Asset Management Plan

Municipality of Bluewater

2024

This Asset Management Plan was prepared by:

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

Key Statistics

Replacement cost of asset portfolio
$392.5 million

Replacement cost of infrastructure per household
$52,000

Percentage of assets in fair or better condition
73%

Percentage of assets with assessed condition data
56%

Annual capital infrastructure deficit
$5.5 million

Recommended timeframe for eliminating annual infrastructure deficit
20 Years

Target reinvestment rate
2.4%

Actual reinvestment rate
1.0%

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Executive Summary

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

Scope

This Asset Management Plan (AMP) identifies the current practices and strategies that are in place to manage public infrastructure and makes recommendations where they can be further refined. Through the implementation of sound asset management strategies, the Municipality can ensure that public infrastructure is managed to support the sustainable delivery of municipal services.

This AMP include the following asset categories:

Asset Categories

- Road Network
- Bridges & Culverts
- Facilities
- Water Network
- Storm Network
- Fleet
- Machinery & Equipment
- Sanitary Sewer Network
- Land Improvements

With the development of this AMP the Municipality has achieved compliance with O. Reg. 588/17 to the extent of the requirements that must be completed by July 1, 2024. There are additional requirements concerning proposed levels of service and growth that must be met by July 1, 2025.

Findings

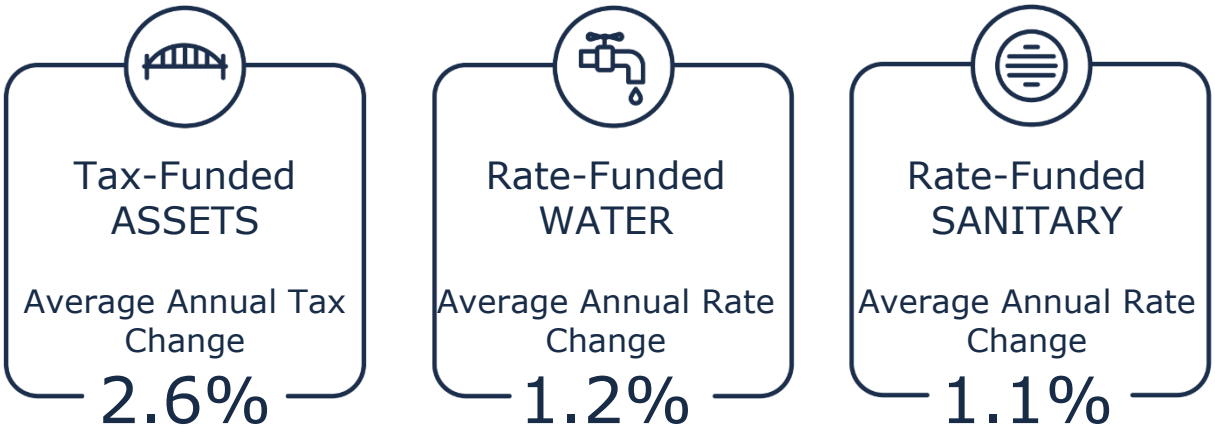
The overall replacement cost of the asset categories included in this AMP totals $392.5 million. 73% of all assets analysed in this AMP are in fair or better condition and assessed condition data was available for 56% of assets. For the remaining 44% of assets, assessed condition data was unavailable, and asset age was used to approximate condition – a data gap that persists in most municipalities. Generally, age misstates the true condition of assets, making assessments essential to accurate asset management planning, and a recurring recommendation in this AMP. The development of a long-term, sustainable financial plan requires an analysis of whole lifecycle costs. This AMP uses a combination of proactive lifecycle strategies (paved road) and replacement only strategies (all other assets) to determine the lowest cost option to maintain the current level of service.

To meet capital replacement and rehabilitation needs for existing infrastructure, prevent infrastructure backlogs, and achieve long-term sustainability, the Municipality's average annual capital requirement totals $9.6 million. Based on a historical analysis of sustainable capital funding sources, the Municipality is committing approximately $4.1 million towards capital projects or reserves per year. As a result, there is currently an annual funding gap of $5.5 million.

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

Recommendations

A financial strategy was developed to address the annual capital funding gap. The following graphics show the annual tax/rate change required to eliminate the Municipality's infrastructure deficit based on a 20-year plan for tax-funded assets, and a 10-year plan for both rate-funded categories:



Recommendations to guide continuous refinement of the Municipality's asset management program. These include:

- Review data to update and maintain a complete and accurate dataset
- Develop a condition assessment strategy with a regular schedule
- Review and update lifecycle management strategies
- Development and regularly review short- and long-term plans to meet capital requirements
- Measure current levels of service and identify sustainable proposed levels of service for 2025 compliance
- Implementation of asset management software
- Update and adoption of critical documents (TCA policy, AM policy, reserve funding strategy, etc.)

1 Introduction & Context

Key Insights

- The goal of asset management is to minimize the lifecycle costs of delivering infrastructure services, manage the associated risks, while maximizing the value ratepayers receive from the asset portfolio

- The Municipality's asset management policy provides clear direction to staff on their roles and responsibilities regarding asset management

- An asset management plan is a living document that should be updated regularly to inform long-term planning

- Ontario Regulation 588/17 outlines several key milestone and requirements for asset management plans in Ontario between July 1, 2022, and 2025

1.1 Bluewater Community Profile[1]

Census Characteristic	Municipality of Bluewater	Huron County	Ontario
Population 2021	7,540	61,366	14,223,942
Population Change 2016-2021	5.7	3.5	5.8
Total Private Dwellings	4,882	29,455	5,929,250
Population Density	18.1/km^2	18.1/km^2	15.9/km^2
Land Area	416.70 km^2	3,398.28 km^2	892,411.76 km^2

The Municipality of Bluewater is a small Municipality of 7,540 (2021 Census) located 70 kilometres Northwest of London, Ontario. The Municipality is situated along the shores of Lake Huron, within Huron County.

The Municipality of Bluewater was incorporated in 2001 via the amalgamation of the former municipalities of Hay and Stanley, and the villages of Bayfield, Hensall, and Zurich. Bluewater boasts 26 kilometres of Lake Huron shoreline along their western boundary. The Municipality is home to plenty of picturesque bluffs and beaches, such as Bayfield Pier Beach, Houston Heights Beach, Howard Street Beach, and Hay Municipality Beach.

The Municipality provides the ideal mix of nature, agricultural industry, and quaint villages such as Bayfield, Brucefield, Dashwood, Hensall, Varna, and Zurich. These villages have a long history, with the Village of Bayfield being founded in 1832. The village soon had a grist and lumber mill, and today the area is home to large agricultural operations. Hensall, Ontario is the White Bean Capital of Canada. The Municipality of Bluewater has several historic districts, such as the historic Main Street of Bayfield.

The Municipality of Bluewater is nearby regional centres such as Grand Bend, Exeter, and London. Bluewater provides a mix of small-town life, access to urban amenities, and natural beauty, making the Municipality an excellent place for residents to work, live, and play.

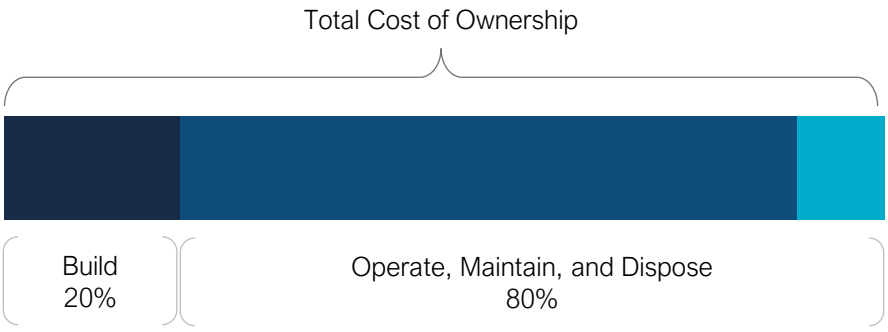
The Municipality has prioritized maintenance of its current infrastructure, allocating resources to ensure the ongoing functionality and resilience of its assets. This dedication highlights the Municipality’s commitment to maintaining the effectiveness and integrity of its essential infrastructure.

[1] Statcan 2021 census

1.2 An Overview of Asset Management

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

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



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

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

1.2.1 Asset Management Policy

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

Municipality of Bluewater's "Strategic Asset Management Policy" was approved by Council on June 3, 2019, in accordance with Ontario Regulation 588/17.

The goals and objectives of the policy is to:

- Deliver a consistent framework for applying asset management throughout the organization
- Prioritize the need for existing and future assets to effectively and efficiently provide services
- Provide transparency and accountability
- Demonstrate to stakeholders the legitimacy of decision-making processes by integrating strategic plans, budgets, service levels, and risks
- Support sustainability and economic development
- Promote environmental stewardship

1.2.2 Asset Management Strategy

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

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

1.2.3 Asset Management Plan

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

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

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

1.3 Key Concepts in Asset Management

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

1.3.1 Lifecycle Management Strategies

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

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

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

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

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

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

1.3.2 Risk Management Strategies

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

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

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

1.3.3 Levels of Service

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

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

Community Levels of Service

Community levels of service are a simple, plain language description or measure of the service that the community receives. For core asset categories (roads, bridges & culverts, water, sanitary, and storm) the province, through O. Reg. 588/17, has provided qualitative descriptions that are required to be included in this AMP. For

non-core asset categories, the Municipality has determined the qualitative descriptions that will be used to determine the community level of service provided. These descriptions can be found in the Levels of Service subsection within each asset category.

Technical Levels of Service

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

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

Current and Proposed Levels of Service

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

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

1.4 Climate Change

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

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

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

1.4.1 Bluewater Climate Profile

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

Higher Average Annual Temperature:

- Between the years 1971 and 2000 the annual average temperature was 7.6 ºC

- Under a high emissions scenario, the annual average temperatures are projected to increase by 4.6 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, Bluewater is projected to experience an 12% increase in precipitation by the year 2051 and a 16% increase by the end of the century.

Increase in Frequency of Extreme Weather Events:

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

1.4.2 Lake Huron

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

Public health and safety depend on the stability and predictability of the ecosystem in the Great Lakes watershed. The quality of water is threatened by anthropogenic climate change due to blue-green algae blooms, soil erosion, and agricultural, stormwater, and wastewater runoff. These phenomena put undue stress on regional water filtering and treatment systems. The safety of the public is threatened by the physical impacts of flooding such as flooding and erosion. In some cases, homeowners located near the lakeshore are already at risk of losing their homes.

1.4.3 Integrating Climate change and Asset Management

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

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

1.5 Ontario Regulation 588/17

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

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

2019

Strategic Asset Management Policy

2022

Asset Management Plan for Core Assets with the following components:

1. Current levels of service
2. Inventory analysis
3. Lifecycle activities to sustain LOS
4. Cost of lifecycle activities
5. Population and employment forecasts
6. Discussion of growth impacts

2024

Asset Management Plan for Core and Non-Core Assets (same components as 2022) and Asset Management Policy Update

2025

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

1. Proposed levels of service for next 10 years
2. Updated inventory analysis
3. Lifecycle management strategy
4. Financial strategy and addressing shortfalls
5. Discussion of how growth assumptions impacted lifecycle and financial strategies

1.5.1 O. Reg. 588/17 Compliance Review

The following table identifies the requirements outlined in Ontario Regulation 588/17 for municipalities to meet by July 1, 2024. Next to each requirement a page or section reference is included in addition to any necessary commentary.

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

2 Scope and Methodology

Key Insights

- This asset management plan includes 9 asset categories
- The source and recency of replacement costs impacts the accuracy and reliability of asset portfolio valuation
- Accurate and reliable condition data helps to prevent premature and costly rehabilitation or replacement and ensures that lifecycle activities occur at the right time to maximize asset value and useful life

2.1 Asset Categories Included in this AMP

This asset management plan for the Municipality of Bluewater is produced in compliance with Ontario Regulation 588/17. The July 2024 deadline under the regulation requires analysis of both core and non-core assets.

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

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

2.2 Deriving Replacement Costs

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

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

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

2.3 Estimated Useful Life and Service Life Remaining

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

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

$$Service\ Life\ Remaining\ (SLR) = In\ Service\ Date + Estimated\ Useful\ Life (EUL) - Current\ Year$$

2.4 Reinvestment Rate

As assets age and deteriorate, they require additional investment to maintain a state of good repair. The reinvestment of capital funds, through asset renewal or replacement, is necessary to sustain an adequate level of service. The reinvestment rate is a measurement of available or required funding relative to the total replacement cost.

By comparing the actual vs. target reinvestment rate the Municipality can determine the extent of any existing funding gap. The reinvestment rate is calculated as follows:

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

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

2.5 Deriving Asset Condition

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

A condition assessment rating system provides a standardized descriptive framework that allows comparative benchmarking across the Municipality's asset portfolio. The table below outlines the condition rating system used in this AMP to determine asset condition. This rating system is aligned with the Canadian Core Public Infrastructure Survey which is used to develop the Canadian Infrastructure Report Card. When assessed condition data is not available, service life remaining is used to approximate asset condition.

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

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

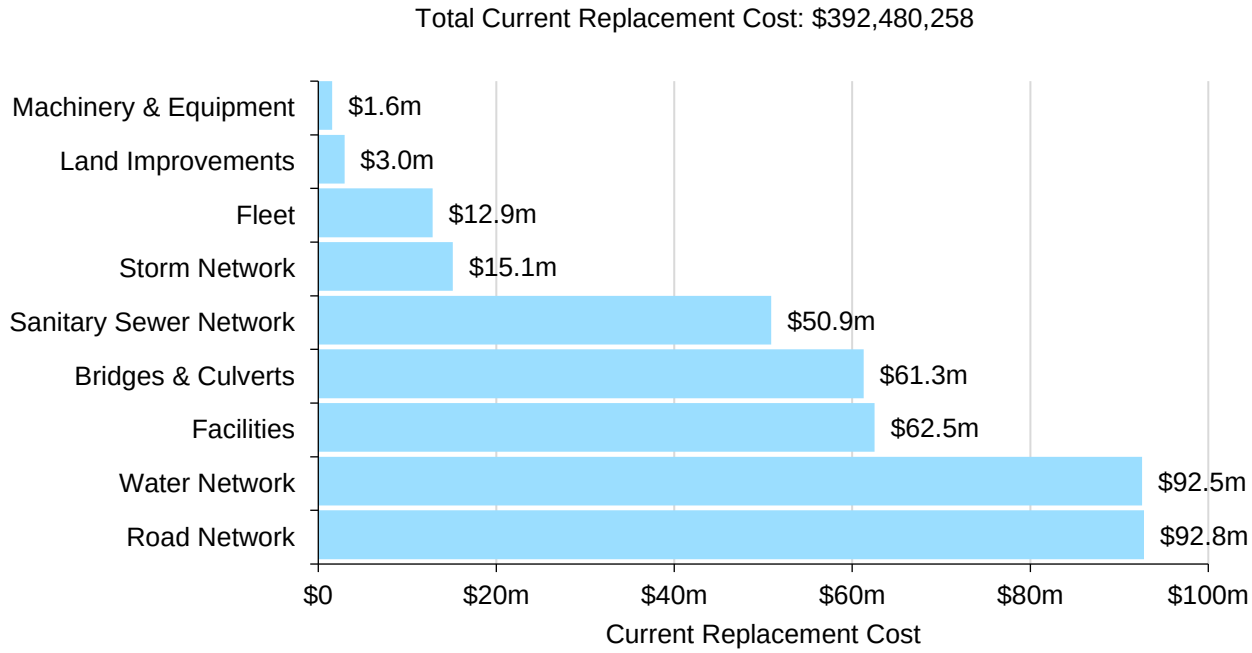
3 Portfolio Overview

Key Insights

- The total replacement cost of the Municipality's asset portfolio is $392.5 million
- The Municipality's target re-investment rate is 2.4%, and the actual re-investment rate is 1.0%, contributing to an expanding infrastructure deficit
- 73% of all assets are in fair or better condition
- Average annual capital requirements total $9.6 million per year across all assets

3.1 Total Replacement Cost of Asset Portfolio

The asset categories analyzed in this AMP have a total replacement cost of $392.5 million based on inventory data from 2022. 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.

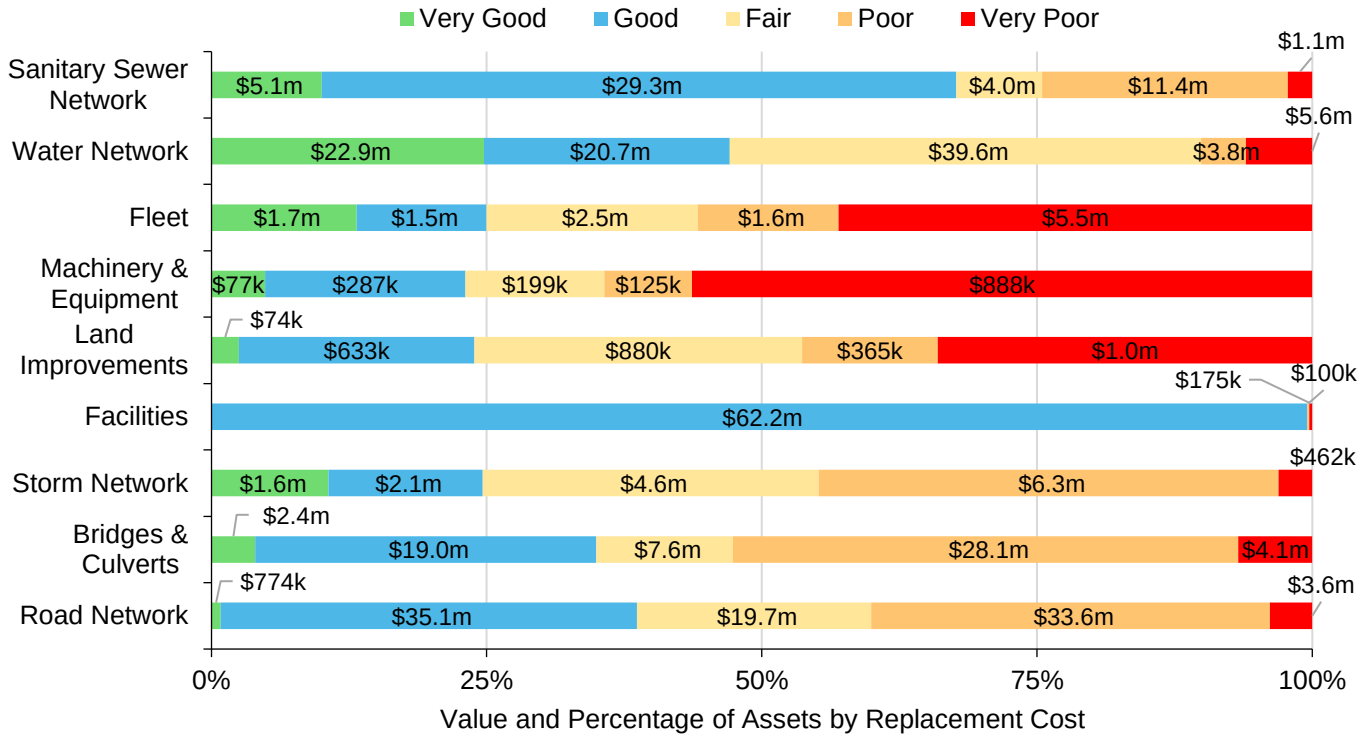


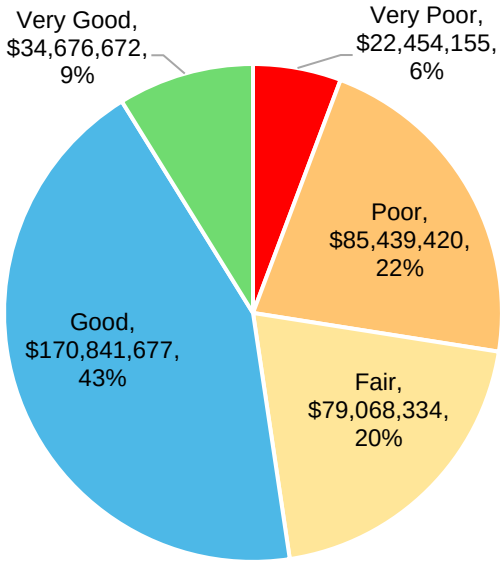
3.2 Target vs Actual Reinvestment Rate

The graph below depicts funding gaps or surpluses by comparing target vs actual reinvestment rates. To meet the long-term replacement needs, the Municipality should be allocating approximately $9.6 million annually, for a target reinvestment rate of 2.4%. Actual annual spending on infrastructure totals approximately $4.1 million, for an actual reinvestment rate of 1.0%

3.3 Condition of Asset Portfolio

The current condition of the assets is central to all asset management planning. Collectively, 73% of assets in Bluewater are in fair or better condition. This estimate relies on both age-based and field condition data.





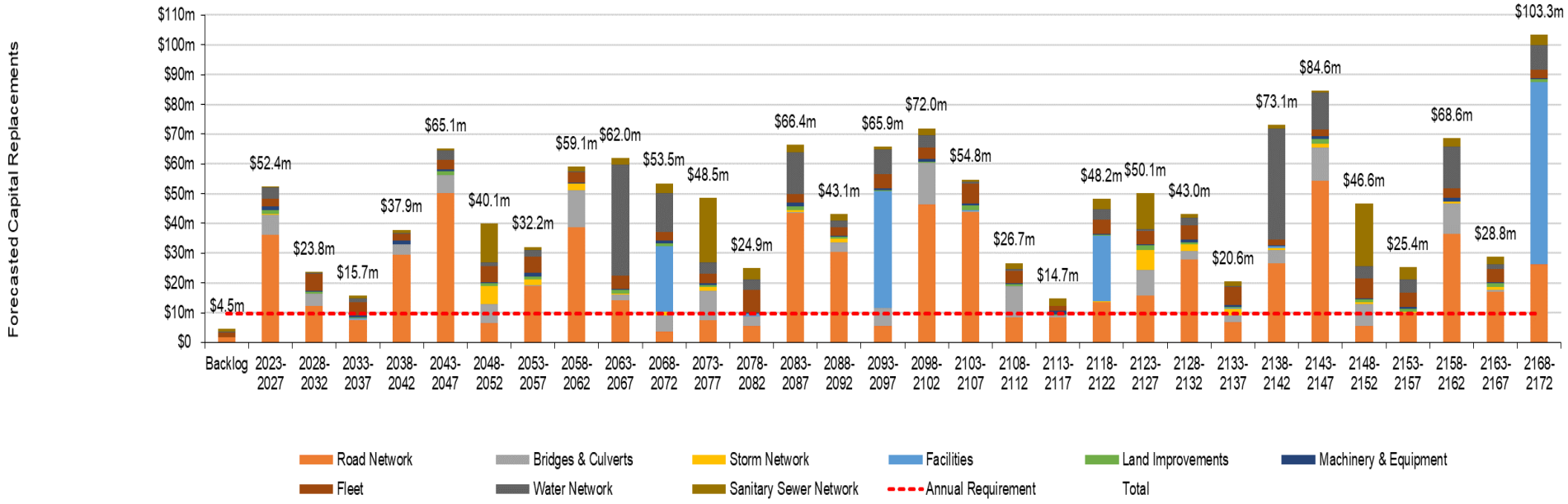
This AMP relies on assessed condition data for 56% of assets; for the remaining portfolio, age is used as an approximation of condition. Assessed condition data is invaluable in asset management planning as it reflects the true condition of the asset and its ability to perform its functions. The table below identifies the source of condition data used throughout this AMP.

Asset Category	Asset Segment	% of Assets with Assessed Condition	Source of Condition Data
Road Network	All	95%	Internal & External Assessments
Bridges & Culverts	All	100%	OSIM Report
Storm Network	All	0%	Age-Based
Facilities	All	100%	Building Condition Assessments (FCI)
Land Improvements	All	100%	Internal Assessments
Fleet	All	0%	Age-based
Machinery & Equipment	All	100%	Internal Assessments
Sanitary Sewer Network	All	5%	Building Condition Assessments
Water Network	All	0%	Age-based

3.4 Forecasted Capital Requirements

The development of a long-term capital forecast should include both asset rehabilitation and replacement requirements. With the development of asset-specific lifecycle strategies that include the timing and cost of future capital events, the Municipality can produce an accurate long-term capital forecast.

The following graph identifies capital requirements over the next 150 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.



4 Analysis of Tax-Funded Assets

Key Insights

- Tax-funded assets are valued at $249.0 million
- 65% of tax-funded assets are in fair or better condition
- The average annual capital requirement to sustain the current level of service for all assets is approximately $7.5 million

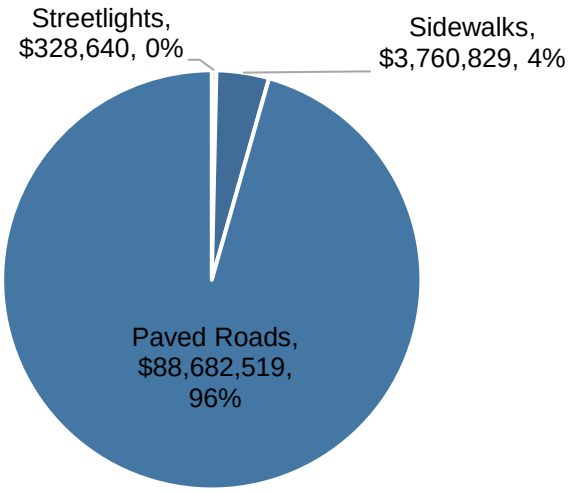
4.1 Road Network

The road network is a critical component of the provision of safe and efficient transportation services and represents the highest value asset category in the Municipality's asset portfolio. It includes all municipally owned and maintained roadways in addition to supporting roadside infrastructure including sidewalks, and streetlights.

4.1.1 Asset Inventory & Replacement Costs

The table below includes the quantity, unit of measure, total replacement cost, and primary replacement cost method of each asset segment in the Municipality's road network inventory.

Segment	Quantity	Unit of Measure	Replacement Cost	Primary RC Method
Paved Roads	144.63	Kilometers	$88,683,000	User-defined
Sidewalks	17,930.20	Meters	$3,761,000	User-defined
Streetlights	658	Assets	$329,000	User-defined
Dirt Roads	7.60	Kilometers	$152,000[2]	User-defined
Unpaved Roads	212.79	Kilometers	$100,000,000[3]	User-defined



Total Current Replacement Cost: $92,771,988

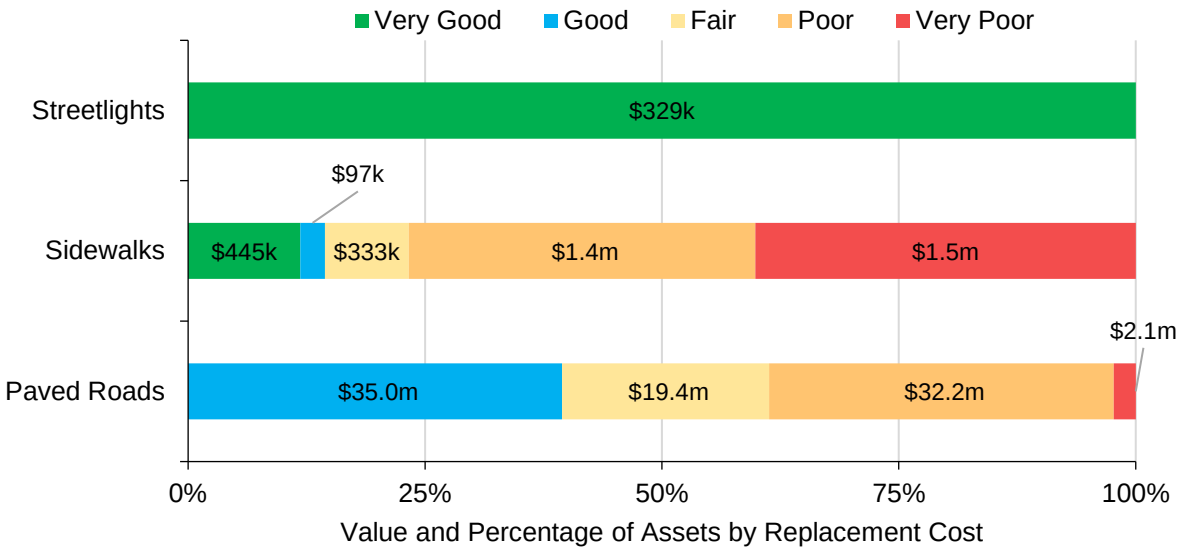
[2] Though not planned for replacement, the Municipality's dirt roads have a current replacement value of $152,000

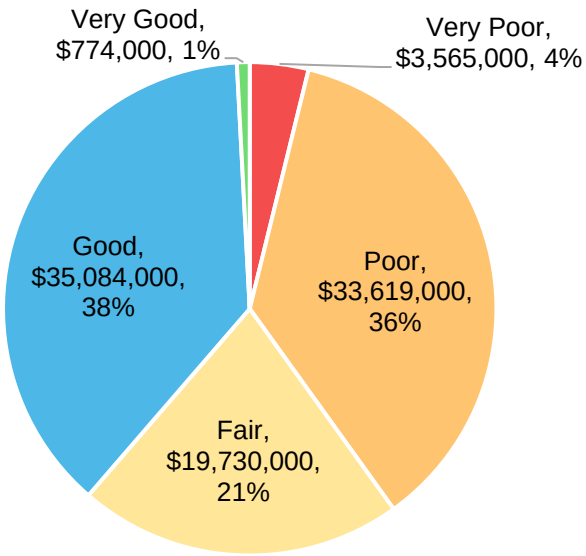
[3] Though not planned for replacement, the Municipality's unpaved roads have a current replacement value of $100,000,000

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

4.1.2 Asset Condition

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





To ensure that the Municipality's road network continues to provide an acceptable level of service, it should monitor the average condition of all assets. If the average condition declines, staff should re-evaluate their lifecycle management strategy to

determine what combination of maintenance, rehabilitation, and replacement activities is required to increase the overall condition of the roads.

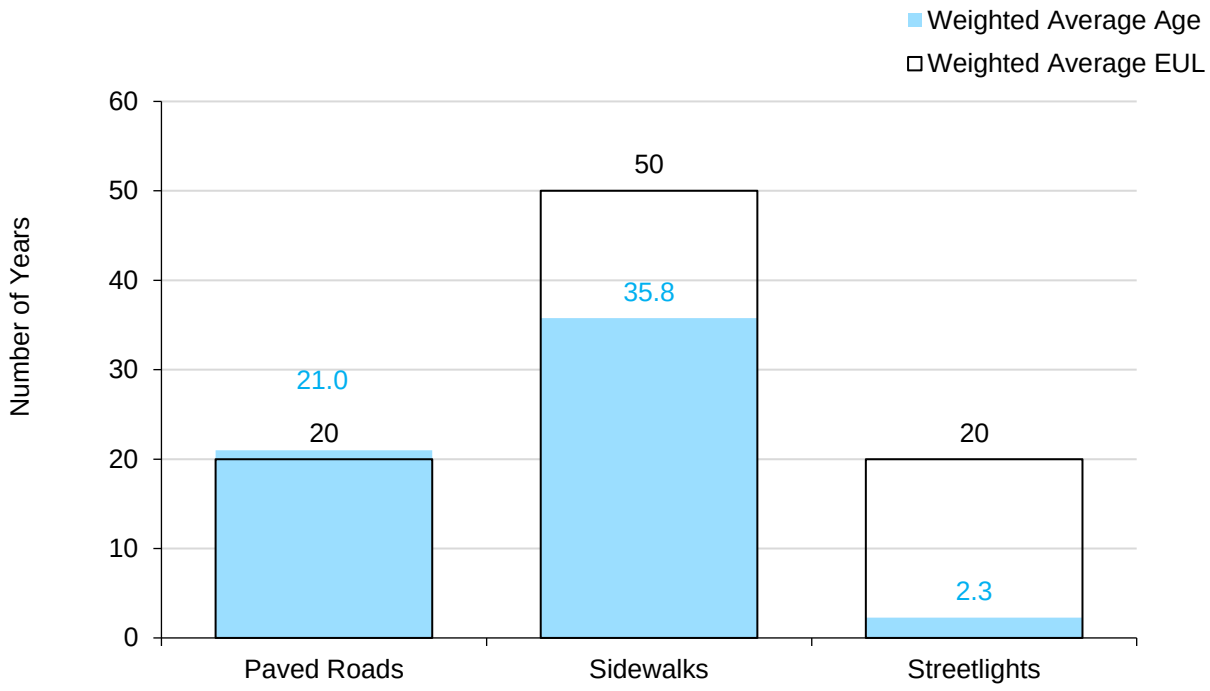
Current Approach to Condition Assessment

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

- The Municipality completed a Road Needs Study in 2019 in coordination with B.M Ross. The Municipality has adopted a 5-year cycle for Roads Needs Studies completed by external contractors
- Streetlight Assessments are carried out annually by internal staff in accordance with minimum maintenance standards.

4.1.3 Estimated Useful Life & Average Age

The Estimated Useful Life for road network assets has been assigned according to a combination of established industry standards and staff knowledge. The Average Age of each asset is based on the number of years each asset has been in-service. Assessed condition may increase or decrease the average service life remaining.



Each asset's Estimated Useful Life should 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.

4.1.4 Lifecycle Management Strategy

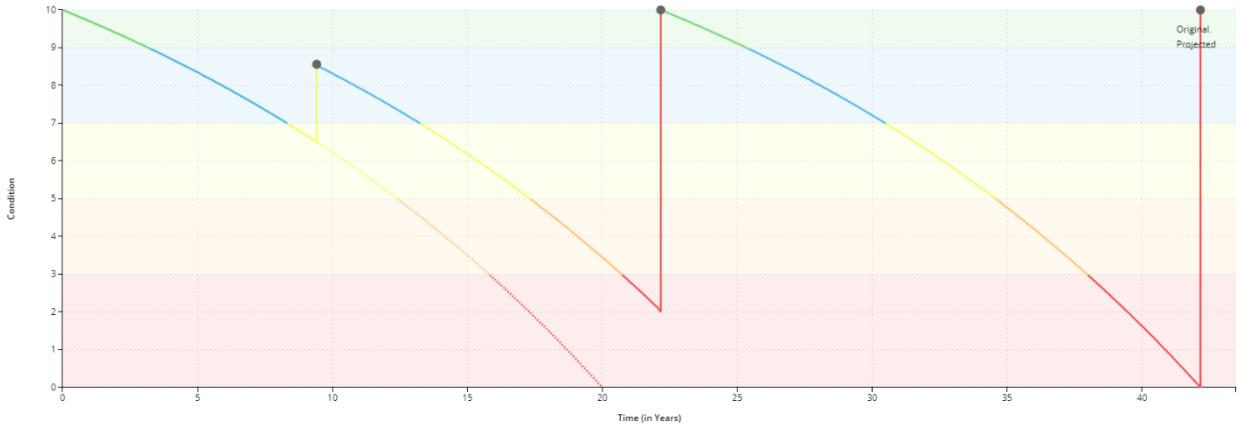
The condition or performance of most assets will deteriorate over time. This process is affected by a range of factors including an asset's characteristics, location, utilization, maintenance history, and environment.

The following table outlines the Municipality's current lifecycle management strategy.

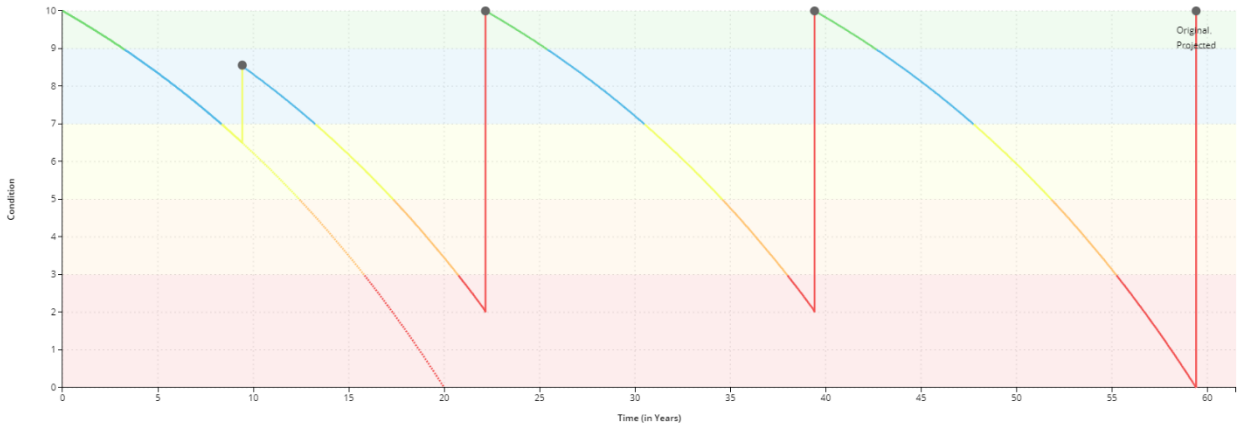
Activity Type	Description of Current Strategy
Maintenance	Routine maintenance activities include inspections, cleaning, minor repairs (such as crack sealing and grading application of maintenance gravel), and vegetation management.
	Maintenance activities are performed according to the timelines specified in the Minimum Maintenance Standards
Rehabilitation	Rehabilitation activities involve resurfacing, structural repairs or base replacement, and upgrades to municipal cross-sections. Rehabilitation programs are initiated annually, with the municipality aiming to complete one reconstruction project and one repaving project each year.
	Asset prioritization is based on nearing the end of life and condition ratings as outlined in the asset assessments. However, prioritization may be adjusted based on economies of scale for projects in the same location (e.g., replacing a culvert crossing during road reconstruction).
Replacement	Condition data informs the budget for replacement recommendations, with priority given to the assets in the worst condition as noted in the report.

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

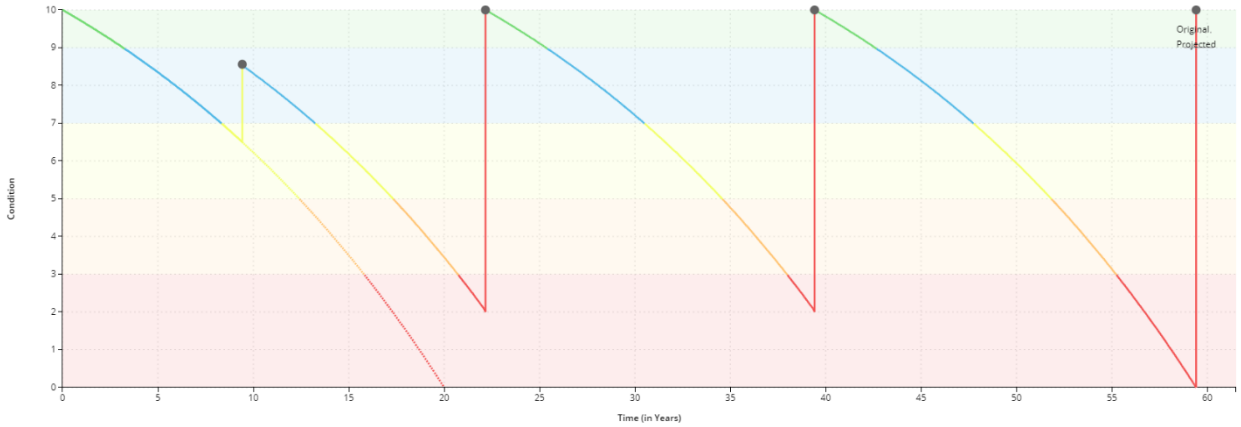
Rural Roads		
Event Name	**Event Class**	**Event Trigger**
Crack Sealing	Maintenance	6.5 Condition
Pad & Pave	Rehabilitation	2 Condition
Full Reconstruction	Replacement	0 Condition



Urban Roads		
Event Name	**Event Class**	**Event Trigger**
Patching	Maintenance	6.5 Condition
Mill & Pave	Rehabilitation	2 Condition
Mill & Pave II	Rehabilitation	2 Condition
Full Reconstruction	Replacement	0 Condition

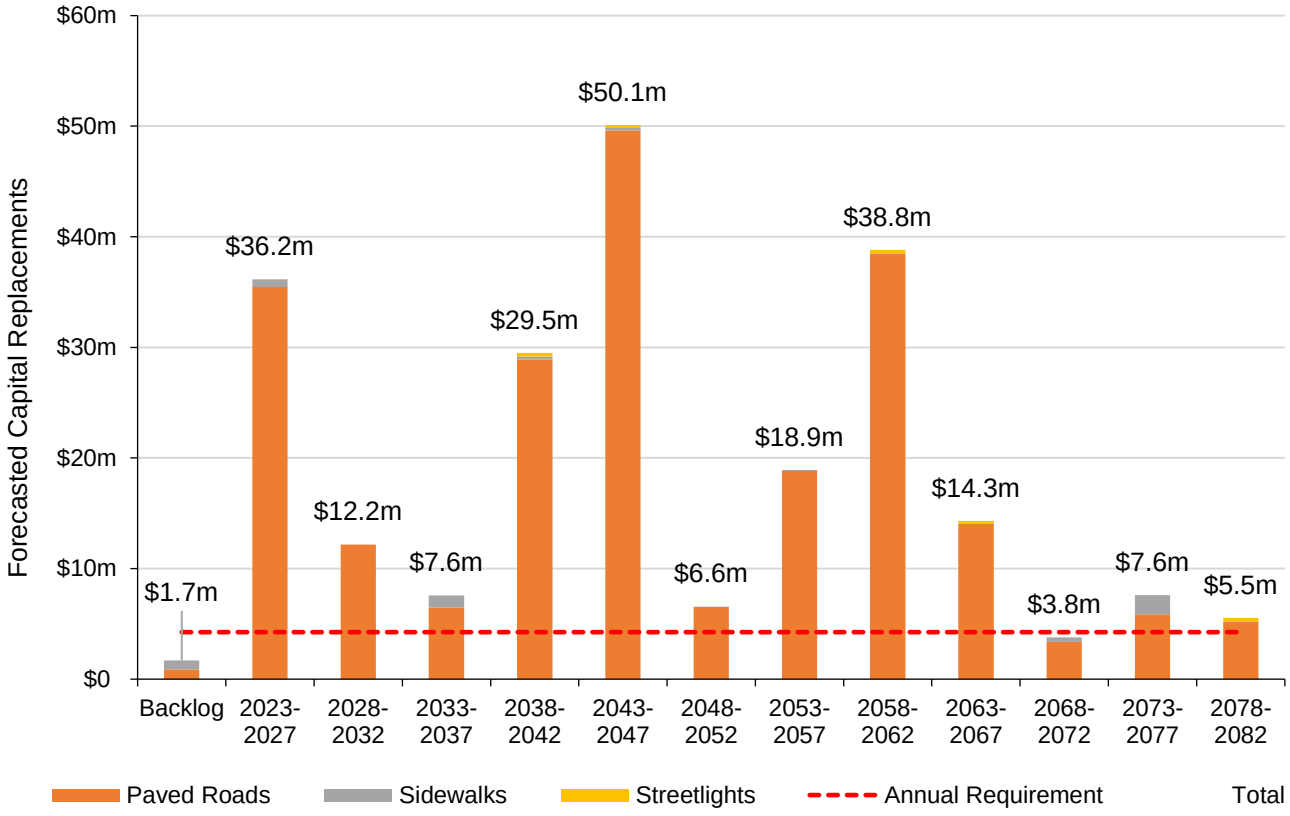


Semi-Urban Roads		
Event Name	**Event Class**	**Event Trigger**
Patching	Maintenance	6.5 Condition
Pad & Pave	Rehabilitation	2 Condition
Pad & Pave II	Rehabilitation	2 Condition
Full Reconstruction	Replacement	0 Condition



Forecasted Capital Requirements

The following graph forecasts long-term capital requirements. The annual capital requirement represents the average amount per year that the Municipality should allocate towards funding rehabilitation and replacement needs. The graph identifies capital requirements over the next 60 years. This projection is used as it ensures that every asset has gone through one full iteration of replacement.

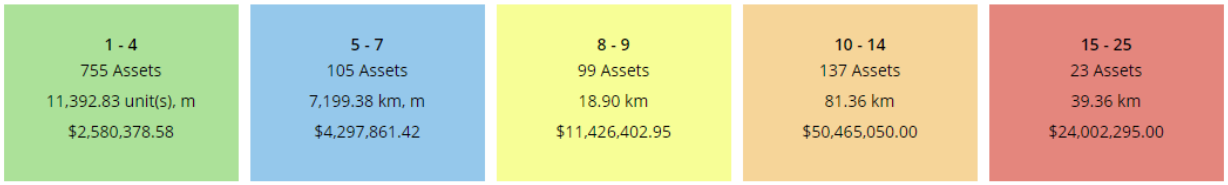


The projected cost of lifecycle activities that will need to be undertaken over the next 10 years to maintain the current level of service can be found in Appendix A.

4.1.5 Risk & Criticality

Risk Matrix

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 2022 inventory data.



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

The asset-specific attributes that municipal staff utilize to define and prioritize the criticality of the road network are documented below:

Probability of Failure (POF)	Consequence of Failure (COF)
Condition	Replacement Cost (Economic)
Service Life Remaining (%)	Road Type (Social)
	AADT (Health and Safety)

The identification of critical assets allows the Municipality to determine appropriate risk mitigation strategies and treatment options. Risk mitigation may include asset-specific lifecycle strategies, and condition assessment strategies.

Risks to Current Asset Management Strategies

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

Aging Infrastructure
Many road assets in the Municipality of Bluewater are nearing the end of their useful lives. Staff estimate that around 45% of paved roads are nearing the end of their useful lives.

Climate Change
An increase in the frequency and intensity of precipitation events can result in flooding of sections of the road network. The drainage capacity of the road network is not sufficient to withstand heavy water flow, particularly on gravel roads. Further issues can arise due to flooding and poor drainage including accelerated deterioration caused by freeze/thaw cycles. To improve asset resiliency, Staff should identify problem areas and improve drainage through enhanced lifecycle strategies.

Infrastructure Re-Investment
The current level of financial reinvestment is not adequate to address lifecycle requirements and maintain a good state of repair. The financial strategy in this report addresses the extent of this underfunding.

4.1.6 Levels of Service

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

Community Levels of Service

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

Service Attribute	Qualitative Description	Current LOS (2022)
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 condition	The Municipality completed a Road Management Study in 2019 in coordination with B.M Ross and Associates Ltd. Every road section received a surface condition rating (1-10), adhering to the MTO's guidelines for assessing road section conditions. (1-5) Road surface exhibits moderate to significant deterioration and generally requires renewal or full replacement within 1-5 years (6-10) Road surface is in good condition or has been recently re-surfaced. Renewal or reconstruction is generally not required for 6-10+ years

Technical Levels of Service

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

Service Attribute	Technical Metric	Current LOS (2022)
Scope	Lane-km of arterial roads (MMS classes 1 and 2) per land area (km/km^2)	N/A
	Lane-km of collector roads (MMS classes 3 and 4) per land area (km/km^2)	1.054
	Lane-km of local roads (MMS classes 5 and 6) per land area (km/km^2)	0.694
Quality	Average pavement condition index for paved roads in the Municipality	60

Service Attribute	Technical Metric	Current LOS (2022)
	Average surface condition for unpaved roads in the Municipality (e.g. excellent, good, fair, poor)	Fair
Performance	Capital reinvestment rate	0.7%

4.1.7 Recommendations

Asset Inventory

- It is highly recommended that the Municipality invest in obtaining software, which serves as a central repository for its assets. Currently, the Municipality does not have a centralized asset register, making proactive asset management difficult.
- The Municipality should begin taking steps to bring in all asset inventory data, for the 2025 compliant AMP. For example, the Municipality owns several signs, which have not been integrated into this AMP, due to a lack of data.

Condition Assessment Strategies

- As scheduled condition assessments are conducted, the Municipality should allocate resources to updating and maintaining its asset data, as condition assessments are completed

Lifecycle Management Strategies

- Implement and continuously refine the identified lifecycle management strategies for paved roads to realize potential cost avoidance and maintain a high quality of road pavement condition.
- Evaluate the efficacy of the Municipality’s lifecycle management strategies at regular intervals to determine the impact cost, condition, and risk. This could be done by updating the condition assessment data whenever new data becomes available and rerunning the capital projections and risk reports.

Risk Management Strategies

- Implement risk-based decision-making as part of asset management planning and budgeting processes. This should include the regular review of high-risk assets to determine appropriate risk mitigation strategies.

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

Levels of Service

- Continue to measure current levels of service in accordance with the metrics identified in O. Reg. 588/17 and those metrics that the Municipality believes to provide meaningful and reliable inputs into asset management planning.
- Work towards identifying proposed levels of service as per O. Reg. 588/17 and identify the strategies that are required to close any gaps between current and proposed levels of service.

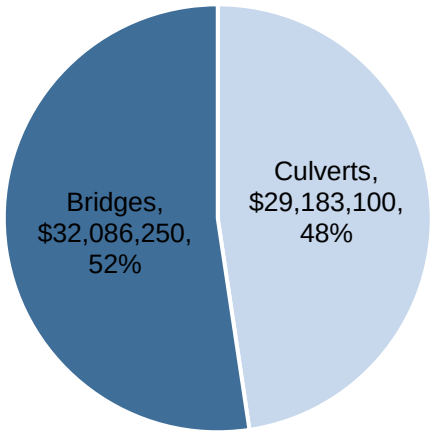
4.2 Bridges & Culverts

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

4.2.1 Asset Inventory & Replacement Costs

The table below includes the quantity, unit of measure, total replacement cost, and primary replacement cost method of each asset segment in the Municipality's bridges & culverts inventory.

Segment	Quantity	Unit of Measure	Replacement Cost	Primary RC Method
Bridges	16	Assets	$32,086,000	User-defined
Culverts	62	Assets	$29,183,000	User-defined

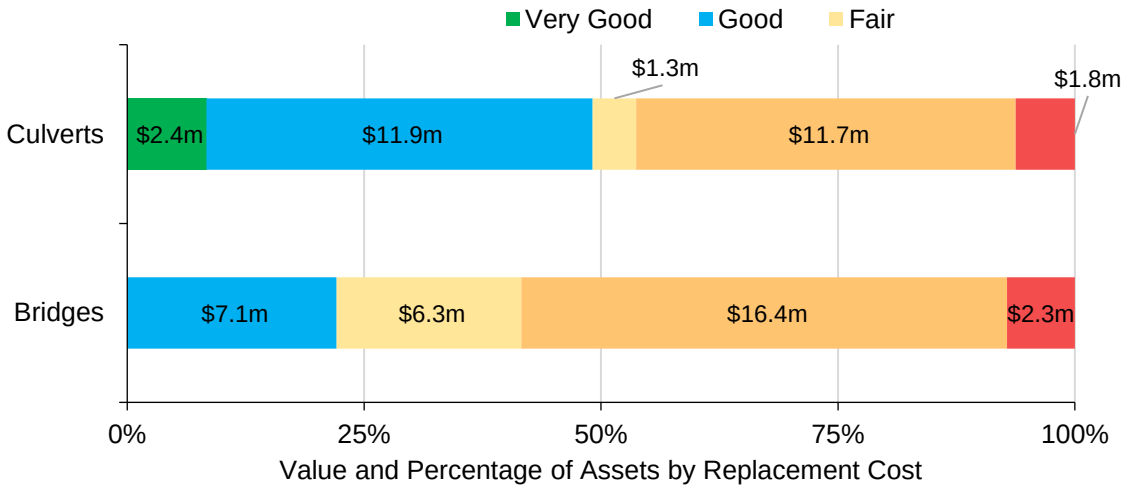


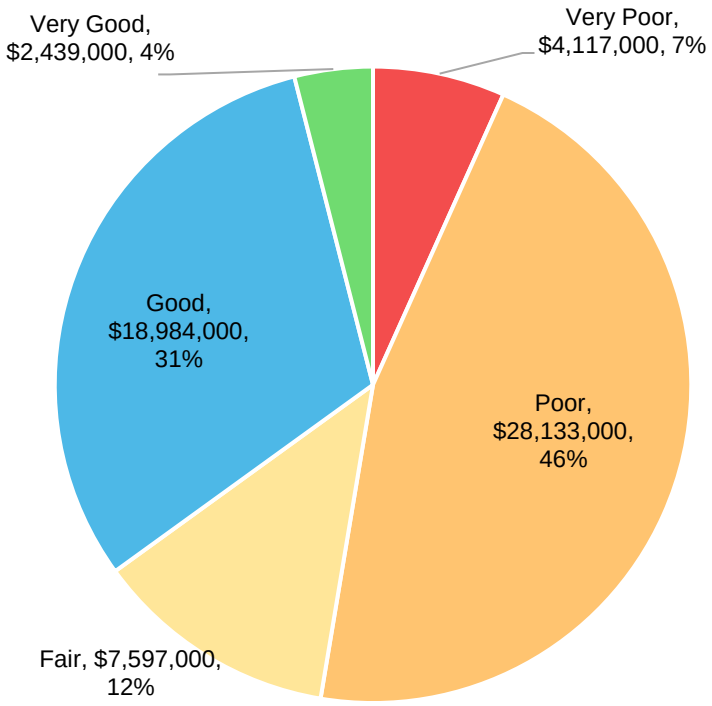
Total Current Replacement Cost: $61,269,350

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

4.2.2 Asset Condition

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





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

rehabilitation, and replacement activities is required to increase the overall condition of the bridges and culverts.

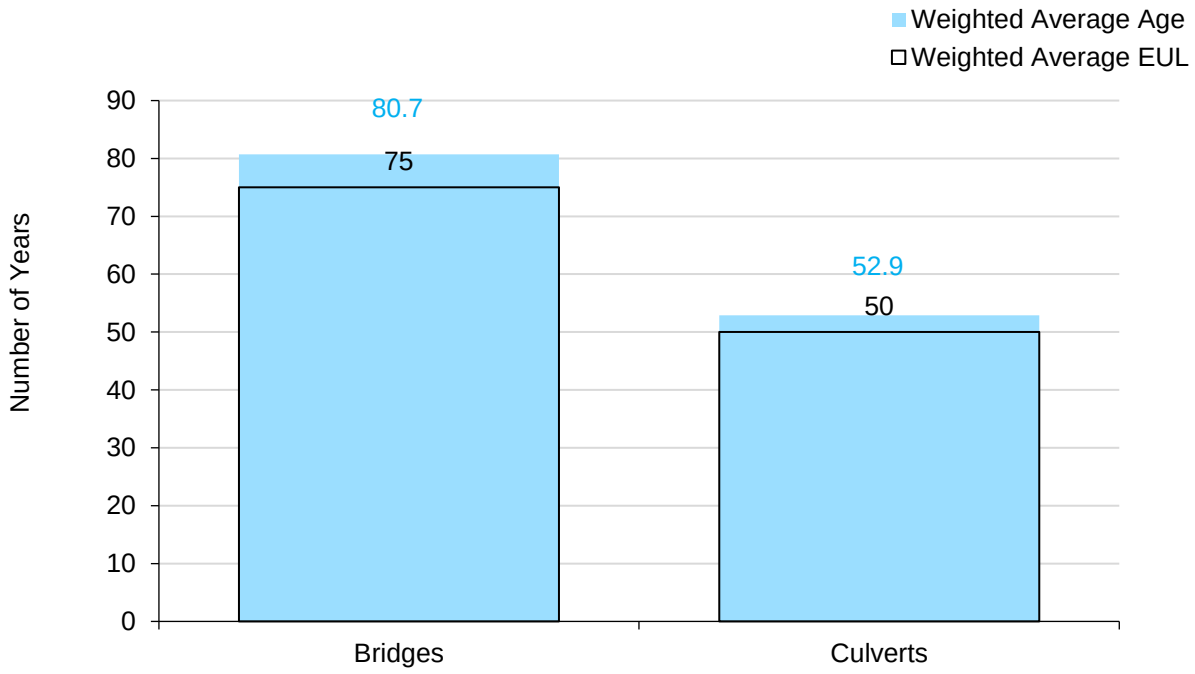
Current Approach to Condition Assessment

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

- Condition assessments of all culverts with a span greater than or equal to 3 meters are completed every 2 years in accordance with the Ontario Structure Inspection Manual (OSIM). OSIM reports are completed by external consultants.
- Condition data plays a crucial role in budget allocation, allowing the Municipality to prioritize projects based on asset condition and critical needs.

4.2.3 Estimated Useful Life & Average Age

The Estimated Useful Life for bridge & culvert assets has been assigned according to a combination of established industry standards and staff knowledge. The Average Age of each asset is based on the number of years each asset has been in-service. Assessed condition may increase or decrease the average service life remaining.



Each asset's Estimated Useful Life should 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.

4.2.4 Lifecycle Management Strategy

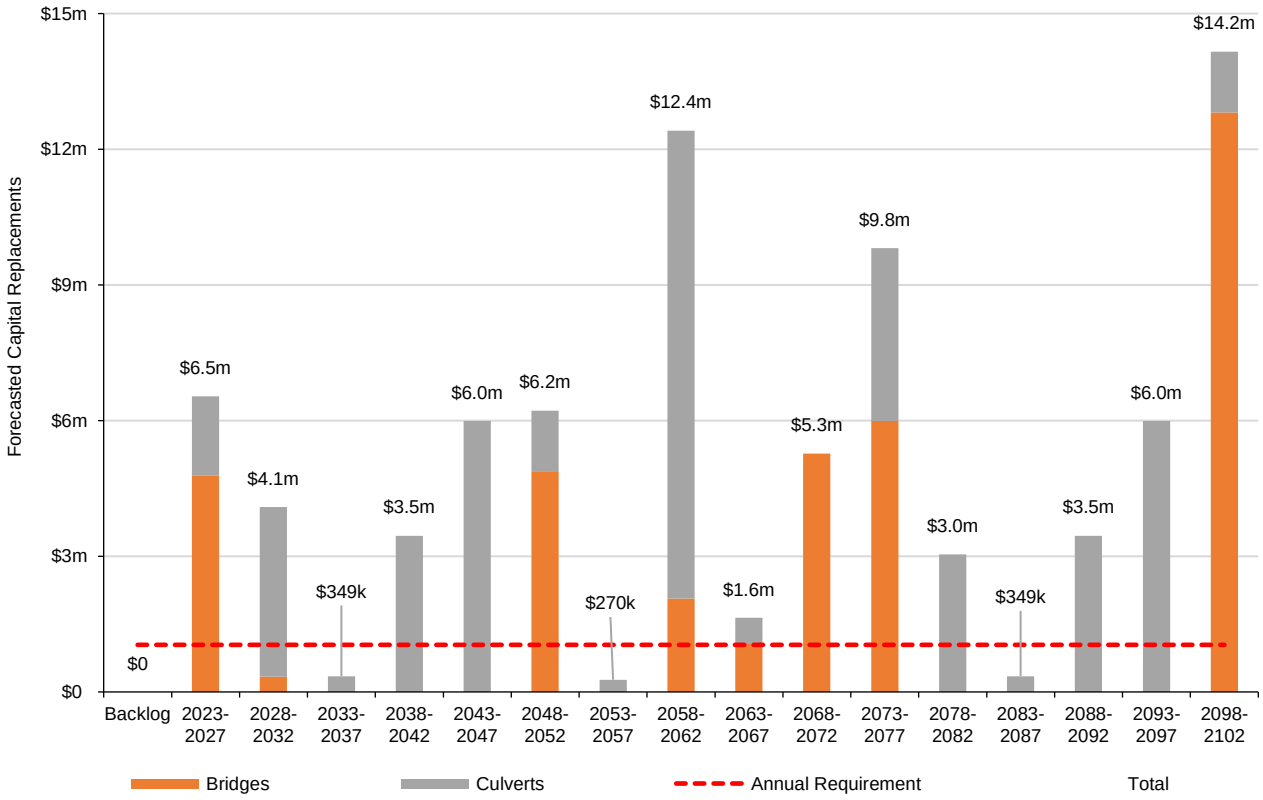
The condition or performance of most assets will deteriorate over time. To ensure that municipal assets are performing as expected and meeting the needs of customers, it is important to establish a lifecycle management strategy to proactively manage asset deterioration.

The following table outlines the Municipality's current lifecycle management strategy.

Activity Type	Description of Current Strategy
Maintenance, Rehabilitation and Replacement	All lifecycle activities are driven by the results of mandated structural inspections competed according to the Ontario Structure Inspection Manual (OSIM).
	Maintenance activities for bridges include cleaning, minor repairs, and vegetation management. When identified through OSIM inspections or regular patrols, these maintenance tasks are promptly addressed to ensure structural integrity.
	Recent rehabilitation efforts for bridges have focused on activities such as deck repair and erosion protection. Rehabilitation programs are typically initiated based on the results of OSIM inspections to address identified issues and maintain operational standards. Asset replacement decisions are guided by criteria outlined in OSIM inspection reports. Each bridge is assigned a priority score based on its Bridge Condition Index (BCI) and risk assessment, helping to determine the replacement frequency. Replacement priorities are aligned with OSIM recommendations and consider the impact on the overall road network infrastructure.

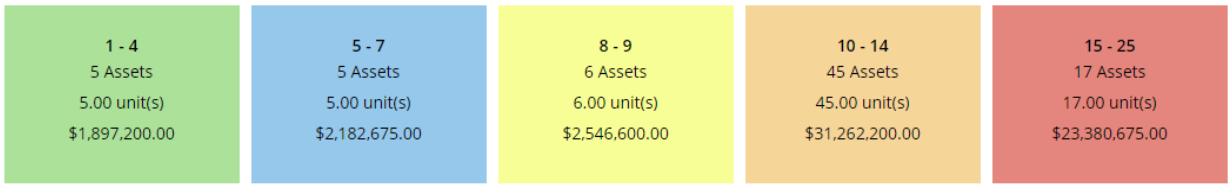
Forecasted Capital Requirements

The following graph forecasts long-term capital requirements. The annual capital requirement represents the average amount per year that the Municipality should allocate towards funding rehabilitation and replacement needs. The graph identifies capital requirements over the next 80 years. This projection is used as it ensures that every asset has gone through one full iteration of replacement.
The projected cost of lifecycle activities that will need to be undertaken over the next 10 years to maintain the current level of service can be found in Appendix A.



4.2.5 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 2022 inventory data.



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

The asset-specific attributes that municipal staff utilize to define and prioritize the criticality of bridges and culverts are documented below:

Probability of Failure (POF)	Consequence of Failure (COF)
Condition	Replacement Cost (Economic)
Service Life Remaining (%)	Span/Diameter (Economic)

The identification of critical assets allows the Municipality to determine appropriate risk mitigation strategies and treatment options. Risk mitigation may include asset-specific lifecycle strategies, and condition assessment strategies.

4.2.6 Levels of Service

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

Community Levels of Service

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

Service Attribute	Qualitative Description	Current LOS (2022)
Scope	Description of the traffic that is supported by municipal bridges (e.g. heavy transport fleet, motor fleet, emergency fleet, pedestrians, cyclists, and farm equipment)	Bridges & structural culverts are a key component of the municipal transportation network. The majority of bridges and structural culverts have no load or dimensional restrictions, with the exception of 2 structures (B-21 & B-40) having restrictions. Traffic that is supported by municipal bridges &structural culverts includes heavy transport fleet, motor fleet, emergency fleet, pedestrians and cyclists. Refer to appendix B for a map of all structures owned and managed by the Municipality.
Quality	Description or images of the condition of culverts and how this would affect use of the culverts	Every structure is given a condition rating from 0-100. Excellent: 90-100 Good: 70-89 Fair: 40-69 Poor: <40

Technical Levels of Service

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

Service Attribute	Technical Metric	Current LOS (2022)
Scope	% of bridges in the Municipality with loading or dimensional restrictions	5.9%[4]
Quality	Average bridge condition index value for bridges in the Municipality	62
	Average bridge condition index value for structural culverts in the Municipality	56
Performance	Capital reinvestment rate	0.6%

4.2.7 Recommendations

Asset Inventory

- It is highly recommended that the Municipality invest in obtaining software, which serves as a central repository for its assets. Currently, the Municipality does not have a centralized asset register, making proactive asset management difficult.
- Continue to review and validate inventory data, assessed condition data and replacement costs for all assets upon the completion of OSIM inspections every 2 years.

Risk Management Strategies

- Implement risk-based decision-making as part of asset management planning and budgeting processes. This should include the regular review of high-risk assets to determine appropriate risk mitigation strategies.
- Review risk models on a regular basis and adjust according to an evolving understanding of the probability and consequences of asset failure.

[4] Currently, structures B-21 & B-40 have loading restrictions. This calculation is replacement cost weighted.

Lifecycle Management Strategies

- This AMP only includes capital costs associated with the reconstruction of culverts. The Municipality should work towards identifying projected capital rehabilitation and renewal costs for culverts and integrating these costs into long-term planning.

Levels of Service

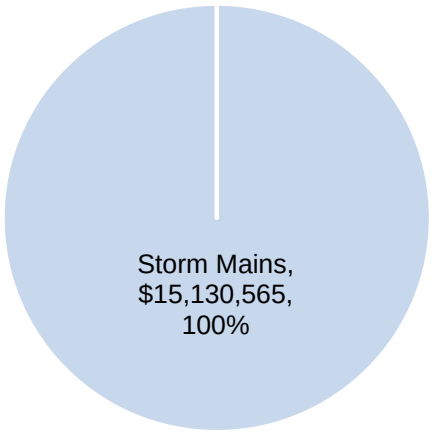
- Continue to measure current levels of service in accordance with the metrics identified in O. Reg. 588/17 and those metrics that the Municipality believe to provide meaningful and reliable inputs into asset management planning.
- Work towards identifying proposed levels of service as per O. Reg. 588/17 and identify the strategies that are required to close any gaps between current and proposed levels of service.

4.3 Storm Network

4.3.1 Asset Inventory & Replacement Cost

The table below includes the quantity, unit of measure, total replacement cost, and primary replacement cost method of each asset segment in the Municipality's storm network inventory.

Segment	Quantity	Unit of Measure	Replacement Cost	Primary RC Method
Storm Mains	26,876	Meters	$15,131,000	Cost per unit

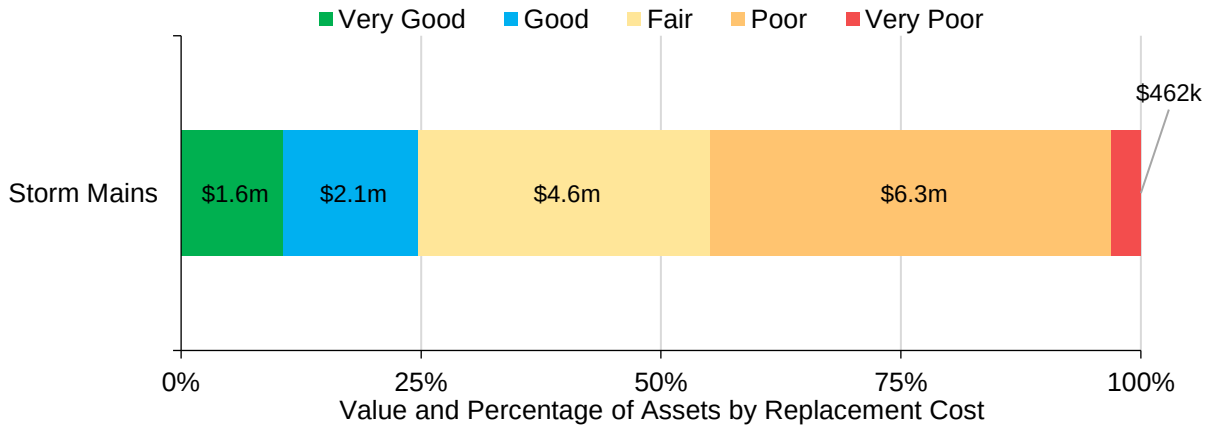


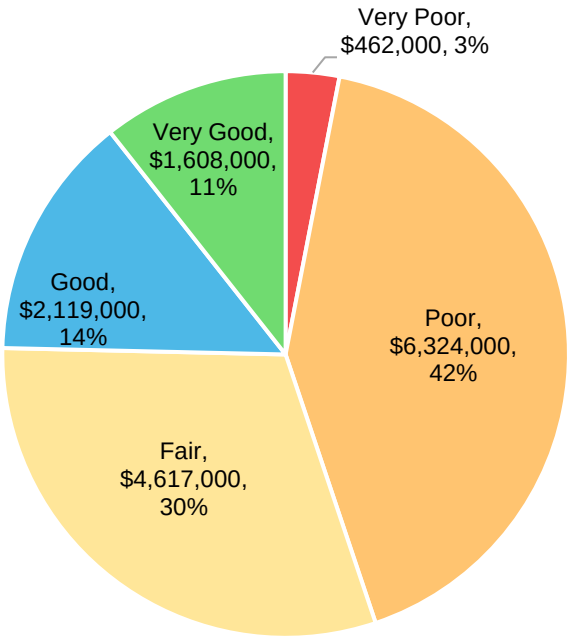
Total Current Replacement Cost: $15,130,565

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

4.3.2 Asset Condition

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





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

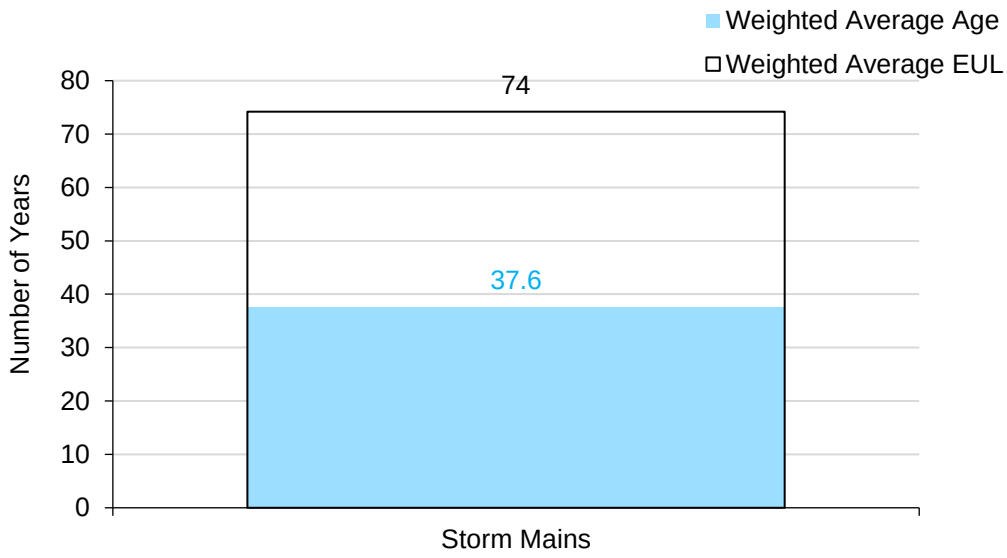
Current Approach to Condition Assessment

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

- Internal inspections are performed where feasible, such as for catch basins and stormwater management ponds, while underground infrastructure is inspected by external contractors. Assessments primarily rely on visual inspection methods.
- Stormwater infrastructure, including SWM ponds and catch basins, undergo annual inspections as per the municipality's CLI ECA.

4.3.3 Estimated Useful Life & Average Age

The Estimated Useful Life for storm network assets has been assigned according to a combination of established industry standards and staff knowledge. The Average Age of each asset is based on the number of years each asset has been in-service. Assessed condition may increase or decrease the average service life remaining.



Each asset's Estimated Useful Life should 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.

4.3.4 Lifecycle Management Strategy

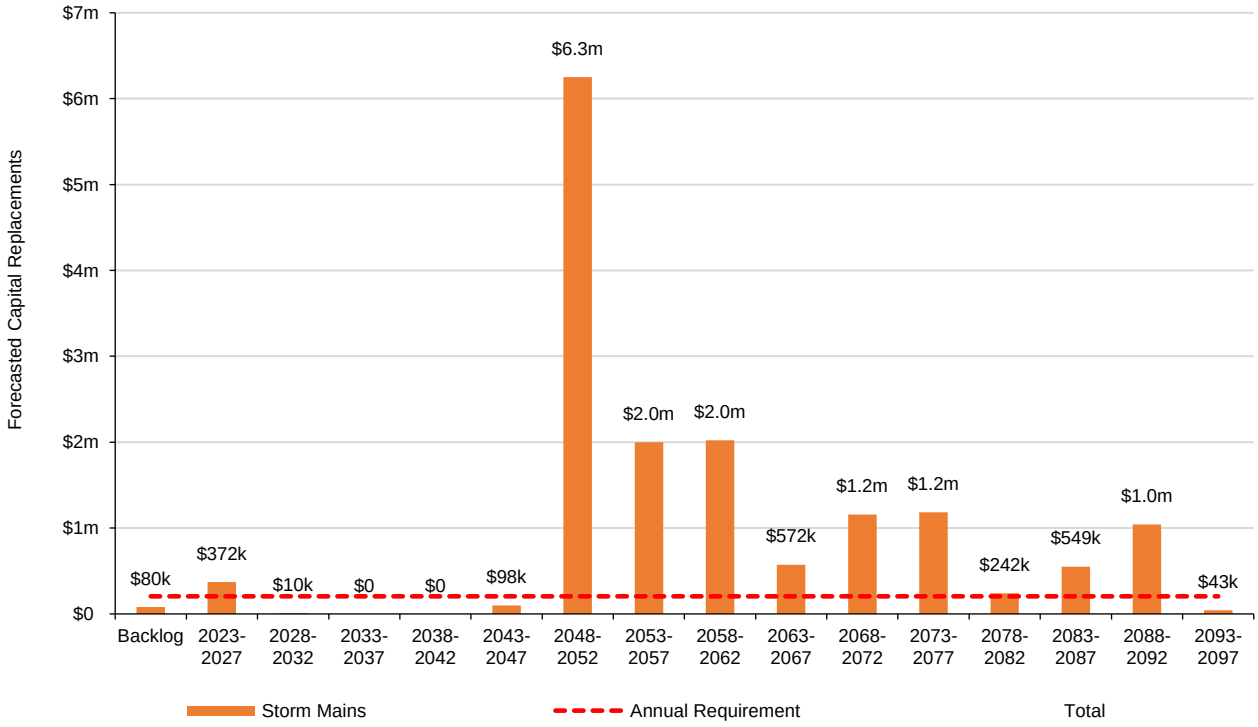
The condition or performance of most assets will deteriorate over time. To ensure that municipal assets are performing as expected and meeting the needs of customers, it is important to establish a lifecycle management strategy to proactively manage asset deterioration.

The following table outlines the Municipality's current lifecycle management strategy.

Activity Type	Description of Current Strategy
Maintenance/ Rehabilitation	Maintenance activities for the storm network encompass inspections, cleanouts, minor repairs, vegetation management, and ditching. These activities are largely reactive, triggered by issues identified during inspections or reported concerns from the public. Certain tasks, such as annual catch basin cleanouts, are performed on a scheduled basis to maintain operational efficiency.
	There are no rehabilitation activity cycles in place.
Replacement	Assets nearing their expected service life or requiring frequent and costly repairs are prioritized for replacement. Additionally, asset replacement may be coordinated proactively as part of street reconstruction projects, where the overall infrastructure lifecycle assists in determining optimal replacement schedules.

Forecasted Capital Requirements

The following graph forecasts long-term capital requirements. The annual capital requirement represents the average amount per year that the Municipality should allocate towards funding rehabilitation and replacement needs. The 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.

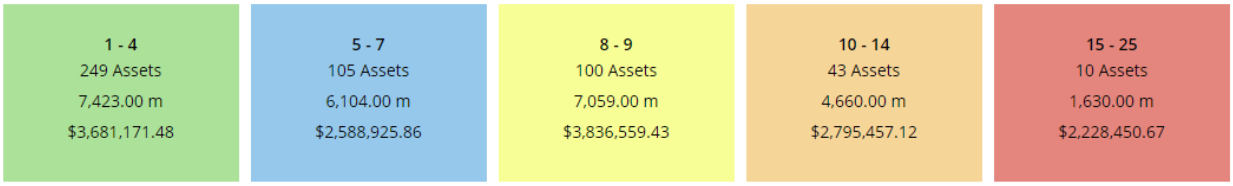


The projected cost of lifecycle activities that will need to be undertaken over the next 10 years to maintain the current level of service can be found in Appendix A.

4.3.5 Risk & Criticality

Risk Matrix

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 2022 inventory data.



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

The asset-specific attributes that municipal staff utilize to define and prioritize the criticality of the storm network are documented below:

Probability of Failure (POF)	Consequence of Failure (COF)
Condition	Replacement Cost (Economic)
Service Life Remaining (%)	Diameter (Social)

The identification of critical assets allows the Municipality to determine appropriate risk mitigation strategies and treatment options. Risk mitigation may include asset-specific lifecycle strategies, and condition assessment strategies.

Risks to Current Asset Management Strategies

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

Asset Data Confidence
There is a lack of confidence in the available inventory data, particularly due to unknown installation dates. To address the challenge of unknown installation dates for certain assets, the municipality should prioritize conducting detailed condition assessments and consulting historical records where possible. This proactive approach will support informed decision-making regarding maintenance, replacement, and overall asset management strategies.

Infrastructure Design & Climate Change
Climate change poses a significant risk to the storm system infrastructure, as older assets may not be designed to withstand more frequent and intense 5-year storm events. This mismatch between infrastructure capacity and climate-induced demands increases the likelihood of flooding, drainage issues, and potential damage to property and public safety.

4.3.6 Levels of Service

The following tables identify the Municipality's current level of service for the storm network. These metrics include the technical and community level of service metrics that the Municipality has selected for this AMP.

Community Levels of Service

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

Service Attribute	Qualitative Description	Current LOS (2022)
Scope	Description, which may include maps, of the user groups or areas of the municipality that are protected from flooding, including the extent of protection provided by the municipal stormwater system	See Appendix B

Technical Levels of Service

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

Service Attribute	Technical Metric	Current LOS (2022)
Scope	% of properties in municipality resilient to a 100-year storm	0[5]
	% of the municipal stormwater management system resilient to a 5-year storm	TBD[6]
Performance	Capital reinvestment rate	0%

4.3.7 Recommendations

Asset Inventory

- It is highly recommended that the Municipality invest in obtaining software, which serves as a central repository for its assets. Currently, the Municipality does not have a centralized asset register, making proactive asset management difficult.
- Currently, the Municipality's storm assets are pooled. It is recommended that the Municipality allocate resources to componentize its storm assets (catch basins, manholes, headwalls, etc.). As these different assets have varying replacement costs, estimate useful lives, and other requirements, asset management best practices dictate that to have accurate capital projections, the Municipality should have greater asset granularity with its storm network infrastructure.

Condition Assessment Strategies

- The development of a comprehensive inventory should be accompanied by a system-wide assessment of the condition of all assets in the storm network through CCTV inspections.

[5] The Municipality does not currently have data available to determine this technical metric. The rate of properties that are expected to be resilient to a 100-year storm is expected to be low

[6] The Municipality does not currently have data available to determine this technical metric. The percentage of the stormwater system resilient to a 5-year storm is expected to be high

Risk Management Strategies

- Implement risk-based decision-making as part of asset management planning and budgeting processes. This should include the regular review of high-risk assets to determine appropriate risk mitigation strategies.
- Review risk models on a regular basis and adjust according to an evolving understanding of the probability and consequences of asset failure.

Levels of Service

- Continue measuring current levels of service in accordance with the metrics that the Municipality has established in this AMP. Additional metrics can be established as they are determined to provide meaningful and reliable inputs into asset management planning.
- Work towards identifying proposed levels of service as per O. Reg. 588/17 and identify the strategies that are required to close any gaps between current and proposed levels of service.

4.4 Facilities

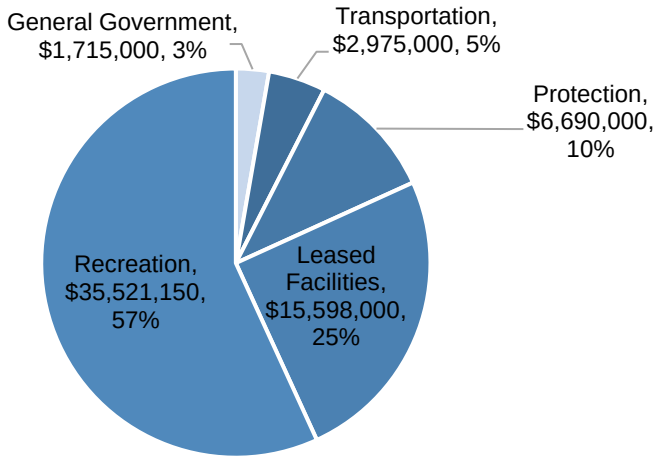
The Municipality of Bluewater owns and maintains several facilities that provide key services to the community. These include:

- General government facilities
- Fire halls
- Culture and recreational facilities
- Public works depots and storage

4.4.1 Asset Inventory & Replacement Costs

The table below includes the quantity, unit of measure, total replacement cost, and primary replacement cost method of each asset segment in the Municipality's facilities inventory.

Segment	Quantity	Unit of Measure	Replacement Cost	Primary RC Method
General Government	3	Assets	$1,715,000	User-defined
Leased Facilities[7]	10	Assets	$15,598,000	User-defined
Protection	4	Assets	$6,690,000	User-defined
Recreation	10	Assets	$35,521,000	User-defined
Transportation	3	Assets	$2,975,000	User-defined



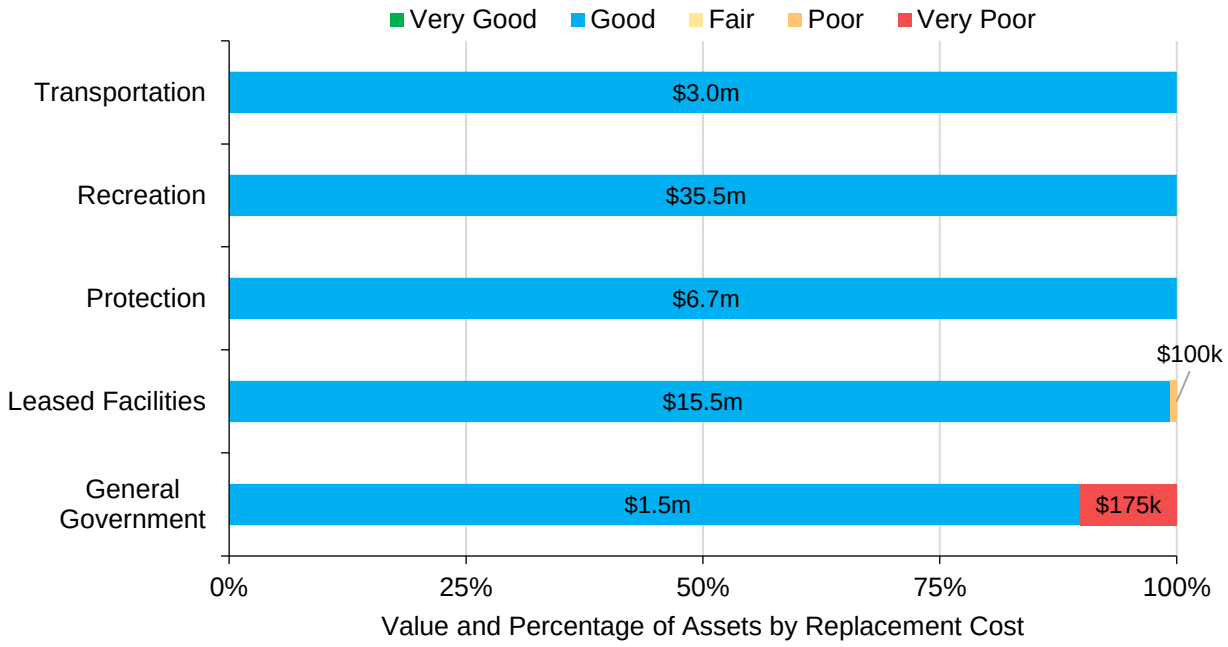
Total Current Replacement Cost: $62,499,150

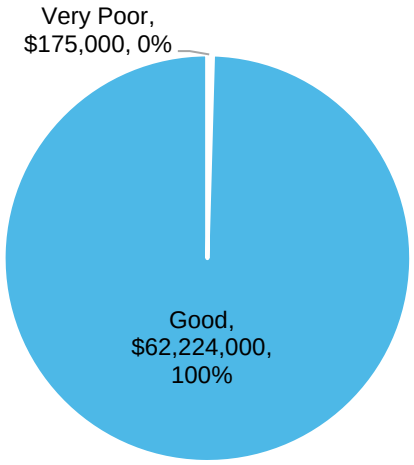
[7] The Municipality has numerous lease agreements in place for various facilities. These facilities have a combined cost of $15,598,000, which accounts for 25% of the total replacement cost.

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

4.4.2 Asset Condition

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





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

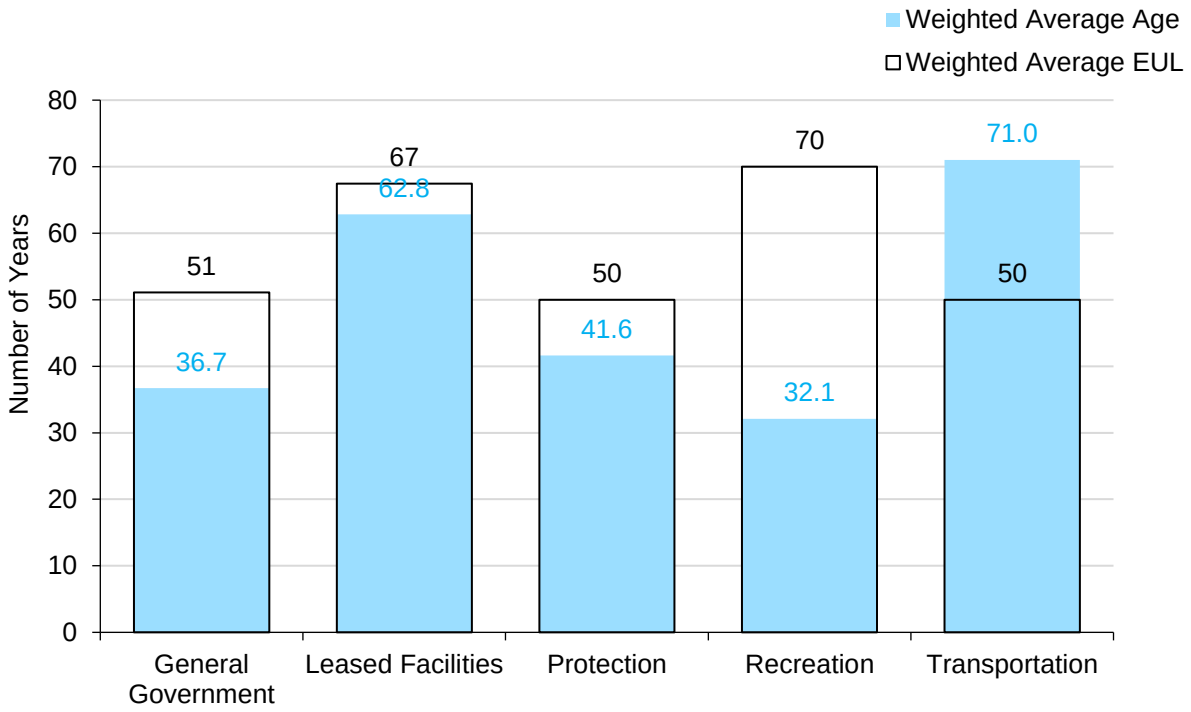
Current Approach to Condition Assessment

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

- All facilities received formal building condition assessments by Walter Fedy, in 2022, and utilized a facility condition index score (FCI).
- Daily inspections are conducted by internal staff using specific checklists are conducted for facilities where staff work. Internal staff utilize an arena checklist to assess buildings.

4.4.3 Estimated Useful Life & Average Age

The Estimated Useful Life for facility assets has been assigned according to a combination of established industry standards and staff knowledge. The Average Age of each asset is based on the number of years each asset has been in-service. Assessed condition may increase or decrease the average service life remaining.



Each asset's Estimated Useful Life should 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.

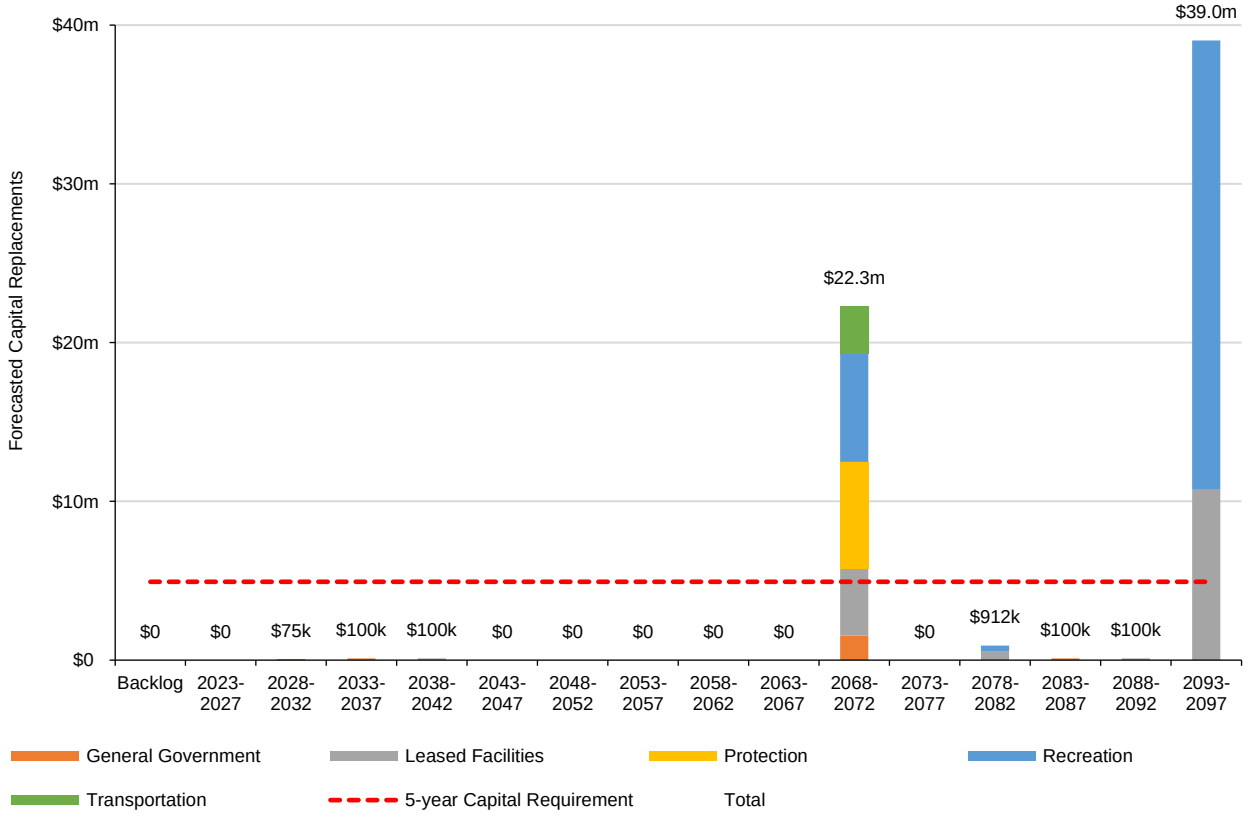
4.4.4 Lifecycle Management Strategy

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 table outlines the Municipality's current lifecycle management strategy.

Activity Type	Description of Current Strategy
Maintenance / Rehabilitation	Maintenance activities for buildings include HVAC systems, fire safety equipment, refrigeration needs, boilers, water heaters, and general upkeep. Routine maintenance is performed weekly for buildings where municipal staff work.
	Maintenance is initiated by identifying staff-reported issues, including safety or structural concerns, and promptly addressing public concerns.
	Rehabilitation efforts include replacements of roofs, windows, doors, etc., as needed based on lifecycle considerations or unexpected requirements arising from condition assessments.
Replacement	Decisions regarding building replacements hinge on factors such as cost, ongoing maintenance needs, and budget approval. The usage of the building also plays a pivotal role, with priority given to facilities that are crucial to the community and those with high utilization rates. This ensures that resources are allocated effectively to maintain essential community infrastructure.

Forecasted Capital Requirements

The following graph forecasts long-term capital requirements. The annual capital requirement represents the average amount per year that the Municipality should allocate towards funding rehabilitation and replacement needs. The 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.

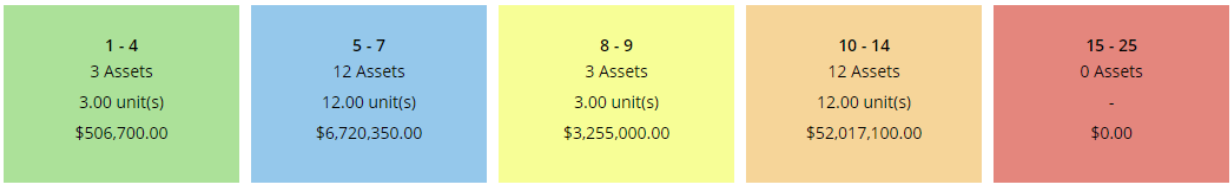


The projected cost of lifecycle activities that will need to be undertaken over the next 10 years to maintain the current level of service can be found in Appendix A.

4.4.5 Risk & Criticality

Risk Matrix

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 2022 inventory data.



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

The asset-specific attributes that municipal staff utilize to define and prioritize the criticality of facilities are documented below:

Probability of Failure (POF)	Consequence of Failure (COF)
Condition	Replacement Cost (Economic)
Service Life Remaining (%)	

The identification of critical assets allows the Municipality to determine appropriate risk mitigation strategies and treatment options. Risk mitigation may include asset-specific lifecycle strategies, and condition assessment strategies.

Risks to Current Asset Management Strategies

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

Capital Funding Strategies
Major capital rehabilitation projects for municipal buildings are entirely dependant on the availability of grant funding opportunities. When grants are not available, building rehabilitation projects may be deferred. An annual capital funding strategy can reduce dependency on grant funding and help prevent deferral of capital works.

Regulatory Compliance
Regulatory requirements are established to ensure the safety, efficiency, and compliance of municipal facilities with legal standards and best practices. Staff find it a continuous challenge to keep up with regulatory requirements for its municipal buildings due to budget challenges. To mitigate this risk, staff plan to prioritize efforts to enhance compliance with regulatory standards applicable to municipal buildings.

4.4.6 Levels of Service

The following tables identify the Municipality's current level of service for the facilities. These metrics include the technical and community level of service metrics that the Municipality has selected for this AMP.

Community Levels of Service

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

Service Attribute	Qualitative Description	Current LOS (2022)
Scope	Description of the types of facility assets that the Municipality operates and maintains	Refer to section 4.4.1
Quality	Description of criteria for rehabilitation and replacement decisions and any related long-term forecasts	Refer to section 4.4.4

Technical Levels of Service

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

Service Attribute	Technical Metric	Current LOS (2022)
Scope	Average Condition Rating (FCI)	0.704 (Good)

	Average Risk Rating	10.16[8]
Performance	Capital reinvestment Rate	0.9%

4.4.7 Recommendations

Asset Inventory

- The Municipality should update its condition scores on a scheduled basis. The building condition assessments which were completed in 2022 have projected FCI scores for 2027 – the Municipality, at a minimum, should integrate these projected scores in the coming years, within its asset register.

Condition Assessment Strategies

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

Risk Management Strategies

- Implement risk-based decision-making as part of asset management planning and budgeting processes. This should include the regular review of high-risk assets to determine appropriate risk mitigation strategies.
- Review risk models on a regular basis and adjust according to an evolving understanding of the probability and consequences of asset failure.

Levels of Service

- Continue measuring current levels of service in accordance with the metrics that the Municipality has established in this AMP. Additional metrics can be established as they are determined to provide meaningful and reliable inputs into asset management planning.
- Work towards identifying proposed levels of service as per O. Reg. 588/17 and identify the strategies that are required to close any gaps between current and proposed levels of service.

[8] Refer to section 4.4.5

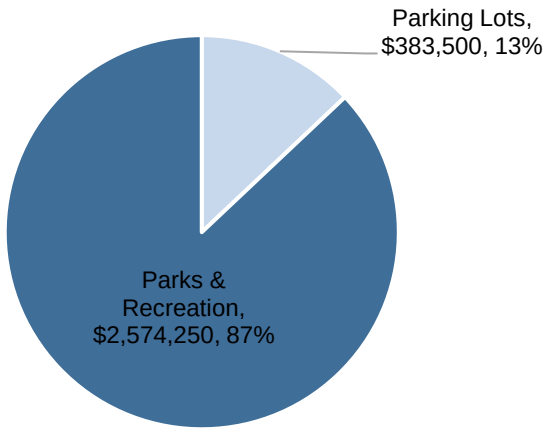
4.5 Land Improvements

The Municipality of Bluewater owns various land improvement assets including parking lots, playground equipment, outdoor lighting, splash pads, along with other parks and recreational equipment.

4.5.1 Asset Inventory & Replacement Costs

The table below includes the quantity, unit of measure, total replacement cost, and primary replacement cost method of each asset segment in the Municipality's land improvements inventory.

Segment	Quantity	Unit of Measure	Replacement Cost	Primary RC Method
Parking Lots	5	Assets	$384,000	User-defined
Parks & Recreation	26	Assets	$2,574,000	User-defined

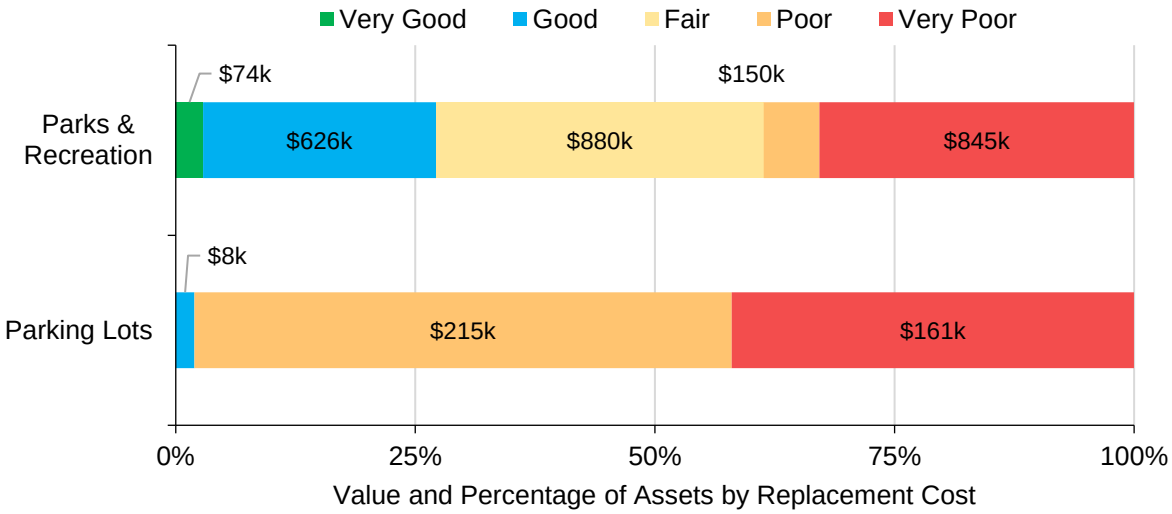


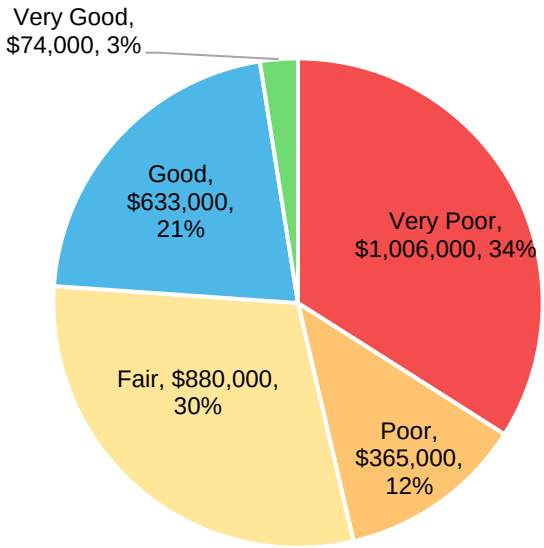
Total Current Replacement Cost: $2,957,750

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

4.5.2 Asset Condition

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





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

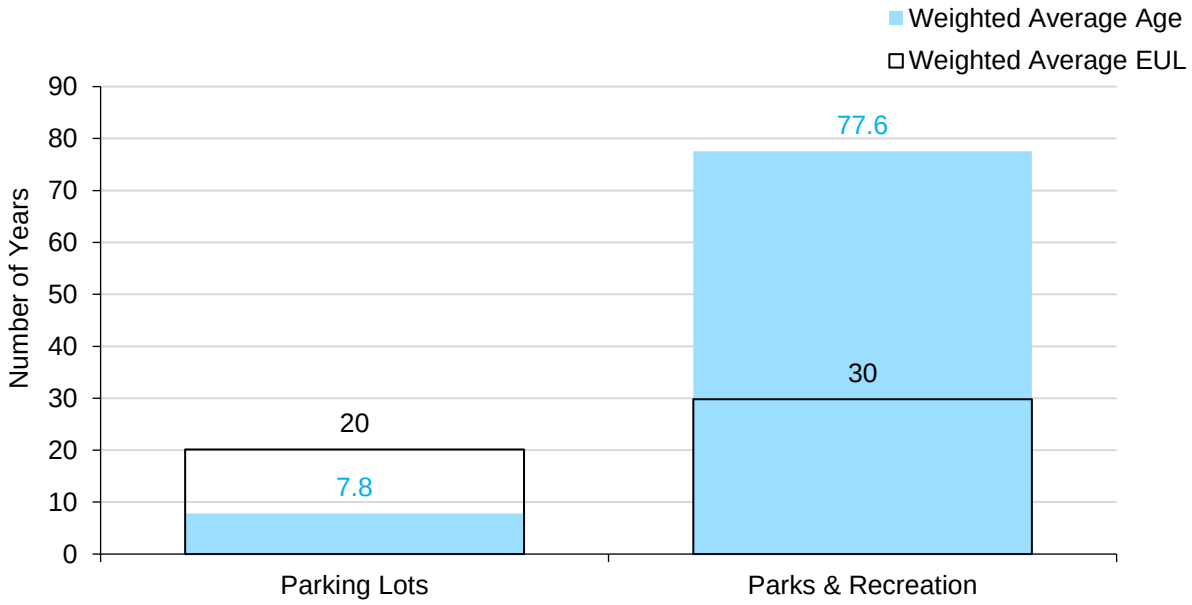
Current Approach to Condition Assessment

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

- Regular inspections are carried out according to Canadian Standards Association (CSA) guidelines.
- Currently, there is no formal ongoing assessment program in place for other asset within the land improvements asset category.
- The most recent assessment of land improvements and parks in Bluewater was conducted as part of the Parks and Recreation Master Plan, completed in 2022, by Thinc Design.

4.5.3 Estimated Useful Life & Average Age

The Estimated Useful Life for land improvement assets has been assigned according to a combination of established industry standards and staff knowledge. The Average Age of each asset is based on the number of years each asset has been in-service. Assessed condition may increase or decrease the average service life remaining.



Each asset's Estimated Useful Life should 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.

4.5.4 Lifecycle Management Strategy

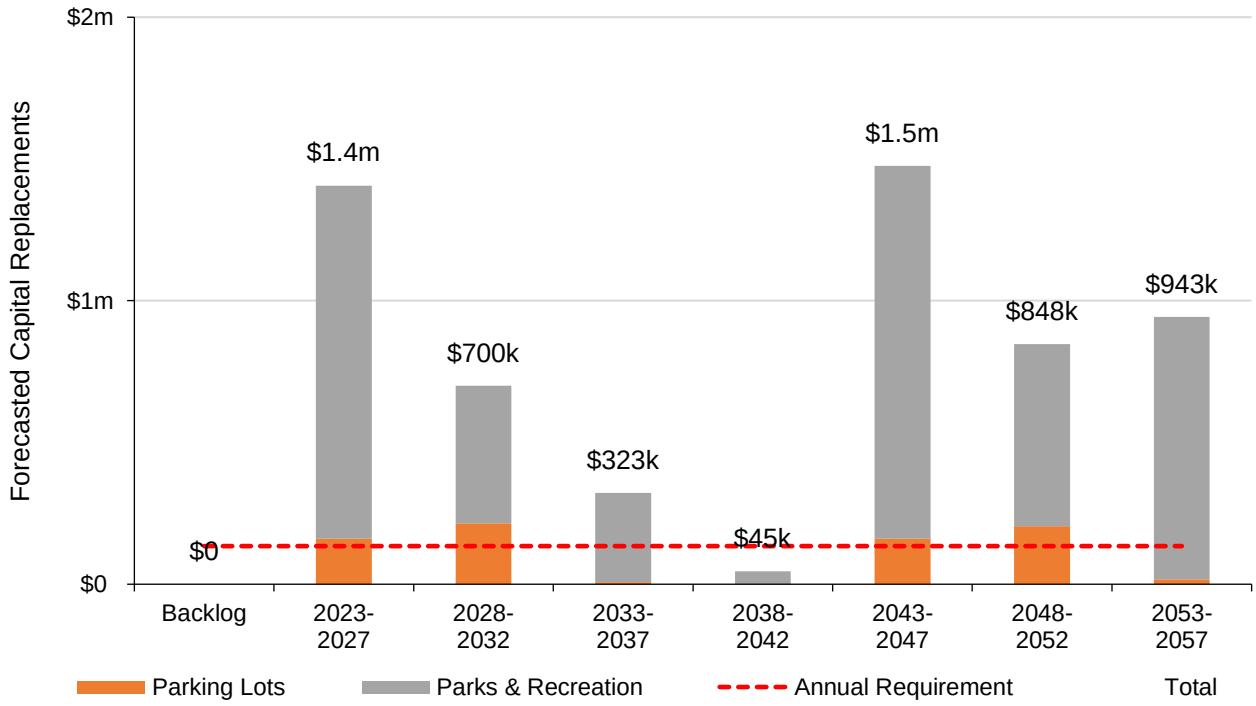
The condition or performance of most assets will deteriorate over time. To ensure that municipal assets are performing as expected and meeting the needs of customers, it is important to establish a lifecycle management strategy to proactively manage asset deterioration.

The following table outlines the Municipality's current lifecycle management strategy.

Activity Type	Description of Current Strategy
Maintenanace, Rehabilitation & Replacement	Maintenance activities for land improvement assets include grass cutting, tree trimming, arborist assessments for select trees, and professional landscaping services. Major park maintenance is performed seasonally by professional landscapers. Municipality staff conduct weekly maintenance activities across parks in the area.
	Rehabilitation projects involve professional landscaping services to enhance the aesthetic and functional aspects of the area. Safety concerns serve as the primary driver for initiating rehabilitation efforts.
	Assets with significant damage posing potential harm to the public are prioritized for replacement. This approach ensures that critical safety issues are promptly addressed, maintaining a safe environment for community use.

Forecasted Capital Requirements

The following graph forecasts long-term capital requirements. The annual capital requirement represents the average amount per year that the Municipality should allocate towards funding rehabilitation and replacement needs. The graph identifies capital requirements over the next 35 years. This projection is used as it ensures that every asset has gone through one full iteration of replacement.

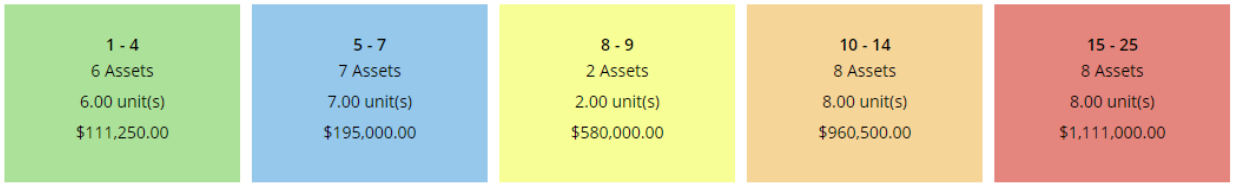


The projected cost of lifecycle activities that will need to be undertaken over the next 10 years to maintain the current level of service can be found in Appendix A.

4.5.5 Risk & Criticality

Risk Matrix

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 2022 inventory data.



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

The asset-specific attributes that municipal staff utilize to define and prioritize the criticality of land improvements are documented below:

Probability of Failure (POF)	Consequence of Failure (COF)
Condition	Replacement Cost (Economic)
Service Life Remaining (%)	

The identification of critical assets allows the Municipality to determine appropriate risk mitigation strategies and treatment options. Risk mitigation may include asset-specific lifecycle strategies, and condition assessment strategies.

Risks to Current Asset Management Strategies

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

Climate Change

Climate change and the rising frequency of extreme weather events has accelerated asset deterioration. Staff have noticed an increased frequency in damaged outdoor assets, requiring unexpected replacement. These events make long-term planning difficult and can result in a lower level of service.

Regulatory Compliance & Aging Infrastructure

Playground structures require safety compliance, monitored through the CSA inspections. A concern for the Municipality is aging assets, risking playground elements not meeting safety requirements. Although this is not a concern currently, it may become critical over time if playground assets are not managed proactively.

4.5.6 Levels of Service

The following tables identify the Municipality's current level of service for land improvements. These metrics include the technical and community level of service metrics that the Municipality has selected for this AMP.

Community Levels of Service

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

Service Attribute	Qualitative Description	Current LOS (2022)
Scope	Description of the types of land improvement assets that the Municipality operates and maintains	Refer to section 4.5.1
Quality	Description of criteria for rehabilitation and replacement decisions and any related long-term forecasts	Refer to section 4.5.4

Technical Levels of Service

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

Service Attribute	Technical Metric	Current LOS (2022)
Scope	Average Condition Rating	39 (Poor)
	Average Risk Rating	13.95[9]
Performance	Capital reinvestment Rate	0%

[9] Refer to section 4.5.5

4.5.7 Recommendations

Asset Inventory

- It is highly recommended that the Municipality invest in obtaining software, which serves as a central repository for its assets. Currently, the Municipality does not have a centralized asset register, making proactive asset management difficult.
- With numerous assets approaching their estimated useful lives, the Municipality should gather ensure that replacement costs remain up to date.
- The Municipality should allocate appropriate resources to improve various attribute details (ex. in-service dates).

Condition Assessment Strategies

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

Risk Management Strategies

- Implement risk-based decision-making as part of asset management planning and budgeting processes. This should include the regular review of high-risk assets to determine appropriate risk mitigation strategies.
- Review risk models on a regular basis and adjust according to an evolving understanding of the probability and consequences of asset failure.

Levels of Service

- Continue measuring current levels of service in accordance with the metrics that the Municipality has established in this AMP. Additional metrics can be established as they are determined to provide meaningful and reliable inputs into asset management planning.
- Work towards identifying proposed levels of service as per O. Reg. 588/17 and identify the strategies that are required to close any gaps between current and proposed levels of service.

4.6 Fleet

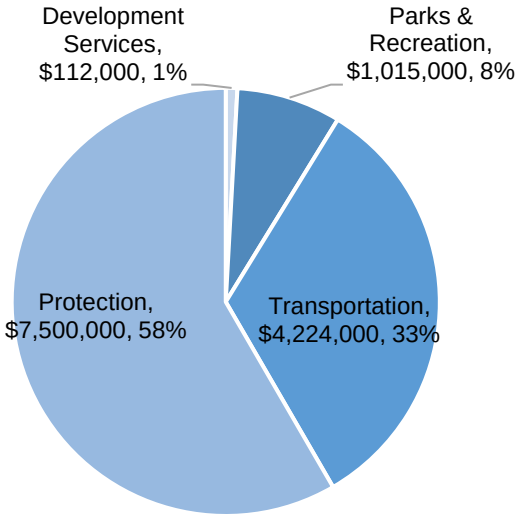
Fleet allow staff to efficiently deliver municipal services and personnel. Municipal fleet is used to support several service areas, including:

- Transportation fleet including pick-up trucks, plows, loaders, and graders
- Protection fleet for fire services
- Various fleet to support the maintenance of the transportation network and parks and recreational services

4.6.1 Asset Inventory & Replacement Costs

The table below includes the quantity, unit of measure, total replacement cost, and primary replacement cost method of each asset segment in the Municipality's fleet inventory.

Segment	Quantity	Unit of Measure	Replacement Cost	Primary RC Method
Development Services	2	Assets	$112,000	User-defined
Parks & Recreation	20	Assets	$1,015,000	User-defined
Protection	12	Assets	$7,500,000	User-defined
Transportation	26	Assets	$4,224,000	User-defined

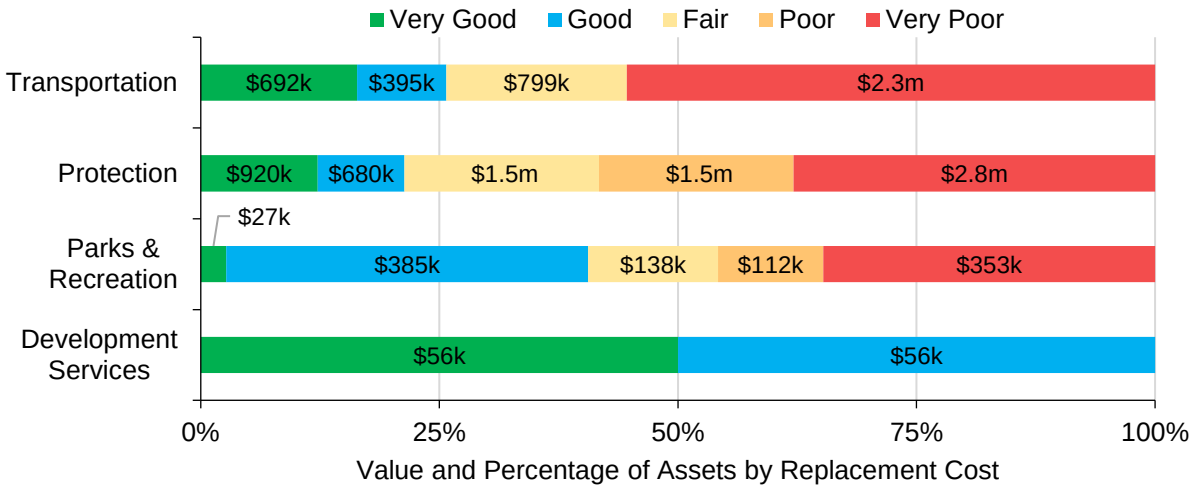


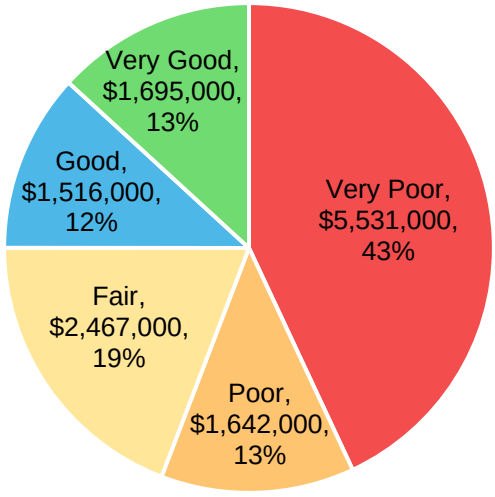
Total Current Replacement Cost: $12,851,000

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

4.6.2 Asset Condition

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





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

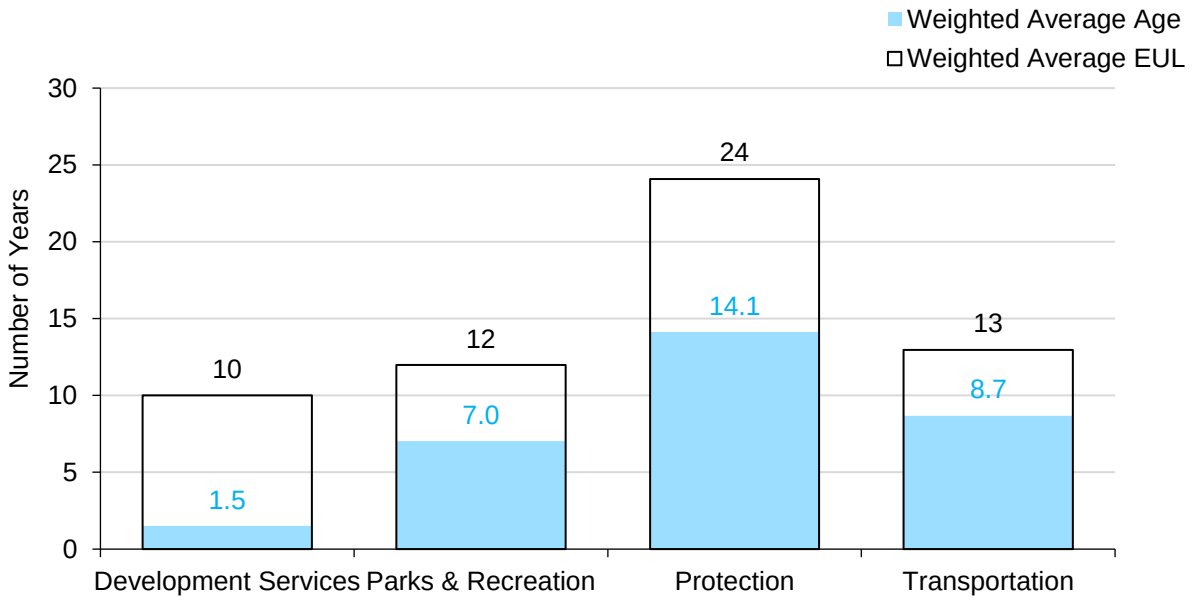
Current Approach to Condition Assessment

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

- Fleet undergo assessments at least every 5,000 km as part of their regular service. These assessments are primarily conducted by internal staff and include visual inspections for signs of wear and tear.
- CVOR fleet and heavy equipment are inspected daily in accordance with CVOR regulations. Internal staff primarily conduct these assessments, focusing on visual inspections for operational integrity.
- Protection fleet undergo annual safety inspections and annual pump tests (for pumpers only) conducted by an external contractor. The annual safety inspection results in either a pass, fail, or recommendations for improvements. Certain replacements adhere to NFPA standards.

4.6.3 Estimated Useful Life & Average Age

The Estimated Useful Life for fleet assets has been assigned according to a combination of established industry standards and staff knowledge. The Average Age of each asset is based on the number of years each asset has been in-service. Assessed condition may increase or decrease the average service life remaining.



Each asset's Estimated Useful Life should 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.

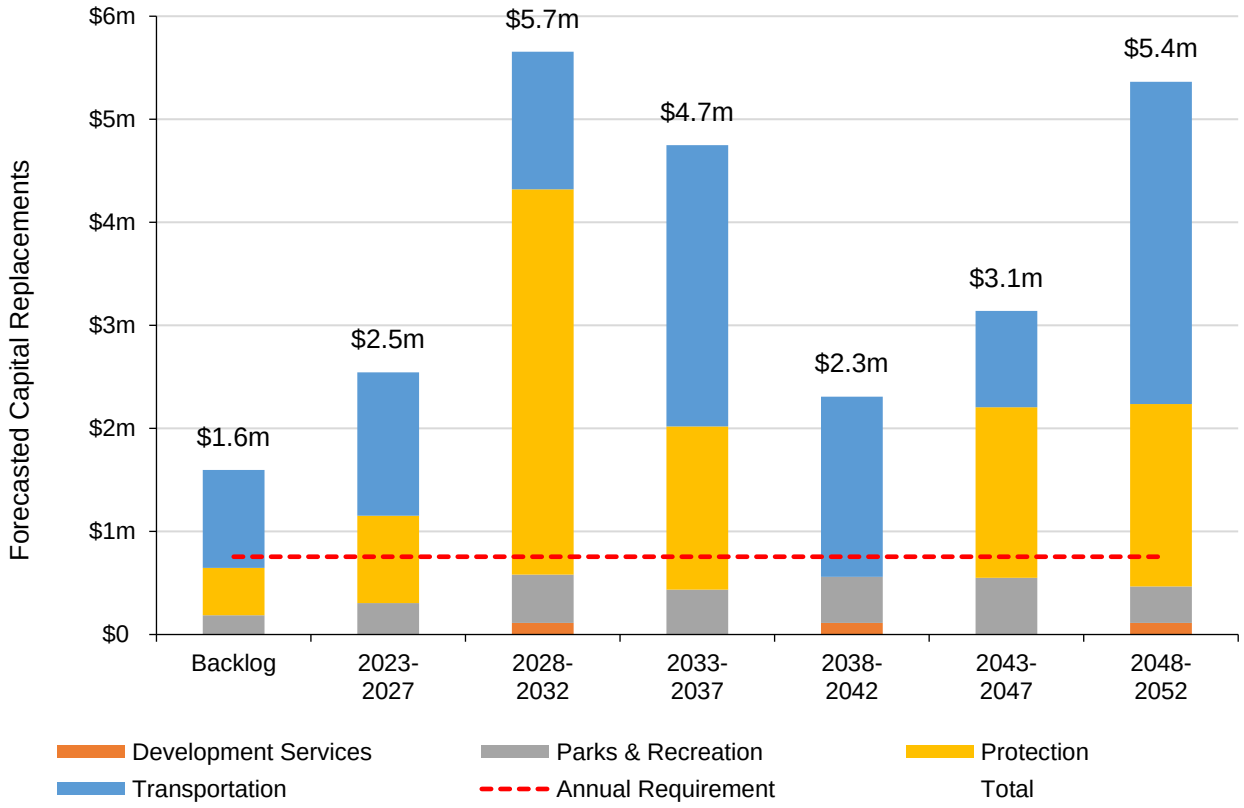
4.6.4 Lifecycle Management Strategy

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 following table outlines the Municipality's current lifecycle management strategy.

Activity Type	Description of Current Strategy
Maintenance / Rehabilitation	Routine maintenance for fleet includes inspections, tire rotations, minor repairs, and oil changes. Other necessary maintenance tasks are promptly addressed upon identification during inspections or reported concerns from operators regarding safety or mechanical issues. Maintenance for protection fleet is scheduled based on kilometers driven, time between oil changes, frequency of calls, and the annual safety inspection.
	Currently, there are no specific rehabilitation activities applied to fleet. Rehabilitation is not performed on protection fleet due to compliance constraints with NFPA standards dictating useful life.
Replacement	Replacement schedules for fleet are determined based on condition data and the defined asset lifecycle. This information directly informs budget considerations for fleet asset replacement. Fleet nearing the end of their expected service life or requiring frequent and costly repairs are prioritized for replacement to ensure continued operational efficiency and safety. Protection fleet assets are replaced when they reach the end of their NFPA-defined life or when maintenance becomes impractical or costly.

Forecasted Capital Requirements

The following graph forecasts long-term capital requirements. The annual capital requirement represents the average amount per year that the Municipality should allocate towards funding rehabilitation and replacement needs. The graph identifies capital requirements over the next 30 years. This projection is used as it ensures that every asset has gone through one full iteration of replacement.

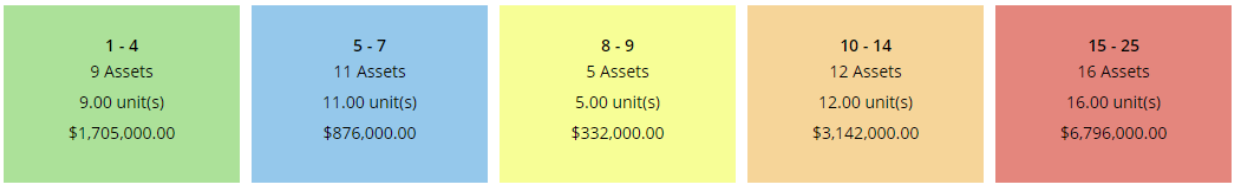


The projected cost of lifecycle activities that will need to be undertaken over the next 10 years to maintain the current level of service can be found in Appendix A.

4.6.5 Risk & Criticality

Risk Matrix

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 2022 inventory data.



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

The asset-specific attributes that municipal staff utilize to define and prioritize the criticality of fleet are documented below:

Probability of Failure (POF)	Consequence of Failure (COF)
Condition	Replacement Cost (Economic)
Service Life Remaining (%)	Department (Social)

The identification of critical assets allows the Municipality to determine appropriate risk mitigation strategies and treatment options. Risk mitigation may include asset-specific lifecycle strategies, and condition assessment strategies.

Risks to Current Asset Management Strategies

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

Lifecycle Management Strategies

There is some concern that the lack of defined lifecycle management strategy for fleet in the past resulted in failure to adhere to scheduled replacements. Addressing these challenges is crucial to maintaining optimal asset performance and minimizing lifecycle costs.

4.6.6 Levels of Service

The following tables identify the Municipality's current level of service for the fleet. These metrics include the technical and community level of service metrics that the Municipality has selected for this AMP.

Community Levels of Service

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

Service Attribute	Qualitative Description	Current LOS (2022)
Scope	Description of the types of fleet assets that the Municipality operates and maintains	Refer to section 4.6.1
Quality	Description of criteria for rehabilitation and replacement decisions and any related long-term forecasts	Refer to section 4.6.4

Technical Levels of Service

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

Service Attribute	Technical Metric	Current LOS (2022)
Scope	Average Condition Rating	36 (Poor)
	Average Risk Rating	15.46[10]
Performance	Capital reinvestment Rate	5.5%

[10] Refer to section 4.6.5

4.6.7 Recommendations

Asset Inventory

- It is highly recommended that the Municipality invest in obtaining software, which serves as a central repository for its assets. Currently, the Municipality does not have a centralized asset register, making proactive asset management difficult.
- Gather accurate replacement costs and update on a regular basis to ensure the accuracy of capital projections.

Condition Assessment Strategies

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

Risk Management Strategies

- Implement risk-based decision-making as part of asset management planning and budgeting processes. This should include the regular review of high-risk assets to determine appropriate risk mitigation strategies.
- Review risk models on a regular basis and adjust according to an evolving understanding of the probability and consequences of asset failure.

Levels of Service

- Continue measuring current levels of service in accordance with the metrics that the Municipality has established in this AMP. Additional metrics can be established as they are determined to provide meaningful and reliable inputs into asset management planning.
- Work towards identifying proposed levels of service as per O. Reg. 588/17 and identify the strategies that are required to close any gaps between current and proposed levels of service.

4.7 Machinery & Equipment

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

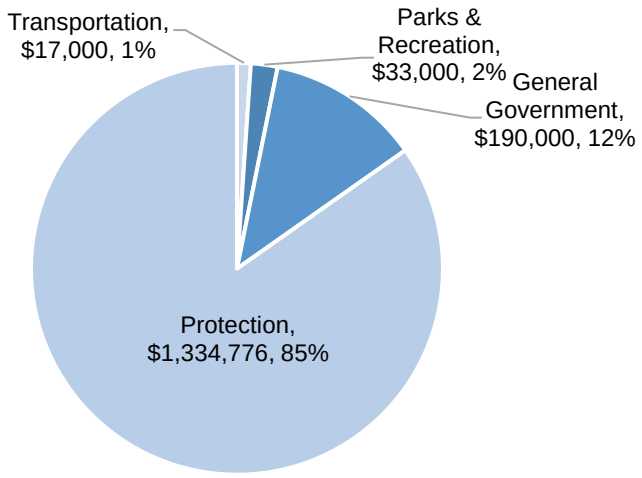
- Office equipment to support government services
- Protection equipment to support the delivery of fire services
- Public works equipment

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

4.7.1 Asset Inventory & Replacement Costs

The table below includes the quantity, unit of measure, total replacement cost, and primary replacement cost method of each asset segment in the Municipality's machinery and equipment inventory.

Segment	Components	Unit of Measure	Replacement Cost	Primary RC Method
General Government	5	Assets	$190,000	User-defined
Parks & Recreation	1	Assets	$33,000	User-defined
Protection	15	Assets	$1,335,000	User-defined
Transportation	2	Assets	$17,000	User-defined

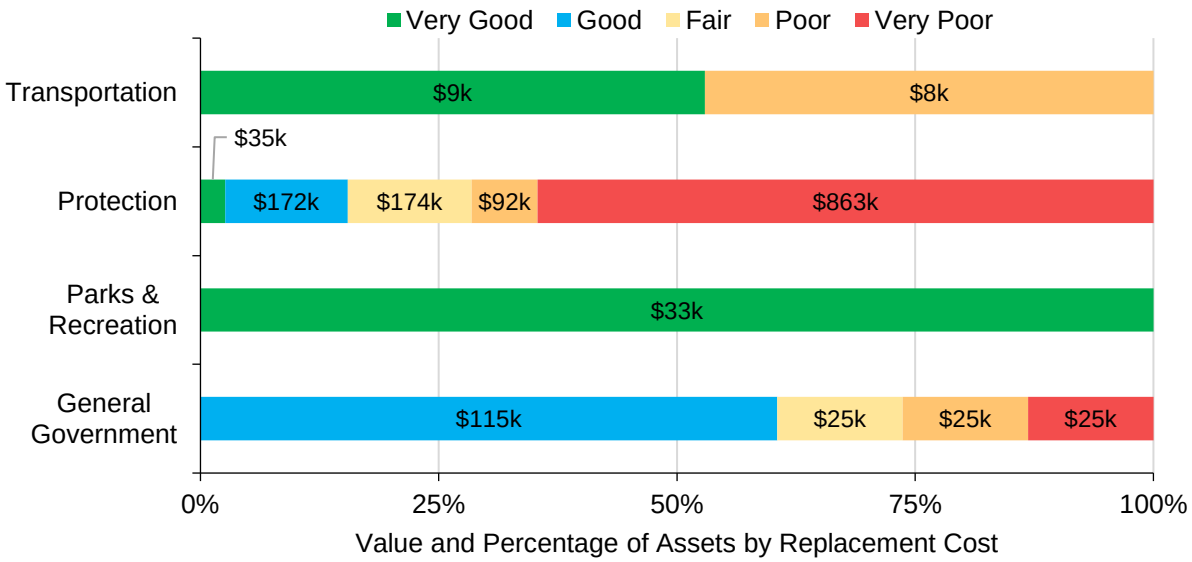


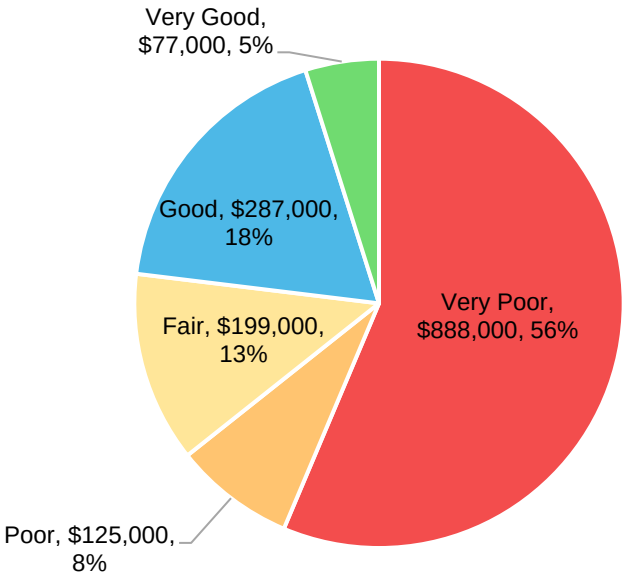
Total Current Replacement Cost: $1,574,776

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

4.7.2 Asset Condition

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





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

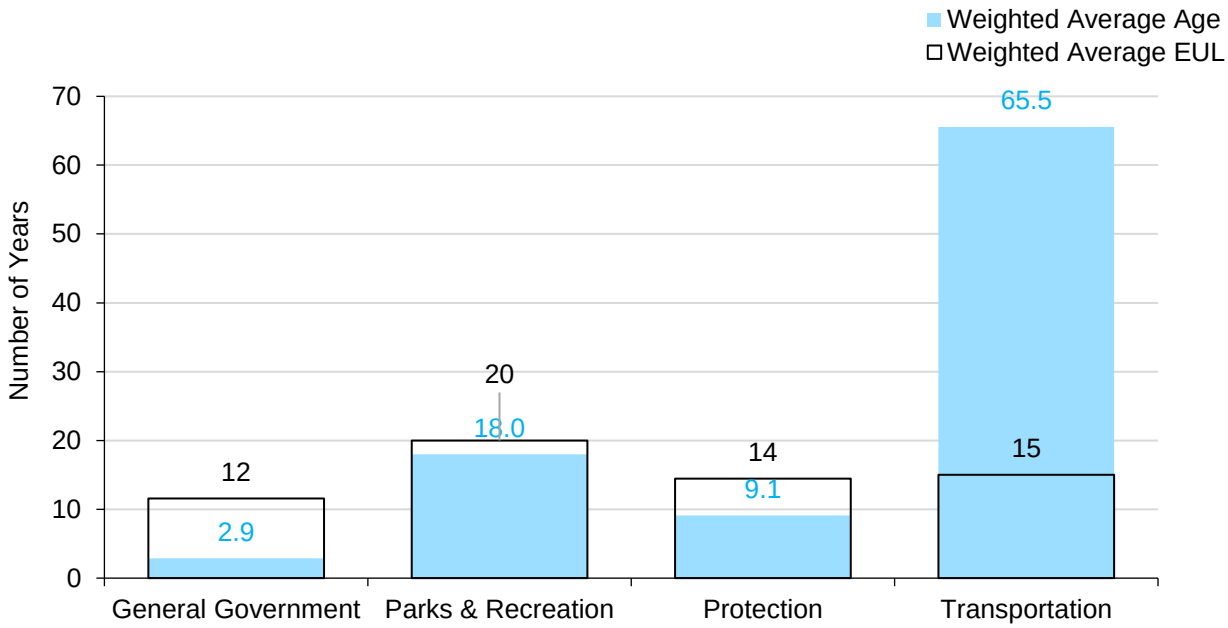
Current Approach to Condition Assessment

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

- Daily pre-trip inspections are conducted as part of regular operations. Assessments also occur within scheduled maintenance cycles, primarily conducted by internal staff. Visual inspections focus on identifying notable defects and signs of wear.
- While a formal condition rating system is not currently in place, it is under consideration for future implementation.
- Personal Protective Equipment (PPE) undergoes annual evaluations for condition and is repaired as necessary over its 10-year useful life. Internal staff handle all evaluations. External contractors conduct SCBA bottle testing every 5 years and annual flow testing for SCBA breathing apparatus, which results in a pass/fail outcome.

4.7.3 Estimated Useful Life & Average Age

The Estimated Useful Life for machinery & equipment assets has been assigned according to a combination of established industry standards and staff knowledge. The Average Age of each asset is based on the number of years each asset has been in-service. Assessed condition may increase or decrease the average service life remaining.



Each asset's Estimated Useful Life should 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.

4.7.4 Lifecycle Management Strategy

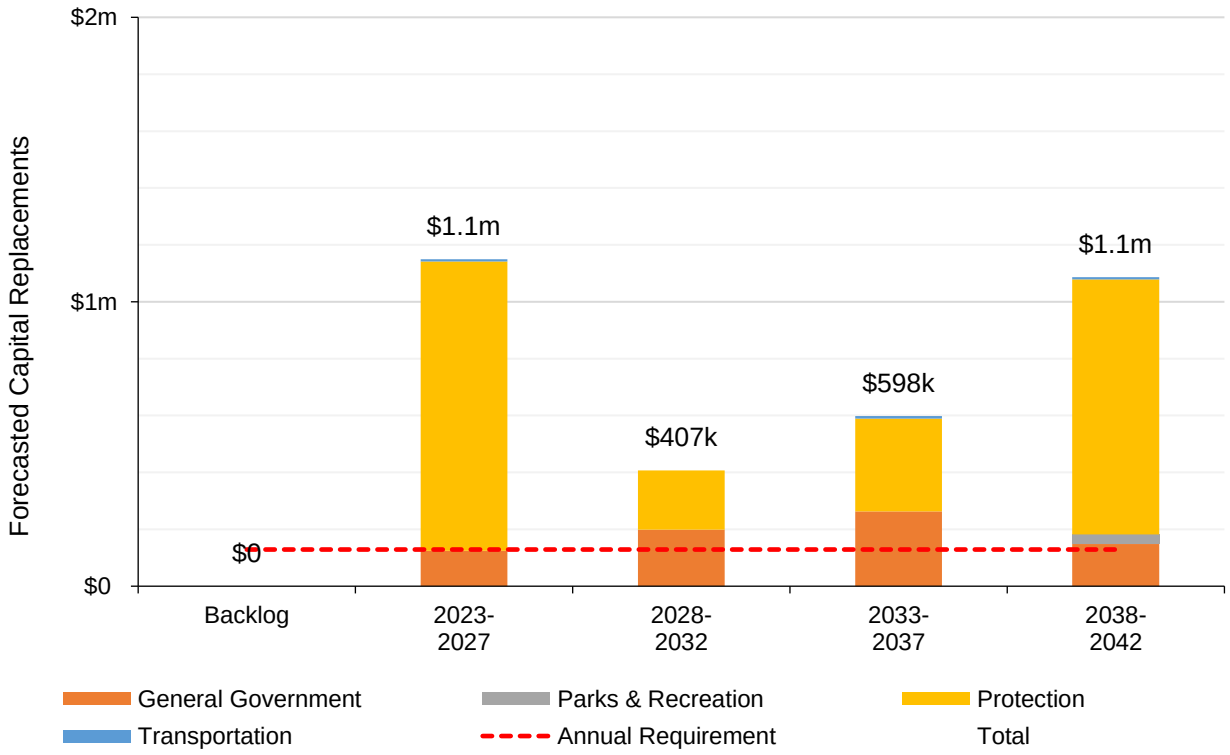
The condition or performance of most assets will deteriorate over time. To ensure that municipal assets are performing as expected and meeting the needs of customers, it is important to establish a lifecycle management strategy to proactively manage asset deterioration.

The following table outlines the Municipality's current lifecycle management strategy.

Activity Type	Description of Current Strategy
Maintenance/ Rehabilitation	Routine maintenance for machinery and equipment includes inspections, minor repairs, oil changes, and replacement of consumables. Daily pre-trip inspections ensure immediate safety and operational checks, while regular inspections are conducted at defined intervals as part of ongoing maintenance protocols. SCBA equipment is cleaned after each use, while all PPE is sent annually for cleaning and inspection. Maintenance is triggered by use, such as responding to high-hazard calls that may require immediate cleaning of PPE rather than waiting for the annual cycle.
	Rehabilitation activities for PPE and heavy equipment is typically not performed as part of current practices.
Replacement	Asset replacement decisions are guided by reaching the defined useful life in years. Assets nearing their expected service life or experiencing frequent and costly repairs are prioritized for replacement. This approach ensures efficient operational performance and minimizes downtime associated with aging equipment. SCBA equipment is replaced if testing fails, or maintenance costs become ineffective. PPE is replaced if compromised during evaluations or operational use. Replacement decisions are otherwise guided by NFPA-defined useful life spans.

Forecasted Capital Requirements

The following graph forecasts long-term capital requirements. The annual capital requirement represents the average amount per year that the Municipality should allocate towards funding rehabilitation and replacement needs. The graph identifies capital requirements over the next 20 years. This projection is used as it ensures that every asset has gone through one full iteration of replacement.

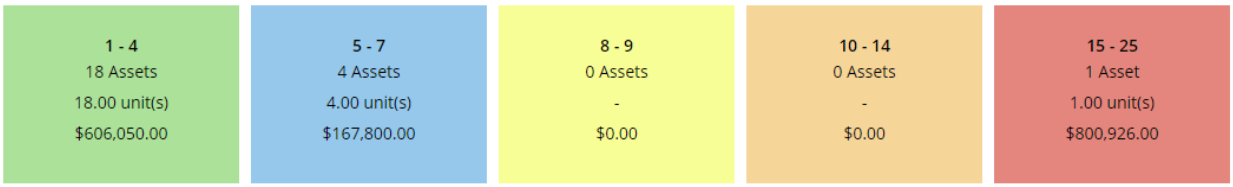


The projected cost of lifecycle activities that will need to be undertaken over the next 10 years to maintain the current level of service can be found in Appendix A.

4.7.5 Risk & Criticality

Risk Matrix

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 2022 inventory data.



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

The asset-specific attributes that municipal staff utilize to define and prioritize the criticality of machinery and equipment are documented below:

Probability of Failure (POF)	Consequence of Failure (COF)
Condition	Replacement Cost (Economic)
Service Life Remaining (%)	

The identification of critical assets allows the Municipality to determine appropriate risk mitigation strategies and treatment options. Risk mitigation may include asset-specific lifecycle strategies, and condition assessment strategies.

Risks to Current Asset Management Strategies

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

Lifecycle Management Strategies

There is some concern that the lack of defined lifecycle management strategy for machinery & equipment in the past resulted in failure to adhere to scheduled replacements. Addressing these challenges is crucial to maintaining optimal asset performance and minimizing lifecycle costs

4.7.6 Levels of Service

The following tables identify the Municipality's current level of service for the machinery and equipment. These metrics include the technical and community level of service metrics that the Municipality has selected for this AMP.

Community Levels of Service

The following table outlines the qualitative descriptions that determine the community levels of service provided by machinery & equipment assets.

Service Attribute	Qualitative Description	Current LOS (2022)
Scope	Description of the types of machinery & equipment assets that the Municipality operates and maintains	Refer to section 4.7.1
Quality	Description of criteria for rehabilitation and replacement decisions and any related long-term forecasts	Refer to section 4.7.4

Technical Levels of Service

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

Service Attribute	Technical Metric	Current LOS (2022)
Scope	Average Condition Rating	31 (Poor)
	Average Risk Rating	12.34[11]
Performance	Capital reinvestment Rate	16.6%

[11] Refer to section 4.6.5

4.7.7 Recommendations

Asset Inventory

- It is highly recommended that the Municipality invest in obtaining software, which serves as a central repository for its assets. Currently, the Municipality does not have a centralized asset register, making proactive asset management difficult.
- Continue to gather accurate replacement costs and update on a regular basis to ensure the accuracy of capital projections.

Condition Assessment Strategies

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

Risk Management Strategies

- Implement risk-based decision-making as part of asset management planning and budgeting processes. This should include the regular review of high-risk assets to determine appropriate risk mitigation strategies.
- Review risk models on a regular basis and adjust according to an evolving understanding of the probability and consequences of asset failure.

Levels of Service

- Continue measuring current levels of service in accordance with the metrics that the Municipality has established in this AMP. Additional metrics can be established as they are determined to provide meaningful and reliable inputs into asset management planning.
- Work towards identifying proposed levels of service as per O. Reg. 588/17 and identify the strategies that are required to close any gaps between current and proposed levels of service.

5 Analysis of Rate-Funded Assets

Key Insights

- Rate-funded assets are valued at $143.4 million
- 85% of rate-funded assets are in fair or better condition
- The average annual capital requirement to sustain the current level of service for rate-funded assets is approximately $2.1 million

5.1 Sanitary Sewer Network

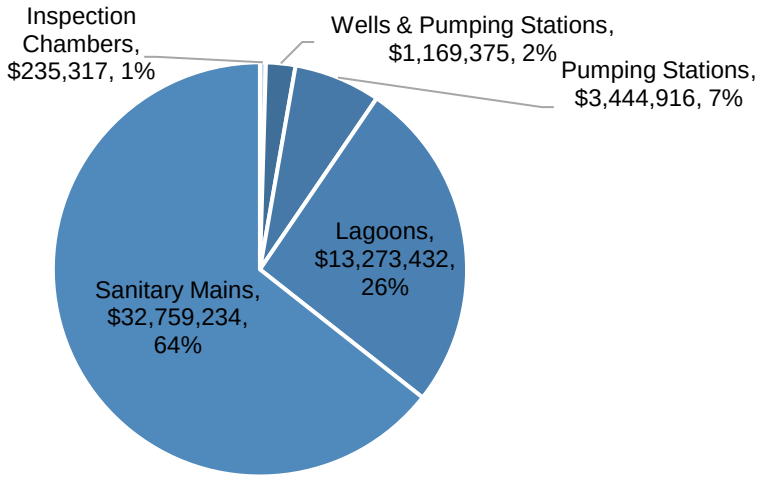
The Municipality manages an extensive sanitary sewer network consisting of various assets including:

- Inspection chambers
- Lagoons
- Wells and pumping stations
- Sanitary mains

5.1.1 Asset Inventory & Replacement Costs

The table below includes the quantity, unit of measure, total replacement cost, and primary replacement cost method of each asset segment in the Municipality's sanitary sewer network inventory.

Segment	Components	Unit of Measure	Replacement Cost	Primary RC Method
Inspection Chambers	1	Assets	$235,000	User-defined
Lagoons	98	Assets	$13,273,000	User-defined
Pumping Stations	72	Assets	$3,445,000	User-defined
Sanitary Mains	50,390.54	Meters	$32,759,000	Cost per unit
Wells & Pumping Stations	6	Assets	$1,169,000	User-defined

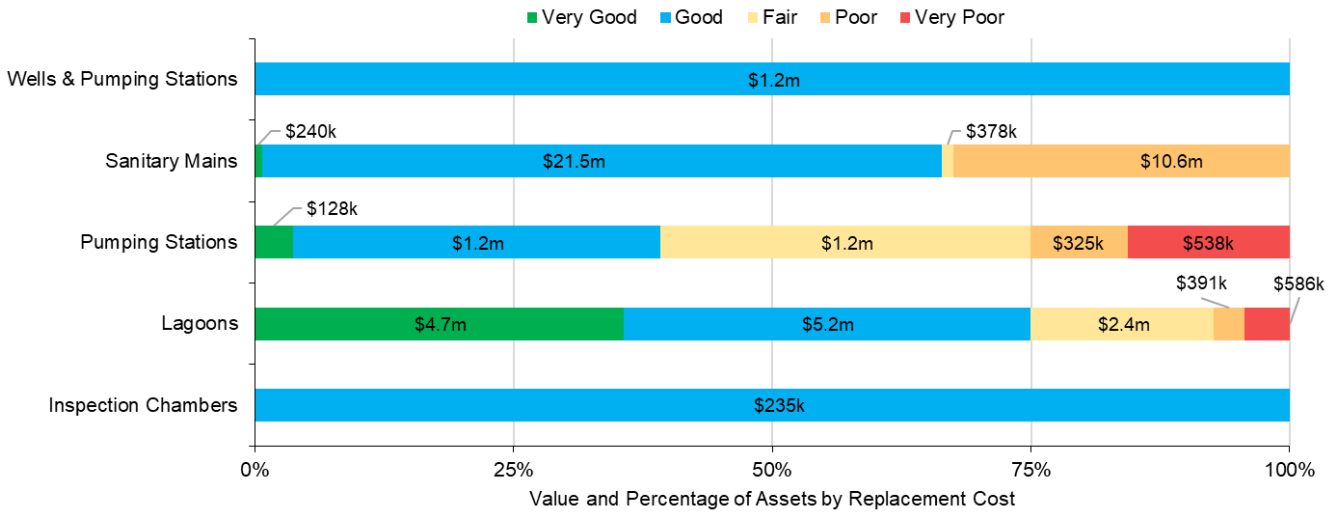


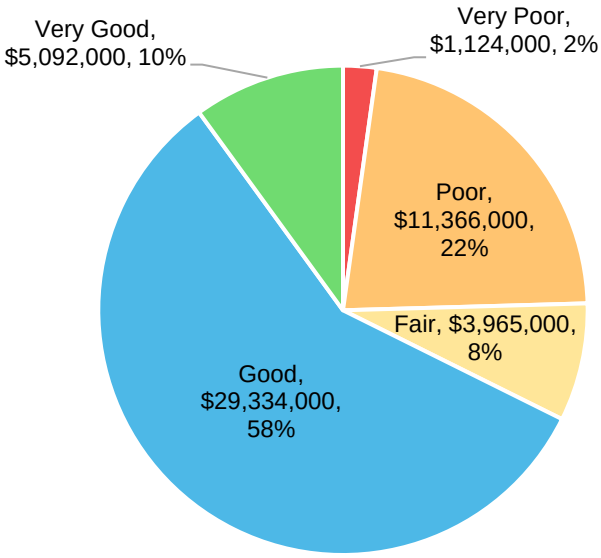
Total Current Replacement Cost: $50,882,275

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

5.1.2 Asset Condition

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





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

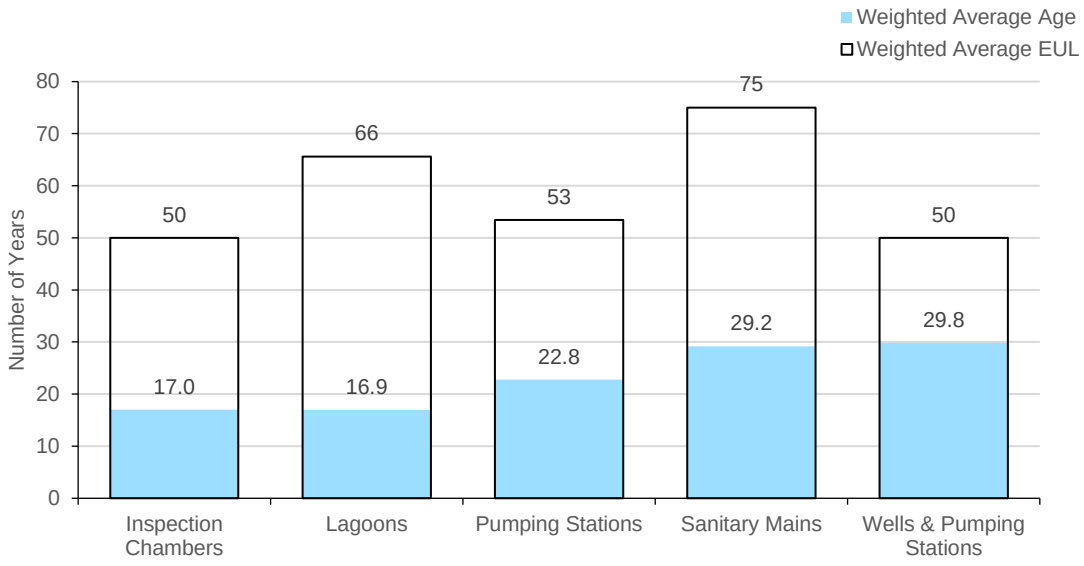
Current Approach to Condition Assessment

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

- Assessments are conducted on an as-needed basis, triggered by encountered concerns or in preparation for road reconstruction projects. These assessments are typically performed by third-party contractors. Supporting infrastructure assessments are conducted by the Municipality's contracted water/wastewater operator, involving visual inspections for defects and utilizing checklists for larger infrastructure components.

5.1.3 Estimated Useful Life & Average Age

The Estimated Useful Life for sanitary sewer network assets has been assigned according to a combination of established industry standards and staff knowledge. The Average Age of each asset is based on the number of years each asset has been in-service. Assessed condition may increase or decrease the average service life remaining.



Each asset's Estimated Useful Life should 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.

5.1.4 Lifecycle Management Strategy

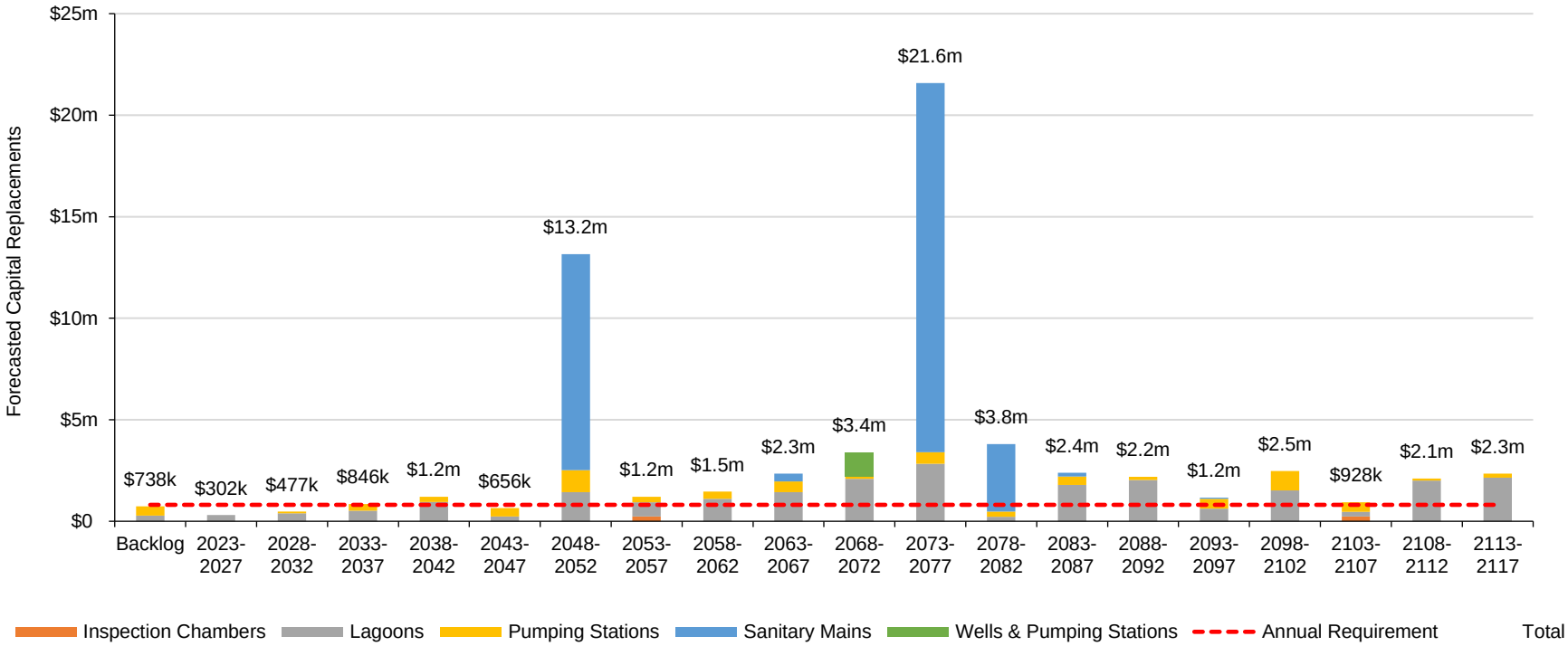
The condition or performance of most assets will deteriorate over time. To ensure that municipal assets are performing as expected and meeting the needs of customers, it is important to establish a lifecycle management strategy to proactively manage asset deterioration.

The following table outlines the Municipality's current lifecycle management strategy.

Activity Type	Description of Current Strategy
Maintenance/ Rehabilitation	Routine maintenance activities include inspections, flushing or cleaning, and minor repairs. Maintenance actions are taken as issues are identified during inspections or through reported concerns.
	Rehabilitation activities for wastewater systems may involve structural repairs and upgrading outdated systems. The consideration of relining for future rehabilitation is under review but has not been implemented to date.
Replacement	Replacement decisions are made when the condition of an asset has significantly deteriorated, and rehabilitation is no longer cost-effective. Replacement may also coincide with other infrastructure projects in the same geographic area, such as road reconstruction. Assets nearing their expected service life or experiencing frequent and costly repairs are prioritized for replacement. Additionally, assets nearing the end of their useful life may be replaced as part of planned road reconstruction projects, ensuring efficient resource allocation and infrastructure improvement.

Forecasted Capital Requirements

The following graph forecasts long-term capital requirements. The annual capital requirement represents the average amount per year that the Municipality should allocate towards funding rehabilitation and replacement needs. The graph identifies capital requirements over the next 95 years. This projection is used as it ensures that every asset has gone through one full iteration of replacement.

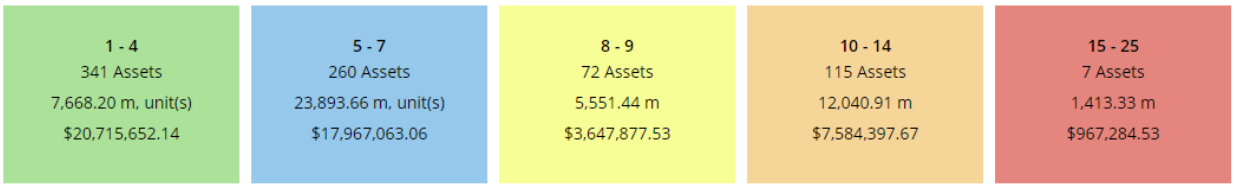


The projected cost of lifecycle activities that will need to be undertaken over the next 10 years to maintain the current level of service can be found in Appendix A.

5.1.5 Risk & Criticality

Risk Matrix

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 2022 inventory data.



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

The asset-specific attributes that municipal staff utilize to define and prioritize the criticality of the sanitary sewer network are documented below:

Probability of Failure (POF)	Consequence of Failure (COF)
Condition	Replacement Cost (Economic)
Service Life Remaining (%)	Diameter (Social)

The identification of critical assets allows the Municipality to determine appropriate risk mitigation strategies and treatment options. Risk mitigation may include asset-specific lifecycle strategies, and condition assessment strategies.

Risks to Current Asset Management Strategies

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

Climate Change & Extreme Weather Events
Climate change and extreme weather events pose potential risks to sanitary infrastructure, potentially increasing inflow and infiltration rates and necessitating heightened treatment requirements. Moreover, elevated temperatures can diminish the efficiency of sewage treatment processes. In response to these challenges, staff are striving to adopt a proactive approach to manage inflow and infiltration through enhanced flow monitoring. Implementing a regular flow monitoring program will enable early detection of inflow and infiltration issues, equipping staff with valuable data to support lifecycle planning.

5.1.6 Levels of Service

The following tables identify the Municipality's current level of service for the sanitary sewer network. These metrics include the technical and community level of service metrics that the Municipality has selected for this AMP.

Community Levels of Service

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

Service Attribute	Qualitative Description	Current LOS (2022)
Scope	Description, which may include maps, of the user groups or areas of the municipality that are connected to the municipal wastewater system	See Appendix B
Reliability	Description of how combined sewers in the municipal wastewater system are designed with overflow structures in place which allow overflow during storm events to prevent backups into homes	N/A

Description of the frequency and volume of overflows in combined sewers in the municipal wastewater system that occur in habitable areas or beaches	N/A
Description of how stormwater can get into sanitary sewers in the municipal wastewater system, causing sewage to overflow into streets or backup into homes	Stormwater can enter into sanitary sewers due to cracks in sanitary mains or through indirect connections (e.g. weeping tiles). In the case of heavy rainfall events, sanitary sewers may experience a volume of water and sewage that exceeds its designed capacity. In some cases, this can cause water and/or sewage to overflow backup into homes. The disconnection of weeping tiles from sanitary mains and the use of sump pumps and pits directing storm water to the storm drain system can help to reduce the chance of this occurring.
Description of how sanitary sewers in the municipal wastewater system are designed to be resilient to stormwater infiltration	Sanitary sewers manholes are sealed. There is also a municpal by-law to ensure that there are no illegal connections from private downspouts and sump pumps. Furthermore, there are inspections in known problem areas.
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.

Technical Levels of Service

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

Service Attribute	Technical Metric	Current LOS (2022)
Scope	% of properties connected to the municipal wastewater system	38%[12]
Reliability	# of events per year where combined sewer flow in the municipal wastewater system exceeds system capacity compared to the total number of properties connected to the municipal wastewater system	N/A
	# of connection-days per year having wastewater backups compared to the total number of properties connected to the municipal wastewater system	0
	# of effluent violations per year due to wastewater discharge compared to the total number of properties connected to the municipal wastewater system	2
Performance	Capital reinvestment rate	1.2%

[12] 1847 active wastewater accounts. 2021 census data indicates that there are 4882 private dwellings.

5.1.7 Recommendations

Asset Inventory

- It is highly recommended that the Municipality invest in obtaining software, which serves as a central repository for its assets. Currently, the Municipality does not have a centralized asset register, making proactive asset management difficult.
- Continue to gather accurate replacement costs and update on a regular basis to ensure the accuracy of capital projections.

Condition Assessment Strategies

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

Risk Management Strategies

- Implement risk-based decision-making as part of asset management planning and budgeting processes. This should include the regular review of high-risk assets to determine appropriate risk mitigation strategies.
- Review risk models on a regular basis and adjust according to an evolving understanding of the probability and consequences of asset failure.

Levels of Service

- Continue measuring current levels of service in accordance with the metrics that the Municipality has established in this AMP. Additional metrics can be established as they are determined to provide meaningful and reliable inputs into asset management planning.
- Work towards identifying proposed levels of service as per O. Reg. 588/17 and identify the strategies that are required to close any gaps between current and proposed levels of service.

5.2 Water Network

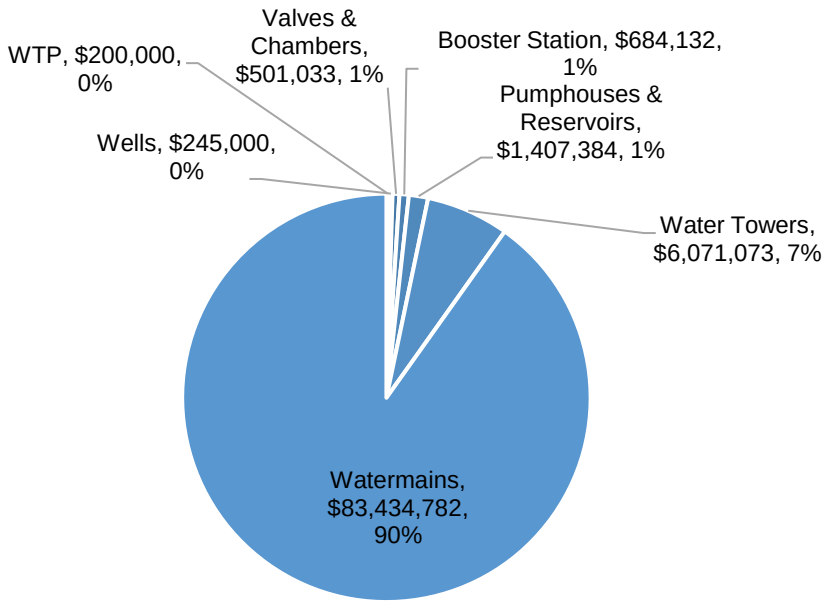
The Municipality manages an extensive water network consisting of various assets including:

- Booster stations, pumphouses, wells, and reservoirs
- Water equipment such as valves and chambers
- Water towers
- Water treatment plant
- Watermains

5.2.1 Asset Inventory & Replacement Costs

The table below includes the quantity, unit of measure, total replacement cost, and primary replacement cost method of each asset segment in the Municipality's water network inventory.

Segment	Components	Unit of Measure	Replacement Cost	Primary RC Method
Booster Station	11	Assets	$684,000	User-defined
Pumphouses & Reservoirs	8	Assets	$1,407,000	User-defined
Valves & Chambers	9	Assets	$501,000	User-defined
Water Towers	13	Assets	$6,071,000	User-defined
Watermains	130,767	Meters	$83,435,000	Cost per unit
Wells	1	Assets	$245,000	User-defined
WTP	1	Assets	$200,000	User-defined

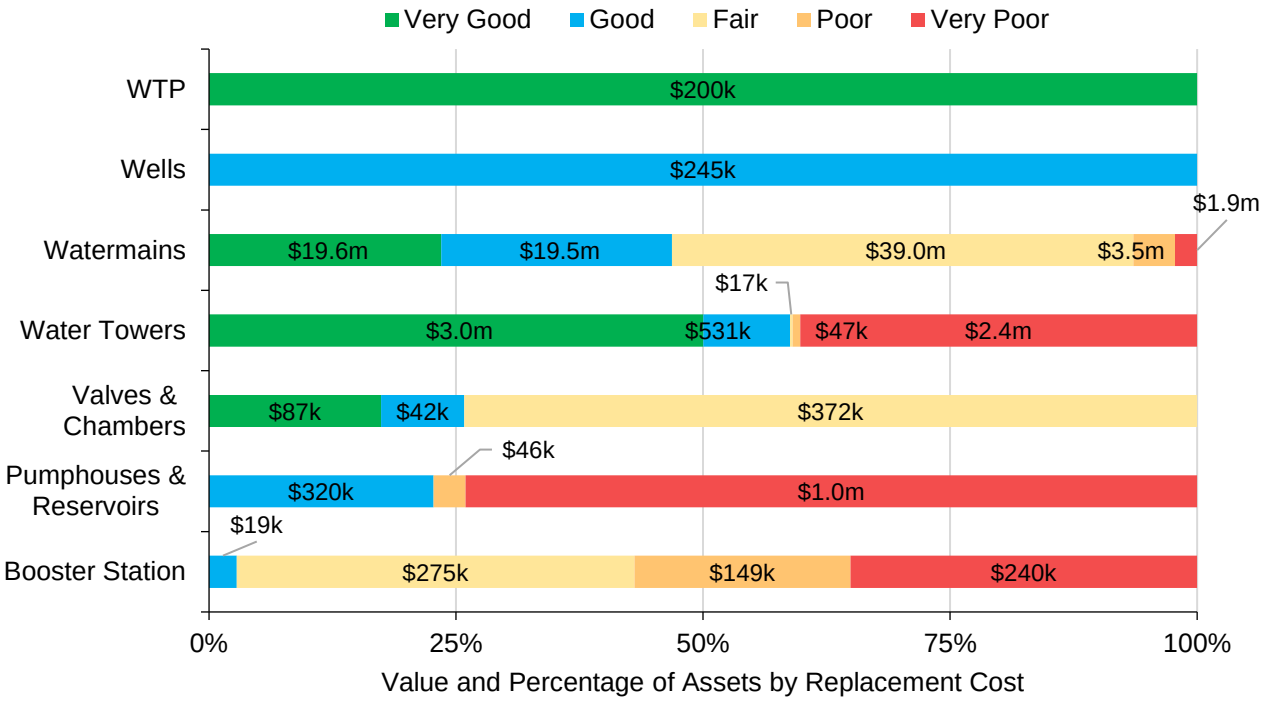


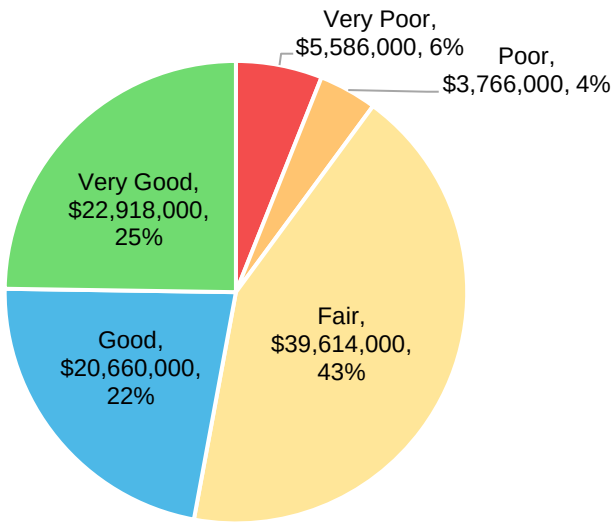
Total Current Replacement Cost: $92,543,404

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

5.2.2 Asset Condition

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





To ensure that the Municipality's water network continues to provide an acceptable level of service, the Municipality should monitor the average condition of all assets. If the average condition declines, staff should re-evaluate their lifecycle management strategy to determine what combination of maintenance,

rehabilitation and replacement activities is required to increase the overall condition of the water network.

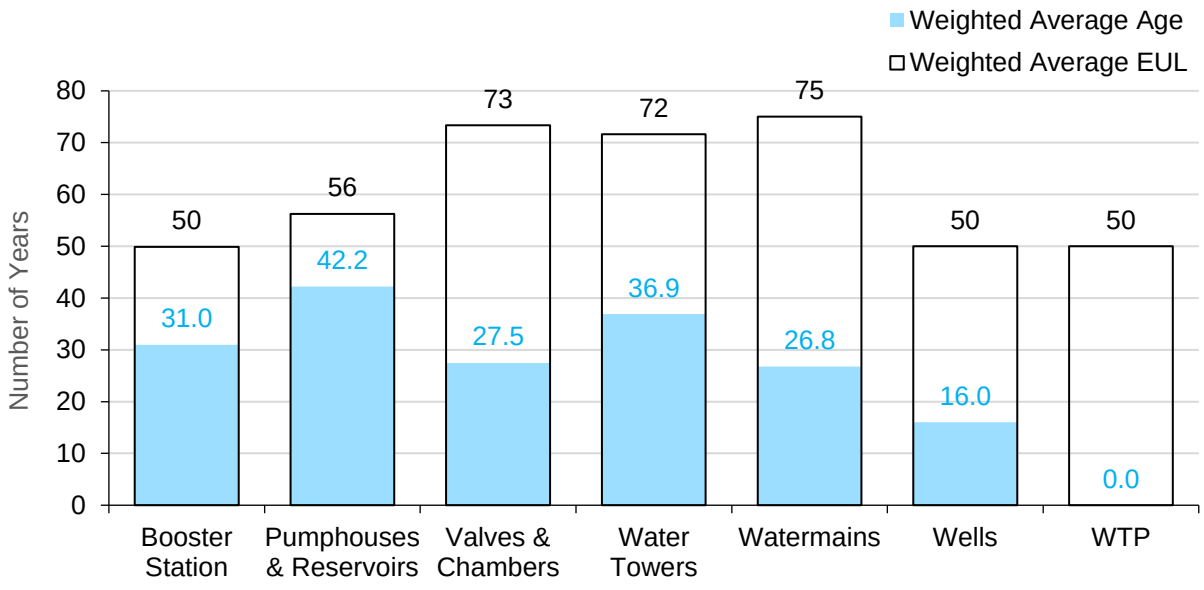
Current Approach to Condition Assessment

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

- Supporting infrastructure like fire hydrants are assessed annually by the Municipality's contracted third-party water operator. These inspections adhere to requirements outlined in the Safe Drinking Water Act.

5.2.3 Estimated Useful Life & Average Age

The Estimated Useful Life for water network assets has been assigned according to a combination of established industry standards and staff knowledge. The Average Age of each asset is based on the number of years each asset has been in-service. Assessed condition may increase or decrease the average service life remaining.



Each asset's Estimated Useful Life should 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.

5.2.4 Lifecycle Management Strategy

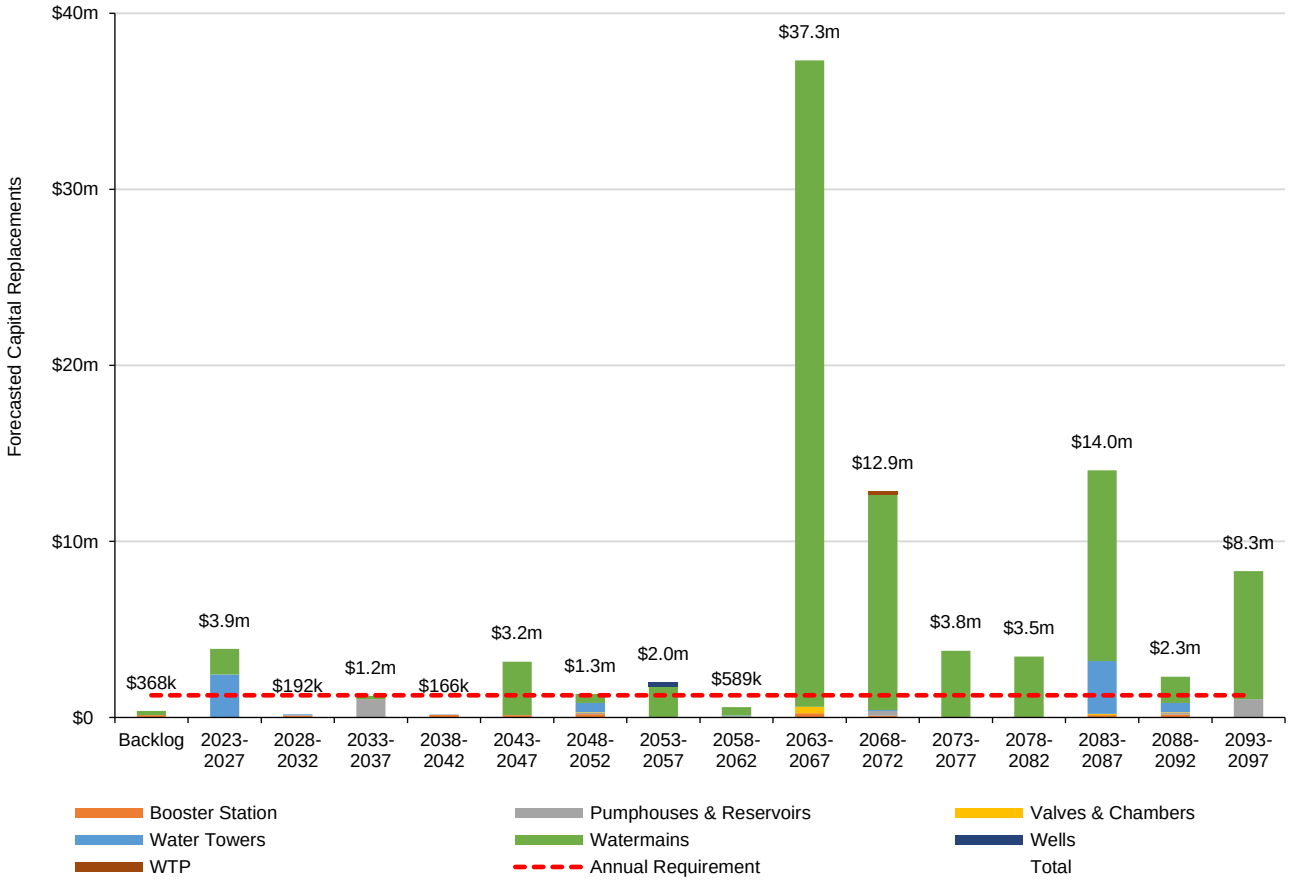
The condition or performance of most assets will deteriorate over time. To ensure that municipal assets are performing as expected and meeting the needs of customers, it is important to establish a lifecycle management strategy to proactively manage asset deterioration.

The following table outlines the Municipality's current lifecycle management strategy.

Activity Type	Description of Current Strategy
Maintenance/ Rehabilitation	Routine maintenance activities for water network assets include inspections, flushing, minor repairs, valve turning, and other necessary tasks. Maintenance actions are prompted by inspections or identified issues within the system.
Replacement	Replacement decisions for water network assets are made when the condition of an asset has significantly deteriorated, and rehabilitation is no longer cost-effective. Additionally, replacements may be considered when adjacent infrastructure requires replacement or when assets near the end of their useful life.

Forecasted Capital Requirements

The following graph forecasts long-term capital requirements. The annual capital requirement represents the average amount per year that the Municipality should allocate towards funding rehabilitation and replacement needs. The 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.

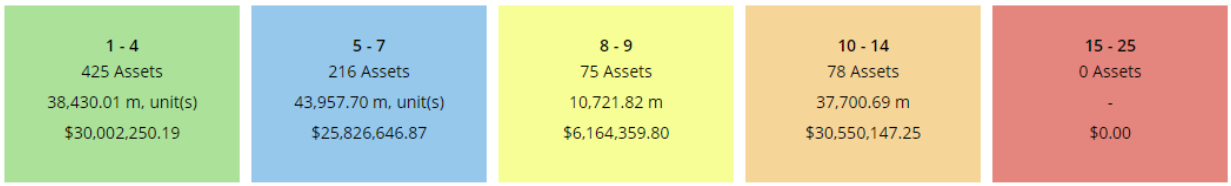


The projected cost of lifecycle activities that will need to be undertaken over the next 10 years to maintain the current level of service can be found in Appendix A.

5.2.5 Risk & Criticality

Risk Matrix

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 2022 inventory data.



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

The asset-specific attributes that municipal staff utilize to define and prioritize the criticality of the water network are documented below:

Probability of Failure (POF)	Consequence of Failure (COF)
Condition	Replacement Cost (Economic)
Service Life Remaining (%)	Diameter (Social)

The identification of critical assets allows the Municipality to determine appropriate risk mitigation strategies and treatment options. Risk mitigation may include asset-specific lifecycle strategies, and condition assessment strategies.

Risks to Current Asset Management Strategies

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

Growth

The Municipality is expected to experience growth. Population and employment growth will increase the demand on municipal services and potentially decrease the lifecycle of certain assets. As the population continues to grow, the Municipality must prioritize expanding its capacity, particularly those in Lakeshore and Bayfield, to serve the larger population. Staff are working towards developing a comprehensive long-term capital plan with considerations for growth.

Climate Change & Extreme Weather Events

Changes in precipitation patterns, increased frequency of extreme weather events, and rising temperatures could potentially disrupt or diminish the reliability and availability of water from the Varna Well system. This risk underscores the importance of proactive monitoring, resilience planning, and infrastructure adaptations to mitigate potential impacts on water supply reliability and community resilience.

Capital Funding Strategies

Current water rates do not achieve a full cost recovery model and highlights the necessity for grant support to fund large-scale projects. When grants are not available, major water network projects may be deferred. An annual capital funding strategy can reduce dependency on grant funding and help prevent deferral of capital works.

5.2.6 Levels of Service

The following tables identify the Municipality's current level of service for the water network. These metrics include the technical and community level of service metrics that the Municipality has selected for this AMP.

Community Levels of Service

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

Service Attribute	Qualitative Description	Current LOS (2022)
Scope	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
	Description, which may include maps, of the user groups or areas of the municipality that have fire flow	See Appendix B
Reliability	Description of boil water advisories and service interruptions	There were no water boil advisories for the Municipality in 2022

Technical Levels of Service

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

Service Attribute	Technical Metric	Current LOS (2022)
Scope	% of properties connected to the municipal water system	73%[13]
	% of properties where fire flow is available	98%[14]
Reliability	# of connection-days per year where a boil water advisory notice is in place compared to the total number of properties connected to the municipal water system	0
	# of connection-days per year where water is not available due to water main breaks compared to the total number of properties connected to the municipal water system	8:3569
Performance	Capital reinvestment rate	0.9%

[13] 3569 properties receive water services. As per 2021 census, there are 4882 private dwellings.
[14] 3512 of 3569 properties.

5.2.7 Recommendations

Asset Inventory

- It is highly recommended that the Municipality invest in obtaining software, which serves as a central repository for its assets. Currently, the Municipality does not have a centralized asset register, making proactive asset management difficult.
- Continue to gather accurate replacement costs and update on a regular basis to ensure the accuracy of capital projections.

Condition Assessment Strategies

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

Risk Management Strategies

- Implement risk-based decision-making as part of asset management planning and budgeting processes. This should include the regular review of high-risk assets to determine appropriate risk mitigation strategies.
- Review risk models on a regular basis and adjust according to an evolving understanding of the probability and consequences of asset failure.

Levels of Service

- Continue measuring current levels of service in accordance with the metrics that the Municipality has established in this AMP. Additional metrics can be established as they are determined to provide meaningful and reliable inputs into asset management planning.
- Work towards identifying proposed levels of service as per O. Reg. 588/17 and identify the strategies that are required to close any gaps between current and proposed levels of service.

6 Impacts of Growth

Key Insights

- Understanding the key drivers of growth and demand will allow the Municipality to more effectively plan for new infrastructure, and the upgrade or disposal of existing infrastructure

- Low-to-moderate population growth is expected over the next 20 years

- The costs of growth should be considered in long-term funding strategies that are designed to maintain the current level of service

6.1 Description of Growth Assumptions

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

6.1.1 Municipality of Bluewater Official Plan (Consolidated March 2024)

The Bluewater Official Plan was adopted on July 4, 2005, and consolidated in April 2024, with a planning horizon extending to the year 2026. The purpose of the plan is to define the vision of the community, identify the resources, capabilities, and constraints of the land, and enhance environmental stewardship.

The Official Plan aims to create a planning environment addressing community needs and aspirations, build a future vision with community involvement, promote compatible land use, and ensure future development aligns with the plan's vision, goals, and policies while implementing provincial legislation.

The primary objectives in terms of infrastructure focus on reducing deficiencies and improving municipal services to maintain community quality, safety, and stability. This involves creating new services as needed, ensuring efficient and cost-effective locations for infrastructure, establishing a road system for safe and efficient movement, coordinating long-range land use planning with infrastructure planning, and protecting infrastructure facilities from incompatible land uses.

Growth and development are directed primarily to the settlement areas of Bayfield, Hensall, and Zurich, which are equipped with full municipal services. The plan promotes infilling, redevelopment, and conversions to use land and services efficiently. New subdivisions and multi-unit developments are permitted only if they connect to full municipal sewage and water services. Additionally, comprehensive stormwater management and improvements in municipal services will be pursued to maintain the community's quality, safety, and stability.

6.1.2 County of Huron Official Plan (Consolidated October 2021)

The County is responsible for the allocation of growth to the local municipalities, which is based on a combination of local factors including: local planning policy; historic and recent growth trends; market demand; and the capacity to accommodate growth from land supply and servicing perspectives.

The following table outlines the population and employment forecasts allocated to Bluewater.

Year	Population	Employment
2016 (Actual)	7,136	4,660
2021 (Projected)	7,209	4,707
2021 (Actual)	7,540	N/A
2026	7,293	4,762
2031	7,353	4,801
2036	7,353	4,801
2041	7,317	4,778

The recent 2021 census data indicates that Bluewater's population is 7,540, suggesting a faster growth rate than previously predicted. The Municipality should consider this trend in future planning efforts.

6.2 Impact of Growth on Lifecycle Activities

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

Planning for forecasted population growth may require the expansion of existing infrastructure and services. As growth-related assets are constructed or acquired, they should be integrated into the Municipality’s AMP. While the addition of residential units will add to the existing assessment base and offset some of the costs associated with growth, the Municipality will need to review the lifecycle costs of growth-related infrastructure. These costs should be considered in long-term funding strategies that are designed to, at a minimum, maintain the current level of service.

7 Financial Strategy

Key Insights

- The Municipality is committing approximately $4.1 million towards capital projects per year from sustainable revenue sources
- Given the annual capital requirement of $9.6 million, there is currently a funding gap of $5.5 million annually
- For tax-funded assets, we recommend increasing tax revenues by 2.6% each year for the next 20 years to achieve a sustainable level of funding
- For rate-funded sanitary sewer network, we recommend increasing tax revenues by 1.1% each year for the next 10 years to achieve a sustainable level of funding
- For the rate-funded water network, we recommend increasing tax revenues by 1.2% each year for the next 10 years to achieve a sustainable level of funding

7.1 Financial Strategy Overview

For an asset management plan to be effective and meaningful, it must be integrated with financial planning and long-term budgeting. The development of a comprehensive financial plan will allow Municipality of Bluewater to identify the financial resources required for sustainable asset management based on existing asset inventories, desired levels of service, and projected growth requirements.

This report develops such a financial plan by presenting several scenarios for consideration and culminating with final recommendations. As outlined below, the scenarios presented model different combinations of the following components:

1. The financial requirements for:
    a. Existing assets
    b. Existing service levels
    c. Requirements of contemplated changes in service levels (none identified for this plan)
    d. Requirements of anticipated growth (none identified for this plan)
2. Use of traditional sources of municipal funds:
    a. Tax levies
    b. User fees
    c. Debt
    d. Development charges
3. Use of non-traditional sources of municipal funds:
    a. Reallocated budgets
    b. Partnerships
    c. Procurement methods
4. Use of Senior Government Funds:
    a. CCBF
    b. Annual grants

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

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

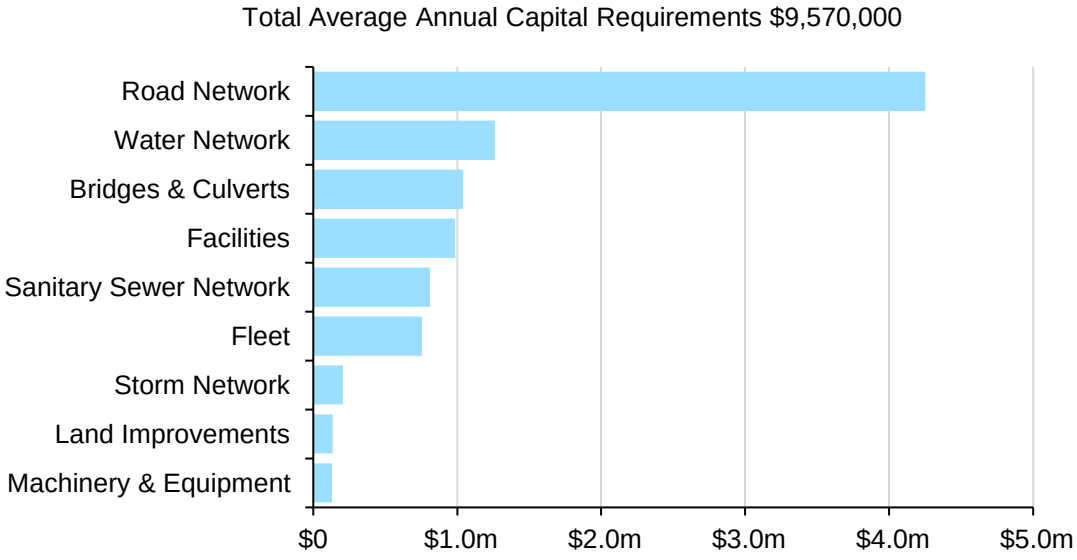
1. To reduce financial requirements, consideration has been given to revising service levels downward.

2. All asset management and financial strategies have been considered. For example:
    a. If a zero-debt policy is in place, is it warranted? If not the use of debt should be considered.
    b. Do user fees reflect the cost of the applicable service? If not, increased user fees should be considered.

7.1.1 Annual Requirements & Capital Funding

Annual Requirements

The annual requirements represent the amount the Municipality should allocate annually to each asset category to meet replacement needs as they arise, prevent infrastructure backlogs and achieve long-term sustainability. In total, the Municipality must allocate approximately $9.6 million annually to address capital requirements for the assets included in this AMP.



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.

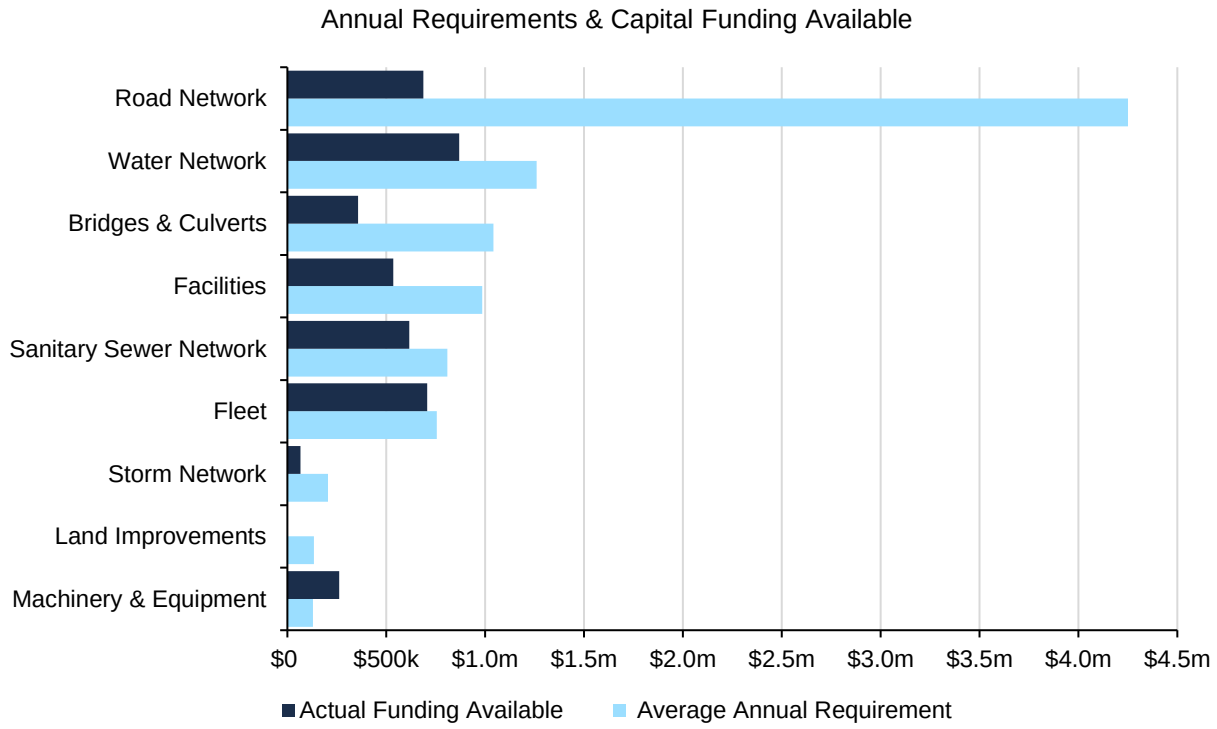
However, where applicable, lifecycle management strategies have been developed to identify capital costs that are realized through strategic rehabilitation and renewal of some of the main assets in these categories. The development of these strategies allows for a comparison of potential cost avoidance if the strategies were to be implemented. The following table compares two scenarios for the Road Network and Sanitary sewer network:

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

The implementation of a proactive lifecycle strategy leads to a potential annual cost avoidance and better overall performance. As the lifecycle strategy scenario represents the lowest cost option available to the Municipality, we have used these annual requirements in the development of the financial strategy.

Annual Funding Available

Based on a historical analysis of sustainable capital funding sources, the Municipality is committing approximately $4.1 million towards capital projects per year. Given the annual capital requirement of $9.6 million, there is currently a funding gap of $5.5 annually.



7.2 Funding Objective

We have developed a scenario that would enable Bluewater to achieve full funding within 1 to 20 years for the following assets:

- **Tax Funded Assets:** Road Network, Bridges & Culverts, Storm Network, Facilities, Land Improvements, Fleet, and Machinery & Equipment
- **Rate Funded Assets:** Water Network, and Sanitary Sewer Network

Note: For the purposes of this AMP, we have excluded gravel/dirt roads since they are a perpetual maintenance asset and end of life replacement calculations do not normally apply. If gravel roads are maintained properly, they can theoretically have a limitless service life.

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

7.3 Financial Profile: Tax Funded Assets

7.3.1 Current Funding Position

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

Asset Category	Avg. Annual Requirement	Annual Funding Available					Annual Deficit
		Taxes to Reserves[15]	Government Transfers[16]	Vibrancy	Marina Operator Contribution[17]	Total Available	
Bridges & Culverts	$1,042,000		$357,000			$357,000	$685,000
Facilities	$986,000	$303,000		$227,000	$5,000	$535,000	$451,000
Land Improvements	$134,000					$0	$134,000
Machinery & Equipment	$129,000	$92,000		$170,000		$262,000	($133,000)
Road Network	$4,250,000	$212,000	$475,000			$687,000	$3,563,000
Storm Network	$205,000		$66,000			$66,000	$139,000
Fleet	$755,000	$537,000		$170,000		$707,000	$48,000
	$7,501,000	**$1,144,000**	**$898,000**	**$567,000**	**$5,000**	**$2,614,000**	**$4,887,000**

The average annual investment requirement for the above categories is approximately $7.5 million. Annual revenue currently allocated to these assets for capital purposes is approximately $2.6 million leaving an annual deficit of about $4.9 million. Put differently, these infrastructure categories are currently funded at 34.8% of their long-term requirements.

[15] 3-year rolling average

[16] Government transfers include CCBF of $236 thousand and OCIF of $662 thousand

[17] Per agreement, the marina operator contributes $5 thousand annually

7.3.2 Full Funding Requirements

In 2023, Bluewater had budgeted annual tax revenues of $9.5 million. As illustrated in the following table, without consideration of any other sources of revenue or cost containment strategies, full funding would require the following tax change over time:

Asset Category	Tax Change Required for Full Funding
Bridges & Culverts	7.2%
Facilities	4.8%
Land Improvements	1.4%
Machinery & Equipment	-1.4%
Road Network	37.6%
Storm Network	1.5%
Fleet	0.5%
Weighted Average Total	**51.6%**

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

	Net Infrastructure Deficit			
	5 Years	10 Years	15 Years	20 Years
Net Infrastructure Deficit:	$4,887,000	$4,887,000	$4,887,000	$4,887,000
Tax Increase Required	51.6%	51.6%	51.6%	51.6%
Annually:	**10.3%**	**5.2%**	**3.4%**	**2.6%**

7.3.3 Financial Strategy Recommendations

Considering all the above information, we recommend the 20-year option. This involves full funding being achieved over 20 years by:

a) increasing tax revenue by 2.6% each year for the next 20 years solely for the purpose of phasing in full funding to the asset categories covered in this section of the AMP.
b) adjusting tax revenue increases in future year(s) when allocations to capex exceed or fail to meet budgeted amounts.
c) allocating the CCBF, OCIF revenue, Taxes to Reserves, Vibrancy and Annual Marina Operator Contribution as outlined previously.

d) allocating the scheduled OCIF grant increases to the infrastructure deficit as they occur.
e) reallocating appropriate revenue from categories in a surplus position to those in a deficit position, when applicable.
f) increasing existing and future infrastructure budgets by the applicable inflation index on an annual basis in addition to the deficit phase-in.

Notes:

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

Although this option achieves full capex funding within 20 years and provides financial sustainability over the period modeled, the recommendations do require prioritizing capital projects to fit the resulting annual funding available. Current data shows a pent-up investment demand of $2,080,000, for tax funded 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.

7.4 Financial Profile: Rate Funded Assets

7.4.1 Current Funding Position

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

Asset Category	Avg. Annual Requirement	Rates	To Operations	Total Available	Annual Deficit
Water Network	$1,260,000	$3,159,000	($2,291,000)	$868,000	$392,000
Sanitary Sewer Network	$809,000	$1,802,000	($1,186,000)	$616,000	$193,000
	$2,069,000	**$4,961,000**	**($3,477,000)**	**$1,484,000**	**$585,000**

The average annual investment requirement for the above categories is $2.1 million. Annual revenue currently allocated to these assets for capital purposes is $1.5 million leaving an annual deficit of $585,000. Put differently, these infrastructure categories are currently funded at 71.7% of their long-term requirements.

7.4.2 Full Funding Requirements

In 2023, the Bluewater had budgeted annual water and sanitary revenues of $3,159,000 and $1,802,000 respectively. As illustrated in the table below, without consideration of any other sources of revenue, full funding would require the following changes over time:

Asset Category	Tax Change Required for Full Funding
Water Network	12.4%
Sanitary Sewer Network	10.7%
Weighted Average Total	**11.8%**

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

	Water Network			
	5 Years	10 Years	15 Years	20 Years
Net Infrastructure Deficit:	$392,000	$392,000	$392,000	$392,000
Rate Increase Required	12.4%	12.4%	12.4%	12.4%
Annually:	**2.5%**	**1.2%**	**0.8%**	**0.6%**

	Sanitary Sewer Network			
	5 Years	10 Years	15 Years	20 Years
Resulting Infrastructure Deficit:	$193,000	$193,000	$193,000	$193,000
Rate Increase Required	10.7%	10.7%	10.7%	10.7%
Annually:	**2.1%**	**1.1%**	**0.7%**	**0.5%**

7.4.3 Financial Strategy Recommendations

Considering all the above information, we recommend the 10-year options for both the water network and the sanitary network. This involves full funding being achieved by:

a) increasing rate revenues by 1.2% for water services each year for the next 10 years and 1.1% for sanitary services each year for the next 10 years solely for the purpose of phasing in full funding to 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 full funding on an annual basis in 5 years for the water network and 10 years for the sanitary network and provides financial sustainability over the period modeled, the recommendations do require prioritizing

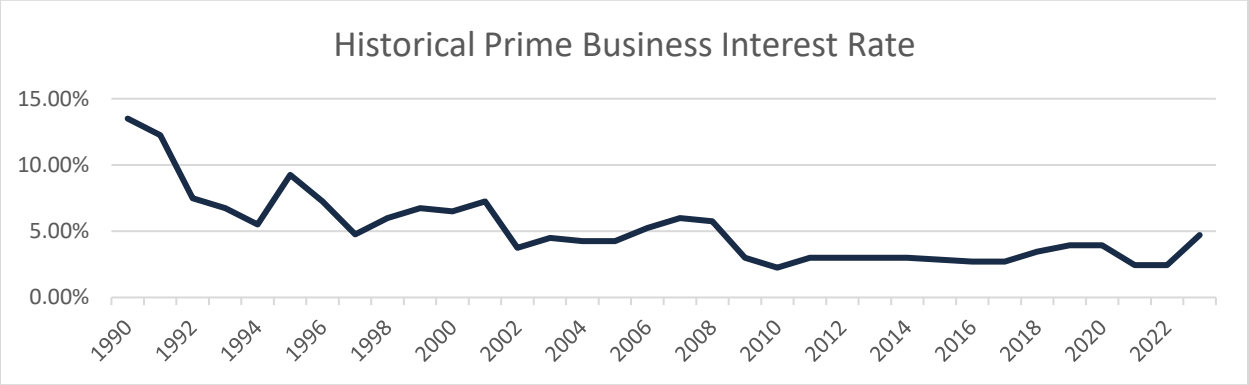
capital projects to fit the resulting annual funding available. Current data shows the pent-up investment demand of $1,106,000 in backlog, for rate-funded assets.

7.5 Use of Debt

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

- the ability to stabilize tax & user rates when dealing with variable and sometimes uncontrollable factors
- equitable distribution of the cost/benefits of infrastructure over its useful life
- a secure source of funding
- flexibility in cash flow management

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



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

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

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

A change in 15-year rates from 3% to 6% would change the premium from 26% to 54%. Such a change would have a significant impact on a financial plan.

The following tables outline how Bluewater has historically used debt for investing in the asset categories as listed. There is currently $12,682,000 of debt outstanding for the assets covered by this AMP with corresponding principal and interest payments of $986,000 (2024), well within its provincially prescribed maximum of $3,359,140.

Asset Category	Current Debt Outstanding	Use of Debt in the Last Five Years				
		2018	2019	2020	2021	2022
Bridges & Culverts	-	-	-	-	-	-
Facilities	-	-	-	-	-	-
Land Improvements	-	-	-	-	-	-
Machinery & Equipment	-	-	-	-	-	-
Road Network	-	-	-	-	-	-
Storm Network	-	-	-	-	-	-
Fleet	-	-	-	-	-	-
Total Tax Funded:	**-**	**-**	**-**	**-**	**-**	**-**
Water Network	$11,259,000	**-**	**-**	**-**	**-**	$3,632,000
Sanitary Sewer Network	$1,423,000	**-**	**-**	**-**	**-**	-
Total Special Service Tax funded:	**$12,682,000**	**-**	**-**	**-**	**-**	**$3,632,000**

Asset Category	Principal & Interest Payments in the Next Ten Years						
	2024	2025	2026	2027	2028	2029	2034
Bridges & Culverts	-	-	-	-	-	-	-
Facilities	-	-	-	-	-	-	-
Land Improvements	-	-	-	-	-	-	-
Machinery & Equipment	-	-	-	-	-	-	-
Road Network	-	-	-	-	-	-	-
Storm Network	-	-	-	-	-	-	-
Fleet	-	-	-	-	-	-	-
Total Tax Funded:	-	-	-	-	-	-	-
Water Network	$766,000	$1,161,000	$1,161,000	$1,161,000	$1,161,000	$1,053,000	$811,000
Sanitary Sewer Network	$220,000	$220,000	$220,000	$220,000	$220,000	$114,000	
Total Special Service Tax funded:	**$986,000**	**$1,381,000**	**$1,381,000**	**$1,381,000**	**$1,381,000**	**$1,167,000**	**$811,000**

The revenue options outlined in this plan allow Bluewater to fully fund its long-term infrastructure requirements without further use of debt.

7.6 Use of Reserves

7.6.1 Available Reserves

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

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

By asset category, the table below outlines the details of the reserves currently available to Bluewater.

Asset Category	Balance at December 31, 2022
Bridges & Culverts	$775,000
Facilities	$1,160,000
Land Improvements	$801,000
Machinery & Equipment	$1,165,000
Road Network	$1,863,000
Storm Network	$50,000
Fleet	$1,084,000
Total Tax Funded:	**$6,898,000**
Water Network	$4,081,000
Sanitary Sewer Network	$2,071,000
Total Rate Funded:	**$6,152,000**

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

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

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

7.6.2 Recommendation

In 2025, Ontario Regulation 588/17 will require Bluewater to integrate proposed levels of service for all asset categories in its asset management plan update. We recommend that future planning should reflect adjustments to service levels and their impacts.

8 Appendices

Key Insights

- Appendix A identifies projected 10-year capital requirements for each asset category
- Appendix B includes several maps that have been used to visualize the current level of service
- Appendix C provides additional guidance on the development of a condition assessment program

Appendix A: 10-Year Capital Requirements

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

Road Network

Asset Segment	Backlog	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032
Paved Roads	$883k	$2.4m	$10.5m	$3.4m	$16.3m	$3.0m	$11.5m	$710k	$0	$0	$0
Sidewalks	$821k	$0	$0	$688k	$0	$0	$0	$0	$0	$0	$0
Streetlights	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Dirt Roads	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Unpaved Roads	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
	$1.7m	**$2.4m**	**$10.5m**	**$4.1m**	**$16.3m**	**$3.0m**	**$11.5m**	**$710k**	**$0**	**$0**	**$0**

Bridges & Culverts

Asset Segment	Backlog	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032
Bridges	$0	$1.6m	$308k	$1.7m	$613k	$589k	$0	$0	$0	$341k	$0
Culverts	$0	$613k	$763k	$13k	$313k	$40k	$401k	$0	$0	$3.3m	$0
	$0	**$2.2m**	**$1.1m**	**$1.7m**	**$926k**	**$629k**	**$401k**	**$0**	**$0**	**$3.7m**	**$0**

Storm Network

Asset Segment	Backlog	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032
Storm Mains	$80k	$0	$372k	$0	$0	$0	$10k	$0	$0	$0	$0
	$80k	**$0**	**$372k**	**$0**	**$0**	**$0**	**$10k**	**$0**	**$0**	**$0**	**$0**

Facilities											
Asset Segment	Backlog	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032
General Government	$0	$0	$0	$0	$0	$0	$0	$75k	$0	$0	$0
Leased Facilities	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Protection	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Recreation	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Transportation	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
	$0	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$75k**	**$0**	**$0**	**$0**

Land Improvements											
Asset Segment	Backlog	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032
Parking Lots	$0	$0	$161k	$0	$0	$0	$205k	$0	$10k	$0	$0
Parks & Recreation	$0	$0	$770k	$150k	$100k	$225k	$0	$0	$0	$0	$485k
	$0	**$0**	**$931k**	**$150k**	**$100k**	**$225k**	**$205k**	**$0**	**$10k**	**$0**	**$485k**

Machinery & Equipment											
Asset Segment	Backlog	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032
General Government	$0	$25k	$50k	$25k	$0	$25k	$98k	$25k	$0	$25k	$50k
Parks & Recreation	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Protection	$0	$62k	$801k	$92k	$0	$62k	$0	$62k	$57k	$35k	$55k
Transportation	$0	$0	$0	$0	$0	$8k	$0	$0	$0	$0	$0
	$0	**$87k**	**$851k**	**$117k**	**$0**	**$95k**	**$98k**	**$87k**	**$57k**	**$60k**	**$105k**

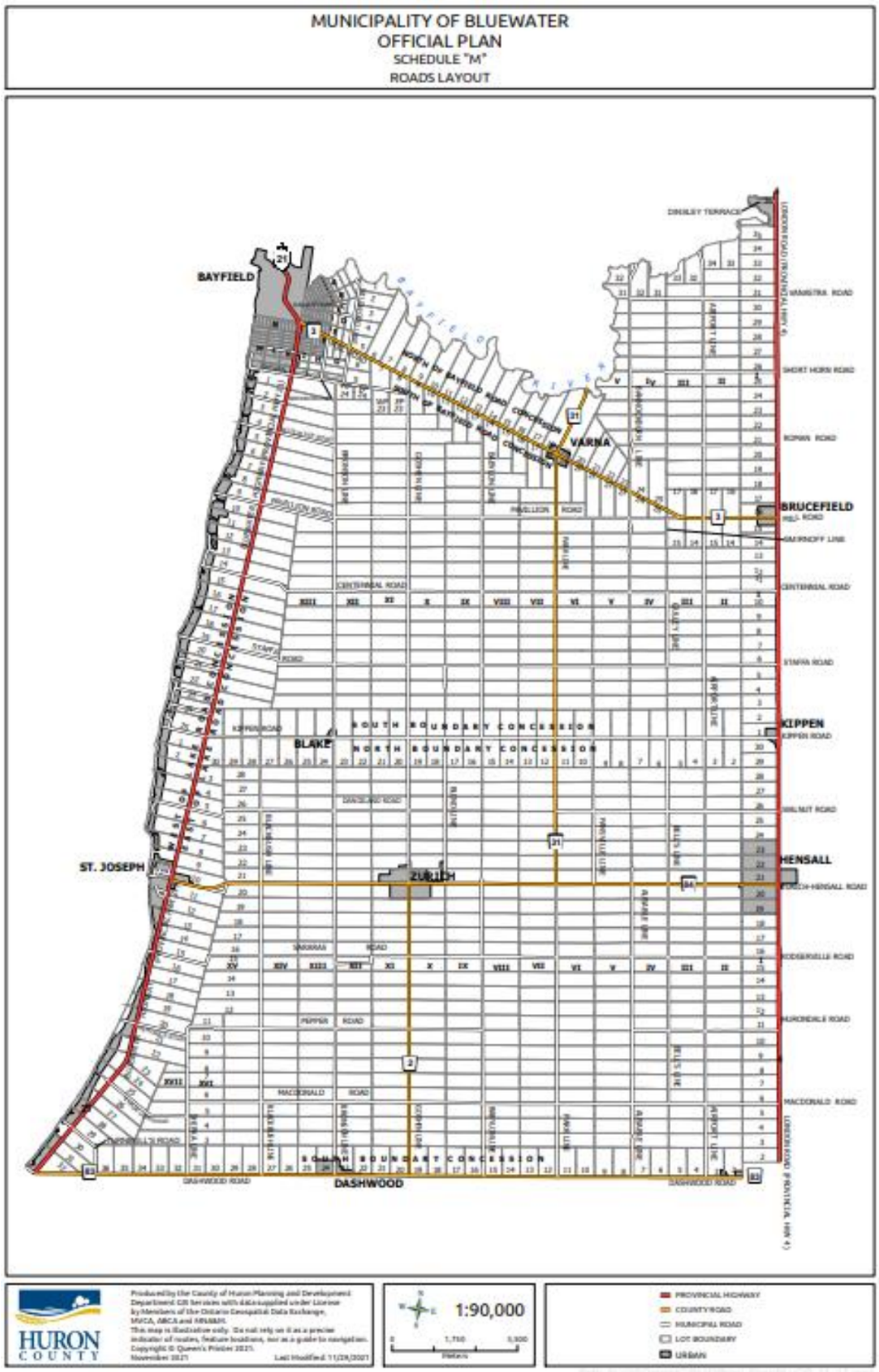
Fleet											
Asset Segment	Backlog	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032
Development Services	$0	$0	$0	$0	$0	$0	$0	$56k	$0	$0	$56k
Parks & Recreation	$188k	$125k	$40k	$0	$112k	$27k	$192k	$0	$0	$125k	$152k
Protection	$460k	$0	$0	$0	$0	$850k	$1.5m	$850k	$680k	$0	$680k
Transportation	$948k	$847k	$138k	$405k	$0	$0	$421k	$800k	$0	$56k	$56k
	$1.6m	**$972k**	**$178k**	**$405k**	**$112k**	**$877k**	**$2.1m**	**$1.7m**	**$680k**	**$181k**	**$944k**

Water Network											
Asset Segment	Backlog	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032
Booster Station	$141k	$0	$0	$0	$0	$0	$0	$0	$0	$99k	$0
Pumphouses & Reservoirs	$0	$0	$0	$0	$0	$0	$0	$46k	$0	$0	$0
Valves & Chambers	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Water Towers	$0	$2.4m	$0	$0	$0	$0	$0	$0	$47k	$0	$0
Watermains	$227k	$1.5m	$0	$0	$0	$0	$0	$0	$0	$0	$0
Wells	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
WTP	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
	$368k	**$3.9m**	**$0**	**$0**	**$0**	**$0**	**$0**	**$46k**	**$47k**	**$99k**	**$0**

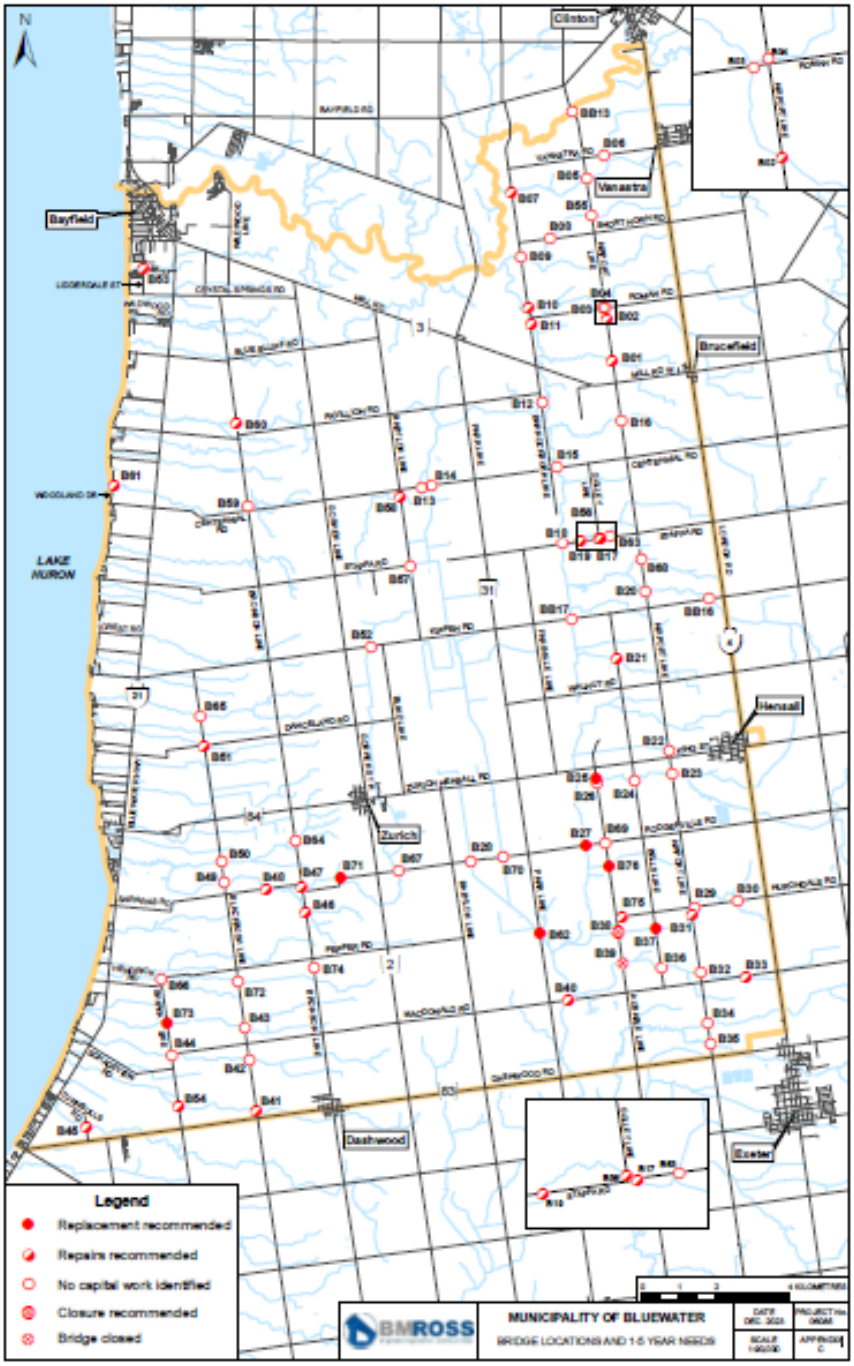
Sanitary Sewer Network											
Asset Segment	Backlog	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032
Inspection Chambers	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Lagoons	$284k	$4k	$0	$0	$298k	$0	$0	$0	$0	$386k	$0
Pumping Stations	$454k	$0	$0	$0	$0	$0	$0	$0	$0	$91k	$0
Sanitary Mains	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Wells & Pumping Stations	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
	$738k	**$4k**	**$0**	**$0**	**$298k**	**$0**	**$0**	**$0**	**$0**	**$477k**	**$0**

Appendix B: Level of Service Maps

Road Network Map

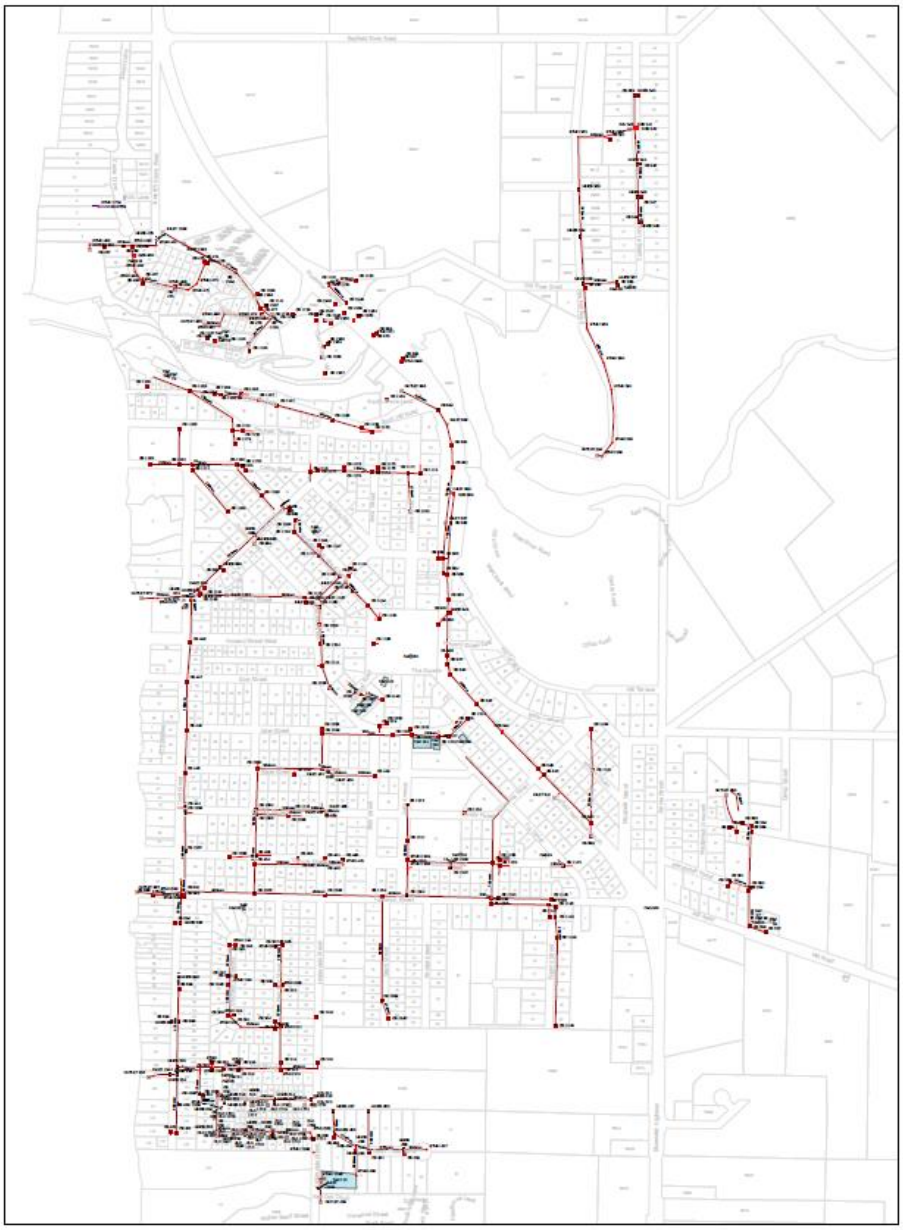


Bridges & Culverts Map

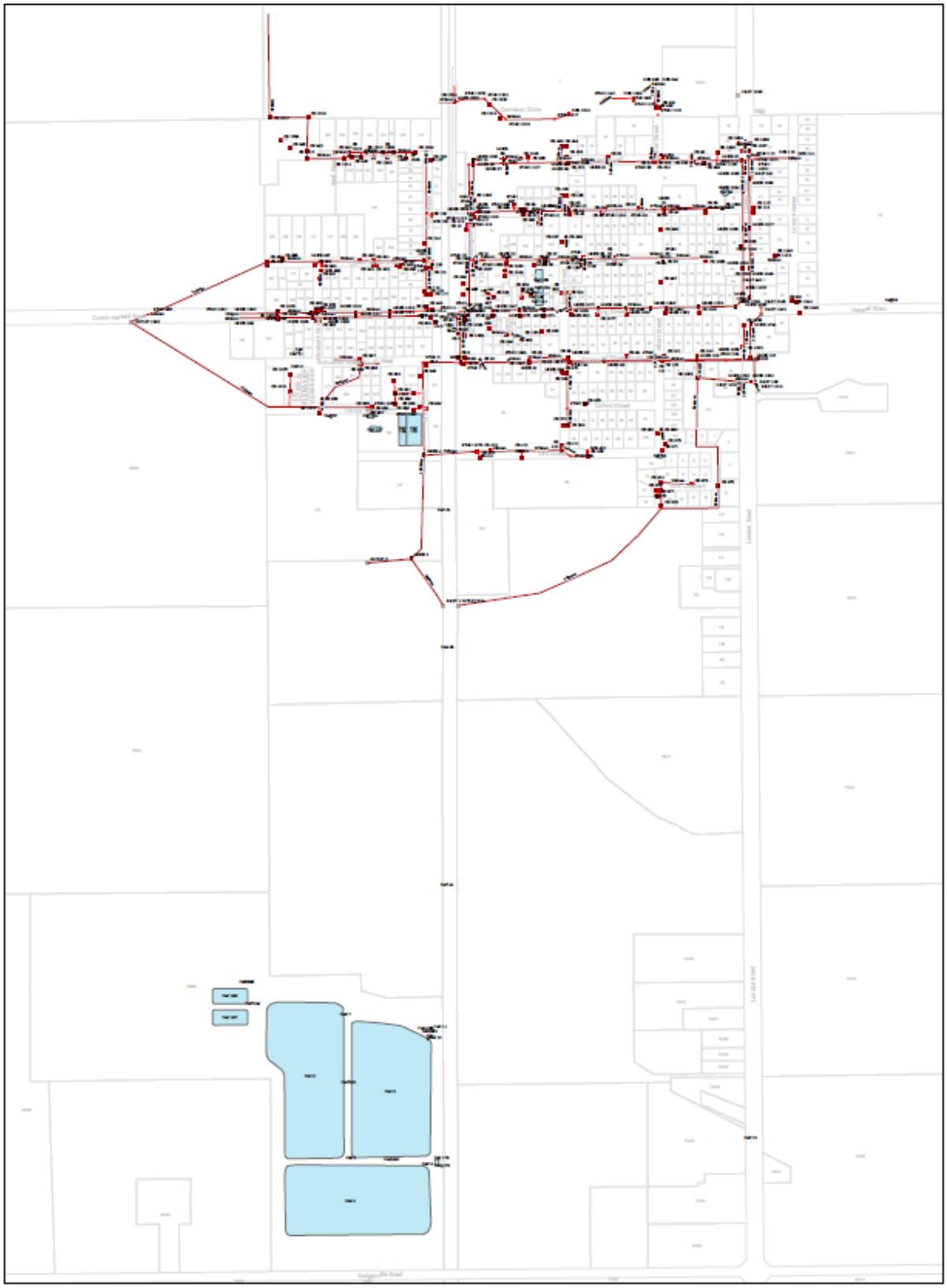


Storm Network Maps

Bayfield Stormwater Management System

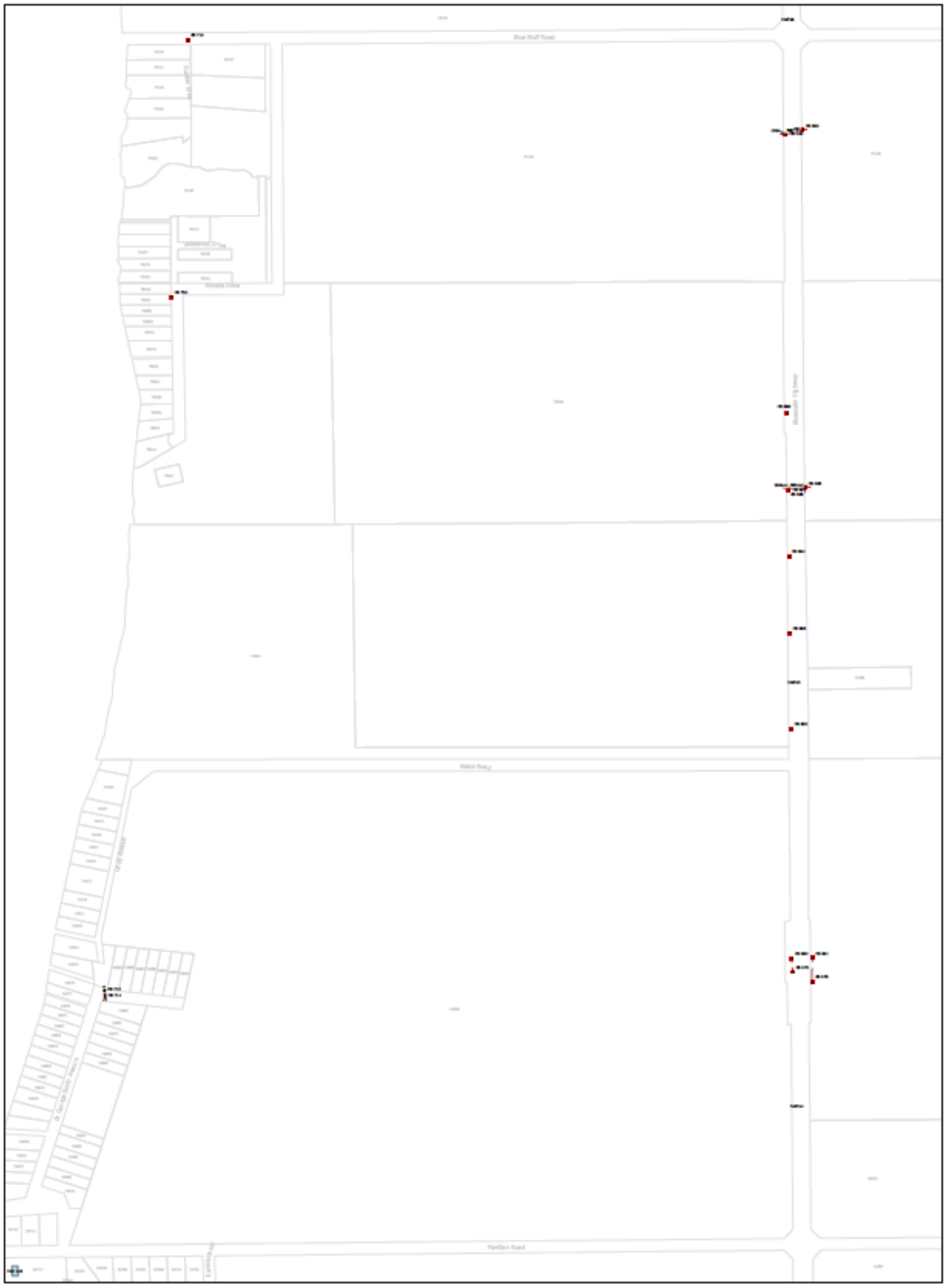


Hensall Stormwater Management System



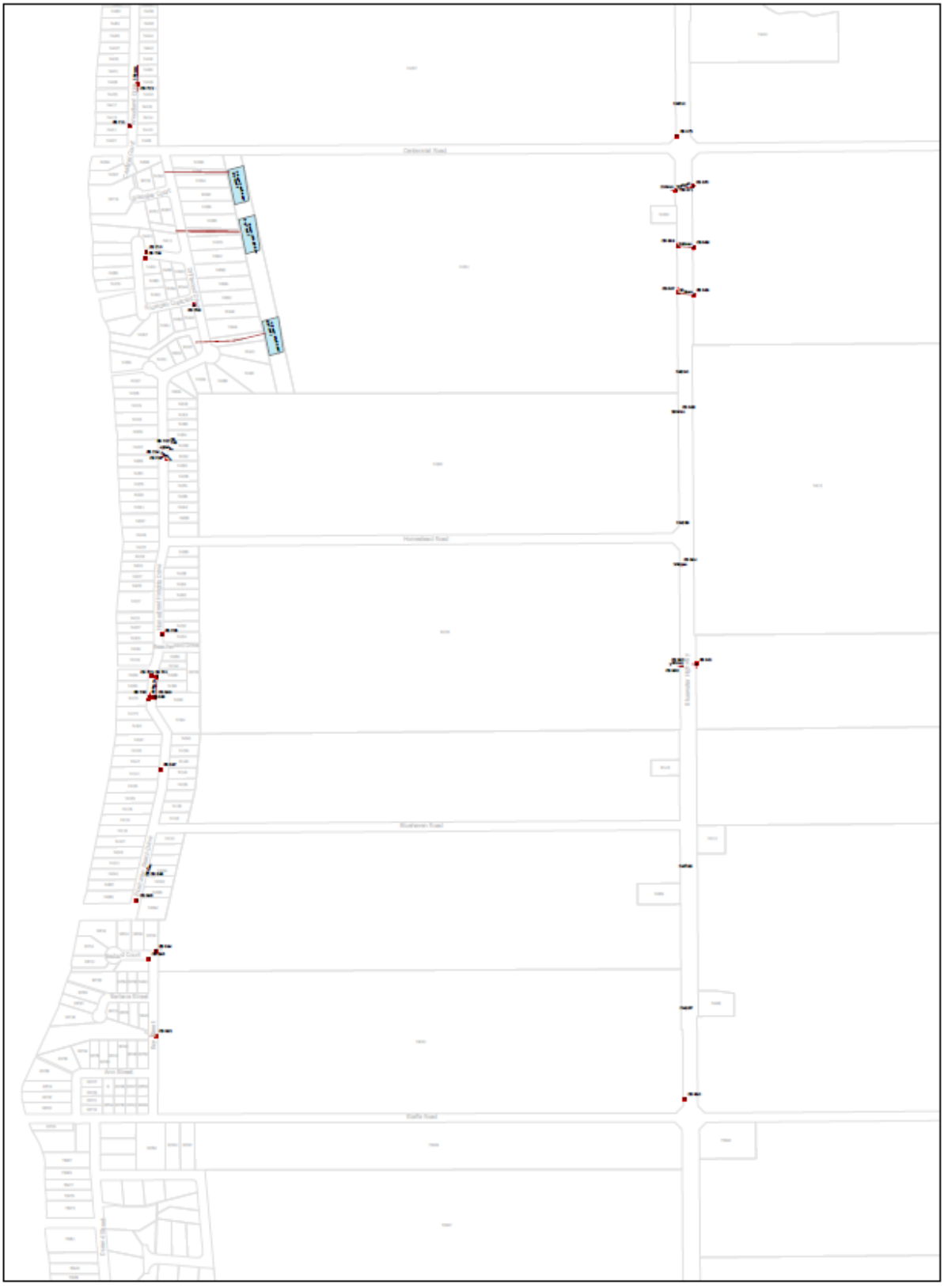
Lakeshore 1 - Paul Bunyan Rd to Blue Bluff Rd Storm System

Lakeshore 2 - Blue Bluff Rd to Pavillion Rd Storm System



Lakeshore 3 - Pavillion Rd to Centennial Rd Storm System

Lakeshore 4 - Centennial Rd to Staffa Rd Storm System

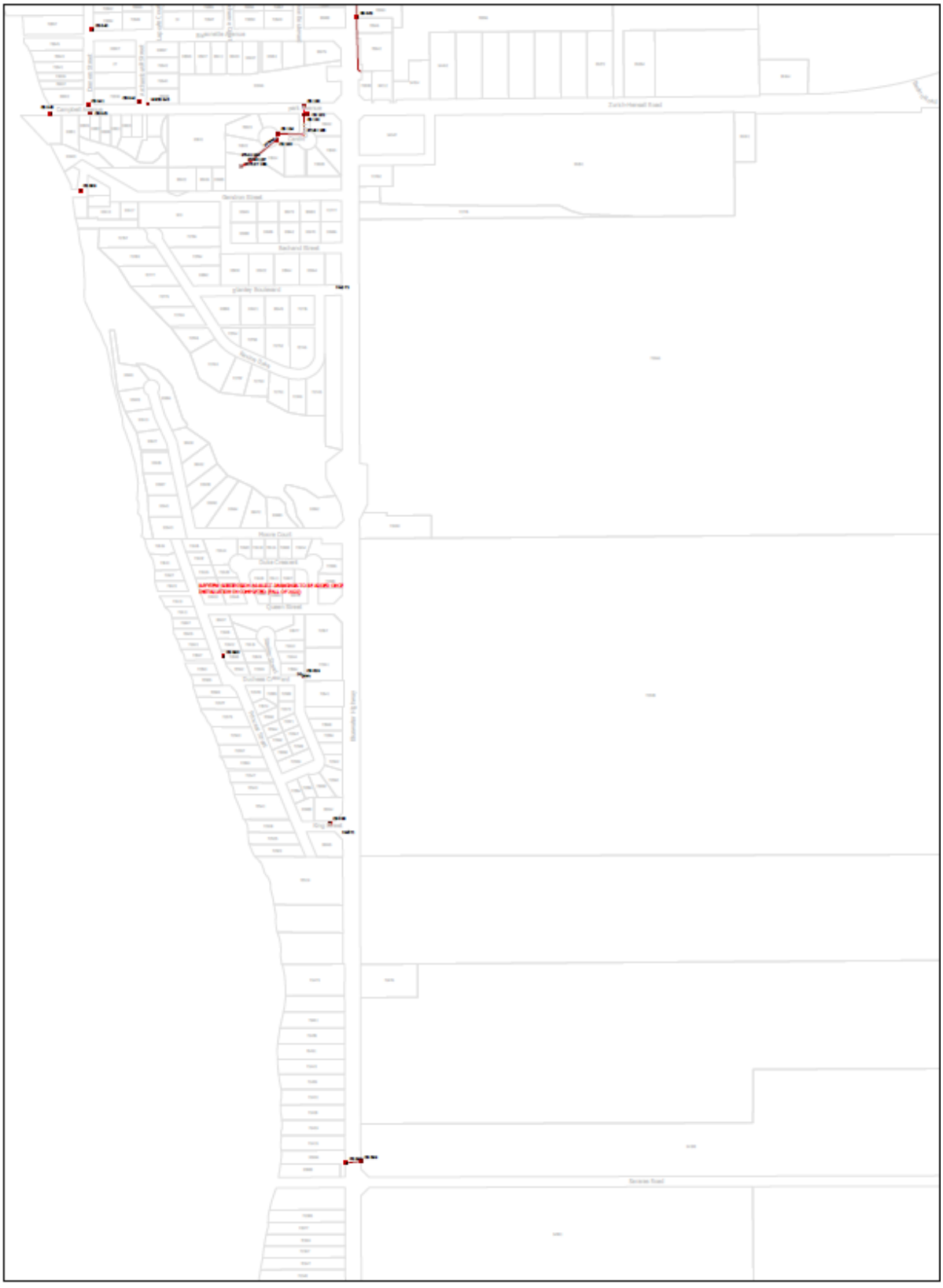


Lakeshore 5 - Staffa Rd to Kippen Rd Storm System

Lakeshore 6 - Kippen Rd to Danceland Rd Storm System

Lakeshore 7 - Danceland Rd to Zurich-Hensall Rd Storm System

Lakeshore 8 - Zurich-Hensall Rd to Sararas Rd Storm System



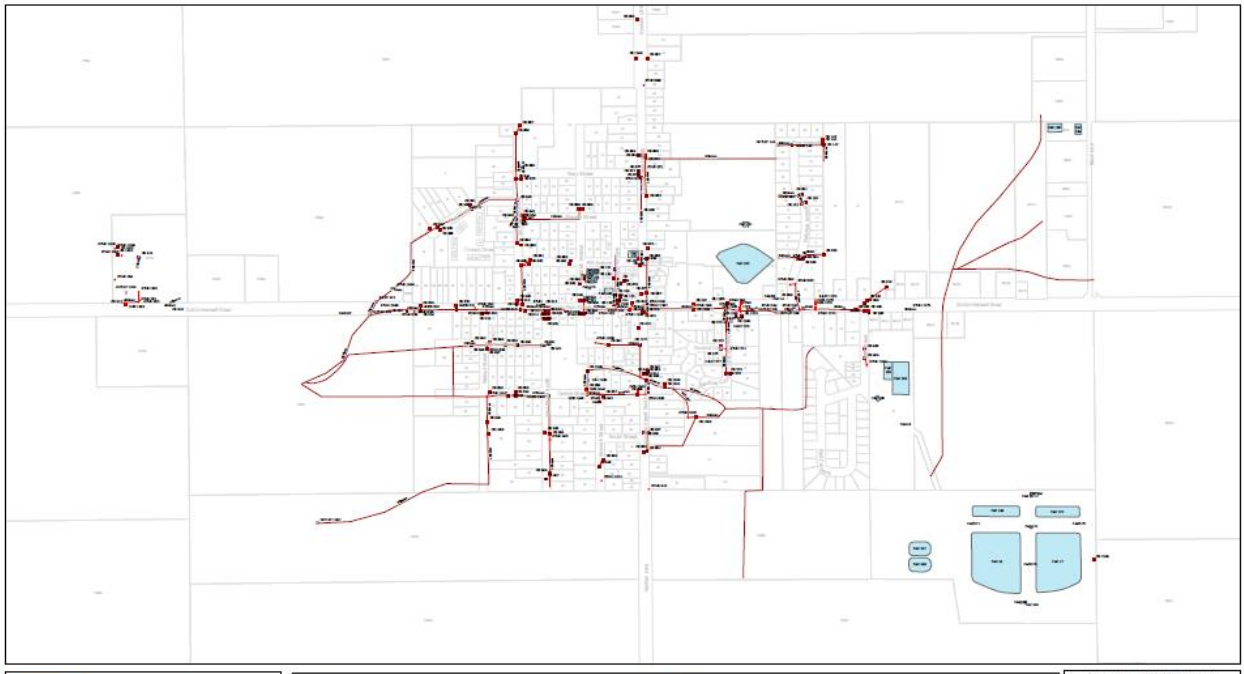
Lakeshore 9 - Sararas Rd to Hendrick Rd Storm System

Lakeshore 10 - Hendrick Rd to Schadeview Rd Storm System

Lakeshore 11 - Schadeview Rd to Dashwood Rd Storm System

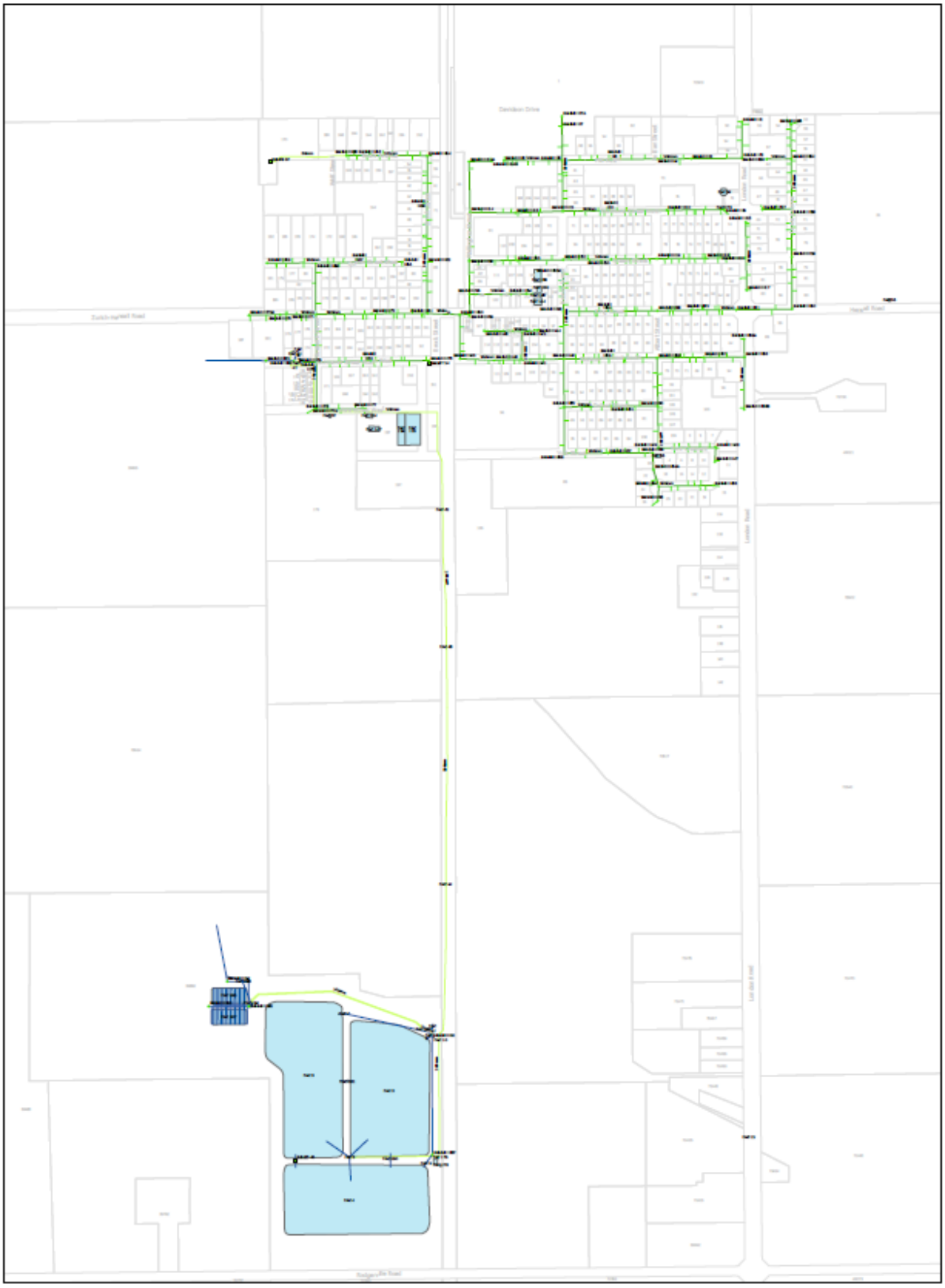
South of Clinton Storm System

Zurich Stormwater Management System

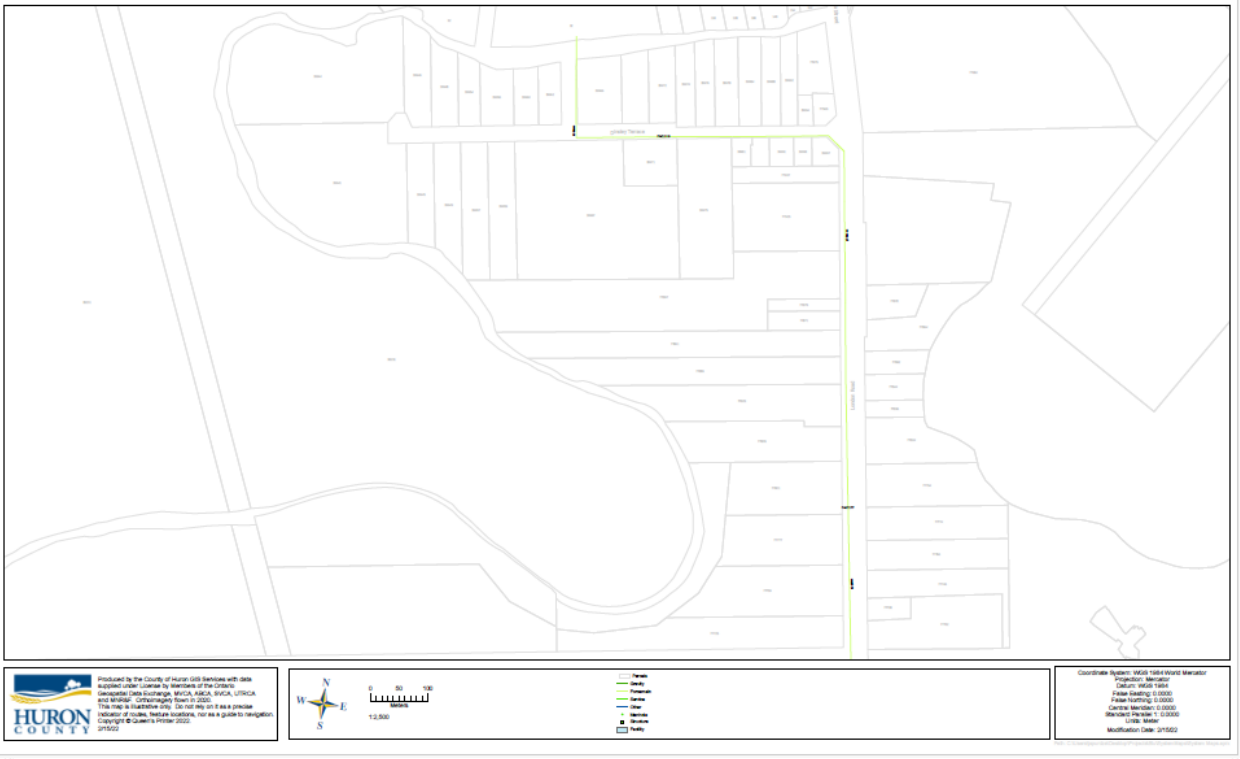


Sanitary Network Maps

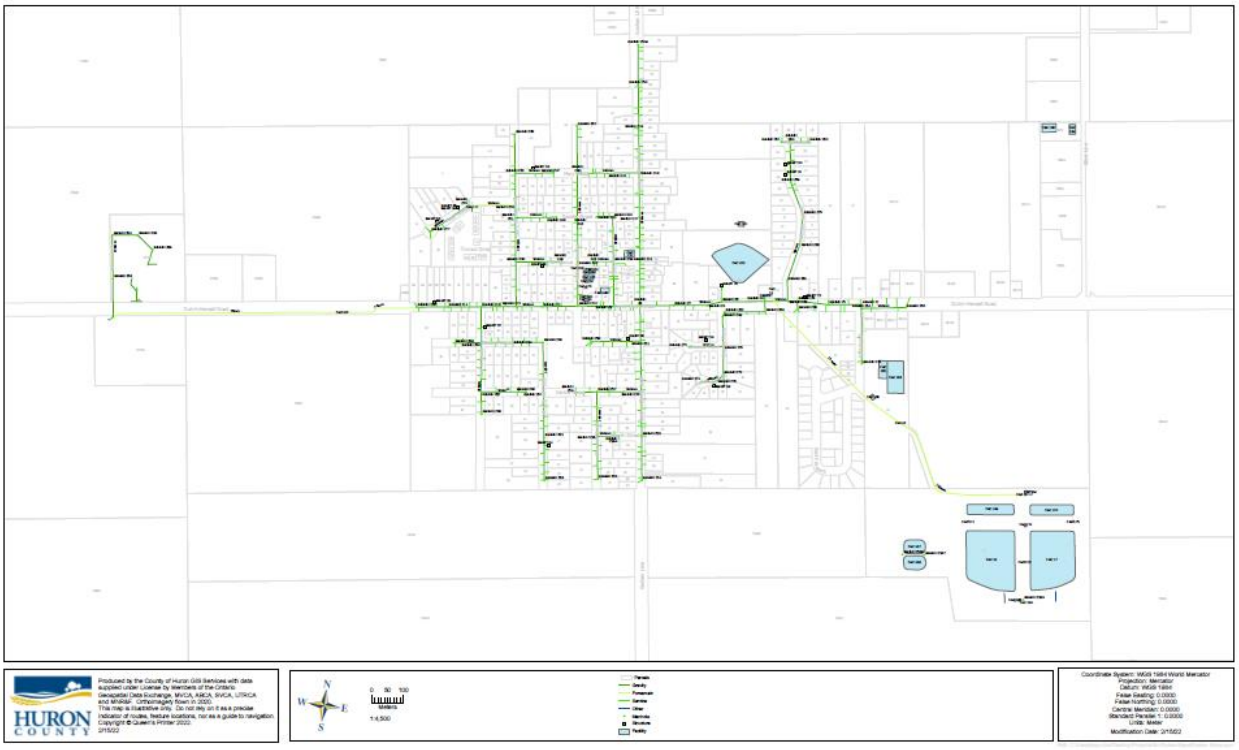
Hensall Sanitary System



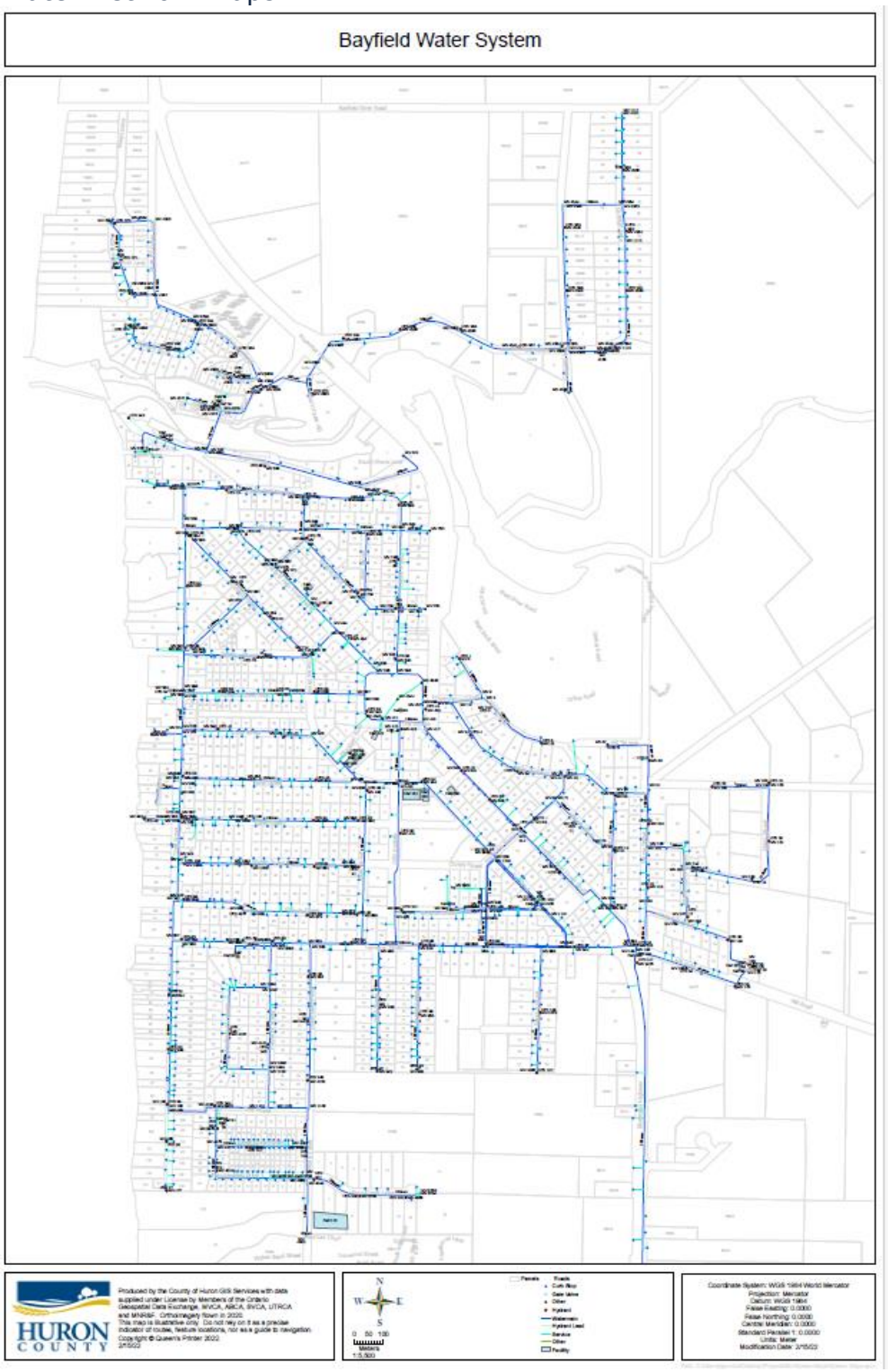
South of Clinton Sanitary System



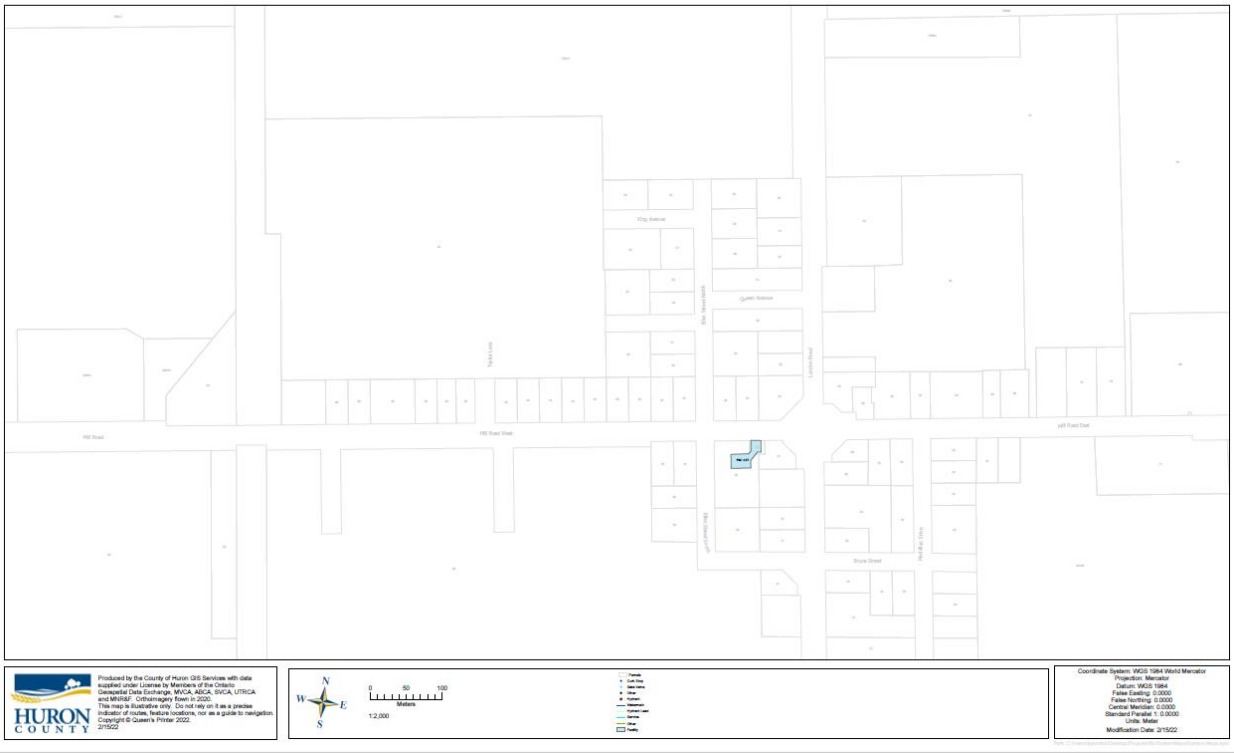
Zurich Sanitary System



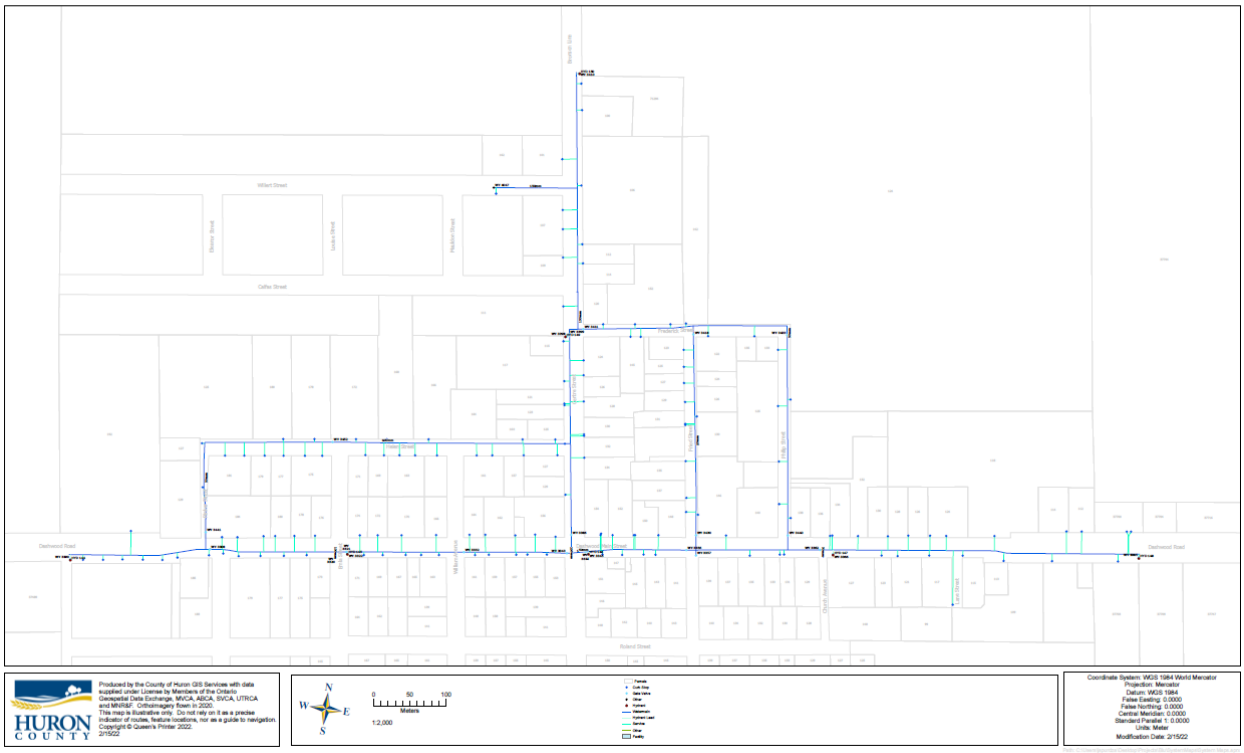
Water Network Maps



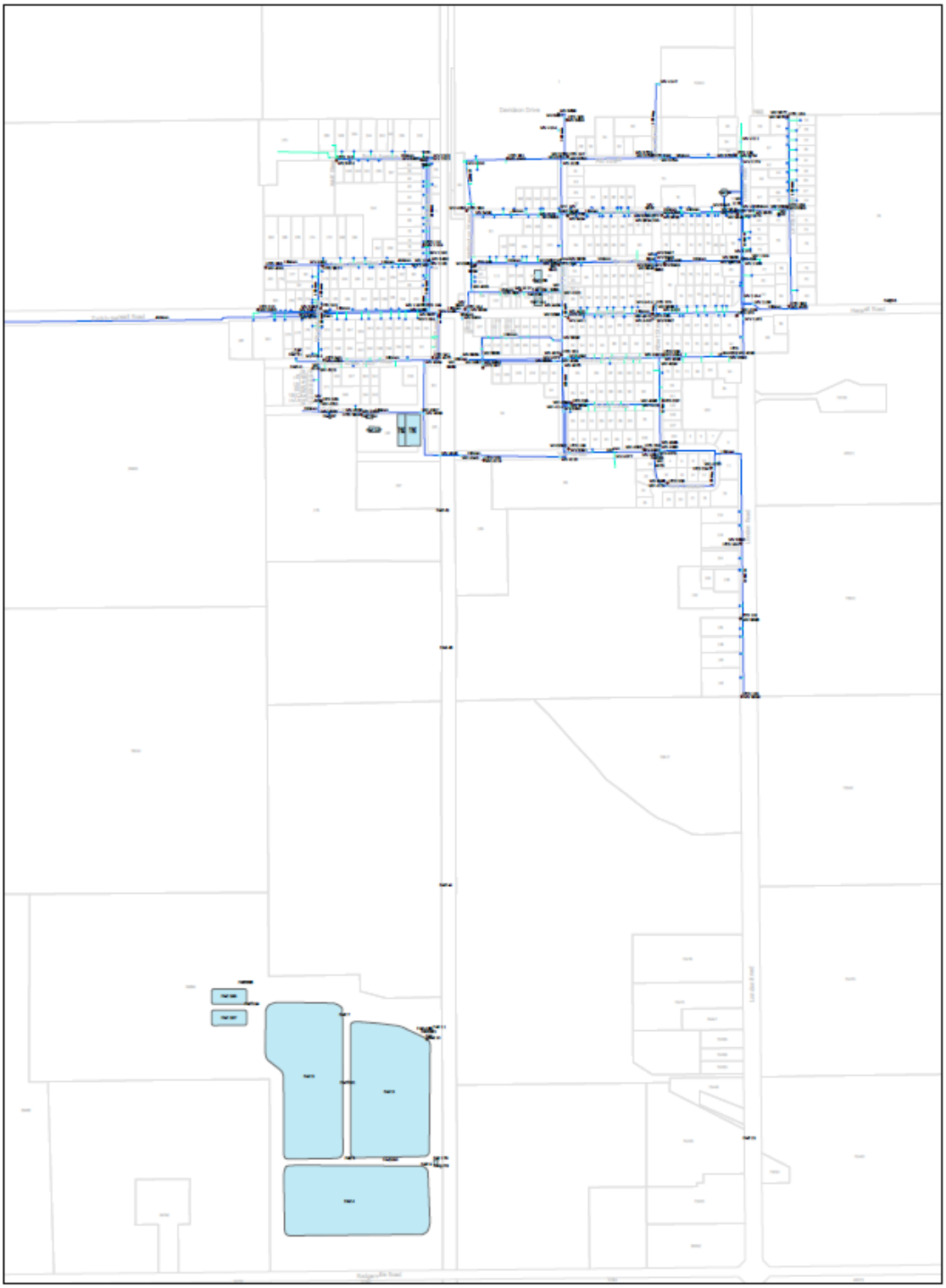
Brucefield Water System



Dashwood Water System



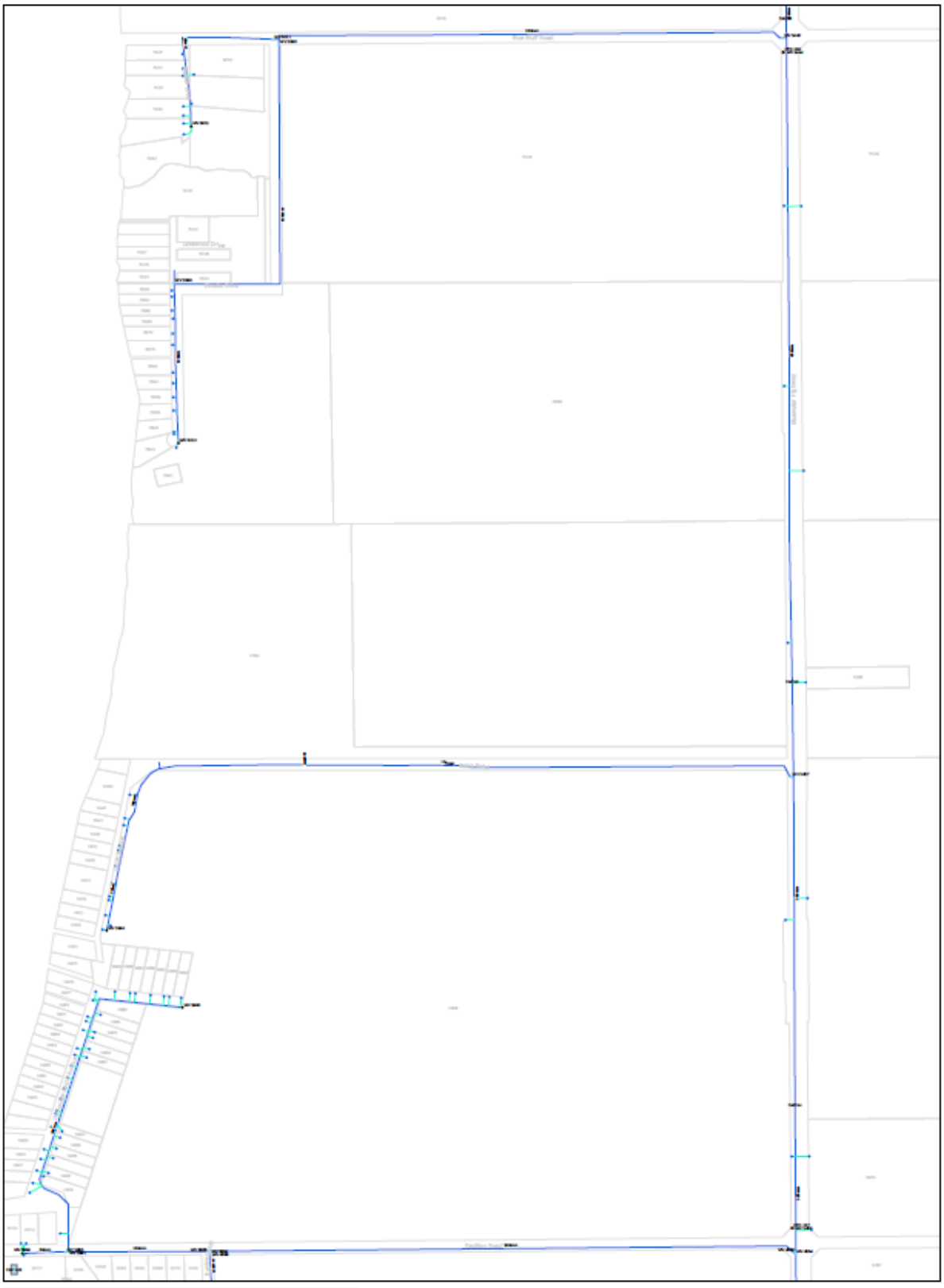
Hensall Water System



Kippen Water System

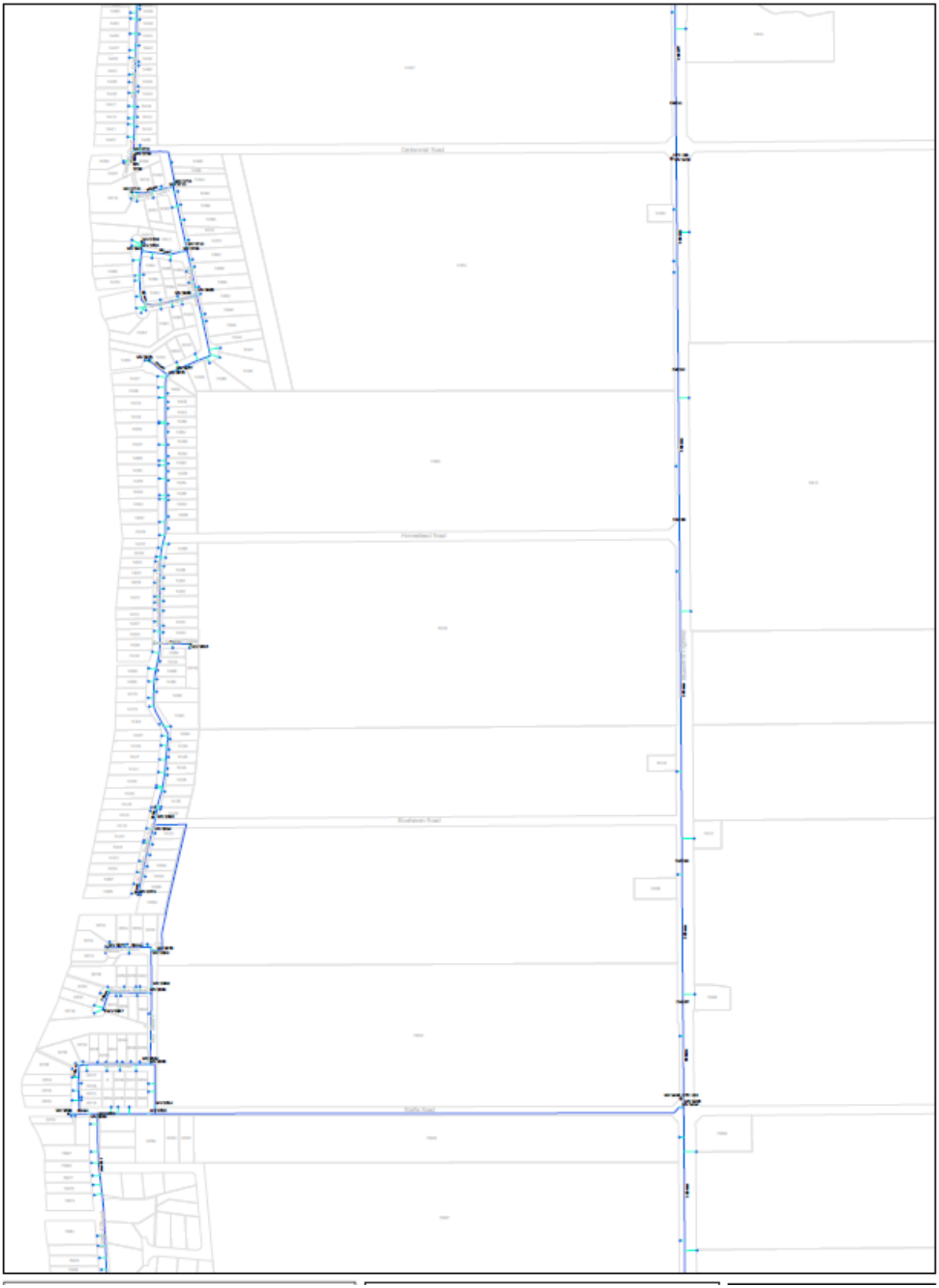
Lakeshore 1 - Paul Bunyan Rd to Blue Bluff Rd Water System

Lakeshore 2 - Blue Bluff Rd to Pavillion Rd Water System



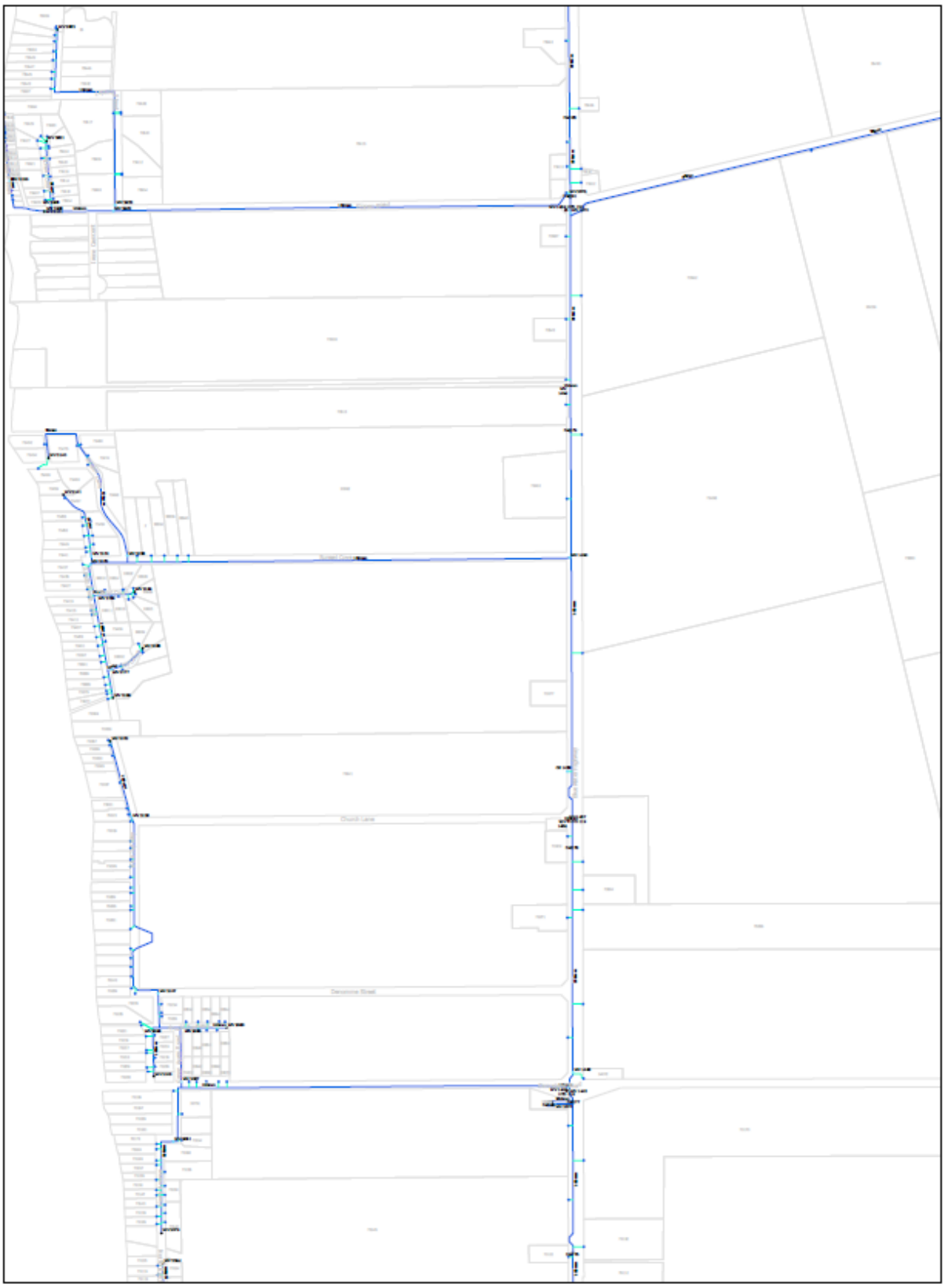
Lakeshore 3 - Pavillion Rd to Centennial Rd Water System

Lakeshore 4 - Centennial Rd to Staffa Rd Water System

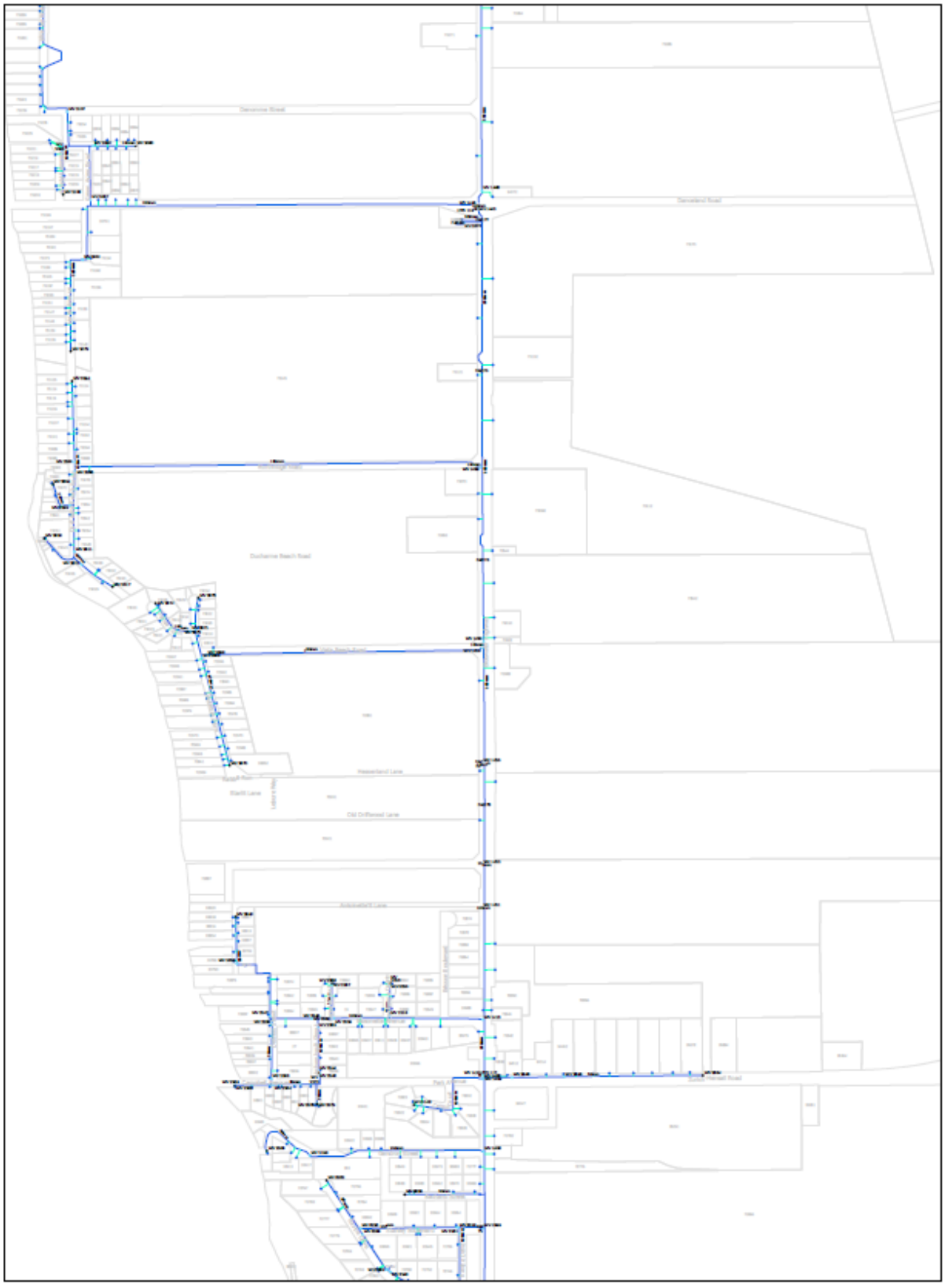


Lakeshore 5 - Staffa Rd to Kippen Rd Water System

Lakeshore 6 - Kippen Rd to Danceland Rd Water System

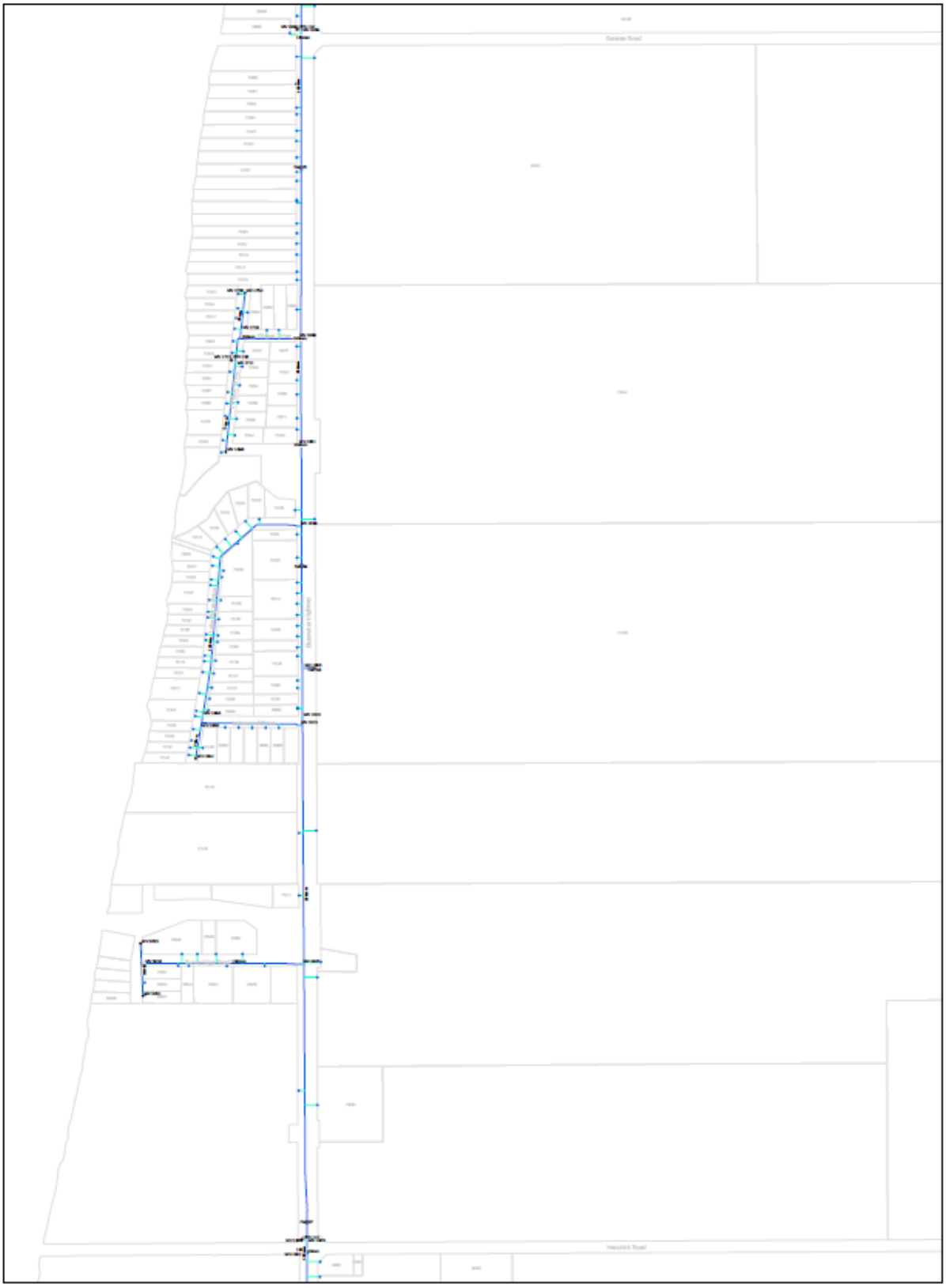


Lakeshore 7 - Danceland Rd to Zurich-Hensall Rd Water System

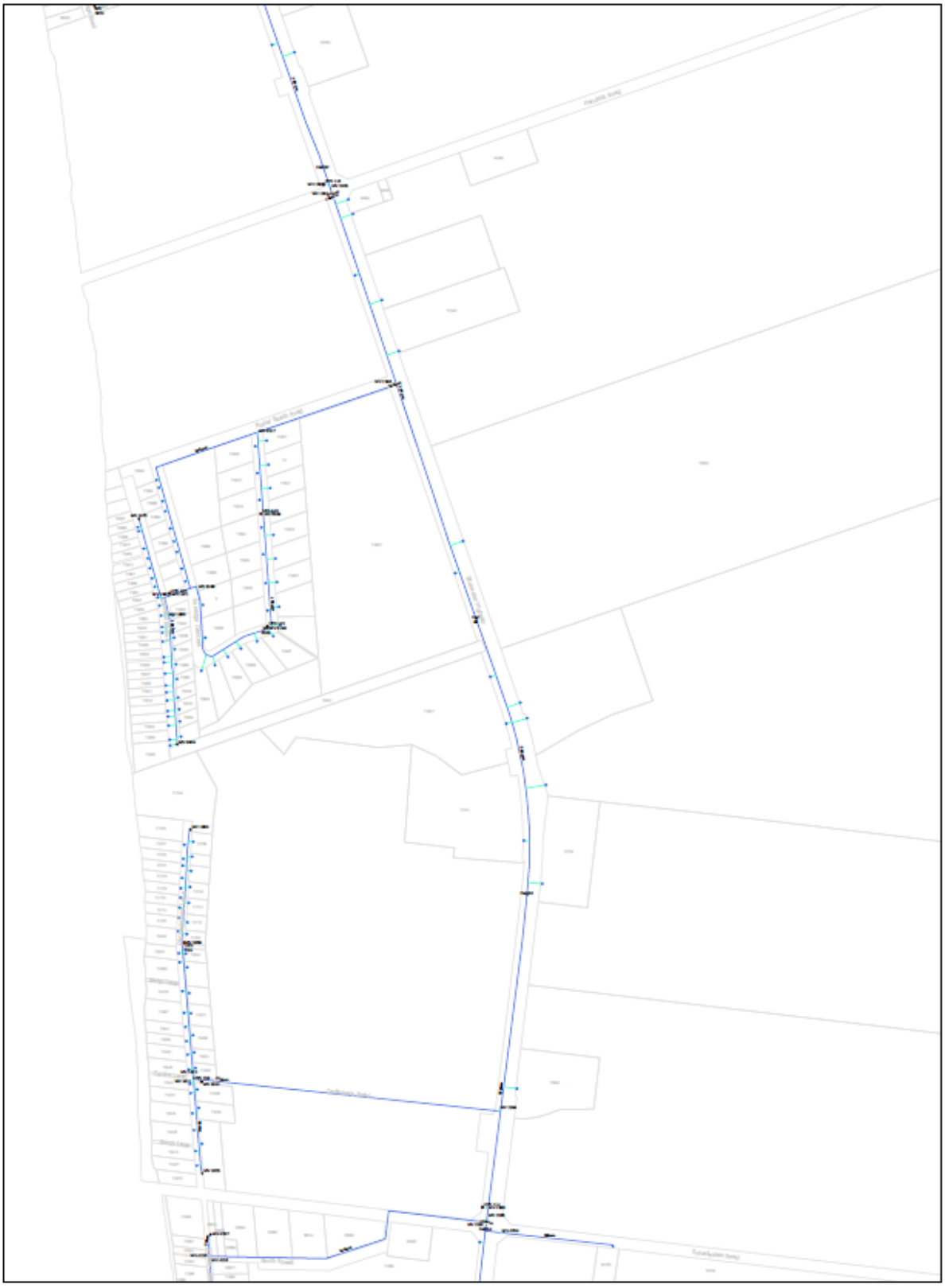


Lakeshore 8 - Zurich-Hensall Rd to Sararas Rd Water System

Lakeshore 9 - Sararas Rd to Hendrick Rd Water System

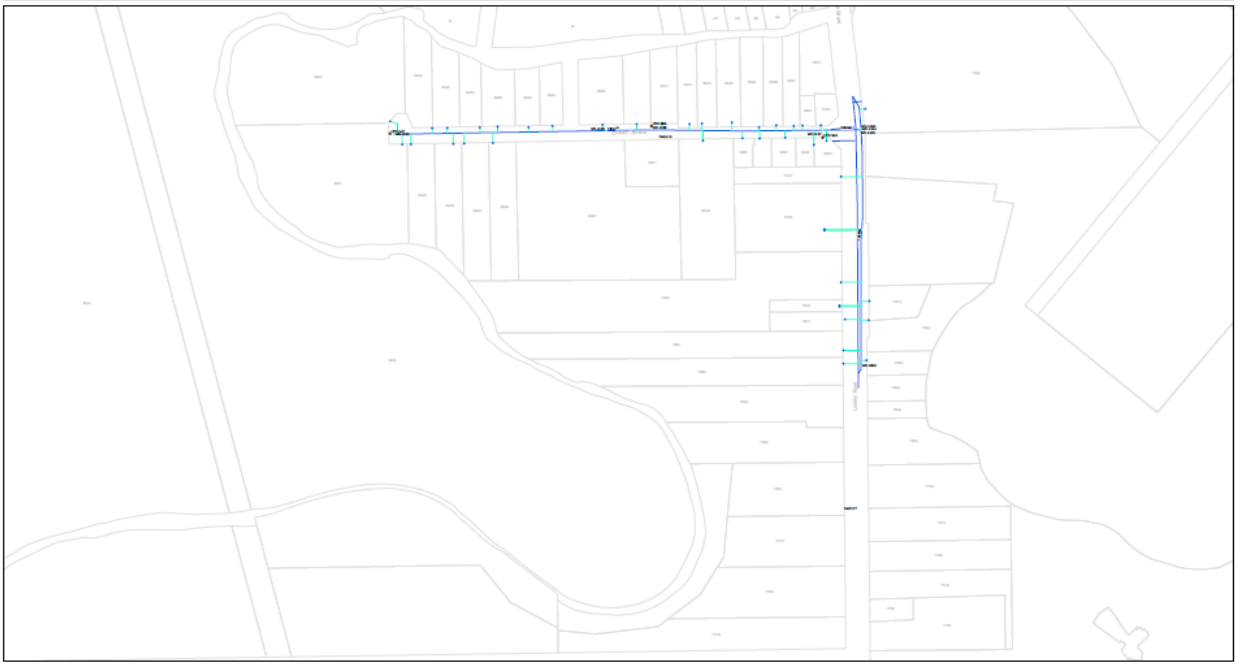


Lakeshore 10 - Hendrick Rd to Schadeview Rd Water System

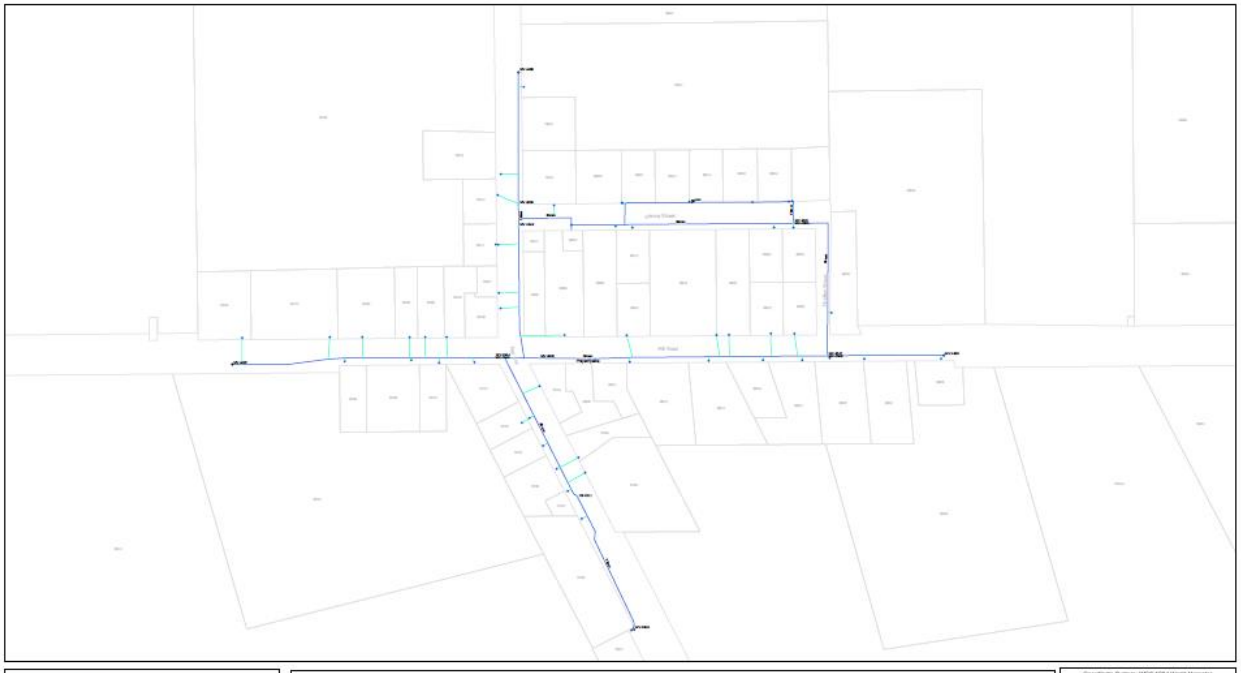


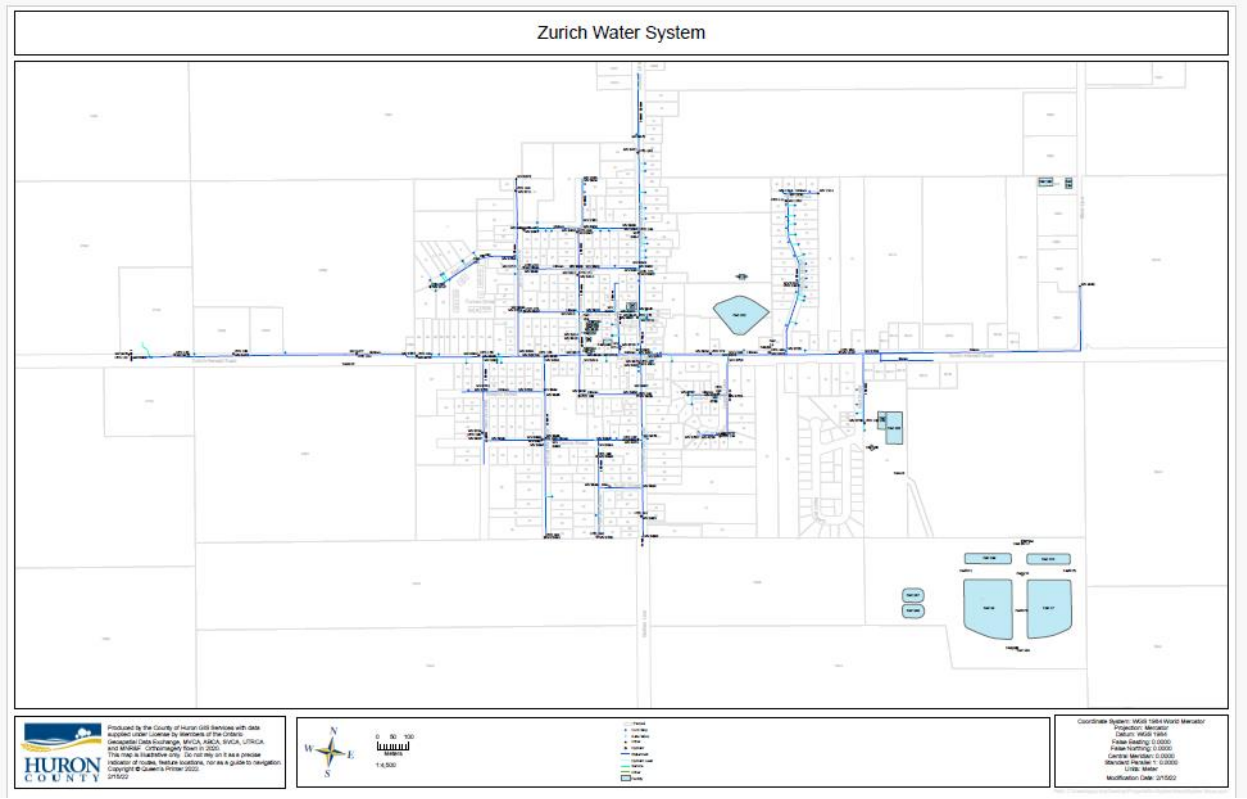
Lakeshore 11 - Schadeview Rd to Dashwood Rd Water System

South of Clinton Water System



Varna Water System




Zurich Water System
HURON COUNTY
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This map is illustrative only. Do not rely on it as a precise indication of routes, feature locations, nor as a guide to navigation.
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2/15/22
N
W
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0 50 100
1:4,500
Coordinate System: WGS 1984 World Mercator
Projection: Mercator
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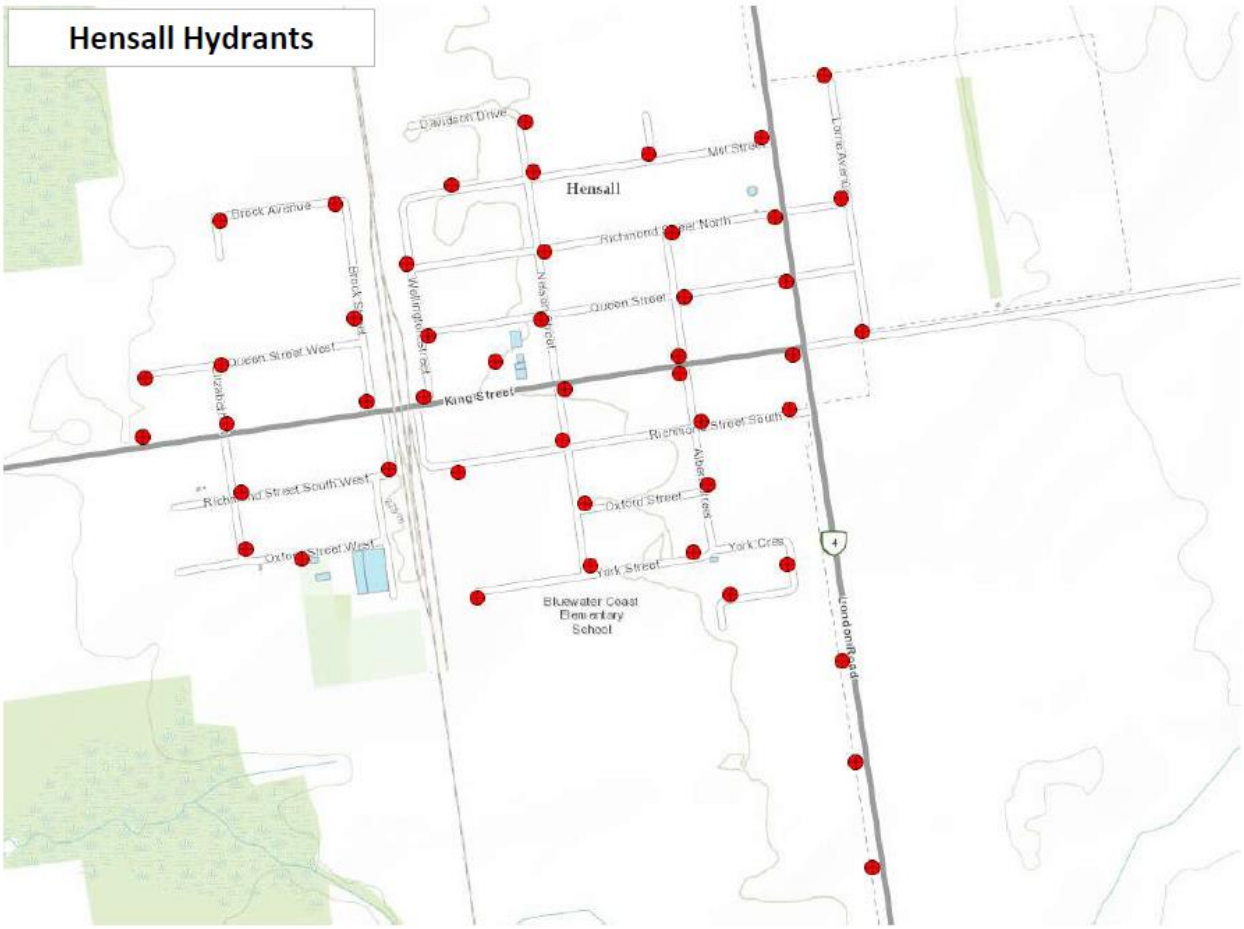
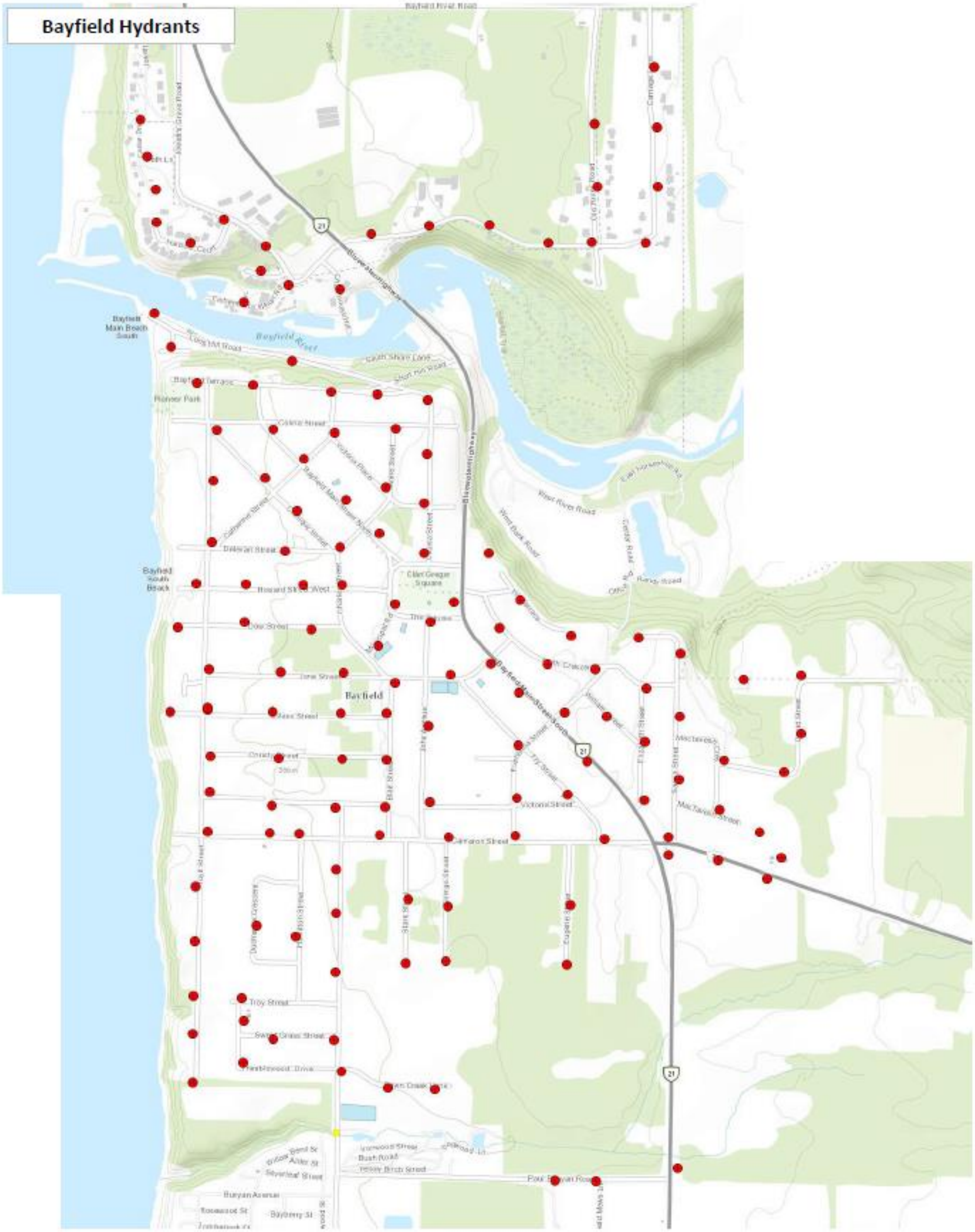
Modification Date: 2/15/22

Fireflow Maps

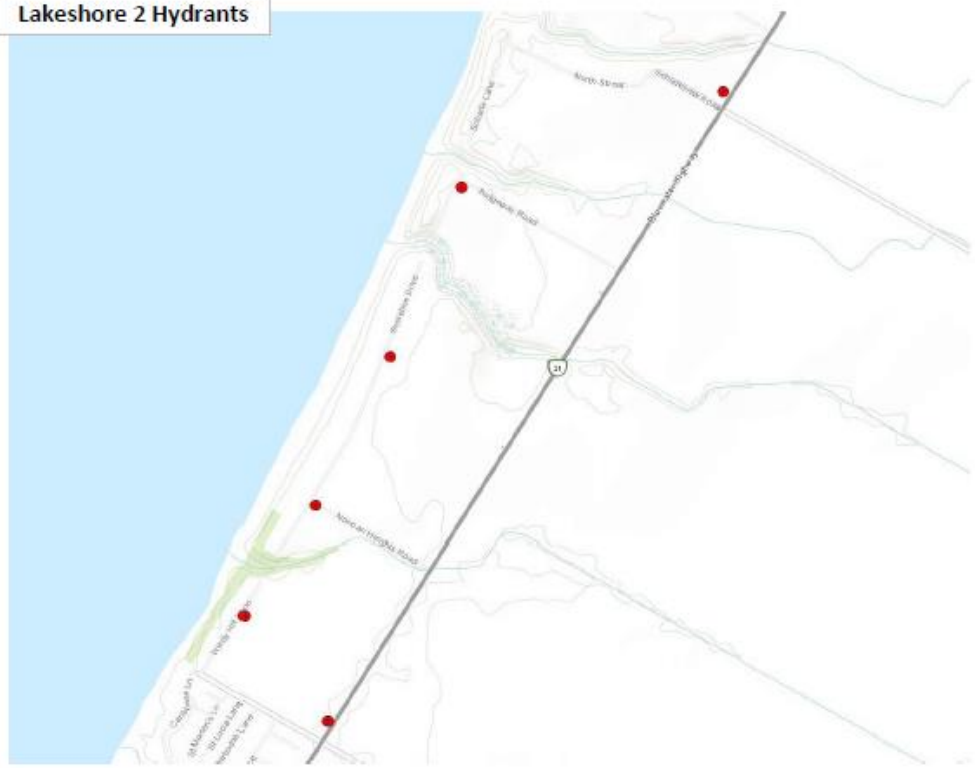

Hensall Hydrants
Davidson Drive
Mill Street
Hensall
Brock Avenue
Richmond Street North
Queen Street
Queen Street West
King Street
Richmond Street South
Richmond Street South West
Oxford Street
Oxford Street West
York Street
York Cres
Bluewater Coast
Elementary
School
London Road


Bayfield Hydrants
Bayfield


South Clinton Hydrants

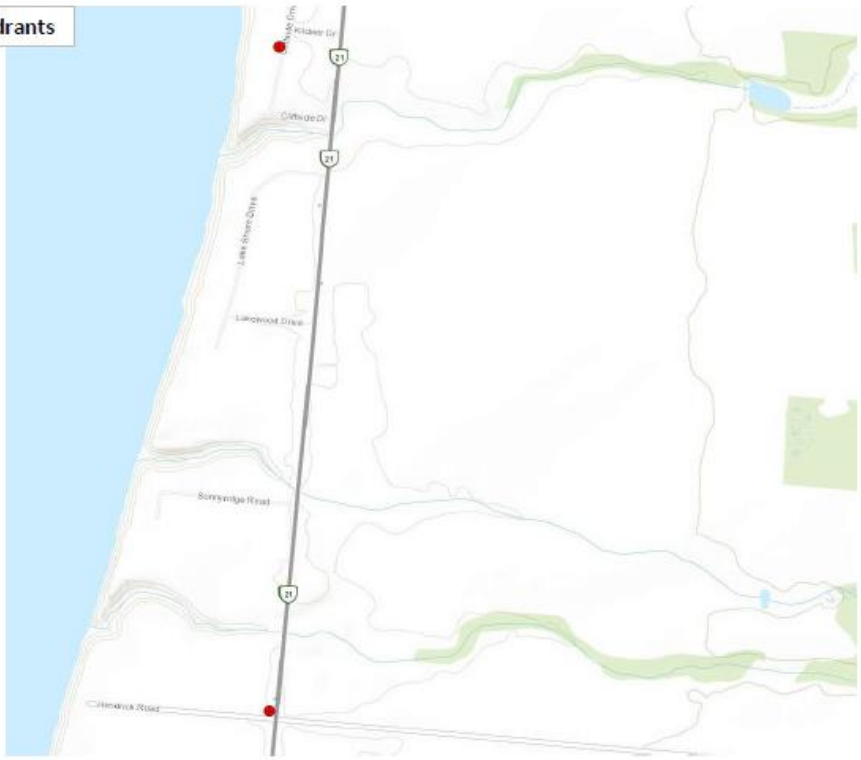

Lakeshore 1 Hydrants

Lakeshore 2 Hydrants

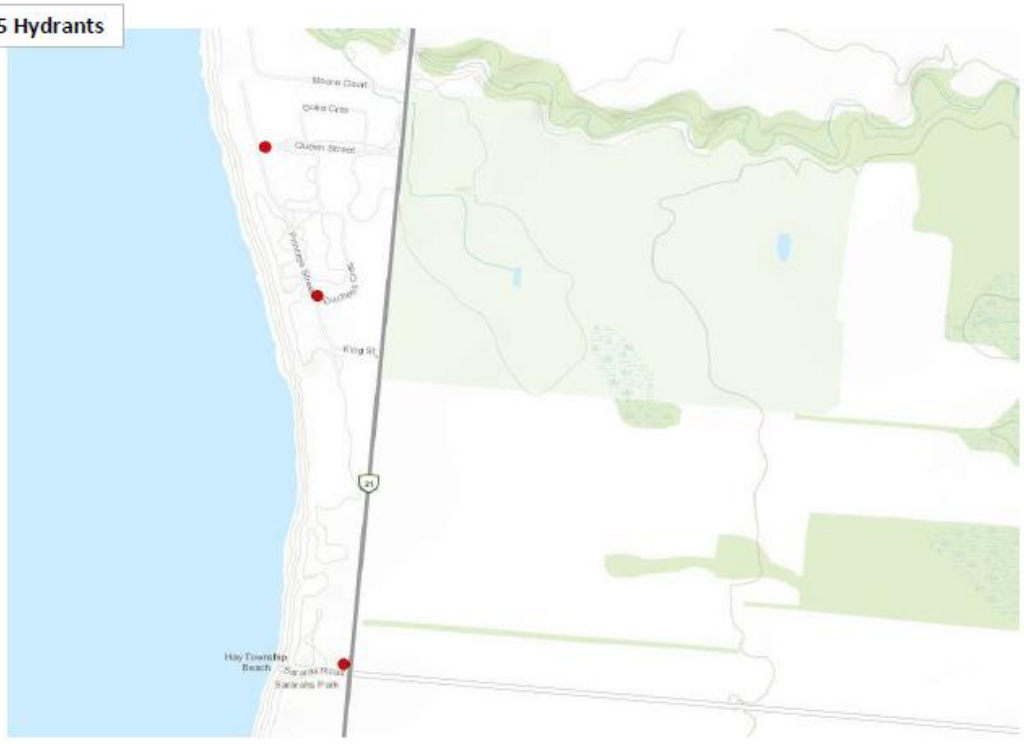


Lakeshore 3 Hydrants

Lakeshore 4 Hydrants



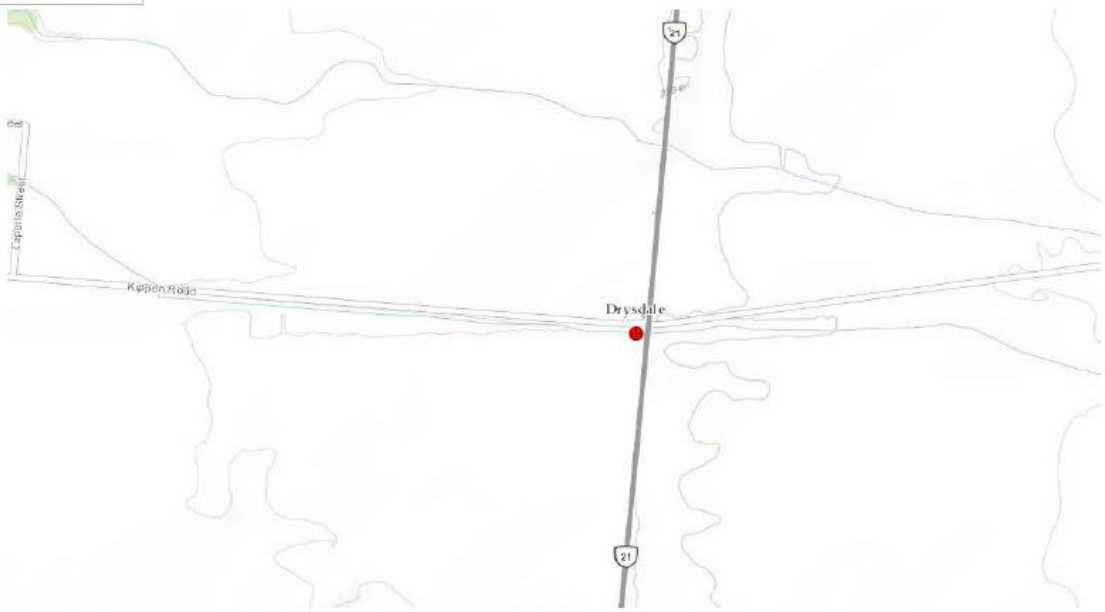
Lakeshore 5 Hydrants



Lakeshore 6 Hydrants

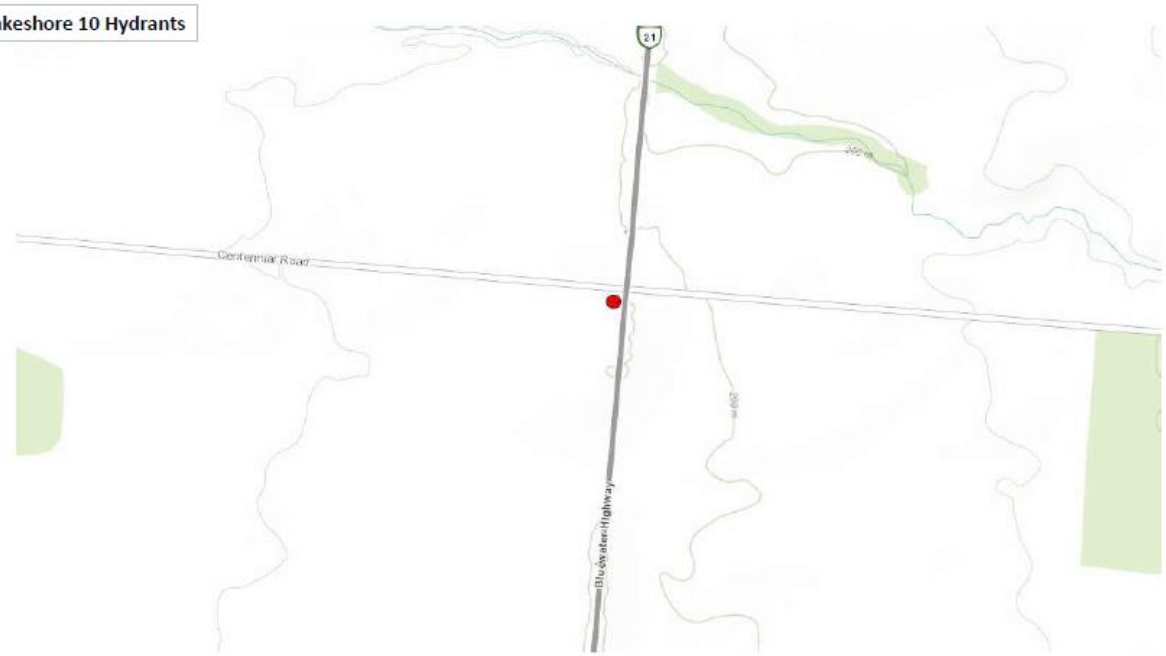
Lakeshore 7 Hydrants

Lakeshore 8 Hydrants

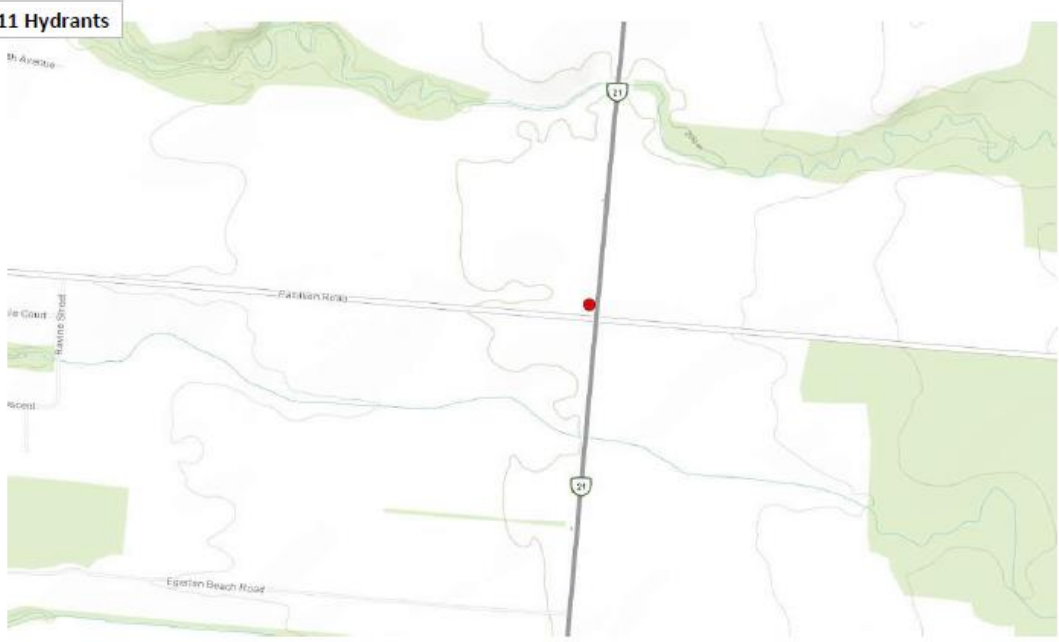


Lakeshore 9 Hydrants

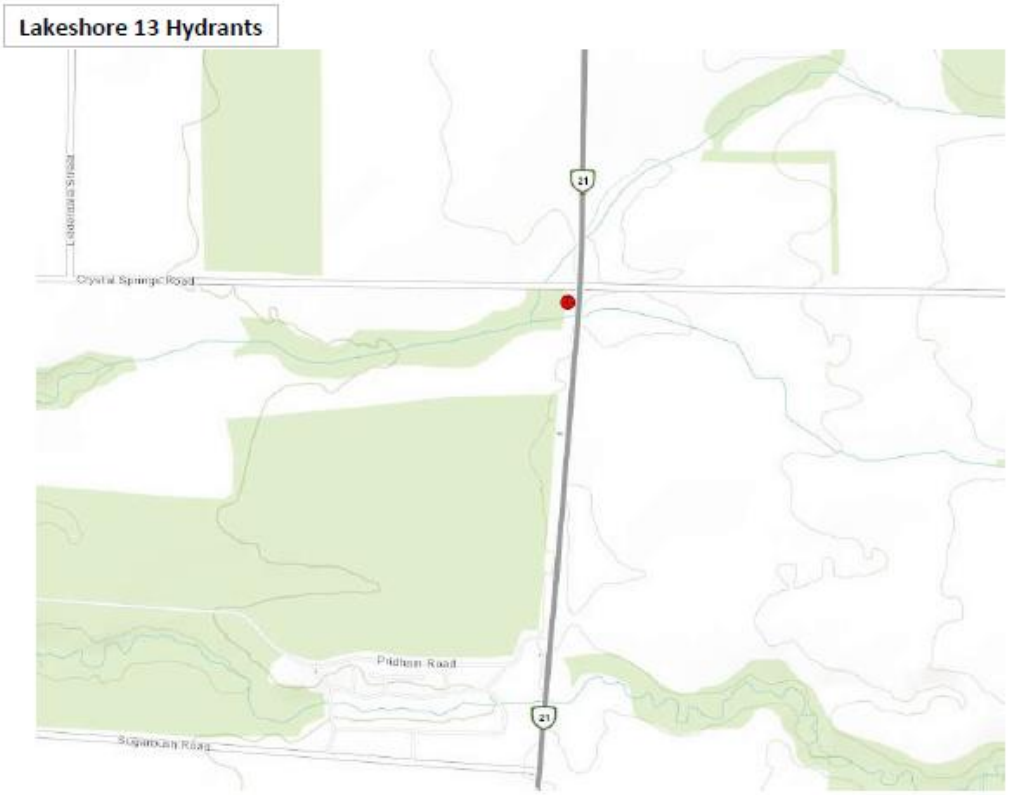
Lakeshore 10 Hydrants



Lakeshore 11 Hydrants



Lakeshore 12 Hydrants


Lakeshore 13 Hydrants
Lakeshore Road
Crystal Springs Road
21
Pridham Road
21
Sugarloaf Road

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 Municipality's condition assessment strategy should outline several key considerations, including:

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

Role of Asset Condition Data

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

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

Guidelines for Condition Assessment

Whether completed by external consultants or internal staff, condition assessments should be completed in a structured and repeatable fashion, according to consistent

and objective assessment criteria. Without proper guidelines for the completion of condition assessments there can be little confidence in the validity of condition data and asset management strategies based on this data.

Condition assessments must include a quantitative or qualitative assessment of the current condition of the asset, collected according to specified condition rating criteria, in a format that can be used for asset management decision-making. As a result, it is important that staff adequately define the condition rating criteria that should be used and the assets that require a discrete condition rating. When engaging with external consultants to complete condition assessments, it is critical that these details are communicated as part of the contractual terms of the project. There are many options available to the Municipality to complete condition assessments. In some cases, external consultants may need to be engaged to complete detailed technical assessments of infrastructure. In other cases, internal staff may have sufficient expertise or training to complete condition assessments.

Developing a Condition Assessment Schedule

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

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