Asset Management Plan

City of Kenora

As presented in 2022

This Asset Management Program was prepared by:

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

Key Statistics

Replacement cost of asset portfolio
$1.2 billion

Replacement cost of infrastructure per household
$157,000 (2021 Census)

Percentage of assets in fair or better condition
87%

Percentage of assets with assessed condition data
43%

Annual capital infrastructure deficit
$13.7 million

Recommended timeframe for eliminating annual infrastructure deficit
10-15 Years

Target reinvestment rate
2.0%

Actual reinvestment rate
0.8%

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

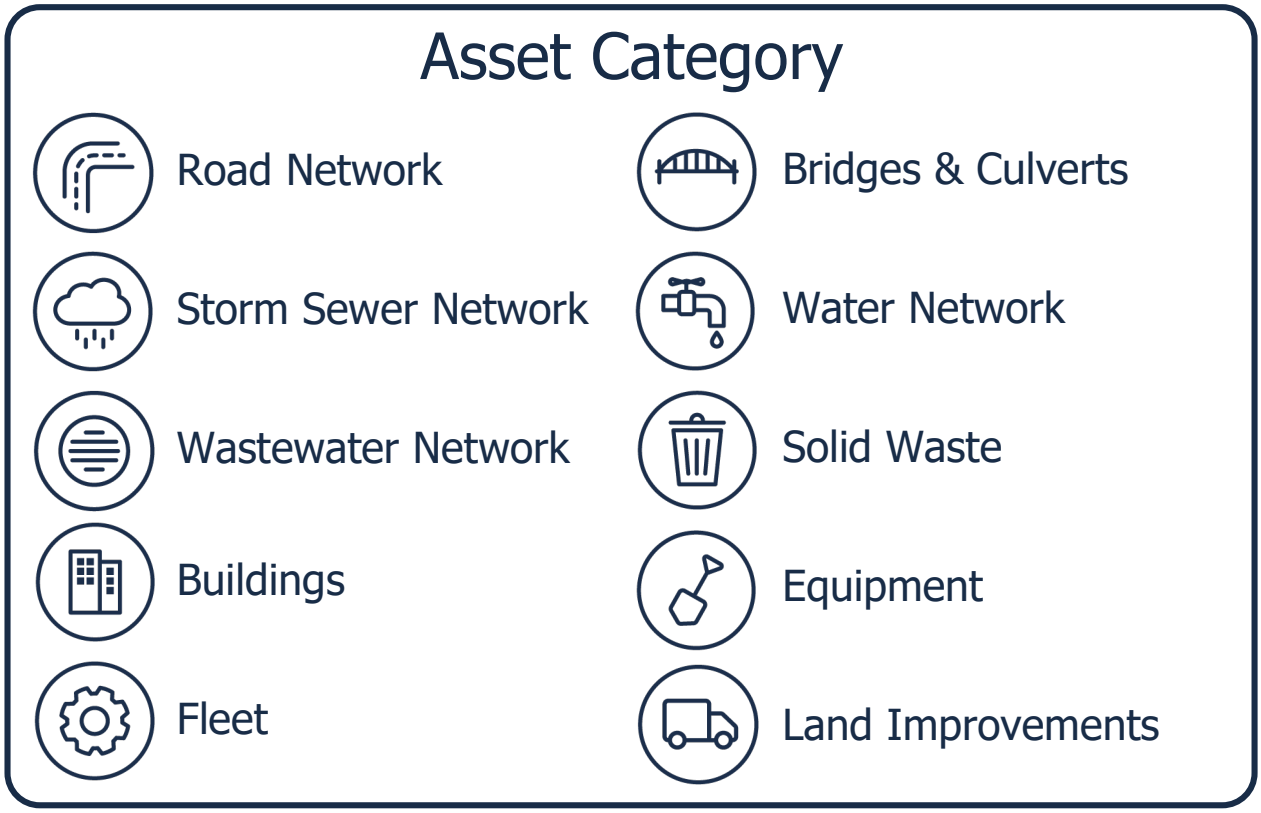
Executive Summary

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 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 City can ensure that public infrastructure is managed to support the sustainable delivery of municipal services.

This AMP includes the following asset categories:



With the development of this AMP, the City 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 $1.2 billion. 87% of all assets analysed in this AMP are in fair or better condition and assessed condition data was available for 43% of assets. For the remaining assets, assessed condition data was unavailable, and asset age was used to approximate condition – a data gap that persists in most municipalities. Generally, age misstates the true condition of assets, making assessments essential to accurate asset management planning, and a recurring recommendation in this AMP.

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

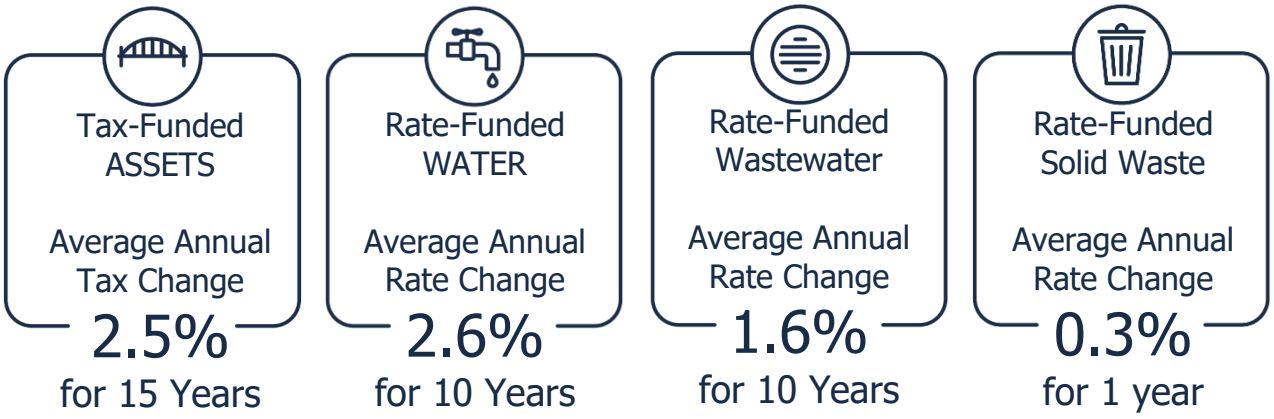
To meet capital replacement and rehabilitation needs for existing infrastructure, prevent infrastructure backlogs, and achieve long-term sustainability, the City's average annual capital requirement totals $23.6 million. Based on a historical analysis of sustainable capital funding sources, the City is committing approximately $9.9 million towards capital projects or reserves per year. As a result, there is currently an annual funding gap of $13.7 million, translating to $1,800 per household (2021 Census).

Annual Capital
Deficit Per Household

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 City. 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 City's infrastructure deficit:



Recommendations to guide continuous refinement of the City'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
- Develop and regularly review short- and long-term plans to meet capital requirements
- Measure current levels of service and identify sustainable proposed levels of service

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

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

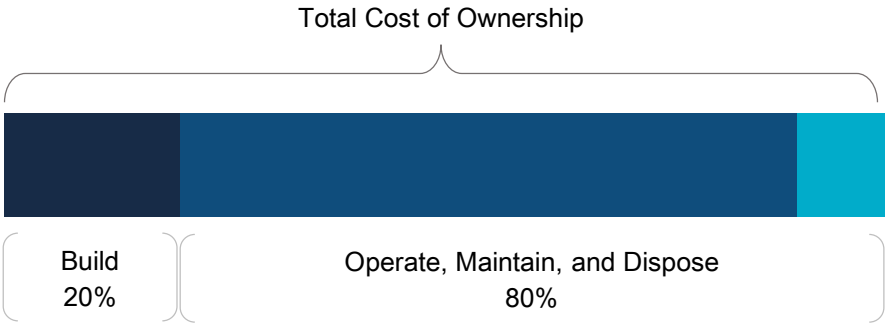
- Ontario Regulation 588/17 outlines several key milestones and requirements for asset management plans in Ontario between July 1, 2022, and 2025

1.1 An Overview of Asset Management

Municipalities are responsible for managing and maintaining a broad portfolio of infrastructure assets to deliver services to the community. This includes roads and bridges, to facilitate movement; water, sewer, and stormwater systems to provide clean drinking water and dispose of waste or excessive rainfall; and buildings, facilities, and parks to provide community and recreational spaces and services.

Planning for the sustainability of these assets requires a systematic and comprehensive plan for maintaining, rehabilitating, and replacing infrastructure at the lowest cost to the organization and its stakeholders. 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 fiscal responsibility is spread equitably across generations. An asset management plan is critical to this planning, and an essential element of the broader asset management program. The industry-standard approach and sequence to developing a practical asset management program begin 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.

1.1.1 Asset Management Policy

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

The City adopted Policy Number AF-6-2 Strategic Asset Management Policy on May 22, 2018, in accordance with Ontario Regulation 588/17. The Policy is aligned with the City's Official Plan and Strategic Plan to support a comprehensive approach to asset management.

The guiding principles of this document include:

- Long-term planning
- Financial efficiency
- Health and safety

1.1.2 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 City plans to achieve asset management objectives through planned activities and decision-making criteria.

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

1.1.3 Asset Management Plan

The asset management plan (AMP) presents the outcomes of the City'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 assets and financial data become available. This will allow the City to re-evaluate the state of infrastructure and identify how the organization's asset management and financial strategies are progressing.

1.2 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.

1.2.1 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 placed into one of three categories: maintenance, rehabilitation, and replacement. The following table provides a description of each type of activity and the general difference in cost.

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

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 City'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.

1.2.2 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.

1.2.3 Levels of Service

A level of service (LOS) is a measure of what the City 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 City as worth measuring and evaluating. The City 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, Wastewater, Stormwater) the Province, through O. Reg. 588/17, has provided qualitative descriptions that are required to be included in this AMP. For non-core asset categories, the City 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 City'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, Water, Wastewater, Storm) the Province, through O. Reg. 588/17, has provided technical metrics that are required to be included in this AMP.

Current and Proposed Levels of Service

This AMP focuses on measuring the current level of service provided to the community. Once current levels of service have been measured, the City 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 City. 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 City must identify a lifecycle management and financial strategy which allows these targets to be achieved.

1.3 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, Environment and Climate Change Canada (ECCC) released Canada's Changing Climate Report (CCCR 2019).

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

Observed precipitation changes in Canada include an increase of approximately 20 percent between 1948 and 2012. By the late 21st century, the projected increase could reach an additional 24 percent. 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[1].

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 elevated 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.

1.3.1 Kenora Climate Profile

The City of Kenora is located in Northern Ontario just over 50 kilometres from the border of Manitoba. The City is surrounded by bodies of fresh water, including the Lake of the Woods. The City 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.[2] Furthermore, the City's proximity to numerous bodies of water poses a significant risk to assets as flooding is becoming a more common occurrence.

[1] Based on information from the 2019 Canada's Changing Climate Report (CCCR)

[2] The City of Kenora, ClimateData [website], https://climatedata.ca/explore/location/?loc=FDGDQ&location-select-temperature=tx_max&location-select-precipitation=r1mm&location-select-other=frost_days

According to Climatedata.ca – a collaboration supported by Environment and Climate Change Canada (ECCC) – the City of Kenora may experience the following trends.

Higher Average Annual Temperature:

- Between the years 1981 and 2010 the annual average temperature was 3.2 ºC.
- Under a high emissions scenario, the annual average temperatures are projected to increase by 2 ºC by the year 2050 and by 5.5 ºC by the end of the century.

Increase in Total Annual Precipitation:

- Under a high emissions scenario, Kenora is projected to experience an 6% increase in precipitation by the year 2050 and a 10% 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.
- Flooding is likely to become a more common occurrence due to the proximity to numerous bodies of water.

1.3.2 Integration Climate change and Asset Management

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

In order 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 comprehensive approach to risk management. The City of Kenora has made notable efforts to advance climate adaptation and mitigation practices by forming a Sustainable Advisory Committee, adopting a Sustainability Action Plan, and by integrating climate considerations into their risk asset management program. These documents and ongoing efforts will further advance The City's capacity to develop asset management strategies that incorporate climate change mitigation and adaptation considerations.

1.4 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

2025

Asset Management Policy Update and an 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

1.4.1 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 - 5.3.1	Complete
Replacement cost of assets in each category	S.5(2), 3(ii)	4.1.1 - 5.3.1	Complete
Average age of assets in each category	S.5(2), 3(iii)	4.1.3 - 5.3.3	Complete
Condition of core assets in each category	S.5(2), 3(iv)	4.1.2 – 5.3.2	Complete
Description of municipality's approach to assessing the condition of assets in each category	S.5(2), 3(v)	4.1.2 – 5.3.2	Complete
Current levels of service in each category	S.5(2), 1(i-ii)	4.1.6 - 5.3.6	Complete
Current performance measures in each category	S.5(2), 2	4.1.6 - 5.3.6	Complete
Lifecycle activities needed to maintain current levels of service for 10 years	S.5(2), 4	4.1.4 - 5.3.4	Complete
Costs of providing lifecycle activities for 10 years	S.5(2), 4	Appendix B	Complete
Growth assumptions	S.5(2), 5(i-ii) S.5(2), 6(i-vi)	6.1-6.3	Complete

2 Scope and Methodology

Key Insights

- This asset management plan includes 10 asset categories and is divided between tax-funded and rate-funded categories
- The source and recency of replacement costs impact 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 City of Kenora is produced in compliance with Ontario Regulation 588/17. The July 2022 deadline under the regulation—the first of three AMPs—requires analysis of only core assets (roads, bridges & culverts, water, wastewater, and stormwater). The 2024 deadline under the regulation requires an analysis of all assets including core and non-core assets.

The AMP summarizes the state of the infrastructure for the City'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 Sewer Network	
Buildings	
Equipment	
Fleet	
Land Improvements	
Water Network	User Rates
Wastewater Network	
Solid Waste	

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 City incurred. As assets age and new products and technologies become available, cost inflation becomes a less reliable method.

2.3 Estimated Useful Life

The estimated useful life (EUL) of an asset is the period over which the City 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.

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 City 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 City'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, the 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 the end of service life, condition below standard, a substantial portion of the 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.

2.6 Calculating Average Risk

A risk assessment framework, when applied to asset management, should provide an asset risk rating to assist with the management of infrastructure. This requires the development of quantitative models that can leverage the asset data and information available to the municipality.

Asset risk is typically defined using the following formula:

Risk = Probability of Failure (POF) × Consequence of Failure (COF)

Probability of Failure (POF)

The probability of failure relates to the likelihood that an asset will fail at a given time. The current physical condition and service life remaining are two commonly used risk parameters in determining this likelihood.

The ranges used to determine an asset's POF are aligned with the following qualitative rating scale:

1 – Rare
2 – Unlikely
3 – Possible
4 – Likely
5 – Almost Certain

Consequence of Failure (COF)

The consequence of failure describes the overall effect that an asset's failure will have on an organization's asset management goals. Consequences of failure can range from non-eventful to impactful: a small diameter watermain break in a subdivision may cause several rate payers to be without water service for a short time. However, a larger trunk watermain may break outside a hospital, leading to significantly higher consequences. The COF parameters are also organized by the type of consequence they pertain to; these include Economic, Social, Environmental, Operational and Health & Safety consequence types.

The ranges used to determine an asset's consequence of failure are aligned with the following qualitative rating scale:

1 – Insignificant
2 – Minor
3 – Moderate
4 – Major
5 – Severe

After identifying the attribute information available that can be utilized as probability and/or consequence of failure metrics and applying the most appropriate range and weighting to each metric, the risk rating for each asset can be calculated using the Risk formula above. The risk ratings are then pooled into five levels: Very Low, Low, Moderate, High, and Very High Risk.

3 Portfolio Overview

Key Insights

- The total replacement cost of the City's asset portfolio is $1.2 billion
- The City's target re-investment rate is 2.0%, and the actual re-investment rate is 0.8%, contributing to an expanding infrastructure deficit
- 87% of all assets are in fair or better condition
- The average annual capital requirements total $23.6 million per year across all asset categories

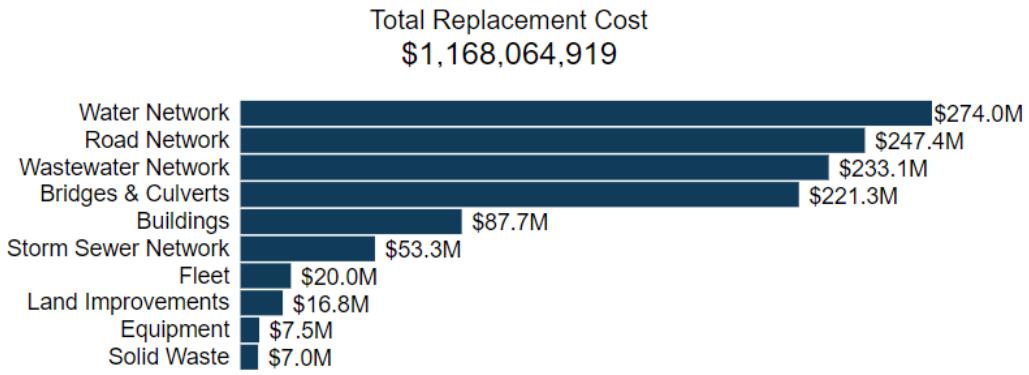
3.1 State of the Infrastructure

The following table summarizes the state of the City's infrastructure.

Asset	Replacement Cost (million)	Asset Condition	Average Risk Rating (out of 25)	Financial Capacity	
Road Network	**$247**	Good (61%)	Low (7.5)	Annual Requirement:	$7,157,000
				Funding Available:	$2,054,000
Bridges & Culverts	**$221**	Good (74%)	Moderate (9.4)	Annual Requirement:	$3,230,000
				Funding Available:	$915,000
Storm Sewer Network	**$53**	Very Good (84%)	Low (5.9)	Annual Requirement:	$730,000
				Funding Available:	$90,000
Water Network	**$274**	Good (70%)	Low (6.4)	Annual Requirement:	$3,818,000
				Funding Available:	$2,325,000
Wastewater Network	**$233**	Good (76%)	Low (4.7)	Annual Requirement:	$3,176,000
				Funding Available:	$2,325,000
Solid Waste	**$7**	Good (63%)	Moderate (9.1)	Annual Requirement:	$406,000
				Funding Available:	$399,000
Buildings	**$88**	Very Good (92%)	Low (4.4)	Annual Requirement:	$2,361,000
				Funding Available:	$748,000
Equipment	**$7.5**	Very Poor (19%)	High (14.8)	Annual Requirement:	$968,000
				Funding Available:	$241,000
Fleet	**$20**	Good (62%)	Moderate (8.1)	Annual Requirement:	$1,254,000
				Funding Available:	$650,000
Land Improvements	**$17**	Good (61%)	Moderate (8.8)	Annual Requirement:	$522,000
				Funding Available:	$122,000
Overall	**$1,168**	**Good (72%)**	**Low (6.8)**	Annual Requirement:	**$23,624,000**
				Funding Available:	**$9,869,000**

3.2 Total Replacement Cost of Asset Portfolio

The asset categories analysed in this AMP have a total replacement cost of $1.2 billion based on inventory data from 2020. This total was determined based on a combination of user-defined costs and historical cost inflation. This estimate reflects the replacement of historical assets with similar, not necessarily identical, assets available for procurement today. The following graph displays the total replacement cost per asset category.



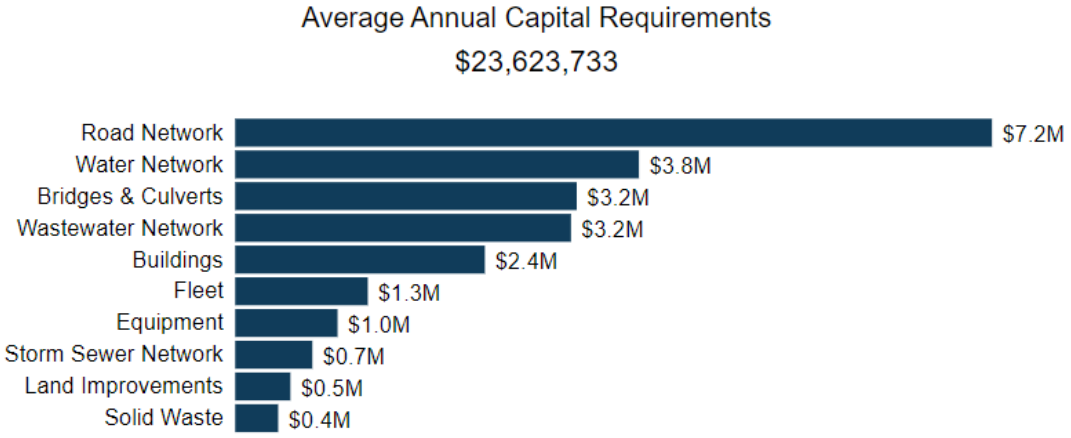
The following table identifies the methods employed to determine replacement costs across each asset category:

Asset Category	Replacement Cost Method	
	User-Defined	Notes
Road Network	98%	2020 latest tender prices
Bridges & Culverts	100%	2020 Bridge inspections
Storm Sewer Network	99%	Latest tender prices
Buildings	94%	2020 Insurance Appraisal and Staff estimates
Fleet	63%	Latest tender prices and Staff estimates
Equipment	9%	Staff estimates and 2020 Insurance Appraisal
Land Improvements	29%	
Water Network	95%	Latest project prices and Staff estimates
Wastewater Network	98%	
Solid Waste	73%	
Overall	**95%**	

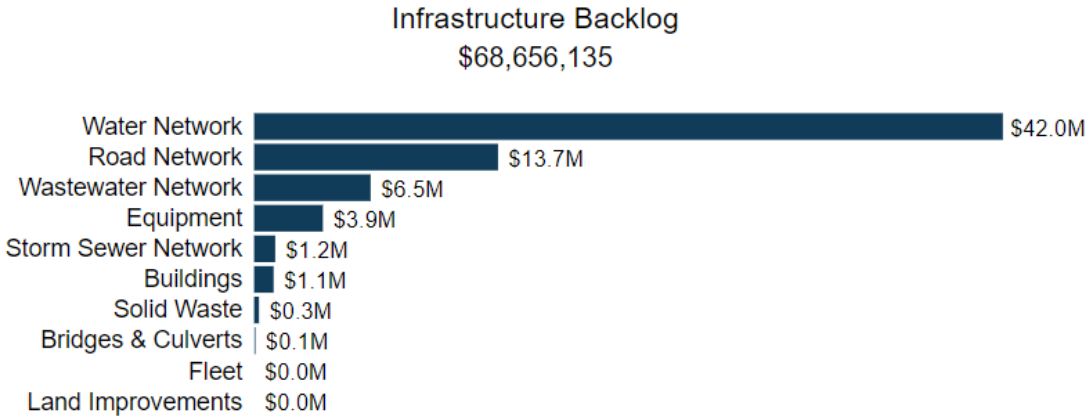
3.3 Average Annual Capital Requirements

Annual capital requirements represent the amount the City should allocate annually to each asset category to meet replacement and/or rehabilitation needs, prevent infrastructure backlogs, and achieve long-term sustainability.

For most asset categories, the annual capital requirement has been calculated based on a "replacement only scenario," in which capital expenditures are only incurred at the construction and replacement of each asset. However, for the Road Network and Bridges & Culverts, lifecycle management strategies have been developed to identify capital costs that are realized through strategic rehabilitation and renewal of the City's assets.

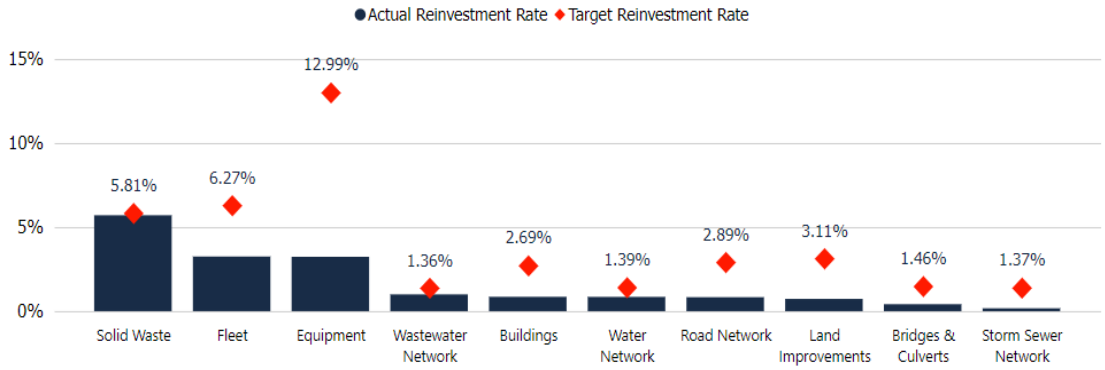


In total, the City must allocate approximately $23.6 million annually to address capital requirements for the assets included in this AMP. The annual capital requirements, however, do not incorporate the backlog costs or value of assets that have reached their end of useful life by the 2020 reporting year. The graph below shows the amount of backlog that the City has accumulated.



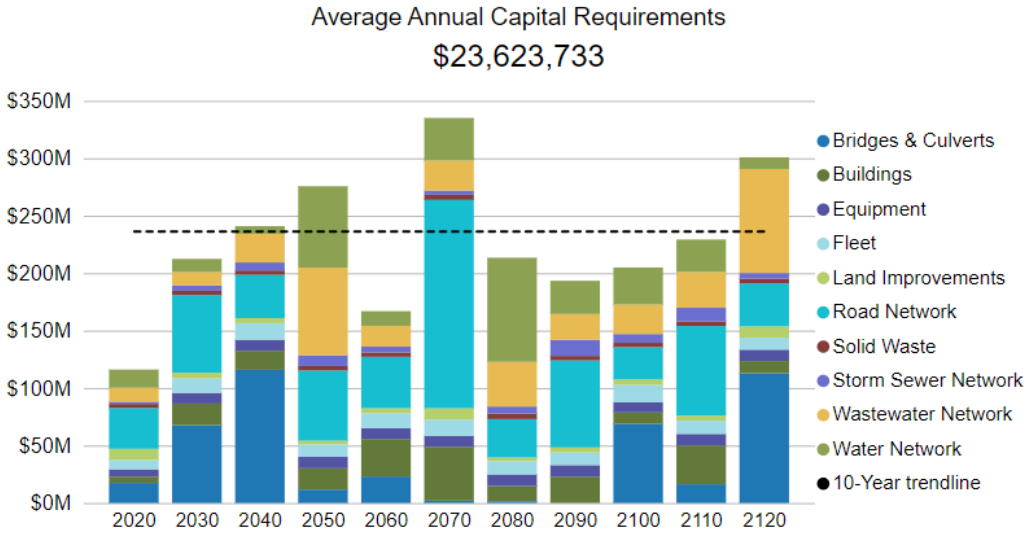
3.4 Target vs. Actual Reinvestment Rate

The graph below depicts funding gaps or surpluses by comparing target vs actual reinvestment rate. To meet the long-term replacement needs, the City should be allocating approximately $23.6 million annually, for a target reinvestment rate of 2.0%. Actual annual spending on infrastructure totals approximately $9.9 million, for an actual reinvestment rate of 0.8%.



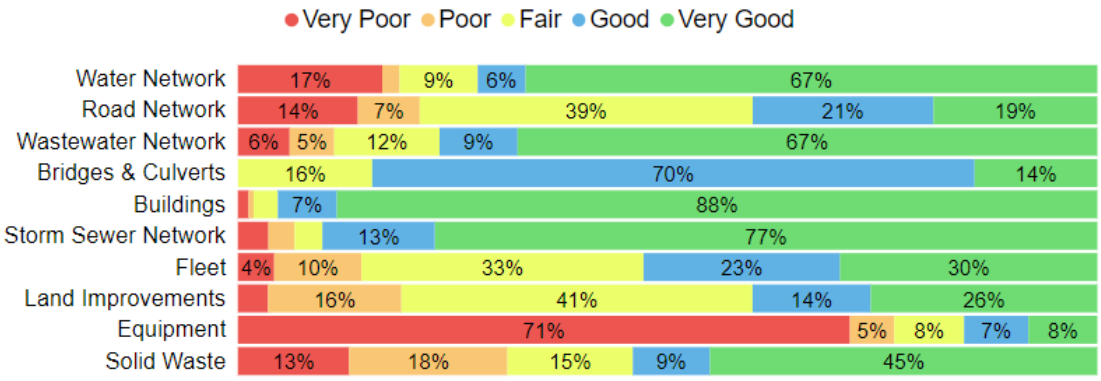
3.5 Forecasted Capital Requirements

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 City can produce an accurate long-term capital forecast. The following graph identifies capital requirements over the next 100 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 10-year bins and the trend line represents the average 10-year capital requirements.



3.6 Condition of Asset Portfolio

The current condition of the assets is central to all asset management planning. Collectively, 87% of assets in the City are in fair or better condition. This estimate relies on both age-based and field condition data. Condition of each asset is weighted by replacement cost.



This AMP relies on assessed condition data for 43% of assets; for the remaining portfolio, age is used as an approximation of condition. Assessed condition data, whether in the form of actual physical asset inspection or staff estimation of condition/performance, is invaluable in asset management planning and reflects a truer assessment of the assets' condition and field performance.

The table below identifies the source of condition data used throughout this AMP.

Asset Category	Assessed Condition	Source of Condition Data
Road Network	80%	2020 Pavement Condition Index
Bridges & Culverts	98%	2020 Bridge inspections
Storm Sewer Network	4%	2019 and 2020 CCTV inspections
Buildings	3%	Staff assessments
Equipment	0%	Age-based assessments
Fleet	42%	Staff assessments
Land Improvements	54%	
Water Network	1%	
Wastewater Network	12%	2018, 2019, 2020 CCTV inspections and Staff assessments
Solid Waste	5%	Staff assessments
Overall	**43%**	

4 Road Network

4.1 Asset Category & Service Description

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 City's asset portfolio. It includes all municipally owned and maintained roadways in addition to supporting roadside infrastructure including sidewalks, road culverts and streetlights.

The City's road assets are managed by the Engineering & Infrastructure services department who is also responsible for pothole patching, ditch brushing, sanding, and salting, and snow removal operations.

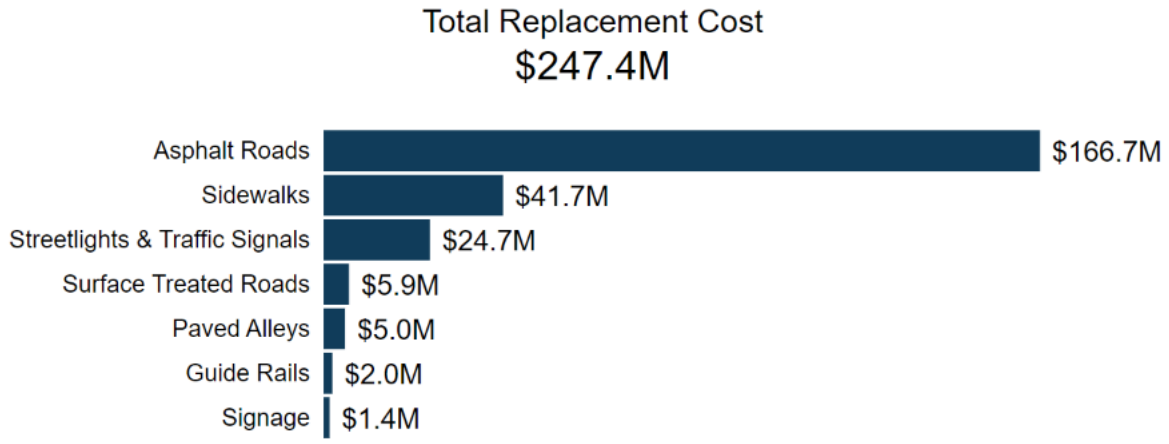
The state of the infrastructure for road network is summarized in the following table.

Replacement Cost	Condition	Average Risk Rating (out of 25)	Financial Capacity	
$247 million	Good (61%)	Low (7.5)	Annual Requirement:	$7,157,000
			Funding Available:	$2,054,000
			Annual Deficit:	$5,103,000

4.2 Asset Inventory & Costs

The table below includes the quantity, replacement cost, and annual capital requirements of each asset segment in the City's Road Network inventory.

Asset Segment	Quantity	Replacement Cost	Annual Capital Requirement
Asphalt Roads	1,161 km^2	$166,652,000	$4,182,000
Gravel Roads	638 km^2	Not Planned for Replacement[3]	
Guide Rails	64	$2,022,000	$101,000
Paved Alleys	35 km^2	$4,972,000	$123,000
Sidewalks	125 km^2	$41,736,000	$886,000
Signage	11	$1,385,000	$277,000
Streetlights & Traffic Signals	1,845	$24,749,000	$1,239,000
Surface Treated Roads	412 km^2	$5,918,000	$348,000
Total		**$247,434,000**	**$7,157,000**



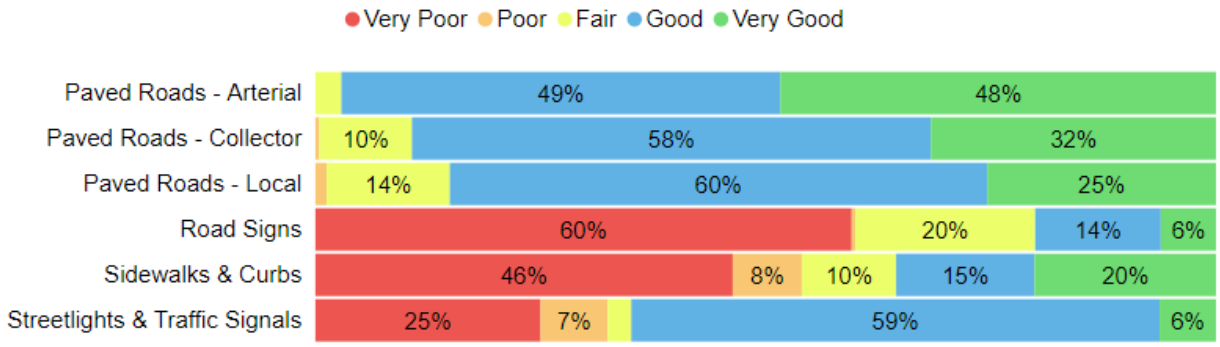
Each asset's replacement cost should be reviewed periodically to determine whether adjustments are needed to more accurate represent realistic capital requirements.

[3] Gravel roads are typically in a constant state of repair and maintenance, with capital activities, such as regrading, completed as needed.

4.3 Data Insights: Useful Life, Age & Condition

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

Asset Segment	Estimated Useful Life (Years)	Average Age (Years)	Average Condition (%)
Asphalt Roads	25	45.9	69% (Good)
Guide Rails	20	22.3	55% (Fair)
Paved Alleys	25	24.7	26% (Poor)
Sidewalks	50	25.4	34% (Poor)
Signage	5	7.6	58% (Fair)
Streetlights & Traffic Signals	5-20	26.4	61% (Good)
Surface Treated Roads	15	56.2	45% (Fair)
Average		**37.5**	**61% (Good)**



To ensure that the City's Road Network continues to provide an acceptable level of service, the City 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 Road Network.

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

4.3.1 Current Approach to Condition

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

- Roads are inspected, for rideability and structural integrity, annually through visual staff assessments.
- Pavement Condition Index (PCI) are completed every 3 years, on average, to provide reliable condition ratings. The most recent PCI was conducted in 2020 and the information was utilized to support accurate asset management decision-making within this AMP.
- Sidewalks are inspected annually to identify deficiencies, in accordance with Minimum Maintenance Standards (MMS).
- Regulatory signs undergo reflectivity testing, in accordance with the Ontario Traffic Manual (OTM) requirements.
- Other road appurtenances are visually inspected on an as-needed basis.

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

Condition	Rating
Very Good	80-100
Good	70-80
Fair	50-70
Poor	40-50
Very Poor	0-40

For the other assets in the Road Network, the following rating criteria is used to determine current condition and forecast future capital requirements:

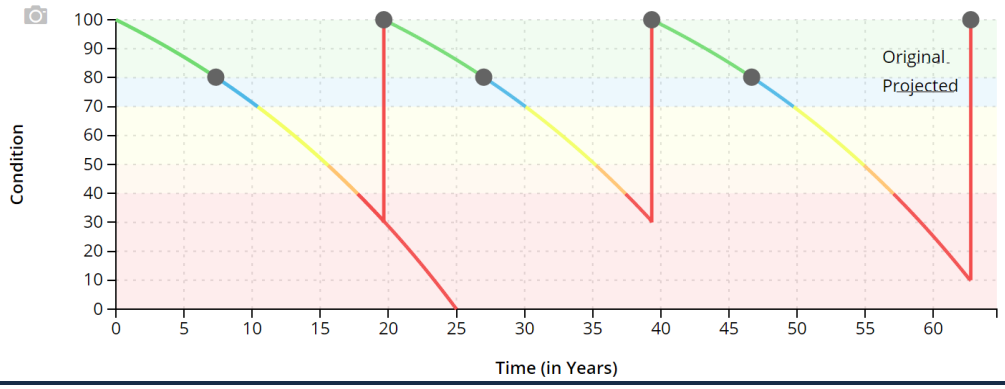
Condition	Rating
Very Good	80-100
Good	60-80
Fair	40-60
Poor	20-40
Very Poor	0-20

4.4 Lifecycle Management Strategy

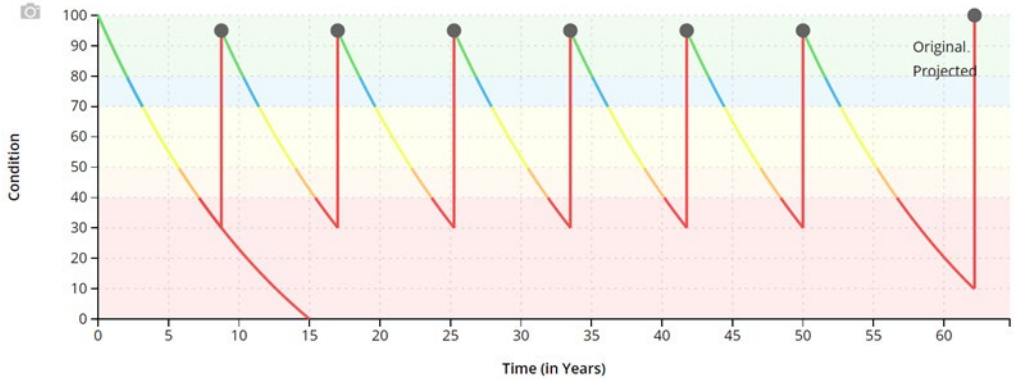
4.4.1 Lifecycle Models

The condition or performance of most assets will deteriorate over time. This process is affected by a range of factors including an asset's characteristics, location, utilization, maintenance history and environment. The following lifecycle strategies have been developed as a proactive approach to managing the lifecycle of asphalt and surface treated 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.

Asphalt Roads		
Event Name	**Event Class**	**Event Trigger**
Crack Sealing	Preventative Maintenance	80% Condition
Resurfacing	Rehabilitation	30% Condition
Full Reconstruction	Replacement	10% Condition



Surface Treated Roads		
Event Name	**Event Class**	**Event Trigger**
Surface Lift Treatment	Rehabilitation	30% Condition
Full Reconstruction	Replacement	0%-10% Condition



4.4.2 Lifecycle Strategies

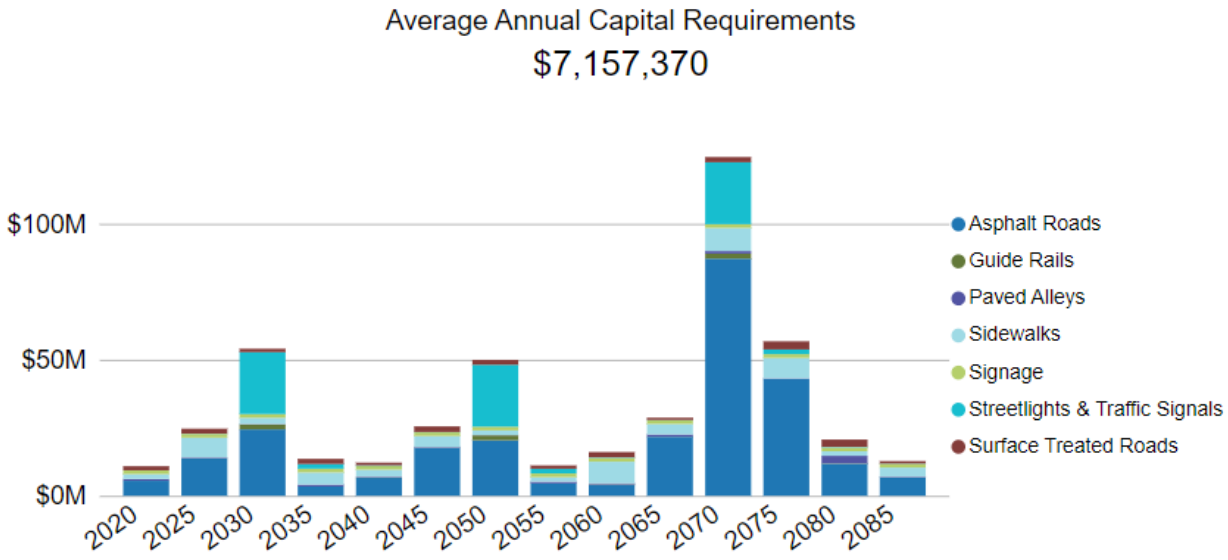
The following table outlines the City's current lifecycle management strategy.

Activity Type	Description of Current Strategy
Maintenance	A crack sealing program is in place for asphalt roads as needed; typically, within the first 4-6 years of construction.
	The City conducts regular road shouldering, grading, and dust suppression for gravel roads to maintain structural integrity and performance.
	The City conducts several seasonal maintenance activities. All season maintenance activities include asphalt patching, graveling/shouldering, and sweeping. Summer mainteance activities include sidewalk repairs, grading, re-gravelling, dust control, ditching, roadside mowing, tree trimming, brush cleanup, road sign installation/maintenance, and line painting. Winter maintenance activities include snow plowing, sanding and snow removal.
Rehabilitation/ Replacement	Asphalt and Surface Treated Roads are resurfaced proactively, at various intervals, based on performance, road criticality/priority, and public input. Resurfacing includes removal of the existing surface layer, base re-strengethinign and repaving.
	Road replacement is determined by consideration of growth, risk, condition, health and safety, and social impact. Staff also consider road reconstruction in coordination with other right-of-way asset replacements (i.e., underground linear).
	Sidewalks and other road assets are repaired and/or replaced, as needed.

4.5 Forecasted Capital Requirements

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

The annual capital requirement represents the average amount per year that the City should allocate towards funding rehabilitation and replacement needs to meet future capital needs. The following graph identifies capital requirements over the next 65 years. This projection ensures that every asset has gone through one full iteration of replacement. The forecasted requirements are aggregated into 5-year bins and the trend line represents the average 5-year capital requirements.

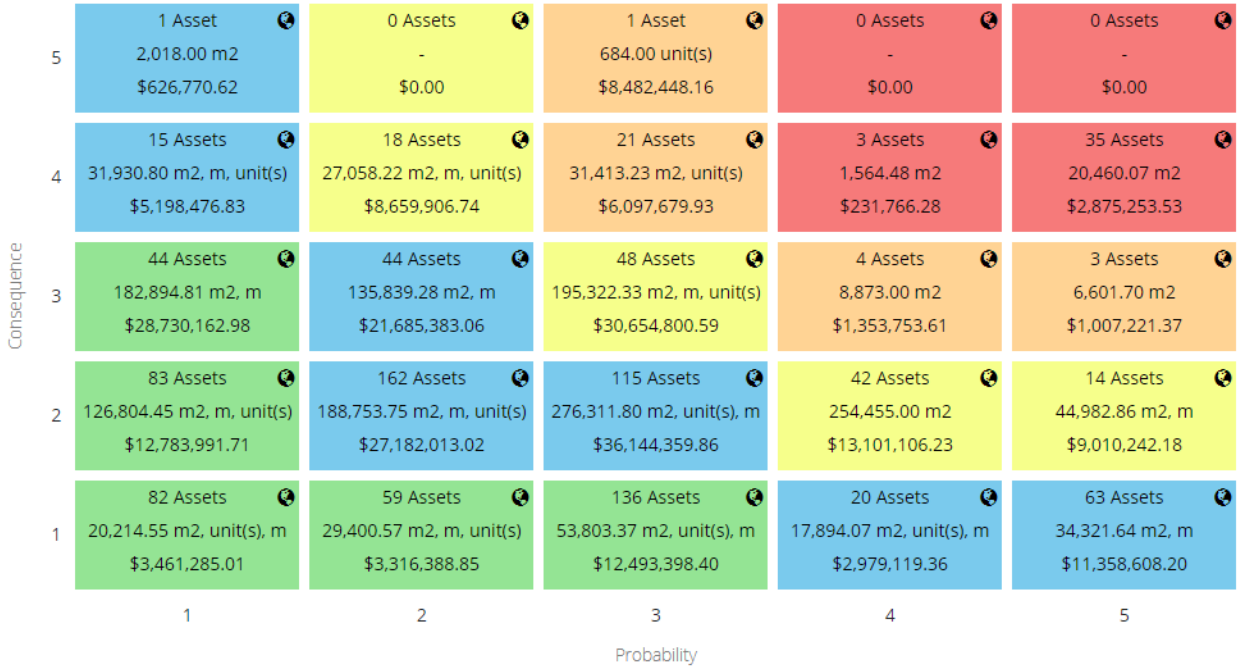


The projected cost of lifecycle activities that will need to be undertaken over the next 10 years to maintain the current level of service can be found in Appendix A.

4.6 Risk & Criticality

4.6.1 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 2020 inventory data.



Some of the asset-specific attributes that Staff utilized when prioritizing and defining the risk and criticality of these assets are documented below:

Probability of Failure (POF)	Consequence of Failure (COF)
Condition	Replacement Cost (Financial)
Average Daily Traffic Counts	Road Classification (Operational)
Truck/Bus Route	Speed Limit (Health & Safety)
	Land Use (Strategic)

4.6.2 Risks to Current Asset Management Strategies

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

Climate Change & Extreme Weather Events

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 always sufficient to withstand heavy water flow, particularly in low-lying areas along a body of water. Further issues can arise as a result of flooding and poor drainage including accelerated deterioration caused by freeze/thaw cycles. To improve asset resiliency, staff should continue to identify problem areas and improve drainage through enhanced lifecycle strategies.

Capital Funding Strategies

Major capital rehabilitation projects for roads are sometimes dependant on the availability of grant funding opportunities. When grants are not available, rehabilitation projects may be deferred. A long-term capital funding strategy can reduce dependency on grant funding and help prevent the deferral of capital works.

4.7 Levels of Service

The following tables identify the City'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 City has selected for this AMP.

4.7.1 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 (2020)
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	

4.7.2 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 (2020)
Scope	Lane-km of arterial roads (MMS classes 1 and 2) per land area (km/km^2)	0
	Lane-km of collector roads (MMS classes 3 and 4) per land area (km/km^2)	0.66
	Lane-km of local roads (MMS classes 5 and 6) per land area (km/km^2)	2.14
Quality	Average pavement condition index for paved roads in the municipality	70.8%
	Average surface condition for unpaved roads in the municipality (e.g., excellent, good, fair, poor)	Fair
Performance	Percentage of sidewalks inspected annually	100%
	Percetnage of road network in poor/very poor condition	20%
	Average risk rating associated to road network	7.54 (Low)
	Annual capital reinvestment rate	0.83%

4.8 Recommendations

Data and Asset Information

- Develop a data governance strategy, including a condition assessment protocol, to ensure condition information and vital attribute information is collected and updated consistently into the Citywide database for accurate asset management reporting.

Lifecycle Management Strategies

- Continue to evaluate the efficacy of the City's current lifecycle management strategies at regular intervals to determine the impact on cost, condition, and risk. If possible, assess the feasibility of implementing an experimental lifecycle strategies program, on a trial basis on select roads, to assess and track applicability, cost-effectiveness, and customer experience.

Risk Management Strategies

- Review risk models on a regular basis and adjust according to an evolving understanding of the probability and consequences of asset failure. This should include the regular review of high-risk assets to determine appropriate risk mitigation strategies.

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 City 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.

5 Bridges & Culverts

5.1 Asset Category & Service Description

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

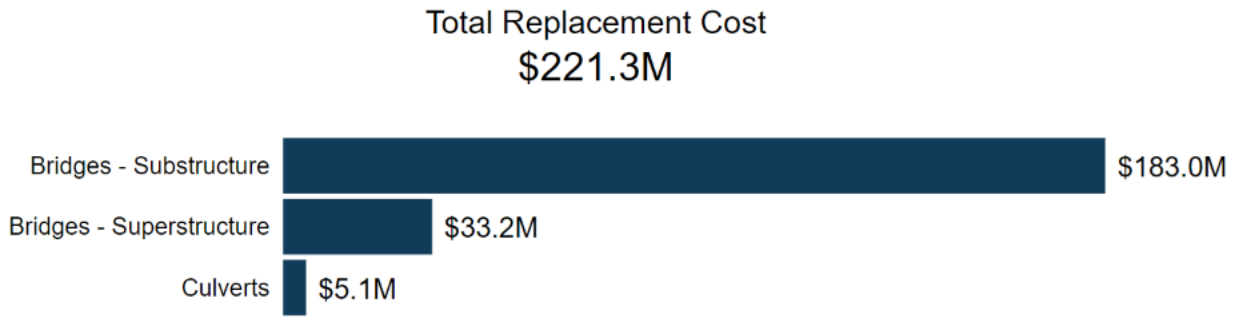
The state of the infrastructure for bridges and culverts is summarized in the following table.

Replacement Cost	Condition	Average Risk Rating (out of 25)	Financial Capacity	
$221 million	Good (74%)	Moderate (9.4)	Annual Requirement:	$3,230,000
			Funding Available:	$915,000
			Annual Deficit:	$2,315,000

5.2 Asset Inventory & Costs

The table below includes the quantity, replacement cost method, and annual capital requirements of each asset segment in the City's Bridges & Culverts inventory.

Asset Segment	Quantity	Replacement Cost	Annual Capital Requirement
Bridges - Substructure	22	$183,030,000	$2,447,000
Bridges - Superstructure	22	$33,172,000	$668,000
Culverts	411	$5,087,000	$115,000
Total		**$221,289,000**	**$3,230,000**

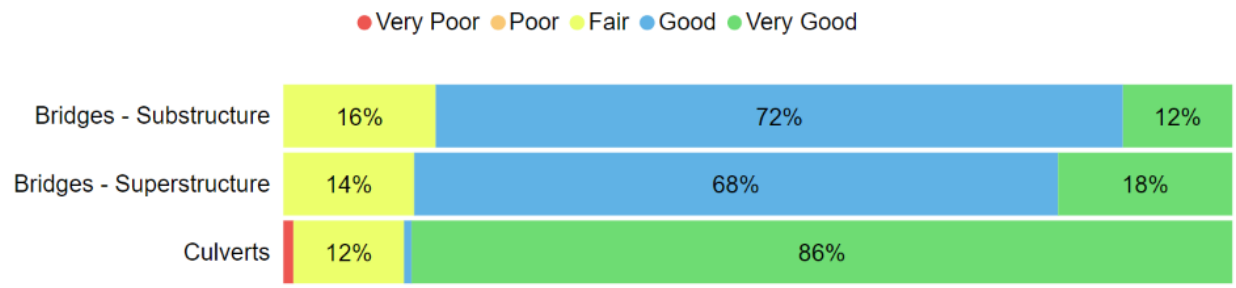


Each asset's replacement cost should be reviewed periodically to determine whether adjustments are needed to more accurate represent realistic capital requirements.

5.3 Asset Data: Useful Life, Age & Condition

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

Asset Segment	Estimated Useful Life (Years)	Average Age (Years)	Average Condition (%)
Bridges - Substructure	75 Years	42.7	73% (Good)
Bridges - Superstructure	75 Years	41.3	75% (Good)
Culverts	25 – 50 Years	18.2	90% (Very Good)
Average		**20.4**	**74% (Good)**



To ensure that the City's Bridges & Culverts continue to provide an acceptable level of service, the City 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 & Culverts.

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

5.3.1 Current Approach to Condition Assessment

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

- Condition assessments of all structural bridges and culverts are completed every 2 years in accordance with the Ontario Structure Inspection Manuals (OSIM). This AMP utilizes condition information from the latest 2020 OSIMs.

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

Condition	Rating
Very Good	80-100
Good	70-80
Fair	60-70
Poor	50-60
Very Poor	0-40

5.4 Lifecycle Management Strategy

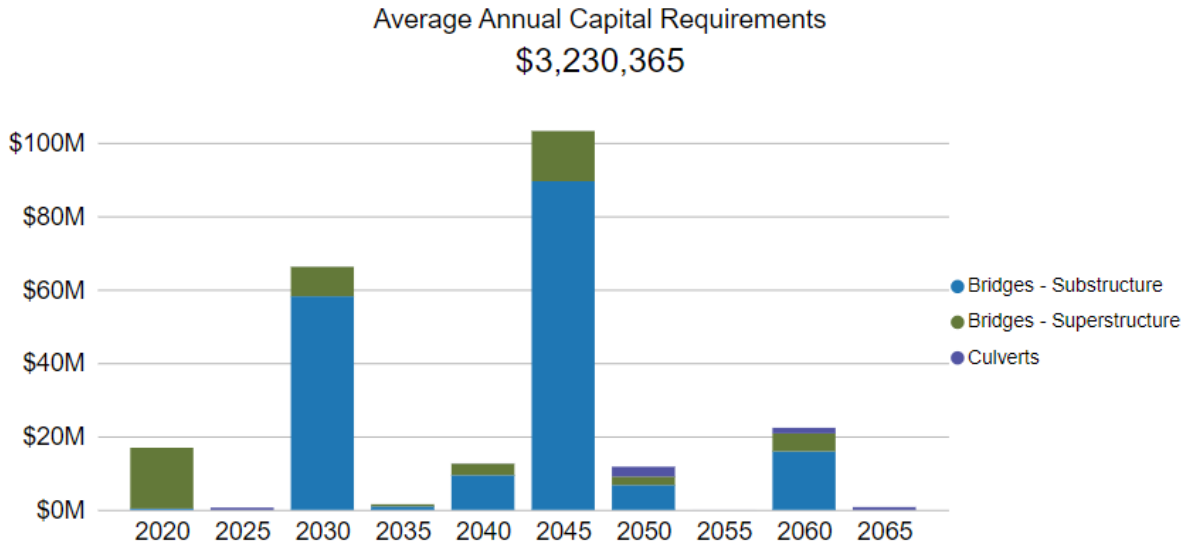
The condition or performance of most assets will deteriorate over time. To ensure that municipal assets are performing as expected and meeting the needs of customers, it is important to establish a lifecycle management strategy to proactively manage asset deterioration.

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

Activity Type	Description of Current Strategy
Maintenance, Rehabilitation and Replacement	Lifecycle activities are driven by the recommendations of mandated structural inspections competed according to the Ontario Structure Inspection Manual (OSIM) and staff expertise.

5.5 Forecasted Capital Requirements

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



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.

5.6 Risk & Criticality

5.6.1 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 2020 inventory data.

Some of the asset-specific attributes that Staff utilized when prioritizing and defining the risk and criticality of these assets are documented below:

Probability of Failure (POF)	Consequence of Failure (COF)
Condition	Replacement Cost (Financial)
Average Daily Traffic Counts	Detour Distance (Social)
Loading & Dimensional Restrictions	Truck/Bus Route (Social)
	Road Classification (Operational)
	Road Environment (Strategic)
	Speed Limit (Health & Safety)
	Replacement Cost (Financial)

5.6.2 Risks to Current Asset Management Strategies

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

Climate Change & Extreme Weather Events

Flooding and extreme weather can cause damage to multiple elements of the City's bridges including the deck, superstructure, substructure, and approaches. The rising levels of freshwater and the increased frequency and intensity of precipitation events are likely to advance the deterioration of bridge components. Staff should identify and monitor affected bridges and culverts. The City should also prioritize infrastructure maintenance, rehabilitation, and replacement based on susceptibility to climate impacts.

Funding & Staff Capacity

The City has a large inventory of bridges which require regular maintenance and assessment. Staff capacity is insufficient or not economically feasible to deploy optimal maintenance and assessment strategies. Major capital rehabilitation projects for bridges and culverts may also be deferred depending on the availability of grant funding opportunities. A long-term capital funding strategy can reduce dependency on grant funding and help prevent the deferral of necessary capital works.

5.7 Levels of Service

The following tables identify the City'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 City has selected for this AMP.

5.7.1 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 (2020)
Scope	Description of the traffic that is supported by municipal bridges (e.g., heavy transport vehicles, motor vehicles, emergency vehicles, pedestrians, cyclists)	Structural bridges and culverts are a key component of the City's transportation service, and support the movement of pedestrians, trucks, emergency vehicles, and motor vehicles in and around Kenora.
Quality	Description or images of the condition of bridges & culverts and how this would affect use of the bridges & culverts	Excellent (BCI 100): Considered like new. No repair or rehabilitation work required within 5-10 years. Good (BCI 70-100): Considered to be in good Condition. Repair or rehabilitation work is not usually required within the next 5 years. Fair (BCI 60-70): Considered to be in good-fair condition. Repair or rehabilitation work recommended is ideally scheduled to be completed within the next 5 years. Poor (BCI Less than 60): Considered poor with lower numbers representing structures nearing the end of their service life. The repair or rehabilitation of these structures is ideally best scheduled to be completed within a year. However, if determined that replacement is more viable, the structure can be identified for continued monitoring and scheduled for replacement within the short-term.

5.7.2 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 (2020)
Scope	% of bridges in the municipality with loading or dimensional restrictions	5%
Quality	Average bridge condition index value for bridges in the municipality	73.1%
	Average bridge condition index value for structural culverts in the municipality	74.9%
Performance	Percentage of bridges and culverts in poor/very poor condition	0%
	Average risk rating associated to bridges and culverts	9.4 (Low)
	Annual capital reinvestment rate	0.4%

5.8 Recommendations

Data Review/Validation

- Continue to review, validate, and upload inventory data, assessed condition data and replacement costs for all bridges and structural culverts upon the completion of OSIM inspections.

Risk Management Strategies

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

Lifecycle Strategies

- Continue to upload the recommended capital lifecycle management activities, within the OSIMs, into the Citywide database to improve capital planning and asset management decision-making.

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 City 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.

6 Storm Sewer Network

6.1 Asset Category & Service Description

The City is responsible for maintaining a Storm Sewer Network of storm mains, catchbasins, manholes and other supporting infrastructure. Staff are working towards improving the accuracy and reliability of their inventory to assist with long-term asset management planning.

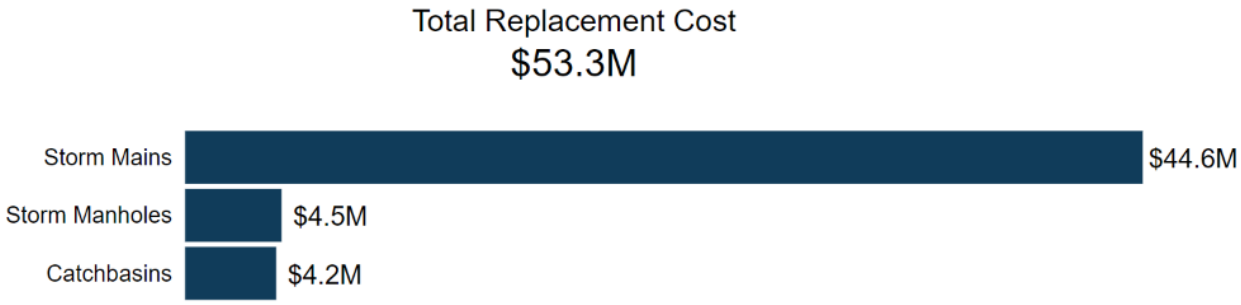
The state of the infrastructure for storm sewer network is summarized in the following table.

Replacement Cost	Condition	Average Risk Rating (out of 25)	Financial Capacity	
			Annual Requirement:	$730,000
$53 million	Very Good (84%)	Low (5.9)	Funding Available:	$90,000
			Annual Deficit:	$640,000

6.2 Asset Inventory & Costs

The table below includes the quantity, replacement cost method, and annual capital requirements of each asset segment in the City's Storm Sewer Network inventory.

Asset Segment	Quantity	Replacement Cost	Annual Capital Requirement
Catchbasins	709	$4,238,000	$56,500
Storm Mains	42 km	$44,584,000	$613,000
Storm Manholes	599	$4,493,000	$60,000
Total		**$53,314,000**	**$730,000**

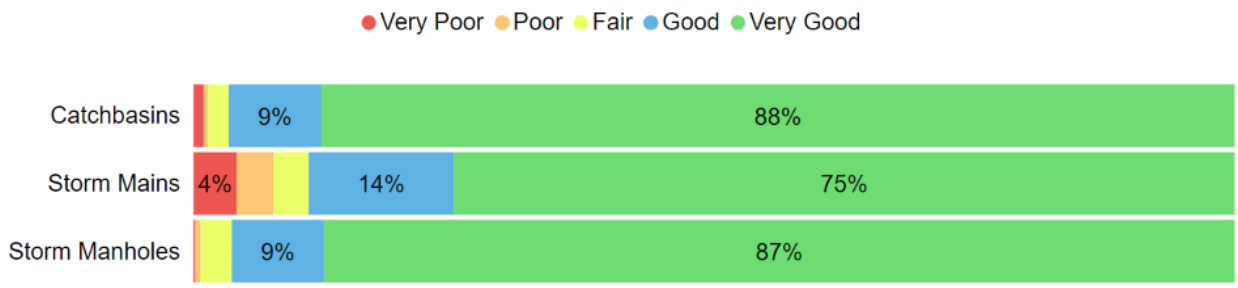


Each asset's replacement cost should be reviewed periodically to determine whether adjustments are needed to more accurate represent realistic capital requirements.

6.3 Asset Data: Useful Life, Age & Condition

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

Asset Segment	Estimated Useful Life (Years)	Average Age (Years)	Average Condition (%)
Catchbasins	75 Years	29.8	88% (Very Good)
Storm Mains	50 – 100 Years	27.5	84% (Very Good)
Storm Manholes	75 Years	35.0	86% (Very Good)
Average		**29.6**	**84% (Very Good)**



To ensure that the City's Storm Sewer Network continue to provide an acceptable level of service, the City 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 Sewer Network.

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

6.3.1 Current Approach to Condition Assessment

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

- CCTV inspections are performed, as needed, to capture condition/performance and grade the pipes. However, in the absence of direct physical condition, staff rely on a multitude of metrics such as age, pipe material, pipe size and performance to gauge overall condition.
- Other storm assets, such as manholes and catchbasins, are inspected on a regular as-needed basis.

In this AMP, the following rating criteria, based on the North American Pipeline Assessment Certification Program (PACP), is used to determine the current condition of storm mains, and forecast future capital requirements:

Condition	Rating
Very Good	0-1
Good	1-2
Fair	2-3
Poor	3-4
Very Poor	4-5

For the other assets in the Storm Sewer Network, the following rating criteria is used to determine current condition and forecast future capital requirements:

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

6.4 Lifecycle Management Strategy

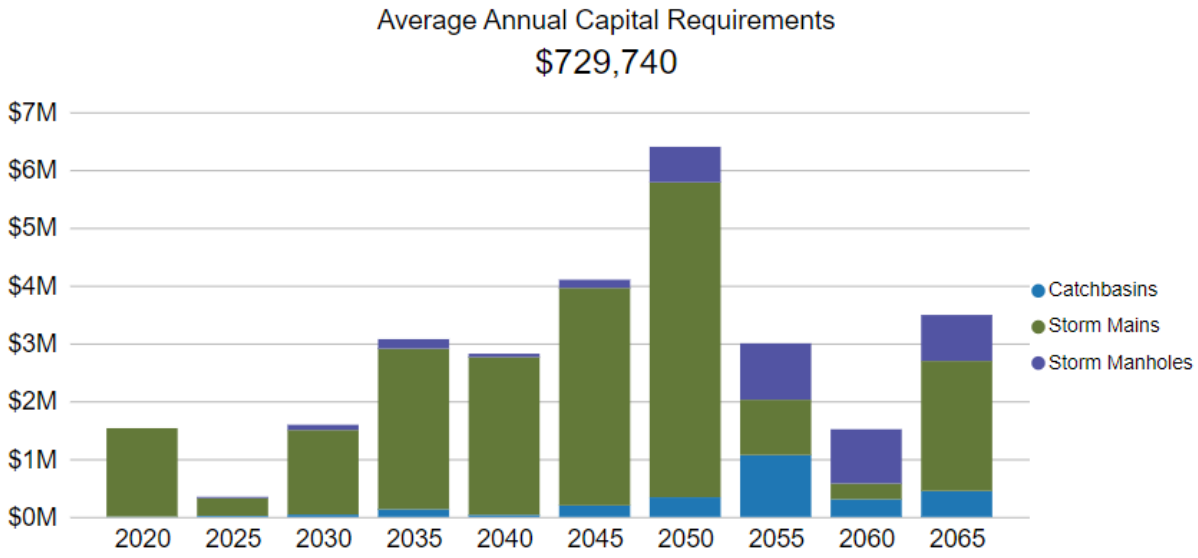
The condition or performance of most assets will deteriorate over time. To ensure that municipal assets are performing as expected and meeting the needs of customers, it is important to establish a lifecycle management strategy to proactively manage asset deterioration.

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

Activity Type	Description of Current Strategy
Maintenance	Maintenance activities include annual catchbasin cleanouts. Storm main flushing is performed on a small percentage of the network annually in prepartion for CCTV inspections.
	CCTV inspections are currently completed, as budget allows, with the goal of achieving a 5-8 year cycle for the entire network.
Rehabilitation	Trenchless re-lining has been conducted minimally, when viable candidates have been identified, based on location/depth, criticality, material, and size.
	Mainline repairs are mostly reactive based on identified deificienies, poor draiange and flooding, or complaints.
Replacement	Replacement of storm sewer assets is mostly reactive, and is typically performed in coordination with other road or underground replacements. Staff also factor in capacity or growth considerations when replacing these assets.

6.5 Forecasted Capital Requirements

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



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.

6.6 Risk & Criticality

6.6.1 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 2020 inventory data.

Some of the asset-specific attributes that Staff utilized when prioritizing and defining the risk and criticality of these assets are documented below:

Probability of Failure (POF)	Consequence of Failure (COF)
Condition	Replacement Cost (Financial)
Pipe Material	Pipe Diameter (Operational)
Slope	Land Use (Strategic)
Service Life Remaining	Average Daily Traffic Counts (Social)

6.6.2 Risks to Current Asset Management Strategies

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

Climate Change & Extreme Weather Events

Staff need a better sense of the impacts of climate change on the storm sewer network to inform retrofitting and replacement planning. Additional data will help address concerns with system capacity and the ability of the stormwater network to manage any potential increase in the intensity, frequency, and duration of rainfall events. Incorporating a monitoring and maintenance program for all stormwater infrastructure into the asset management plan can further support infrastructure resiliency and reduce risk.

Capital Funding

The City has limited funding to dedicate towards the storm sewer network. Major capital rehabilitation and replacement projects for storm sewer assets may also be deferred depending on the availability of grant funding opportunities. A long-term capital funding strategy can reduce dependency on grant funding and help prevent the deferral of necessary capital works.

Asset Data & Information

There are some data gaps for the storm sewer network. Staff are in the process of evaluating the resources and activities required to improve the existing asset inventory. Staff plan to prioritize data refinement efforts and hope to conduct more CCTV inspections.

This has become even more crucial, in light of recent changes to the Environmental Compliance Approval (ECA) application process, managed by the Ministry of Environment, Conservation, and Parks (MECP), requiring accurate inventory of municipal sewer systems.

6.7 Levels of Service

The following tables identify the City's current level of service for Storm Sewer 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 City has selected for this AMP.

6.7.1 Community Levels of Service

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

Service Attribute	Qualitative Description	Current LOS (2020)
Scope	Description, which may include map, of the user groups or areas of the municipality that are protected from flooding, including the extent of protection provided by the municipal storm water system	See Appendix B

6.7.2 Technical Levels of Service

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

Service Attribute	Technical Metric	Current LOS (2020)
Scope	% of the municipal properties resilient to a 100-year storm	TBD
	% of the municipal storm water management system resilient to a 5-year storm	0.0%[4]
Performance	% of storm network in poor / very poor condition	7%
	Average Risk Rating associated to storm network	5.85 (Low)
	Annual capital reinvestment rate	0.35%

[4] The City does not currently have data available to confidently determine the resilience of the storm sewer network to a 5-year storm, however, the network was built to withstand a 2-year storm.

6.8 Recommendations

Condition Assessment Strategies

- Update the condition information for storm mains as the information becomes available from CCTV inspections. Condition data for all other stormwater assets should be integrated into the asset inventory to support the development of appropriate maintenance, rehabilitation, and replacement strategies.

Risk Management Strategies

- Review risk models on a regular basis and adjust according to an evolving understanding of the probability and consequences of asset failure.
- Utilize the Coordinated ID functionality in the Citywide database to link various asset classes (i.e., storm, water, wastewater, roads) together and prioritize lifecycle projects accordingly. This is especially pertinent to the storm sewer network since these assets are typically repaired/replaced in coordination with other types of assets.

Lifecycle Strategies

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

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 City 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.

7 Buildings

7.1 Asset Category & Service Description

The City of Kenora owns and maintains numerous facilities and recreation centres that provide key services to the community. These include:

- Administrative offices
- Fire halls and associated offices and facilities
- Public works garages and storage sheds
- An arena, library, and other community centres

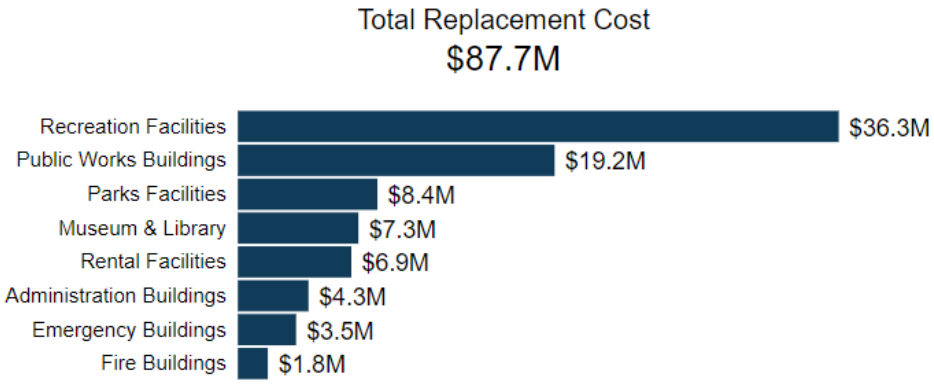
The state of the infrastructure for buildings is summarized in the following table.

Replacement Cost	Condition	Average Risk Rating (out of 25)	Financial Capacity	
$88 million	Very Good (92%)	Low (4.4)	Annual Requirement:	$2,361,000
			Funding Available:	$748,000
			Annual Deficit:	$1,613,000

7.2 Asset Inventory & Costs

The table below includes the quantity, replacement cost method, and annual capital requirements of each asset segment in the City's Buildings inventory.

Asset Segment	Quantity (Components)	Replacement Cost	Annual Capital Requirement
Administration Buildings	4 (8)	$4,273,000	$90,000
Emergency Buildings	4 (1)	$3,521,000	$62,000
Fire Buildings	10 (13)	$1,812,000	$36,000
Museum & Library	4 (19)	$7,287,000	$158,000
Parks Facilities	37	$8,440,000	$342,000
Public Works Buildings	12 (11)	$19,157,000	$506,000
Recreation Facilities	12 (75)	$36,344,000	$997,000
Rental Facilities	14 (9)	$6,863,000	$170,000
Total		**$87,698,000**	**$2,361,000**

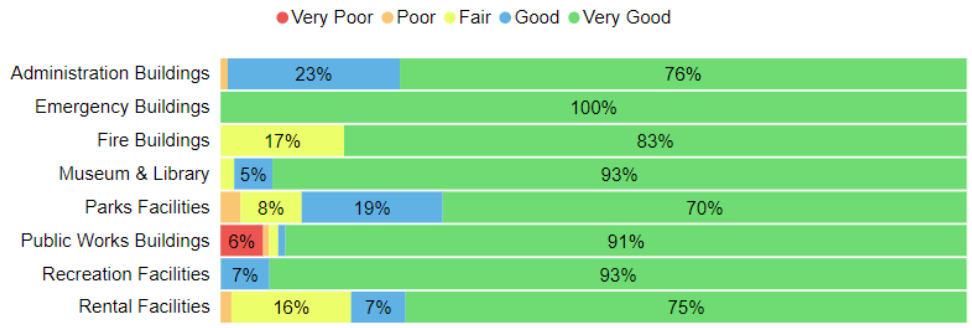


Each asset's replacement cost should be reviewed periodically to determine whether adjustments are needed to more accurate represent realistic capital requirements.

7.3 Asset Data: Useful Life, Age & Condition

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

Asset Segment	Estimated Useful Life (Years)	Average Age	Average Condition (%)
Administration Buildings	20 – 75 Years	19.5	93% (Very Good)
Emergency Buildings	20 – 75 Years	30.9	89% (Very Good)
Fire Buildings	75 Years	23.4	85% (Very Good)
Museum & Library	75 Years	26.1	91% (Very Good)
Parks Facilities	10 – 75 Years	30.5	87% (Very Good)
Public Works Buildings	10 – 75 Years	8.7	90% (Very Good)
Recreation Facilities	10 – 75 Years	9.7	96% (Very Good)
Rental Facilities	10 – 75 Years	33.1	87% (Very Good)
Average		**18.8**	**92% (Very Good)**



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

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

7.3.1 Current Approach to Condition Assessment

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

- Buildings are assessed by internal staff on a regular basis to identify component failures and deficiencies. Findings are documented for the purposes of short-term capital planning.
- Formal condition assessments are conducted by external consultants on an as-needed basis; However, staff are actively considering conducting a network wide assessment of all their critical buildings in the short-term to support accurate and proactive capital planning.

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

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

7.4 Lifecycle Management Strategy

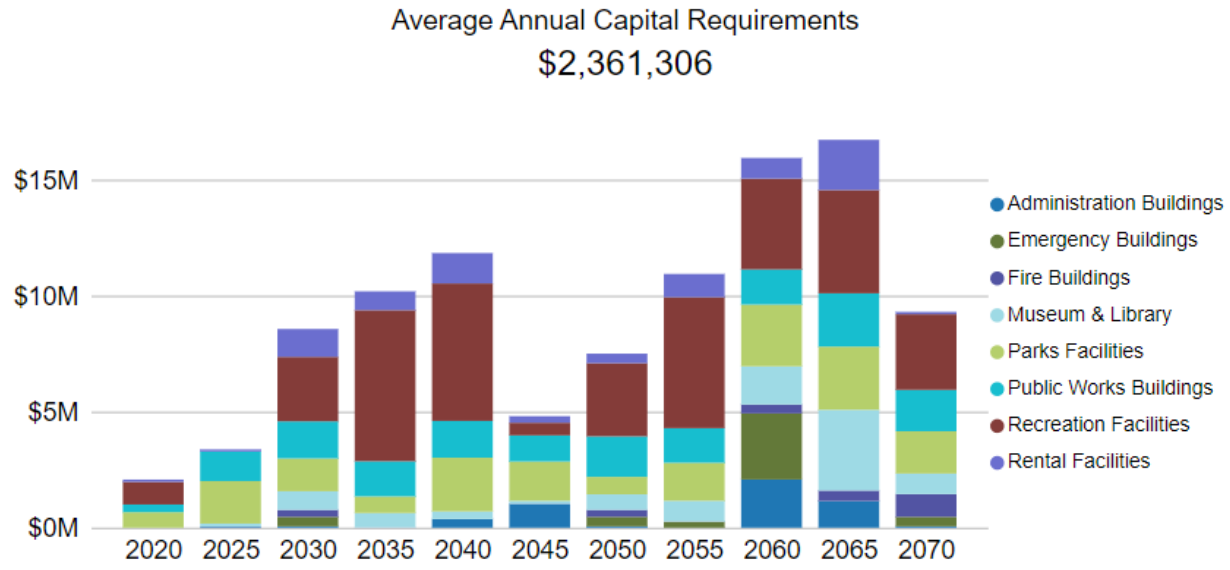
The condition or performance of most assets will deteriorate over time. To ensure that municipal assets are performing as expected and meeting the needs of customers, it is important to establish a lifecycle management strategy to proactively manage asset deterioration.

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

Activity Type	Description of Current Strategy
Maintenance	Municipal buildings are subject to monthly health & safety inspections by the City's Joint Health & Safety Committee.
	Critical buildings (i.e. fire buildings and emergency buildings) have detailed maintenance and rehabilitation schedules, while less critical facilities are managed more reactively.
	Specific components of buildings, such as HVAC systems, generators, and elevators, are inspected in accordance with their manufacturing recommendations and/or Building Code Act requirements.
Rehabilitation/ Replacement	Rehabilitation and/or replacement activities are completed strategically based on the criticality of the components to the function/operation of the buildings, customer impact, Health and Safety concerns, and capacity/growth requirements.

7.5 Forecasted Capital Requirements

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



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.

7.6 Risk & Criticality

7.6.1 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 2020 inventory data.

Some of the asset-specific attributes that Staff utilized when prioritizing and defining the risk and criticality of these assets are documented below:

Probability of Failure (POF)	Consequence of Failure (COF)
Condition	Replacement Cost (Financial)
Service Life Remaining	Function/Department (Strategic)

7.6.2 Risks to Current Asset Management Strategies

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

Asset Data & Information

The current limited structure and componentization of the City's buildings restricts Staff's abilities to plan capital projects and asset rehabilitations/replacements proactively; these components have unique estimated useful lives and require asset-specific lifecycle strategies. Staff have begun prioritizing data refinement efforts to componentize their buildings to improve capital planning and lifecycle management.

Climate Change & Extreme Events

Flooding and extreme weather can cause damage to multiple elements of the City's buildings. Changing temperatures, rising levels of freshwater, and the increased frequency and intensity of precipitation events, lightning storms, and windstorms pose a risk to buildings. Staff should identify and monitor the effects of climate change and extreme events on buildings. The City should also prioritize infrastructure maintenance, rehabilitation, and replacement based on susceptibility to climate impacts.

7.7 Levels of Service

The following tables identify the City's current level of service for Buildings. The metrics include technical and community level of service metrics that are determined by municipal staff.

7.7.1 Community Levels of Service

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

Service Attribute	Qualitative Description	Current LOS (2020)
Accessible & Reliable	List of facilities that meet accessibility standards and any work that has been undertaken to achieve alignment	**City Hall** offers an accessible ramp and automatic doors to enter the main building and council chambers. There are lower level desks for wheelchair access and accessible public washrooms. Parking lot offers one handicap spot. **Operations Centre** offers an accessible ramp and automatic doors to enter the building. An elevator allowing passage between two floors and accessible public washrooms. Parking lot offers one handicap spot. **Lake of the Woods Discovery Centre** offers sidewalk-level entrance with automatic doors; Elevators allowing passage between two floors, accessible public washrooms, and Wi-Fi throughout the building. **Thistle Pavilion** offers sidewalk-level entrance with automatic doors for entry and accessible public washrooms. **Whitecap Pavilion** offers accessible all around level. **Kenora Public Libraries** offer online access and physical access to books, audio, and video tapes. Other services include inter-library loan of materials, access to a fax machine and word processing software, along with a variety of special programs for children and adults. Two branches provide internet access. **The Muse** (includes the Lake of the Woods Museum and Douglas Family Art Centre) Offers a sidewalk-level entrance with automatic doors; elevators allowing passage between all three floors, accessible public washrooms, wide hallways and door openings and Wi-Fi throughout the building. **Kenora Recreation Centre** offers an accessible ramp with automatic doors leading into the building; Elevators allowing passage between two floors; contains accessible public washrooms, accessible pool entry/exit and wheelchair ice-level seating by lift. **Keewatin Memorial Arena** offers an accessible ramp with automatic doors for entry and/or exit.

		Transfer Station offers sidewalk-level entry with automatic doors. **Cemetery** provides internet services. **Fire Stations** offer sidewalk-level entry with automatic doors; Elevators allowing passage between two floors.
Affordable	Description of usage rates and operating hours	**City Hall** – Monday to Friday, 8 a.m-4:30 pm. Usage rates would be to rent Council Chambers, in Tariff of Fees and Charges. **Operations Centre** – Monday to Friday, 8 am to 4:30 pm. **Lake of the Woods Discovery Centre** – Open daily, 9 am to 4 pm. Usage rates in the Tariff of Fees and Charges **Thistle Pavilion** – open in the summer. User rates in the Tariff of Fees and Charges **Whitecap Pavilion** – variable hours depending on scheduled events. User rates in Tariff of Fees and Charges **Kenora Library** – Mon/Wed/Thurs/Fri (9 am-5 pm); Tue (9 am-7 pm); Sat (9 am-2 pm); closed on statutory holidays and Sunday. **Keewatin Library** – Mon/Wed/Fri (10 am-12 pm and 1 pm-5 pm); closed on statutory holidays and Tue/Thurs/Sat/Sun. **The Muse** - September – June: Tuesday to Saturday, 10am – 5pm; July – August: Sunday to Saturday, 10am – 5pm. User rates for Museum or Art Centre can be found here: https://themusekenora.ca/plan-your-visit/hours-and-admission/ **Kenora Recreation Centre** – Open Monday to Friday, 6 am to 9:30 pm; Saturday and Sunday 7:15 am to 8:15 pm; walking track open daily 6 am to 10:00 pm. Usage rates in the Tariff of Fees and Charges; parking fees and tenant rental fees available **Keewatin Memorial Arena** – Open Monday to Friday, 6 am to 9:30 pm; Saturday and Sunday 7:15 am to 8:15 pm; ice surface is open in summer months. Usage rates in the Tariff of Fees and Charges. **Transfer Station** – Monday to Friday, 8 am to 5:30 pm; Saturday 8:30 am to 4 pm, Sunday - April to October, 8:30 am to 4 pm - November to March, 12 noon to 4 pm. Closed on statutory holidays. Usage rates are included in the fees. **Cemetery garage** – Open during park hours (8 am to 8 pm). Usage rates are identified in the By-law 87-2020 . **Fire Stations** – Station One is open all day, every day; Station Two is unmanned; Stations Three and Four are open an on-call basis. Usage rates for parking and rental of training room and be found here: https://www.kenora.ca/en/living-here/fire-services.aspx

7.7.2 Technical Levels of Service

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

Service Attribute	Technical Level of Service	Current LOS (2020)
Accessible & Reliable	% of assets where their age is greater than their useful service life	3%
Safe & Regulatory	# of health and safety inspections per building	12
Sustainable	% of buildings that are in good/very good condition	95%
	% of buildings that are in poor/very poor condition	2%
	% of buildings and facilities having a building condition assessment over the last (5) years	0%
	Average Risk Rating associated to buildings	Low (4.4)
	Annual capital reinvestment rate	0.85%

7.8 Recommendations

Condition Assessment Strategies

- The City should implement regular condition assessments for all buildings to better inform short- and long-term capital requirements.
- Although there were a couple of building condition assessments available at the time of this AMP, due to the current structure and lack of componentization of buildings in the Citywide asset management database, the condition ratings and recommendations from those assessments could not be easily incorporated. Staff can work towards componentizing their buildings using the Building Uniformat II Code Classification.

Risk Management Strategies

- Review risk models on a regular basis and adjust according to an evolving understanding of the probability and consequences of asset failure. When the municipal building are componentized consistently, consider incorporating risk metrics and/or models that are component-specific (i.e., roofing, plumbing, electrical, etc.) for a more granular prioritization analysis.

Lifecycle Strategies

- Within this iteration of the AMP, asset end-of-life replacement is the only lifecycle strategy that was identified and quantified for Buildings. As Staff continue to operationalize their inventory, component-based rehabilitative events can be incorporated to assist with effective short-term and long-term capital planning.
- Evaluate the efficacy of the City's lifecycle management strategies at regular intervals to determine the impact cost, condition, and risk.

Levels of Service

- Continue to measure current levels of service in accordance with the metrics the City believes to provide meaningful and reliable inputs into asset management planning.
- Work towards identifying proposed levels of service and identify the strategies that are required to close any gaps between current and proposed levels of service.

8 Equipment

8.1 Asset Category & Service Description

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

- Landscaping equipment to maintain public parks
- Machinery and equipment to maintain and repair core infrastructure
- Machinery to maintain recreational facilities
- Equipment for public use within recreation centers
- Administrative computers and other hardware
- Fire and police equipment to support the delivery of emergency and protective services

Keeping machinery & equipment in an adequate state of repair is important to maintain the desired level of service.

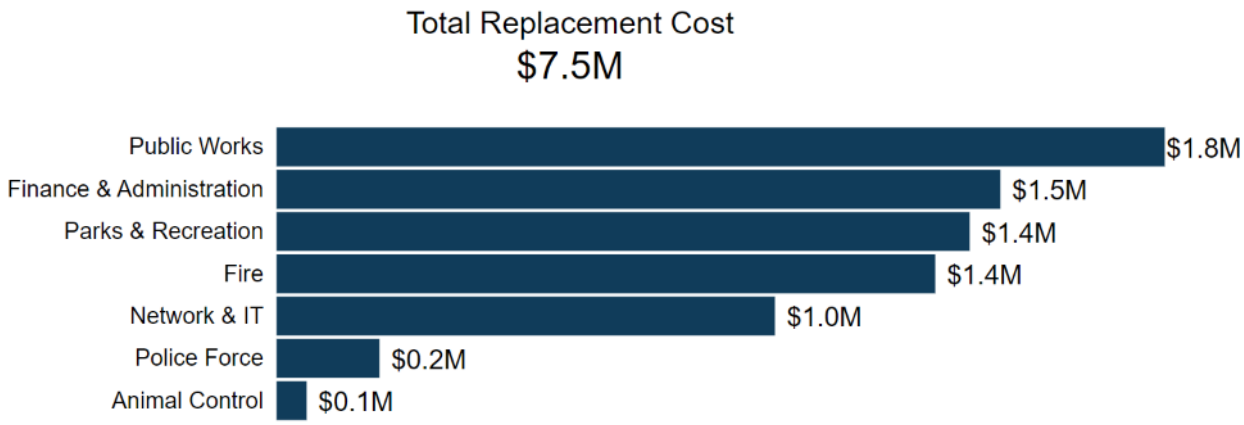
The state of the infrastructure for equipment is summarized in the following table.

Replacement Cost	Condition	Average Risk Rating (out of 25)	Financial Capacity	
$7.5 million	Very Poor (19%)	High (14.8)	Annual Requirement:	$968,000
			Funding Available:	$241,000
			Annual Deficit:	$727,000

8.2 Asset Inventory & Costs

The table below includes the quantity, replacement cost method, and annual capital requirements of each asset segment in the City's Equipment inventory.

Asset Segment	Quantity	Replacement Cost	Annual Capital Requirement
Animal Control	8	$62,000	$8,000
Finance & Administration	176	$1,501,000	$243,000
Fire	212	$1,365,000	$133,000
Network & IT	70	$1,033,000	$216,000
Parks & Recreation	49	$1,437,000	$119,000
Police Force	42	$214,000	$45,000
Public Works	472	$1,842,000	$204,000
Total		**$7,454,000**	**$968,000**

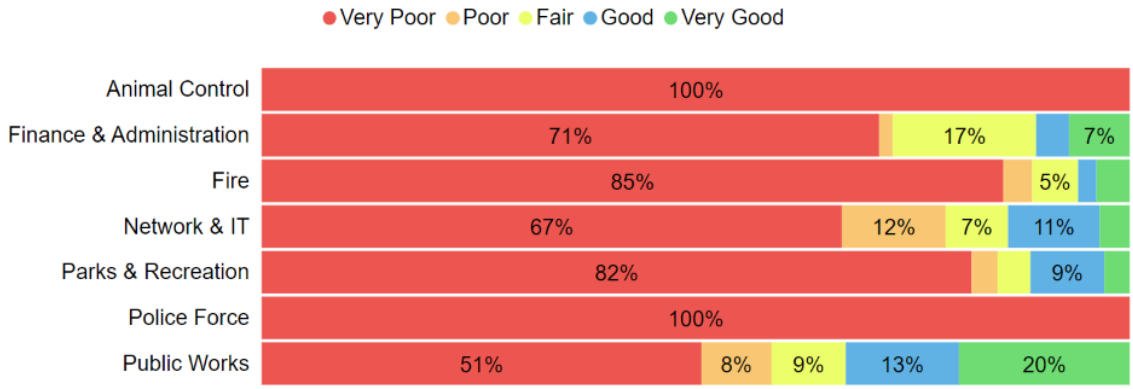


Each asset's replacement cost should be reviewed periodically to determine whether adjustments are needed to more accurate represent realistic capital requirements.

8.3 Asset Data: Useful Life, Age & Condition

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

Asset Segment	Estimated Useful Life (Years)	Average Age	Average Condition (%)
Animal Control	10 Years	13.5	0% (Very Poor)
Finance & Administration	3 – 10 Years	12.6	18% (Very Poor)
Fire	15 Years	12.5	10% (Very Poor)
Network & IT	3 – 10 Years	10.3	19% (Very Poor)
Parks & Recreation	25 Years	12.3	12% (Very Poor)
Police Force	3 – 10 Years	15.5	0% (Very Poor)
Public Works	25 Years	10.5	34% (Poor)
Average		12.1	19% (Very Poor)



To ensure that the City's Equipment assets continue to provide an acceptable level of service, the City 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 Equipment assets. Each asset's Estimated Useful Life should also be reviewed periodically to determine whether adjustments need to be made to better align with the observed length of service life for each asset type.

8.3.1 Current Approach to Condition Assessment

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

- There are no formal condition assessment programs in place for most equipment, however, internal, and external inspections of equipment are completed as needed to ensure they are in state of adequate repair.

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

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

8.4 Lifecycle Management Strategy

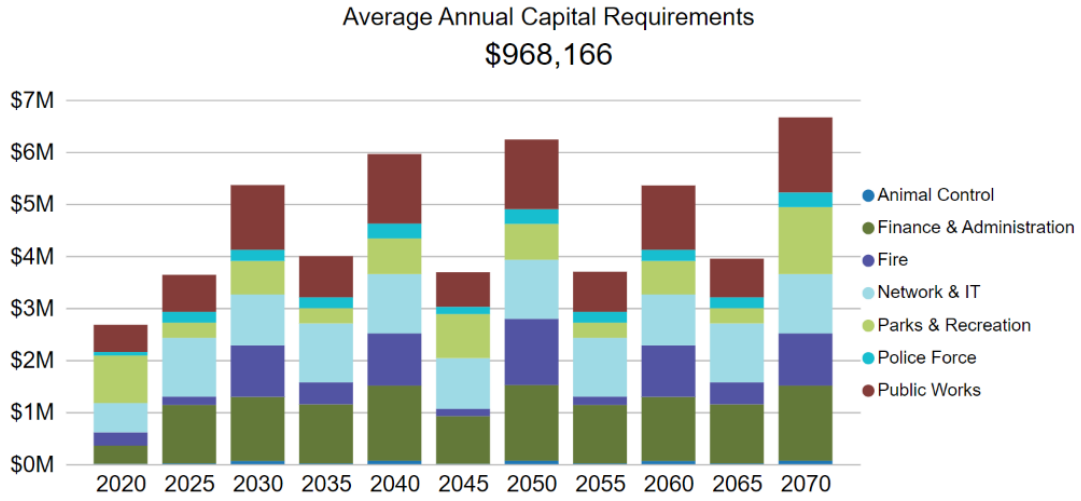
The condition or performance of most assets will deteriorate over time. To ensure that municipal assets are performing as expected and meeting the needs of customers, it is important to establish a lifecycle management strategy to proactively manage asset deterioration.

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

Activity Type	Description of Current Strategy
Maintenance/ Rehabilitation/ Replacement	The maintenance program varies by department, but most equipment assets have minimal maintenance activities. Fire equipment and other critical assets are inspected and maintained more riguously.
	Equipment repair and/or replacement is driven by manufacturer recommendations and municipal staff expertise. Staff priortize the repalcement of assets based on their criticality, available redundancies and budget constraints.

8.5 Forecasted Capital Requirements

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



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.

8.6 Risk & Criticality

8.6.1 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 2020 inventory data.

Some of the asset-specific attributes that Staff utilized when prioritizing and defining the risk and criticality of these assets are documented below:

Probability of Failure (POF)	Consequence of Failure (COF)
Condition	Replacement Cost (Financial)
Service Life Remaining	Function/Department (Strategic)

8.6.2 Risks to Current Asset Management Strategies

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

Aging Infrastructure
A significant portion of equipment assets are approaching or beyond their useful life. As equipment ages, its performance and reliability declines exponentially, leading to an increase in operating expenses to maintain the required level of service.

8.7 Levels of Service

The following tables identify the City's current level of service for Equipment. The metrics include technical and community level of service metrics that are determined by municipal staff.

8.7.1 Community Levels of Service

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

Service Attribute	Qualitative Description	Current LOS (2020)
Accessible & Reliable	Description of redundancies available to ensure equipment is available, as necessary, for operations	Redundancies are present in the majority of equipment segements to ensure it is available to complete operations. For computers and IT devices, a staff member can work from any City device of which there are many spares. For critical operational activities generally back-ups and/or spares are available.
Safe & Regulatory	Description of the timelines for equipment inspections and timing for IT software and hardware upgrades	Typical personal computers are replaced every three to four years including software updates if available.
Affordable	Description of the lifecycle activities (maintenance, rehabilitation, and	Lifecycle activities vary widely depending on the type of equipment asset, and are guided

	replacement) performed on equipment assets	by the criticality of the asset and budget constraints. End-of-life replacement is typically employed.
Sustainable	Description of the current condition of equipment and the plans that are in place to maintain or improve the condition	Most equipment assets are maintained reactively, and are repaired/replaced at end-of-life or as-needed.

8.7.2 Technical Levels of Service

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

Service Attribute	Technical Level of Service	Current LOS (2020)
Accessible & Reliable	% of assets where their age is greater than their useful service life	58%
Safe & Regulatory	# of workplace injuries due to equipment failures	0
Sustainable	% of equipment that are in good/very good condition	16%
	% of equipment that are in poor/very poor condition	76%
	Average Risk Rating associated with Equipment assets	High (14.8)
	Annual Capital Reinvestment rate	3.2%

8.8 Recommendations

Data and Asset Information

- The Equipment inventory is somewhat accurate; however, it can be managed more simply and effectively by pooling/amalgamating smaller assets that are replaced regularly (e.g., computers, hoses, printers) together.
- Almost all asset replacement costs used in this AMP are based on historical inflation. These costs should be evaluated to determine their reliability based on the most current market prices.

Condition Assessment Strategies

- Identify condition assessment strategies for high-value and high-risk equipment.
- 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 to maintain an accurate assessment.

Risk Management Strategies

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

Lifecycle Strategies

- Within this iteration of the AMP, asset end-of-life replacement is the only lifecycle strategy that was identified and quantified for Equipment assets. Staff should continue to evaluate the efficacy of current lifecycle management strategies and incorporate into the Citywide database, when possible, to assist in their capital projections.

Levels of Service

- Continue to measure current levels of service in accordance with the metrics the City believes to provide meaningful and reliable inputs into asset management planning.
- Work towards identifying proposed levels of service and identify the strategies that are required to close any gaps between current and proposed levels of service.

9 Fleet

9.1 Asset Category & Service Description

Fleet allows staff to efficiently deliver municipal services and personnel. Municipal fleet supports several service areas, including:

- Pick-up trucks and heavy machinery to support the maintenance of the transportation network and address service requests for parks and recreation
- Fire rescue vehicles to provide emergency services

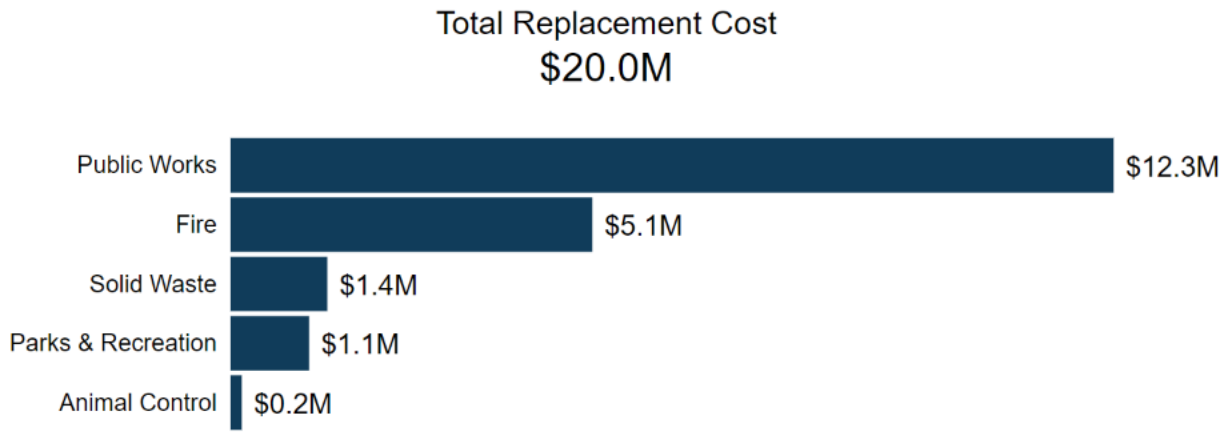
The state of the infrastructure for fleet is summarized in the following table.

Replacement Cost	Condition	Average Risk Rating (out of 25)	Financial Capacity	
$20 million	Good (62%)	Moderate (8.1)	Annual Requirement:	$1,254,000
			Funding Available:	$650,000
			Annual Deficit:	$604,000

9.2 Asset Inventory & Costs

The table below includes the quantity, replacement cost method, and annual capital requirements of each asset segment in the City's Fleet.

Asset Segment	Quantity	Replacement Cost	Annual Capital Requirement
Animal Control	3	$156,000	$13,000
Fire	12	$5,056,000	$211,000
Parks & Recreation	21	$1,097,000	$85,000
Public Works	95	$12,338,000	$855,000
Solid Waste	6	$1,351,000	$91,000
Total		**$19,999,000**	**$1,254,000**

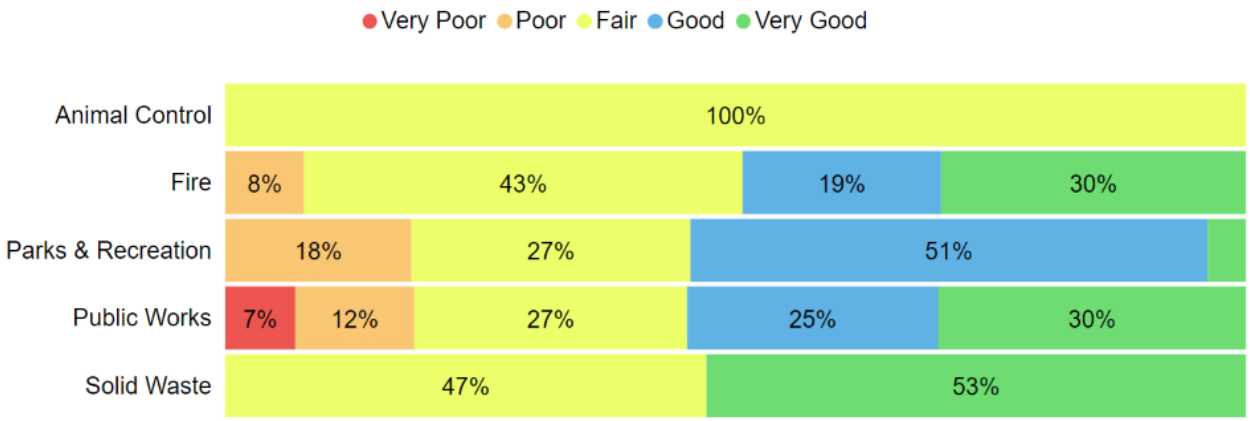


Each asset's replacement cost should be reviewed periodically to determine whether adjustments are needed to more accurate represent realistic capital requirements.

9.3 Asset Data: Useful Life, Age & Condition

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

Asset Segment	Estimated Useful Life (Years)	Average Age	Average Condition (%)
Animal Control	12 Years	5.5	54% (Fair)
Fire	7 - 25 Years	20.0	64% (Good)
Parks & Recreation	7 - 20 Years	11.8	58% (Fair)
Public Works	20 Years	11.7	61% (Good)
Solid Waste	15 Years	4.8	75% (Good)
Average		**11.9**	**62% (Good)**



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

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

9.3.1 Current Approach to Condition Assessment

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

- Staff complete regular visual inspections of fleet to ensure they are in state of adequate repair prior to operation. Annual certification and safety inspections are completed as required by Commercial Vehicle Operator's Registration (CVOR).
- Inspection of fire-related fleet adhere to National Fire Protection Association (NFPA) requirements.

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

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

9.4 Lifecycle Management Strategy

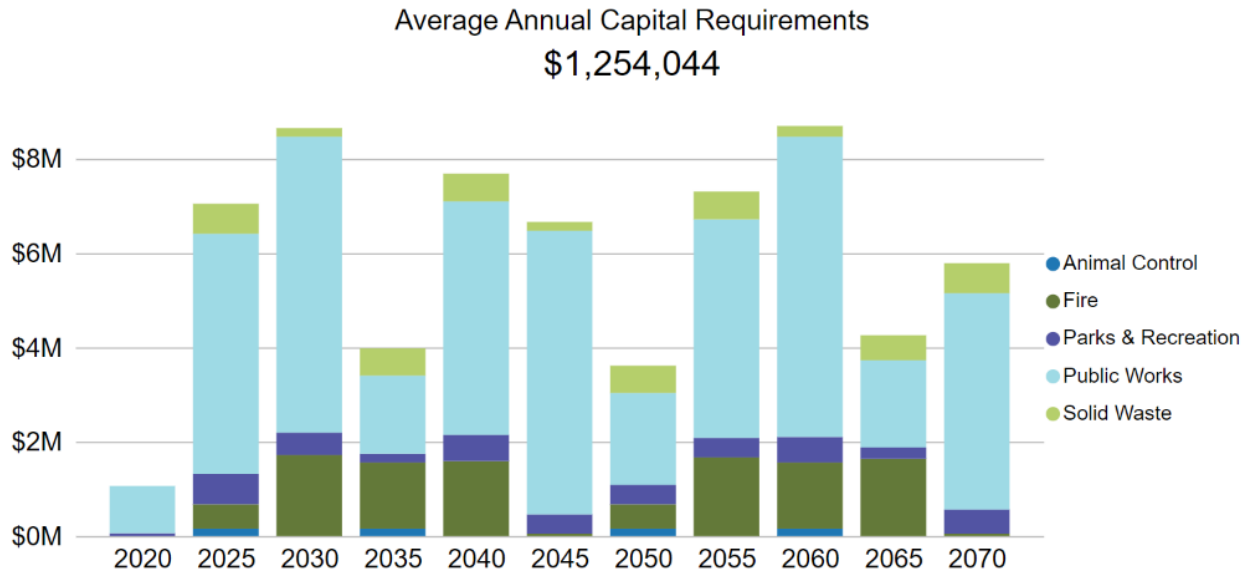
The condition or performance of most assets will deteriorate over time. To ensure that municipal assets are performing as expected and meeting the needs of customers, it is important to establish a lifecycle management strategy to proactively manage asset deterioration.

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

Activity Type	Description of Current Strategy
Maintenance / Rehabilitation	Visual inspections are completed and documented daily; fluids are inspected at every fuel stop; tires are inspected monthly.
	Certification and safety inspections are completed annually, as required.
	Annual preventative maintenance activities include system components check and additional detailed inspections by internal mechanics.
Replacement	Fleet replacement is performed strategically to maximize the estimated useful life and remaining value of the assets, with some assets being transferred or rotated to different departments or lighter function.
	Service life remaining, mileage, performance, regulatory requirements, and annual repair costs are taken into consideration when determining the most appropriate treatment option for fleet assets.

9.5 Forecasted Capital Requirements

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



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.

9.6 Risk & Criticality

9.6.1 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 2020 inventory data.

Some of the asset-specific attributes that Staff utilized when prioritizing and defining the risk and criticality of these assets are documented below:

Probability of Failure (POF)	Consequence of Failure (COF)
Condition	Replacement Cost (Financial)
Service Life Remaining	Function/Department (Strategic)

9.6.2 Risks to Current Asset Management Strategies

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

Inventory Supply & Staff Capability

The City does not have sufficient inventory to efficiently execute lifecycle activities. Excessive use and user-error result in increased asset deterioration and vehicles are often out of commission due to repairs. Further delay is caused by the lack of available parts for repairs. The City should consider investing in expanding the fleet and staff training to reduce asset failure.

Capital Funding Strategies

Fleet procurement and capital rehabilitation projects are often dependent on the availability of grant funding opportunities. When grants are not available, rehabilitation projects or necessary acquisition may be deferred. An annual capital funding strategy can reduce dependency on grant funding and help prevent deferral of capital works.

9.7 Levels of Service

The following tables identify the City's current level of service for Fleet. The metrics include technical and community level of service metrics that are determined by municipal staff.

9.7.1 Community Levels of Service

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

Service Attribute	Qualitative Description	Current LOS (2020)
Accessible & Reliable	List of fleet that have an annual out-of-service time exceeding 3 days	N/A
Safe & Regulatory	Description of the MTO vehicles inspection process undertaken each year	Fleet within the fire department are inspected in reference to vehicle manuals and in accordance with the guidelines set by the National Fire Protection Association (NFPA). The Commercial Vehicle Operator's Registration (CVOR) Fleet are inspected and maintained by an external, certified mechanic.
Affordable	Description of the lifecycle activities (maintenance, rehabilitation, and replacement) performed on vehicles	Regular maintenance and rehabilitation activities such as servicing, or engine refurbishments are performed when required and/or based on mileage.
Sustainable	Description of the current condition of vehicles and the plans that are in place to maintain or improve the provided level of service	The City develops a 10-year capital plan for its assets' renewal considering the condition, service life remaining, and criticality of those assets. Staff try to maximize the useful life of vehicles by rotating them to light work when they get older and less efficient.

9.7.2 Technical Levels of Service

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

Service Attribute	Technical Level of Service	Current LOS (2020)
Accessible & Reliable	% of assets where their age is greater than their useful service life	25%
Safe & Regulatory	# of fleet involved in a collision per year	0
Sustainable	% of fleet that are in good/very good condition	53%
	% of fleet that are in poor/very poor condition	14%
	Average Risk Rating associated to fleet	Moderate (8.1)
	Annual Capital Reinvestment Rate	3.3%

9.7.3 Recommendations

Replacement Costs

- Continue to revise and update user-defined replacement costs. Replacement costs should be updated according to the best available information every 1-2 years.

Condition Assessment Strategies

- 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

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

Lifecycle Strategies

- Within this iteration of the AMP, asset end-of-life replacement is the only lifecycle strategy that was identified and quantified for Fleet assets. Staff should continue to evaluate the efficacy of current lifecycle management strategies and incorporate into the Citywide database, when possible, to assist in their capital projections.

Levels of Service

- Continue to measure current levels of service in accordance with the metrics the City believes to provide meaningful and reliable inputs into asset management planning.
- Work towards identifying proposed levels of service and identify the strategies that are required to close any gaps between current and proposed levels of service.

10 Land Improvements

10.1 Asset Category & Service Description

The City of Kenora owns a number of assets that are considered Land Improvements. This category includes:

- Parking lots for municipal facilities and parks
- Trailways and playgrounds
- Athletic courts and fields
- Docks and wharfs

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

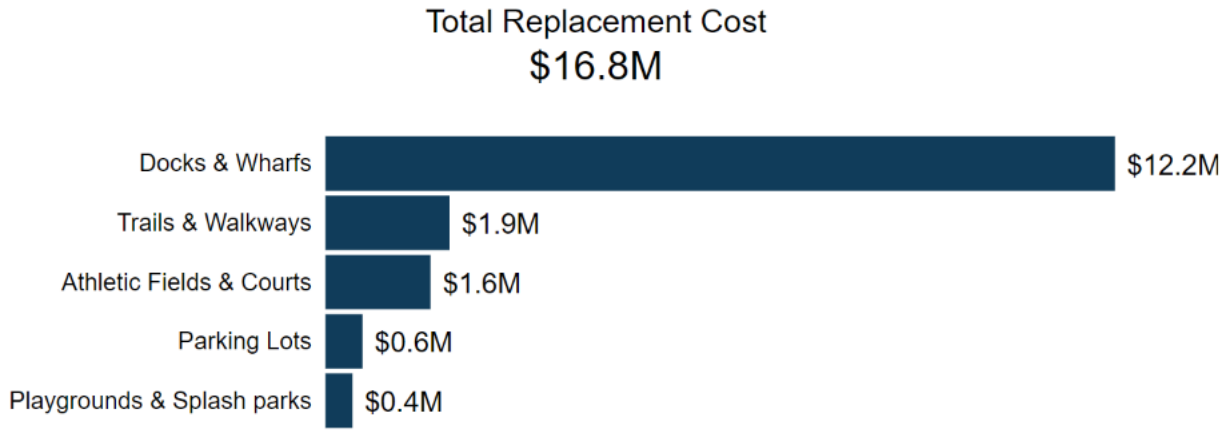
Replacement Cost	Condition	Average Risk Rating (out of 25)	Financial Capacity	
$16.8 million	Good (62%)	Moderate (8.8)	Annual Requirement:	$522,000
			Funding Available:	$122,000
			Annual Deficit:	$400,000

10.1.1 Asset Inventory & Costs

The table below includes the quantity, replacement cost method, and annual capital requirements of each asset segment in the City's Land Improvements inventory.

Asset Segment	Quantity	Total Replacement Cost	Annual Capital Requirement
Athletic Fields & Courts	28	$1,628,000	$70,000
Docks & Wharfs	34	$12,225,000	$332,000
Parking Lots	5	$573,000	$23,000
Playgrounds & Splash parks	7	$420,000	$25,000
Trails & Walkways	11	$1,922,000	$72,000
Total		**$16,768,000**	**$522,000**

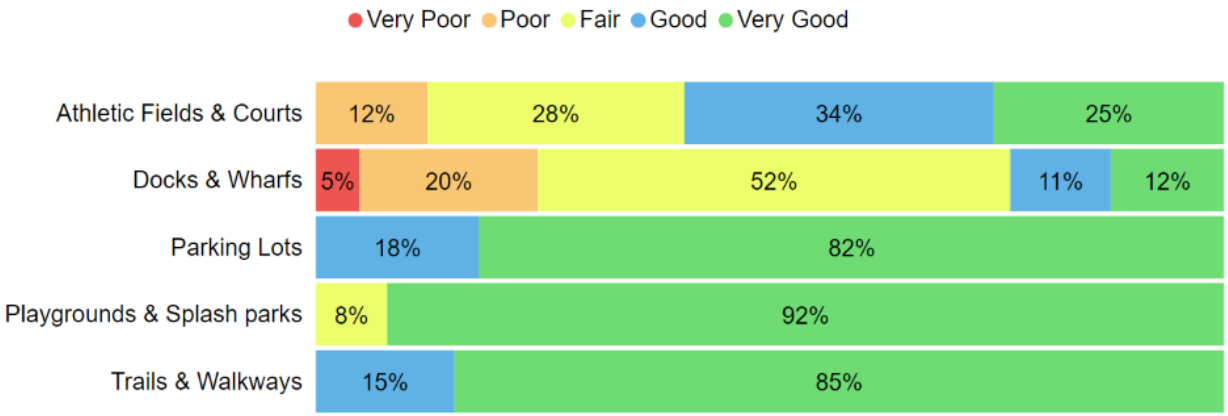
Each asset's replacement cost should be reviewed periodically to determine whether adjustments are needed to more accurate represent realistic capital requirements.



10.2 Asset Data: Useful Life, Age & Condition

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

Asset Segment	Estimated Useful Life (Years)	Average Age	Average Condition (%)
Athletic Fields & Courts	10 – 75 Years	20	65% (Good)
Docks & Wharfs	75 Years	27.5	53% (Fair)
Parking Lots	25 Years	6.9	89% (Very Good)
Playgrounds & Splash parks	10 - 25 Years	7.8	91% (Very Good)
Trails & Walkways	25 - 50 Years	7.5	90% (Very Good)
Average		**19**	**61% (Good)**



To ensure that the City's Land Improvements continues to provide an acceptable level of service, the City 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.

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

10.2.1 Current Approach to Condition Assessment

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

- To ensure they are in a state of adequate repair, daily and/or weekly visual inspections of playgrounds and parks are undertaken. Safety inspections are conducted by a qualified playground inspector in accordance with CSA Z614 standards.
- Other land improvement assets are assessed as needed. Asset failures and deficiencies are documented for the purposes of short-term capital planning.

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

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

10.3 Lifecycle Management Strategy

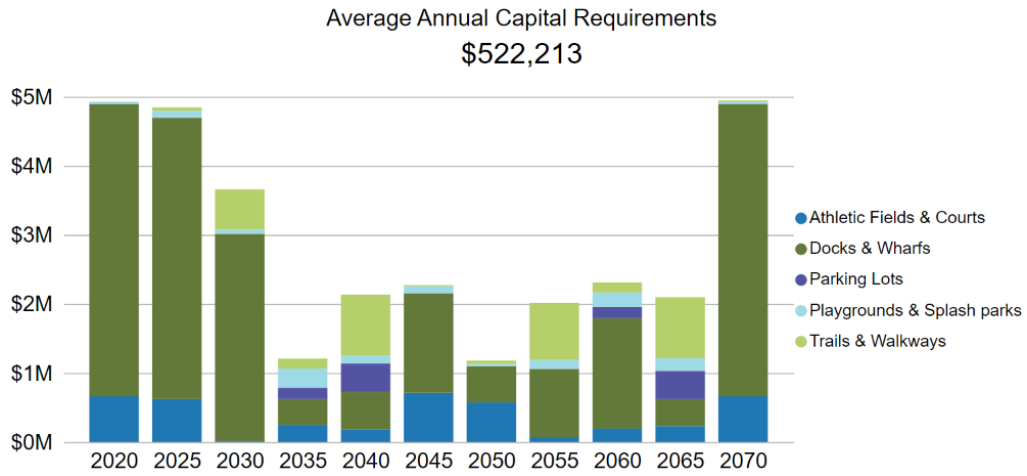
The condition or performance of most assets will deteriorate over time. To ensure that municipal assets are performing as expected and meeting the needs of customers, it is important to establish a lifecycle management strategy to proactively manage asset deterioration.

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

Activity Type	Description of Current Strategy
Maintenanace, Rehabilitation & Replacement	Land Improvements assets include several unique asset types and maintenance activities which are dealt with on a case-by-case basis. Maintenance often includes daily and/or weekly cleaning and inspection of land improement assets.
	Most land improvement assets are replaced at end-of-life; Repairs are driven by health and safety concerns, customer complaints/expectations and budget constraints.

10.4 Forecasted Capital Requirements

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



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.

10.5 Risk & Criticality

10.5.1 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 2020 inventory data.

Some of the asset-specific attributes that Staff utilized when prioritizing and defining the risk and criticality of these assets are documented below:

Probability of Failure (POF)	Consequence of Failure (COF)
Condition	Replacement Cost (Financial)
Service Life Remaining	Function/Department (Strategic)

10.5.2 Risks to Current Asset Management Strategies

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

Staff Capacity & Asset Information
Staff capacity limitations can make it challenging to deploy optimal maintenance and assessment strategies for land improvement assets, particularly for trails. The City owns an unknown length of trails and natural assets that require constant maintenance and rehabilitation. A standardized approach to data and condition gathering can enable the City to proactively manage these assets.

10.6 Levels of Service

The following tables identify the City's current level of service for Land Improvements. 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 City has selected for this AMP.

10.6.1 Community Levels of Service

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

Service Attribute	Qualitative Description	Current LOS (2020)
Scope	Description, which may include maps, of municipal parks and their location	Anicinabe Park – 955 Gold Course Rd. Beatty Park – Tenth St S. & Front St. Coney Island Park – Lake of the Woods Garrow Park – Birchwood Cres. & Rabbit Lake Rd. Jack Robinson Park – Redditt Rd. & Rabbit Lake Rd. Jaffray Melick Lookout Point – North West End of Rabbit Lake Rd. Keewatin Rock Potholes – 6th St. in Keewatin Norman Park – 35 Minnesota St.

Safe & Regulatory	Description of the parks' inspection process and timelines for inspections	Trails, parks, and natural assets are inspected at various intervals (daily, weekly, and monthly).
Sustainable	Description of the current condition of land improvement assets and the plans that are in place to maintain or improve condition	Land Improvement assets are in an overall Good condition as they are repaired and replaced as-needed.

10.6.2 Technical Levels of Service

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

Service Attribute	Technical Level of Service	Current LOS (2020)
Affordable	Annual Capital Reinvestment Rate	0.7%
Sustainable	% of land improvements that are in good/very good condition	40%
	% of land improvements that are in poor/very poor condition	19%
	Average Risk Rating associated with land improvement assets	Moderate (8.8)
	% of natural assets in good/very good condition	TBD
	% of natural assets in poor/very poor condition	TBD
	Average Risk Rating associated to natural assets	TBD

10.7 Recommendations

Replacement Costs

- The majority of replacement costs used in this AMP are based on the inflation of historical costs. These costs should be evaluated to determine their accuracy and reliability.

Condition Assessment Strategies

- 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

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

Lifecycle Strategies

- Within this iteration of the AMP, asset end-of-life replacement is the only lifecycle strategy that was identified and quantified for Land Improvement assets. Staff should continue to evaluate the efficacy of current lifecycle management strategies and incorporate into the Citywide database, when possible, to assist in their capital projections.

Levels of Service

- Continue to measure current levels of service in accordance with the metrics the City believes to provide meaningful and reliable inputs into asset management planning.
- Work towards identifying proposed levels of service and identify the strategies that are required to close any gaps between current and proposed levels of service.

11 Water Network

11.1 Asset Category & Service Description

The City of Kenora maintains and operates municipal water services. Municipal staff maintain critical infrastructure to provide safe and clean drinking water to the public. The Water Network includes the following assets:

- Underground water mains and accompanying assets such as meters, valves, and hydrants
- Fleet and equipment utilized by staff to support the delivery of the water services
- Water buildings such as the treatment plant, pumping stations and booster stations.

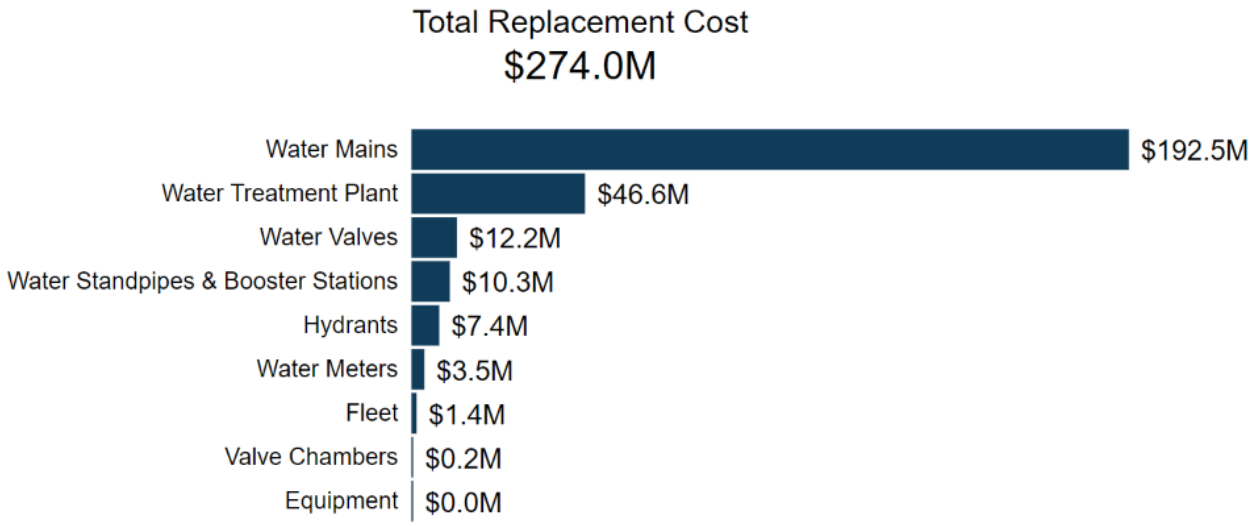
The state of the infrastructure for water network is summarized in the following table.

Replacement Cost	Condition	Average Risk Rating (out of 25)	Financial Capacity	
$274 million	Good (70%)	Low (6.4)	Annual Requirement:	$3,818,000
			Funding Available:	$2,325,000
			Annual Deficit:	$1,493,000

11.2 Asset Inventory & Costs

The table below includes the quantity, replacement cost method, and annual capital requirements of each asset segment in the City's Water Network inventory.

Asset Segment	Quantity	Replacement Cost	Annual Capital Requirement
Equipment	3	$1,000	$200
Fleet	11	$1,383,000	$98,000
Hydrants	578	$7,419,000	$100,000
Valve Chambers	28	$202,000	$3,000
Water Mains	138 km	$192,529,000	$2,377,000
Water Meters	6,602	$3,453,000	$182,000
Water Standpipes & Booster Stations	13	$10,255,000	$139,000
Water Treatment Plant	17	$46,588,000	$798,000
Water Valves	1,683	$12,185,000	$122,000
Total		**$ 274,014,000**	**$3,818,000**

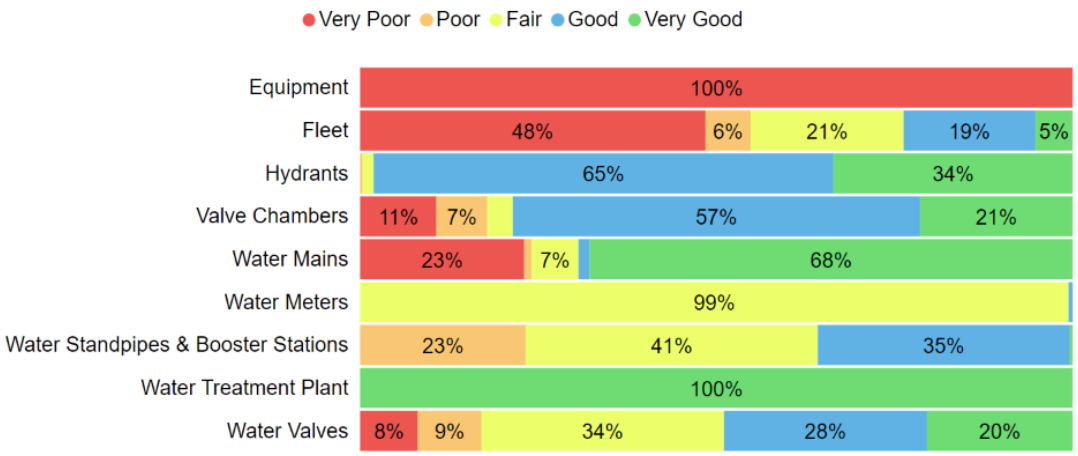


Each asset's replacement cost should be reviewed periodically to determine whether adjustments are needed to more accurate represent realistic capital requirements.

11.3 Asset Condition

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

Asset Segment	Estimated Useful Life (Years)	Average Age	Average Condition (%)
Equipment	5 - 10 Years	16.5	0% (Very Poor)
Fleet	12 - 15 Years	10.3	30% (Poor)
Hydrants	10 - 75 Years	34.7	87% (Very Good)
Valve Chambers	75 Years	45.0	74% (Good)
Water Mains	60 - 100 Years	43.2	68% (Good)
Water Meters	15 - 20 Years	15.7	60% (Good)
Water Standpipes & Booster Stations	20 - 75 Years	24.0	51% (Fair)
Water Treatment Plant	75 Years	7.4	86% (Very Good)
Water Valves	100 Years	41.5	59% (Fair)
Average		**40.9**	**70% (Good)**



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

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

11.3.1 Current Approach to Condition Assessment

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

- Staff primarily rely on the age, pipe material, and the number of breaks to determine the projected condition of water mains. The City has recently completed a hydraulic modelling analysis to investigate the requirements to create redundancies to some areas with a higher population density.
- Hydrants, valves, and other point assets are visually inspected on a regular basis and repaired/replaced as needed.
- Water buildings are inspected on a monthly basis in accordance with Health and Safety standards. Annual roofing inspections are conducted to ensure structural integrity, and Bi-annual HVAC inspections are conducted.
- Water vehicles are inspected and serviced in accordance with Commercial Vehicle Operators Registration (CVOR) requirements.

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

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

11.4 Lifecycle Management Strategy

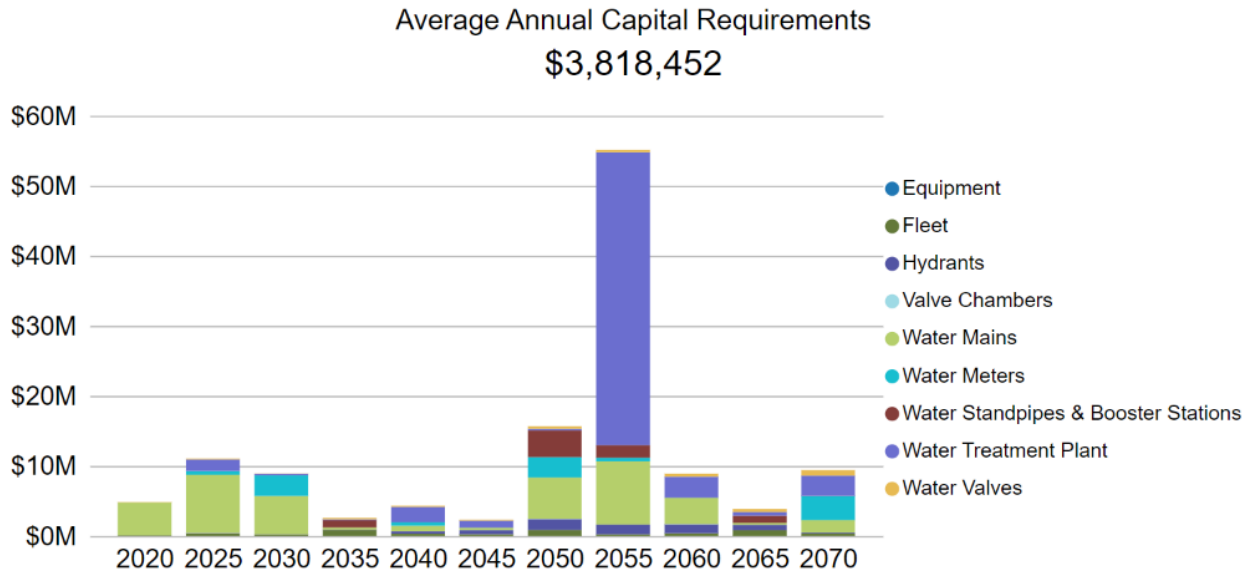
The condition or performance of most assets will deteriorate over time. To ensure that municipal assets are performing as expected and meeting the needs of customers, it is important to establish a lifecycle management strategy to proactively manage asset deterioration.

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

Activity Type	Description of Current Strategy
Maintenance	Main flushing and valve exercising is completed for the entire network on a 5-8 year cycle.
	Periodic pressure and flow testing is completed to identify areas with reduced flows.
Rehabilitation	Trenchless re-lining of water mains presents significant challenges and is not typically a viable option that the City has employed.
Replacement	In the absence of mid-lifecycle rehabilitative events, most mains are simply maintained with the goal of full replacement once they reach end-of-life.
	Replacement activities are identified based on an analysis of the main break rate, any issues identified during regular maintenance activities, and in coordination with other right-of-way projects. Linear infrastructure with cement asbestos material is also prioritized for replacement.

11.5 Forecasted Capital Requirements

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

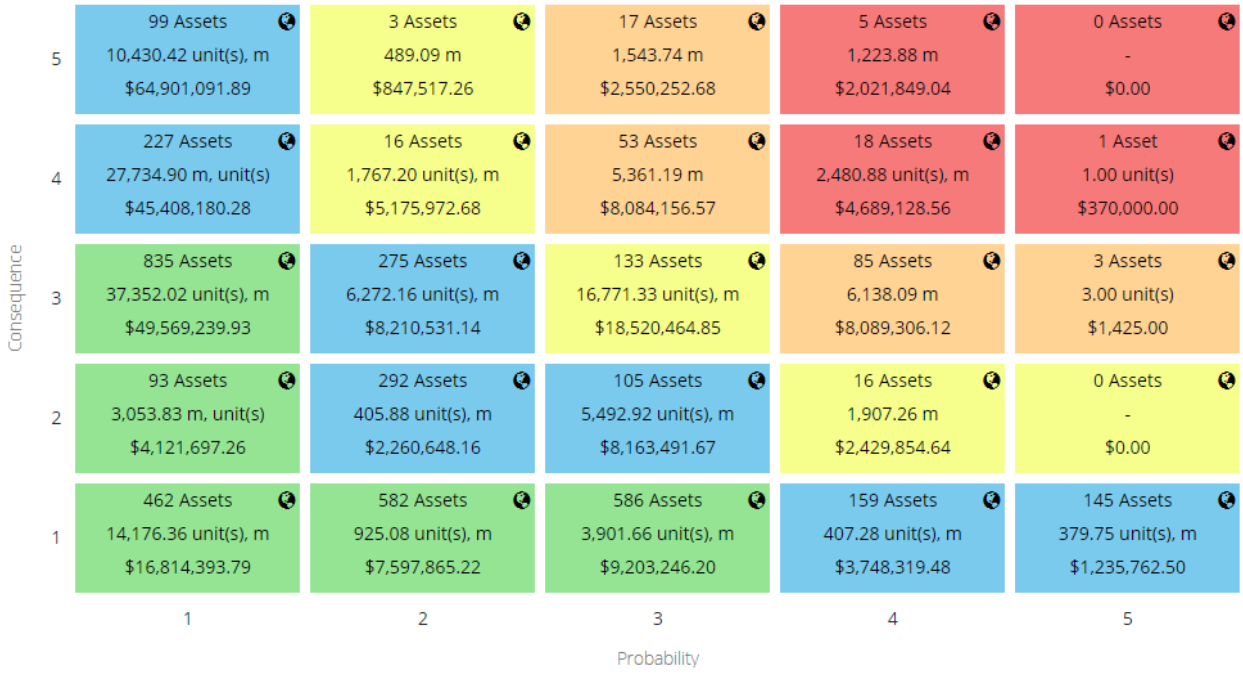


The projected cost of lifecycle activities that will need to be undertaken over the next 10 years to maintain the current level of service can be found in Appendix A.

11.6 Risk & Criticality

11.6.1 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 2020 inventory data.



Some of the asset-specific attributes that Staff utilized when prioritizing and defining the risk and criticality of these assets are documented below:

Probability of Failure (POF)	Consequence of Failure (COF)
Condition	Replacement Cost (Financial)
Pipe Material	Pipe Diameter (Operational)
Breaks/Segment	Land Use (Strategic)
Service Life Remaining	Average Daily Traffic Counts (Social)

11.6.2 Risks to Current Asset Management Strategies

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

Capital Funding

The City has limited funding to dedicate towards the water network. Major capital rehabilitation and replacement projects for water assets may also be deferred depending on the availability of grant funding opportunities. A long-term capital funding strategy can reduce dependency on grant funding and help prevent the deferral of necessary capital works.

Asset Data & Information

There is a lack of confidence in the available condition information for the water network; only 1% of the network has assessed condition. Although many of the above-ground assets can be physically assessed, it can be challenging to collect direct assessed condition on watermains. An approximated condition, based on reliable metrics, will help staff develop optimal strategies for rehabilitation/replacement. When possible, staff should consider conducting ultrasonic testing or leak detection testing to supplement their knowledge of the linear water network.

11.7 Levels of Service

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

11.7.1 Community Levels of Service

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

Service Attribute	Qualitative Description	Current LOS (2020)
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	
Reliability	Description of boil-water advisories and service interruptions	In accordance with regulatory requirements, the City reports each incident to the Ministry of Health (MOH) and completes the Notice of Adverse Test Results and Issue Resolution form and informs the public.

11.7.2 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 (2020)
Scope	Percentage of properties connected to the municipal water system	64%
	Percentage of properties where fire flow is available	69%
Reliability	Number 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	386 : 4,888
	Number 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	244 : 4,888
Performance	Percentage of water network in poor/very poor condition	21%
	Average Risk Rating associated to water network	6.73
	Annual Capital reinvestment rate	0.8%

11.8 Recommendations

Replacement Costs

- Continue to revise and update user-defined replacement costs; especially for linear mains and high-priority assets (i.e., water buildings, vehicles). Replacement costs should be updated according to the latest tender or project prices, every 1-2 years.

Condition Assessment Strategies

- Identify condition assessment strategies for high-value and high-risk water network assets such as the water treatment plant, fleet, and equipment.
- Consider conducting building condition assessments on the water buildings to obtain condition information, rehabilitation recommendations and a componentized inventory.
- Consider solidifying a condition calculation for water mains based on available asset attributes (age, material, break history, diameter) to approximate true condition and support capital planning.

Risk Management Strategies

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

Lifecycle Strategies

- Evaluate the efficacy of the City's lifecycle management strategies at regular intervals to determine the impact cost, condition, and risk. When applicable, apply the cost, trigger, and impact of trenchless relining to the viable pipe candidates in the Citywide database in order to build a more accurate capital forecast. For non-linear assets, incorporate relevant rehabilitation activities where possible, particularly for water buildings and structures.

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 City 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.

12 Wastewater Network

12.1 Asset Category & Service Description

The City of Kenora maintains and operates wastewater services. Staff maintain critical infrastructure to distribute and safely dispose of municipal wastewater. The Wastewater Network includes the following assets:

- Underground sanitary mains and accompanying assets such as manholes and valves
- Fleet and equipment utilized by staff to support the delivery of wastewater services
- Wastewater buildings such as the treatment plant and pumping/lift stations.

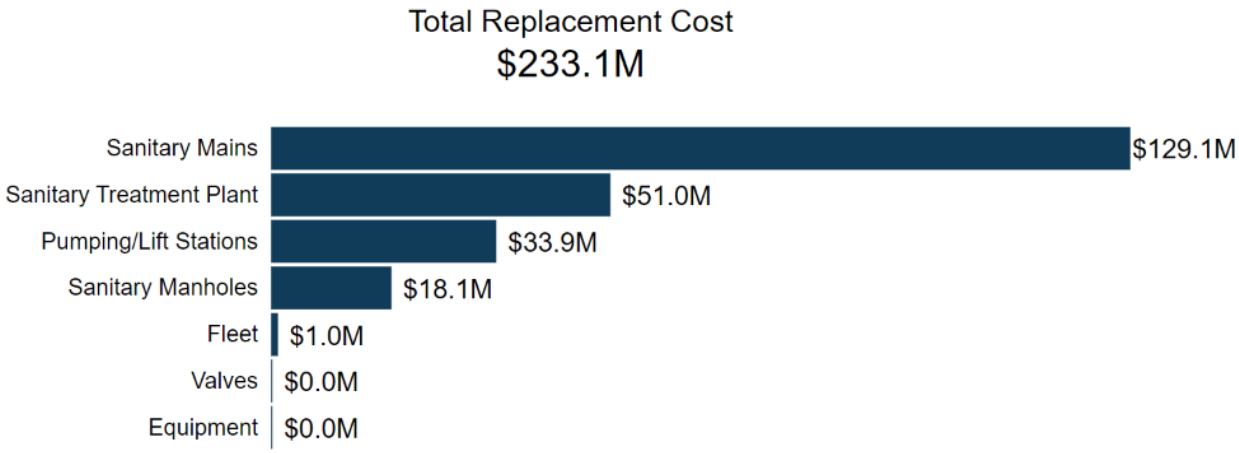
The state of the infrastructure for wastewater network is summarized in the following table.

Replacement Cost	Condition	Average Risk Rating (out of 25)	Financial Capacity	
$233 million	Good (76%)	Low (4.7)	Annual Requirement:	$3,176,000
			Funding Available:	$2,325,000
			Annual Deficit:	$851,000

12.2 Asset Inventory & Costs

The table below includes the quantity, replacement cost method, and annual capital requirements of each asset segment in the City's Wastewater Network inventory.

Asset Segment	Quantity	Replacement Cost	Annual Capital Requirement
Equipment	4	$13,000	$3,000
Fleet	10	$1,046,000	$76,000
Pumping/Lift Stations	118	$33,851,000	$503,000
Sanitary Mains	131,993 m	$129,088,000	$1,547,000
Sanitary Manholes	1,602	$18,085,000	$241,000
Sanitary Treatment Plant	27	$50,981,000	$805,000
Valves	5	$36,000	$900
Total		**$233,100,601**	**$3,175,596**

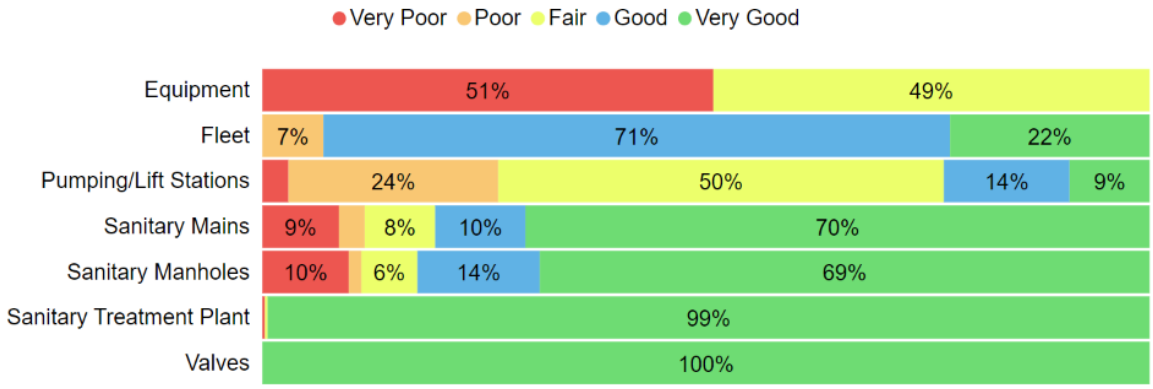


Each asset's replacement cost should be reviewed periodically to determine whether adjustments are needed to more accurate represent realistic capital requirements.

12.3 Asset Data: Useful Life, Age & Condition

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

Asset Segment	Estimated Useful Life (Years)	Average Age	Average Condition (%)
Equipment	3 – 10 Years	12.2	22% (Poor)
Fleet	12 - 15 Years	4.9	75% (Good)
Pumping/Lift Stations	75 Years	22.7	50% (Fair)
Sanitary Mains	50 - 100 Years	42.0	78% (Good)
Sanitary Manholes	75 Years	43.0	75% (Good)
Sanitary Treatment Plant	5 - 75 Years	7.8	86% (Very Good)
Valves	25 - 50 Years	4.9	89% (Very Good)
Average		**41.3**	76% (Good)



To ensure that the City's Wastewater Network continues to provide an acceptable level of service, the City 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 Wastewater Network.

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

12.3.1 Current Approach to Condition Assessment

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

- CCTV inspections are conducted on the entire network on a 5 to 8 year cycle or in coordination with road construction projects.
- Staff rely on a variety of metrics including age, pipe material and diameter, location, backup history, and available CCTV assessments to determine the projected condition of sanitary mains.
- Sanitary buildings are inspected on a monthly basis in accordance with Health and Safety standards. Annual roofing inspections are conducted to ensure structural integrity, and bi-annual HVAC inspections are conducted.
- Wastewater vehicles are inspected and serviced in accordance with Commercial Vehicle Operators Registration (CVOR) requirements.
- Point assets such as manholes and valves are inspected on a regular basis.

In this AMP, the following rating criteria, based on the North American Pipeline Assessment Certification Program (PACP), is used to determine the current condition of sanitary mains, and forecast future capital requirements:

Condition	Rating
Very Good	0-1
Good	1-2
Fair	2-3
Poor	3-4
Very Poor	4-5

For the other assets in the Wastewater Network, the following rating criteria is used to determine current condition and forecast future capital requirements:

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

12.4 Lifecycle Management Strategy

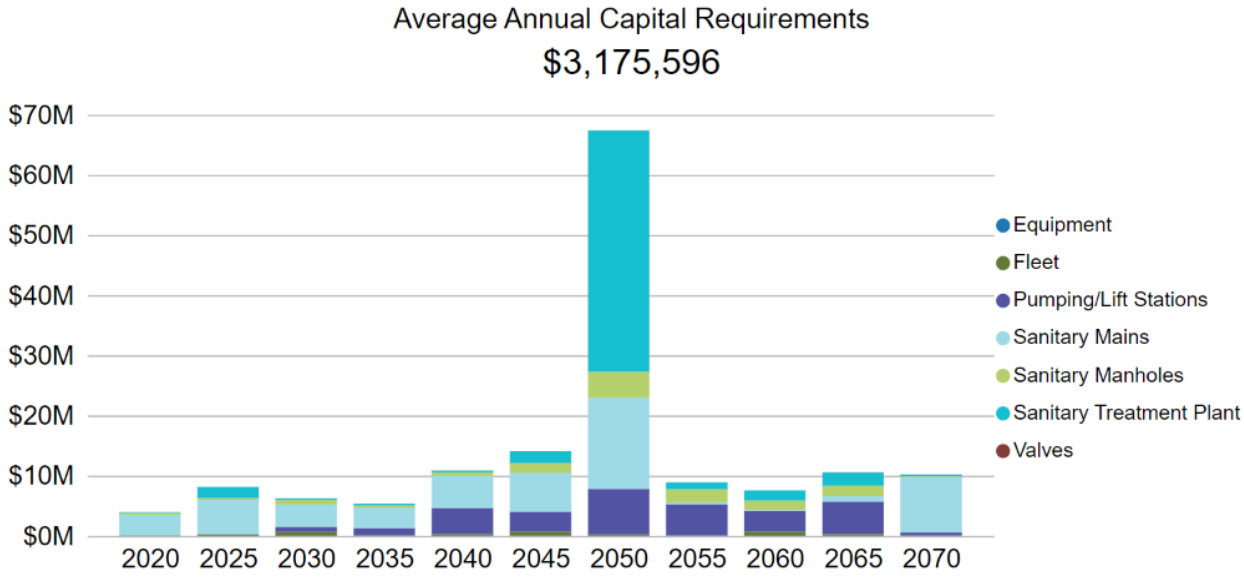
The condition or performance of most assets will deteriorate over time. To ensure that municipal assets are performing as expected and meeting the needs of customers, it is important to establish a lifecycle management strategy to proactively manage asset deterioration.

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

Activity Type	Description of Current Strategy
Maintenance	Flushing is completed for the entire network on a 5-8 year cycle by a third party contractor. Pumping station cleaning and flushing is performed annually.
Rehabilitation	Trenchless relining is considered and performed when viable candidates are identified, and budget allows. Wastewater buildings, fleet and equipment are repaired and/or replaced strategically based on staff expertise, manufacturer and other third-party recommendations, and budget availability.
Replacement	In the absence of mid-lifecycle rehabilitative events, most mains are simply maintained with the goal of full replacement once they reach end-of-life.
	Project prioritization is based on available CCTV inspections, asset age, material, backup history, environmental risks, and customer complaints.

12.5 Forecasted Capital Requirements

The following graph forecasts long-term capital requirements. The annual capital requirement represents the average amount per year that the City should allocate towards funding rehabilitation and replacement needs. The following graph identifies capital requirements over the next 50 years. This projection is used as it ensures that every asset has gone through one full iteration of replacement. The forecasted requirements are aggregated into 5-year bins and the trend line represents the average 10-year capital requirements.



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.

12.6 Risk & Criticality

12.6.1 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 2020 inventory

Some of the asset-specific attributes that Staff utilized when prioritizing and defining the risk and criticality of these assets are documented below:

Probability of Failure (POF)	Consequence of Failure (COF)
Condition	Replacement Cost (Financial)
Pipe Material	Pipe Diameter (Operational)
Service Life Remaining	Land Use (Strategic)
Surcharge/Blockage	Average Daily Traffic Counts (Social)

12.6.2 Risks to Current Asset Management Strategies

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

Inflow & Infiltration

The wastewater network experiences occasional inflow and infiltration issues, particularly in the spring, which reduces overall collection and treatment capacity. To address concerns with inflow & infiltration staff aim to become more proactive with flow monitoring. A regular flow monitoring program would help identify I&I at an earlier stage and provide staff with data to inform lifecycle planning.

Asset Data & Information

There is a lack of confidence in the available condition information for the wastewater network; only 12% of the network has assessed condition. Staff plan to prioritize data refinement efforts and hope to conduct more CCTV inspections as budget becomes available. Assessed condition will help staff develop better defined strategies that will extend the network's lifecycle, increase capacity for growth, and the lower total cost.

12.7 Levels of Service

The following tables identify the City's current level of service for Wastewater 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 City has selected for this AMP.

12.7.1 Community Levels of Service

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

Service Attribute	Qualitative Description	Current LOS (2020)
Scope	Description, which may include maps, of the user groups or areas of the municipality that are connected to the municipal wastewater system	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 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.

Service Attribute	Qualitative Description	Current LOS (2020)
		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	The municipality follows a series of design standards that integrate servicing requirements and land use considerations when constructing or replacing sanitary sewers. These standards have been determined with consideration of the minimization of sewage overflows and backups.
	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.

12.7.2 Technical Levels of Service

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

Service Attribute	Technical Metric	Current LOS (2020)
Scope	Percentage of properties connected to the municipal wastewater system	61%
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	0
	# 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	8 : 4,915
Performance	Percentage of wastewater network in poor/very poor condition	11%
	Average risk rating associated to wastewater network	4.73
	Annual Capital Reinvestment	0.8%

12.8 Recommendations

Replacement Costs

- Continue to revise and update user-defined replacement costs. Replacement costs should be updated according to the best available information on the cost to replace the asset in today's value.

Condition Assessment Strategies

- Identify condition assessment strategies for high value and high-risk wastewater network assets.
- Consider conducting building condition assessments on the water buildings to obtain condition information, rehabilitation recommendations and a componentized inventory.
- Consider expediting the current CCTV inspection program to complete a network-wide inspection within 2-3 years to develop a baseline for all sanitary mains and build a proactive rehabilitation/replacement strategy.

Risk Management Strategies

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

Lifecycle Management Strategies

- Evaluate the efficacy of the City's lifecycle management strategies at regular intervals to determine the impact cost, condition, and risk. When applicable, apply the cost, trigger, and impact of trenchless relining to the viable pipe candidates in the Citywide database in order to build a more accurate capital forecast. For non-linear assets, incorporate relevant rehabilitation activities where possible, particularly for wastewater buildings and structures.

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 City 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.

13 Solid Waste

13.1 Asset Category & Service Description

The City of Kenora maintains and operates solid waste services. Staff maintain critical infrastructure to transport and dispose of household waste and recycling. The Solid Waste Network includes the following assets:

- Pick-up trucks, dump trucks, and other vehicles and machinery and equipment utilized by staff to maintain the solid waste network
- Solid waste facilities and transfer stations
- Containers and bins for solid waste storage

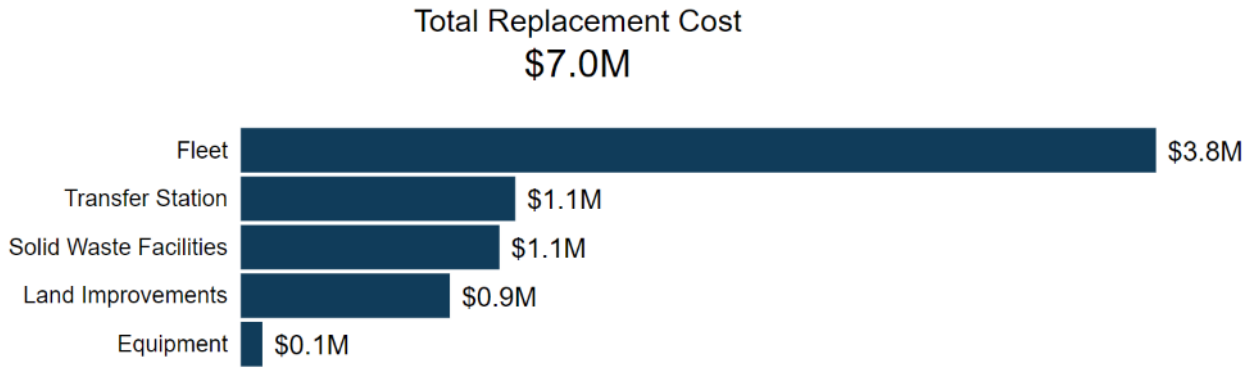
The state of the infrastructure for solid waste is summarized in the following table.

Replacement Cost	Condition	Average Risk Rating (out of 25)	Financial Capacity	
$7 million	Good (63%)	Moderate (9.1)	Annual Requirement:	$406,000
			Funding Available:	$399,000
			Annual Deficit:	$7,000

13.2 Asset Inventory & Costs

The table below includes the quantity, replacement cost method, and annual capital requirements of each asset segment in the City's Solid Waste inventory.

Asset Segment	Quantity	Replacement Cost	Annual Capital Requirement
Equipment	17	$90,000	$14,000
Fleet	19	$3,812,000	$259,000
Land Improvements	17	$871,000	$69,000
Solid Waste Facilities	11	$1,077,000	$32,000
Transfer Station	13	$1,143,000	$32,000
Total		**$6,994,000**	**$406,000**

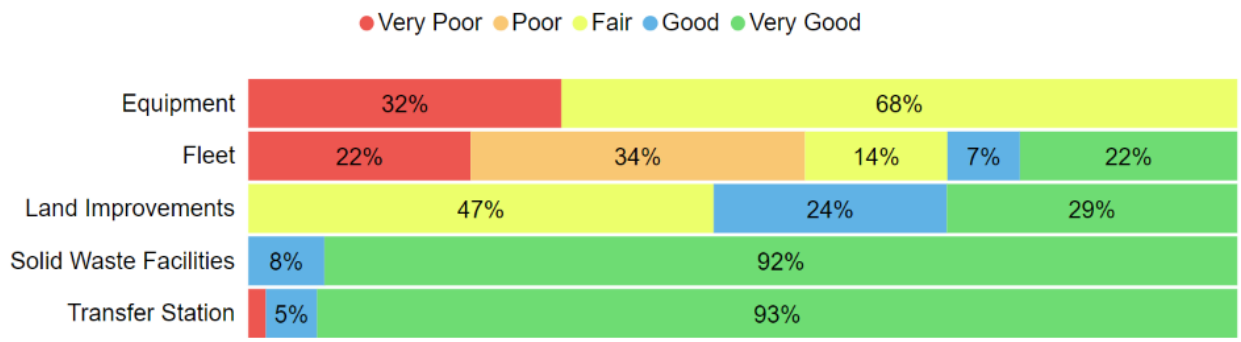


Each asset's replacement cost should be reviewed periodically to determine whether adjustments are needed to more accurately represent realistic capital requirements.

13.3 Asset Data: Useful Life, Age & Condition

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

Asset Segment	Estimated Useful Life (Years)	Average Age	Average Condition (%)
Equipment	3 – 10 Years	13.6	34% (Poor)
Fleet	15 Years	9.5	45% (Fair)
Land Improvements	10 – 25 Years	11.0	70% (Good)
Solid Waste Facilities	75 Years	14.3	94% (Very Good)
Transfer Station	75 Years	7.9	94% (Very Good)
Average		**11.2**	**63% (Good)**



To ensure that the City's Solid Waste Network continues to provide an acceptable level of service, the City 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 solid waste assets.

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

13.3.1 Current Approach to Condition Assessment

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

- Staff complete regular visual inspections of fleet and equipment to ensure they are in state of adequate repair prior to operation. Annual certification and safety inspections are completed as required by Commercial Vehicle Operator's Registration (CVOR).
- Solid waste buildings and stations are inspected in accordance with Building Code Act requirements, and have monthly Health and Safety inspections conducted on them.
- Other smaller assets are inspected as-needed.

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

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

13.4 Lifecycle Management Strategy

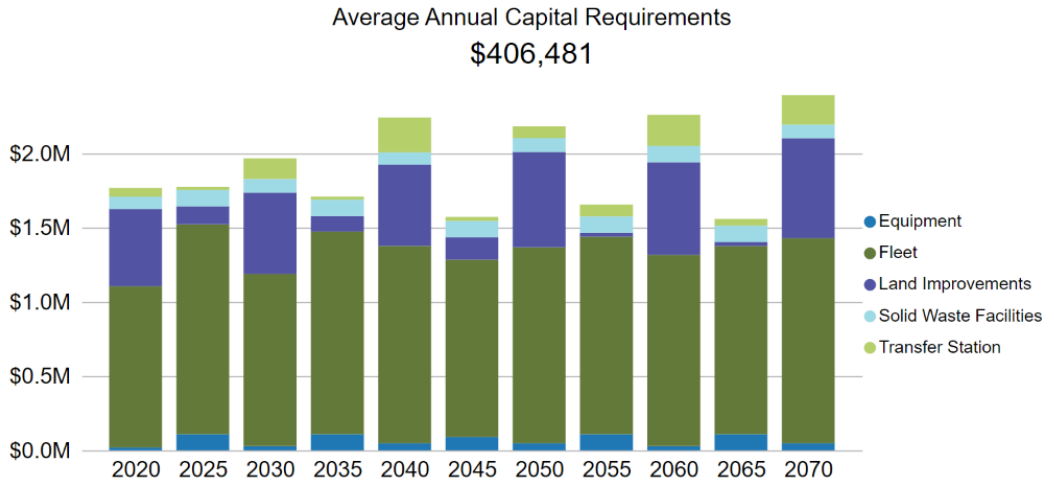
The condition or performance of most assets will deteriorate over time. To ensure that municipal assets are performing as expected and meeting the needs of customers, it is important to establish a lifecycle management strategy to proactively manage asset deterioration.

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

Activity Type	Description of Current Strategy
Maintenance, Rehabilitation/ Replacement	Solid Waste assets include several unique asset types and maintenance activities which are dealt with on a case-by-case basis. Maintenance often includes daily cleaning and inspection.
	In the absence of mid-lifecycle rehabilitative events, most solid waste assets are maintained with the goal of full replacement once they reach end-of-life.
	Replacement activities are identified based on age, performance, regulatory requirements, and budget restraints.

13.5 Forecasted Capital Requirements

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



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.

13.6 Risk & Criticality

13.6.1 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 2020 inventory data.

Some of the asset-specific attributes that Staff utilized when prioritizing and defining the risk and criticality of these assets are documented below:

Probability of Failure (POF)	Consequence of Failure (COF)
Condition	Replacement Cost (Financial)
Service Life Remaining	Function (Strategic)

13.6.1 Risks to Current Asset Management Strategies

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

Asset Data & Information

There is a lack of confidence in the available condition information for the solid waste assets; only 5% of the network has assessed condition. Staff plan to prioritize data refinement efforts and hope condition assessments for solid waste infrastructure. Assessed condition will help staff develop better defined strategies that will extend the network's lifecycle, increase capacity for growth, and the lower total cost.

13.7 Levels of Service

The following tables identify the City's current level of service for Solid Waste. These metrics include the technical and community level of service metrics that the City has selected to track.

13.7.1 Community Levels of Service

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

Service Attribute	Qualitative Description	Current LOS (2020)
Scope	Description, which may include maps, of the solid waste operational system	See Appendix B

13.7.2 Technical Levels of Service

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

Service Attribute	Technical Metric	Current LOS (2020)
Accessible	# of waste facility transactions per site	51,336
Safe & Regulatory	# of regulatory non-compliance events per year (Ministry of Environment, Conservation and Parks requirements)	0
	Residential diversion rate of waste from landfill (%)	27.8
	Total diversion rate of waste from landfill (%)	6.4
	# of required inspections completed of landfill sites and transfer stations	1
	# of hours in-service of vehicles and machinery per year	0
	# of workplace incidents per FTE per year	15
	# of incidents of non-compliance events related to groundwater tests	0
	# of complaints received related to regulatory compliance of waste facility operations	0
	# of MECP inspections conducted on City facilities	1

	# of orders or recommendations received from the Ministry of Environment	0
	# of orders or recommendations received from the Ministry of Labour	0
	# of orders or recommendations received from the Ministry of Natural Resources	0
Affordable	Tipping Fee divided by Full Cost Recovery	1.4
	Average annual solid waste bill / real median household income	0.2
	Total solid waste revenue / number of households	363.1
	(Total Solid Waste Operating Cost per year) / Population Served	108.6
Sustainable	Remaining landfill capacity (%)	63
	Annual tonnage of waste buried	24,017
	Annual capital reinvestment rate	5.7%
	% of solid waste assets in good/very good condition	54%
	% of solid waste assets in poor/very poor condition	31%
	Average Risk Rating associated to solid waste assets	Moderate (9.1)

13.8 Recommendations

Replacement Costs

- Continue to revise and update user-defined replacement costs. Replacement costs should be updated according to the best available information on the cost to replace the asset in today's value.

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.

Lifecycle Strategies

- Implement the identified lifecycle management strategies to realize potential cost avoidance and maintain a high-quality condition.
- Evaluate the efficacy of the City's lifecycle management strategies at regular intervals to determine the impact cost, condition, and risk.

Levels of Service

- Continue to measure current levels of service in accordance with the metrics that the City 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.

14 Impacts of Growth

Key Insights

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

14.1 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 City to more effectively plan for new infrastructure, 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.

14.1.1 Kenora Strategic Plan (2016)

The City of Kenora adopted a Strategic Plan for the years of 2016 to 2020. A new Strategic Plan is in developed for the years of 2021 to 2026. Kenora's current strategic priorities include the following:

1. Diversify the economy and grow the industrial base
2. Reduce the infrastructure deficit
3. Enable affordable housing
4. Recruit, develop and retain talented city staff
5. Promote recreation and healthy lifestyles
6. Champion environmental stewardship
7. Expand tourism
8. Strengthen cultural relations
9. Advocate for new funding

Many of these priorities will be supported by the advancement of the City's asset management program as stated in the Strategic Plan. The City's second goal is to strengthen its foundation by ensuring that municipal infrastructure assets are managed and maintained through a robust asset management plan. This AMP is aligned with the City's Strategic Plan and can support long-term planning for infrastructure and economic management to build a durable foundation.

14.1.2 Kenora Official Plan (2015) & Official Plan Review (2021)

The City of Kenora's Official Plan guides future growth in the city by outlining the municipality's positions on land use, community improvement, and what services like roads, watermains, sewers, and parks will ne needed. The current plan was adopted by council in May of 2015; however, a review of the plan was completed in January of 2021.

The City's Official Plan emphasizes the role of asset management planning. The Plan notes that changes to the municipality's land use should be support by integrated planning for infrastructure and public service facilities with consideration of the financial viability over the lifecycle of the assets.

The Official Plan Review provides updated population projections based on a 2020 Vacant Lands and Growth Strategy report. The following table provides the population and employment projections for the year 2039.

	2011	2016	2039 (Projected)
Population	15,348	15,096	17,371
Employment	-	7,510	8,135

Kenora is experiencing a moderate shortage of housing with a total of 7,376 private dwelling according to the 2016 census. The Report projected a need of 623 additional dwelling units to accommodate growth, this figure does not include existing housing shortages. The land requirement for projected housing needs total nearly 0.5 square kilometers, compared to a total land area of 211.6 square kilometers for the City. The vacant land analysis has determined that the City has sufficient land to accommodate growth, with 2.3 square kilometers of vacant land.

14.2 Impact of Growth on Lifecycle Activities

Future versions of the City's asset management plan must include assumptions regarding projected changes in population and economic activity informing the preparation of lifecycle management and financial strategies.

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 City'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 City 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.

The City has developed and adopted numerous documents to guide strategic planning and promote growth. Such documents include but are not limited to the following: Community Improvement Plans, Housing Plans, Parks and Recreation Master Plan, Sustainable Action Plan, and Service Delivery Review Report. These documents, paired with this AMP will inform the expected impact of growth on municipal lifecycle activities.

15 Financial Strategy

Key Insights

- The City is committing approximately $9.9 million towards capital projects per year from sustainable revenue sources
- Given the annual capital requirement of $23.6 million, there is currently a funding gap of $13.7 million annually
- For tax-funded assets, we recommend increasing tax revenues by 2.5% each year for the next 15 years to achieve a sustainable level of funding
- For the Water Network, we recommend increasing rate revenues by 2.6% annually for the next 10 years to achieve a sustainable level of funding
- For the Wastewater Network, we recommend increasing rate revenues by 1.6% annually for the next 10 years to achieve a sustainable level of funding
- For the Solid Waste Network, we recommend increasing rate revenues by 0.3% for 1 year to achieve a sustainable level of funding

15.1 Financial Strategy Overview

For an asset management plan to be effective and meaningful, it must be integrated with a long-term financial plan (LTFP). The development of a comprehensive financial plan will allow the City of Kenora 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. Reserves
    d. Debt
    e. 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. Gas tax
    b. Annual grants

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

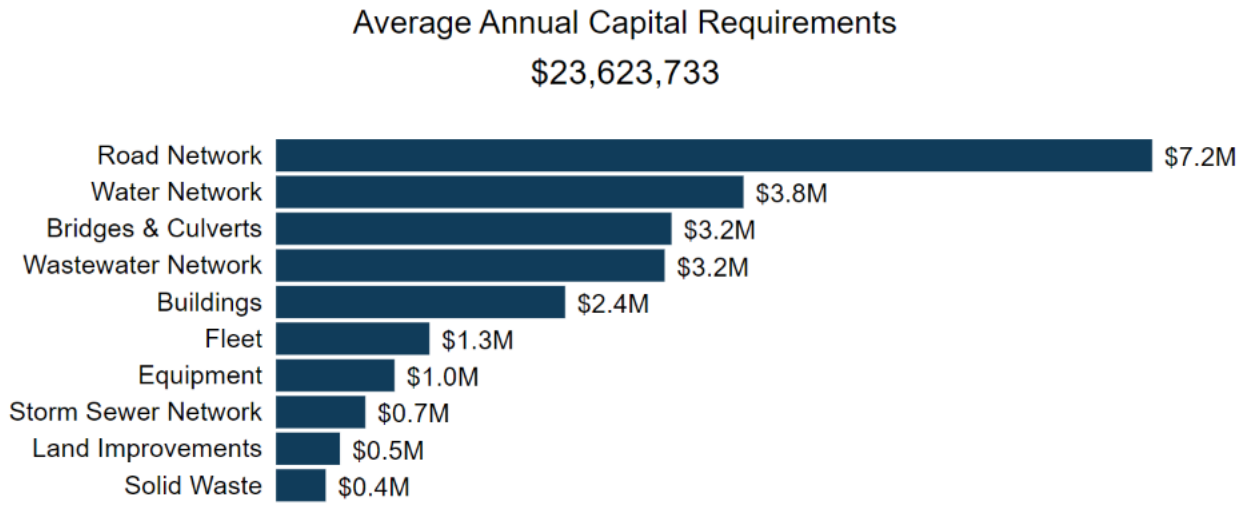
If the financial plan component results in a funding shortfall, the Province requires the inclusion of a specific plan as to how the impact of the shortfall will be managed. In determining the legitimacy of a funding shortfall, the Province may evaluate a City's approach to the following:

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

15.1.1 Annual Requirements & Capital Funding

Annual Requirements

The annual requirements represent the amount the City 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 City must allocate approximately $23.6 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, for the Road Network and Bridges & Culverts, lifecycle management strategies have been developed to identify capital costs that are realized through strategic rehabilitation and renewal of the City's assets. The development of these strategies can allow for a comparison of potential cost avoidance if the strategies were to be implemented.

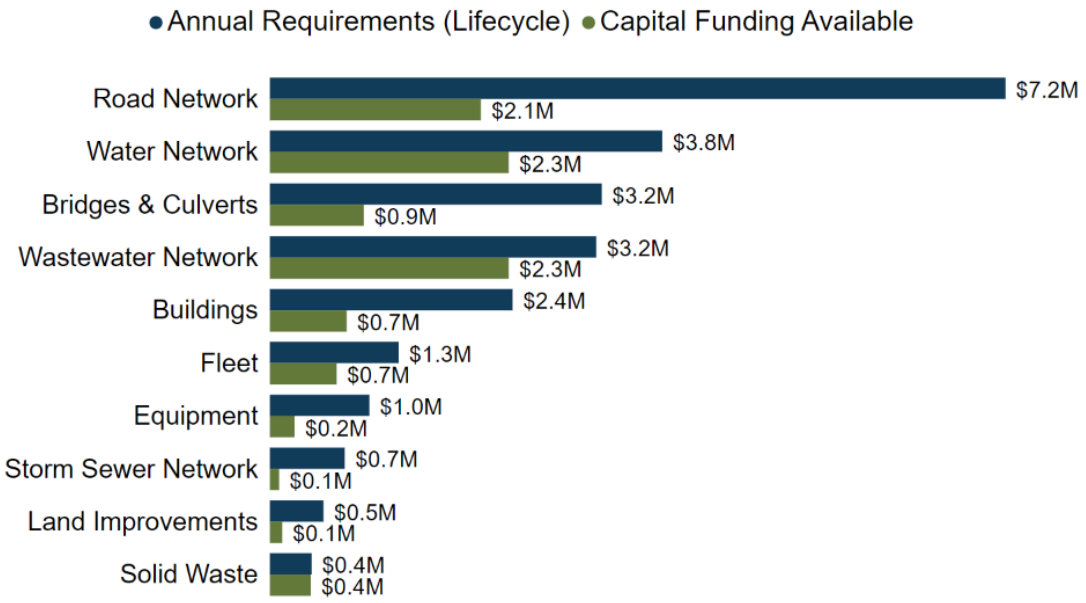
Replacement Only Scenario: Based on the assumption that assets deteriorate and – without regularly scheduled maintenance and rehabilitation – are replaced at the end of their service life.

Lifecycle Strategy Scenario: Based on the assumption that lifecycle activities are performed at strategic intervals to extend the service life of assets until replacement is required

The implementation of a proactive lifecycle strategy can lead to direct and indirect cost savings. Potential cost savings are influenced by current rehabilitation and reconstruction costs, the coordination of multiple projects, and the criticality of the assets and projects. Beyond cost savings, having proactive lifecycle strategies can also decrease the number of complaints received, lower health and safety hazards, and maintain the desired level of service that the City wants to achieve.

Annual Funding Available

Based on a historical analysis of sustainable capital funding sources, the City is committing approximately $9.9 million towards capital projects per year. Given the annual capital requirement of $23.6 million, there is currently a funding gap of $13.7 million annually.



15.2 Funding Objective

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

1. **Tax Funded Assets:** Road Network, Bridges & Culverts, Storm Sewer Network, Buildings, Equipment, Land Improvements, Fleet
2. **Rate-Funded Assets:** Water Network, Wastewater Network, Solid Waste

Note: For the purposes of this AMP, we have excluded gravel 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.

15.3 Financial Profile: Tax Funded Assets

15.3.1 Current Funding Position

The following tables show, by asset category, Kenora's average annual capital expenditure requirements, current funding positions, and funding increases required to achieve full funding on tax-funded assets.

Asset Category	Avg. Annual Requirement	Annual Funding Available				Annual Deficit
		Taxes	Gas Tax	Tax to Reserves	Total Available	
Road Network	7,157,000	1,494,000	550,000	10,000	2,054,000	5,103,000
Bridges & Culverts	3,230,000	0	915,000	0	915,000	2,315,000
Storm Sewer Network	730,000	90,000	0	0	90,000	640,000
Buildings	2,361,000	0	0	748,000	748,000	1,613,000
Equipment	968,000	42,000	0	199,000	241,000	727,000
Land Improvements	522,000	30,000	0	92,000	122,000	400,000
Fleet	1,254,000	0	0	650,000	650,000	604,000
Total	**16,222,000**	**1,656,000**	**1,465,000**	**1,699,000**	**4,820,000**	**11,402,000**

The average annual capital expenditure requirement for the above categories is $16.2 million. Annual revenue currently allocated to these assets for capital purposes is $4.8 million leaving an annual deficit of $11.4 million. Put differently, these infrastructure categories are currently funded at 29.7% of their long-term requirements.

15.3.2 Full Funding Requirements

In 2020, City of Kenora has annual tax revenues of $27.7 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
Road Network	18.4%
Bridges & Culverts	8.3%
Storm Sewer Network	2.3%
Buildings	5.8%
Fleet	2.2%
Equipment	2.6%
Land Improvements	1.4%
Total	41.0%

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

a) Kenora's debt payments for these asset categories will be decreasing by $406,000 over the next 5 years, $866,000 over the next 10 years, by $1.1 million over the next 15 years, and by $1.4 million over the next 20 years.

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:

	Without Capturing Changes			
	5 Years	**10 Years**	**15 Years**	**20 Years**
Infrastructure Deficit	11,402,000	11,402,000	11,402,000	11,402,000
Change in Debt Costs	N/A	N/A	N/A	N/A
Resulting Infrastructure Deficit	11,402,000	11,402,000	11,402,000	11,402,000
Tax Increase Required	41.1%	41.1%	41.1%	41.1%
Annually	**8.2%**	**4.1%**	**2.7%**	**2.1%**

	With Capturing Changes			
	5 Years	**10 Years**	**15 Years**	**20 Years**
Infrastructure Deficit	11,402,000	11,402,000	11,402,000	11,402,000
Change in Debt Costs	-406,000	-866,000	-1,128,000	-1,392,000
Resulting Infrastructure Deficit	10,996,000	10,536,000	10,274,000	10,010,000
Tax Increase Required	39.6%	38.0%	37.0%	36.1%
Annually	**7.9%**	**3.8%**	**2.5%**	**1.8%**

15.3.3 Financial Strategy Recommendations

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

a) when realized, reallocating the debt cost reductions to the infrastructure deficit as outlined above.
b) increasing tax revenue by 2.5% each year for the next 15 years solely for the purpose of phasing in full funding to the asset categories covered in this section of the AMP.
c) allocating the current gas tax and OCIF revenue 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.
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[5].
2. We realize that raising tax revenues by the amounts recommended above for infrastructure purposes will be challenging to do. However, considering a longer phase-in window may have even greater consequences in terms of infrastructure failure.

Although this option achieves full capital expenditure funding on an annual basis in 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 $13.7 million for the Road Network, $53,000 for Bridges & Culverts, $1.2 million for the Storm Sewer Network, $1.1 million for the Buildings, $3.9 million for Equipment, and $0 for Fleet.

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

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

15.4 Financial Profile: Rate Funded Assets

15.4.1 Current Funding Position

The following tables show, by asset category, Kenora's average annual CapEx requirements, current funding positions, and funding increases required to achieve full funding on rate-funded assets.

Asset Category	Avg. Annual Requirement	Annual Funding Available			Annual Deficit
		Rates	To Operations	Total Available	
Water Network	3,818,000	5,348,000	-3,023,000	2,325,000	1,493,000
Wastewater Network	3,176,000	5,460,000	-3,135,000	2,325,000	851,000
Solid Waste	406,000	2,638,000	-2,239,000	399,000	7,000
Total	6,994,000	10,808,000	-6,158,000	4,650,000	2,334,000

The average annual capital expenditure requirement for the above categories is $7.0 million. Annual revenue currently allocated to these assets for capital purposes is $4.6 million leaving an annual deficit of $2.3 million. Put differently, these infrastructure categories are currently funded at 66.5% of their long-term requirements.

15.4.2 Full Funding Requirements

In 2021, Kenora had annual budgeted wastewater revenues of $5.5 million, annual budgeted water revenues of $5.3 million and annual budgeted solid waste revenues of $2.6 million. 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	Rate Change Required for Full Funding
Water Network	27.9%
Wastewater Network	15.6%
Solid Waste	0.3%
Total	**17.4%**

In the following tables, we have expanded the above scenario to present multiple options. Due to the significant increases required, we have provided phase-in options of up to 20 years:

Water Network (Without Capturing Changes)				
	5 Years	**10 Years**	**15 Years**	**20 Years**
Infrastructure Deficit	1,493,000	1,493,000	1,493,000	1,493,000
Change in Debt Costs	N/A	N/A	N/A	N/A
Resulting Infrastructure Deficit	1,493,000	1,493,000	1,493,000	1,493,000
Rate Increase Required	27.9%	27.9%	27.9%	27.9%
Annually	**5.6%**	**2.8%**	**1.9%**	**1.4%**

Water Network (With Capturing Changes)				
	5 Years	**10 Years**	**15 Years**	**20 Years**
Infrastructure Deficit	1,493,000	1,493,000	1,493,000	1,493,000
Change in Debt Costs	-94,000	-94,000	-94,000	-128,000
Resulting Infrastructure Deficit	1,399,000	1,399,000	1,399,000	1,365,000
Rate Increase Required	26.2%	26.2%	26.2%	25.5%
Annually	**5.2%**	**2.6%**	**1.7%**	**1.3%**

Wastewater Network (Without Capturing Changes)				
	5 Years	**10 Years**	**15 Years**	**20 Years**
Infrastructure Deficit	851,000	851,000	851,000	851,000
Change in Debt Costs	N/A	N/A	N/A	N/A
Resulting Infrastructure Deficit	851,000	851,000	851,000	851,000
Rate Increase Required	15.6%	15.6%	15.6%	15.6%
Annually	**3.1%**	**1.6%**	**1.0%**	**0.8%**

Wastewater Network (With Capturing Changes)				
	5 Years	**10 Years**	**15 Years**	**20 Years**
Infrastructure Deficit	851,000	851,000	851,000	851,000
Change in Debt Costs	-3,000	-3,000	-3,000	-37,000
Resulting Infrastructure Deficit	848,000	848,000	848,000	814,000
Rate Increase Required	15.5%	15.5%	15.5%	14.9%
Annually	**3.1%**	**1.6%**	**1.0%**	**0.7%**

15.4.3 Financial Strategy Recommendations

Considering the above information, we recommend the 10-year option for the Water Network and the Wastewater Network, and a 1-year option for Solid Waste. This involves full CapEx funding being achieved over 10 years by:

a) when realized, reallocating the debt cost reductions to the infrastructure deficit as outlined above.
b) increasing rate revenues by 2.6% for the Water Network each year for the next 10 years, 1.6% for the Wastewater Network each year for the next 10 years, and a 1-year 0.3% rate revenue increase for Solid Waste.
c) these rate revenue increases are solely for the purpose of phasing in full funding to the respective asset categories covered in this AMP.
d) increasing existing and future infrastructure budgets by the applicable inflation index on an annual basis in addition to the deficit phase-in.

Notes:

1. As in the past, periodic senior government infrastructure funding will most likely be available during the phase-in period. 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 challenging 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 strategy achieves full CapEx funding for rate-funded assets over 20 years, the recommendation does require prioritizing capital projects to fit the annual funding available. Current data shows a pent-up investment demand of $42 million for the Water Network and $6.5 million for the Wastewater Network.

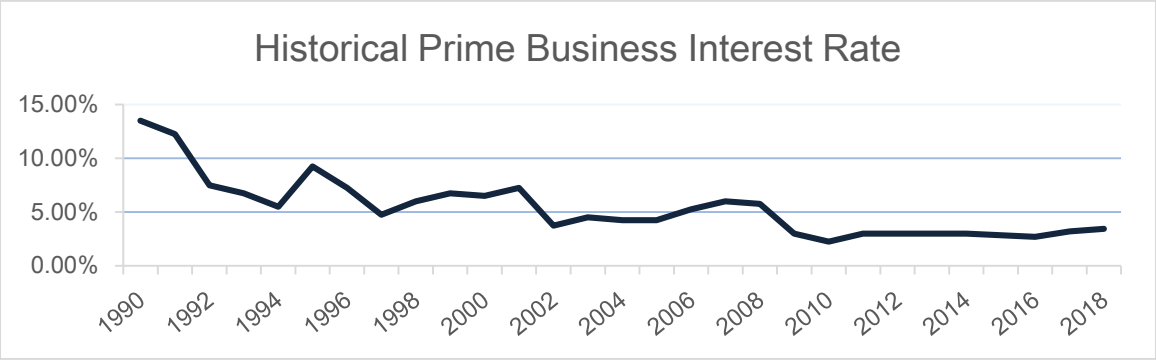
Prioritizing future projects will require the current data to be replaced by condition-based data. Although our recommendations include no further use of debt, the results of the condition-based analysis may require otherwise.

15.5 Use of Debt

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%[6] over 15 years would result in a 26% premium or $260,000 of increased costs due to interest payments. For simplicity, the table does not consider the time value of money or the effect of inflation on delayed projects.

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%

It should be noted that current interest rates are near all-time lows. Sustainable funding models that include debt need to incorporate the risk of rising interest rates. The following graph shows where historical lending rates have been:



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

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 Kenora has historically used debt for investing in the asset categories as listed. There is currently $12.1 million of debt outstanding for the assets covered by this AMP with corresponding principal and interest payments of $1.6 million, within its provincially prescribed maximum of $12.3 million.

Asset Category	Current Debt Outstanding	Use of Debt in the Last Five Years				
		2016	2017	2018	2019	2020
Road Network	6,656,000	0	0	2,000,000	0	4,714,000
Bridges & Culverts	0	0	0	0	0	0
Storm Sewer Network	0	0	0	0	0	0
Buildings	3,937,000	0	1,195,000	276,000	0	0
Equipment	0	0	0	0	0	0
Land Improvements	0	0	0	0	0	0
Fleet	287,000	0	0	0	518,000	0
Total Tax Funded	10,880,000	0	1,195,000	2,276,000	518,000	4,714,000
Water Network	599,000	0	0	0	0	615,000
Wastewater Network	599,000	0	0	0	0	615,000
Solid Waste	0	0	0	0	0	0
Total Rate Funded	1,198,000	0	0	0	0	1,230,000

Asset Category	Principal & Interest Payments in the Next Ten Years						
	2020	2021	2022	2023	2024	2025	2030
Road Network	657,000	657,000	522,000	522,000	410,000	410,000	410,000
Bridges & Culverts	0	0	0	0	0	0	0
Storm Sewer Network	0	0	0	0	0	0	0
Buildings	604,000	604,000	576,000	576,000	576,000	576,000	116,000
Equipment	0	0	0	0	0	0	0
Land Improvements	0	0	0	0	0	0	0
Fleet	131,000	131,000	84,000	84,000	0	0	0
Total Tax Funded	1,392,000	1,392,000	1,182,000	1,182,000	986,000	986,000	526,000
Water Network	128,000	37,000	34,000	34,000	34,000	34,000	34,000
Wastewater Network	37,000	37,000	34,000	34,000	34,000	34,000	34,000
Solid Waste	0	0	0	0	0	0	0
Total Rate Funded	165,000	74,000	68,000	68,000	68,000	68,000	68,000

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

15.6 Use of Reserves

15.6.1 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 Kenora.

Asset Category	Balance at December 31, 2020
Road Network	1,425,000
Storm Sewer Network	0
Bridges & Culverts	0
Buildings & Facilities	3,809,000
Equipment	323,000
Land Improvements	427,000
Fleet	2,157,000
Total Tax Funded	8,141,000
Water Network	1,655,000
Wastewater Network	1,655,000
Solid Waste	3,136,000
Total Rate Funded	3,310,000

There is considerable debate in the municipal sector as to the appropriate level of reserves that a City 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 Kenora'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.

15.6.2 Recommendation

In 2025, Ontario Regulation 588/17 will require Kenora 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 on reserve balances.

16 Appendices

Key Insights

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

Appendix A: 10-Year Capital Requirements

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

Road Network

Segment	Backlog	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029
Asphalt Roads	$1,233,278	$549,479	$535,943	$737,198	$2,420,214	$1,269,665	$1,078,453	$1,325,282	$2,228,310	$5,203,731	$3,885,012
Guide Rails	$49,949	$0	$0	$0	$0	$0	$0	$0	$29,340	$29,926	$0
Paved Alleys	$2,227,822	$325,288	$199,577	$31,066	$103,284	$0	$139,921	$26,041	$89,391	$56,038	$0
Sidewalks	$9,606,492	$0	$0	$415,627	$737,872	$643,396	$1,310,886	$2,317,525	$1,501,707	$2,133,942	$0
Signage	$0	$0	$0	$0	$1,242,402	$142,223	$0	$0	$0	$1,242,402	$142,223
Streetlights & Traffic Signals	$0	$0	$0	$0	$12,041	$0	$0	$0	$0	$12,041	$87,582
Surface Treated Roads	$560,238	$90,872	$726,078	$419,824	$136,776	$137,077	$290,321	$222,360	$125,012	$365,162	$836,901
Total:	$13,677,779	$965,639	$1,461,598	$1,603,714	$4,652,589	$2,192,361	$2,819,581	$3,891,208	$3,973,761	$9,043,243	$4,951,717

Bridges & Culverts

Segment	Backlog	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029
Bridges - Substructure	$0	$0	$335,000	$0	$0	$0	$0	$0	$0	$0	$0
Bridges - Superstructure	$0	$0	$841,400	$161,000	$4,568,500	$11,000,000	$0	$0	$0	$0	$0
Culverts	$52,970	$0	$0	$0	$0	$0	$571,212	$0	$31,182	$0	$0
Total	$52,970	$0	$1,176,400	$161,000	$4,568,500	$11,000,000	$571,212	$0	$31,183	$0	$0

Storm Sewer Network											
Segment	**Backlog**	**2020**	**2021**	**2022**	**2023**	**2024**	**2025**	**2026**	**2027**	**2028**	**2029**
Catchbasins	$35,864	$5,977	$0	$0	$0	$0	$17,932	$0	$0	$0	$0
Storm Mains	$1,140,842	$346,332	$0	$118,163	$961,437	$102,825	$231,199	$0	$0	$65,705	$9,785
Storm Manholes	$7,500	$0	$0	$0	$0	$0	$22,500	$0	$0	$0	$0
Total	$1,184,206	$352,309	$0	$118,163	$961,437	$102,825	$271,631	$0	$0	$65,705	$9,785

Buildings											
Segment	**Backlog**	**2020**	**2021**	**2022**	**2023**	**2024**	**2025**	**2026**	**2027**	**2028**	**2029**
Administration Buildings	$0	$0	$0	$0	$0	$0	$0	$0	$0	$41,183	$0
Emergency Buildings	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Fire Buildings	$0	$0	$0	$0	$0	$0	$0	$0	$8,541	$0	$0
Museum & Library	$0	$0	$0	$0	$0	$0	$0	$128,574	$0	$0	$0
Parks Facilities	$0	$0	$202,778	$91,000	$0	$375,000	$23,224	$997,676	$390,000	$420,759	$0
Public Works Buildings	$1,094,277	$0	$0	$236,265	$0	$94,995	$0	$0	$1,032,197	$91,584	$150,000
Recreation Facilities	$0	$0	$0	$10,533	$523,426	$440,593	$0	$0	$0	$0	$0
Rental Facilities	$0	$0	$100,000	$0	$0	$0	$0	$0	$91,000	$0	$0
Total	$1,094,277	$0	$302,778	$337,798	$523,426	$910,588	$23,224	$1,126,250	$1,521,738	$553,526	$150,000

Equipment											
Segment	**Backlog**	**2020**	**2021**	**2022**	**2023**	**2024**	**2025**	**2026**	**2027**	**2028**	**2029**
Animal Control	$62,226	$0	$0	$0	$5,804	$0	$0	$5,804	$0	$0	$5,804
Finance & Administration	$1,007,517	$20,269	$28,406	$11,372	$223,646	$67,582	$527,617	$291,960	$14,197	$27,086	$264,010
Fire	$973,331	$0	$182,895	$10,236	$45,871	$16,455	$26,048	$74,852	$14,748	$14,319	$29,425
Network & IT	$543,136	$11,808	$97,846	$161,330	$195,972	$92,887	$432,514	$270,491	$139,528	$37,639	$251,220
Parks & Recreation	$349,960	$600,000	$208,515	$16,736	$87,420	$0	$63,350	$44,156	$19,303	$103,121	$62,342
Police Force	$213,507	$0	$0	$0	$69,898	$0	$69,055	$69,898	$0	$0	$69,898
Public Works	$708,519	$46,693	$156,709	$20,810	$187,613	$112,157	$91,719	$206,382	$69,033	$42,296	$301,768
Total	$3,858,196	$678,770	$674,371	$220,484	$816,224	$289,081	$1,210,303	$963,543	$256,809	$224,461	$984,467

Fleet											
Segment	**Backlog**	**2020**	**2021**	**2022**	**2023**	**2024**	**2025**	**2026**	**2027**	**2028**	**2029**
Animal Control	$0	$0	$0	$0	$0	$0	$0	$0	$156,000	$0	$0
Fire	$0	$0	$0	$0	$0	$0	$50,000	$0	$0	$391,239	$78,000
Parks & Recreation	$0	$0	$0	$0	$0	$58,000	$200,000	$143,500	$0	$64,000	$235,356
Public Works	$25,834	$410,000	$0	$0	$471,902	$121,167	$1,250,192	$350,500	$992,419	$1,803,421	$697,844
Solid Waste	$0	$0	$0	$0	$0	$0	$0	$47,000	$0	$315,000	$275,000
Total	$25,834	$410,000	$0	$0	$471,902	$179,167	$1,500,192	$541,000	$1,148,419	$2,573,660	$1,286,200

Land Improvements											
Segment	**Backlog**	**2020**	**2021**	**2022**	**2023**	**2024**	**2025**	**2026**	**2027**	**2028**	**2029**
Athletic Fields & Courts	$0	$0	$0	$215,732	$0	$445,000	$0	$20,955	$0	$601,979	$0
Docks & Wharfs	$0	$590,000	$0	$23,384	$642,354	$2,978,324	$87,124	$19,993	$3,936,999	$28,529	$0
Parking Lots	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Playgrounds & Splash parks	$0	$0	$0	$33,055	$0	$0	$0	$0	$100,978	$0	$0
Trails & Walkways	$0	$0	$0	$0	$0	$0	$0	$0	$49,382	$0	$0
Total	$0	$590,000	$0	$272,171	$642,354	$3,423,324	$87,124	$40,948	$4,087,359	$630,508	$0

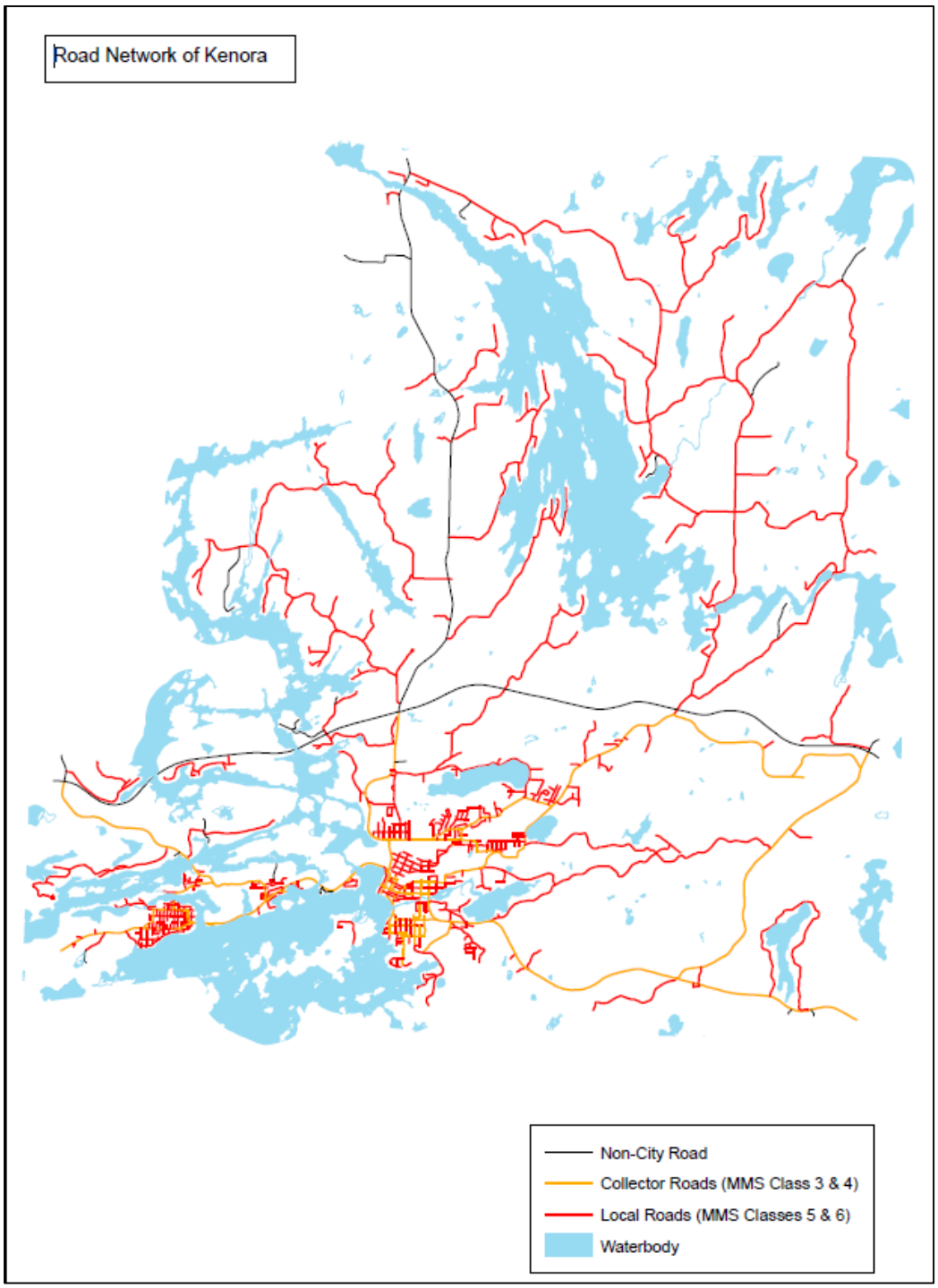
Water Network											
Segment	**Backlog**	**2020**	**2021**	**2022**	**2023**	**2024**	**2025**	**2026**	**2027**	**2028**	**2029**
Equipment	$1,425	$0	$0	$0	$0	$0	$402	$0	$0	$0	$0
Fleet	$670,000	$0	$0	$0	$0	$88,000	$0	$67,000	$50,000	$179,842	$76,000
Hydrants	$0	$0	$0	$0	$0	$0	$12,835	$0	$12,835	$12,835	$0
Valve Chambers	$14,400	$0	$7,200	$0	$0	$0	$0	$0	$0	$14,400	$0
Water Mains	$40,862,434	$3,348,250	$140,521	$0	$925,683	$268,242	$708,513	$377,412	$3,142,919	$3,942,764	$162,498
Water Meters	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$515,320
Water Standpipes & Booster Stations	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Water Treatment Plant	$0	$0	$0	$0	$0	$0	$0	$0	$1,603,660	$0	$65,356
Water Valves	$432,000	$79,200	$0	$0	$0	$0	$79,200	$0	$0	$28,800	$0
Total	$41,980,259	$3,427,450	$147,721	$0	$925,683	$356,242	$800,950	$444,412	$4,809,415	$4,178,641	$819,174

Wastewater Network											
Segment	**Backlog**	**2020**	**2021**	**2022**	**2023**	**2024**	**2025**	**2026**	**2027**	**2028**	**2029**
Equipment	$4,417	$0	$0	$0	$6,527	$0	$6,688	$6,527	$0	$0	$6,527
Fleet	$0	$0	$0	$0	$0	$72,000	$0	$0	$0	$0	$267,698
Pumping/Lift Stations	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Sanitary Mains	$5,013,822	$927,720	$637,595	$786,495	$685,027	$399,567	$1,336,098	$655,029	$1,643,517	$1,556,979	$480,339
Sanitary Manholes	$1,512,769	$112,893	$0	$135,472	$11,289	$33,868	$214,497	$0	$45,157	$11,289	$67,736
Sanitary Treatment Plant	$0	$150,000	$0	$0	$0	$0	$85,187	$0	$0	$0	$1,774,143
Valves		$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Total	$6,531,008	$1,190,613	$637,595	$921,967	$702,844	$505,435	$1,642,470	$661,556	$1,688,674	$1,568,268	$2,596,443

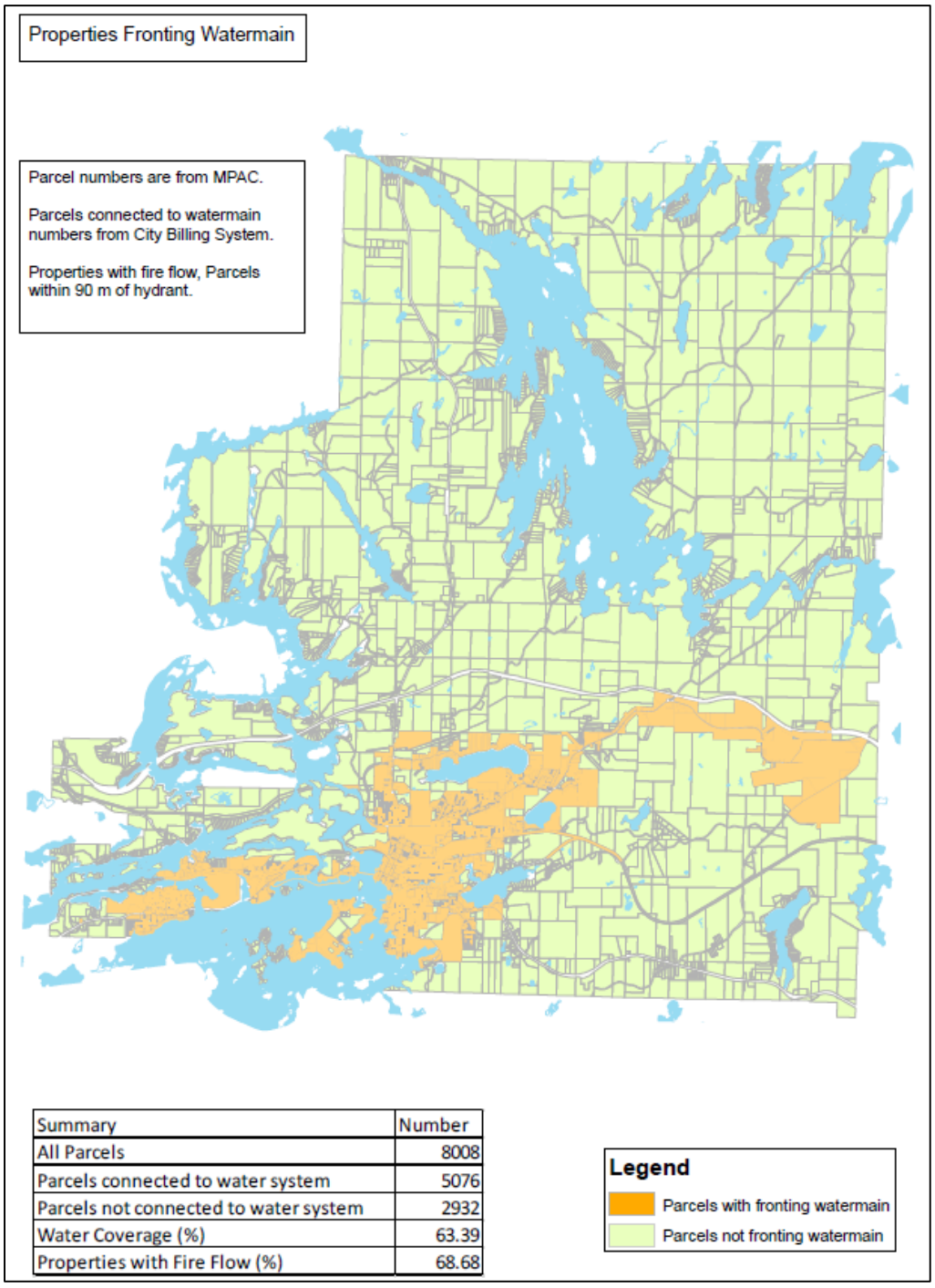
Solid Waste											
Segment	**Backlog**	**2020**	**2021**	**2022**	**2023**	**2024**	**2025**	**2026**	**2027**	**2028**	**2029**
Equipment	$28,476	$0	$0	$0	$19,315	$0	$70,638	$19,315	$0	$0	$19,315
Fleet	$226,494	$0	$0	$0	$630,000	$456,000	$184,000	$698,000	$260,000	$271,000	$0
Land Improvements	$0	$0	$0	$314,896	$94,459	$110,773	$94,857	$0	$0	$0	$26,912
Solid Waste Facilities	$0	$0	$0	$0	$82,975	$0	$110,539	$0	$0	$0	$0
Transfer Station	$20,172	$0	$0	$0	$59,455	$0	$20,172	$0	$0	$0	$0
Total	$275,142	$0	$0	$314,896	$886,204	$566,773	$480,206	$717,315	$260,000	$271,000	$46,227

Appendix B: Level of Service Maps

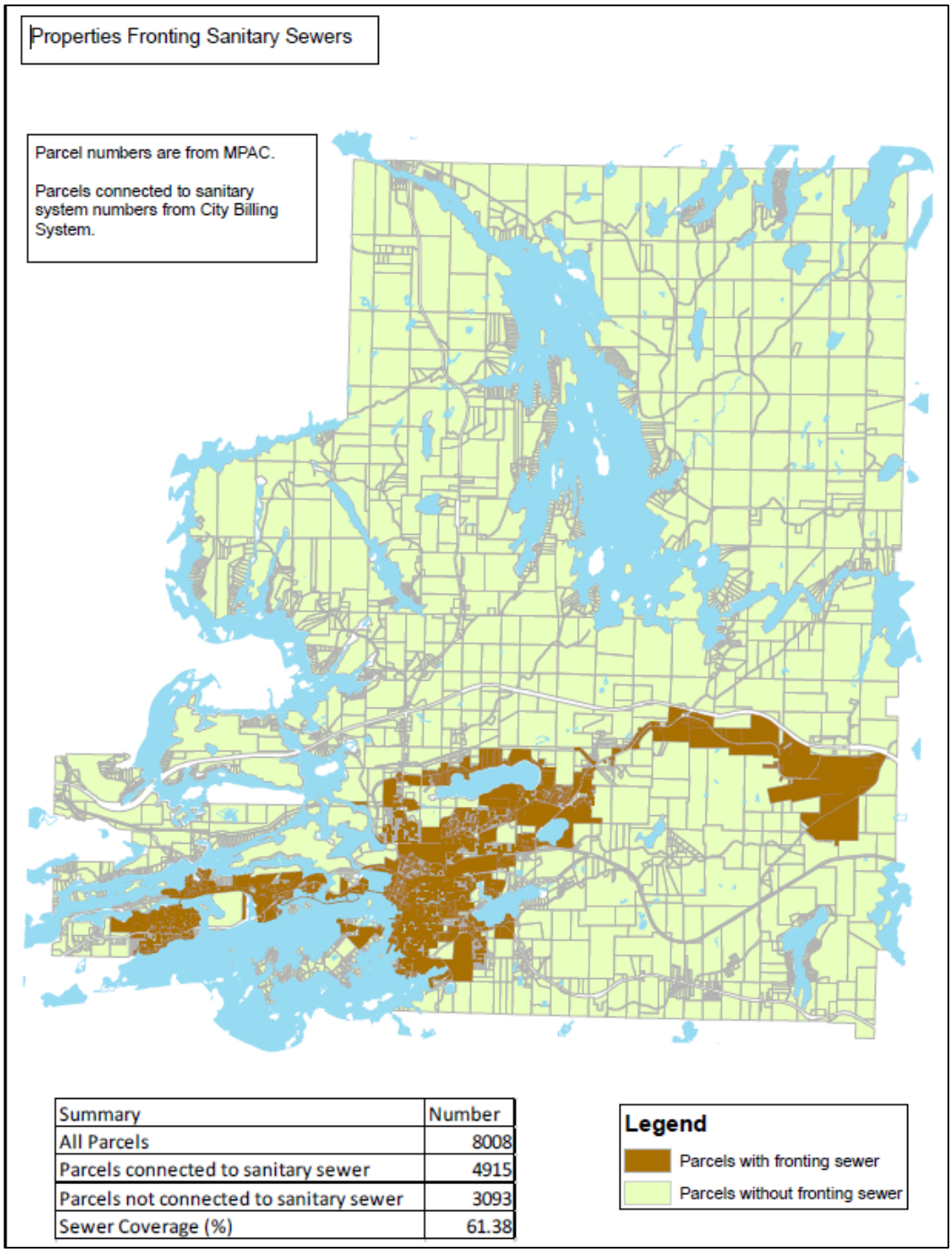
Road Network Map



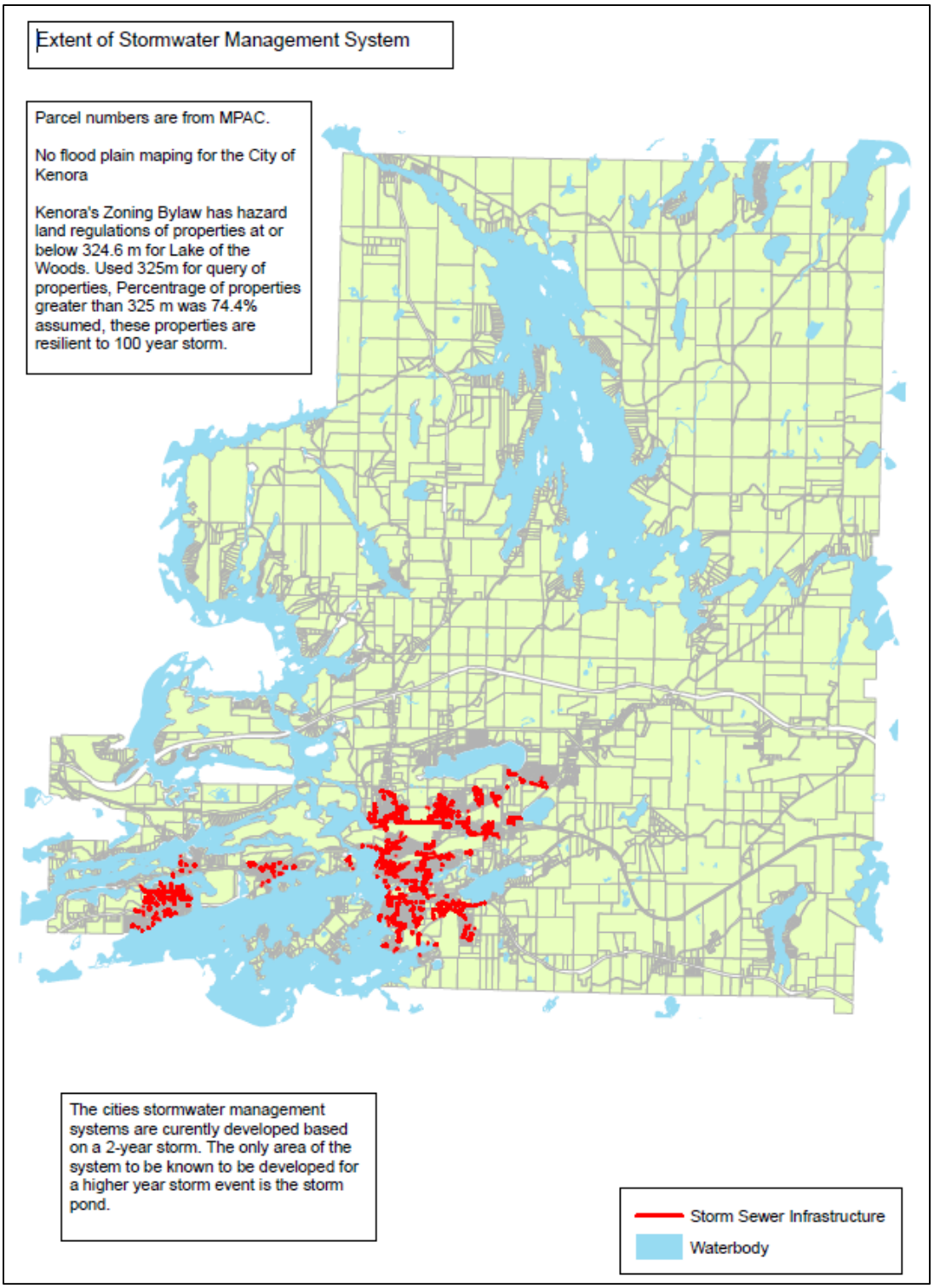
Water Network Map



Wastewater Network Map



Storm Sewer Network Map



Solid Waste System