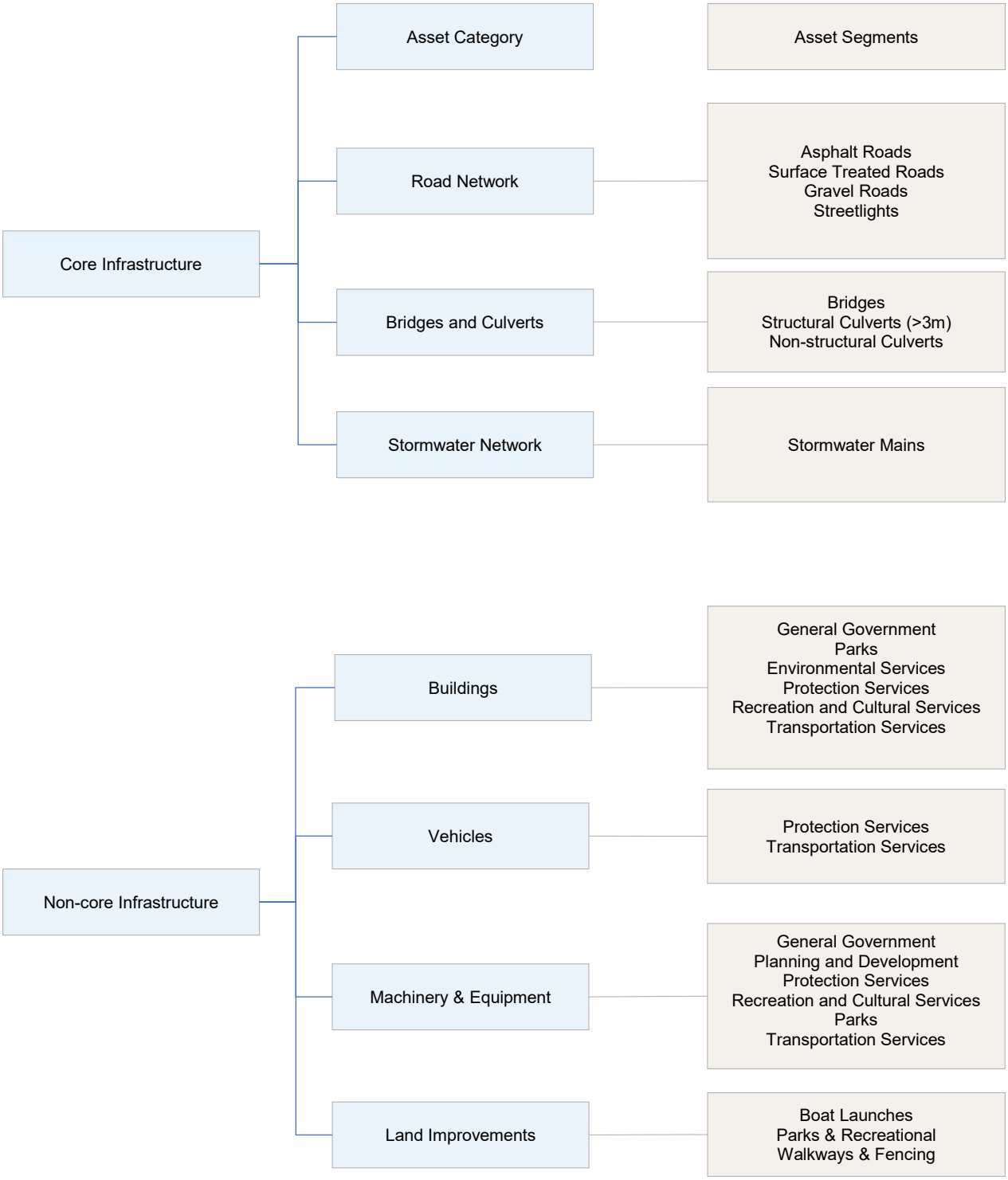
The state of the infrastructure (SOTI) summarizes the inventory, condition, age profiles, and other key performance indicators for the Municipality's infrastructure portfolio. These details are presented for three asset categories. Figure 5 illustrates how assets were classified within the Municipality's organizational structure.

Asset Hierarchy and Data Classification

Asset hierarchy explains the relationship between individual assets and their components, and a wider, more expansive network and system, as well as the organizational structure as a whole. How assets are grouped in a hierarchy structure can impact how data is interpreted.

Assets were structured to support meaningful, efficient reporting and analysis. Key category details are summarized at asset segment level. We note that this AMP comprises SOTI details only on core asset categories, and buildings. However, lifecycle strategies for other non-core assets are included in Appendix 1: Lifecycle Strategies for Other Asset Categories.

Figure 5 Asset Hierarchy and Data Classification



Road Network

The Municipality of Huron Shores' road network comprises the second largest share of its infrastructure portfolio, with a current replacement cost of more than $31 million, distributed primarily between asphalt and surface treated roads. The Municipality also owns and manages approximately 150.8km of gravel roads. However, as these roads are perpetually maintained through operating budgets and are maintained on a perpetual basis, these are excluded from some analyses.

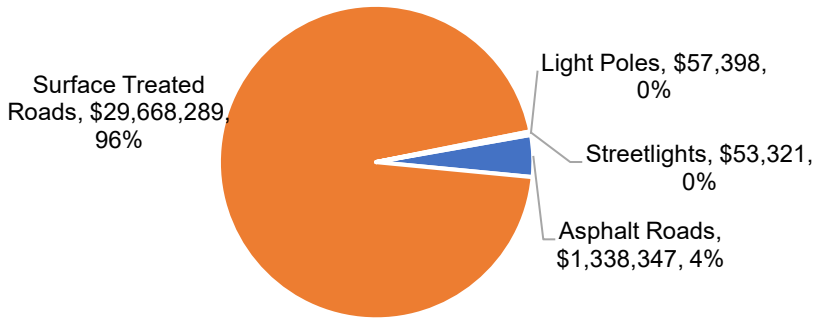
Inventory and Valuation

Surface treated roads comprise the largest share of the road network, worth 96% of the total current replacement cost. Table 4 summarizes the quantity and current replacement cost of major transportation assets.

Table 4 Detailed Asset Inventory - Road Network

Asset	Quantity	Replacement Cost	Average Age
Roads	85.9km	$31,006,636	
Asphalt	2.2km	$1,338,347	26 years
Surface Treated	83.7km	$29,668,289	15 years
Streetlights	133	$53,321	6 years
Light Poles	21	$70,903	12 years
Total		**$31,117,355**	

Figure 6 Portfolio Valuation



Asset Condition

Figure 7 summarizes the replacement cost-weighted condition of the Municipality's road network. Based on a combination of field inspection data and age, 62% of assets are in fair or better condition. However, the remaining 38% of assets, comprising only surface treated roads, are in poor or worse condition. These assets may be candidates for replacement in the short term; similarly, assets in fair condition may require rehabilitation or replacement in the medium term and should be monitored for further degradation in condition. Figure 8 details the condition of each asset segment.

Figure 7 Asset Condition - Road Network: Overall

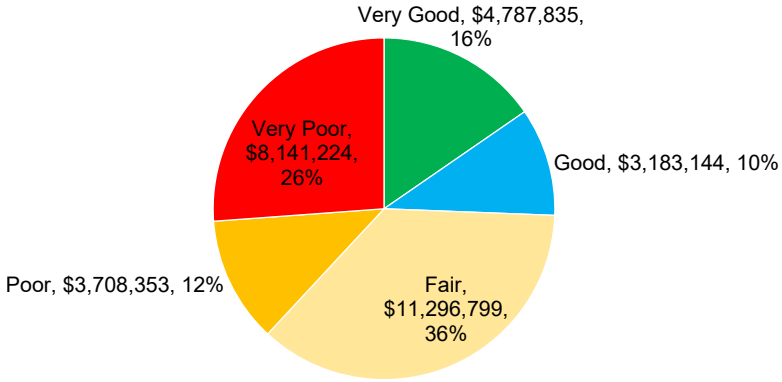
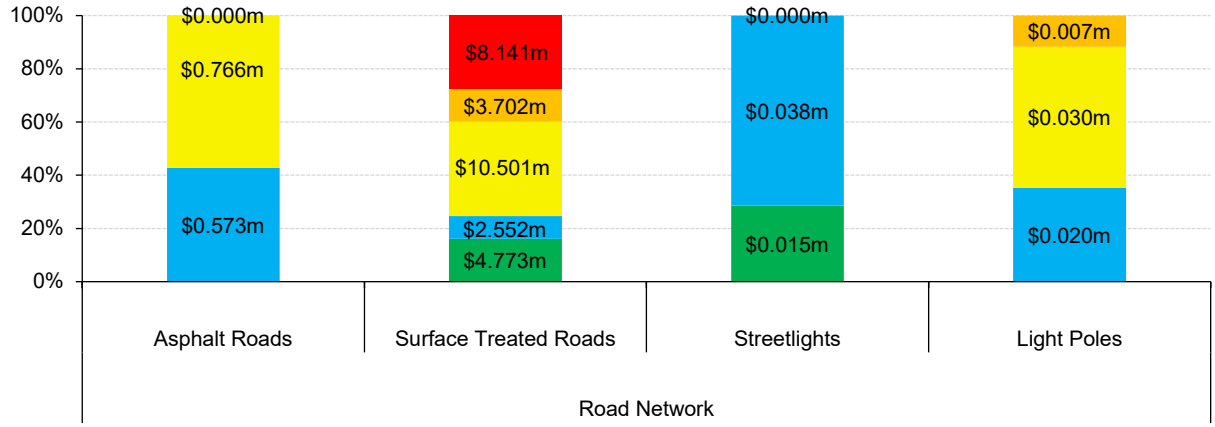


Figure 8 Asset Condition - Road Network: By Asset Type



Current Approach to Lifecycle Management

This section outlines Huron Shores' current approach to managing its road network. Key data was collected through staff interviews. As applicable, models were also built in CityWide™ for further application.

Asphalt Roads

Currently, there are 2.2 kilometres of asphalt roads in the Municipality's road network. The condition of asphalt roads is assessed through internal inspections by the Municipality. A road needs study is conducted by external consultants every five years. The following table outlines the current strategies in place to maintain Huron Shores' road network and identify when rehabilitation and replacements may be required.

Table 5 Current Lifecycle Management Strategies - Asphalt Roads

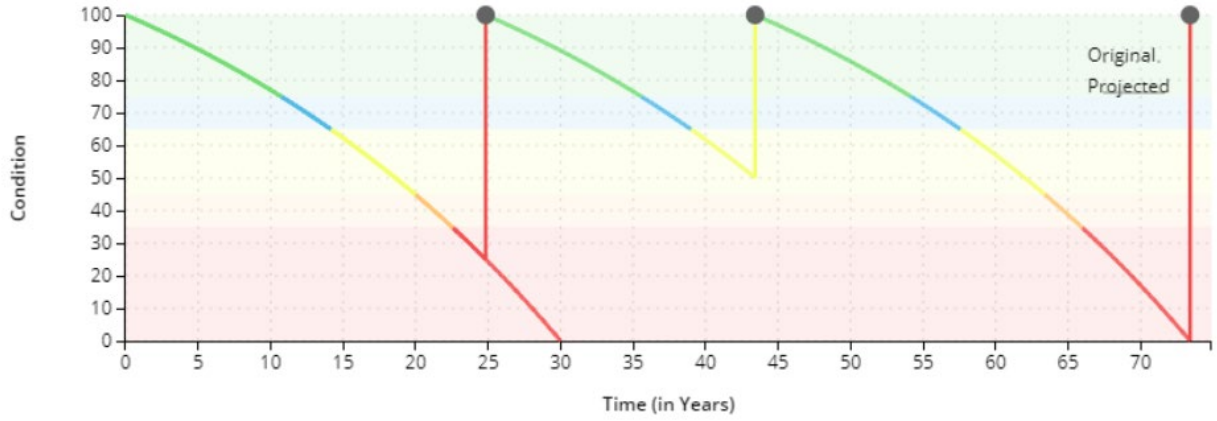
Activity Type	Description of Current Strategy
Maintenance	• Routine street sweeping is performed by contractors and/or internal staff. • Road assessments are performed by internal staff. • Pothole patching yearly from spring to fall seasons as needed. • Chip sealing is performed periodically.
Rehabilitation	• Mill and pave with base reconstruction and chip sealing is performed when the roads reach poor condition. • Single lift overlay is performed when the roads reach fair condition after mill and pave. • Double lift overlay is performed when the roads reach fair condition after mill and pave for roads with heavy traffic.
Replacement	• Reconstruction is considered with signs of surface failures or to meet increased traffic requirements. • No major road replacements have been done since 2010.

Table 6 outlines the lifecycle strategy in place for asphalt roads. Overall, the strategy is primarily reactive. Figure 9 depicts this strategy on a typical asphalt deterioration curve. Similarly, the lifecycle strategy for Huron Shores' surface treated roads is depicted in subsequent tables and applicable deterioration curves.

Table 6 Current Lifecycle Strategy: Asphalt Roads

Event Name	Event Class	Event Trigger	Event Impact	Event Cost
Milling & Pave	Rehabilitation	25% to 35% condition	100% Condition	$46.81/m^2
Single Lift Overlay	Rehabilitation	50% to 60% condition After Mill & Pave	100% Condition	$22.50/m^2
Reconstruction	Reconstruction	0% Condition After 2 Mill & Pave	100% Condition	As per Road Needs Study

Figure 9 Typical Deterioration Curve: Asphalt Roads



Surface Treated Roads

Currently, there are 83.7 kilometres of surface treated roads in the Municipality's road network. The condition of the surface treated roads is also assessed through internal inspections by the Municipality, and a road needs study is conducted by external consultants every five years.

Table 7 Current Lifecycle Management Strategies - Surface Treated Roads

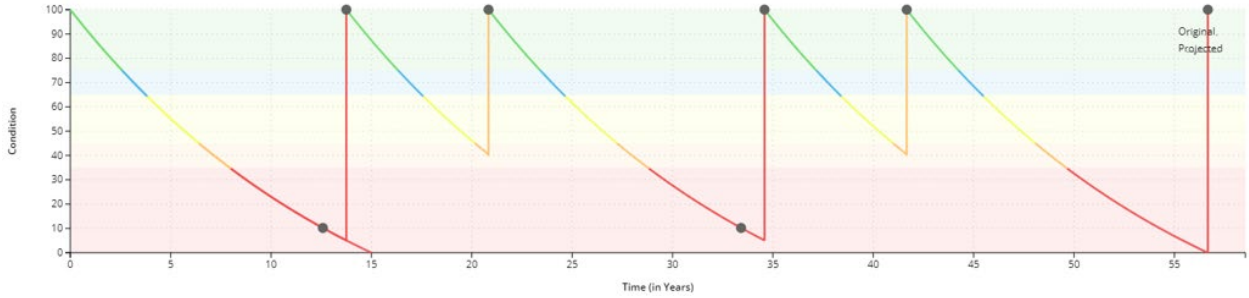
Activity Type	Description of Current Strategy
Maintenance	• Routine street sweeping is performed by contractors and/or internal staff. • Road assessments are performed by internal staff. • Road study is conducted by external consultant every five years. • Pothole patching yearly from spring to fall seasons as needed.
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.

Similar to asphalt roads, the current lifecycle management approach for surface treated roads is reactive. The activities deployed by staff to maintain surface treated roads are summarized below.

Table 8 Current Lifecycle Strategy: Surface Treated Roads

Event Name	Event Class	Event Trigger	Event Impact	Event Cost
Milling & Strengthening of Road Base	Rehabilitation	10% to 20% condition	No Impact	$206.63/ m
Double surface treatment	Rehabilitation	5% to 10% condition	100% Condition	$12.00/ m^2
Single surface treatment	Rehabilitation	40% to 50% condition after double surface treatment	100% Condition	$6.00/$m^2$
Reconstruction	Reconstruction	0% condition after 2 single surface treatment	100% Condition	As per Road Needs Study

Figure 10 Typical Deterioration Curve: Surface Treated



Gravel Roads

Currently, there are 150.8 kilometres gravel roads in the Municipality's road network. Similar to asphalt and surface treated roads, gravel roads undergo internal inspections by municipal staff. A comprehensive road needs study is completed by external consultants on a five-year cycle.

Table 9 Current Lifecycle Management Strategies - Gravel Roads

Activity Type	Description of Current Strategy
Maintenance and Preventative Maintenance	• Re-gravelling is applied annually as needed. • Calcium Chloride is applied as dust suppressant on yearly basis. • Grading is performed multiple times per year as needed. • Ditching/mowing/brushing are performed annually over a period of 5 years. • Ideally, two inches of gravel is applied every two years on each road segment
Rehabilitation	• Gravel roads are perpetually maintained.

Replacement	• Gravel roads generally do not require conventional asset replacement events.

The current lifecycle strategy employed by the Municipality to maintain its gravel road network includes grading and reapplication of gravel on a cyclical basis. Dust suppressant is applied annually on selected areas.

Table 10 Current Lifecycle Strategy: Gravel Roads

Event Name	Event Class	Event Trigger	Event Impact	Event Cost
Ditching/Mowing/Brushing	Maintenance	20% annually	No impact	$1.50/m
Dust Suppressant	Maintenance	Annually	No impact	$1.00/m
Gravelling – Adding Material	Preventative Maintenance	25% Annually	Adds 4 years	$2.50/m

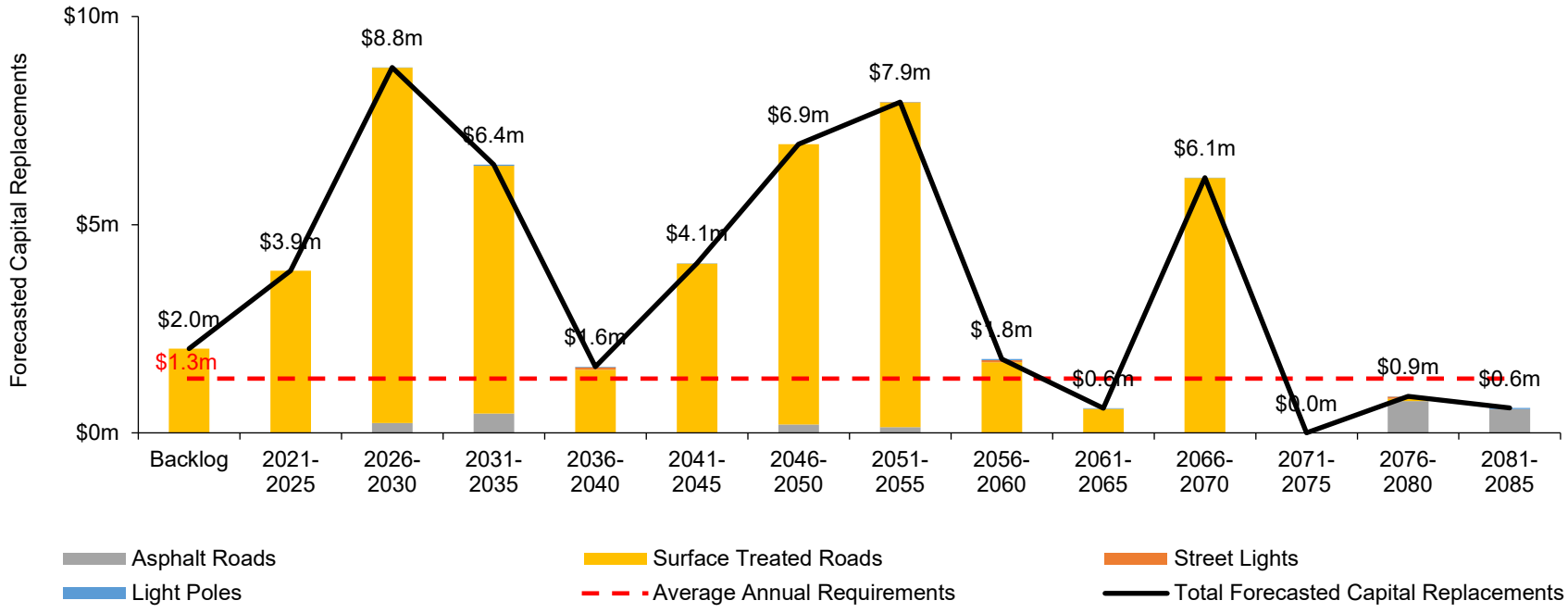
The use of lifecycle strategies for asphalt roads and surface treated roads allows the Municipality to extend the life of the assets, and as a result, reduces the annual requirements associated with these assets from $2,022,498 to $1,275,197.

Forecasted Replacement Needs

Figure 11 illustrates the cyclical short-, medium- and long-term infrastructure replacement requirements for the Municipality's road network. This analysis was run to capture at least one iteration of replacement for the longest-lived asset within the road network asset inventory. This required the projection to span more than 60 years. Huron Shores is projected to experience several major replacement spikes over the next five decades. The largest replacement spike is forecasted to occur between 2026 and 2030, totaling $8.8 million.

The chart also illustrates a replacement backlog of $2 million, comprising assets that have reached the end of their estimated useful life but remain in service. Both age and condition should be used to forecast replacement needs and refine capital expenditure estimates.

Figure 11 Forecasted Capital Replacement Requirements - Road Network: 2022-2071



On average, the road network requires $1.3 million annually to remain current with replacement needs. This figure was based on Huron Shores' current lifestyle strategy for roads, which extends the life of roads through regular maintenance and repairs, thereby deferring the need to replace assets.

Often, the magnitude of replacement needs is substantially higher than most municipalities can afford to fund. In addition, most assets may not need to be replaced. However, quantifying and monitoring these spikes is essential for long-term financial planning, including establishing dedicated reserves and gradually building funding capacity over a long term. Regular condition assessments and a robust risk framework will ensure that high-criticality assets receive proper and timely lifecycle intervention, including replacements.

10-Year Replacement Needs

The table below summarizes the projected cost of lifecycle activities (capital replacement only) that will need to be undertaken over the next 10 years to maintain the current level of service. These values are derived from CityWide™, the Municipality's primary asset management application. The projections rely on condition data and age data to forecast these values.

Table 11 10-Year Capital Replacement Forecast - Road Network

Asset Type	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031
Asphalt Roads	$0	$0	$0	$0	$0	$0	$0	$0	$234,284	$0
Surface Treated Roads	$1,808,219	$760,536	$832,719	$489,976	$66,300	$723,205	$2,565,993	$2,819,128	$2,359,691	$1,673,500
Street Lights	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Light Poles	$0	$0	$0	$0	$0	$0	$0	$0	$6,753	$0
Total Capital Expenditures	$1,808,219	$760,536	$832,719	$489,976	$66,300	$723,205	$2,565,993	$2,819,128	$2,600,728	$1,673,500

These estimates are developed at the asset network level, illustrate replacement needs only, and are built on available asset data, including quantities, replacement costs, age, or assessed condition. They can be different from actual capital forecasts. Consistent data updates, especially condition, and asset acquisitions and disposals will improve the alignment between the system generated expenditure requirements, and the Municipality's capital expenditure forecasts.

Risk Analysis

The risk matrix below is generated using available asset data, such as condition, service life remaining, replacement costs, traffic data, and road class. It classifies assets based on their probability and likelihood of failure, each scored from 1 to 5. Their product generates a risk index ranging from 1-25. Assets with the highest criticality and likelihood of failure receive a risk rating of 25; those with lowest probability of failure and lowest criticality carry a risk rating of 1. As new data and information is gathered, the Municipality may consider integrating relevant information that improves confidence in the criteria used to assess asset risk and criticality.

The strength of a risk assessment framework depends on the reliability and availability of asset attribute data and the use of risk models designed to leverage that data. The integration of meaningful asset attribute data that represent the contributing factors to the probability and consequence of an asset's failure will provide increased confidence in capital project decision-making and support evidence-based budget allocations. While more data does not necessarily mean better outcomes, the careful selection of risk criteria can optimize asset management decision-making.

These risk models have been built into the Municipality's Asset Management Database (CityWide Asset Manager).

Figure 12 Risk Matrix - Road Network

In addition to asset level risk, the Municipality may also face risk associated with not executing key lifecycle activities, including repairs, rehabilitation, and replacement of critical assets. These include:

- Missed opportunities for cost savings and increases in lifecycle costs

- Deferral of vital projects, or further lending and borrowing
- Accelerated asset deterioration and premature failure, which may lead to public health and safety hazards, and disruption of services to the Municipality's residential and commercial base
- A decline in public satisfaction with the Municipality's service standards and the resulting reputational damage

An asset's criticality rating, determined by the nature and magnitude of the consequences of its potential failure should be used to prioritize projects, particularly lifecycle management strategies. Using risk in conjunction with levels of service, and the recommended treatment options can assist in optimizing limited funds.

Levels of Service

The tables that follow summarize Huron Shores' current levels of service with respect to prescribed KPIs under Ontario Regulation 588/17.

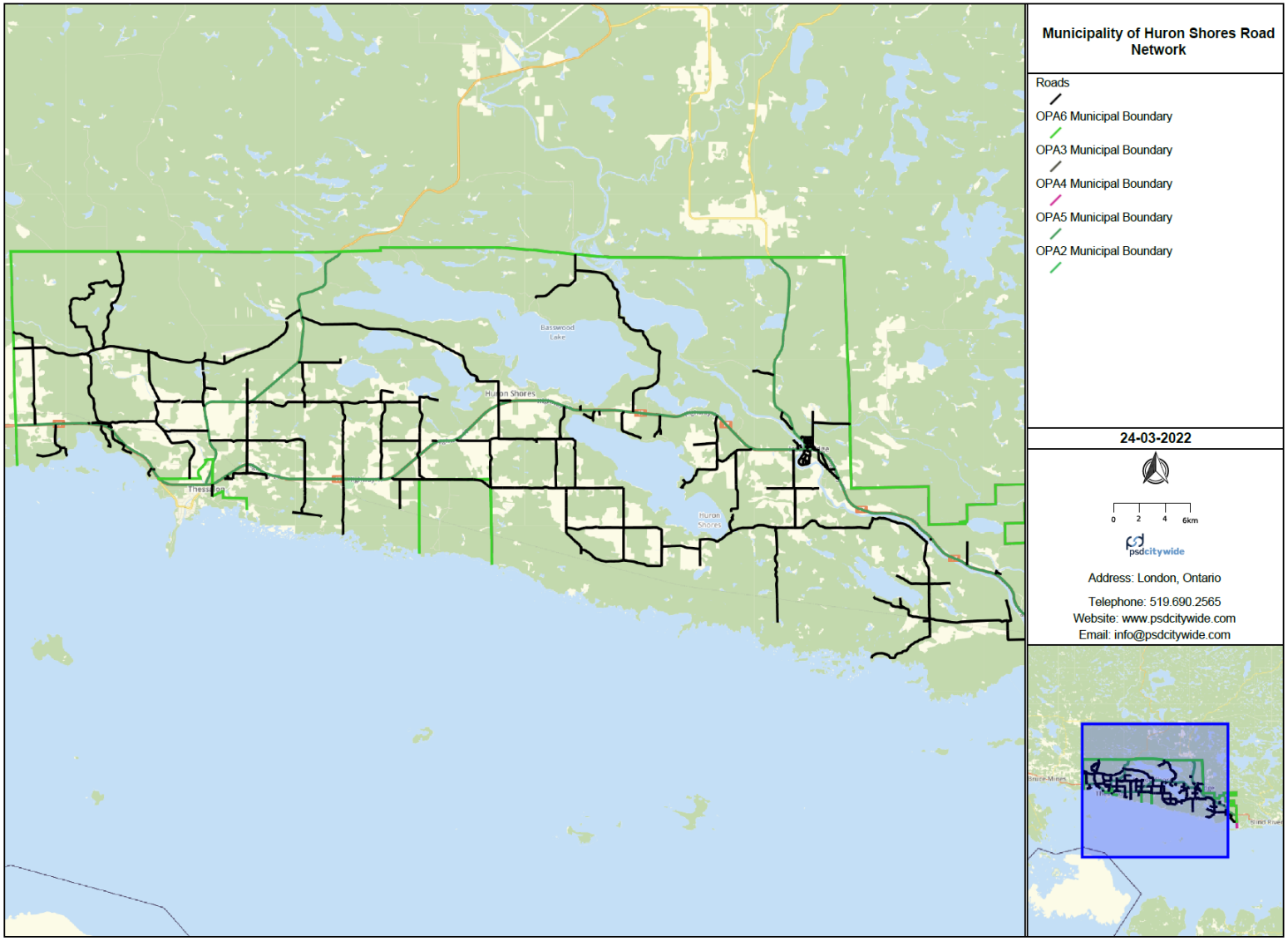
Table 12 Ontario Regulation 588/17 Community Levels of Service - Roads

Service Attribute	Qualitative Description	Current Level of Service
Scope	Description, which may include maps, of the road network in the Municipality and its level of connectivity	The Municipality currently owns and manages 83.7km of asphalt and surface treated roads, and 150.8km of gravel roads. The Municipality is connected to Highway 17/Trans-Canada Highway; Highway 129 and Highway 548. See road network map below.
Quality	Description or images that illustrate the different levels of road class pavement condition.	See condition data in Figure 8. Huron Shores' road network comprises only local roads (MMS Class 5 and 6).

Table 13 Ontario Regulation 588/17 Technical Levels of Service - Roads

Service Attribute	Qualitative Description	Current Level of Service
Scope	Lane-km of arterial roads (MMS classes 1 and 2) per land area (km/km^2)	0
	Lane-km of collector roads (MMS classes 3 and 4) per land area (km/km^2)	0
	Lane-km of local roads (MMS classes 5 and 6) per land area (km/km^2)	468.8
Quality	Average pavement condition for paved roads in the Municipality	48%
Performance	Average surface condition for unpaved roads in the Municipality (e.g. excellent, good, fair, poor)	Poor

Figure 13 Road Network Map



Recommendations

- Gathering information about traffic count (AADT), road class or roadside environment (e.g., urban, trucking routes) can be helpful for the Municipality to identify areas with different desired LOS. With this, the Municipality can assign unique lifecycle strategies to different areas to improve resource allocation and reduce the overall annual capital requirements.
- The Municipality should also identify roads which can be the potential candidates for upgrades to asphalt roads.
- Risk models can be used in decision-making to prioritize the roads replacement, upgrades, and rehabilitation, and streamline inspection programs. Collecting key asset attributes will support asset criticality analysis and help prioritize projects.
- Staff should evaluate lifecycle event schedules, timing, and costs on a regular basis and update according to an evolving understanding of the optimal strategy to extend the life of the asset at the lowest total cost of ownership.
- Replacement costs should reflect staff judgement and expenditures on recent projects. These costs should be regularly updated in CityWide™ to ensure currency of data.
- Similarly, costs for various lifecycle events, such as milling and paving, overlays, etc., should also be updated to reflect recent work completed.
- Expenditures on various lifecycle activities should be systematically tracked and measured against impact on asset performance and levels of service.
- In preparation for compliance with Ontario Regulation 588/17, public engagements may offer an opportunity to identify infrastructure priorities and support potential adjustments to levels of service and the associated KPIs. Lifecycle costs and affordability should be central to any planned service level changes.

Bridges and Culverts

The Municipality of Huron Shores' transportation network also includes bridges and structural culverts, with a current replacement cost of nearly $33 million. Bridges and culverts comprise the largest share of the Municipality's infrastructure portfolio.

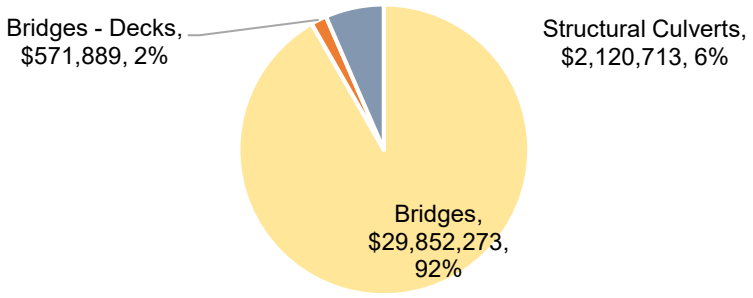
Inventory and Valuation

Table 4 summarizes the quantity and current replacement cost of bridges and culverts. The Municipality owns and manages 18 bridges and four structural culverts. Some bridges are componentized by element, i.e., bridge decks.

Table 14 Detailed Asset Inventory - Bridges and Culverts

Asset	Quantity	Replacement Cost	Average Age
Bridges	23 asset records	$30,424,162	50 years
Structural Culverts (>3m)	4	$2120,713	9 years
Total		**$32,544,875**	

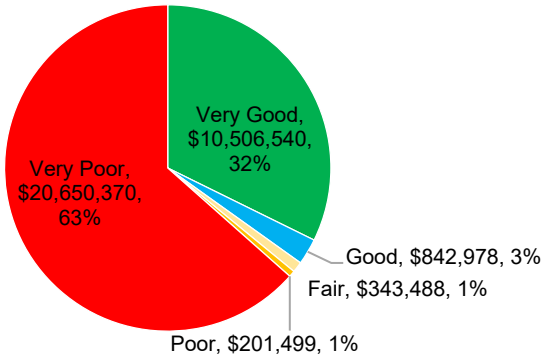
Figure 14 Portfolio Valuation



Asset Condition

Figure 157 summarizes the replacement cost-weighted condition of the Municipality's bridges and culverts. Based on a combination of field inspection data and age, 64% of assets are poor or worse condition. These assets may be candidates for replacement in the short term; similarly, assets in fair condition may require rehabilitation or replacement in the medium term and should be monitored for further degradation in condition.

Figure 15 Asset Condition - Bridges and Culverts: Overall



Current Approach to Lifecycle Management

This section outlines Huron Shores' current approach to managing its bridges and culverts. Key data was collected through staff interviews. As applicable, models were also built in CityWide™ for further application. The condition of bridges and structural culverts is assessed by Tulloch Engineering biennially in compliance with Ontario Structure Inspection Manual (OSIM). The most recent inspection report was completed in 2021. However, there is no formal condition assessment program for non-structural culverts. These culverts are assessed during road patrols.

The following table outlines the current strategies in place to maintain Huron Shores' bridges and culverts and identify when rehabilitation and replacements may be required.

Table 15 Current Lifecycle Management Strategies - Bridges and Culverts

Activity Type	Description of Current Strategy
Maintenance	• Sweeping, mowing and deck washing is performed annually.
Rehabilitation and 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 and type of traffic.

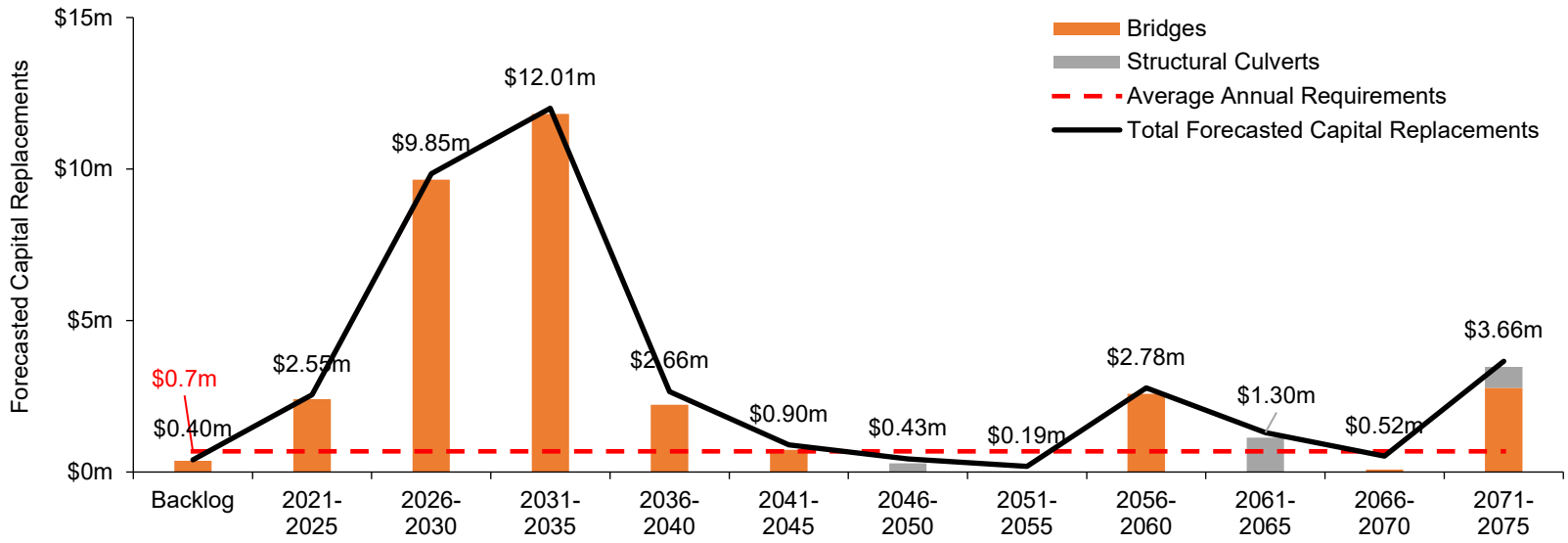
Capital costs for bridge maintenance, repairs, and renewal are estimated in the 2021 OSIM report and can serve as an estimate for future capital requirements. It is estimated that $1,740,300 will be required within one year to maintain the bridge network in a state of good repair.

Forecasted Replacement Needs

Figure 16 illustrates the cyclical short-, medium- and long-term infrastructure replacement requirements for the Municipality's bridges and culverts. This analysis was run to capture at least one iteration of replacement for the longest-lived asset within the road network asset inventory. This required the projection to span more than 50 years. Huron Shores is projected to experience rapidly increasing replacement spikes over the 15 years, peaking at $12 million between 2031 and 2035.

The chart also illustrates a replacement backlog of $0.4 million, comprising assets that have reached the end of their estimated useful life but remain in service. Both age and condition should be used to forecast replacement needs and refine capital expenditure estimates.

Figure 16 Forecasted Capital Replacement Requirements - Bridges and Culverts: 2022-2071



On average, bridges and culverts require $0.7 million annually to remain current with replacement needs. Often, the magnitude of replacement needs is substantially higher than most municipalities can afford to fund. In addition, most assets may not need to be replaced. However, quantifying and monitoring these spikes is essential for long-term financial planning, including establishing dedicated reserves and gradually building funding capacity over a long term. Regular condition assessments and a robust risk framework will ensure that high-criticality assets receive proper and timely lifecycle intervention, including replacements.

10-Year Replacement Needs

The table below summarizes the projected cost of lifecycle activities (capital replacement only) that will need to be undertaken over the next 10 years to maintain the current level of service. These values are derived from CityWide™, the Municipality's primary asset management application. The projections rely on condition data and age data to forecast these values.

Table 16 10-Year Capital Replacement Forecast - Bridges and Culverts

Asset Type	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031
Bridges	$0	$534,400	$0	$2,011,500	$0	$8,501,625	$1,345,624	$0	$0	$2,831,625
Structural Culverts	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Total Capital Expenditures	**$0**	**$534,400**	**$0**	**$2,011,500**	**$0**	**$8,501,625**	**$1,345,624**	**$0**	**$0**	**$2,831,625**

These estimates are developed at the asset network level, illustrate replacement needs only, and are built on available asset data, including quantities, replacement costs, age, or assessed condition. They can be different from actual capital forecasts. Consistent data updates, especially condition, and asset acquisitions and disposals will improve the alignment between the system generated expenditure requirements, and the Municipality's capital expenditure forecasts.

Risk Analysis

The risk matrix below is generated using available asset data, such as condition, service life remaining, replacement costs, and bridge type. It classifies assets based on their probability and likelihood of failure, each scored from 1 to 5. Their product generates a risk index ranging from 1-25. Assets with the highest criticality and likelihood of failure receive a risk rating of 25; those with lowest probability of failure and lowest criticality carry a risk rating of 1. As new data and information is gathered, the Municipality may consider integrating relevant information that improves confidence in the criteria used to assess asset risk and criticality.

The strength of a risk assessment framework depends on the reliability and availability of asset attribute data and the use of risk models designed to leverage that data. The integration of meaningful asset attribute data that represent the contributing factors to the probability and consequence of an asset's failure will provide increased confidence in capital project decision-making and support evidence-based budget allocations. While more data does not necessarily mean better outcomes, the careful selection of risk criteria can optimize asset management decision-making.

These risk models have been built into the Municipality's Asset Management Database (CityWide Asset Manager).

Figure 17 Risk Matrix - Bridges and Culverts

In addition to asset level risk, the Municipality may also face risk associated with not executing key lifecycle activities, including repairs, rehabilitation, and replacement of critical assets. These include:

- Missed opportunities for cost savings and increases in lifecycle costs

- Deferral of vital projects, or further lending and borrowing
- Accelerated asset deterioration and premature failure, which may lead to public health and safety hazards, and disruption of services to the Municipality's residential and commercial base
- A decline in public satisfaction with the Municipality's service standards and the resulting reputational damage
- Bridges are inherently vital to the Municipality's transportation infrastructure, and their failures can disconnect communities, lead to public health and safety incidents, and can impede the efficient flow of residential and commercial traffic.

An asset's criticality rating, determined by the nature and magnitude of the consequences of its potential failure should be used to prioritize projects, particularly lifecycle management strategies. Using risk in conjunction with levels of service, and the recommended treatment options can assist in optimizing limited funds.

Levels of Service

The tables that follow summarize Huron Shores' current levels of service with respect to prescribed KPIs under Ontario Regulation 588/17.

Table 17 Ontario Regulation 588/17 Community Levels of Service - Bridges and Culverts

Service Attribute	Qualitative Description	Current Level of Service
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	1. Description or images of the condition of bridges and how this would affect use of the bridges.	The Municipality's 2021 OSIM report identified structure #2, with a BCI of 24, as being closed to vehicular traffic but adequate for continued use for pedestrians and ATVs. Structure #7, with a BCI of 38, is also being planned to be used only for recreational traffic, including pedestrians, snowmobiles, and ATVs.
	2. Description or images of the condition of culverts and how this would affect use of the culverts.	

Table 18 Ontario Regulation 588/17 Technical Levels of Service - Bridges and Culverts

Service Attribute	Qualitative Description	Current Level of Service
Scope	Percentage of bridges in the Municipality with loading or dimensional restrictions.	36%, based on 8 bridges and culverts with load restrictions
Quality	1. For bridges in the Municipality, the average bridge condition index value.	29
	2. For structural culverts in the Municipality, the average bridge condition index value.	98

Recommendations

- Consider adopting a formal preventative maintenance, rehabilitation, and replacement strategy for bridges and culverts.
- As completed, all condition assessments should be uploaded into CityWide to drive forward asset management planning and forecasting activities.
- Replacement costs should be updated on a two-year cycle, following completion of external OSIM inspections.
- Risk models can be used in decision-making to prioritize the bridges and culverts replacement, rehabilitation and streamline inspection programs. Collecting key asset attributes will support asset criticality analysis and help prioritize projects.
- In preparation for compliance with Ontario Regulation 588/17, public engagements may offer an opportunity to identify infrastructure priorities and support potential adjustments to levels of service and the associated KPIs. Lifecycle costs and affordability should be central to any planned service level changes.

Stormwater Network

Huron Shores' Stormwater Network comprises mains with a total current replacement cost of $1.7 million. The Municipality is responsible for approximately 2.16 kilometres of stormwater mains which includes about 1.1 kilometres of corrugated steel pipe (CSP) and 1.0 kilometres of polyvinyl chloride pipe (PVC).

Inventory and Valuation

Table 19 summarizes the quantity and current replacement cost of stormwater mains and stormwater management facilities.

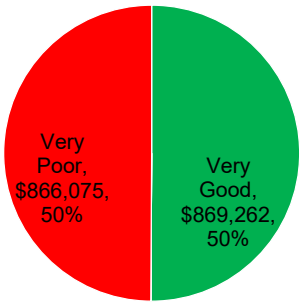
Table 19 Detailed Asset Inventory – Stormwater Network

Asset	Quantity	Replacement Cost
Stormwater Mains	2,156m	$1,735,337
Total		**$1,735,337**

Asset Condition

Figure 18 summarizes the replacement cost-weighted condition of the Municipality's stormwater mains. Based on age data, 50% of assets are in very good condition, with the remaining in very poor condition.

Figure 18 Asset Condition - Stormwater Network



Current Approach to Lifecycle Management

The Municipality had completed a condition assessment for 90% of the storm mains using CCTV and 50% of the mains were replaced five years ago. 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 following table outlines the current strategies in place to maintain Huron Shores' linear stormwater infrastructure and identify when rehabilitation and replacement of stormwater mains may be required.

Table 20 Current Lifecycle Management Strategies - Stormwater Network

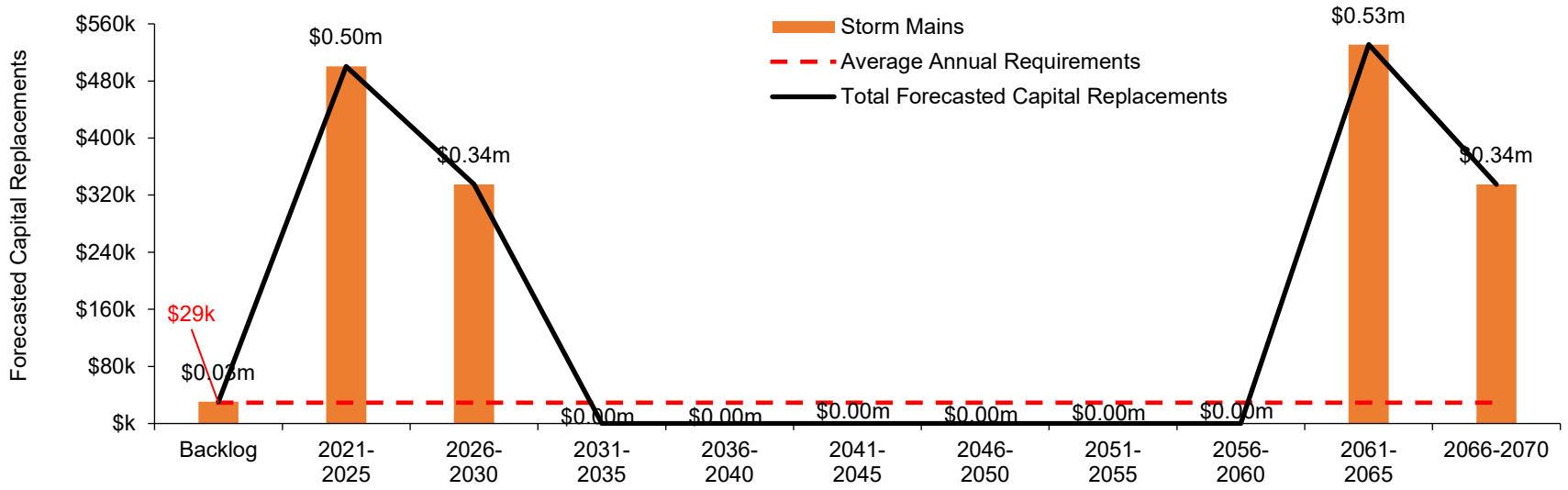
Activity Type	Description of Current Strategy
Maintenance	• Stormwater mains are flushed as needed and when budget allows, at a cost of $10 per metre. • CCTV inspections are performed on need basis.
Rehabilitation/ Replacement	• Most stormwater main replacement are reactive, when failures occur, or if warranted by the main's defect history. • The strategy for corrugated steel pipes is end-of-life replacement. • Currently no system wide relining program in place. However, relining can be considered for PVC stormwater mains below highway sections.

We note that implementing a relining program for PVC pipes may produce some cost avoidance, allowing the Municipality to extend the useful life of these assets. If pipes are structurally sound, relining can be triggered at an equivalent condition rating of 50-60%. These models have been built into CityWide™ Asset Manager. These models continue to assume CSP pipes are simply replaced at end-of-life and no significant rehabilitation events are implemented.

Forecasted Replacement Needs

Figure 19 illustrates the cyclical short-, medium- and long-term infrastructure replacement requirements for the Municipality's stormwater network assets. This analysis was run to capture at least one iteration of replacement for the longest-lived asset within the stormwater asset inventory. This required the projection to span nearly 50 years. Replacement projections for the current decade are estimated to total $0.84 million. Given the lengthy useful life of stormwater mains, no replacements are forecasted until the next cycle beginning in 2061. There is also an infrastructure backlog of $30,600, comprising assets that have reached the end of their useful life but remain in service. In addition, specific projects that had been previously identified but have not yet been completed total $610,000.

Figure 19 Forecasted Capital Replacement Requirements - Stormwater Network: 2022-2120



On average, stormwater mains require $29k annually to remain current with replacement needs. Often, the magnitude of replacement needs is substantially higher than most municipalities can afford to fund. In addition, most assets may not need to be replaced. However, quantifying and monitoring these spikes is essential for long-term financial planning, including establishing dedicated reserves and gradually building funding capacity over a long term. A robust risk framework will ensure that high-criticality assets receive proper and timely lifecycle intervention, including replacements.

10-Year Replacement Forecast

The table below summarizes the projected cost of lifecycle activities (capital replacement only) that will need to be undertaken over the next 10 years to maintain the current level of service. These values are derived from CityWide™, the Municipality's primary asset management application. The projections rely on condition data and age data to forecast these values.

Table 21 10-Year Replacement Forecast - Stormwater Network

Asset Type	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031
Stormwater Mains	$273,900	$226,525	$0	$0	$335,050	$0	$0	$0	$0	$0
Total Capital Expenditures	**$273,900**	**$226,525**	**$0**	**$0**	**$335,050**	**$0**	**$0**	**$0**	**$0**	**$0**

These estimates are developed at the asset network level, illustrate replacement needs only, and are built on available asset data, including quantities, replacement costs, age, or assessed condition. They can be different from actual capital forecasts. Consistent data updates, especially condition, and asset acquisitions and disposals will improve the alignment between the system generated expenditure requirements, and the Municipality's capital expenditure forecasts.

Risk Analysis

The risk matrix below is generated using available asset data, such as condition, service life remaining, replacement costs, and bridge type. It classifies assets based on their probability and likelihood of failure, each scored from 1 to 5. Their product generates a risk index ranging from 1-25. Assets with the highest criticality and likelihood of failure receive a risk rating of 25; those with lowest probability of failure and lowest criticality carry a risk rating of 1. As new data and information is gathered, the Municipality may consider integrating relevant information that improves confidence in the criteria used to assess asset risk and criticality.

The strength of a risk assessment framework depends on the reliability and availability of asset attribute data and the use of risk models designed to leverage that data. The integration of meaningful asset attribute data that represent the contributing factors to the probability and consequence of an asset's failure will provide increased confidence in capital project decision-making and support evidence-based budget allocations. While more data does not necessarily mean better outcomes, the careful selection of risk criteria can optimize asset management decision-making.

These risk models have been built into the Municipality's Asset Management Database (CityWide Asset Manager). Detailed attribute data within CityWide includes Estimated Useful Life, In-Service Date, pipe material, diameter, length and replacement cost.

Figure 20 Risk Matrix - Stormwater Network

In addition to asset level risk, the Municipality may also face risk associated with not executing key lifecycle activities, including repairs, rehabilitation, and replacement of critical assets. These include:

- Missed opportunities for cost savings and increases in lifecycle costs
- Deferral of vital projects, or further lending and borrowing
- Accelerated asset deterioration and premature failure, which may lead to public health and safety hazards, and disruption of services to the Municipality's residential and commercial base
- A decline in public satisfaction with the Municipality's service standards and the resulting reputational damage
- Failure of stormwater assets can be particularly detrimental, causing excessive flooding, erosion, backups, road and bridge closures, environmental damage, and substantial property damage. Water quality may also be jeopardized, further exacerbating public health and safety challenges. Increased frequency of extreme weather events has made some communities even more vulnerable to flooding. These events can also create legal liabilities for the Municipality.

An asset's criticality rating, determined by the nature and magnitude of the consequences of its potential failure should be used to prioritize projects, particularly lifecycle management strategies. Using risk in conjunction with levels of service, and the recommended treatment options can assist in optimizing limited funds.

Levels of Service

The tables that follow summarize Huron Shores' current levels of service with respect to prescribed KPIs under Ontario Regulation 588/17.

Table 22 Ontario Regulation 588/17 Community Levels of Service - Stormwater Network

Service Attribute	Qualitative Description	Current Level of Service
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.	TBD

Table 23 Ontario Regulation 588/17 Technical Levels of Service - Stormwater Network

Service Attribute	Qualitative Description	Current Level of Service
Scope	1. Percentage of properties in municipality resilient to a 100-year storm.	100%
	2. Percentage of the municipal stormwater management system resilient to a 5-year storm.	100%

Recommendations

- Implement a consistent flushing program on a 5-year cycle.
- Consider reviewing estimated useful life for stormwater mains and adjusting these values based on in-field asset performance and industry standards. Increase in EULs will lower average annual financial requirements.
- Replacement costs are currently estimated using CPI indexes. This method produces inaccurate estimates. Replacement costs should be user-defined or generated based on per unit costing, and should reflect, at minimum, pipe size and material.
- Costs of various lifecycle activities, including flushing, cleaning, CCTV inspections, and relining should reflect recent projects or quotes. Further, these costs should be refined and updated in CityWide™ as they become available.
- Risk models can be used in decision-making to prioritize the stormwater mains replacement, rehabilitation and streamline inspection programs. Collecting key asset attributes will support asset criticality analysis and help prioritize projects.
- In preparation for compliance with Ontario Regulation 588/17, public engagements may offer an opportunity to identify infrastructure priorities and support potential adjustments to levels of service and the associated KPIs. Lifecycle costs and affordability should be central to any planned service level changes.

Buildings

Huron Shores' Building portfolio provides essential services to residents. These include General Government, Environmental Services, Protection Services, Recreation and Cultural Services, and Transportation Services. Together, these assets have a total current replacement cost of $12 million.

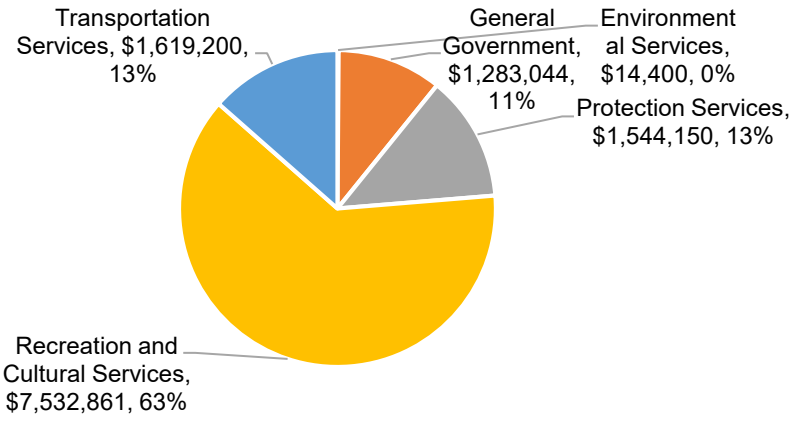
Inventory and Valuation

Recreation and Cultural facilities represent the largest segment of Huron Shores' building portfolio, at 63% of the current replacement cost. Table 24 summarizes the quantity and current replacement cost of major facilities assets.

Table 24 Detailed Asset Inventory - Buildings

Asset	Quantity (asset records)	Replacement Cost	Asset Age
Environmental Services	1	$14,400	21 years
General Government	2	$1,283,044	13 years
Protection Services	5	$1,544,150	32 years
Recreation and Cultural Services	17	$7,532,861	31 years
Transportation Services	4	$1,619,200	43 years
Total	**29**	**$11,993,655**	

Figure 21 Portfolio Valuation - Buildings



Asset Condition

Figure 22 summarizes the replacement cost-weighted condition of the Municipality's building portfolio. Based age data, more than 80% of assets are in fair or better condition. However, the remaining 20% are in poor or worse condition. These assets may be candidates for replacement in the short term; similarly, assets in fair condition may require rehabilitation or replacement in the medium term and should be monitored for further degradation in condition. Figure 23 details the condition of each asset segment.

Figure 22 Asset Condition - Buildings: Overall

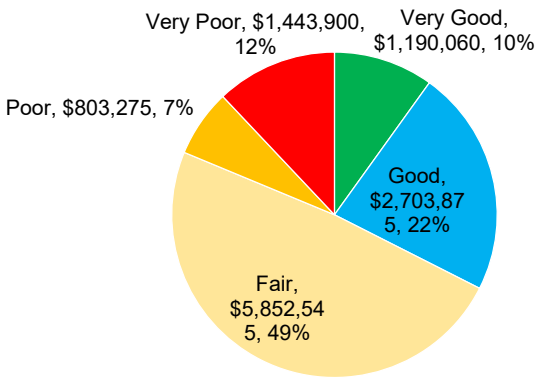
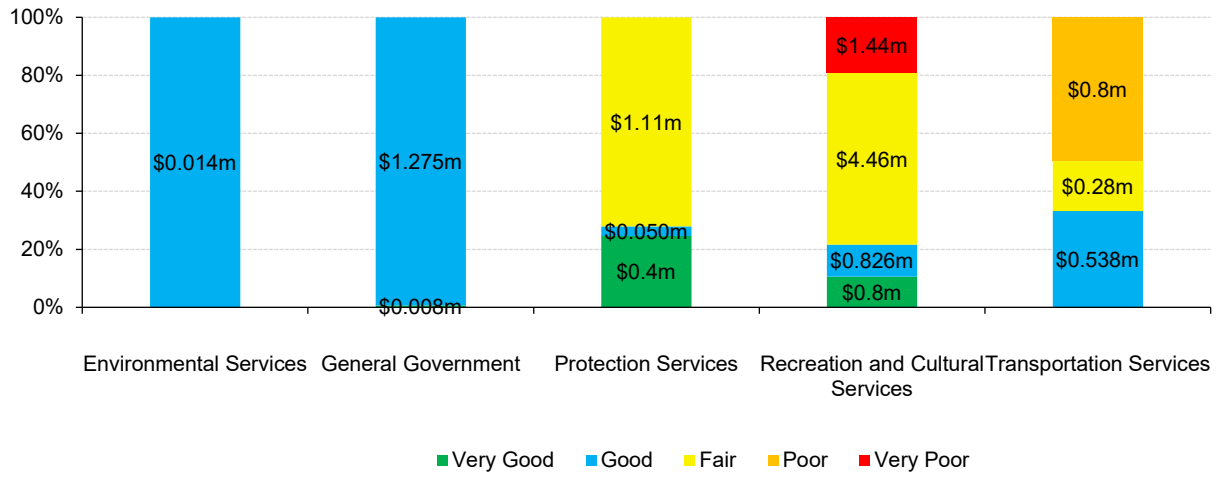


Figure 23 Asset Condition - - Buildings and Facilities: By Asset Type



Current Approach to Lifecycle Management

The Municipality is responsible for an extensive inventory of municipal buildings and facilities, including municipal buildings, waste disposal shelters, fire stations, office buildings, storage, community halls, library, park, and museum. Some buildings are segmented into components (e.g., ramp, shed, and washroom), and it is consistent across most of the buildings.

The Municipality doesn't have a formal condition assessment program in place to assess the condition of the buildings. However, some energy audits have been done in the past and the Municipality is planning on conducting an assessment next year, in particular to identify assets with retirement obligations.

Table 25 Current Lifecycle Management Strategies - Buildings

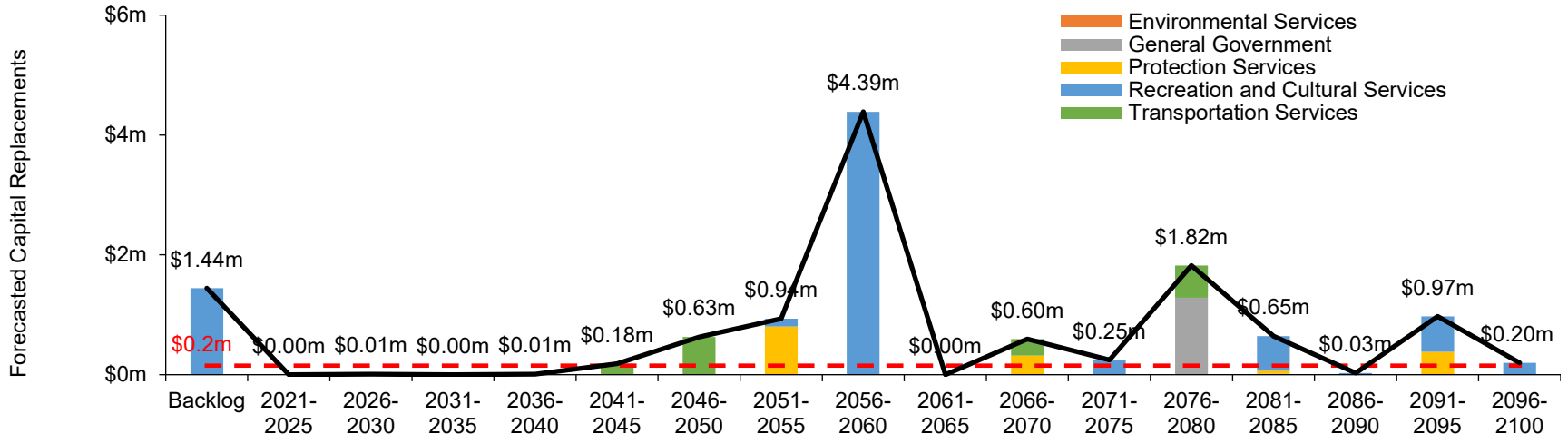
Activity Type	Description of Current Strategy
Maintenance and Preventative Maintenance	• The Municipality's public works staff performs monthly visual inspections. • Building assets are maintained by the public works staff with support from volunteers for recreation centres on routine basis or as needed. • Visual inspections related to fire extinguishers, HVAC, and firehalls are carried out on monthly basis, considering the health and safety measures. • The community centres, museum, and library are subjected to monthly health and safety inspections and continual cleaning. • Sprinkler system in the Iron Bridge Community Centre is inspected every six months. • Lift is inspected on monthly basis.
Rehabilitation and 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 Replacement Needs

Figure 24 illustrates the cyclical short-, medium- and long-term infrastructure replacement requirements for the Municipality's building portfolio. This analysis was run to capture at least one iteration of replacement for the longest-lived asset within the building asset inventory. This required the projection to span approximately 80 years. Replacement needs are minimal over the next few decades. However, we do note that buildings are not fully componentized. The projections reflect singular assets or whole building structures rather than individual building components and elements, such as electrical and mechanical assets. These elements have variable useful lives, ranging from several years to many decades. More detailed componentization may reveal additional replacement needs at the element or component level.

The chart also illustrates a replacement backlog of $1.4 million, dominated by recreation facilities. These are assets that have reached the end of their estimated useful life but remain in service. Both age and condition should be used to forecast replacement needs and refine capital expenditure estimates.

Figure 24 Forecasted Capital Replacement Requirements - Buildings



On average, building assets require $0.2 million annually to remain current with replacement needs. Often, the magnitude of replacement needs is substantially higher than most municipalities can afford to fund. In addition, most assets may not need to be replaced. However, quantifying and monitoring these spikes is essential for long-term financial planning, including establishing dedicated reserves and gradually building funding capacity over a long term. A robust risk framework, along with public demand for various recreation services will ensure that high-criticality assets receive proper and timely lifecycle intervention, including replacements. Building condition assessments will also remain integral in project selection.

10-Year Replacement Forecast

The table below summarizes the projected cost of lifecycle activities (capital replacement only) that will need to be undertaken over the next 10 years to maintain the current level of service. These values are derived from CityWide™, the Municipality's primary asset management application. The projections rely on condition data and age data to forecast these values.

Table 26 10-Year Replacement Forecast - Buildings and Facilities

Asset Type	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031
Environmental Services	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
General Government	$0	$0	$0	$0	$0	$0	$0	$0	$8,044	$0
Protection Services	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Recreation and Cultural Services	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Transportation Services	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Total Capital Expenditures	$0	$0	$0	$0	$0	$0	$0	$0	$8,044	$0

These estimates are developed at the asset network level, illustrate replacement needs only, and are built on available asset data, including quantities, replacement costs, age, or assessed condition. They can be different from actual capital forecasts. Consistent data updates, especially condition, and asset acquisitions and disposals will improve the alignment between the system generated expenditure requirements, and the Municipality's capital expenditure forecasts. Improved componentization is also essential for greater alignment between system-generated values and staff-developed project lists.

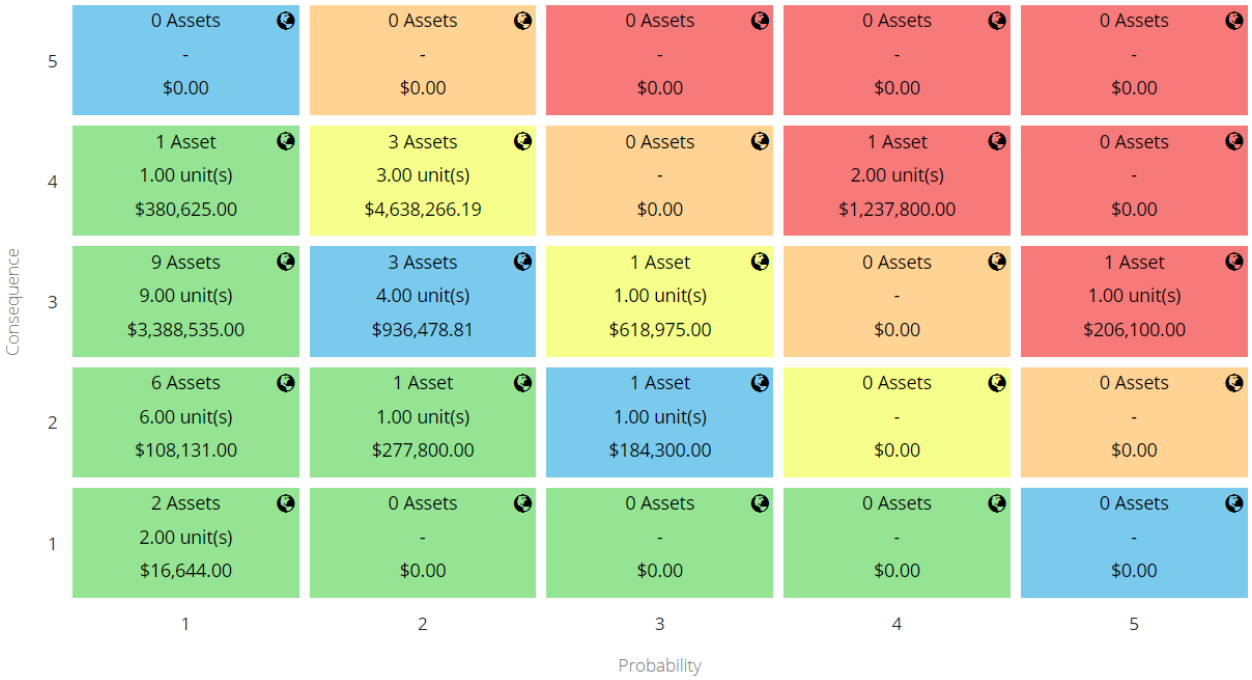
Risk Analysis

The risk matrix below is generated using available asset data, such as condition, service life remaining, replacement costs, and building type. It classifies assets based on their probability and likelihood of failure, each scored from 1 to 5. Their product generates a risk index ranging from 1-25. Assets with the highest criticality and likelihood of failure receive a risk rating of 25; those with lowest probability of failure and lowest criticality carry a risk rating of 1. As new data and information is gathered, the Municipality may consider integrating relevant information that improves confidence in the criteria used to assess asset risk and criticality.

The strength of a risk assessment framework depends on the reliability and availability of asset attribute data and the use of risk models designed to leverage that data. The integration of meaningful asset attribute data that represent the contributing factors to the probability and consequence of an asset's failure will provide increased confidence in capital project decision-making and support evidence-based budget allocations. While more data does not necessarily mean better outcomes, the careful selection of risk criteria can optimize asset management decision-making.

These risk models have been built into the Municipality's Asset Management Database (CityWide Asset Manager).

Figure 25 Risk Matrix - Buildings



In addition to asset level risk, the Municipality may also face risk associated with not executing key lifecycle activities, including repairs, rehabilitation, and replacement of critical assets. These include:

- Missed opportunities for cost savings and increases in lifecycle costs

- Deferral of vital projects, or further lending and borrowing
- Accelerated asset deterioration and premature failure, which may lead to public health and safety hazards, and disruption of services to the Municipality's residential and commercial base
- A decline in public satisfaction with the Municipality's service standards and the resulting reputational damage

An asset's criticality rating, determined by the nature and magnitude of the consequences of its potential failure should be used to prioritize projects, particularly lifecycle management strategies. Using risk in conjunction with levels of service, and the recommended treatment options can assist in optimizing limited funds.

Levels of Service

Levels of service and the associated KPIs will be developed for the Municipality's 2024 asset management plan, in compliance with O. Reg 588/17.

Recommendations

- Buildings should be componentized using the Uniformat II code standards. Componentization will improve replacement forecasts and allow for analysis and planning around individual major elements, rather than singular sites.
- Review feasibility of completing building condition assessments for all buildings to improve understanding of facilities condition and potential expenditures.
- Consider completing internal building assessments or inspections on a regular cycle to identify major deficiencies.
- Develop a 5-10 year proactive building replacement/rehabilitation plan, utilizing any available inspection information.
- Risk models can be used in decision-making to prioritize the buildings replacement, rehabilitation and streamline inspection programs. Collecting key asset attributes will support asset criticality analysis and help prioritize projects.
- In preparation for compliance with Ontario Regulation 588/17, public engagements may offer an opportunity to identify infrastructure priorities and support potential adjustments to levels of service and the associated KPIs. Lifecycle costs and affordability should be central to any planned service level changes.

Financial Strategy

Infrastructure is expensive to build and even more expensive to maintain in a state of good repair. Huron Shores' infrastructure portfolio has a total current replacement cost of $530 million. These assets require ongoing and periodic maintenance, repairs, rehabilitation, and eventual replacement. Most municipalities across Canada are unable to meet these annual needs, and face annual infrastructure funding shortages or deficits. Over time, these annual deficits accumulate and create infrastructure backlogs.

Each year, this backlog grows, and the quality of infrastructure degrades as projects are deferred due to funding constraints. Infrastructure disrepair can restrict economic activity, jeopardize public safety, lower the quality of life of residents, and expose organizations to financial risk. The condition of a community's infrastructure can also create political and reputational damage.

Most local governments have limited options to raise additional funds for infrastructure, relying primarily on tax levies, debt, and user fees. Rural and small municipalities are also less attractive for public-private partnerships (P3s) that can leverage private sector funds to deliver major projects. This makes senior government support critical, whether through matching formulas for major capital projects, or through grants and subsidies that can make additional capital available for municipalities.

Given the level of investment required, it will take many years or decades for municipalities to reach fiscal sustainability. In this section, we provide an analysis of the Municipality of Huron Shores' current fiscal framework for supporting its infrastructure portfolio, and include a financial strategy to close identified annual funding gaps associated with capital spending, including maintenance, rehabilitation, and replacements.

Annual Capital Requirements

Each year, investments must be made in infrastructure maintenance, renewal, rehabilitation, and replacement to ensure it remains in a state of good repair. The focus of this asset management strategy, and that of most municipal asset management plans, is typically annual capital expenditures. These target investment levels, or annual capital requirements, are distributed across the lifecycle of the asset.

The objective is to ensure that when assets do reach the end of their useful life, sufficient funding is available to replace them in order to minimize service disruption. The annual requirements are directly proportional to the value of the infrastructure portfolio and the average useful life of assets contained within it.

Table 27 outlines current annual capital requirements by asset category. Based on a replacement cost of $65 million, Huron Shores' average annual requirements total approximately $2 million for the three asset categories included in this analysis. The table also illustrates the equivalent reinvestment rate (ERR), calculated by dividing the annual capital requirements by the total replacement cost of each asset category. As there is no industry standard guide on optimal annual investment in infrastructure, the ERR provides a target for organizations.

Table 27 Average Annual Capital Requirements

Asset Category	Replacement Cost	Annual Capital Requirements	Equivalent Reinvestment Rate
Road Network	$31,117,355	$1,303,144	4.2%
Bridges and Culverts	$32,544,875	$683,008	2.1%
Stormwater Network	$1,735,337	$29,226	1.7%
Total	**$65,397,567**	**$2,015,379**	**3.1%**

Current Infrastructure Funding Framework

An annual reinvestment rate of 3.1% of the total replacement cost of Huron Shores' infrastructure portfolio would ensure that replacement needs are fulfilled, and high service levels are delivered across these infrastructure categories.

Current Funding Position and Reinvestment Rates

Table 28 summarizes the Municipality's current funding position after all permanent and predictable funding sources are accounted for. These include portion of tax revenues allocated to infrastructure, the Ontario Community Infrastructure Fund (OCIF), and the federal Gas Tax Fund, (now called Canada Community-Building Fund). Current funding levels generate an annual infrastructure funding gap of $0.68 million.

Table 28 Current Funding Position vs. Required Funding

Asset Category	Annual Capital Requirements	Total Funding Available					Deficit
		Tax Revenues	Gas Tax	OCIF	Transfer to Reserves	Total	
Road Network	$1,303,144	$244,654	$207,014	$67,962	$297,014	$816,644	$486,500
Bridges and Culverts	$683,008	$246,019	$0	$0	$275,000	$521,019	$161,989
Stormwater Network	$29,226	$0	$0	$0	$0	$0	$29,226
Total	**$2,015,379**	$490,673	$207,014	$67,962	$572,014	$1,337,663	$677,716

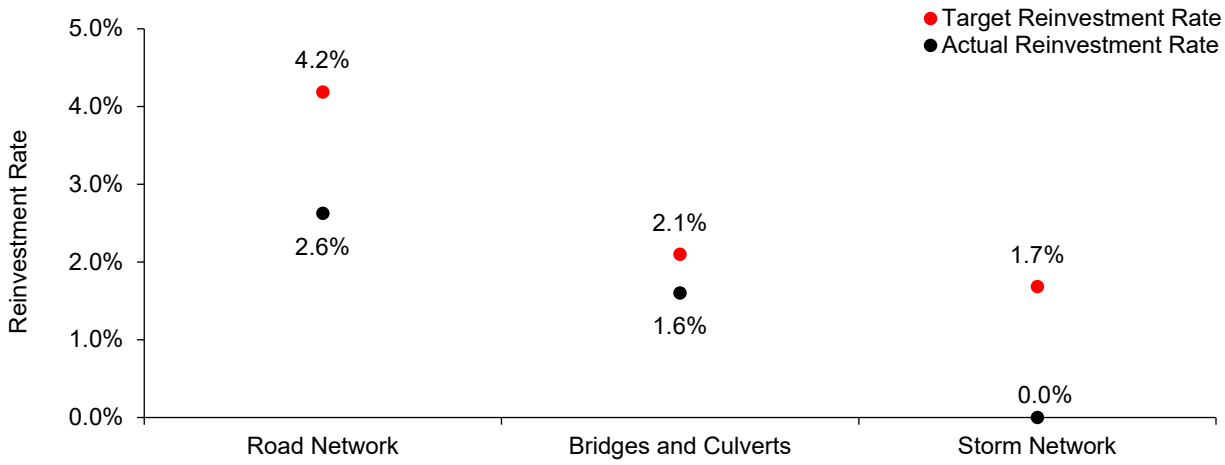
At current levels, the Municipality is funding 66% of its annual capital requirements for the three core asset categories analyzed in this section. Closing the annual deficit for these categories would require tax revenues to increase by 19.4%.

Table 29 Current Funding Percentage and Tax Increase Required

Asset Category	% of Capital Requirements Funded	Tax Increased Required to Achieve Full Funding
Road Network	63%	14.0%
Bridges and Culverts	76%	4.6%
Stormwater Network	0%	0.8%
Total	66%	19.4%

Figure 26 illustrates Huron Shores' target and actual reinvestment rates for its core asset classes. Compared to a total target reinvestment rate of 3.1%, the Municipality's current reinvestment rate totals 2.0%.

Figure 26 Target vs. Actual Reinvestment Rates



Closing Funding Gaps

Eliminating annual infrastructure funding shortfalls is a difficult endeavour for municipalities. Substantial investments have been made over decades, and constituents quickly become accustomed to service levels. Considering the Municipality's current funding position, it will require many years to reach full funding.

In 2021, Huron Shores' annual tax revenues totalled $3,487,106. We use this value as the foundation for developing two scenarios to meet infrastructure funding needs and achieve full-funding.

Both scenarios rely on potential tax increases to close the current infrastructure deficit over a 5-, 10-, 15, or 20-year phase-in period. The phase-in period would allow the Municipality to gradually achieve full-funding by enacting incremental tax increases during each year of the phase-in period. Under the first scenario, reductions in debt repayments are not captured and reallocated to infrastructure.

Table 30 Scenario 1: Tax Increase Required to Close Infrastructure Deficit **Without** Reallocation of Reductions in Debt Repayments

Asset Category	Phase-in Period to Achieve Full Funding			
	5 Years	10 Years	15 Years	20 Years
Annual Infrastructure Deficit	$677,716	$677,716	$677,716	$677,716
Less: Decrease in debt payments	$0	$0	$0	$0
Net Infrastructure Deficit	$677,716	$677,716	$677,716	$677,716
Total Tax Increase Required to Close Deficit	19.4%	19.4%	19.4%	19.4%
Annual Tax Increase Required	3.62%	1.79%	1.19%	0.89%

Scenario 1 above shows that without capturing any reductions in debt repayments and reallocating them to infrastructure, the Municipality would need to increase its total tax revenues by 19.4%. Over a 5-year phase in period, an annual tax increase of 3.62% would be required each year. If a phase-in period of 20 years is selected, the annual tax increase required would decrease to 0.89%.

Over the next five years, the Municipality's debt repayments are expected to increase by $45,685; the infrastructure deficit will increase by the same amount. However, following this initial increase in debt, debt repayments are expected to decline by $23,493 in the next decade. As illustrated in Scenario 2 below, if these reductions are reallocated for infrastructure purposes, the annual infrastructure deficit can be reduced to approximately $654,000.

As a result, the total tax increase required to close the remaining deficit will decrease from 19.4% to 18.8%. Over a 10-year phase-in period for full funding, a 1.73% annual tax increase will be required, contrasted with 1.79% if these reductions are not reallocated to infrastructure.

Table 31 Scenario 2: Tax Increase Required to Close Infrastructure Deficit **With** Reallocation of Reductions in Debt Repayments

Asset Category	Phase-in Period to Achieve Full Funding			
	5 Years	10 Years	15 Years	20 Years
Annual Infrastructure Deficit	$677,716	$677,716	$677,716	$677,716
Less: Decrease in debt payments	$45,685	-$23,493	-$23,493	-$23,493
Net Infrastructure Deficit	$723,400	$654,223	$654,223	$654,223
Total Tax Increase Required to Close Deficit	20.7%	18.8%	18.8%	18.8%
Annual Tax Increase Required	3.84%	1.73%	1.15%	0.86%

Growth and Impact on Lifecycle Activities

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. Based on 2021 Census data, Huron Shores has a permanent population of approximately 1,860 residents - an increase of 11.8% from 2016 levels.

Both the magnitude of population change and the resulting demographic structure determine the size and composition of community infrastructure portfolios. The growing popularity of remote work has made rural and small communities more attractive. This presents both an opportunity and a challenge to the Municipality in determining the right mix of assets. New assets acquired to support a growing community will increase the annual requirements associated with the infrastructure portfolio.

Water and Wastewater

While Huron Shores does not currently own or maintain water and sewage, municipal water services or municipal sewage services have been provided to some areas through the Town of Thessalon. According to the Official Plan, development in the Municipality of Huron Shores can be serviced with individual on-site water and sewage systems. Huron Shores intends to avoid a density of development which requires municipal water or sewage service.

Due to future developments, the Municipality should improve the current stormwater water system to meet the increase of needs in stormwater water management and lake protection. 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.

Recommendations

1. **Review feasibility of adopting Scenario 2 to close annual infrastructure deficits.** Under this scenario, reductions in debt repayments are captured, and reallocated for capital purposes, specifically to the three infrastructure categories analyzed in this AMP. Under this scenario, the Municipality would achieve full-funding for these three asset categories by:
    i. adopting a 10-year phase-in period for full-funding, requiring an annual tax increase of 1.73% each year.
    ii. continuing to allocate OCIF funding and CCBF funding as outlined previously
    iii. increasing existing and future infrastructure budgets by the applicable inflation index on an annual basis in addition to the deficit phase-in.

2. **The Municipality should develop risk and levels of service frameworks to guide project selection and make spending decisions.**

    i. Risk frameworks identify assets with the highest probability and consequences of failure (asset criticality). Once developed, they should be used in conjunction with staff judgement to inform project selection, and maximize the use of existing funding capacity, as well as any increase in this capacity as a result of enacting tax increases or senior government programs.
    ii. An asset's criticality and risk profile should also be used to address existing infrastructure backlog, which totals $2,021,600 for the road network, $396,995 for bridges and structural culverts, and $30,600 for stormwater.
    iii. As new asset attribute information is obtained, it should be entered into CityWide™ to further refine risk frameworks, and further improve asset prioritization and project selection.
    iv. Performance targets should be established for each asset category in a levels of service framework, and tracked on an annual basis.
    v. 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.

Appendix 1: Lifecycle Strategies for Other Asset Categories

This section provides a summary of current lifecycle strategies for land improvements, machinery and equipment, and vehicles.

Land Improvements

Asset Overview

The Municipality's land improvement assets include walkways, fencing, boat launches and baseball diamond. The inventory contains complete counts for assets and contains accompanying in-service dates, historical cost, quantity, and estimated useful life information.

Condition Assessment

There is no formal condition assessment program in place for land improvement assets. Age is used to guide project selection and spending priorities.

Current Approach and Industry Practice

Event Class	Description
Maintenance	• Parking lots are assessed as part of regular road patrols and are treated similarly. • Baseball diamond is inspected on a weekly basis; hazards and entanglements are documented and addressed. • Playgrounds are inspected by a third party on annual basis and recommendations are provided to the Municipality. • Boat launches are inspected quarterly for health and safety purposes.
Rehabilitation/ Replacement	• There are no formal guiding documents prescribing replacement or upgrades of most land improvements. Assets are assessed and replaced as needed and budgeted annually. • Project prioritizations for replacement/rehabilitation is based on costs, health and safety, life expectancy, and the asset's criticality.

Cost Comparison

Without a detailed maintenance and rehabilitation schedule, lifecycle activity costs cannot be known.

Strategy	Annual Capital Requirements
End-of-Life Replacement Only	$5,639.68

Recommendations

- Develop a deficiencies list and prioritize lifecycle activities by the risk each deficiency poses.
- Warranty information and maintenance records should be maintained in an easily accessible database or ledger to ensure that information is available to both operators and those responsible for determining lifecycle event schedules.
- Replacement costs are estimated using the CPI method, which is typically inaccurate. Recent procurement data, including invoices and/or quotes should be used to establish more accurate replacement costs.
- Update current asset replacement costs and condition assessments on a cyclical basis (recommended cycle is five years).
- Consider reviewing the useful life of assets to ensure they reflect in-field performance.

Vehicles

Asset Overview

The Municipality is responsible for managing 24 vehicle assets across multiple service areas, including public works, and fire. These assets are documented in the asset inventory, and contain attributes such as in-service date, estimated useful life, quantity, and historical cost.

Condition Assessment

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.

Current Approach and Industry Practice

Event Class	Description
Maintenance	• Maintenance is done externally based on vehicle mileage or when an issue arises. • Public works snowplows are maintained and inspected on an annual basis. This includes replacement of chutes, blades, pins, and other components. • Tire changes, fluid top up, minor component changes, such as wipers, are completed internally 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, however, fire vehicles have a replacement cycle of 25 years. • 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.

Cost Comparison

Without lifecycle rehabilitative events, the only available strategy at this time involves end-of-life replacement. Current replacement cost data assumes that fleet assets will be replaced once they are near fully consuming their estimated useful life. However, vehicular assets do not

depreciate in the same manner as other assets, and in practice, will not necessarily be replaced when EUL is fully consumed.

Strategy	Annual Capital Requirements
End-of-Life Replacement Only	$188,158

Recommendations

- Undertake an annual review of all fleet assets to determine and update the replacement schedule. Vehicle age, kilometers, and annual repair costs should be taken into consideration when determining appropriate replacement options.
- Consider engine rebuilds and mechanical refurbishments as required or prescribed by the manufacturer.
- Recycle attachments of vehicles or heavy machinery (ex. plow blades have a longer lifecycle than the corresponding vehicle).
- Warranty information and maintenance records should be maintained in an easily accessible database or ledger to ensure that information is available to both operators and those responsible for determining lifecycle event schedules.
- Replacement costs are estimated using the CPI method, which is typically inaccurate. Recent procurement data, including invoices and/or quotes should be used to establish more accurate replacement costs.
- Update current asset replacement costs and condition assessments on a cyclical basis (recommended cycle is three years).
- Consider reviewing the useful life of assets to ensure they reflect in-field performance.
- Undertake a cost-benefit analysis of maintenance activities to understand the optimal-timing for asset replacement. Although capital costs can be reduced by extending the time a vehicle is in-service, significant operating and maintenance costs will accumulate and may outweigh capital savings.

Machinery & Equipment

Asset Overview

The Municipality is responsible for managing 175 machinery and equipment assets across multiple service areas, including public works, administration, planning, fire, parks, library, and recreation. These assets are managed in the asset inventory, and contain attributes such as in-service date, estimated useful life, and historical cost.

Condition Assessment

There is no formal condition assessment program in place for land improvement assets. Age is used to guide project selection and spending priorities.

Current Approach and Industry Practice

Event Class	Description
Maintenance	• Bunker gear is inspected routinely by staff, and every six months by a certified agent, as per NFPA standards. Monthly 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. • CO2 testers and the air filling machines are tested and sampled every six months to ensure proper working order. • Computer maintenance and support is done by outside consultants.
Rehabilitation/ Replacement	• Most of the machinery and equipment assets are replaced between five and 10 years, unless defects or issues warrant earlier replacements. • The replacement of these assets is based on the service life remaining and available budget.

Cost Comparison

Without lifecycle rehabilitative events, the only available strategy at this time involves end-of-life replacement.

Strategy	Annual Capital Requirements
End-of-Life Replacement Only	$152,843

Recommendations

- Install a replacement cycle strategy for specialized equipment based on assessed condition or manufacturer recommendations.
- Explore the opportunity to repurpose equipment to different departments or lower risk applications (e.g., repurpose critical backup generators to noncritical applications when being replaced).
- Schedule strategies for fire equipment as per NFPA requirements within the Municipality's asset management software lifecycle framework.
- Replacement costs are estimated using the CPI method, which is typically inaccurate. Recent procurement data, including invoices and/or quotes should be used to establish more accurate replacement costs.
- Update current asset replacement costs and condition assessments on a cyclical basis (recommended cycle is three years).
- Consider reviewing the useful life of assets to ensure they reflect in-field performance.