Asset Management Plan

Township of Cramahe

December 2025

CRAMAHE
It's In Our Nature

psdcitywide

This Asset Management Program was prepared by:

psdcitywide

Empowering your organization through advanced asset management, budgeting & GIS solutions

Key Statistics

$195.1M	Replacement Cost of Asset Portfolio
$70.4k	Replacement Cost of Infrastructure Per Household
60%	Percentage of Assets in Fair or Better Condition
37%	Percentage of Assets with Assessed Condition Data
$3.6M	Annual Capital Infrastructure Deficit
15 Years	Recommended Timeframe to reach Proposed Levels of Service
3.1%	Target Investment Rate to meet Proposed Levels of Service
1.2%	Actual Investment Rate

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1. Executive Summary

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

1.1. Scope

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

The AMP's categories are summarized in Figure 1.

Figure 1: Core and Non-Core Asset Categories

Core Assets

- Road Network
- Bridges & Culverts
- Water Network
- Sanitary Sewer Network
- Storm Sewer Network

Non-Core Assets

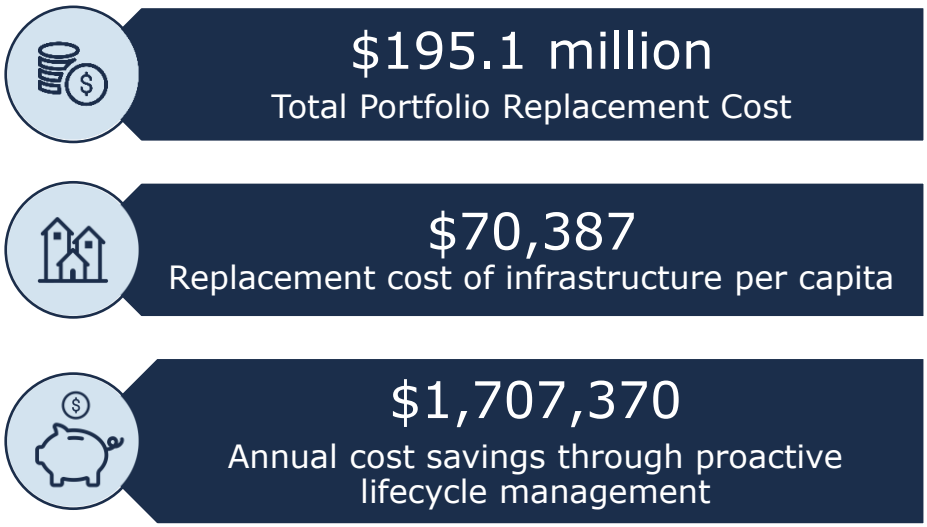
- Buildings & Facilities
- Parks & Recreation
- Vehicles
- Machinery & Equipment

1.2. Compliance

With the development of this AMP the Township of Cramahe has achieved compliance with July 1, 2025, requirements under O. Reg. 588/17. This includes requirements for proposed levels of service and inventory reporting for all asset categories.

1.3. Findings

Figure 2: Key Findings



The overall replacement cost of the asset categories owned by Cramahe total $195 million. 60% of all assets analyzed are in fair or better condition. Assessed condition data was available for bridges and culverts, road network, vehicles, and most machinery and equipment assets. For the remaining assets, assessed condition data was unavailable, and asset age was used to approximate condition.

To meet capital replacement and rehabilitation needs for existing infrastructure, prevent infrastructure backlogs, and achieve long-term sustainability, the municipality's average annual capital requirement totals $6.0 million. Based on a historical analysis of sustainable capital funding sources, Cramahe is committing approximately $2.4 million towards capital projects or reserves per year. As a result, there is currently an annual funding gap of $3.6 million.

To support the proposed levels of service, the Township has selected a financial strategy aimed at achieving full funding within 15 years. This phased approach will gradually increase reinvestment levels over 15 years, enabling the Township to meet both current and future infrastructure needs while minimizing the risk of service disruptions.

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 municipality. Strategic asset management planning is an ongoing and dynamic process that requires continuous improvement and dedicated resources.

1.4. Limitations and Constraints

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

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

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

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

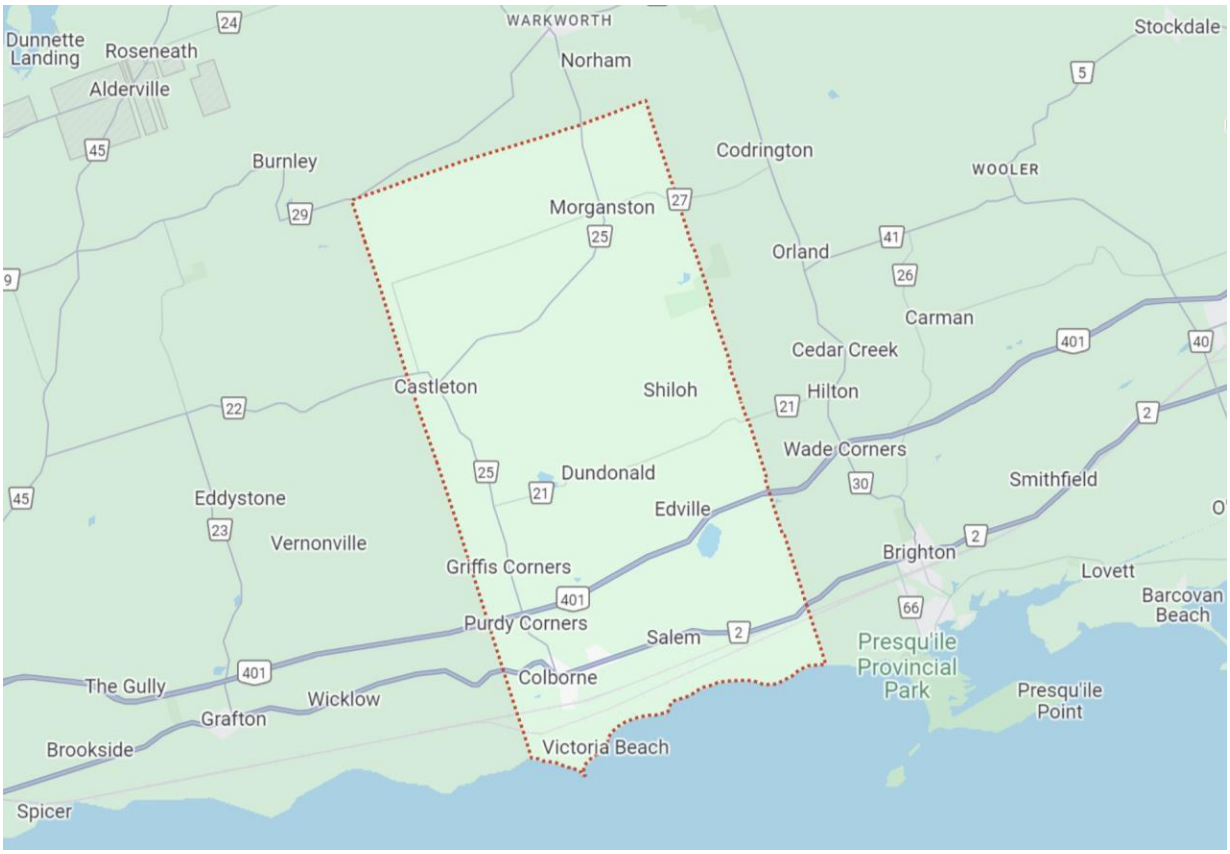
2. Introduction and Context

2.1. Community Profile

Census Characteristic	Township of Cramahe	Ontario
Population 2021	6,509	14,223,942
Population Change 2016-2021	+2.4%	5.8%
Total Private Dwellings	2,772	5,929,250
Population Density	32.2/ km2	15.9/km^2
Land Area	202.22 km2	892,411.76 km^2

Table 1: The Township of Cramahe Census Information

The Township of Cramahe is located in Northumberland County of Central Ontario, part of the Greater Golden Horseshoe. The Township is situated in southeastern Ontario, east of Toronto and west of Kingston. The natural landscapes of forests, lakes, and rivers in Cramahe provide plentiful opportunities for outdoor activities



The Township of Cramahe was incorporated in 1850. This incorporation was part of a broader movement during the mid-19th century in Ontario to establish municipal governance structures in rural and urban areas. The incorporation allowed for local administration and governance tailored to the specific needs and interests of the

Township's residents. In 2001, the Township of Cramahe and the Village of Colborne was subject to a municipal amalgamation.

The Township includes several small communities, with Colborne being the largest and the administrative center. Other communities include Castleton, Salem, and others. Each of these communities has its own unique history and characteristics. The region is primarily rural, characterized by agricultural lands, small communities, and natural landscapes.

Demand in Cramahe Township is primarily driven by its agricultural base, residential growth due to its appeal as a rural community, and the flourishing tourism sector attracted by its natural beauty and historical sites. The local economy is also influenced by the needs of a growing population, requiring further development within infrastructure. As a rural municipality, the Township faces the typical challenges of balancing infrastructure development with the preservation of its natural and cultural heritage.

The Township focuses on intensification within the built boundary for growth and of the protection and conservation of environmental sensitive areas and natural heritage. Municipal staff have identified the road network as the primary infrastructure priority. Current design of the Township's transportation network is not capable to serve the heavy traffic coming from Ontario 401 Highway. Staff are aiming to expand the road network and improve the level of service through a series of rehabilitation and replacement projects.

2.2. Climate Change

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

The report revealed that between 1948 and 2016, the average temperature increase across Canada was 1.7°C; moreover, during this time period, Northern Canada experienced a 2.3°C increase. The temperature increase in Canada has doubled that of the global average. If emissions are not significantly reduced, the temperature could increase by 6.3°C in Canada by the year 2100 compared to 2005 levels. Observed precipitation changes in Canada include an increase of approximately 20% between 1948 and 2012. By the late 21st century, the projected increase could reach an additional 24%. During the summer months, some regions in Southern Canada are expected to experience periods of drought at a higher rate. Extreme weather events and climate conditions are more common across Canada. Recorded events include droughts, flooding, cold extremes, warm extremes, wildfires, and record minimum arctic sea ice extent.

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

2.2.1 Cramahe Climate Profile

The Township of Cramahe is located in Southeastern Ontario in Northumberland County. The Township is expected to experience notable effects of climate change which include higher average annual temperatures, an increase in total annual precipitation, and an increase in the frequency and severity of extreme events. According to Climatedata.ca – a collaboration supported by Environment and Climate Change Canada (ECCC) – the Township of Cramahe 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 5.6 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, Cramahe is projected to experience a 13% increase in precipitation by the year 2051 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.

2.2.2 Integration Climate change and Asset Management

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

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

2.3. Asset Management Overview

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

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

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

2.3.1 Foundational Documents

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

Strategic Plan

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

Asset Management Policy

An asset management policy represents a statement of the principles guiding the Township'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 Township adopted the Asset Management Policy in accordance with Ontario Regulation 588/17 on July 2nd, 2019.

The approval of this policy is important to integrate the Township's strategic mission, vision and goals with its asset management program, and ensuring the critical municipal infrastructure assets and vital services are maintained and provided to the community in a reliable, sustainable manner. The essential services

include transportation networks, stormwater management, facilities and parks and other infrastructure.

Asset Management Strategy

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

Asset Management Plan

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

2.3.2 Key Technical Concepts

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

Replacement Costs

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

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

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

Estimated Useful Life and Service Life Remaining

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

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

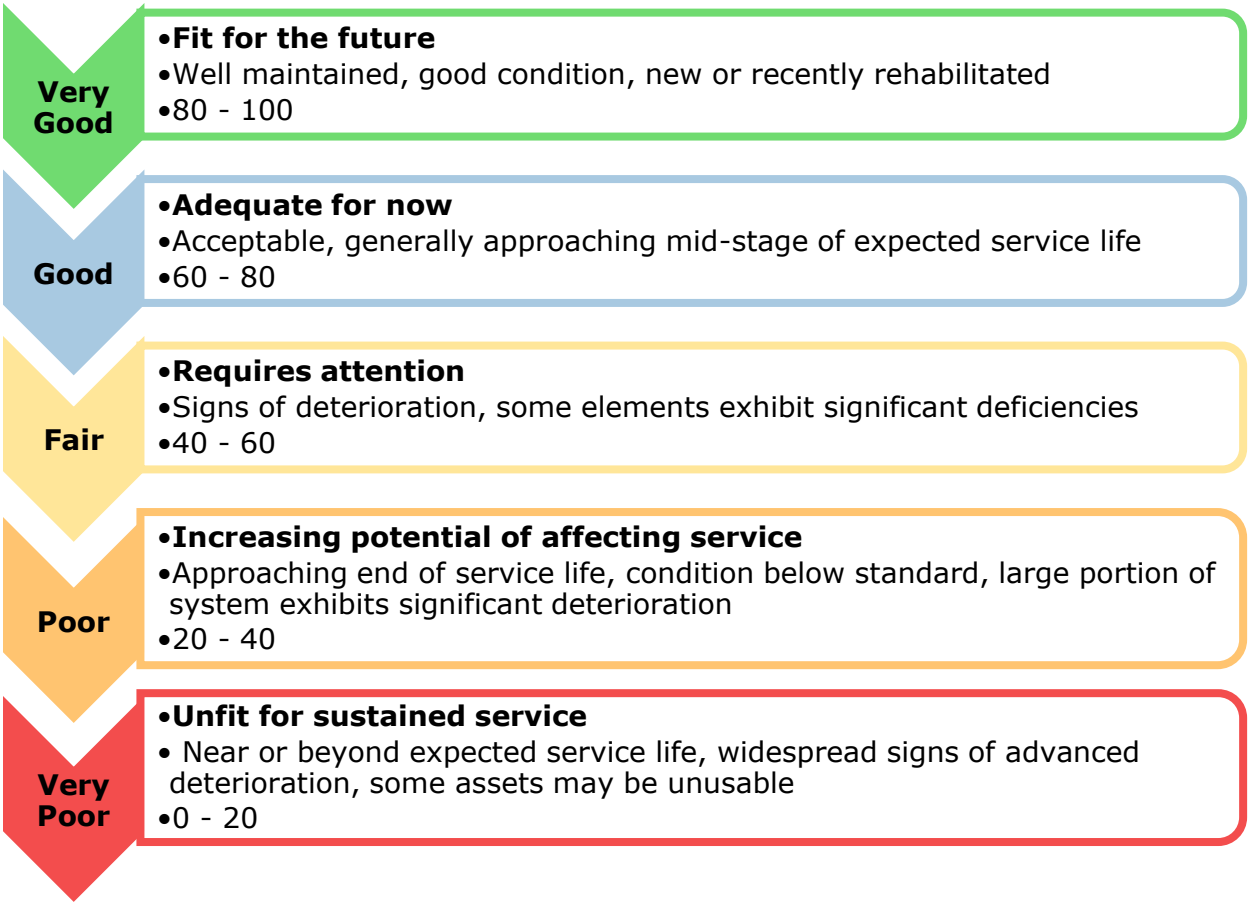
Figure 3: Service Life Remaining Calculation

Asset Condition

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

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

Figure 4: Standard Condition Rating Scale



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

Lifecycle Management Strategies

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

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

There are several field intervention activities that are available to extend the life of an asset. These activities can be generally placed into one of three categories: maintenance, rehabilitation, and replacement. Figure 4 provides a description of each type of activity and the general difference in cost.

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

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

Figure 5: Lifecyle Management Typical Interventions

Maintenance

- General level of cost is **$**
- All actions necessary for retaining an asset as near as practicable to its original condition, but excluding rehabilitation or renewal. Maintenance does not increase the service potential of the asset
- It slows down deterioration and delays when rehabilitation or replacement is necessary.

Rehabilitation / Renewal

- General level of cost is **$$$**
- Works to rebuild or replace parts or components of an asset, to restore it to a required functional condition and extend its life, which may incorporate some modification.
- Generally involves repairing the asset to deliver its original level of service (i.e. milling and paving of roads) without resorting to significant upgrading or replacement, using available techniques and standards.

Replacement

- General level of cost is **$$$$$**
- The complete replacement of an asset that has reached the end of its life, so as to provide a similar, or agreed alternative, level of service.
- Existing asset disposal is generally included.

Risk Management Strategies

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

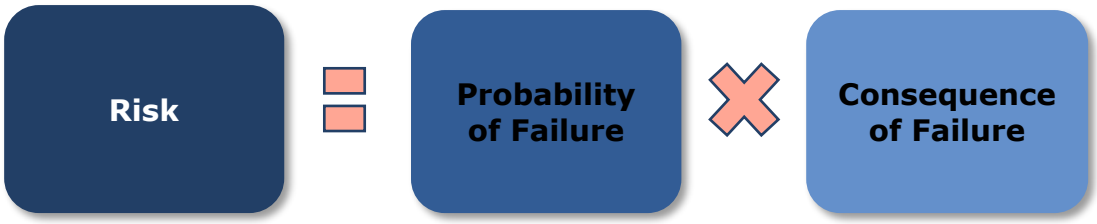
By identifying the various impacts of asset failure and the likelihood that it will fail, risk management strategies can identify critical assets, and determine where maintenance efforts, and spending, should be focused.

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

Risk is a product of two variables: the probability that an asset will fail, and the resulting consequences of that failure event. It can be a qualitative measurement, (low, medium, high) or quantitative measurement (1-5), that can be used to rank

assets and projects, identify appropriate lifecycle strategies, optimize short- and long-term budgets, minimize service disruptions, and maintain public health and safety.

Figure 6: Risk Equation



Probability of Failure

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

Consequence of Failure

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

Levels of Service

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

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

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

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

Community Levels of Service

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

be used. The community LOS can be found in the Levels of Service subsection within each asset category section.

Technical Levels of Service

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

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

Current and Proposed Levels of Service

Current LOS are the past performance metrics of an asset category up until present day. In contrast, Proposed LOS looks toward the municipality's goal for asset performance by a defined future date.

It is important to note that O. Reg 588/17 does not dictate which proposed LOS metrics municipality's need to strive for. A proposed LOS will be very specific to each community's resident desires, political goals, and financial capacity. This can range from increasing service levels and costs, to maintaining or even reducing current performance in order to mitigate future cost increases. Regardless of the proposed LOS chosen, O. Reg 588/17 requires municipalities to demonstrate the achievability of their selected metrics.

Reinvestment Rate

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

3. Portfolio Overview

3.1. Asset Hierarchy and Data Classification

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

Table 2 Asset Hierarchy

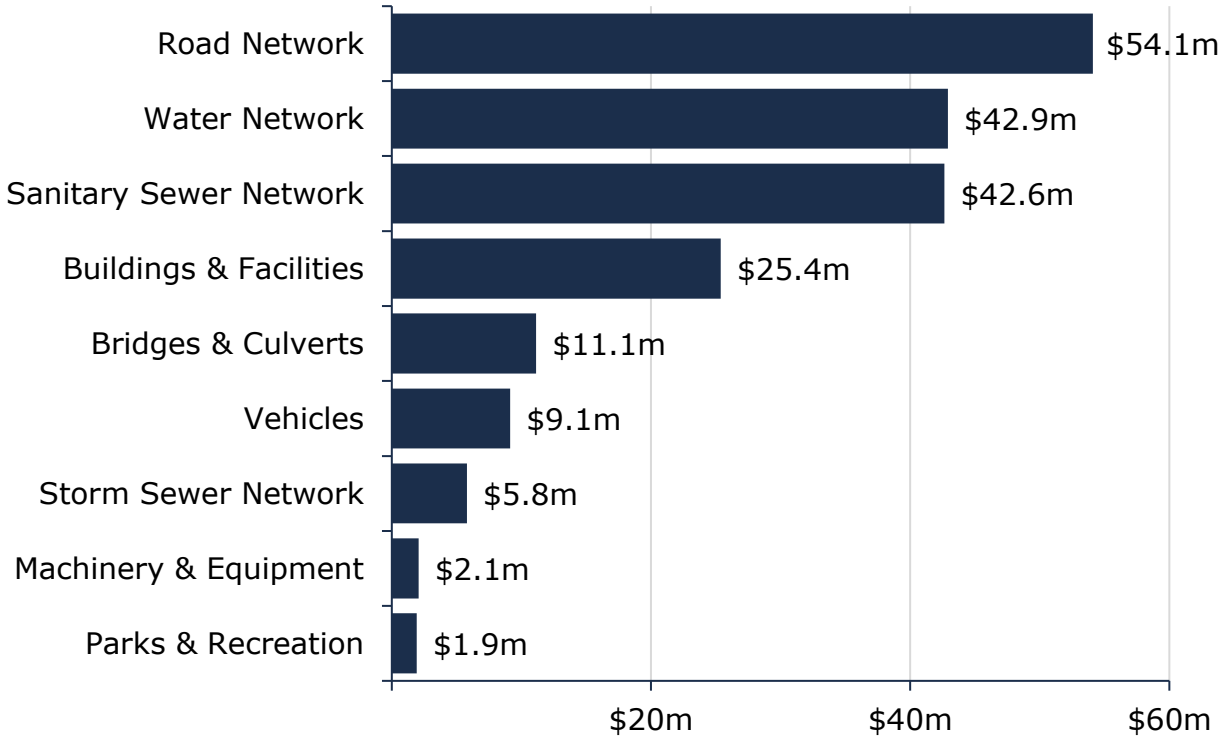
•Paved Roads •Surface Treated Roads •Gravel Roads •Streetlights •Sidewalks •Cross Walks **Road Network**	•Bridges •Culverts •Non – OSIM Culverts **Bridges & Culverts**	•Hydrants •SCADA System •Water Mains •Water Meters •Water Tower •Well No 1 •Well No 2 •Water Treatment Plant **Water Network**
•Sanitary Maintenance Holes •Sanitary Sewers •SCADA System •Sanitary Treatment Plant **Sanitary Sewer Network**	•Storm Sewer •Storm Structures **Storm Sewer Network**	•Arena •Buildings Over 1000 Square Feet •Buildings Under 1000 Square Feet **Buildings & Facilities**
•Athletic Fields •Bike Paths/ Walking Trails •Parking Lots •Parks •Playground Equipment •Retention Ponds •Tennis Courts **Parks & Recreation**	•Building •Community Services •Fire •Public Works **Vehicles**	•CCTV •Community Services •Computer Systems/ Software •Fire Department Equipment •LED Sign •Public Works Equipment **Machinery & Equipment**

3.2. State of the Infrastructure

3.2.1 Replacement Cost

All Cramahe' asset categories have a total replacement cost of $195 million based on available inventory data. This total was determined based on a combination of user-defined costs and historical cost inflation. This estimate reflects replacement of historical assets with similar, not necessarily identical, assets available for procurement today.

Figure 7: Portfolio Replacement Value

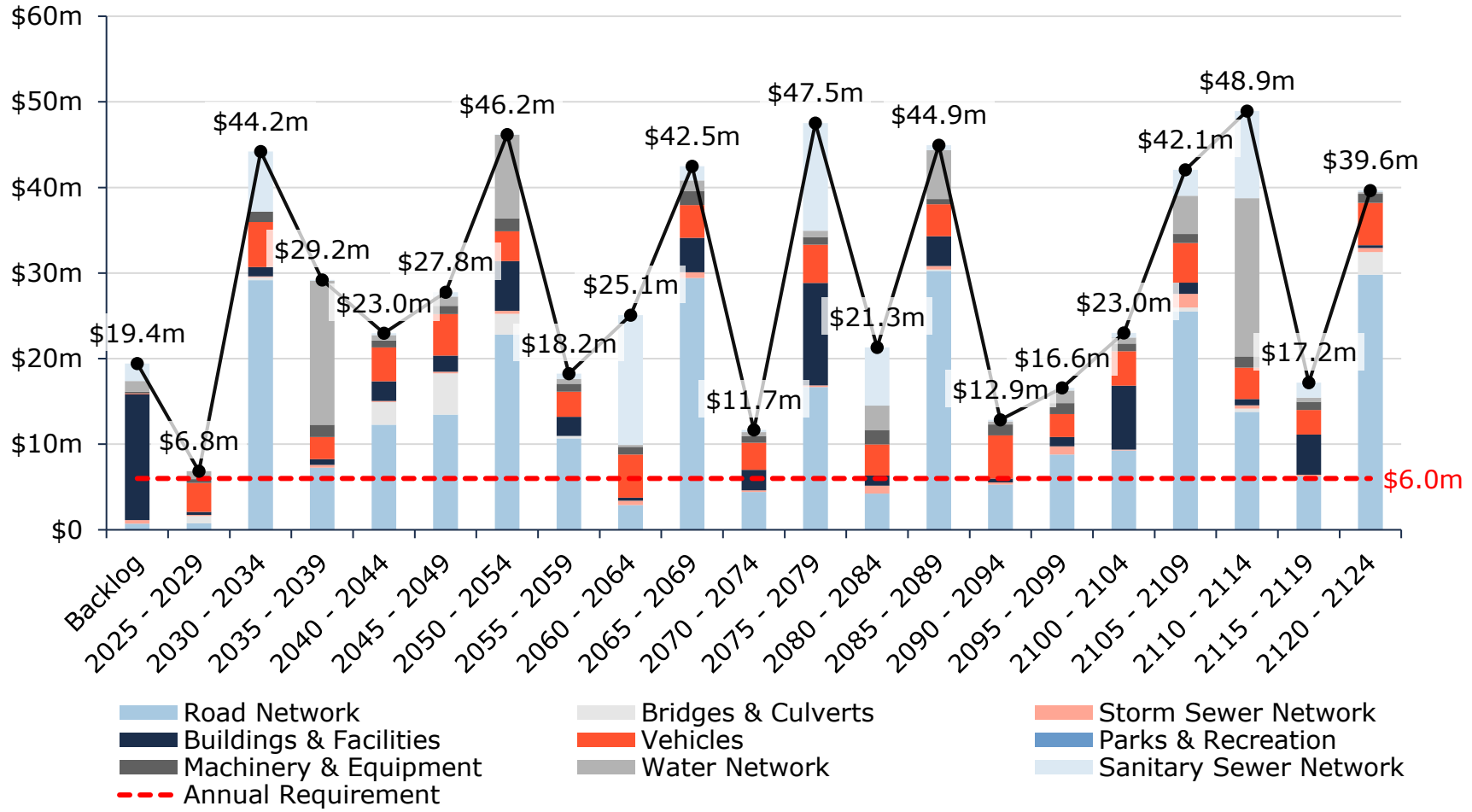


3.2.2 Forecasted Capital Requirements

Aging assets require maintenance, rehabilitation, and replacement. Figure 7 below illustrates the cyclical short-, medium- and long-term infrastructure replacement requirements for all asset categories analyzed. On average, $6.0 million is required each year to remain current with capital replacement needs for Cramahe' asset portfolio (red dotted line).

Although actual spending may fluctuate substantially from year to year, this figure is a useful benchmark for annual capital expenditure targets (or allocations to reserves) to ensure projects are not deferred and replacement needs are met as they arise. This figure relies on age and available condition data. Based on the current replacement cost of the portfolio, estimated at $195.1 million, this represents an annual target reinvestment rate of 3.1%

Figure 8: Forecasted Capital Requirements



The chart also illustrates a backlog of $19.4 million, comprising assets that remain in service beyond their estimated useful life. It is unlikely that all such assets are in a state of disrepair, requiring immediate replacements or major renewals. This makes targeted and consistent condition assessments integral.

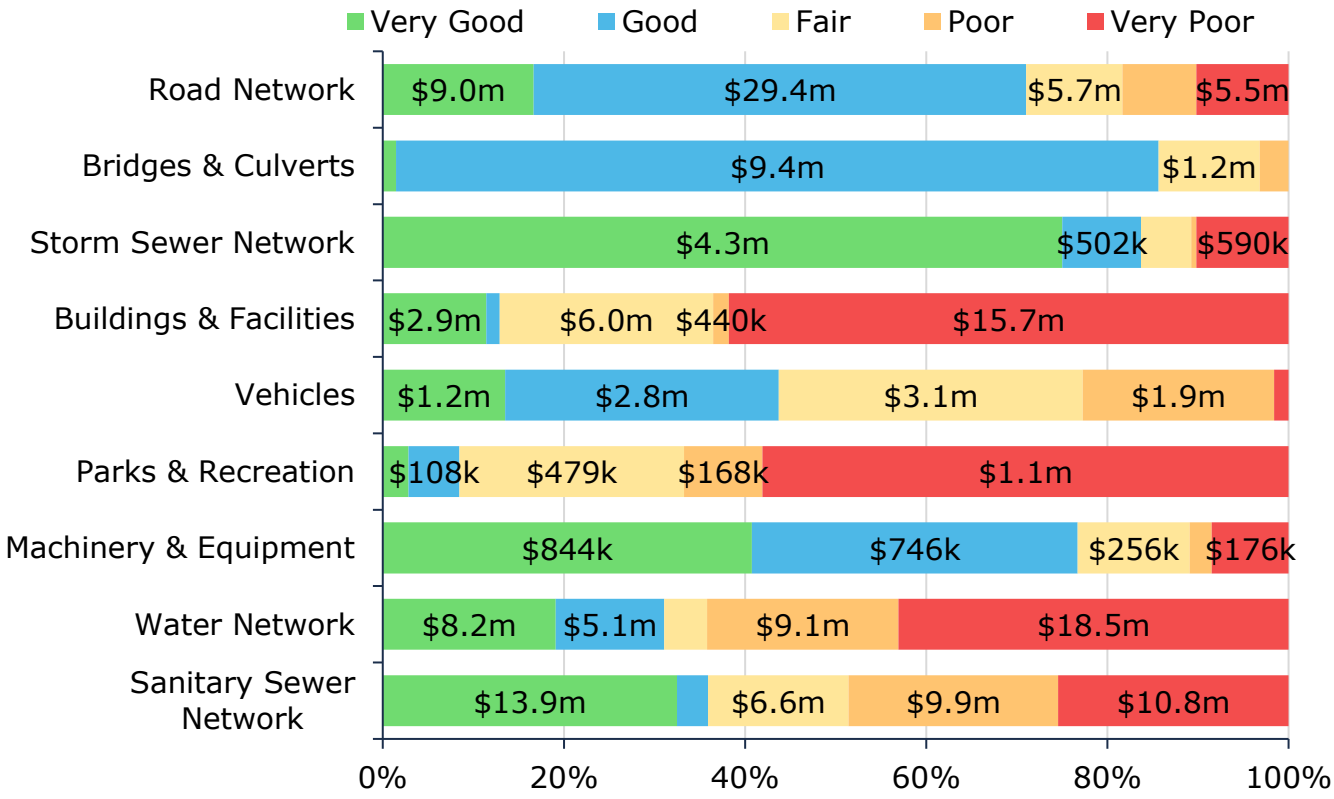
Risk frameworks, proactive lifecycle strategies, and levels of service targets can then be used to prioritize projects, continuously refine estimates for backlogs and ongoing capital needs and help select the right treatment for each asset.

3.2.3 Condition of Asset Portfolio

The current condition of the assets is central to all asset management planning. Collectively, 60% of assets in Cramahe are in fair or better condition. This estimate relies on both age-based and field condition data.

Assessed condition data is available for bridges and culverts, road network, vehicles and most machinery and equipment 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.

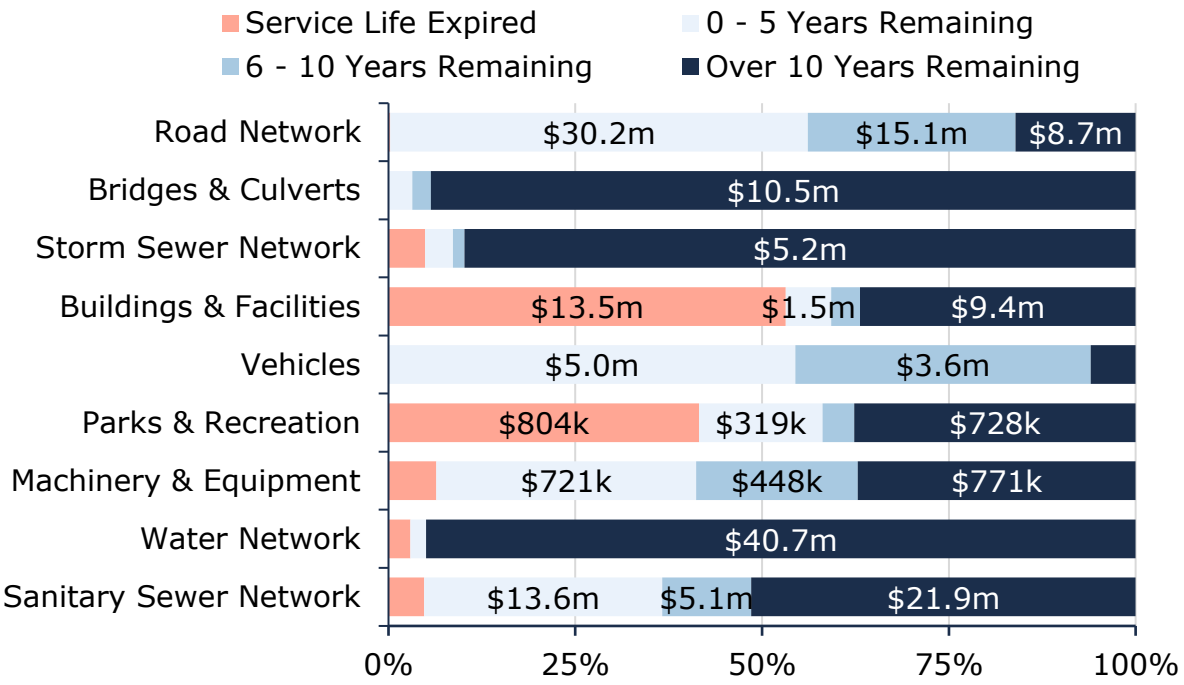
Figure 9: Asset Condition by Asset Category



3.2.4 Service Life Remaining

Based on asset age, available assessed condition data and estimated useful life, 50% of the Township's assets will require rehabilitation/replacement within the next 10 years. Details of the capital requirements are identified in each asset section.

Figure 10: Service Life Remaining by Asset Category



3.2.5 Risk & Criticality

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

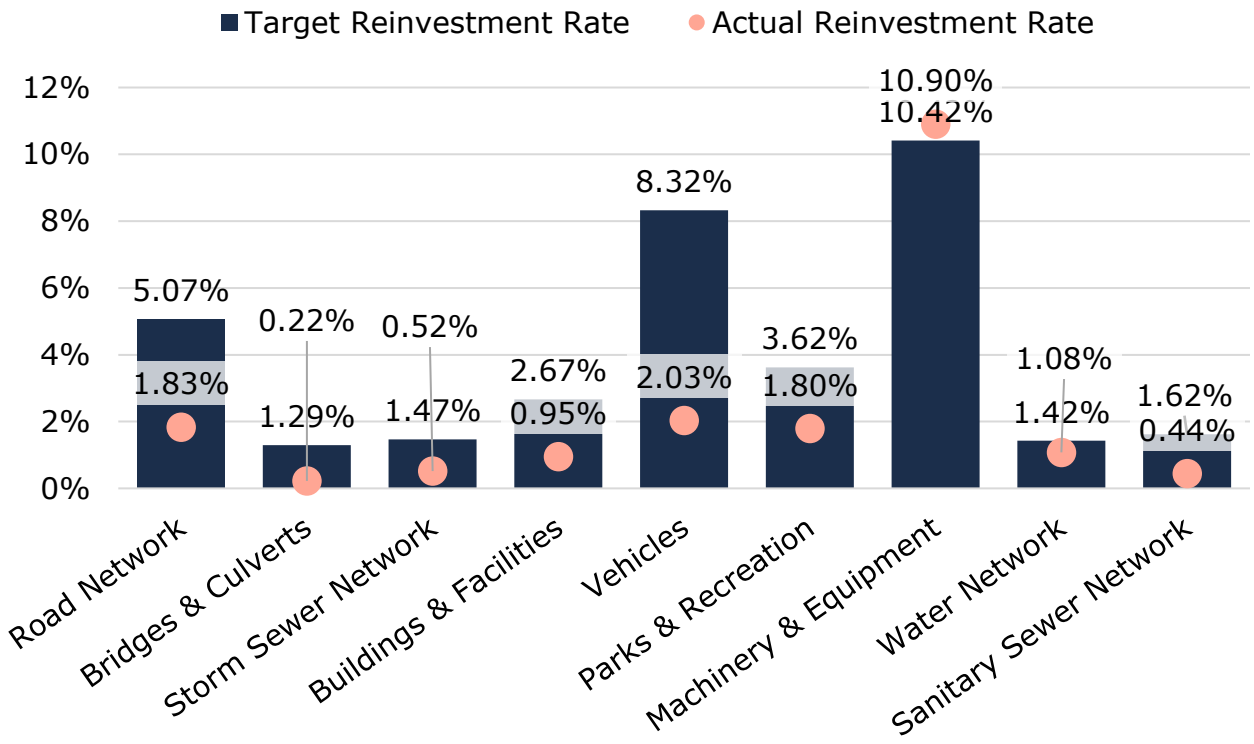
Figure 11: Overall Asset Risk Breakdown

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

3.2.6 Reinvestment Rate

The graph below depicts funding gaps or surpluses by comparing target vs actual reinvestment rate. To meet the long-term replacement needs, the Township is recommended to be allocating approximately $6.0 million annually, for a target reinvestment rate of 3.1%. Actual annual spending on infrastructure totals approximately $2.4 million, for an actual reinvestment rate of 1.2%.

Figure 12: Target vs Actual Reinvestment Rates



Proposed Levels of Service

4. Proposed Levels of Service

4.1. Proposed Levels of Service Overview

4.1.1 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 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.

Additionally, a lifecycle management and financial strategy to support these LOS must be identified, covering a 10-year period and including:

1. Identification of lifecycle activities needed to provide the proposed LOS with consideration for:
    - Full lifecycle of assets.
    - Lifecycle activities options available to meet proposed LOS.
    - Risks associated with the options identified in sub-paragraph B, above.
    - 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.

4.1.2 Methodology

Target levels of service for the Township have been developed through comprehensive engagement with Township 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.

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.

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.

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.

4.1.3 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.

4.2. Proposed Levels of Service Analysis

4.2.1 Community Engagement Survey

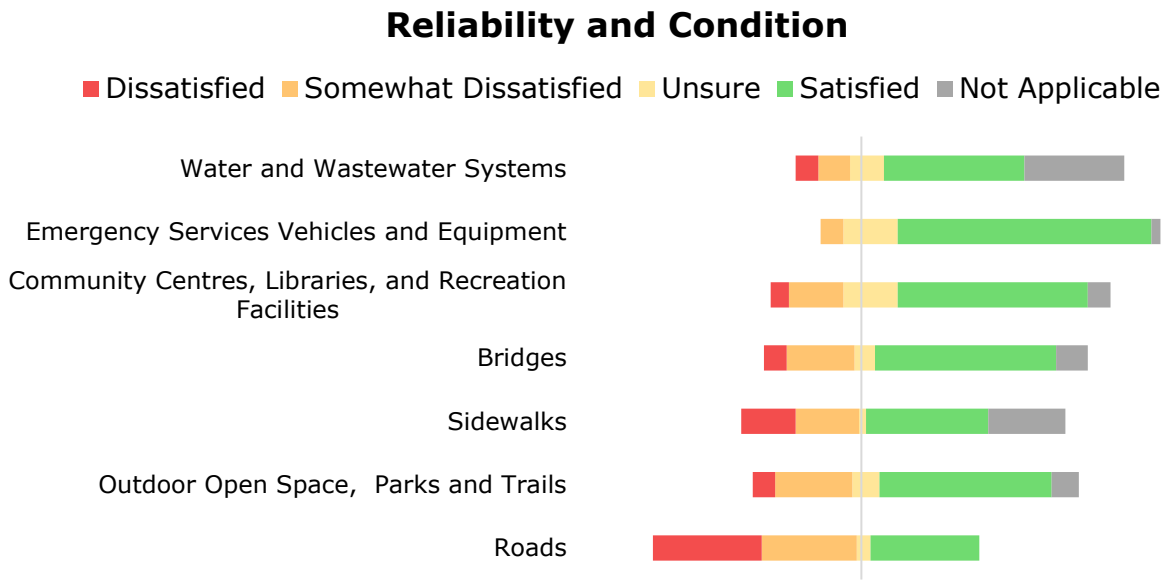
As part of the development of the Asset Management Plan, the Township of Cramahe conducted a community engagement survey to gather feedback on current service levels. Community input has been crucial in ensuring that the proposed Levels of Service align with both community expectations and municipal goals. The survey captured a broad range of responses, with the participants equally distributed at rural and urban areas at 45% each followed by the semi-rural (10%).

Survey participants were asked to rate their satisfaction with a range of municipal infrastructure types in terms of availability, reliability and condition, and safety.

The results show generally high satisfaction across all categories, particularly for critical services such as water, wastewater, stormwater, transportation, building and emergency services:

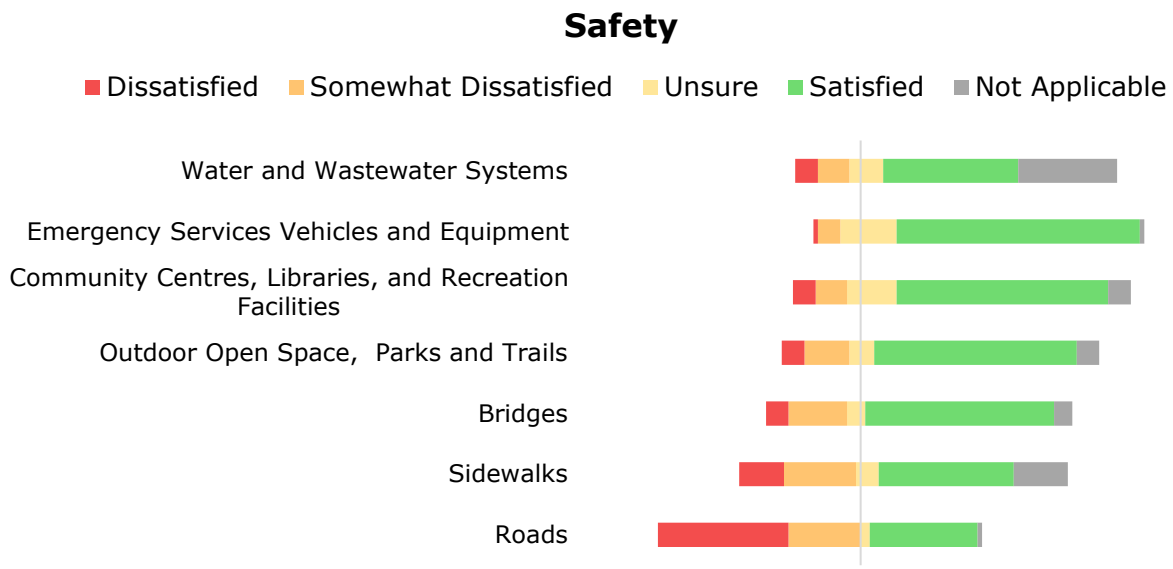
- Reliability and Condition
  - An average of 52% of respondents showed satisfaction for the services, especially for emergency services (79%), however respondents were unsatisfied with roads (34%) and sidewalks (38%).

Figure 13: Community Engagement Responses – Question 10



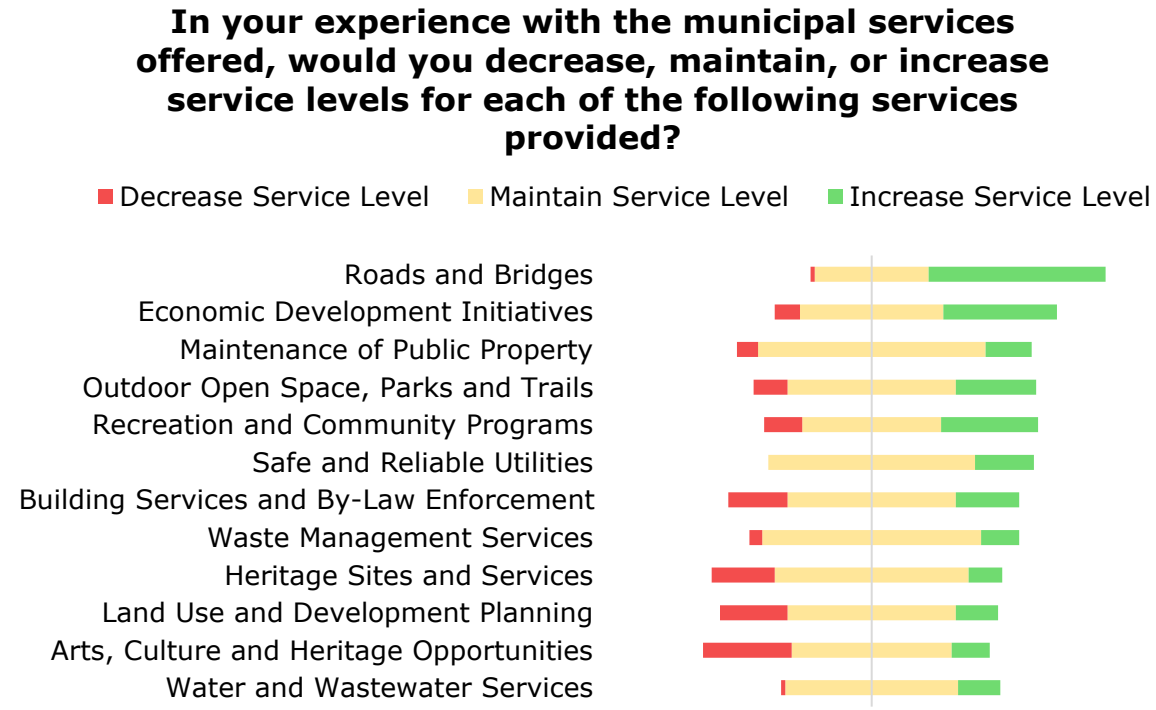
- Safety
  - An average of 56% of respondents showed satisfaction for the services, especially for emergency services (77%), however respondents were unsatisfied with roads (34%), water and wastewater systems (43%).

Figure 14: Community Engagement Responses – Question 11



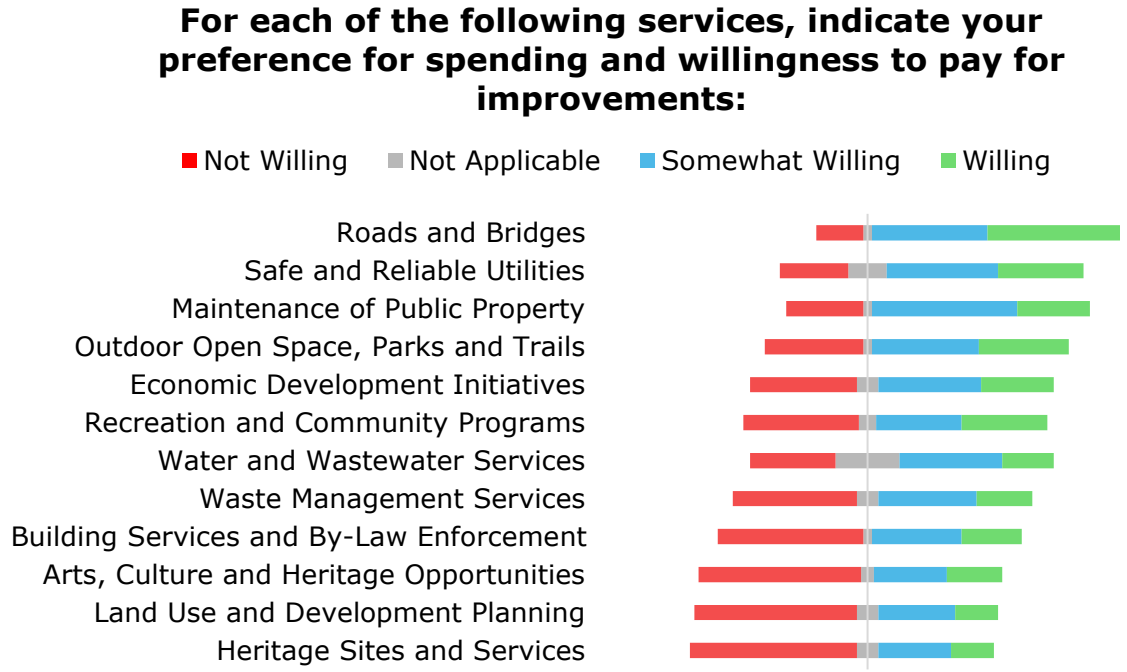
When asked about service levels, 82% of respondents preferred to either maintain or increase them across all service categories. For roads and bridges, 60% of respondents wanted to increase service levels while 39% preferred to maintain the current service levels. Only 12% of respondents supported any decrease in these areas, reinforcing the community's strong interest in preserving quality infrastructure and services.

Figure 15: Community Engagement Responses – Question 12



In terms of spending priorities, residents showed the highest willingness to pay for improvements in roads and bridges (82%), maintenance of public property (72%), and outdoor open spaces, parks and trails, and safe and reliable utilities (65%). Conversely, there was less willingness to fund enhancements to heritage sites and services, with only 38% expressing strong support. This suggests a clear preference for prioritizing core infrastructure services that support public safety and essential daily needs.

Figure 16: Community Engagement Responses – Question 13



The engagement results also show that residents place the highest importance on roads and bridges (79%) and emergency services (79%). Maintenance of public property (91%) also ranked mid to high in terms of importance to households.

Overall, the community engagement survey has provided valuable insights into public satisfaction, expectations, and priorities. The findings underscore a strong preference for maintaining essential services and making strategic, sustainable investments in infrastructure. While residents are mindful of costs, there is broad support for funding improvements that protect long-term service delivery and public safety. These insights will directly inform the Township's Asset Management Plan and help guide future infrastructure decisions that reflect both financial responsibility and community values.

4.2.2 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.

While all three scenarios were reviewed, the Township of Cramahe selected the Scenario of 100% funding as their preferred path forward regarding proposed levels of service, which is reflected in the financial strategy and 10-year capital replacement forecasts.

Scenario 1: Achieving Full Funding in 15 Years

Approach: This scenario assumes a phased annual tax increase of approximately 2.2%, 1.3% for water rates over 10 years, and 3.0% for sanitary rates, achieving full funding in 15 years.

Scenario 2: Achieving 75% Funding in 15 Years

Approach: This scenario assumes a phased annual tax increase of approximately 1.4%, 0.2% increase in water rates to achieve 80% funding, and 2.1% for sanitary rates, reaching an overall funding level of 75% within 15 years.

Scenario 3: Achieving 50% Funding in 15 Years

Approach: This scenario assumes a phased annual tax increase of approximately 0.5%, no increase for water rates to maintain the current 75% funding level, and 1.1% for sanitary rates to reach 50% funding within 15 years.

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

Through comprehensive assessment, the following levels of service for 9 asset categories have been developed, aligning with the long-term interests of the Township. Achievability is the key consideration, with measures in place to ensure realistic targets. The Township's financial capacity was thoroughly reviewed, confirming its ability to sustain the proposed service levels. 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.

These funding strategies reflect the Township's consideration of long-term service levels, financial capacity, and the risks of underinvestment, as outlined in Section 6.2 of Ontario Regulation 588/17.

4.2.3 Preferred Level of Service Approach and Rationale

The Township of Cramahe has selected a Proposed Level of Service scenario that targets achieving 100% of average annual infrastructure funding requirements over the next 15 years. This commitment reflects the Township's goal of maintaining current levels of service for all residents, while ensuring long-term infrastructure sustainability and resilience.

This approach ensures that the Township plans and budgets for the full lifecycle of its infrastructure assets, thereby avoiding service disruptions, deferred maintenance, and unexpected financial pressures. It aligns with the Township's core values of providing high standards of municipal services and supports the Strategic Plan's priorities of effective governance, reliable service delivery, and resource optimization.

Community engagement and feedback underscore strong support for maintaining current service levels, with residents expressing satisfaction in key areas such as transportation infrastructure, water and wastewater services, and public safety. The Township's strategic goals of resource optimization, financial sustainability, and service delivery improvements are well-served by a full funding approach that promotes stable and predictable investment.

By committing to full funding, Cramahe positions itself to address asset renewal proactively, reduce long-term costs, and ensure infrastructure remains resilient and responsive to the evolving needs of the community. This investment strategy supports maintaining essential services without imposing undue financial burden on residents and users.

The Township also recognizes the need for flexibility to respond to emerging priorities, external funding opportunities, and evolving community needs. Future updates to the Asset Management Plan will allow Cramahe to refine funding strategies to align with its ongoing strategic objectives and operational capacity.

By adopting a full funding strategy, the Township demonstrates its commitment to maintaining high-quality infrastructure and services that support the community's long-term well-being, while fostering accountable and effective governance aligned with its vision of being a welcoming community that provides quality services to its residents.

The following sections provide a detailed analysis of all Level of Service options that were considered by the Township. Each scenario was evaluated based on alignment with community priorities, financial feasibility, long-term sustainability, and the Township's strategic goals. This analysis outlines the potential implications, benefits, and risks associated with each option, offering a transparent overview of the decision-making process that led to the selection of the full funding scenario.

4.3. Scenario 1: Achieving Full Funding in 15 Years

This scenario outlines a phased funding approach, with an annual tax increase of approximately 2.2%, along with 1.3% increases in water rates over 10 years and 3.0% increases in sanitary rates, aiming to achieve full funding within 15 years. The approach focuses on ensuring the Township can fully fund its infrastructure needs over a set period.

The following analysis considers the affordability, achievability, and associated risks of this scenario, evaluating how the proposed funding strategy aligns with both community expectations and long-term infrastructure sustainability.

4.3.1 Lifecycle Changes

Increasing capital investment to achieve full funding over 15 years would significantly improve the Township's ability to manage its infrastructure assets. This phased approach would allow for incremental funding increases, enabling proactive maintenance, timely upgrades, and early replacements, which would reduce the need for emergency repairs and extend asset lifecycles. The following lifecycle activities would be undertaken:

- Road Network
    - Implement full road lifecycle model (maintenance → rehabilitation → reconstruction) with cost forecasting.
    - Secure full 66 ft right-of-way for all future reconstructions.
    - Align reconstruction plans with County and growth forecasts.
- Bridges and Culverts
    - Address all OSIM recommendations, without deferral.
- Water and Sanitary Network
    - Fully integrate rate study outcomes into long-term financial and capital planning.
    - Integrate new developments through developer-paid upgrades with lifecycle alignment.
    - Move toward proactive asset management rather than reactive fixes.
- Storm Sewer System
    - Complete and trust a new stormwater management study.
    - Apply a dedicated stormwater levy to fund drainage improvements.
    - Use asset data to prioritize upgrades in flood-prone areas.
- Buildings & Facilities
    - Implement 20-year building renewal plan with reserve funding strategy.
    - Fund lifecycle replacements (roofing, HVAC) based on BCA-recommended intervals.
- Parks & Recreation

- Implement Parks Master Plan update with lifecycle-based replacement schedules.
- Create dedicated renewal reserves based on lifecycle cost models.
- Ensure AODA compliance Township-wide.

- Machinery & Equipment and Vehicles
  - Implement lifecycle-based renewal strategy across all departments.
  - Optimize Vehicles size and replacement cycles to reduce operating costs.

4.3.2 Sustainability and Feasibility of Proposed Service Levels

Of the three scenarios analyzed, Scenario 1 requires the highest tax increase. Reaching full funding immediately would require an increase of 38.8% in tax revenue, 13.3% increase in water rates, and 55.3% increase in sanitary rates. This is not reasonable or realistic to achieve in a short period of time. With the recommended implementation timeframe of 15 years, tax revenue would be increased gradually from $7.6 million to $10.6 million, water revenue would be increased gradually from $1.1 million to $1.3 million over 10 years, and sanitary revenue from $905 thousand to $1.4 million.

Based on maintaining current funding levels and existing sustainable grant funding, the available capital funding over the next 10 years for Scenario 1 is indicated in the table below:

Table 3: Scenario 1 Available Capital Funding Source Over Next 10 Years

Source	Available Capital Funding									
	2026	**2027**	**2028**	**2029**	**2030**	**2031**	**2032**	**2033**	**2034**	**2035**
Tax Revenue	$2.0m	$2.2m	$2.4m	$2.6m	$2.8m	$2.9m	$3.1m	$3.3m	$3.5m	$3.7m
Water Rates	$477k	$492k	$507k	$522k	$537k	$552k	$568k	$584k	$600k	$611k
Sanitary Rates	$92k	$118k	$144k	$172k	$200k	$229k	$259k	$290k	$322k	$354k

The above table accounts for both current and future expenditures in order to achieve and maintain the service level option. This requires a combination of capital spending and saving (i.e. reserves) to ensure future large expenditures can be financed.

4.3.3 Risk Analysis

Evaluating the risks associated with each service level option is essential for balancing infrastructure needs, financial sustainability, and community

expectations. By identifying and assessing these risks, the Township can make informed decisions that support long-term service reliability.

Figure 17: Scenario 1 Risk Analysis

Scenario 1 Risks

- Delayed Improvement: Improvements in overall asset condition and service levels may be limited in the short term, as funding increases are spread out over a longer timeline. However, incremental gains will be made as investment gradually ramps up.
- Infrastructure Backlog: The existing infrastructure backlog may grow during the early years of the phase-in, particularly if asset deterioration outpaces funding increases. This could lead to elevated future costs and greater risk of service disruption.
- Resource Constraints: Scaling up to full funding will require the Township to increase internal capacity for planning, procurement, and project delivery. Without sufficient resources, the effectiveness of increased investment may be reduced.
- Public Support: Although the required tax or rate increases are technically feasible, sustained support from the community may be difficult to maintain over the full 15-year period, particularly if residents do not see immediate improvements or are sensitive to cost-of-living concerns.

4.4. Scenario 2: Achieving 75% Funding in 15 Years

This scenario outlines a phased funding approach, with an annual tax increase of approximately 1.4%, along with 0.2% increases in water rates, and 2.1% increases in sanitary rates, aiming to achieve a 75% funding level within 15 years.

The following analysis considers the affordability, achievability, and associated risks of this scenario, evaluating how the proposed funding strategy aligns with both community expectations and long-term infrastructure sustainability.

4.4.1 Lifecycle Changes

Increasing capital investment to achieve 75% funding over 15 years would improve the Township's ability to manage its infrastructure assets. This phased approach would allow for incremental funding increases, enabling proactive maintenance, timely upgrades, and early replacements, which would reduce the need for emergency repairs and extend asset lifecycles. The following lifecycle activities would be undertaken:

- Road Network
    - Begin prioritizing full reconstruction (including base, drainage, sidewalks) based on road condition and service requests.
    - Begin acquiring right-of-way where possible for future improvements.
    - Patch and seal cracks based on pavement lifecycle stage.
- Bridges and Culverts
    - Prioritize low-cost rehabilitation based on inspection recommendations.
- Water and Sanitary Network
    - Implement scheduled replacement of aging components based on expected lifespans and condition.
    - Begin removing or consolidating manholes to reduce I&I.
    - Use rate study to develop long-term upgrade program.
- Storm Sewer System
    - Upsize or repair storm lines based on flooding frequency and assessment results.
    - Conduct storm camera assessments and condition ratings.
- Buildings & Facilities
    - Update Building Condition Assessments.
    - Prioritize repairs and energy-efficient retrofits.
- Parks & Recreation
    - Plan and schedule lifecycle replacements for key facilities.
    - Begin asset tracking of major park features (surfacing, equipment age).
    - Develop reserve fund and schedule lifecycle replacements (every 15–20 years for playgrounds).

- Machinery & Equipment and Vehicles
    - Follow replacement schedules for critical equipment (graders, mowers).
    - Introduce a Vehicles renewal tracking process.

4.4.2 Sustainability and Feasibility of Proposed Service Levels

Of the three scenarios analyzed, Scenario 2 requires a moderate tax increase. Reaching 75% of full funding immediately would require an increase of 23.4% in tax revenue, 2.4% increase in water rates, and 36.2% increase in sanitary rates. This is not reasonable or realistic to achieve in a short period of time. With the recommended implementation timeframe of 15 years, tax revenue would be increased gradually from $7.6 million to $9.4 million, water revenue would be increased gradually from $1.11 million to $1.15 million over 10 years, and sanitary revenue would be increased gradually from $905 thousand to $1.2 million.

Based on maintaining current funding levels and existing sustainable grant funding, the available capital funding over the next 10 years for Scenario 2 is indicated in the table below:

Table 4: Scenario 2 Available Capital Funding Source Over Next 10 Years

Source	Available Capital Funding									
	2026	**2027**	**2028**	**2029**	**2030**	**2031**	**2032**	**2033**	**2034**	**2035**
Tax Revenue	$2.0m	$2.1m	$2.2m	$2.3m	$2.4m	$2.5m	$2.7m	$2.8m	$2.9m	$3.0m
Water Rates	$466k	$469k	$473k	$476k	$479k	$483k	$486k	$490k	$493k	$489k
Sanitary Rates	$83k	$101k	$119k	$137k	$156k	$174k	$194k	$213k	$233k	$254k

The above table accounts for both current and future expenditures in order to achieve and maintain the service level option. This requires a combination of capital spending and saving (i.e. reserves) to ensure future large expenditures can be financed.

4.4.3 Risk Analysis

Evaluating the risks associated with each service level option is essential for balancing infrastructure needs, financial sustainability, and community expectations. By identifying and assessing these risks, the Township can make informed decisions that support long-term service reliability.

Figure 18: Scenario 2 Risk Analysis

Scenario 2 Risks

- Delayed Improvement: Because the Township is targeting 75% of full lifecycle funding, it may not be able to achieve optimal asset condition or service levels, even after the phase-in period is complete. While gradual improvements will occur over time, certain non-critical assets may continue to degrade or be deferred beyond ideal timelines.
- Infrastructure Backlog: Without immediate funding, there is a risk that the existing infrastructure backlog could continue to grow during the phase-in period, potentially leading to higher long-term costs and service disruptions.
- Resource Constraints: Implementing and maintaining this service level option may stretch the Township's operational capacity, particularly if there are limited resources or capacity to handle the expanded scope of work over the long term.
- Taxation Increase: While these increases are technically achievable, there’s a possibility that residents may not fully support sustained increases over the long term, especially given the preference for moderate tax rates and the general satisfaction with current services.

4.5. Scenario 3: Achieving 50% Funding in 15 Years

This scenario involves a phased tax increase of approximately 0.5% annually, no increase in water rates and 1.1% increase in sanitary rates, aiming to achieve 50% funding within 15 years. The goal of this scenario is to provide a lower tax burden while making incremental progress toward meeting the Township's infrastructure funding needs.

The following analysis considers the affordability, achievability, and associated risks of this scenario, evaluating how the proposed funding strategy aligns with both community expectations and long-term infrastructure sustainability.

4.5.1 Lifecycle Changes Required

Increasing capital investment to achieve 50% funding would lead to gradual improvements in managing infrastructure assets. This level of investment would support some proactive maintenance and early replacements but may not fully address aging infrastructure as effectively. Overall, this scenario would maintain some infrastructure reliability, but service delivery improvements would be less significant. The following lifecycle activities would be undertaken:

- Road Network
    - Maintain current 5–7 year surface treatment schedule.
    - Ensure roads remain drivable during construction.
    - Reconstruct sidewalks at minimum 5 ft width where required.
    - Conduct visual condition assessments periodically.
- Bridges and Culverts
    - Maintain bridge closures safely (signage, barriers).
    - Address only the most critical OSIM recommendations, with many upgrades and lower-risk repairs deferred.
- Water and Sanitary Network
    - Conduct periodic camera inspections.
    - Respond to service issues and failures reactively.
    - Perform camera inspections for infiltration monitoring.
- Storm Sewer System
    - Continue culvert and catch basin maintenance.
    - Drainage mapping and basic monitoring of problem areas.
- Buildings & Facilities
    - Address complaints and perform essential repairs.
    - Continue energy-efficiency upgrades when possible.
- Parks & Recreation
    - Maintain safety and accessibility with basic upkeep.
    - Continue applying for grants for key improvements.
- Machinery & Equipment and Vehicles

- Maintain basic operability of current Vehicles and equipment.
- Use refurbished or used vehicles where possible.

4.5.2 Sustainability and Feasibility of Proposed Service Levels

Scenario 3 requires a conservative tax increase, requiring the lowest increase of the three scenarios analyzed. Reaching 50% of full funding immediately would require an increase of 8.2% in tax revenue, no increase in water rates, and 17.2% increase in sanitary rates. This is not reasonable or realistic to achieve in a short period of time. With the recommended implementation timeframe of 15 years, tax revenue would be increased gradually from $7.6 million to $7.2 million, water revenue would remain constant at $1.1 million, and sanitary revenue would be increased gradually from $905 thousand to $1.1 million.

Based on maintaining current funding levels and existing sustainable grant funding, the available capital funding over the next 10 years for Scenario 3 is indicated in the table below:

Table 5: Scenario 3 Available Capital Funding Source Over Next 10 Years

Source	Available Capital Funding									
	2026	**2027**	**2028**	**2029**	**2030**	**2031**	**2032**	**2033**	**2034**	**2035**
Tax Revenue	$1.9m	$1.9m	$2.0m	$2.0m	$2.1m	$2.1m	$2.2m	$2.2m	$2.2m	$2.3m
Water Rates	$463k	$463k	$463k	$463k	$463k	$463k	$463k	$463k	$463k	$463k
Sanitary Rates	$75k	$84k	$94k	$103k	$112k	$122k	$131k	$141k	$151k	$161k

The above table accounts for both current and future expenditures in order to achieve and maintain the proposed levels of service. This requires a combination of capital spending and saving (i.e. reserves) to ensure future large expenditures can be financed.

4.5.3 Risk Analysis

Evaluating the risks associated with each service level option is essential for balancing infrastructure needs, financial sustainability, and community expectations. By identifying and assessing these risks, the Township can make informed decisions that support long-term service reliability.

Figure 19: Scenario 3 Risk Analysis

Scenario 3 Risks

- Deferred Maintenance and Backlog Growth: With minimal increases in funding, asset replacements and upgrades may be delayed, contributing to a growing infrastructure backlog. This can lead to higher long-term costs, unplanned repairs, and reduced asset performance.
- Regulatory and Compliance: Insufficient investment may hinder the Township's ability to meet future regulatory requirements, posing risks to compliance and public safety.
- Financial Instability: Continued reliance on external grants and limited tax increases could create financial instability, delaying critical projects and impacting the ability to maintain service levels.
- Taxation Increase: While the annual increases are the most manageable, it may not provide enough funding to meet future service demands. This scenario may be more acceptable in the short term, but could become unsustainable in the long run if infrastructure needs continue to rise.
- Reserve Funding: Drawing on asset management reserves to address funding gaps may reduce the Township’s capacity to respond to future infrastructure needs and achieve long-term goals.

Categorical Analysis

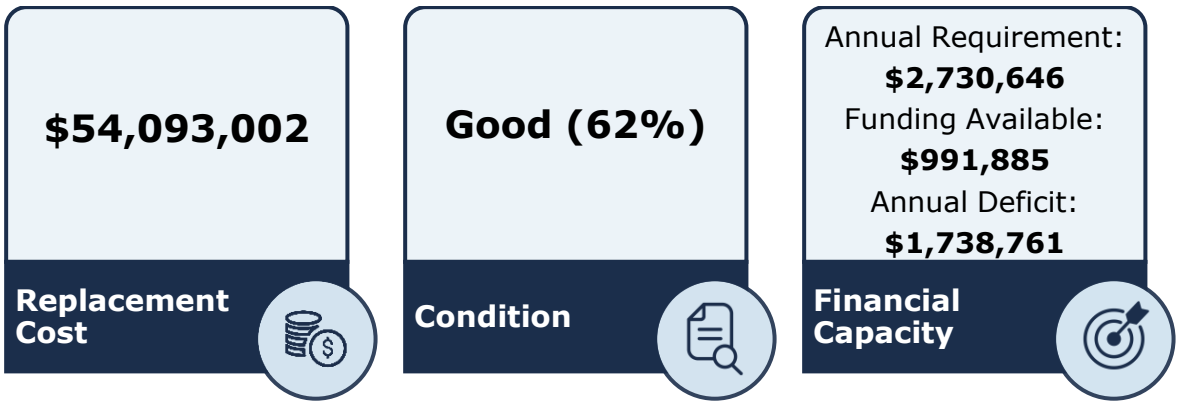
5. Road Network

5.1. State of the Infrastructure

Cramahe's road network is the largest component of its infrastructure portfolio, with a replacement cost of $54.1 million. It includes primarily surface treated roads, along with gravel and paved roads, as well as supporting assets like streetlights, crosswalks, and sidewalks.

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

Figure 20: Road Network State of the Infrastructure



5.2. Inventory & Valuation

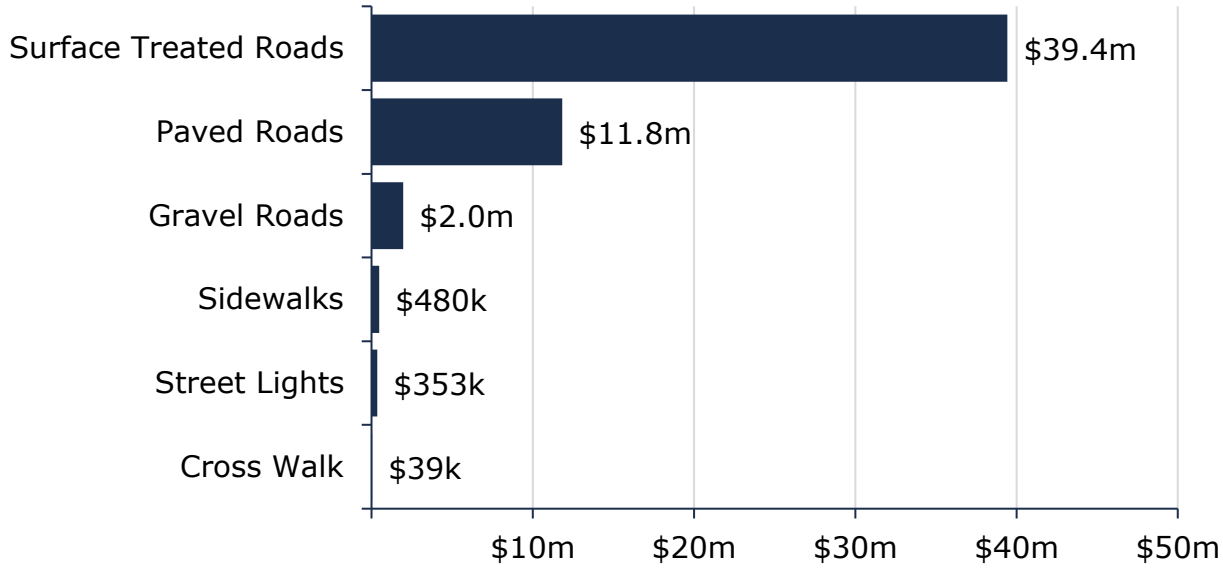
The table below includes the quantity, replacement cost method and total replacement cost of each asset segment in the Township's Road Network inventory.

Table 6: Road Network Detailed Asset Inventory

Segment	Quantity	Unit of Measure	Primary Replacement Cost Method	Replacement Cost
Cross Walk	15	Meters	CPI	$39,133
Gravel Roads	76,510	Meters	User-Defined	$1,965,250
Paved Roads	21,505	Meters	User-Defined	$11,828,006
Sidewalks	2,174	Meters	CPI	$479,535
Streetlights	489	Assets	CPI	$352,664
Surface Treated Roads	115,968	Meters	User-Defined	$39,428,415
Total				**$54,093,002**

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

Figure 21: Road Network Replacement Value

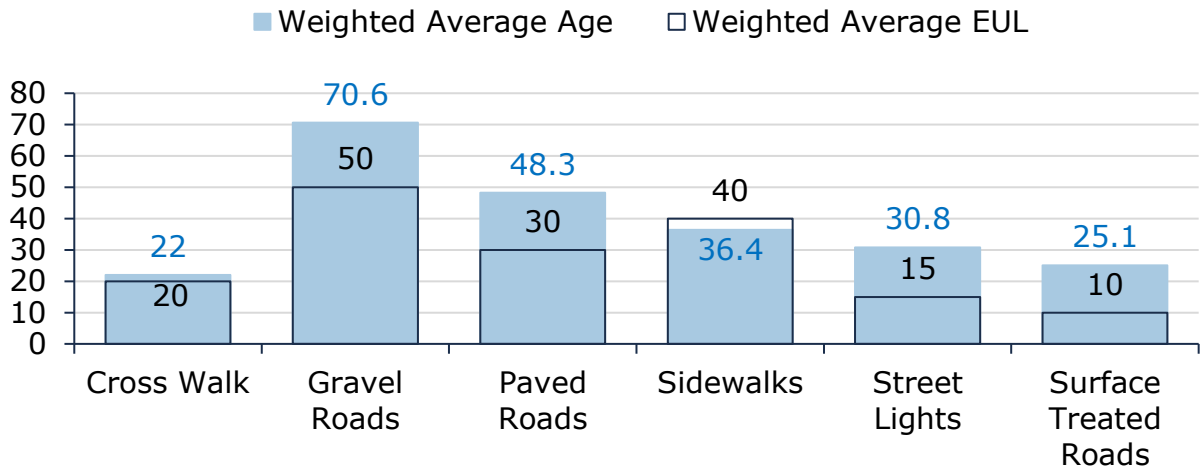


Each asset's replacement cost should be reviewed periodically to determine whether adjustments are needed to more accurate represent realistic capital requirements.

5.3. Asset Condition & Age

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

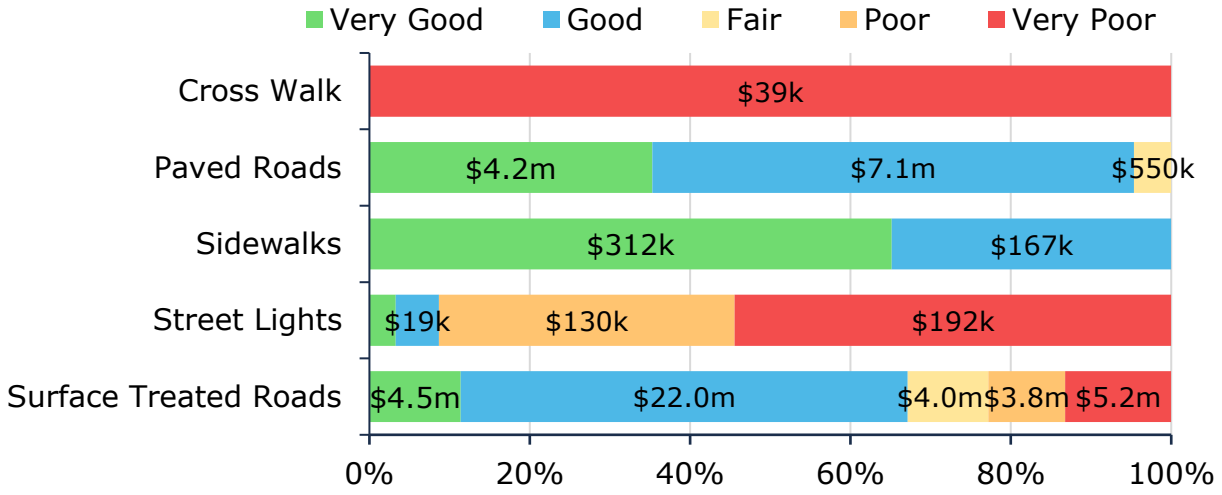
Figure 22: Road Network Average Age vs Average EUL



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

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

Figure 23: Road Network Condition Breakdown



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

5.3.1 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 Township's current approach:

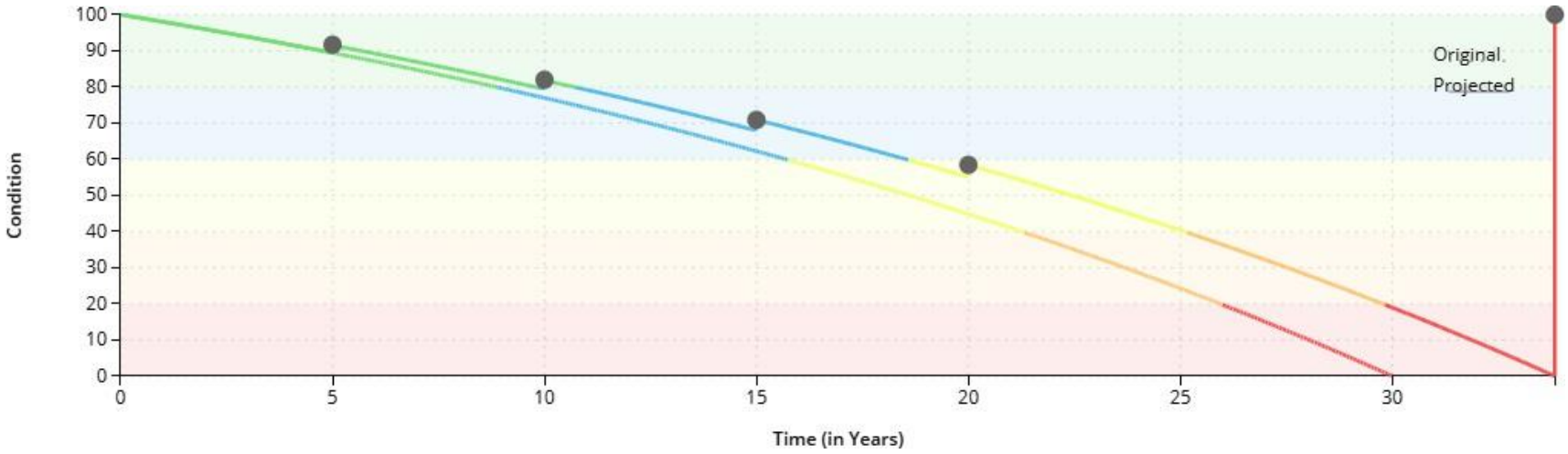
- Inspections are performed on an as needed basis, partially informed by complaints.
- Soil material testing is required in some areas where hazardous material is present.
- A Road Needs Study was completed by external contractors in 2023 that included a detailed assessment of the condition of each road segment
- The Road Needs Study is renewed every five years by external contractors

5.4. Lifecycle Management Strategy

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

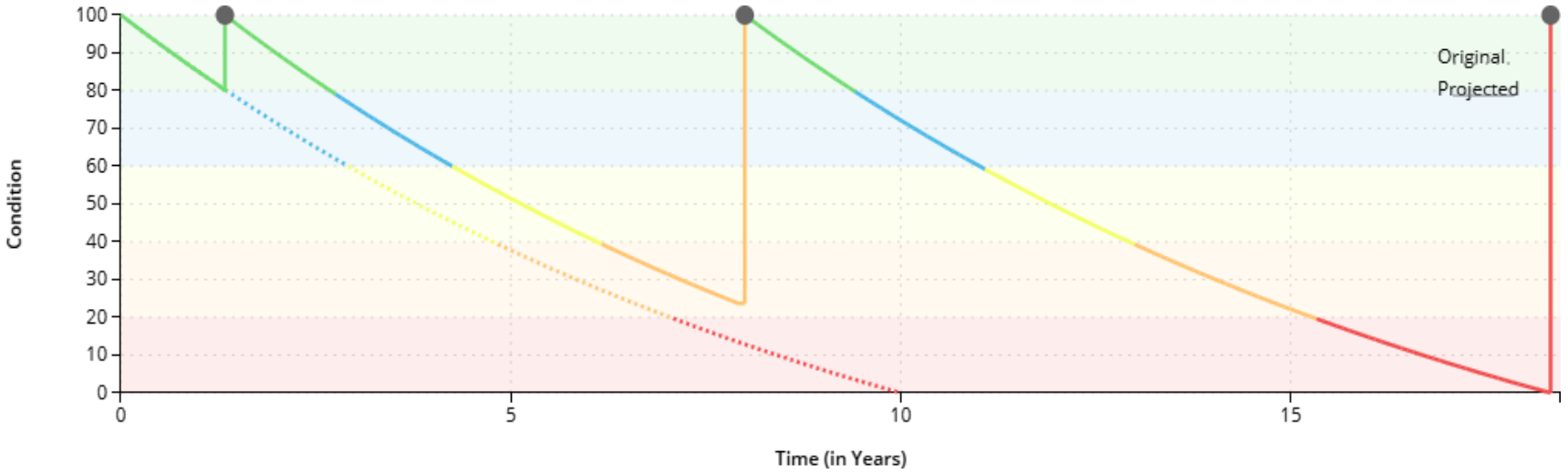
Lifecycle models used to estimate the savings to annual capital requirement are shown below in Figure 24 for Paved (HCB) roads, Figure 25 for Surface Treated Roads and Figure 26 for Gravel Roads.

Figure 24: Paved (HCB) Road Lifecycle Model



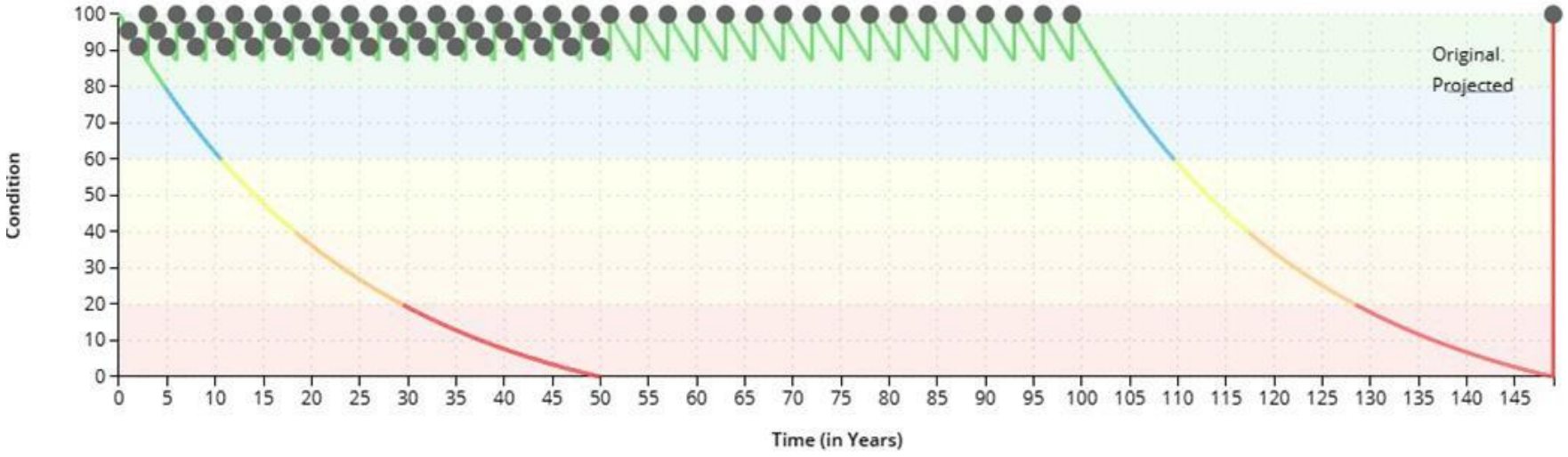
HCB Roads		
Event Name	**Event Class**	**Event Trigger**
Crack Sealing	Preventative Maintenance	Repeated every 5 years 4 times
Full Reconstruction	Replacement	0% Condition

Figure 25: Surface Treated Roads Lifecycle Model



Surface Treated Roads		
Event Name	**Event Class**	**Event Trigger**
Cold Patch / Hot Mix Repairs	Preventative Maintenance	80% Condition
Single Lift Surface Treatment	Rehabilitation	7-8 years
Full Reconstruction	Replacement	0% Condition

Figure 26: Gravel Roads Lifecycle Model



Gravel Roads		
Event Name	**Event Class**	**Event Trigger**
Dust Suppressant	Maintenance	Repeat annually
Grading	Maintenance	Repeat annually
Gravelling – Adding Material	Rehabilitation	Repeat every 3 years[1]

[1] The Unit Cost for re-stoning is $14.93/m. Due to the TCA thresholds set by the Township, gravelling costs are assumed to be operating and excluded from this plan. Future investigation should determine an appropriate portion of gravelling costs to be included as capital.

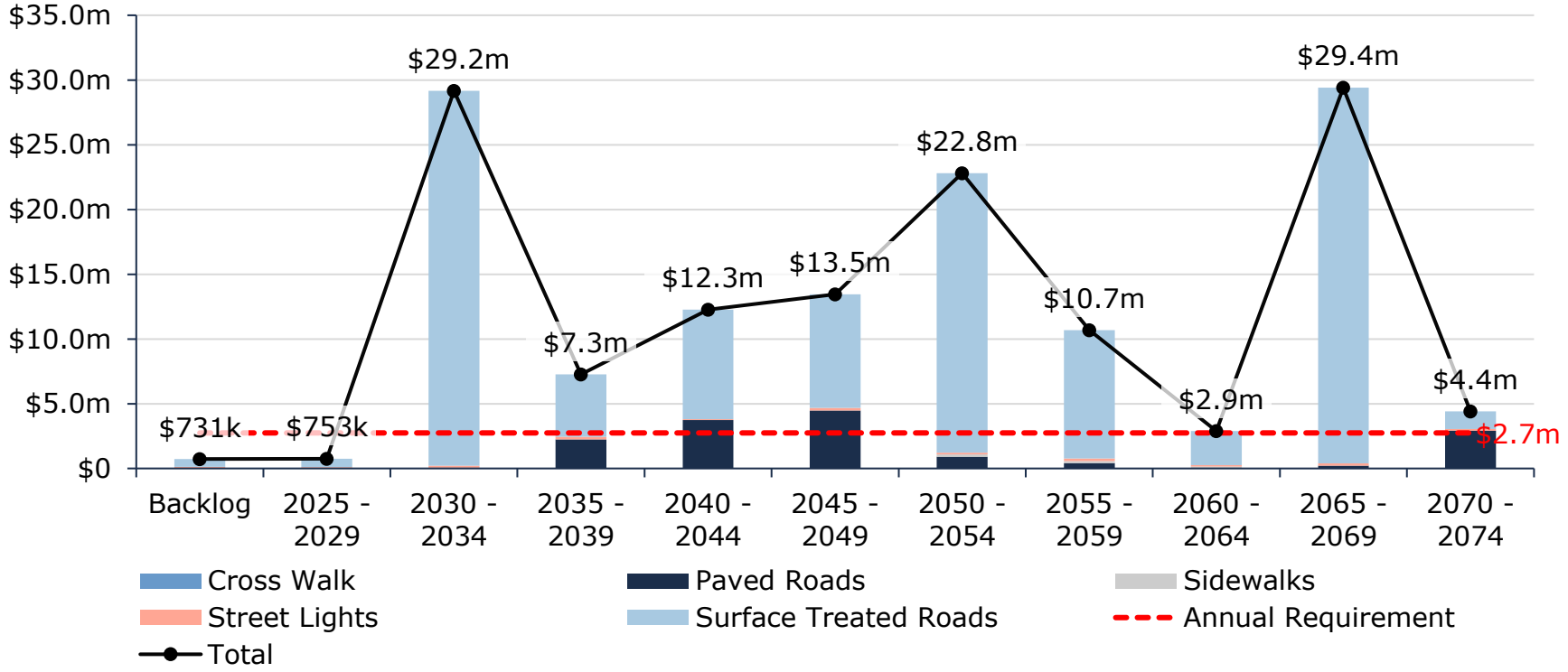
5.5. Forecasted Capital Requirements

The figure below illustrates the cyclical short-, medium- and long-term infrastructure rehabilitation and replacement requirements for the Township's road network. Assuming the end-of-life replacement of assets in this category, the following graph forecasts capital requirements for the road network. This analysis was run until 2074 to capture at least one iteration of replacement for the longest-lived asset in the asset register.

Cramahe' average annual requirements (red dotted line) total $2.7 million for all assets in the road network. Although actual spending may fluctuate substantially from year to year, this figure is a useful benchmark value for annual capital expenditure targets (or allocations to reserves) to ensure projects are not deferred and replacement needs are met as they arise. The chart illustrates capital needs through the forecast period in 5-year intervals.

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

Figure 27: Road Network Forecasted Capital Replacement Requirements



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

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

Table 7 Road Network System-generated 10-Year Capital Costs

Segment	Backlog	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034
Cross Walk	$39k	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Paved Roads	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$55k
Sidewalks	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Street Lights	$92k	$100k	$0	$0	$0	$0	$19k	$130k	$0	$0	$13k
Surface Treated Roads	$600k	$0	$114k	$175k	$67k	$296k	$3.8m	$10.3m	$12.3m	$2.6m	$0
Total	**$731k**	**$100k**	**$114k**	**$175k**	**$67k**	**$296k**	**$3.9m**	**$10.4m**	**$12.3m**	**$2.6m**	**$68k**

5.6. Risk & Criticality

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

Figure 28: Road Network Risk Matrix

1 - 4	5 - 7	8 - 9	10 - 14	15 - 25
Very Low $12,715,786 (24%)	**Low** $9,370,367 (17%)	**Moderate** $7,340,600 (14%)	**High** $14,576,250 (27%)	**Very High** $10,090,000 (19%)

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

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

5.7. Risks to Current Asset Management Strategies

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

Aging Infrastructure

Rapid expansion of the Road Network occurred in the 1950s, resulting in large cohorts of roads now exceeding 70 years of service life. A higher volume of traffic and heavy vehicles accelerate the deterioration of road surfaces. The large historical investments are now coming due for renewal and replacement, requiring either large expenditures or a decrease in service provision. The Township will need to invest approximately $1.1 million, with the Roads network requiring the most capital. Finding a balance between meeting service demands and maintaining affordability will require the Township to employ strategic lifecycle management and prioritization of critical assets.

Climate Change & Extreme Weather Events

The trend of climate change-induced extreme precipitation events is projected to continue. Severe rainfall and drought, or increased temperature can impact service availability and usage. Flooding can tax the existing drainage system and damage roads. The Township maintains a large Road Network that could be impacted from more rapid freeze-thaw cycles, contributing to pavement deterioration. As a result, higher maintenance and rehabilitation requirements are expected to maintain the same level of service, to avoid complaints, liabilities, and larger capital spending. To improve asset resiliency, staff should identify the critical areas and improve drainage through enhanced lifecycle strategies.

5.8. Levels of Service

The following tables identify the Township's metrics to identify their current level of service for the roads.

5.8.1 Community Levels of Service

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

Table 8 Road Network Community Levels of Service

Service Attribute	Qualitative Description	Current LOS
Scope	Description, which may include maps, of the Road Network in the municipality and its level of connectivity	See Appendix B.
Quality	Description or images that illustrate the different levels of road class pavement and sidewalk condition	The Township completed a Road Needs Study in 2023 in coordination with Tatham Engineering Limited. Every road section received a Pavement Condition Index (PCI) score from 1-100. The PCI rates the condition of the surface of the road section. • 0 being the worst possible condition (e.g. an impassable road) • 100 being the best possible condition (e.g. a road in perfect condition)

5.8.2 Technical Levels of Service

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

Table 9 Road Network Technical Levels of Service

Service Attribute	Technical Metric	Current LOS	Proposed LOS (2040)
Accessible & Reliable	Lane-km of arterial roads (MMS classes 1 and 2) per land area (km/km^2)	0 km/km^2	0 km/km^2

Service Attribute	Technical Metric	Current LOS	Proposed LOS (2040)
	Lane-km of collector roads (MMS classes 3 and 4) per land area (km/km^2)	1.4 km/km^2	1.4 km/km^2
	Lane-km of local roads (MMS classes 5 and 6) per land area (km/km^2)	1.31 km/km^2	1.31 km/km^2
	Average duration of planned road closures (days)	5	5
	# of unplanned road closures per year	0	<2
Safe & Regulatory	Number of service requests related to road condition	176[2]	<100
	Percentage of signs inspected for reflectivity	100%	100%
	Number of service requests related to sidewalk condition	3	3
Sustainable	Average pavement condition index for paved roads in the municipality	76	47
	Average surface condition for surface treated roads in the municipality	61	35
	Average surface condition for unpaved roads in the municipality	2	2
	Average Risk Rating	6.64	8.20
	Capital reinvestment rate	1.8%	5.1%

[2] Including pot holes, washouts, bumps, cracks, dust, and road grading.

5.8.3 Proposed Levels of Service Analysis

As per O. Reg. 588/17, by July 1, 2025, municipalities are required to consider proposed levels of service (PLOS), discuss the associated risks and long-term sustainability of these service levels, and explain the municipality's ability to afford the PLOS.

The following tables and graphs explain the proposed levels of service scenarios that were analyzed for the Road Network. Further PLOS analysis at the portfolio level can be found in Section 4.

Table 10: Road Network PLOS Scenarios

Scenario	Description
Scenario 1: Achieving Full Funding in 15 Years	This scenario assumes a phased tax increase of approximately 2.2% annually, reaching full funding within 15 years
Scenario 2: Achieving 75% Funding in 15 Years	This scenario assumes a phased tax increase of approximately 1.4% annually, reaching 75% funding within 15 years
Scenario 3: Achieving 50% Funding in 15 Years	This scenario assumes a phased tax increase of approximately 0.5% annually, reaching 50% funding within 15 years

The following table presents three proposed service level scenarios for the Road Network. These options were developed based on current municipal practices, stakeholder input, and future-oriented asset management strategies. Each scenario outlines the expected impact on service delivery, lifecycle activities, costs, resource needs, risk exposure, and alignment with municipal goals and provincial policy. This structured comparison allows Council and staff to assess trade-offs between investment levels and outcomes, ensuring informed decision-making aligned with community priorities and financial realities.

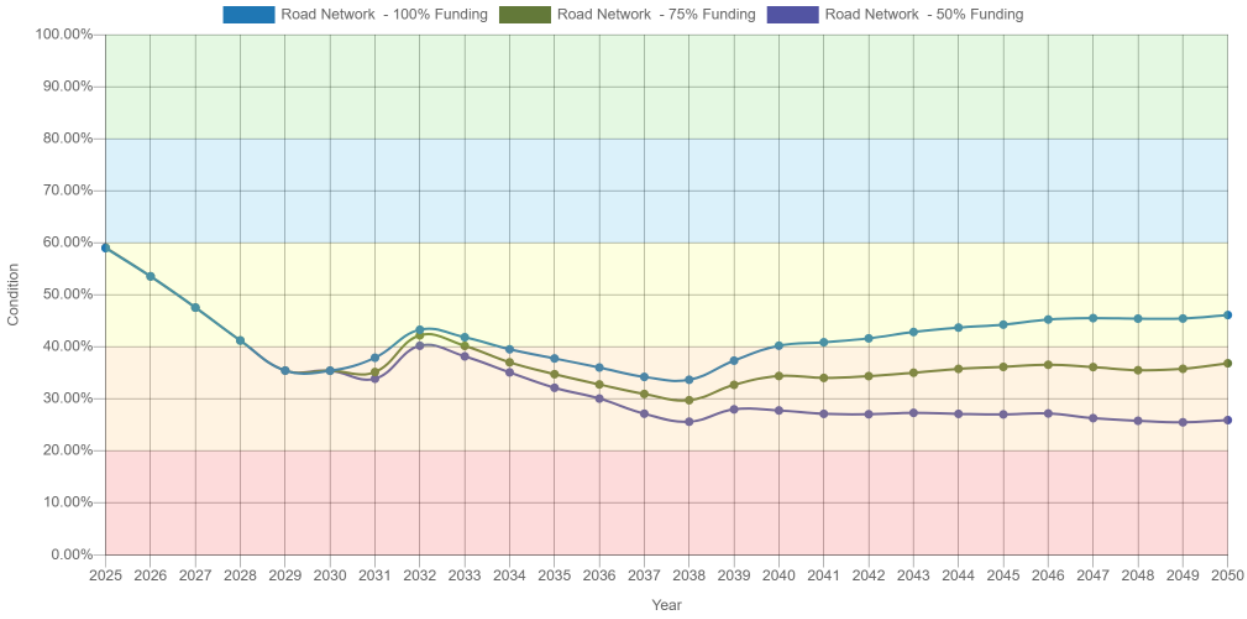
Table 11: Road Network pLOS Scenario Analysis

Scenario	Technical LOS Outcomes	Initial Value (2025)	10 Year Projection (2035)	25 Year Projection (2050)	Scenario Average
Scenario 1	Average Condition	58.96%	37.76%	46.11%	42.11%
	Average Asset Risk	6.64	9.15	8.20	8.75
	Annual Investment Target		$2,744,316		
	Capital re-investment rate		5.1%		
Scenario 2	Average Condition	58.96%	34.74%	36.83%	37.62%
	Average Asset Risk	6.64	9.51	9.28	9.29
	Annual Investment Target		$2,058,237		

Scenario	Technical LOS Outcomes	Initial Value (2025)	10 Year Projection (2035)	25 Year Projection (2050)	Scenario Average
	Capital re-investment rate		3.8%		
Scenario 3	Average Condition	58.96%	32.13%	25.91%	32.94%
	Average Asset Risk	6.64	9.89	10.55	9.86
	Annual Investment Target		$1,372,158		
	Capital re-investment rate		2.5%		

The following figure illustrates the projected condition of the asset category under each of the three investment level scenarios, demonstrating how varying reinvestment strategies impact overall asset condition over time.

Figure 29: Road Network Scenario Comparison



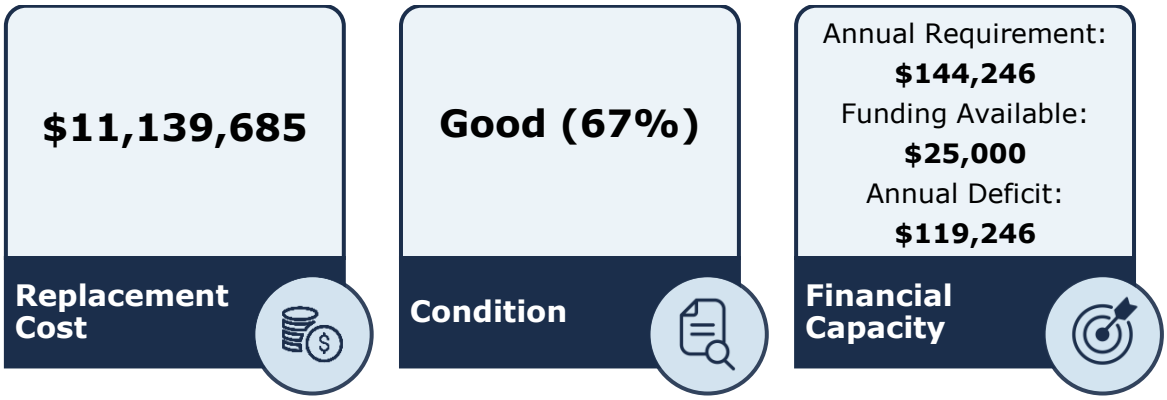
6. Bridges & Culverts

6.1. State of the Infrastructure

Bridges and Culverts (B&C) 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 structural 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 below.

Figure 30: Bridges & Culverts State of the Infrastructure



6.2. Inventory & Valuation

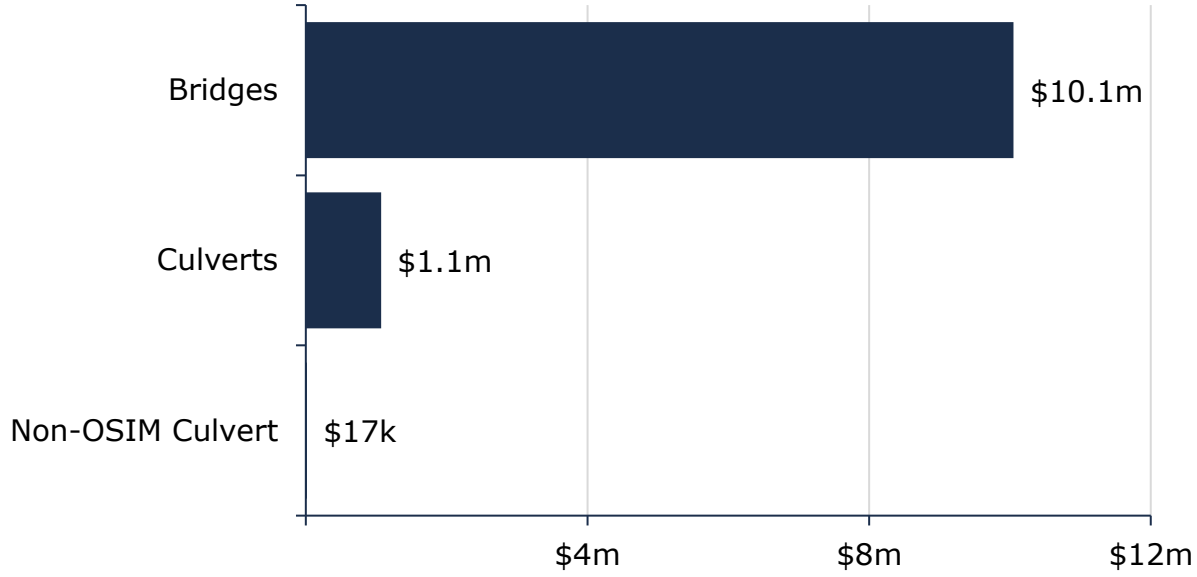
The table below includes the quantity, replacement cost method and total replacement cost of each asset segment in the Bridges & Culverts inventory.

Table 12: Bridges & Culverts Detailed Asset Inventory

Segment	Quantity	Unit of Measure	Primary Replacement Cost Method	Replacement Cost
Bridges	19	Assets	User-Defined	$10,052,197
Culverts	3	Assets	User-Defined	$1,070,000
Non-OSIM Culvert	1	Assets	CPI	$17,488
Total	**23**	**Assets**		**$11,139,685**

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

Figure 31: Bridges & Culverts Replacement Cost

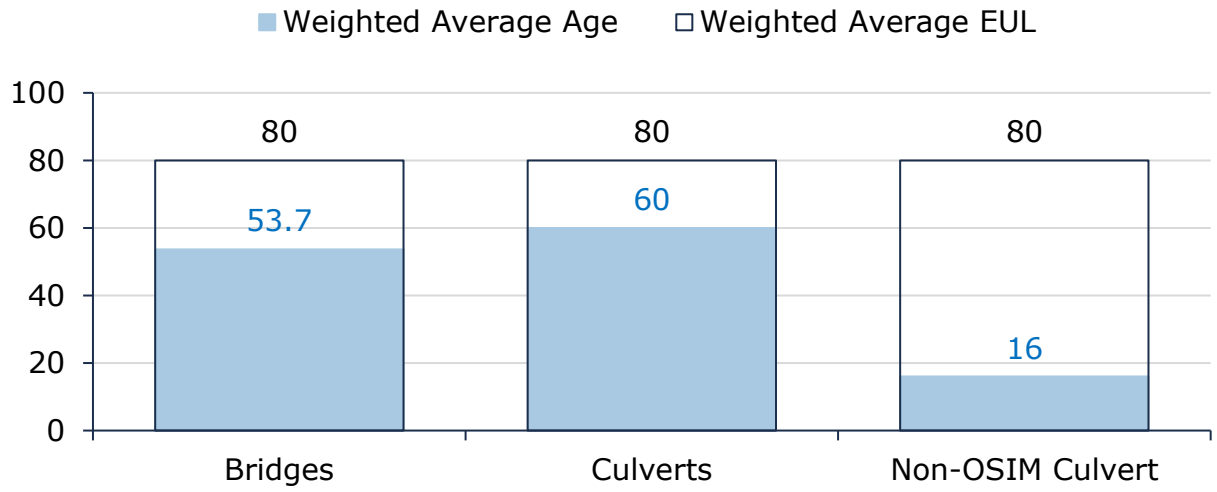


Each asset's replacement cost should be reviewed periodically to determine whether adjustments are needed. This can be included in the Ontario Structures Inspection Manual (OSIM) inspections as the replacement cost is part of the calculation for the bridge condition index (BCI).

6.3. Asset Condition & Age

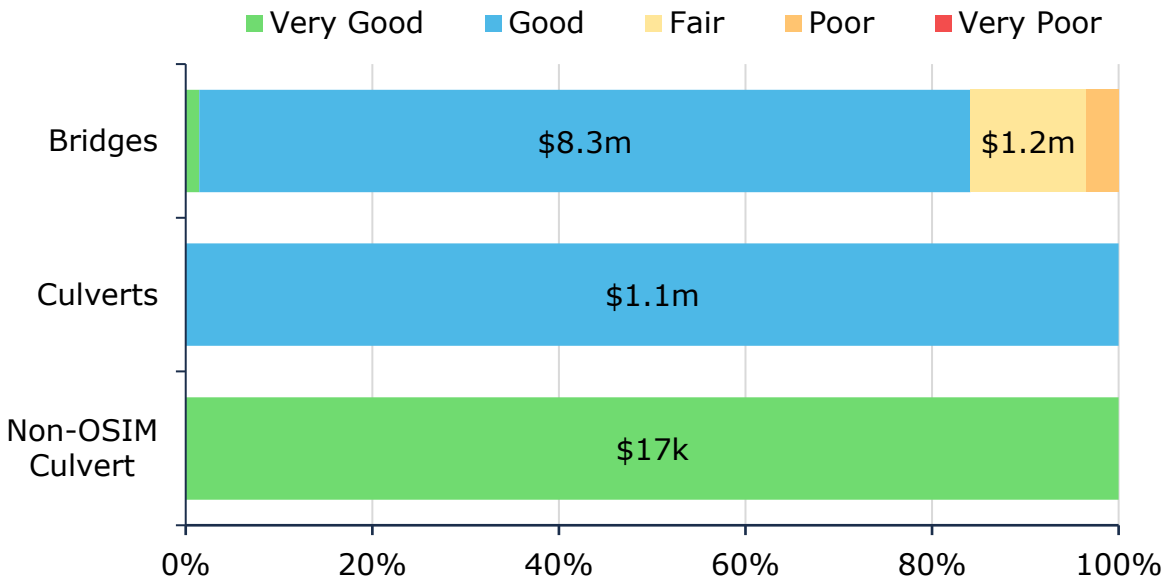
The graph below identifies the average age and the estimated useful life for each asset segment. The values are weighted based on replacement cost.

Figure 32: B&C Average Age vs Average EUL



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

Figure 33: B&C Condition Breakdown



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

6.3.1 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. Cramahe' current approach is to assess the 19 bridges and 3 structural culverts every 2 years in accordance with the Ontario Structure Inspection Manual (OSIM). The most recent assessment was completed in 2024 by HP Engineering.

6.4. Lifecycle Management Strategy

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

Figure 34: B&C Current Lifecycle Strategy

Maintenance

- Annual bridge washing is conducted in the Spring. Other maintenance items include deck sealing, guardrail repair, and expansion joint maintenance as needed
- Snow removal is a significant operating cost. Locations and timing are directed from the Maintenance Standards criteria

Rehabilitation / Renewal / Replacement

- All lifecycle activities are driven by the results of inspections competed according to the Ontario Structure Inspection Manual (OSIM).

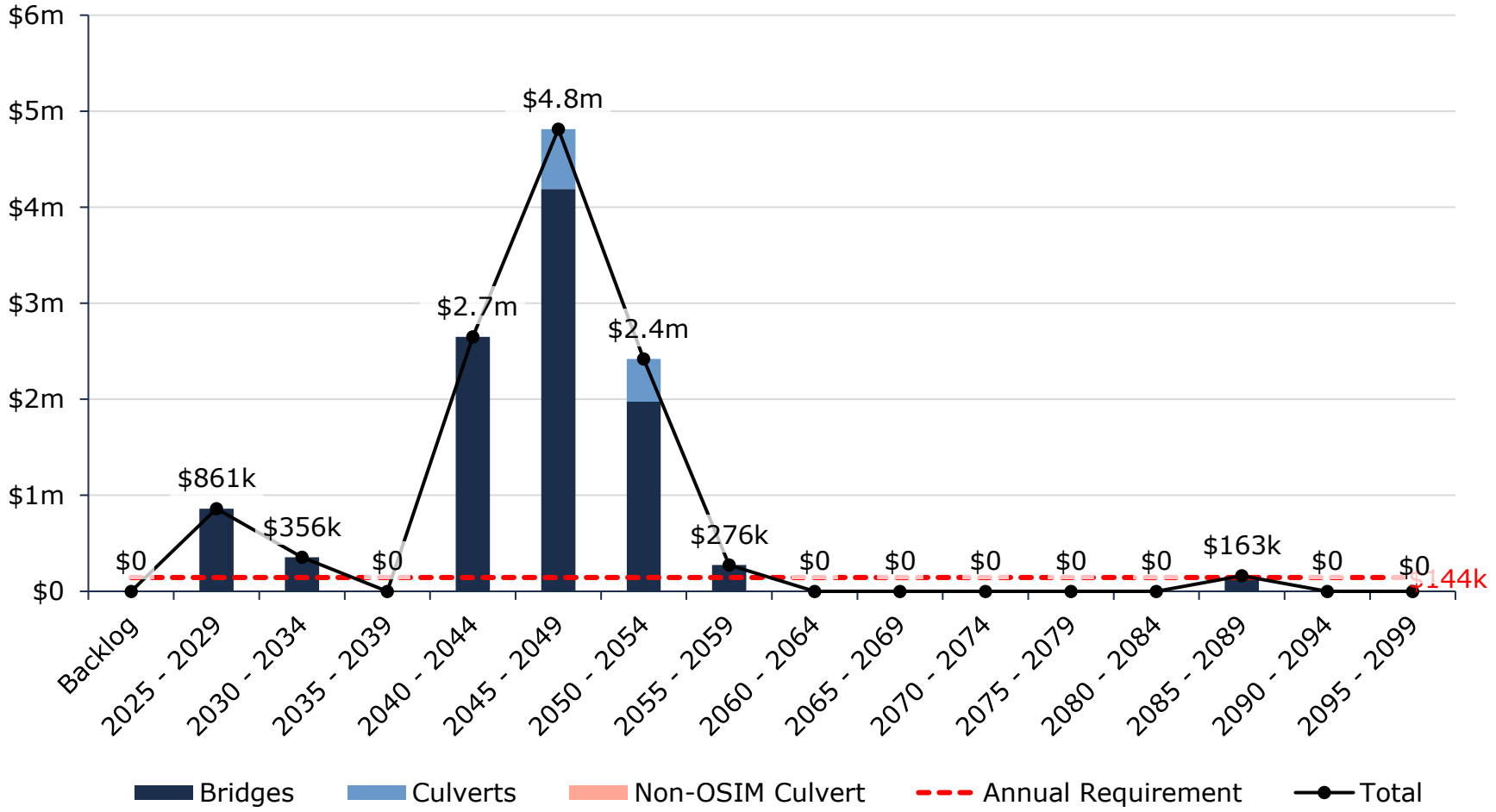
6.5. Forecasted Capital Requirements

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

The following analysis was run until 2099, and the resulting graph identifies capital requirements over the next 75 years. Cramahe' average annual requirements (red dotted line) for bridges and culverts total $144 thousand. Although actual spending may fluctuate substantially from year to year, this figure is a useful benchmark value for annual capital expenditure targets (or allocations to reserves) to ensure projects are not deferred and replacement needs are met as they arise.

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

Figure 35: B&C Forecasted Capital Replacement Requirements



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

Table 13 B&C System-generated 10-Year Capital Costs

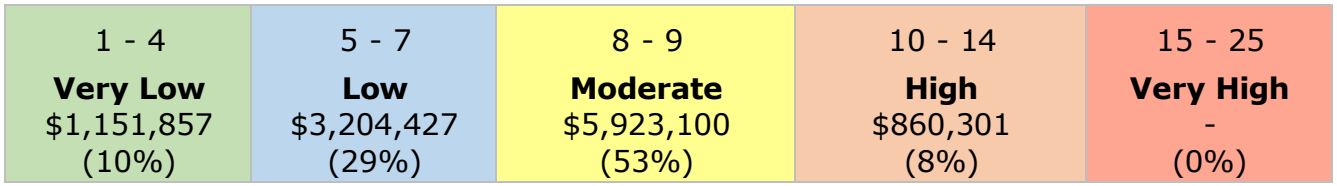
Segment	Backlog	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034
Bridges	$0	$400k	$0	$0	$461k	$0	$356k	$0	$0	$0	$0
Culverts	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Non-OSIM Culvert	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Total	**$0**	**$400k**	**$0**	**$0**	**$461k**	**$0**	**$356k**	**$0**	**$0**	**$0**	**$0**

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

6.6. Risk & Criticality

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

Figure 36: B&C Risk Matrix



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

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

6.7. Risks to Current Asset Management Strategies

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

Climate Change & Extreme Weather Events

Flooding and extreme weather causes damage to multiple components of the Township's bridges including the deck, superstructure, substructure, and approaches. The rising levels of freshwater and the increased frequency and intensity of precipitation events are likely to accelerate the deterioration of bridge components. The Township also should consider prioritizing infrastructure maintenance, rehabilitation, and replacement based on susceptibility to climate impacts.

Capital Funding Strategies

Major capital rehabilitation projects for Bridges and Culverts are entirely dependant on the availability of grant funding opportunities. The Township should continue to complete regular inspections according to the Ontario Structural Inspections Manual (OSIMs) and utilize the assessment recommendations for the development of lifecycle strategies and capital planning. The Township should also consider updating asset replacement costs and event costs on a cyclical basis to improve the effectiveness of capital planning.

6.8. Levels of Service

The following tables identify the Township's metrics to identify their current level of service for the bridges and culverts.

6.8.1 Community Levels of Service

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

Table 14 B&C Community Levels of Service

Service Attribute	Qualitative Description	Current LOS
Accessible & Reliable	Description of the traffic that is supported by municipal bridges (e.g. heavy transport, motor, emergency vehicles, pedestrians, cyclists)	Bridges and structural culverts are a key component of the municipal transportation network. None of the Township'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.

Service Attribute	Qualitative Description	Current LOS
Quality	Description or images of the condition of bridges and culverts and how this would affect use of the bridges and culverts	See Appendix B.

6.8.2 Technical Levels of Service

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

Table 15 B&C Technical Levels of Service

Service Attribute	Technical Metric	Current LOS	Proposed LOS (2040)
Accessible & Reliable	% of bridges in the municipality with loading or dimensional restrictions	0%	0%
	# of unplanned Structure closures	0	0
	Average duration of unplanned structure closures (days)	0	0
Safe & Regulatory	% of bridges and structural culverts inspected every two years	100%	100%
Sustainable	Average bridge condition index value for bridges in the municipality	67	38
	Average bridge condition index value for structural culverts in the municipality	72	45
	Average Risk Rating	6.73	11.00
	Capital re-investment rate	0.2%	1.3%

6.8.3 Proposed Levels of Service Analysis

As per O. Reg. 588/17, by July 1, 2025, municipalities are required to consider proposed levels of service (PLOS), discuss the associated risks and long-term sustainability of these service levels, and explain the municipality's ability to afford the PLOS.

The below tables and graphs explain the proposed levels of service scenarios that were analyzed for Bridges & Culverts. Further PLOS analysis at the portfolio level can be found in Proposed Levels of Service Scenario Analysis.

Table 16: B&C PLOS Scenarios

Scenario	Description
Scenario 1: Achieving Full Funding in 15 Years	This scenario assumes a phased tax increase of approximately 2.2% annually, reaching full funding within 15 years
Scenario 2: Achieving 75% Funding in 15 Years	This scenario assumes a phased tax increase of approximately 1.4% annually, reaching 75% funding within 15 years
Scenario 3: Achieving 50% Funding in 15 Years	This scenario assumes a phased tax increase of approximately 0.5% annually, reaching 50% funding within 15 years

The following table presents three proposed service level scenarios for Bridges & Culverts. These options were developed based on current municipal practices, stakeholder input, and future-oriented asset management strategies. Each scenario outlines the expected impact on service delivery, lifecycle activities, costs, resource needs, risk exposure, and alignment with municipal goals and provincial policy. This structured comparison allows Council and staff to assess trade-offs between investment levels and outcomes, ensuring informed decision-making aligned with community priorities and financial realities.

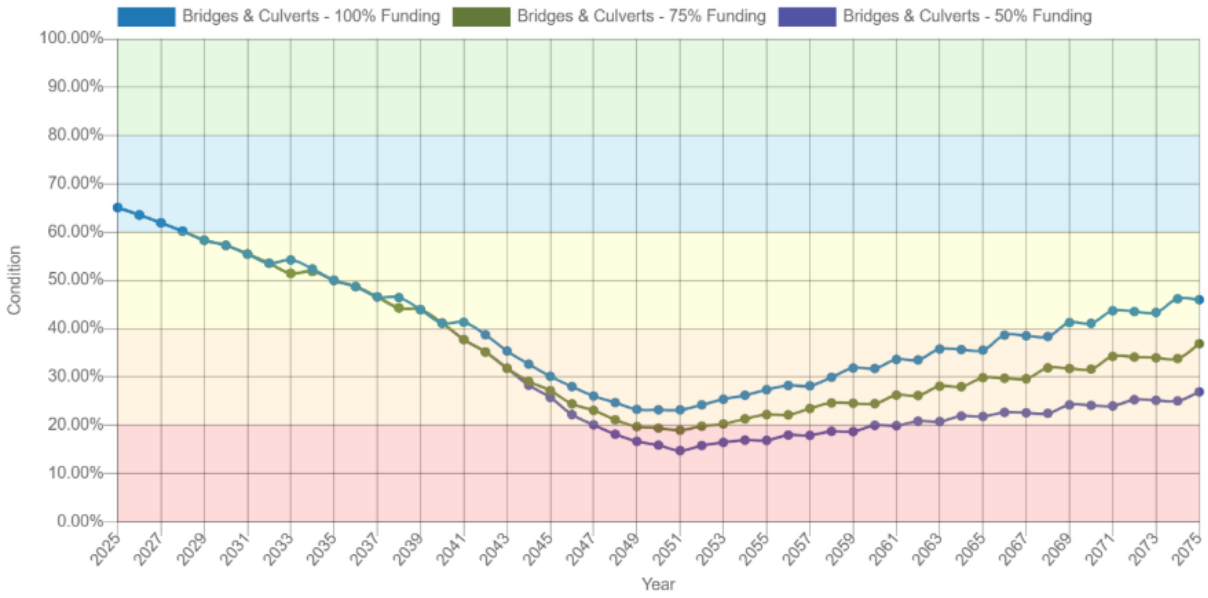
Table 17: B&C pLOS Scenario Analysis

Scenario	Technical LOS Outcomes	Initial Value (2025)	10 Year Projection (2035)	25 Year Projection (2050)	Scenario Average
Scenario 1	Average Condition	65.11%	50.01%	23.20%	39.88%
	Average Asset Risk	6.73	9.80	13.86	11.47
	Annual Investment Target	$144,246			
	Capital re-investment rate	1.3%			
Scenario 2	Average Condition	65.11%	50.01%	19.41%	35.50%
	Average Asset Risk	6.73	9.80	14.31	12.00
	Annual Investment Target	$108,185			
	Capital re-investment rate	1.0%			
Scenario 3	Average Condition	65.11%	50.01%	15.89%	31.91%
	Average Asset Risk	6.73	9.80	14.59	12.36
	Annual Investment Target	$72,123			

Scenario	Technical LOS Outcomes	Initial Value (2025)	10 Year Projection (2035)	25 Year Projection (2050)	Scenario Average
	Capital re-investment rate		0.7%		

The following figure illustrates the projected condition of the asset category under each of the three investment level scenarios, demonstrating how varying reinvestment strategies impact overall asset condition over time.

Figure 37: B&C Scenario Comparison



7. Water Network

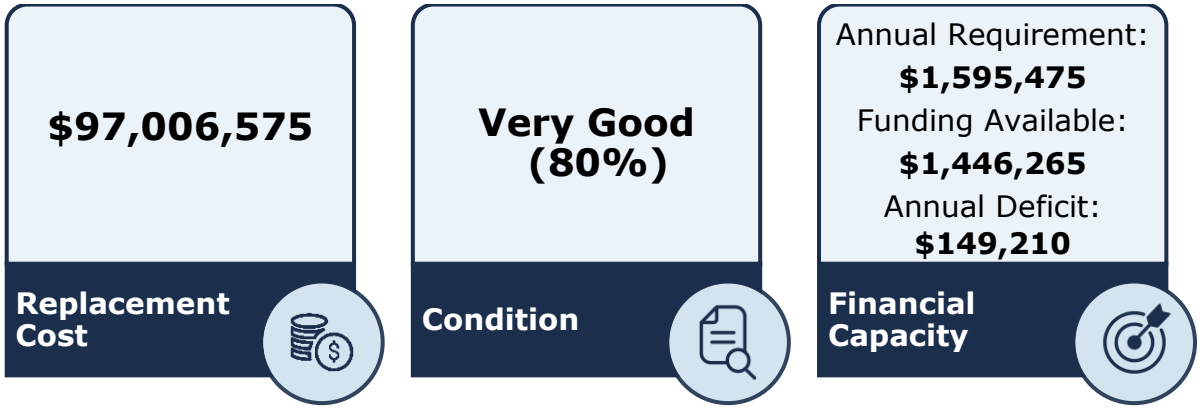
7.1. State of the Infrastructure

The Colborne Water Supply and Distribution System is maintained and operated by Lakefront Utility Services Inc. The Water Network in the Township includes the following:

- Water Treatment Plant
- Watermains
- Water Towers, Wells
- Hydrants, Water Meters and other Appurtenances

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

Figure 38: Water Network State of the Infrastructure



7.2. Inventory & Valuation

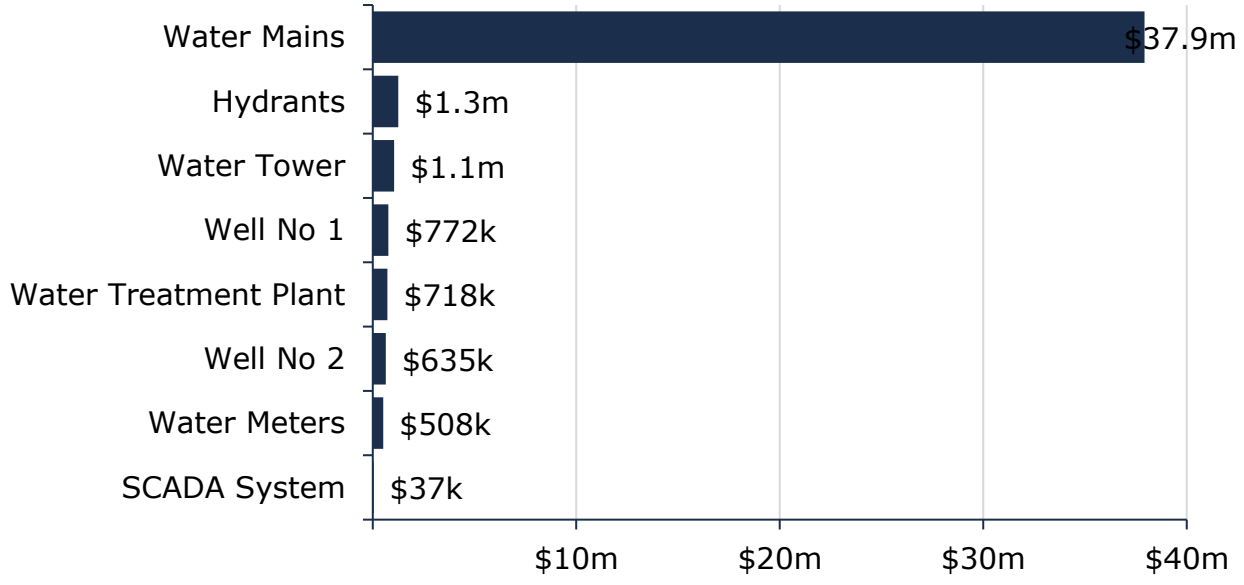
The table below includes the quantity, replacement cost method and total replacement cost of each asset segment for the Township's Water Network.

Table 18: Water Network Detailed Asset Inventory

Segment	Quantity	Unit of Measure	Primary Replacement Cost Method	Replacement Cost
Hydrants	126	Assets	Cost per Unit	$1,260,000
SCADA System	1	Assets	CPI	$36,554
Water Mains	25,844	Meters	Cost per Unit	$37,920,657
Water Meters	1,041	Assets	CPI	$508,040
Water Tower	2	Assets	CPI	$1,052,947
Water Treatment Plant	4	Assets	CPI	$718,455
Well No 1	4	Assets	CPI	$771,968
Well No 2	1 (3)	Assets	CPI	$634,680
Total				**$42,903,301**

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

Figure 39: Water Network Replacement Cost

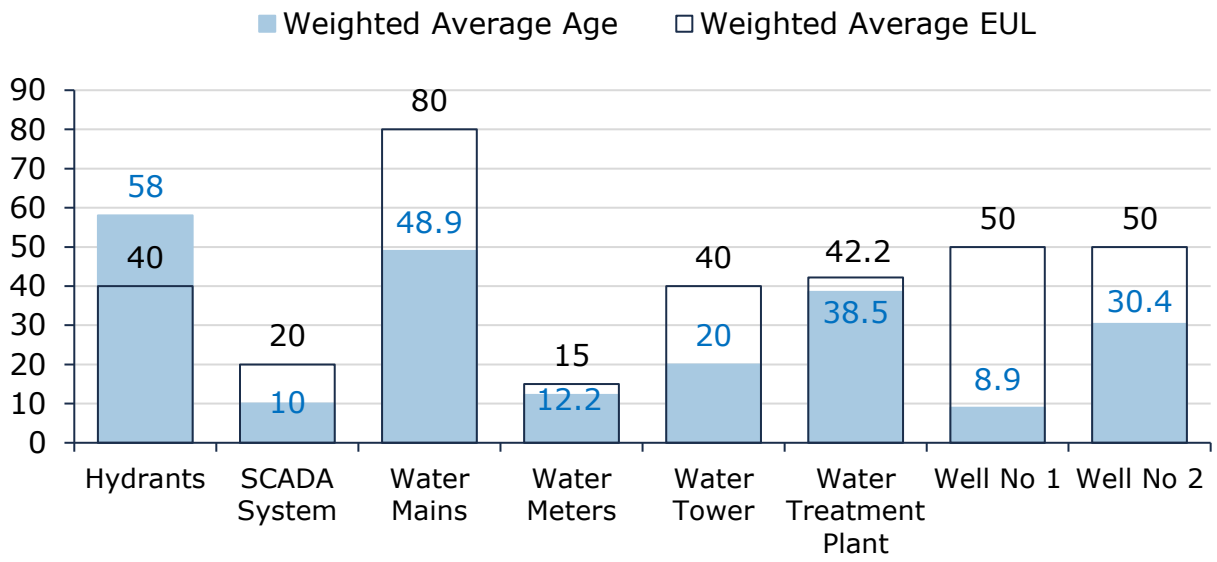


Each asset's replacement cost should be reviewed periodically to determine whether adjustments are needed to more accurate represent realistic capital requirements.

7.3. Asset Condition & Age

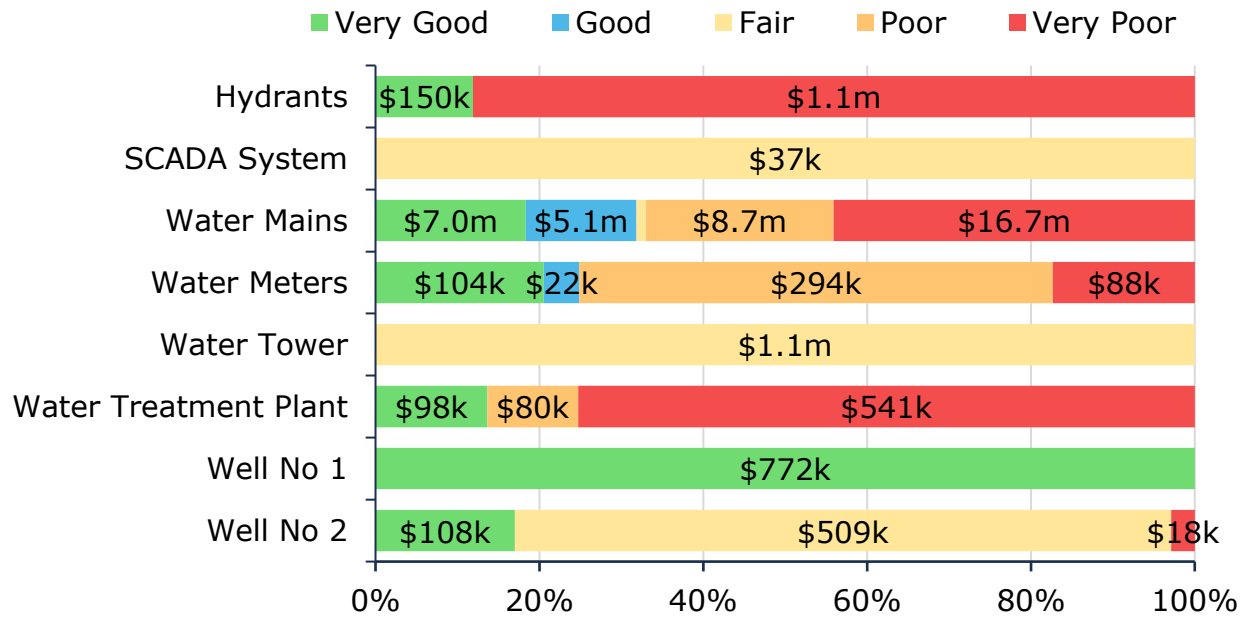
The figure below identifies the current average condition, the average age, and the estimated useful life for each asset segment. The average condition (%) is a weighted value based on replacement cost.

Figure 40: Water Network Average Age vs Average EUL



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

Figure 41: Water Network Condition Breakdown



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

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

7.3.1 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 Township's current approach:

- Currently, there are no formal condition assessment programs for water assets in place
- Staff primarily rely on the historical break records, pipe diameter, age and material types to determine the projected condition of water mains

7.4. 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, the lifecycle management strategies have been developed to proactively manage asset deterioration.

Figure 42: Water Network Current Lifecycle Strategy

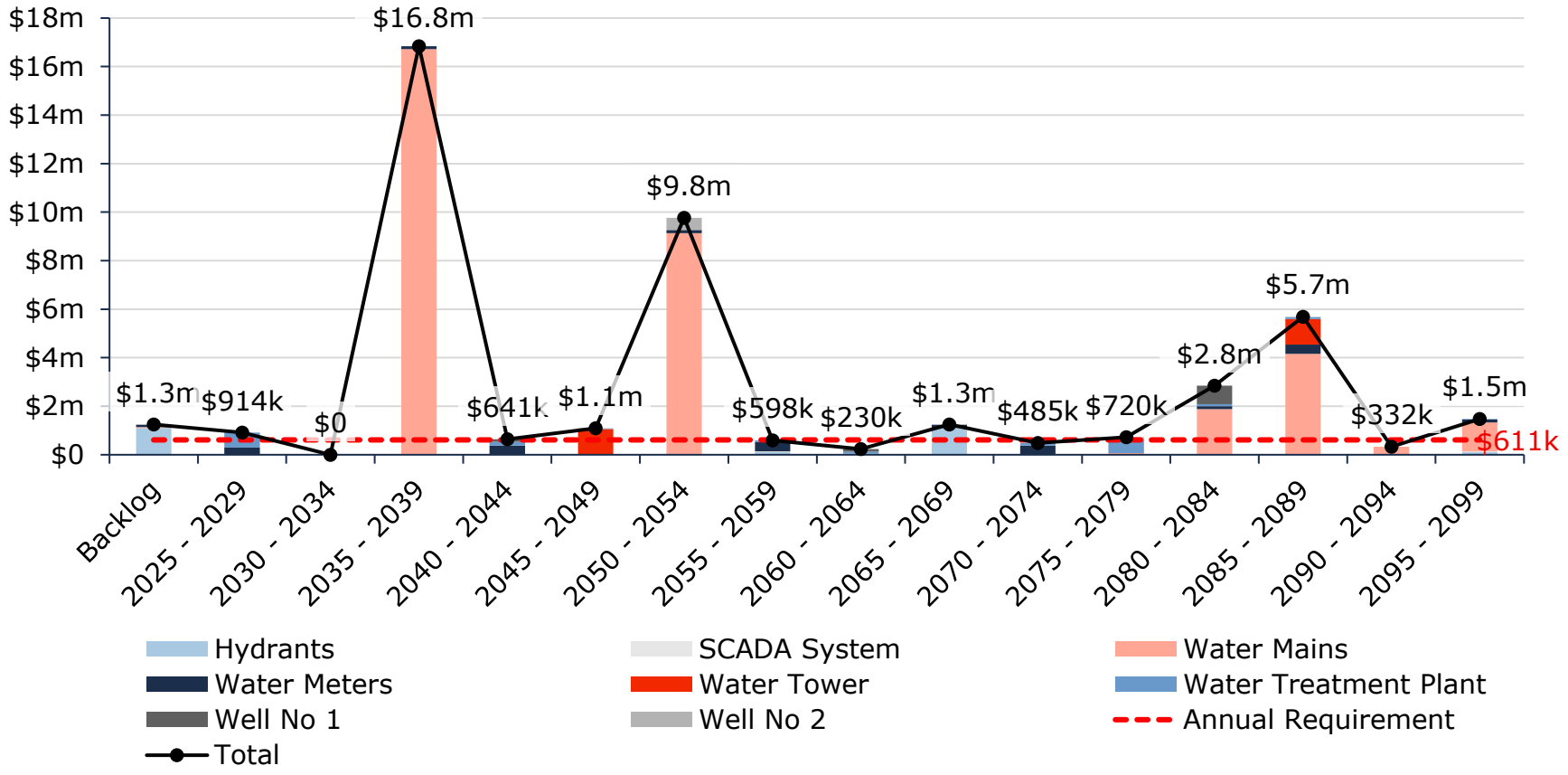
Maintenance / Rehabilitation / Replacement

- Main flushing and valve turning is completed on the network on an annual basis
- Maintenance on water meters and hydrants is undertaken annually in batches.
- A water relining program is not considered, as the network is relatively small and relining costs are significant.
- In the absence of mid-lifecycle rehabilitative events, full replacement for most mains is completed once it reaches its end-of-life.
- The prioritized list of watermains is scheduled to align with work on the storm, sanitary, and roads networks

7.5. Forecasted Capital Requirements

The annual capital requirement represents the average amount per year that Cramahe should allocate towards funding rehabilitation and replacement needs. The following graph identifies capital requirements over the next 75 years. This projection is used as it ensures that every asset has gone through one full iteration of replacement. The forecasted requirements are aggregated into 5-year bins and the trend line represents the average capital requirement of $611,000.

Figure 43: Water Network Forecasted Capital Replacement Requirements



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

Table 19: Water Network System-Generated 10-Year Capital Costs

Segment	Backlog	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034
Hydrants	$1.1m	-	-	-	-	-	-	-	-	-	-
SCADA System	-	-	-	-	-	-	-	-	-	-	-
Water Mains	$34k	-	-	-	-	-	-	-	-	-	-
Water Meters	$88k	-	-	-	$294k	-	-	-	-	-	-
Water Tower	-	-	-	-	-	-	-	-	-	-	-
Water Treatment Plant	-	-	$541k	-	$80k	-	-	-	-	-	-
Well No 1	-	-	-	-	-	-	-	-	-	-	-
Well No 2	$18k	-	-	-	-	-	-	-	-	-	-
Total	**$1.3m**	**-**	**$541k**	**-**	**$373k**	**-**	**-**	**-**	**-**	**-**	**-**

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

7.6. Risk & Criticality

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

Figure 44: Water Network Risk Matrix

1 - 4	5 - 7	8 - 9	10 - 14	15 - 25
Very Low $8,760,309 (20%)	**Low** $7,321,567 (17%)	**Moderate** $1,973,292 (5%)	**High** $6,979,693 (16%)	**Very High** $17,868,440 (42%)

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

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

7.7. Risks to Current Asset Management Strategies

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

Lifecycle Management Strategies

The current lifecycle management strategy for the Water Network is considered reactive. Replacement of watermain is dependent on break records, water quality, age and material type. This poses a risk of service disruption when assets failure occurs. The Township can consider assessing the suitability of corrosion protection for metallic mains, such as cathodic protection systems, zinc galvanization, and plastic coating to extend service life of the assets. The Township can also consider leak detection technologies to reduce costs related to water loss and excavation to find the leak locations.

Growth & Infrastructure Design

The population of the Township is projected to grow to 7,013 by 2034. Past designs of the Water Network have been inadequate for the population growth because some water pipes are undersized. The Township needs to prioritize expanding its capacity to serve a larger population. Developing a comprehensive long-term capital plan with considerations for growth can be helpful to increase the capacity strategically.

7.8. Levels of Service

The following tables identify the Township's metrics to identify their current level of service for the Water Network.

7.8.1 Community Levels of Service

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

Table 20 Water Network Community Levels of Service

Service Attribute	Qualitative Description	Current LOS
Accessible & Reliable	Description, which may include maps, of the user groups or areas of the municipality that are connected to the municipal water system	See Appendix B.
		See Appendix B.
Reliability	Description of boil water advisories and service interruptions	No water quality issue that required a boil water advisory.

7.8.2 Technical Levels of Service

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

Table 21 Water Network Technical Levels of Service

Service Attribute	Technical Metric	Current LOS	Proposed LOS (2040)
Accessible & Reliable	% of properties connected to the municipal water system	37%	37%
	% of properties where fire flow is available	82%	82%
	# of connection-days per year due to water main breaks compared to the total number of properties connected to the municipal water system	1	<2

Service Attribute	Technical Metric	Current LOS	Proposed LOS (2040)
Safe & Regulatory	# 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	1	<2
Affordable	Capital re-investment rate	1.1%	1.4%
Sustainable	Average Risk Rating	11.71	11.68
	Average condition of water network assets	40	39

7.8.3 Proposed Levels of Service Analysis

As per O. Reg. 588/17, by July 1, 2025, municipalities are required to consider proposed levels of service (PLOS), discuss the associated risks and long-term sustainability of these service levels, and explain the municipality's ability to afford the PLOS.

The below tables and graphs explain the proposed levels of service scenarios that were analyzed for the Water Network. Further PLOS analysis at the portfolio level can be found in Proposed Levels of Service Scenario Analysis.

Table 22: Water Network PLOS Scenarios

Scenario	Description
Scenario 1: Achieving Full Funding in 15 Years	This scenario assumes a phased rate increase of approximately 1.3% annually, reaching full funding within 10 years
Scenario 2: Achieving 80% Funding in 15 Years	This scenario assumes a phased rate increase of approximately 0.3% annually, reaching 80% funding within 10 years
Scenario 3: Achieving 75% Funding in 15 Years	This scenario assumes no changes to rates, maintaining 75% funding over 15 years

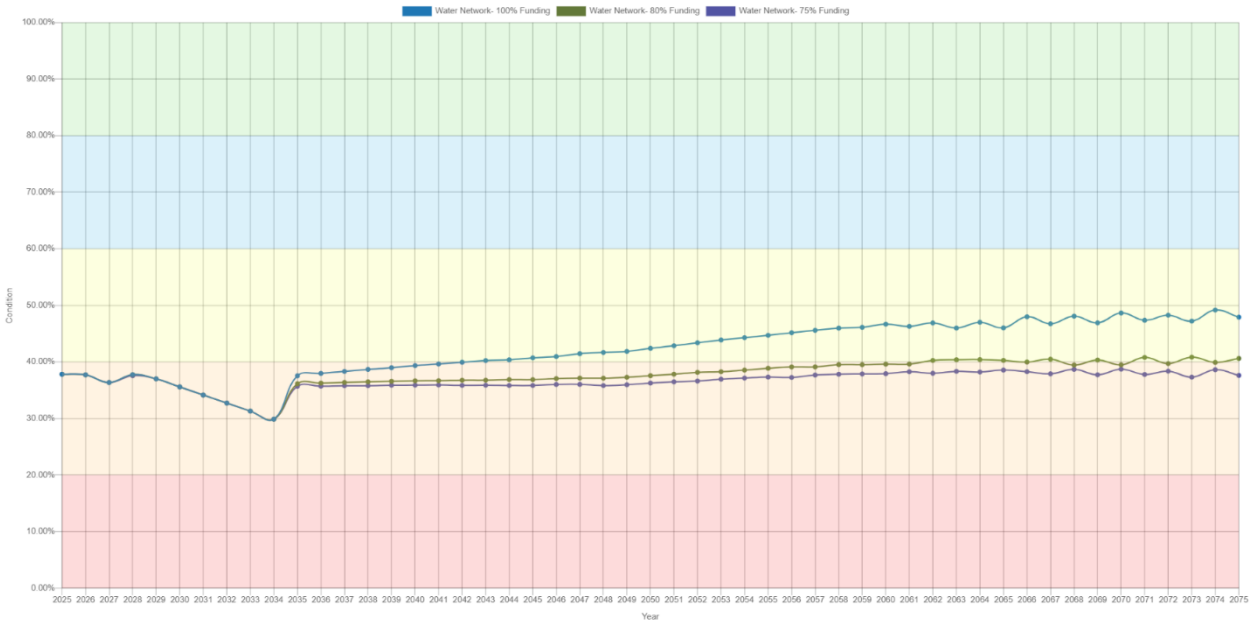
The following table presents three proposed service level scenarios for the Water Network. These options were developed based on current municipal practices, stakeholder input, and future-oriented asset management strategies. Each scenario outlines the expected impact on service delivery, lifecycle activities, costs, resource needs, risk exposure, and alignment with municipal goals and provincial policy. This structured comparison allows Council and staff to assess trade-offs between investment levels and outcomes, ensuring informed decision-making aligned with community priorities and financial realities.

Table 23: Water Network pLOS Scenario Analysis

Scenario	Technical LOS Outcomes	Initial Value (2025)	10 Year Projection (2035)	25 Year Projection (2050)	Scenario Average
Scenario 1	Average Condition	37.82%	37.54%	42.40 %	42.14%
	Average Asset Risk	11.71	11.85	10.43	10.85
	Annual Investment Target		$611,320		
	Capital re-investment rate		1.4%		
Scenario 2	Average Condition	37.82%	36.14%	37.56%	37.84%
	Average Asset Risk	11.71	12.08	11.21	11.50
	Annual Investment Target		$489,056		
	Capital re-investment rate		1.1%		
Scenario 3	Average Condition	37.82%	35.68%	36.25%	36.66%
	Average Asset Risk	11.71	12.12	11.41	11.68
	Annual Investment Target		$458,490		
	Capital re-investment rate		1.07%		

The following figure illustrates the projected condition of the asset category under each of the three investment level scenarios, demonstrating how varying reinvestment strategies impact overall asset condition over time.

Figure 45: Water Network Scenario Comparison



8. Sanitary Sewer Network

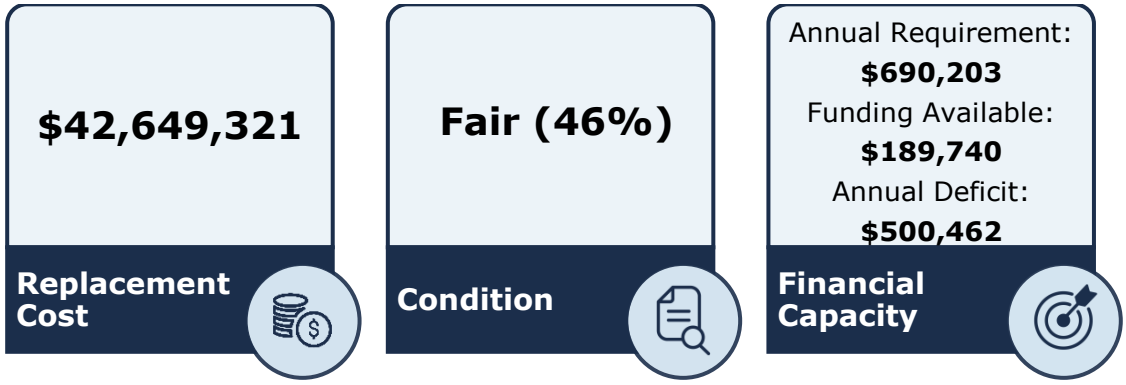
8.1. State of the Infrastructure

The Sanitary Sewer Network is owned, maintained and operated by the Township. The network includes the following:

- Sanitary Treatment Plant
- Sewer mains
- Maintenance holes

The state of the infrastructure for the Sanitary Sewer Network is summarized in the following table:

Figure 46: Sanitary Sewer Network State of the Infrastructure



8.2. Inventory & Valuation

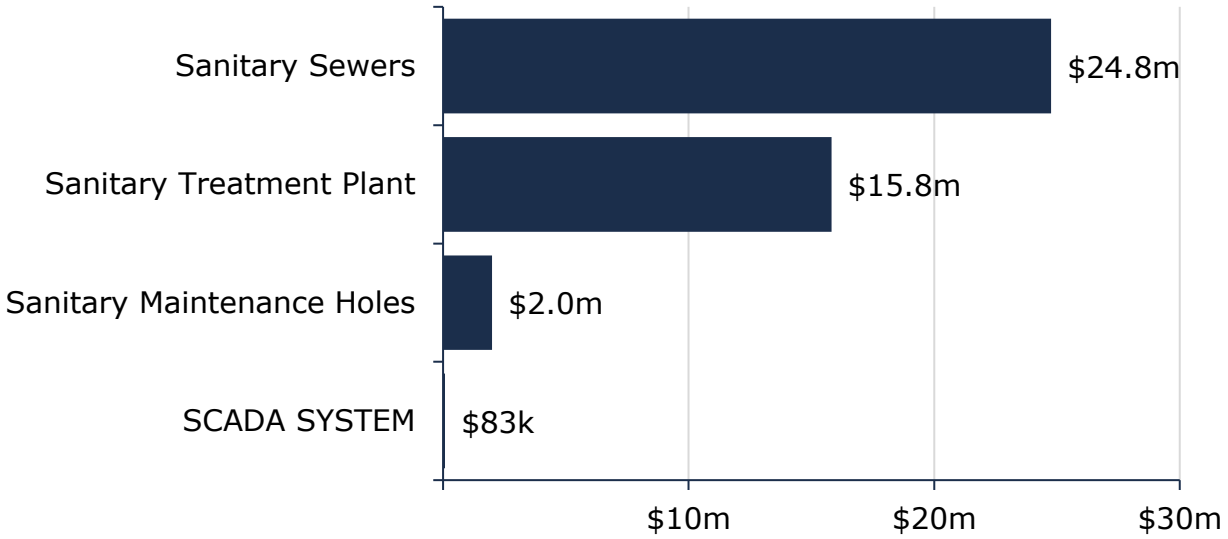
The table below includes the quantity, replacement cost method and total replacement cost of each asset segment for the Township's Sanitary Network.

Table 24: Sanitary Sewer Network Detailed Asset Inventory

Segment	Quantity	Unit of Measure	Primary Replacement Cost Method	Replacement Cost
Sanitary Maintenance Holes	207	Assets	Cost per Unit	$1,997,550
Sanitary Sewers	17,835	Length	Cost per Unit	$24,754,733
Sanitary Treatment Plant	1	Assets	CPI	$15,814,012
SCADA SYSTEM	1 (7)	Assets	CPI	$83,026
Total				**$42,649,321**

The graph below displays the total replacement cost of each asset segment in Cramahe' Sanitary Sewer Network inventory.

Figure 47: Sanitary Sewer Network Replacement Cost

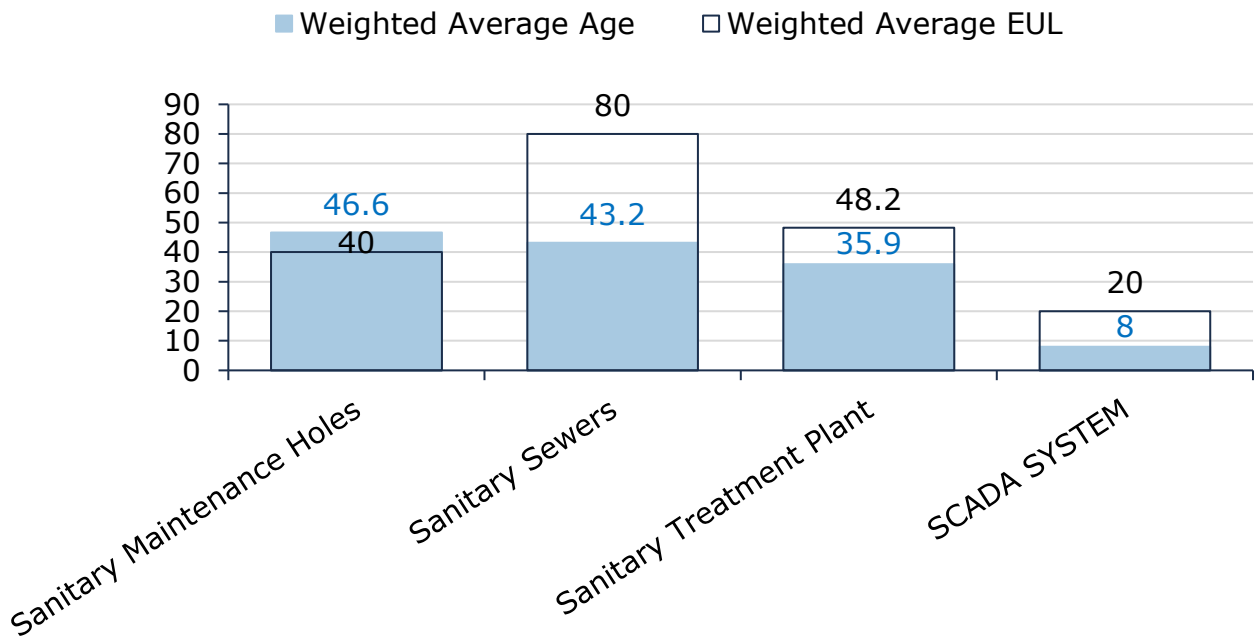


Each asset's replacement cost should be reviewed periodically to determine whether adjustments are needed to more accurate represent realistic capital requirements.

8.3. Asset Condition & Age

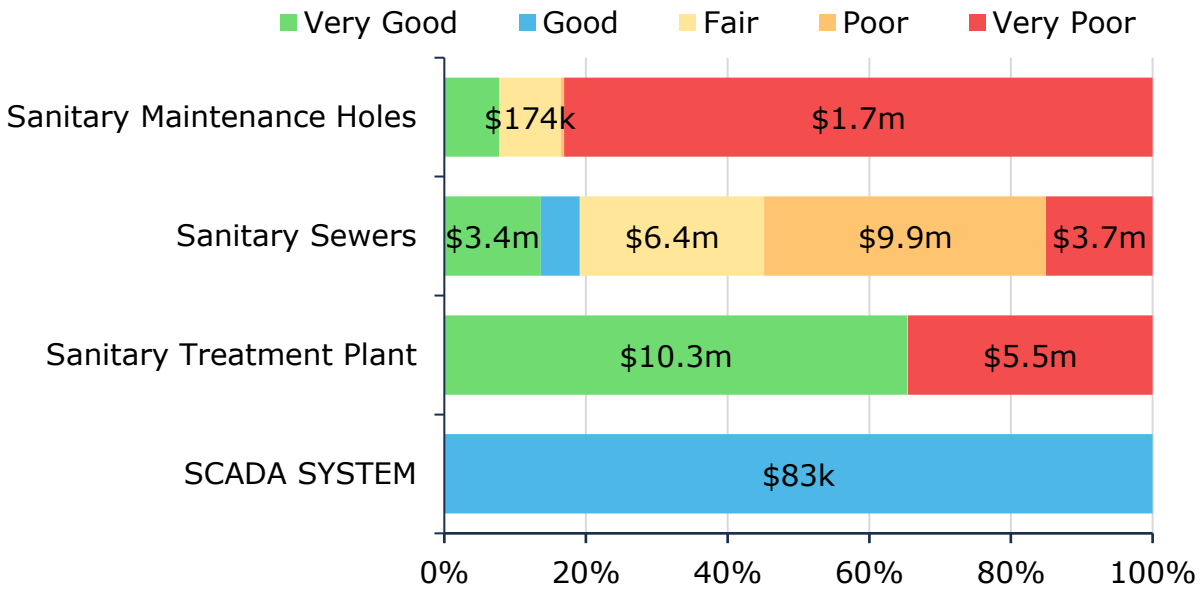
The figure below identifies the current average condition, the average age, and the estimated useful life for each asset segment. The average condition (%) is a weighted value based on replacement cost.

Figure 48: Sanitary Sewer Network Average Age vs Average EUL



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

Figure 49: Sanitary Sewer Network Condition Breakdown



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

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

8.3.1 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 Township's current approach:

- CCTV inspections are completed for sanitary mains by in-house staff on a project basis
- The wastewater treatment plant is inspected daily to compliant with the Ministry of Environment standards.

8.4. 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, the lifecycle management strategies have been developed to proactively manage asset deterioration.

Figure 50: Sanitary Sewer Network Current Lifecycle Strategy

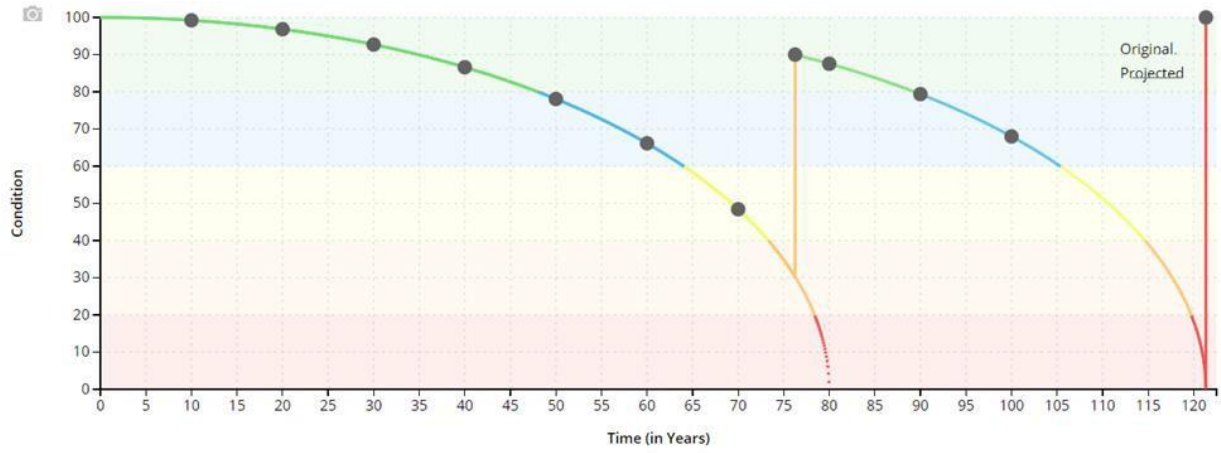
Maintenance / Rehabilitation / Replacement

- Rodding, boring, and flushing is performed on an as-needed basis, generally complaint driven
- A structural relining program is being considered for specific locations where road reconstruction is not an option.
- CCTV inspections and flushing are incorporated within the inflow and infiltration (I&I) program, to identify areas with significant stormwater intrusion. Reducing overall I&I will reduce demands on the wastewater conveyance and treatment system, ensuring capacity is more readily available
- Sewer mains are generally replaced as part of the I&I program, or in coordination with road reconstruction
- For purpose of this AMP, the relining program is applied to all the sanitary sewer mains and assumed the entire network is flushed and completed a CCTV inspection every 10 years.

The following lifecycle strategies have been developed as a proactive approach to managing the lifecycle of Sanitary Sewer mains. Instead of allowing the mains to deteriorate until replacement is required, strategic rehabilitation is expected to extend the service life of roads at a lower total cost.

Figure 51: Sanitary Sewer Mains Lifecycle model

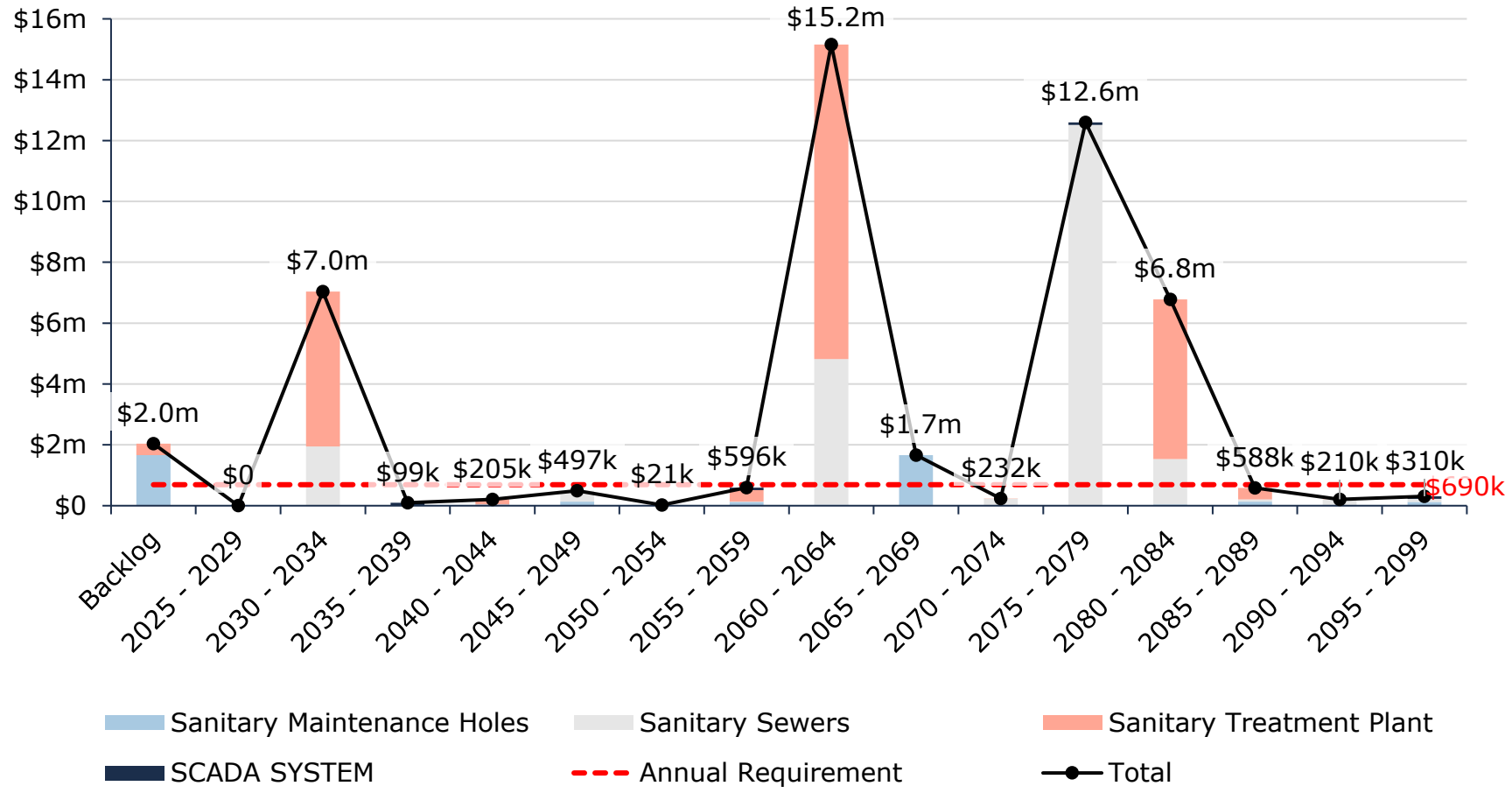
Sanitary Sewer Mains		
Event Name	**Event Class**	**Event Trigger**
O&M Activities (flushing and CCTV inspection)	Maintenance	Repeated every 10 years
Trenchless Relining	Rehabilitation	30% Condition
Full Reconstruction	Replacement	0% Condition



8.5. Forecasted Capital Requirements

The annual capital requirement represents the average amount per year that Cramahe should allocate towards funding rehabilitation and replacement needs. The following graph identifies capital requirements over the next 75 years. This projection is used as it ensures that every asset has gone through one full iteration of replacement. The forecasted requirements are aggregated into 5-year bins and the trend line represents the average capital requirements at $690 thousand.

Figure 52: Sanitary Sewer Network Forecasted Capital Replacement Requirements



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

Table 25 Sanitary Sewer Network System-Generated 10-Year Capital Costs

Segment	Backlog	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034
Sanitary Maintenance Holes	$1.7m	-	-	-	-	-	-	-	-	-	$10k
Sanitary Sewers	-	-	-	-	-	-	-	-	$1.9m	-	-
Sanitary Treatment Plant	$381k	-	-	-	-	-	-	-	-	$5.1m	$11k
SCADA SYSTEM	-	-	-	-	-	-	-	-	-	-	-
Total	**$2.0m**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**$1.9m**	**$5.1m**	**$21k**

These projections are generated in Citywide and rely on the data available in the asset register. Age-based condition data and replacement costs were used to assist in forecasting replacement needs for sanitary network assets.

8.6. Risk & Criticality

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

Figure 53: Sanitary Sewer Network Risk Matrix

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

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

8.7. Risks to Current Asset Management Strategies

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

Growth

The population of the Township is projected to grow to 7,013 by 2034. The Township needs to prioritize expanding its capacity to serve a larger population. Currently, the Township focuses on solving the inflow and infiltration issues to save capacity and reduce costs for water treatment. However, the rapid development requires the Township to increase capital and operating costs to maintain current levels of service and improve efficiency of the sanitary network. Developing a comprehensive long-term capital plan with considerations for growth can be helpful to increase the capacity strategically.

Capital Funding Strategies

A concern for the Township's aging assets, it requires the Township to maintain the assets more frequently to ensure the assets are meeting safety requirements. Current lifecycle strategies for sanitary assets are relatively reactive. The Township should consider developing an annual capital funding strategy to reduce dependency on grant funding and prevent deferral the capital works. The Township should also consider updating asset replacement costs and event costs on a cyclical basis to improve the effectiveness of capital planning.

8.8. Levels of Service

The following tables identify the Township's metrics to identify their current level of service for the Water Network.

8.8.1 Community Levels of Service

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

Table 26 Sanitary Sewer Network Community Levels of Service

Service Attribute	Qualitative Description	Current LOS
Scope	Description, which may include maps, areas of the municipality that are connected to the municipal wastewater system	See Appendix B.
Reliability	Description of how stormwater can get into sanitary sewers in the municipal wastewater	Inflow and infiltration issues are identified in the current sanitary system of the Township, the water can infiltrate through cracks in the joints and through manholes.

Service Attribute	Qualitative Description	Current LOS
	system, causing sewage to overflow into streets or backup into homes.	
	Description of how sanitary sewers in the municipal wastewater system are designed to be resilient to avoid stormwater infiltration	The newly installed sewer pipes are designed to be watertight to minimize infiltration.
	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.

8.8.2 Technical Levels of Service

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

Table 27 Sanitary Sewer Network Technical Levels of Service

Service Attribute	Technical Metric	Current LOS	Proposed LOS (2040)
Accessible & Reliable	% of properties connected to the municipal sanitary system	34%	34%
	# of sanitary sewer main backups	0	0
Safe & Regulatory	# of connection-days per year due to sanitary main backups compared to the total number of properties connected to the municipal sanitary system	0	0
	# of connection-days per year due to sanitary service backups compared to the total number of properties connected to the municipal sanitary system	1	1
	# of effluent violations per year due to sanitary discharge compared to the total number of properties connected to the municipal sanitary system	1	1
Affordable	Capital Re-investment rate	0.4%	1.6%

Service Attribute	Technical Metric	Current LOS	Proposed LOS (2040)
Sustainable	Average Risk Rating	6.12	7.18
	Average condition of sanitary sewer network assets	46	52

8.8.3 Proposed Levels of Service Analysis

As per O. Reg. 588/17, by July 1, 2025, municipalities are required to consider proposed levels of service (PLOS), discuss the associated risks and long-term sustainability of these service levels, and explain the municipality's ability to afford the PLOS.

The below tables and graphs explain the proposed levels of service scenarios that were analyzed for Land Improvement assets. Further PLOS analysis at the portfolio level can be found in Proposed Levels of Service Scenario Analysis.

Table 28: Sanitary Sewer Network PLOS Scenarios

Scenario	Description
Scenario 1: Achieving Full Funding in 15 Years	This scenario assumes a phased rate increase of approximately 3.0% annually, reaching full funding within 15 years
Scenario 2: Achieving 75% Funding in 15 Years	This scenario assumes a phased rate increase of approximately 2.1% annually, reaching 75% funding within 15 years
Scenario 3: Achieving 50% Funding in 15 Years	This scenario assumes a phased rate increase of approximately 1.1% annually, reaching 75% funding within 15 years

The following table presents three proposed service level scenarios for the Sanitary Network. These options were developed based on current municipal practices, stakeholder input, and future-oriented asset management strategies. Each scenario outlines the expected impact on service delivery, lifecycle activities, costs, resource needs, risk exposure, and alignment with municipal goals and provincial policy. This structured comparison allows Council and staff to assess trade-offs between investment levels and outcomes, ensuring informed decision-making aligned with community priorities and financial realities.

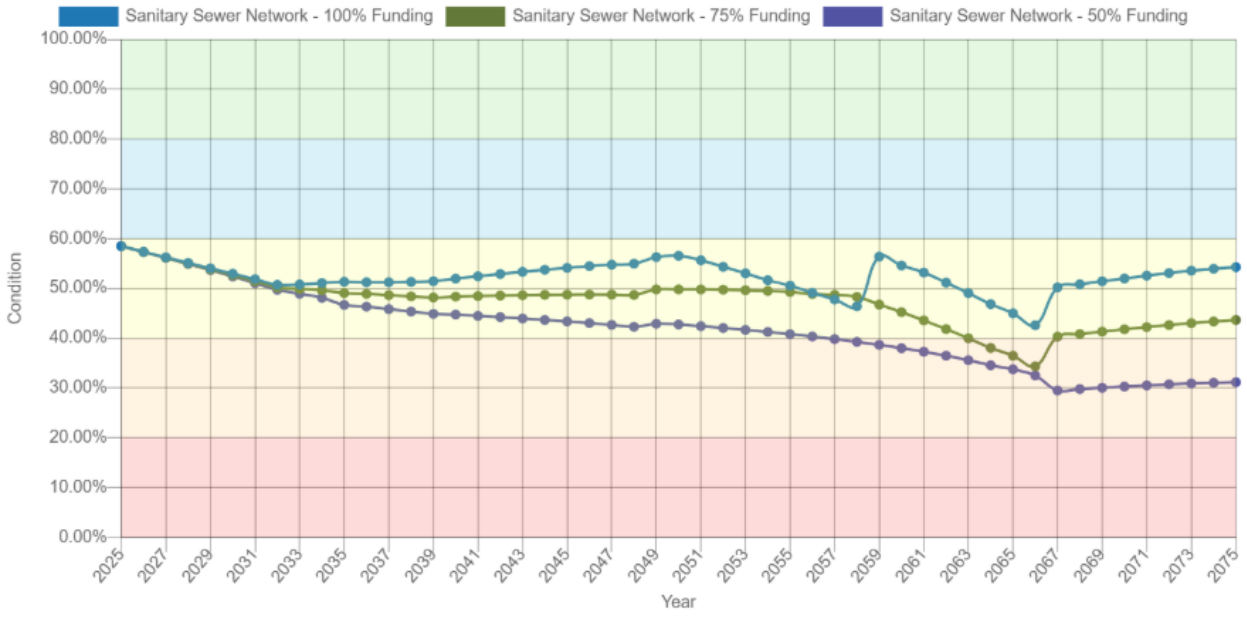
Table 29: Sanitary Sewer Network pLOS Scenario Analysis

Scenario	Technical LOS Outcomes	Initial Value (2025)	10 Year Projection (2035)	25 Year Projection (2050)	Scenario Average
Scenario 1	Average Condition	58.50%	51.32%	56.64%	52.35%
	Average Asset Risk	6.12	7.59	7.61	8.04

Scenario	Technical LOS Outcomes	Initial Value (2025)	10 Year Projection (2035)	25 Year Projection (2050)	Scenario Average
	Annual Investment Target		$690,203		
	Capital re-investment rate		1.6%		
Scenario 2	Average Condition	58.50%	49.05%	49.81%	47.34%
	Average Asset Risk	6.12	7.74	7.97	8.31
	Annual Investment Target		$482,690		
	Capital re-investment rate		1.1%		
Scenario 3	Average Condition	58.50%	46.69%	42.76%	41.69%
	Average Asset Risk	6.12	7.91	8.45	8.70
	Annual Investment Target		$321,793		
	Capital re-investment rate		0.8%		

The following figure illustrates the projected condition of the asset category under each of the three investment level scenarios, demonstrating how varying reinvestment strategies impact overall asset condition over time.

Figure 54: Sanitary Sewer Network Scenario Comparison



9. Storm Water Network

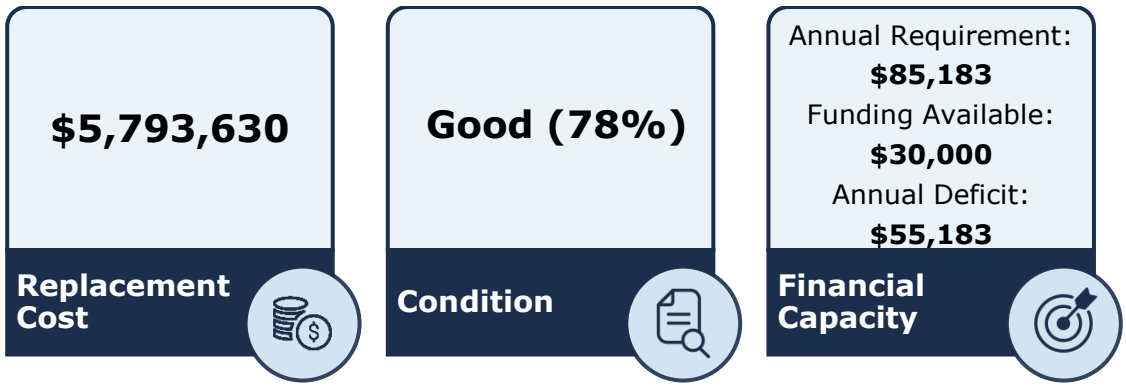
9.1. State of the Infrastructure

The Township is responsible for owning and maintaining a storm sewer network of 6.2 km of storm sewer mains, catch basins and other supporting infrastructure.

Staff are working towards improving the accuracy and reliability of their storm sewer network inventory to assist with long-term asset management planning.

The state of the infrastructure for the Storm Water Network is summarized below:

Figure 55: Storm Sewer Network State of the Infrastructure



9.2. Inventory & Valuation

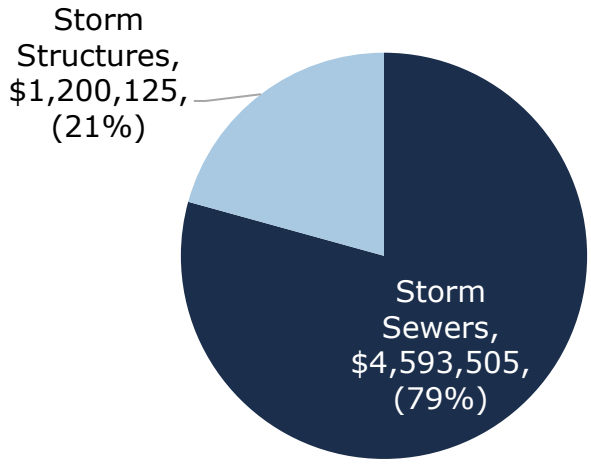
The table below includes the quantity, replacement cost method and total replacement cost of each asset segment for the Township's Storm Water Network.

Table 30: Storm Sewer Network Detailed Asset Inventory

Segment	Quantity	Unit of Measure	Primary Replacement Cost Method	Replacement Cost
Storm Sewers	6,200	Meters	Cost per Unit	$4,593,505
Storm Structures	208	Assets	Cost per Unit	$1,200,125
Total				**$5,793,630**

The graph below displays the total replacement cost of each asset segment in Cramahe' Storm Network inventory.

Figure 56: Storm Sewer Network Replacement Cost

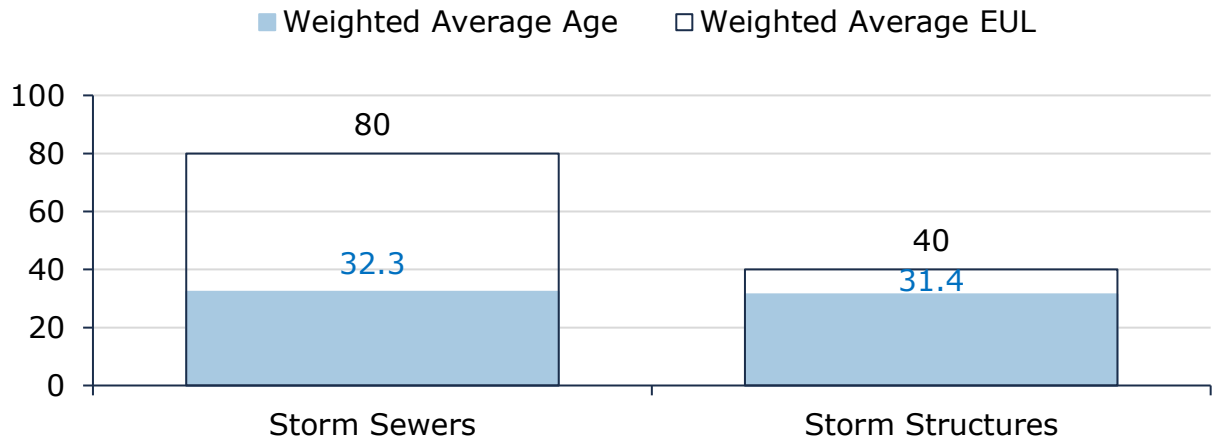


Each asset's replacement cost should be reviewed periodically to determine whether adjustments are needed to more accurate represent realistic capital requirements.

9.3. Asset Condition & Age

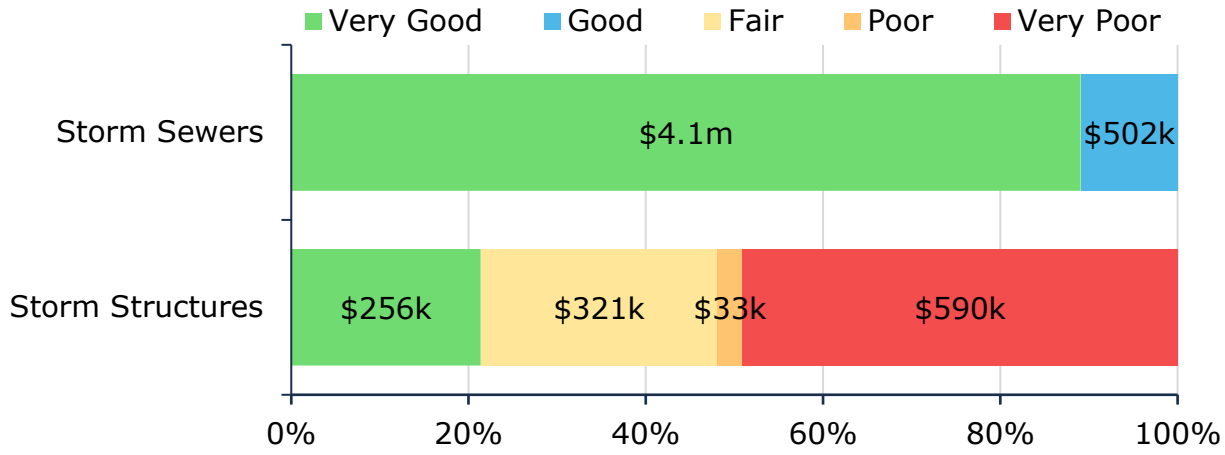
The graph below identifies the current average condition, the average age, and the estimated useful life for each asset segment. The average condition (%) is a weighted value based on replacement cost.

Figure 57: Storm Sewer Network Average Age vs Average EUL



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

Figure 58: Storm Sewer Network Condition Breakdown



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

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

9.3.1 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 Township's current approach:

- There are no formal condition assessment programs or CCTV Program in place for the Storm Sewer Network.
- As the Township refines the available asset inventory for the Storm Sewer Network, a regular assessment cycle should be established.

9.4. Lifecycle Management Strategy

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

The following table outlines the Township's current lifecycle management strategy:

Figure 59: Storm Sewer Network Current Lifecycle Strategy

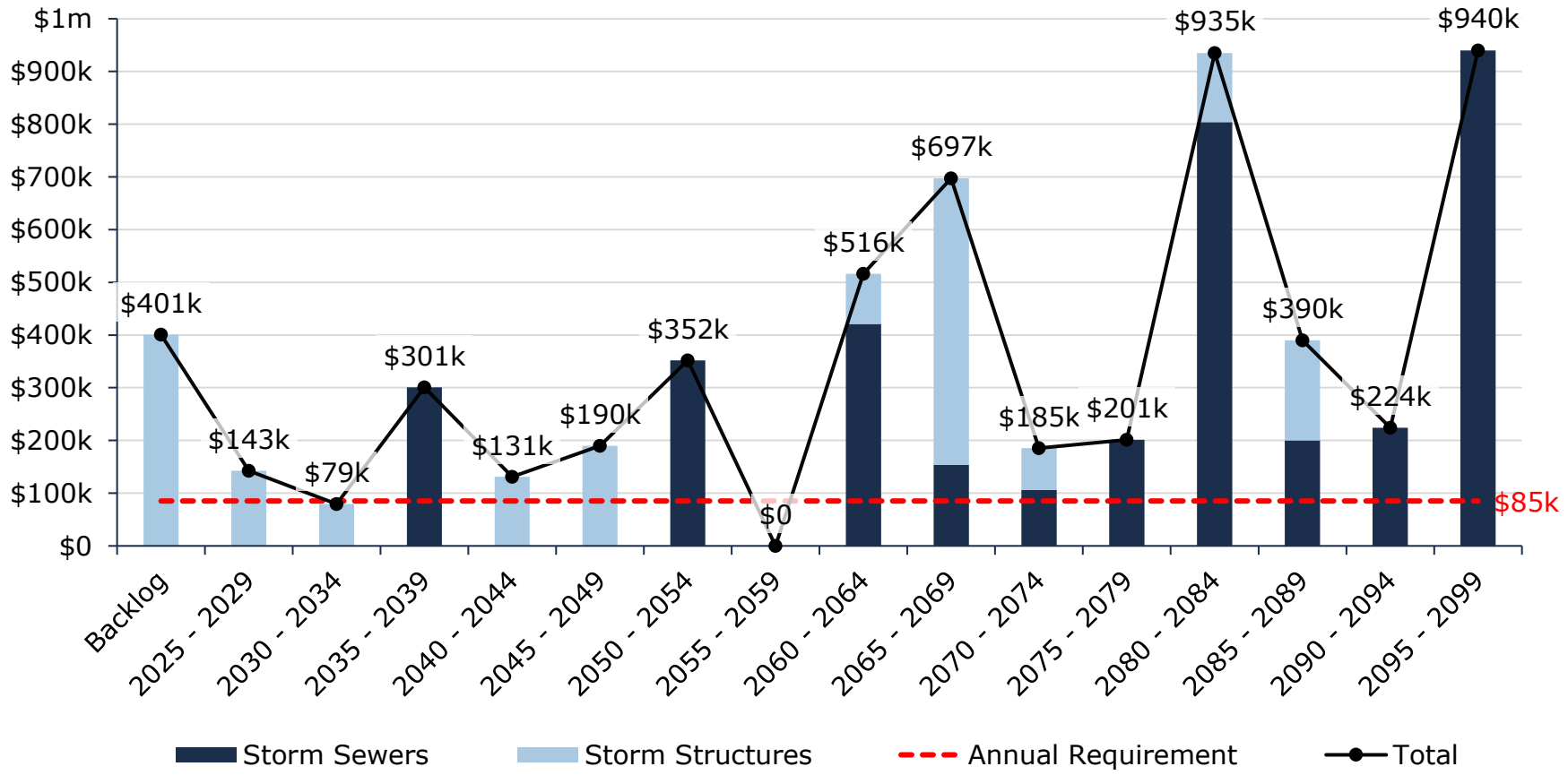
Maintenance / Rehabilitation / Replacement

- Driveway culvert maintenance is performed as-needed, generally complaint based. Crushed culverts are replaced, and culverts with significant sedimentation are flushed.
- The road right-of-way is mowed on an annual basis.
- The engineered storm ponds are cleaned on a 10-15 year cycle. Sumps in catch basins are vacuumed out on an annual basis.
- Pipe flushing is performed as-needed, removing winter sand buildup.
- Currently, no system-wide flushing or CCTV program is in place.
- Trenchless relining is not considered to be an effective strategy for storm pipes, considering they are smaller in diameter than sanitary pipes.
- Replacements are failure-driven, as this is considered more cost-effective than proactive replacements. Since the storm mains are generally lower risk than the road, water, or sanitary network, a reactive strategy is considered acceptable.

9.5. Forecasted Capital Requirements

The annual capital requirement represents the average amount per year that Cramahe should allocate towards funding rehabilitation and replacement needs. The following graph identifies capital requirements over the next 75 years. This projection is used as it ensures that every asset has gone through one full iteration of replacement. The forecasted requirements are aggregated into 5-year bins and the trend line represents the average capital requirements at $85 thousand.

Figure 60: Storm Sewer Network Forecasted Capital Replacement Requirements



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

Table 31 Storm Sewer Network System-Generated 10-Year Capital Costs

Segment	Backlog	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034
Storm Sewers	-	-	-	-	-	-	-	-	-	-	-
Storm Structures	$401k	$57k	$43k	-	-	$43k	-	$46k	-	-	$33k
Total	**$401k**	**$57k**	**$43k**	**-**	**-**	**$43k**	**-**	**$46k**	**-**	**-**	**$33k**

These projections are generated in Citywide and rely on the data available in the asset register. Age-based condition data and replacement costs were used to assist in forecasting replacement needs for storm sewer lines assets.

9.6. Risk & Criticality

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

Figure 61: Storm Sewer Network Risk Matrix

1 - 4 Very Low	5 - 7 Low	8 - 9 Moderate	10 - 14 High	15 - 25 Very High
$4,886,824 (84%)	$906,806 (16%)	- (0%)	- (0%)	- (0%)

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

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

9.7. Risks to Current Asset Management Strategies

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

Infrastructure Design & Extreme Weather Events

Past designs of the Storm Sewer Network are currently inadequate since the extreme weather impacts currently are much greater than at the time of design. The design of the Storm Sewer Network is not built to withstand the peak flows and may cause flooding and damage roads. Even though the township has not identified any immediate impacts on service delivery resulting from flooding, it poses a risk when extreme precipitation events is projected to continue. To improve asset resiliency, staff should identify the critical areas and incorporating a monitoring and maintenance program to support infrastructure resiliency and help mitigate the risk.

Lifecycle Management Strategies

The current lifecycle management strategy for Storm Sewer Network is considered reactive. There are no formal condition assessment programs in place for the Storm Sewer Network. This poses a risk of service disruption when assets failure occurs. An enhanced proactive strategy can be developed for critical assets to extend the service life of the assets, reduce the risk of service disruption, and reduce grant dependency.

9.8. Levels of Service

The following tables identify the Township's metrics to identify their current level of service for the Storm Sewer Network.

9.8.1 Community Levels of Service

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

Table 32 Storm Sewer Network Community Levels of Service

Service Attribute	Qualitative Description	Current LOS
Sustainable	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	A piped drainage system of approximately 6.2 kilometres is present in the Township, mainly located in Colborne. The Storm Sewer Network is consisting of sewer mains, manholes and catch basins. Storm sewer mains are managed in segments from road intersection to road intersection. Refer to Appendix B.

9.8.2 Technical Levels of Service

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

Table 33 Storm Sewer Network Technical Levels of Service

Service Attribute	Technical Metric	Current LOS	Proposed LOS (2040)
Accessible & Reliable	# of service requests related to surface flooding	10	<10
Safe & Regulatory	% of properties in municipality resilient to a 100-year storm	17.4%	17.4%
	% of the municipal stormwater management system resilient to a 5-year storm	100%	100%
Affordable	Capital Re-investment Rate	0.5%	1.5%
Sustainable	Average Risk Rating	3.63	3.69
	Average condition of stormwater assets	78	74

9.8.3 Proposed Levels of Service Analysis

As per O. Reg. 588/17, by July 1, 2025, municipalities are required to consider proposed levels of service (PLOS), discuss the associated risks and long-term sustainability of these service levels, and explain the municipality's ability to afford the PLOS.

The below tables and graphs explain the proposed levels of service scenarios that were analyzed for Land Improvement assets. Further PLOS analysis at the portfolio level can be found in Proposed Levels of Service Scenario Analysis.

Table 34: Storm Sewer Network PLOS Scenarios

Scenario	Description
Scenario 1: Achieving Full Funding in 15 Years	This scenario assumes a phased tax increase of approximately 2.2% annually, reaching full funding within 15 years
Scenario 2: Achieving 75% Funding in 15 Years	This scenario assumes a phased tax increase of approximately 1.4% annually, reaching 75% funding within 15 years
Scenario 3: Achieving 50% Funding in 15 Years	This scenario assumes a phased tax increase of approximately 0.5% annually, reaching 50% funding within 15 years

The following table presents three proposed service level scenarios for the Storm Network. These options were developed based on current municipal practices, stakeholder input, and future-oriented asset management strategies. Each scenario outlines the expected impact on service delivery, lifecycle activities, costs, resource needs, risk exposure, and alignment with municipal goals and provincial policy. This structured comparison allows Council and staff to assess trade-offs between investment levels and outcomes, ensuring informed decision-making aligned with community priorities and financial realities.

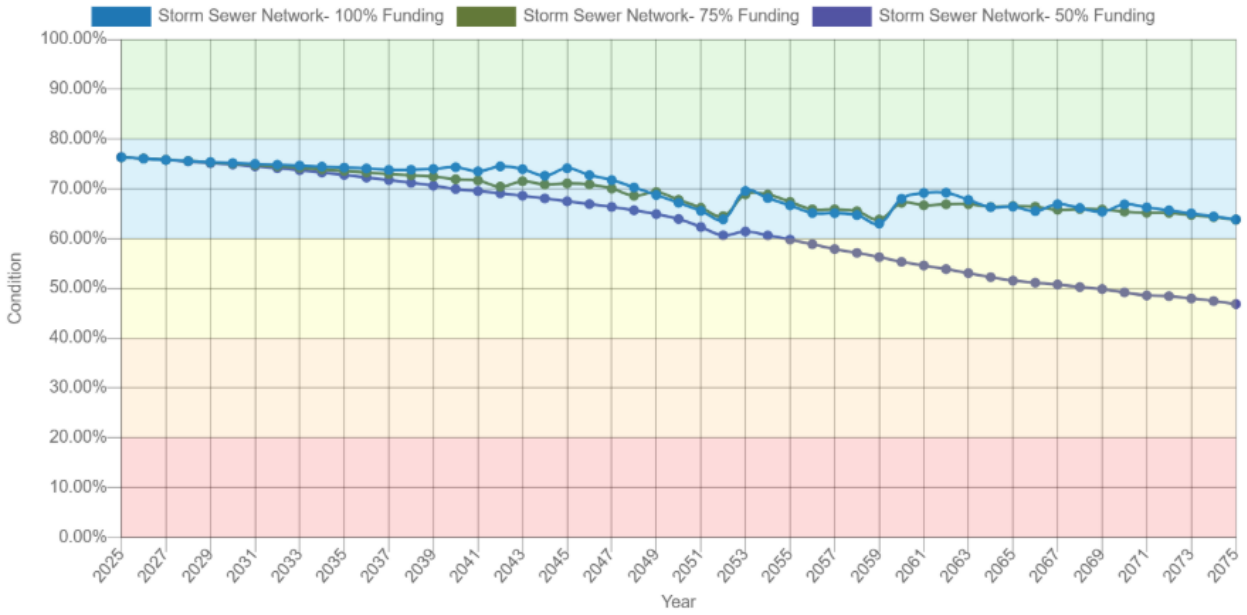
Table 35: Storm Sewer Network pLOS Scenario Analysis

Scenario	Technical LOS Outcomes	Initial Value (2025)	10 Year Projection (2035)	25 Year Projection (2050)	Scenario Average
Scenario 1	Average Condition	76.33%	74.27%	67.20%	70.04%
	Average Asset Risk	3.63	3.95	4.53	4.12
	Annual Investment Target		$85,183		
	Capital re-investment rate		1.5%		
Scenario 2	Average Condition	76.33%	73.59%	67.80%	69.43%
	Average Asset Risk	3.63	3.98	4.52	4.17

Scenario	Technical LOS Outcomes	Initial Value (2025)	10 Year Projection (2035)	25 Year Projection (2050)	Scenario Average
	Annual Investment Target		$63,887		
	Capital re-investment rate		1.1%		
Scenario 3	Average Condition	76.37%	72.79%	63.94%	62.65%
	Average Asset Risk	3.63	4.02	4.93	4.79
	Annual Investment Target		$42,592		
	Capital re-investment rate		0.7%		

The following figure illustrates the projected condition of the asset category under each of the three investment level scenarios, demonstrating how varying reinvestment strategies impact overall asset condition over time.

Figure 62: Storm Sewer Network Scenario Comparison



10. Buildings & Facilities

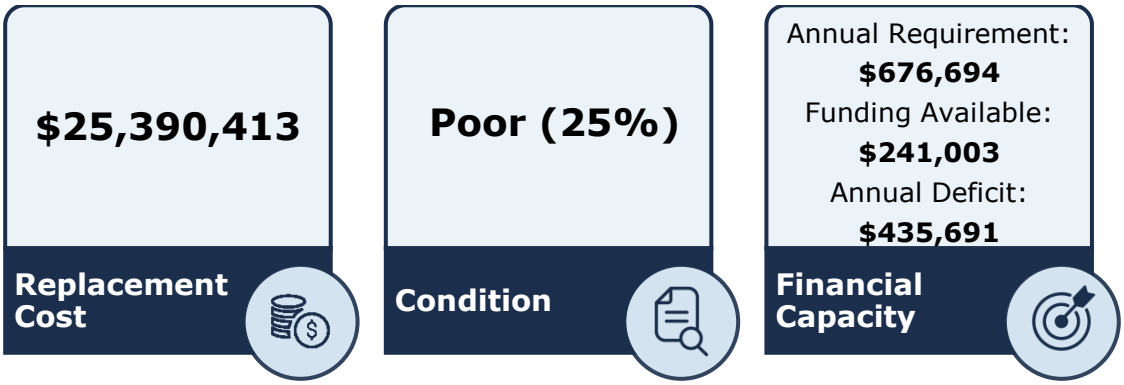
10.1. State of the Infrastructure

The Township of Cramahe owns and maintains several facilities and recreation centres that provide key services to the community. These include:

- Keeler Centre
- Art Gallery
- Public Library
- Municipal Offices
- Fire Halls
- Storage Buildings and Garage

The state of the infrastructure for municipal buildings and facilities is summarized below:

Figure 63: Buildings & Facilities State of the Infrastructure



10.2. Inventory & Valuation

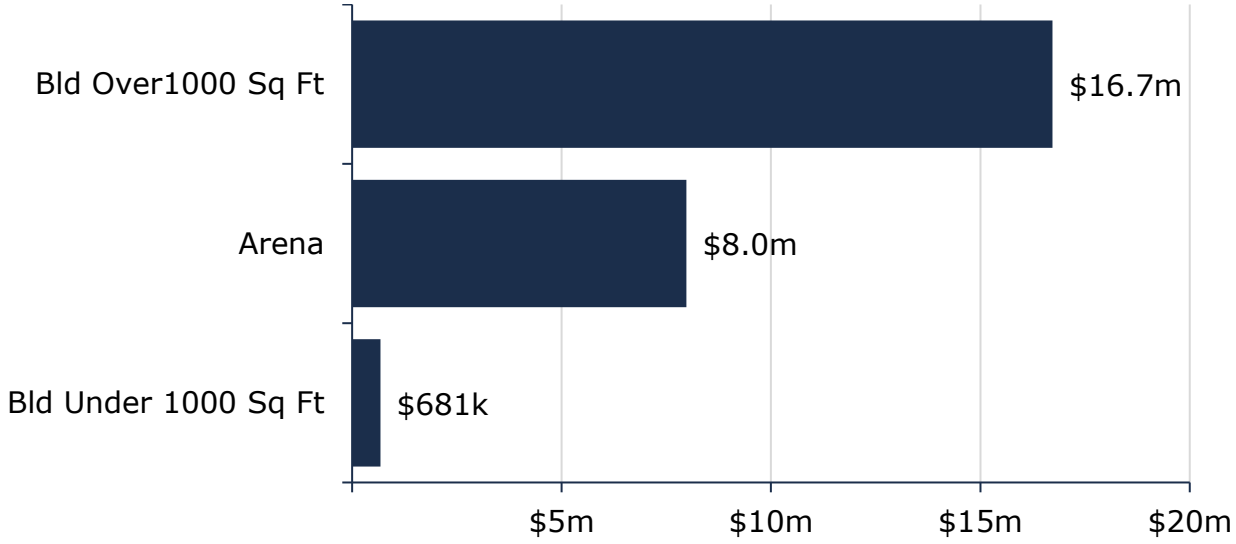
The table below includes the quantity, replacement cost method and total replacement cost of each asset segment in the Township's Buildings inventory.

Table 36: Buildings & Facilities Detailed Asset Inventory

Segment	Quantity	Unit of Measure	Primary Replacement Cost Method	Replacement Cost
Arena	1 (85)	Assets	CPI	$7,984,110
Bld Over1000 Sq Ft	9 (31)	Assets	CPI	$16,725,555
Bld Under 1000 Sq Ft	7 (9)	Assets	CPI	$680,748
Total				**$25,390,413**

The graph below displays the total replacement cost of each asset segment in Cramahe' buildings inventory.

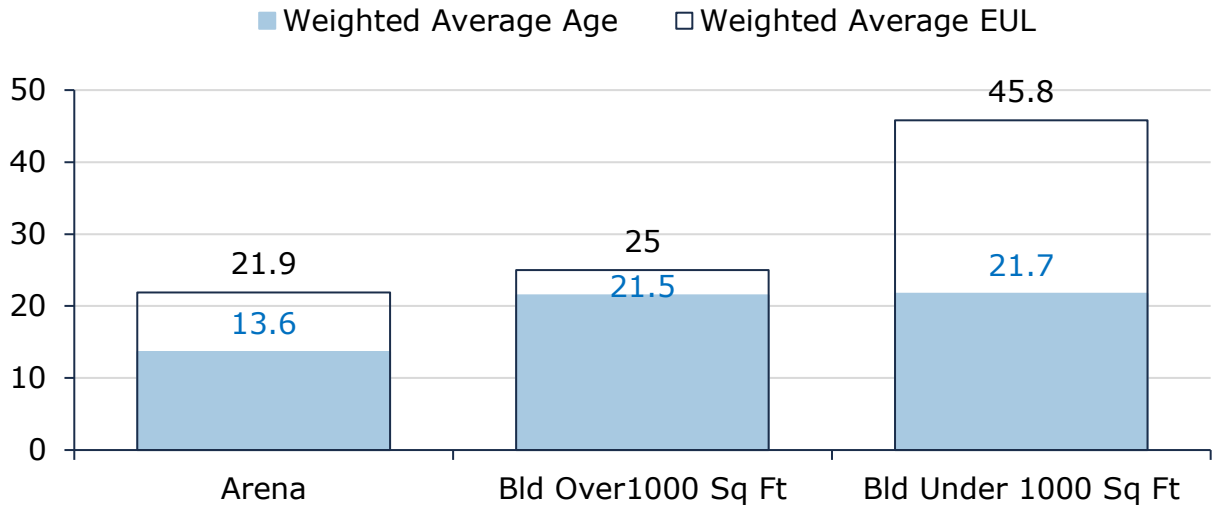
Figure 64: Buildings & Facilities Replacement Cost



10.3. Asset Condition & Age

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

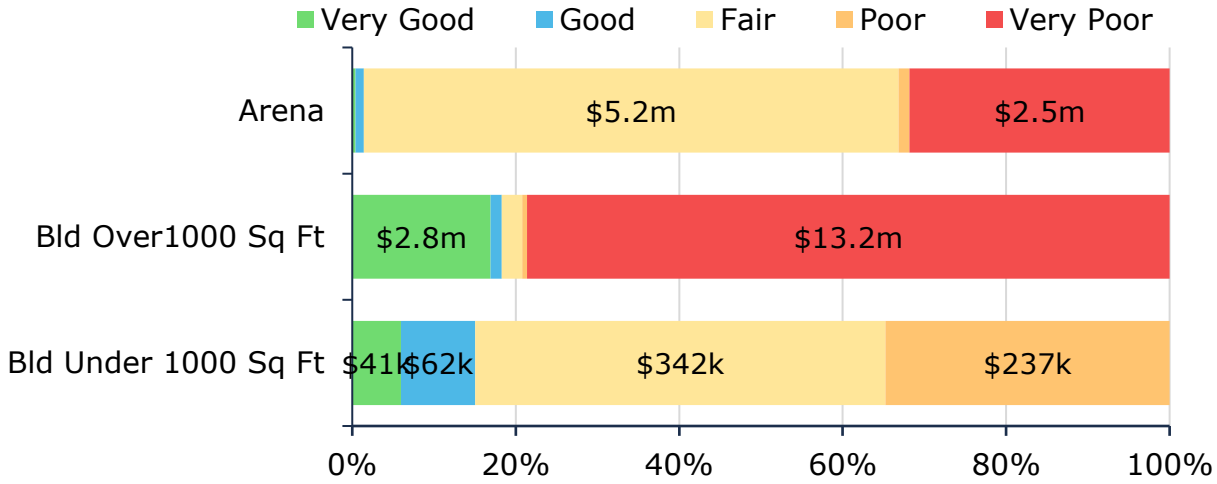
Figure 65: Buildings & Facilities Average Age vs Average EUL



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

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

Figure 66: Buildings & Facilities Condition Breakdown



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

10.3.1 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 Township's current approach:

- Health and safety inspection by internal staff is completed monthly
- Municipal buildings are subject to internal inspections on an as-needed basis
- Currently, there are no formal condition structural assessment programs for building assets in place.

10.4. Lifecycle Management Strategy

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

The following describes the Township's current lifecycle management strategy.

Figure 67: Buildings & Facilities Current Lifecycle Strategy

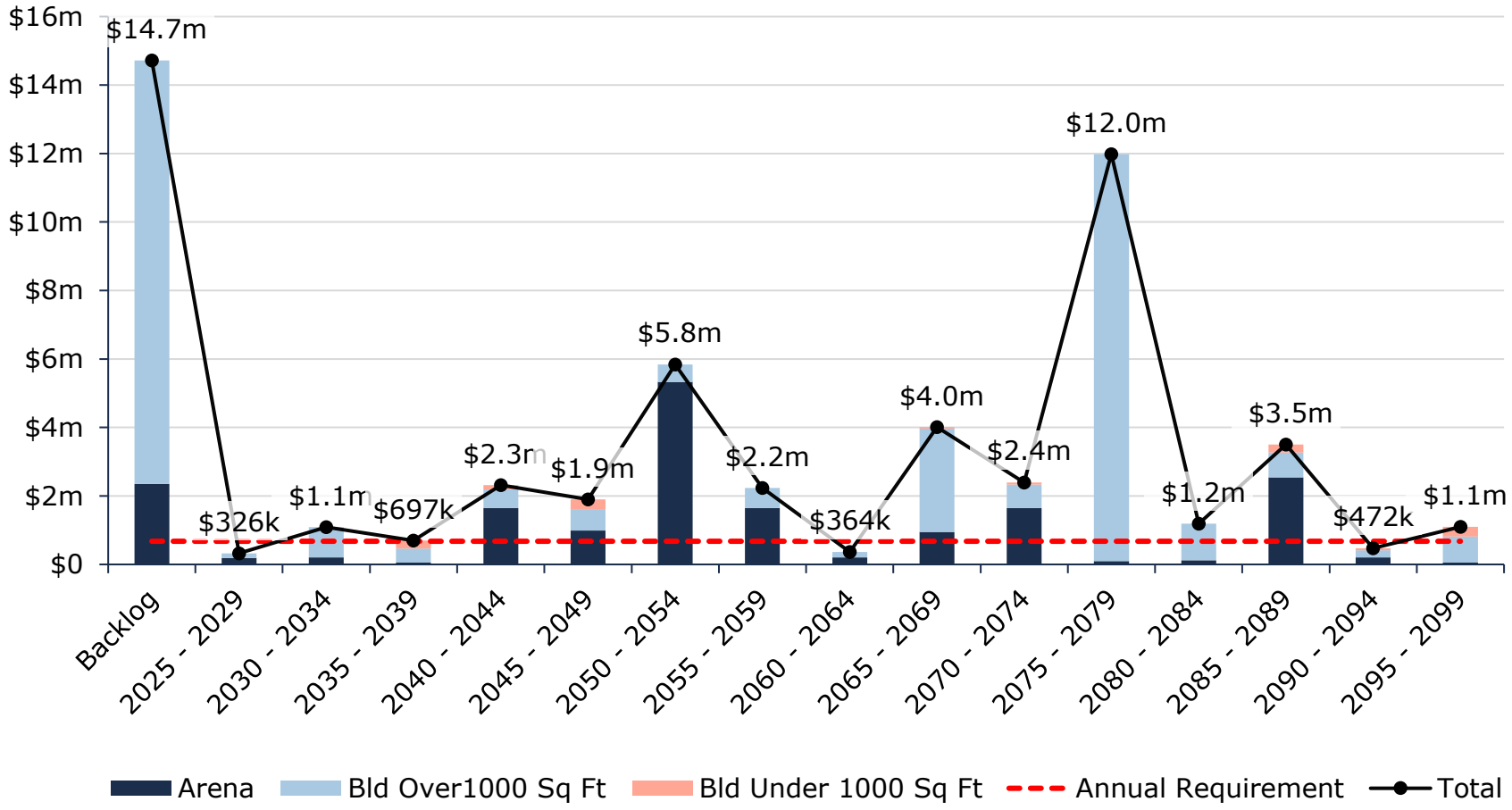
Maintenance / Rehabilitation / Replacement

- Municipal buildings are subject to regular inspections for health and safety requirements.
- Maintenance activities are undertaken as a result of internal inspections, prioritizing activities related to health and safety, and regulatory compliance.
- Critical buildings (Fire Stations, etc.) have a regular inspection, maintenance and rehabilitation schedule.
- Currently, no maintenance and rehabilitation schedule for municipal buildings in place, the maintenance is dealt with on an as-needed basis.
- Refubishments and replacements are projected out for the next 1-2 years. The Township is moving towards a 5-10 year proactive planning horizon.

10.5. Forecasted Capital Requirements

The annual capital requirement represents the average amount per year that Cramahe should allocate towards funding rehabilitation and replacement needs. The following graph identifies capital requirements over the next 75 years. This projection is used as it ensures that every asset has gone through one full iteration of replacement. The forecasted requirements are aggregated into 5-year bins and the trend line represents the average capital requirements at $677 thousand.

Figure 68: Buildings & Facilities Forecasted Capital Replacement Requirements



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

Table 37 Buildings & Facilities System-Generated 10-Year Capital Costs

Segment	Backlog	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034
Arena	$2.4m	-	$190k	-	-	-	-	$128k	-	$79k	-
Bld Over1000 Sq Ft	$12.4m	-	$105k	-	$31k	-	$676k	$66k	-	$29k	$109k
Bld Under 1000 Sq Ft	-	-	-	-	-	-	-	-	-	-	-
Total	**$14.7m**	**-**	**$295k**	**-**	**$31k**	**-**	**$676k**	**$194k**	**-**	**$108k**	**$109k**

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

10.6. Risk & Criticality

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

Figure 69: Buildings & Facilities Risk Matrix

1 - 4 Very Low $1,197,258 (5%)	5 - 7 Low $14,303,236 (56%)	8 - 9 Moderate $236,695 (<1%)	10 - 14 High $2,983,172 (12%)	15 - 25 Very High $6,670,052 (26%)

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

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

10.7. Risks to Current Asset Management Strategies

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

Growth & Demographic Change

Inadequate staffing levels for building inspections present a significant risk considering potential legislative or liability changes. As building codes and regulations evolve, the demand for thorough and timely inspections increases. Without sufficient personnel to conduct these inspections, there may be delays in compliance, increased vulnerability to regulatory fines, and greater liability exposure. To mitigate this, the Township should ensure adequate staffing levels and consider training or outsourcing options to maintain timely inspections and compliance with evolving regulations. This will help reduce the likelihood of non-compliance and safety hazards.

Aging Infrastructure & Capital Funding Strategies

Many building assets in the Township are reaching the end of their estimated useful life. There is currently a backlog of approximately $13.2M for all assets, with Buildings & Facilities accounting for $6.7M. Several buildings require replacements of major components in the coming years. Major capital rehabilitation projects for buildings and facilities will be heavily reliant on the availability of grant funding opportunities. The Township should consider performing internal building structure inspections on a regular cycle and document all deficiencies. With the inspection data, a 5-to-10-year proactive facilities replacement /rehabilitation plan can be developed to reduce grant dependency and prevent deferral of capital works.

10.8. Levels of Service

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

10.8.1 Technical Levels of Service

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

Table 38 Buildings & Facilities Technical Levels of Service

Service Attribute	Technical Metric	Current LOS	Proposed LOS (2040)
Accessible & Reliable	Number of unplanned facility closures	3	<5
	Square Meter of indoor recreation facilities per 1,000 people	663.54m^2	663.54m^2
Safe & Regulatory	# of user group complaints	0	<2
	# of health and safety inspections per facility	12	12
	# of service requests about unsafe conditions in facilities	3	<5
Affordable	Total equivalent kWh energy consumption /m2 of all buildings and facilities	206.43	206.43
	Capital re-investment rate	1.0%	2.7%
Sustainable	Average Risk Rating	7.46	9.23
	Average condition of municipal Buildings	25	26

10.8.2 Proposed Levels of Service Analysis

As per O. Reg. 588/17, by July 1, 2025, municipalities are required to consider proposed levels of service (PLOS), discuss the associated risks and long-term sustainability of these service levels, and explain the municipality's ability to afford the PLOS.

The below tables and graphs explain the proposed levels of service scenarios that were analyzed for municipal Buildings. Further PLOS analysis at the portfolio level can be found in Proposed Levels of Service Scenario Analysis.

Table 39: Buildings & Facilities PLOS Scenarios

Scenario	Description
Scenario 1: Achieving Full Funding in 15 Years	This scenario assumes a phased tax increase of approximately 2.2% annually, reaching full funding within 15 years
Scenario 2: Achieving 75% Funding in 15 Years	This scenario assumes a phased tax increase of approximately 1.4% annually, reaching 75% funding within 15 years
Scenario 3: Achieving 50% Funding in 15 Years	This scenario assumes a phased tax increase of approximately 0.5% annually, reaching 50% funding within 15 years

The following table presents three proposed service level scenarios for municipal Buildings. These options were developed based on current municipal practices, stakeholder input, and future-oriented asset management strategies. Each scenario outlines the expected impact on service delivery, lifecycle activities, costs, resource needs, risk exposure, and alignment with municipal goals and provincial policy. This structured comparison allows Council and staff to assess trade-offs between investment levels and outcomes, ensuring informed decision-making aligned with community priorities and financial realities.

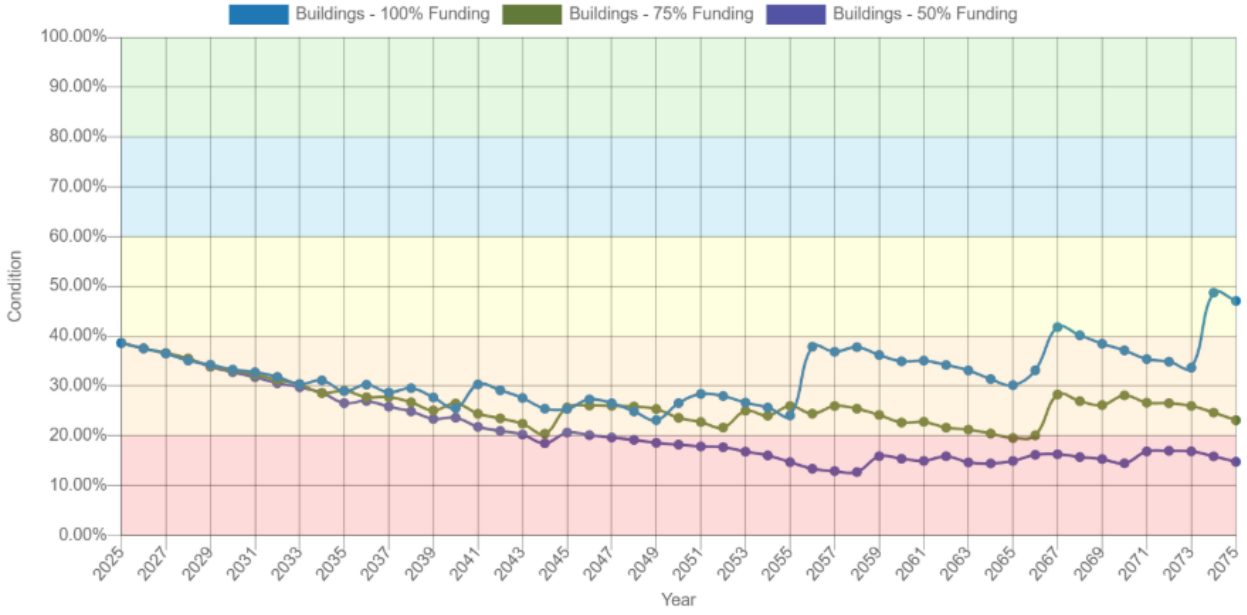
Table 40: Buildings & Facilities pLOS Scenario Analysis

Scenario	Technical LOS Outcomes	Initial Value (2025)	10 Year Projection (2035)	25 Year Projection (2050)	Scenario Average
Scenario 1	Average Condition	38.63%	28.96%	26.65%	32.34%
	Average Asset Risk	7.46	9.08	10.42	9.49
	Annual Investment Target		$676,694		
	Capital re-investment rate		2.7%		
Scenario 2	Average Condition	38.65%	29.04%	23.59%	26.44%
	Average Asset Risk	7.46	9.07	10.64	9.77
	Annual Investment Target		$507,520		

	Capital re-investment rate		2.0%		
Scenario 3	Average Condition	38.65%	26.56%	18.22%	21.02%
	Average Asset Risk	7.46	9.27	10.64	10.35
	Annual Investment Target		$338,347		
	Capital re-investment rate		1.3%		

The following figure illustrates the projected condition of the asset category under each of the three investment level scenarios, demonstrating how varying reinvestment strategies impact overall asset condition over time.

Figure 70: Buildings & Facilities Scenario Comparison



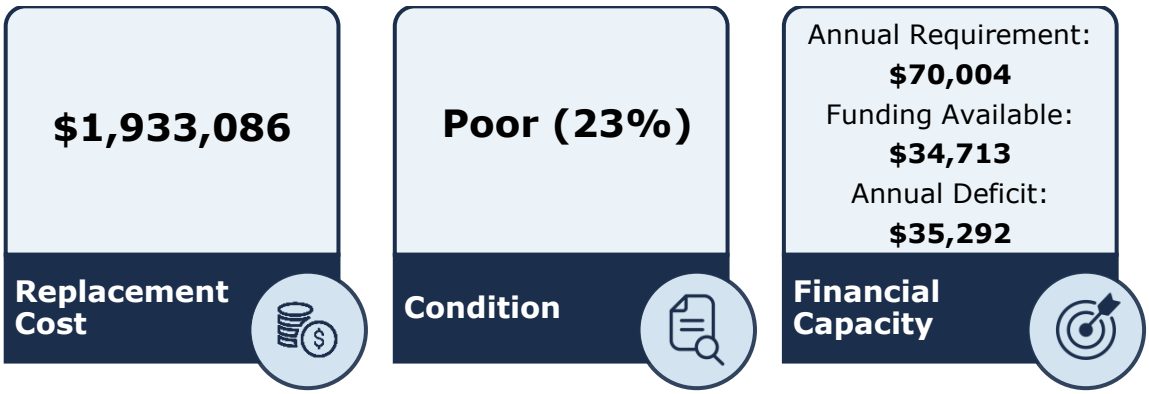
11. Parks & Recreation

11.1. State of the Infrastructure

The Township owns a range of parks and recreation assets, including Memorial Park Ball Diamond, the Keeler Centre soccer pitch, playground equipment, tennis courts, parking lots, and trails along King Street.

The state of the infrastructure for the Parks & Recreation is summarized below:

Figure 71: Parks & Recreation State of the Infrastructure



11.2. Asset Inventory & Valuation

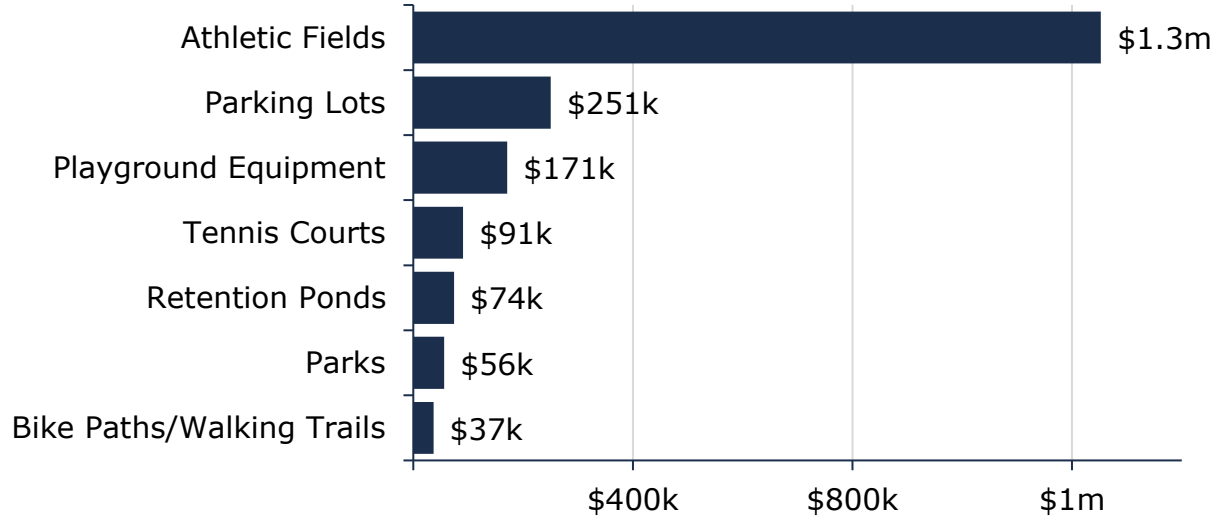
The table below includes the quantity, replacement cost method and total replacement cost of each asset segment for the Township's Parks & Recreation.

Table 41: Parks & Recreation Detailed Asset Inventory

Segment	Quantity	Unit of Measure	Primary Replacement Cost Method	Replacement Cost
Athletic Fields	5 (18)	Assets	CPI	$1,252,781
Bike Paths/Walking Trails	2	Assets	CPI	$37,147
Parking Lots	7	Assets	CPI	$250,637
Parks	1 (87)	Assets	CPI	$56,284
Playground Equipment	2	Assets	CPI	$171,264
Retention Ponds	1	Assets	CPI	$74,106
Tennis Courts	1 (2)	Assets	CPI	$90,867
Total				**$1,933,086**

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

Figure 72: Parks & Recreation Replacement Cost

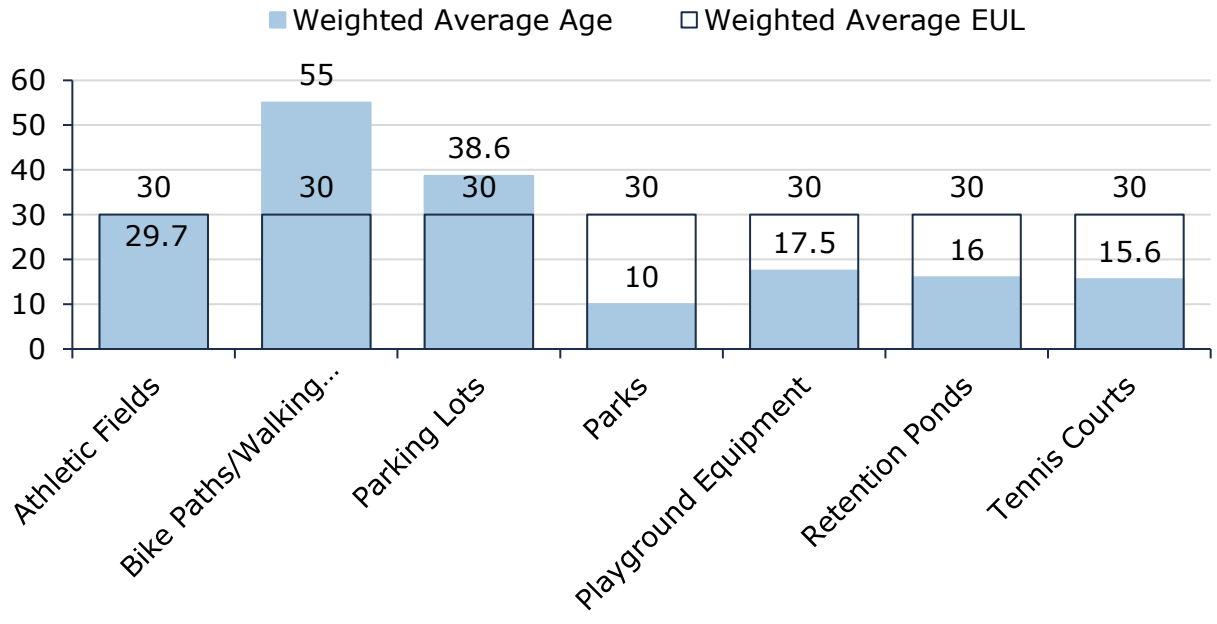


Each asset's replacement cost should be reviewed periodically to determine whether adjustments are needed to represent capital requirements more accurately.

11.3. Asset Condition & Age

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

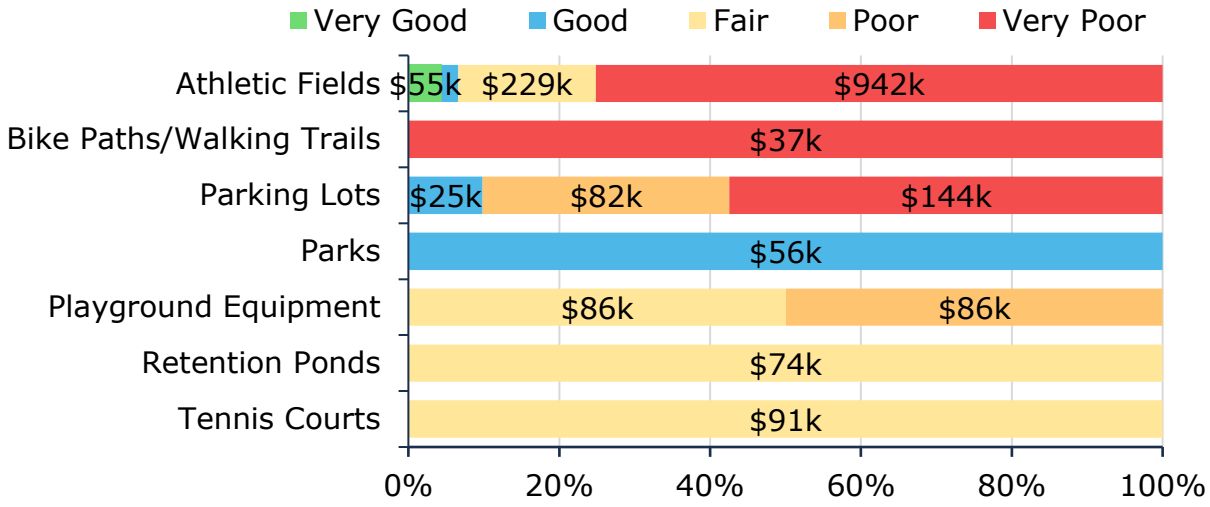
Figure 73: Parks & Recreation Average Age vs Average EUL



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

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

Figure 74: Land Improvement Condition Breakdown



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

11.3.1 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 Township's current approach:.

- Regular visual inspections of parks are completed by in-house staff on a weekly basis
- Play structures are inspected by in-house staff on a monthly basis for CSA compliance
- Sports fields are inspected monthly, or in response to user group planning

11.4. Lifecycle Management Strategy

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 Township's current approach:

Figure 75: Parks & Recreation Current Lifecycle Strategy

Maintenance / Rehabilitation / Replacement

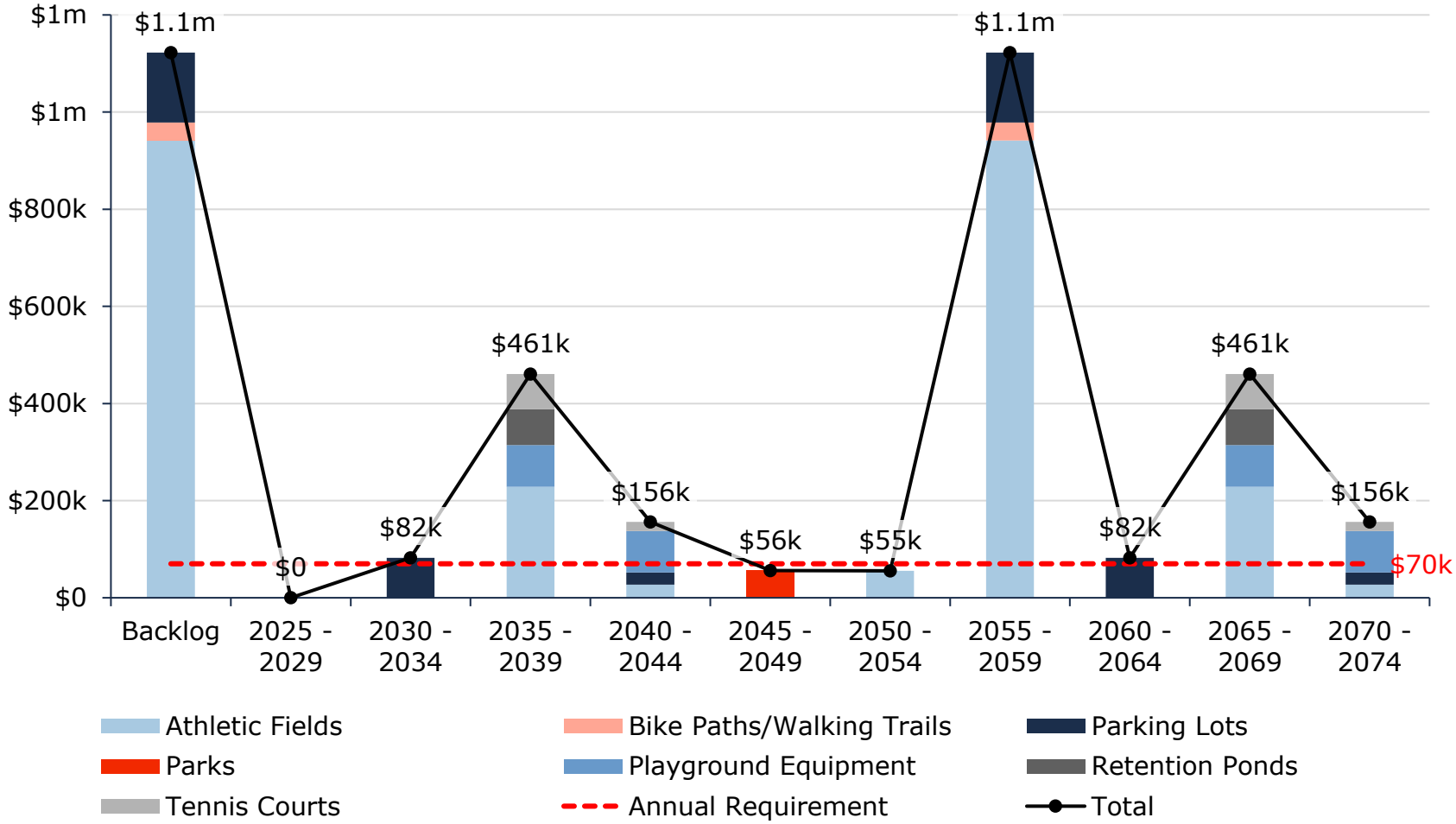
- Parks are subjected to scheduled mowing and landscaping, prescribed by asset usage and season.
- All trails are seasonal and do not require winter maintenance. In the past, trail inspection and maintenance was undertaken by a volunteer group; going forward the Township will maintain all trails.
- Assets that fall under the operating budget are replaced when they reach end-of-life.

11.5. Forecasted Capital Requirements

The figure below illustrates the cyclical short-, medium- and long-term infrastructure replacement requirements for the Township's land improvement infrastructure. This analysis was run until 2074 to capture at least one iteration of replacement for the longest-lived asset in the asset register. Cramahe' average annual requirements (red dotted line) total $70 thousands for all land improvement assets. Although actual spending may fluctuate substantially from year to year, this figure is a useful benchmark value for annual capital expenditure targets (or allocations to reserves) to ensure projects are not deferred and replacement needs are met as they arise.

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

Figure 76: Parks & Recreation Forecasted Capital Replacement Requirements



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

Table 42 Parks & Recreation System-Generated 10-Year Capital Costs

Segment	Backlog	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034
Athletic Fields	$942k	-	-	-	-	-	-	-	-	-	-
Bike Paths/Walking Trails	$37k	-	-	-	-	-	-	-	-	-	-
Parking Lots	$144k	-	-	-	-	-	-	-	-	$82k	-
Parks	-	-	-	-	-	-	-	-	-	-	-
Playground Equipment	-	-	-	-	-	-	-	-	-	-	-
Retention Ponds	-	-	-	-	-	-	-	-	-	-	-
Tennis Courts	-	-	-	-	-	-	-	-	-	-	-
Total	**$1.1m**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**$82k**	**-**

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

11.6. Risk & Criticality

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

Figure 77: Land Improvement Risk Matrix

1 - 4 Very Low	5 - 7 Low	8 - 9 Moderate	10 - 14 High	15 - 25 Very High
$736,327 (38%)	$1,196,759 (62%)	- (0%)	- (0%)	- (0%)

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

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

11.7. Risks to Current Asset Management Strategies

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

Growth & Community Expectations

The Census data indicates that the population of the Township has grown to 6509 in 2021, and it is projected to grow to 7,013 by 2034. The residents in the Township expect to have more Parks and Recreation assets, such as basketball courts, tennis courts and trails. The Township is required to increase capital and operating costs for expanding capacity and maintain current levels of service. Finding a balance between meeting service demands and maintaining affordability will require the Township to employ strategic lifecycle management and prioritization of critical assets.

11.8. Levels of Service

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

11.8.1 Technical Levels of Service

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

Table 43 Parks & Recreation Technical Levels of Service

Service Attribute	Technical Metric	Current LOS	Proposed LOS (2040)
Safe & Regulatory	# of service requests about unsafe conditions in parks	4	<5
	# of inspections per playground/park per month	1	1
Affordable	Capital Re-investment Rate	1.8%	3.6%
Sustainable	Average Risk Rating	4.20	3.83
	Average condition of parks & recreation assets	23	32

11.8.2 Proposed Levels of Service Analysis

As per O. Reg. 588/17, by July 1, 2025, municipalities are required to consider proposed levels of service (PLOS), discuss the associated risks and long-term sustainability of these service levels, and explain the municipality's ability to afford the PLOS.

The below tables and graphs explain the proposed levels of service scenarios that were analyzed for Parks & Recreation assets. Further PLOS analysis at the portfolio level can be found in Proposed Levels of Service Scenario Analysis.

Table 44: Parks & Recreation PLOS Scenarios

Scenario	Description
Scenario 1: Achieving Full Funding in 15 Years	This scenario assumes a phased tax increase of approximately 2.2% annually, reaching full funding within 15 years
Scenario 2: Achieving 75% Funding in 15 Years	This scenario assumes a phased tax increase of approximately 1.4% annually, reaching 75% funding within 15 years

Scenario	Description
Scenario 3: Achieving 50% Funding in 15 Years	This scenario assumes a phased tax increase of approximately 0.5% annually, reaching 50% funding within 15 years

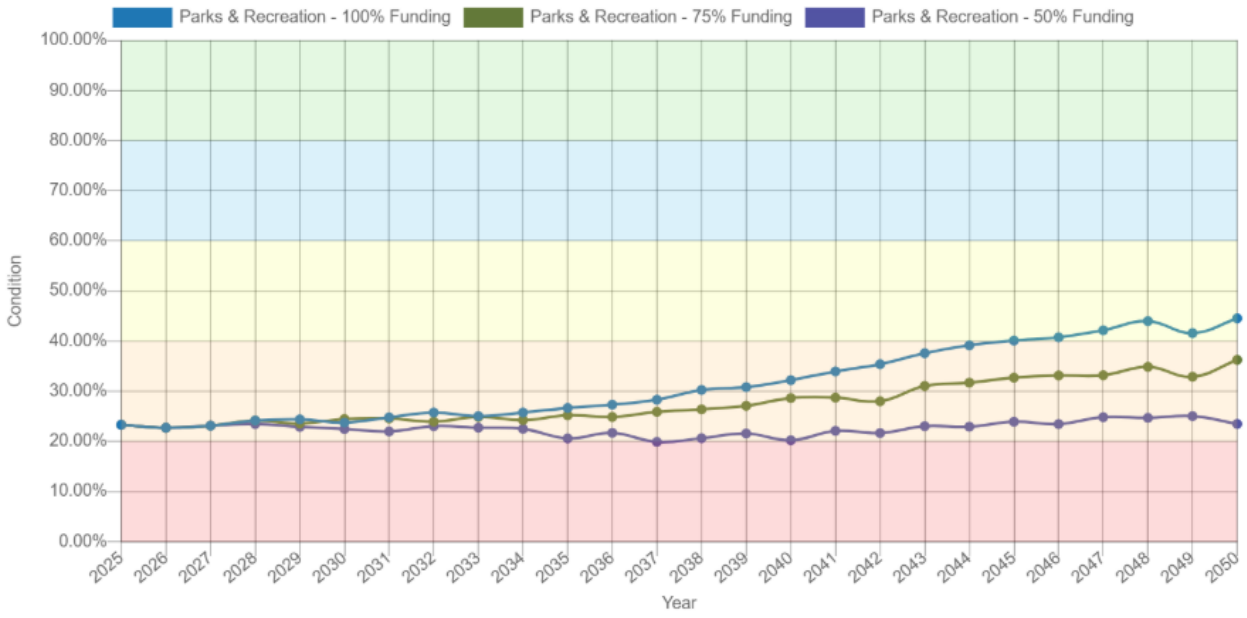
The following table presents three proposed service level scenarios for Land Improvement assets. These options were developed based on current municipal practices, stakeholder input, and future-oriented asset management strategies. Each scenario outlines the expected impact on service delivery, lifecycle activities, costs, resource needs, risk exposure, and alignment with municipal goals and provincial policy. This structured comparison allows Council and staff to assess trade-offs between investment levels and outcomes, ensuring informed decision-making aligned with community priorities and financial realities.

Table 45: Parks & Recreation pLOS Scenario Analysis

Scenario	Technical LOS Outcomes	Initial Value (2025)	10 Year Projection (2035)	25 Year Projection (2050)	Scenario Average
Scenario 1	Average Condition	23.32%	26.69%	44.57%	31.47%
	Average Asset Risk	4.20	4.16	3.18	3.86
	Annual Investment Target		$70,004		
	Capital re-investment rate		3.6%		
Scenario 2	Average Condition	23.32%	25.24%	36.28%	27.70%
	Average Asset Risk	4.20	4.22	3.52	4.03
	Annual Investment Target		$52,503		
	Capital re-investment rate		2.7%		
Scenario 3	Average Condition	23.32%	20.61%	23.52%	22.64%
	Average Asset Risk	4.20	4.42	4.22	4.27%
	Annual Investment Target		$35,002		
	Capital re-investment rate		1.8%		

The following figure illustrates the projected condition of the asset category under each of the three investment level scenarios, demonstrating how varying reinvestment strategies impact overall asset condition over time.

Figure 78: Parks & Recreation Scenario Comparison



12. Machinery & Equipment

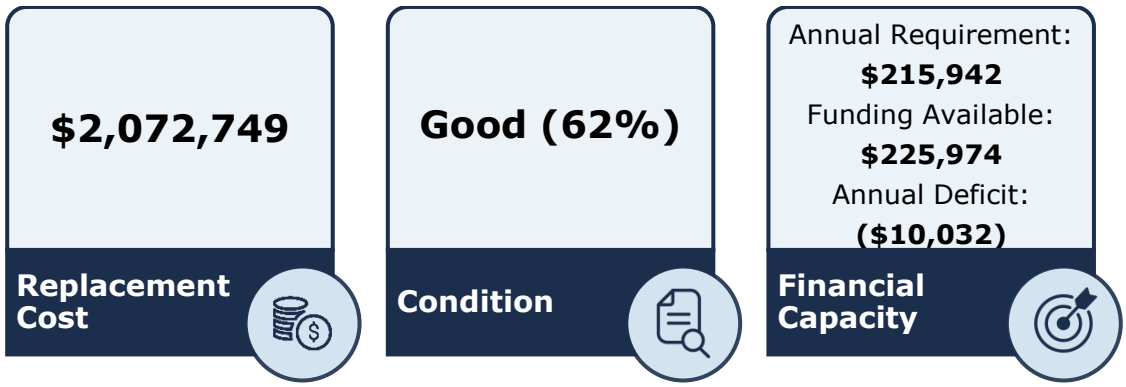
12.1. State of the Infrastructure

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

- Fire equipment to support the delivery of emergency services
- Public Work equipment to provide winter control activities and support transportation services
- Other equipment to support administration services and community services

The state of the infrastructure for municipal Machinery & Equipment is summarized below:

Figure 79: Machinery & Equipment State of the Infrastructure



12.2. Inventory & Valuation

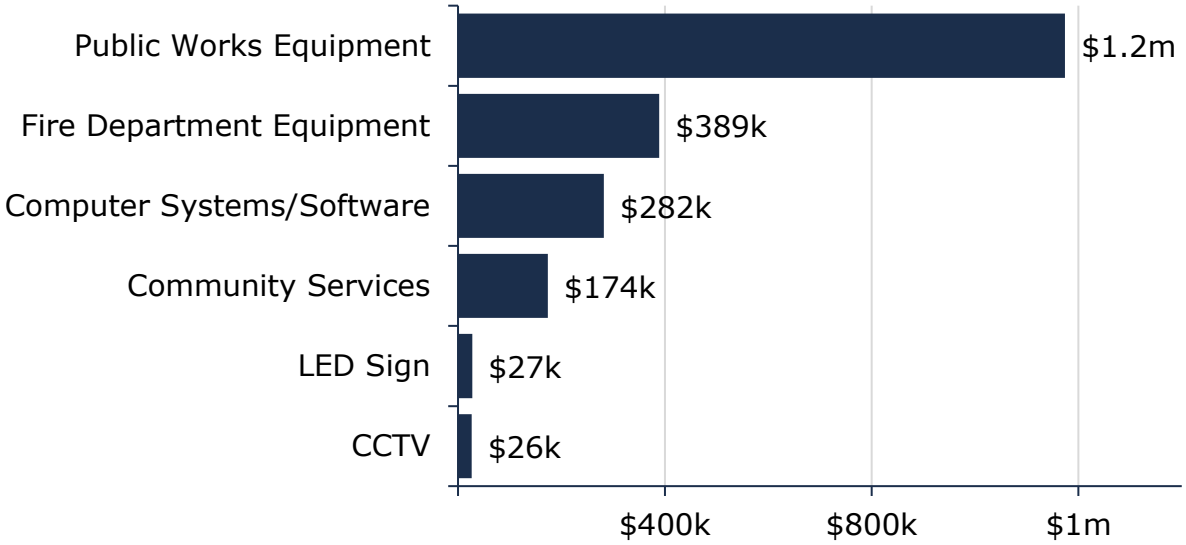
The table below includes the quantity, replacement cost method and total replacement cost of each asset segment in the Township's Machinery & Equipment inventory.

Table 46: Machinery & Equipment Detailed Asset Inventory

Segment	Quantity	Unit of Measure	Primary Replacement Cost Method	Replacement Cost
CCTV	1	Assets	CPI	$26,448
Community Services	5	Assets	CPI	$173,597
Computer Systems/Software	4	Assets	CPI	$281,820
Fire Department Equipment	123	Assets	User-Defined	$389,117
LED Sign	1	Assets	CPI	$27,421
Public Works Equipment	38	Assets	User-Defined	$1,174,346
Total				**$2,072,749**

The graph below displays the total replacement cost of each asset segment in the Cramahe' Machinery & Equipment inventory.

Figure 80: Machinery & Equipment Replacement Costs

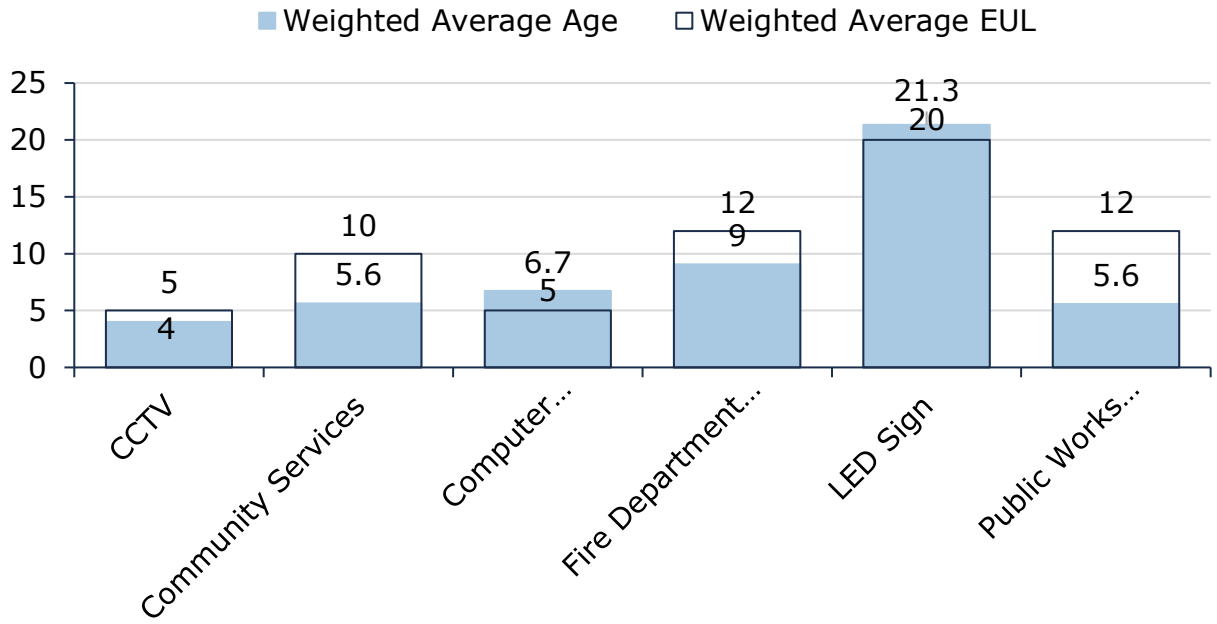


Each asset's replacement cost should be reviewed periodically to determine whether adjustments are needed to more accurate represent capital requirements.

12.3. Asset Condition & Age

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

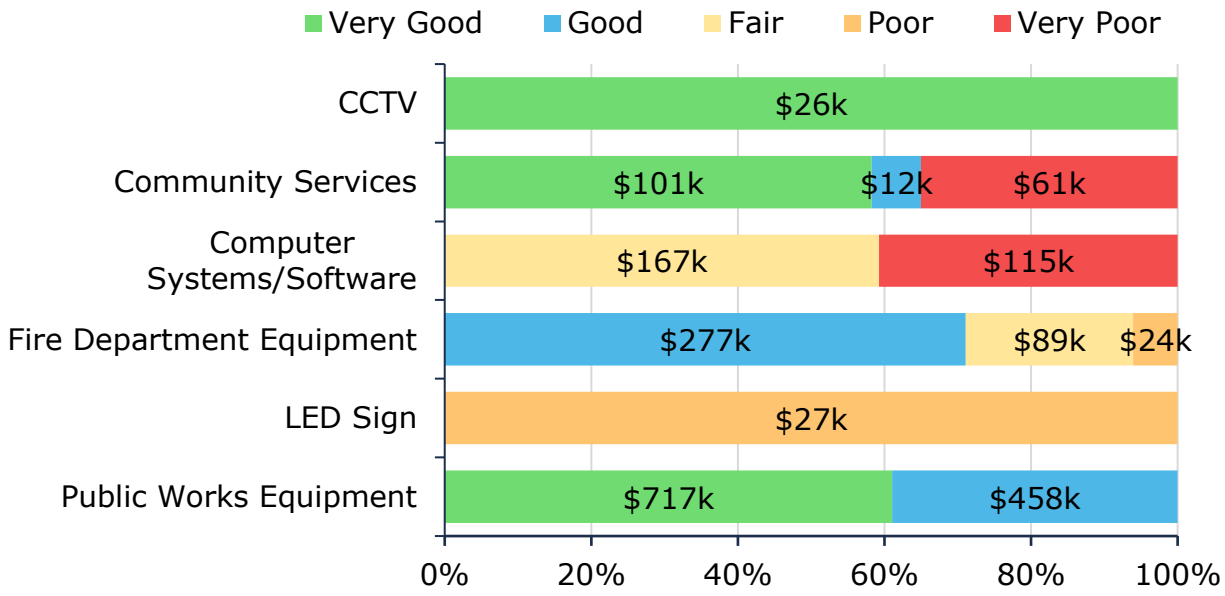
Figure 81: Machinery & Equipment Average Age vs Average EUL



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

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

Figure 82: Machinery & Equipment Condition Breakdown



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

12.3.1 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 current approach is having regular inspection and maintenance by staff and third-party contractor.

12.4. Lifecycle Management Strategy

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

Figure 83: Machinery & Equipment Current Lifecycle Strategy

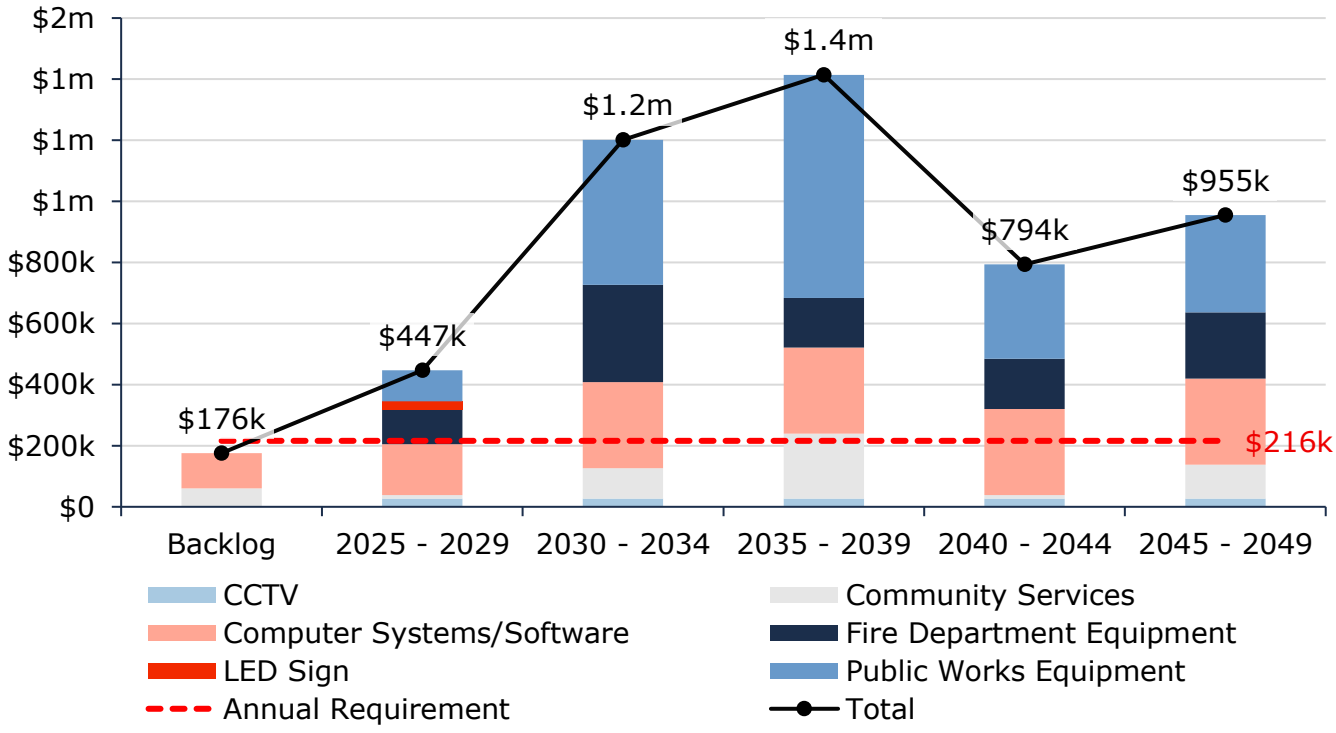
Maintenance / Rehabilitation / Replacement

- Maintenance program varies by department.
- Annual inspections and cleaning for equipment are completed
- Fire Protection Services equipment is subject to a much more rigorous inspection and maintenance program compared to most other departments
- Machinery & Equipment is maintained according to Maintenance Standards, manufacturer recommendations and supplemented by the expertise of municipal staff
- The replacement of Machinery & Equipment depends on its expected useful life, usage and deficiencies identified by operators that may impact their ability to complete required tasks
- Fire equipment is replaced on schedules defined by the Health and Safety Act, and manufacturer recommendations. Specifically, helmets and PPE are replaced on a 10-year schedule for compliance

12.5. Forecasted Capital Requirements

The following graph identifies capital requirements over the next 25 years. This projection is used as it ensures that every asset has gone through one full iteration of replacement. The forecasted requirements are aggregated into 5-year bins and the trend line represents the average annual capital requirements at $216 thousand.

Figure 84: Machinery & Equipment Forecasted Capital Replacement Requirements



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

Table 47 Machinery & Equipment System-Generated 10-Year Capital Costs

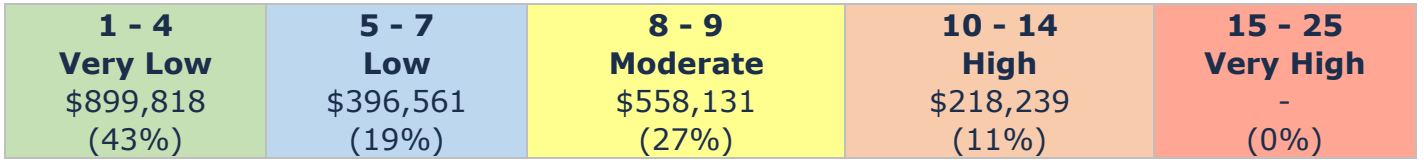
Segment	Backlog	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034
CCTV	-	-	-	-	$26k	-	-	-	-	$26k	-
Community Services	$61k	-	-	-	$12k	-	-	$39k	$61k	-	-
Computer Systems/Software	$115k	-	$167k	-	-	-	$115k	$167k	-	-	-
Fire Department Equipment	-	-	-	$93k	$20k	-	$102k	-	$143k	$74k	-
LED Sign	-	-	-	-	-	$27k	-	-	-	-	-
Public Works Equipment	-	-	-	-	$82k	$19k	$34k	-	$122k	$319k	-
Total	**$176k**	**-**	**$167k**	**$93k**	**$141k**	**$46k**	**$251k**	**$206k**	**$325k**	**$419k**	**-**

As assessed condition data was available for few equipment, age based condition was mostly used to determine forthcoming replacement needs. These projections can be different from actual capital forecasts. Consistent data updates, especially condition, will improve the alignment between the system-generated expenditure requirements, and the Township's capital expenditure forecasts.

12.6. Risk & Criticality

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

Figure 85: Machinery & Equipment Risk Matrix



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

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

12.7. Risks to Current Asset Management Strategies

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

Community Expectations

The Township is primarily a rural township, a significant portion of its population work in neighboring cities. Residents form larger urban centres may bring with them an expectation of higher level of service. Currently, the Township does not have the population density and user base to afford these expectations. An example is that requiring additional equipment and resources for road cleaning and building maintenance. 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 improve the efficiency.

Aging Infrastructure and Funding Strategies

As Machinery & Equipment age, they will require increasing O&M costs to function adequately. As capital budgets become more constrained, more maintenance will be postponed, which will further amplify this risk. Replacement and major rehabilitation of the Machinery & Equipment are entirely dependant on the availability of reserve fund. Commit to a dedicated equipment reserve contribution can avoid service disruption when the equipment fails. The Township should also consider updating asset replacement costs and event costs on a cyclical basis to improve the effectiveness of capital planning.

12.8. Levels of Service

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

12.8.1 Technical Levels of Service

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

Table 48 Machinery & Equipment Technical Levels of Service

Service Attribute	Technical Metric	Current LOS	Proposed LOS (2040)
Accessible & Reliable	% of equipment with preventative maintenance overdue	0	0
Safe & Regulatory	% of safety equipment used beyond its recommended life	0	0
	% of Ministry/safety regulated maintenance and inspection activities completed	100%	100%
Affordable	Capital Re-investment Rate	10.9%	10.4%
Sustainable	Average Risk Rating	5.37	8.34
	Average condition of machinery & equipment	62	38

12.8.2 Proposed Levels of Service Analysis

As per O. Reg. 588/17, by July 1, 2025, municipalities are required to consider proposed levels of service (PLOS), discuss the associated risks and long-term sustainability of these service levels, and explain the municipality's ability to afford the PLOS.

The below tables and graphs explain the proposed levels of service scenarios that were analyzed for Machinery & Equipment. Further PLOS analysis at the portfolio level can be found in Proposed Levels of Service Scenario Analysis.

Table 49: Machinery & Equipment PLOS Scenarios

Scenario	Description
Scenario 1: Achieving Full Funding in 15 Years	This scenario assumes a phased tax increase of approximately 2.2% annually, reaching full funding within 15 years
Scenario 2: Achieving 75% Funding in 15 Years	This scenario assumes a phased tax increase of approximately 1.4% annually, reaching 75% funding within 15 years
Scenario 3: Achieving 50% Funding in 15 Years	This scenario assumes a phased tax increase of approximately 0.5% annually, reaching 50% funding within 15 years

The following table presents three proposed service level scenarios for Machinery & Equipment. These options were developed based on current municipal practices, stakeholder input, and future-oriented asset management strategies. Each scenario outlines the expected impact on service delivery, lifecycle activities, costs, resource needs, risk exposure, and alignment with municipal goals and provincial policy. This structured comparison allows Council and staff to assess trade-offs between investment levels and outcomes, ensuring informed decision-making aligned with community priorities and financial realities.

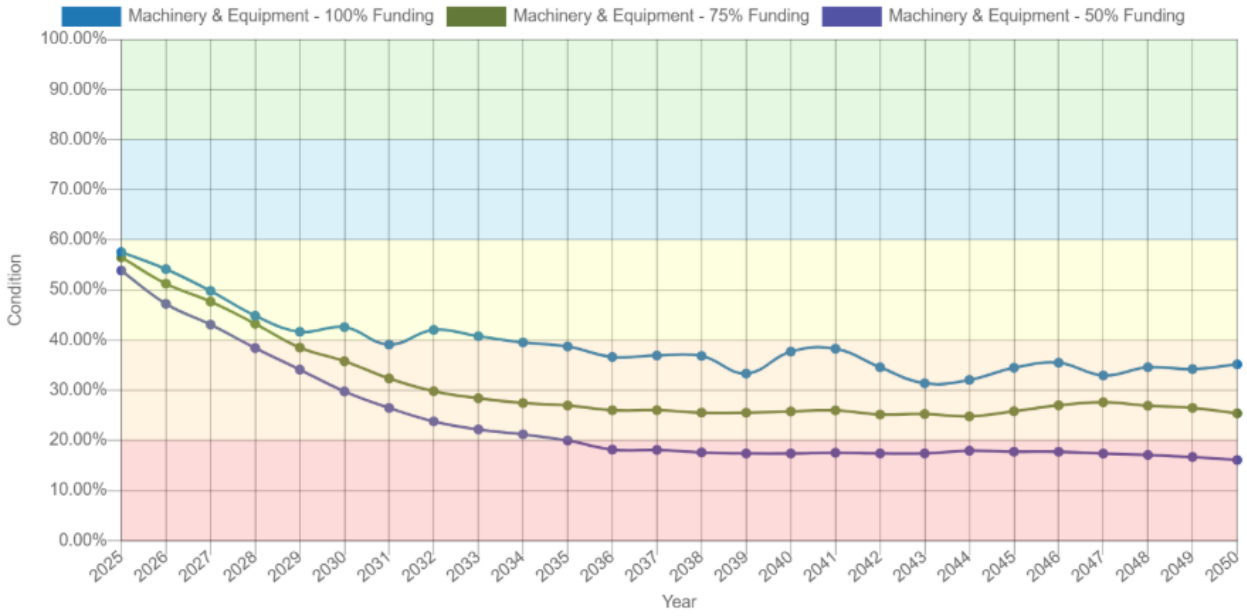
Table 50: Machinery & Equipment pLOS Scenario Analysis

Scenario	Technical LOS Outcomes	Initial Value (2025)	10 Year Projection (2035)	25 Year Projection (2050)	Scenario Average
Scenario 1	Average Condition	57.59%	38.76%	35.20%	39.08%
	Average Asset Risk	5.37	8.63	8.71	8.14
	Annual Investment Target		$215,942		
	Capital re-investment rate		10.4%		
Scenario 2	Average Condition	56.55%	26.99%	25.42%	31.08%
	Average Asset Risk	5.43	9.65	9.78	8.93
	Annual Investment Target		$161,957		
	Capital re-investment rate		7.8%		
Scenario 3	Average Condition	53.89%	20.00%	16.12%	23.94%
	Average Asset Risk	5.72	10.47	10.58	9.70
	Annual Investment Target		$107,971		

Scenario	Technical LOS Outcomes	Initial Value (2025)	10 Year Projection (2035)	25 Year Projection (2050)	Scenario Average
	Capital re-investment rate		5.2%		

The following figure illustrates the projected condition of the asset category under each of the three investment level scenarios, demonstrating how varying reinvestment strategies impact overall asset condition over time.

Figure 86: Machinery & Equipment Scenario Comparison



13. Vehicles

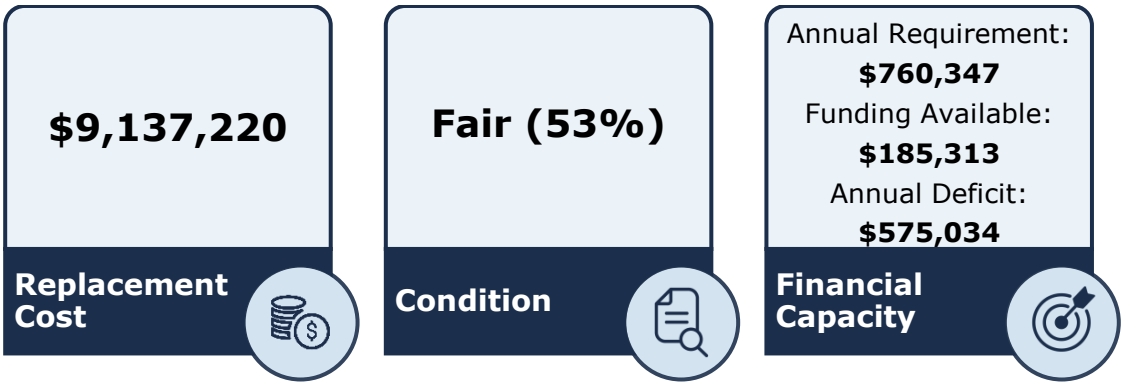
13.1. State of the Infrastructure

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

- Public Works vehicles for winter control activities and the maintenance of the Transportation Network
- Fire vehicles to provide emergency services
- Community Services vehicles to address service requests in the Community and maintain the Buildings and Facilities

The state of the infrastructure for municipal Vehicles is summarized below:

Table 51: Vehicles State of the Infrastructure



13.2. Inventory & Valuation

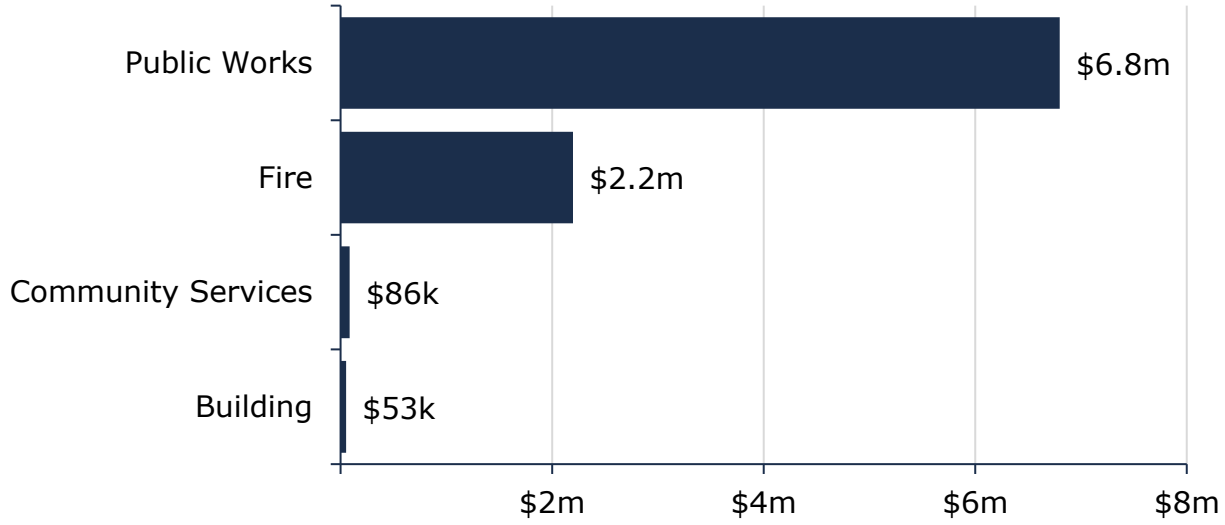
The table below includes the quantity, replacement cost method and total replacement cost of each asset segment in the Township's Vehicles inventory.

Table 52: Detailed Asset Inventory - Vehicles

Segment	Quantity	Unit of Measure	Primary Replacement Cost Method	Replacement Cost
Building	1	Assets	User-Defined	$52,993
Community Services	2	Assets	User-Defined	$86,441
Fire	7	Assets	User-Defined	$2,198,236
Public Works	24	Assets	User-Defined	$6,799,550
Total	**34**	**Assets**		**$9,137,220**

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

Figure 87: Vehicles Replacement Costs

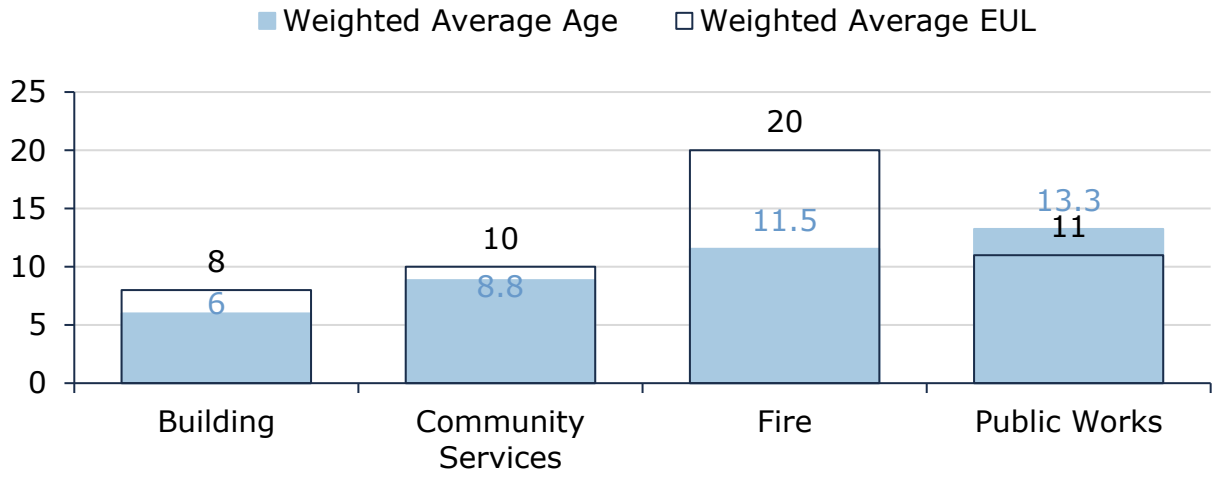


Each asset's replacement cost should be reviewed periodically to determine whether adjustments are needed to represent capital requirements more accurately.

13.3. Asset Condition & Age

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

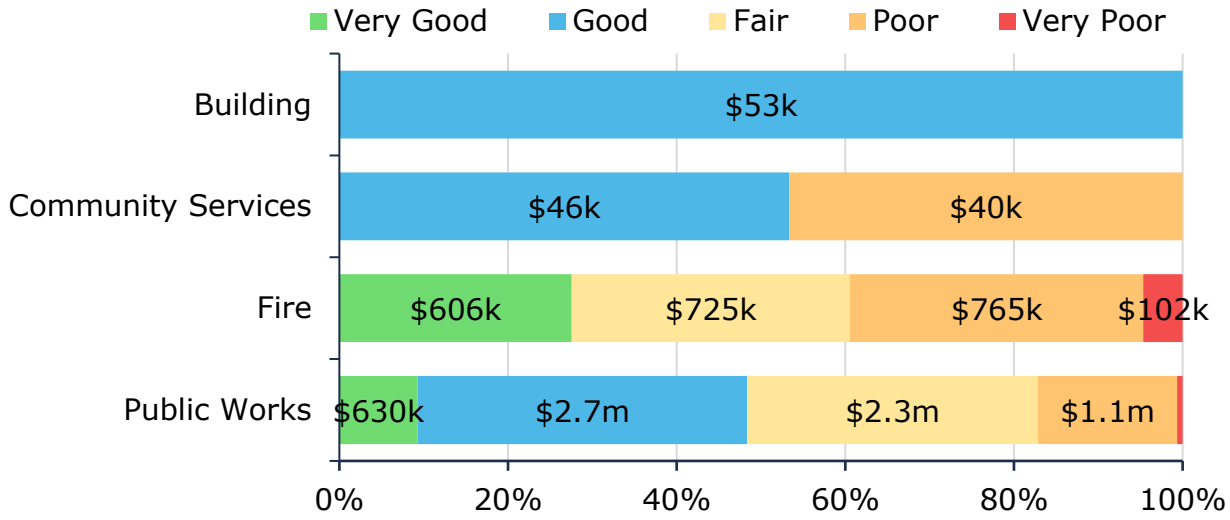
Figure 88: Vehicles Average Age vs Average EUL



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

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

Figure 89: Vehicles Condition Breakdown



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

13.3.1 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 Township's current approach:

- Personal protective equipment (PPE) is sent to the manufacturer annually for testing. Repairs are made as needed based on the results.
- SCBAs are subject to annual bench testing to ensure functioning as per National Fire Protection Agency (NFPA) requirements.
- Gas detection equipment is bump tested after every use to recalibrate the sensors.
- Other fire equipment, such as the radios, Jaws of Life, and portable pumps, are subject to annual testing. Health and Safety standards govern the functionality of this equipment, and repairs are made to reduce risk of failure.
- Public Works equipment is generally inspected and maintained on a seasonal, or as-needed basis. Significant equipment, such as plow blades, are managed for functionality as per Maintenance Standards. However, there is no formal condition assessment program in place.

13.4. Lifecycle Management Strategy

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

Figure 61: Vehicles Current Lifecycle Strategy

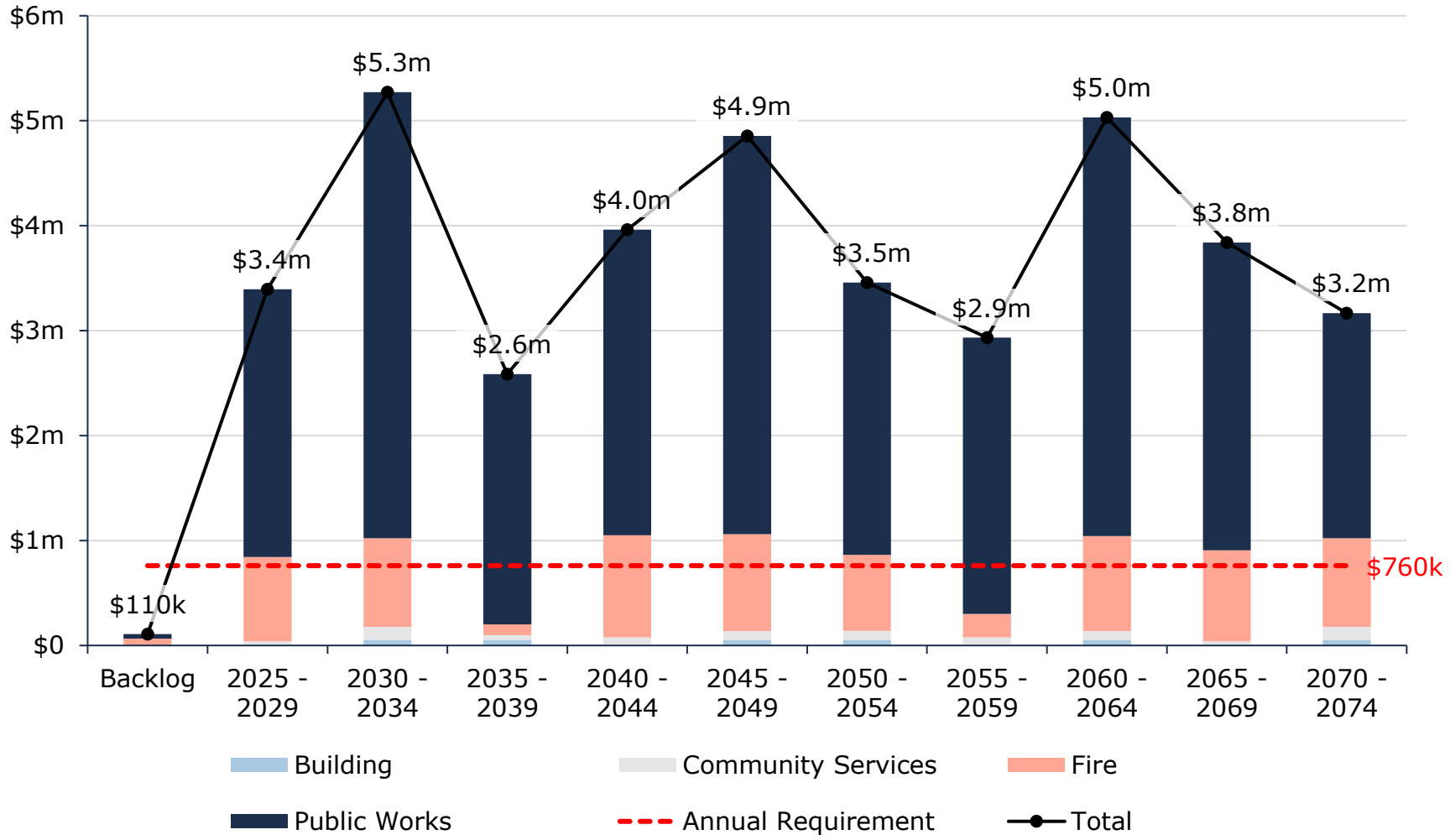
Maintenance / Rehabilitation / Replacement

- Currently, most maintenance and rehabilitation recommendations are completed by 3rd party mechanics.
- Oil changes are completed based on mileage driven.
- License stickers and registration if needed under CVOR, are completed on an annual basis.
- Tire changes, fluid top-up, and minor component changes such as wipers are completed on an annual basis. Certain speciality parts, such as electronics or sensors, have been cited to be scarce at times.
- Fire department pumpers and tankers are replaced at the end of a 20-year lifecycle, fire support vehicles are replaced oat the end of year 10.
- Public Works vehicles are constrained by budget limitations, resulting in some trucks being replaced 12-16 years into lifecycle.
- Generally, vehicles are operated past the industry standard recommendations for replacements.

13.5. Forecasted Capital Requirements

The annual capital requirement represents the average amount per year that the Township should allocate towards funding rehabilitation and replacement needs. The following graph identifies capital requirements over the next 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 annual capital requirements at $760 thousand.

Figure 90: Vehicles Forecasted Capital Replacement Requirements



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

Table 53 Vehicles System-Generated 10-Year Capital Costs

Segment	Backlog	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034
Building	-	-	-	-	-	-	$53k	-	-	-	-
Community Services	-	-	$40k	-	-	-	$46k	-	$38k	-	$40k
Fire	$65k	$37k	$65k	-	$700k	-	-	-	$780k	$65k	-
Public Works	$45k	-	$928k	$195k	$1.1m	$298k	$965k	$80k	$2.0m	$723k	$490k
Total	**$110k**	**$37k**	**$1.0m**	**$195k**	**$1.8m**	**$298k**	**$1.1m**	**$80k**	**$2.8m**	**$788k**	**$530k**

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

13.6. Risk & Criticality

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

Figure 91: Vehicles Risk Matrix

1 - 4 Very Low $226,083 (2%)	5 - 7 Low $2,116,219 (23%)	8 - 9 Moderate $402,543 (4%)	10 - 14 High $1,253,375 (14%)	15 - 25 Very High $5,139,000 (56%)

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

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

13.7. Risks to Current Asset Management Strategies

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

Aging Infrastructure & Capital Funding Strategies

Several vehicles within the Township are approaching or have exceeded their estimated useful life. As vehicles age, they will require exponentially increasing O&M costs to ensure compliance with MTO standards and to function adequately. As capital budgets become more constrained, more maintenance will be postponed, which will further amplify this risk. Replacement and major rehabilitation of the Vehicles are entirely dependant on the availability of reserve fund. Committing to a dedicated vehicle reserve contribution can be helpful to prevent deferral of critical vehicle replacement and reduce the risk of service disruption. The Township should consider updating asset replacement costs and event costs on a cyclical basis to improve the effectiveness of capital planning.

13.8. Levels of Service

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

13.8.1 Technical Levels of Service

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

Table 54 Vehicles Technical Levels of Service

Service Attribute	Technical Metric	Current LOS	Proposed LOS (2040)
Accessible & Reliable	Average % of time a vehicle is in service and capable of performing its primary function	95%	100%
Safe & Regulatory	% of regulated MTO maintenance inspections completed	100%	100%
	# of vehicles safety inspections completed per year per vehicle	1	1
Affordable	Annual Capital Reinvestment Rate	2.0%	8.3%
Sustainable	Average Risk Rating	12.48	13.16
	Average condition of municipal vehicles	53	38

13.8.2 Proposed Levels of Service Analysis

As per O. Reg. 588/17, by July 1, 2025, municipalities are required to consider proposed levels of service (PLOS), discuss the associated risks and long-term sustainability of these service levels, and explain the municipality's ability to afford the PLOS.

The below tables and graphs explain the proposed levels of service scenarios that were analyzed for municipal vehicles. Further PLOS analysis at the portfolio level can be found in Proposed Levels of Service Scenario Analysis.

Table 55: Vehicles PLOS Scenarios

Scenario	Description
Scenario 1: Achieving Full Funding in 15 Years	This scenario assumes a phased tax increase of approximately 2.2% annually, reaching full funding within 15 years
Scenario 2: Achieving 75% Funding in 15 Years	This scenario assumes a phased tax increase of approximately 1.4% annually, reaching 75% funding within 15 years

Scenario 3: Achieving 50% Funding in 15 Years	This scenario assumes a phased tax increase of approximately 0.5% annually, reaching 50% funding within 15 years

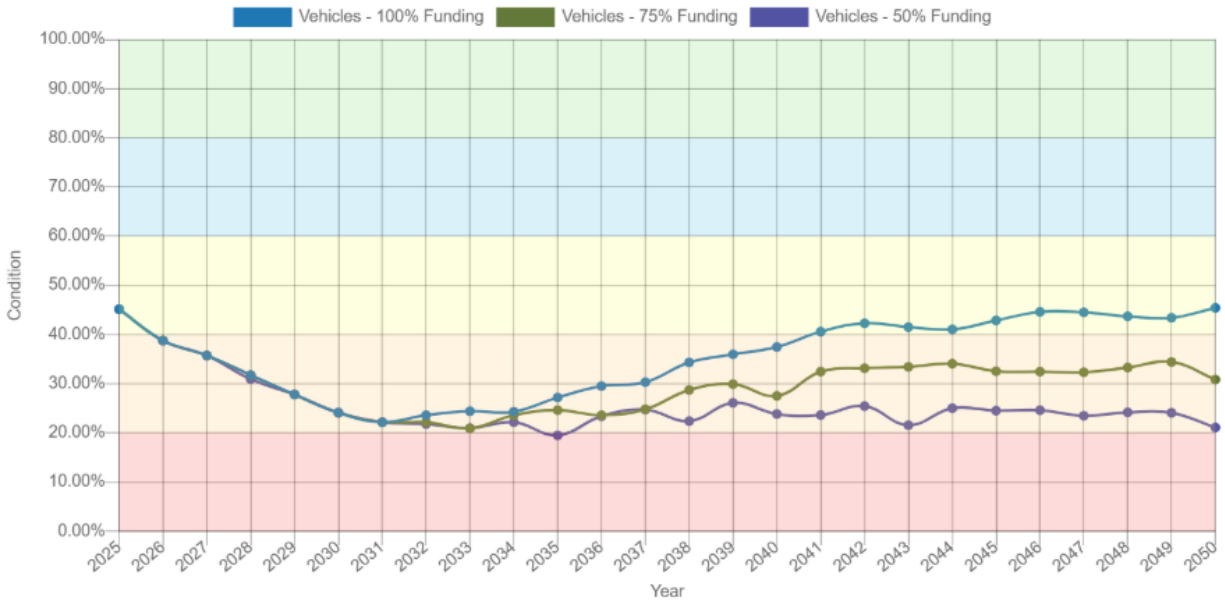
The following table presents three proposed service level scenarios for municipal Vehicles. These options were developed based on current municipal practices, stakeholder input, and future-oriented asset management strategies. Each scenario outlines the expected impact on service delivery, lifecycle activities, costs, resource needs, risk exposure, and alignment with municipal goals and provincial policy. This structured comparison allows Council and staff to assess trade-offs between investment levels and outcomes, ensuring informed decision-making aligned with community priorities and financial realities.

Table 56: Vehicles pLOS Scenario Analysis

Scenario	Technical LOS Outcomes	Initial Value (2025)	10 Year Projection (2035)	25 Year Projection (2050)	Scenario Average
Scenario 1	Average Condition	45.16%	27.20%	45.44%	35.49%
	Average Asset Risk	12.48	15.32	11.77	12.46
	Annual Investment Target		$760,347		
	Capital re-investment rate		8.3%		
Scenario 2	Average Condition	45.16%	24.63%	30.86%	30.02%
	Average Asset Risk	12.48	15.51	14.82	14.85
	Annual Investment Target		$570,260		
	Capital re-investment rate		6.2%		
Scenario 3	Average Condition	45.16%	19.51%	21.10%	25.67
	Average Asset Risk	12.48	16.52	16.24	15.56
	Annual Investment Target		$380,174		
	Capital re-investment rate		4.2%		

The following figure illustrates the projected condition of the asset category under each of the three investment level scenarios, demonstrating how varying reinvestment strategies impact overall asset condition over time.

Figure 92: Vehicles Scenario Comparison



Strategies

Financial Management

Growth

14. Financial Management

14.1. Financial Strategy Overview

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

This plan identifies the financial requirements necessary to meet the identified proposed levels of service. These requirements are based on the financial requirements for existing assets as of December 31, 2024. However, the required funding is based on meeting the proposed levels of service, with consideration for any additional financial impacts from economic and population growth. The financial plan considers and accounts for traditional and non-traditional sources of municipal funding.

The annual funding typically available is determined by averaging historical capital expenditures on infrastructure, inclusive of any allocations to reserves for capital purposes. For Cramahe, an average of capital allocations for 2021-2024 was used to project available funding.

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

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

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

14.1.1 Annual Capital Requirements

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

However, for the road network and the sanitary sewer network, lifecycle management strategies have been developed to identify capital costs that are realized through strategic rehabilitation and renewal. 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:

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

Table 57 Annual Requirement Comparison

Asset Category	Annual Requirements (Replacement Only)	Annual Requirements (Lifecycle Strategy)	Difference
Road Network	$4,378,699	$2,730,646	($1,648,053)
Sanitary Sewer Network	$749,520	$690,203	($59,317)

The implementation of a proactive lifecycle strategy for paved roads and the sanitary sewer network leads to a potential annual cost avoidance of approximately $1.7 million. This represents an overall reduction of the annual requirements by 32%.

As the lifecycle strategy scenario represents the lowest cost option available to the Township, we have used this annual requirement in the development of the financial strategy.

The table below presents the system-generated average annual capital requirements for existing assets across each asset category. These figures are based on a total replacement value of $195 million, resulting in an estimated annual capital need of approximately $6 million for all analyzed assets.

Table 58 Average Annual Capital Requirements

Asset Category	Replacement Cost	Annual Capital Requirements	Target Reinvestment Rate
Road Network	$54,093,002	$2,730,646	5.1%
Bridges & Culverts	$11,139,685	$144,246	1.3%
Storm Sewer Network	$5,793,630	$85,183	1.5%
Buildings & Facilities	$25,390,413	$676,694	2.7%
Vehicles	$9,137,220	$760,347	8.3%
Parks & Recreation	$1,933,086	$70,004	3.6%
Machinery & Equipment	$2,072,749	$215,942	10.4%
Water Network	$42,903,301	$611,320	1.4%
Sanitary Sewer Network	$42,649,321	$690,203	1.6%
Total	**$195,112,408**	**$5,984,585**	**3.1%**

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

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

14.2. Financial Profile: Tax Funded Assets

14.2.1 Current Funding Levels

The table below outlines how current funding levels compare to the investment required to achieve the proposed levels of service for each asset category. Under existing funding, the Township is meeting approximately 37.0% of the annual capital investment needed to maintain the proposed service levels, resulting in an estimated annual funding shortfall of $2.9 million.

Table 59 Current Funding Levels

Asset Category	Annual Capital Requirements	Annual Funding Available	Annual Infrastructure Deficit	Funding Level
Road Network	$2,730,646	$991,885	$1,738,761	36.3%
Bridges & Culverts	$144,246	$25,000	$119,246	17.3%
Storm Sewer Network	$85,183	$30,000	$55,183	35.2%
Buildings & Facilities	$676,694	$241,003	$435,691	35.6%
Vehicles	$760,347	$185,313	$575,034	24.4%
Machinery & Equipment	$215,942	$225,974	($10,032)	104.6%
Parks & Recreation	$70,004	$34,713	$35,292	49.6%
Total	**$4,683,062**	**$1,733,889**	**$2,949,173**	**37.0%**

Table 60: Table 68: Taxes: Required Funding vs Current Funding Position

Asset Category	Avg. Annual Requirement	Annual Funding Available					Annual Deficit
		Taxes	Reserves	CCBF	OCIF	Total Available	
Road Network	$2,730,646	$471,018	$100,868	$270,000	$150,000	$991,885	$1,738,761
Bridges & Culverts	$144,246		$25,000			$25,000	$119,246
Storm Sewer Network	$85,183			$30,000		$30,000	$55,183
Buildings & Facilities	$676,694	$33,582	$207,421			$241,003	$435,691
Vehicles	$760,347	$12,475	$172,838			$185,313	$575,034
Machinery & Equipment	$215,942	$84,894	$141,081			$225,974	($10,032)
Parks & Recreation	$70,004	$27,213	$7,500			$34,713	$35,292
Total	**$4,683,062**	**$629,181**	**$654,708**	**$300,000**	**$150,000**	**$1,733,889**	**$2,949,173**

The average annual investment requirement for the proposed levels of service is $4,683,062. Annual revenue currently allocated to these assets for capital purposes is $1,733,889 leaving an annual deficit of $2,949,173. Put differently, these infrastructure categories are currently funded at 37% of their long-term requirements.

Closing the Gap

Eliminating annual infrastructure funding shortfalls is a difficult and long-term endeavor for municipalities. Achieving recommended funding levels to support the proposed levels of service, while maintaining affordability for residents, will require time and deliberate financial planning.

This section outlines how Cramahe can gradually work toward closing the annual capital funding shortfall using its own-source revenues, such as property taxes and utility rates. This approach avoids the use of additional debt for existing assets and supports the Township's goal of sustainably increasing investment to maintain service delivery at the chosen targets. By phasing in additional funding as financial capacity allows, Cramahe can begin to align infrastructure spending with service level expectations and the priorities identified through community and stakeholder engagement.

Funding Requirements Tax Revenues

In 2024, Cramahe had annual tax revenues of $7,614,132. As illustrated in the following table, without consideration of any other sources of revenue or cost containment strategies, achieving the target levels of service would require a 38.8% tax change over time.

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

Table 61 Phasing in Annual Tax Increases

Asset Category	Tax Change Required
Road Network	22.8%
Bridges & Culverts	1.6%
Storm Sewer Network	0.7%
Buildings & Facilities	5.7%
Vehicles	7.6%
Machinery & Equipment	No increase required
Parks & Recreation	0.5%

The selected full funding strategy is designed to fully close the annual capital funding gap over time, ensuring that all infrastructure needs are met as they arise. This approach enables the Township to proactively invest in asset rehabilitation and replacement, supporting long-term service reliability and sustainability. By aligning funding with actual capital requirements, the strategy reduces reliance on deferrals, minimizes long-term risk, and enhances the ability to plan and deliver infrastructure projects on schedule. While reserves and external grants will continue to play a supportive role, this approach prioritizes financial self-sufficiency and provides a stable foundation for maintaining asset performance and managing service expectations into the future.

Our recommendations include capturing the above changes and allocating them to the infrastructure deficit outlined above.

Table 62: Phase-in Period for proposed LOS

	Phase-in Period			
	5 Years	**10 Years**	**15 Years**	**20 Years**
Infrastructure Deficit	$2,949,173	$2,949,173	$2,949,173	$2,949,173
Change in Debt Costs	($11,084)	($62,486)	($62,486)	($169,110)
Resulting Infrastructure Deficit:	**$2,938,090**	**$2,886,687**	**$2,886,687**	**$2,780,063**
Tax Increase Required	38.6%	37.9%	37.9%	36.5%
Annually:	**6.8%**	**3.3%**	**2.2%**	**1.6%**

Proposed levels of service play a role in the development of the Annual Average Requirement discussed above. For comparison, the taxation impact for achieving each service level option is provided below:

Table 63: Scenarios Annual Impact on Taxation

Annual Impact on Taxation				
Change in Levels of Service	**5 Year**	**10 Year**	**15 Year**	**20 Year**
100% Funding	6.8%	3.3%	2.2%	1.6%
75% Funding	4.3%	2.1%	1.4%	1.0%
50% Funding	1.6%	0.7%	0.5%	0.3%
Recommended	6.8%	3.3%	2.2%	1.6%

Financial Strategy Recommendations

Considering all the above information, we recommend the 15-year option to achieve the proposed levels of service:

a) Increasing tax revenues by 2.2% each year for the next 15 years to gradually implement the funding strategy outlined in the selected scenario for the asset categories covered in this section of the AMP.
b) Allocating the current Canada Community-Building Fund (Formerly known as Gas Tax Fund) 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.
e) Leveraging additional, non-sustainable revenue sources such as one-time grants, surpluses, and reserves, as supplementary funding to advance asset management goals.

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[3].
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 the proposed levels of service 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 $731k for the Road Network, $14.7m for Buildings, $401k for the Storm Network, $176k for Machinery & Equipment, and $110k for Vehicles.

14.3. Financial Profile: Rate Funded Assets

14.3.1 Current Funding Levels

The table below summarizes how current funding levels compare with funding required for the proposed levels of service. At existing levels, the Township is meeting approximately 50.1% of the annual capital needs associated with these service levels, resulting in an annual funding shortfall of $649 thousand.

Table 9: Rates - Required Funding vs Current Funding Position

Asset Category	Avg. Annual Requirement	Annual Funding Available			Annual Deficit
		Rates	Reserves	Total Available	
Water Network	$611,320	$303,262	$159,334	$462,596	$148,725
Sanitary Sewer Network	$690,203	$43,401	$146,340	$189,740	$500,462
	$1,301,523	**$346,662**	**$305,674**	**$652,336**	**$649,187**

The average annual investment requirement for the above categories is $1,301,523. Annual revenue currently allocated to these assets for capital purposes

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

is $652,336 leaving an annual deficit of $649,187. Put differently, these infrastructure categories are currently funded at 50.1% of their long-term requirements.

Closing the Gap

Eliminating annual infrastructure funding shortfalls is a difficult and long-term endeavor for municipalities. Considering the Township's current funding position, it will require many years to achieve the proposed levels of service.

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

Funding Requirements Rate Revenues

In 2024, Cramahe had annual water revenues of $1,114,780, and annual wastewater revenues of $905,496. As illustrated in the following table, without consideration of any other sources of revenue or cost containment strategies, achieving the target levels of service would require a 32.1% rate change over time.

Table 10: Phasing in Annual Rate Increases

Asset Category	Rate Change Required
Water Network	13.3%
Sanitary Sewer Network	55.3%

The selected full funding strategy for rate-supported assets is designed to fully address the annual capital requirements necessary to sustain system performance and service levels over the long term. By aligning user rates with the actual cost of maintaining and replacing infrastructure, the strategy ensures the continued reliability, safety, and compliance of essential services. This proactive approach reduces reliance on deferred investment, lowers long-term risk, and allows for more predictable capital planning. While reserves and external funding (such as grants) will continue to supplement where available, the strategy emphasizes financial self-reliance within the rate base, ensuring the utility systems remain sustainable, resilient, and responsive to community needs.

Our recommendations include capturing the above changes and allocating them to the infrastructure deficit outlined above.

Table 64: Phasing in Annual Water and Wastewater Rates

	Water Network				Sanitary Sewer Network			
	5 Years	10 Years	15 Years	20 Years	5 Years	10 Years	15 Years	20 Years
Infrastructure Deficit:	$148.7k	$148.7k	$148.7k	$148.7k	$500.5k	$500.5k	$500.5k	$500.5k

Rate Increase Required	13.3%	13.3%	13.3%	13.3%	55.3%	55.3%	55.3%	55.3%
Annually:	**2.6%**	**1.3%**	**0.9%**	**0.7%**	**9.2%**	**4.5%**	**3.0%**	**2.3%**

Similarly to the Tax Funded asset, the proposed levels of service play a role in the development of the Annual Average Requirement discussed above. For comparison, the taxation impact for achieving each service level option is provided below:

Table 65: Scenarios Annual Impact on Rates

Annual Impact on Rates					
	Changes in Levels of Service	**5 year**	**10 Year**	**15 Year**	**20 Year**
Water	100% Funding	2.6%	1.3%	0.9%	0.7%
	80% Funding	0.5%	0.3%	0.2%	0.2%
	Maintain 75% Funding	0%	0%	0%	0%
	Recommended	2.6%	1.3%	0.9%	0.7%
	Changes in Levels of Service	**5 year**	**10 Year**	**15 Year**	**20 Year**
Sanitary Sewer	100% Funding	9.2%	4.5%	3.0%	2.3%
	75% Funding	6.4%	3.2%	2.1%	1.6%
	50% Funding	3.3%	1.6%	1.1%	0.8%
	Recommended	9.2%	4.5%	3.0%	2.3%

Financial Strategy Recommendations

Considering all the above information, we recommend the 15-year option to achieve the proposed levels of service:

a) increasing rate revenues by 1.3% for water services each year for the next 10 years and 3.0% for sanitary services each year for the next 15 years to gradually implement the funding strategy outlined in the selected scenario for the asset categories covered in this section of the AMP.
b) 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. 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 the proposed levels of service and provides financial sustainability over 10 and 15 years respectively, the recommendations do require prioritizing capital projects to fit the resulting annual funding available. Current data shows a pent-up investment demand of $1.3 million for Water Network assets, and $2.0 million for Sanitary Sewer Network assets.

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.

14.4. Use of Reserves

14.4.1 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, the table below outlines the details of the reserves currently available to Cramahe.

Table 66: Reserve Balances

Asset Category	Balance at December 31, 2024
Road Network	$1,818,369
Bridges & Culverts	$658,765
Storm Sewer Network	$0
Buildings & Facilities	$788,353
Vehicles	$0
Machinery & Equipment	$644,440
Parks & Recreation	$130,465
Total Tax Funded:	**$4,040,392**
Water Network	$0
Sanitary Sewer Network	$0

Asset Category	Balance at December 31, 2024
Total Rate Funded:	**$0**

There is considerable debate in the municipal sector as to the appropriate level of reserves that a Township 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 achieve proposed levels of service. This 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.

15. Growth

15.1. Description of Growth Assumptions

The demand for infrastructure and services in Cramahe will change over time due to internal and external factors including population trends, economic shifts, environmental considerations and policy changes. A thorough understanding of these key drivers of growth and demand will allow the Township to more effectively plan for new infrastructure investments, upgrades and decommissioning of existing assets. Fluctuations in demand can influence what assets are needed and what level of service meets the needs of the community.

15.1.1 Cramahe Official Plan (2024)

The Township of Cramahe's Official Plan is intended to provide a framework for the future growth, set out the policies to guide the development and use of land with consideration of social, economic and environmental factors. The document planning horizon spans 20 years, covering it to the year 2023. A review of the official plan is in progress, and it is expected to be finalized in 2026.

Following the 2001 amalgamation of the Township of Cramahe and the Village of Colborne, the current official plan was developed, based on the plans adopted in 1998 and consolidated in 2024.

The Official Plan reflects the priority of promoting commercial and industrial growth in designated areas, and policies pertaining to these land uses have been updated. The Township focuses on directing development to the Colborne urban area and existing hamlet areas of Castleton, Salem Corners and Dundonald. The Official Plan does not encourage expansion of communal sewage and water servicing within the hamlet settlement areas. While intensification, redevelopment and renewal are encouraged, all development within the Township shall have regard for the character and quality of established neighbourhoods.

The Township shall direct 85% growth to the Colborne Urban Area through intensification and the remaining (15%) to the rural areas. Under the Plan, the Province and the County of Northumberland has determined the population and employment projections, density and intensification targets based on the Northumberland Growth Management Strategy.

15.1.2 Northumberland County Official Plan (2016)

The Northumberland County Official Plan provides the framework for managing land use, accommodating growth, and protecting resources within the County through 2034. It directs Cramahe Township to focus growth primarily within existing urban areas while allowing limited, targeted expansion in rural settlements. Urban intensification is encouraged, with Colborne required to accommodate at least 31% of new residential development within its built boundary, and 40% countywide. New development should make efficient use of existing municipal or communal services, be compact and contiguous to existing built-up areas, and offer a range of housing options. In rural settlements, on-site or partial services are only permitted for infill

or minor expansions and must meet sustainability and infrastructure capacity requirements.

Cramahe Township is projected to experience steady population growth, rising from 6,283 in 2011 to 7,013 by 2034. Growth is expected to be concentrated in Colborne, which could see an increase of 450 to 624 residents depending on the forecast horizon, while rural areas may grow by 280 to 389 people. Overall, Cramahe is anticipated to account for approximately 4% of the County's total population growth. These projections provide essential context for planning infrastructure, services, and capital reinvestment priorities within the Township.

The table below summarizes projected population growth by area within Cramahe Township:

Source 1: Adapted from Table E: Population Growth Forecast by Municipality to 2034, 2036 and 2041 in the Northumberland County Official Plan

	2011-2034 Population Growth Forecast	2011-2036 Population Growth Forecast	2011-2041 Population Growth Forecast	Share of Population Growth
Colborne	450	499	624	
Rural	280	311	389	**4.05%**
Total	**730**	**810**	**1,013**	

This table summarizes the total projected population in Cramahe Township in 2034, highlighting the overall growth the Township is expected to accommodate.

Source 2: Adapted from Table G: Population Forecast for 2034 by Municipality in the Northumberland County Official Plan

	2011 Population	2034 Population
Cramahe	6,283	7,013

The County is currently updating the Official Plan to guide growth and development over the next 30 years, which will provide additional guidance for future planning and infrastructure decisions in Cramahe Township..

15.1.3 Growth Plan for the Greater Golden Horseshoe

As part of the Greater Golden Horseshoe, Cramahe Township is subject to the policies of the Growth Plan for the Greater Golden Horseshoe. That plan (including Amendment 1) came into effect on August 28, 2020, and places strong emphasis on optimizing existing infrastructure and public service facilities before expanding urban areas. The Growth Plan provides population and employment forecasts at the County level, for Northumberland, it estimates a population of 100,000 by 2031 (projected to 110,000 by 2041) and employment of 36,000 in 2031, increasing to 39,000 by 2041 (per Schedule 3). With the new Provincial planning statement

adopted in 2024, these policies continue to guide growth in Cramahe through its alignment with Northumberland County's Official Plan.

Source 3: Adapted from Schedule 3: Distribution of Population and Employment for the Greater Golden Horseshoe to 2041 in the Growth Plan for the Greater Golden Horseshoe

	Population 2031	Population 2041	Employment 2031	Employment 2041
County of Northumberland	100,000	110,000	36,000	39,000

15.1.4 Impact of Growth on Lifecycle Activities

The Township of Cramahe is experiencing modest but steady population growth, increasing from 6,355 in 2016 to 6,509 in 2021, representing a 2.4% rise. Projections indicate continued growth, with the population expected to reach approximately 6,990 by 2031 and further increase by 2041 in line with County-wide forecasts. Notably, 85% of this growth is concentrated in the Colborne urban area, with the remaining 15% occurring in rural areas. These projections are consistent with the updated Provincial Planning Statement (2024), which extends the planning horizon to 2051 and emphasizes sustainable, compact, and well-serviced communities in the Greater Golden Horseshoe.

Employment growth within the Township is expected to mirror regional trends, supporting Northumberland County's projected employment of 36,000 by 2031 and 39,000 by 2041. This anticipated growth underlines the need for ongoing infrastructure improvements to accommodate new residential, commercial, and industrial development.

To manage the impacts of growth, Cramahe has aligned its Asset Management Plan with key objectives set out in the Township's Strategic Plan, particularly under the goal of "*Growth Through Diversity*". The Township is committed to ensuring that infrastructure assets evolve to meet the emerging needs of the community while maintaining the area's rural character and heritage.

Centralized in Colborne, the Township's core water and wastewater infrastructure currently has sufficient capacity to serve existing development. The water system, which comprises two groundwater wells, a water tower, and approximately 1,023 metered connections, supports over 2,700 residents, or more than one-third of the Township's population. The wastewater system includes 961 connections and is supported by a conventional activated sludge treatment plant. While both systems are presently adequate, new residential and industrial developments will gradually increase pressure on service capacity.

To respond effectively, the Township will incorporate new infrastructure into its asset inventory and monitor these assets through lifecycle tracking and performance assessments. As identified in the Strategic Plan, Cramahe will undertake an Infrastructure Master Plan to assess existing and future needs, prioritize capital investments, and align infrastructure improvements with land use

changes. Key priorities include extending sewer servicing to the industrial park and realigning the Emergency Detour Route to improve network efficiency. Infrastructure planning will also reflect updated provincial policies emphasizing climate resilience, active transportation, and age-friendly, inclusive community design.

The Township will update its Official Plan, Secondary Plans, and Zoning By-Laws to support planned development, enabling infrastructure and services to grow in tandem with new residential, commercial, and employment areas. Growth-related infrastructure costs will continue to be offset through development charges and connection fees, as established by municipal by-law. Additionally, the Township will actively seek grant funding from federal and provincial programs to reduce reliance on the existing tax base.

Cramahe's demographic profile, marked by a median age of 49.2 and nearly 23% of residents aged 65 and over, also influences infrastructure planning. The Township recognizes the importance of adaptive, inclusive, and accessible infrastructure as both older adults and younger families shape future service demands, consistent with provincial guidance on aging populations.

Together, these actions ensure that Cramahe's approach to growth remains financially sustainable, service-oriented, and aligned with the evolving needs of its residents while meeting the objectives of the 2024 Provincial Planning Statement and the Growth Plan for the Greater Golden Horseshoe.

16. Recommendations

16.1. Financial Strategies

- Review the feasibility of adopting the funding required to meet the proposed levels of service for the asset categories analyzed. This includes:
    a. Increasing taxes by 2.2% per year over a period of 15 years;
    b. Increasing water rates by 1.3% per year over a period of 10 years; and
    c. Increasing wastewater rates by 3.0% per year over a period of 15 years.
- Continued allocation of OCIF and CCBF funding as previously outlined.
- Increasing existing and future infrastructure budgets by the applicable inflation index on an annual basis in addition to the deficit phase-in.
- Continue to apply for project specific grant funding to supplement sustainable funding sources

16.2. Asset Data

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

16.3. Risk & Levels of Service

- Risk models and matrices can play an important role in identifying high-value assets, and developing an action plan which may include repair, rehabilitation, replacement, or further evaluation through condition assessments. As a result, project selection and the development of multi-year capital plans can become more strategic and objective. Initial models have been built into Citywide for all asset groups. These models reflect current data, which was limited. As the data evolves and new attribute information is obtained, these models should also be refined and updated.
- Available data on current performance should be centralized and tracked to support any calibration of service levels for long-term tracking of O. Reg. 588's requirements on proposed levels of service.
- Staff should monitor evolving local, regional, and environmental trends to identify factors that may shape the demand and delivery of infrastructure programs. These can include population growth, and the nature of population growth; climate change and extreme weather events; and economic conditions and the local tax base. This data can also be used to review service level targets.

Appendices

Appendix A: Proposed LOS 10-Year Capital Requirements

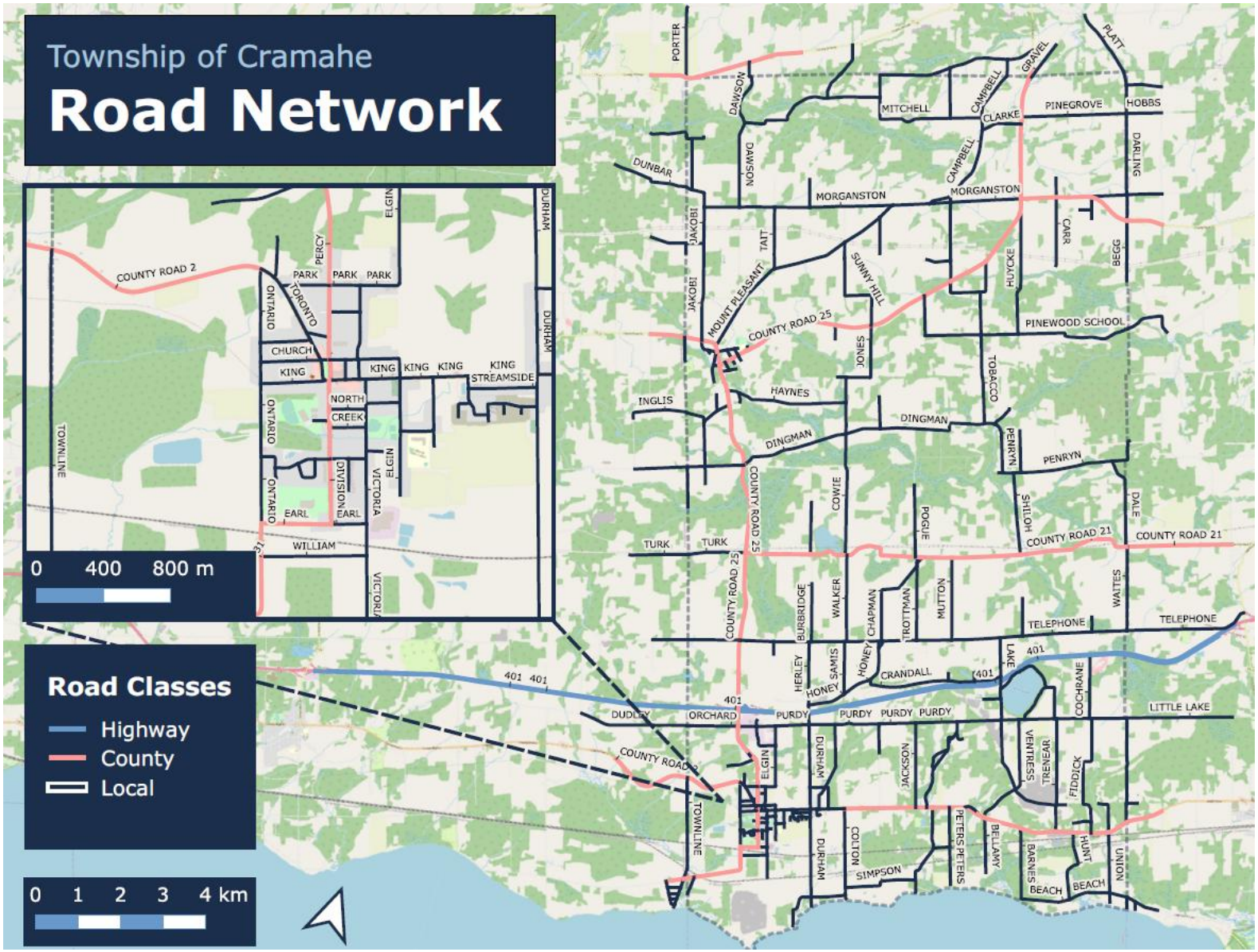
The table below outlines the capital cost requirements for recommended lifecycle activities, as determined through the Township's asset management software. These projections are based on annual budgets starting at current funding levels, with a gradual increase over a 10 and 15-year period to achieve full recommended funding for all assets. This strategy follows Scenario 1, as outlined in Section 4, to ensure the Township can sustain current service levels over the long term. For further details, please refer to the Financial Strategy.

Table 67: System-Generated 10-Year Capital Requirements - All Asset Categories

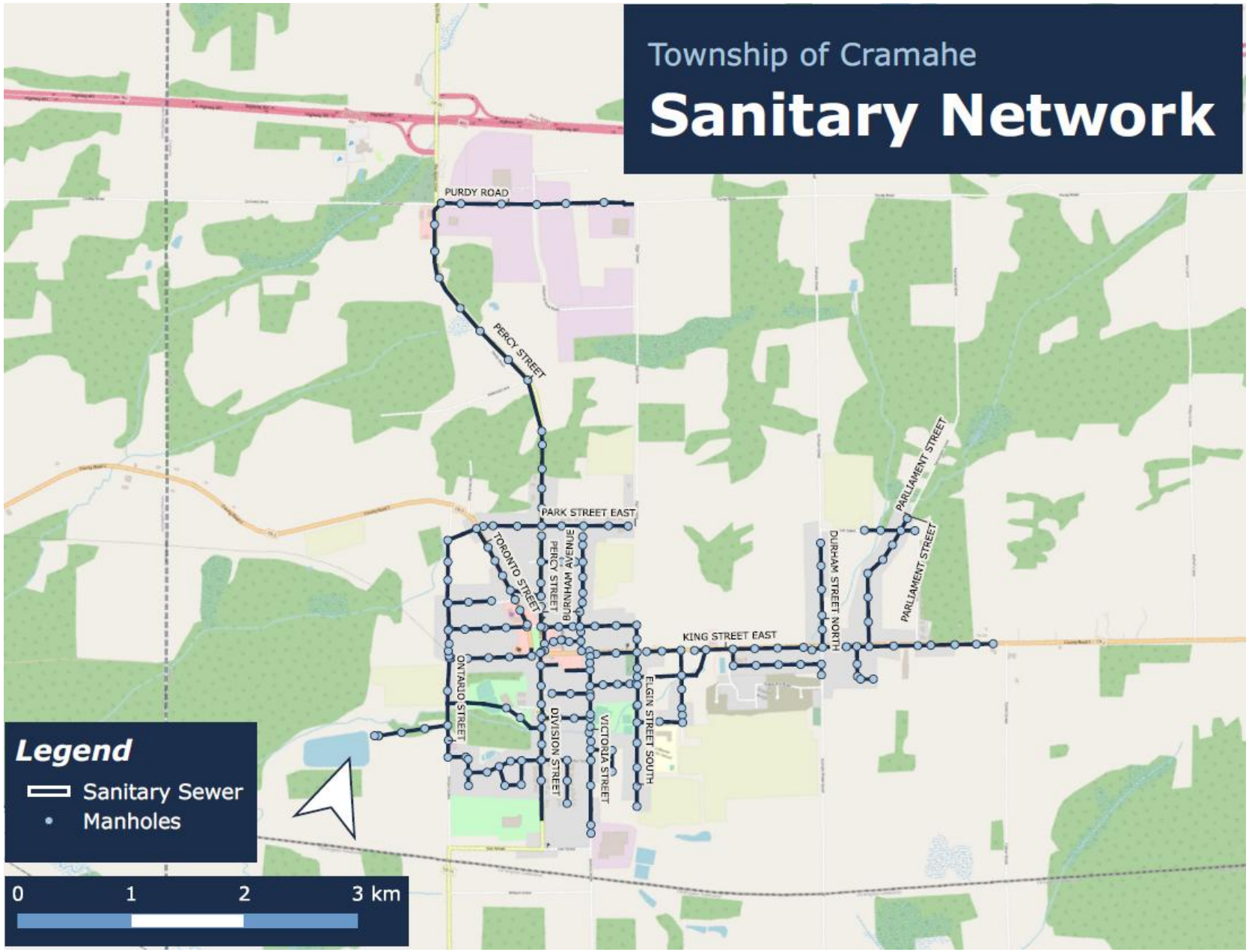
Asset Category	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034
Road Network	$998k	$863k	$175k	$241k	$96k	$3.2m	$4.0m	$1.8m	$1.9m	$2.1m
Bridges & Culverts	-	-	-	-	-	$155k	-	-	$356k	$69k
Buildings and Facilities	$159k	$273k	$296k	$197k	$363k	$324k	$459k	$348k	$215k	$799k
Machinery & Equipment	$159k	$175k	$154k	$141k	$181k	$278k	$175k	$323k	$222k	$203k
Vehicles	$37k	$165k	$434k	$345k	$222k	$245k	$375k	$600k	$460k	$337k
Parks & Recreation	$32k	$21k	$42k	$57k	$42k	$25k	$62k	$62k	$28k	$57k
Storm Sewer Network	$48k	$39k	$57k	$42k	$48k	$100k	$57k	$55k	$62k	$77k
Water Network	$141k	$541k	-	$1.2m	$294k	-	-	-	-	-
Sanitary Sewer Network	$204k	$90k	$172k	$147k	$285k	$209k	$239k	$266k	$378k	$370k
Total	**$1.8m**	**$2.2m**	**$1.3m**	**$2.4m**	**$1.5m**	**$4.6m**	**$5.4m**	**$3.5m**	**$3.7m**	**$4.0m**

Appendix B: Levels of Service Maps

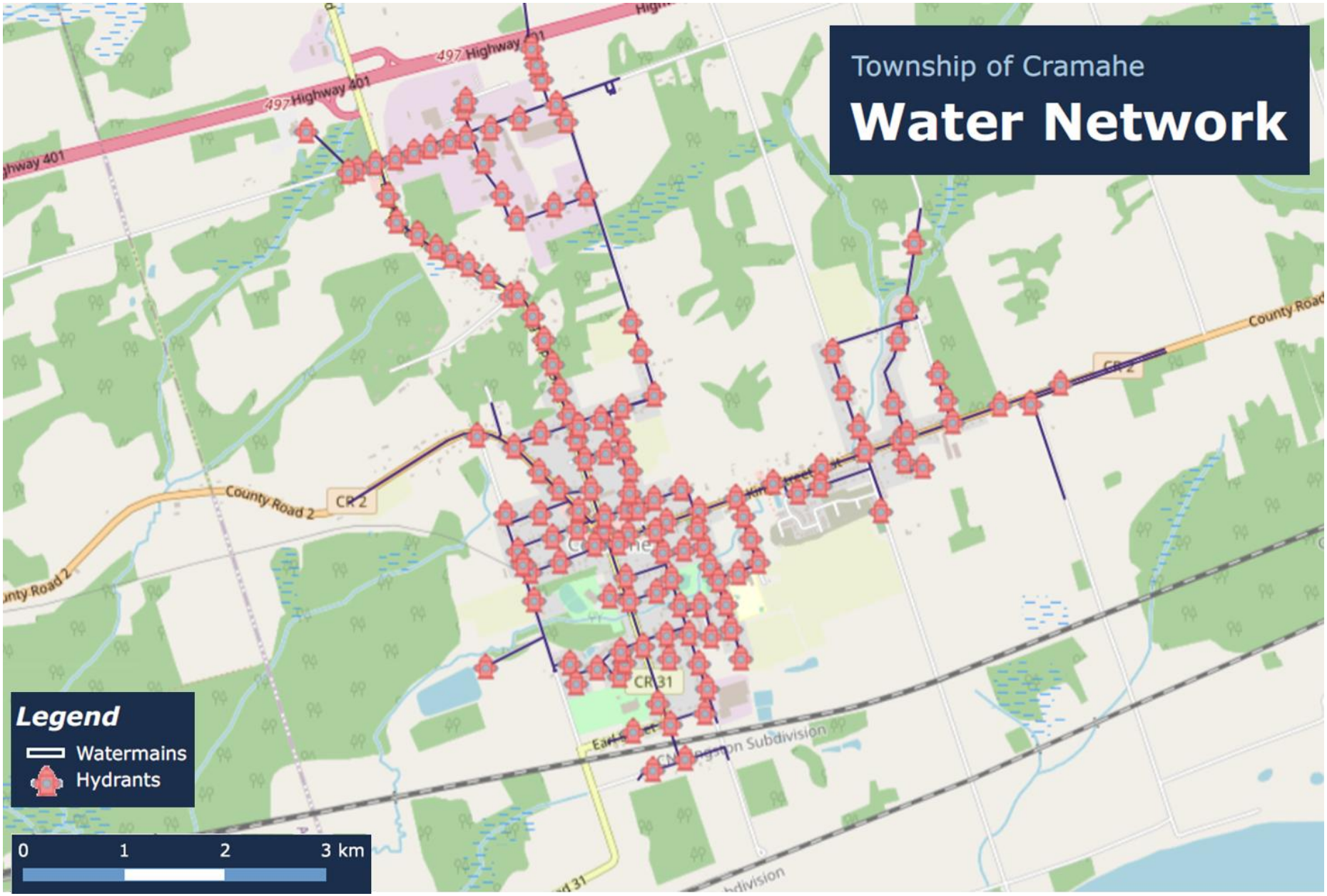
Road Network Maps



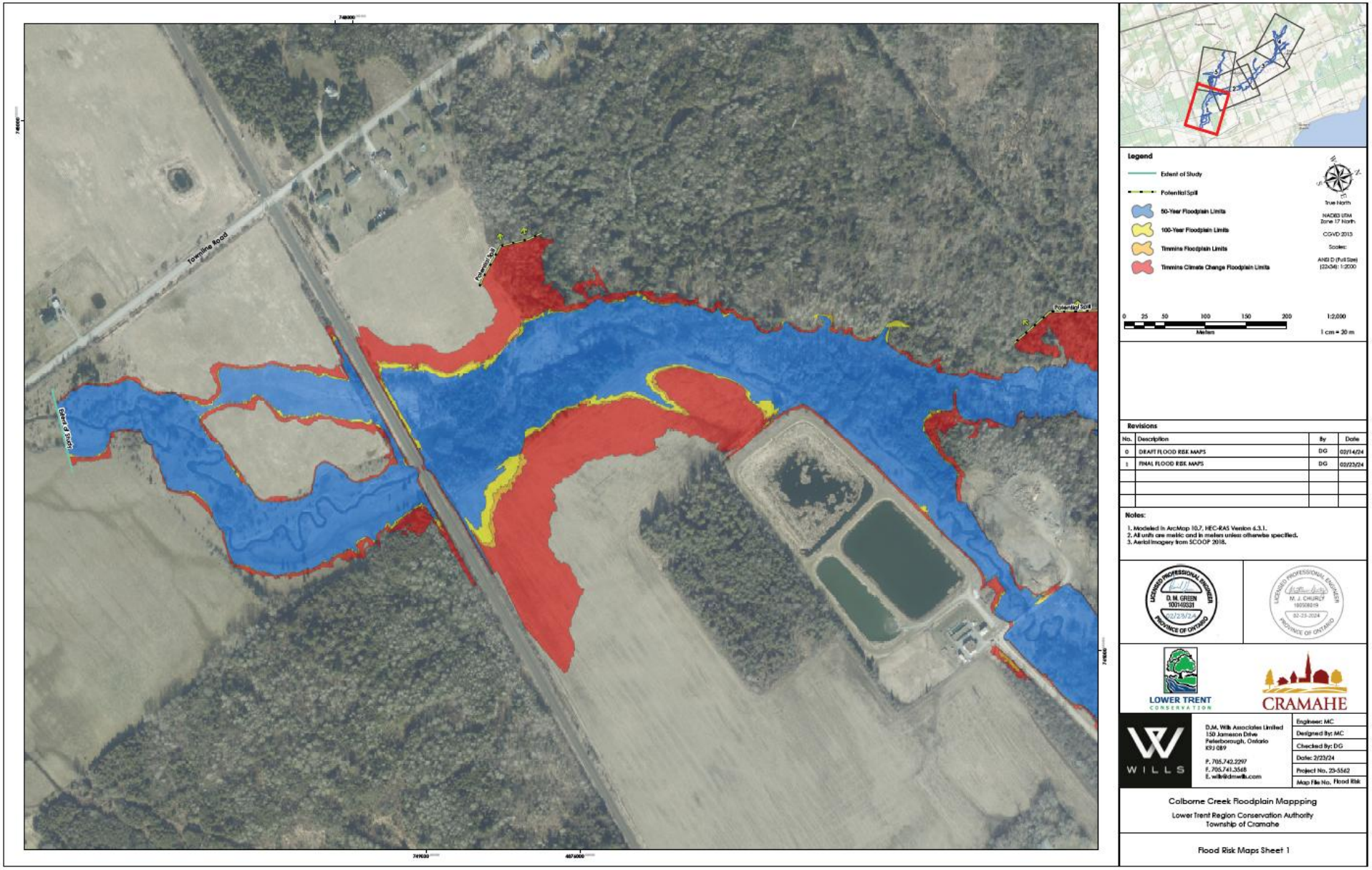
Sanitary Network Maps

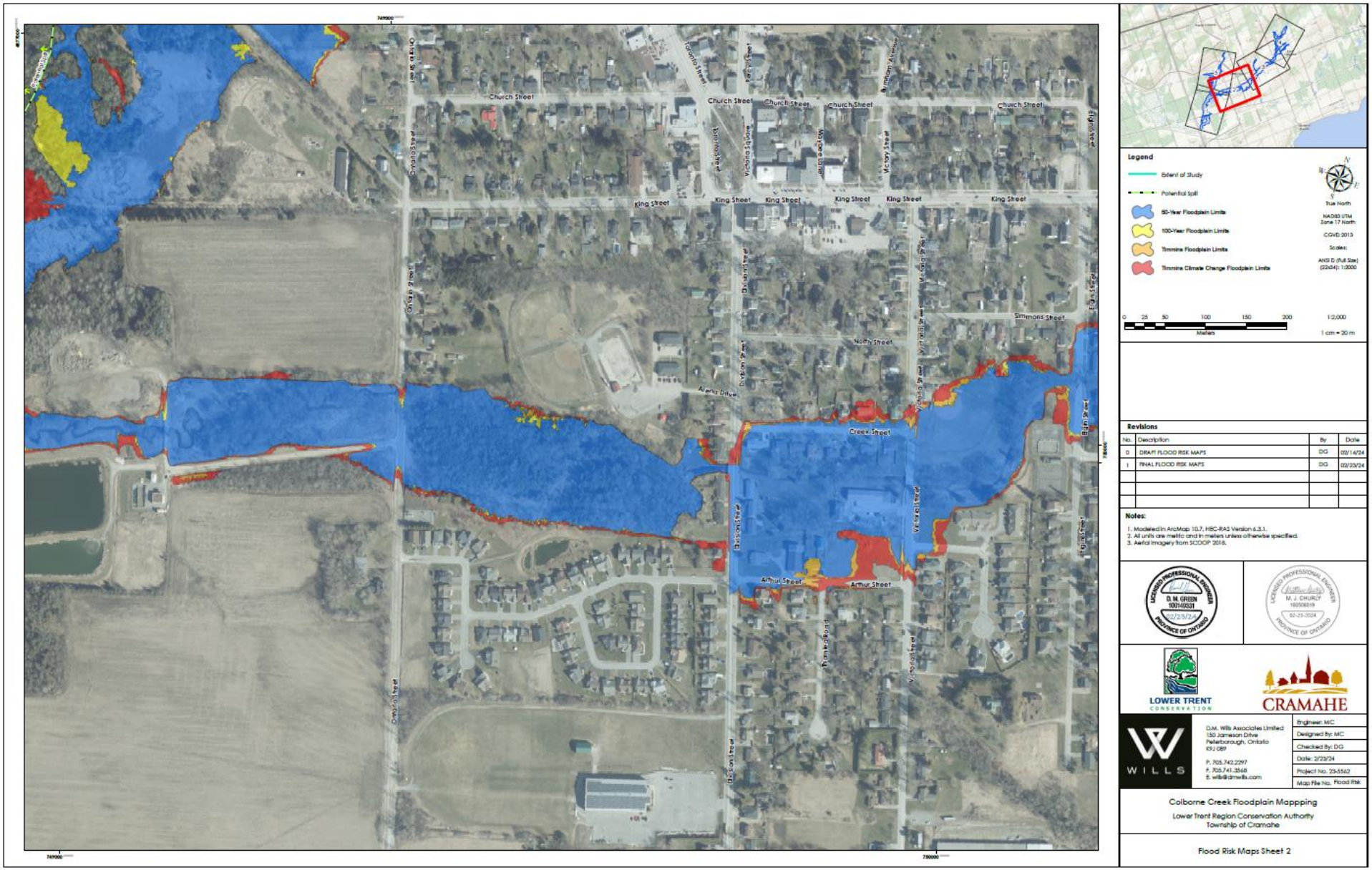


Water Network Maps



Flood Risk Maps




Church Street
King Street
North Street
Simmons Street
Creek Street
Arthur Street
Victoria Street
Ontario Street
Victoria Square
Legend
Extent of Study
Potential Spill
50-Year Floodplain Limits
100-Year Floodplain Limits
Timmins Floodplain Limits
Timmins Climate Change Floodplain Limits
True North
NAD83 UTM Zone 17 North
CGVD 2013
Meters
1 cm = 20 m
Revisions
No. Description By Date
0 DRAFT FLOOD RISK MAPS DG 02/14/24
1 FINAL FLOOD RISK MAPS DG 02/23/24
Notes:
1. Modelled in ArcMap 10.7, HEC-RAS Version 6.3.1.
2. All units are metric and in meters unless otherwise specified.
3. Aerial Imagery from SCOOP 2016.
LOWER TRENT CONSERVATION
CRAMAHE
WILLS
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Peterborough, Ontario
K9J 0B9
Engineer: MC
Designed By: MC
Checked By: DG
Date: 2/23/24
Project No. 23-5562
Colborne Creek Floodplain Mappping
Lower Trent Region Conservation Authority
Township of Cramahe
Flood Risk Maps Sheet 2


Legend
Extent of Study
Potential Spill
50-Year Floodplain Limits
100-Year Floodplain Limits
Timmins Floodplain Limits
Timmins Climate Change Floodplain Limits
True North
NAD83 UTM Zone 17 North
CGVD 2013
Scales:
ANSI D (Full Size) (22x34): 1:2000
0 25 50 100 150 200
Metres
1:2,000
1 cm = 20 m
Revisions
No. Description By Date
0 DRAFT FLOOD RISK MAPS DG 02/14/24
1 FINAL FLOOD RISK MAPS DG 02/23/24
Notes:
1. Modelled in ArcMap 10.7, HEC-RAS Version 6.3.1.
2. All units are metric and in meters unless otherwise specified.
3. Aerial imagery from SCDOP 2018.
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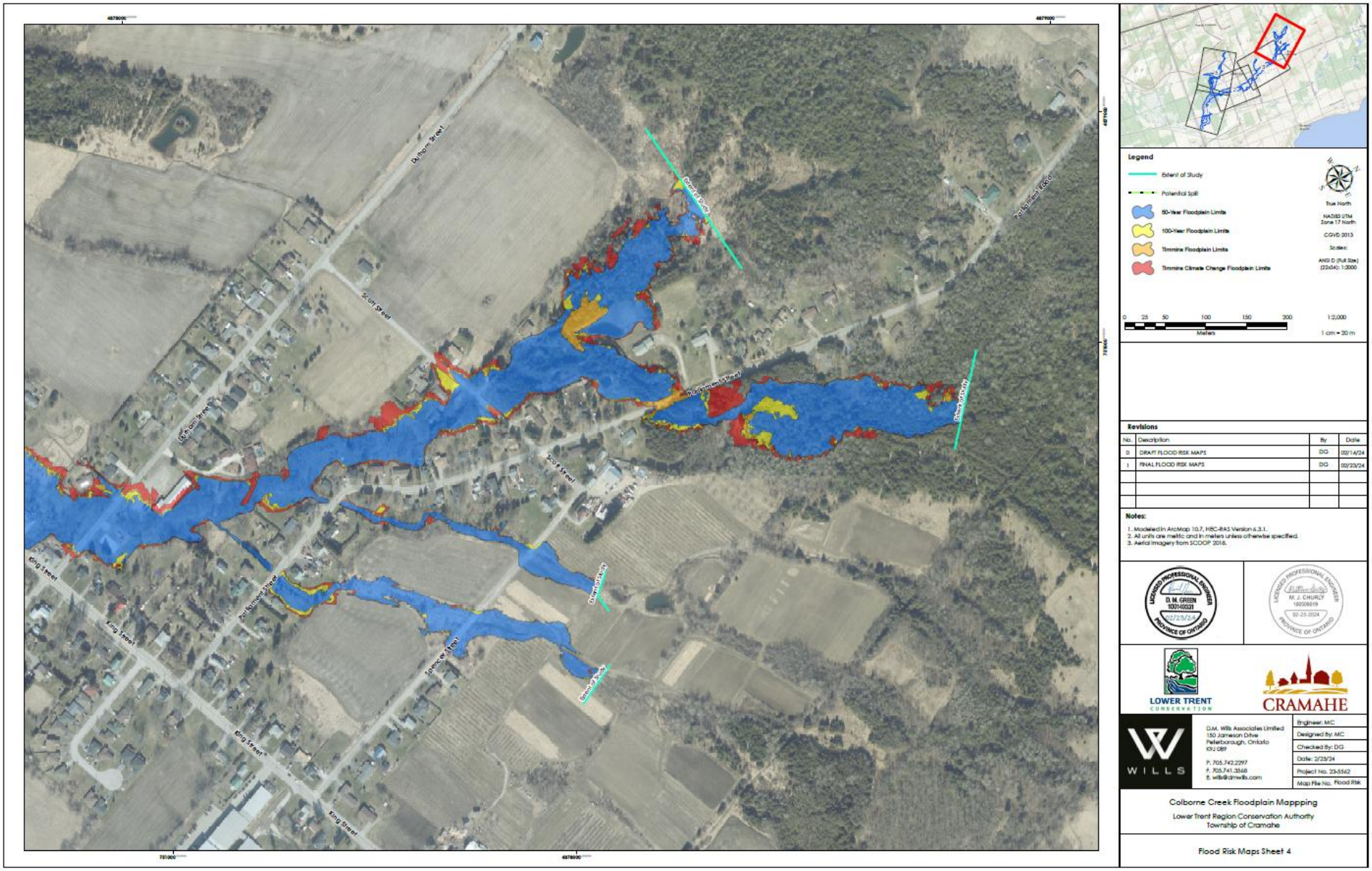
Date: 2/23/24
Project No. 23-3562
Map File No. Flood Risk
Colborne Creek Floodplain Mappping
Lower Trent Region Conservation Authority
Township of Cramahe
Flood Risk Maps Sheet 3
Burnham Avenue
Durham Street
Scott Street
Church Street
King Street
Fifth Street
Simmons Street
Streamside Drive
Kenilworth Avenue
Alfred Street
Colborne Creek


Dutcham Street
Scott Street
Parliament Street
Spencer Street
King Street
Colborne Creek
Legend
Extent of Study
Potential Spill
50-Year Floodplain Limits
100-Year Floodplain Limits
Timmins Floodplain Limits
Timmins Climate Change Floodplain Limits
True North
NAD83 UTM Zone 17 North
CGVD 2013
Scale:
ANSI D (Full Size) (22x34): 1:2000
Meters
1 cm = 20 m
Revisions
No. Description By Date
0 DRAFT FLOOD RISK MAPS DG 02/14/24
1 FINAL FLOOD RISK MAPS DG 02/23/24
Notes:
1. Modelled in ArcMap 10.7, HEC-RAS Version 6.3.1.
2. All units are metric and in meters unless otherwise specified.
3. Aerial imagery from SCOOP 2016.
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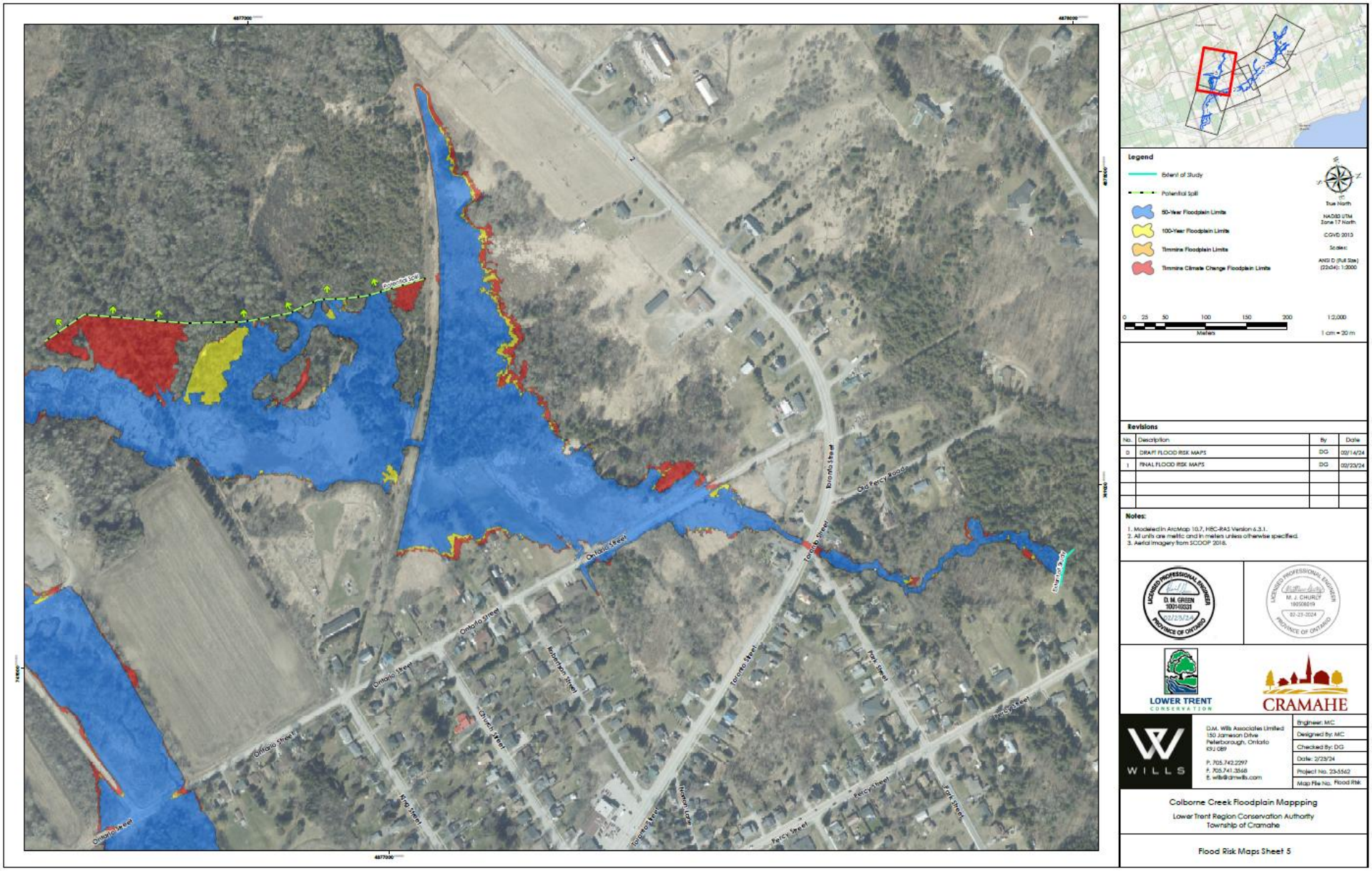
Project No. 23-5562
Map File No. Flood Risk
Colborne Creek Floodplain Mappping
Lower Trent Region Conservation Authority
Township of Cramahe
Flood Risk Maps Sheet 4


Legend
Extent of Study
Potential Spill
50-Year Floodplain Limits
100-Year Floodplain Limits
Timmins Floodplain Limits
Timmins Climate Change Floodplain Limits
True North
NAD83 UTM Zone 17 North
CGVD 2013
Scale:
ANSI D (Full Size) (22x34): 1:2000
0 25 50 100 150 200
Meters
1:2,000
1 cm = 20 m
Revisions
No. Description By Date
0 DRAFT FLOOD RISK MAPS DG 02/14/24
1 FINAL FLOOD RISK MAPS DG 02/23/24
Notes:
1. Modelled in ArcMap 10.7, HEC-RAS Version 6.3.1.
2. All units are metric and in meters unless otherwise specified.
3. Aerial imagery from SCOOP 2016.
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Engineer: MC
Designed By: MC
Checked By: DG
Date: 2/23/24
Project No. 23-5562
Map File No. Flood Risk
Colborne Creek Floodplain Mappping
Lower Trent Region Conservation Authority
Township of Cramahe
Flood Risk Maps Sheet 5
Potential Spill
Ontario Street
Toronto Street
Old Percy Road
Mechanic Street
Church Street
King Street
Percy Street
Park Street
Trent River

Bridges & Culverts Images

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

Campbell Road Bridge (BCI = 71 Good)

Dingman Road West Bridge (BCI = 48 Fair)

Ontario Street Bridge Culvert (BCI = 75 Good)

King Street Steel Culvert (BCI = 72 Good)

Appendix C: Condition Assessment Guidelines

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

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

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

Role of Asset Condition Data

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

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

Guidelines for Condition Assessment

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

Condition assessments must include a quantitative or qualitative assessment of the current condition of the asset, collected according to specified condition rating criteria, in a format that can be used for asset management decision-making. As a result, it is important that staff adequately define the condition rating criteria that should be used and the assets that require a discrete condition rating. When

engaging with external consultants to complete condition assessments, it is critical that these details are communicated as part of the contractual terms of the project.

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

Developing a Condition Assessment Schedule

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

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

Appendix D: Risk Rating Criteria

Risk Definitions

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

Risk Frameworks

Road Network – Paved (HCB/LCB) Roads

Probability of Failure			
Criteria	**Sub-Criteria**	**Value/ Range**	**Score**
Performance	Asset Condition	0-19	5 - Almost Certain
		20-39	4 - Likely
		40-59	3 - Possible
		60-70	2 - Unlikely
		80-100	1 - Rare

Consequence of Failure			
Criteria	**Sub-Criteria**	**Value/Range**	**Score**
Financial (60%)	Replacement Cost	>$5,000,000	5 – Severe
		$1,000,000	4 – Major
		$500,000	3 - Moderate
		$250,000	2 – Minor
		<$50,000	1 – Insignificant
Social (20%)	AADT – 50%	>2000	5 – Severe
		600	4 – Major
		400	3 – Moderate
		200	2 – Minor
		<50	1 – Insignificant
	MTO Class - 50%	4	4 – Major
		5	3 – Moderate
		6	2 – Minor
Health & Safety (20%)	Speed Limit	>80	5 – Severe
		70	4 – Major
		60	3 – Moderate
		50	2 – Minor
		<40	1 – Insignificant

Bridges & Culverts

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

Consequence of Failure			
Criteria	**Sub-Criteria**	**Value/Range**	**Score**
Financial (60%)	Replacement Cost	>$1,000,000	5 – Severe
		$1,000,000	4 – Major
		$500,000	3 - Moderate
		$250,000	2 – Minor
		<$100,000	1 – Insignificant
Social (20%)	AADT – 50%	>2000	5 – Severe
		600	4 – Major
		400	3 – Moderate
		200	2 – Minor
		<50	1 – Insignificant
Health & Safety (20%)	Speed Limit	School Route	4 - Major
		80	4 – Major
		60	3 – Moderate
		50	2 – Minor

Buildings

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

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

Parks and Recreation

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

Consequence of Failure			
Criteria	**Sub-Criteria**	**Value/Range**	**Score**
Financial 70%	Replacement Cost	>$1,000,000	5 - Severe
		$1,000,000	4 - Major
		$500,000	3 - Moderate
		$250,000	2 - Minor
		<$100,000	1 - Insignificant
Social 30%	Asset Segment	Fire	5 - Severe
		Public Works	4 – Moderate
		Community Services	2 – Minor

Machinery & Equipment

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

Consequence of Failure			
Criteria	**Sub-Criteria**	**Value/Range**	**Score**
Financial 70%	Replacement Cost	>$500,000	5 - Severe
		$500,000	4 - Major
		$250,000	3 - Moderate
		$100,000	2 - Minor
		<$50,000	1 - Insignificant
	Fleet Type	Heavy Duty	4 - Major
		Medium Duty	4 – Moderate
		Light Duty	2 - Minor
Social 30%	Asset Segment	Fire	5 - Severe
		Public Works	4 – Moderate
		Community Services	2 – Minor

Vehicles

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

Consequence of Failure			
Criteria	**Sub-Criteria**	**Value/Range**	**Score**
Financial 70%	Replacement Cost	>$500,000	5 - Severe
		$500,000	4 - Major
		$250,000	3 - Moderate
		$100,000	2 - Minor
		<$50,000	1 - Insignificant
	Fleet Type	Heavy Duty	4 - Major
		Medium Duty	4 – Moderate
		Light Duty	2 - Minor
Social 30%	Asset Segment	Fire	5 - Severe
		Public Works	4 – Moderate
		Community Services	2 – Minor

Water Mains

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

Consequence of Failure			
Criteria	**Sub-Criteria**	**Value/Range**	**Score**
Financial	Replacement Cost	>$500,000	5 - Severe
		$500,000	4 - Major
		$250,000	3 - Moderate
		$100,000	2 - Minor
		<$50,000	1 - Insignificant
	Diameter	>500	5 - Severe
		350	4 - Major
		250	3 - Moderate
		150	2 - Minor
		100	1 - Insignificant
	Road Surface Type	Hot Mix	4 - Major
		Surface Treated	3 - Moderate
		Gravel	1 - Insignificant

Sanitary Mains

Probability of Failure			
Criteria	**Sub-Criteria**	**Value/Range**	**Score**
Performance 80%	Asset Condition	0	5 - Almost Certain
		20	4 - Likely
		40	3 - Possible
		60	2 - Unlikely
		80	1 - Rare
Structural 20%	Material	C.P	5 – Likely
		PVC, Conc, Asbestos	3 - Possible
		Steel, Ductile Iron, Cast Iron	2 - Unlikely
		HDPE, PVC, Polyurethane	1 - Rare

Consequence of Failure			
Criteria	**Sub-Criteria**	**Value/Range**	**Score**
Financial 80%	Replacement Cost	>$1,000,000	5 - Severe
		$1,000,000	4 - Major
		$500,000	3 - Moderate
		$250,000	2 - Minor
		<$100,000	1 - Insignificant
	Diameter	>500	5 - Severe
		500	4 - Major
		250	4 – Moderate
		100	2 - Minor
		50	1 - Insignificant
Social 20%	AADT Ranges	0-199	5 - Severe
		200-399	4 - Major
		400-999	4 – Moderate
		1000-1999	2 – Minor
		>2000	1 - Insignificant

Storm Mains

Probability of Failure			
Criteria	**Sub-Criteria**	**Value/Range**	**Score**
Performance 80%	Asset Condition	0	5 - Almost Certain
		20	4 - Likely
		40	3 - Possible
		60	2 - Unlikely
		80	1 - Rare
Structural 20%	Material	C.P	5 – Likely
		PVC, Conc, Asbestos	3 - Possible
		Steel, Ductile Iron, Cast Iron	2 - Unlikely
		HDPE, PVC, Polyurethane	1 - Rare

Consequence of Failure			
Criteria	**Sub-Criteria**	**Value/Range**	**Score**
Financial 80%	Replacement Cost	>$1,000,000	5 - Severe
		$1,000,000	4 - Major
		$500,000	3 - Moderate
		$250,000	2 - Minor
		<$100,000	1 - Insignificant
	Diameter	>750	5 - Severe
		500	4 - Major
		375	4 – Moderate
		250	2 - Minor
		100	1 - Insignificant
Social 20%	AADT Ranges	0-199	5 - Severe
		200-399	4 - Major
		400-999	4 – Moderate
		1000-1999	2 – Minor
		>2000	1 - Insignificant