2024
ASSET MANAGEMENT PLAN

Georgian Bluffs

DEEPLY ROOTED. SUSTAINABLY GROWING.

This Asset Management Program was prepared by:

Empowering your organization through advanced
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Executive Summary

Municipal infrastructure provides the foundation for the economic, social, and environmental health and growth of a community through the delivery of services. The goal of asset management is to balance delivering critical services in a cost-effective manner. This involves the development and implementation of asset management strategies and long-term financial planning.

The overall replacement cost of the asset categories owned by Georgian Bluffs total $434.8 million. 64% of all assets analysed are in fair or better condition and assessed condition data was available for 66% of all assets. For the remaining assets, assessed condition data was unavailable, and asset age was used to approximate condition – a data gap that persists in most municipalities. Generally, age misstates the true condition of assets, making assessments essential to accurate asset management planning, and a recurring recommendation.

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

To meet capital replacement and rehabilitation needs for existing infrastructure, prevent infrastructure backlogs, and achieve long-term sustainability, the Township's average annual capital requirement totals $7.5 million. Based on a historical analysis of sustainable capital funding sources, the Township is committing approximately $3.5 million towards capital projects or reserves per year. As a result, the Township is funding 46% of its annual capital requirements. This creates a total annual funding deficit of $4 million.

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

To close annual deficits for capital contributions from tax revenues for asset needs, it is recommended the Township review the feasibility of implementing a 1.5% annual increase in revenues over a 15-year phase-in period.

To close annual deficits for capital contributions from water revenues for asset needs, it is recommended the Township review the feasibility of implementing a 2.2% annual increase in revenues over a 15-year phase-in period for water rates. Funding scenarios over longer time frames are also presented which reduce the annual increases. A water rates study is planned for 2025 and will further evaluate full funding opportunities.

In addition to annual needs, there is also an infrastructure backlog of $8 million, comprising assets that remain in service beyond their estimated useful life. It is highly unlikely that all such assets are in a state of disrepair, requiring immediate replacements or full reconstruction. This makes targeted and consistent condition assessments integral to refining long-term replacement and backlog estimates.

Risk frameworks and levels of service targets can then be used to prioritize projects and help select the right lifecycle intervention for the right asset at the right time—including replacement or full reconstruction. The Township has developed preliminary risk models which are integrated with its asset register. These models can produce risk matrices that classify assets based on their risk profiles.

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

- Continuous and dedicated improvement to the Township's infrastructure datasets, which form the foundation for all analysis, including financial projections and needs.
- Continuous refinements to the risk and lifecycle models as additional data becomes available. This will aid in prioritizing projects and creating more strategic long-term capital budgets.
- Development of key performance indicators for all infrastructure programs to establish benchmark data to calibrate levels of service.

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

About this Document

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

Ontario Regulation 588/17

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

Table 1 Ontario Regulation 588/17 Requirements and Reporting Deadlines

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

Scope

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

Asset Category	Source of Funding
Road Network	Tax Levy
Bridges & Culverts	
Buildings	
Land Improvements	
Machinery & Equipment	
Vehicles	
Furniture & Fixtures	
Technology & Communications	
Water Network	User Rates

Limitations and Constraints

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

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

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

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

An Overview of Asset Management

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

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

This industry standard, defined by the Institute of Asset Management (IAM), emphasizes the alignment between the corporate strategic plan and various asset management documents.

Foundational Documents

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

Strategic Plan

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

Asset Management Policy

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

Asset Management Strategy

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

Key Technical Concepts

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

Asset Hierarchy and Data Classification

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

Table 2 Asset Classifications

	AM CATEGORY	AM SEGMENT
Non-Core Assets	Buildings	Administration Landfill Cemetery Recreation Transportation
	Land Improvements	Administration Landfill Cemetery Recreation Transportation
	Furniture & Fixtures	Administration Recreation
	Technology & Communications	Administration Recreation Transportation
	Machinery & Equipment	Administration Landfill Recreation Transportation
	Vehicles	Administration Recreation Transportation

	AM CATEGORY	AM SEGMENT
Core Assets	Road Network	Asphalt Roads Concrete Roads Surface Treated Roads Gravel Roads Guiderails Sidewalks Signs Streetlights
	Bridges & Culverts	Catch Basins Drainage
	Water Network	Booster Station Curb Stops Hydrants Other Structures Storage Valve Chambers Water Equipment Water Treatment Plant Watermains

Replacement Costs

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

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

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

Estimated Useful Life and Service Life Remaining

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

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

Figure 1 Service Life Remaining Calculation

Asset Condition

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

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

Figure 2 Standard Condition Rating Scale

Very Good	**Fit for the future**	**80 - 100**
•Well maintained, good condition, new or recently rehabilitated		
Good	**Adequate for now**	**60 - 80**
•Acceptable, generally approaching mid-stage of expected service life		
Fair	**Requires attention**	**40 - 60**
•Signs of deterioration, some elements exhibit significant deficiencies		
Poor	**Increased potential of affecting service**	**20 - 40**
•Approaching end of service life, large portion of system exhibits deficiencies		
Very Poor	**Unfit for sustained service**	**0 - 20**
• Near or beyond expected service life, widespread signs of advanced deterioration		

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

Lifecycle Management Strategies

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

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

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

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

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

Figure 3 Lifecyle Management Typical Interventions

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

Risk Management Strategies

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

provides access to critical services poses a higher risk than a low volume rural road. These high-value assets should receive funding before others.

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

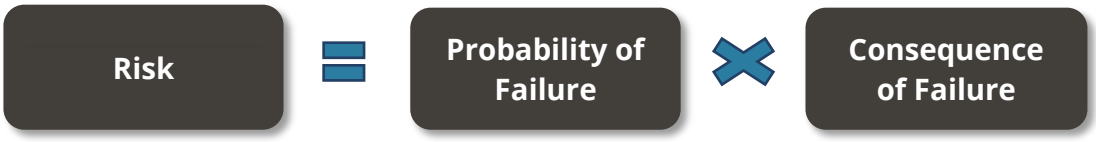
Qualitative Approach to Risk

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

Quantitative Approach to Risk

Asset risk is defined using the following formula:

Figure 4 Risk Equation



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

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

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

Levels of Service

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

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

Community Levels of Service

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

Technical Levels of Service

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

Current and Proposed Levels of Service

The Township is focused on measuring the current level of service provided to the community. Once current levels of service have been measured, the Township plans to establish proposed levels of service over a 10-year period, in accordance with Ontario Regulation 588/17.

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

Climate Change

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

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

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

The changing climate poses a significant risk to the Canadian economy, society, environment, and infrastructure. Physical infrastructure is vulnerable to damage and

increased wear when exposed to these extreme events and climate variabilities. Canadian municipalities are faced with the responsibility to protect their local economy, citizens, environment, and physical assets.

Integration Climate Change and Asset Management

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

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

Impacts of Growth

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

As growth-related assets are constructed or acquired, they should be integrated into Georgian Bluffs' asset management program. While the addition of residential units will add to the existing assessment base and offset some of the costs associated with growth, the Township will need to review the lifecycle costs of growth-related infrastructure. These costs should be considered in long-term funding strategies that are designed to, at a minimum, maintain the current level of service.

Reinvestment Rate

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

Portfolio Overview

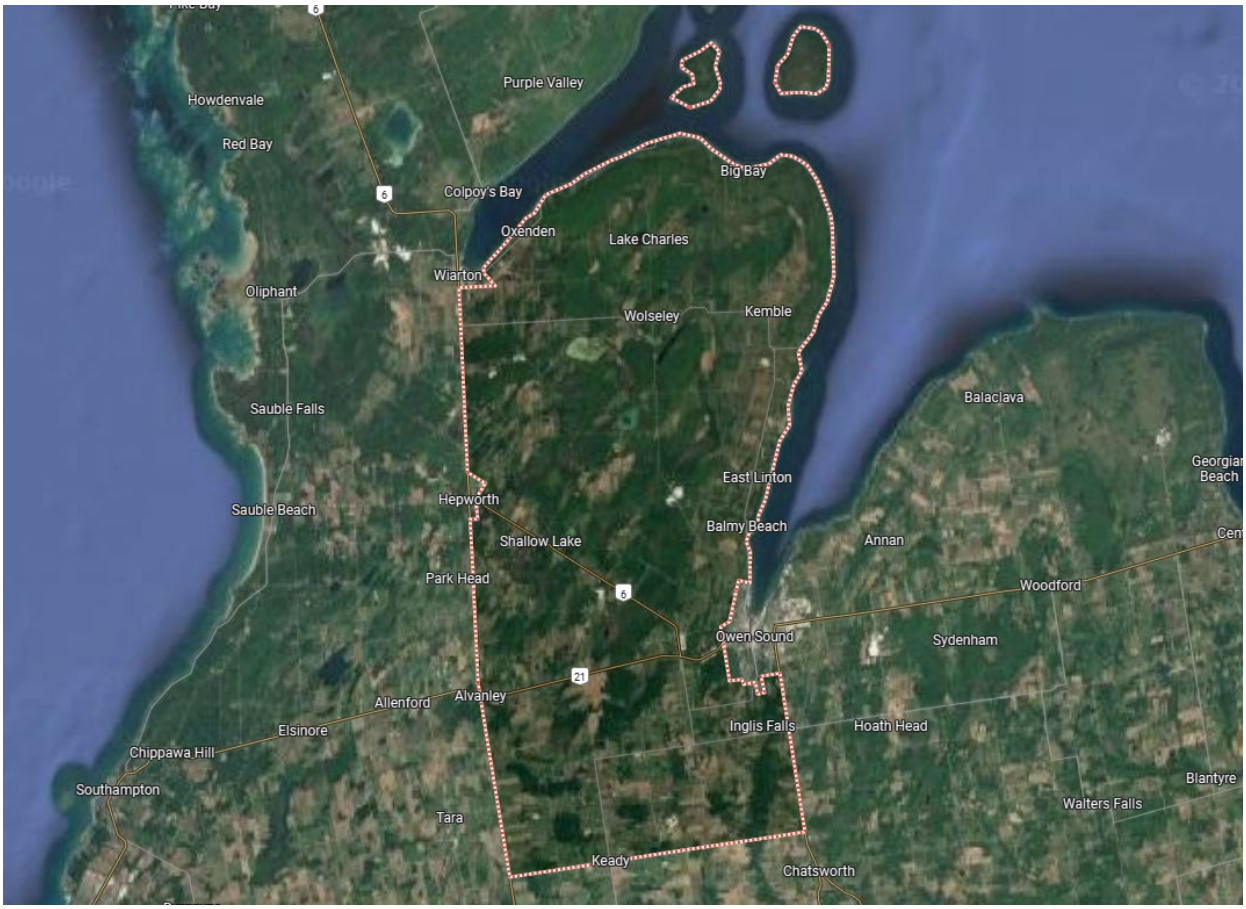
Community Profile

A place of astonishing beauty carved by glaciers into the Niagara Escarpment and inhabited for thousands of years. Today, the people of Georgian Bluffs enjoy friendly and welcoming communities surrounded by a lush natural landscape, rich soil, famed hiking trails and beaches, and an atmosphere of serenity.

The future looks bright from here, with careful stewardship of our resources, events and activities to connect people at every stage of their lives, and economic development supporting local businesses and new investors. An inclusive, diverse, and vibrant community that looks ahead while honouring our shared histories and responsibilities to one another.

This is the place we choose to call home. A place where you're welcome to put down deep roots or just stay awhile to enjoy the view. This is a place that values sustainable growth, investing in the infrastructure, opportunities, and people who will carry this vision forward.

Figure 5: Map Showing the outline of Georgian Bluffs



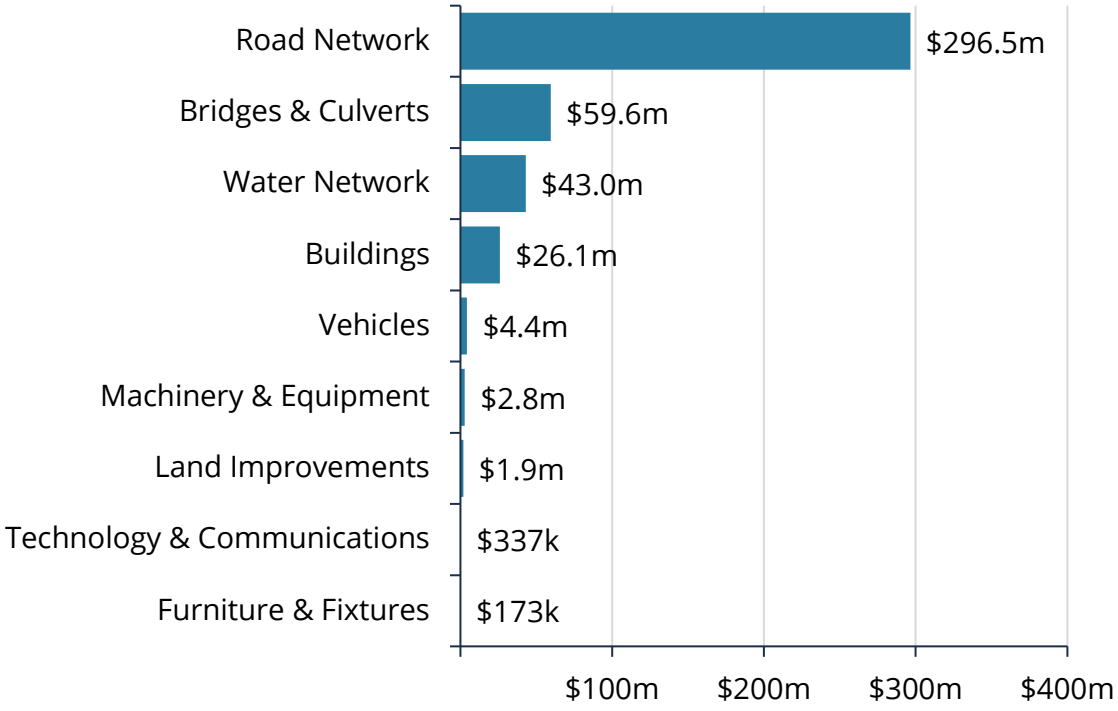
State of the Infrastructure

Asset Category	Replacement Cost	Asset Condition	Financial Capacity	
Road Network	$296,480,730	Fair (48%)	Annual Requirement:	$4,534,134
			Funding Available:	$2,687,641
			Annual Deficit:	**$1,846,494**
Bridges & Culverts	$59,607,183	Good (62%)	Annual Requirement:	$968,331
			Funding Available:	$96,898
			Annual Deficit:	**$871,433**
Technology & Communications	$336,670	Poor (30%)	Annual Requirement:	$64,431
			Funding Available:	$26,951
			Annual Deficit:	**$37,479**
Buildings	$26,056,580	Fair (45%)	Annual Requirement:	$538,602
			Funding Available:	$170,714
			Annual Deficit:	**$367,889**
Land Improvements	$1,912,535	Very Good (81%)	Annual Requirement:	$81,386
			Funding Available:	$33,895
			Annual Deficit:	**$47,491**
Vehicles	$4,371,755	Good (76%)	Annual Requirement:	$262,366
			Funding Available:	$85,469
			Annual Deficit:	**$176,897**
Machinery & Equipment	$2,839,196	Good (78%)	Annual Requirement:	$167,999
			Funding Available:	$54,824
			Annual Deficit:	**$113,175**
Water Network	$43,034,568	Very Good (82%)	Annual Requirement:	$895,783
			Funding Available:	$329,600
			Annual Deficit:	**$566,183**
Furniture & Fixtures	$172,583	Fair (57%)	Annual Requirement:	$13,655
			Funding Available:	$5,712
			Annual Deficit:	**$7,943**
Overall	$434,811,800	Fair (54%)	Annual Requirement:	$7,526,688
			Funding Available:	$3,491,703
			Annual Deficit:	**$4,034,985**

Replacement Cost

All Georgian Bluffs' asset categories have a total replacement cost of $434.8 million based on available inventory data. This total was determined based on a combination of user-defined costs and historical cost inflation. This estimate reflects replacement of historical assets with similar, not necessarily identical, assets available for procurement today.

Figure 6 Replacement Cost by Category

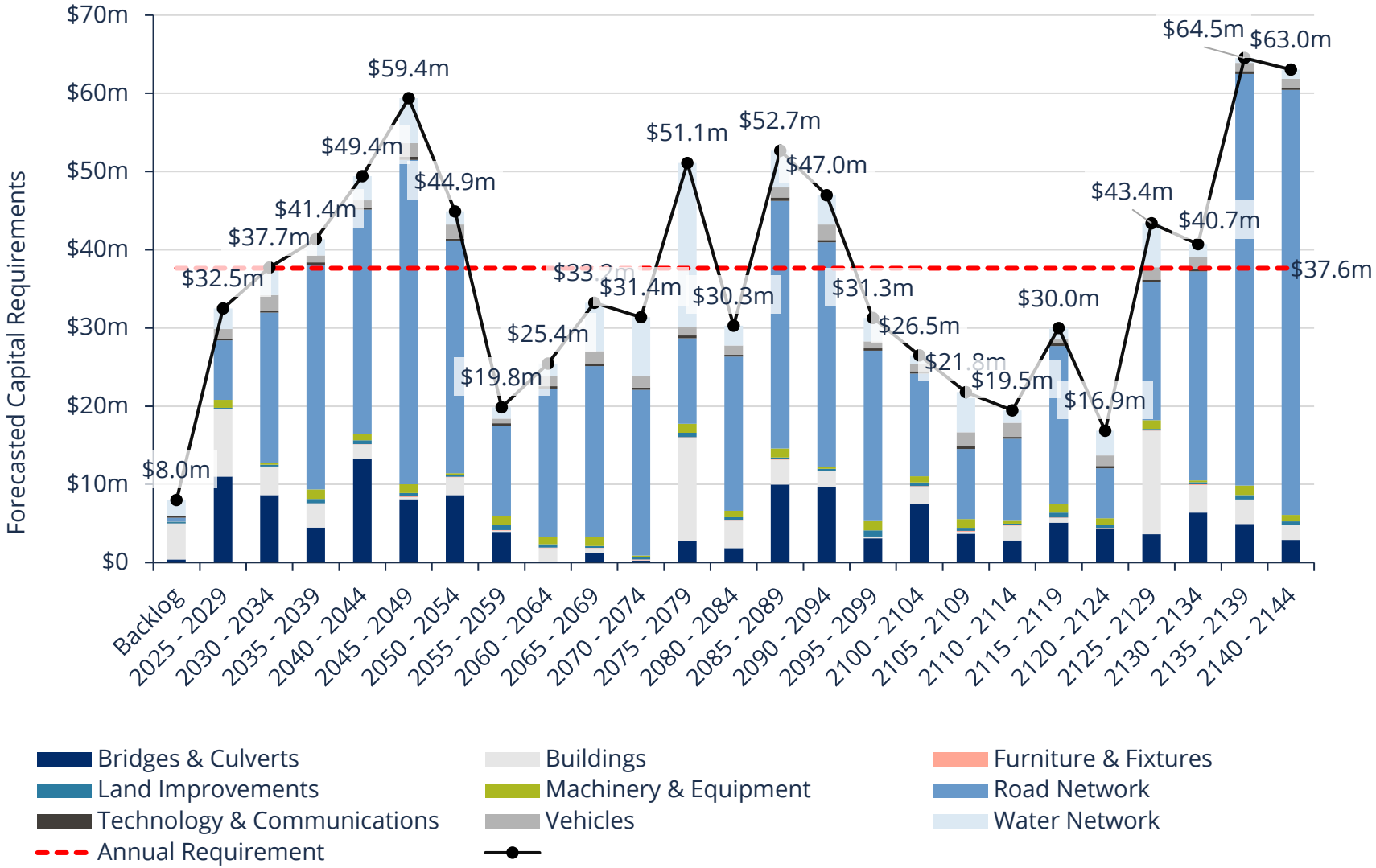


Forecasted Capital Requirements

Aging assets require maintenance, rehabilitation, and replacement. Figure 7 below illustrates the cyclical short-, medium- and long-term infrastructure replacement requirements for all asset categories analyzed. Based on the current replacement cost of the portfolio, the average annual capital needs over the lifecycle of all assets total $7.5 million (red dotted line in 5-year buckets $37.6 million)

Although actual spending may fluctuate substantially from year to year, this figure is a useful benchmark for annual capital expenditure targets (or allocations to reserves) to ensure projects are not deferred and replacement needs are met as they arise. This figure relies on age and available condition data. Based on the current replacement cost of the portfolio, estimated at $434.8 million, this represents an annual target reinvestment rate of 1.73%.

Figure 7 Forecasted Capital Requirements



The chart also illustrates a backlog of $8 million, comprising assets that remain in service beyond their estimated useful life. It is unlikely that all such assets are in a state of disrepair, requiring immediate replacements or major renewals. This makes targeted and consistent condition assessments integral.

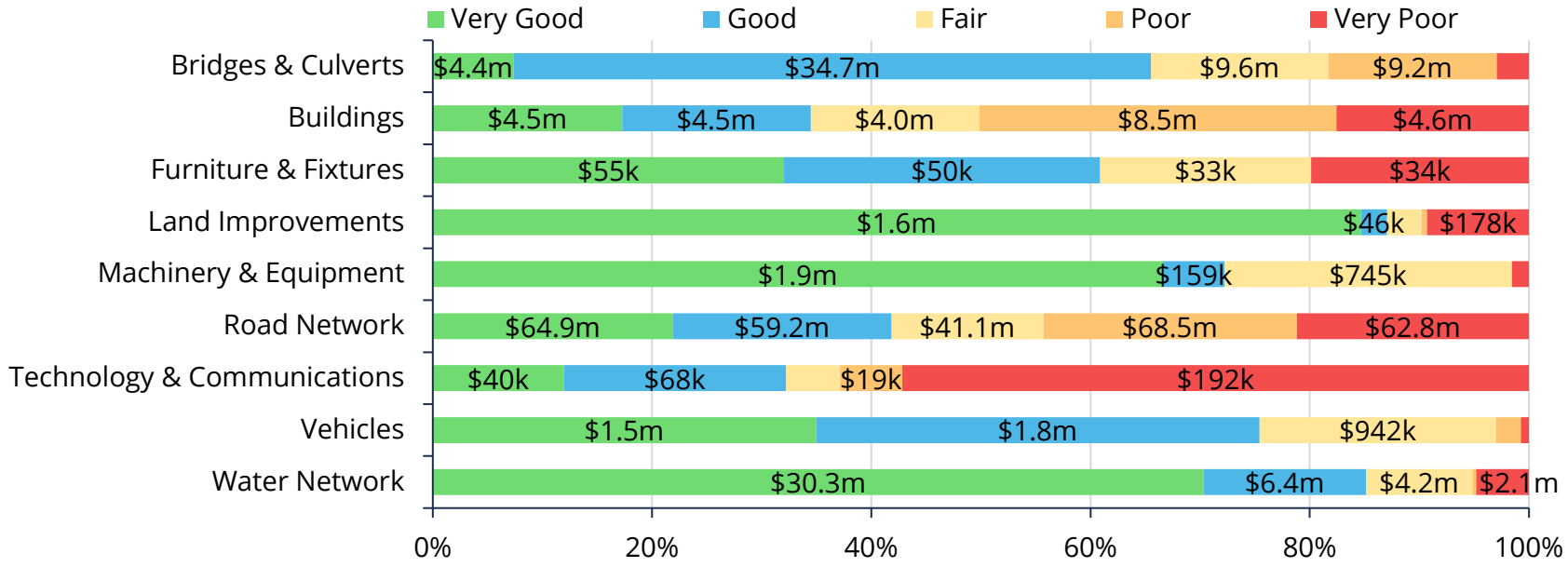
Risk frameworks, proactive lifecycle strategies, and levels of service targets can then be used to prioritize projects, continuously refine estimates for both backlogs and ongoing capital needs and help select the right treatment for each asset.

Condition of Asset Portfolio

The current condition of the assets is central to all asset management planning. Collectively, 64% of assets in Georgian Bluffs are in fair or better condition. This estimate relies on both age-based and field condition data.

Assessed condition data is available for the inventory in the road network, bridges and culverts as well as the parts of the water network; for the remaining portfolio, age is used as an approximation of condition. Assessed condition data is invaluable in asset management planning as it reflects the true condition of the asset and its ability to perform its functions.

Figure 8 Overall Condition Breakdown by Asset Segment and Replacement Cost



Service Life Remaining

Based on asset age, available assessed condition data and estimated useful life, 13% of the Township's assets will require rehabilitation / replacement within the next 10 years. Details of the capital requirements are identified in each asset section.

Risk & Criticality

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

Capital Funding Strategies

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

Lifecycle Management Strategies & Aging Infrastructure

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

Asset Data & Information

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

Organizational Capacity

Both short- and long-term planning requires the regular collection of infrastructure data to support asset management decision-making. Staff find it a continuous challenge to dedicate resources and time towards data collection and condition assessments.

Climate Change & Extreme Weather

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

Growth

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

The overall asset risk breakdown for Georgian Bluffs' asset inventory is portrayed in the figure below.

Figure 9 Overall Asset Risk Breakdown

1 - 4 Very Low	5 - 7 Low	8 - 9 Moderate	10 - 14 High	15 - 25 Very High
$99,137,237 (23%)	$106,859,693 (25%)	$42,104,518 (10%)	$152,392,351 (35%)	$34,318,002 (8%)

Reviewing the list of very high-risk assets to evaluate how best to mitigate the level of risk the Township is experiencing will help advance Georgian Bluffs' asset management program.

Levels of Service

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

Strategic Plan

Georgian Bluffs' strategic plan was developed in 2024 with an effective date of 2025 – 2030.

Vision

This is Georgian Bluffs. Deeply rooted. Sustainably growing. And a bright vision for the future of our community.

Values

Community - We build connections that bring people together. We collaborate to create a sense of belonging for all. We make Georgian Bluffs a better place.

Service - We put the residents at the heart of all decisions and actions. We proudly act as the caretakers of the resources of Georgian Bluffs. We are known for being responsive, accessible and reliable.

Respect - We appreciate each person's unique contributions and welcome diverse perspectives. We treat others with compassion, understanding and fairness. We create a supportive environment and engage with others considerately.

Integrity - We hold ourselves accountable. We do what we say we are going to do. We take responsibility for our actions.

Service Delivery Values

As a guide to developing and measuring service delivery, service delivery values were identified that align staff work practices with community expectations. The corporate service statement that staff developed is as follows:

The Township of Georgian Bluffs is committed to providing service levels that are sustainable, reliable and that are delivered with accountably and integrity.

Figure 10: Service Delivery Values

All the community and technical levels of service will be directly linked to the level of service statement through ensuring sustainability and meeting regulatory requirements for each asset category outlined in the appendix.

Georgian Bluffs Climate Profile

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

Higher Average Annual Temperature:

- Between the years 1971 and 2000 the annual average temperature was 6.6 ºC
- Under a high emissions scenario, the annual average temperatures are projected to increase by 2.6 ºC by the year 2050 and by over 3.8 ºC by the end of the century.

Increase in Total Annual Precipitation:

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

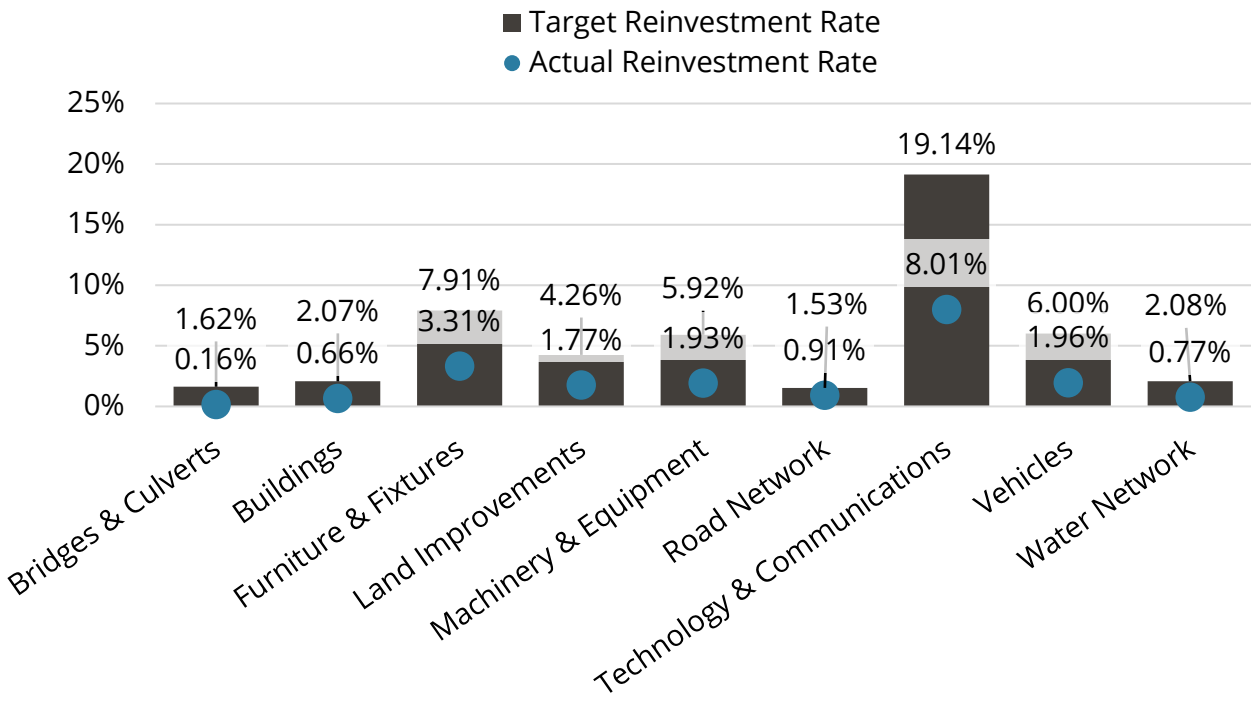
Increase in Frequency of Extreme Weather Events:

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

Reinvestment Rate

The graph below depicts funding gaps or surpluses by comparing target vs actual reinvestment rate. To meet the long-term replacement needs, the Township is recommended to be allocating approximately $7.5 million annually, for a target reinvestment rate of 1.73%. Actual annual spending on infrastructure totals approximately $3.5 million, for an actual reinvestment rate of 0.81%.

Figure 11 Target vs Actual Reinvestment Rates



Impacts of Growth

Understanding the key drivers of growth and demand will allow the Township to plan for new infrastructure effectively, and the upgrade or disposal of existing infrastructure. Increases or decreases in demand can affect what assets are needed and what level of service meets the needs of the community.

The census of population for the Township of Georgian Bluffs highlighted several key facts. First, the Township is home to over 11k individuals, and that the 2016-2021 period saw growth of 5.9% slightly higher than the provincial average.

Table 3 Georgian Bluffs & Ontario Census Information

Census Characteristic	Georgian Bluffs	Ontario
Population 2021	11,100	14,223,942
Population Change 2016-2021	5.9%	5.8%
Total Private Dwellings	5,269	5,929,250
Population Density	18.5/km^2	15.9/km^2
Land Area	599.96 km^2	892,411.76 km^2

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

Financial Strategy

Financial Strategy Overview

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

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

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

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

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

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

Annual Capital Requirements

The annual requirements represent the amount the Township should allocate annually to each asset category to meet replacement needs as they arise, prevent infrastructure backlogs, and achieve long-term sustainability. For most asset categories the annual requirement has been calculated based on a "replacement only" scenario, in which capital costs are only incurred at the construction and replacement of each asset.

However, for the road network lifecycle management strategies have been developed to identify costs that are realized through strategic rehabilitation and renewal. The development of these strategies allows for a comparison of potential cost avoidance.

The following table compares two scenarios:

Replacement Only Scenario: Based on the assumption that assets deteriorate and – without regularly scheduled maintenance and rehabilitation – are replaced at the end of their service life.
Lifecycle Strategy Scenario: Based on the assumption that lifecycle activities are performed at strategic intervals to extend the service life of assets until replacement is required.

Table 4 Road Network Annual Capital Requirement Comparison

Asset Segment	Annual Requirements (Replacement Only)	Annual Requirements (Lifecycle Strategy)	Difference
Asphalt Roads	$1,771,602	$1,771,602	$0
Concrete Roads	$11,248	$11,248	$0
Surface Treated Roads	$3,179,579	$2,670,900	$508,679
Guiderails	$11,558	$11,558	$0
Sidewalks	$11,308	$11,308	$0
Signs	$19,509	$19,509	$0
Streetlights	$38,010	$38,010	$0
Total	**$5,042,814**	**$4,534,134**	**$508,679**

The implementation of a proactive lifecycle strategy for surface treated roads, leads to a potential annual cost avoidance of approximately $500 thousand. This represents a reduction of the annual capital requirement for paved roads of 10%.

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

Table 5 outlines the total average annual capital requirements for existing assets in each asset category. Based on a replacement cost of $434.8 million, annual capital requirements total approximately $7.5 million for all the asset categories analysed.

The table also illustrates the system-generated, equivalent target reinvestment rate (TRR), calculated by dividing the annual capital requirements by the total replacement cost of each category. The cumulative target reinvestment for these categories is estimated at 1.73%.

Table 5 Average Annual Capital Requirements

Asset Category	Replacement Cost	Annual Capital Requirements	Target Reinvestment Rate
Bridges & Culverts	$59,607,183	$968,331	1.62%
Buildings	$26,056,580	$538,602	2.07%
Furniture & Fixtures	$172,583	$13,655	7.91%
Land Improvements	$1,912,535	$81,386	4.26%
Machinery & Equipment	$2,839,196	$167,999	5.92%
Road Network	$296,480,730	$4,534,134	1.53%

Technology & Communications	$336,670	$64,431	19.14%
Vehicles	$4,371,755	$262,366	6.00%
Water Network	$43,034,568	$895,783	2.08%
Total	**$434,811,800**	**$7,526,688**	**1.73%**

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

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

Current Funding Levels

Table 6 summarizes how current capital funding levels compare with funding required for each asset category. At existing levels, the Township is funding 46% of its annual capital requirements for all infrastructure analyzed. This creates a total annual funding deficit of $4 million.

Table 6 Current Funding Position vs Required Funding

	Annual Capital Requirements	Annual Funding Available	Annual Deficit	Funding Level
All Assets	$7,526,688	$3,491,703	$4,034,985	46%

Closing the Gap

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

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

Full Funding Requirements Tax Revenues

In 2024, Georgian Bluffs will have an annual tax revenue of $12,920,075. As illustrated in the following table, without consideration of any other sources of revenue or cost containment strategies, full funding would require a 25.3% tax change over time.

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

Table 7 Phasing in Annual Tax Increases

Total % Increase Needed in Annual Property Taxation Revenues	Phase-in Period			
	5 Years	10 Years	15 Years	20 Years
25.3%	4.6%	2.3%	1.5%	1.1%

Funding 100% of annual capital requirements ensures that major capital events, including replacements, are completed as required. Under this scenario, projects are unlikely to be deferred to future years. This delivers the highest asset performance and customer levels of service.

Reallocating debt payments as they become available is a financial strategy that Georgian Bluffs has considered utilizing once their loans have been paid. That strategy has been included in the strategy values above in Table 7.

Full Funding Requirements - Utility Rate Revenues

For 2024, Georgian Bluffs' forecasted water rate revenues total $1,456,750. Annual capital requirements for the water network total $895,783, against available funding of $329,600. This creates a funding deficit of $566,183. To close this annual gap, the Township's water revenues would need to increase.

To achieve this increases, several scenarios have been developed using phase-in periods ranging from five to twenty years. As with tax revenues, short phase-in periods may require excessive rate increases, whereas more protracted timeframes may lead to larger backlogs and more unpredictable spending on emergency repairs and replacements.

Funding 100% of annual capital requirements ensures that major capital events, including replacements, are completed as required. Table 8 illustrates the % annual increase needed for the water network.

Table 8 Phasing in Rate Increases

Total % Increase Needed in Annual Water Rate Revenues	Phase In Period			
	5 Years	10 Years	15 Years	20 Years
38.9%	6.8%	3.3%	2.2%	1.7%

Use of Debt

For reference purposes, the following table outlines the premium paid on a project if financed by debt. For example, a $1M project financed at 3.0% over 15 years would result in a 26% premium or $260,000 of increased costs due to interest payments. For simplicity, the table does not consider the time value of money or the effect of inflation on delayed projects. Although, the use of debt will result in higher costs, debt can be a way to have future residents pay for infrastructure that they use rather than today's residents.

Table 9 Premiums for Debt Financing Projects

Interest Rate	Number of Years Financed					
	5	10	15	20	25	30
7.0%	22%	42%	65%	89%	115%	142%
6.5%	20%	39%	60%	82%	105%	130%
6.0%	19%	36%	54%	74%	96%	118%
5.5%	17%	33%	49%	67%	86%	106%
5.0%	15%	30%	45%	60%	77%	95%
4.5%	14%	26%	40%	54%	69%	84%
4.0%	12%	23%	35%	47%	60%	73%
3.5%	11%	20%	30%	41%	52%	63%
3.0%	9%	17%	26%	34%	44%	53%

Recommendations and Key Considerations

Financial Strategies

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

- implementing a 1.5% annual tax increase over a 15-year phase-in period and allocating the full increase in revenue towards capital funding
- implementing a 2.2% annual rate increase over a 15-year phase-in period for water and allocating the full increase in revenue towards capital funding. The 2025 rate study will be utilized to review and develop the final strategy.
- continued allocation of OCIF and CCBF funding as previously outlined
- using risk frameworks and staff judgement to prioritize projects, particularly to aid in elimination of existing infrastructure backlogs

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

Asset Data

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

Risk and Levels of Service

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

Appendix A: Road Network

State of the Infrastructure

Georgian Bluffs' road network comprises the largest share of its infrastructure portfolio, with a current replacement cost of $296 million, distributed primarily between asphalt, surface treatment, and gravel roads.

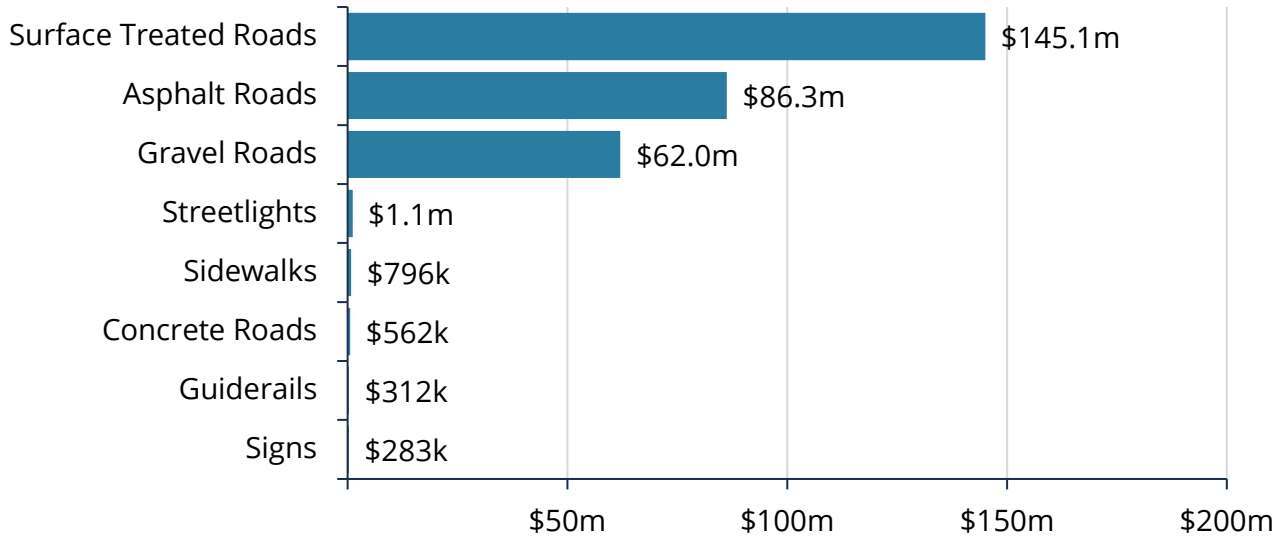
The state of the infrastructure for the road network is summarized below.

Replacement Cost	Condition	Financial Capacity	
$296 million	Fair (48%)	Annual Requirement:	$4,534,134
		Funding Available:	$2,687,641
		Annual Deficit:	$1,846,494

Inventory & Valuation

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

Figure 12 Road Network Replacement Value by Segment

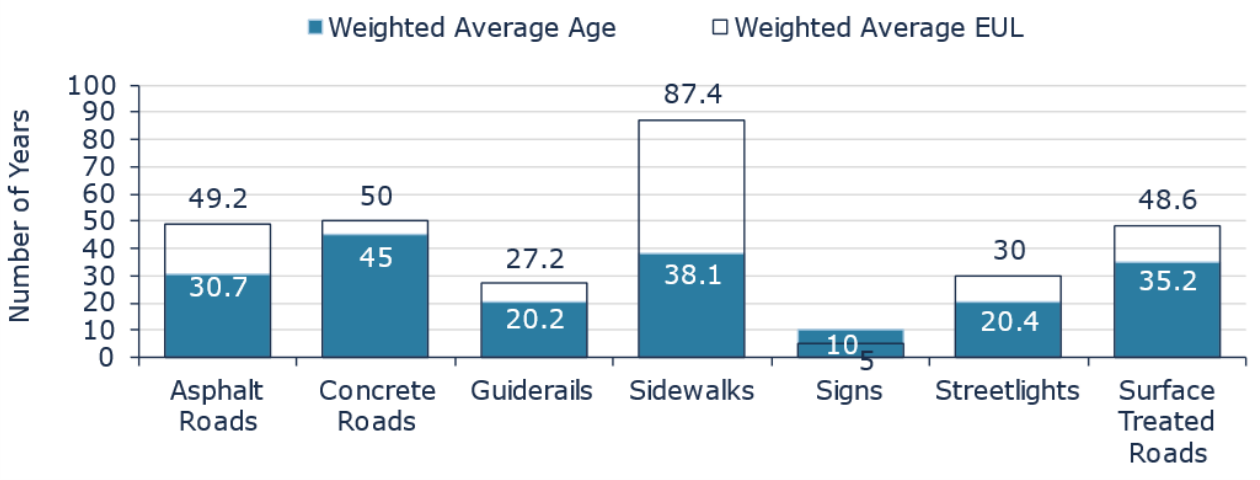


Each asset's replacement cost should be reviewed periodically to determine whether adjustments are needed to more accurate represent realistic capital requirements.

Asset Condition & Age

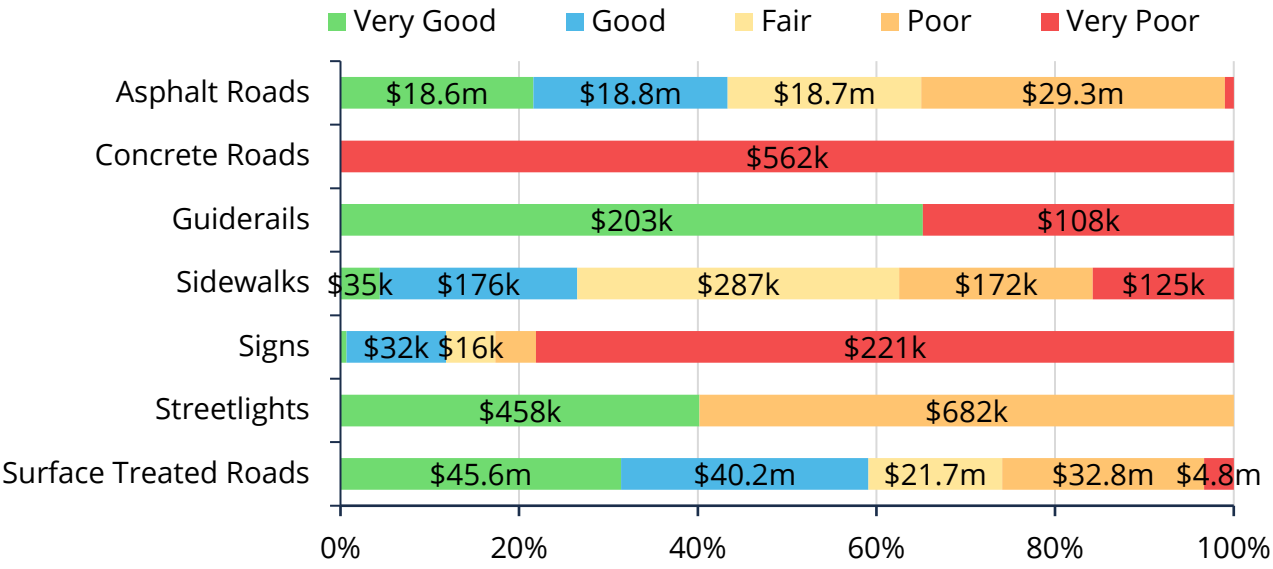
The graph below identifies the average age, and the estimated useful life for each asset segment. It is all weighted by replacement cost.

Figure 13 Road Network Average Age vs Average EUL



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

Figure 14 Road Network Condition Breakdown



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

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

Current Approach to Condition Assessment

Accurate and reliable condition data allows staff to determine the remaining service life of assets and identify the most cost-effective approach to managing assets. The Township is currently developing their approach to assessing their road assets in the field.

The condition scale for roads utilized is from 0 to 100 from Very Poor to Very Good.

Lifecycle Management Strategy

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

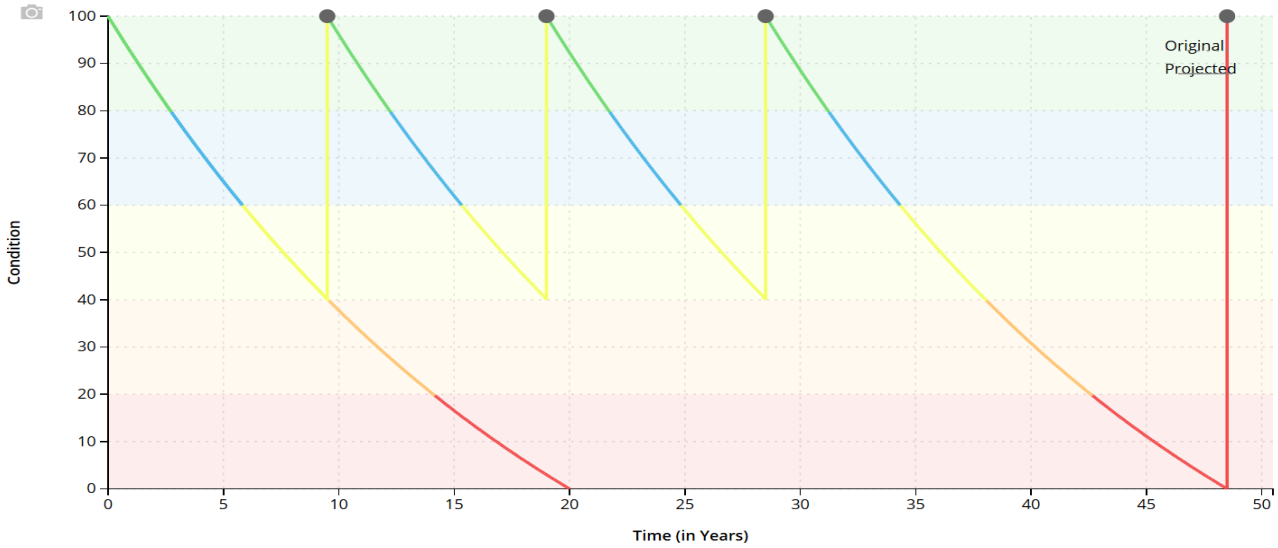
The following lifecycle strategies shown in the table below have been developed as a proactive approach to managing the lifecycle of municipally owned roads. Instead of allowing the roads to deteriorate until replacement is required, strategic rehabilitation is expected to extend the service life of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

Table 10 Road Network Current Lifecycle Strategy

Activity Type	Description of Current Strategy
Maintenance	• winter control activities • gravel roads are graded and dust control applied as required and additional gravel application is done every 5 years
Rehabilitation/ Replacement	• prioritization is based on road usage • activities are more reactive for mill and pave work on asphalt roads only

Lifecycle models used to estimate the cost avoidance to annual capital requirement are shown below in Figure 15 for surface treated roads. Only surface treated roads are utilizing lifecycle activities

Figure 15 Surface Treated Roads (LCB) Road Lifecycle Model



Forecasted Capital Requirements

Figure 16 illustrates the cyclical short-, medium- and long-term infrastructure rehabilitation and replacement requirements for the Township's road network. This analysis was run until 2123 to capture at least one iteration of replacement for the longest-lived asset in the asset register.

Georgian Bluffs' average annual requirements (red dotted line) total $4.5 million for all assets in the road network. Although actual spending may fluctuate substantially from year to year, this figure is a useful benchmark value for annual capital expenditure targets (or allocations to reserves) to ensure projects are not deferred and replacement needs are met as they arise. The chart illustrates capital needs through the forecast period in 5-year intervals.

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

Figure 16 Road Network Forecasted Capital Replacement Requirements

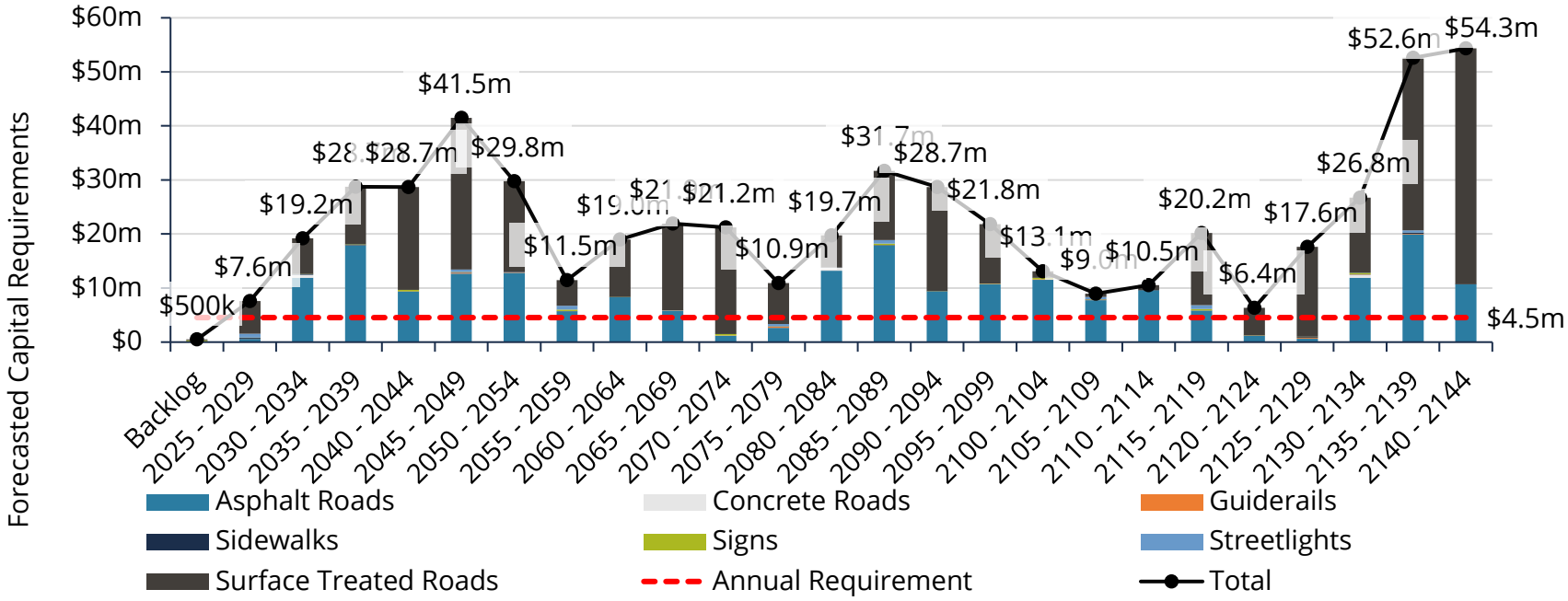


Table 11 below summarizes the projected cost of lifecycle activities (rehabilitation and replacement) that may need to be undertaken over the next 10 years to support current levels of service. These projections are generated in Citywide and rely on the data available in the asset register.

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

Table 11 Road Network System-generated 10-Year Capital Costs

Segment	Backlog	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034
Asphalt Roads	$0	$570k	$0	$0	$0	$0	$294k	$0	$608k	$6.0m	$5.0m
Concrete Roads	$0	$0	$0	$0	$0	$0	$562k	$0	$0	$0	$0
Guiderails	$108k	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Sidewalks	$45k	$15k	$77k	$58k	$71k	$19k	$54k	$46k	$0	$51k	$0
Signs	$221k	$13k	$9k	$7k	$5k	$12k	$15k	$0	$0	$0	$0
Streetlights	$0	$0	$0	$682k	$0	$0	$0	$0	$0	$0	$0
Surface Treated Roads	$126k	$1.3m	$614k	$1.2m	$840k	$2.1m	$3.1m	$92k	$103k	$1.7m	$268k
Total	$500k	$1.9m	$701k	$1.9m	$916k	$2.1m	$4.1m	$138k	$711k	$7.8m	$5.2m

Risk & Criticality

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

Figure 17 Road Network Risk Breakdown

1 - 4	5 - 7	8 - 9	10 - 14	15 - 25
Very Low	**Low**	**Moderate**	**High**	**Very High**
$54,984,069	$87,004,250	$29,421,943	$120,228,841	$4,841,627
(19%)	(29%)	(10%)	(41%)	(2%)

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

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

Levels of Service

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

Community Levels of Service

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

Table 12 Road Network Community Levels of Service

Service Attribute	Qualitative Description	Current LOS
Regulatory	Description, which may include maps, of the road network in the Township and its level of connectivity	See Figure 18
Reliable	Description or images that illustrate the different levels of road class pavement condition	See Figure 2 for the description of road condition

Technical Levels of Service

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

Table 13 Road Network Technical Levels of Service

Service Attribute	Technical Metric	Current LOS
Regulatory	Lane-km of arterial roads (MMS classes 1 and 2) per land area (km/km^2)	0 km/km^2
	Lane-km of collector roads (MMS classes 3 and 4) per land area (km/km^2)	0.168 km/km^2
	Lane-km of local roads (MMS classes 5 and 6) per land area (km/km^2)	0.445 km/km^2
Reliable	Average pavement condition index for paved roads in the municipality	61% - Good
	Average surface condition for unpaved roads in the municipality (e.g., excellent, good, fair, poor)	Fair
	Average Condition Rating	61%
	Average Asset Risk	8.39 (Moderate)
Sustainable	Actual reinvestment rate	0.9%
	Target reinvestment rate	1.6%

Figure 18 Map of Roads

Appendix B: Bridges & Culverts

State of the Infrastructure

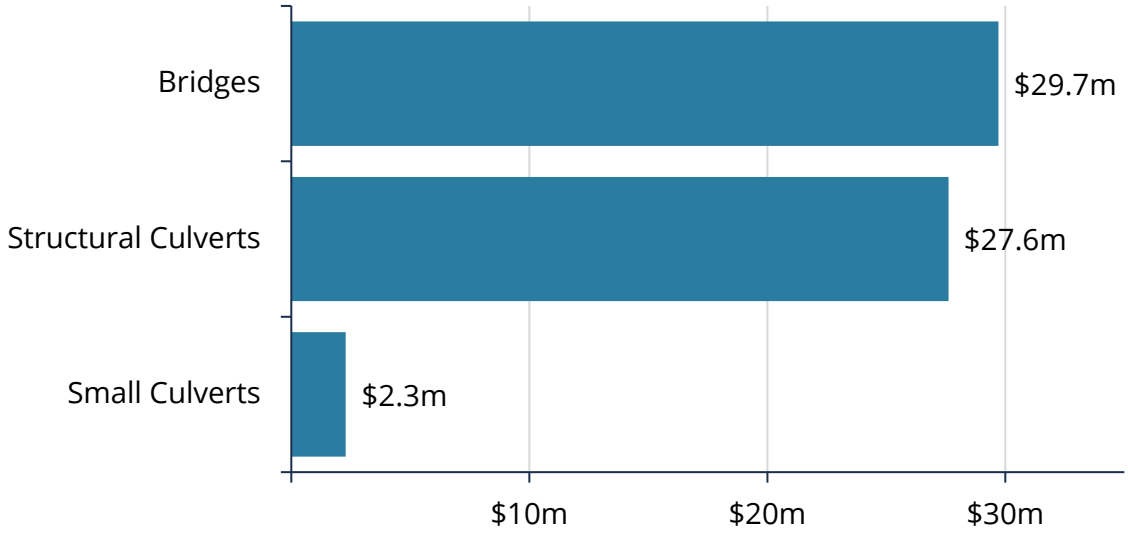
Bridges & culverts represent a critical portion of the transportation services provided to the community. The state of the infrastructure for bridges & culverts is summarized in the following table.

Replacement Cost	Condition	Financial Capacity	
$59.6 million	Good (62%)	Annual Requirement:	$968,331
		Funding Available:	$96,898
		Annual Deficit:	$871,433

Inventory & Valuation

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

Figure 19 Bridges & Culverts Replacement Cost by Segment

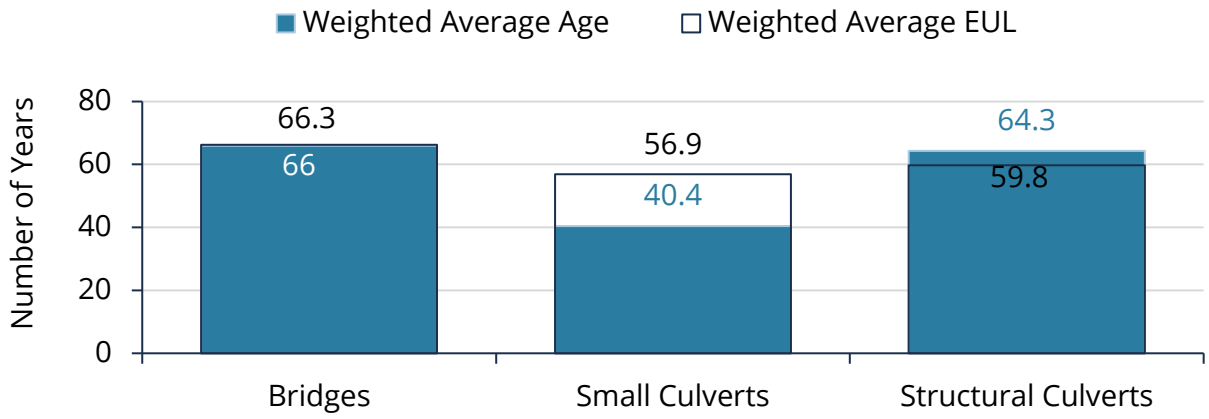


Each asset's replacement cost should be reviewed periodically to determine whether adjustments are needed. This can be included in the Ontario Structures Inspection Manual (OSIM) inspections as the replacement cost is part of the calculation for the bridge condition index (BCI).

Asset Condition & Age

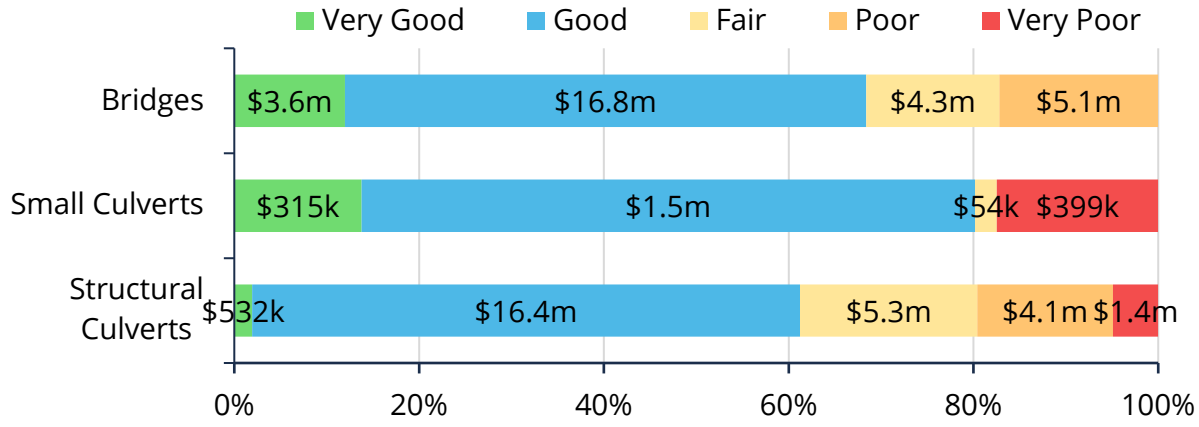
The graph below identifies the average age and the estimated useful life for each asset segment in the bridges & culverts. The values are weighted based on replacement cost.

Figure 20 Bridges & Culverts Average Age vs Average EUL



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

Figure 21 Bridges & culverts Condition Breakdown



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

Current Approach to Condition Assessment

Accurate and reliable condition data allows staff to determine the remaining service life of assets and identify the most cost-effective approach to managing assets. Georgian Bluff's current approach is to assess all bridges and structural culverts every 2 years in accordance with the Ontario Structure Inspection Manual (OSIM). The most recent assessment was completed in 2024 by Pearson Engineering.

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

Figure 22 Bridge & Culvert Condition Images

Main Street Bridge (BCI – 74 Good)

Photo 1 - View of Structure Facing West.

Photo 2 - View of Structure Facing North.

Sunny Valley Park Culvert (BCI – 70 Good)

Photo 1 - View of Structure Facing East.

Photo 2 - View of South Culvert Ends.

Sideroad 3 Bridge (BCI – 34 Poor)

Photo 1 - View of Structure Facing South

Photo 2 - View of Structure Facing East.

Gleason Culvert (BCI – 33 Poor)

Photo 1 - View of Structure Facing West.

Photo 2 - View of Structure Facing South.

Lifecycle Management Strategy

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

Table 14 Bridges & culverts Current Lifecycle Strategy

Activity Type	Description of Current Strategy
Maintenance	All maintenance and repair activities are driven by the results of inspections competed according to the Ontario Structure Inspection Manual (OSIM) as well as internal staff monitoring
Rehabilitation/ Replacement	Replacement occurs when the OSIM inspection recommends it, and funding is available

Forecasted Capital Requirements

Figure 23 illustrates the cyclical short-, medium- and long-term infrastructure rehabilitation and replacement requirements for the Township's bridges & culverts. These projections are based on asset replacement costs and age analysis. They are designed to provide a long-term, portfolio-level overview of capital needs and should be used to support improved financial planning over several decades.

The analysis was run until 2098 to capture at least one iteration of replacement for the longest-lived asset in the asset register. Georgian Bluffs' average annual requirements (red dotted line) for bridges & culverts total $968 thousand. Although actual spending may fluctuate substantially from year to year, this figure is a useful benchmark value for annual capital expenditure targets (or allocations to reserves) to ensure projects are not deferred and replacement needs are met as they arise.

Figure 23 Bridges & culverts Forecasted Capital Replacement Requirements

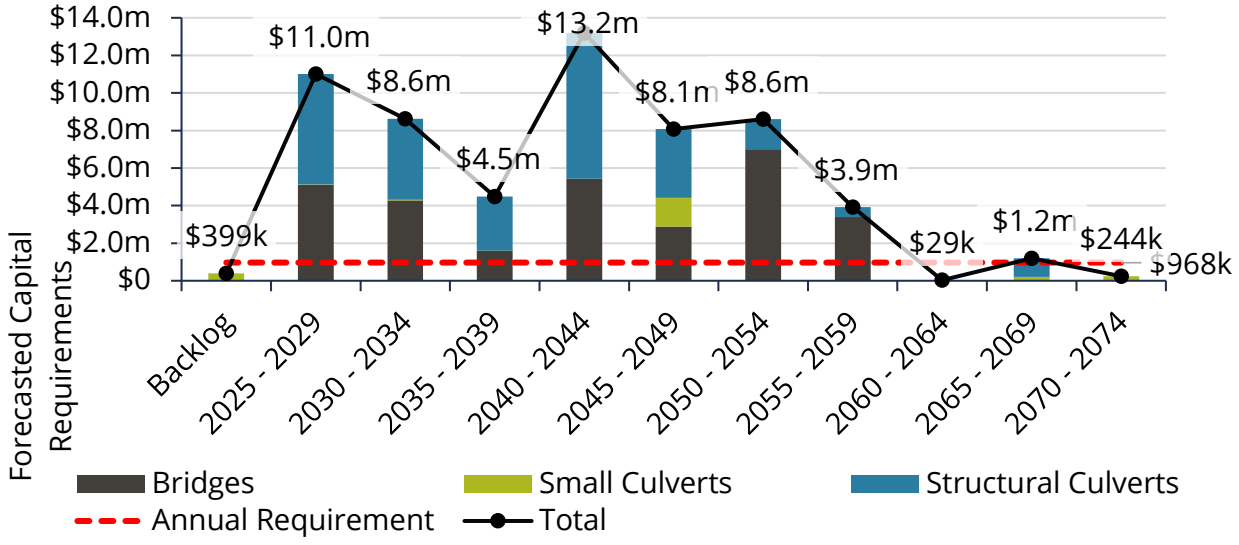


Table 15 below summarizes the projected cost of lifecycle activities (as previously described) that may need to be undertaken over the next 10 years to support current levels of service. These are represented at the major asset level.

Table 15 Bridges & Culverts System-generated 10-Year Capital Costs

Segment	Backlog	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034
Bridges	-	-	-	$1.1m	$1.1m	$2.9m	-	$1.6m	-	-	$2.7m
Small Culverts	$399k	-	-	-	$17k	-	$38k	-	-	-	-
Structural Culverts	-	$1.4m	-	$1.3m	$1.9m	$1.3m	-	$1.0m	$1.5m	$407k	$1.4m
Total	$399k	$1.4m	-	$2.4m	$3.1m	$4.2m	$38k	$2.6m	$1.5m	$407k	$4.1m

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

Risk & Criticality

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

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

Figure 24 Bridges & Culverts Risk Breakdown

1 - 4 Very Low $5,383,695 (9%)	5 - 7 Low $11,960,202 (20%)	8 - 9 Moderate $5,503,180 (9%)	10 - 14 High $22,698,900 (38%)	15 - 25 Very High $14,061,206 (24%)

Levels of Service

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

Community Levels of Service

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

Table 16 Bridges & Culverts Community Levels of Service

Service Attribute	Qualitative Description	Current LOS
Regulatory	Description of the traffic that is supported by municipal bridges (e.g. heavy transport vehicles, motor vehicles, emergency vehicles, pedestrians, cyclists)	The traffic supported by the municipal bridges is varied. Large agricultural equipment, heavy transport vehicles, motor vehicles, emergency vehicles, cyclists and pedestrians all utilize the bridges to travel throughout the Township.
Reliable	Description or images of the condition of bridges and culverts and how this would affect use of the bridges and culverts	See Figure 22 Bridge & Culvert Condition Images

Technical Levels of Service

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

Table 17 Bridges & Culverts Technical Levels of Service

Service Attribute	Technical Metric	Current LOS
Regulatory	% of bridges in the municipality with loading or dimensional restrictions	5 bridges are closed to traffic or have load restrictions
Reliable	Average bridge condition index value for bridges	Good (64)
	Average bridge condition index value for structural culverts	Fair (59)
	Average Condition Rating	60
	Average Asset Risk	9.41 (Moderate)
Sustainable	Actual reinvestment rate	0.16%
	Target reinvestment rate	1.62%

Appendix C: Buildings

State of the Infrastructure

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

- Administrative office
- Cemetery
- Landfill
- Recreation facilities
- Transportation facilities

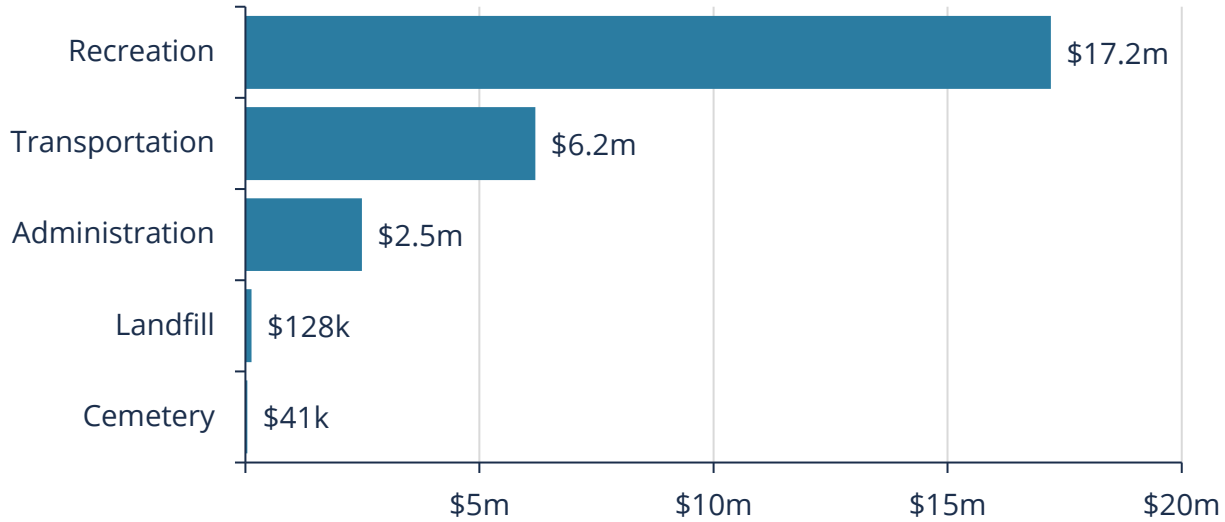
The state of the infrastructure for the buildings is summarized in the following table.

Replacement Cost	Condition	Financial Capacity	
$26 million	Fair (45%)	Annual Requirement:	$538,602
		Funding Available:	$170,714
		Annual Deficit:	$367,889

Inventory & Valuation

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

Figure 25 Buildings Replacement Cost by Segment

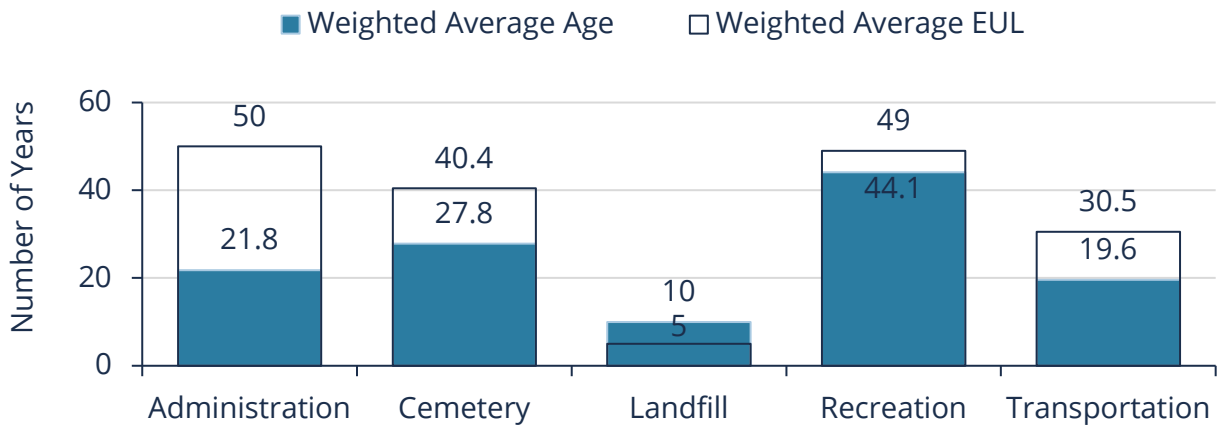


Each asset's replacement cost should be reviewed periodically to determine whether adjustments are needed to represent capital requirements more accurately.

Asset Condition & Age

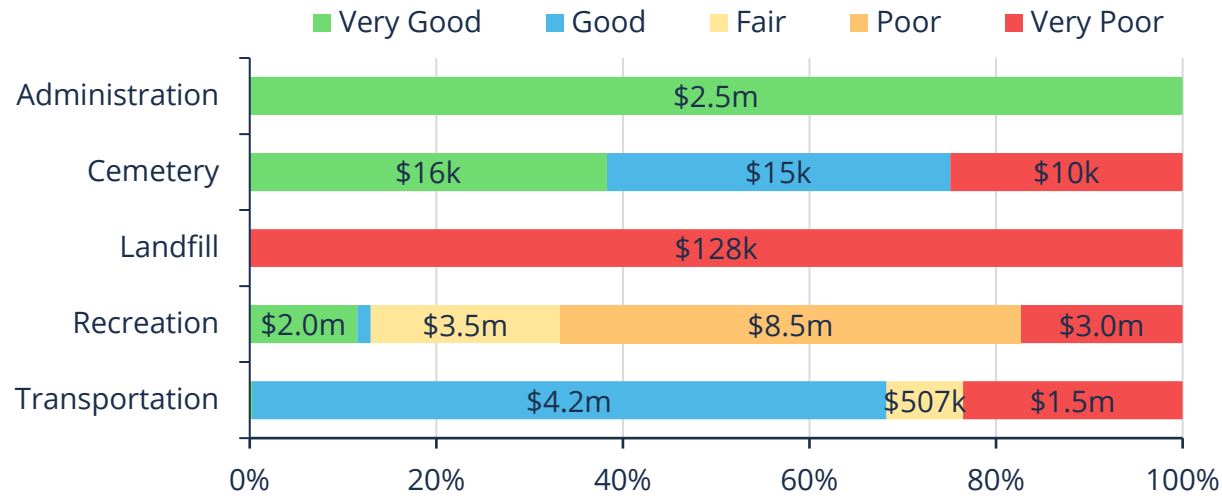
The graph below identifies the average age, and the estimated useful life for each asset segment. The values are weighted based on replacement cost.

Figure 26 Buildings Average Age vs Average EUL



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

Figure 27 Buildings Condition Breakdown



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

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

Current Approach to Condition Assessment

Accurate and reliable condition data allows staff to determine the remaining service life of assets and identify the most cost-effective approach to managing assets. Buildings are repaired as required based on deficiencies identified by outside experts, staff, or residents.

Lifecycle Management Strategy

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

Table 18 Buildings Current Lifecycle Strategy

Activity Type	Description of Current Strategy
Maintenance	Maintenance of buildings is identified by staff in a reactive breakdown response HVAC systems are maintained semi-annually (spring & fall)
Rehabilitation/ Replacement	Without the availability of up-to-date condition assessment information replacement activities are purely reactive in nature

Forecasted Capital Requirements

The annual capital requirement represents the average amount per year that Georgian Bluffs should allocate towards funding rehabilitation and replacement needs. The following graph identifies capital requirements over the next 45 years. This projection is used as it ensures that every asset has gone through one full iteration of replacement. The forecasted requirements are aggregated into 5-year bins and the trend line represents the average capital requirements at $539 thousand.

Figure 28 Buildings Forecasted Capital Replacement Requirements

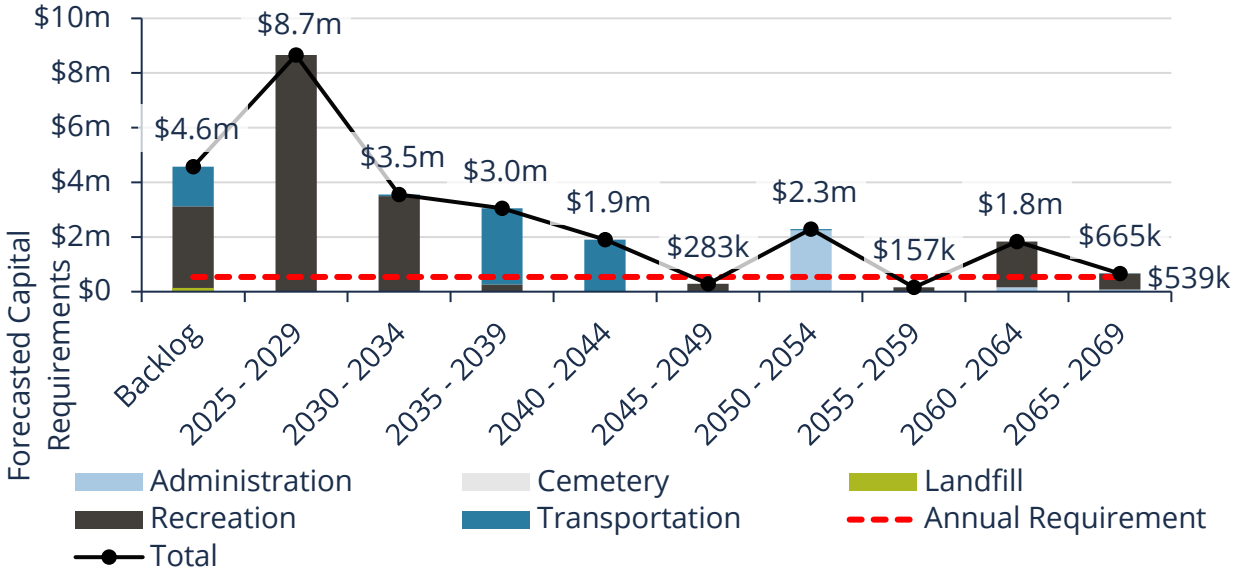


Table 19 below summarizes the projected cost of lifecycle activities (capital activities only) that may need to be undertaken over the next 10 years to support current levels of service.

Table 19 Buildings System-Generated 10-Year Capital Costs

Segment	Backlog	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034
Administration	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Cemetery	$10k	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Landfill	$128k	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Recreation	$3.0m	$0	$0	$8.7m	$0	$0	$3.5m	$9k	$0	$0	$0
Transportation	$1.5m	$0	$0	$0	$0	$0	$0	$0	$41k	$7k	$0
Total	$4.6m	$0	$0	$8.7m	$0	$0	$3.5m	$9k	$41k	$7k	$0

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

Risk & Criticality

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

Figure 29 Buildings Risk Breakdown

1 - 4	5 - 7	8 - 9	10 - 14	15 - 25
Very Low	**Low**	**Moderate**	**High**	**Very High**
$4,521,326	$2,406,824	$2,057,395	$4,110,151	$12,960,884
(17%)	(9%)	(8%)	(16%)	(50%)

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

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

Levels of Service

By comparing the cost, performance (average condition) and risk year-over-year, the Township will be able to evaluate how their services/assets are trending.

Community Levels of Service

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

Table 20 Buildings Community Levels of Service

Service Attribute	Qualitative Description	Current LOS
Scope	Description of the services being provided	The Township's building services provide regulatory and reliable programing while ensuring sustainability in service delivery.

Technical Levels of Service

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

Table 21 Buildings Technical Levels of Service

Service Attribute	Technical Metric	Current LOS
Reliable	Average Asset Risk	12.2 (High)
	Average Condition Rating	Fair (44%)
Sustainable	Actual reinvestment rate	0.9%
	Target reinvestment rate	2.1%

Appendix D: Land Improvements

State of the Infrastructure

Georgian Bluffs' land improvement infrastructure is comprised of cemeteries, landscaping, fence, walkways and parking lots, and parks and sports fields.

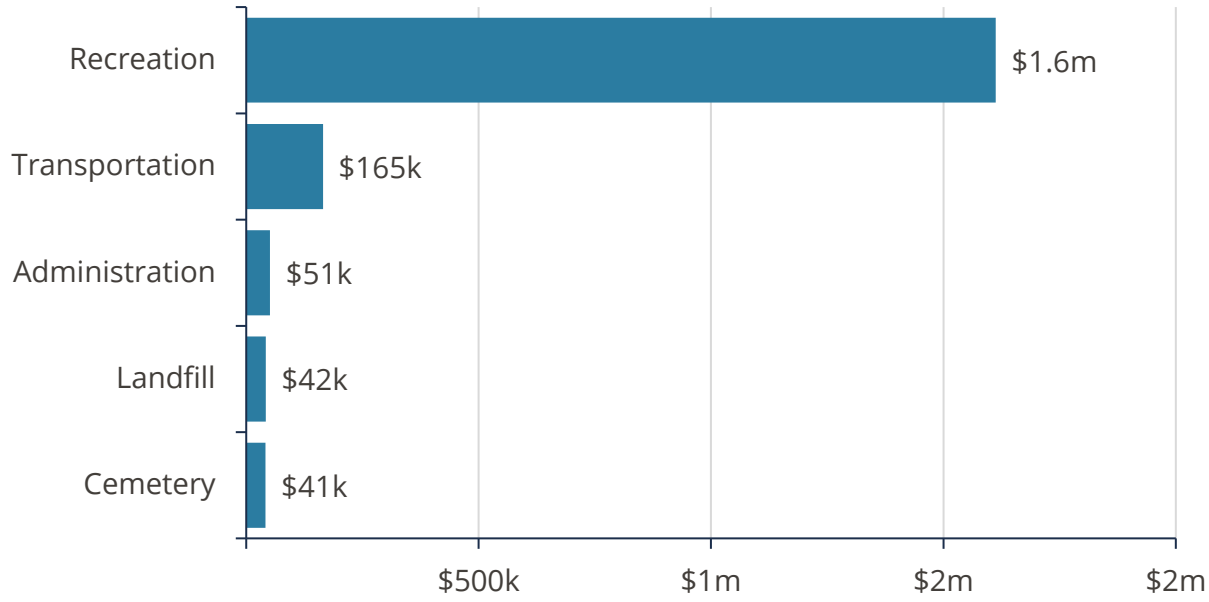
The state of the infrastructure for the land improvements is summarized in the following table.

Replacement Cost	Condition	Financial Capacity	
$1.9 million	Very Good (81%)	Annual Requirement:	$81,386
		Funding Available:	$33,895
		Annual Deficit:	$47,491

Asset Inventory & Valuation

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

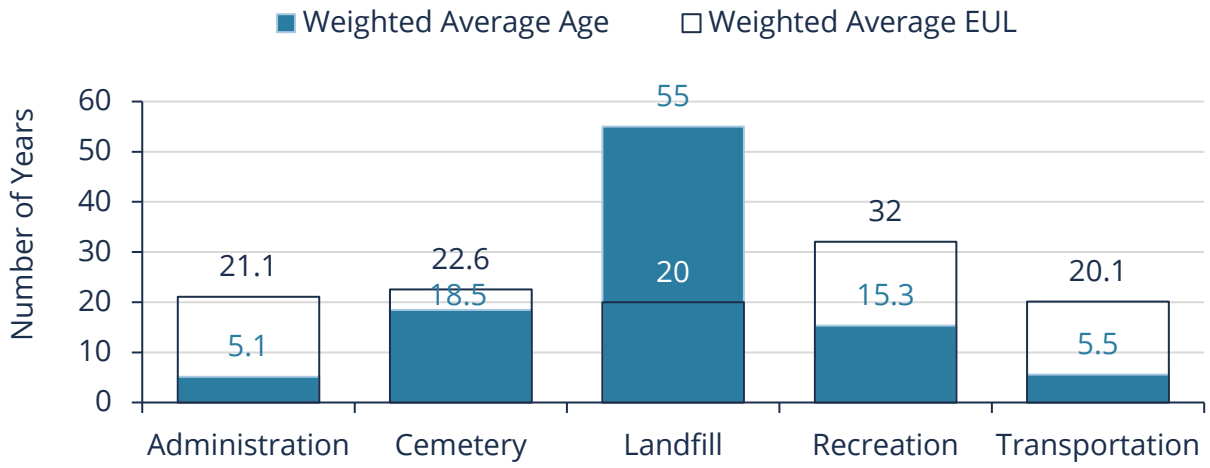
Figure 30 Land Improvements Replacement Cost by Segment



Asset Condition & Age

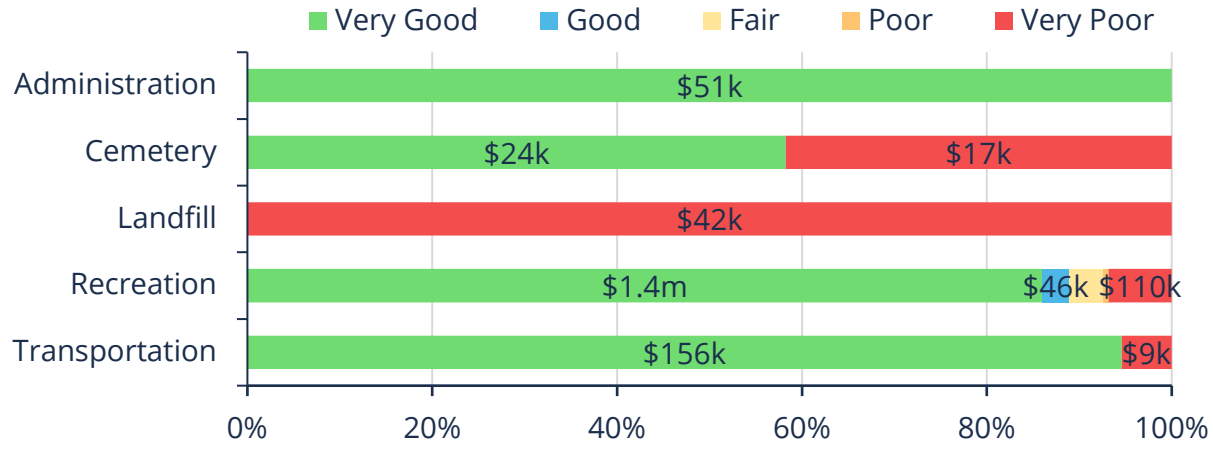
The graph below identifies the average age, and the estimated useful life for each asset segment. The values are weighted based on replacement cost.

Figure 31 Land Improvements Average Age vs Average EUL



Each asset's estimated useful life should also be reviewed periodically to determine whether adjustments need to be made to better align with the observed length of service life for each asset type. The graph below visually illustrates the average condition for each asset segment on a very good to very poor scale.

Figure 32 Land Improvement Condition Breakdown



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

Current Approach to Condition Assessment

Accurate and reliable condition data allows staff to determine the remaining service life of assets and identify the most cost-effective approach to managing assets. Due to the varied nature of the asset category the assets are managed individually by each department responsible.

Lifecycle Management Strategy

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

Table 22 Land Improvements current lifecycle strategy

Activity Type	Description of Current Strategy
Maintenance	All playgrounds are inspected as per CSA recommendations
Rehabilitation/ Replacement	Replacement activities are purely reactive in nature

Forecasted Capital Requirements

The figure below illustrates the cyclical short-, medium- and long-term infrastructure replacement requirements for the Township's land improvement infrastructure. This analysis was run until 2109 to capture at least one iteration of replacement for the longest-lived asset in the asset register. Georgian Bluffs' average annual requirements (red dotted line) total $81 thousand for all land improvement assets. Although actual spending may fluctuate substantially from year to year, this figure is a useful benchmark value for annual capital expenditure targets (or allocations to reserves) to ensure projects are not deferred and replacement needs are met as they arise.

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

Figure 33 Land Improvements Forecasted Capital Replacement Requirements

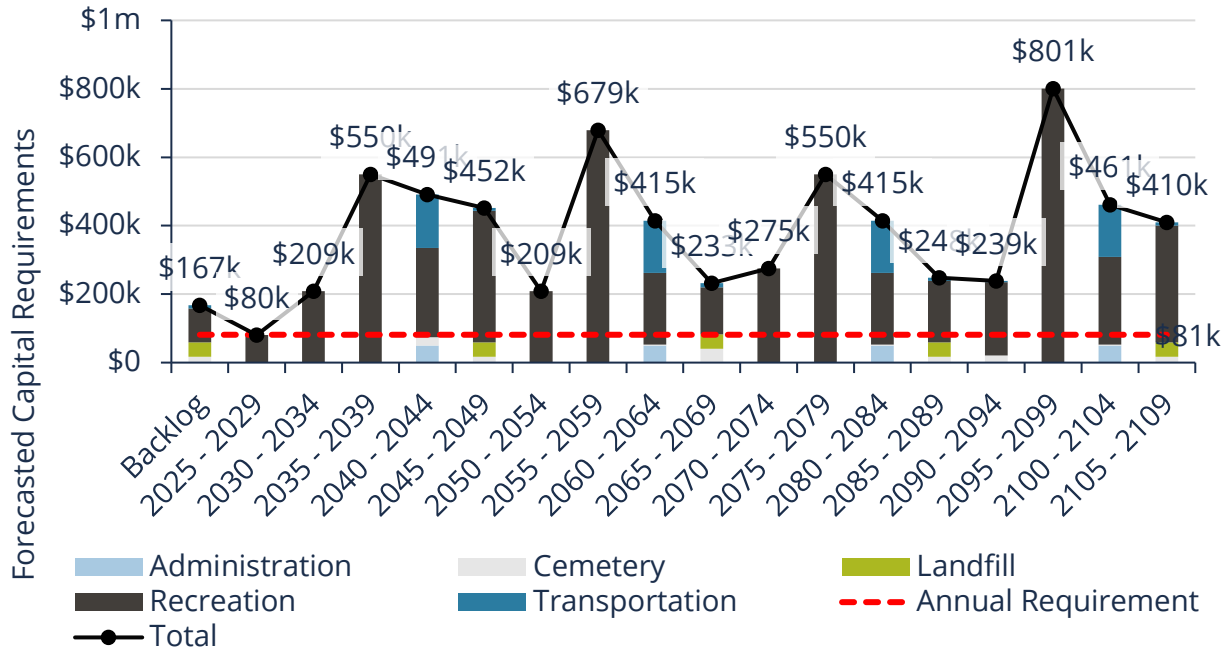


Table 23 below summarizes the projected cost of lifecycle activities (capital replacement only) that will need to be undertaken over the next 10 years to support current levels of service. These projections rely on the data available in the asset register, which was limited to asset age, replacement cost, and useful life.

Table 23 Land Improvements System-Generated 10-Year Capital Costs

Segment	Backlog	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034
Administration	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Cemetery	$17k	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Landfill	$42k	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Recreation	$94k	$21k	$0	$0	$60k	$0	$46k	$0	$0	$163k	$0
Transportation	$9k	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Total	$162k	$21k	$0	$0	$60k	$0	$46k	$0	$0	$163k	$0

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

Risk & Criticality

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

Figure 34 Land Improvement Risk Breakdown

1 - 4	5 - 7	8 - 9	10 - 14	15 - 25
Very Low	**Low**	**Moderate**	**High**	**Very High**
$674,201	$990,668	-	$141,114	$106,552
(35%)	(52%)	(0%)	(7%)	(6%)

This is a high-level model developed by municipal staff and should be reviewed and adjusted to reflect an evolving understanding of both the probability and consequences of asset failure. The identification of critical assets allows the Township to determine appropriate risk mitigation strategies and treatment options.

Levels of Service

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

Community Levels of Service

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

Table 24 Land Improvements Community Levels of Service

Service Attribute	Qualitative Description	Current LOS
Scope	Description of the services being provided	The Township's land improvements provide reliable and sustainable service while ensuring regulatory requirements are met.

Technical Levels of Service

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

Table 25 Land Improvements Technical Levels of Service

Service Attribute	Technical Metric	Current LOS
Reliable	Average Asset Risk	5.59 (Low)
	Average Condition Rating	Very Good (82%)
Sustainable	Actual reinvestment rate	1.8%
	Target reinvestment rate	4.2%

Appendix E: Technology & Communications

State of the Infrastructure

To maintain the quality stewardship of Georgian Bluffs' infrastructure and support the delivery of services, municipal staff own and employ various types of technology & communications. This includes:

- Phone system
- Computers
- Printers
- Software
- Mobile radios
- Security Systems

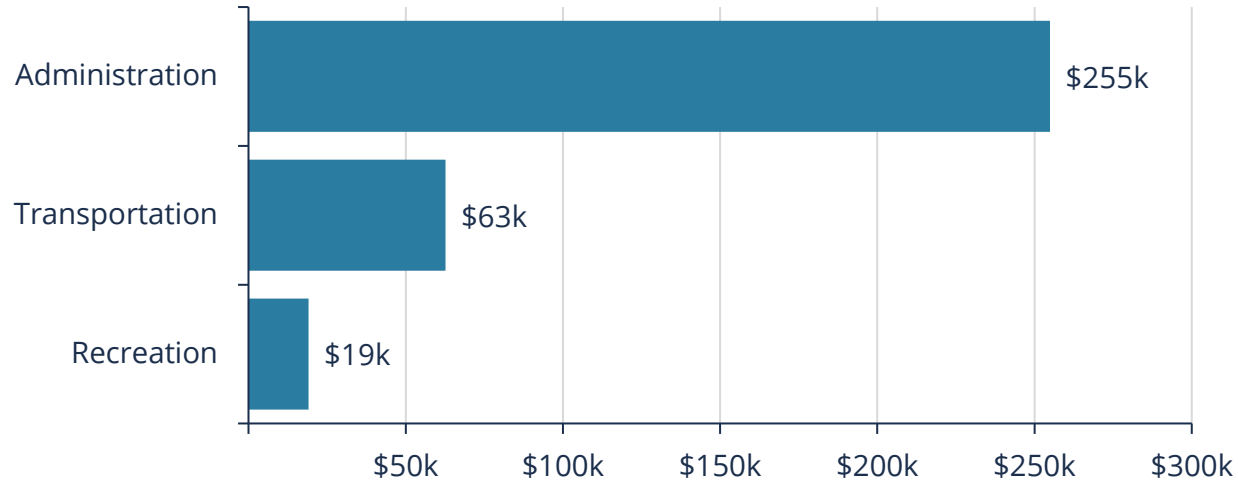
The state of the infrastructure for technology & communications is summarized in the following table.

Replacement Cost	Condition	Financial Capacity	
$0.3 million	Poor (30%)	Annual Requirement:	$64,431
		Funding Available:	$26,951
		Annual Deficit:	$37,479

Inventory & Valuation

The graph below displays the total replacement cost of each asset segment in the Georgian Bluffs' technology & communications inventory.

Figure 35 Technology & communications Replacement Costs

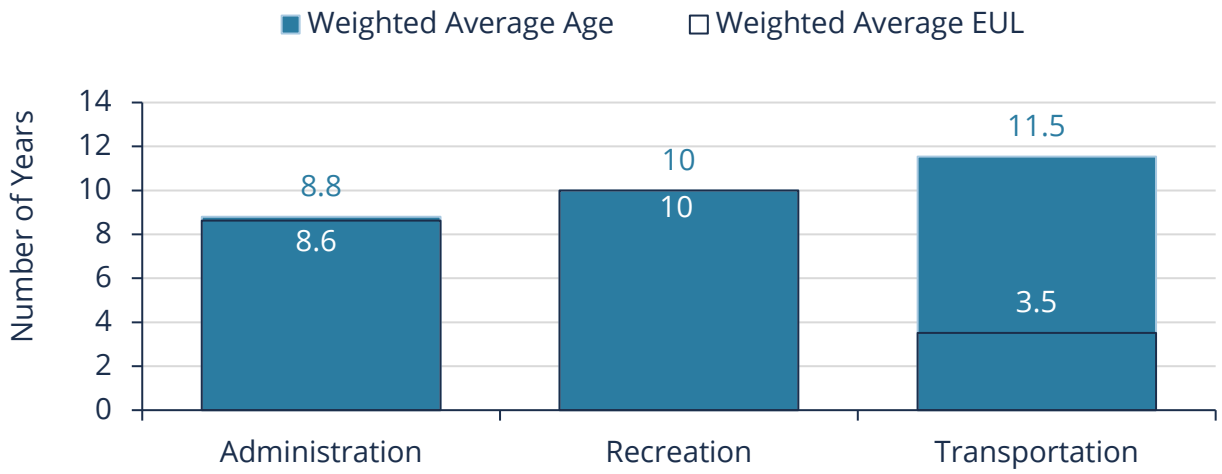


Each asset's replacement cost should be reviewed periodically to determine whether adjustments are needed to more accurate represent capital requirements.

Asset Condition & Age

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

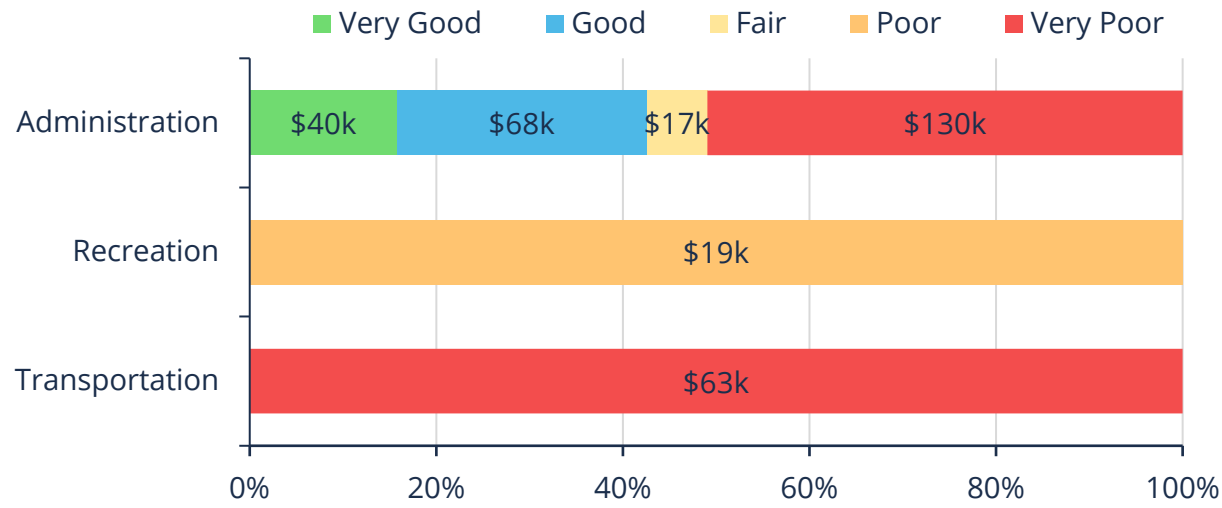
Figure 36 Technology & communications Average Age vs Average EUL



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

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

Figure 37 Technology & communications Condition Breakdown



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

Current Approach to Condition Assessment

Accurate and reliable condition data allows staff to determine the remaining service life of assets and identify the most cost-effective approach to managing assets. The current approach is varied because of the broad range of types of technology & communications assets included in this category.

Lifecycle Management Strategy

The condition or performance of most assets will deteriorate over time. To ensure that municipal assets are performing as expected and meet the needs of customers, it is important to establish a lifecycle management strategy to proactively manage asset deterioration. Georgian Bluffs currently replaces their technology & communications assets at end of expected useful life.

Forecasted Capital Requirements

The following graph identifies capital requirements over the next 45 years. This projection is used as it ensures that every asset has gone through one full iteration of replacement. The forecasted requirements are aggregated into 5-year bins and the trend line represents the average annual capital requirements at $64 thousand.

Figure 38 Technology & Communications Forecasted Capital Replacement Requirements

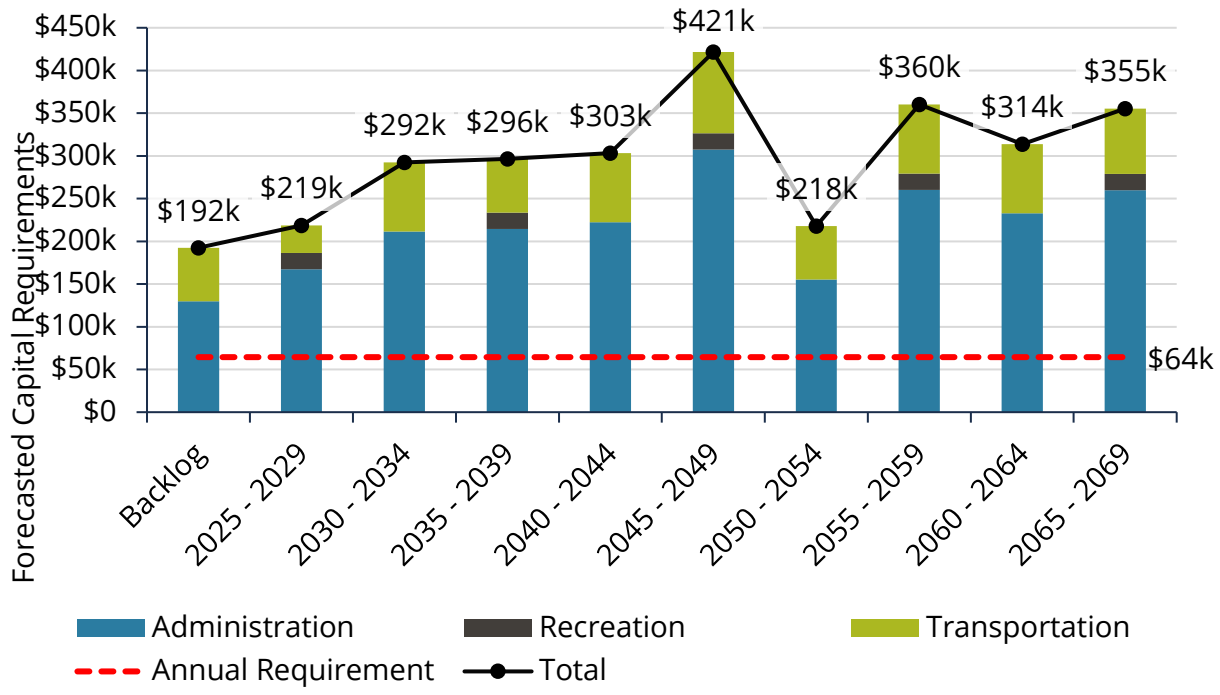


Table 26 below summarizes the projected cost of lifecycle activities (capital replacement only) that may need to be undertaken over the next 10 years to support current levels of service. These projections are generated in Citywide and rely on the data available in the asset register.

Table 26 Technology & Communications System-Generated 10-Year Capital Costs

Segment	Backlog	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034
Administration	$130k	$17k	$9k	$59k	$46k	$37k	$64k	$65k	$0	$37k	$46k
Recreation	$0	$19k	$0	$0	$0	$0	$0	$0	$0	$0	$0
Transportation	$63	$0	$0	$0	$18k	$14k	$30k	$18k	$0	$14k	$18k
Total	$192k	$36k	$9k	$59k	$64k	$51k	$94k	$83k	$0	$51k	$64k

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

Risk & Criticality

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

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

Figure 39 Technology & Communications Risk Breakdown

1 - 4	5 - 7	8 - 9	10 - 14	15 - 25
Very Low	**Low**	**Moderate**	**High**	**Very High**
$49,112	$69,188	-	$43,916	$174,454
(15%)	(21%)	(0%)	(13%)	(52%)

Levels of Service

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

Community Levels of Service

The qualitative descriptions that determine the community levels of service provided by technology & communications are outlined below:

Table 27 Technology & Communications Community Levels of Service

Service Attribute	Qualitative Description	Current LOS
Scope	Description of the types of services provided.	Technology & communications assets provide reliable and sustainable service while ensuring all regulatory requirements are met.

Technical Levels of Service

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

Table 28 Technology & Communications Technical Levels of Service

Service Attribute	Technical Metric	Current LOS
Reliability	Average Asset Risk	11.14 (High)
	Average Condition Rating	Poor (30%)
Sustainable	Actual reinvestment rate	8.0%
	Target reinvestment rate	19.1%

Appendix F: Furniture & Fixtures

State of the Infrastructure

To maintain the quality stewardship of Georgian Bluffs' infrastructure and support the delivery of services, municipal staff own and employ various types of furniture & fixtures. This includes:

- Vault filing systems
- Office furniture
- Protective netting

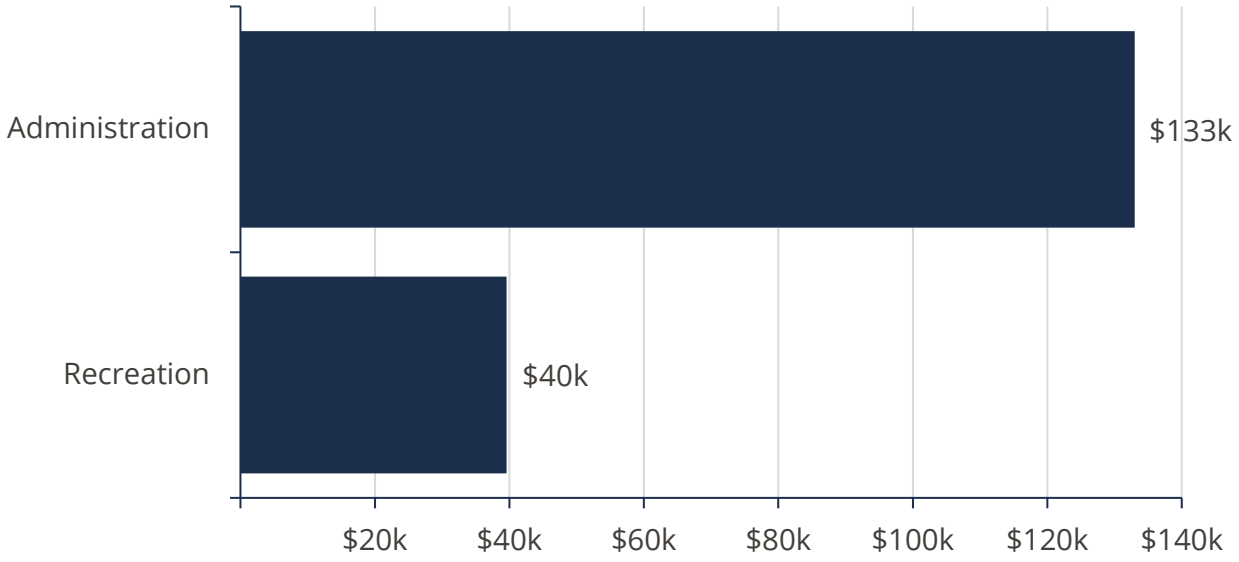
The state of the infrastructure for furniture & fixtures is summarized in the following table.

Replacement Cost	Condition	Financial Capacity	
$0.17 million	Fair (57%)	Annual Requirement:	$13,655
		Funding Available:	$5,712
		Annual Deficit:	$7,943

Inventory & Valuation

The graph below displays the total replacement cost of each asset segment in the Georgian Bluffs' furniture & fixtures inventory.

Figure 40 Furniture & fixtures Replacement Costs by Segment

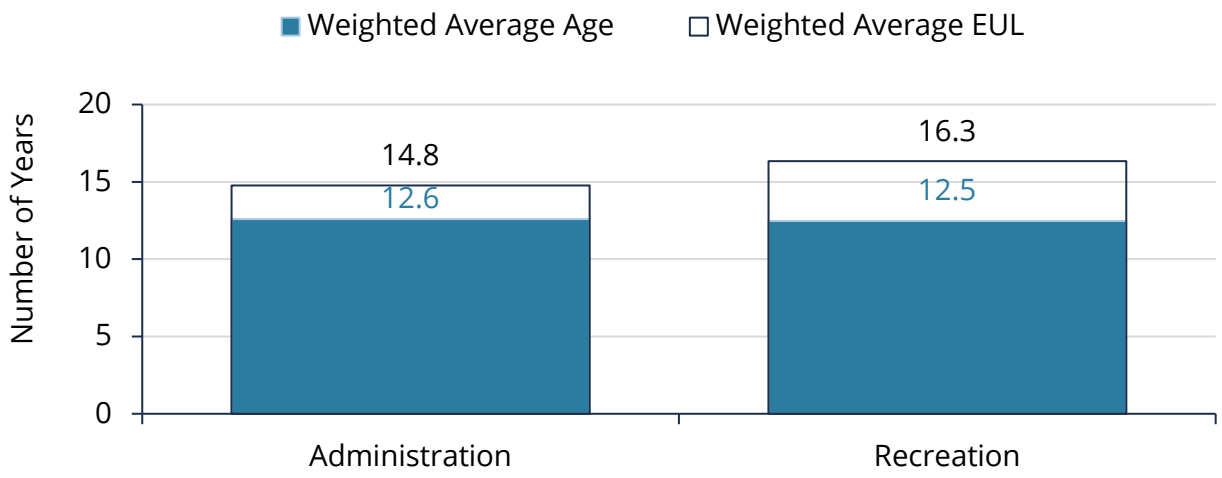


Each asset's replacement cost should be reviewed periodically to determine whether adjustments are needed to more accurate represent capital requirements.

Asset Condition & Age

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

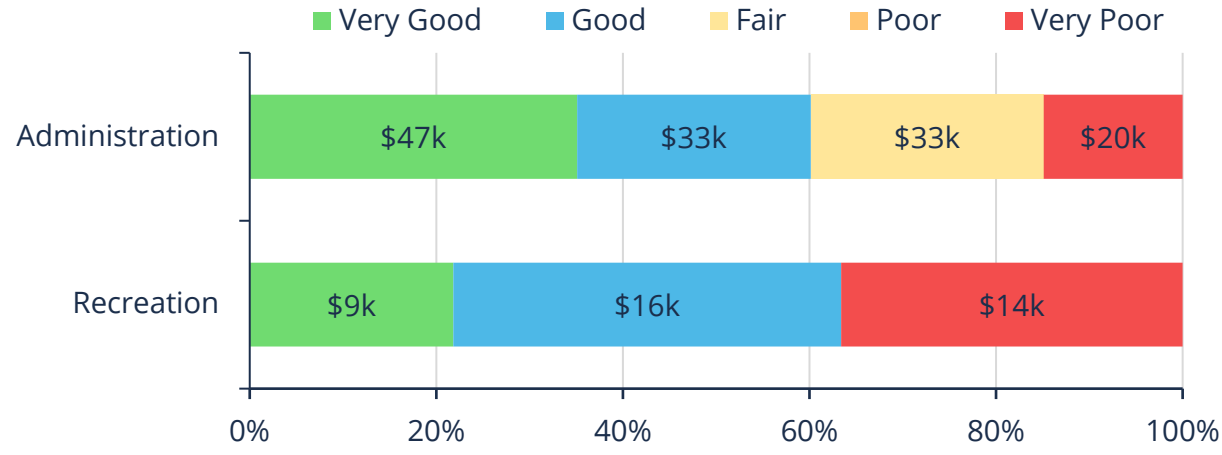
Figure 41 Furniture & Fixtures Average Age vs Average EUL



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

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

Figure 42 Furniture & Fixtures Condition Breakdown



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

Current Approach to Condition Assessment

Accurate and reliable condition data allows staff to determine the remaining service life of assets and identify the most cost-effective approach to managing assets. The current approach is varied because of the broad range of types of furniture & fixtures assets included in this category.

Lifecycle Management Strategy

The condition or performance of most assets will deteriorate over time. To ensure that municipal assets are performing as expected and meet the needs of customers, it is important to establish a lifecycle management strategy to proactively manage asset deterioration. Georgian Bluffs currently replaces their furniture and fixtures assets at the end of their expected useful life.

Forecasted Capital Requirements

The following graph identifies capital requirements over the next 15 years. This projection is used as it ensures that every asset has gone through one full iteration of replacement. The forecasted requirements are aggregated into 5-year bins and the trend line represents the average annual capital requirements at $14 thousand.

Figure 43 Furniture & Fixtures Forecasted Capital Replacement Requirements

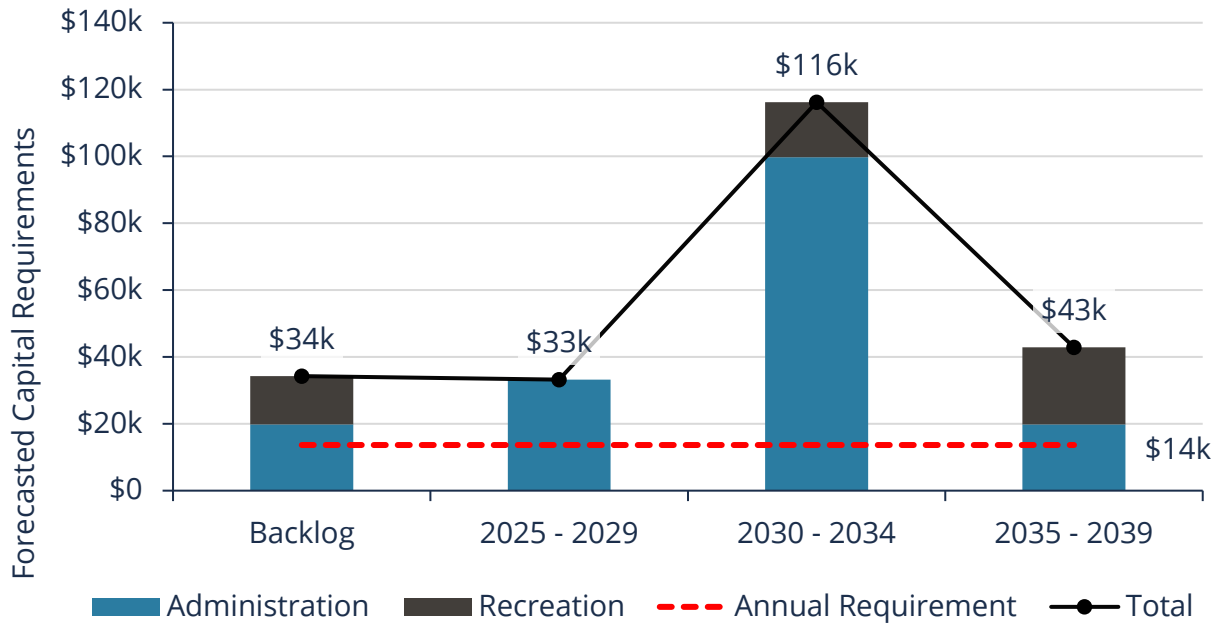


Table 29 below summarizes the projected cost of lifecycle activities (capital replacement only) that may need to be undertaken over the next 10 years to support current levels of service. These projections are generated in Citywide and rely on the data available in the asset register.

Table 29 Furniture & fixtures System-Generated 10-Year Capital Costs

Segment	Backlog	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034
Administration	$20k	$0	$28k	$6k	$0	$0	$20k	$80k	$0	$0	0
Recreation	$14k	$0	$0	$0	$0	$0	$0	$16k	$0	$0	0
Total	$34k	$0	$28k	$6k	$0	$0	$20k	$96k	$0	$0	$0

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

Risk & Criticality

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

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

Figure 44 Furniture & Fixtures Risk Breakdown

1 - 4	5 - 7	8 - 9	10 - 14	15 - 25
Very Low	**Low**	**Moderate**	**High**	**Very High**
$55,579	$54,993	$27,721	$34,290	-
(32%)	(32%)	(16%)	(20%)	(0%)

Levels of Service

By comparing the cost, performance (average condition) and risk year-over-year, Georgian Bluffs will be able to evaluate how their services/assets are trending.

Community Levels of Service

The qualitative descriptions that determine the community levels of service provided by furniture & fixtures are outlined below:

Table 30 Furniture & Fixtures Community Levels of Service

Service Attribute	Qualitative Description	Current LOS
Scope	Description of the types of services provided.	Furniture & fixtures assets provide reliable and sustainable service while ensuring regulatory requirements are met

Technical Levels of Service

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

Table 31 Furniture & Fixtures Technical Levels of Service

Service Attribute	Technical Metric	Current LOS
Reliability	Average Asset Risk	6.11 (Low)
	Average Condition Rating	Fair (57%)
Sustainable	Actual reinvestment rate	3.3%
	Target reinvestment rate	7.9%

Appendix G: Machinery & Equipment

State of the Infrastructure

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

- Generators
- Transportation equipment to support roadway maintenance
- Recreation equipment to support recreation programs

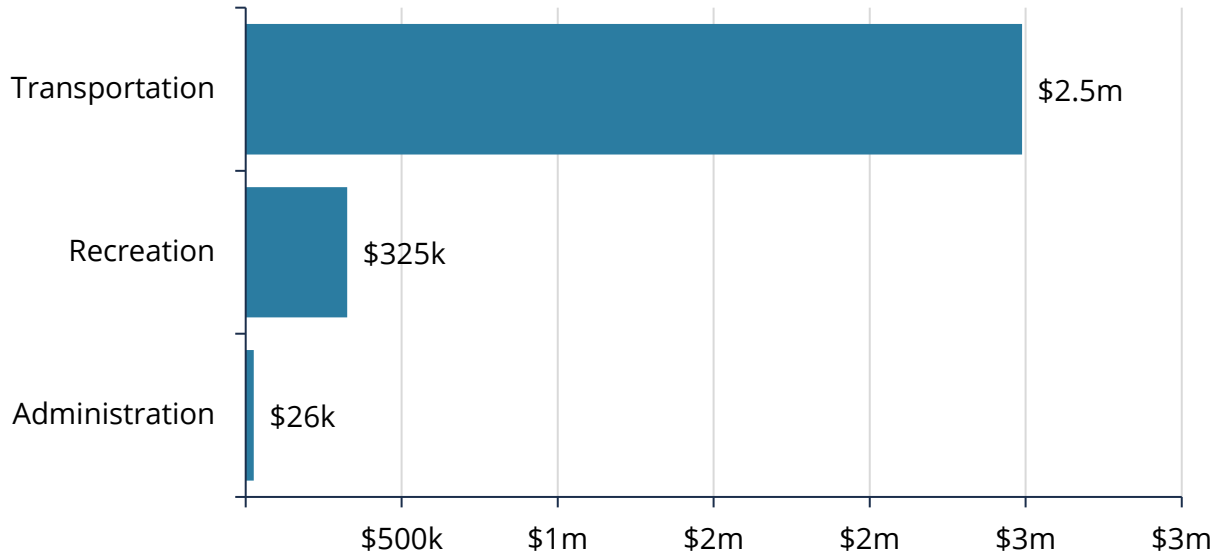
The state of the infrastructure for equipment is summarized in the following table.

Replacement Cost	Condition	Financial Capacity	
$2.8 million	Good (78%)	Annual Requirement:	$167,999
		Funding Available:	$54,824
		Annual Deficit:	$113,175

Inventory & Valuation

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

Figure 45 Machinery & Equipment Replacement Costs by Segment

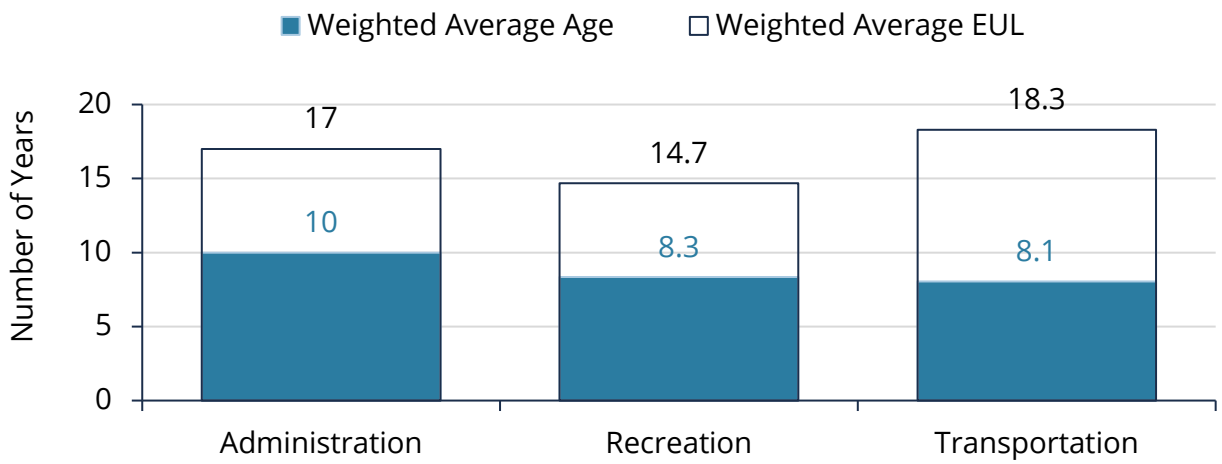


Each asset's replacement cost should be reviewed periodically to determine whether adjustments are needed to more accurate represent capital requirements.

Asset Condition & Age

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

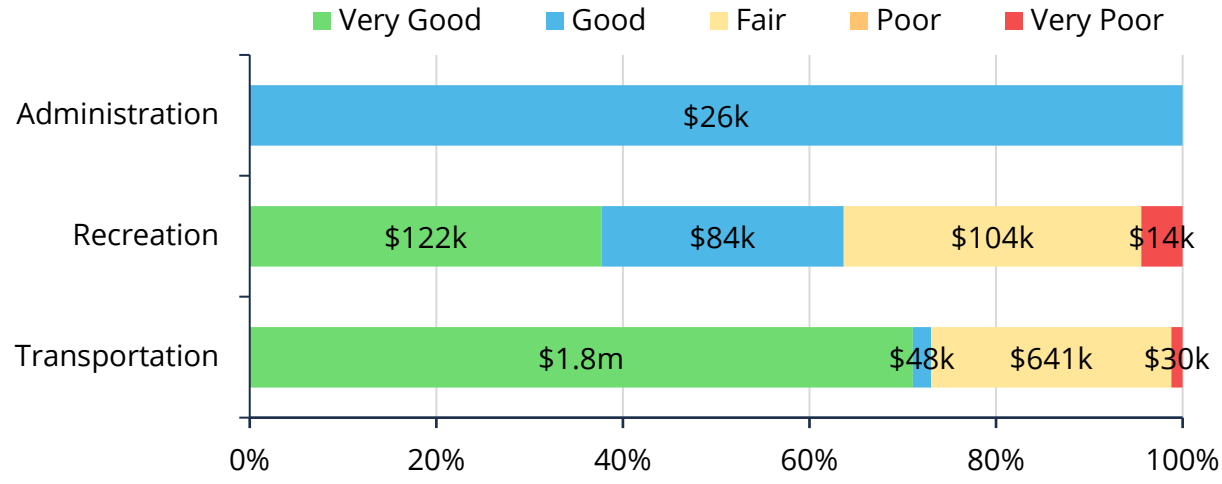
Figure 46 Machinery & Equipment Average Age vs Average EUL



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

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

Figure 47 Machinery & Equipment Condition Breakdown



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

Current Approach to Condition Assessment

Accurate and reliable condition data allows staff to determine the remaining service life of assets and identify the most cost-effective approach to managing assets. The current approach is varied because of the broad range of types of equipment included in this category.

Lifecycle Management Strategy

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

Table 32 Land Improvements current lifecycle strategy

Activity Type	Description of Current Strategy
Maintenance	Staff perform maintenance as required and hire external contractors as needed.
Rehabilitation/ Replacement	Replacement activities are based on life expectancy and staff recommendations

Forecasted Capital Requirements

The following graph identifies capital requirements over the next 40 years. This projection is used as it ensures that every asset has gone through one full iteration of replacement. The forecasted requirements are aggregated into 5-year bins and the trend line represents the average annual capital requirements at $168 thousand.

Figure 48 Machinery & Equipment Forecasted Capital Replacement Requirements

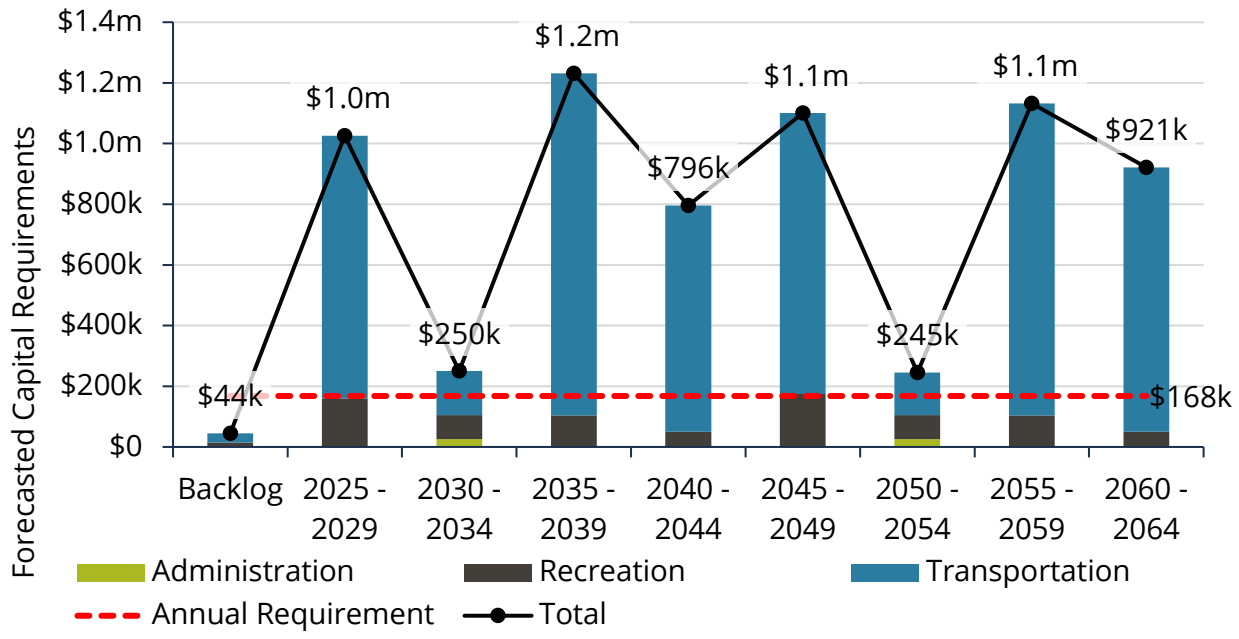


Table 33 below summarizes the projected cost of lifecycle activities (capital replacement only) that may need to be undertaken over the next 10 years to support current levels of service. These projections are generated in Citywide and rely on the data available in the asset register.

Table 33 Machinery & Equipment System-Generated 10-Year Capital Costs

Segment	Backlog	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034
Administration	$0	$0	$0	$0	$0	$0	$0	$0	$26k	$0	$0
Recreation	$14k	$10k	$0	$0	$94k	$56k	$25k	$0	$48k	$0	$6k
Transportation	$30k	$105k	$6k	$403k	$126k	$225k	$57k	$0	$49k	$19k	$0
Total	$44k	$115k	$6k	$403k	$220k	$281k	$82k	$0	$123k	$19k	$6k

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

Risk & Criticality

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

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

Figure 49 Machinery & Equipment Risk Breakdown

1 - 4	5 - 7	8 - 9	10 - 14	15 - 25
Very Low	**Low**	**Moderate**	**High**	**Very High**
$1,891,423	$173,616	$498,022	$254,875	$21,260
(67%)	(6%)	(18%)	(9%)	(<1%)

Levels of Service

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

Community Levels of Service

The qualitative descriptions that determine the community levels of service provided by equipment are outlined below:

Table 34 Machinery & Equipment Community Levels of Service

Service Attribute	Qualitative Description	Current LOS
Scope	Description of the types of services provided.	Machinery and equipment assets provide reliable and sustainable service while ensuring regulatory requirements are met.

Technical Levels of Service

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

Table 35 Machinery & Equipment Technical Levels of Service

Service Attribute	Technical Metric	Current LOS
Reliable	Average Asset Risk	6.17 (Low)
	Average Condition Rating	Good (78%)
Sustainable	Actual reinvestment rate	1.93%
	Target reinvestment rate	5.92%

Appendix H: Vehicles

State of the Infrastructure

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

- Administration vehicles
- Recreation trucks
- Transportation vehicles and plow trucks

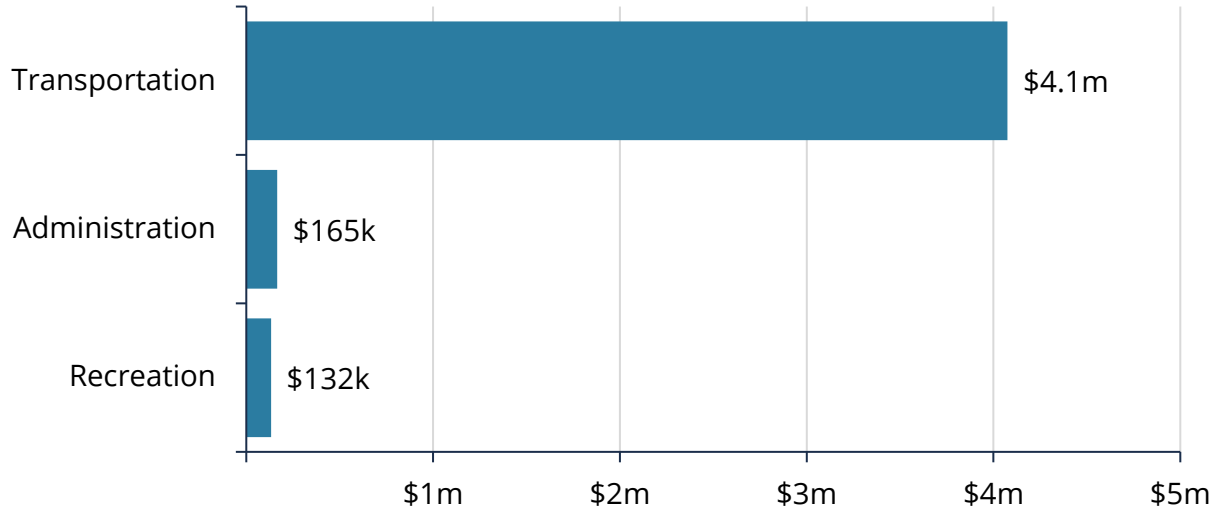
The state of the infrastructure for the vehicles is summarized in the following table.

Replacement Cost	Condition	Financial Capacity	
$4.4 million	Good (76%)	Annual Requirement:	$262,366
		Funding Available:	$85,469
		Annual Deficit:	$176,897

Inventory & Valuation

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

Figure 50 Vehicle Replacement Costs by Segment

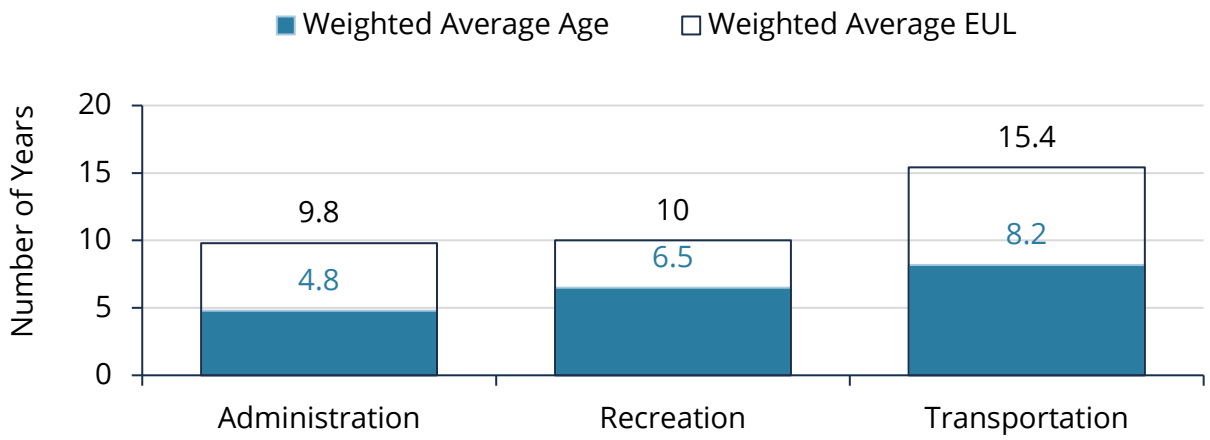


Each asset's replacement cost should be reviewed periodically to determine whether adjustments are needed to represent capital requirements more accurately.

Asset Condition & Age

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

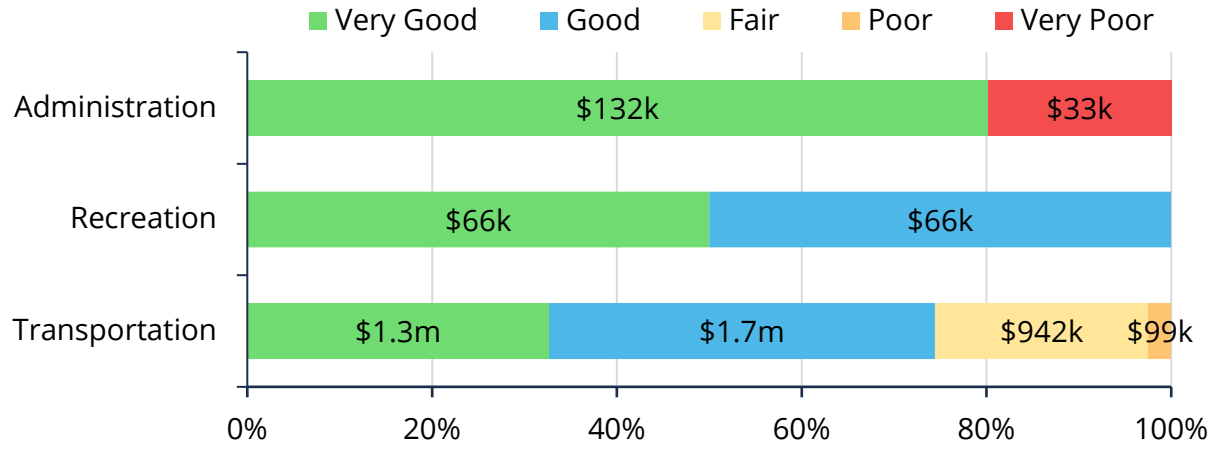
Figure 51 Vehicles Average Age vs Average EUL



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

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

Figure 52 Vehicles Condition Breakdown



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

Current Approach to Condition Assessment

Accurate and reliable condition data allows staff to determine the remaining service life of assets and identify the most cost-effective approach to managing assets. An example of the Township's current approach is staff complete regular visual inspections of vehicles to ensure they are in state of adequate repair prior to operation.

Lifecycle Management Strategy

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

Table 36 Vehicles current lifecycle strategy

Activity Type	Description of Current Strategy
Maintenance	Annual Safety inspection for CVOR vehicles Maintenance is completed by external resources based on mileage/ time
Rehabilitation/ Replacement	Replacement activities are based on life expectancy, mileage / time and staff recommendations

Forecasted Capital Requirements

The annual capital requirement represents the average amount per year that the Township should allocate towards funding rehabilitation and replacement needs. The following graph identifies capital requirements over the next 20 years. This projection is used as it ensures that every asset has gone through one full iteration of replacement. The forecasted requirements are aggregated into 5-year bins and the trend line represents the average annual capital requirements at $262 thousand.

Figure 53 Vehicle Forecasted Capital Replacement Requirements

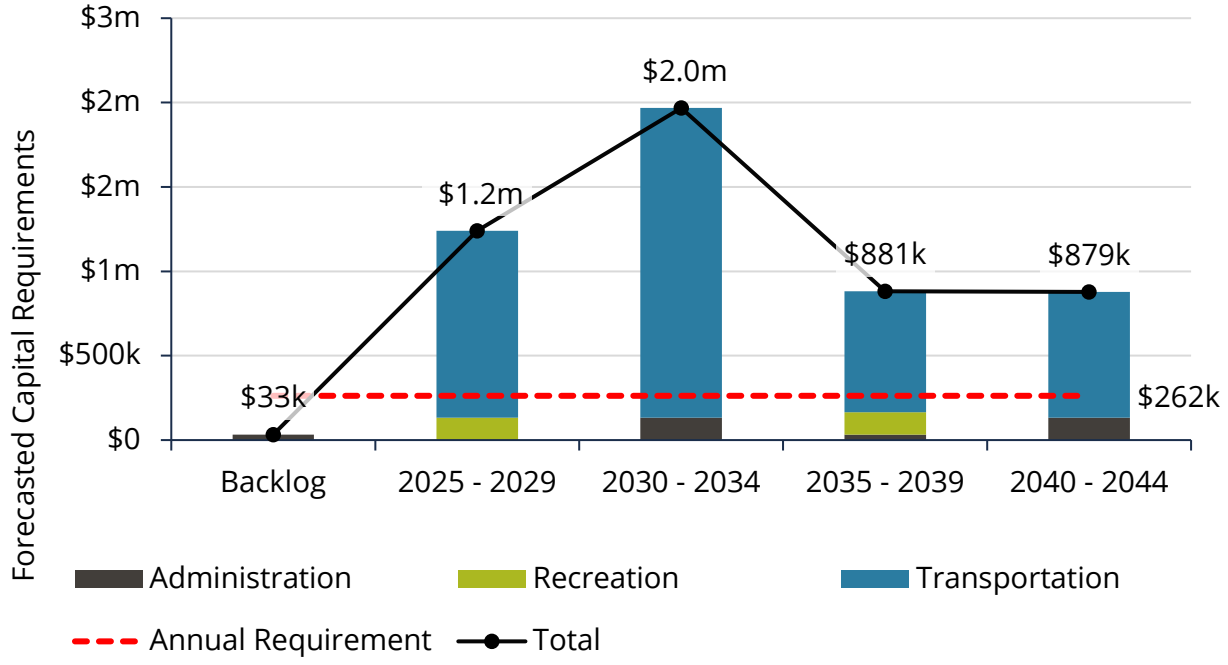


Table 37 below summarizes the projected cost of lifecycle activities (capital replacement only) that may need to be undertaken over the next 10 years to support current levels of service. These projections rely on the data available in the asset register.

Table 37 Vehicles System-Generated 10-Year Capital Costs

Segment	Backlog	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034
Administration	$33k	$0	$0	$0	$0	$0	$0	$66k	$66k	$0	$0
Recreation	$0	$0	$0	$0	$66k	$66k	$0	$0	$0	$0	$0
Transportation	$0	$0	$166k	$66k	$584k	$292k	$896k	$448k	$491k	$0	$0
Total	$33k	$0	$166k	$66k	$650k	$358k	$896k	$514k	$557k	$0	$0

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

Risk & Criticality

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

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

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

Figure 54 Vehicles Risk Breakdown

1 - 4 Very Low	5 - 7 Low	8 - 9 Moderate	10 - 14 High	15 - 25 Very High
$1,528,794 (35%)	$132,466 (3%)	$1,636,373 (37%)	$974,632 (22%)	$99,490 (2%)

Levels of Service

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

Community Levels of Service

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

Table 38 Vehicles Community Levels of Service

Service Attribute	Qualitative Description	Current LOS
Scope	Description of the types of services provided.	Vehicles provide reliable and sustainable service while ensuring all regulatory requirements are being met.

Technical Levels of Service

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

Table 39 Vehicles Technical Levels of Service

Service Attribute	Technical Metric	Current LOS
Reliable	Average Asset Risk	6.86 (Low)
	Average Condition Rating	Good (78%)
Sustainable	Actual reinvestment rate	2.5%
	Target reinvestment rate	6.1%

Appendix I: Water Network

State of the Infrastructure

The Township's public water system includes both the distribution and treatment infrastructure for four (4) individual systems, they are East Linton, Oxenden, Pottawatomi and Shallow Lake water systems. The Township has an agreement with OCWA to operate and manage the facilities in each of these systems.

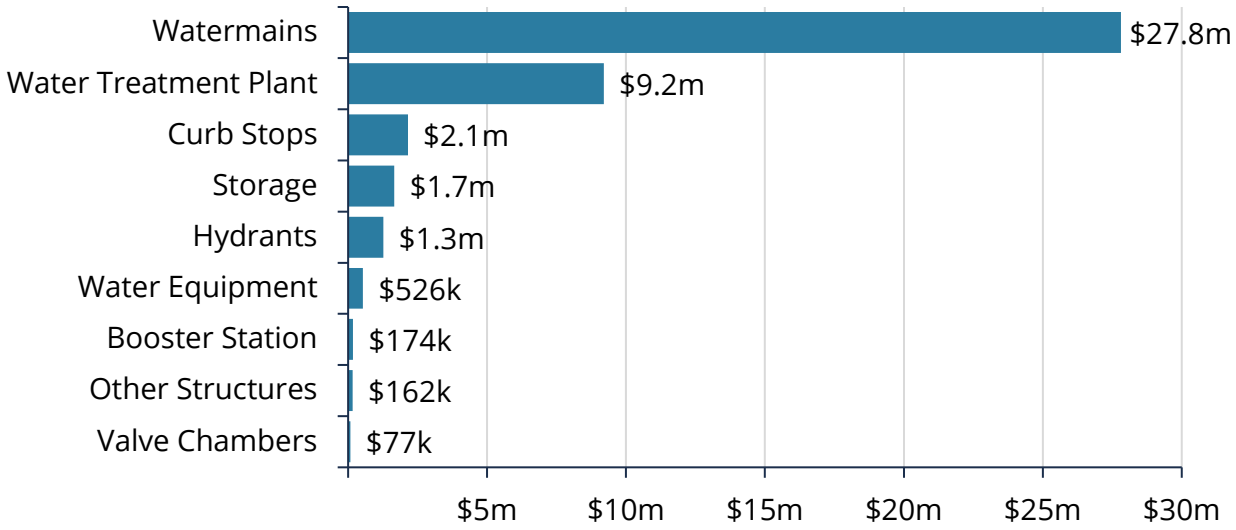
The state of the infrastructure for the water network is summarized in the following table:

Replacement Cost	Condition	Financial Capacity	
$43 million	Good (82%)	Annual Requirement:	$895,783
		Funding Available:	$329,600
		Annual Deficit:	$566,183

Inventory & Valuation

The graph below displays the total replacement cost of each asset segment in Georgian Bluffs' water network inventory.

Figure 55 Water Network Replacement Value by Segment

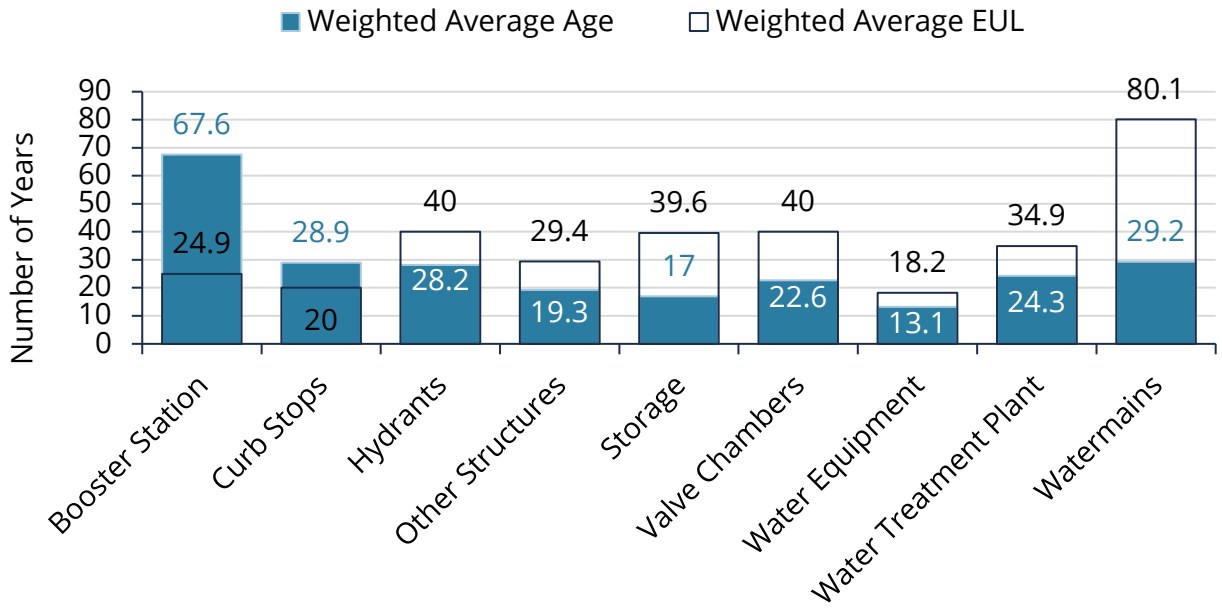


Each asset's replacement cost should be reviewed periodically to determine whether adjustments are needed to more accurate represent realistic capital requirements.

Asset Condition & Age

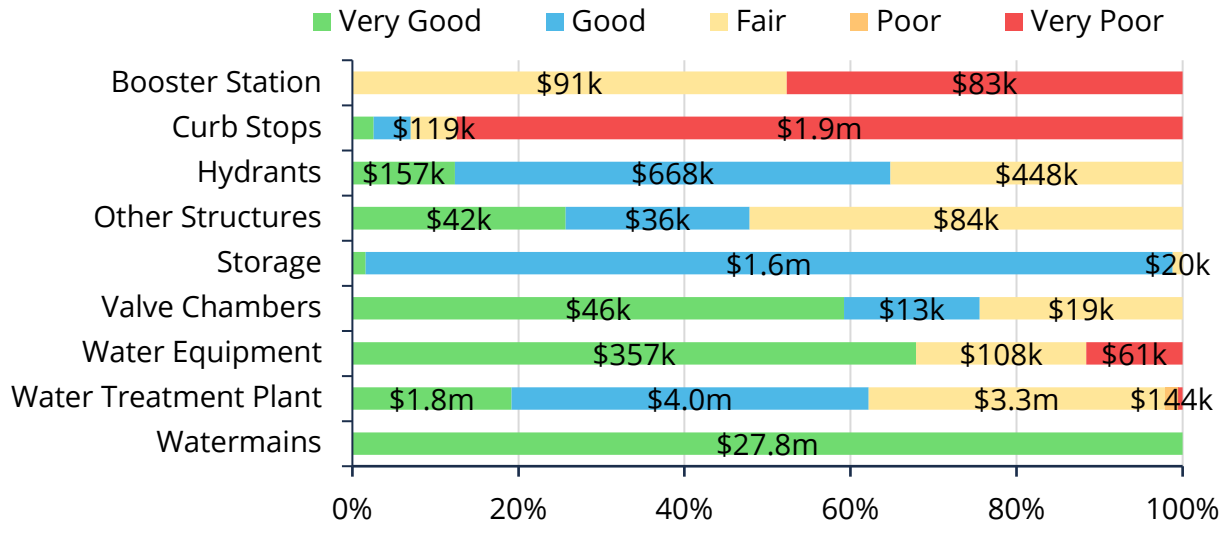
The graph below identifies the current average condition, the average age, and the estimated useful life for each asset segment. The average condition (%) is a weighted value based on replacement cost.

Figure 56 Water Network Average Age vs Average EUL



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

Figure 57 Water Network Condition Breakdown



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

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

Current Approach to Condition Assessment

Accurate and reliable condition data allows staff to determine the remaining service life of assets and identify the most cost-effective approach to managing assets. OCWA manages and evaluates the performance of the treatment infrastructure and makes recommendations to Georgian Bluffs.

Lifecycle Management Strategy

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

Table 40 Water Network current lifecycle strategy

Activity Type	Description of Current Strategy
Maintenance	Facilities are inspected and reviewed on a regular basis.
Rehabilitation/ Replacement	Replacement and/or relining of assets is done based on useful life, staff recommendations and in coordination with other infrastructure replacements (such as roads). OCWA provides the recommendations for infrastructure renewal for the water facilities, annually or as required.

Forecasted Capital Requirements

The annual capital requirement represents the average amount per year that Georgian Bluffs should allocate towards funding rehabilitation and replacement needs. The following graph identifies capital requirements over the next 90 years. This projection is used as it ensures that every asset has gone through one full iteration of replacement. The forecasted requirements are aggregated into 5-year bins and the trend line represents the average capital requirements at $896 thousand.

Figure 58 Water Network Forecasted Capital Replacement Requirements

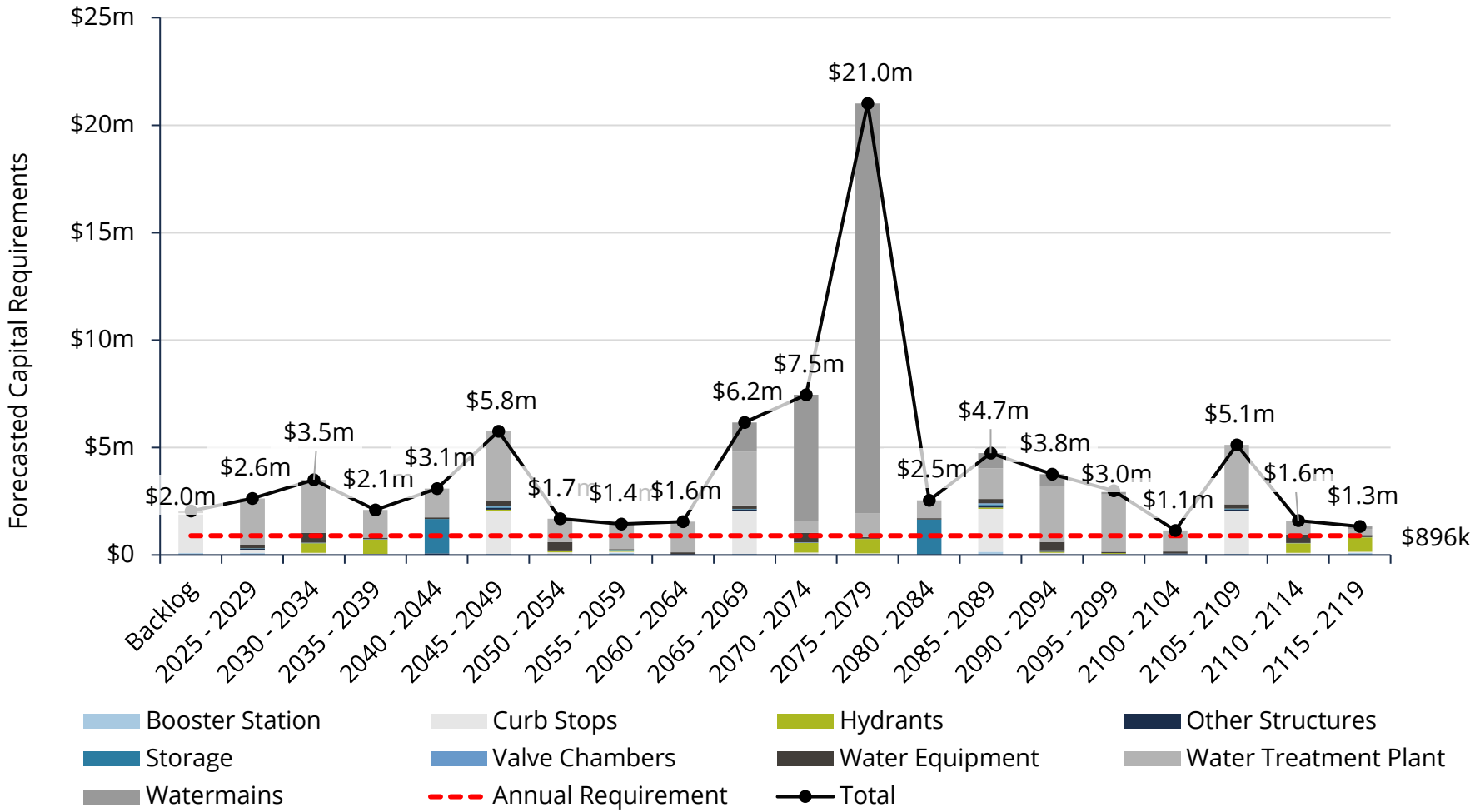


Table 41 below summarizes the projected cost of lifecycle activities (capital activities only) that may need to be undertaken over the next 10 years to support current levels of service.

Table 41 Water Network System-Generated 10-Year Capital Costs

Segment	Backlog	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034
Booster Station	$83k	$0k	$0k	$18k	$50k	$24k	$0k	$0k	$0k	$0k	$0k
Curb Stops	$1.9m	$0k	$0k	$0k	$119k	$0k	$96k	$0k	$0k	$0k	$0k
Hydrants	$0k	$0k	$0k	$0k	$0k	$0k	$0k	$0k	$0k	$448k	$0k
Other Structures	$0k	$0k	$0k	$0k	$76k	$0k	$0k	$0k	$0k	$0k	$0k
Storage	$0k	$0k	$0k	$0k	$20k	$0k	$0k	$0k	$0k	$0k	$15k
Valve Chambers	$0k	$0k	$0k	$0k	$0k	$0k	$0k	$0k	$0k	$19k	$0k
Water Equipment	$61k	$0k	$0k	$0k	$142k	$0k	$0k	$34k	$27k	$351k	$40k
Water Treatment Plant	$19k	$90k	$187k	$53k	$1.2m	$703k	$1.2m	$97k	$469k	$7k	$655k
Watermains	$0k	$0k	$0k	$0k	$0k	$0k	$0k	$0k	$0k	$0k	$0k
Total	$2.0m	$90k	$187k	$71k	$1.6m	$727k	$1.3m	$131k	$496k	$825k	$710k

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

Risk & Criticality

The risk breakdown provides a visual representation of the relationship between the probability of failure and the consequence of failure for the assets within this asset category based on available inventory data.

Figure 59 Water Network Risk Breakdown

1 - 4	5 - 7	8 - 9	10 - 14	15 - 25
Very Low	**Low**	**Moderate**	**High**	**Very High**
$30,049,037	$4,067,486	$2,959,884	$3,905,632	$2,052,529
(70%)	(9%)	(7%)	(9%)	(5%)

This is a high-level model that has been developed based on information currently available and should be reviewed and adjusted to reflect an evolving understanding of both the probability and consequences of asset failure. Additional details of the parameters utilized can be found in Appendix K: Risk Rating Criteria.

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

Levels of Service

The following tables identify the Township's metrics to identify their current level of service for the water network. By comparing the cost, performance (average condition) and risk year-over-year, Georgian Bluffs will be able to evaluate how their services/assets are trending.

Community Levels of Service

The qualitative descriptions that determine the community levels of service provided by the water network are outlined below:

Table 42 Water Network Community Levels of Service

Service Attribute	Qualitative Description	Current LOS
Scope	Description, which may include maps, of the user groups or areas of the municipality that are connected to the municipal water system	See Figure 60 Water Network Map
	Description, which may include maps, of the user groups or areas of the municipality that have fire flow	100%
Reliability	Description of boil water advisories and service interruptions	N/A

Technical Levels of Service

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

Table 43 Water Network Technical Levels of Service

Service Attribute	Technical Metric	Current LOS
Scope	% of properties connected to the municipal water system	91.4%
	% of properties where fire flow is available	88.8%
Reliable	# of connection-days per year where a boil water advisory notice is in place compared to the total number of properties connected to the municipal water system	0
	# of connection-days per year where water is not available to water main breaks compared to the total number of properties connected to the municipal water system	0
	Average Asset Risk	6.13 (Low)
	Average Condition Rating	Good (77%)
Sustainable	Actual reinvestment rate	1.1%
	Target reinvestment rate	2.4%

Figure 60 Water Network Map – Shallow Lake

Figure 61 Water Network Map – Oxenden

Figure 62 Water Network Map – East Linton

Figure 63 Water Network Map – Pottawatomi

Appendix J: Condition Assessment Guidelines

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

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

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

Role of Asset Condition Data

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

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

Guidelines for Condition Assessment

Whether completed by external consultants or internal staff, condition assessments should be completed in a structured and repeatable fashion, according to consistent and objective assessment criteria. Without proper guidelines for the completion of condition assessments there can be little confidence in the validity of condition data and asset management strategies based on this data.

Condition assessments must include a quantitative or qualitative assessment of the current condition of the asset, collected according to specified condition rating criteria, in a format

that can be used for asset management decision-making. As a result, it is important that staff adequately define the condition rating criteria that should be used and the assets that require a discrete condition rating. When engaging with external consultants to complete condition assessments, it is critical that these details are communicated as part of the contractual terms of the project.

There are many options available to the Township to complete condition assessments. In some cases, external consultants may need to be engaged to complete detailed technical assessments of infrastructure. In other cases, internal staff may have sufficient expertise or training to complete condition assessments.

Developing a Condition Assessment Schedule

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

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

Appendix K: Risk Rating Criteria

Risk Definitions

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

Risk Frameworks – General

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

Consequence of Failure			
Criteria	**Sub-Criteria**	**Value/Range**	**Score**
Financial 100%	Replacement Cost ($)	>$150,000	5 - Severe
		$75,000 - $150,000	4 - Major
		$10,000 - $75,000	3 - Moderate
		$5,000 - $10,000	2 - Minor
		< $5,000	1 - Insignificant

Risk Frameworks – Road Network

Probability of Failure			
Criteria	**Sub-Criteria**	**Value/ Range**	**Score**
Performance (80%)	Condition	0-39	5 - Almost Certain
		40-49	4 - Likely
		50-69	3 - Possible
		70-89	2 - Unlikely
		90-100	1 - Rare
Operational (20%)	Service Life Remaining	<10%	5 - Almost Certain
		10 - <20%	4 - Likely
		20 - <30%	3 - Possible
		30 - <40%	2 - Unlikely
		=>40%	1 - Rare

Consequence of Failure			
Criteria	**Sub-Criteria**	**Value/Range**	**Score**
Financial (50%)	Road Surface	Concrete	4 - Major
		Asphalt	3 - Moderate
		Gravel	2 - Minor
Operational (50%)	Roadside Environment	Urban	4 - Major
		Semi-Urban	3 - Moderate
		Rural	2 - Minor
	Speed Limit (km/h)	80	5 - Severe
		70	4 - Major
		60	3 - Moderate
		50	2 - Minor
		<50	1 - Insignificant
	AADT (traffic counts ranges align with O.Reg 239 MMS)	>1000	5 - Severe
		500-999	4 - Major
		200-499	3 - Moderate
		50-199	2 - Minor
		0-49	1 - Insignificant

Risk Frameworks – Bridges & Culverts

Probability of Failure			
Criteria	**Sub-Criteria**	**Value/ Range**	**Score**
Performance (80%)	Condition	0-39	5 - Almost Certain
		40-49	4 - Likely
		50-69	3 - Possible
		70-89	2 - Unlikely
		90-100	1 - Rare
Operational (20%)	Service Life Remaining	<10%	5 - Almost Certain
		10 - <20%	4 - Likely
		20 - <30%	3 - Possible
		30 - <40%	2 - Unlikely
		=>40%	1 - Rare

Consequence of Failure			
Criteria	**Sub-Criteria**	**Value/Range**	**Score**
Financial (50%)	Replacement Cost	$150,000 <	5 - Severe
		$75,001 - $150,000	4 - Major
		$10,001 - $75,000	3 - Moderate
		$5,001 - $10,000	2 - Minor
		<= $5,000	1 - Insignificant
Operational (50%)	Asset Segment	Bridges	4 - Major
		Culverts	2 - Minor
	Span	>5m	4 - Major
		3-5m	3 - Moderate
		<3m	2 - Minor

Risk Frameworks – Buildings, Furniture & Fixtures, Machinery & Equipment, and Vehicles

Probability of Failure			
Criteria	**Sub-Criteria**	**Value/ Range**	**Score**
Performance (60%)	Condition	0-39	5 - Almost Certain
		40-49	4 - Likely
		50-69	3 - Possible
		70-89	2 - Unlikely
		90-100	1 - Rare
Operational (40%)	Service Life Remaining	<10%	5 - Almost Certain
		10 - <20%	4 - Likely
		20 - <30%	3 - Possible
		30 - <40%	2 - Unlikely
		=>40%	1 - Rare

Consequence of Failure			
Criteria	**Sub-Criteria**	**Value/Range**	**Score**
Financial (50%)	Replacement Cost	>$250,000	5 - Severe
		$150,000 - $250,000	4 - Major
		$75,000 - $150,000	3 - Moderate
		$5,000 - $75,000	2 - Minor
		< $5,000	1 - Insignificant
Operational (50%)	Asset Function	Protection	4 - Major
		Transportation	3 - Moderate
		Recreation	2 - Minor
		General Gov.	2 - Minor
		Health	1 - Insignificant

Risk Frameworks – Watermains

Probability of Failure			
Criteria	**Sub-Criteria**	**Value/ Range**	**Score**
Performance (60%)	Condition	0-39	5 - Almost Certain
		40-49	4 - Likely
		50-69	3 - Possible
		70-89	2 - Unlikely
		90-100	1 - Rare
Operational (40%)	Service Life Remaining	<10%	5 - Almost Certain
		10 - <20%	4 - Likely
		20 - <30%	3 - Possible
		30 - <40%	2 - Unlikely
		=>40%	1 - Rare

Consequence of Failure			
Criteria	**Sub-Criteria**	**Value/Range**	**Score**
Financial (50%)	Diameter(mm)	>150mm	4 - Major
		150mm	3 - Moderate
		services	2 - Minor
Operational (50%)	Surface Type	Asphalt	4 - Major
		Surface Treatment	3 - Moderate
		Gravel / Easement	2 - Minor
	Material Type	Welded Steel	5 - Severe
		Asbestos Cement	4 - Major
		Cast Iron/Ductile Iron	3 - Moderate
		PVC	2 - Minor

Risk Frameworks – Water Network

Probability of Failure			
Criteria	**Sub-Criteria**	**Value/ Range**	**Score**
Performance (60%)	Condition	0-39	5 - Almost Certain
		40-49	4 - Likely
		50-69	3 - Possible
		70-89	2 - Unlikely
		90-100	1 - Rare
Operational (40%)	Service Life Remaining	<10%	5 - Almost Certain
		10 - <20%	4 - Likely
		20 - <30%	3 - Possible
		30 - <40%	2 - Unlikely
		=>40%	1 - Rare

Consequence of Failure			
Criteria	**Sub-Criteria**	**Value/Range**	**Score**
Financial (50%)	Replacement Cost	>$250,000	5 - Severe
		$150,000 - $250,000	4 - Major
		$75,000 - $150,000	3 - Moderate
		$5,000 - $75,000	2 - Minor
		< $5,000	1 - Insignificant
Operational (50%)	Asset Segment	Treatment	4 - Major
		Other Structures/Valve Chambers	3 - Moderate
		Water Equipment	2 - Minor
		Hydrants	2 - Minor
		Curb stops	1 - Insignificant