Asset Management Plan

Town of Aurora

2024

This Asset Management Program was prepared by:

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

Key Statistics

Replacement cost of asset portfolio $2.35 billion	Replacement cost of infrastructure per household $105k
Percentage of assets in fair or better condition 85%	Percentage of assets with assessed condition data 38%
Annual capital infrastructure deficit $27.6 million	Recommended timeframe for eliminating annual infrastructure deficit 10-20 Years
Target reinvestment rate 1.9%	Actual reinvestment rate 1.1%

Figure 1 Key Statistics Summary

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Executive Summary

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

Scope

This Asset Management Plan (AMP) summarizes the current state of infrastructure within the Town's asset portfolio. It establishes the existing levels of service and proposes enhancements to these levels, accompanied by relevant technical and customer-oriented key performance indicators (KPIs). The plan outlines lifecycle strategies designed for optimal asset management and performance, and offers financial strategies aimed at achieving sustainability for the following asset categories:

Figure 2 AMP Asset Categories

Findings

The overall replacement cost of the asset categories included in this AMP totals $2.3 billion. 85% of all assets analysed in this AMP are in fair or better condition and assessed condition data was available for 38% of assets. For the remaining 62% of 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 in this AMP.
The development of a long-term, sustainable financial plan requires an analysis of whole lifecycle costs. This AMP uses a combination of proactive lifecycle strategies (paved roads) and replacement only strategies (all other assets) to determine the lowest cost option to maintain the current level of service.

To meet capital replacement and rehabilitation needs for existing infrastructure, prevent infrastructure backlogs, and achieve long-term sustainability, the Town's average annual capital requirement totals $43.8 million. Based on a historical analysis of sustainable capital funding sources, the Town is committing approximately $16.2 million towards capital projects or reserves per year. As a result, there is currently an annual funding gap of $27.6 million.

It is important to note that this AMP represents a snapshot in time and is based on the best available processes, data, and information at the Town. Strategic asset management planning is an ongoing and dynamic process that requires continuous improvement and dedicated resources.

Figure 3 Average Annual Requirements per Household

A financial strategy was developed to address the annual capital funding gap. The following graphics shows annual tax/rate change required to eliminate the Town's infrastructure deficit based over the period modelled and includes the 0.8% already being collected:

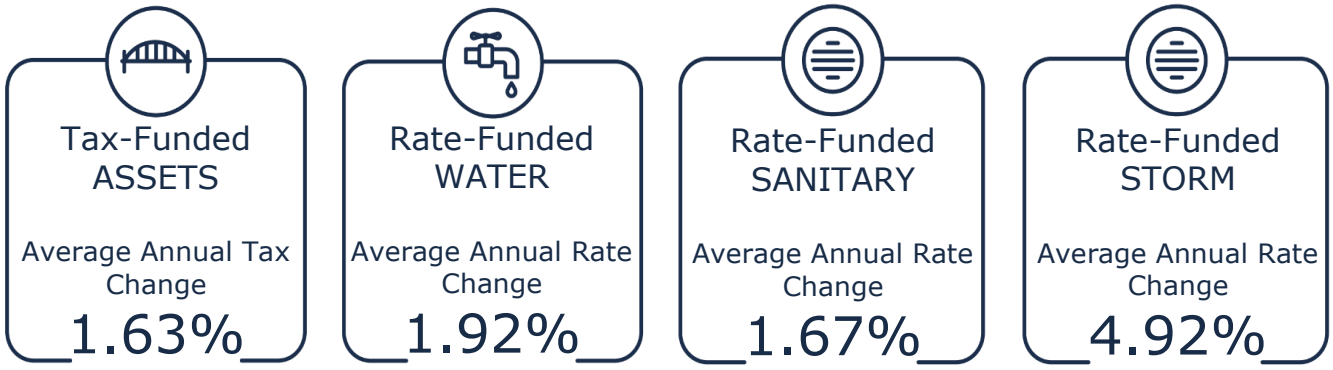


Figure 4 Summary of Annual Tax/Rate Changes

With the development of this AMP the Town has achieved compliance with O. Reg. 588/17 to the extent of the requirements that must be completed by July 1, 2025.

1 Introduction & Context

Key Insights

- The goal of asset management is to minimize the lifecycle costs of delivering infrastructure services, manage the associated risks, while maximizing the value ratepayers receive from the asset portfolio
- The Town's asset management policy provides clear direction to staff on their roles and responsibilities regarding asset management
- An asset management plan is a living document that should be updated regularly to inform long-term planning
- Ontario Regulation 588/17 outlines several key milestones and requirements for asset management plans in Ontario between July 1, 2023 and 2025

1.1 Aurora Community Profile

Census Characteristic	Town of Aurora	Ontario
Population 2021	62,057	14,223,942
Population Change 2016-2021	11.9	5.8
Total Private Dwellings	22,253	5,929,250
Population Density	1,241.1/km^2	15.9/km^2
Land Area	50 km^2	892,411.76 km^2

Table 1 Town of Aurora Community Profile

The Town of Aurora (Town) is a family friendly community with an attractive natural environment, urban amenities, and a growing economy. The Town is located in the Central York Region, within the Golden Horseshoe of Southern Ontario. The Town is within easy commuting distance to major cities like Toronto and Hamilton. As one of the growth centres of York Region, Aurora benefits from a convenient transit network and easy access to Highway 404.

The Town was founded in 1854. With a long history of industrial and agricultural business, Aurora was incorporated as a town in 1888. However, by the end of the 19th century, many factories moved out and Aurora experienced a slow growth period until the end of World War II. In the years following the war, many developments took place in the area and the Town was rejuvenated, due to its proximity to Toronto. In the 21st century, the Town has expanded to Highway 404 and experienced a considerable growth in population and economy. Currently, Aurora has a diversified economic base with over 1,300 businesses including both large businesses and start-up companies. The Town seeks to provide high quality employment lands for new business development, encourage employment opportunities for residents, and revitalize their downtown core. Looking to the future, the Town of Aurora prioritizes the promotion of economic growth.

Like many municipalities in the greater Toronto area, the Town is currently experiencing significant growth. Since 2016, the population has increased at more than 2 times the provincial average. The rapid growth is projected to be continued for the next 20 years. The Town continues to promote sustainable growth management that encourages mixed-use, transit-oriented development, and affordability. The Town also aims to provide and maintain adequate services and sustainable infrastructure that match the changing demographic.

The Town generates a total revenue of $57.0 million from taxes and $31.0 million from rates and has an approved capital budget authority of $202.4 million, with $73.6 million planned spending in 2023.

The Town is mostly an urbanized environment, containing roads, bridges, culverts, facilities, water, sanitary, storm, fleet, and equipment infrastructure. Generally, residents are satisfied with Town services. However, the 2023 resident satisfaction survey identified an expectation for improved traffic calming measures. The Roads, bridges and structural culverts are the priority for Town staff, as these are critical assets. With improved inspection and assessment programs, the Town will be able to better identify other infrastructure priorities in the future.

1.2 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 ratepayers receive from the asset portfolio.

The acquisition of capital assets accounts for only 10-20% of their total cost of ownership. The remaining 80-90% derives from operations and maintenance. This AMP focuses its analysis on the capital costs to maintain, rehabilitate and replace existing municipal infrastructure assets.

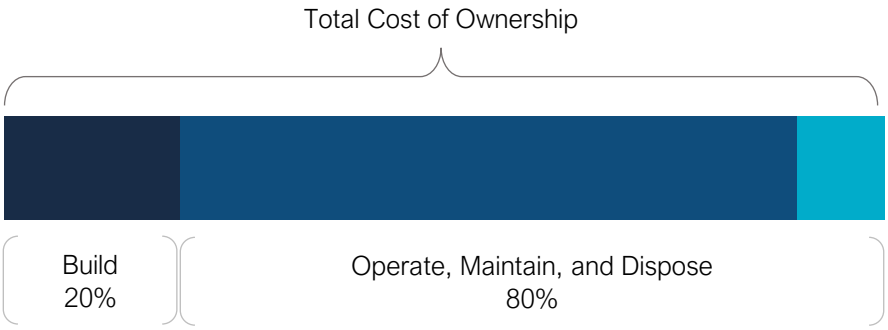


Figure 5 Total Cost of Asset Ownership

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

Management Policy and an Asset Management Strategy, concluding with an Asset Management Plan.

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

1.2.1 Asset Management Policy

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

The Town adopted Policy No. FS-07 Strategic Asset Management Policy on March 26th, 2019, in accordance with Ontario Regulation 588/17.

The asset management plan satisfies the policy statement 1.0 section 5:

> *"The Town will develop an asset management plan (AMP) that incorporates all infrastructure categories and municipal infrastructure assets that are necessary to the provision of services… The AMP will be reviewed annually to address the Town's progress in implementing its asset management plan and updated at least every five years in accordance with O. Reg. 588/17 requirements, to promote, document and communicate continuous improvement of the asset management program."*

The Town's strategic asset management policy identifies various priorities such as commitments to the utilization of levels of service information, lifecycle management, mitigation approaches to climate change, and the coordination with upper and neighbouring municipalities in its asset maintenance. The Town of Aurora is committed to executing rehabilitation and replacement decision points wherever possible.

1.2.2 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 Town plans to achieve asset management objectives through planned activities and decision-making criteria.

The Town's Asset Management Policy contains many of the key components of an asset management strategy and may be expanded on in future revisions or as part of a separate strategic document.

1.2.3 Asset Management Plan

The asset management plan (AMP) presents the outcomes of the Town's asset management program and identifies the resource requirements needed to achieve a defined level of service. The AMP typically includes the following content:

- State of Infrastructure
- Asset Management Strategies
- Levels of Service
- Financial Strategies

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

1.3 Key Concepts in Asset Management

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

1.3.1 Lifecycle Management Strategies

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

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

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

maintenance, rehabilitation, and replacement. The following table provides a description of each type of activity and the general difference in cost.

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	$$
Replacement/ Reconstruction	Asset end-of-life activities that often involve the complete replacement of assets	Full Reconstruction	$$$

Table 2 Lifecycle Management: Typical Lifecycle Interventions

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

1.3.2 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.

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

1.3.3 Levels of Service

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

These measures include a combination of those that have been outlined in O. Reg. 588/17 in addition to performance measures identified by the Town as worth measuring and evaluating. The Town measures the level of service provided at two levels: Community Levels of Service, and Technical Levels of Service.

Community Levels of Service

Community levels of service are a simple, plain language description or measure of the service that the community receives. For core asset categories (roads, bridges and culverts, water, wastewater, stormwater) the Province, through O. Reg. 588/17, has provided qualitative descriptions that are required to be included in this AMP. For non-core asset categories, the Town 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 Town's asset management strategies on the physical condition of assets or the quality/capacity of the services they provide.

For core asset categories (roads, bridges and culverts, water, wastewater, stormwater) the Province, through O. Reg. 588/17, has provided technical metrics that are required to be included in this AMP. For non-core asset categories, the Town has determined the technical metrics that will be used to determine the technical level of service provided. These metrics can be found in the Levels of Service subsection within each asset category.

Current and Proposed Levels of Service

This AMP focuses on updating and establishing the current levels of service, in addition to providing proposed levels of service options over the next ten years, in accordance with O. Reg. 588/17. Proposed levels comprise of the following: establishing a target for each technical LOS measure, identification of budgetary impacts, and a description of the rationale of the target and the impacts on risk and the lifecycle strategy.

Three proposed LOS scenarios have been developed for each asset category. These scenarios include maintain existing LOS, enhance LOS, and reduce LOS. The recommended LOS scenario is chosen on the basis of the balance of affordability, risk, and user priorities.

1.4 Climate Change

Climate change is causing 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; 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. The impacts on infrastructure are often a result of climate-related extremes such as droughts, floods, higher frequency of freeze-thaw cycles, extended periods of high temperatures, high winds, and wildfires. 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.

The Town has been proactive in their efforts to combat the effects of climate change. The Town adopted the Climate Change Adaptation Plan on October 24, 2023. The Climate Change Adaptation Plan was created by WSP, and projects that between 2021 and 2050, Aurora is expected to experience:

- A mean summer maximum temperature increase of 9%
- The number of heat waves are projected to increase from 1.2 to 3.6 per year
- Cooling Degree Days are projected to almost double
- Winter temperatures are projected to increase, leading to an increase in extreme cold risks, snow depth, and annual freeze-thaw cycles

To prepare for the anticipated climate change effects, the Town has identified short-term priorities including:

- Improving flood resilience of the stormwater system, evaluating future projected precipitation impacts to the system, and applying lot-level runoff controls
- Improving flood management to reduce risks to the sanitary system
- Preventing and repairing debris hazards for parks and natural heritage assets through proactive landscape maintenance
- Ensuring facilities have sufficient cooling capacity in critical buildings as temperatures and heatwaves increase, and ensure backup power is in place in facilities as required

The Town plans to incorporate climate change projections into asset management planning to ensure that infrastructure designs, operations, and maintenance procedures are prepared for future conditions. The Town also recognises the importance of planning for and implementing resilience interventions upon asset renewal, during major retrofits, or as needed when new risks are identified.

1.4.1 Aurora Climate Profile

Several extreme weather events such as heat waves, strong winds, and flooding have been experienced in Aurora. Heatwaves accelerate the deterioration of paved roads and increase the demand of energy used by people and facilities. Flooding caused by severe precipitation can weaken roads and buildings. Strong winds can damage the roofs, trees and power lines which cause further damage to the property, machinery, and equipment.

The Town 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 weather events. According to Climatedata.ca – a collaboration supported by Environment and Climate Change Canada (ECCC) – the Town may experience the following trends:

Higher Average Annual Temperature:

- Between the years 1971 and 2000 the annual average temperature was 6.9 ºC.
- Under a high emissions scenario, the annual average temperatures are projected to increase by 2.5 ºC by the year 2050 and over 6.4 ºC by the end of the century.

Increase in Total Annual Precipitation:

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

Increase in Frequency of Extreme Weather Events:

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

1.4.2 Integration of 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.

The Town has developed a series of documents to improve their climate resilience; some key documents are listed below:

- Community Energy Plan
- Climate Emergency Declaration
- Corporate Environmental Action Plan (CEAP)
- Aurora's Energy Conservation and Demand Management Plan (ECDMP)
- Climate Change Adaptation Plan (CCAP)
- Green Fleet Action Plan (GFAP)

These documents will further advance the Municipality's capacity to develop asset management strategies that incorporate climate change mitigation and adaptation considerations.

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. Climate vulnerability risks from the Climate Change Adaptation Plan (2023) will be integrated into various categories in this Asset Management Plan. The risk matrices from this report highlight how assets may be affected by the changing climate, and mitigation strategies that the Town should consider adopting to combat the expected changes. For example, pedestrian paths may be degraded by an increased number and frequency of freeze-thaw cycles, which may increase the number of trip hazards and accessibility disturbances to residents. To mitigate this change, the Town may consider enhancing pedestrian paths with increased rip rap or other improvements.

1.5 Watershed Protection

Watersheds are recognized as an important ecological asset for managing both ground and surface water systems. York Region supplies water to the local municipalities using Lake Ontario, Lake Simcoe, and groundwater sources. To maintain the water quality, York Region has developed and implemented watershed plans in cooperation with the Toronto and Region Conservation Authority (TRCA) and the Lake Simcoe Region Conservation Authority (LSRCA).

1.5.1 Lake Simcoe Watershed

The drinking water in the Town is supplied by the groundwater from the Lake Simcoe Watershed and surface water from Lake Ontario. Lake Simcoe is the fourth largest lake wholly located in Ontario. The Lake Simcoe Watershed covers 3,400 square kilometres and 20 municipal borders, including the entirety of Aurora. There are over 500,000 residents in the watershed and the population in the southern portion of the region is growing quickly. Land use in the watershed is evolving over time, currently with 8% classified as urban land and 36% classified as agricultural land.

The physical impacts of climate change are most noticeable due to a shorter winter season, seasonal changes in river and creek flow, and more phosphorus in the water. The shorter winter season can have profound impacts on the natural habitat as it affects the distribution of oxygen and nutrients in the lake, which wildlife are dependant on. The seasonal changes in the river and creek flow include less water flowing in the spring and more flowing in the winter; such changes can impact infrastructure networks located near the East Holland River due to flooding or a decline in groundwater. Finally, the amount of phosphorus in the lake, most likely increasing because of more extreme weather such as rainstorms, can lead to degraded water quality and more frequent algal blooms. Public health and safety depend on the stability and predictability of the ecosystem in the Lake Simcoe watershed.

1.5.2 Lake Ontario

The York Drinking Water System (York DWS) supplies treated water from Lake Ontario to the Town and other municipalities in York Region.
Lake Ontario is the easternmost of the Great Lakes of North America. The Lake Ontario watershed supplies water to approximately 9 million residents, which is roughly 25% of Canada's population.

According to Climate Change in the Great Lakes Basins: Summary of Trends and Impacts, a summary report by the TRCA, an increase in over-land air temperature and over-lake precipitation and a reduction in ice coverage are expected until the end of the century. Warmer water inhibits the mixing of lake water, extends the stratification period, and increases oxygen depletion which causes more widespread and longer periods of bottom anoxia or dead zones. As a result, massive fish kills, and certain types of algal blooms produce toxic chemicals and negatively affect the water quality. The release of heavy metals such as mercury, manganese, and iron are promoted when low oxygen water reacts with the bottom sediments, which further damages the water quality. Low oxygen water is more corrosive and can damage water pipes, release metals, and affect the quality and the taste of the water delivered to the residents.

1.6 Resident Satisfaction Survey

1.6.1 Overview

It is considered best practice for municipalities across Canada to conduct periodical resident satisfaction surveys. The Town recognizes the importance of resident input and began seeking a third-party public polling firm to conduct the 2023 Resident Satisfaction Survey. It is estimated that prior to 2023, the last resident survey was over 15 years ago, with the last mention of a resident survey being the November 2007 General Committee Report. The objectives for the 2023 Resident Satisfaction Survey were as follows:

- Determine the overall impressions of the Town's use of tax dollars
- Residents' perceived quality of life in the Town
- Identify top of mind issues
- Determine level of satisfaction with and perceived importance of services, programs, and communications provided by the Town
- Identify residents' perceptions and expectations concerning specific municipal planning priorities
- Determine how residents would like to receive information and preferred ways of engagement in the future

In September 2023, Forum Research was selected to conduct the survey. A computer-assisted telephone interviewing methodology was selected, which is an industry standard. Residents were selected using random digit dialing techniques, which is a random sampling technique. The criteria for participation were residents in the Town of Aurora who are 18 years of age or older. The sample size for the telephone survey was 800 residents and included both landline and mobile phone numbers to ensure accuracy and representativeness. Not all respondents were asked every survey question to keep the length of the interview under 10 minutes. Results were weighted by age and gender to ensure the sample reflected the target population of Aurora according to 2021 census data. Forum Research also provided the Town with an open link online survey that allowed all residents to answer the survey questions online. A summary of the results can be found below in Figure 6.

The telephone survey was conducted between November 21 and December 21, 2023, while the open link online survey was available on the Engage Aurora website (https://engageaurora.ca/) between December 6, 2023, and January 6, 2023. The link to the survey was promoted through the typical communication channels of the Town. As is industry standard, only the telephone survey is considered statistically valid, due to its random sampling technique. However, the open link online survey was an important engagement tool for the Town. In total, 432 people completed the open link online survey. The open link survey still provides the Town with important insights.

Both the Corporate Management Team and the Executive Leadership Team were engaged to help inform the questions included in the survey. The Town was advised to keep survey questions like those asked in surveys for other municipalities to allow for benchmarking.

1.6.2 Key Findings

Overall, most respondents (98%) rated the quality of life in Aurora as “good” or “very good”. When benchmarked against six other Canadian municipalities that Forum conducted resident surveys for, the Town has the highest quality of life. Regarding quality of services, 92% of survey respondents indicated that they are satisfied with the Town’s delivery of services. When compared to other municipalities across Canada, the Town has the highest rating of satisfaction with services. Respondents were most satisfied with fire services, parks, greenspaces, and multi-use trails, arts and culture offerings, recreation facilities and spaces, and availability of online services. Below is a visual representation of respondent satisfaction of services provided.

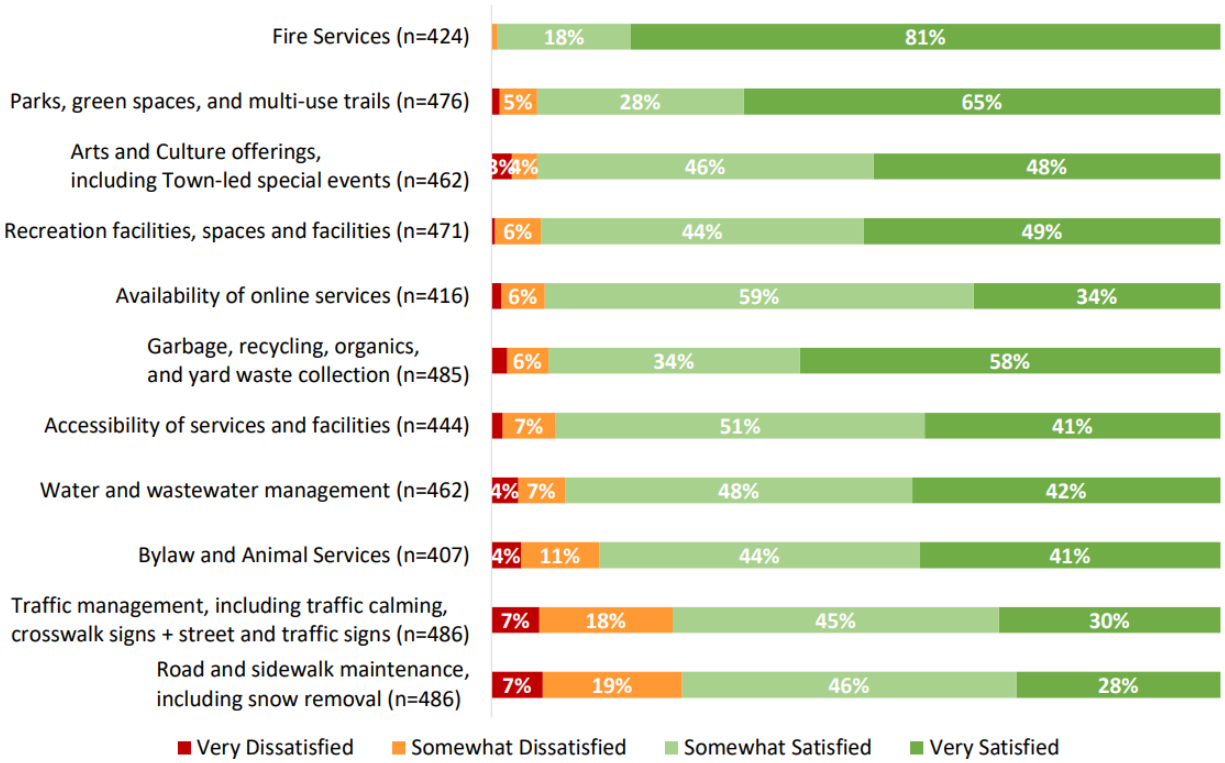


Figure 6: Satisfaction of Services Provided, Annual Aurora Resident Survey, February 2023

A statistical analysis, called a Gap Analysis, has been used to show the difference between how satisfied residents are with each Town's service and the impact of the services to residents' overall service satisfaction (i.e. perceived importance). A visual representation of the Gap Analysis is shown below. The satisfaction scores are plotted vertically, while the impact on overall satisfaction scores is plotted horizontally. The impact on overall satisfaction scores is based on a statistical method called regression analysis that determines how a specific service contributes to respondents' overall satisfaction with the services, or perceived importance.

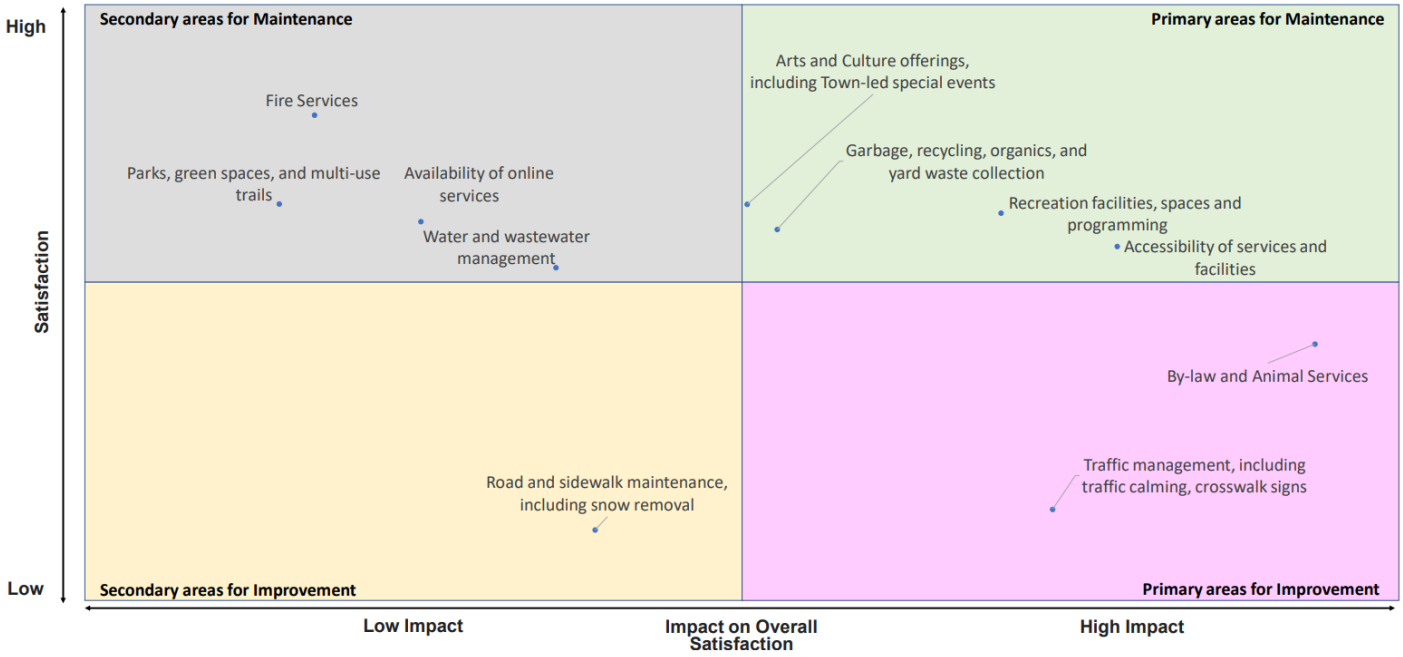


Figure 7: Gap Analysis, Annual Resident Survey, Town of Aurora, February 2023

Findings from this Gap Analysis identified two primary areas improvement: By-law and animal services, and traffic management. The analysis suggests that an increase in satisfaction in these areas would have the largest impact on overall satisfaction with Town services. A secondary area for improvement is road and sidewalk maintenance.

Most respondents (85%) said they receive a good value for their tax dollars. When compared to six other municipalities across Canada, the Town has the second highest rating of value for tax dollars. The majority (79%) of respondents are supportive of the Town spending money on infrastructure renewal and construction, however respondents were split on how to fund this renewal in infrastructure, with half supporting an increase in taxes to fund this, and half opposing. This means the Town is likely receptive to a conservative increase in spending.

1.6.3 Integration with AMP

The resident satisfaction survey is a key piece of information, with valuable findings. The Town is committed to continuing to prioritize the satisfaction of residents. Results from the 2023 Resident Satisfaction Survey will be used to inform the Proposed Levels of Service put forward in this AMP.

1.7 Ontario Regulation 588/17

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

Figure 8 below outlines key reporting requirements under O. Reg 588/17 and the associated timelines.

2019

Strategic Asset Management Policy

2023

Asset Management Plan for Core Assets with the following components:

- Current levels of service
- Inventory analysis
- Lifecycle activities to sustain LOS
- Cost of lifecycle activities
- Population and employment forecasts
- Discussion of growth impacts

2024

Asset Management Plan for Core and Non-Core Assets (same components as 2023) and Asset Management Policy Update

2025

Asset Management Plan for All Assets with the following additional components:

- Proposed levels of service for next 10 years
- Updated inventory analysis
- Lifecycle management strategy
- Financial strategy and addressing shortfalls
- Discussion of how growth assumptions impacted lifecycle and financial strategies

Figure 8 O. Reg. 588/17 Requirements and Reporting Timelines

1.7.1 O. Reg. 588/17 Compliance Review

The following table identifies the requirements outlined in Ontario Regulation 588/17 for municipalities to meet by July 1, 2025. Next to each requirement a page or section reference is included in addition to any necessary commentary.

Requirement	O. Reg. Section	AMP Section Reference	Status
Summary of assets in each category	S.5(2), 3(i)	4.1.1 - 5.2.1	Complete
Replacement cost of assets in each category	S.5(2), 3(ii)	4.1.1 - 5.2.1	Complete
Average age of assets in each category	S.5(2), 3(iii)	4.1.3 - 5.2.3	Complete
Condition of core assets in each category	S.5(2), 3(iv)	4.1.2 – 5.2.2	Complete
Description of municipality's approach to assessing the condition of assets in each category	S.5(2), 3(v)	4.1.2 – 5.2.2	Complete
Current levels of service in each category	S.5(2), 1(i-ii)	4.1.6 - 5.2.6	Complete for Core Assets Only
Current performance measures in each category	S.5(2), 2	4.1.6 - 5.2.6	Complete for Core Assets Only
Lifecycle activities needed to maintain current levels of service for 10 years	S.5(2), 4	4.1.4 - 5.2.4	Complete
Costs of providing lifecycle activities for 10 years	S.5(2), 4	Appendix A	Complete
Growth assumptions	S.5(2), 5(i-ii) S.5(2), 6(i-vi)	6.1-6.2	Complete

Table 3 O. Reg. 588/17 Compliance Review Summary

2 Scope and Methodology

Key Insights

- This asset management plan includes 9 asset categories and is divided between tax-funded and rate-funded categories
- The source and recency of replacement costs impacts the accuracy and reliability of asset portfolio valuation
- 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

2.1 Asset Categories Included in this Asset Management Plan

This asset management plan (AMP) for the Town is produced in compliance with Ontario Regulation 588/17. The July 2025 iteration of the AMP requires analysis of both core and non-core assets.

The AMP summarizes the state of the infrastructure for the Town's asset portfolio, establishes current levels of service, proposed levels of service, and the associated technical and customer-oriented key performance indicators (KPIs), outlines lifecycle strategies for optimal asset management and performance, and provides financial strategies to reach sustainability for the asset categories listed below.

Asset Category	Source of Funding
Road Network	Tax Levy
Bridges & Culverts	
Buildings	
Fleet	
Machinery & Equipment	
Park Facilities	
Water Network	User Rates
Sanitary Network	
Storm Network	

Table 4 AMP Asset Categories and Funding Sources

2.2 Deriving Replacement Costs

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

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

User-defined costs based on reliable sources are a reasonably accurate and reliable way to determine asset replacement costs. Cost inflation is typically used in the

absence of reliable replacement cost data. It is a reliable method for recently purchased and/or constructed assets where the total cost is reflective of the actual costs that the Town incurred. As assets age, and new products and technologies become available, cost inflation becomes a less reliable method.

2.3 Estimated Useful Life and Service Life Remaining

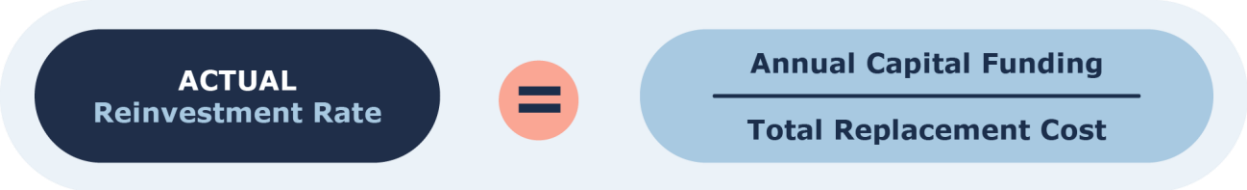
The estimated useful life (EUL) of an asset is the period over which the Town expects the asset to be available for use and remain in service before requiring replacement or disposal. The EUL for each asset in this AMP was assigned according to the knowledge and expertise of municipal staff and supplemented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

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

2.4 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 Town can determine the extent of any existing funding gap. The reinvestment rate is calculated as follows:



2.5 Deriving Asset Condition

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

Table 5 Standard Condition Rating Scale

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

3 Portfolio Overview

Key Insights

- The total replacement cost of the Town's asset portfolio is approximately $2.3 billion
- The Town's target re-investment rate is 1.9%, and the actual re-investment rate is 1.1%, contributing to an expanding infrastructure deficit
- 85% of all assets are in fair or better condition
- Average annual capital requirements total $43.8 million per year across all assets, excluding any planned contributions to supporting reserves

3.1 Total Replacement Cost of Asset Portfolio

The asset categories analyzed in this AMP have a total replacement cost of $2.3 billion based on inventory data from 2023. 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.

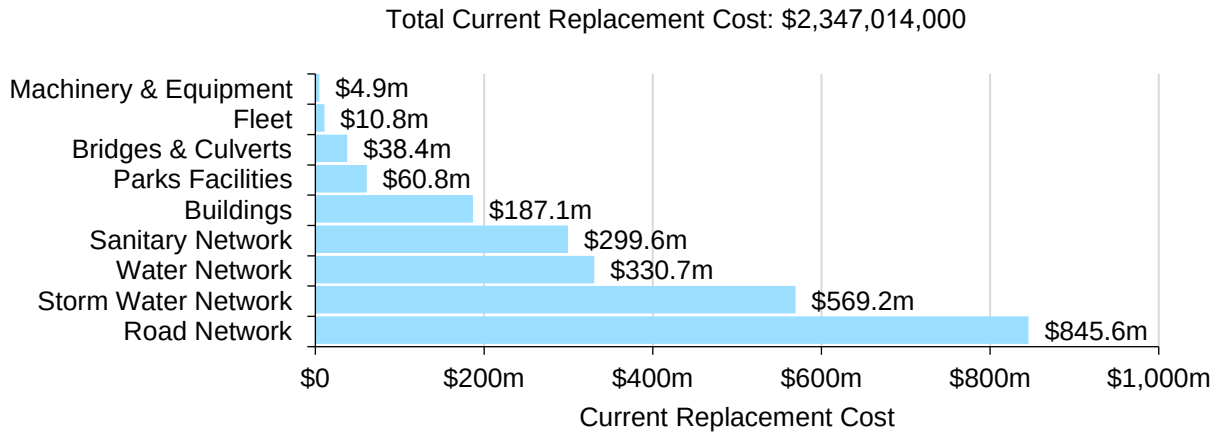


Figure 9 Current Replacement Cost by Asset Category

Table 6 below identifies the methods employed to determine replacement costs across each asset category:

Asset Category	Replacement Cost Method
Road Network	Cost per Unit 71%, CPI Tables 19% User-Defined 8%
Bridges & Culverts	CPI Tables
Storm Network	Cost per Unit 89%, CPI Tables 10% User-Defined 1%
Water Network	Cost per unit 5%, CPI Tables 28% User-Defined 67%
Sanitary Network	Cost per Unit 97%, User-Defined 3%
Buildings	User Defined
Machinery & Equipment	CPI Tables
Fleet	CPI Tables
Park Facilities	CPI Tables 69%, User-Defined 22% Cost per Unit 9%

Table 6 Replacement Cost Methods by Asset Category

3.2 Target vs. Actual Reinvestment Rate

Table 7 below depicts funding gaps or surpluses by comparing target vs actual reinvestment rate. To meet the long-term replacement needs, the Town should be allocating approximately $43.8 million annually, for a target reinvestment rate of 1.9%. Actual annual spending on infrastructure totals approximately $25.9 million, for an actual reinvestment rate of 1.1%.

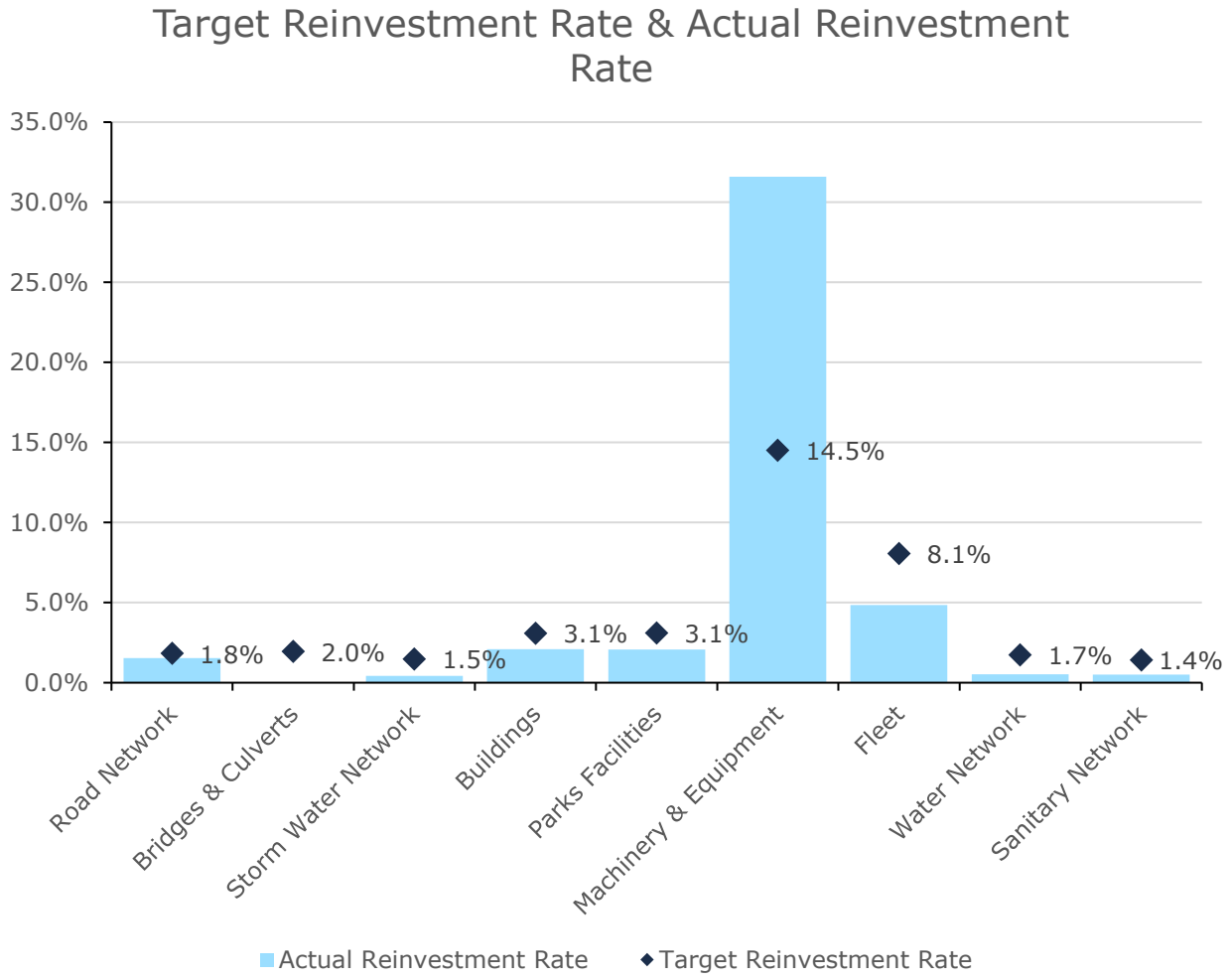


Table 7 Target vs. Actual Reinvestment Rate by Asset Category

3.3 Condition of Asset Portfolio

The current condition of the assets is central to all asset management planning. Collectively, 85% of assets in Aurora are in fair or better condition. This estimate relies on both age-based and field condition data.

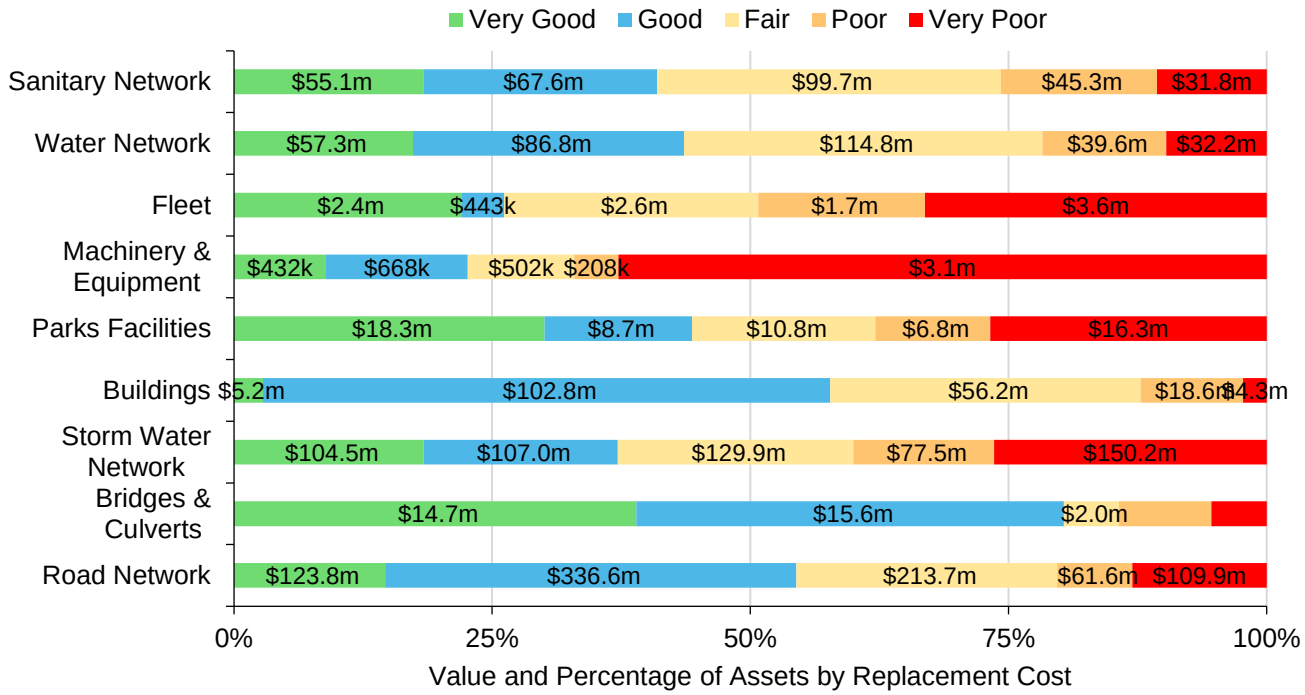


Figure 10 Asset Condition by Asset Category

This AMP relies on assessed condition data for 37% of assets; for the remaining portfolio, age is used as an approximation of condition. Assessed condition data is invaluable in asset management planning as it reflects the true condition of the asset and its ability to perform its functions. Table 8 below identifies the source of condition data used throughout this AMP.

Asset Category	% of Assets with Assessed Condition
Road Network	71%
Bridges & Culverts	82%
Stormwater Network	0%
Buildings & Facilities	98%
Parks Facilities	4%
Machinery & Equipment	0%
Fleet	0%
Water Network	2%
Sanitary Network	4%

Table 8 Condition Data by Asset Category

3.4 Forecasted Capital Requirements

The development of a long-term capital forecast should include both asset rehabilitation and replacement requirements. With the development of asset-specific lifecycle strategies that include the timing and cost of future capital events, the Town can produce an accurate long-term capital forecast. The following graph identifies capital requirements over the next 80 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 5-year capital requirements.

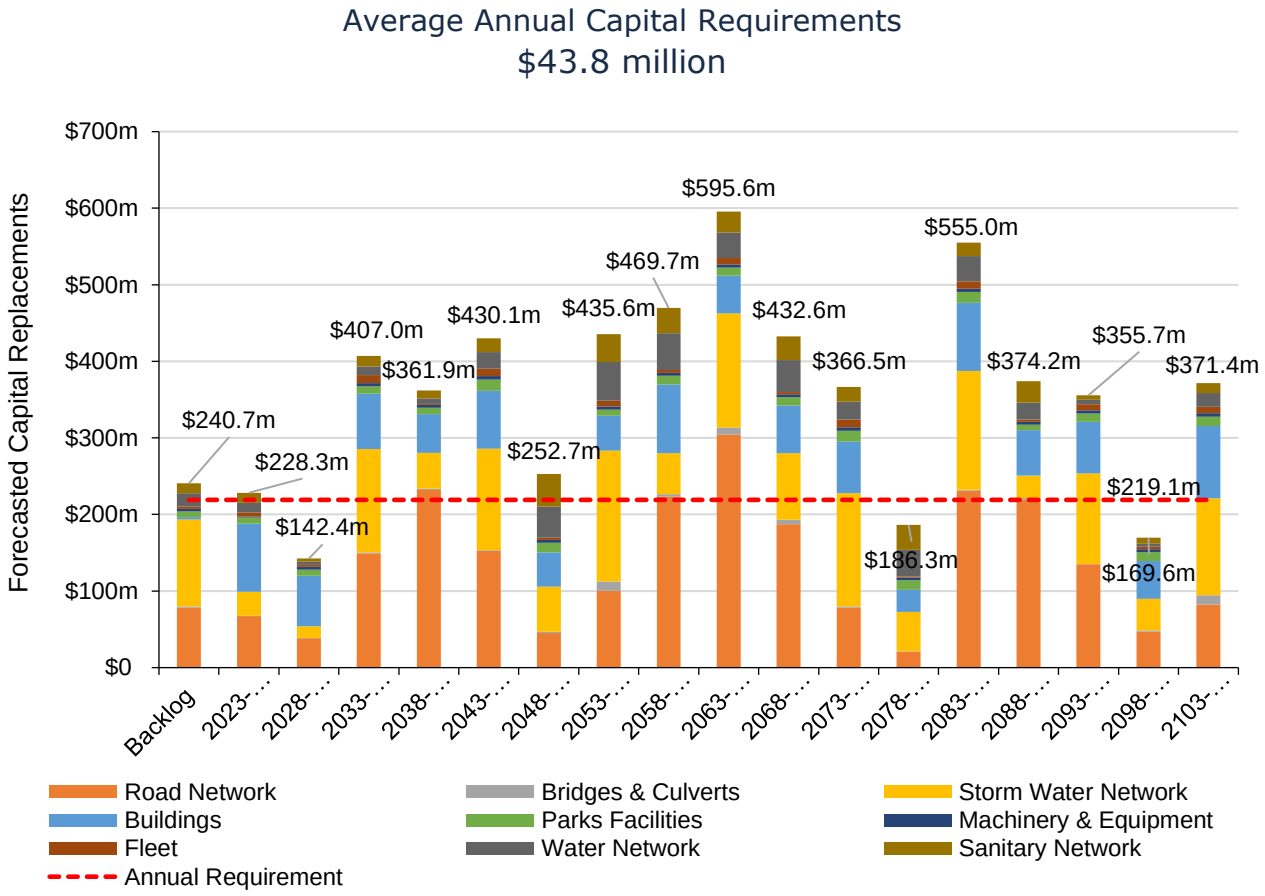


Figure 11 Capital Replacement Needs: Portfolio Overview 2023-2107

4 Impacts of Growth

Key Insights

- Understanding the key drivers of growth and demand will allow the Town to plan for new infrastructure more effectively, and the upgrade or disposal of existing infrastructure.
- Significant population and employment growth is expected.
- The costs of growth should be considered in long-term funding strategies that are designed to maintain the current level of service.

4.1 Description of Growth Assumptions

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 Town 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.

4.1.1 Aurora Official Plan (2024)

The Official Plan is a planning document for the purpose of guiding the future development of the Town. The Town's Official Plan is intended to direct the actions of local governments, and provide guidance for land use, development decisions, and growth management with consideration of social, economic, and environmental factors. The document planning horizon spans the next 37 years, concluding in 2051.

The Official Plan for the Town was prepared and originally adopted in September 2010. The Plan has been updated to include approved Official Plan Amendments as of January 1, 2024. The Official Plan is developed based on the stakeholder consultation in accordance with the Provincial and York Region policies.

The Official Plan reflects the goals of developing a complete community, enhancing environmental responsibility, promoting responsible growth management, supporting the use of transit, and efficient use of infrastructure. The Town seeks to maintain a sustainable development pattern that focuses on intensification in strategic areas, protection of existing stable neighbourhoods, the revitalization of the Aurora Promenade, and the efficient use of the greenfield lands.

One of the primary factors considered in the Plan is to provide adequate municipal services (water, sewer, and stormwater), transportation services, social services, recreational facilities, and utility services to accommodate the proposed growth cost-effectively and efficiently. According to the Plan, the population is projected to grow to 85,800 people with the number of jobs projected to reach 41,600 by 2051. The following table outlines the projected population and employment changes to the Town between 2021 and 2051 from Statistics Canada.

Year	Population (Projected)	Employment (Projected)
2021	64,000	29,600
2031	71,900	34,100
2041	79,600	38,300
2051	85,800	41,600

Table 9 Projected Population and Employment for Aurora 2021-2051

Approximately 45 percent of new residential growth, is to be accommodated through intensification within the Built Boundary. The remaining 55 percent of new residential growth is to be accommodated within the Residential Designated Greenfield Area. Furthermore, new employment within the Greenfield areas must be planned to achieve a minimum gross density of 55 jobs per hectare.

Aurora's projected new employment growth shall be accommodated by a combination of new Designated Greenfield Area development, intensification of existing designated employment areas, and intensification in Strategic Growth Areas. The Existing Employment areas will continue to function as important employment areas. In addition, it is anticipated that additional home based jobs will be created within the existing residential land base.

4.1.2 Master Plans and Studies

The Town has developed several key master plans and studies that serve as guiding documents for municipal services with the expected growth. The Town has the following master plans and studies:

- Comprehensive Stormwater Management Master Plan (2014)
- Stream Management Master Plan (2019)
- Master Transportation Study (2020)
- Parks & Recreation Master Plan (2023)
- Active Transportation Master Plan (2024)

Additionally, York Region has developed the York Region Transportation Master Plan (2023).

The Comprehensive Stormwater Management Master Plan (CSWM-MP) was developed by Aquafor Beech Ltd and submitted to the Town in November 2014. The plan identifies the Town as being located within the Lake Simcoe watershed, and more specifically, in the East Holland sub watershed where anthropogenic activities have altered the ecological landscape and associated natural processes. This has resulted in increased surface runoff and degradation of water quality within the Lake Simcoe watershed. The development of the Comprehensive Stormwater

Management Master Plan is an important step in meeting the objectives of the Lake Simcoe Protection Plan, which are to reduce phosphorus loading and other nutrients of concern to Lake Simcoe and to reduce the discharge of pollutants to Lake Simcoe. The CSWM-MP identified various implementable measures for the Town of Auora to help meet these objectives. For pollution control, these measures include implementing materials storage controls, advising landowners on environmentally acceptable ways to drain pools, implementing an erosion and sediment control program, a cross connection control program, undertaking public and business education, as well as salt management measures and snow disposal practices in the winter months. The plan also recommends several retrofits that would serve as source control such as rain gardens soak away pits, pervious pavements, and rain barrels. The plan recommends various other retrofits and low impact developments (LIDs) such as adding perforated pipes, bioswales, or oil and grit separators to roads without ditches.

The Stream Management Master Plan & Tannery Creek Flood Relief Study was completed in 2019. This master plan was created in accordance with recommendations from the Town's Comprehensive Stormwater Management Master Plan (2014) and with its obligations under the Lake Simcoe Protection Plan (2009). Areas identified in the Stream Management Master Plan include watercourse enlargement and widening, deterioration of erosion control structures, erosion of private property, creation of barriers to fish mitigation, undercutting of bridge abutments and bank restoration materials, loss of floodplain access during more frequent flows, and more. Urbanization has placed the integrity of watercourses and adjacent lands at risk. The master plan has identified several possible approaches to mitigate the stream management problem in Aurora, such as stream restoration projects for erosion, flood mitigation, and improvement of aquatic habitat and long-term watershed management strategies.

The Master Transportation Study (MTS) was completed in 2020. The MTS seeks to review and address existing transportation needs within the Town, as well as provide support for the growth of the Town to 2041. The MTS seeks to develop and integrated set of road network and infrastructure solutions that continue to accommodate vehicles, cyclists, pedestrians, and transit users, while streamlining the improvements to preserve the small-town community characteristics of the Town and the Town's historic downtown core. The solutions recommended by the MTS were to implement Travel Demand Management, supporting and encouraging transit use, and active transportation improvements such as completing the sidewalk network. Additionally, the MTS puts forth the recommendation to improve traffic signal timing adjustments, and implement travel lane modifications, safety improvements, and parking management.

The Parks and Recreation Master Plan was prepared by Monteith Brown Planning Consultants and submitted to the Town in May 2023. The master plan is intended to

guide decision-making with respect to municipal parks and recreation facilities and services in the Town from 2023 to 2027. The plan puts forward several recommendations, from acquiring new land to develop new facilities, to reconstructing facilities with stakeholder input, to undertaking regular condition assessments for park amenities.

The Master Plans for core infrastructure largely indicate that the Town must integrate notable considerations for population and employment growth in new development. Further studies may be required to update the plans and strategies to improve growth management.

4.1.3 Development Charges Background Study (2024)

The Town prepared a Development Charges Background Study in 2023 through Watson & Associates Economists Ltd, pursuant to Section 10 of the Development Charges Act, 1997 (DCA). The 2024 DC Background Study addresses: the forecast amount, type, and location of growth; identification of the servicing needs to accommodate growth; the capital costs to provide the services; and the approved by-law (No. 6592-24) enables the Town to collect development charges in support of its provision of municipal services to its growing community.

The DC Study presents proposed new development charges based upon costing and related assumptions outlined in this document and compares the proposed charges to the current charges. Development charges are broken down by each municipal-wide service.

The DC Background Study, pursuant to the DCA, includes a reference to an AMP for the purposes of developing an asset management program that considers future growth. This AMP supports the objectives defined in the Development Charges Background Study.

4.2 Regional Growth

The Regional Official Plan was adopted by York Region Council in June 2023 and approved by the Minister of Municipal Affairs and Housing in November 2023. The Plan incorporates seven major goals based on population and employment growth. According to the Plan, the nine local municipalities in York Region (Aurora, East Gwillimbury, Georgina, King, Markham, Newmarket, Richmond Hill, Vaughan, Whitchurch-Stouffville) are currently experiencing the following trends: population growth and labour growth.

The 2021 Growth and Development Review states that York Region's population and employment growth will continue. The following graph, found in the document, displays the annual population growth in the region from 2012 to 2021. The average growth rate from 2012 to 2021 is 1.3%.

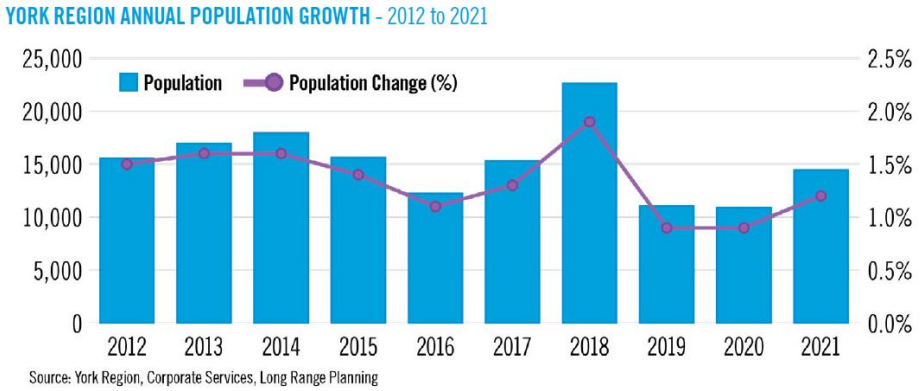


Figure 12 York Region Population Growth 2012-2021

In accordance with the Provincial document *A Place to Grow: Growth Plan* for the Greater Golden Horseshoe, Figure 13 below (referenced from the same document) shows the population and employment projections from 2016 to 2051.

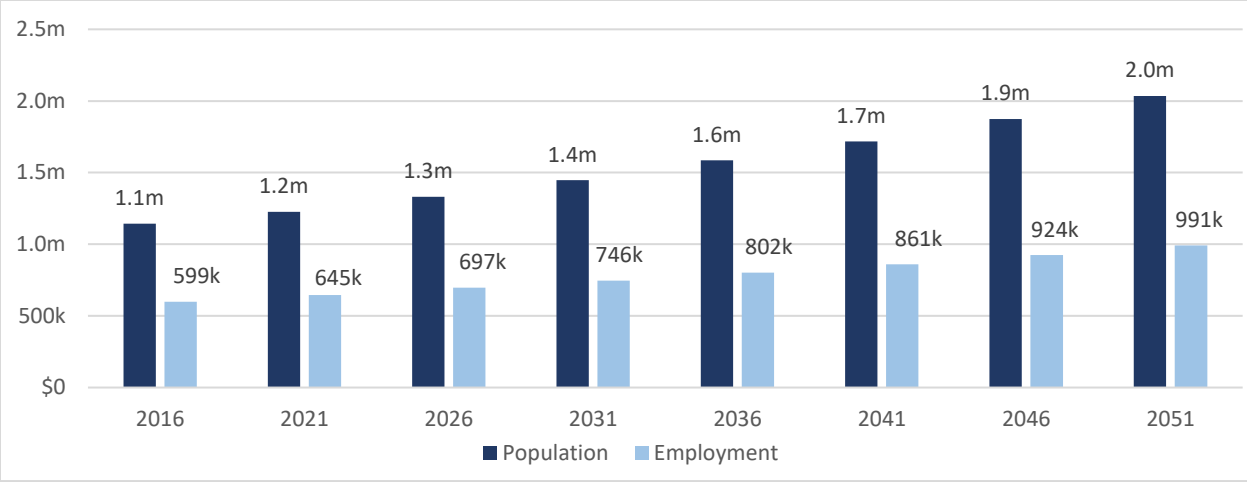


Figure 13 Population and Employment Projections for Greater Golden Horseshoe

York Region has established population and employment forecasts for the nine local municipalities to 2051 in the Official Plan. Table 10 below shows the population and employment projections in Aurora from 2016 to 2051.

	2016	2021	2031	2041	2051
Population	57,200	63,800	71,600	79,000	85,000
Employment	27,300	29,200	33,700	37,900	41,400

Table 10 Population and Employment Projections for Aurora from York Region Official Plan

The most recent census data from 2021 shows an employment increase above the projected level, reaching 34,205 while the population increase below the projected level. Given the upward trends of population and employment, Aurora is likely to experience continuous growth.

4.3 Impact of Growth

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

The Strategic Plan for the Town has indicated the priorities of maintaining sustainable infrastructure and a thriving business community, providing fiscally responsible practices, supporting balanced and sustainable growth, as well as providing gathering places and ensuring effective communications.

The Town will ensure the water and sewage disposal services, water supply services, stormwater management, transport pathways, recreation trails, public utilities, and emergency services are planned and developed to provide for the

growth targets outlined in the Official Plan. As growth-related assets are constructed or acquired, they should be integrated into the Town's AMP. While the addition of residential units will add to the existing assessment base and offset some of the costs associated with growth, the Town 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.

5 Analysis of Tax-funded Assets

Key Insights

- Tax-funded assets are valued at $1.7 billion
- Tax-funded assets are funded at 41.4% of their long-term requirements
- Average annual capital requirement for tax-funded assets is $25.4 million
- Critical assets should be evaluated to determine appropriate risk mitigation activities and treatment options

5.1 Road Network

The Road Network is a critical component of the provision of safe and efficient transportation services and represents one of the highest value asset categories in the Town's asset portfolio. It includes all municipally owned and maintained roadways in addition to supporting roadside infrastructure including pavement and curbs, sidewalks, paths, multiuse trails, streetlights, signage, retaining walls, and traffic signals.

Decisions on road maintenance and repairs are primarily managed through RoadMatrix – a data-driven pavement modelling and management tool. The tool factors in the condition of the road and other linear right-of-way assets and the road classification to recommend the most cost-effective treatments within a finite funding envelope. In addition to the recommendations from the pavement management system, input from the Operations road division annual inspections is incorporated to create a more comprehensive workplan. The Town has not yet optimized Citywide's project prioritization applications, therefore, staff should continue to use their pavement management system to develop a work plan for their linear assets.

The state of the infrastructure for the road network is summarized in Table 11.

Replacement Cost	Condition	Financial Capacity	
$846 M	65%	Recommended Annual Requirement:	$15.5 M
		Funding Available:	$13.0 M
		Annual Deficit:	$2.5 M

Table 11 Road Network State of the Infrastructure

The following core values and level of service statements are a key driving force behind the Town's asset management planning:

Service Attribute	Level of Service Statement
Scope	The road network service is conveniently accessible to the whole community in sufficient capacity (meets traffic demands) and is available under all weather conditions.
Quality	The road network is in good condition with minimal unplanned service interruptions and road closures.

Table 12 Road Network Level of Service Statements

5.1.1 Asset Inventory & Costs

Table 13 below includes the quantity, total replacement cost and annual capital requirements of each asset segment in the Town's road network inventory.

Asset Segment	Quantity	Replacement Cost	Recommended Annual Capital Requirement
Arterial Roads	58,210 m^2	$24,099,000	$367,000
Collector Roads	586,321 m^2	$194,659,000	$2,959,000
Local Roads	1,514,588 m^2	$355,928,000	$5,410,000
Retaining Walls	168 Assets	$54,032,000	$1,896,000
Signage	8,420 Assets	$1,434,000	$143,000
Sidewalks	414,343 m^2	$111,161,000	$2,138,000
Streetlights	5,891 Assets	$68,690,000	$1,280,000
Traffic Signals	18 Assets	$4,114,000	$206,000
Railing and Fencing	1,342 m	$2,734,000	$96,000
Parking Lot	67,482 m^2	$28,790,000	$960,000
Total		**$845,639,000**	**$15,454,000**

Table 13 Road Network Inventory and Valuation

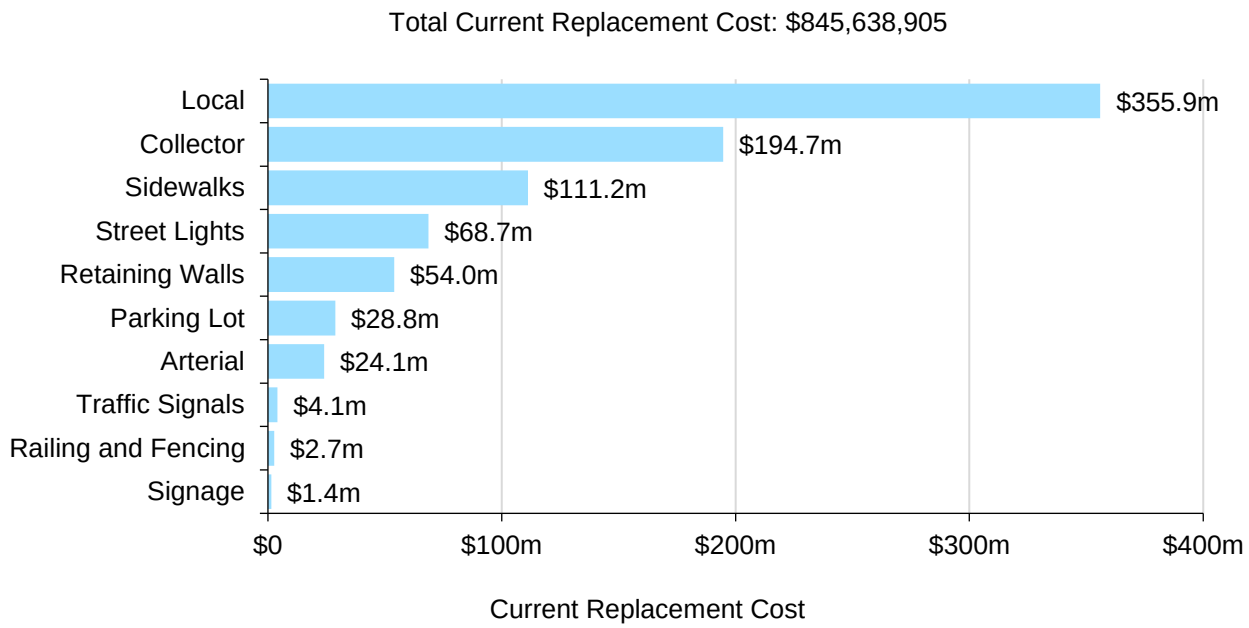


Figure 14 Road Network Replacement Cost by Segment

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

5.1.2 Asset Condition & Age

Table 14 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.

Asset Segment	Average Estimated Useful Life (Years)	Average Age (Years)	Average Condition
Arterial Roads	60	24	72%
Collector Roads	60	25	73%
Local Roads	60	24	69%
Retaining Walls	30	19	26%
Signage	10	18	12%
Sidewalks	50	23	66%
Streetlights	50	27	49%
Traffic Signals	20	25	15%
Railing and Fencing	30	4	80%
Parking Lot	30	16	59%
Average			**65%**

Table 14 Road Network Asset Age and Condition Summary

An asset's age profile comprises two key values: estimated useful life (EUL), or design life; and the percentage of EUL consumed. The EUL is the serviceable lifespan of an asset during which it can continue to fulfil its intended purpose and provide value to users, safely and efficiently. As assets age, their performance diminishes, often more rapidly as they approach the end of their design life.

In conjunction with condition data, an asset's age profile provides a more complete summary of the state of infrastructure. It can help identify assets that may be candidates for further review through condition assessment programs, inform the selection of optimal lifecycle strategies, and improve planning for potential long-term replacement spikes.

Figure 15 below displays the average asset age vs EUL for each asset segment.

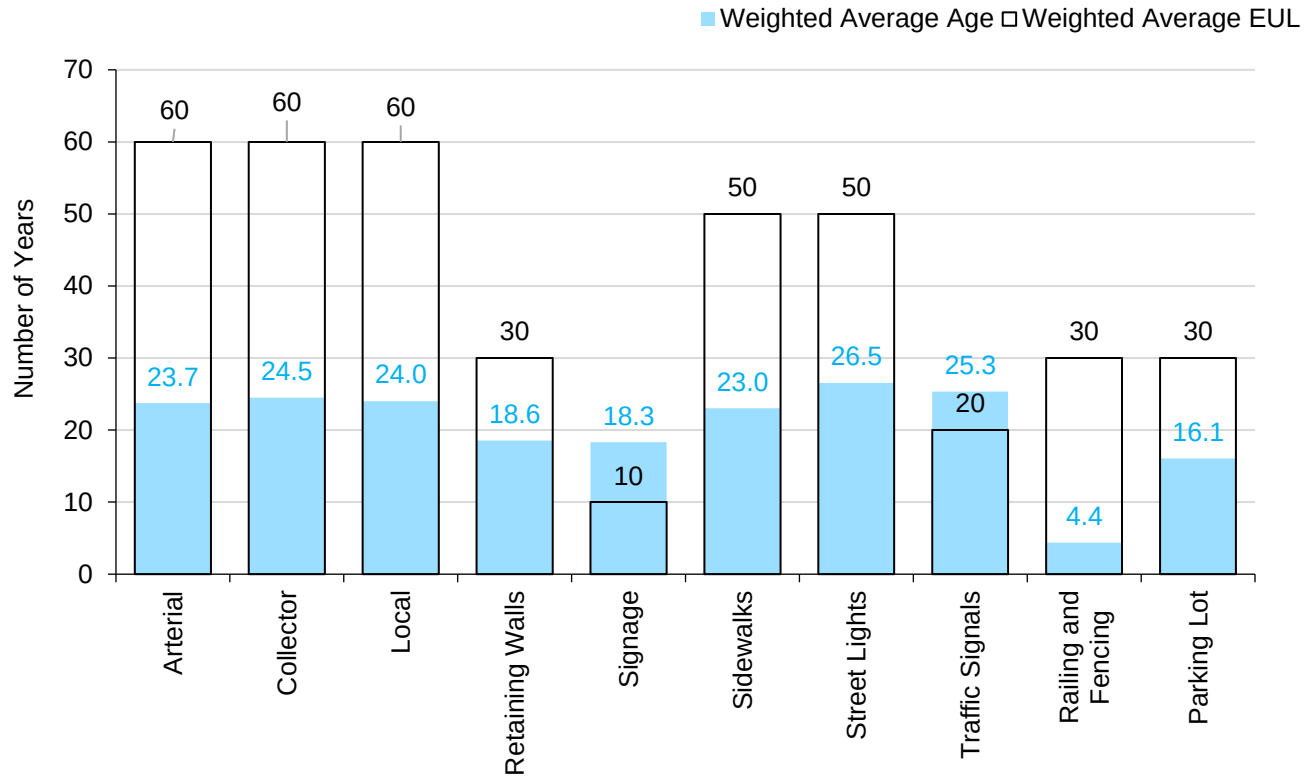


Figure 15 Road Network Asset Age vs. EUL

Figure 16 below visually illustrates the average condition for each asset segment on a very good to very poor scale.

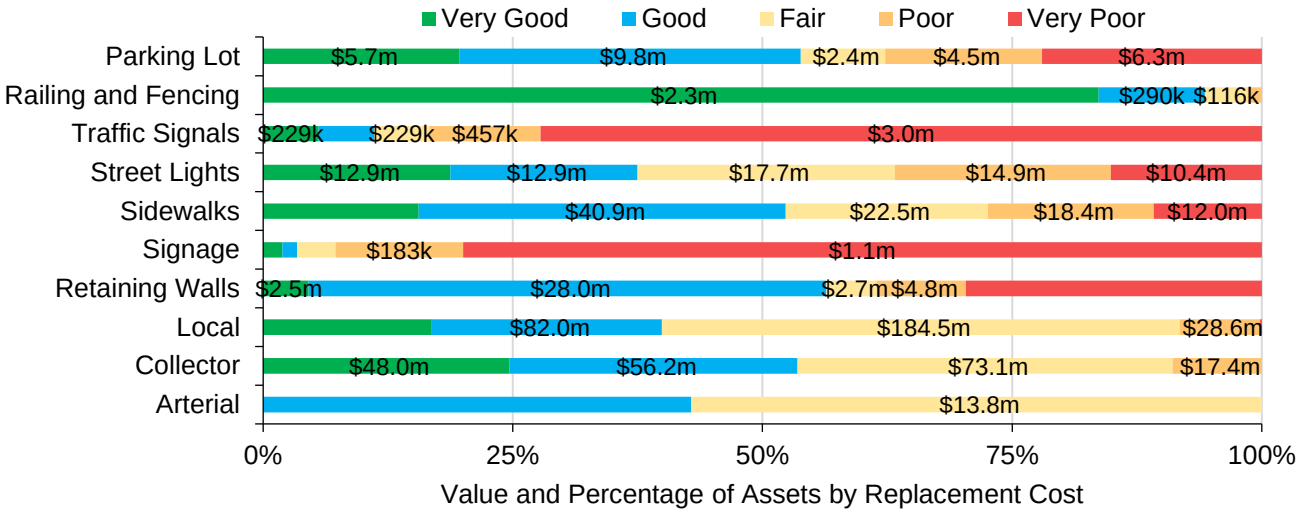


Figure 16 Road Network Asset Condition by Segment

To ensure that the Town's Road network continues to provide an acceptable level of service, the Town 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 more confidently. The following describes the Town's current approach:

- A Road Needs Study is performed every 3 years and entered into a pavement management system
- Parking lots are assessed cyclically every 10 years
- Annual inspections for sidewalks that include deficiency testing
- Regulatory and warning road signs are assessed for post condition and reflectivity on an annual basis as per MMS standards
- Traffic signals are inspected every two years, along with conflict monitoring
- Streetlights are inspected as per minimum maintenance standards, with extra inspections during winter months for public safety
- Regular internal inspections are completed for various other road assets

In this AMP the following rating criteria is used to determine the current condition of road segments and forecast future capital requirements:

Condition	Rating
Very Good	90-100
Good	70-89
Fair	50-69
Poor	30-49
Very Poor	0-29

Table 15 Road Network Condition Rating Scale

5.1.3 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.

Table 16 outlines typical lifecycle management activities commonly deployed to the Town's road network:

Activity Type	Description of Current Strategy
Maintenance & Inspection	The Town regularly conducts a variety of maintenance activities including the following planned activities: street light inspection and maintenance (monthly to annually), sidewalk inspection (annually), crack sealing (monthly to annually). Repairs and maintenance, such as snow removal are completed as needed. All activities are conducted to meet Minimum Maintenance Standards for Municipal Highways (O. Reg. 239/02).
	Paved roads may receive crack sealing treatment based on if the pavement meets the road intervention decision criteria. In most cases, the road must be below an established condition threshold and have had no crack sealing treatment previously.
	Paved roads are to be assessed for condition at least every three (3) years. The last assessment was completed in 2023. Assessments were completed by an external engineering consultant. Data collected included surface distress and roughness data which helped inform the pavement quality index (PQI).
Rehabilitation	Rehabilitation activities may be planned or reactive in nature. Roads are commonly selected for mill and overlay, asphalt replacement, or full reconstruction. The decision to rehabilitate is mostly driven by the roads condition, with additional considerations (i.e. other linear projects, strategic opportunities, etc.) as needed.
Replacement	On an annual basis sidewalks are reconstructed. Candidates for reconstruction are based on an annual assessment focused on condition.
	Parking lot rehabilitation is primarily determined based on condition assessments.
	Roads may be reconstructed where the pavement condition has declined beyond the established threshold. Roads can also be selected for reconstruction as part of a road urbanization project.

Table 16 Road Network Lifecycle Management Strategies

The following decision tree outlines the general decision-making framework for paved roads. In some cases, exceptions and/or additional considerations (i.e. road class) may apply. The Pavement Quality Index (PQI) and Surface Distress Index

(SDI) has been factored into the Town's pavement management system decision tree below:

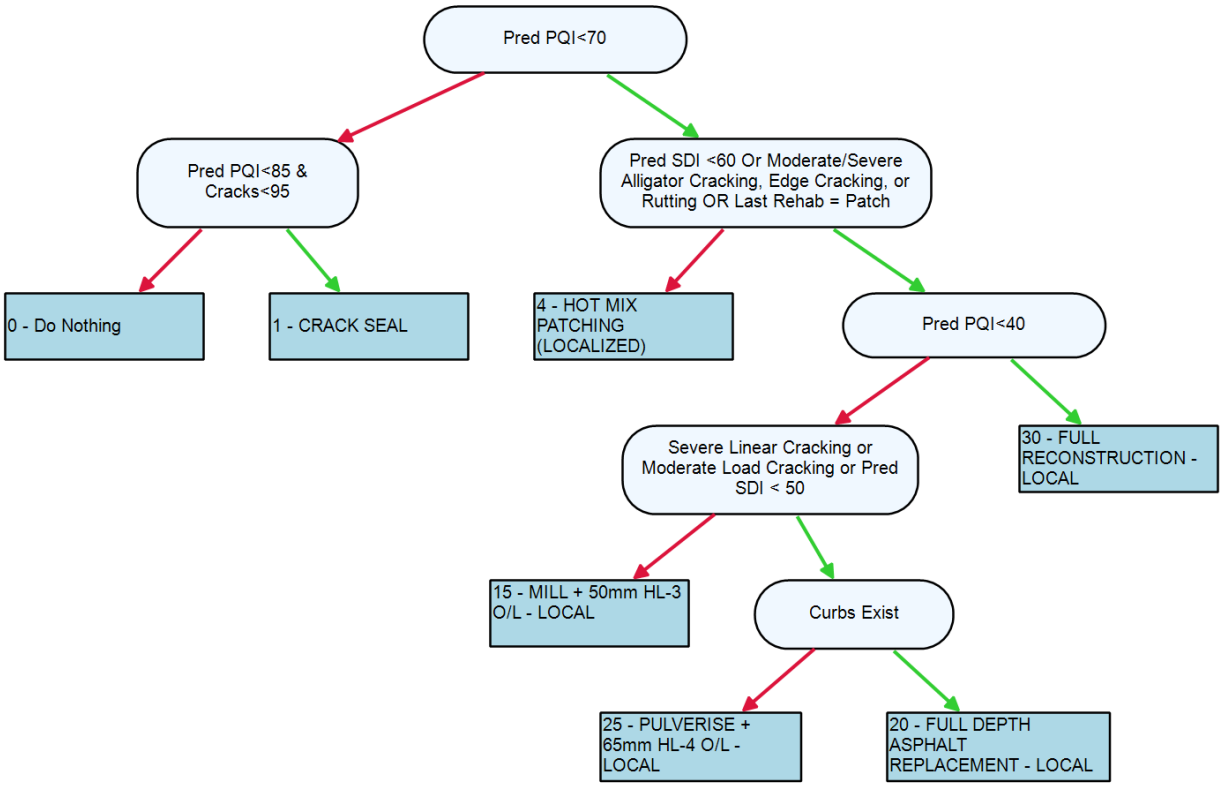


Figure 17 Paved Roads Decision Tree Summary

Forecasted Capital Requirements

Based on the lifecycle strategies identified previously for Paved Roads, and assuming the end-of-life replacement of all other assets in this category, the following graph forecasts capital requirements for the Road Network.

The annual capital requirement represents the average amount per year that the Town should allocate towards funding rehabilitation and replacement needs to meet future capital needs. Figure 18 Road Network Forecasted Replacement Needs 2024-2108 is developed using information from the CityWide software which relies on the capital needs within an asset category. The projected cost of lifecycle activities that will need to be undertaken over the next 10 years to maintain the current level of service can be found in Table 126 in Appendix A.

The capital costs will typically differ between these two graphs since a capital plan resulting from individual asset needs will be different than the capital plan resulting from a project-based approach. The goal of this asset management plan is to assess the required long-term funding for these assets to maintain the desired

levels of service. As staff work towards refining the data and structure within CityWide, they will be able to run various risk and lifecycle strategies that will help them prioritize assets for rehabilitation and/or replacement effectively. In the meantime, the road reconstruction program from the pavement management system will provide a more accurate project-based forecast.

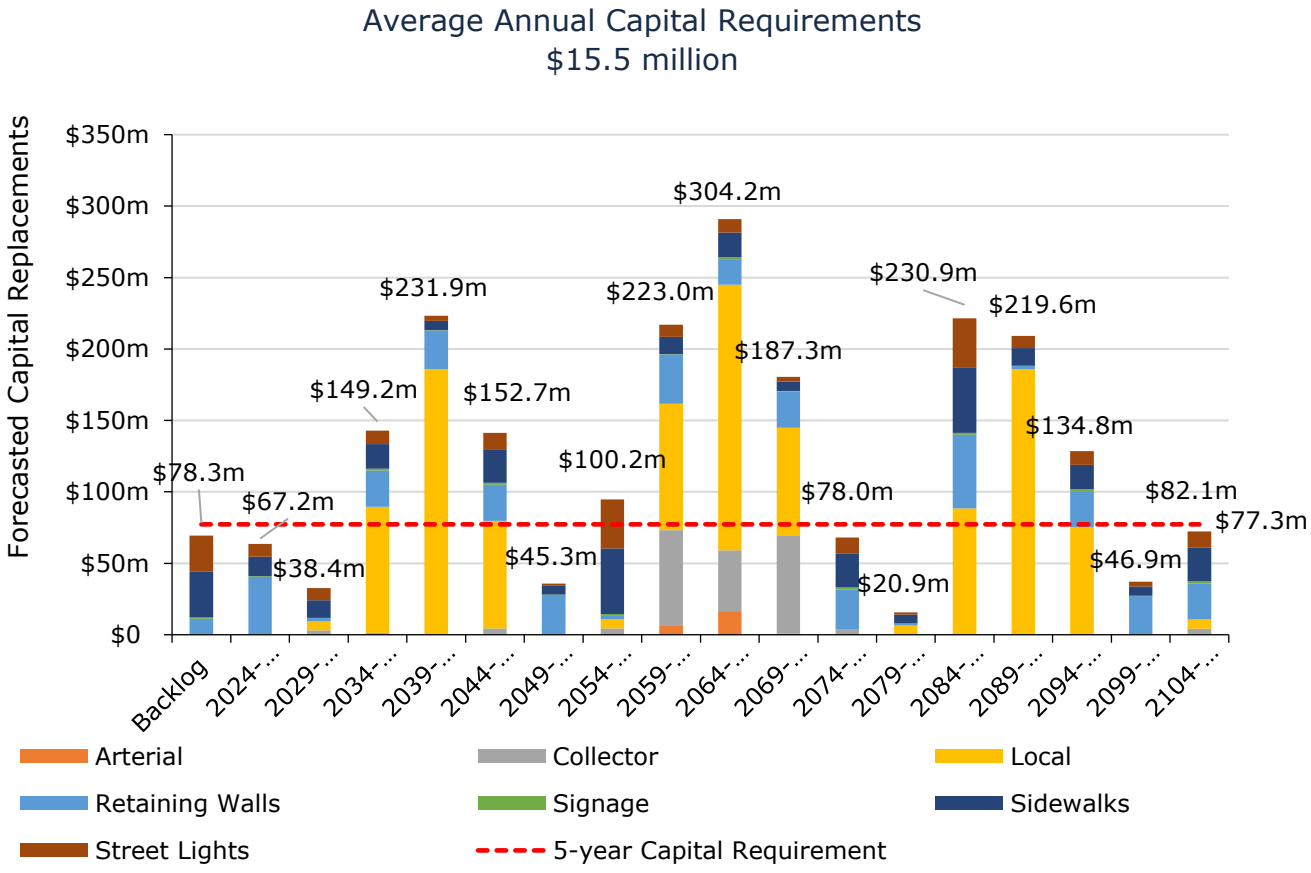


Figure 18 Road Network Forecasted Replacement Needs 2024-2108

5.1.4 Risk & Criticality

Risk Matrix

The asset-specific attributes that municipal staff utilize to define and prioritize the criticality of the road network are documented below, with their weights indicated in brackets:

Probability of Failure (POF)	Consequence of Failure (COF)
Structural (75%)	Economic (25%)
Functional (25%)	Social (15%)
	Health and Safety (40%)
	Environmental (20%)

Table 17 Road Network Risk Parameters

Based on the above noted attributes and weightings, risk is calculated for each asset. The following heat map illustrates the probability and consequence of failure scores for all road network assets based on 2023 inventory data. Please refer to Figure 96 in Appendix C for a more detailed overview of the criteria used to estimate the risk rating of each asset.

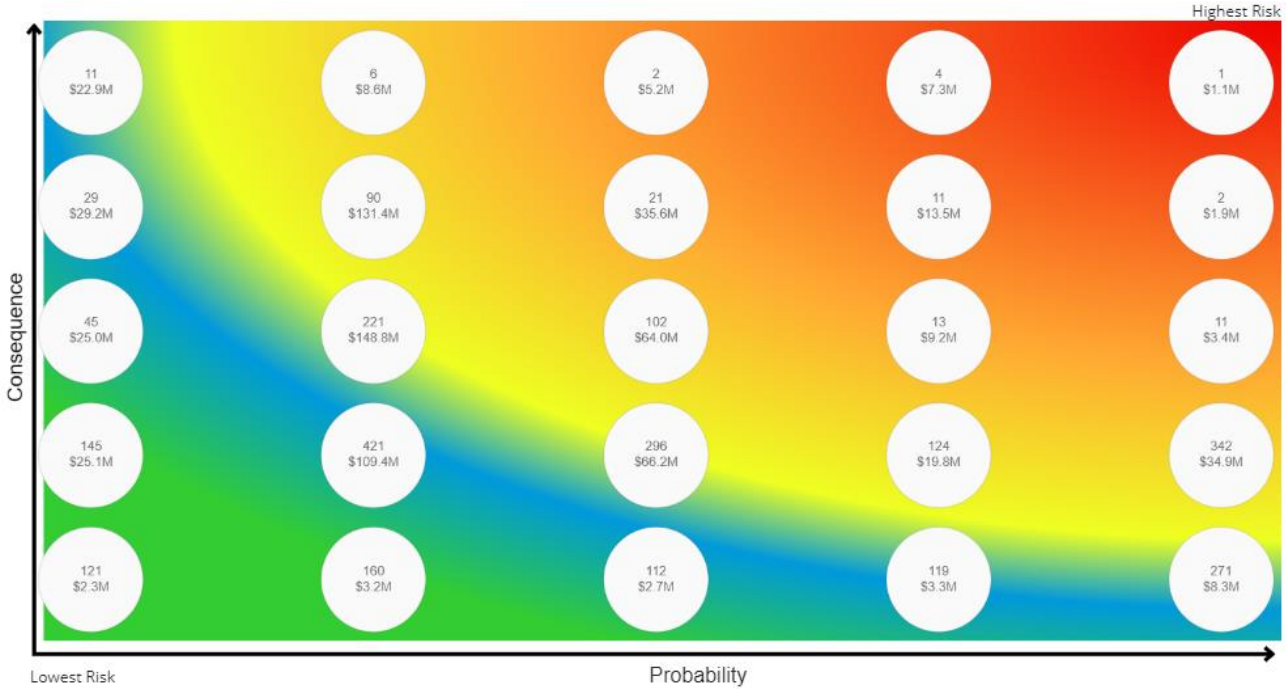


Figure 19 Road Network Risk Matrix Heat Map

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

The identification of critical assets is a valuable tool in identifying potential risk mitigation strategies and treatment options. Risk mitigation may include asset-specific lifecycle strategies, condition assessment strategies, or simply the need to collect better asset data.

Risks to Current Asset Management Strategies

Table 18 summarizes key trends, challenges, and risks to service delivery that the Town is currently facing:

Asset Data & Information

Inventory data is gathered continuously. Staff have plans to enhance data management process to increase the accuracy and reliability of asset data and information. Once completed, staff can confidently develop data-driven strategies to address infrastructure needs.

Lifecycle Management Strategies

The current lifecycle management strategy for roads is considered mainly proactive with reactive measures when required. It is a challenge to find the right balance between maintenance, capital rehabilitation, and the reconstruction of roads. Staff has plans to formally adopt better defined strategies to replace inferior infrastructure design, extend pavement lifecycle, explore cooperation opportunity with other assets, and reduce overall lifecycle costs. These strategies will require sustainable annual funding to minimize the deferral of capital works.

Capital Funding Strategies

Major capital rehabilitation and replacement projects are often dependant on the availability of grant funding opportunities. The Town has developed a project plan to address the infrastructure needs. When grants are not available, rehabilitation and replacement projects may be deferred. An enhanced proactive strategy can help to extend the service life of structures with lower funding requirements. A long-term capital funding strategy can reduce dependency on grant funding and help prevent deferral of necessary capital works.

	**Aging Infrastructure** As roads continue to age, there are a handful of structures that are approaching the end of their useful lives. High volumes of traffic and heavy vehicles accelerate the deterioration of road surfaces. Roads with poor condition pose higher demand on maintenance and rehabilitation. Current lifecycle management strategies are proactive. An enhanced proactive strategy can help to extend the service life of structures with lower funding requirement.
	Climate Change & Extreme Weather Events As extreme weather events are projected to continue, the events can result in damage to the road network and pose higher demand on maintenance and repair of the assets. Incorporating a monitoring and maintenance program for all road infrastructure can further support infrastructure resiliency and help mitigate the risk.

Table 18 Road Network Qualitative Risk Summary

5.1.5 Current Levels of Service

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

Community Levels of Service

Table 19 outlines the qualitative descriptions that determine the community levels of service provided by the road network.

Service Attribute	O. Reg. 588/17 Mandated	Qualitative Description	Current LOS (2023)
Scope	Yes	Description, which may include maps, of the road network in the municipality and its level of connectivity	The Town's road network contains local, collector, and arterial roads which are classified based on O. Reg. 239/02 speed limits and annual average daily traffic counts. These roads provide access throughout the Town and to neighbouring municipalities. Please refer to Figure 84 in Appendix B for a map of the Town's road network.
Quality	Yes	Description or images that illustrate the different levels of road class pavement condition	The Town's most recent road condition assessment was completed in 2023. Every road section received a surface condition rating ranging from 0-100. Condition scores are generally grouped and defined as follows: Very Poor: 0-29 Poor: 30-49 Fair: 50-69 Good: 70-89 Very Good: 90-100
Safe & Compliant	No	The Transportation Network is safe to use and complies with all relevant regulations	Description of the Town's winter maintenance policy, including a map of the Town served. Please refer to Figure 85 in Appendix B for a map of the Town's winter maintenance routes.
Affordable	No	The transportation network is affordable to all users	Description of measures to improve service cost effectiveness

Table 19 Road Network Community Levels of Service

Technical Levels of Service

Table 20 outlines the quantitative metrics that determine the technical level of service provided by the road network. The current LOS indicates the performance of each metric as of the specified date, in brackets. Current LOS performance is distinct from proposed LOS which is discussed in section 5.1.5.

Service Attribute	O. Reg. 588/17 Mandated	Technical Metric	Current LOS (2023)
Scope	Yes	Lane-km of arterial roads (mms classes 1 and 2) per land area (km/km^2)	0.4 km
	Yes	Lane-km of collector roads (mms classes 3 and 4) per land area (km/km^2)	4.0 km
	Yes	Lane-km of local roads (MMS classes 5 and 6) per land area (km/km^2)	6.1 km
Quality	Yes	Average pavement condition index for paved roads in the municipality	70
	Yes	Average surface condition for unpaved roads in the municipality (e.g. excellent, good, fair, poor)	N/A
Safe & Compliant	No	O&M expenditure related to winter maintenance	$1.6 M
		Response time for sidewalk clearing	24 hours
		Response time for arterial roads	16 hours
		Response time for collector roads	24 hours
		Response time for local roads	24 hours
Accessible	No	% of roads equipped with bike lanes	3.4%
Affordable	No	O&M Expenditure per capita	$208
	No	Average Annual Reinvestment Rate	1.5%
	No	Five Year Average Annual Capital Expenditure	$4,910,000

Table 20 Road Network Technical Levels of Service

5.2 Bridges & Culverts

Bridges and culverts represent a critical portion of the transportation services provided to the community. The Department of Public Works is responsible for the maintenance of all bridges and culverts located across municipal roads with the goal of keeping structures in an adequate state of repair and minimizing service disruptions.

The state of the infrastructure for bridges and culverts is summarized in Table 21.

Replacement Cost	Condition	Financial Capacity	
$38.4 M	63%	Annual Requirement:	$739,000
		Funding Available:	$0
		Annual Deficit:	$739,000

Table 21 Bridges and Culverts State of the Infrastructure

The following core values and level of service statements are a key driving force behind the Town's asset management planning:

Service Attribute	Level of Service Statement
Scope	Bridges and culverts are available under all weather conditions. No bridges or culverts in the Municipality have loading restrictions.
Quality	The bridges and culverts are in very good condition with minimal unplanned service interruptions and closures.

Table 22 Bridges and Culverts Level of Service Statements

5.2.1 Asset Inventory & Costs

Table 23 below includes the quantity, total replacement cost and annual capital requirements of each asset segment in the Town's bridges and culverts inventory.

Asset Segment	Quantity	Replacement Cost	Annual Capital Requirement
Structural Bridges	4 Assets	$8,511,000	$180,000
Structural Culverts	45 Assets	$20,914,000	$429,000
Cross Culverts & Small Bridges	577 Assets	$8,987,000	$130,000
Total		**$38,412,000**	**$739,000**

Table 23 Bridges and Culverts Inventory and Valuation

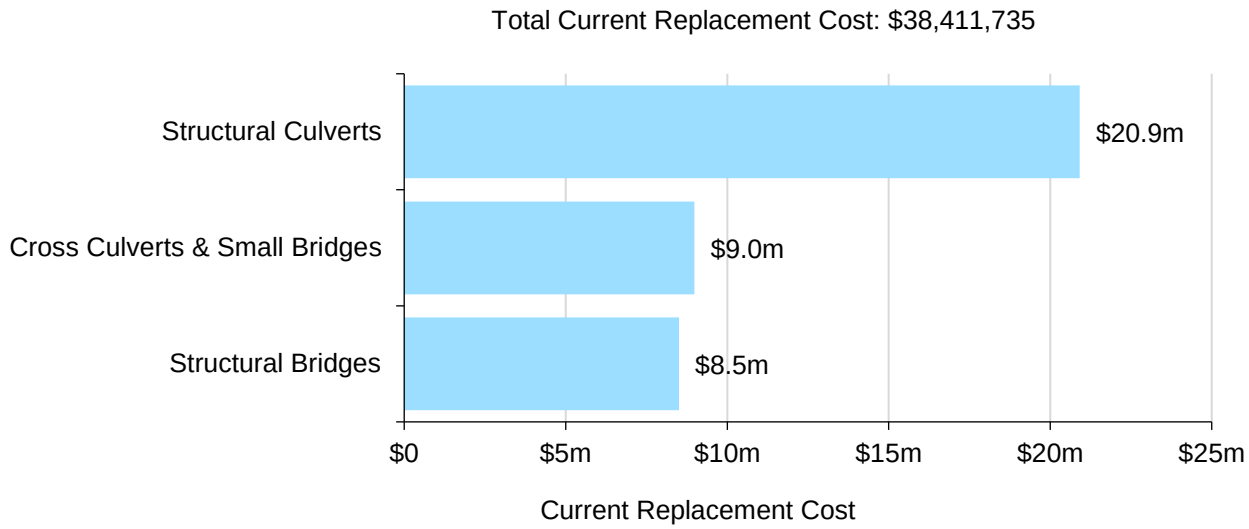


Figure 20 Bridges and Culverts Replacement Cost by Segment

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

5.2.2 Asset Condition & Age

Table 24 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.

Asset Segment	Average Estimated Useful Life (Years)	Average Age (Years)	Average Condition
Structural Bridges	75	24	79%
Structural Culverts	75	36	71%
Cross Culverts & Small Bridges	50	30	32%
Average			**63%**

Table 24 Bridges and Culverts Asset Age and Condition Summary

An asset's age profile comprises two key values: estimated useful life (EUL), or design life; and the percentage of EUL consumed. The EUL is the serviceable lifespan of an asset during which it can continue to fulfil its intended purpose and provide value to users, safely and efficiently. As assets age, their performance diminishes, often more rapidly as they approach the end of their design life.

In conjunction with condition data, an asset's age profile provides a more complete summary of the state of infrastructure. It can help identify assets that may be candidates for further review through condition assessment programs, inform the selection of optimal lifecycle strategies, and improve planning for potential long-term replacement spikes.

Figure 21 below displays the average asset age vs EUL for each asset segment.

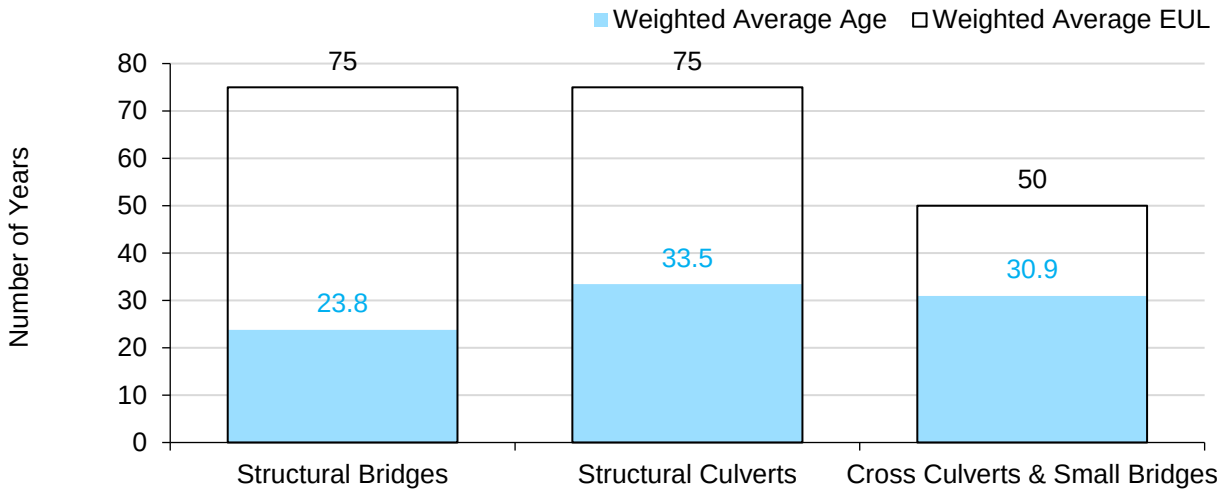


Figure 21 Bridges and Culverts Asset Age vs. EUL

Figure 22 below visually illustrates the average condition for each asset segment on a very good to very poor scale.

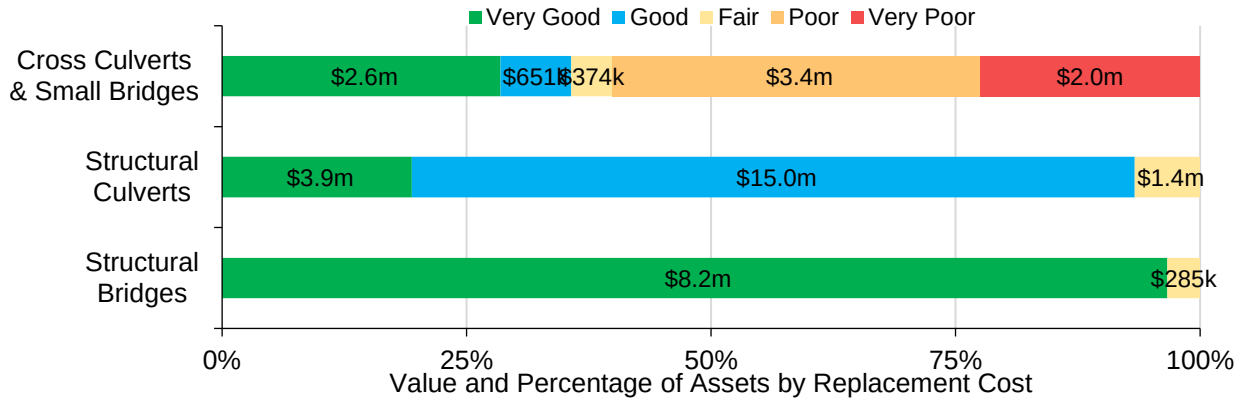


Figure 22 Bridges and Culverts Asset Condition by Segment

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

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

Current Approach to Condition Assessment

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

- Condition assessments of all bridges and culverts with a span greater than or equal to 3 meters are completed every 2 years in accordance with the Ontario Structure Inspection Manual (OSIMs)
- Operations staff perform regular visual inspections in between OSIM inspections

In this AMP, the following rating criteria is used to determine the current condition of bridges and culverts and forecast future capital requirements:

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

Table 25 Bridges and Culverts Condition Rating Scale

5.2.3 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.

Table 26 outlines the Town's current lifecycle management strategy.

Activity Type	Description of Current Strategy
Maintenance, Rehabilitation & Replacement	All lifecycle activities are driven by the results of mandated structural inspections competed according to the Ontario Structure Inspection Manual (OSIM). Staff perform lifecycle activities (ex: deck replacements, concrete patch repairs, guard rail repairs, etc.) depending on recommendations through OSIM and/or staff inspections. Maintenance activities, such as cleaning or brushing, are completed by Operations staff as capacity allows

Table 26 Bridges and Culverts Lifecycle Management Strategies

Forecasted Capital Requirements

The following graph forecasts long-term capital requirements. The annual capital requirement represents the average amount per year that the Town should allocate towards funding rehabilitation and replacement needs. Figure 23 identifies capital requirements over the next 50 years. This projection is used as it ensures that most assets have gone through one full iteration of replacement. The forecasted requirements are aggregated into 5-year bins and the trend line represents the average 5-year capital requirements.

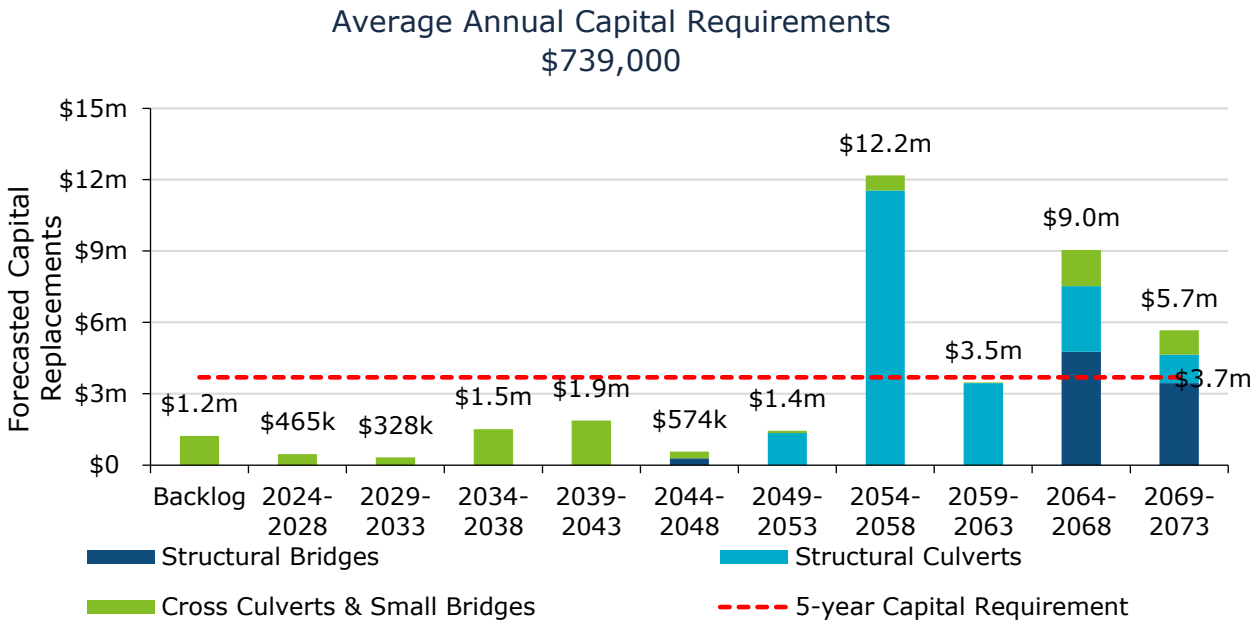


Figure 23 Bridges and Culverts Forecasted Replacement Needs 2024-2073

The projected cost of lifecycle activities that will need to be undertaken over the next 10 years to maintain the current level of service can be found in Table 127 in Appendix A.

5.2.4 Risk & Criticality

Risk Matrix

The asset-specific attributes that municipal staff utilize to define and prioritize the criticality of the bridges and culverts are documented below, with their weights indicated in brackets:

Probability of Failure (POF)	Consequence of Failure (COF)
Structural (80%)	Economic (60%)
Functional (20%)	Health and Safety (20%)
	Environmental (20%)

Table 27 Bridges and Culverts Risk Parameters

Based on the above noted attributes and weightings, risk is calculated for each asset. The following heat map illustrates the probability and consequence of failure scores for all bridge and culvert assets based on 2023 inventory data. Please refer to Figure 97 in Appendix C for a more detailed overview of the criteria used to estimate the risk rating of each asset.

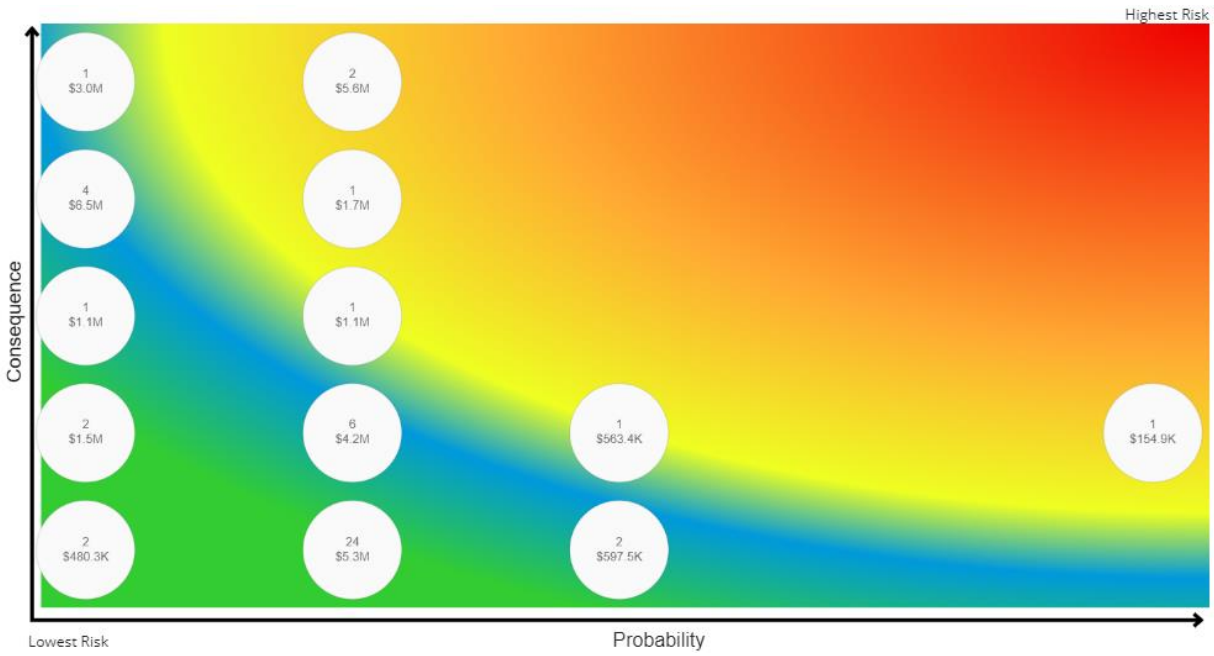


Figure 24 Bridges and Culverts Risk Matrix Heat Map

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

The identification of critical assets is a valuable tool in identifying potential risk mitigation strategies and treatment options. Risk mitigation may include asset-specific lifecycle strategies, condition assessment strategies, or simply the need to collect better asset data.

Risks to Current Asset Management Strategies

Table 28summarizes key trends, challenges, and risks to service delivery that the Town is currently facing:

	Asset Data & Information
	Inventory data is gathered continuously. Staff have plans to enhance data management process to increase the accuracy and reliability of asset data and information. Once completed, staff can confidently develop data-driven strategies to address infrastructure needs.
	Capital Funding Strategies
	Major capital rehabilitation and replacement projects are often dependant on the availability of grant funding opportunities. The Town has developed a project plan to address the infrastructure needs. When grants are not available, rehabilitation and replacement projects may

	be deferred. An enhanced proactive strategy can help to extend the service life of structures with lower funding requirements. A long-term capital funding strategy can reduce dependency on grant funding and help prevent deferral of necessary capital works.
	**Climate Change & Extreme Weather Events** As extreme weather events are projected to continue, the events can result in damage to bridges and culverts and pose higher demand on maintenance and repair of the assets. Incorporating a monitoring and maintenance program for all bridges and culverts can further support infrastructure resiliency and help mitigate the risk.

Table 28 Bridges and Culverts Qualitative Risk Summary

5.2.5 Current Levels of Service

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

Community Levels of Service

Table 29 outlines the qualitative descriptions that determine the community levels of service provided by bridges and culverts.

Service Attribute	O. Reg. 588/17 Mandated	Qualitative Description	Current LOS (2023)
Scope	Yes	Description of the traffic that is supported by municipal bridges (e.g. heavy transport vehicles, motor vehicles, emergency vehicles, pedestrians, cyclists)	Bridges and structural culverts are a key component of the municipal transportation network. None of the Town's structures have loading or dimensional restrictions meaning that most types of vehicles, including heavy transport, motor vehicles, emergency vehicles and cyclists can cross them without restriction.
Quality	Yes	Description or images of the condition of bridges and culverts and how this would affect use of the bridges and culverts	See Figure 93, Figure 94, and Figure 95 in Appendix B

Table 29 Bridges and Culverts Community Levels of Service

Technical Levels of Service

Table 30 outlines the quantitative metrics that determine the technical level of service provided by bridges and culverts. Current LOS performance metrics are reported as of 2023.

Service Attribute	O. Reg. 588/17 Mandated	Technical Metric	Current LOS (2023)
Scope	Yes	% of bridges in the Town with loading or dimensional restrictions	0%
Quality	Yes	Average bridge condition index value for bridges in the Town	79
	Yes	Average bridge condition index value for structural culverts in the Town	71

Table 30 Bridges and Culverts Technical Levels of Service

5.3 Buildings

The buildings portfolio includes property, facilities, and related property with respect to administration services, community centres, library, fire services, and other miscellaneous buildings that are available for public use or lease to third party tenants.

The state of the infrastructure for buildings and facilities is summarized in Table 31.

Replacement Cost	Condition	Financial Capacity	
$187 M	54%	Annual Requirement:	$5.8 M
		Funding Available:	$3.9 M
		Annual Deficit:	$1.9 M

Table 31 Buildings State of the Infrastructure

The following core values and level of service statements are a key driving force behind the Town's asset management planning:

Service Attribute	Level of Service Statement
Scope	The building and facilities service is conveniently accessible to the whole community in sufficient capacity.
Quality	The buildings and facilities are in good condition with minimal unplanned service interruptions and closures.

Table 32 Buildings Level of Service Statements

5.3.1 Asset Inventory & Costs

Table 33 below includes the quantity, total replacement cost and annual capital requirements of each asset segment in the Town's buildings and facilities inventory.

Asset Segment	Quantity	Replacement Cost	Annual Capital Requirement
General Government	3	$35,825,000	$1,077,000
Protection Services	1	$9,555,000	$287,000
Recreation & Cultural Services	10	$114,399,000	$3,584,000
Transportation Services	1	$27,276,000	$819,000
Total		**$187,055,000**	**$5,767,000**

Table 33 Buildings Inventory and Valuation

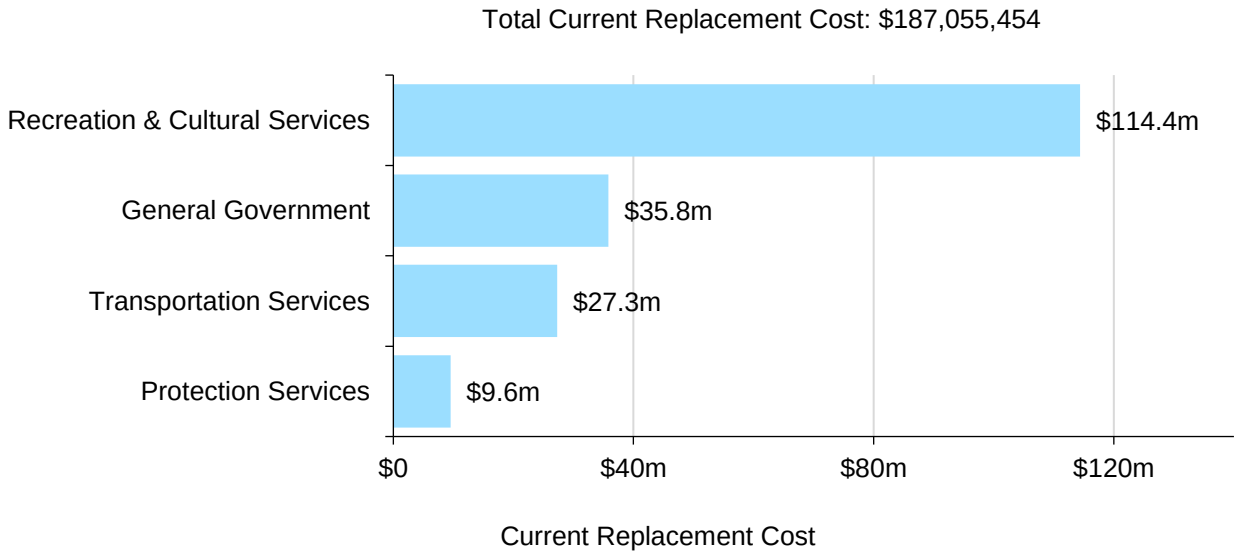


Figure 25 Buildings Replacement Cost by Segment

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

5.3.2 Asset Condition & Age

Table 34 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.

Asset Segment	Average Estimated Useful Life (Years)	Average Age (Years)	Average Condition
General Government	30	21	55%
Protection Services	30	21	59%
Recreation & Cultural Services	30	20	56%
Transportation Services	30	8	66%
Average			**54%**

Table 34 Buildings Asset Age and Condition Summary

An asset's age profile comprises two key values: estimated useful life (EUL), or design life; and the percentage of EUL consumed. The EUL is the serviceable lifespan of an asset during which it can continue to fulfil its intended purpose and provide value to users, safely and efficiently. As assets age, their performance diminishes, often more rapidly as they approach the end of their design life.

In conjunction with condition data, an asset's age profile provides a more complete summary of the state of infrastructure. It can help identify assets that may be candidates for further review through condition assessment programs, inform the selection of optimal lifecycle strategies, and improve planning for potential long-term replacement spikes.

Figure 26 below displays the average asset age vs EUL for each asset segment.

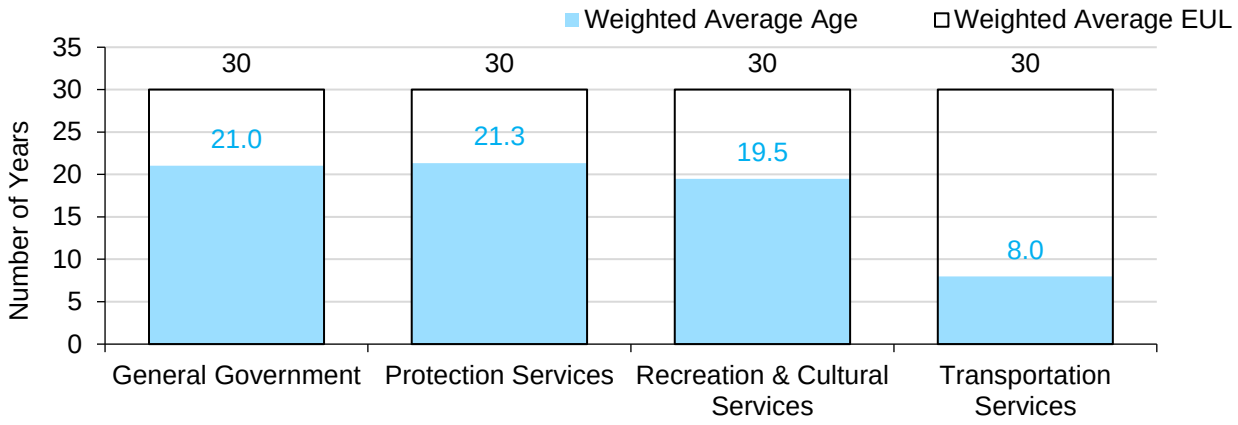


Figure 26 Buildings Asset Age vs. EUL

Figure 27 below visually illustrates the average condition for each asset segment on a very good to very poor scale.

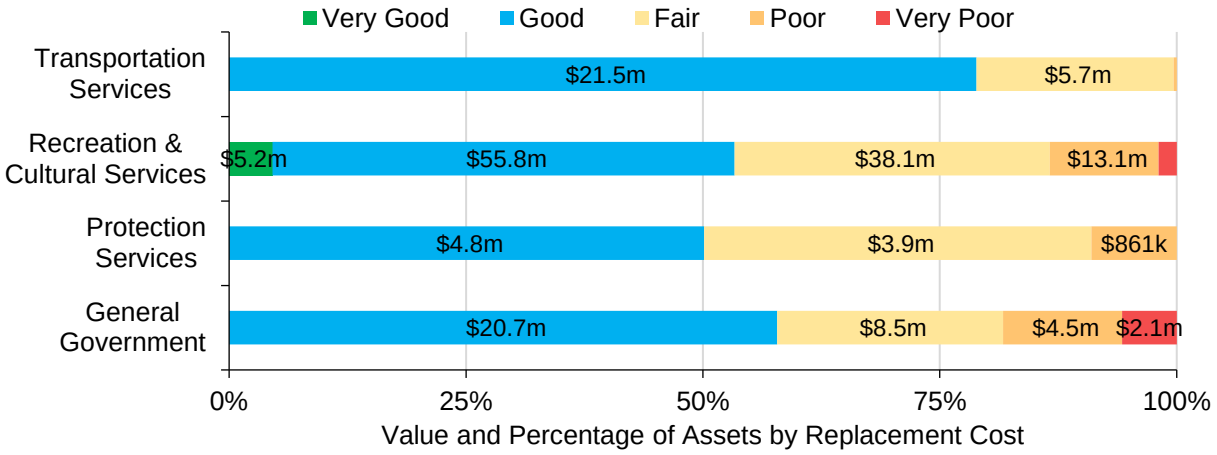


Figure 27 Buildings Asset Condition by Segment

To ensure that the Town's buildings and facilities continues to provide an acceptable level of service, the Town 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 and facilities.

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

Current Approach to Condition Assessment

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

- Staff complete regular visual inspections of buildings to ensure they are in a state of adequate repair.
- Staff will be working with a third-party contractor to develop building condition assessments on their critical buildings, including a detailed componentized building inventory, complete with rehabilitation and replacement recommendations.

In this AMP the following rating criteria is used to determine the current condition of building assets and forecast future capital requirements:

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

Table 35 Buildings Condition Rating Scale

5.3.3 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. Table 36 outlines the Town's current lifecycle management strategy.

Activity Type	Description of Current Strategy
Maintenance / Rehabilitation	Municipal buildings are subject to regular inspections to identify health and safety requirements, as well as structural deficiencies that require additional attention
	Critical buildings (Water Booster Stations, Wastewater Pumping Stations, Fire Stations etc.) have a detailed maintenance and rehabilitation schedule, while the maintenance of other facilities is dealt with on a case-by-case basis
Replacement	As a supplement to the knowledge and expertise of municipal staff, the Town regularly works with contractors to complete Facility Needs Assessment Studies

	Assessments are completed strategically as buildings approach their end-of-life to determine whether replacement or rehabilitation is appropriate

Table 36 Buildings Lifecycle Management Strategies

Forecasted Capital Requirements

The following graph forecasts long-term capital requirements. The annual capital requirement represents the average amount per year that the Town should allocate towards funding rehabilitation and replacement needs. Figure 28 identifies capital requirements over the next 70 years. This projection is used as it ensures that every asset has gone through one full iteration of replacement. The forecasted requirements are aggregated into 5-year bins and the trend line represents the average 5-year capital requirements.

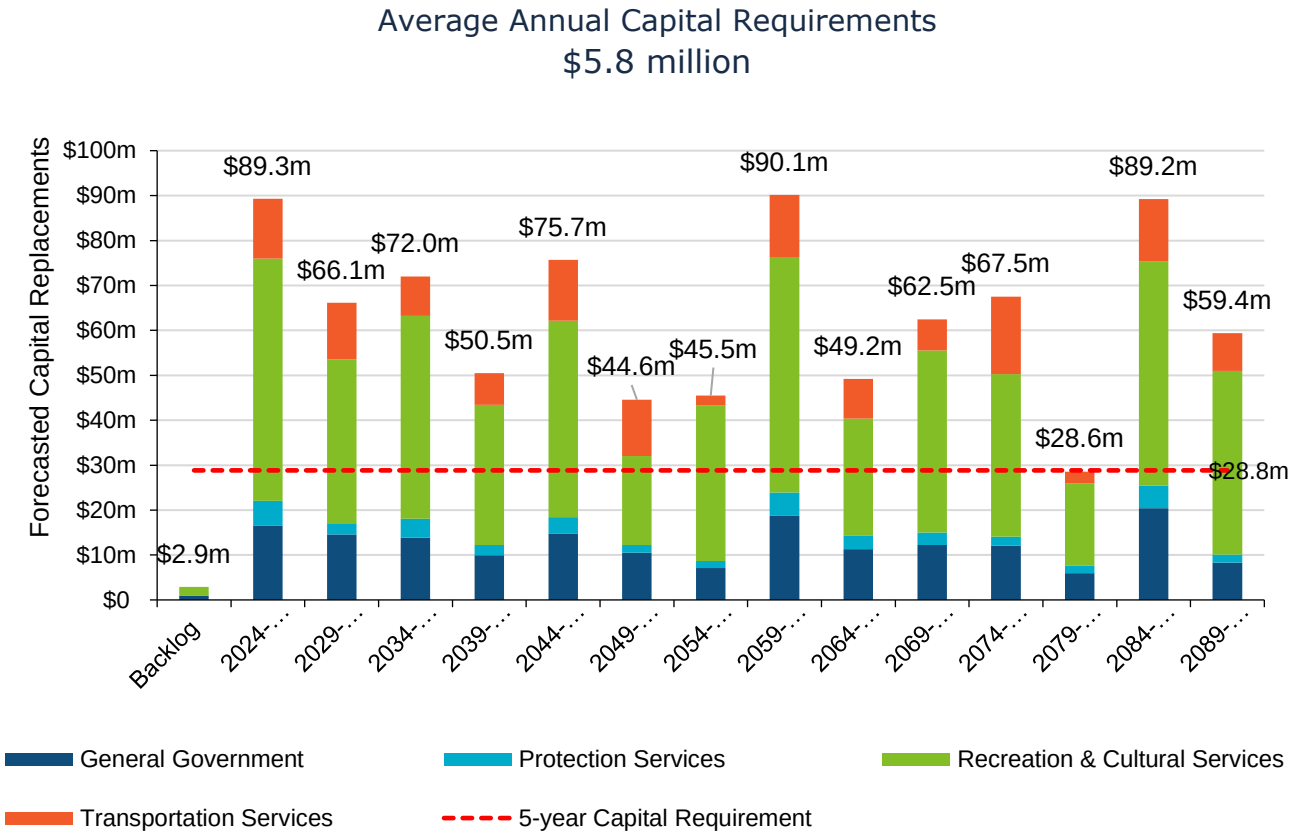


Figure 28 Buildings Forecasted Replacement Needs 2024-2093

The projected cost of lifecycle activities that will need to be undertaken over the next 10 years to maintain the current level of service can be found in Table 128 in Appendix A.

5.3.4 Risk & Criticality

Risk Matrix

The asset-specific attributes that municipal staff utilize to define and prioritize the criticality of the buildings are documented below with their weights indicated in brackets:

Probability of Failure (POF)	Consequence of Failure (COF)
Structural (100%)	Economic (60%)
	Social (40%)

Table 37 Buildings Risk Parameters

Based on the above noted attributes and weightings, risk is calculated for each asset. The following heat map illustrates the probability and consequence of failure scores for all building assets based on 2023 inventory data. Please refer to Figure 98 in Appendix C for a more detailed overview of the criteria used to estimate the risk rating of each asset.

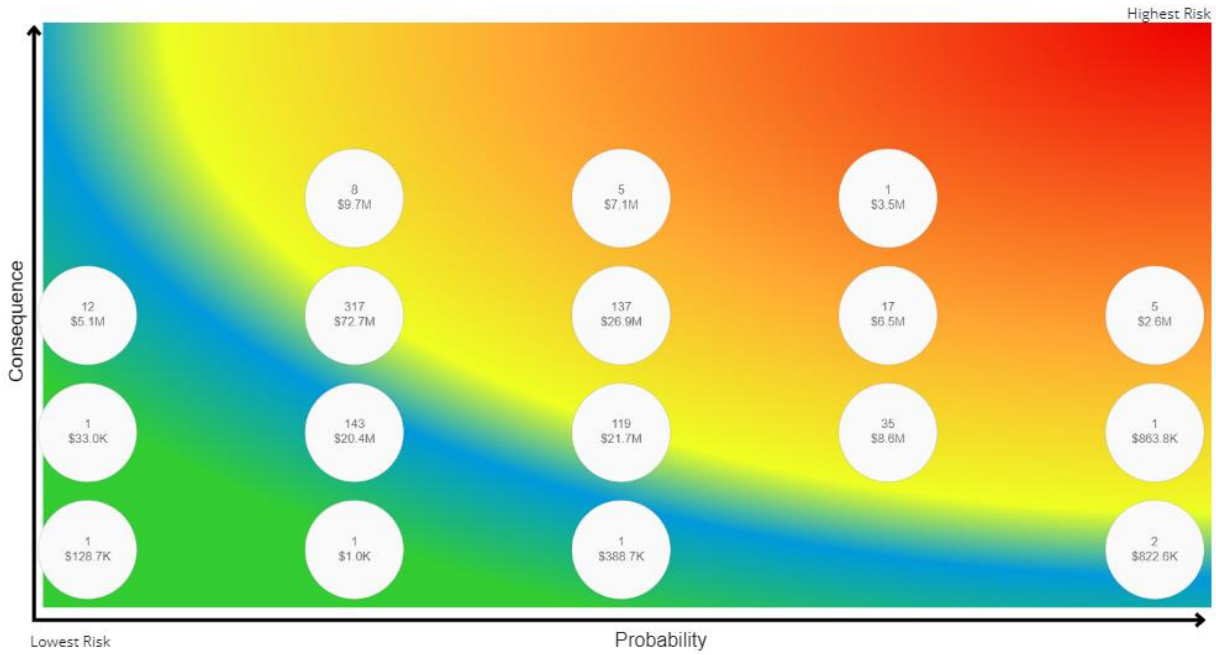


Figure 29 Buildings Risk Matrix Heat Map

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

The identification of critical assets is a valuable tool in identifying potential risk mitigation strategies and treatment options. Risk mitigation may include asset-

specific lifecycle strategies, condition assessment strategies, or simply the need to collect better asset data.

Risks to Current Asset Management Strategies

Table 38 summarizes key trends, challenges, and risks to service delivery that the Town is currently facing:

	**Capital Funding Strategies** In recent years, there has been a significant increase in material and construction costs. Rehabilitation projects for buildings may be delayed due to the limited contractors available. Major capital rehabilitation projects of the buildings will be heavily reliant on the availability of grant funding opportunities. As capital budgets become more constrained, more maintenance will be postponed, which will further amplify this risk. An annual capital funding strategy can also reduce dependency on grant funding and help prevent deferral of capital works.
	**Staff Capacity and Growth** The Town currently has a large inventory of buildings which require regular maintenance and assessment. As the population continues to grow, the Town must prioritize expanding its capacity to serve a larger population. However, staff capacity may become insufficient to deploy optimal maintenance and assessment strategies for the growth. Developing a comprehensive long-term capital plan with considerations for growth and proactive lifecycle strategy can be helpful to minimize dependency on grant funding and increase the capacity.
	**Climate Change & Extreme Weather Events** As extreme weather events are projected to continue, the events can result in damage to buildings and pose higher demand on maintenance and repair of the assets. Incorporating a monitoring and maintenance program for all buildings can further support infrastructure resiliency and help mitigate the risk.

Table 38 Buildings Qualitative Risk Summary

5.3.5 Current Levels of Service

Buildings are a non-core asset category and as such, there are no LOS metrics that are mandated. Instead, the Town has selected metrics based on what is suitable, valuable, and feasible to collect. The following tables identify the selected LOS metrics for building assets.

Community Levels of Service

Table 39 outlines the qualitative descriptions that determine the community levels of service provided by building assets.

Service Attribute	Qualitative Description	Current LOS (2023)
Safety and Regulatory Compliance	Facilities are safe to use and do not pose a hazard to users	Description of the facilities health and safety inspection process.
Reliable	Buildings are in good condition, meeting the functional needs of users within facility operating hours	Description of maintenance and renewal activities to maintain buildings in a suitable condition
Accessible	Municipal buildings have adequate capacity to serve public programs and support Town staff work functions	Description, which may include maps, of facilities owned by the Town
Sustainability	Facilities are operated in a way to reduce overall power usage and greenhouse gas (GHG) generation	Description of energy conservation measures implemented to reduce energy consumption and GHG emissions
Affordability	Facilities are managed in a cost-effective way to reduce overall service costs	Description of the significant operating costs

Table 39 Buildings Community Levels of Service

Technical Levels of Service

Table 40 outlines the quantitative metrics that determine the technical level of service provided by the stormwater network. The current LOS performance for each metric as of 2023 is also detailed below.

Service Attribute	Technical Metric	Current LOS (2023)
Safety and Regulatory Compliance	% of buildings inspected monthly for safety	100%
Reliable	Average Condition of Buildings	54%
Accessible	# of Residents per community centre	21,370
Sustainable	Kw/Hrs of energy consumption by Facilities	19,386,242
Affordable	O&M costs per household	N/A
	Average Annual Reinvestment Rate	2.1%

Table 40 Buildings Technical Levels of Service

5.4 Fleet

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

- tandem axle trucks for winter control activities
- fire rescue vehicles to provide emergency services
- pick-up trucks to support the maintenance of the transportation network and address service requests for Environmental Services and Parks & Recreation

The state of the infrastructure for the vehicles is summarized in Table 41.

Replacement Cost	Condition	Financial Capacity	
$10.8 M	42%	Annual Requirement:	$869,000
		Funding Available:	$521,000
		Annual Deficit:	$348,000

Table 41 Fleet State of the Infrastructure

The following core values and level of service statements are a key driving force behind the Town's asset management planning:

Service Attribute	Level of Service Statement
Scope	Town vehicles are available to service whole community in sufficient capacity.
Quality	The Fleet is in good condition with minimal unplanned service interruptions and down time.

Table 42 Fleet Level of Service Statements

5.4.1 Asset Inventory & Costs

Table 43 below includes the quantity, replacement cost method and total replacement cost of each asset segment in the Town's Fleet.

Asset Segment	Quantity	Replacement Cost	Annual Capital Requirement
Equipment/ Attachments	95	$3,377,000	$456,000
Heavy Duty	12	$3,088,000	$150,000
Light Duty	49	$2,786,000	$122,000
Medium Duty	24	$1,520,000	$141,000
Total		**$10,770,000**	**$869,000**

Table 43 Fleet Inventory and Valuation

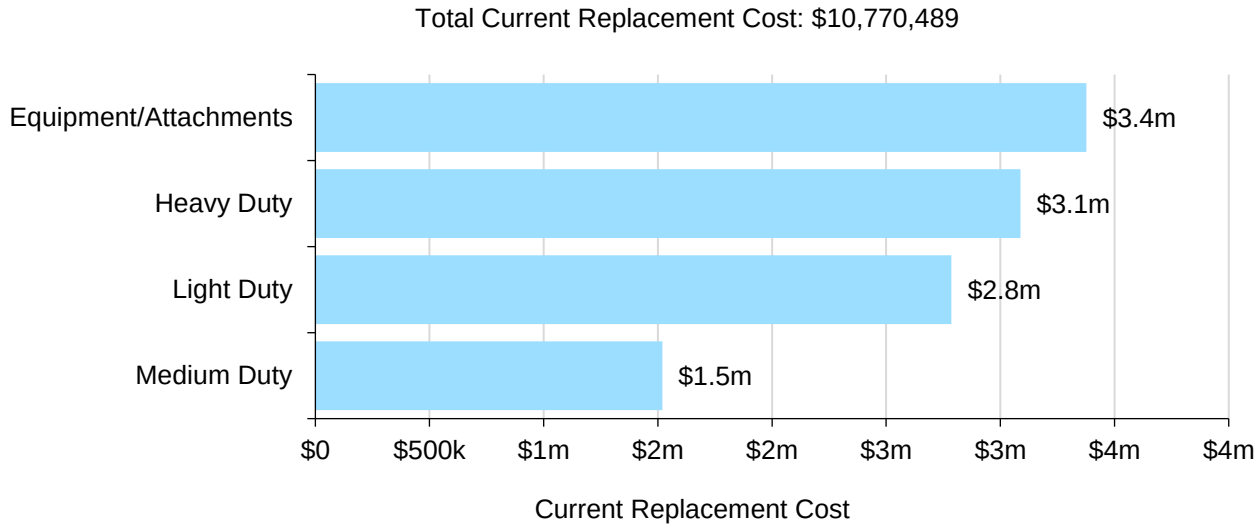


Figure 30 Fleet Replacement Cost by Segment

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

5.4.2 Asset Condition & Age

Table 44 below identifies the current average condition and source of available condition data for each asset segment. The average condition (%) is a weighted value based on replacement cost.

Asset Segment	Average Estimated Useful Life (Years)	Average Age (Years)	Average Condition
Equipment/ Attachments	10	8	31%
Heavy Duty	15	7	56%
Light Duty	10	10	20%
Medium Duty	12	7	52%
Average			**42%**

Table 44 Fleet Asset Age and Condition Summary

An asset's age profile comprises two key values: estimated useful life (EUL), or design life; and the percentage of EUL consumed. The EUL is the serviceable lifespan of an asset during which it can continue to fulfil its intended purpose and provide value to users, safely and efficiently. As assets age, their performance diminishes, often more rapidly as they approach the end of their design life.

In conjunction with condition data, an asset's age profile provides a more complete summary of the state of infrastructure. It can help identify assets that may be candidates for further review through condition assessment programs, inform the selection of optimal lifecycle strategies, and improve planning for potential long-term replacement spikes.

Figure 31 below displays the average asset age vs EUL for each asset segment.

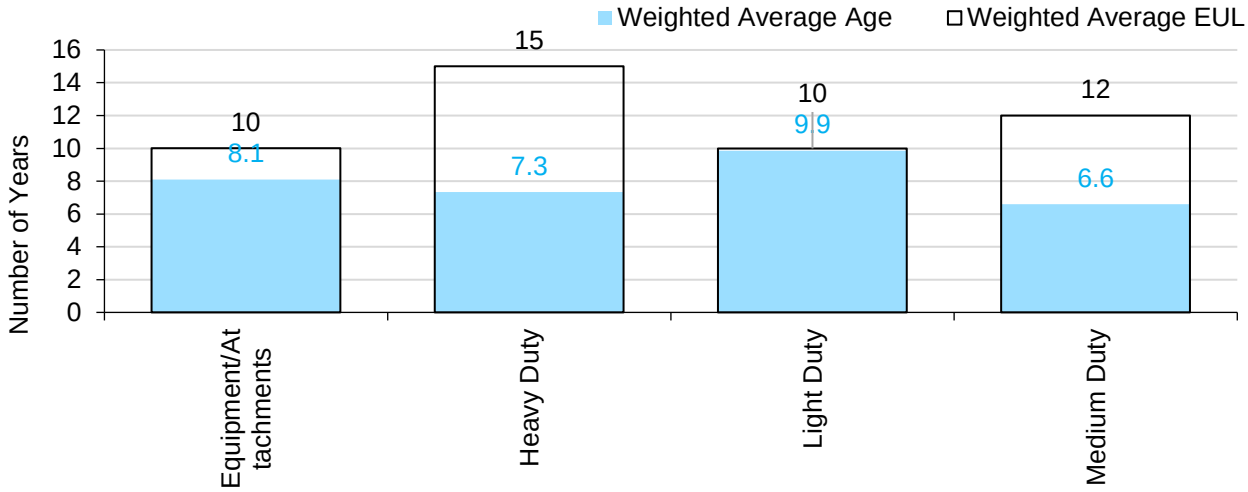


Figure 31 Fleet Asset Age vs. EUL

Figure 32 below visually illustrates the average condition for each asset segment on a very good to very poor scale.

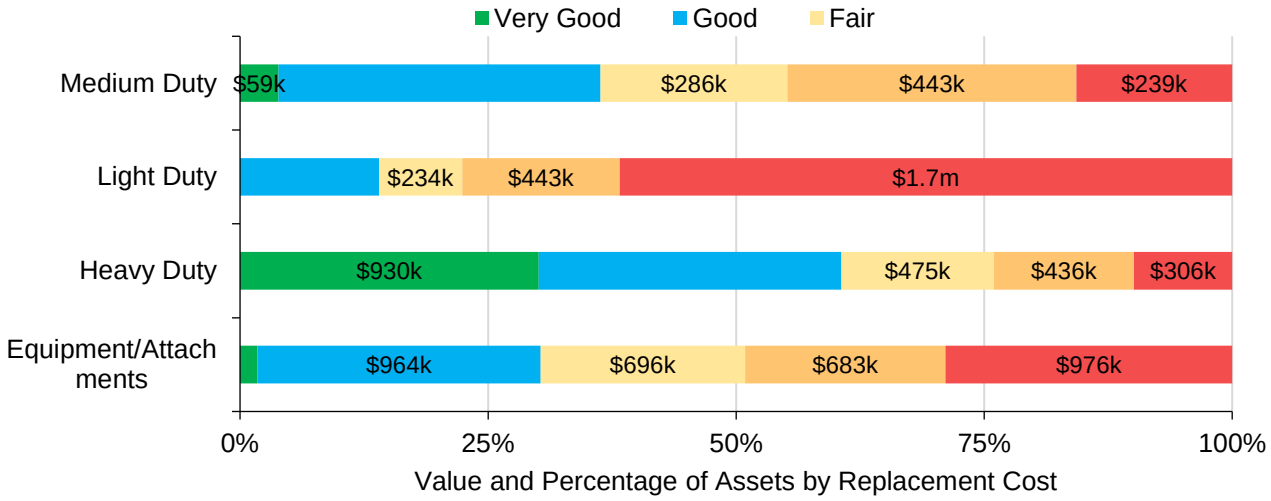


Figure 32 Fleet Asset Condition by Segment

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

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 more confidently. The following describes the Town's current approach:

- Staff complete regular visual inspections of vehicles to ensure they are in state of adequate repair prior to operation
- Condition assessments are conducted on vehicles in accordance with regulations for health and safety regulations including National Fire Protection Association (NFPA) codes and standards for fire service-related vehicles

In this AMP the following rating criteria is used to determine the current condition of fleet assets and forecast future capital requirements:

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

Table 45 Fleet Condition Rating Scale

5.4.3 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. Table 46 outlines the Town's current lifecycle management strategy.

Activity Type	Description of Current Strategy
Maintenance / Rehabilitation	Visual inspections completed and documented daily; fluids inspected at every fuel stop; tires inspected monthly
	Every 4000-7000km includes a detailed inspection which includes tire rotation and oil changes
	Annual preventative maintenance activities include system components check and additional detailed inspections
Replacement	Vehicle replacements are based on the Town's Capital Asset Policy 2015-45
	Vehicle age, kilometres and annual repair costs are taken into consideration when determining appropriate treatment options

Table 46 Fleet Lifecycle Management Strategies

Forecasted Capital Requirements

The following graph forecasts long-term capital requirements. The annual capital requirement represents the average amount per year that the Town should allocate towards funding rehabilitation and replacement needs. Figure 33 identifies capital requirements over the next 50 years. This projection is used as it ensures that every asset has gone through one full iteration of replacement. The forecasted requirements are aggregated into 5-year bins and the trend line represents the average 5-year capital requirements.

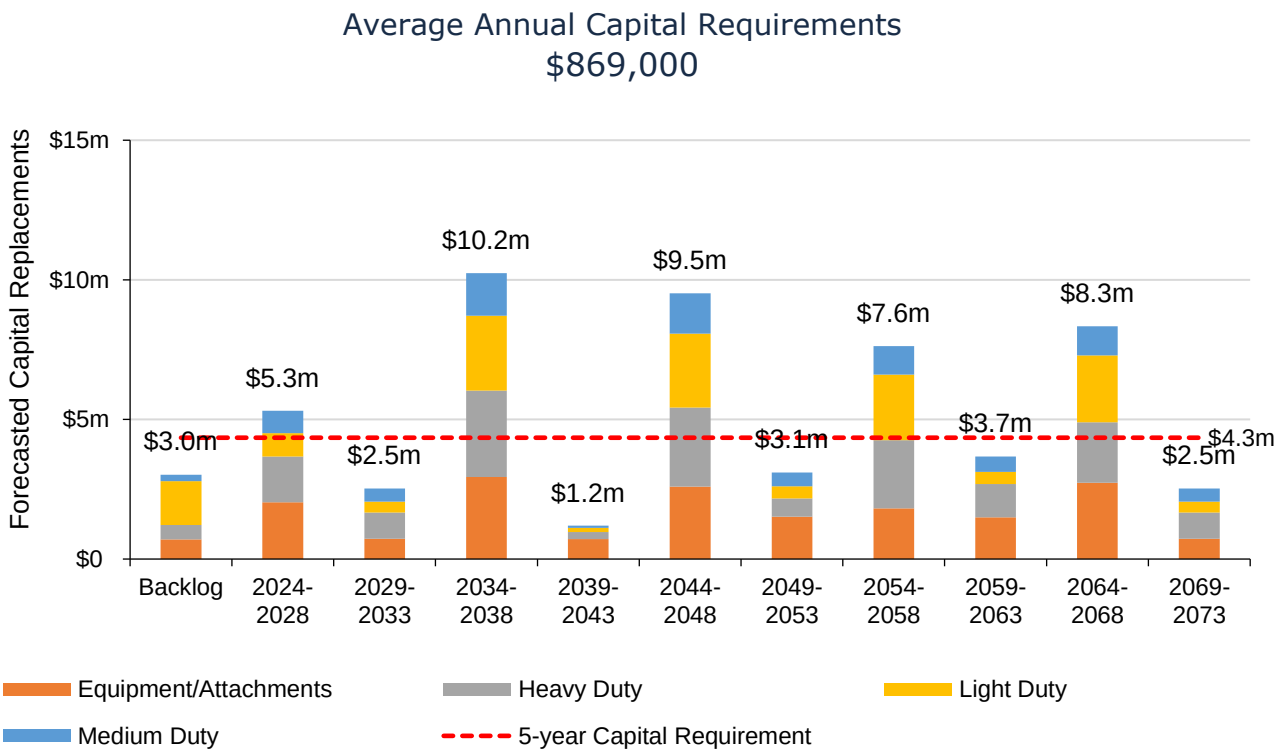


Figure 33 Fleet Forecasted Replacement Needs 2024-2108

The projected cost of lifecycle activities that will need to be undertaken over the next 10 years to maintain the current level of service can be found in Table 130 in Appendix A.

5.4.4 Risk & Criticality

Risk Matrix

The asset-specific attributes that municipal staff utilize to define and prioritize the criticality of the fleet are documented below, with their weights indicated in brackets:

Probability of Failure (POF)	Consequence of Failure (COF)
Condition (100%)	Economic (20%)
	Social (40%)
	Health and Safety (40%)

Table 47 Fleet Risk Parameters

Based on the above noted attributes and weightings, risk is calculated for each asset. The following heat map illustrates the probability and consequence of failure scores for all fleet assets based on 2023 inventory data. Please refer to Figure 99 in

Appendix C for a more detailed overview of the criteria used to estimate the risk rating of each asset.

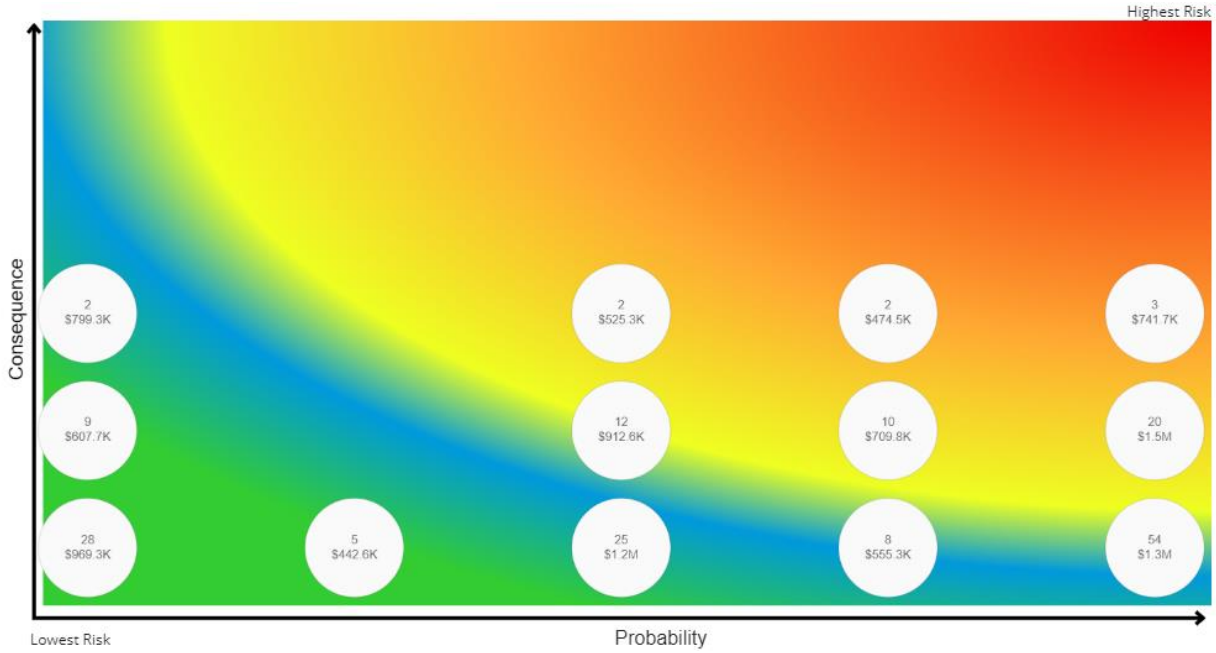


Figure 34 Fleet Risk Matrix Heat Map

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

The identification of critical assets is a valuable tool in identifying potential risk mitigation strategies and treatment options. Risk mitigation may include asset-specific lifecycle strategies, condition assessment strategies, or simply the need to collect better asset data.

Risks to Current Asset Management Strategies

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

Capital Funding Strategies

The Town currently has a large inventory of vehicles which require regular maintenance and assessment to ensure compliance with MTO standards and to function adequately. Major rehabilitation and vehicle replacement will be heavily reliant on the availability of grant funding opportunities. The significant increase in market prices of the vehicles further amplifies this risk. Staff has developed the annual replacement plan to allow more lead time and avoid unplanned service disruption. An annual capital funding strategy can also reduce dependency on

	grant funding and help prevent the deferral for vehicles renewal or vehicles purchase.
	**Growth** As the population continues to grow, the Town must prioritize expanding its capacity to serve a larger population. It will require increasing O&M costs to ensure compliance with MTO standards and to function adequately. Developing a comprehensive long-term capital plan with considerations for growth can be helpful to minimize dependency on grant funding and increase the capacity.
	**Climate Change & Extreme Weather Events** As extreme weather events are projected to continue, the events can result increased demand on fleet assets which can lead to higher demand on maintenance and repair of the fleet. Incorporating a monitoring and maintenance program for all fleet assets can further support infrastructure resiliency and help mitigate the risk.

Table 48 Fleet Qualitative Risk Summary

5.4.5 Current Levels of Service

Fleet assets are a non-core asset category and as such, there are no LOS metrics that are mandated. Instead, the Town selected metrics based on what is suitable, valuable, and feasible to collect. The following tables identify the selected LOS metrics for fleet assets.

Community Levels of Service

Table 49 outlines the qualitative descriptions that determine the community levels of service provided by fleet assets.

Service Attribute	Qualitative Description	Current LOS (2023)
Safety & Regulatory Compliance	Fleet vehicles are safe to use and do not pose a hazard to operators	The annual fleet inspection process is a comprehensive assessment conducted to ensure compliance, safety, and operational efficiency.
Reliable	Fleet vehicles are in good repair and are available for use during service hours	Several factors can contribute to fleet downtime exceeding 48 hours. Each situation is unique, but common causes include major mechanical failure, accidents or collisions, parts supply issues, complex repairs, or shortage of replacement vehicles.
Accessible	Fleet and Equipment provide winter maintenance, road repair and Fire Services to the Town	Description of users accommodated by Winter Maintenance Services
Sustainable	Fleet and equipment are replaced with sustainable alternatives to reduce the Town's carbon footprint	Description of energy conservation measures implemented to reduce energy consumption and GHG emissions
Affordable	The Town’s fleet is managed in a cost-effective way to reduce overall service costs	Description of initiatives and practices to vehicle ownership and replacement costs

Table 49 Fleet Community Levels of Service

Technical Levels of Service

Table 50 outlines the quantitative metrics that determine the technical level of service provided by the fleet asset. The current LOS performance for each metric as of 2023 is also detailed below.

Service Attribute	Technical Metric	Current LOS (2023)
Safety & Regulatory Compliance	% of regulated MTO inspections complete - CVOR	100%
	% of vehicles with safety inspection as per highway traffic act	100%
Reliable	Average condition of heavy-duty vehicles	56%
	Average condition of medium duty vehicles	52%
	Average condition of light duty vehicles	20%
	Number of vehicles with downtime more than 48 hrs	N/A
	Number of hours spent on unscheduled repairs - Operations	N/A
Accessible	% of Town Receiving Winter Maintenance Services	100%
	Average lead time for light and medium duty vehicles	12-18 months
	Average lead time for heavy duty vehicles	12-16 months
Sustainable	Percentage of fleet vehicles that are classified as EV or hybrid	4%
	Number of vehicles using biodiesel	39
Affordable	O&M expenditure per heavy duty vehicle	$5,000
	O&M expenditure per medium duty vehicle	$3,500
	O&M expenditure per light duty vehicle	$1,500
	Average Annual Reinvestment Rate	4.8%

Table 50 Fleet Technical Levels of Service

5.5 Machinery & Equipment

In order to maintain the high quality of public infrastructure and support the delivery of core services, Town staff own and employ various types of machinery and equipment. This includes:

- Landscaping equipment to maintain public parks
- Fire equipment to support the delivery of emergency services
- Plows and sand hoppers to provide winter control activities
- Library books for public loan

Keeping machinery and equipment in an adequate state of repair is important to maintain a high level of service.

The state of the infrastructure for the machinery and equipment is summarized in Table 51.

Replacement Cost	Condition	Financial Capacity	
$4.9 M	38%	Annual Requirement:	$0.7 M
		Funding Available:	$1.5 M
		Annual Surplus:	$0.8 M

Table 51 Machinery and Equipment State of the Infrastructure

The following core values and level of service statements are a key driving force behind the Town's asset management planning:

Service Attribute	Level of Service Statement
Scope	The Town is committed to providing efficient, reliable, and sustainable services through the proper management and maintenance of our machinery and equipment.
Quality	Machinery and equipment are in good condition with minimal unplanned service interruptions.

Table 52 Machinery and Equipment Level of Service Statements

5.5.1 Asset Inventory & Costs

Table 53 below includes the quantity, total replacement cost and annual capital requirements of each asset segment in the Town's machinery and equipment inventory.

Asset Segment	Quantity	Replacement Cost	Annual Capital Requirement
IT	1,842 Assets	$4,429,000	$633,000
Miscellaneous	236 Assets	$433,000	$72,000
Total		**$4,862,000**	**$705,000**

Table 53 Machinery and Equipment Inventory and Valuation

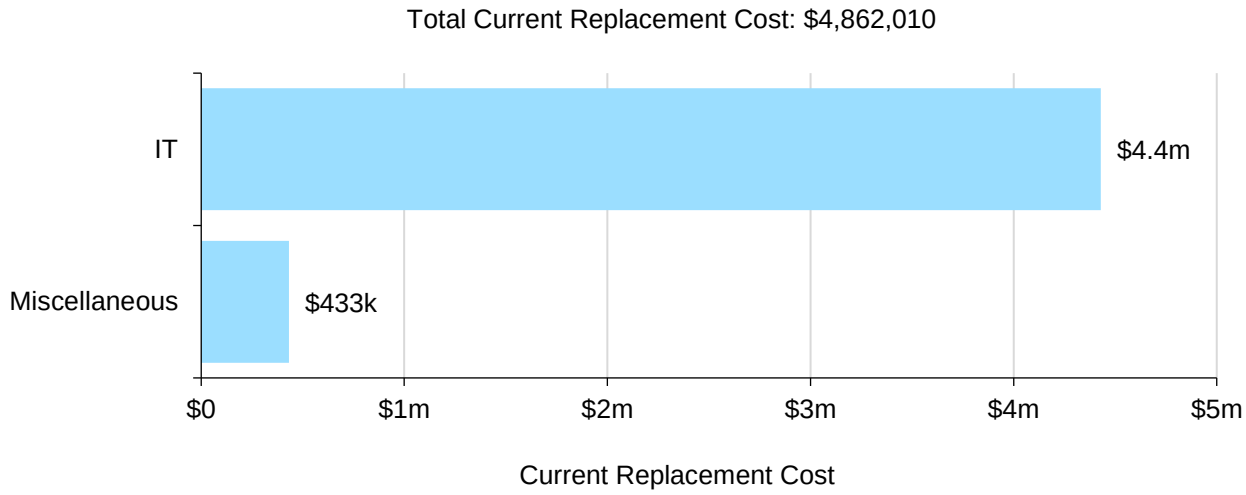


Figure 35 Machinery and Equipment Replacement Cost by Segment

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

5.5.2 Asset Condition & Age

Table 54 below identifies the current average condition and source of available condition data for each asset segment. The average condition (%) is a weighted value based on replacement cost.

Asset Segment	Average Estimated Useful Life (Years)	Average Age (Years)	Average Condition
IT	7	9	36%
Miscellaneous	6	4	55%
Average			**38%**

Table 54 Machinery and Equipment Asset Age and Condition Summary

An asset's age profile comprises two key values: estimated useful life (EUL), or design life; and the percentage of EUL consumed. The EUL is the serviceable lifespan of an asset during which it can continue to fulfil its intended purpose and provide value to users, safely and efficiently. As assets age, their performance diminishes, often more rapidly as they approach the end of their design life.

In conjunction with condition data, an asset's age profile provides a more complete summary of the state of infrastructure. It can help identify assets that may be candidates for further review through condition assessment programs, inform the selection of optimal lifecycle strategies, and improve planning for potential long-term replacement spikes.

Figure 36 below displays the average asset age vs EUL for each asset segment.

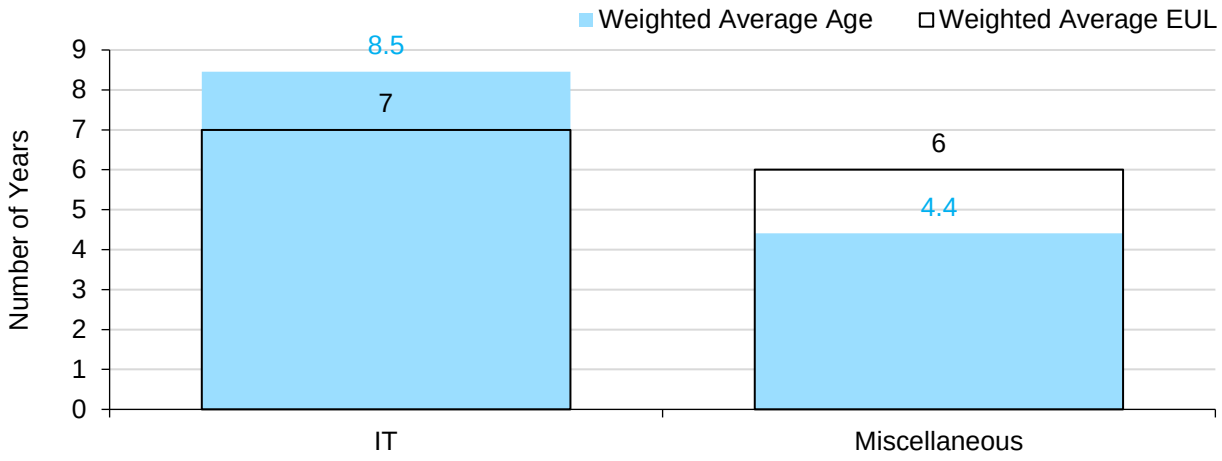


Figure 36 Machinery and Equipment Asset Age vs. EUL

Figure 37 below visually illustrates the average condition for each asset segment on a very good to very poor scale.

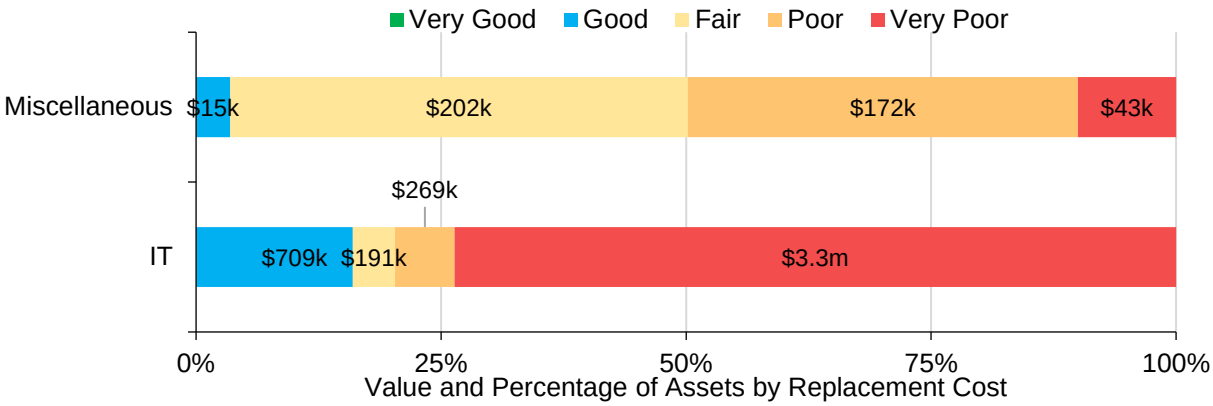


Figure 37 Machinery and Equipment Asset Condition by Segment

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

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 more confidently. The following describes the Town's current approach:

- Staff complete regular visual inspections of their machinery & equipment to ensure they are structurally and functionally sound. Assets typically stay true to their estimated useful life and are replaced at end of life

In this AMP the following rating criteria is used to determine the current condition of machinery and equipment segments and forecast future capital requirements:

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

Table 55 Machinery and Equipment Condition Rating Scale

5.5.3 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.

Table 56 outlines the Town's current lifecycle management strategy.

Activity Type	Description of Current Strategy
Maintenance/ Rehabilitation	Maintenance program varies by department and asset
	Fire Protection Services equipment is subject to a much more rigorous inspection and maintenance program compared to most other departments
	Machinery and equipment are maintained according to manufacturer recommended actions and supplemented by the expertise of municipal staff
Replacement	The replacement of machinery and equipment depends on deficiencies identified by operators that may impact their ability to complete required tasks

Table 56 Machinery and Equipment Lifecycle Management Strategies

Forecasted Capital Requirements

The following graph forecasts long-term capital requirements. The annual capital requirement represents the average amount per year that the Town should allocate towards funding rehabilitation and replacement needs. Figure 38 identifies capital requirements over the next 50 years. This projection is used as it ensures that every asset has gone through one full iteration of replacement. The forecasted requirements are aggregated into 5-year bins and the trend line represents the average 5-year capital requirements.

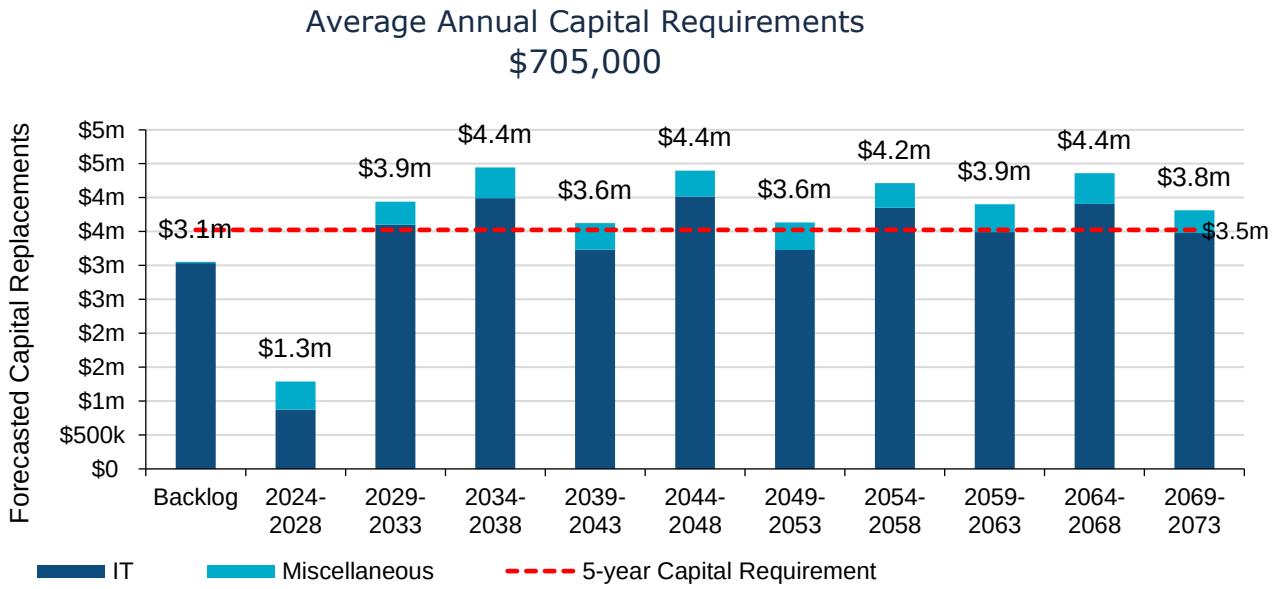


Figure 38 Machinery and Equipment Forecasted Replacement Needs 2024-2073

The projected cost of lifecycle activities that will need to be undertaken over the next 10 years to maintain the current level of service can be found in Table 131 in Appendix A.

5.5.4 Risk & Criticality

Risk Matrix

The asset-specific attributes that municipal staff utilize to define and prioritize the criticality of the machinery and equipment are documented below, with their weights indicated in brackets:

Probability of Failure (POF)	Consequence of Failure (COF)
Condition (100%)	Economic (80%)
	Health and Safety (20%)

Table 57 Machinery and Equipment Risk Parameters

Based on the above noted attributes and weightings, risk is calculated for each asset. The following heat map illustrates the probability and consequence of failure scores for all machinery and equipment assets based on 2023 inventory data. Please refer to Figure 100 and Figure 101 in Appendix C for a more detailed overview of the criteria used to estimate the risk rating of each asset.

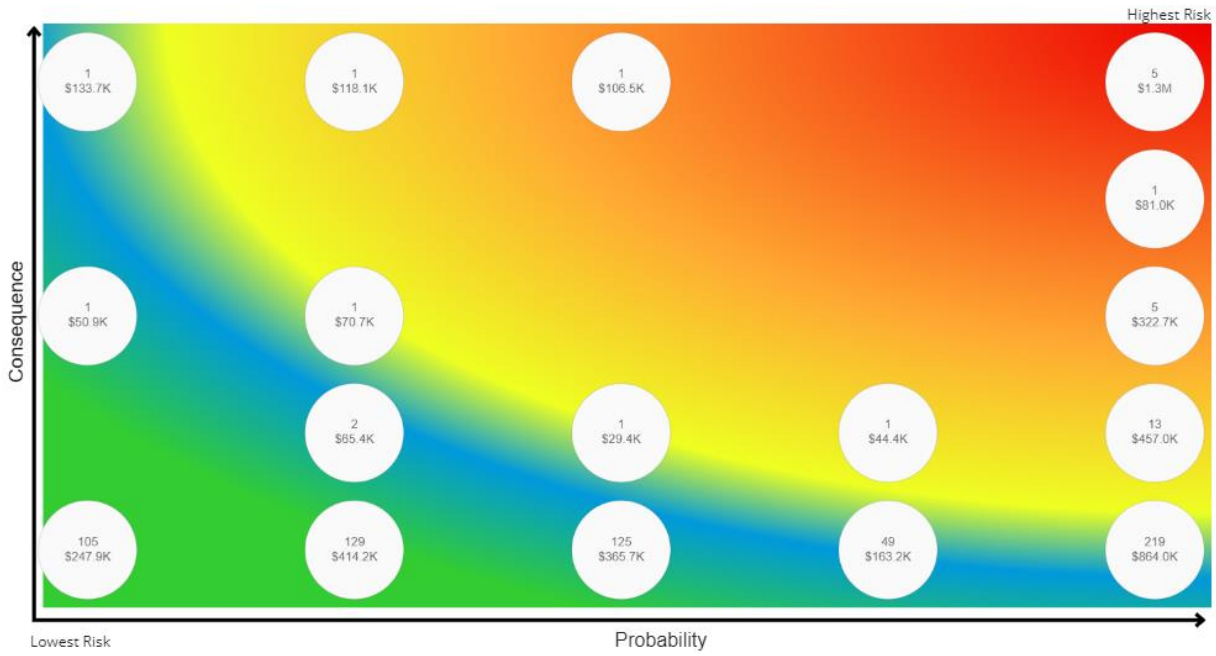


Figure 39 Machinery and Equipment Risk Matrix Heat Map

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

The identification of critical assets is a valuable tool in identifying potential risk mitigation strategies and treatment options. Risk mitigation may include asset-specific lifecycle strategies, condition assessment strategies, or simply the need to collect better asset data.

Risks to Current Asset Management Strategies

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

Capital Funding Strategies and Growth

The Town currently has a large inventory of machinery and equipment which require regular maintenance and assessment to function adequately. As the population continues to grow, the Town must prioritize expanding its capacity to serve a larger population. When funds are not available, it will cause the deferral of renewal or additional equipment purchase. The significant increase in market prices of the machinery and equipment further amplifies this risk. An annual capital funding strategy can also reduce dependency on grant funding and help prevent deferral of capital works.

	**Organizational Cognizance and Capacity** There is a concern about the increasing rates of cybercrime in recent years. The IT department is working proactively on developing Training and awareness program to improve staff knowledge about cybersecurity. Staff in the IT department have distinct skills and knowledge. The Town is working towards building in skill-set redundancy and provide trainings to staff to expand their skill sets.
	**Climate Change & Extreme Weather Events** As extreme weather events are projected to continue, the possibility of fire, earthquakes and tornado events also increases. These events lead to the damages of the IT infrastructure and pose higher demand on maintenance and repair of the assets. The Town has developed the disaster recovery plan to support infrastructure resiliency and help mitigate the risk.

Table 58 Machinery and Equipment Qualitative Risk Summary

5.5.5 Current Levels of Service

Machinery and equipment is a non-core asset category and as such, there are no LOS metrics that are mandated. Instead, the Town has selected metrics based on what is suitable, valuable, and feasible to collect. The following tables identify the selected LOS metrics.

Community Levels of Service

Table 59 outlines the qualitative descriptions that determine the community levels of service provided by machinery and equipment.

Service Attribute	Qualitative Description	Current LOS (2023)
Safety & Regulatory Compliance	Machinery and equipment assets are safe to use and do not pose a hazard to operators	Description of asset inspection processes
Reliable	Machinery and equipment assets are in good repair and are available for use during service hours	Description of machinery and equipment and their cause for fleet with downtime more than 48 hrs
	IT assets are in good condition, meeting the functional needs of users	Description of maintenance, renewal, and monitoring efforts to ensure IT assets are functioning reliably

Accessible	Machinery and equipment provide winter maintenance, road repair and Fire Services to the Town	Description of users accommodated by Winter Maintenance Services. See winter maintenance route map in Figure 85 in Appendix B.
Sustainable	Machinery and equipment are replaced with sustainable alternatives to reduce the Town's carbon footprint	Description of energy conservation measures implemented to reduce energy consumption and GHG emissions
Affordable	IT services are provided to the Town in an affordable manner	Description of the significant operating costs
	Machinery and equipment are managed in a cost-effective way to reduce overall service costs	Description of initiatives and practices to asset ownership and replacement costs

Table 59 Machinery and Equipment Community Levels of Service

Technical Levels of Service

Table 60 outlines the quantitative metrics that determine the technical level of service provided by the machinery and equipment assets. The current LOS performance for each metric as of 2023 is also detailed below.

Service Attribute	Technical Metric	Current LOS (2023)
Safety & Regulatory Compliance	% of regulated MTO inspections completed	N/A
Reliable	% of useful life consumed of all IT equipment	N/A
	Average number of IT support tickets submitted per staff member	12.7
	# of IT FTEs that respond to tickets per 100 staff	4.9
	Average Condition of equipment and attachments	24%
	Number of equipment assets with downtime more than 48 hrs	N/A
	Number of hours spent on unscheduled repairs - Operations	N/A
Sustainable	Number of electric powered machinery and equipment assets	N/A
Affordable	O & M expenditures for all machinery and equipment assets	$748,700
	Average Annual Reinvestment Rate	31.6%

Table 60 Machinery and Equipment Technical Levels of Service

5.6 Park Facilities

The Town owns a variety of diverse assets categorizes as park facilities. Examples of assets included in this category are:

- Playground Equipment
- Gazebos
- Skateboard facility and equipment
- Basketball Courts
- Various Park Signs
- Various Park Fixtures including trash receptacles, benches, bleachers, and tables.

The state of the infrastructure for park facilities is summarized in Table 61.

Replacement Cost	Condition	Financial Capacity	
$60.8 M	65%	Annual Requirement:	$1.9 M
		Funding Available:	$1.3 M
		Annual Deficit:	$0.6 M

Table 61 Park Facilities State of the Infrastructure

The following core values and level of service statements are a key driving force behind the Town's asset management planning:

Service Attribute	Level of Service Statement
Scope	Parks facilities and trails are safe to use and do not pose a hazard to users.
Quality	Parks assets are in good condition, conveniently accessible, and meet the functional needs of users within facility operating hours.

Table 62 Park Facilities Level of Service Statements

5.6.1 Asset Inventory & Costs

Table 63 below includes the quantity, total replacement cost and annual capital requirements of each asset segment in the Town's park facilities inventory.

Asset Segment	Quantity	Replacement Cost	Annual Capital Requirement
Athletic Fields	1,527 m^2	$18,506,000	$402,000
Fencing & Gates	4,815 m	$3,369,000	$123,000
Park Fixtures & Lighting	1,640 Assets	$7,904,000	$264,000
Park Structures	771 Assets	$5,259,000	$175,000
Parking Lots	55,028 m^2	$5,691,000	$190,000
Playgrounds & Splashpads	693 Assets	$6,711,000	$335,000
Sanitary Infrastructure	221 Assets	$141,000	$2,000
Stormwater Infrastructure	1,796 Assets	$1,570,000	$19,000
Trails & Walkways	14,219 Assets	$11,491,000	$380,000
Water Infrastructure	272 Assets	$161,000	$2,000
Total		**$60,803,000**	**$1,892,000**

Table 63 Park Facilities Inventory and Valuation

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

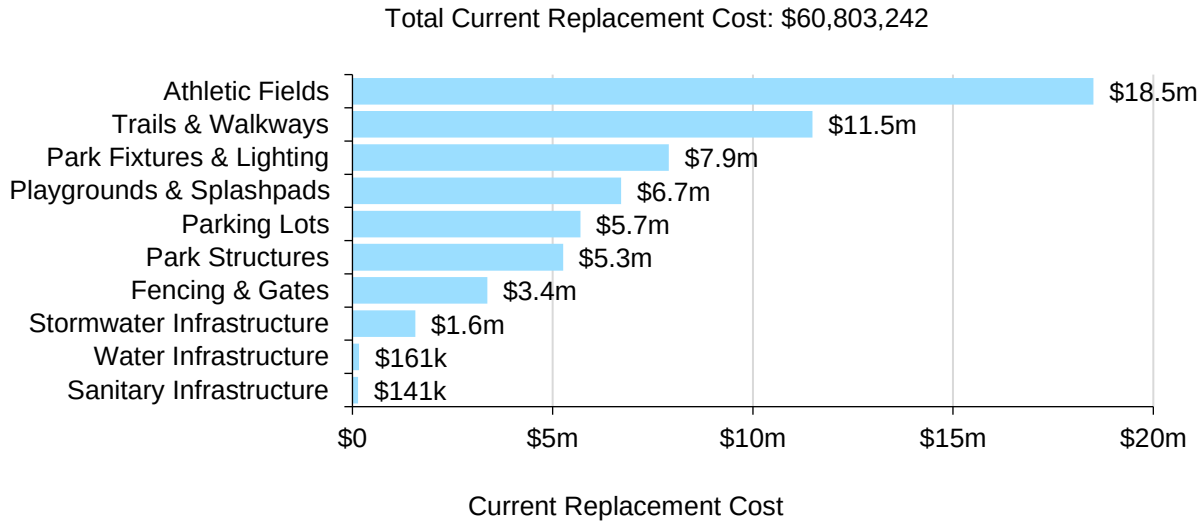


Figure 40 Park Facilities Replacement Cost by Segment

5.6.2 Asset Condition & Age

Table 64 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.

Asset Segment	Average Estimated Useful Life (Years)	Average Age (Years)	Average Condition
Athletic Fields	46	27	50%
Fencing & Gates	30	22	42%
Park Fixtures & Lighting	30	14	29%
Park Structures	30	13	57%
Parking Lots	30	18	69%
Playgrounds & Splashpads	20	14	43%
Sanitary Infrastructure	80	38	59%
Stormwater Infrastructure	85	12	85%
Trails & Walkways	30	12	62%
Water Infrastructure	75	31	69%
Average			**65%**

Table 64 Park Facilities Asset Age and Condition Summary

An asset's age profile comprises two key values: estimated useful life (EUL), or design life; and the percentage of EUL consumed. The EUL is the serviceable lifespan of an asset during which it can continue to fulfil its intended purpose and provide value to users, safely and efficiently. As assets age, their performance diminishes, often more rapidly as they approach the end of their design life.

In conjunction with condition data, an asset's age profile provides a more complete summary of the state of infrastructure. It can help identify assets that may be candidates for further review through condition assessment programs, inform the selection of optimal lifecycle strategies, and improve planning for potential long-term replacement spikes.

Figure 41 below displays the average asset age vs EUL for each asset segment.

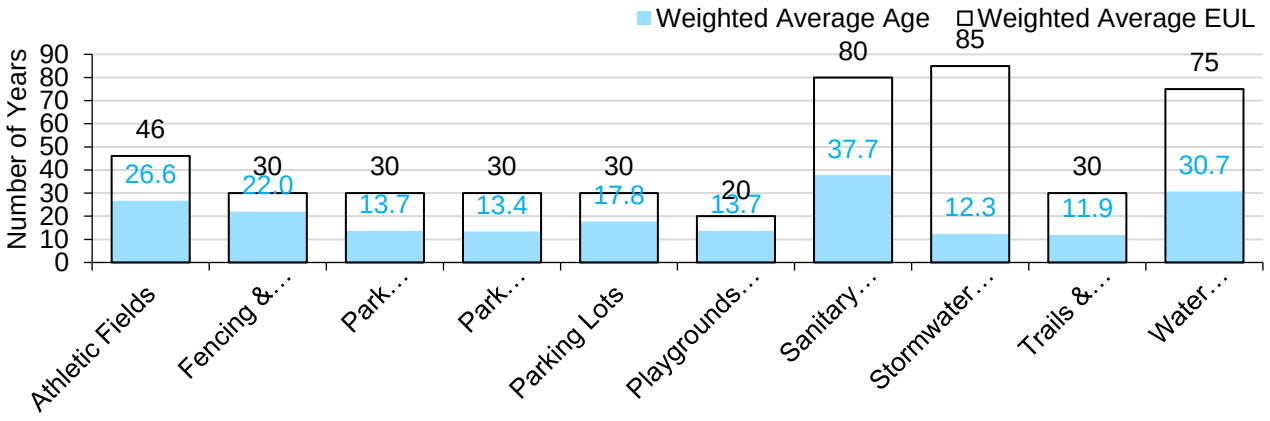


Figure 41 Park Facilities Asset Age vs. EUL

Figure 42 below visually illustrates the average condition for each asset segment on a very good to very poor scale.

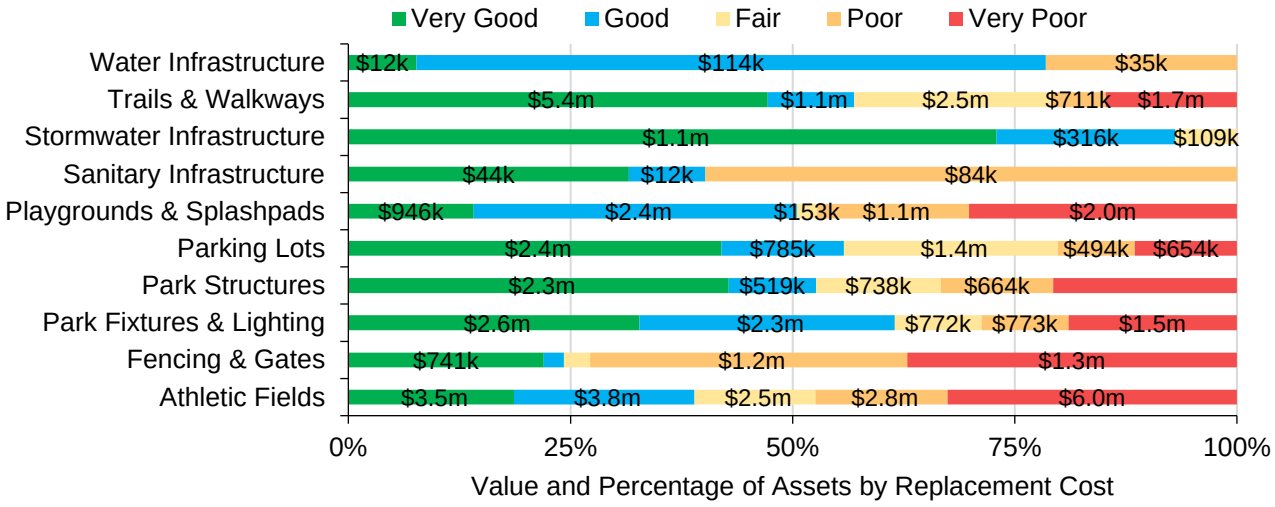


Figure 42 Park Facilities Asset Condition by Segment

To ensure that the Town's park facilities continue to provide an acceptable level of service, the Town 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 park facilities.

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

Current Approach to Condition Assessment

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

- Staff complete regular visual inspections on park facilities assets to ensure they are in state of adequate repair. Playgrounds are inspected according to CSA standards.

In this AMP the following rating criteria is used to determine the current condition of park asset segments and forecast future capital requirements:

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

Table 65 Park Facilities Condition Rating Scale

5.6.3 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.

Table 66 outlines the Town's current lifecycle management strategy.

Activity Type	Description of Current Strategy
Maintenance, Rehabilitation & Replacement	The Park Facilities asset category includes several unique asset types and lifecycle requirements are dealt with on a case-by-case basis

Table 66 Park Facilities Lifecycle Management Strategies

Forecasted Capital Requirements

The following graph forecasts long-term capital requirements. The annual capital requirement represents the average amount per year that the Town should allocate towards funding rehabilitation and replacement needs. Figure 43 identifies capital requirements over the next 80 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 5-year capital requirements.

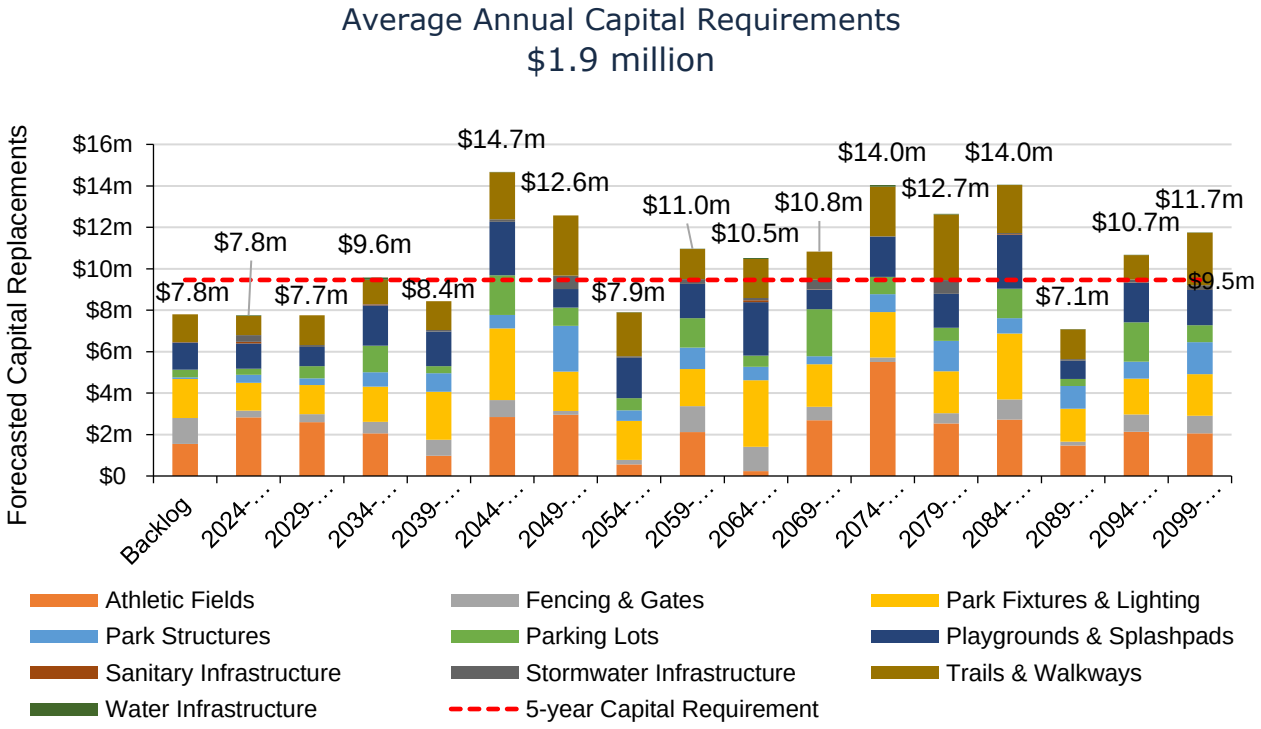


Figure 43 Park Facilities Forecasted Replacement Needs 2024-2103

The projected cost of lifecycle activities that will need to be undertaken over the next 10 years to maintain the current level of service can be found in Table 129 in Appendix A.

5.6.4 Risk & Criticality

Risk Matrix

The asset-specific attributes that municipal staff utilize to define and prioritize the criticality of the park facilities are documented below, with their weights indicated in brackets:

Probability of Failure (POF)	Consequence of Failure (COF)
Structural (100%)	Economic (30%)
	Health and Safety (50%)
	Social (20%)

Table 67 Park Facilities Risk Parameters

Based on the above noted attributes and weightings, risk is calculated for each asset. The following heat map illustrates the probability and consequence of failure scores for all park assets based on 2023 inventory data. Please refer to Figure 102 in Appendix C for a more detailed overview of the criteria used to estimate the risk rating of each asset.

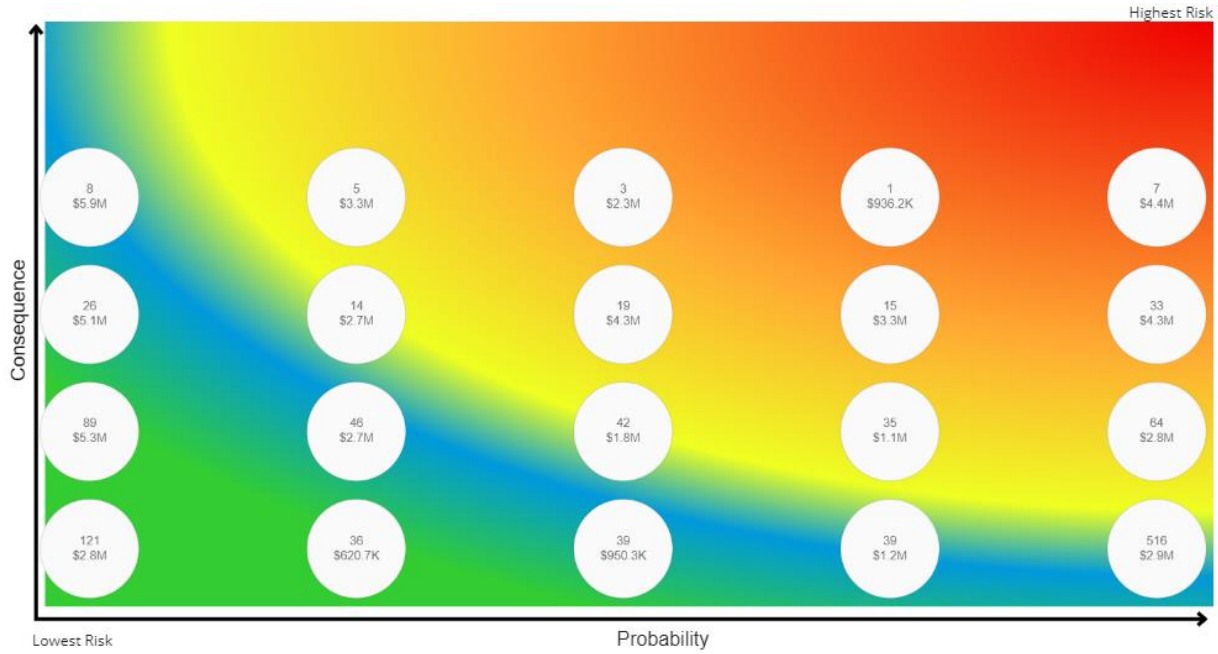


Figure 44 Park Facilities Risk Matrix Heat Map

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

The identification of critical assets is a valuable tool in identifying potential risk mitigation strategies and treatment options. Risk mitigation may include asset-specific lifecycle strategies, condition assessment strategies, or simply the need to collect better asset data.

Risks to Current Asset Management Strategies

Table 68 summarizes key trends, challenges, and risks to service delivery that the Town is currently facing:

	Aging Infrastructure and Asset Information
	A portion of park assets and playgrounds are approaching the end of their useful lives. As the assets age, it requires an increased operating costs and the aging playground elements may not meet the safety requirements. There is no formal condition assessment currently in

	place for park assets and park related land improvements. Staff are seeking to update the inventory and refine the asset information. A formal condition assessment program can also help to identify infrastructure needs, help capital planning, and reduce unplanned service disruption.
	**Growth** As the population continues to grow, the Town must prioritize expanding its capacity to serve a larger population. The demographic change in population also indicate the change in the community expectations on parks and park related land improvements. The Town has developed a five-year plan for parks and park related land improvements. This plan is updated regularly. Developing a comprehensive long-term capital plan with considerations for growth can be helpful to minimize dependency on grant funding and provide desired services.
	**Capital Funding Strategies** The Town currently has a large inventory of park assets which require regular maintenance and assessment. Major rehabilitation and replacement will be heavily reliant on the availability of grant funding opportunities. The significant increase in market prices of materials further amplify this risk. An annual capital funding strategy can also reduce dependency on grant funding and help prevent the deferral of asset renewal and acquisition.
	**Climate Change & Extreme Weather Events** As extreme weather events are projected to continue, the events can result in damage to parks facilities assets and pose higher demand on maintenance and repair of the assets. Incorporating a monitoring and maintenance program for all parks facilities assets can further support infrastructure resiliency and help mitigate the risk.

Table 68 Park Facilities Qualitative Risk Summary

5.6.5 Current Levels of Service

Park facilities are a non-core asset category and as such, there are no LOS metrics that are mandated. Instead, the Town selected metrics based on what is suitable, valuable, and feasible to collect. The following tables identify the selected LOS metrics.

Community Levels of Service

Table 69 outlines the qualitative descriptions that determine the community levels of service provided by park facilities.

Service Attribute	Qualitative Description	Current LOS (2023)
Safety & Regulatory Compliance	Parks facilities and trails are safe to use and do not pose a hazard to users	Description of the parks and trails inspection process
Reliable	Parks assets are in good condition, meeting the functional needs of users within facility operating hours	Description of maintenance and renewal activities to maintain parks in a suitable condition
Accessible	Parks Facilities are suitable to all kinds of users and are easy to access. Green Space development meets the needs of the community	See Figure 87 in Appendix B

Table 69 Park Facilities Community Levels of Service

Technical Levels of Service

Table 70 outlines the quantitative metrics that determine the technical level of service provided by park facility assets. The current LOS performance for each metric as of 2023 is also detailed below.

Service Attribute	Technical Metric	Current LOS (2023)
Safety & Regulatory Compliance	% of safety inspections completed as scheduled	100%
Reliable	Capital expenditure per hectare of parkland	N/A
	Park Service Area Ratio	800m radius
Accessible	# outdoor park facilities per 1,000 people	1.0
	Hectares of parkland per 1,000 people	2.7

Table 70 Park Facilities Technical Levels of Service

6 Analysis of Rate-funded Assets

Key Insights

- Rate-funded assets are valued at $630.3 million
- Water, wastewater, and storm assets are funded at 30.9% of their long-term requirements
- Average annual capital requirement for rate-funded assets is $18.4 million
- Critical assets should be evaluated to determine appropriate risk mitigation activities and treatment options

6.1 Water Network

The Town is responsible for water distribution to the end users, consumer metering, and billing. York Region is responsible for water production and bulk distribution. Water in Aurora is 20 percent ground water source and 80 percent lake-based source. Water Services are coordinated between York Region and the Town's Operational Services department.

The state of the infrastructure for the water network is summarized in Table 71.

Replacement Cost	Condition	Financial Capacity	
$331 M	61%	Annual Requirement:	$5.7 M
		Funding Available:	$1.7 M
		Annual Deficit:	$4.0 M

Table 71 Water Network State of the Infrastructure

The following core values and level of service statements are a key driving force behind the Town's asset management planning:

Service Attribute	Level of Service Statement
Scope	The Municipal water supply is provided with minimal service disruptions and system failures and service requests are responded to promptly.
Quality/ Reliability	The water network provides adequate pressure, is of acceptable quality, safe to drink, and is adequate for firefighting purposes.

Table 72 Water Network Level of Service Statements

6.1.1 Asset Inventory & Costs

Table 73 below includes the quantity, replacement cost method, and annual capital requirements of each asset segment in the Town's water network inventory.

Asset Segment	Quantity (Component)	Replacement Cost	Annual Capital Requirement
Hydrants	1,797 Assets	$16,022,000	$313,000
Water Booster Station	1 Asset	$438,000	$9,000
Water Mains	255,721 m	$197,488,000	$3,265,000
Water Meters	16,224 Assets	$5,339,000	$267,000
Water Sample Stations	60 Assets	$180,000	$4,000
Water Service Connections	178,780 m	$93,217,000	$1,541,000
Water Underground Enclosures	754 Assets	$8,470,000	$163,000
Water Valves	2,872 Assets	$9,535,000	$184,000
Total		**$330,688,000**	**$5,746,000**

Table 73 Water Network Inventory and Valuation

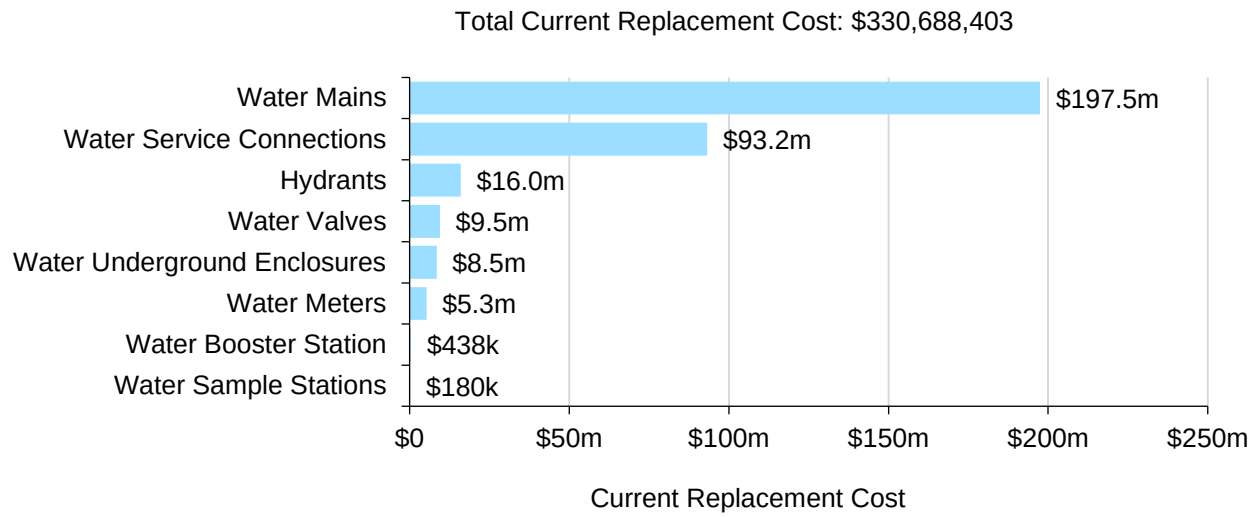


Figure 45 Water Network Replacement Cost by Segment

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

6.1.2 Asset Condition & Age

Table 74 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.

Asset Segment	Average Estimated Useful Life (Years)	Average Age (Years)	Average Condition
Hydrants	50	25	52%
Water Booster Station	50	24	53%
Water Mains	75	27	65%
Water Meters	20	34	3%
Water Sample Stations	50	18	64%
Water Service Connections	75	28	63%
Water Underground Enclosures	50	26	48%
Water Valves	50	24	54%
Average			**61%**

Table 74 Water Network Asset Age and Condition Summary

An asset's age profile comprises two key values: estimated useful life (EUL), or design life; and the percentage of EUL consumed. The EUL is the serviceable lifespan of an asset during which it can continue to fulfil its intended purpose and provide value to users, safely and efficiently. As assets age, their performance diminishes, often more rapidly as they approach the end of their design life.

In conjunction with condition data, an asset's age profile provides a more complete summary of the state of infrastructure. It can help identify assets that may be candidates for further review through condition assessment programs, inform the selection of optimal lifecycle strategies, and improve planning for potential long-term replacement spikes.

Figure 46 below displays the average asset age vs EUL for each asset segment.

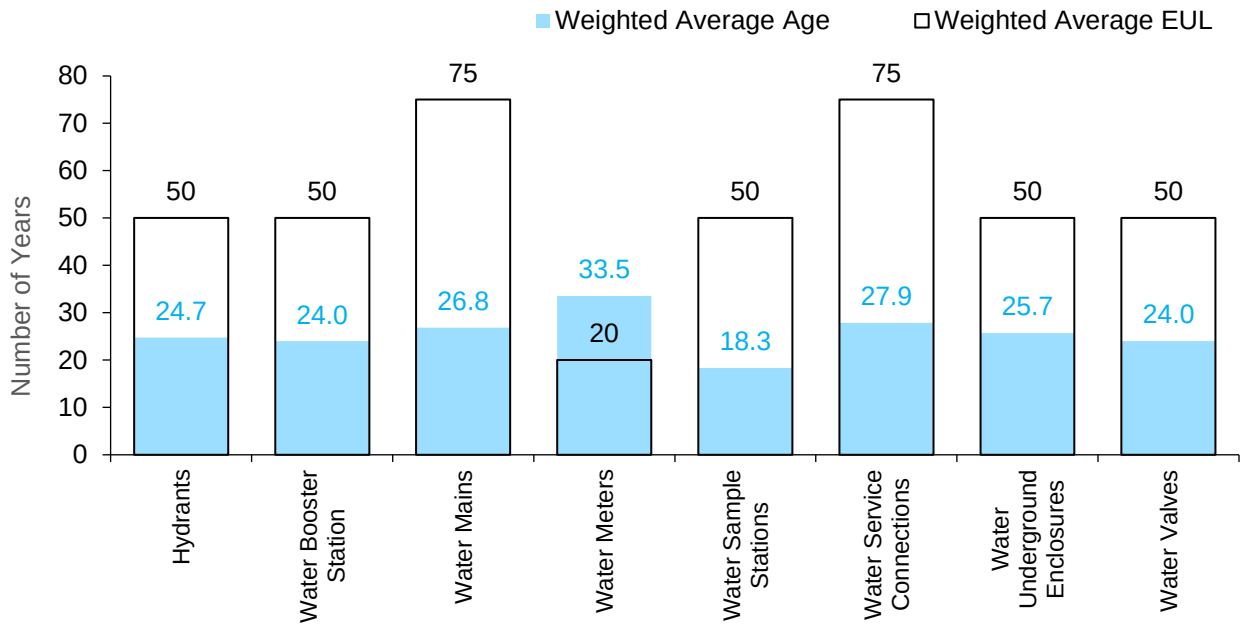


Figure 46 Water Network Asset Age vs. EUL

Figure 47 below visually illustrates the average condition for each asset segment on a very good to very poor scale:

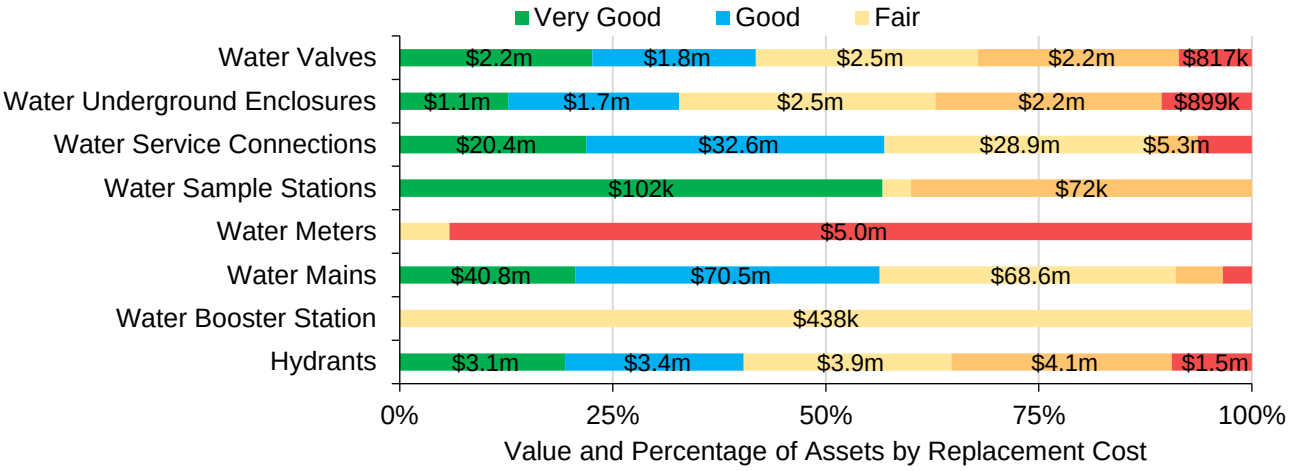


Figure 47 Water Network Asset Condition by Segment

To ensure that the Town's water network continues to provide an acceptable level of service, the Town 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 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 more confidently. The following describes the Town's current approach:

- Water sampling stations are inspected weekly
- Generators are inspected weekly, pumps are inspected monthly, and the structures housing those assets are inspected semi-annually
- Booster stations are inspected regularly for deficiencies
- Hydrants are inspected annually
- 25% of the main line water valves are inspected annually and logged
- Bulk water stations are inspected on a weekly basis or as needed

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

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

Table 75 Water Network Condition Rating Scale

6.1.3 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.

Table 76 outlines the Town's current lifecycle management strategy.

Activity Type	Description of Current Strategy
Maintenance	Hydraulic modelling is completed on an as-needed basis with the most recent study completed in 2021
	Leak detection is completed for service lines when an issue arises, but no formal program is currently in place
	Pressure and fireflow testing are regularly done by developers and insurance companies for new subdivisions
	Hydrants are flushed regularly, problematic areas have been noted to be flushed more frequently
	Main line valves are exercised during inspection, which covers 25% of the network on annual basis
Rehabilitation	A residential water meter replacement program is in place. To date approximately half of the town's water meters have been replaced
Replacement	Booster stations are maintained weekly with different components inspected at varying frequencies. While condition ratings are not assigned, deficiencies are identified and noted
	Metallic watermains are targeted for rehabilitation in conjunction with road rehabilitation projects.

Table 76 Water Network Lifecycle Management Strategies

Forecasted Capital Requirements

The following graph forecasts long-term capital requirements. The annual capital requirement represents the average amount per year that the Town should allocate towards funding rehabilitation and replacement needs. Figure 48 identifies capital requirements over the next 85 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 5-year capital requirements.

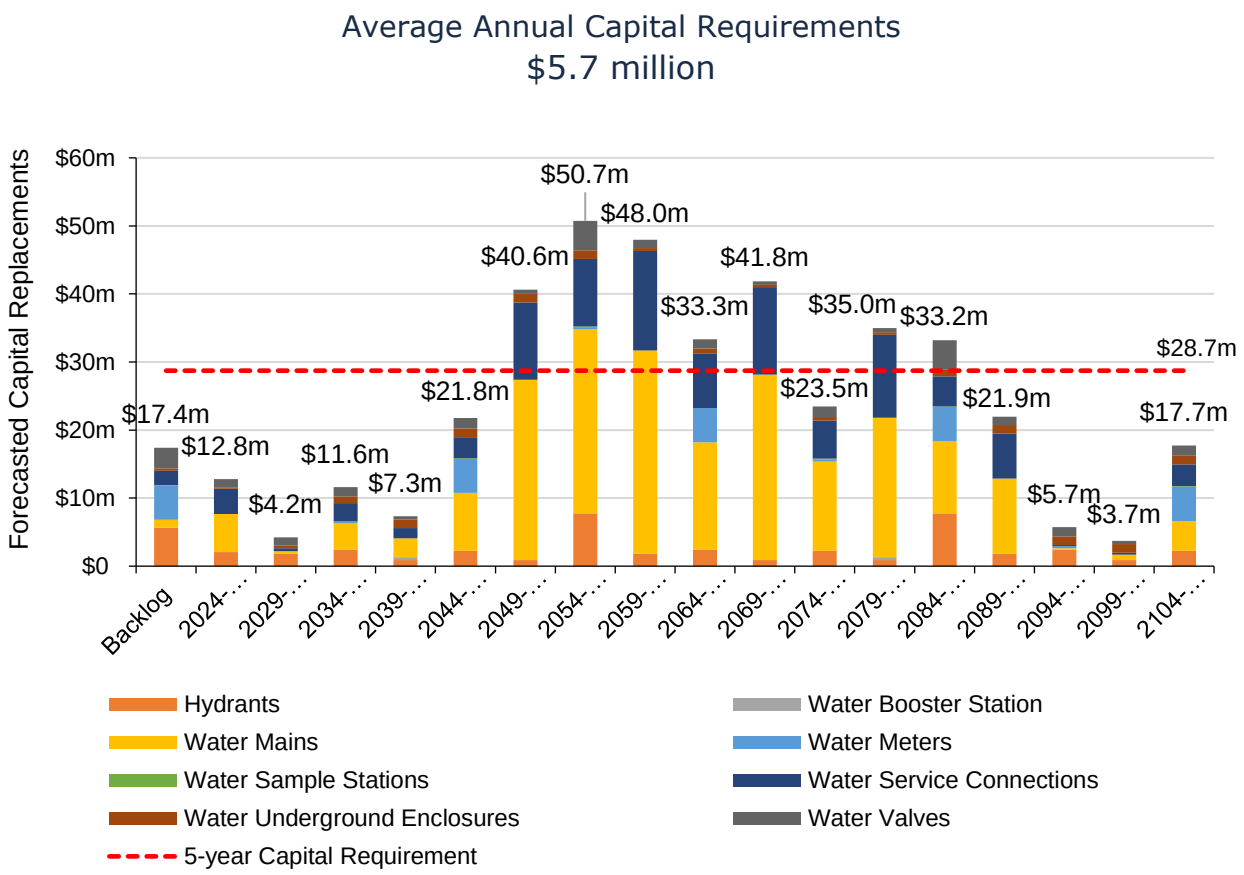


Figure 48 Water Network Forecasted Replacement Needs 2024-2108

The projected cost of lifecycle activities that will need to be undertaken over the next 10 years to maintain the current level of service can be found in Table 134 in Appendix A.

6.1.4 Risk & Criticality

Risk Matrix

The asset-specific attributes that municipal staff utilize to define and prioritize the criticality of the water facilities are documented below, with their weights indicated in brackets:

Probability of Failure (POF)	Consequence of Failure (COF)
Structural (100%)	Economic (40%)
	Health and Safety (60%)

Table 77 Water Network Risk Parameters

The asset-specific attributes that municipal staff utilize to define and prioritize the criticality of the water mains are documented below, with their weights indicated in brackets:

Probability of Failure (POF)	Consequence of Failure (COF)
Structural (100%)	Economic (30%)
Functional (50%)	Social (40%)
	Environmental (30%)

Table 78 Water Network (Water Mains) Risk Parameters

Based on the above noted attributes and weightings, risk is calculated for each asset. The following heat map illustrates the probability and consequence of failure scores for all water network assets based on 2023 inventory data. Please refer to Figure 103 and Figure 104 in Appendix C for a more detailed overview of the criteria used to estimate the risk rating of each asset.

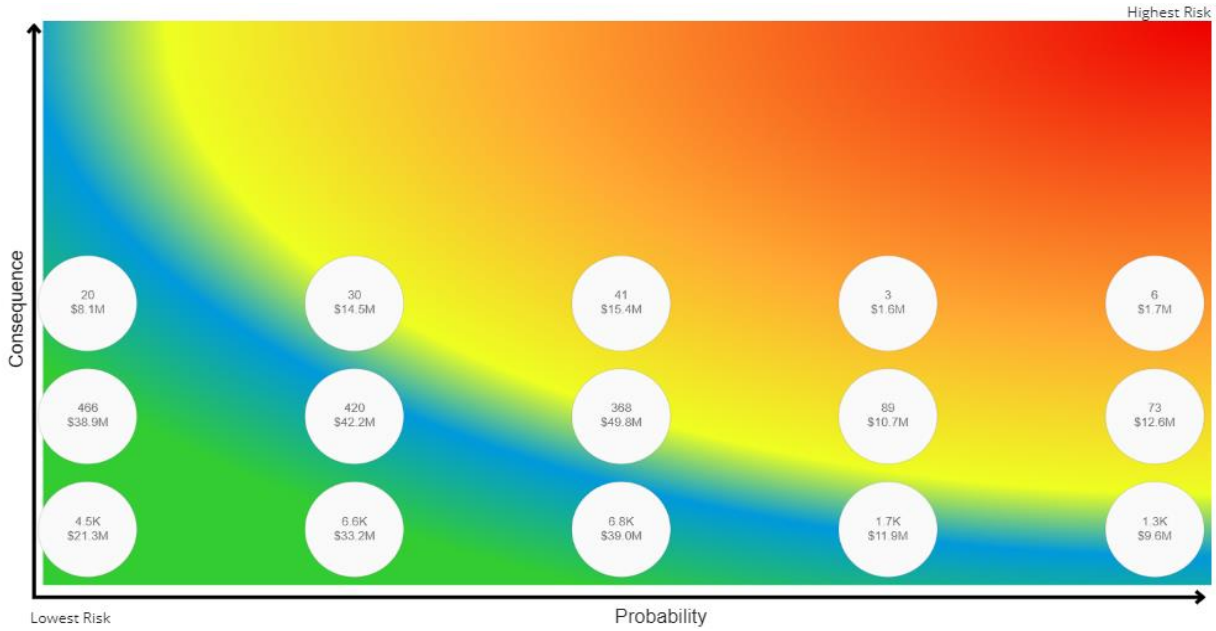


Figure 49 Water Network Risk Matrix Heat Map

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

The identification of critical assets is a valuable tool in identifying potential risk mitigation strategies and treatment options. Risk mitigation may include asset-specific lifecycle strategies, condition assessment strategies, or simply the need to collect better asset data.

Risks to Current Asset Management Strategies

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

Asset Data & Information

There is no formal condition assessment currently in place for water assets. Without an understanding of the condition of the network, unexpected failures are more likely to occur. Staff is actively working towards improving the quality of the available inventory data for the water network. A formal condition assessment program can identify infrastructure needs, help capital planning, and reduce unplanned service disruption.

Climate Change & Extreme Weather Events

As extreme weather events continue to increase, the number of algae blooms in the source water increases. This leads to decreased water quality and degrades the natural environment, causing extra demand

	on the water treatment facilities. As a result, more chlorine residues will remain in the watermains, which poses higher demand on maintenance and rehabilitation activities. Incorporating a monitoring and maintenance program for all water infrastructure can further support infrastructure resiliency and help mitigate the risk.

Table 79 Water Network Qualitative Risk Summary

6.1.5 Current Levels of Service

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

Community Levels of Service

Table 80 outlines the qualitative descriptions that determine the community levels of service provided by water network.

Service Attribute	O. Reg. 588/17 Mandated	Qualitative Description	Current LOS (2023)
Scope	Yes	Description, which may include maps, of the user groups or areas of the municipality that are connected to the municipal water system	See Figure 88 Appendix B
	Yes	Description, which may include maps, of the user groups or areas of the municipality that have fire flow	See Figure 89 Appendix B
Reliability	Yes	Description of boil water advisories and service interruptions	0 boil water advisories

Table 80 Water Network Community Levels of Service

Technical Levels of Service

Table 81 outlines the quantitative metrics that determine the technical level of service provided by the water network.

Service Attribute	O. Reg. 588/17 Mandated	Technical Metric	Current LOS (2023)
Scope	Yes	% of properties connected to the municipal water system	97.1%
	Yes	% of properties where adequate fire flow is available	98.6%
Reliability	No	# 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	0:17,700
	Yes	# of connection-days per year where water is not available due to water main breaks compared to the total number of properties connected to the municipal water system	32:17,700
Performance	No	Capital re-investment rate	0.5%
Affordability	No	O&M Expenditure per capita	$740
	No	Five Year Average Annual Capital Expenditure	$1,562,719

Table 81 Water Network Technical Levels of Service

6.2 Sanitary Network

The Town is responsible for wastewater collection and delivery to regional trunk infrastructure. Sewer services provided by the Town are overseen by the Water and Wastewater Management division.

The state of the infrastructure for the sanitary network is summarized in Table 82.

Replacement Cost	Condition	Financial Capacity	
$300 M	63%	Annual Requirement:	$4.2 M
		Funding Available:	$1.5 M
		Annual Deficit:	$2.7 M

Table 82 Sanitary Network State of the Infrastructure

The following core values and level of service statements are a key driving force behind the Town's asset management planning.

Service Attribute	Level of Service Statement
Scope	96% of properties are connected to the municipal sanitary system in sufficient capacity (does not exceed maximum capacity).
Quality	The sanitary sewer network overall is in good condition.
Reliability	There are minimal unplanned service interruptions due to backups and effluent violations.

Table 83 Sanitary Network Level of Service Statements

6.2.1 Asset Inventory & Costs

Table 84 below includes the quantity, replacement cost method and total replacement cost of each asset segment in the Town's sanitary network inventory.

Asset Segment	Quantity	Replacement Cost	Annual Capital Requirement
Sanitary Equalization Tanks	3 Assets	$1,076,000	$22,000
Sanitary Laterals	180,293 m	$106,126,000	$1,506,000
Sanitary Mains	223,264 m	$145,705,000	$2,067,000
Sanitary Manholes and Underground Enclosures	3,417 Assets	$38,384,000	$467,000
Sanitary Pumping Stations	9 Assets	$8,297,000	$166,000
Sanitary Valve	1 Asset	$3,000	$0
Total		**$299,590,000**	**$4,228,000**

Table 84 Sanitary Network Inventory and Valuation

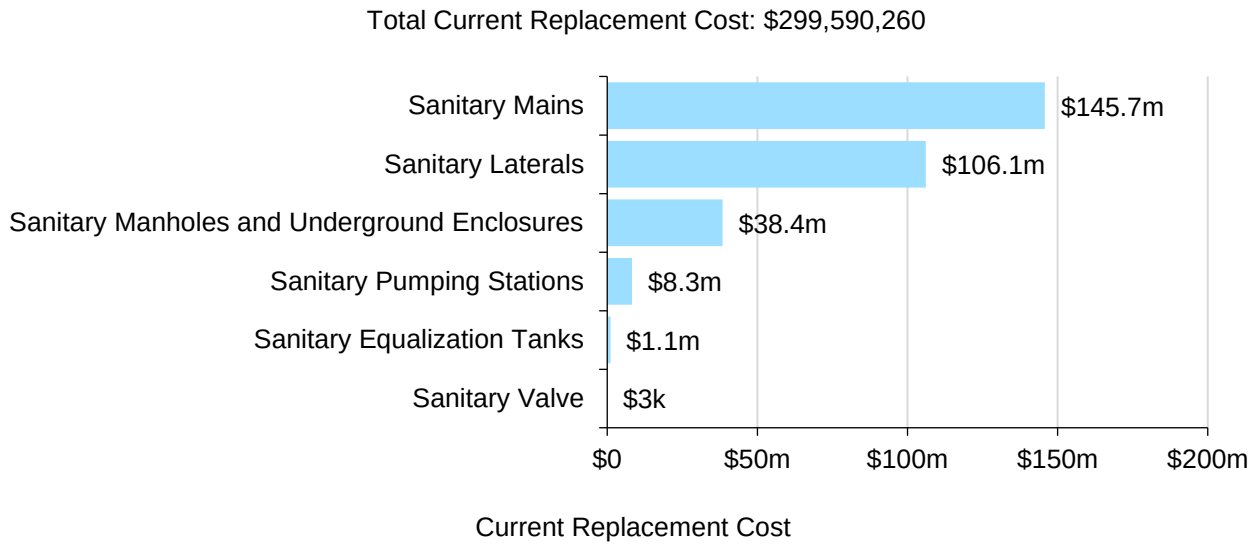


Figure 50 Sanitary Network Replacement Cost by Segment

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

6.2.2 Asset Condition & Age

Table 85 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.

Asset Segment	Average Estimated Useful Life (Years)	Average Age (Years)	Average Condition (%)
Sanitary Equalization Tanks	50	23	52%
Sanitary Laterals	80	28	57%
Sanitary Mains	80	31	54%
Sanitary Manholes and Underground Enclosures	50	30	43%
Sanitary Pumping Stations	50	19	63%
Sanitary Valve	30	17	42%
Average			**63%**

Table 85 Sanitary Network Asset Age and Condition Summary

An asset's age profile comprises two key values: estimated useful life (EUL), or design life; and the percentage of EUL consumed. The EUL is the serviceable lifespan of an asset during which it can continue to fulfil its intended purpose and provide value to users, safely and efficiently. As assets age, their performance diminishes, often more rapidly as they approach the end of their design life.

In conjunction with condition data, an asset's age profile provides a more complete summary of the state of infrastructure. It can help identify assets that may be candidates for further review through condition assessment programs, inform the selection of optimal lifecycle strategies, and improve planning for potential long-term replacement spikes.

Figure 51 below displays the average asset age vs EUL for each asset segment

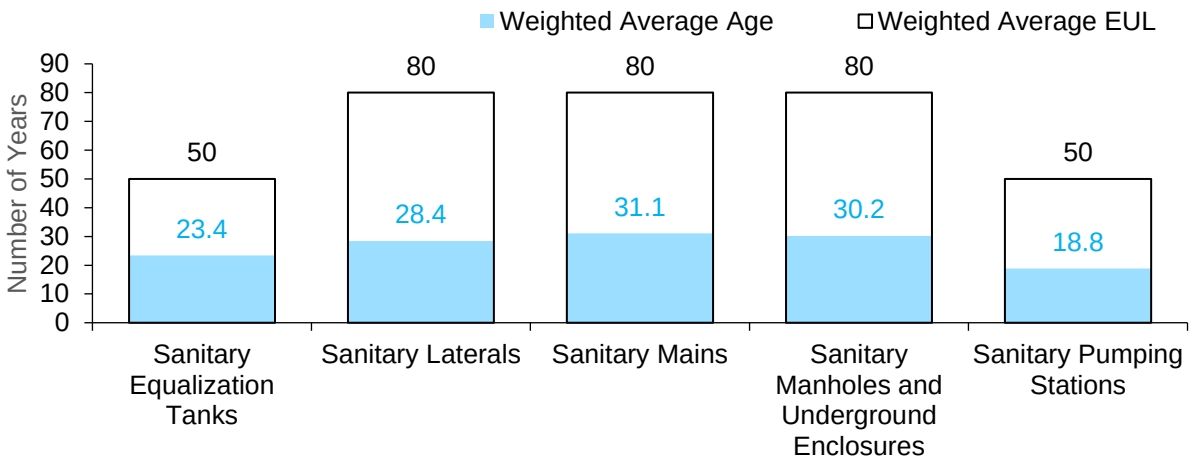


Figure 51 Sanitary Network Asset Age vs. EUL

Figure 52 below visually illustrates the average condition for each asset segment on a very good to very poor scale.

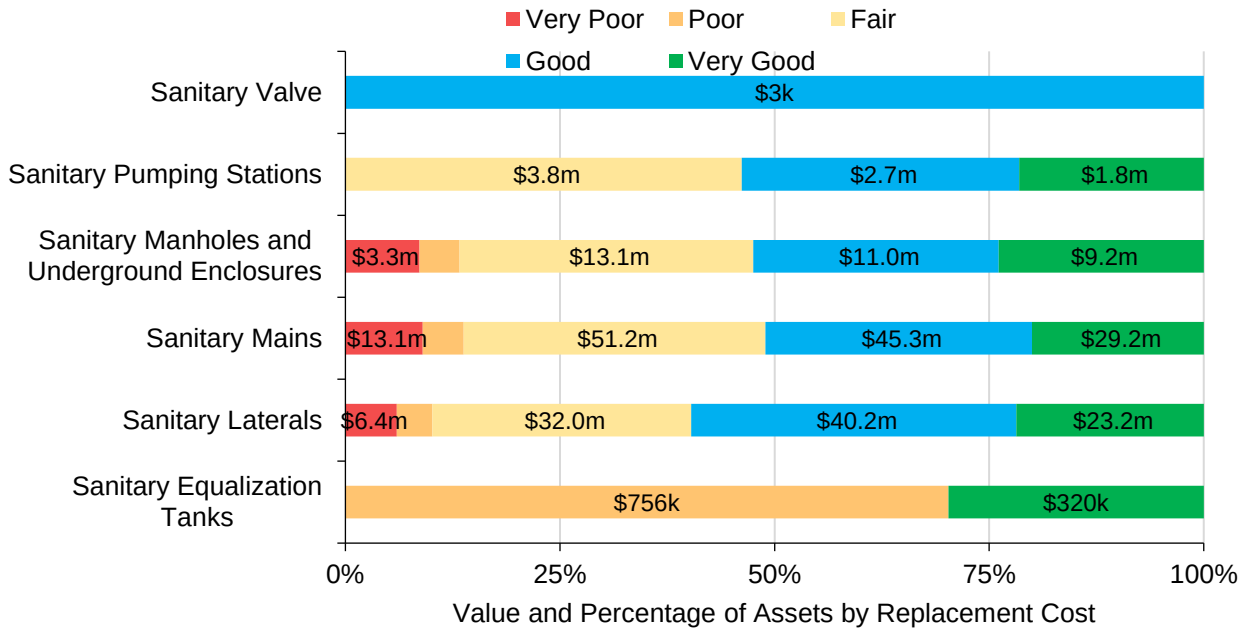


Figure 52 Sanitary Network Asset Condition by Segment

To ensure that the Town's sanitary network continues to provide an acceptable level of service, the Town 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 sanitary network.

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

Current Approach to Condition Assessment

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

- CCTV inspections are done for approximately 10% of the entire sewer network every year
- Manholes are inspected for deficiencies and captured in a checklist type format on an annual basis and logged
- Sanitary pumping stations are inspected alongside water booster stations
- Sanitary laterals are inspected on a regular basis with their connected gravity main

In this AMP the following rating criteria is used to determine the current condition of sewer network assets and forecast future capital requirements:

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

Table 86 Sanitary Network Condition Rating Scale

6.2.3 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.

Table 87 outlines the Township's current lifecycle management strategy.

Activity Type	Description of Current Strategy
Maintenance	Manhole deficiencies are logged. Repairs are then prioritized by condition
Rehabilitation	Manholes are rehabilitated with sewer segments
Replacement	Sewers can be structurally lined to minimize surface impact
	Many sanitary assets are considered for replacement during coordinated lifecycle activities with work on neighbouring assets, such as road rehabilitations

Table 87 Sanitary Network Lifecycle Management Strategies

Forecasted Capital Requirements

The following graph forecasts long-term capital requirements. The annual capital requirement represents the average amount per year that the Town should allocate towards funding rehabilitation and replacement needs. Figure 53 identifies capital requirements over the next 80 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 5-year capital requirements.

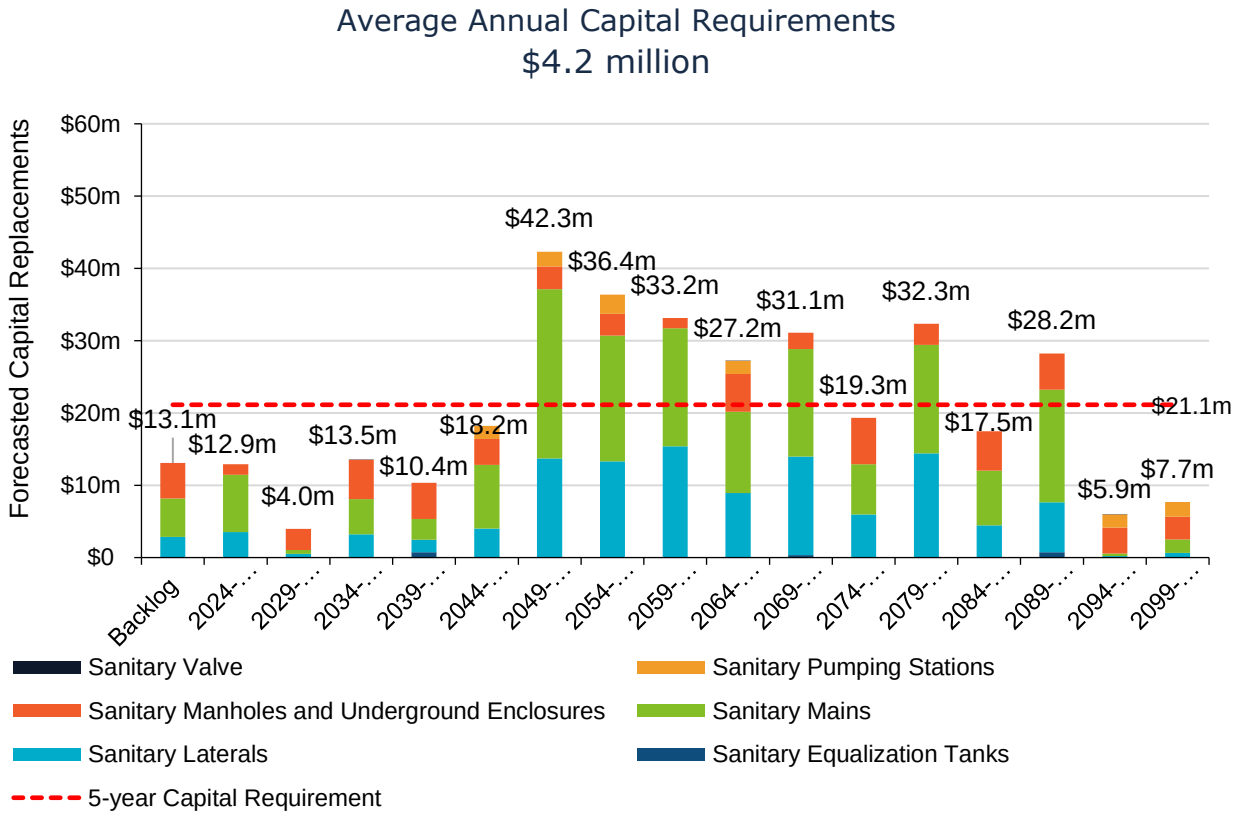


Figure 53 Sanitary Network Forecasted Replacement Needs 2024-2103

The projected cost of lifecycle activities that will need to be undertaken over the next 10 years to maintain the current level of service can be found in Table 132 in Appendix A.

6.2.4 Risk & Criticality

Risk Matrix

The asset-specific attributes that municipal staff utilize to define and prioritize the criticality of the sanitary facilities are documented below, with their weights indicated in brackets:

Probability of Failure (POF)	Consequence of Failure (COF)
Structural (100%)	Economic (40%)
	Health and Safety (60%)

Table 88 Sanitary Network Risk Parameters

The asset-specific attributes that municipal staff utilize to define and prioritize the criticality of the sanitary mains are documented below, with their weights indicated in brackets:

Probability of Failure (POF)	Consequence of Failure (COF)
Structural (75%)	Economic (40%)
Functional (25%)	Social (30%)
	Environmental (30%)

Table 89 Sanitary Network (Sanitary Mains) Risk Parameters

Based on the above noted attributes and weightings, risk is calculated for each asset. The following heat map illustrates the probability and consequence of failure scores for all sanitary network assets based on 2023 inventory data. Please refer to Figure 103 and Figure 105 in Appendix C for a more detailed overview of the criteria used to estimate the risk rating of each asset.

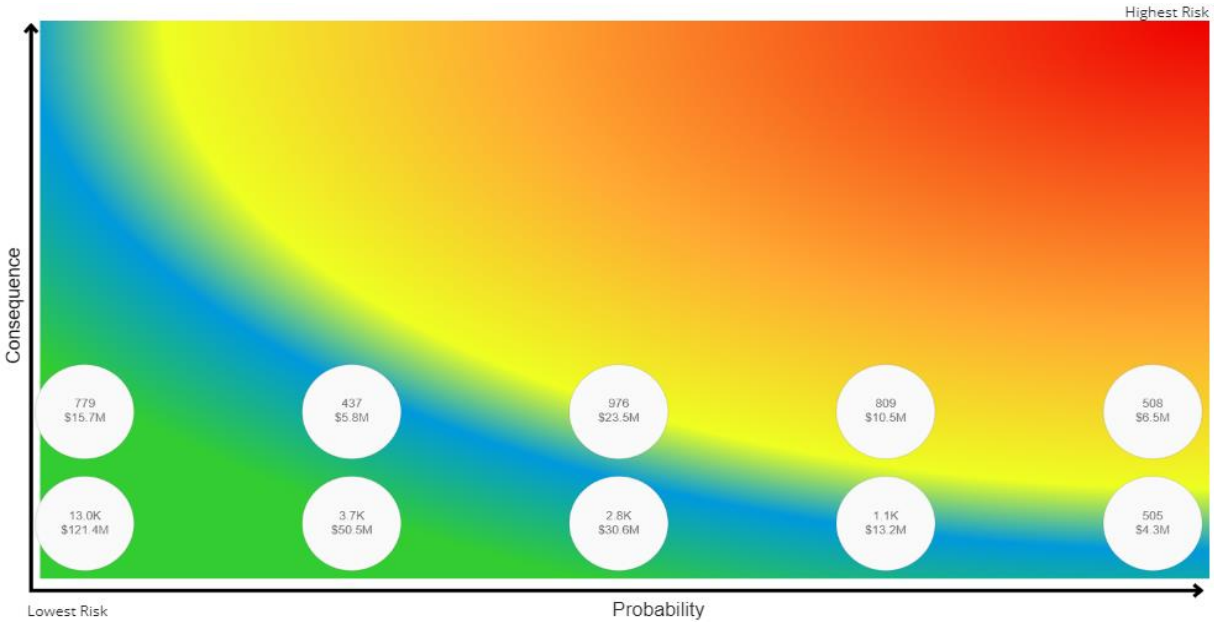


Figure 54 Sanitary Network Risk Matrix Heat Map

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

The identification of critical assets is a valuable tool in identifying potential risk mitigation strategies and treatment options. Risk mitigation may include asset-specific lifecycle strategies, condition assessment strategies, or simply the need to collect better asset data.

Risks to Current Asset Management Strategies

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

Asset Data & Information

Staff is actively working towards collecting additional inventory data for the sanitary network. The current CCTV program in place is focused on the operational needs of the underground assets. Staff is seeking to improve the accuracy of condition data by advancing their CCTV inspection program and utilizing the information to provide a condition rating for underground assets. Once completed there will be greater confidence in the development of data-driven strategies to address infrastructure needs.

Lifecycle Management Strategies

The current lifecycle management strategy for the sanitary network is considered more reactive than proactive. There are no formal condition

	assessment programs in place. Without an understanding of the condition of the network, unexpected failures are more likely to occur. Staff are also working towards developing better defined strategies to help to extend the service life of structures with lower lifecycle costs. These strategies will require sustainable annual funding to minimize the deferral of capital works.
	**Growth** The Town is expected to experience significant growth. Population and employment growth will increase the demand on municipal services and potentially decrease the lifecycle of certain assets. As the population continues to grow, the Town must prioritize expanding its capacity to serve a larger population. Staff are working towards developing a comprehensive long-term capital plan with considerations for growth.
	**Climate Change & Extreme Weather Events** As extreme weather events are projected to continue, the events can result in damage sanitary infrastructure and pose higher demand on maintenance and repair of the assets. Incorporating a monitoring and maintenance program for all sanitary infrastructure can further support infrastructure resiliency and help mitigate the risk.

Table 90 Sanitary Network Qualitative Risk Summary

6.2.5 Current Levels of Service

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

Community Levels of Service

Table 91 outlines the qualitative descriptions that determine the community levels of service provided by sanitary network.

Service Attribute	O. Reg. 588/17 Mandated	Qualitative Description	Current LOS (2023)
Scope	Yes	Description, which may include maps, of the user groups or areas of the municipality that are connected to the municipal wastewater system	See Figure 90 Appendix B

	No	Description of how combined sewers in the municipal wastewater system are designed with overflow structures in place which allow overflow during storm events to prevent backups into homes	The Town does not own any combined sewers
	No	Description of the frequency and volume of overflows in combined sewers in the municipal wastewater system that occur in habitable areas or beaches	The Town does not own any combined sewers
Reliability	No	Description of how stormwater can get into sanitary sewers in the municipal wastewater system, causing sewage to overflow into streets or backup into homes	Stormwater can enter sanitary sewers through cracks in sanitary mains or indirect connections (e.g. weeping tiles). In the case of heavy rainfall events, sanitary sewers may experience a volume of water and sewage that exceeds its designed capacity. In some cases, this can cause water and/or sewage to overflow backup into homes. the disconnection of weeping tiles from sanitary mains and the use of sump pumps and pits directing storm water to the storm drain system can help to reduce the chance of this occurring.
	Yes	Description of how sanitary sewers in the municipal wastewater system are designed to be resilient to stormwater infiltration	The Town follows a series of design standards that integrate servicing requirements and land use considerations when constructing or replacing sanitary sewers. These standards have been determined with consideration of the minimization of sewage overflows and backups.

	Yes	Description of the effluent that is discharged from sewage treatment plants in the municipal wastewater system	Effluent refers to water pollution that is discharged from a wastewater treatment plant, and may include suspended solids, total phosphorous and biological oxygen demand. The Environmental Compliance Approval (ECA) identifies the effluent criteria for municipal wastewater treatment plants.

Table 91 Sanitary Network Community Levels of Service

Technical Levels of Service

Table 92 outlines the quantitative metrics that determine the technical level of service provided by the sanitary network.

Service Attribute	O. Reg. 588/17 Mandated	Technical Metric	Current LOS (2020)
Scope	Yes	% of properties connected to the municipal wastewater system	96%
Reliability	No	# of events per year where combined sewer flow in the municipal wastewater system exceeds system capacity compared to the total number of properties connected to the municipal wastewater system	0:20,500
	No	# of connection-days per year having wastewater backups compared to the total number of properties connected to the municipal wastewater system	0:20,500
	Yes	# of effluent violations per year due to wastewater discharge compared to the total number of properties connected to the municipal wastewater system	0:20,500
Performance	No	Capital re-investment rate	0.5%

Table 92 Sanitary Network Technical Levels of Service

6.3 Storm Network

The Town is responsible for owning and maintaining a stormwater network of storm sewer mains and other supporting infrastructure. Staff continue to improve the accuracy and reliability of their Stormwater inventory to assist with long-term asset management planning.

The state of the infrastructure for the stormwater network is summarized Table 93.

Replacement Cost	Condition	Financial Capacity	
$569 M	64%	Annual Requirement:	$8.4 M
		Funding Available:	$2.4 M
		Annual Deficit:	$6.0 M

Table 93 Storm Network State of the Infrastructure

The following core values and level of service statements are a key driving force behind the Town's asset management planning:

Service Attribute	Level of Service Statement
Scope	The stormwater network service has sufficient capacity for the community and is available under all weather conditions.
Quality	The stormwater network is in good condition with minimal unplanned service interruptions and road closures.

Table 94 Storm Network Level of Service Statements

6.3.1 Asset Inventory & Costs

Table 95 below includes the quantity, total replacement cost and annual capital requirements of each asset segment in the Town's stormwater network inventory.

Asset Segment	Quantity	Replacement Cost	Annual Capital Requirement
Catchbasins	6,131 Assets	$34,021,000	$494,000
Ditches	33,134 m	$6,118,000	$153,000
Headwalls	309 m	$18,481,000	$355,000
LIDs	14 Assets	$6,905,000	$230,000
Oil Grit Separator	44 Assets	$3,643,000	$121,000
Storm Equalization Tanks	61 Assets	$32,760,000	$652,000

Storm Laterals	134,249 m	$76,858,000	$1,222,000
Storm Mains	215,871 m	$223,637,000	$3,555,000
Storm Maintenance Holes and Underground Enclosures	3,503 Assets	$39,350,000	$463,000
Storm Valves	12 Assets	$40,000	$1,000
Stormwater Management Pond	80 Assets	$127,382,000	$1,168,000
Total		**$569,195,000**	**$8,414,000**

Table 95 Storm Network Inventory and Valuation

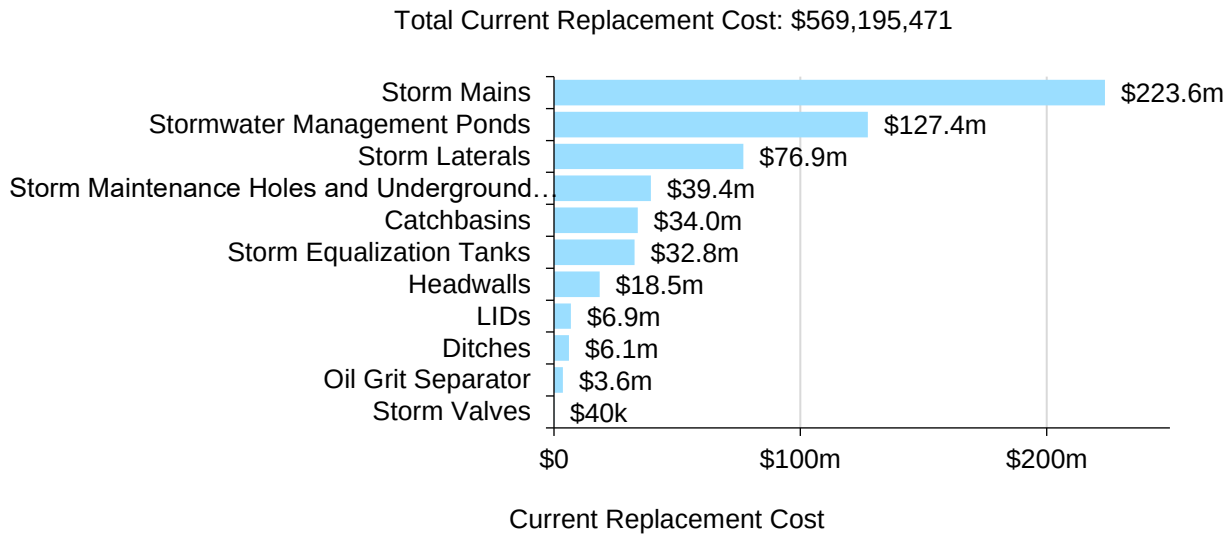


Figure 55 Storm Network Replacement Cost by Segment

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

Asset Condition & Age

Table 96 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.

Asset Segment	Average Estimated Useful Life (Years)	Average Age (Years)	Average Condition
Catchbasins	50	25	60%
Ditches	25	40	12%
Headwalls	50	21	49%

LIDs	25	5	86%
Oil Grit Separator	NA	N/A	56%
Storm Equalization Tanks	50	13	58%
Storm Laterals	67	28	68%
Storm Mains	67	28	68%
Storm Maintenance Holes and Underground Enclosures	50	26	68%
Storm Valves	30	13	73%
Stormwater Management Pond	11	23	44%
Average			**64%**

Table 96 Storm Network Asset Age and Condition Summary

An asset's age profile comprises two key values: estimated useful life (EUL), or design life; and the percentage of EUL consumed. The EUL is the serviceable lifespan of an asset during which it can continue to fulfil its intended purpose and provide value to users, safely and efficiently. As assets age, their performance diminishes, often more rapidly as they approach the end of their design life.

In conjunction with condition data, an asset's age profile provides a more complete summary of the state of infrastructure. It can help identify assets that may be candidates for further review through condition assessment programs, inform the selection of optimal lifecycle strategies, and improve planning for potential long-term replacement spikes.

Figure 56 below displays the average asset age vs EUL for each asset segment.

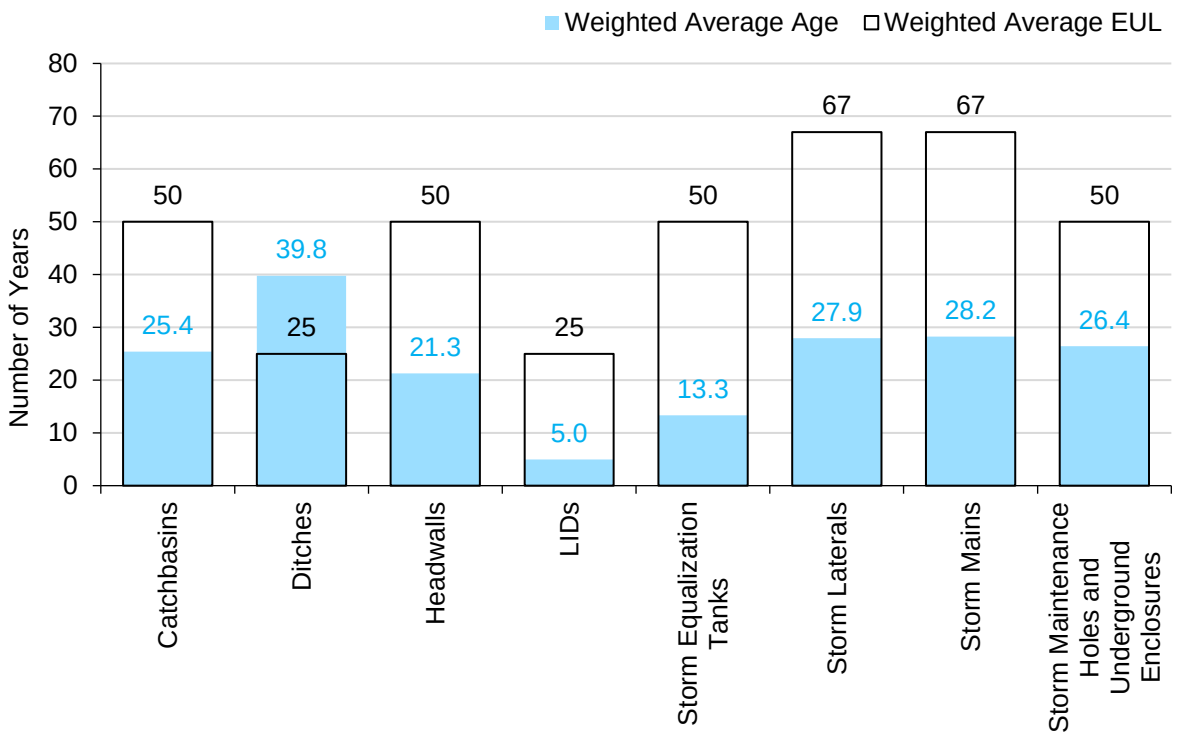


Figure 56 Storm Network Asset Age vs. EUL

Figure 57 below visually illustrates the average condition for each asset segment on a very good to very poor scale.

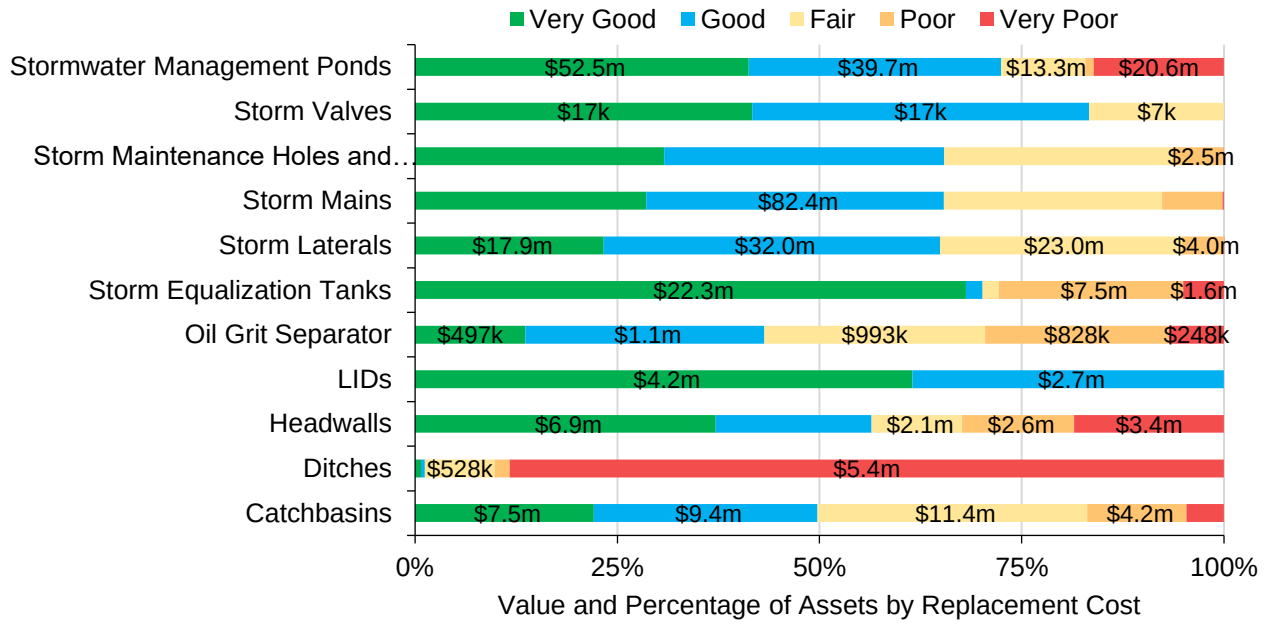


Figure 57 Storm Network Asset Condition by Segment

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

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

Current Approach to Condition Assessment

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

- Closed Circuit Television Video (CCTV) inspections are performed on 10% of the entire storm sewer network annually.
- A comprehensive inspection of storm water management ponds is performed every 2 years.
- Oil grit separators are inspected on an annual basis.
- Catchbasins are inspected when cleaned, approximately 25% are inspected annually.
- Other stormwater assets are inspected on an as-needed basis

In this AMP the following rating criteria is used to determine the current condition of storm network assets and forecast future capital requirements:

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

Table 97 Storm Network Condition Rating Scale

6.3.2 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.

Table 98 outlines the Town's current lifecycle management strategy.

Activity Type	Description of Current Strategy
Maintenance	Storm Master Plans are undertaken as needed. The last plan was completed in 2020 in conjunction with Lake Simcoe's Protection Plan
	25% of catchbasins are cleaned out per year, repairs for catchbasins are usually coordinated with asphalt road repairs
	Storm equalization tanks are inspected yearly and receive cleaning and sediment removal
Rehabilitation	Stormwater management ponds may undergo restorative activities such as silt removal, deepening of the pond, or redesign. Costs are noted to vary widely depending on the extent of restoration. Regular maintenance activities such as vegetation management, debris and litter removal, and clearing of inlet and outlet structures are performed as needed
	Trenchless sewer lining can be considered to minimize impact to neighbouring assets on a case-by-case basis
Replacement	Many storm assets are replaced near the end of life. Earlier replacement is typically coordinated with other work on localized assets, namely the road assets

Table 98 Road Network Lifecycle Management Strategies

Forecasted Capital Requirements

The following graph forecasts long-term capital requirements. The annual capital requirement represents the average amount per year that the Town should allocate towards funding rehabilitation and replacement needs. Figure 58 identifies capital requirements over the next 79 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 5-year capital requirements.

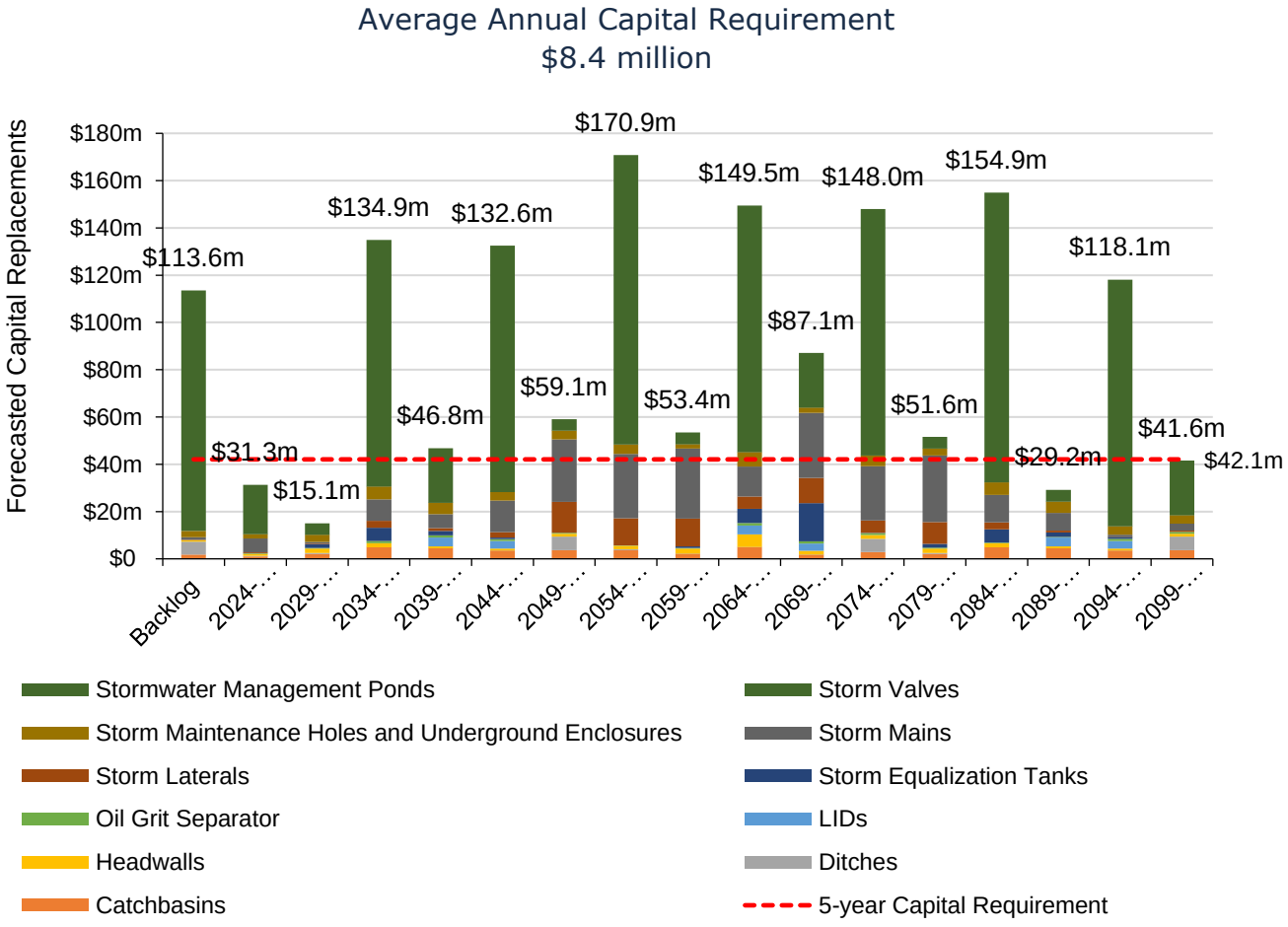


Figure 58 Storm Network Forecasted Replacement Needs 2024-2103

The projected cost of lifecycle activities that will need to be undertaken over the next 10 years to maintain the current level of service can be found in Table 133 in Appendix A.

6.3.3 Risk & Criticality

Risk Matrix

The asset-specific attributes that municipal staff utilize to define and prioritize the criticality of the storm structures are documented below, with their weights indicated in brackets:

Probability of Failure (POF)	Consequence of Failure (COF)
Structural (100%)	Economic (30%)
	Health and Safety (40%)
	Environmental (30%)

Table 99 Storm Network Risk Parameters

The asset-specific attributes that municipal staff utilize to define and prioritize the criticality of the storm mains are documented below, with their weights indicated in brackets:

Probability of Failure (POF)	Consequence of Failure (COF)
Structural (75%)	Economic (30%)
Functional (25%)	Social (40%)
	Environmental (30%)

Table 100 Storm Network (Storm Mains) Risk Parameters

Based on the above noted attributes and weightings, risk is calculated for each asset. The following heat map illustrates the probability and consequence of failure scores for all storm network assets based on 2023 inventory data.

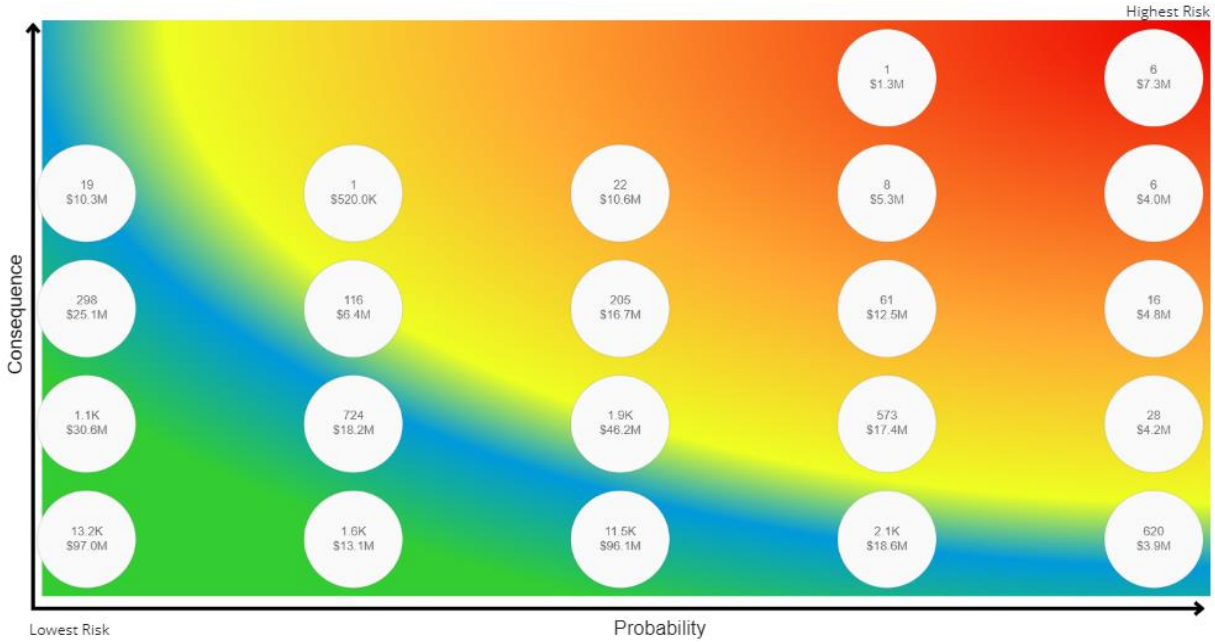


Figure 59 Storm Network Risk Matrix Heat Map

Please refer to Figure 106 and Figure 107 in Appendix C for a more detailed overview of the criteria used to estimate the risk rating of each asset.

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

The identification of critical assets is a valuable tool in identifying potential risk mitigation strategies and treatment options. Risk mitigation may include asset-

specific lifecycle strategies, condition assessment strategies, or simply the need to collect better asset data.

Risks to Current Asset Management Strategies

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

	**Asset Data & Information** Staff is actively working towards collecting additional inventory data for the storm network. Current CCTV program in place is focused on the operational needs of the underground assets. Staff is seeking to improve the accuracy of condition data by advancing their CCTV inspection program and utilizing the information to provide a condition rating for underground assets. Once completed there will be greater confidence in the development of data-driven strategies to address infrastructure needs.
	**Lifecycle Management Strategies** The current lifecycle management strategy for the storm network is considered more reactive than proactive. There are no formal condition assessment programs in place for storm network. Without an understanding of the condition of the network, unexpected failures are more likely to occur. Staff are also working towards developing better defined strategies to help to extend the service life of structures with lower lifecycle costs. These strategies will require sustainable annual funding to minimize the deferral of capital works.
	**Climate Change & Extreme Weather Events** Flooding and road washouts may exist in the poor drainage areas with an increase in intensity, frequency, and duration of precipitation events. This also leads to damages to surrounding infrastructure, pollution of natural resources, and extra demands on the storm system. Current condition assessment strategies and lifecycle strategies for the stormwater network are reactive. Incorporating a monitoring and maintenance program for all stormwater infrastructure can further support infrastructure resiliency and help mitigate the risk.

Table 101 Storm Network Qualitative Risk Summary

6.3.4 Current Levels of Service

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

Community Levels of Service

Table 102 outlines the qualitative descriptions that determine the community levels of service provided by the stormwater network.

Service Attribute	O. Reg. 588/17 Mandated	Qualitative Description	Current LOS (2023)
Scope	Yes	Description, which may include map, of the user groups or areas of the municipality that are protected from flooding, including the extent of protection provided by the municipal stormwater system	See Figure 91 in Appendix B
Affordable	No	Description of measures to improve service cost effectiveness	The stormwater service is affordable to users
Reliable	No	Description of the lifecycle activities to maintain and renew the stormwater system	The stormwater network provides reliable protection, with minimal breaks, blockages, and outages
Safety and Regulatory compliance	No	Description of the erosion and flood mitigation projects in the Town	Stormwater is managed without risk or hazard to public health. There is full compliance with all regulatory requirements

Table 102 Storm Network Community Levels of Service

Technical Levels of Service

Table 103 outlines the quantitative metrics that determine the technical level of service provided by the stormwater network. The current LOS performance for each metric as of 2023 is also detailed below.

Service Attribute	O. Reg. 588/17 Mandated	Technical Metric	Current LOS (2023)
Scope	Yes	% of properties in municipality resilient to a 100-year storm	95.1%
		% of the municipal stormwater management system resilient to a 5-year storm	100%
Affordable	No	O&M Expenditure per capita	$973
		Average Annual Reinvestment Rate	0.4%
		Five Year Average Annual Capital Expenditure	$552,356
Reliable	No	Average Condition of stormwater mains and culverts	58%
		Average Condition of oil grit separators	60%
		Average. Condition of storm ponds	7%
		Average Condition of equalization tanks	63%
		Average condition of catchbasins	52%
		Number of stormwater ponds with a sediment fill more than 50% of total storage volume	11
Safety and Regulatory Compliance	No	% of stormwater pipes CCTV surveyed per year	10%
		km of channels assessed for condition each year	N/A
		% of storm ponds assessed for condition within last 5 years	N/A

Table 103 Storm Network Technical Levels of Service

7 Proposed Service Levels

Key Insights

- 92% of survey respondents indicated that they are satisfied with the Town's delivery of services
- Current maintenance and capital lifecycle activities are meeting level of service needs and expectations
- The majority of assets included in this AMP are considered to be in fair or better condition
- An increase in capital investment is required to sustain a stable level of service over the long term

7.1 Proposed Levels of Service

7.1.1 Scope

Ontario Regulation 588/17 Proposed Levels of Service

The 2025 deadline requires that proposed Levels of Service (LOS) are demonstrated to be appropriate based on an assessment of:

1. Proposed LOS options (i.e., increase, decrease, or maintain current LOS) and the risks associated with these options (i.e., asset reliability, safety, affordability) when considering the long-term sustainability of the municipality.
2. How proposed LOS may differ from current LOS.
3. Whether proposed LOS are achievable.
4. The municipality's ability to afford proposed LOS.

In addition, a lifecycle management and financial strategy to support the proposed LOS must be identified for a period of 10 years with specific reporting on:

1. Identification of lifecycle activities needed to provide the proposed LOS with consideration for:
    a. Full lifecycle of assets.
    b. Lifecycle activities options available to meet proposed LOS.
    c. Risks associated with the options identified in sub-paragraph B, above.
    d. Identification of which lifecycle activities identified in sub-paragraph B carry the lowest cost.
2. An estimate of the annual cost of meeting proposed LOS for a period of 10 years, separated by capital and operating expense.

7.1.2 Methodology

The LOS framework is a valuable tool for assessing and managing the performance of a system or service. Target levels of service for the Town have been developed through comprehensive engagement with Town staff and referencing resident satisfaction surveys. To achieve a target level of service goal, careful consideration of the following should be considered.

Financial Impact Assessment:

- Assess historical expenditures/budget patterns to gauge feasibility of increasing budgets to achieve LOS targets
- Consider implications of LOS adjustments on other services, and other infrastructure programs (tradeoffs)

Infrastructure Condition Assessment:

- Regularly assess the condition of critical infrastructure components.

- Use standardized condition indices or metrics to quantify the state of infrastructure.
- Identify non-critical components where maintenance can be deferred without causing severe degradation.
- Adjust condition indices or metrics to reflect the reduced maintenance budget.
- Use current condition levels as benchmarks to gauge feasibility of large adjustments to levels of service

Service Metrics:

- Measure user satisfaction, response times, and other relevant indicators for the specific service.

Service Impact Assessment:

- Evaluate potential impacts on user satisfaction and service delivery due to decreased infrastructure condition.

Key Activities:

- Implement routine maintenance and inspections to ensure infrastructure longevity.
- Monitor and optimize operational processes for efficiency.
- Regularly review and update preventive maintenance schedules.
- Prioritize critical infrastructure components for maintenance.
- Implement cost-saving measures without compromising safety or compliance.
- Develop strategies for managing and communicating service impacts to stakeholders.
- Invest in technology and process improvements to enhance maintenance efficiency.
- Upgrade critical infrastructure components to improve overall reliability.
- Explore opportunities for innovation and efficiency gains.

Risk Management:

- Identify potential risks to infrastructure and service quality.
- Develop contingency plans to address unforeseen challenges without compromising service quality.
- Monitor performance closely to ensure that the target investment translates into achieving the desired infrastructure condition.

Infrastructure Condition Enhancement:

- Identify areas for improvement and increased maintenance to enhance overall infrastructure condition.

- Adjust condition indices or metrics to reflect the increased maintenance budget.

Service Improvement Metrics:

- Analyze the performance of target levels of service regularly and incorporate more ambitious targets based on user satisfaction if required.

Timelines:

- Although O. Reg requires identification of expenditures for a 10-year period in pursuit of LOS targets, it does not require municipalities to identify the timeframe to achieve them.
- Careful consideration should be given to setting realistic targets for when LOS targets are to be achieved.

General Considerations for All Scenarios:

- **Stakeholder Engagement:**
  - Regularly engage with stakeholders to gather feedback and communicate changes transparently.
- **Data-Driven Decision Making:**
  - Use data analytics to inform decision-making processes and identify areas for improvement.
- **Flexibility and Adaptability:**
  - Design the methodology to be flexible, allowing for adjustments based on evolving conditions and priorities.
- **Continuous Improvement:**
  - Establish a process for continuous review and improvement of the LOS methodology itself.

7.1.3 Proposed Levels of Service Scenarios

The following three scenarios have been considered for establishing target levels of service for all asset categories included in this Asset Management Plan.

Scenario 1: Maintain Condition and Levels of Service

Approach: Adjust capital investment and infrastructure maintenance to sustain the current infrastructure condition and levels of service

Scenario 2: Decrease Infrastructure Condition by 5%

Approach: Adjust capital investment and infrastructure maintenance to accommodate a 5% reduction in overall condition.

Scenario 3: Increase Infrastructure Condition by 5%

Approach: Adjust capital investment and infrastructure maintenance to accommodate a 5% improvement in overall condition.

This methodology provides a structured approach for managing infrastructure condition and levels of service under different budget scenarios, emphasizing adaptability and stakeholder communication.

The charts below depict the categorical analysis for each LOS scenario, facilitated by the Town's Decision Support Module. The results for each category are also systematically compared:

7.2 Portfolio Overview

7.2.1 Categorical Analysis of Tax Funded Assets

	Maintain Current Condition		Current Condition +5%		Current Condition -5%	
Category	**KPI Value**	**Expected Capital Expenditure**	**KPI Value**	**Expected Capital Expenditure**	**KPI Value**	**Expected Capital Expenditure**
Bridges & Culverts	63%	$750,000	68%	$752,000	58%	$560,000
Buildings	54%	$5,764,000	59%	$5,767,000	49%	$5,728,000
Fleet	42%	$736,000	47%	$821,000	37%	$658,000
Machinery & Equipment	38%	$705,000	38%	$705,000	38%	$705,000
Parks Facilities	65%	$1,605,000	65%	$1,605,000	65%	$1,605,000
Road Network	46%	$14,322,000	51%	$15,023,000	41%	$12,756,000
Tax Funded Average/Total	49%	**$23,882,000**	54%	**$24,673,000**	44%	**$22,012,000**

Table 104 Proposed LOS Analysis for Tax Funded Assets

7.2.2 Categorical Analysis of Rate Funded Assets

	Maintain Current Condition		Current Condition +5%		Current Condition -5%	
Category	**KPI Value**	**Expected Capital Expenditure**	**KPI Value**	**Expected Capital Expenditure**	**KPI Value**	**Expected Capital Expenditure**
Sanitary Network	63%	$4,227,512	68%	$4,745,512	58%	$3,815,000
Stormwater Network	64%	$8,405,000	69%	$9,082,857	59%	$7,382,000
Water Network	61%	$5,720,214	66%	$6,526,309	56%	$4,836,000
Tax Funded Assets Totals	63%	**$18,352,726**	68%	**$20,354,678**	58%	**$16,033,000**

Table 105 Proposed LOS Analysis for Rate Funded Assets

7.3 Proposed Levels of Service Details

Through a comprehensive assessment, the following levels of service for the road network, bridges and culverts, sanitary network, storm network, water network, buildings, and fleet asset categories have been developed, aligning with the long-term interests of the Town. Achievability is the key consideration, with measures in place to ensure realistic targets. The Town's financial capacity was thoroughly reviewed, confirming its ability to sustain the proposed service levels. Furthermore, a performance evaluation plan was devised, incorporating asset-specific metrics ensuring accountability over the 10-year period. Complementing this, a detailed lifecycle management and financial strategy was developed, delineating necessary activities for each asset category. This strategy outlines the full lifecycle of assets, presents viable options for lifecycle activities, evaluates associated risks, and prioritizes cost-effective measures to maintain the proposed service standards.

7.3.1 Road Network

Table 106 compares the budget envelopes required to maintain current levels of service and recommended target levels of service for road network assets. The KPI value represents the target condition within each scenario of each segment of the road network. More detail on the average weighted condition of each asset segment can be found in Section 5.1.2.

	Maintain Current Condition		Recommended Target Condition	
Road Network Segment	**KPI Value**	**Expected Capital Expenditure**	**KPI Value**	**Expected Capital Expenditure**
Roads	70%	$8,735,000	70%	$8,735,000
Barriers & Railings	34%	$1,062,000	49%	$1,992,000
Signage	N/A	$143,000	N/A	$143,000
Sidewalks	66%	$2,070,000	71%	$2,138,000
Streetlights	49%	$1,146,000	64%	$1,280,000
Traffic Signals	N/A	$206,000	N/A	$206,000
Parking Lot	54%	$960,000	59%	$960,000
Totals		**$14,322,000**		**$15,454,000**

Table 106 Road Network Proposed LOS Targets

The following graphs illustrate the impacts on cost, performance, and risk for the target levels of service selected for the roads, barriers and railings, sidewalks, and streetlights. Signage, traffic signals, and parking lots were not included in the analysis and did not require a specific strategy to meet a proposed level of service.

The changes in risk are only to the probability of asset failure, and do not impact the consequences of its failure.

Roads

The recommended strategy for arterial, collector, and local roads is to maintain the current condition of roads as a desired levels of service is currently being achieved.

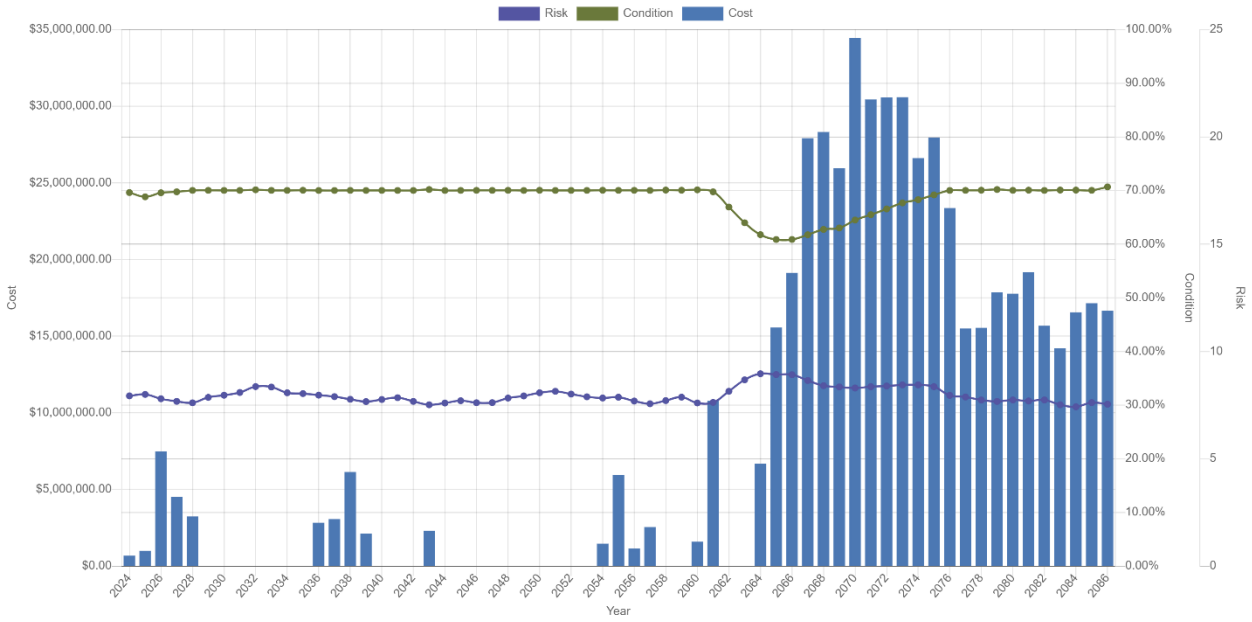


Figure 60 Road Network (Roads) Proposed LOS Impacts

Barriers and Railings

The recommended strategy for barriers and railings is to achieve an average condition of 49% over the next 30 years by increasing the current average condition of 34% by 15% overall.

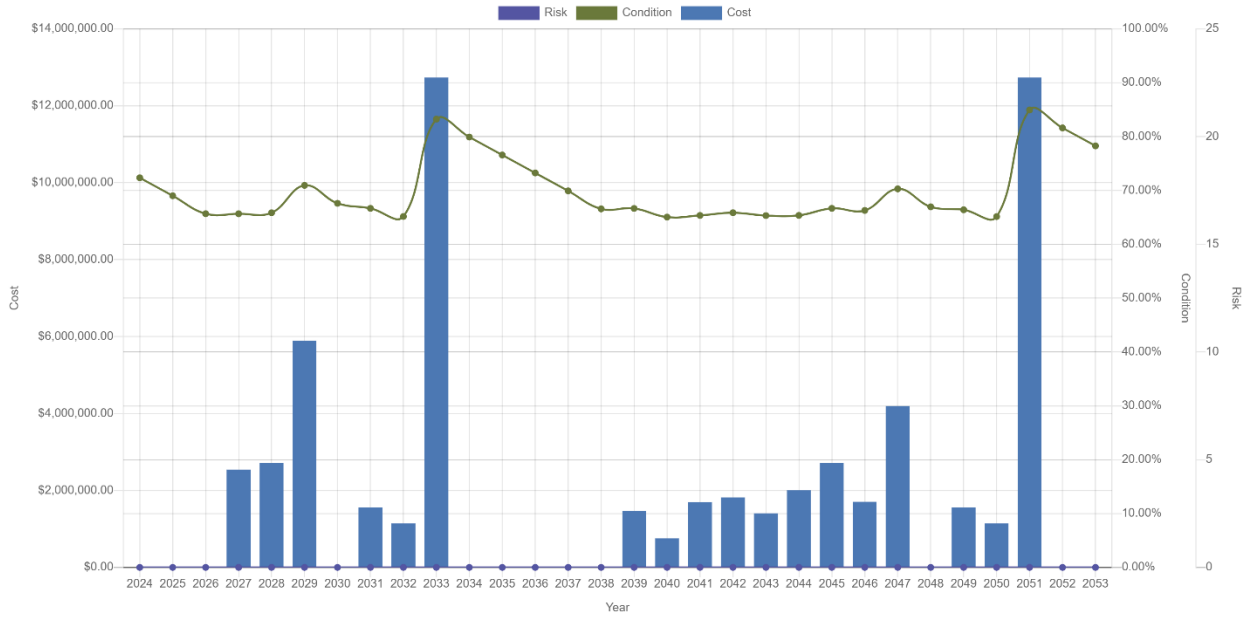


Figure 61 Road Network (Barriers and Railings) Proposed LOS Impacts

Sidewalks

The recommended strategy for sidewalks is to achieve an average condition of 71% over the next 50 years by increasing the current average condition of 66% by 5% overall.

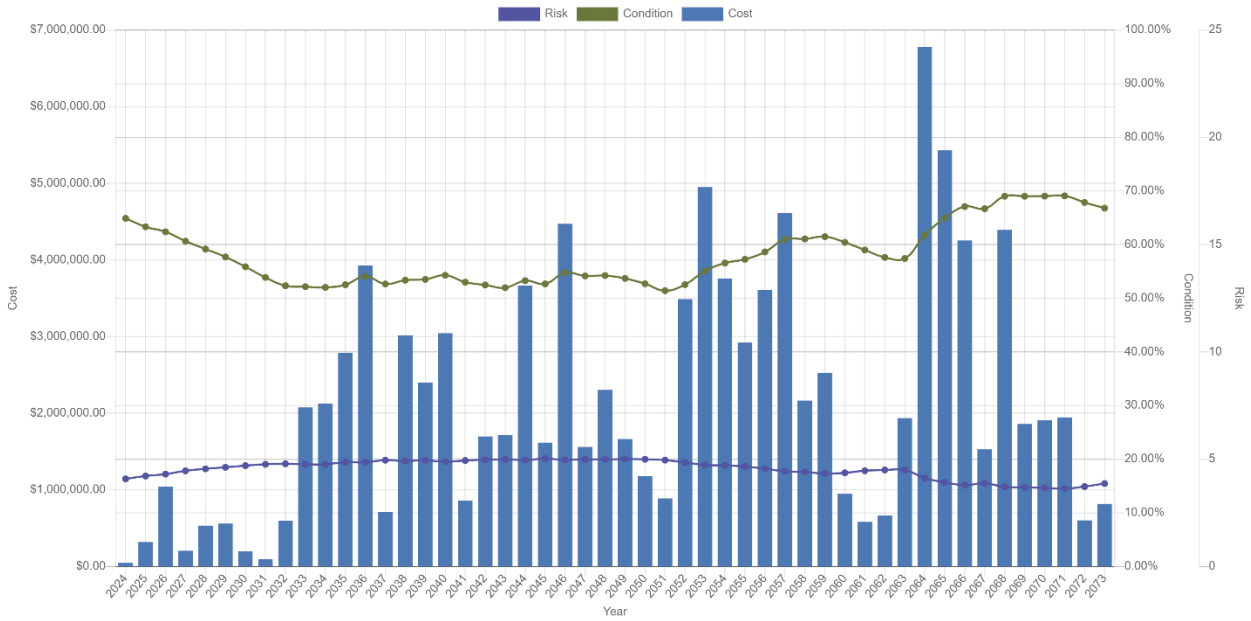


Figure 62 Road Network (Sidewalks) Proposed LOS Impacts

Streetlights

The recommended strategy for streetlights is to achieve an average condition of 64% over the next 50 years by increasing the current average condition of 49% by 15% overall.

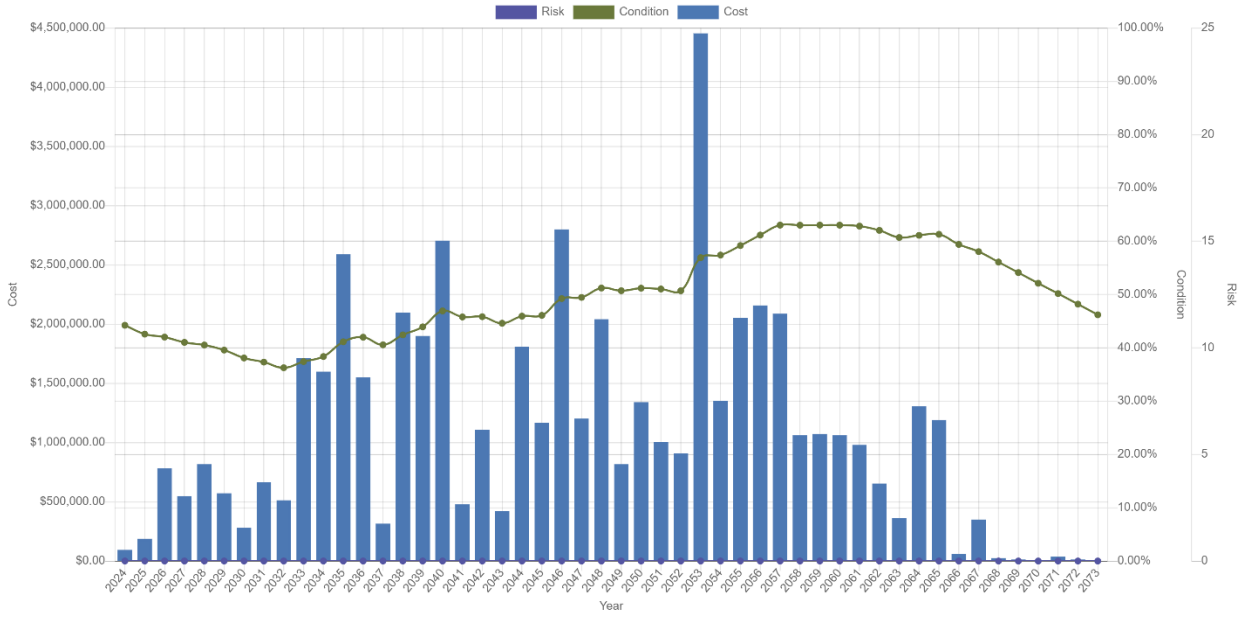


Figure 63 Road Network (Streetlights) Proposed LOS Impacts

The selected target level of service for the road network demonstrates the incremental performance progress achieved over the long-term ensuring the road network remains in a good state of repair while providing expected service delivery. The 10-year capital investment required to fund the lifecycle activities to meet the proposed levels of service over the long term is outlined in Table 126 in Appendix A.

7.3.2 Bridges & Culverts

Table 107 compares the budget envelopes required to maintain current levels of service and recommended target levels of service for bridges & culverts. The KPI value represents the target condition within each scenario of each segment of bridges and culverts. More detail on the average weighted condition of each asset segment can be found in Section 5.2.2.

	Maintain Current Condition		Recommended Target Condition	
Bridges & Culverts Segment	**KPI Value**	**Expected Capital Expenditure**	**KPI Value**	**Expected Capital Expenditure**
Structural Bridges & Culverts	77%	$609,000	77%	$609,000
Cross Culverts & Small Bridges	43%	$141,000	48%	$130,000
Totals		**$750,000**		**$739,000**

Table 107 Bridges and Culverts Proposed LOS Targets

The following graphs illustrate the impacts on cost, performance, and risk for the target levels of service selected for structural and non-structural bridges and culverts. The changes in risk are only to the probability of asset failure, and do not impact the consequences of its failure.

Structural Bridges and Culverts

The recommended strategy for structural bridges and culverts is to maintain the current condition as the desired level of service is currently being achieved.

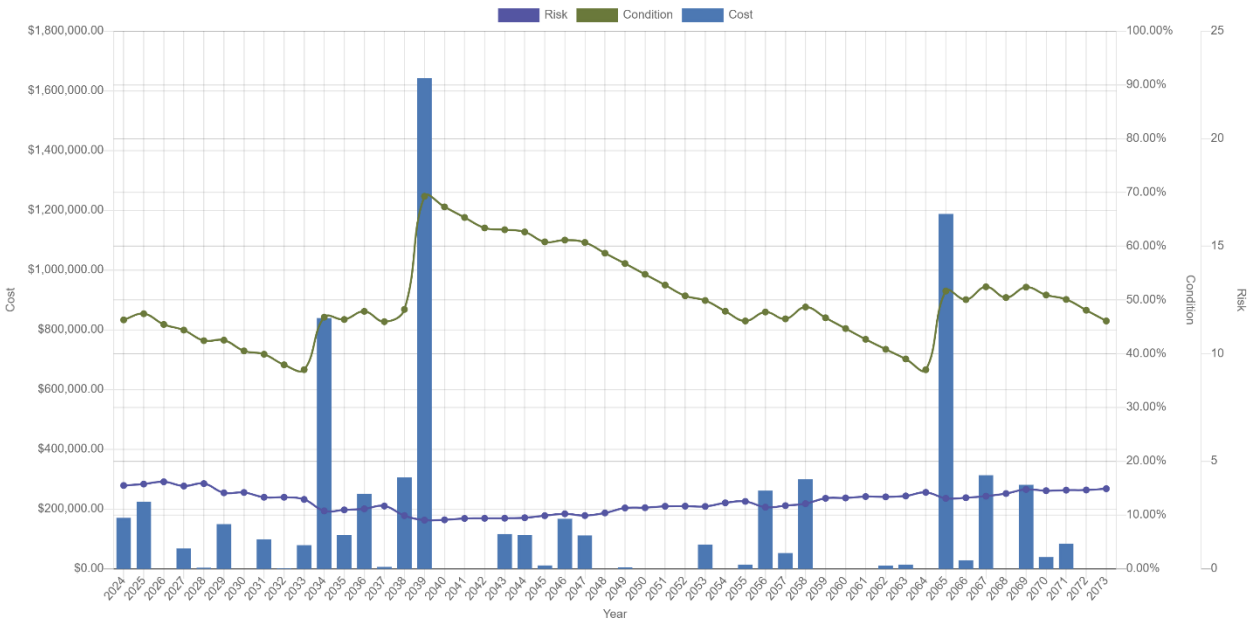


Figure 64 Bridges and Culverts (Structural Bridges and Culverts) Proposed LOS Impacts

Cross Culverts and Small Bridges

The recommended strategy for cross culverts and small bridges is to achieve an average condition of 48% over the next 50 years by increasing the current average condition of 43% by 5% overall.

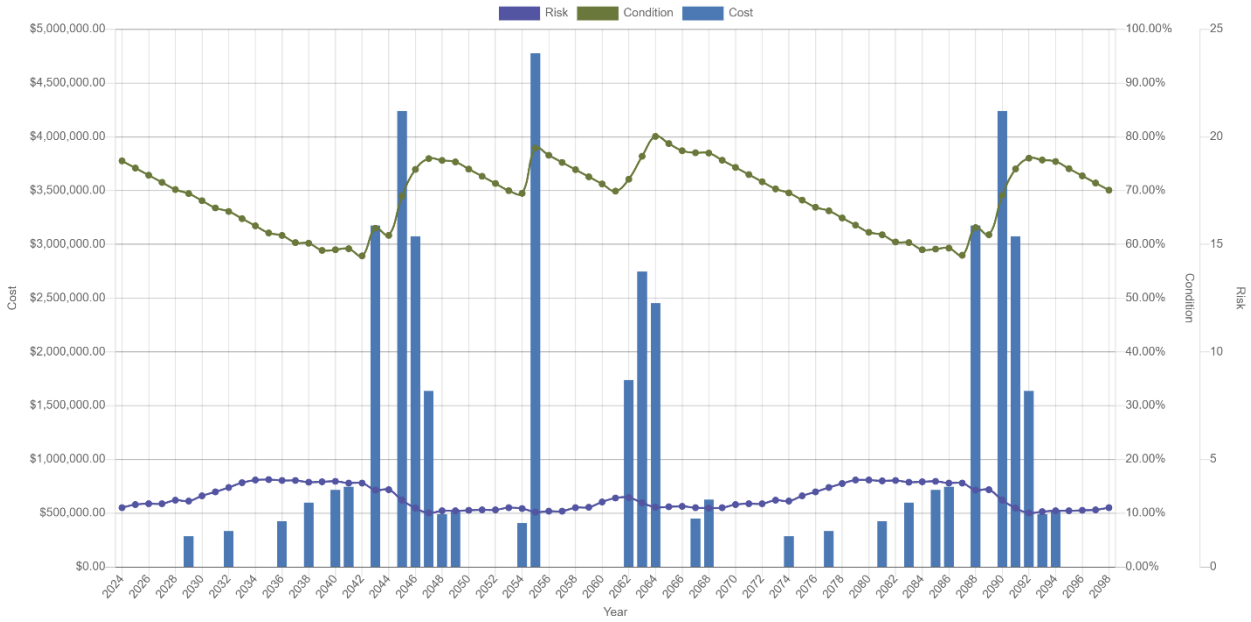


Figure 65 Bridges and Culverts (Cross Culverts and Small Bridges) Proposed LOS Impacts

The selected target level of service for bridges and culverts demonstrates the incremental performance progress achieved over the long-term ensuring bridges and culverts remains in a good state of repair while providing expected service delivery. The 10-year capital investment required to fund the lifecycle activities to meet the proposed levels of service over the long term is outlined in Table 127 in Appendix A.

7.3.3 Sanitary Network

Table 108 compares the budget envelopes required to maintain current levels of service and recommended target levels of service for the sanitary network. The KPI value represents the target condition within each scenario of each segment of the sanitary network. More detail on the average weighted condition of each asset segment can be found in Section 6.2.2.

	Maintain Current Condition		Recommended Target Condition	
Sanitary Network Segment	**KPI Value**	**Expected Capital Expenditure**	**KPI Value**	**Expected Capital Expenditure**
Sanitary Equalization Tanks	62%	$22,000	75%	$22,000
Sanitary Mains	62%	$3,573,000	62%	$3,573,000
Sanitary Pumping Stations	63%	$166,000	63%	$166,000
Sanitary Appurtenances	62%	$467,000	62%	$467,000
Totals		**$4,228,000**		**$4,228,000**

Table 108 Sanitary Network Proposed LOS Targets

The following graph illustrates the impacts on cost, performance, and risk for the target levels of service selected for the sanitary equalization tanks. Mains, pumping stations, and sanitary appurtenances were not included in the analysis and did not require a specific strategy to meet a proposed level of service. The changes in risk are only to the probability of asset failure, and do not impact the consequences of its failure.

The recommended strategy for entire sanitary network is to maintain the current condition as the desired level of service is currently being achieved.

Sanitary Equalization Tanks

The recommended strategy for sanitary equalization tanks is to achieve an average condition of 75% over the next 50 years by increasing the current average condition of 62% by 13% overall.

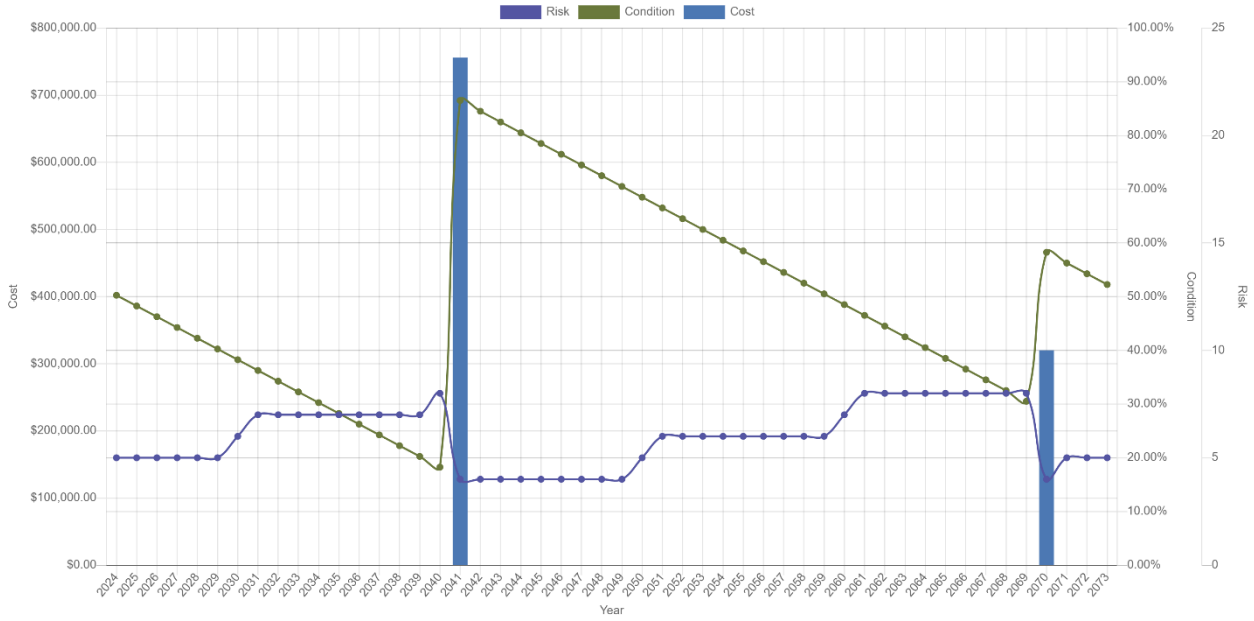


Figure 66 Sanitary Network Proposed LOS Impacts

The selected target level of service for the sanitary network demonstrates the incremental performance progress achieved over the long-term ensuring the sanitary network remains in a good state of repair while providing expected service delivery. The 10-year capital investment required to fund the lifecycle activities to meet the proposed levels of service over the long term is outlined in Table 132 in Appendix A.

7.3.4 Storm Network

Table 109 compares the budget envelopes required to maintain current levels of service and recommended target levels of service for the storm network. The KPI value represents the target condition within each scenario of each segment of the storm network. More detail on the average weighted condition of each asset segment can be found in Section 6.3.2.

	Maintain Current Condition		Recommended Target Condition	
Storm Network Segment	**KPI Value**	**Expected Capital Expenditure**	**KPI Value**	**Expected Capital Expenditure**
Catchbasins	60%	$494,000	60%	$494,000
Ditches	12%	$153,000	12%	$153,000
Headwalls	49%	$346,000	54%	$355,000
Low Impact Developments	86%	$230,000	86%	$230,000
Oil Grit Separators	56%	$121,000	61%	$121,000
Storm Equalization Tanks	58%	$652,000	58%	$652,000
Storm Mains	68%	$4,777,000	68%	$4,777,000
Storm Appurtenances	64%	$464,000	64%	$464,000
Storm Ponds	64%	$1,168,000	64%	$1,168,000
Totals		**$8,405,000**		**$8,414,000**

Table 109 Storm Network Proposed LOS Targets

The following graphs illustrate the impacts on cost, performance, and risk for the target levels of service selected for catchbasins, headwalls, oil grit separators, storm mains, and stormwater appurtenances. Ditches, low impact developments, storm equalization tanks, and storm ponds were not included in the analysis and did not require a specific strategy to meet a proposed level of service. The changes in risk are only to the probability of asset failure, and do not impact the consequences of its failure.

Catchbasins

The recommended strategy for catchbasins is to maintain the current condition as the desired level of service is currently being achieved.

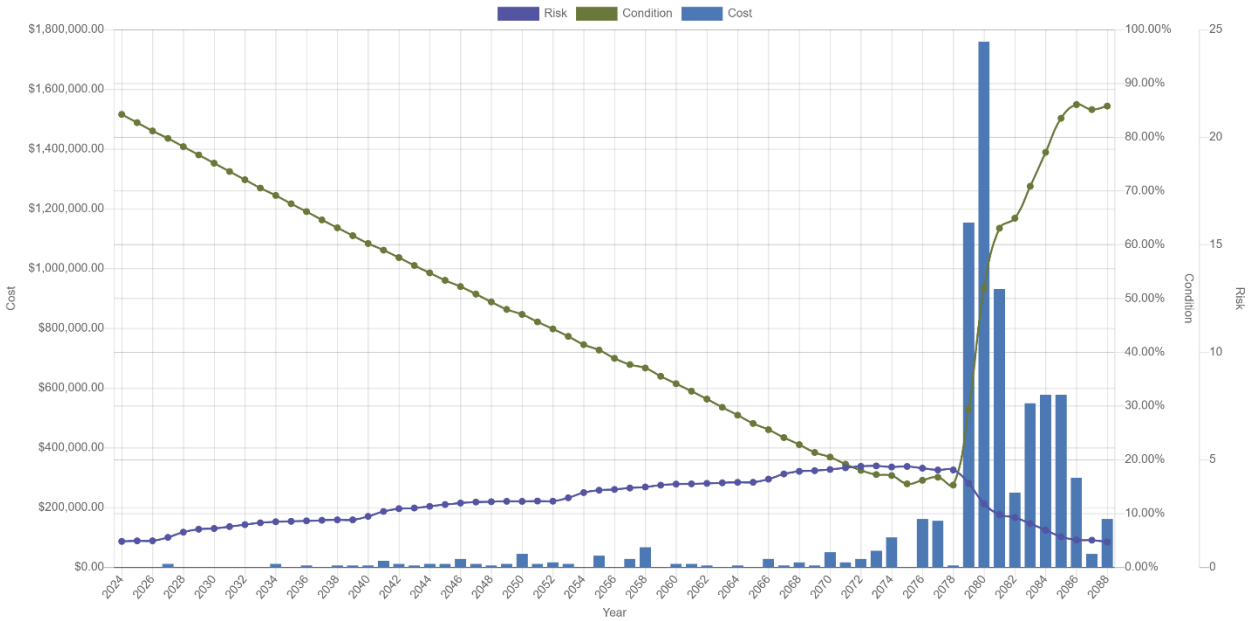


Figure 67 Storm Network (Catchbasins) Proposed LOS Impacts

Headwalls

The recommended strategy for headwalls is to achieve an average condition of 54% over the next 50 years by increasing the current average condition of 49% by 5% overall.

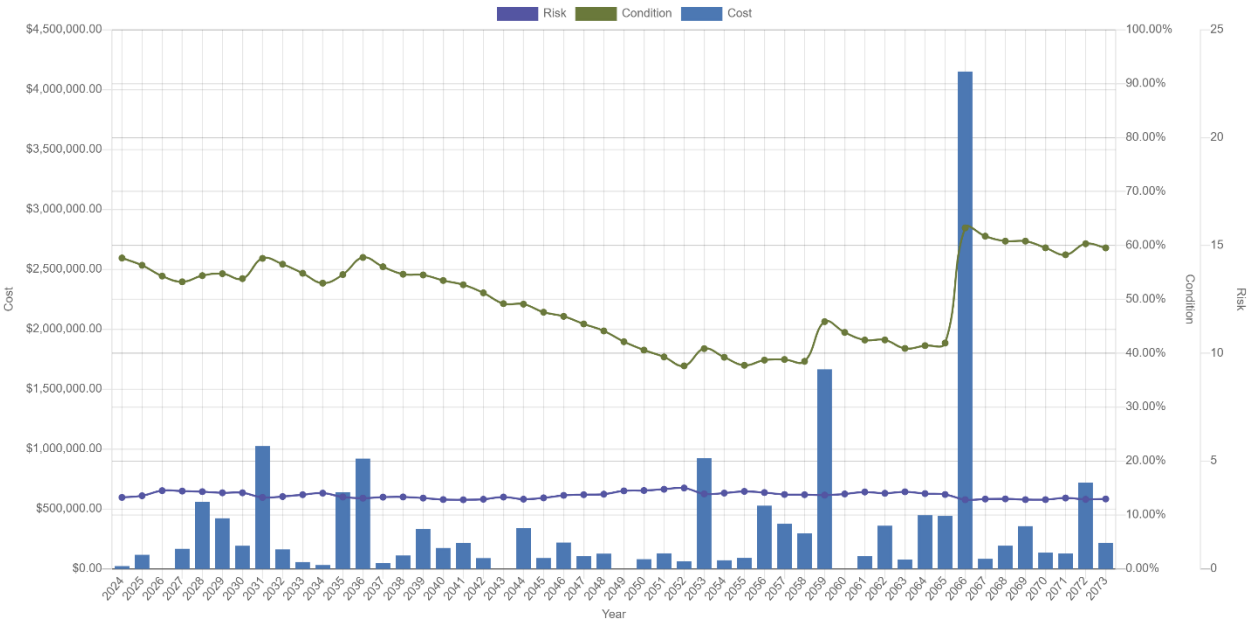


Figure 68 Storm Network (Headwalls) Proposed LOS Impacts

Oil Grit Separators

The recommended strategy for oil grit separators is to achieve an average condition of 61% over the next 30 years by increasing the current average condition of 56% by 5% overall.

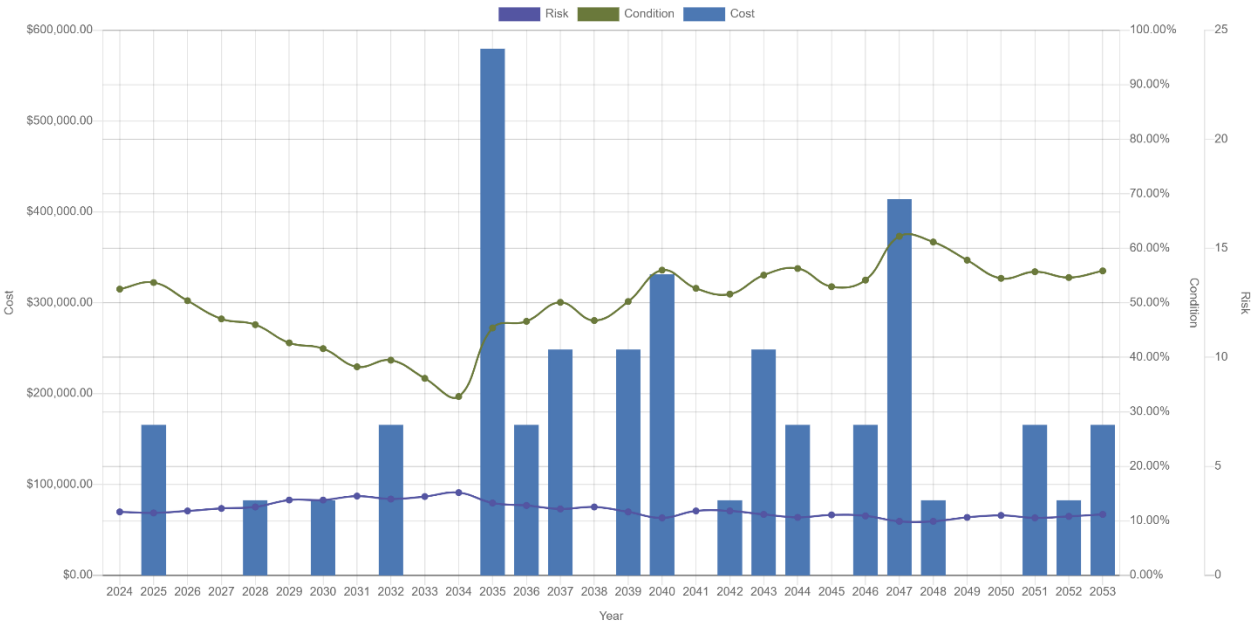


Figure 69 Storm Network (Oil Grit Separators) Proposed LOS Impacts

Storm Mains

The recommended strategy for storm mains is to maintain the current condition as the desired level of service is currently being achieved.

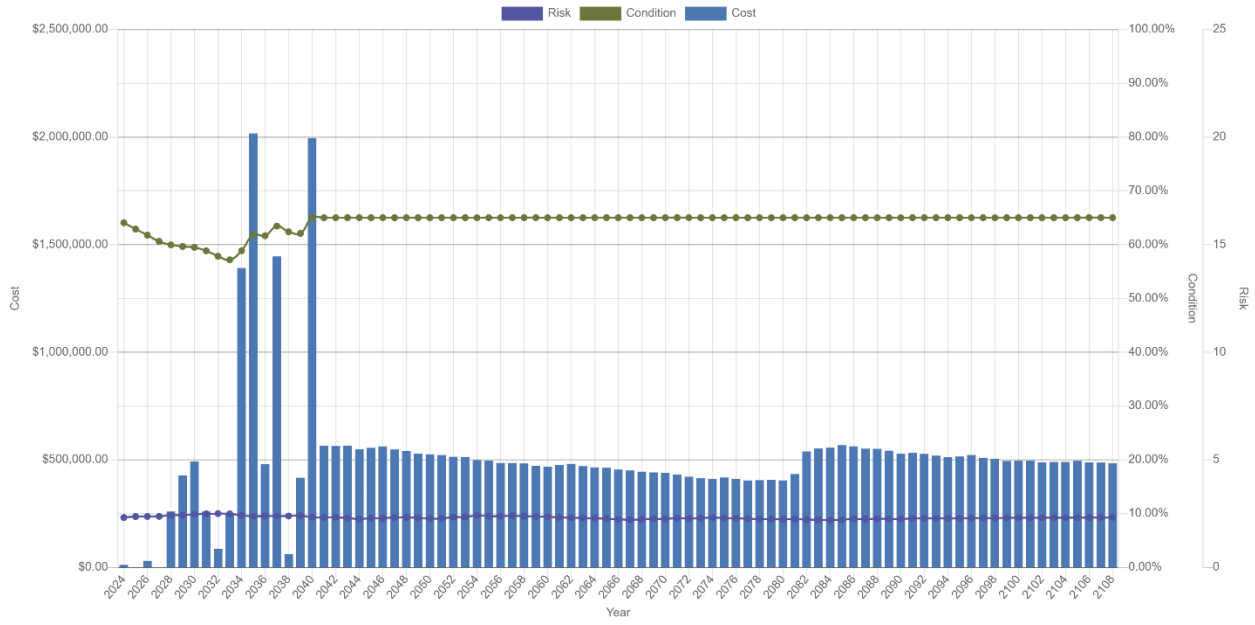


Figure 70 Storm Network (Storm Mains) Proposed LOS Impacts

Stormwater Appurtenances

The recommended strategy for stormwater appurtenances is to maintain the current condition as the desired level of service is currently being achieved.

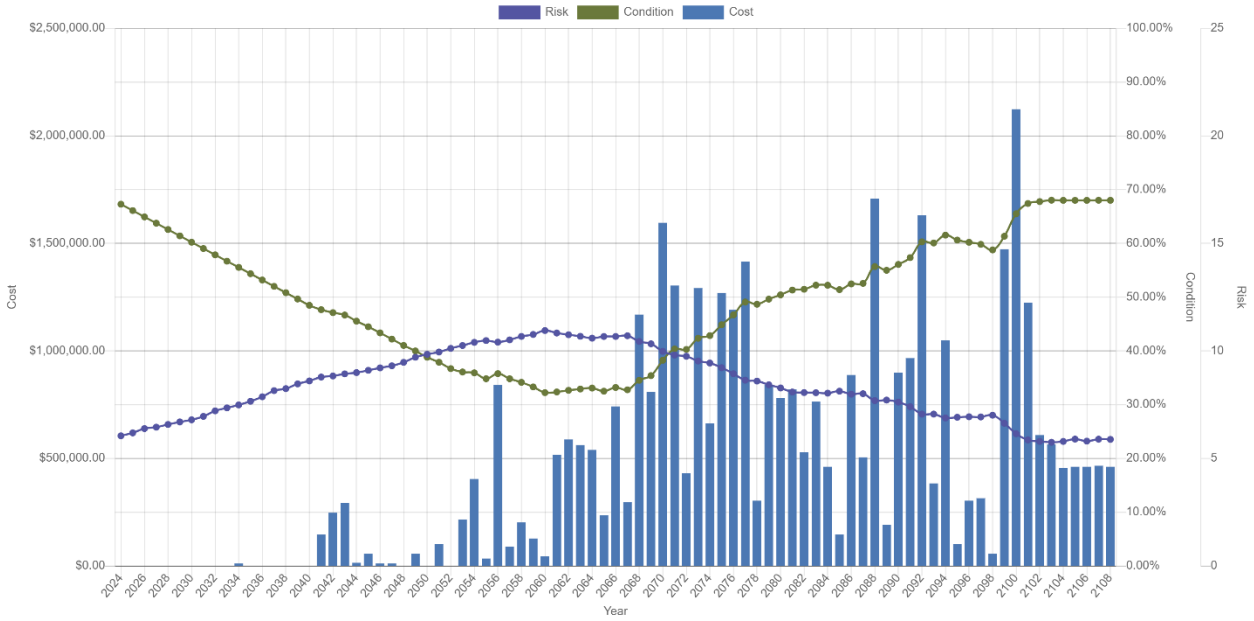


Figure 71 Storm Network (Stormwater Appurtenances) Proposed LOS Impacts

The selected target level of service for the storm network demonstrates the incremental performance progress achieved over the long-term ensuring the storm network remains in a good state of repair while providing expected service delivery. The 10-year capital investment required to fund the lifecycle activities to meet the proposed levels of service over the long term is outlined in Table 133 in Appendix A.

7.3.5 Water Network

Table 110 compares the budget envelopes required to maintain current levels of service and recommended target levels of service for the water network. The KPI value represents the target condition within each scenario of each segment of the water network. More detail on the average weighted condition of each asset segment can be found in Section 6.1.2.

	Maintain Current Condition		Recommended Target Condition	
Water Network Segment	**KPI Value**	**Expected Capital Expenditure**	**KPI Value**	**Expected Capital Expenditure**
Hydrants	52%	$304,000	57%	$313,000
Booster Station	53%	$9,000	53%	$9,000
Water Sampling Stations	64%	$4,000	64%	$4,000
Water Mains	63%	$4,806,000	63%	$4,806,000
Water Meters	13%	$267,000	13%	$267,000
Water Appurtenances	52%	$330,000	57%	$347,000
Totals		**$5,720,000**		**$5,746,000**

Table 110 Water Network Proposed LOS Targets

The following graphs illustrate the impacts on cost, performance, and risk for the target levels of service selected for hydrants, water facilities, watermains, and water network appurtenances. Water meters were not included in the analysis and did not require a specific strategy to meet a proposed level of service. The changes in risk are only to the probability of asset failure, and do not impact the consequences of its failure.

Hydrants

The recommended strategy for hydrants is to achieve an average condition of 57% over the next 35 years by increasing the current average condition of 52% by 5% overall.

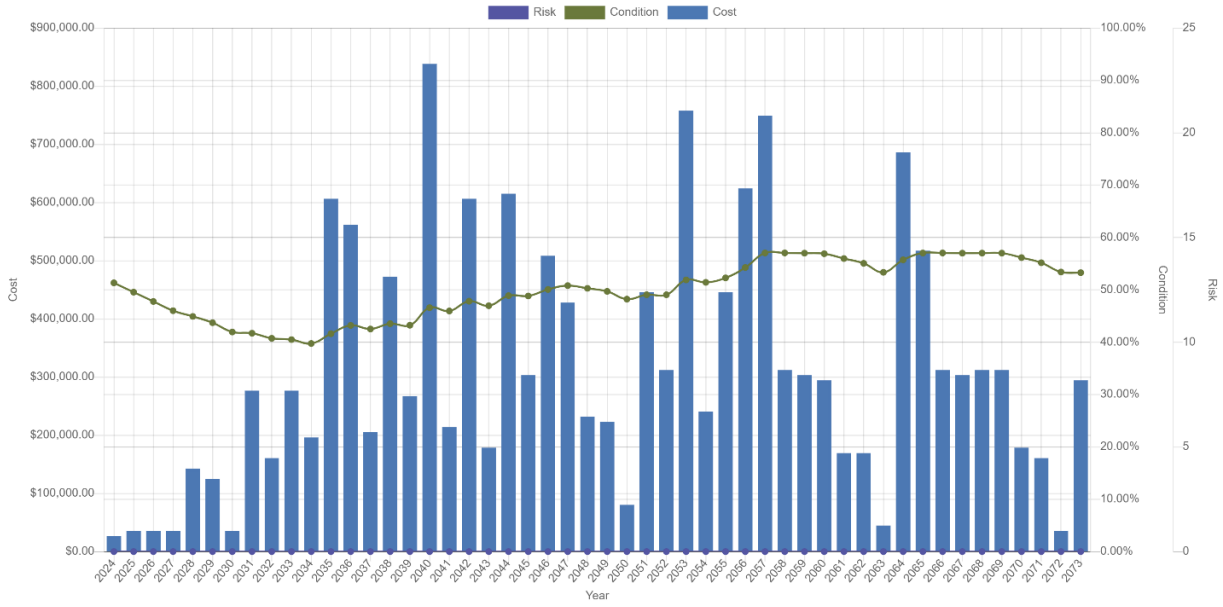


Figure 72 Water Network (Hydrants) Proposed LOS Impacts

Water Facilities

The recommended strategy for water facilities, including the booster station and sampling stations, is to maintain the current condition as the desired level of service is currently being achieved.

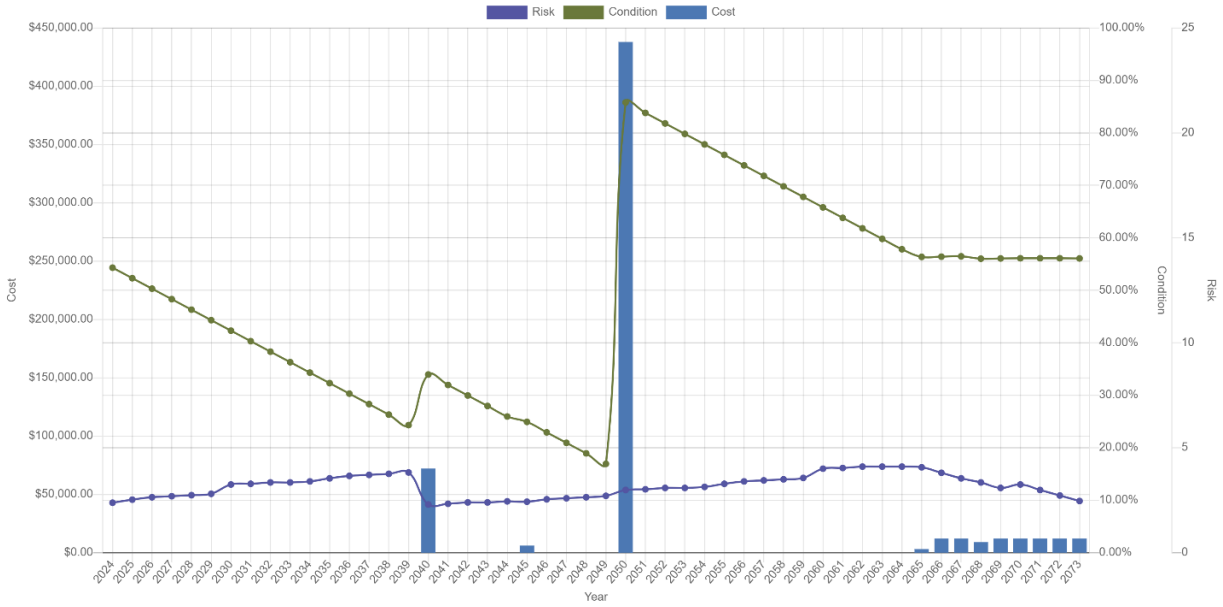


Figure 73 Water Network (Water Facilities) Proposed LOS Impacts

Watermains

The recommended strategy for watermains is to maintain the current condition as the desired level of service is currently being achieved.

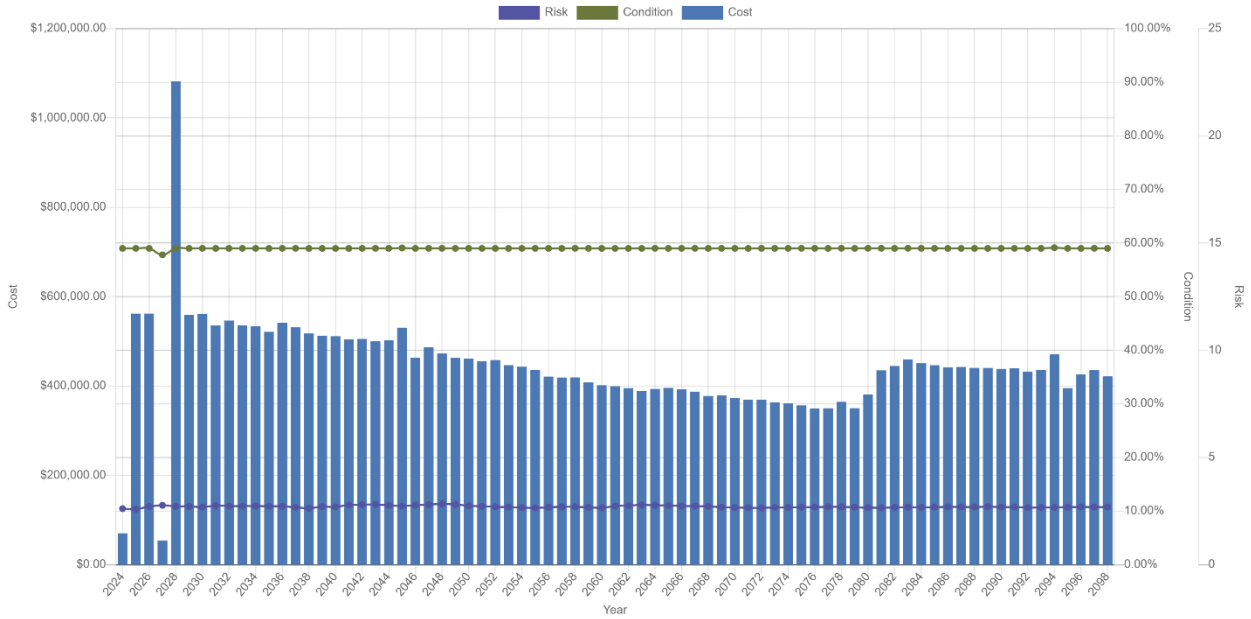


Figure 74 Water Network (Water Mains) Proposed LOS Impacts

Water Appurtenances

The recommended strategy for water appurtenances, including valves and underground enclosures, is to achieve an average condition of 57% over the next 33 years by increasing the current average condition of 52% by 5% overall.

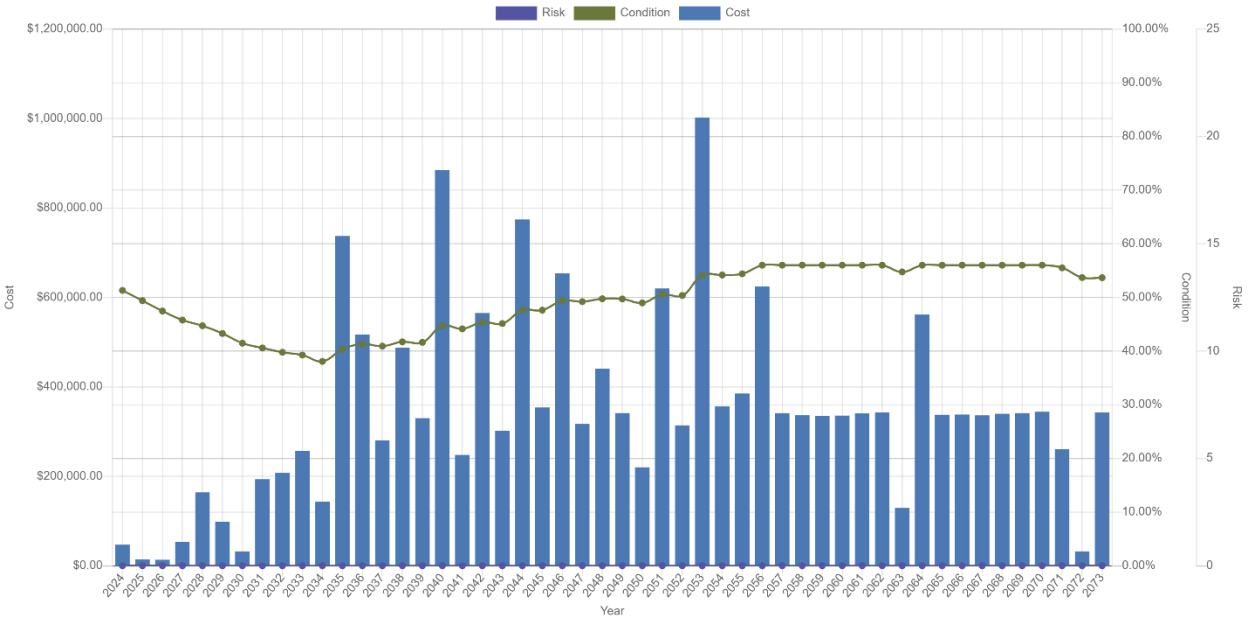


Figure 75 Water Network (Water Appurtenances) Proposed LOS Impacts

The selected target level of service for the water network demonstrates the incremental performance progress achieved over the long-term ensuring the water network remains in a good state of repair while providing expected service delivery. The 10-year capital investment required to fund the lifecycle activities to meet the proposed levels of service over the long term is outlined in Table 134 in Appendix A.

7.3.6 Buildings

Table 111 compares the budget envelopes required to maintain current levels of service and recommended target levels of service for buildings. The KPI value represents the target condition within each scenario of each segment of buildings. More detail on the average weighted condition of each asset segment can be found in Section 5.3.2.

	Maintain Current Condition		Recommended Target Condition	
Building Segment	**KPI Value**	**Expected Capital Expenditure**	**KPI Value**	**Expected Capital Expenditure**
General Government	59%	$1,076,178	64%	$1,077,000
Protection Services	55%	$286,718	60%	$287,000
Recreation & Cultural Services	56%	$3,582,078	61%	$3,584,000
Transportation Services	66%	$819,026	71%	$819,000
Totals		**$5,764,000**		**$$5,767,000**

Table 111 Buildings Proposed LOS Targets

The following graphs illustrate the impacts on cost, performance, and risk for the target levels of service selected for the Town's building portfolio. The changes in risk are only to the probability of asset failure, and do not impact the consequences of its failure.

The recommended strategy for the Town's buildings portfolio is to achieve an average condition of 66% over the next 50 years by increasing the current average condition of 61% by 5% overall.

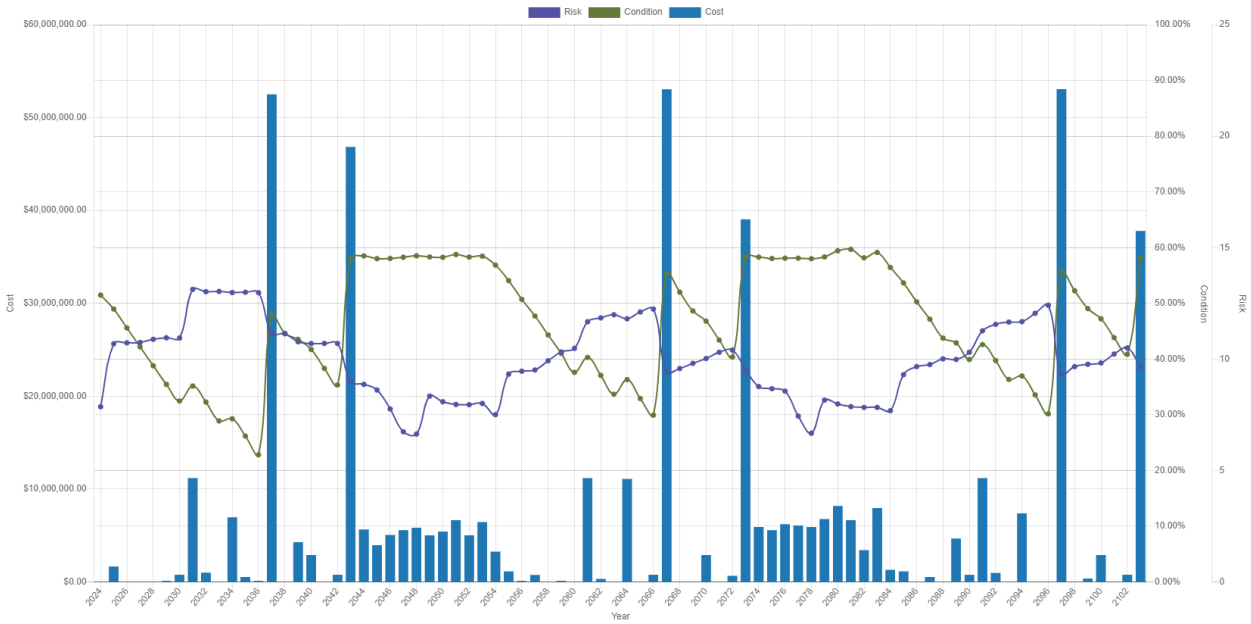


Figure 76 Buildings Proposed LOS Impacts

The selected target level of service for buildings demonstrates the incremental performance progress achieved over the long-term ensuring that buildings remain in a good state of repair while providing expected service delivery. The 10-year capital investment required to fund the lifecycle activities to meet the proposed levels of service over the long term is outlined in Table 128 in Appendix A.

7.3.7 Fleet

Table 112 compares the budget envelopes required to maintain current levels of service and recommended target levels of service for the Town's fleet. The KPI value represents the target condition within each scenario of each segment of fleet assets. More detail on the average weighted condition of each asset segment can be found in Section 5.4.2.

	Maintain Current Condition		Recommended Target Condition	
Fleet Segment	**KPI Value**	**Expected Capital Expenditure**	**KPI Value**	**Expected Capital Expenditure**
Equipment/Attachments	38%	$394,000	43%	$456,000
Heavy Duty	58%	$150,000	63%	$150,000
Light Duty	20%	$65,000	25%	$122,000
Medium Duty	49%	$127,000	54%	$141,000
Totals		**$736,000**		**$869,000**

Table 112 Road Network Proposed LOS Targets

The following graphs illustrate the impacts on cost, performance, and risk for the target levels of service selected for fleet equipment/attachments, heavy duty, medium duty, and light duty vehicles. The changes in risk are only to the probability of asset failure, and do not impact the consequences of its failure.

Fleet Equipment/Attachments

The recommended strategy for fleet equipment and attachments is to achieve an average condition of 43% over the next 10 years by increasing the current average condition of 38% by 5% overall.

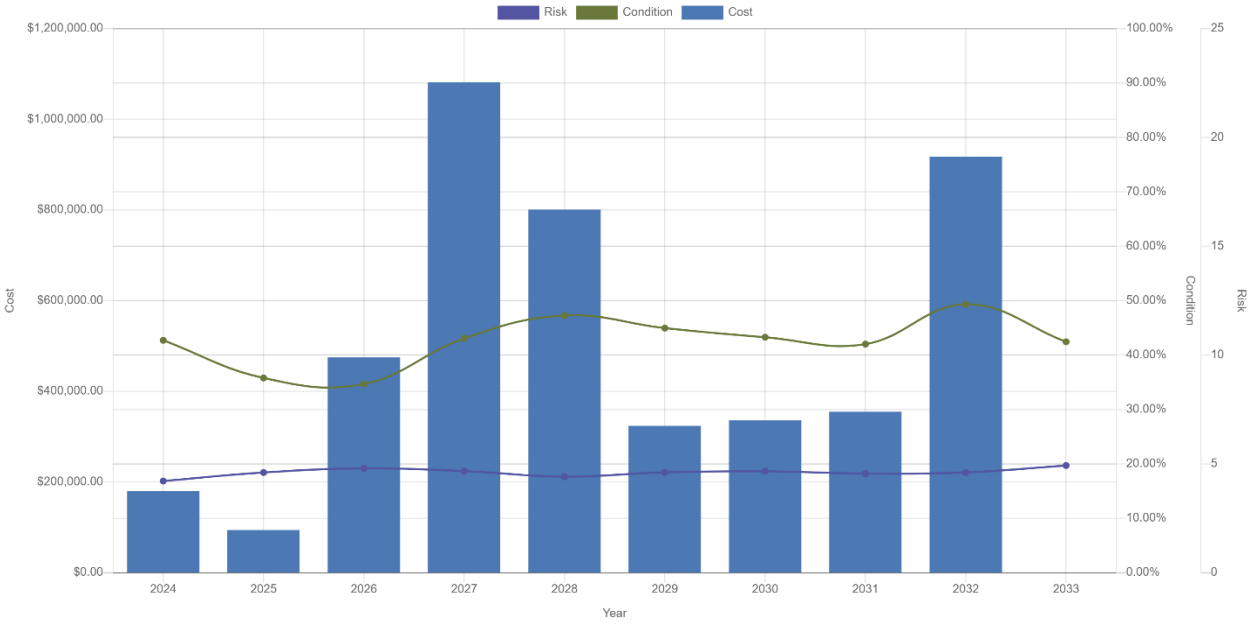


Figure 77 Fleet (Fleet Equipment/Attachments) Proposed LOS Impacts

Heavy Duty

The recommended strategy for heavy duty fleet is to achieve an average condition of 63% over the next 10 years by increasing the current average condition of 58% by 5% overall.

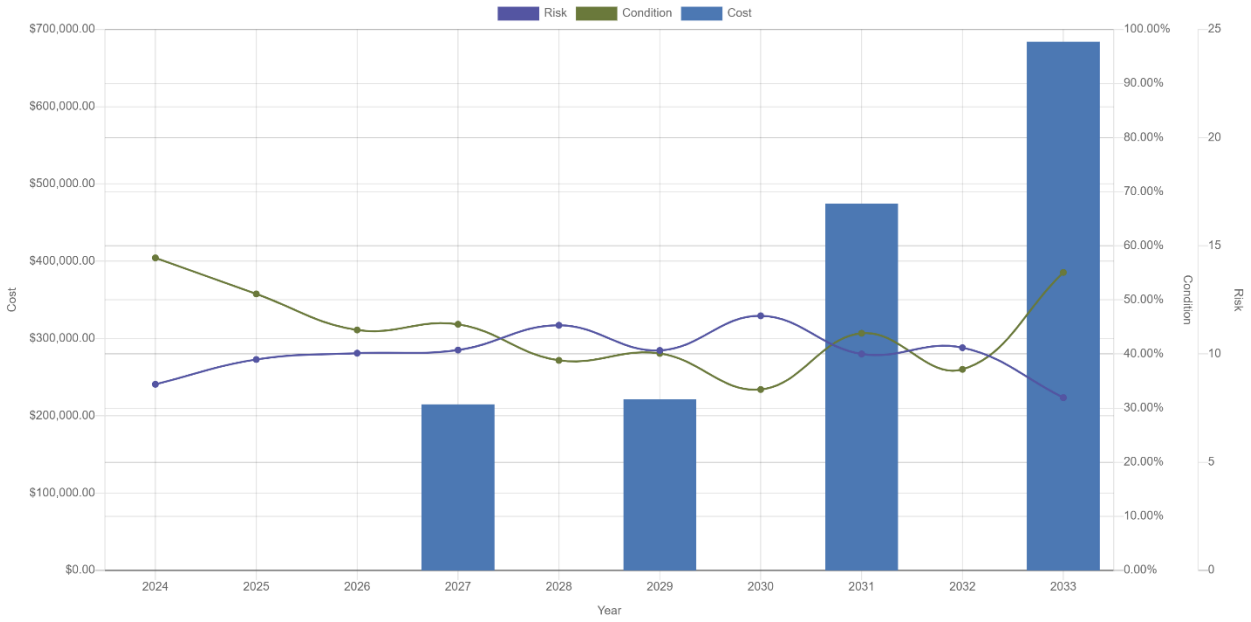


Figure 78 Fleet (Heavy Duty) Proposed LOS Impacts

Medium Duty

The recommended strategy for medium duty fleet is to achieve an average condition of 54% over the next 10 years by increasing the current average condition of 49% by 5% overall.

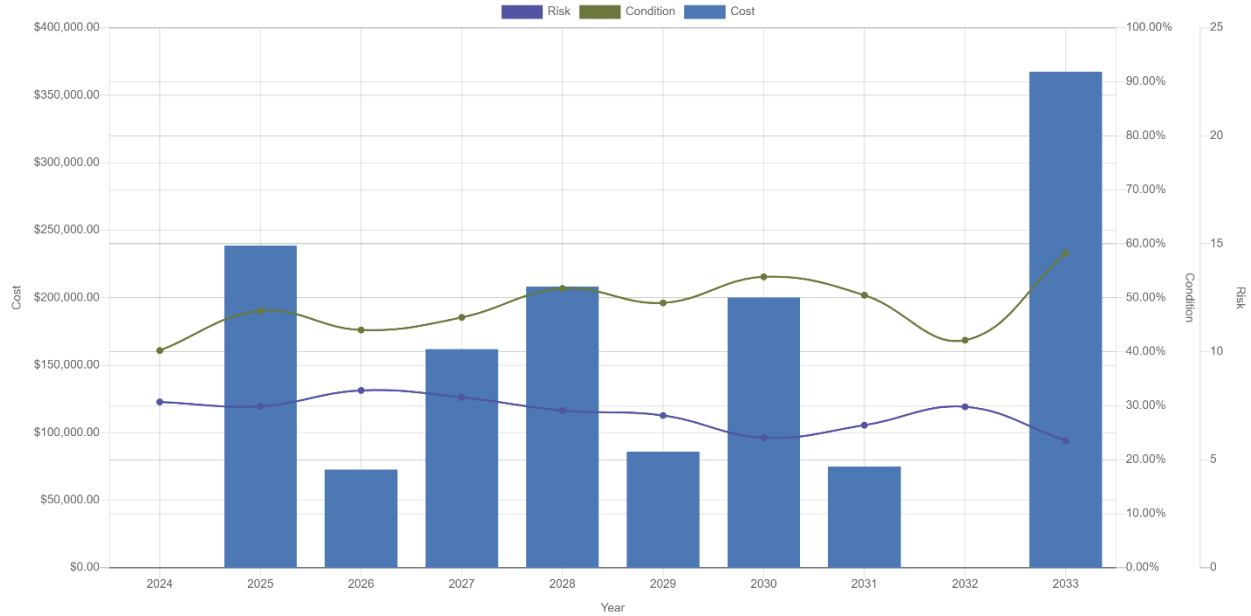


Figure 79 Fleet (Medium Duty) Proposed LOS Impacts

Light Duty

The recommended strategy for light duty fleet is to achieve an average condition of 45% over the next 10 years by increasing the current average condition of 20% by 25% overall.

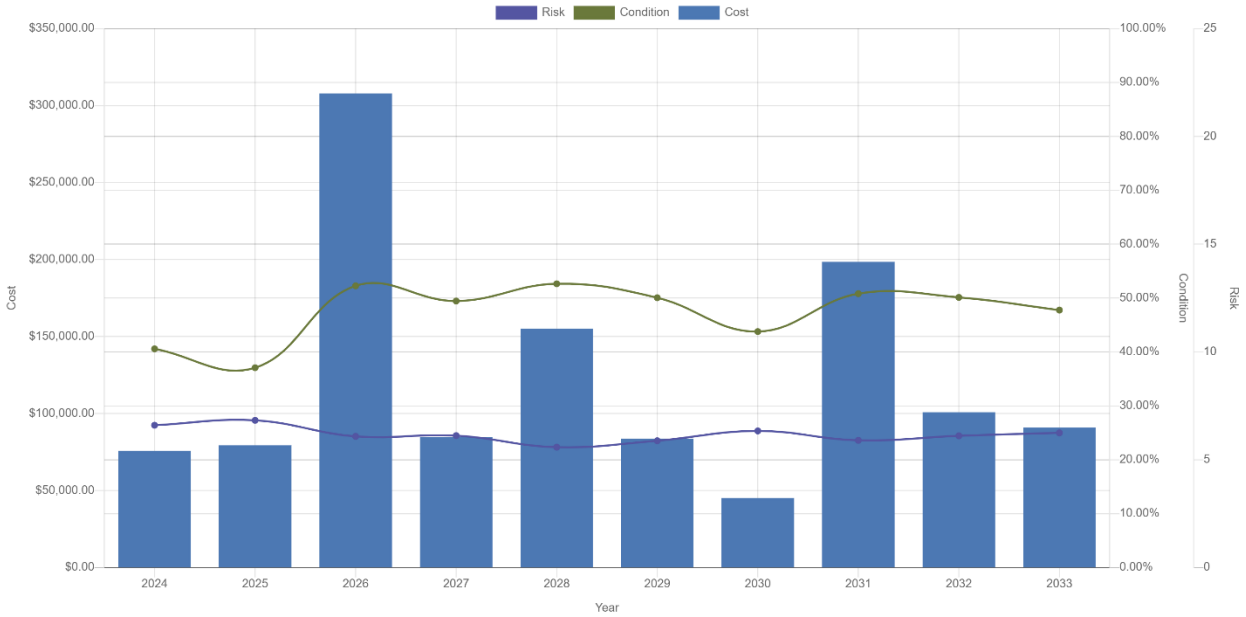


Figure 80 Fleet (Light Duty) Proposed LOS Impacts

The selected target level of service for the Town's fleet demonstrates the incremental performance progress achieved over the long-term ensuring that fleet assets remain in a good state of repair while providing expected service delivery. The 10-year capital investment required to fund the lifecycle activities to meet the proposed levels of service over the long term is outlined in Table 130 in Appendix A.

8 Financial Strategy

Key Insights

- The Town is committing approximately $16.2 million towards capital projects per year from sustainable revenue sources
- Given the annual capital requirement of $43.8 million there is currently a funding gap of $27.6 million annually
- For tax-funded assets, we recommend increasing tax revenues by 0.83% in addition to the 0.80% already collected each year for the next 15 years to achieve a sustainable level of funding
- For the sanitary network, we recommend increasing rate revenues by 1.27% in addition to the 0.4% already collected % each year for the next 10 years to achieve a sustainable level of funding
- For the water network, we recommend decreasing rate revenues from 2.2% to 1.92% annually for the next 15 years to achieve a sustainable level of funding
- For the Storm network, we recommend decreasing rate revenues from 11% to 4.92% each year for the next 20 years to achieve a sustainable level of funding

8.1 Financial Strategy Overview

For an asset management plan to be effective and meaningful, it must be integrated with financial planning and long-term budgeting.
This report develops such a financial plan by presenting several scenarios for consideration and culminating with final recommendations. As outlined below, the scenarios presented model different combinations of the following components:

1. The financial requirements for:
    a. Existing Assets
    b. Proposed Levels of Service
    c. Requirements of anticipated growth
2. Use of traditional sources of municipal funds:
    a. Tax levies
    b. User fees
    c. Reserves
    d. Debt
3. Use of non-traditional sources of municipal funds:
    a. Reallocated budgets
    b. Partnerships
    c. Procurement methods
4. Use of Senior Government Funds:
    a. Gas tax
    b. Annual grants

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

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

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

8.1.1 Annual Requirements & Capital Funding

Annual Requirements

The annual requirements represent the amount the Town should allocate annually to each asset category to meet replacement needs as they arise, prevent infrastructure backlogs and achieve long-term sustainability. In total, the Town must allocate approximately $43.8 million annually to address capital requirements for the assets included in this AMP.

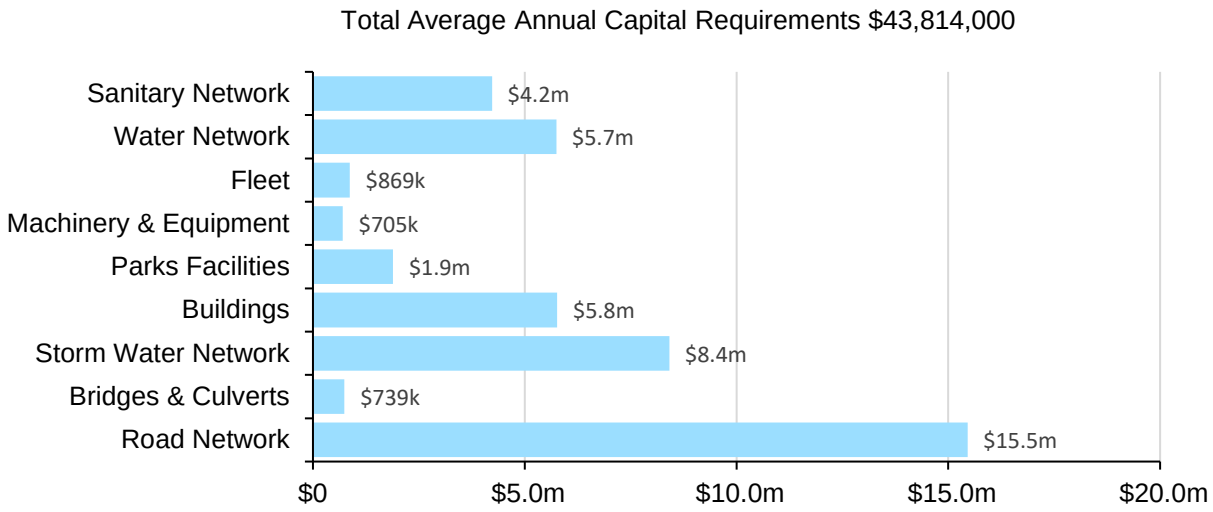


Figure 81 Portfolio Annual Requirements

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

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

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

Asset Category	Annual Requirements (Replacement Only)	Annual Requirements (Lifecycle Strategy)	Potential Cost Avoidance
Road Network	$25,954,000	$15,837,000	$10,117,000

Table 113 Road Network Replacement Only vs. Lifecycle Annual Requirements

The implementation of a proactive lifecycle strategy for roads leads to a potential annual cost avoidance of $10.1 million for the road network. This represents an overall reduction of the annual requirements by 39%. As the lifecycle strategy scenario represents the lowest cost option available to the Town, we have used this annual requirement in the development of the financial strategy.

Annual Funding Available

Based on a historical analysis of sustainable capital funding sources, the Town is committing approximately $16.1 million towards capital projects per year from sustainable revenue sources. Given the annual capital requirement of $43.8 million, there is currently a funding gap of $27.7 million annually.

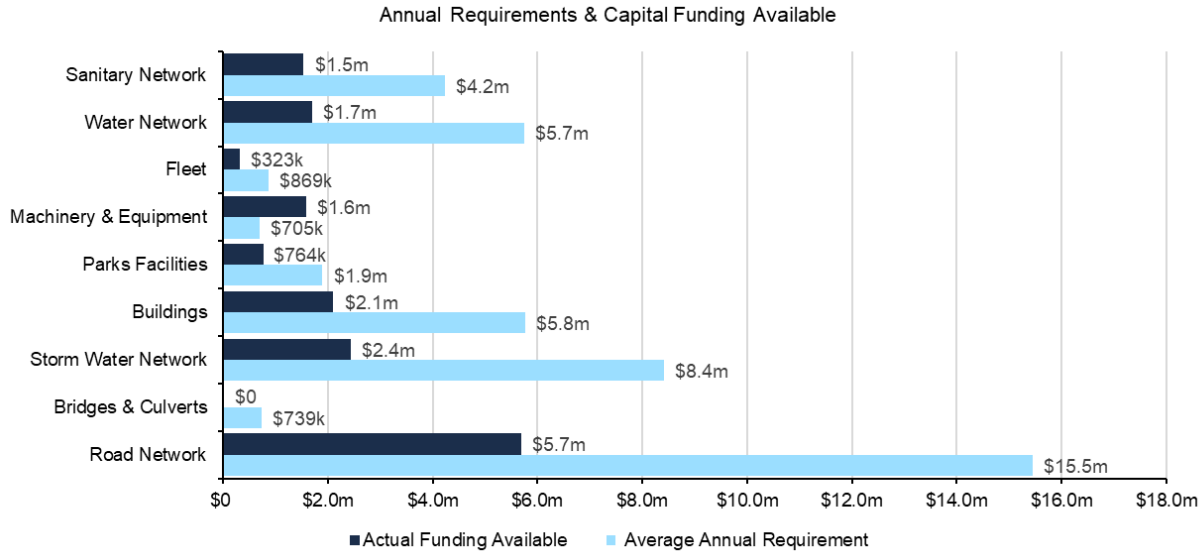


Figure 82 Portfolio Annual Funding Available

8.2 Funding Objective

We have developed a scenario that would enable Aurora to achieve full funding within 15 years for tax funded assets and between 10 and 20 years for rate funded assets. The following outlines the assets included in each category assets:

1. **Tax Funded Assets:** Road Network, Bridges & Culverts, Buildings, Machinery & Equipment, Parks Facilities, and Vehicles

2. **Rate-Funded Assets:** Water Network, Sanitary Network, and Storm Network

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

8.3 Financial Profile: Tax Funded Assets

8.3.1 Current Funding Position

Table 114 shows, by asset category, Aurora's average annual asset investment requirements in order to achieve the recommended level of services, current funding positions, and funding increases required to achieve full funding on assets funded by taxes.

Asset Category	Avg. Annual Requirement Recommend Levels of Service	Annual Funding Available				Annual Deficit
		Taxes	Gas Tax	OCIF or Other	Total Available	
Road Network	15,454,000	1,515,611	1,835,000	2,336,000	5,686,611	9,767,389
Bridges & Culverts	739,000	0	0	0	0	739,000
Buildings	5,767,000	2,101,135	0	0	2,101,135	3,665,865
Machinery & Equipment	705,000	1,587,048	0	0	1,587,048	-882,048
Park Facilities	1,892,000	763,570	0	75,000	838,570	1,053,430
Fleet	869,000	323,263			323,263	545,737
	25,426,000	**6,290,626**	**1,835,000**	**2,411,000**	**10,536,626**	**14,889,374**

Table 114 Tax Funded Assets Current Funding Position

The average annual investment requirement for the above categories is $25,426,000. Annual revenue currently allocated to these assets for capital purposes is $10,536,626 leaving an annual deficit of $15,537,374. Put differently, these infrastructure categories are currently funded at 40.4% of their long-term requirements.

8.3.2 Full Funding Requirements

In 2023, the Town has annual tax revenues of $57 million. As illustrated in Table 115, without consideration of any other sources of revenue or cost containment strategies, full funding would require the following tax change over time:

Asset Category	Tax Change Required for Full Funding
Road Network	18.%
Bridges & Culverts	1.4%
Buildings	6.8%
Machinery & Equipment	-1.6%
Park Facilities	1.9%
Fleet	1.0%
	27.5%

Table 115 Tax Funded Assets Full Funding Requirements

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

a) Aurora's formula based OCIF grant decreased from $2,748,000 in 2023 to $2,336,000 in 2023.

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

	5 Years	10 Years	15 Years	20 Years
Infrastructure Deficit	14,889,374	14,889,374	14,889,374	14,889,374
Tax Increase Required	27.5%	27.5%	27.5%	27.5%
Annually	**4.97%**	**2.45%**	**1.63%**	**1.22%**

Table 116 Tax Adjustment Options to Meet Full Funding Requirements

Proposed levels of service play a role in the development of the Annual Average Requirement discussed above. For comparison, the tax rate impact for decreasing, increasing, and simply maintaining the levels of services are provided below:

Impact on the Tax Rate				
Change in Levels of Service	**5 Year**	**10 Year**	**15 Year**	**20 Year**
Decrease by 5%	3.91%	1.94%	1.29%	0.96%
Maintained	4.49%	2.22%	1.48%	1.10%
Increased by 5%	4.74%	2.34%	1.55%	1.16%
Recommended	5.16%	2.55%	1.69%	1.27%

Table 117 Proposed LOS Impacts on Tax Rate

8.3.3 Financial Strategy Recommendations

Considering all the above information, we recommend the 15-year option. This involves full funding being achieved over 15 years by:

a) increasing tax revenues by an additional 0.89% on top of the 0.80% already being collected each year for the next 15 years solely for the purpose of phasing in full funding to the asset categories covered in this section of the AMP.
b) distributing the current gas tax and OCIF revenue as outlined previously.
c) Reallocating appropriate revenue from categories in a surplus position to those in a deficit position.
d) increasing existing and future infrastructure budgets by the applicable inflation index on an annual basis in addition to the deficit phase-in.

Notes:

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

Although this option achieves full funding on an annual basis in 15 years and provides financial sustainability over the period modeled, the recommendations do require prioritizing capital projects to fit the resulting annual funding available. Current data shows a pent-up investment demand of $78.3 million for the Road network, $1.2 million for Bridges and Culverts, $2.9 million for Buildings, $7.8 million for park facilities, $3.1 million for Machinery & Equipment, and $3 million for Fleet.

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

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

8.4 Financial Profile: Rate Funded Assets

8.4.1 Current Funding Position

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

Asset Category	Avg. Annual Requirement	Annual Funding Available				Annual Deficit
		Rates	To Operations	OCIF	Total Available	
Water Network	5,746,309	12,288,922	-10,588,922	0	1,700,000	4,046,309
Sanitary Network	4,227,512	14,912,691	-13,376,166	0	1,536,525	2,690,987
Storm Network	8,414,426	3,702,512	-1,264,482	0	2,438,030	5,976,396
	18,388,247	**30,904,125**	**-25,229,570**	**0**	**5,674,555**	**12,713,692**

Table 118 Rate Funded Assets Current Funding Position

The average annual investment requirement for the above categories is $18.4 million. Annual revenue currently allocated to these assets for capital purposes is $5.7 million leaving an annual deficit of $12.7 million. Put differently, these infrastructure categories are currently funded at 30.9% of their long-term requirements.

8.4.2 Full Funding Requirements

In 2023, Aurora had annual water revenues of $12,288,922, annual sanitary revenues of $14,912,691, and storm revenues of $3,702,512. As illustrated in Table 119 below, without consideration of any other sources of revenue, full funding would require the following changes over time:

Asset Category	Rate Change Required for Full Funding
Water Network	32.9%
Sanitary Network	18.0%
Storm Network	161.4%

Table 119 Rate Funded Assets Full Funding Requirements

In the following tables, we have expanded the above scenario to present multiple options and have provided phase-in options of up to 20 years:

Water Network				
	5 Years	**10 Years**	**15 Years**	**20 Years**
Infrastructure Deficit	4,046,309	4,046,309	4,046,309	4,046,309
Rate Increase Required	32.9%	32.9%	32.9%	32.9%
Annually:	**5.86%**	**2.89%**	**1.92%**	**1.45%**

Table 120 Tax Adjustment Options to Meet Full Funding Requirements (Water Network)

Sanitary Network				
	5 Years	**10 Years**	**15 Years**	**20 Years**
Infrastructure Deficit	2,690,987	2,690,987	2,690,987	2,690,987
Rate Increase Required	18.0%	18.0%	18.0%	18.0%
Annually:	**3.37%**	**1.67%**	**1.11%**	**0.83%**

Table 121 Tax Adjustment Options to Meet Full Funding Requirements (Sanitary Network)

Storm Network				
	5 Years	**10 Years**	**15 Years**	**20 Years**
Infrastructure Deficit	5,976,396	5,976,396	5,976,396	5,976,396
Rate Increase Required	161.4%	161.4%	161.4%	161.4%
Annually:	**21.19%**	**10.09%**	**6.62%**	**4.92%**

Table 122 Tax Adjustment Options to Meet Full Funding Requirements (Storm Network)

Similarly to the Tax Funded asset, the proposed levels of service play a role in the development of the Annual Average Requirement. For the rate funded assets there a lesser impact because the proposed levels of services are not much greater than what is currently achieved. For comparison, the rate impact for decreasing, increasing, and simply maintaining the levels of services are provided below:

Impact on Rates					
	Changes in Levels of Service	**5 year**	**10 Year**	**15 Year**	**20 Year**
Water	Decreased by 5%	4.65%	2.30%	1.53%	1.14%
	Maintained	5.82%	2.87%	1.90%	1.43%
	Increased by 5%	6.85%	3.37%	2.23%	1.67%
	Recommended	5.86%	2.89%	1.92%	1.45%
	Changes in Levels of Service	**5 year**	**10 Year**	**15 Year**	**20 Year**
Sewer	Decreased by 5%	2.88%	1.43%	0.95%	0.71%
	Maintained	3.37%	1.67%	1.11%	0.83%
	Increased by 5%	3.97%	1.97%	1.31%	0.98%
	Recommended	3.37%	1.67%	1.11%	0.83%
	Changes in Levels of Service	**5 year**	**10 Year**	**15 Year**	**20 Year**
Storm	Decreased by 5%	18.49%	8.85%	5.82%	4.33%
	Maintained	21.17%	10.08%	6.61%	4.92%
	Increased by 5%	22.82%	10.82%	7.09%	5.27%
	Recommended	21.19%	10.09%	6.62%	4.95%

Table 123 Proposed LOS Impacts on Utility Rates

8.4.3 Financial Strategy Recommendations

Considering all the above information, we recommend the 15-year option for water, the 10-year options for sanitary and the 20-year option for the storm network. This involves full funding being achieved over the periods discussed by:

a) decreasing the required annual reinvestment rate for the water network from the previous 2.2 to 1.92 percent for the next 15 years results in a reduced annual burden on water rate payers and will allow for full funding to be phased in
b) increasing the required annual reinvestment rate for the sanitary network from the previous 0.4 to 1.67 percent for the next 10 years enables the Town to achieve a financially sustainable asset renewal program within a shorter period of time.
c) Decreasing the required annual reinvestment rate for the storm network from the previous 11 to 4.92 percent for the next 20 years results in a reduced annual burden on storm rate payers and will allow for full funding to be phased in.
d) increasing existing and future infrastructure requirement plans by the applicable inflation index on an annual basis in addition to the deficit phase-in.

Notes:

1. As in the past, periodic senior government infrastructure funding will most likely be available during the phase-in period. This periodic funding should not be incorporated into an AMP unless there are firm commitments in place.
2. We realize that raising rate revenues for infrastructure purposes will be very difficult to do. However, considering a longer phase-in window may have even greater consequences in terms of infrastructure failure.
3. Any increase in rates required for operations would be in addition to the above recommendations.

Although this option achieves full funding and provides financial sustainability over the period modeled, the recommendations do require prioritizing capital projects to fit the resulting annual funding available. Current data shows a pent-up investment demand of $17.4 million for the water network, $13.1 million for the sanitary network, and $113.6 million for the storm network.

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

8.5 Use of Debt

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

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

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

c) a secure source of funding

d) flexibility in cash flow management

Debt management policies and procedures with limitations and monitoring practices should be considered when reviewing debt as a funding option. In efforts to mitigate increasing commodity prices and inflation, interest rates have been rising. Sustainable funding models that include debt need to incorporate the now current realized risk of rising interest rates. Figure 83 shows the historical changes to the lending rates:

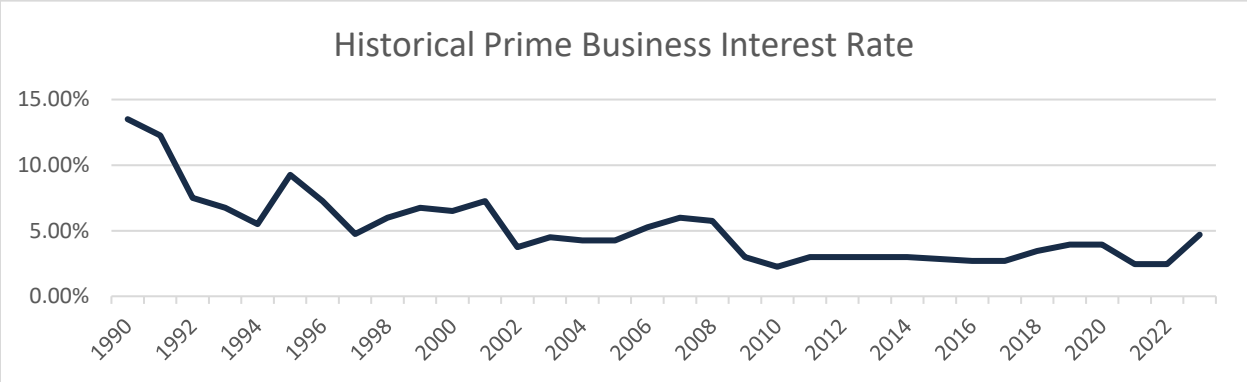


Figure 83 Historical Prime Business Interest Rate

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

For reference purposes, Table 124 outlines the premium paid on a project if financed by debt. For example, a $1 million project financed at 3.0%[2] over 15 years would result in a 26% premium or $260 thousand of increased costs due to interest payments. For simplicity, the table does not consider the time value of money or the effect of inflation on delayed projects.

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

[2] Current municipal Infrastructure Ontario rates for 15-year money is 3.2%.

Table 124 Debt Financing Premiums Paid

8.6 Use of Reserves

8.6.1 Available Reserves

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

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

By asset category, Table 125 below outlines the details of the reserves currently available to Aurora.

Asset Category	Balance on December 31, 2023
Road Network	10,184,000
Bridges & Culverts	0
Buildings	7,393,000
Machinery & Equipment	1,490,000
Park Facilities	3,818,000
Fleet	3,736,000
Total Tax Funded:	**26,621,000**
Water Network	12,430,000
Sanitary Network	6,348,000
Storm Network	13,909,000
Total Rate Funded:	**32,687,000**

Table 125 Available Reserves

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

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

These reserves are available for use by applicable asset categories during the phase-in period to full funding. This coupled with Aurora's judicious use of debt in the past, allows the scenarios to assume that, if required, available reserves and debt capacity can be used for high priority and emergency infrastructure investments in the short- to medium-term.

9 Recommendations

Key Insights

- Asset Inventory, Data Review and Validation
- Condition Assessment Strategies
- Lifecycle Management Strategies
- Risk Management Strategies
- Levels of Service

Asset Inventory, Data Review & Validation

- Continue to review and validate inventory data, assessed condition data and replacement costs for all assets upon the completion of assessments, studies, or inspections as data becomes available.

- Document and review lifecycle management strategies for the stormwater network on a regular basis to achieve the lowest total cost of ownership while maintaining adequate service levels.

- Enhance organizational efficiency and optimize resource utilization through the merging and reconciling the Tangible Capital Asset (TCA) registry with the Asset Management asset registry derived from comprehensive GIS data and other alternative asset registries presently in use.

- Develop a standardized asset data template to collect and updated data on new and rehabilitated infrastructure and ensure data accuracy and quality.

- Deploy a computerized maintenance management system (CMMS) and asset management system to accurately track asset changes.

- Update the Asset Management Plan every five years and review trends and goals annually to continue to grow the Town's asset management maturity level.

Condition Assessment Strategies

- Prioritize and implement a formal condition assessment program for all municipal infrastructure and assets to enhance decision-making, prioritize maintenance, and ensure the long-term resilience of the Town's infrastructure.

- The last comprehensive assessment of the road network was completed in 2023. Continue to undertake condition assessment of the road network every three years.

- The Town should implement regular condition assessments for all facilities to better inform short-term and long-term capital requirements.

- Perform a comprehensive review of sanitary, storm, and water network inventory data accompanied by a system-wide assessment of the condition of all sanitary and storm sewer pipes through CCTV inspections.

Lifecycle Management Strategies

- Evaluate the efficacy of the Town's lifecycle management strategies at regular intervals to determine the impact cost, condition and risk.

- The Town should work towards identifying projected capital rehabilitation and renewal costs for bridges and culverts and integrating these costs into long-term planning.

- Review assets that have surpassed their estimated useful life to determine if immediate replacement is required or whether these assets are expected to remain in-service. Adjust the service life and/or condition ratings for these assets accordingly.

- Many replacement costs used in this AMP were based on the inflation of historical costs or past replacement costs. These costs should be evaluated to determine their accuracy and reliability. Replacement costs should be updated according to the best available information on the cost to replace the asset in today's value.

- A trenchless re-lining strategy is expected to extend the service life of sanitary and storm mains at a lower total cost of ownership and should be implemented to extend the life of infrastructure at the lowest total cost of ownership.

Risk Management Strategies

- Continue to operationalize risk-based decision-making frameworks by configuring the Town's asset management system to intuitively calculate risk as part of asset management planning and budgeting processes. This should include the regular review of high-risk assets to determine appropriate risk mitigation strategies.

- Review risk models on a regular basis and adjust according to an evolving understanding of the probability and consequences of asset failure.

Levels of Service

- Conduct regular reviews of SLAs to ensure they remain relevant and aligned with organizational goals. Adjust targets as needed to accommodate evolving industry standards and customer demands.

- Schedule regular performance reviews to assess the effectiveness of your service level tracking strategies. Use these reviews to identify successes, areas for improvement, and emerging opportunities. Adjust your approach based on the insights gained from these assessments.

- Develop contingency plans to address unforeseen challenges without compromising service quality.

10 Appendices

Key Insights

- Appendix A identifies projected 10-year capital requirements for each asset category
- Appendix B includes several maps that have been used to visualize the current level of service
- Appendix C identifies the criteria used to calculate risk for each asset category

10.1 Appendix A: 10-Year Capital Requirements

The following tables identify the capital cost requirements over 10 years to meet projected capital requirements and maintain the current level of service.

Road Network

Asset Segment	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033
Arterial Roads	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Collector Roads	$0	$240k	$4.9m	$411k	$0	$0	$0	$0	$0	$0
Local Roads	$674k	$744k	$2.6m	$4.1m	$3.2m	$0	$0	$0	$0	$0
Retaining Walls	$0	$0	$0	$2.4m	$2.7m	$5.9m	$0	$1.6m	$1.1m	$12.7m
Signage	$158k	$131k	$122k	$61k	$40k	$15k	$7k	$15k	$10k	$18k
Sidewalks	$47k	$318k	$1.0m	$203k	$531k	$558k	$199k	$92k	$597k	$2.1m
Streetlights	$93k	$187k	$781k	$548k	$816k	$571k	$280k	$665k	$513k	$1.7m
Traffic Signals	$0	$0	$457k	$0	$457k	$0	$0	$0	$0	$0
Railing and Fencing	$0	$0	$0	$116k	$0	$0	$0	$0	$0	$0
Parking Lot	$0	$0	$612k	$0	$204k	$0	$3.7m	$0	$0	$924k
	$972k	**$1.6m**	**$10.5m**	**$7.9m**	**$8.0m**	**$7.0m**	**$4.2m**	**$2.3m**	**$2.3m**	**$17.5m**

Table 126 Road Network 10-Year Capital Requirements

Bridges & Culverts

Asset Segment	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033
Bridges	$0	$0	$0	$0	$0	$285k	$0	$0	$0	$0
Structural Culverts	$0	$0	$0	$0	$0	$0	$0	$0	$332k	$0
Cross Culverts & Small Bridges	$170k	$225k	$0	$68k	$3k	$149k	$0	$99k	$2k	$79k
	$577k	**$225k**	**$0**	**$68k**	**$3k**	**$434k**	**$0**	**$99k**	**$334k**	**$79k**

Table 127 Bridges and Culverts 10-Year Capital Requirements

Buildings

Asset Segment	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033
General Government	$10.9m	$2.8m	$463k	$373k	$2.0m	$7.3m	$644k	$5.7m	$0	$891k
Protection Services	$2.6m	$1.4m	$101k	$842k	$516k	$1.3m	$27k	$1.0m	$31k	$69k
Recreation & Cultural Services	$33.5m	$5.6m	$2.0m	$4.5m	$8.3m	$19.6m	$2.4m	$5.8m	$5.4m	$3.3m
Transportation Services	$5.8m	$253k	$885k	$0	$6.4m	$7.0m	$289k	$1.7m	$3.6m	$0
	$52.8m	**$10.1m**	**$3.5m**	**$5.7m**	**$17.2m**	**$35.2m**	**$3.3m**	**$14.3m**	**$9.1m**	**$4.3m**

Table 128 Buildings 10-Year Capital Requirements

Park Facilities										
Asset Segment	**2024**	**2025**	**2026**	**2027**	**2028**	**2029**	**2030**	**2031**	**2032**	**2033**
Athletic Fields	$0	$2.8m	$21k	$0	$3k	$53k	$52k	$0	$2.3m	$149k
Fencing & Gates	$63k	$137k	$44k	$59k	$26k	$3k	$201k	$32k	$80k	$67k
Park Fixtures & Lighting	$729k	$197k	$74k	$105k	$229k	$267k	$57k	$226k	$606k	$252k
Park Structures	$0	$0	$81k	$303k	$0	$26k	$30k	$158k	$110k	$0
Parking Lots	$0	$0	$0	$0	$291k	$0	$156k	$337k	$0	$96k
Playgrounds & Splashpads	$204k	$295k	$262k	$10k	$456k	$152k	$44k	$583k	$10k	$131k
Sanitary Infrastructure	$69k	$12k	$0	$0	$0	$0	$0	$0	$0	$0
Stormwater Infrastructure	$98k	$217k	$0	$0	$0	$96k	$0	$0	$5k	$0
Trails & Walkways	$62k	$9k	$660k	$134k	$60k	$858k	$219k	$100k	$9k	$235k
Water Infrastructure	$35k	$7k	$0	$0	$0	$0	$0	$0	$0	$0
	$1.3m	**$3.7m**	**$1.1m**	**$610k**	**$1.1m**	**$1.5m**	**$760k**	**$1.4m**	**$3.2m**	**$930k**

Table 129 Park Facilities 10-Year Capital Requirements

Fleet

Asset Segment	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033
Equipment/ Attachments	$180k	$94k	$475k	$1.1m	$800k	$323k	$336k	$355k	$917k	$0
Heavy Duty	-	-	-	$215k	-	$221k	-	$475k	-	$684k
Light Duty	$76k	$79k	$308k	$85k	$155k	$84k	$45k	$198k	$101k	$91k
Medium Duty	-	$239k	$73k	$162k	$208k	$86k	$200k	$75k	-	$367k
	$256k	**$412k**	**$855k**	**$1.5m**	**$1.2m**	**$714k**	**$581k**	**$1.1m**	**$1.0m**	**$1.1m**

Table 130 Fleet 10-Year Capital Requirements

Machinery & Equipment

Asset Segment	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033
IT	$74k	$172k	$354k	$246k	$28k	$2.1m	$424k	$543k	$462k	$109k
Miscellaneous	$113k	$91k	$75k	$102k	$36k	$133k	$84k	$75k	$41k	$7k
	$187k	**$263k**	**$428k**	**$348k**	**$64k**	**$2.2m**	**$507k**	**$618k**	**$502k**	**$115k**

Table 131 Machinery and Equipment 10-Year Capital Requirements

Sanitary Network

Asset Segment	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033
Sanitary Equalization Tanks	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Sanitary Laterals	$0	$791k	$267k	$310k	$559k	$782k	$772k	$2.9m	$1.2m	$901k
Sanitary Mains	$0	$0	$0	$0	$44k	$2.4m	$2.4m	$2.4m	$2.5m	$2.5m
Sanitary MH and UC's	-	-	$22k	-	$56k	$34k	-	$11k	-	$45k
Sanitary Pumping Stations	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Sanitary Valve	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
	$0	**$791k**	**$290k**	**$310k**	**$660k**	**$3.2m**	**$3.2m**	**$5.4m**	**$3.7m**	**$3.4m**

Table 132 Sanitary Network 10-Year Capital Requirements

Storm Network

Asset Segment	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033
Catchbasins	$6k	$0	$0	$0	$0	$11k	$0	$55k	$0	$244k
Ditches	$45k	$0	$14k	$119k	$0	$0	$300k	$95k	$0	$21k
Headwalls	$22k	$116k	$0	$166k	$559k	$421k	$192k	$1.0m	$162k	$56k
LIDs	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Oil Grit Separator	$0	$166k	$0	$0	$83k	$0	$83k	$0	$166k	$0
Storm Equalization Tanks	$0	$0	$0	$0	$0	$0	$0	$217k	$141k	$1.2m
Storm Laterals	$13k	$2k	$111k	$716k	$277k	$523k	$683k	$585k	$169k	$748k
Storm Mains	-	-	$936k	$3.5m	$4.0m	$3.5m	$2.4m	$670k	$3.8m	$1.0m
Storm Maintenance Holes and Underground Enclosures	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Storm Valves	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Stormwater Management Pond	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
	$86k	**$284k**	**$1.1m**	**$4.5m**	**$4.9m**	**$4.5m**	**$3.7m**	**$2.6m**	**$4.4m**	**$3.2m**

Table 133 Storm Network 10-Year Capital Requirements

Water Network

Asset Segment	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033
Hydrants	$27k	$36k	$36k	$36k	$143k	$125k	$36k	$276k	$160k	$276k
Water Booster Station	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Water Mains	$0	$0	$128k	$4.3m	$4.2m	$4.2m	$4.1m	$4.2m	$4.4m	$3.8m
Water Meters	$0	$0	$0	$0	$0	$0	$0	$323	$0	$0
Water Sample Stations	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Water Service Connections	$70k	$582k	$623k	$271k	$1.4m	$570k	$3.3m	$1.3m	$825k	$1.4m
Water Underground Enclosures	$34k	$11k	-	$34k	$101k	$45k	$22k	$67k	$101k	$157k
Water Valves	$13k	$3k	$13k	$20k	$63k	$53k	$10k	$126k	$106k	$100k
	$144k	**$632k**	**$800k**	**$4.6m**	**$5.9m**	**$5.0m**	**$7.5m**	**$6.0m**	**$5.6m**	**$5.8m**

Table 134 Water Network 10-Year Capital Requirements

10.2 Appendix B: Level of Service Maps

Roads Network Map

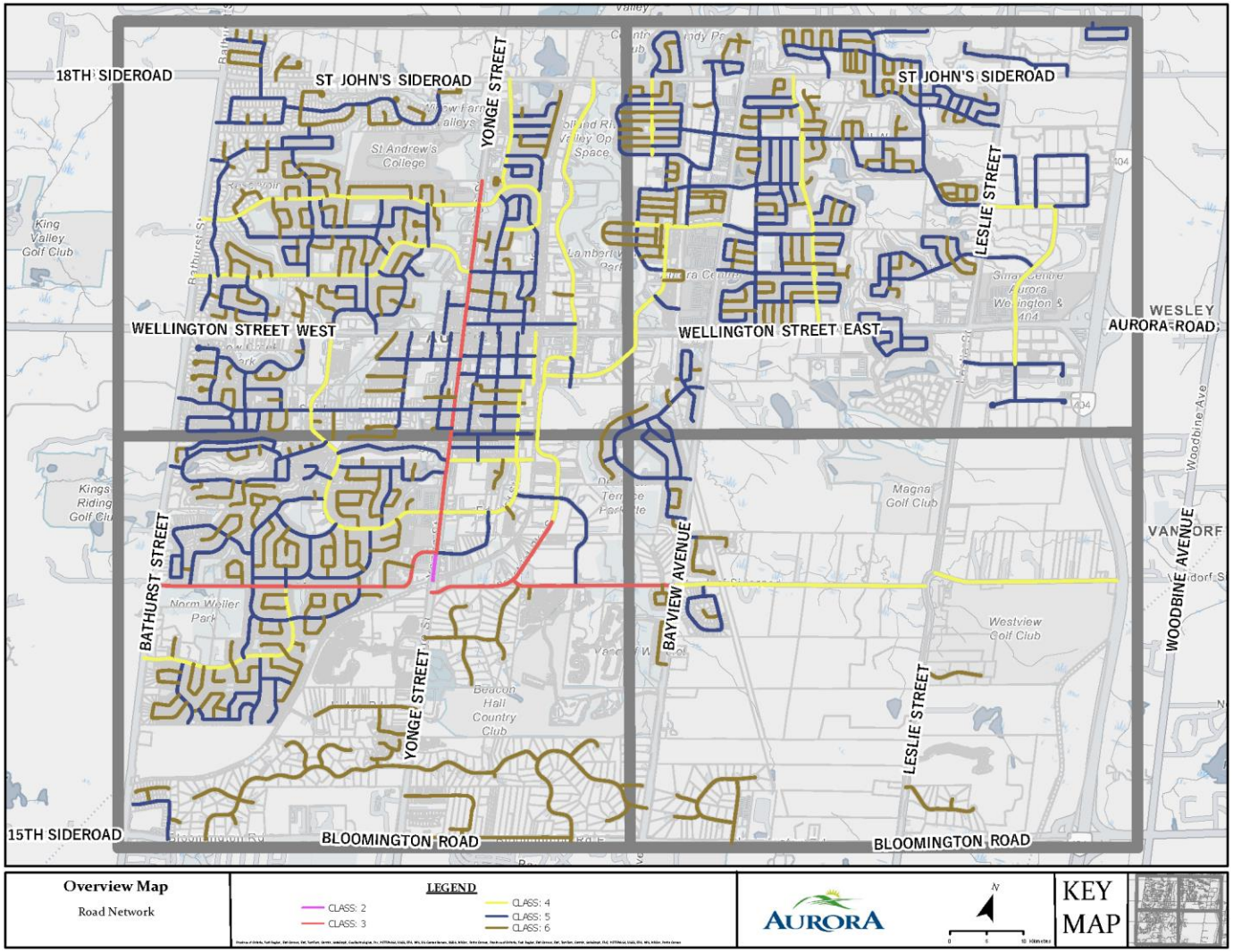


Figure 84 LOS Map: Road Network

Winter Maintenance Routes

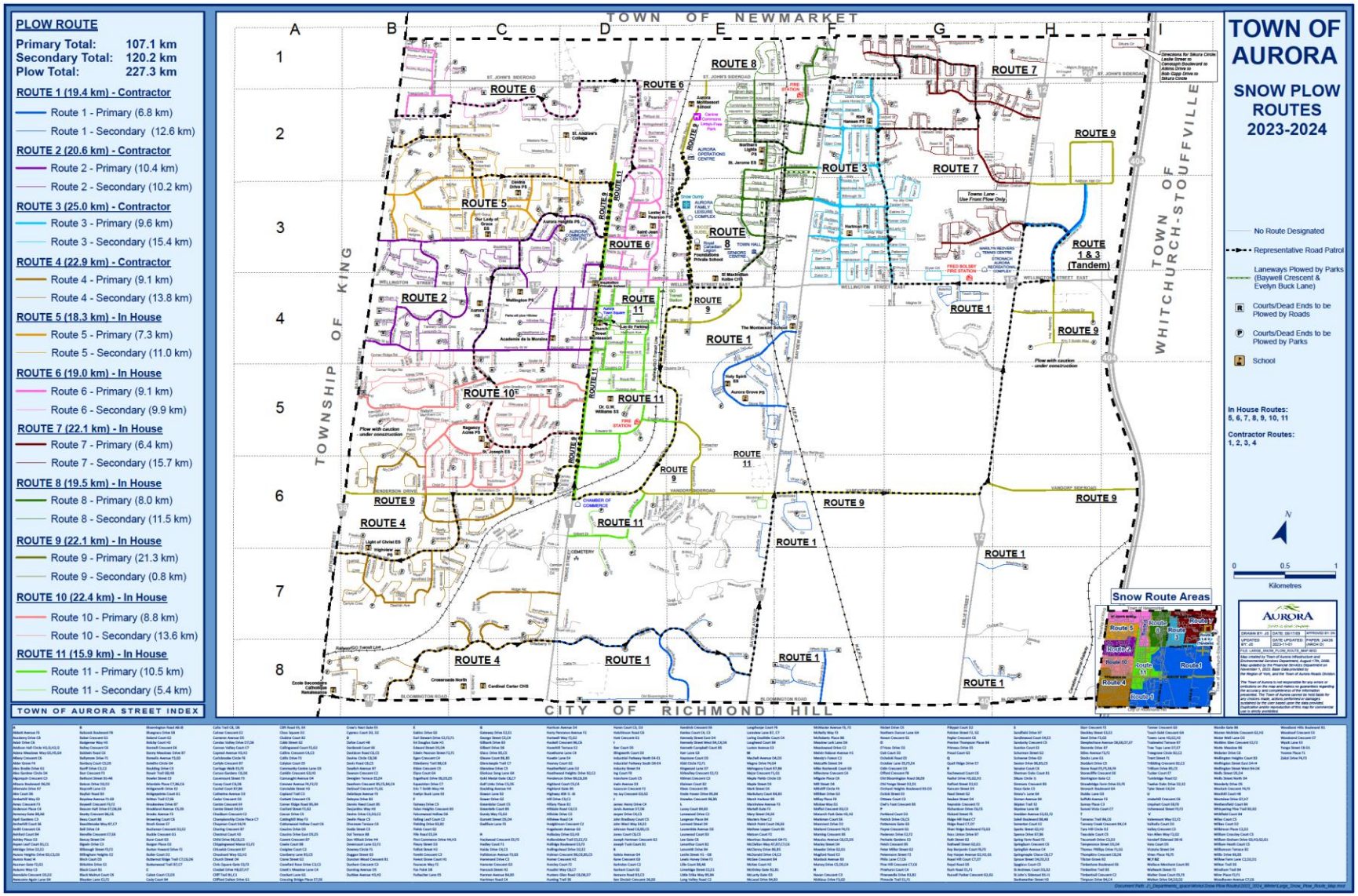


Figure 85 LOS Map: Winter Maintenance Routes

Facility Locations

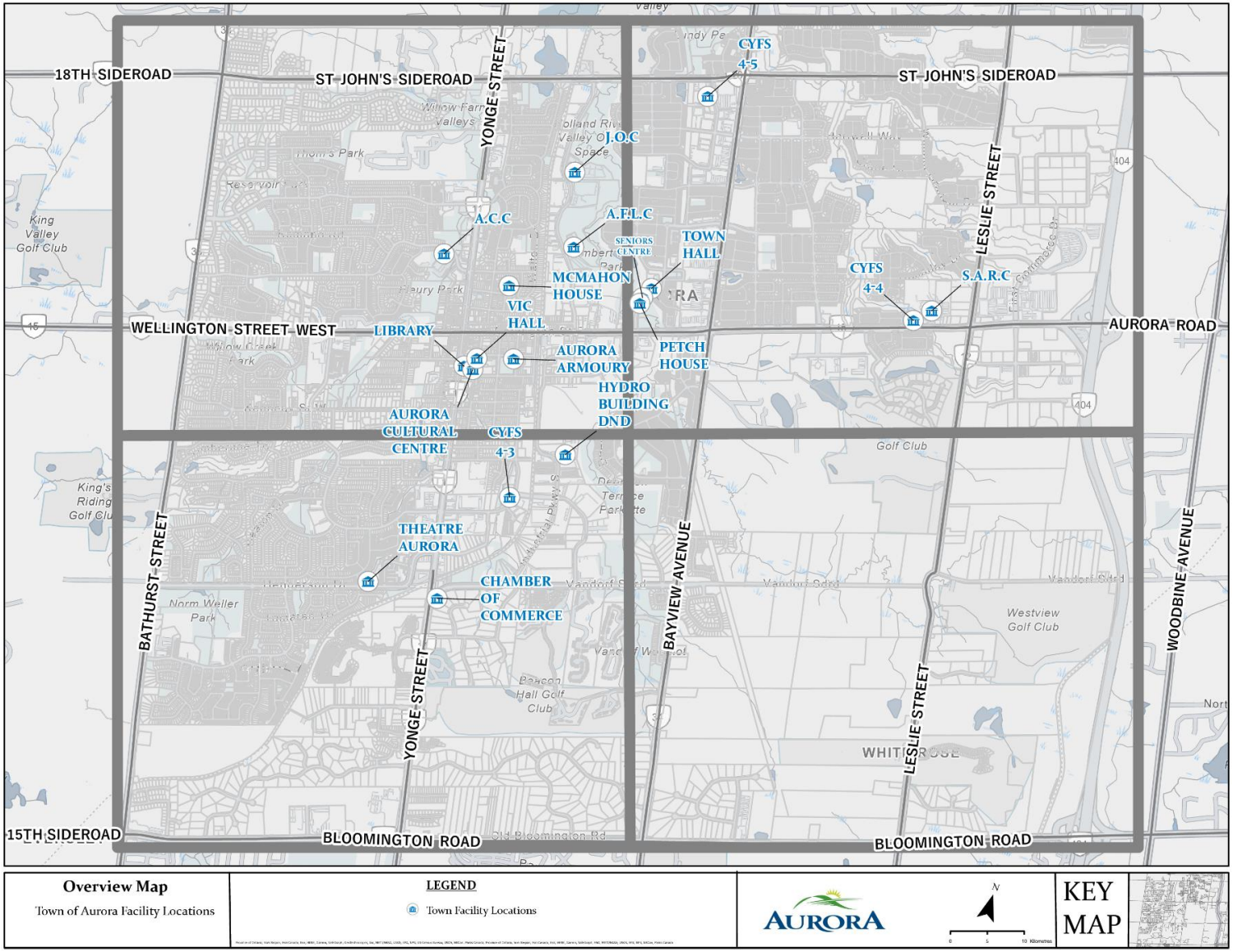


Figure 86 LOS Map: Facility Locations

Park Facilities Locations

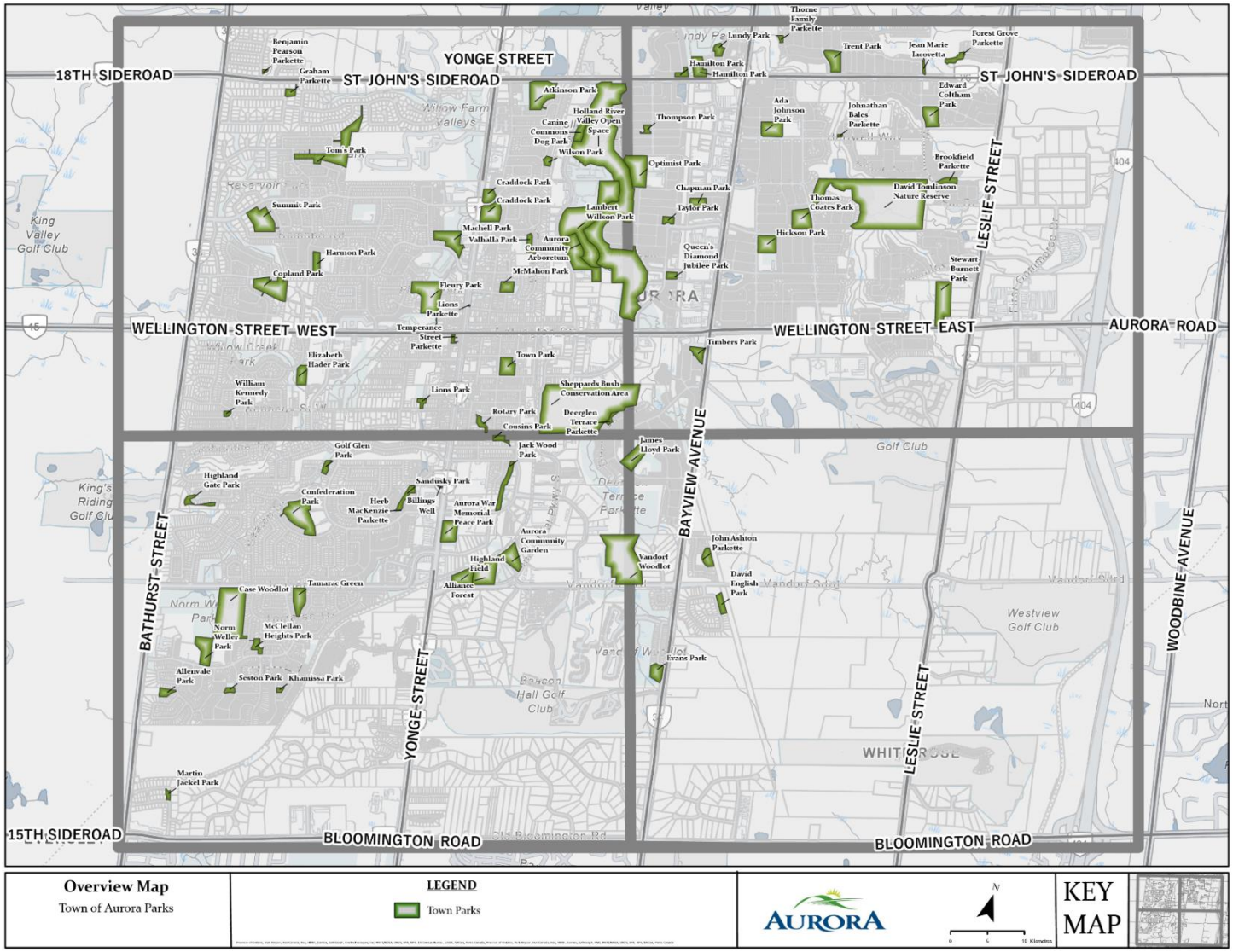


Figure 87 LOS Map: Park Facilities Locations

Watermain Service Map

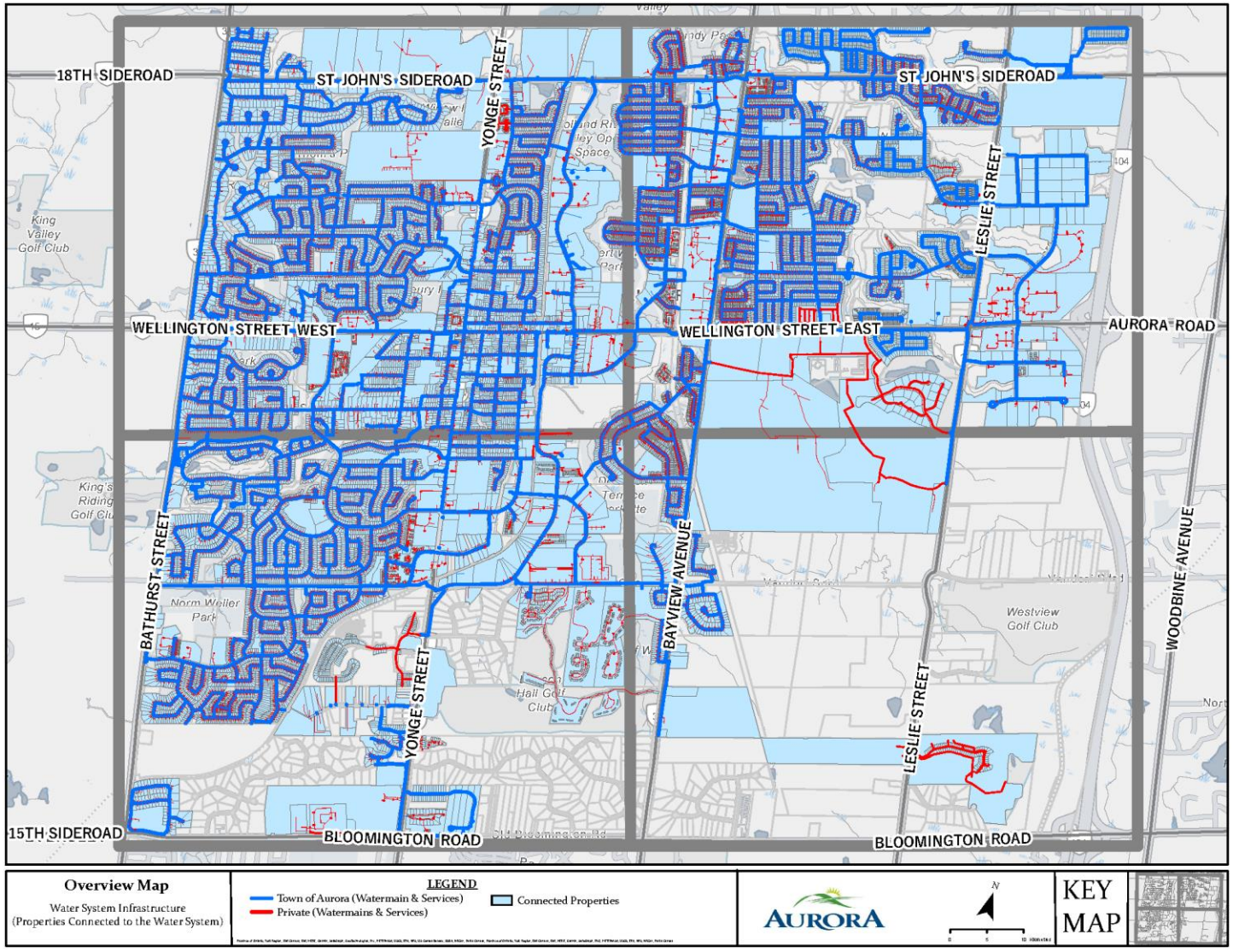


Figure 88 LOS Map: Watermain Services

Fire Flow Access Map

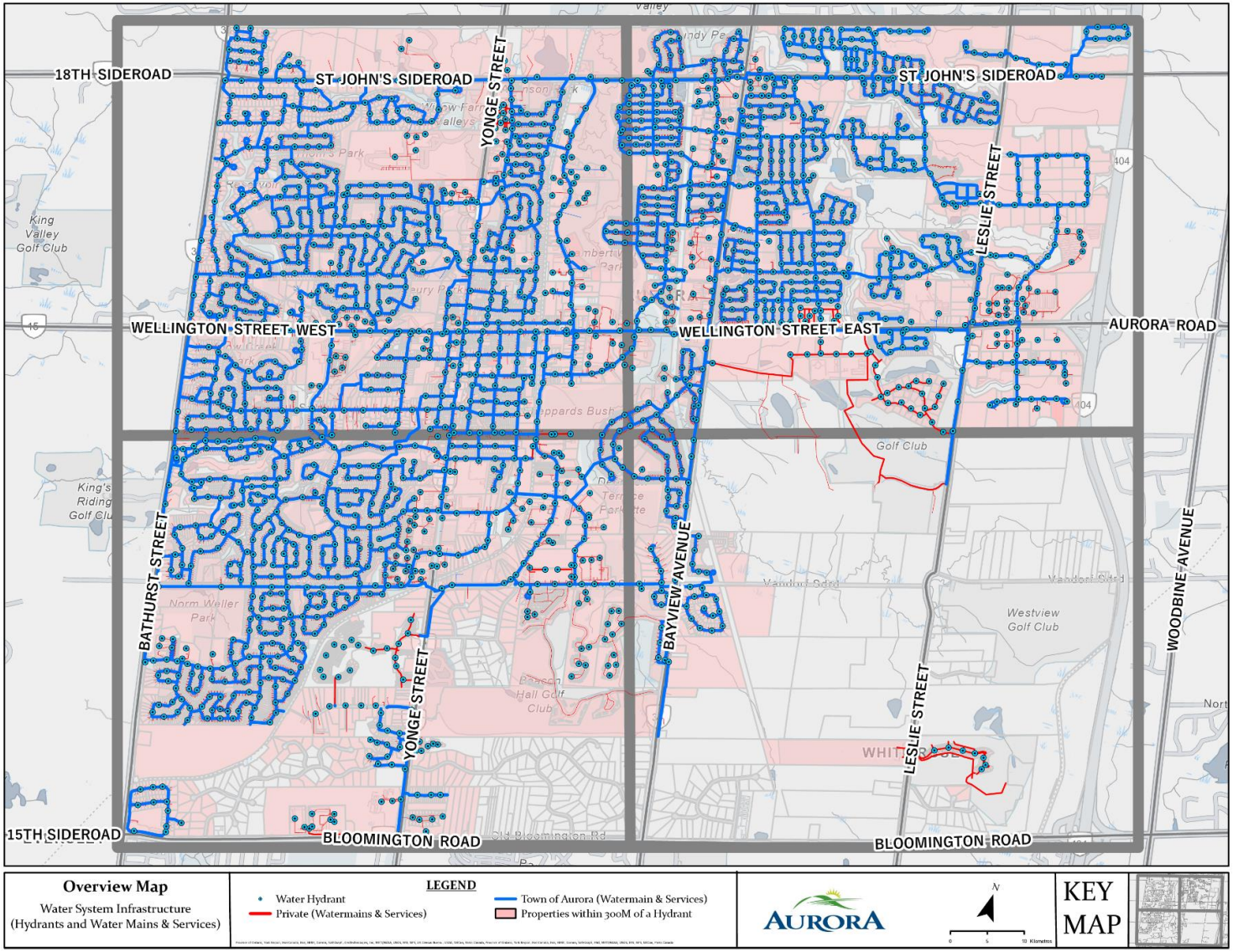


Figure 89 LOS Map: Fire Flow Access

Sanitary Service Map

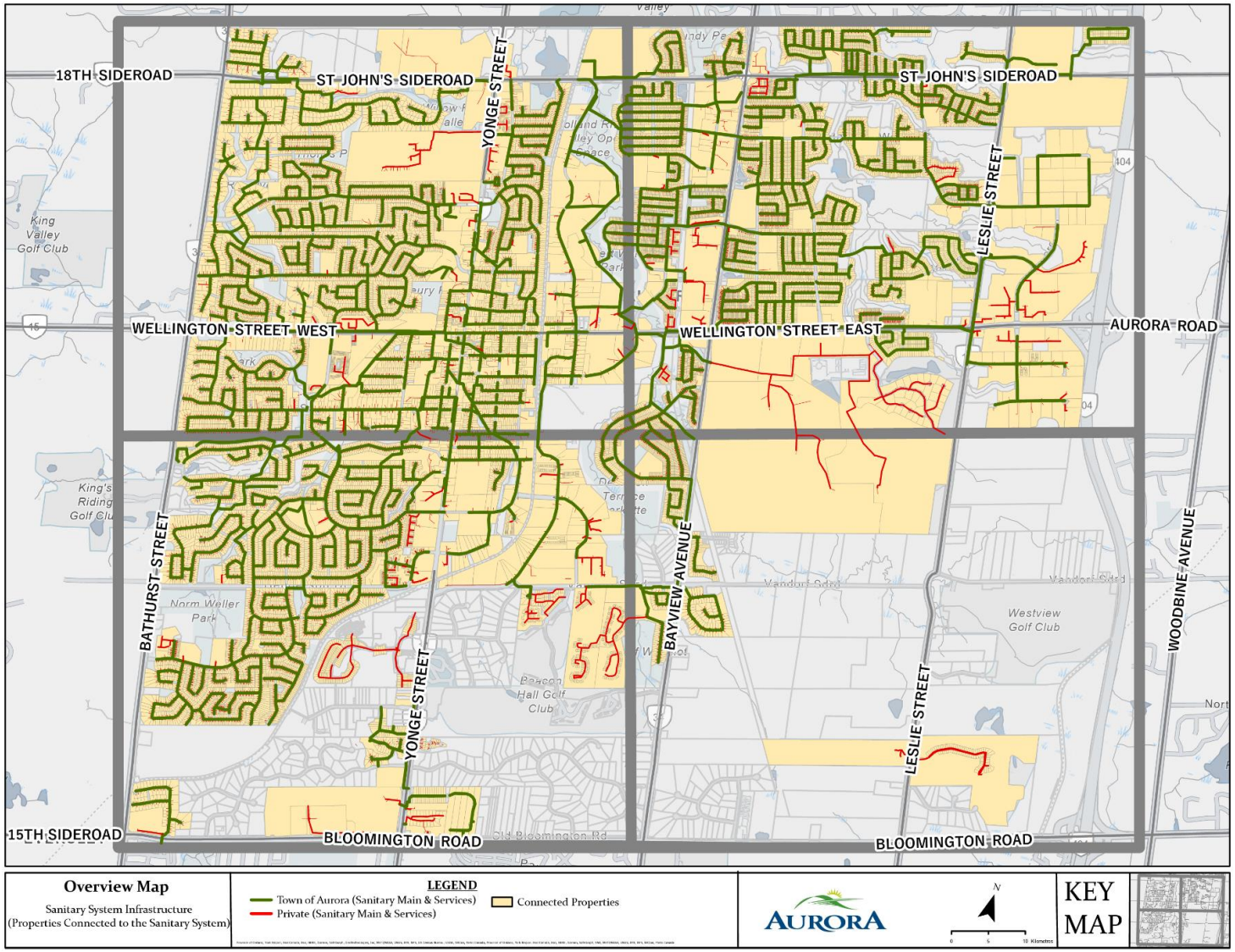


Figure 90 LOS Map: Sanitary Services

Storm Service Map

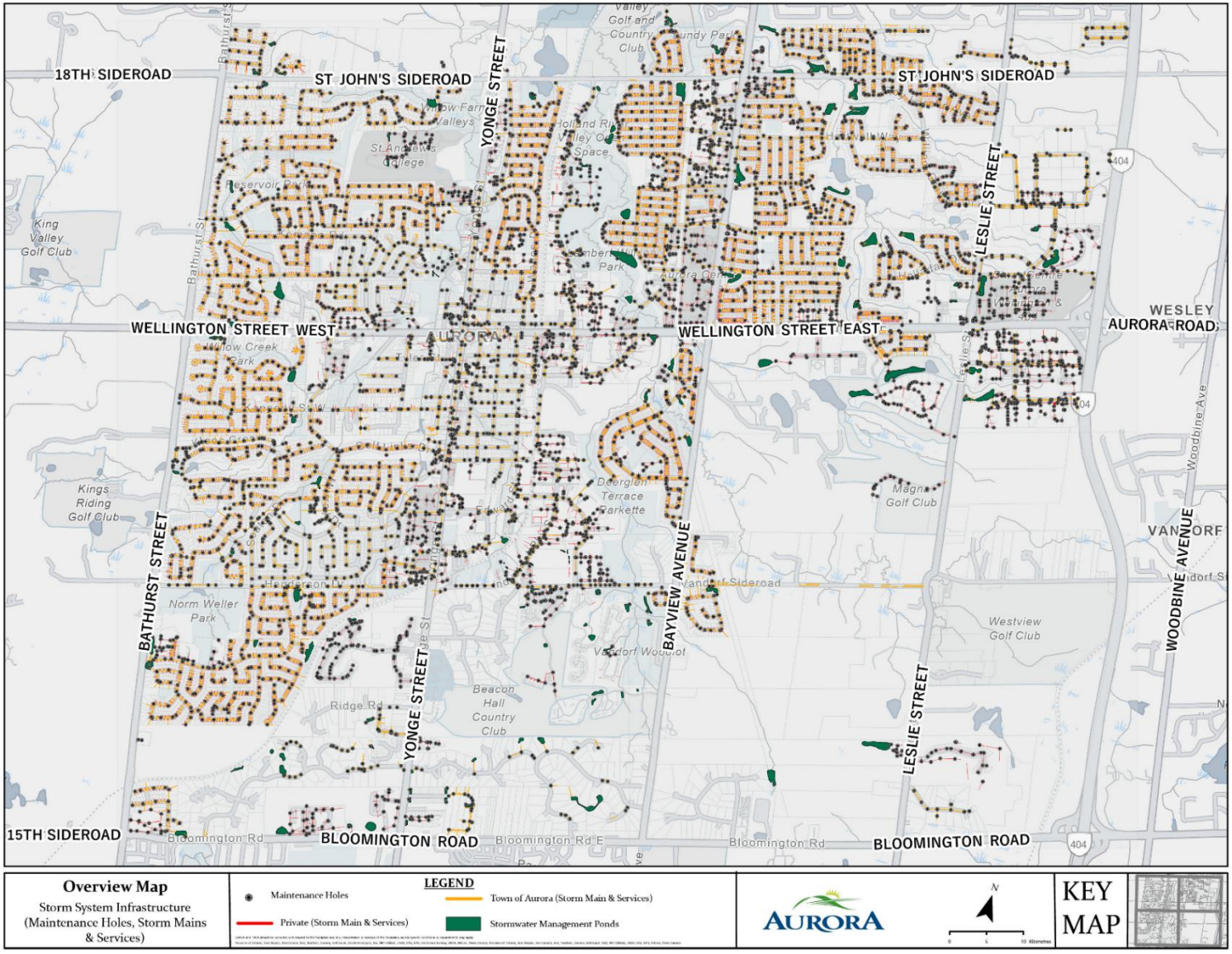


Figure 91 LOS Map: Storm Services

Flood Plain Map

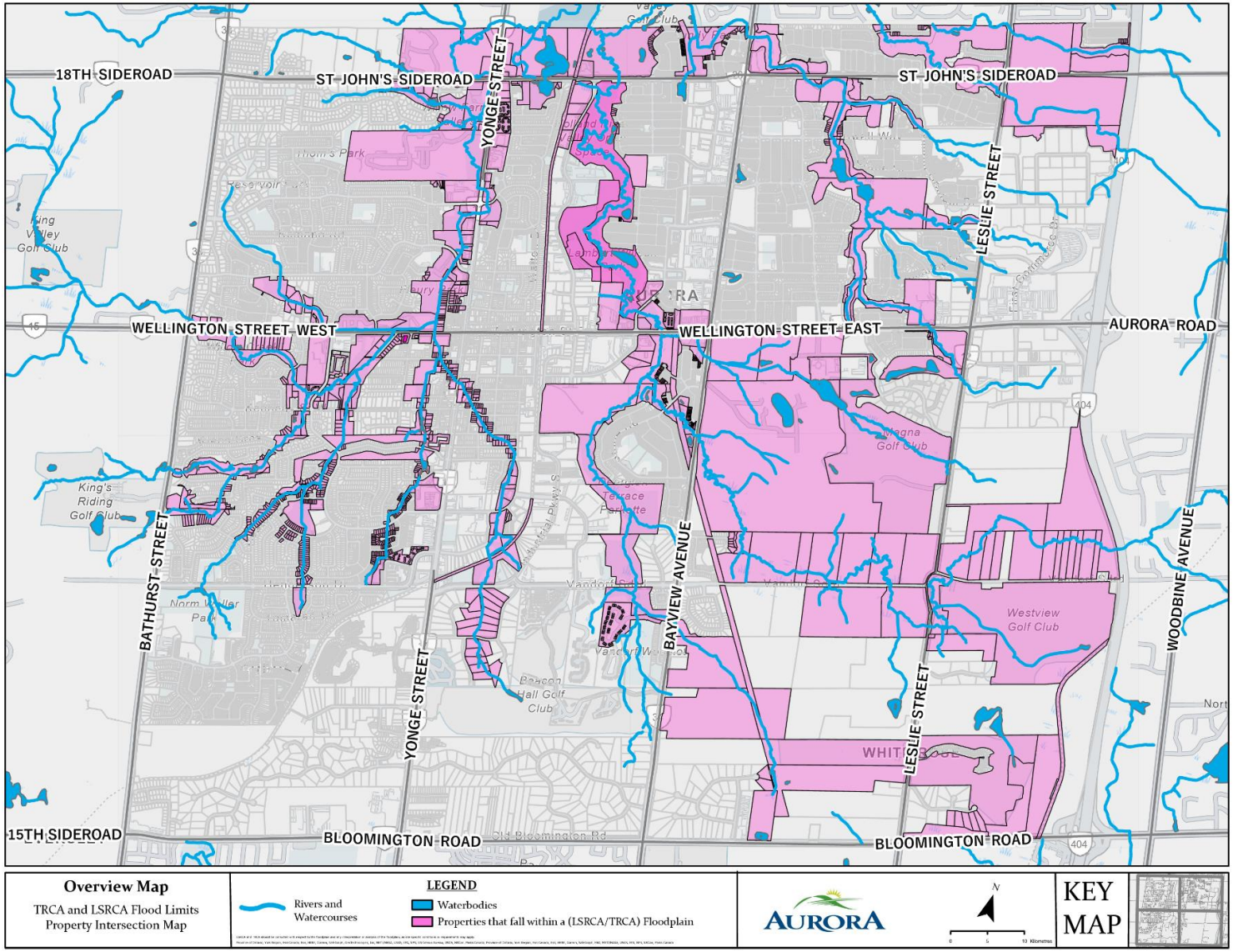


Figure 92 LOS Map: Flood Plain

Images of Bridge in Very Good Condition
John West Way Bridge
Inspected October 11th, 2023

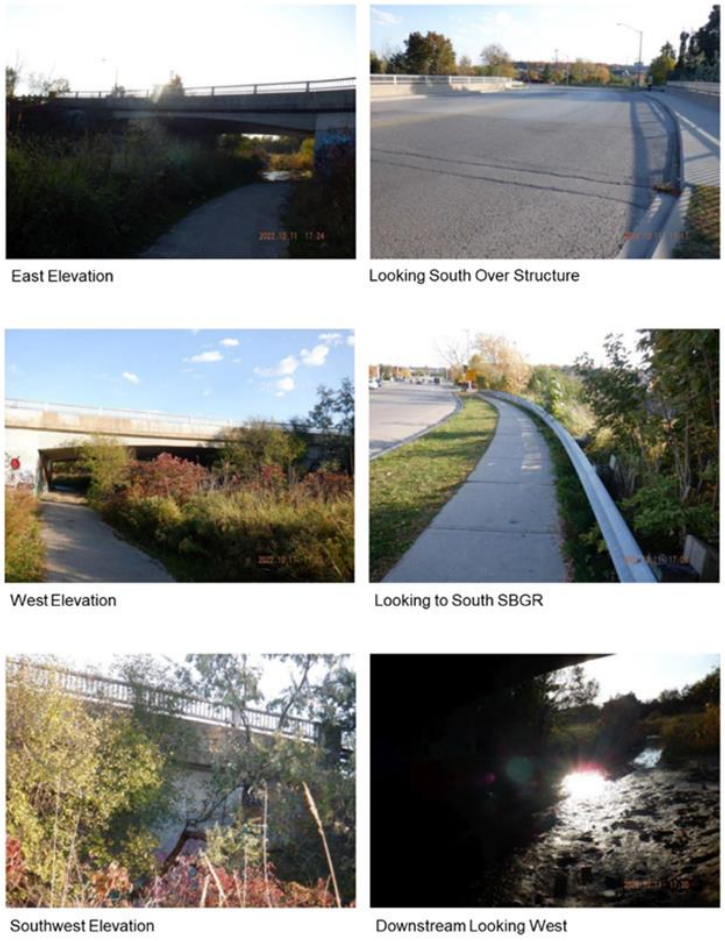


Figure 93 Bridge Condition Example: Very Good

Images of Culvert in Good Condition
Murray Drive Culvert – 145m north of Kennedy Street W

Inspected: October 11th, 2023

Figure 94 Culvert Condition Example: Good

Images of Culvert in Fair Condition
Vandorf Sideroad – 135m east of Leslie Street
Inspected: October 6th, 2023

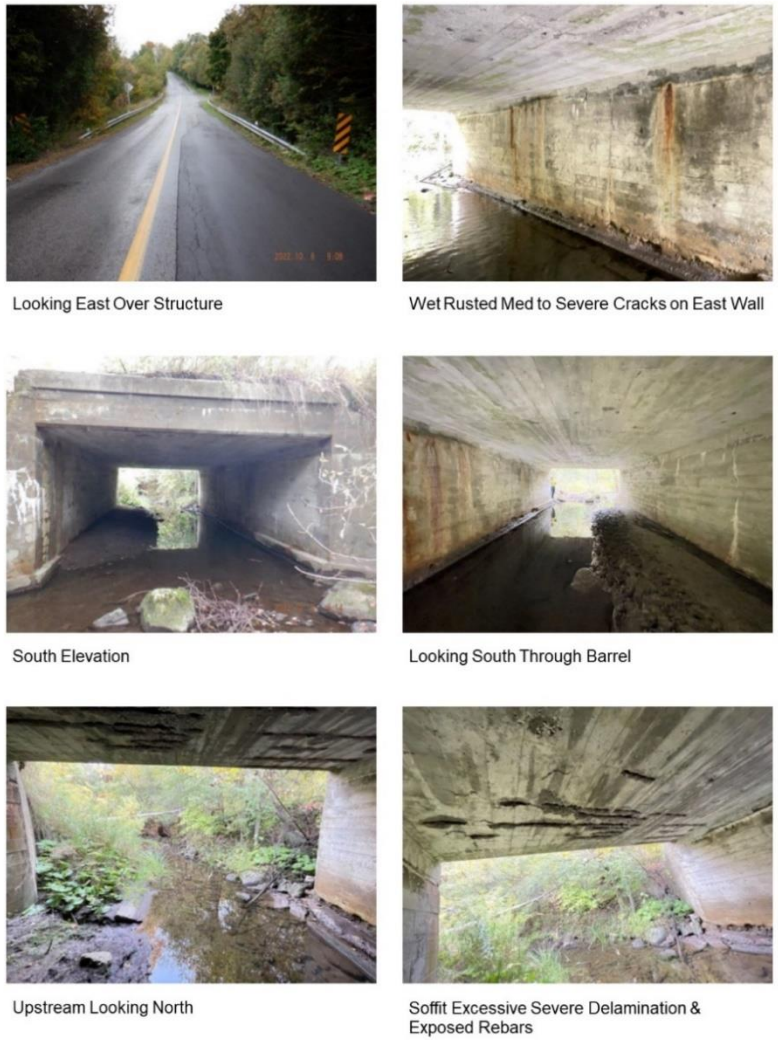


Figure 95 Culvert Condition Example: Fair

10.3 Appendix C: Risk Rating Criteria

Road Network

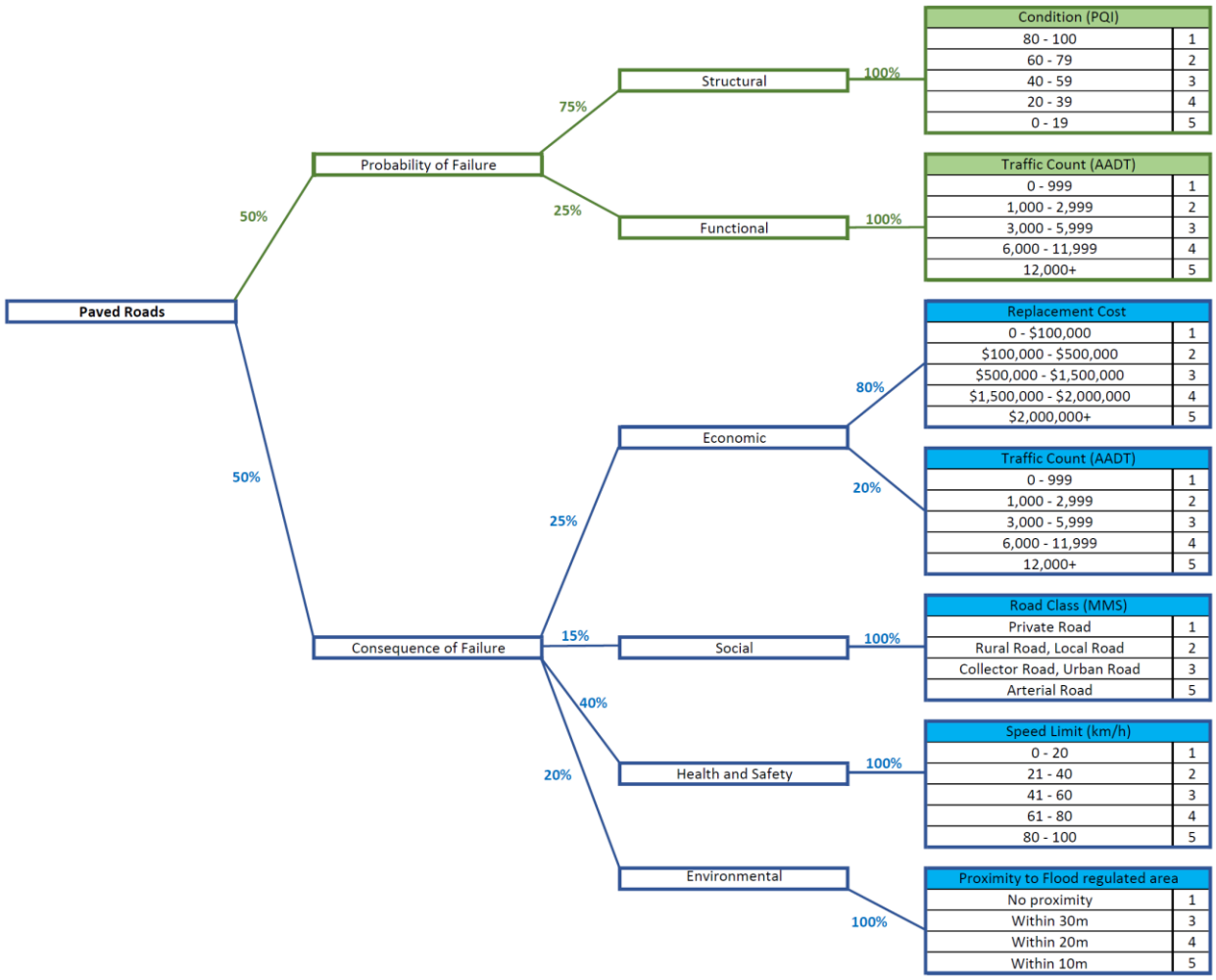


Figure 96 Road Network Risk Rating Criteria

Bridges & Culverts

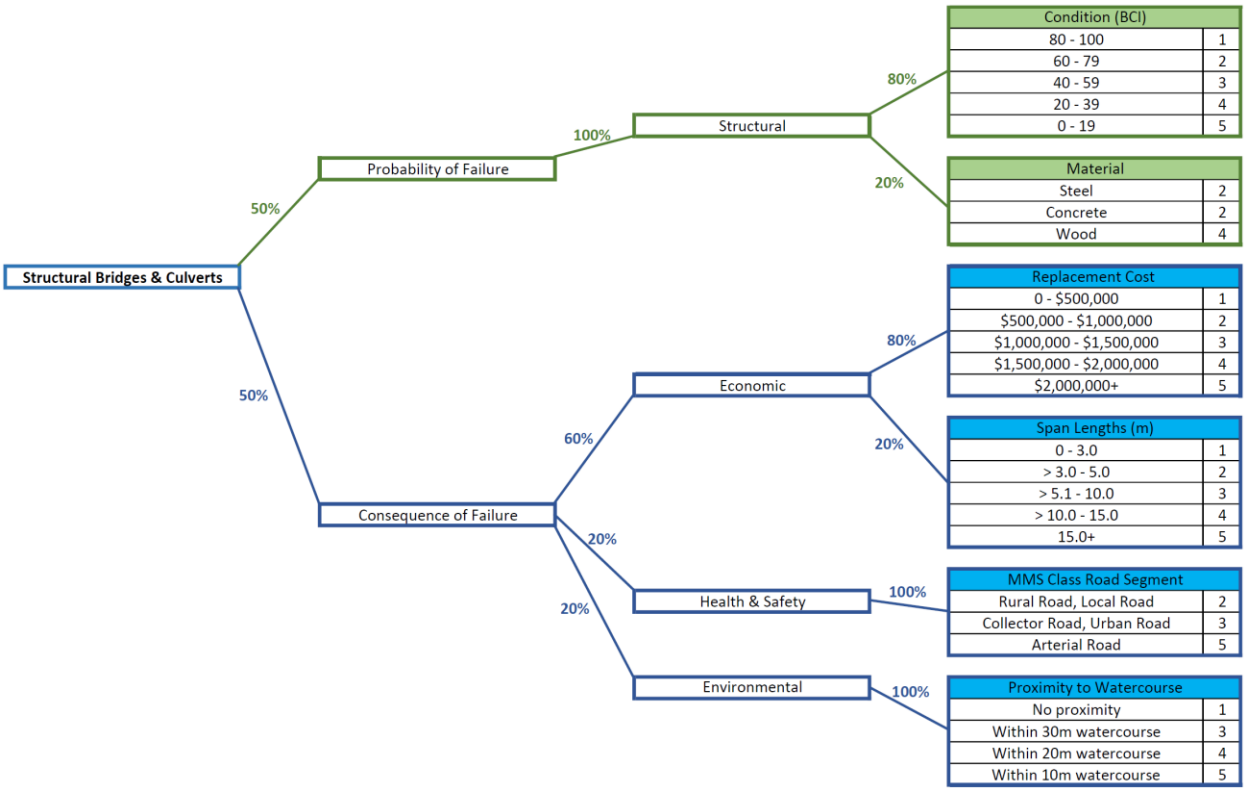


Figure 97 Bridges and Culverts Risk Rating Criteria

Buildings

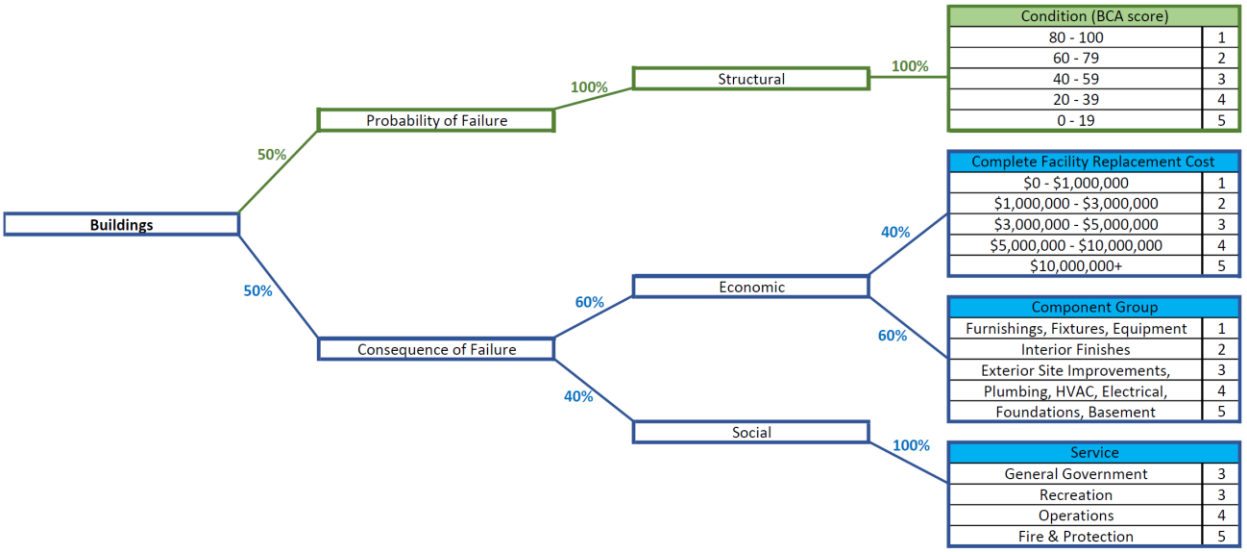


Figure 98 Buildings Risk Rating Criteria

Fleet

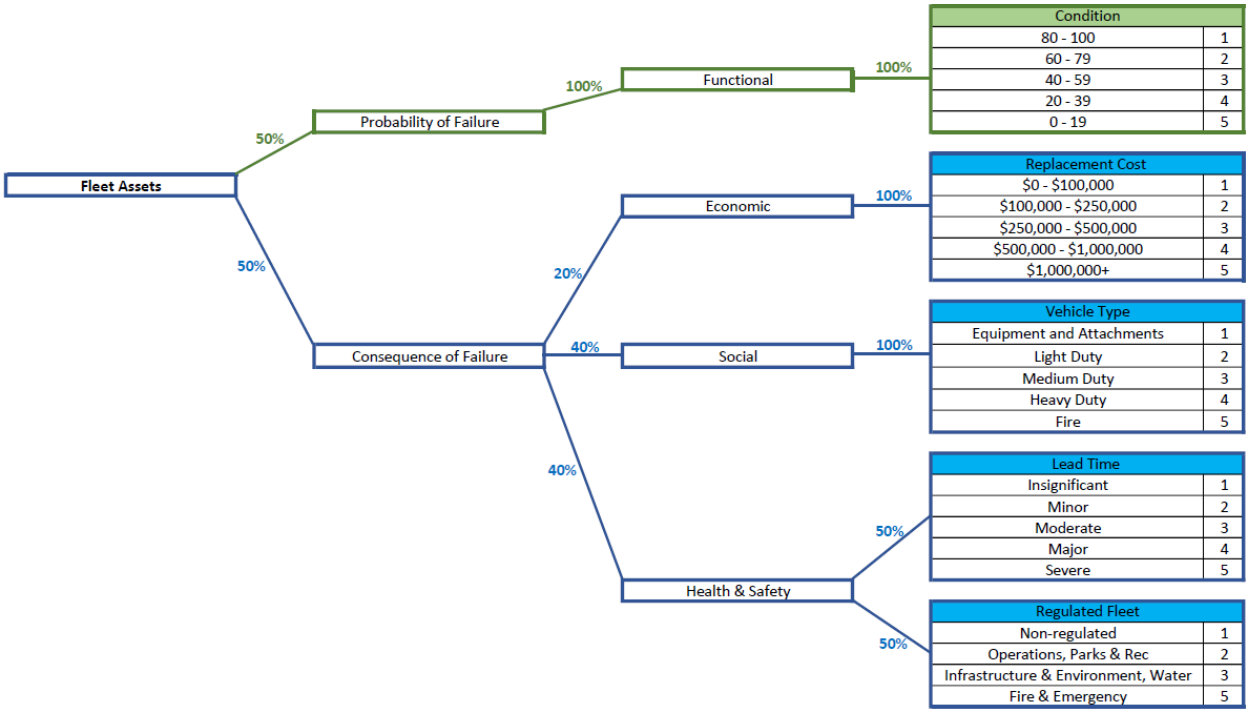


Figure 99 Fleet Risk Rating Criteria

Machinery & Equipment

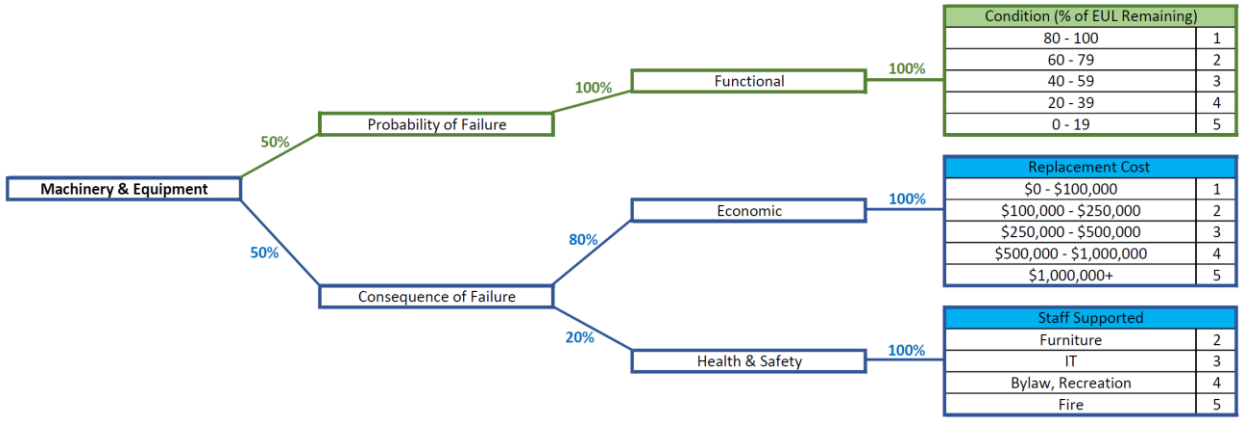


Figure 100 Machinery and Equipment Risk Rating Criteria

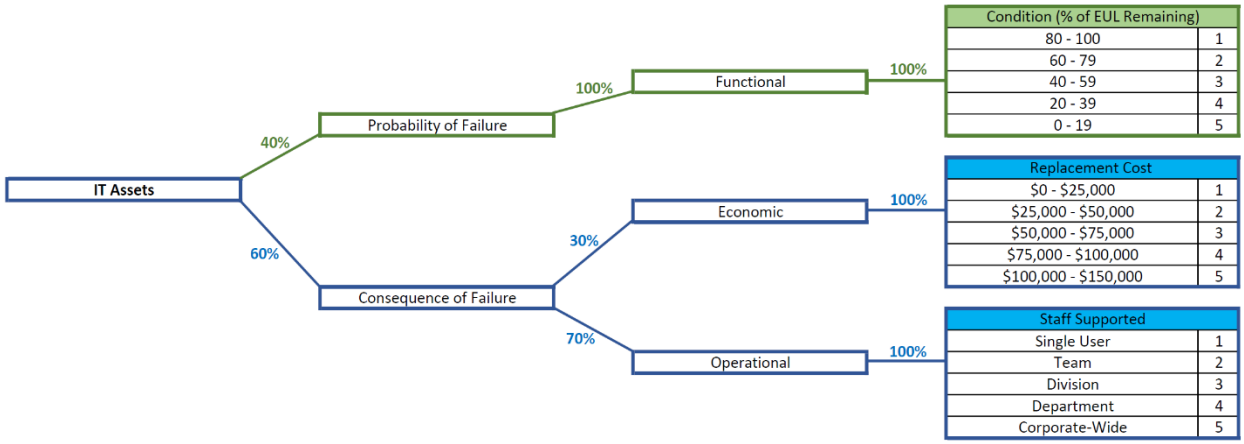


Figure 101 Machinery and Equipment (IT Assets) Risk Rating Criteria

Parks Facilities

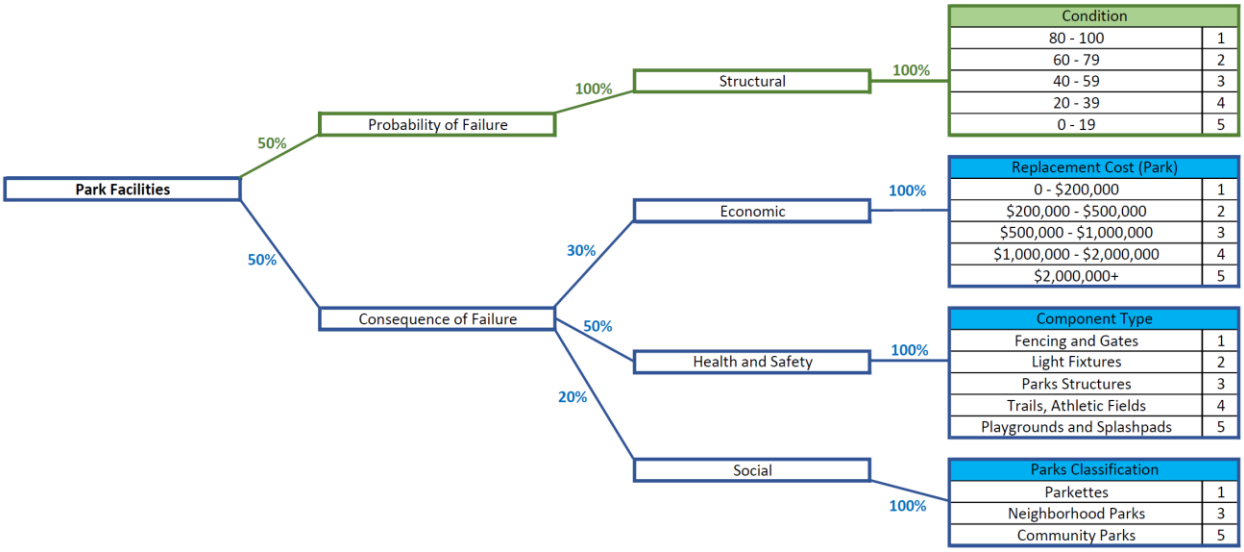


Figure 102 Park Facilities Risk Rating Criteria

Water & Sanitary Facilities

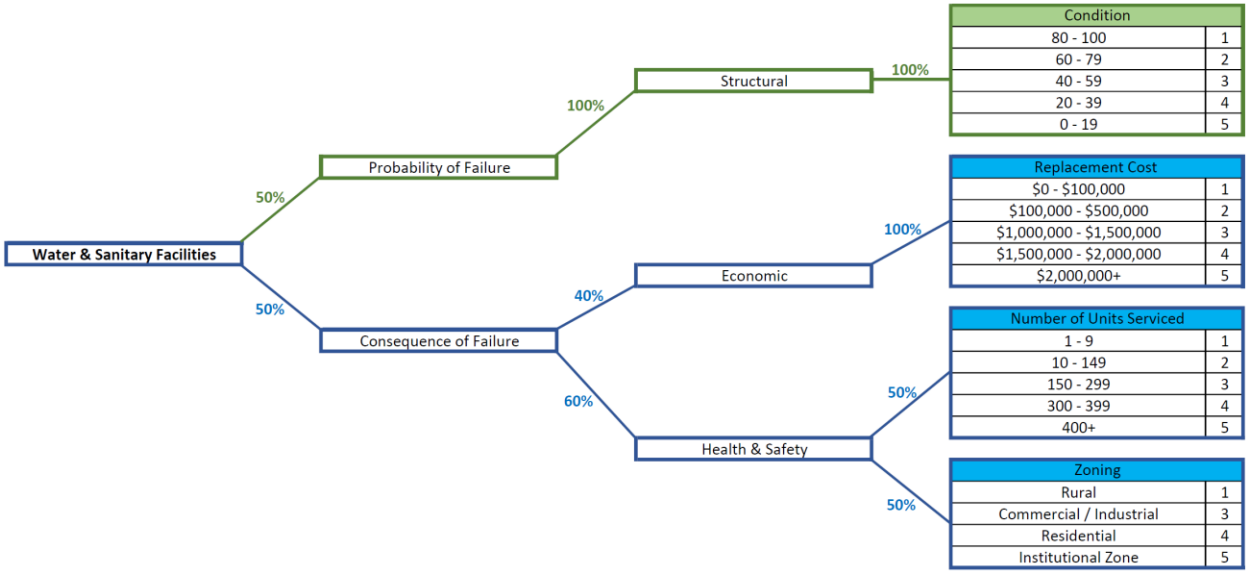


Figure 103 Water and Sanitary Facilities Risk Rating Criteria

Water Network

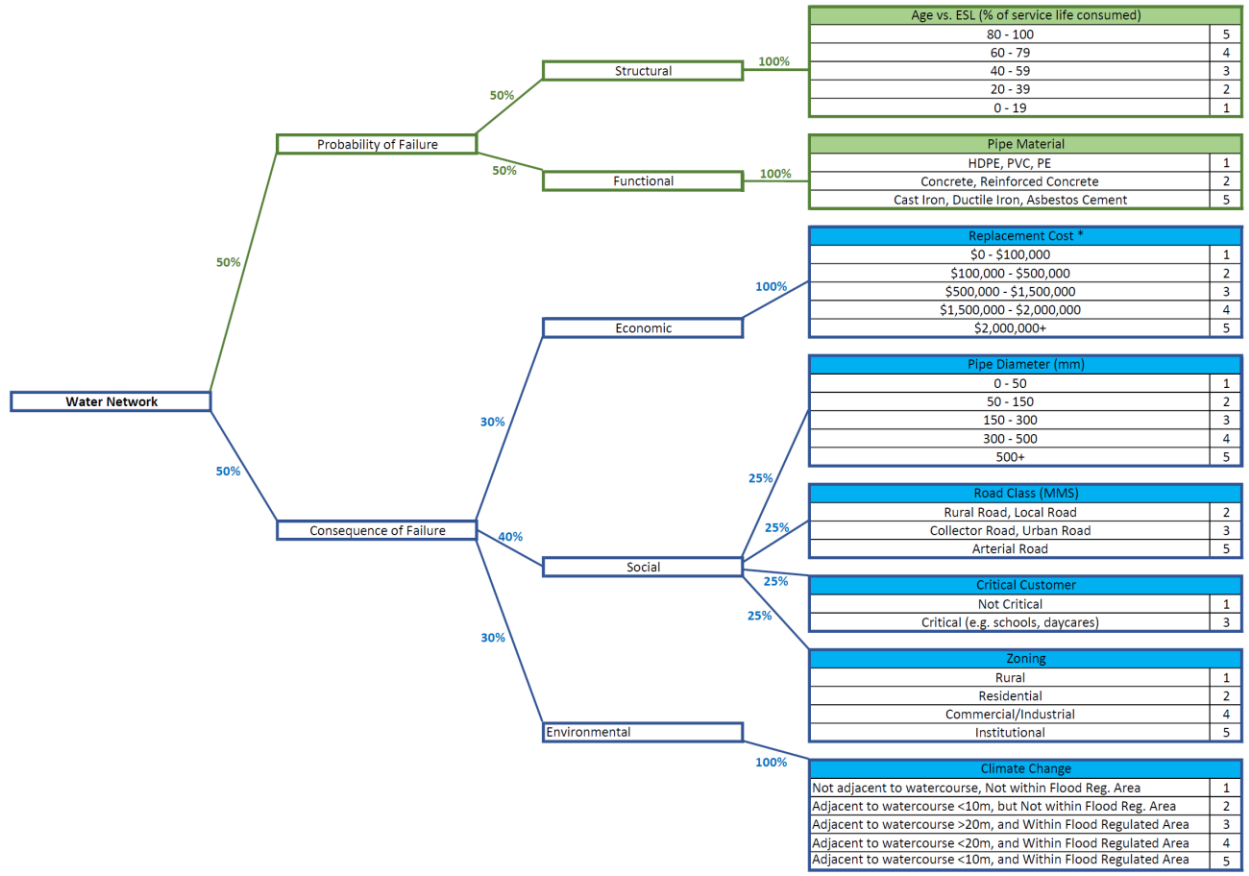


Figure 104 Water Network Risk Rating Criteria

Sanitary Network

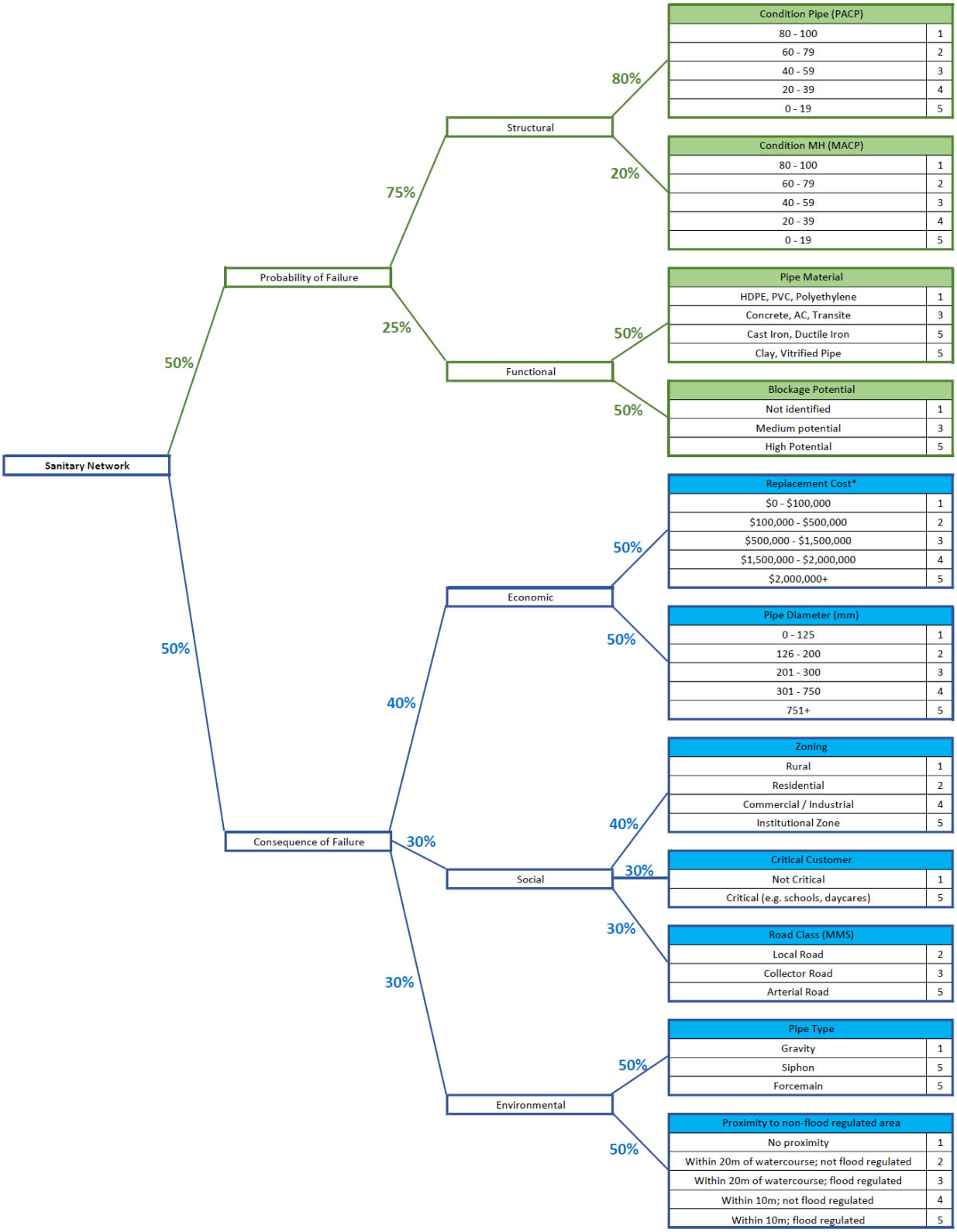


Figure 105 Sanitary Network Risk Rating Criteria

Storm Network

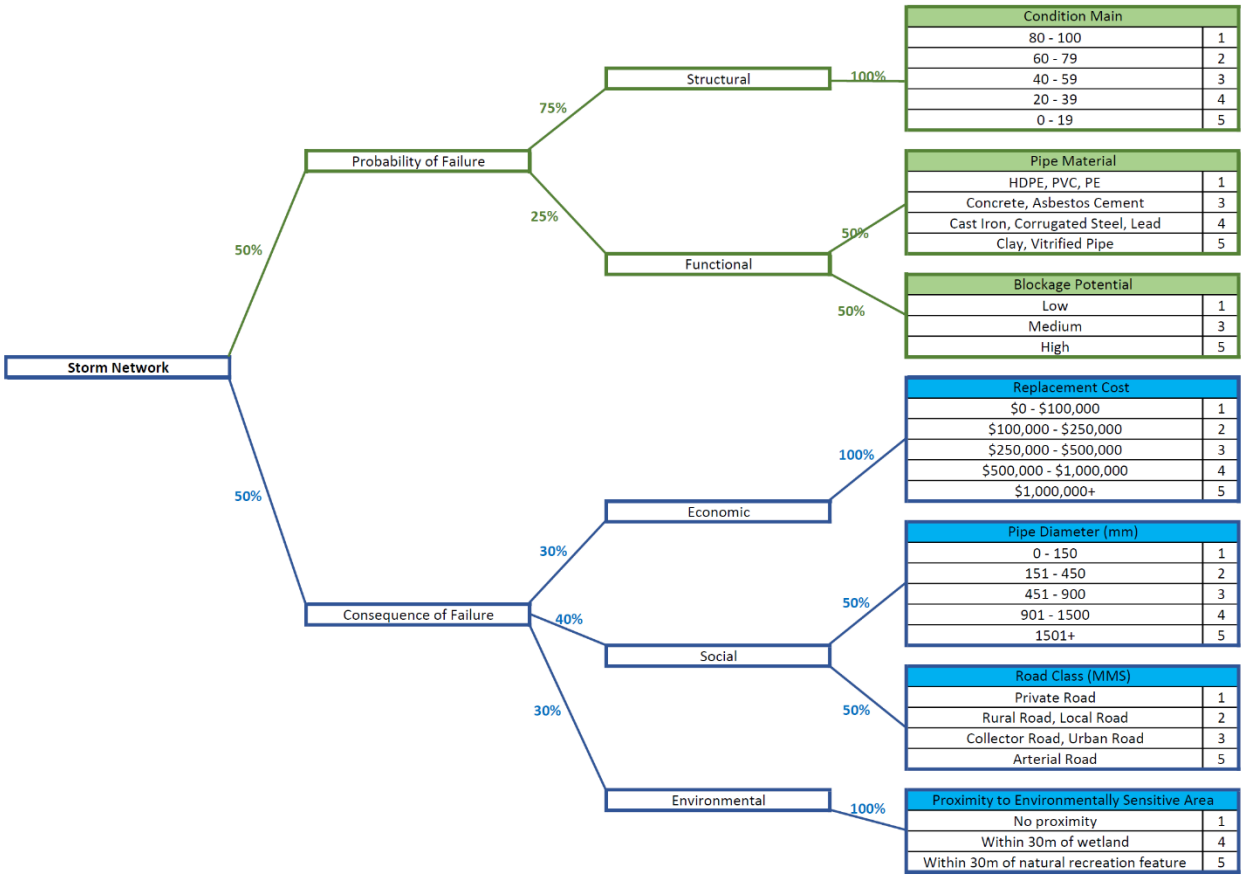
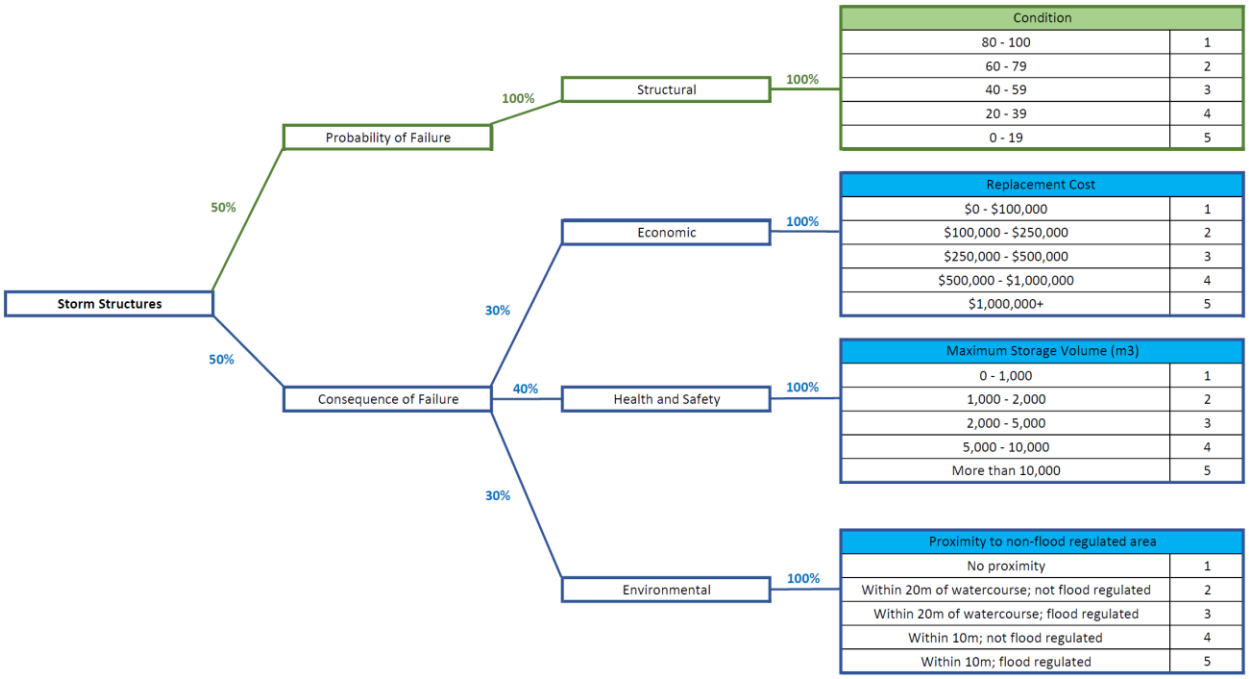


Figure 106 Storm Network Risk Rating Criteria

Storm Structures



Condition	
80 - 100	1
60 - 79	2
40 - 59	3
20 - 39	4
0 - 19	5

Replacement Cost	
$0 - $100,000	1
$100,000 - $250,000	2
$250,000 - $500,000	3
$500,000 - $1,000,000	4
$1,000,000+	5

Maximum Storage Volume (m3)	
0 - 1,000	1
1,000 - 2,000	2
2,000 - 5,000	3
5,000 - 10,000	4
More than 10,000	5

Proximity to non-flood regulated area	
No proximity	1
Within 20m of watercourse; not flood regulated	2
Within 20m of watercourse; flood regulated	3
Within 10m; not flood regulated	4
Within 10m; flood regulated	5

Figure 107 Storm Network (Structures) Risk Rating Criteria